May 2015

CATEGORICAL EXCLUSION
TYPE C

Project Number: P027002

To: Federal Highway Administration

From: SCDOT, Heather Robbins, NEPA Division Manager

Project: I-77 Roadway Widening and Improvements

Project Description

The South Carolina Department of Transportation (SCDOT) proposes to widen approximately seven miles of Interstate 77 (I-77), in both directions, from Percival Road/SC-12 (mile marker 15) on the southern terminus to Killian Road (mile marker 22) on the northern terminus and rehabilitate the pavement surface along the existing lanes from Two Notch Road (mile marker 17) to Killian Road. The project also includes rehabilitating approximately five miles of pavement on the existing I-77 southbound lanes from Killian Road (mile marker 22) to Blythewood Road/SC-59 (mile marker 27) in Richland County, South Carolina (see **Figure 1 and Figure 2 in Appendix A**). From Percival Road (SC 12) to I-20 and from SC 277 to approximately mile marker 25, the existing segments of I-77 within the project limits consist of three southbound travel lanes and three northbound travel lanes. From I-20 to SC 277 and from mile marker 25 to Blythewood Road (S-59), the existing segments of I-77 consist of two travel lanes in each direction. The widening includes adding a single travel lane to the existing median in each direction, improving various exit ramps, and widening ten mainline bridges along I-77. The rehabilitation includes removing the pavement surface along the existing lanes and replacing it with new pavement. The existing project corridor consists of various commercial buildings, including one gas station, residential areas, streams and wetlands. Construction is anticipated to begin in spring 2016.

Purpose and Need

The purpose of the proposed project is to improve operational efficiency and accommodate future traffic volumes along the interstate corridor by increasing I-77's capacity. The existing project limits do not provide enough travel lanes for the traffic through the area, resulting in traffic congestion starting as early as year 2017 when the segment of I-77 between SC 277 and Killian Road is projected to operate at level of service (LOS) E (see Table 1 below and **Appendix B** for traffic data). The proposed widening project will provide the required number of lanes to operate at LOS D or better for the entire project corridor through design year 2037. The goals and objectives of the proposed project are to promote economic benefit, while avoiding and minimizing environmental impacts and mitigating unavoidable impacts.

Table 1: Peak Hour Directional Volumes & LOS

Route	Termini From	Termini To	Year	Peak Hour Directional				
					No-Build		Build	
				Volume	Existing # of Lanes in Each Direction	LOS	Proposed # of Lanes in Each Direction	LOS
I-77	SC 12	I-20	2013	4,281	3	C	-	-
I-77	SC 12	I-20	2017	4,452	3	D	4	C
I-77	SC 12	I-20	2027	4,942	3	D	4	C
I-77	SC 12	I-20	2037	5,432	3	E	4	C
I-77	I-20	SC 277	2013	2,902	2	D	-	-
I-77	I-20	SC 277	2017	3,018	2	D	3	B
I-77	I-20	SC 277	2027	3,350	2	D	3	C
I-77	I-20	SC 277	2037	3,682	2	E	3	C
I-77	SC 277	Killian Road	2013	4,952	3	D	-	-
I-77	SC 277	Killian Road	2017	5,150	3	E	4	C
I-77	SC 277	Killian Road	2027	5,717	3	E	4	D
I-77	SC 277	Killian Road	2037	6,283	3	F	4	D

Source: SCDOT Average Annual Daily Traffic data, see **Appendix B**.

Reasonable Availability of Funding

This project was identified under Act 98 of 2013, which provided SCDOT additional funding for bridge, resurfacing, and mainline interstate projects. All projects identified for funding have been prioritized and selected based on Act 114 criteria, including at a minimum, financial viability, public safety, traffic volume and congestion, potential for economic development, truck traffic, pavement condition, environmental impacts, alternative transportation solutions, and consistency with local land use plans. The priority criteria for mainline interstate widening projects, including the proposed I-77 widening, includes traffic volume, public safety, truck traffic, pavement condition, financial viability, environmental impacts, and economic development. Act 98 provided an annual appropriation to SCDOT, which in turn will transfer an equivalent amount to the South Carolina Transportation Infrastructure Bank (SCTIB) to be used to finance mainline interstate improvements. The pavement rehabilitation portion of the project is funded by the Federal Highway Administration (FHWA) Interstate Program.

FHWA requires demonstration of fiscal constraint at the NEPA stage of project development. Fiscal constraint is met when the Long Range Transportation Plan (LRTP), Transportation Improvement Program (TIP) and the Statewide Transportation Improvement Program (STIP) have sufficient financial information for demonstration that a project in the Metropolitan Transportation Plan (MTP), TIP and STIP can be implemented using committed, available, or reasonably available revenue resources. FHWA's Office of Planning, Environment, and Realty issued an informational memorandum on January 28, 2008, explaining the relationship between certain Transportation Planning and Air Quality Conformity regulations and the timing of a final NEPA decision.

The total estimated project construction cost is $62.6 million and is outlined on page 26 and page 28 in the 2014-2019 STIP (Revision 10 – August 21, 2014).[1]

Preferred Alternative – Widening Inside to the Median

This alternative would widen I-77 from Percival Road to Killian Road by adding a single travel lane in each direction to the existing median and repaving existing lanes (see Figure 3 and Figure 4 below).

Alternatives Analysis

Three alternatives, including the Preferred and No-Build were considered. The No-Build alternative was carried forward for a baseline comparison of impacts. Only two alternatives (Alternative 1 – Widening Inside to the Median and Alternative 2 – Widening to the Outside of Existing Roadway) met the purpose and need for the project.

Alternative 1 (Preferred) – Widening Inside to the Median

This alternative consists of widening the interstate from Percival Road to Killian Road by adding a single travel lane in each direction to the inside (within existing median), improving various exit ramps, and widening ten mainline bridges along I-77. This alternative provides an additional travel lane and improves operational efficiency and LOS along the corridor with minimal environmental and community impacts. By widening to the inside, the project would have no affect to cultural resources, and require no new right-of-way. This alternative would impact freshwater wetlands and streams and is anticipated to require a Section 404 Individual Permit (IP) with the expectation of reducing stream impacts through design minimization to an amount within the impact thresholds of the SCDOT General Permit (GP).

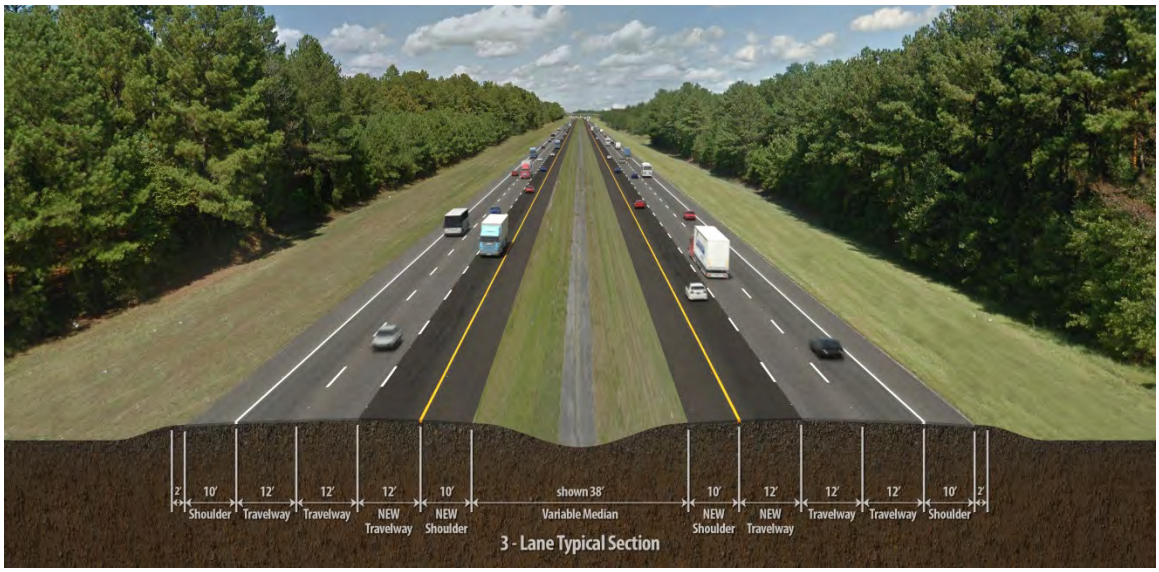

Figure 3: Proposed Typical 6-lane section
I-20 to SC 277

[1] SCDOT Statewide Transportation Improvement Program. 2013. *STIP 2014-2019*. *South Carolina's Six Year Transportation Program: October 1 – September 30, 2019*. Approved August 15, 2013.

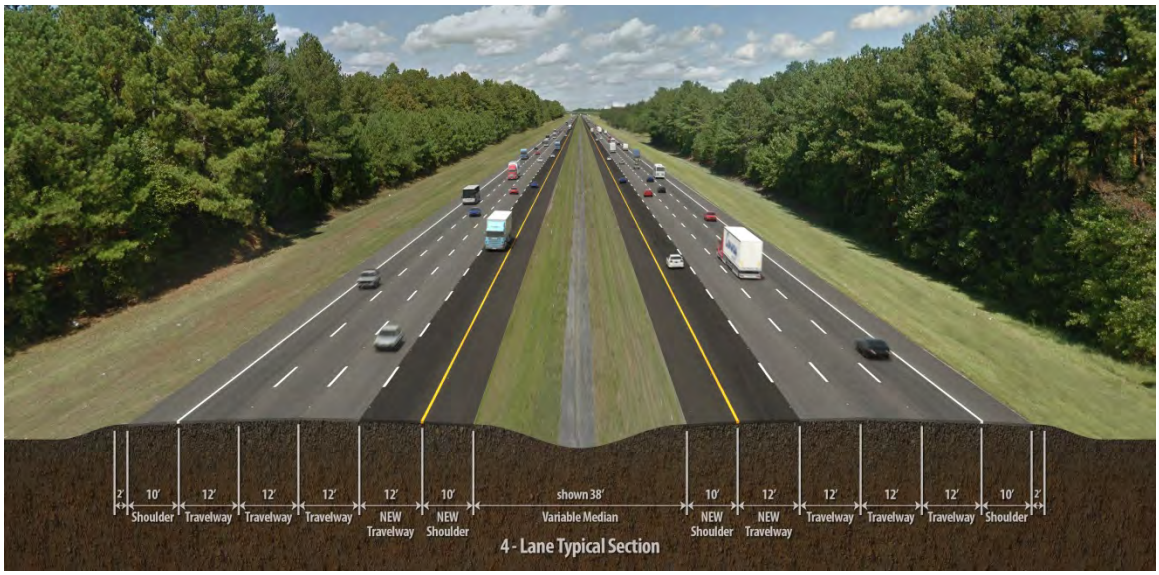

Figure 4: Proposed Typical 8-lane section
Percival Road (SC 12) to I-20 and SC 277 to Killian Road

Alternative 2 – Widening to the Outside of Existing Roadway

This alternative consists of widening the interstate from Percival Road to Killian Road by adding a single travel lane in each direction to the outside of the existing roadway. This alternative provides an additional travel lane and would improve operational efficiency and LOS along the corridor with minimal community impacts. By widening to the outside, the project would likely result in utility impacts and require new right-of-way. In addition, this alternative would have potential effects to cultural resources within previously undisturbed areas of the project corridor and impact greater than 0.30 acre of freshwater wetlands and greater than 300 linear feet of streams, which would require a Section 404 IP. This alternative would have greater wetland and stream impacts than Alternative 1 and due to the increased stream and wetland impacts, would result in increased costs for mitigation.

Table 2: Alternative Comparison

Alternative	Proposed New Right-of-Way (acres)	Estimated Stream Impacts (linear feet)	Estimated Wetland/Open Water Impacts (acres)	Estimated Mitigation Costs ($)*
Alternative 1 – Widening inside to the median	0	317	0.09	198,125
Alternative 2 – Widening to the outside of existing roadway	~0.50	1,090	0.73	900,425

*Mitigation costs are based on current wetland and stream credit pricing and subject to change and credit availability.

Alternative 3 – No-Build

This alternative would propose no new design changes and would maintain the existing lane configuration. The LOS, operational efficiency, and interstate capacity would not be improved and accommodation would not be made for future traffic volumes; therefore, the No-Build alternative would not meet the purpose and need of the project and was therefore, eliminated from further consideration.

Comparison of Alternatives

Table 2 summarizes the impacts associated with each alternative. The analysis shows that Alternative 1 (the Preferred Alternative) would result in less overall project costs, taking into account wetland and stream mitigation costs, and right-of-way acquisition. Alternative 1 would result in less impact to streams and wetlands than Alternative 2. Alternative 1 best meets the purpose of the project while minimizing costs and impacts to the human and natural environment.

Socioeconomics and Demographics

As of 2010, Richland County has an estimated resident population of 384,504, making it the second most populated county in the state (out of 46 counties total) (US Census Bureau 2010)[2] (Table 3). Richland County had a 19 percent growth rate between the years of 2000 and 2010, the eighth fastest growing county in South Carolina. This trend of population growth is expected to continue with a 70 percent increase expected between 2000 and 2030 in Richland County.

Table 3: Estimated and Projected Population, Richland County

2000 Census	2010 Census	2009 Projection	2010 Projection	2020 Projection	2030 Projection	% Growth 2000-2030
320,677	384,504	404,400	424,300	440,100	456,000	70.3

Sources: http://www.sccommunityprofiles.org/census/proj_c2010.php
http://www.sccommunityprofiles.org/census2010data.php

Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations directs federal agencies to analyze "the environmental effects, including human health, economic and social effects, of Federal actions, including effects on minority communities and low income communities" when doing a NEPA analysis. The project corridor includes portions of seven Census Tracts (CT) (see **Figure 5 in Appendix C**):

- CT 101.02
- CT 113.03
- CT 113.04
- CT 113.05
- CT 114.04
- CT 114.12
- CT 9801

[2] US Census Bureau. 2010 Census. American FactFinder. Accessed April 6 and 7, 2015. Available from: http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml

Socioeconomic data was obtained for these tracts from the 2010 Census including population, income, education levels, and housing characteristics for those living near the project corridor (See **Table 6** in **Appendix C**).

Approximately 35,000 people live in the CTs encompassing the project corridor. The population within the referenced CTs ranges from 23 percent to 50 percent white (average of 32 percent for all seven CTs), which is on average lower than Richland County's percentage (47 percent) and the state percentage (66 percent). The median age for those living in the CTs encompassing the project corridor is 31 to 39.5 years of age (average of 35 years old). This is slightly higher than the median age for Richland County (33 years old) and slightly lower than the median age for the state (38 years old). The median household income in the relevant CTs is equal to the levels for Richland County and the state. The percentage of individuals living below the poverty level is on average lower (13 percent) than the county and state percentages (17 and 18 percent, respectively). Based on this data, there are no disproportionate impacts to Environmental Justice populations.

Acquisitions/Displacements

After review of the proposed project, it has been determined that the project would not result in the relocation/displacement of any commercial or residential establishments. No new right-of-way will be acquired.

If any relocations or displacements were required, the SCDOT would process any new right-of-way acquisitions and relocations in compliance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (42 United States Code [U.S.C.] 4601 *et seq*.). The purpose of these regulations is to ensure that owners of real property to be acquired for Federal and federally-assisted projects are treated fairly and consistently, to encourage and expedite acquisition by agreements with such owner, to minimize litigation and relieve congestion in the courts, and to promote public confidence in Federal and federally-assisted land acquisition programs.

Public Involvement

A Public Information Meeting (PIM) was held to inform local residents, businesses and local emergency responders about the project and to involve them in the project development process. Notice of the meeting was published in *The State* newspaper on March 2, 2015 and posted on SCDOT online and on social media (Twitter and Facebook) on March 9, 2015. The meeting was held on Tuesday, March 17, 2015 from 5 pm to 7 pm at Centura College, located at 7500 Two Notch Road, Columbia, South Carolina. Large displays showing the proposed project were available at the meeting for the public to review. SCDOT, FHWA, and design team personnel were readily available for attendees to discuss the project and answer questions. Project summary handouts and comment forms were provided and tablet computers were available to the public for completing electronic comment forms. Thirty-three (33) people attended the meeting. All attendees were encouraged to provide their concerns regarding the project. The comment period ended on April 1, 2015. As a result of the PIM a total of 10 written comments were received. Two comments were received by phone call prior to the meeting (See **Appendix D** for PIM documents). The majority of respondents were in support of the proposed project.

Section 106 - Cultural Resources (Archaeological/Historic)

In accordance with Title 36 Code of Federal Regulations (CFR), Part 800.4 (36 CFR 800.4), background research and an intensive architectural survey of the project's Area of Potential Effects (APE) was conducted in September 2014 to determine if previous cultural resources investigations and previously identified archaeological sites are located in the project limits. The APE extends 300 feet on either side of the road centerlines and is at least 600 feet wide. The architectural survey investigations identified five historic architectural resources within the APE, recommended not eligible for the National Register of Historic Places (NRHP). Three previously identified archeological sites are located within one-quarter mile of the project area. No previously identified historic architectural resources are located within one-quarter mile of the project area. Construction will take place within the existing right-of-way and the majority of construction will occur within previously disturbed areas of the project corridor; therefore, no archaeological investigations are required because the APE was previously disturbed. On March 6, 2015, the State Historic Preservation Office (SHPO) concurred with the findings that no historic properties will be affected by the proposed undertaking. On March 17, 2015 the Catawba Indian Nation-Tribal Historic Preservation Office concurred with the findings (see Archaeological Field Report and concurrences in **Appendix E**).

Section 4f/6f Resources

The basic purpose of Section 4(f) documentation is to protect "public parks and recreation lands, wildlife, and waterfowl refuges, and historic sites" from encroachment by public transportation facilities. In addition to mandating the physical protection of certain lands, (avoiding unintended physical "use" of them), Section 4(f) also addresses proximity impacts such as noise and vibration which may constitute a "constructive use" without actually intruding into the protected area. The FHWA rules require that when the physical location of a project will produce severe impacts to the activities, features, or attributes of a publicly owned park, recreation area, or wildlife and waterfowl refuge, or any significant historical site, then a Section 4(f) Evaluation must be completed. No Section 4(f) resources were identified within the project boundaries and thus there are no anticipated impacts to these resources.

Section 6(f) resources are places such as public parks, trails, courts, and other recreational areas that were purchased in part through federal grants from the Land and Water Conservation Fund Act of 1965 and are protected from conversion to non-public recreational uses. No Section 6(f) properties are located within the project limits and thus there are no anticipated impacts to these resources.

Water Quality

The South Carolina Department of Health and Environmental Control (SCDHEC) conducts water quality assessment and protection on a watershed basis. SCDHEC has assigned a classification to each State Water based on the desired uses of each waterbody, not on natural or existing water quality. Classifications protect waters for recreation, ecological resources, fish and aquatic life survival and propagation, and industrial and agricultural uses. Each classification has specific pollutant thresholds. Waters that exceed the threshold for their specific classification are targeted for water quality management action and are listed on the State of South Carolina Section 303(d) List. Monitoring stations around the state provide the data necessary to assess the quality of surface waters.

In November 2014 and April 2015, the SCDHEC's Water Quality and Watersheds tools were accessed to determine if any impaired waters were located within one-quarter mile upstream or downstream of the project area. No impaired waters were identified within one-quarter mile of the project area. . Within the project area, the Broad River and Gills Creek tributaries, including Crane Creek, Cumbess Creek, and Jackson Creek are classified as Fresh Water (FW) according to SCDHEC's water classification system (R.61-68-Water Classifications and Standards, effective June 22, 2012)[3] (see Permit Determination Form in **Appendix F**).

The project corridor is located within two total maximum daily load (TMDL) watersheds. The southern portion of the project corridor, between Percival Road and Farrow Road, is located in the Gills Creek watershed, or hydrologic unit 03050110-02. SCDHEC developed a dissolved oxygen (DO) TMDL for two monitoring stations, C-048 and C-017, within the Gills Creek watershed. The two stations were included as impaired on the state's 2008 §303(d) list due to low DO concentrations. Water quality monitoring (WQM) station C-017 is located on Gills Creek at Bluff Road, over nine miles south of the project corridor. WQM station C-048 is located along the project corridor on Jackson Creek at Windsor Lake spillway on Windsor Lake Boulevard. According to SCDHEC Technical Document: 011N-18, possible causes of low DO in the watershed include wildlife, failing septic systems, illicit connections, leaking sewers, sanitary sewer overflows, illicit dumping in water bodies, natural biochemical oxygen demand in swamps, agricultural runoff, pet wastes, and stormwater runoff. WQM Station C-048 currently supports water quality standards and it, as well as the associated stream segment, is no longer included on the 2014 §303(d) list.[4]

The northern portion of the project corridor, between Farrow Road and Blythewood Road, is located in the Crane Creek – Broad River watershed, or hydrologic unit 03050106-07. In 2005, SCDHEC established a TMDL for fecal coliform for the Broad River, which includes the Crane Creek – Broad River watershed. WQM station B-110 is located over one mile downstream of the I-77 project on the Elizabeth Lake Spillway. In 2004, WQM station B-110 barely surpassed the threshold of no more than ten percent of the instantaneous samples (400 colony forming units/100 milliliters). According to the SCDHEC Technical Report Number: 028-05, the most probable sources of fecal coliform loading at WQM station B-110 are from stormwater runoff within MS4 areas and nonpoint sources such as failing onsite waste disposal systems, leaking sewers, pets, and wildlife. As of 2014, WQM station B-110 fully supports recreational uses and is not listed for fecal coliform impairments.[5]

[3] South Carolina Department of Health and Environmental Control (SCDHEC). 2012. *R.61-68, Water Classifications & Standards.* Effective June 22, 2012.

[4] SCDHEC. 2010. Total Maximum Daily Load for Gills Creek Watershed. SCDHEC Monitoring Stations: C-048, C-017 (Hydrologic Unit Codes: 03050110-0201, -0202, -0203) Dissolved Oxygen. *SCDHEC Technical Document: 011N-18*.

[5] SCDHEC. 2005. Total Maximum Daily Loads for Fecal Coliform for Turkey Creek, Meng Creek, Browns Creek, Gregorys Creek, Dry Fork, Sandy River, Elizabeth Lake, Little River, Winnsboro Branch, Jackson Creek, and Mill Creek watersheds and the lower portion of the Upper Broad River, South Carolina. Hydrologic Unit Code: 03050106 (B-086, B-136, B-064, B-243, B-155, B-335, B-046, B-074, B-075, B-110, B-316, B-280, B-337, B-145, B-350, B-123, B-077, B-102, B-338). *SCDHEC Technical Report Number: 028-05*.

Section 402 of the Clean Water Act (CWA) provides for various National Pollutant Discharge Elimination System (NPDES) permits, including stormwater discharges from land disturbing activities. SCDHEC administers the NPDES permitting program in the state. To minimize water quality impacts, SCDOT would implement its Erosion and Sediment Control Program, as approved by SCDHEC, during the construction phase of the project. Erosion and sediment control measures would be included in construction contract specifications. A NPDES permit would be acquired before the proposed construction begins. As the operator of a large Municipal Separate Storm Sewer System (MS4), SCDOT is also required to obtain NPDES permit coverage to discharge pollutants into Waters of the State, in accordance with its MS4 Permit.

The proposed project is not expected to have long-term impacts to water quality in the watersheds. Stormwater control measures, both during construction and post construction, are required for SCDOT projects with land disturbance and/or construction near §303(d), TMDL, outstanding resource waters (ORW), tidal, and other sensitive waters in accordance with the SCDOT's MS4 Permit.

The contractor would also be required to minimize potential stormwater impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650B and SCDOT's *Supplemental Specifications on Seeding and Erosion Control Measures* (January 01, 2015). SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction.

Wetlands and Streams

The United States Army Corps of Engineers (USACE), through Section 404 of the CWA, has regulatory authority over waters of the U.S., including wetlands. This authority empowers the USACE to identify wetland/upland boundaries and to regulate alterations of jurisdictional wetlands. These boundaries are established in accordance with the methodology in the 1987 Corps of Engineers Wetlands Delineation Manual. A jurisdictional delineation of the project corridor was conducted in August 2014 for the presence of jurisdictional waters of the U.S., including wetlands and streams. The jurisdictional delineation identified areas of freshwater wetlands, lakes or open water, and streams within the project corridor. A request for verification of the delineated features was submitted to the USACE on January 23, 2015. A field verification meeting was conducted with the USACE on May 12, 2015. The USACE approved the approximate-preliminary jurisdictional delineation on PENDING DATE. A copy of the USACE's approval letter and jurisdictional delineation maps are included in **Appendix F** (PENDING).

Permitting

A USACE Section 404 permit is required for impacts to jurisdictional waters of the U.S., including wetlands. Section 404 of the CWA is administered by the USACE. Depending on the type and extent of jurisdictional waters of the U.S., including wetlands, to be affected, Section 404 permitting requirements can range from activities that are considered exempt or preauthorized to those requiring preconstruction notification (PCN) for a Nationwide Permit (NWP), SCDOT GP, or IP from the USACE.

Based on preliminary design and estimates, impacts to jurisdictional streams slightly exceed 300 linear feet of impacts and trigger an IP; however, due to the intent to deliver this project under a design-build contract, SCDOT anticipates that avoidance and minimization efforts, including, but not limited to reducing the construction footprint, can minimize impacts to jurisdictional waters of the U.S. within the threshold of a SCDOT

GP. Under the SCDOT GP, impacts are not to exceed 3.0 acres of freshwater impacts and/or 300 linear feet of jurisdictional stream impacts. Based on preliminary coordination, compensatory mitigation for wetland and stream impacts would require purchasing mitigation credits from an approved mitigation bank, based on credit availability. Permittee-responsible mitigation to cover the mitigation credits may be required if no credits are available at the time of permitting. The required mitigation for this project will be determined during final design through consultation with SCDOT, the USACE and other resource agencies. Estimated preliminary impacts to waters of the U.S. are in Table 4 below.

Table 4 - Amount of impact to Waters of the U.S. (Preferred Alternative)

Wetland Type	Approximate Amount of Waters	Estimated Amount of Impact	Estimated Mitigation Credits
Freshwater wetlands	4.5 acres	0.02 acre	0.22
Open water (lakes/ponds)	2.1 acres	0.07 acre	0.78
Jurisdictional streams	5,580 linear feet	317 linear feet	1,457

SCDHEC administers the Water Quality Certification program pursuant to Section 401 of the CWA. Section 401 requires that the state issue certification for any activity which requires a USACE Section 404 permit and may result in a discharge to State waters. All activities requiring a Section 404 permit result in a discharge to waters or wetlands. Therefore, SCDHEC must take certification action on all Section 404 permit applications. The Section 404 permit is not valid until Section 401 certification is approved.

Floodplains

The stream crossings at Crane Creek, Cumbess Creek, Jackson Creek, and Little Jackson Creek are located in special flood hazard area Zone AE, areas of high risk for flooding subject to inundation by the 1 percent annual-chance flood where base flood elevations are shown. Each of these crossings is eligible for “No-Rise” certifications since there will be no anticipated change in the 100-year flood elevations. The remainder of the proposed project area is located within Zone X, an area of minimal flood hazard outside of the 0.1 percent and 0.2 percent annual-chance (500-year) flood area, as defined by the Federal Emergency Management Agency (FEMA). FEMA Flood Insurance Rate Maps (FIRMs) for the project are in **Appendix G**. All major bridge and culvert crossings contain the floods with no overtopping of the roadway. Based on the hydraulic analysis of the preconstruction and post construction discharges, the planned roadway improvements will have no significant impact on either flood elevations or flood widths (**Appendix G**). A floodplain checklist was completed and can also be found in **Appendix G**.

Essential Fish Habitat

No essential fish habitat is present within the project limits.

Threatened and Endangered Species

A field survey of the project area, consisting of the project corridor within the existing SCDOT right-of-way (approximately 120 feet from the centerline of the northbound and southbound lanes and ramps) was conducted pursuant to Section 7 of the Endangered

Species Act. The following list of endangered (E), threatened (T), and candidate (C) species within Richland County was obtained from the U.S. Fish and Wildlife Service (USFWS) in October 2014 and then verified in February 2015:

Table 5 – Federally Protected Species in the Project Area

	Federally Protected Species	Scientific Names	Federal Status
Animals	Atlantic Sturgeon	*Acipenser oxyrinchus*	E
	Carolina heelsplitter	*Lasmigona decorate*	E
	Red-cockaded woodpecker	*Picoides borealis*	E
	Shortnose sturgeon	*Acipenser brevirostrum*	E
	Wood stork	*Myceteria americana*	E
	Bald Eagle	*Haliaeetus leucocephalus*	BGEPA*
Plants	Canby's dropwort	*Oxypolis canbyi*	E
	Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E
	Smooth coneflower	*Echinacea laevigata*	E
	Georgia aster	*Symphyotrichum georgianum*	C

*Federally protected under the Bald and Golden Eagle Protection Act (BGEPA)

A survey of bird species nesting under bridges within the proposed project corridor was conducted in August 2014 in compliance with the Migratory Bird Treaty Act. During the survey, barn swallow nests were found under bridges at the following locations: I-20, Two Notch Road, State Route 277 Ramp, Farrow Road, and Hard Scrabble Road (S40-83). In accordance with the Migratory Bird Treaty Act, a full survey of these nests and coordination with the USFWS will be performed prior to any permit submittal and/or construction activity.

Methods

The project area was initially surveyed in the field in August 2014 for endangered and threatened species. Habitats surveyed were determined by each species' ecological requirements.

Results

Based on the literature and field visits it was determined that rough-leaved loosestrife and smooth coneflower are the only species which may be affected by the proposed project. For the rough-leaved loosestrife, although no individuals were identified during the survey, this plant was past its seasonal flowering stage (spring); thus identification may have proved difficult. Additionally, South Carolina Department of Natural Resources (SCDNR) data indicates that an area of potential habitat does exist in the southern portion of the proposed project boundary. Therefore, the proposed project may affect, but is not likely to adversely affect this species. For the smooth coneflower, although no individuals were identified during the survey, this plant was past its seasonal flowering stage (May through July); thus identification may have proved difficult. Additionally, one of its preferred habitats is along roadsides; therefore, this project may affect, but is not likely to adversely affect this species. A copy of the biological assessment as well as the USFWS concurrence letter (dated February 20, 2015) can be found in **Appendix H**.

Noise

In accordance with 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," effective July 2011 and the SCDOT *Traffic Noise Abatement Policy*, effective September 1, 2014, a noise analysis is required for proposed federal-aid highway projects that will physically alter an existing highway or increase the number of

through-traffic lanes. A noise analysis was conducted to evaluate the existing noise levels and potential noise impacts associated with the proposed project. A copy of the noise analysis report can be found in **Appendix I**. The existing (2017) and design year (2037) traffic noise levels for the existing, No-Build, and build alternatives were predicted for noise sensitive sites (each representing one noise sensitive receptor) using the FHWA's latest traffic noise modeling software, Traffic Noise Model (TNM), version 2.5. A receptor is a discrete or representative location of a noise sensitive site or area based on the land use category. Existing land uses within the corridor are mainly residential (category B) with various category C (golf course/cemetery), category D (church/hospital), and category E (hotel/office) land uses in the corridor. Existing traffic noise levels were measured in the field and then compared against TNM results to verify the accuracy of the traffic noise model. If the modeled and measured levels are within plus or minus 3 A-weighted decibels (dBA) of one another, this is an indication that the model is within the accepted level of accuracy.

Approximately 459 noise sensitive receptors were identified within the project area. Based on the noise analysis, the project is anticipated to generate noise impacts at 249 of the 459 noise sensitive receptors along the project corridor.

When traffic noise impacts are identified, FHWA and SCDOT require that noise abatement be evaluated for feasibility and reasonableness. Noise abatement was evaluated for the affected receptors. The most feasible abatement measure for the project was noise barriers. A noise barrier evaluation was performed to determine whether feasible and reasonable barriers could be constructed at the noise sensitive sites as means to reduce or eliminate traffic noise impacts. Sixteen areas within the project corridor were evaluated for noise barriers in accordance with SCDOT guidelines. The noise barriers evaluated were either unable to achieve a 5 dBA reduction for at least 75 percent or more of the affected receptors, unable to achieve an 8 dBA reduction for at least 80 percent of the benefited receptors, or are not cost effective. If the cost per benefitted receptor is more than $30,000 then the barrier is determined to not be cost effective. Therefore, noise barriers were evaluated, but not proposed. Noise abatement measures were found to be not feasible and reasonable per SCDOT guidelines and there appears to be no feasible and reasonable solutions available to mitigate the noise impacts.

Mobile Source Air Toxics (MSATs)

The purpose of this project is to improve operational efficiency and accommodate future traffic volumes along the interstate corridor in Richland County. Richland County is currently in attainment with national ambient air quality standards. This CE includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this CE. Due to these limitations, the following discussion is included in accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

Evaluating the environmental and health impacts from MSATs on a proposed highway project would involve several key elements, including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

As discussed above, in Appendix C of FHWA's December 6, 2012 guidance, "Interim Guidance Update on Air Toxic Analysis for NEPA Documents," technical shortcomings of emissions and dispersion models and uncertain science with respect to health effects prevent meaningful or reliable estimates of MSAT emissions and effects of this project. Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis. A qualitative analysis provides a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the various alternatives. The qualitative assessment presented below is derived in part from a study conducted by the FHWA entitled *A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives*, found at: www.fhwa.dot.go/environment/air_quality/air_toxics/research_and_analysis/methodology/methodology00.cfm

For each alternative in this CE, the amount of MSATs emitted would be proportional to the vehicle miles traveled (VMT), or Average Annual Daily Traffic (AADT), assuming that other variables such as fleet mix are the same for each alternative. The AADT estimated for each of the Build Alternatives (96,000 vehicles per day projected for 2035) is slightly higher than that for the No-Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in AADT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to the U.S. Environmental Protection Agency's (EPA) MOVES2010b model, emissions of all of the priority MSAT decrease as speed increases. Because the estimated AADT under each of the Alternatives are nearly the same, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by over 80 percent between 2010 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, AADT or VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes contemplated as part of the Alternative 2 (Widening to Outside of Existing Roadway) would have the effect of moving some traffic closer to nearby homes, schools and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under Alternative 2 than Alternative 1 (Preferred Alternative) and the No-Build Alternative. However, the magnitude and the duration of these potential increases compared to the No-Build alternative and Alternative 1 cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. In sum, when a highway is widened, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No-Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSAT will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT

levels to be significantly lower than today. Alternative 1 (Preferred Alternative) would widen the roadway inside to the median, away from potential receptors. Localized increases in MSAT concentrations are not anticipated under Alternative 1 (Preferred Alternative).

Land Use

The proposed project is located in the City of Columbia and unincorporated areas of Richland County, South Carolina. Land use in the surrounding areas consists of commercial and residential development with various golf courses, cemeteries, churches, hospitals, and hotels and wooded areas immediately adjacent to the roadway. Residential and mixed-use developments are planned near Blythewood Road and Killian Road and the roadway improvements provide economic benefit. The proposed project is not expected to modify existing land use or change the timing or density of development in the area. The project is not in conflict with any plan, existing land use, or zoning regulation.

Farmlands

The project has been assessed under the provisions of the Farmland Protection Policy Act (FPPA) of 1981. The FPPA outlines several different criteria that determine the presence of prime farmland. Prime farmland is land that is best suited for producing high yield crops because of soil quality, growing season, and moisture content. These criteria were scored on a Farmland Conversion Impact Rating Form for Corridor Type Projects (NRCS-CPA-106). Sites that score above 260 points total are eligible for protection under the FPPA, while sites receiving lower ratings are considered less eligible. Sites that score less than 160 points do not meet the criteria for FPPA protection. The total score is comprised of (1) the Relative Value of Farmland score and (2) the Total Corridor Assessment score. The Relative Value of Farmland (to be converted by the referenced alternative) score is assessed on a scale of 0 to 100. The Total Corridor Assessment score pertains to the use of land, the availability of farm support services, investments in existing farms, and the amount of land that could be rendered non-farmable due to construction of the proposed project. The Total Corridor Assessment has a scale of 0 to 160 points. According to an agreement with Natural Resources Conservation Service (NRCS), SCDOT and FHWA, if a site's Total Corridor Assessment score (NRCS-CPA-106 Form Section VI) is less than 100 points, Sections III, IV and V do not need to be completed and no additional assessment by the NRCS district office would be necessary. The Preferred Alternative received a Total Corridor Assessment score of 35. Since this Total Corridor Assessment score does not exceed the 100-point threshold described above, further coordination with NRCS and mitigation actions are not required. Refer to **Appendix J** for the Farmland Impact Conversion Rating Forms for Corridor Type Projects form (NRCS-CPA-106).

Hazardous Materials

The area directly adjacent to the interstate corridor outside of the existing right-of-way predominately consists of woody area, private property, and commercial buildings with low potential for underground storage tanks (USTs). Therefore, there is low potential for uncovering USTs or other hazardous-material-containing sites during construction activities for the Preferred Alternative or Alternative 2.

An examination of the project area within a one-half mile radius of the corridor and review of environmental records available at SCDHEC was conducted to determine if any sites with potential or existing environmental contamination were present within or

directly adjacent to the project corridor. The project corridor is the existing right-of-way, approximately 120 feet from the centerline of the northbound and southbound lanes and ramps. Databases included, but were not limited to, above ground storage tanks (ASTs), USTs, leaking underground storage tanks (LUSTs), dry cleaners, and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites. The records review indicated that three USTs are within or abutting the project corridor (see **Figures 6a, 6b, and 6c in Appendix K**). The first UST site is Site #18025 (Pantry Express 600), associated with an existing Shell gas station located at 1909 Percival Road. The site is on the west side of Percival Road, approximately 100 feet outside of the I-77 right-of-way and is approximately 800 feet outside (southeast) of the construction limits. The second site, Site #09938 (Blue Cross Blue Shield of SC), is located at 2501 Faraway Drive on the southeast quadrant of I-77 and I-20. The site is approximately 200 feet outside of the right-of-way for the I-77 off-ramps to I-20 and is an abandoned UST (abandoned in 1991) that was subsequently removed. Releases were reported in 1993 and no compliance was required. The third site, Site #07474 (Rent-All Shops), is located at 7809 Two Notch Road on the southwest quadrant of Two Notch Road and I-77, less than 150 feet outside of the I-77 right-of-way. It is an abandoned UST (abandoned in 1993) that was subsequently removed. Releases were reported in 1993 and no compliance was required. This site is approximately 200 feet outside and up gradient of the construction limits. The proposed project will not require any new right-of-way and the sites are outside and/or up gradient from the proposed construction limits for the Preferred Alternative and Alternative 2; therefore, no further investigation is required.

It is SCDOT's practice to avoid the acquisition of USTs and other hazardous waste materials, if at all possible. If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated with petroleum products were encountered during construction, SCDHEC will be informed. If stained soils or potentially hazardous materials are identified during construction, further investigation in the form of Phase I Environmental Site Assessment may be required to assess potential recognized environmental concerns. Hazardous materials will be tested and removed and/or treated with the U.S. Environmental Protection Agency (EPA) and SCDHEC requirements, if necessary.

The bridges within the project corridor were assessed for lead based paint and asbestos. Lead-based paint exceeding the SCDHEC disposal limit of 0.7 milligrams (mg)/centimeters squared (cm^2) was detected in the green painted bolt plates, I-beams and braces of the I-77 bridges over Edgewater Drive and in the green painted bolt plates and I-beams braces of I-77 bridges over I-20 and I-20 ramp. Lead-based paint exceeding the SCDHEC disposal limit was also detected in the green painted bolt plates and I-beams of the I-77 bridges over the I-77 ramp near the I-20 traffic interchange and in the green painted bolt plates of the I-77 bridge over Windsor Lake Boulevard. In addition, lead-based paint exceeding the SCDHEC disposal limit was detected in the gray painted bolt plates of the I-77 bridges over Windsor Lake and although the traffic striping on the I-77 roadway throughout the project limits could not be sampled due to traffic safety reasons, it is presumed that the I-77 striping is lead-containing. Destructive actions (sanding, burning, demolition, component removal, paint preparation) to the lead-containing paint surfaces will require the contractor to comply with the standards of SCDHEC and Occupational Safety and Health Administration (OSHA), including but not limited to proper disposal, initial exposure monitoring, the use of personal protective equipment, and medical surveillance. If additional painted components are discovered during renovation activities, the paint should be tested prior to any destructive actions (sanding, burning, demolition, component removal, paint preparation) or disposal.

SCDHEC Regulation 61-107.19 permits demolition materials painted with lead-based paint (≥ 0.7 mg/cm^2) to be disposed in a permitted Class Two (C&D) or Class Three Subtitle D, Municipal Solid Waste (MSW) landfill. However, accumulations of paint waste (chips, dust, or flakes) from the identified areas of lead-based paint may be classified as hazardous waste, which requires disposal in a Subtitle C (hazardous waste) landfill. The hazardous waste regulations include Title 40 Code of Federal Regulations parts 260 through 272. A sample of accumulated paint waste should be collected for analysis via Toxicity Characteristic Leaching Procedure (TCLP) to determine the waste's lead content and hazardous waste characteristics.[6]

The EPA and SCDHEC define materials as asbestos-containing if an asbestos content greater than one percent (>1%) is detected in a representative sample. Asbestos in concentrations greater than 1 percent was not identified in any of the structures sampled. If additional suspect materials are discovered during the planned renovation activities, bulk samples must be collected and analyzed for asbestos content prior to continuation of work. Prior to the demolition of any regulated facility or structure, written notification must be submitted to SCDHEC at least ten working days in advance of the demolition.

Community Impacts within the Project Corridor

The public information meeting indicated that there is general support of the proposed project. The comments received included a desire to extend the widening of I-77 to Blythewood Road and to improve the Killian Road traffic interchange. Overall under the Preferred Alternative, there would be no significant adverse effect on public facilities, businesses, or services as a result of the proposed project; nor is the proposed project expected to adversely affect the social environment or local economy.

[6] S&ME. 2014. *Asbestos & Lead-Based Paint Assessment Report.* December 2, 2014.

Environmental Commitments

Permitting

Impacts to jurisdictional waters will be permitted under a Department of the Army Section 404 permit from the U.S. Army Corps of Engineers (USACE). Based on preliminary design, it is anticipated that the proposed project would be permitted under SCDOT's General Permit (GP). SCDOT will provide the USACE with information regarding any proposed demolition and construction activities during the Section 404 permitting process.

The required mitigation for this project will be determined through consultation with the USACE and other resource agencies. A detailed stream and wetland compensatory mitigation plan will be developed once final design is complete.

A NPDES permit would be acquired before the proposed construction begins. As the operator of a large Municipal Separate Storm Sewer System (MS4), SCDOT is also required to obtain NPDES permit coverage to discharge pollutants into Waters of the State, in accordance with its MS4 Permit.

Water Quality

Stormwater control measures, both during construction and post construction, are required for SCDOT projects constructed near §303(d), TMDL, outstanding resource waters (ORW), tidal, and other sensitive waters in accordance with SCDOT's MS4 Permit.

The contractor would be required to minimize potential stormwater impacts through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and the SCDOT's *Supplemental Specifications on Seeding and Erosion Control Measures* (January 01, 2015). Other measures including seeding, silt fences and sediment basins, as appropriate will be implemented during construction to minimize impacts to Waters of the U.S.

Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act, 16 USC § 703-711, states that it is unlawful to pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried or received any migratory bird, part, nest, egg or product, manufactured or not.

The Department will comply with the Migratory Bird Treaty Act of 1918 in regard to the avoidance of taking of individual migratory birds and the destruction of their active nests. Prior to construction/demolition of the bridges the Resident Construction Engineer (RCE) will coordinate with SCDOT Environmental Services Office to determine if there are any active nests on the bridges. After this coordination, it will be determined whether construction/demolition can begin. After construction/demolition has begun, measures can be taken to prevent birds from nesting, such as screens, noise producers, and deterrents etc. If during construction or demolition a nest is observed on the bridge that was not discovered during the biological surveys, the contractor will cease work and immediately notify the SCDOT Environmental Services Office. SCDOT biologists will determine whether the nest is active and the species utilizing the nest. After this coordination, it will be determined whether construction/demolition can resume or whether a temporary moratorium will be put into effect. All costs for determining the need

for, the placing of deterrents, and applying of all special actions including, but not limited to, removing nests and any costs associated with conducting work in compliance with the Migratory Bird Treaty Act as stated herein will not be paid for separately but will be considered to have been included with other items of work.

USTs/Hazardous Materials

If avoidance of hazardous materials is not a viable alternative and soils that appear to be contaminated with petroleum products were encountered during construction, SC Department of Health and Environmental Control (SCDHEC), will be informed. Hazardous materials will be tested and removed and/or treated with the U.S. Environmental Protection Agency (EPA) and SCDHEC requirements, if necessary.

If potentially hazardous materials are encountered, an odor is identified, or significantly stained soil is visible during construction, further investigation in the form of a Phase I Environmental Site Assessment may be required to assess potential recognized environmental concerns.

Lead-based paint was detected on bridge surfaces in the project limits. Destructive actions (sanding, burning, demolition, component removal, paint preparation) to the lead-containing paint surfaces will require the contractor to comply with the standards of SCDHEC and Occupational Safety and Health Administration (OSHA), including but not limited to proper disposal, initial exposure monitoring, the use of personal protective equipment, and medical surveillance. If additional painted components are discovered during renovation activities, the paint should be tested prior to any destructive actions (sanding, burning, demolition, component removal, paint preparation) or disposal.

The existing structures shall be removed and disposed of by the Contractor in accordance with Subsection 202.4.2 of the Standard Specifications. The Contractor's attention is called to the fact that this project may require removal and disposal of structural components containing lead-based paints. Removal and disposal of structural components containing lead-based paints shall comply with all applicable Federal, State, and Local requirements for lead as waste, lead in air, lead in water, lead in soil, and worker health and safety.

Asbestos-containing materials was not detected in any of the structures sampled in the project limits; however, if additional suspect materials are discovered during the planned construction activities, bulk samples must be collected and analyzed for asbestos content prior to continuation of work.

Prior to the demolition of any regulated facility or structure, written notification must be submitted to SCDHEC at least ten working days in advance of the demolition.

Cultural Resources

The contractor and subcontractors must notify their workers to watch for the presence of any prehistoric or historic remains, including but not limited to arrowheads, pottery, ceramics, flakes, bones, graves, gravestones, or brick concentrations during the construction phase of the project, if any such remains are encountered, the Resident Construction Engineer (RCE) will be immediately notified and all work in the vicinity of the discovered materials and site work shall ease until the SCDOT Archaeologist directs otherwise.

Date	Environmental Project Manager
Date	Federal Highway Administration

I-77 Roadway Widening and Improvements

Categorical Exclusion Type C

Project ID: P027002

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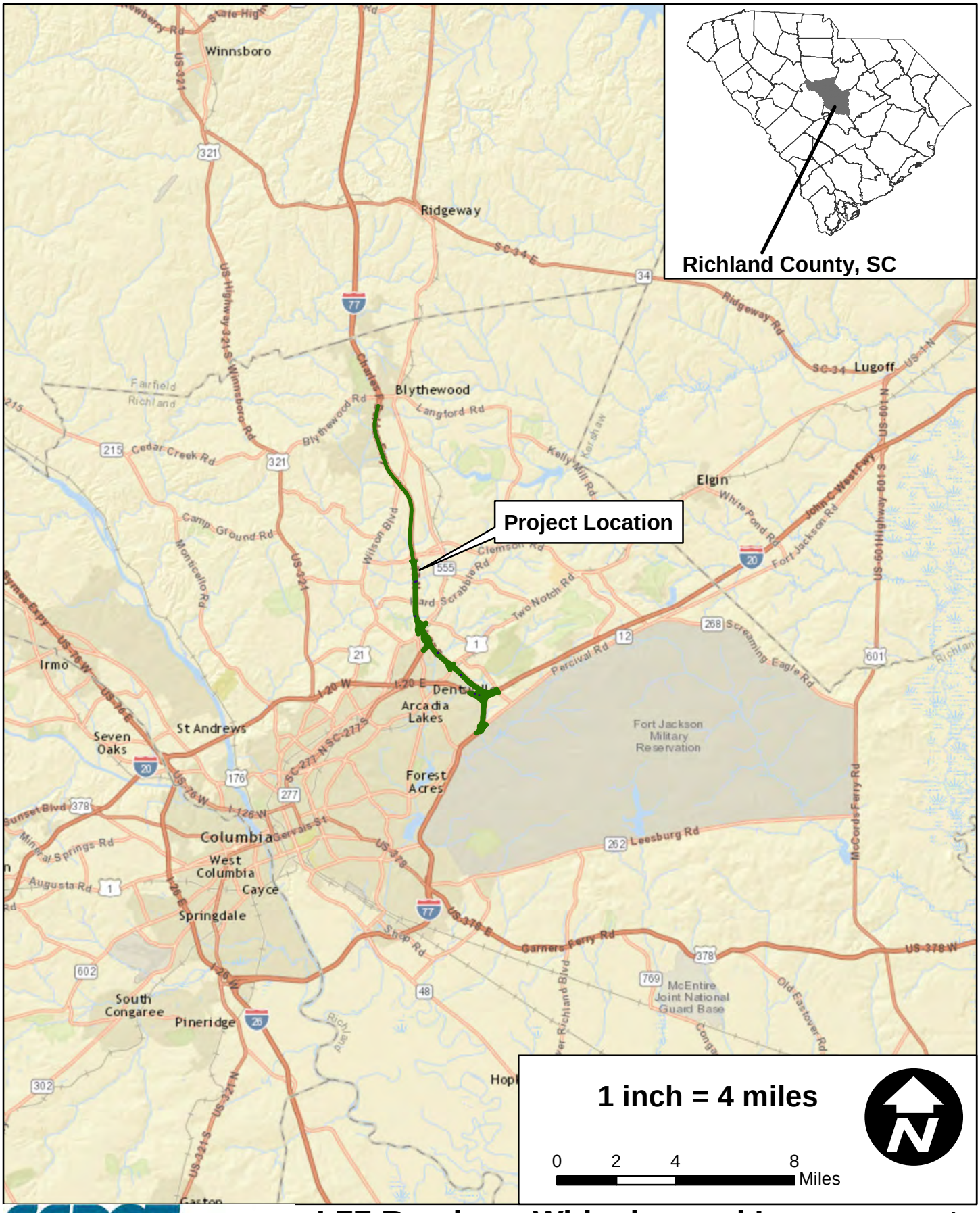
Appendix K – Hazardous Waste Sites Map (Figures 6a, 6b, 6c)

Appendix A

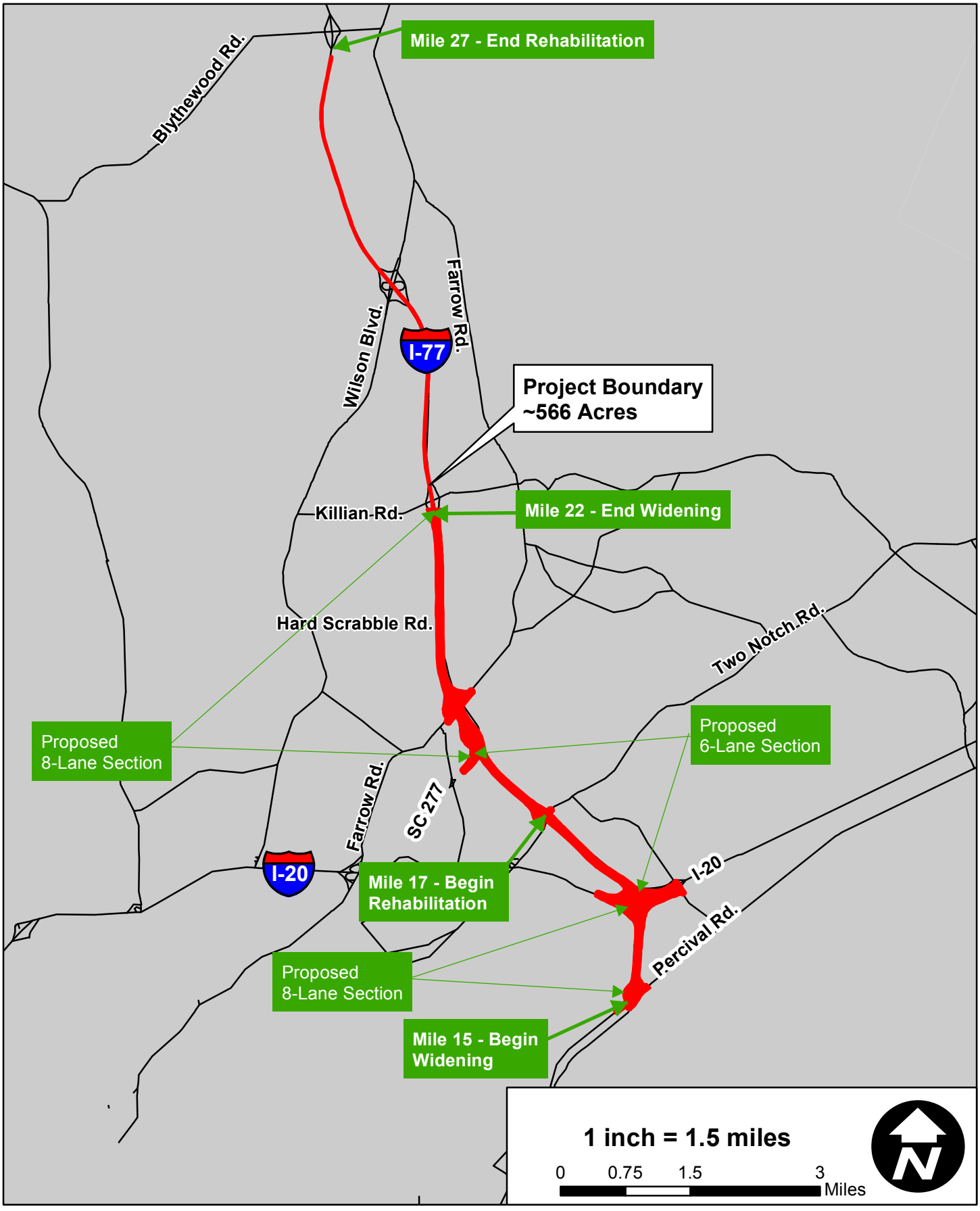
Project Location Maps



SCDOT
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Project Location
Figure 1
April 2015



South Carolina Department of Transportation

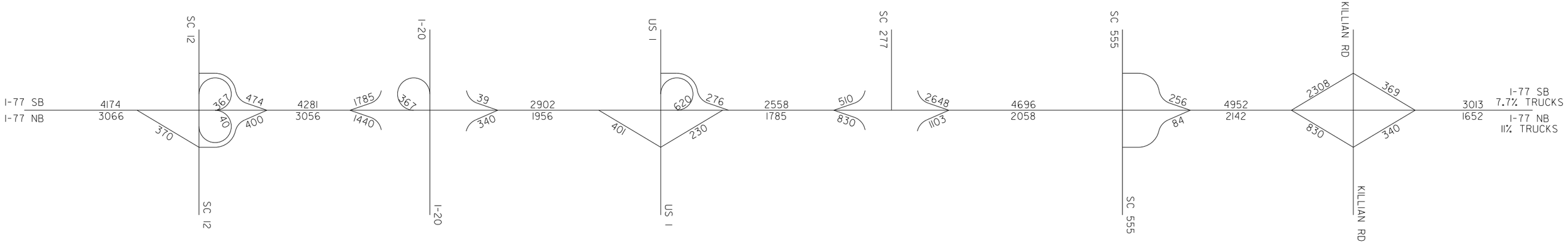
I-77 Roadway Widening and Improvements

I-77 Project Limits
Figure 2
April 2015

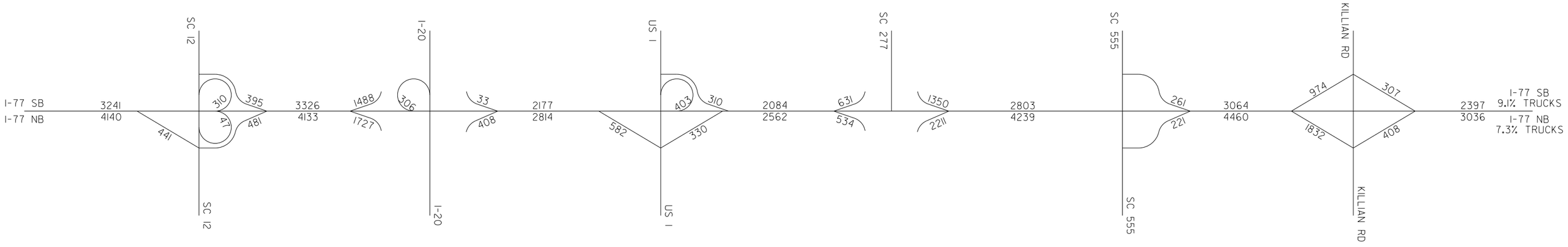
Appendix B

SCDOT Traffic Data
(I-77 Average Annual Daily Traffic peak hour volumes)

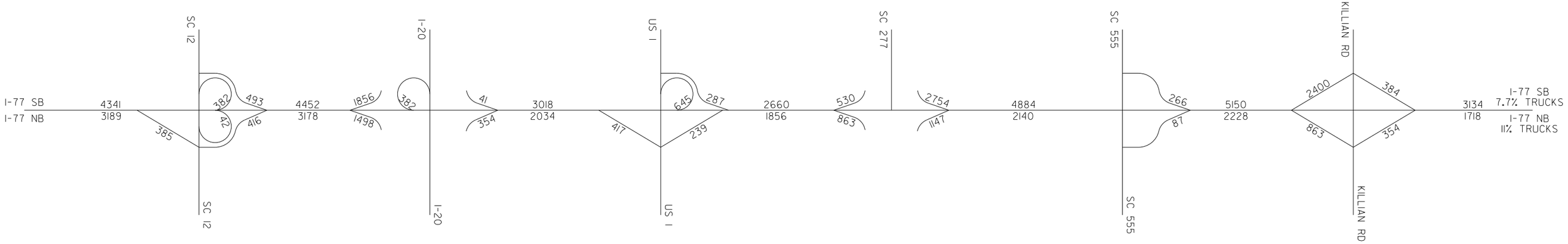
EXISTING 2013 AM VOLUMES



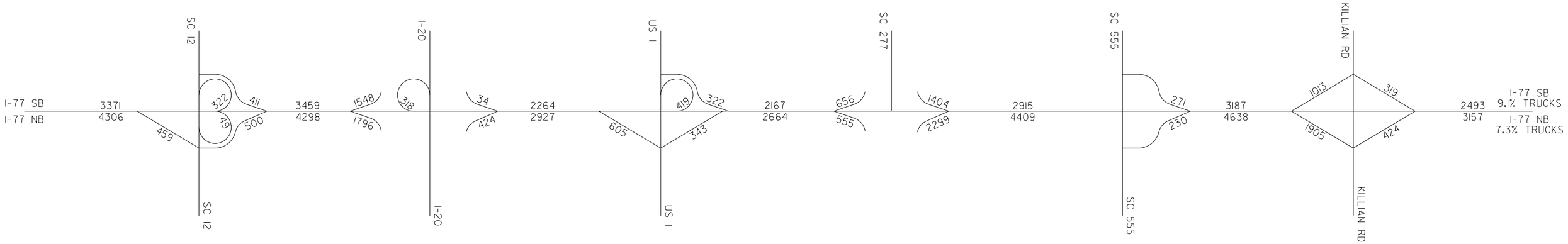
EXISTING 2013 PM VOLUMES



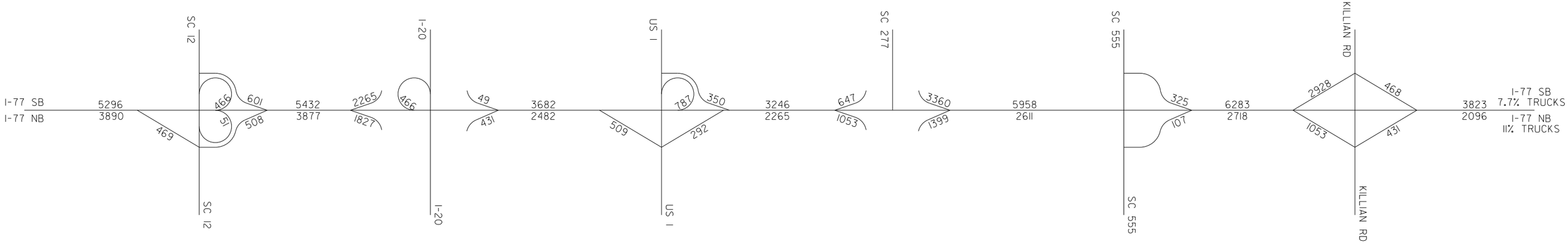
BUILD/NO BUILD 2017 AM VOLUMES



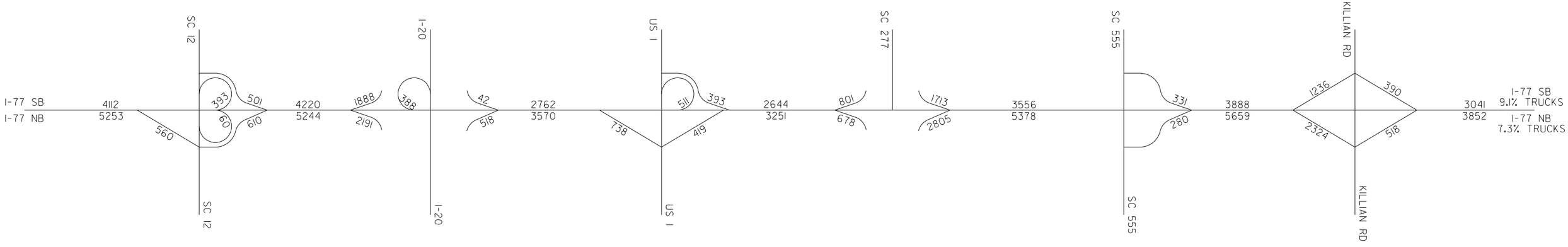
BUILD/NO BUILD 2017 PM VOLUMES



BUILD/NO BUILD 2037 AM VOLUMES

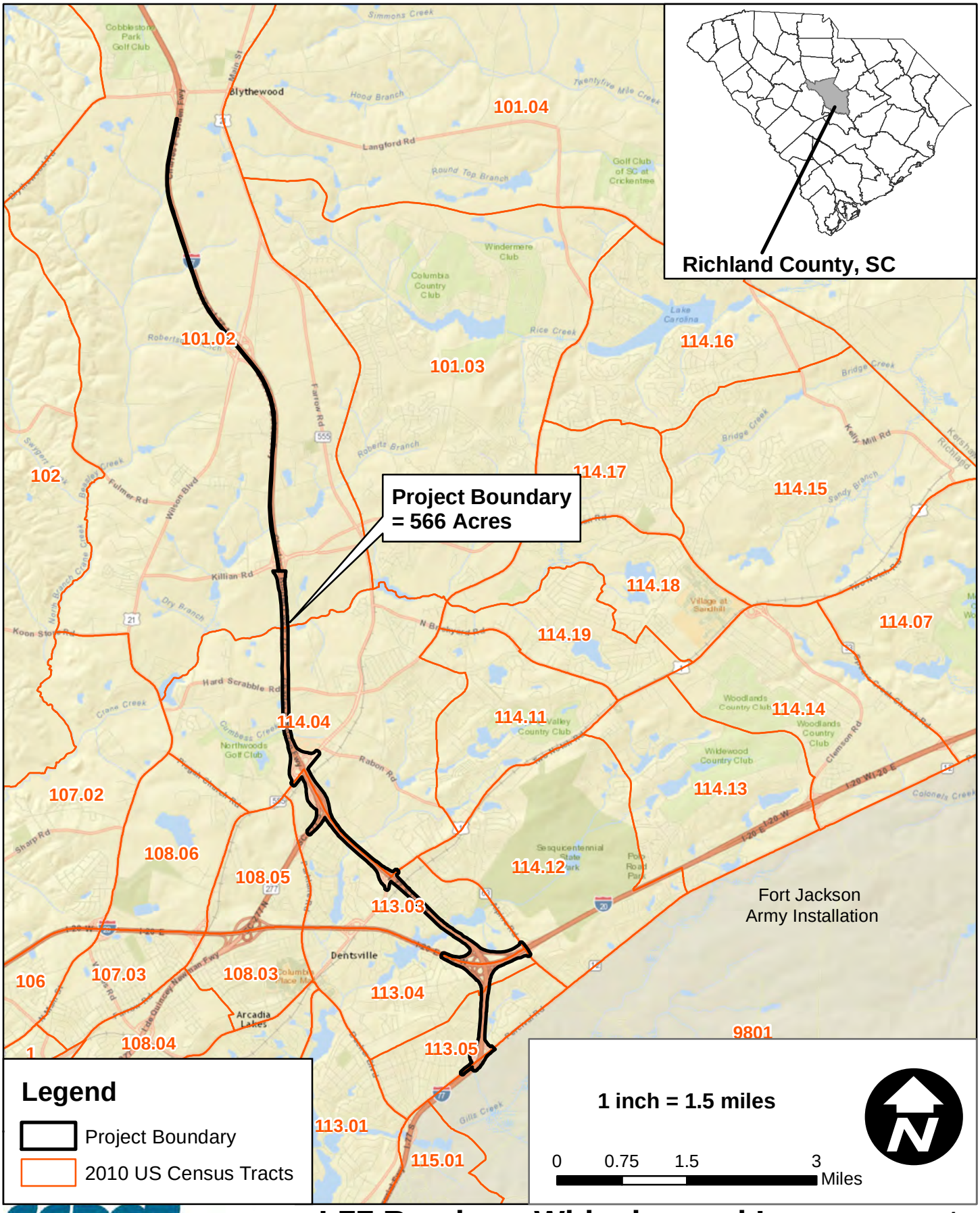


BUILD/NO BUILD 2037 PM VOLUMES



Appendix C

Socioeconomic Data



I-77 Roadway Widening and Improvements

Census Tracts
Figure 5
April 2015

South Carolina Department of Transportation

Table 6: Socioeconomic Characteristics

	Census Tract 9801	Census Tract 101.02	Census Tract 113.03	Census Tract 113.04	Census Tract 113.05	Census Tract 114.04	Census Tract 114.12	Richland County	South Carolina
POPULATION AND RACE									
Population	22	6,219	4,919	5,211	5,154	8,321	5,089	384,504	4,625,364
White	27.3%	50.2%	23.2%	23.4%	36.2%	30.4%	37.8%	47.3%	66.2%
Black	45.5%	41.6%	66.6%	60.8%	46.1%	62.7%	37.4%	45.9%	27.9%
American Indian & Alaska Native	0.0%	0.3%	0.3%	0.7%	0.5%	0.3%	0.9%	0.3%	0.4%
Asian	4.5%	0.9%	3.6%	3.3%	3.0%	2.1%	5.7%	2.2%	1.3%
Native Hawaiian & Other Pacific Islander	0.0%	0.1%	0.3%	0.4%	0.2%	0.1%	0.2%	0.1%	0.1%
Other	18.2%	4.6%	2.7%	7.8%	10.0%	2.4%	13.9%	1.9%	2.5%
Two or More Races	4.5%	2.3%	3.2%	3.7%	4.0%	2.1%	4.2%	2.2%	1.7%
AGE, HOUSEHOLD SIZE, AND INCOME									
Median Age	39.5	36.3	30.7	31.7	37.5	33.7	34	32.6	37.9
Average Household Size	2.75	2.74	2.11	2.43	2.71	2.39	2.6	2.43	2.49
Median Household Income (in dollars)	N/A	$62,340	$38,054	$47,479	$34,527	$39,801	$52,617	$48,359	$44,779
Below poverty Level	0	10.7%	12.3%	11.1%	23.8%	16.4%	18.3%	17.2%	18.1%
EDUCATION LEVELS OF POPULATION 25+ YEARS IN AGE (BY PERCENT)									
Up to 12^{th} Grade, No Diploma	0%	4.4%	5.7%	13%	19.0%	8.0%	18.3%	10.2%	15.4%
High School Diploma or Equivalent	10.7%	28.2%	26.5%	22.6%	40.6%	23.8%	10.9%	22.4%	29.9%
Some College, No Degree	9.8%	21.1%	24.6%	23%	22.3%	23.6%	28.8%	22.6%	20.9%
Associate Degree	30.3%	8.6%	8.9%	13.9%	6.5%	13.5%	8.4%	8.6%	8.7%
Bachelor's Degree	37.7%	22%	17.1%	19.7%	8.8%	21.4%	22.8%	22.0%	16.1%
Graduate or Professional	11.5%	15.7%	17.1%	7.9%	2.7%	9.2%	10.9%	14.1%	9.0%
HOUSING CHARACTERISTICS									
Median Home Value (owner occupied; in dollars)	N/A	$219,600	$136,000	$145,000	$73,600	$125,600	$150,200	$149,800	$137,400
Number of Housing Units	12	2,498	2,595	2,331	2,144	3,828	2,041	161,725	2,137,683
Owner Occupied	75%	75.8%	22.3%	37.8%	67.2%	57.2%	68.8%	61.30%	69.30%
Renter Occupied	25%	24.2%	77.7%	62.2%	32.8%	42.8%	31.2%	38.70%	30.70%
Vacant	33.3%	9.5%	11.7%	8.0%	14.3%	9.6%	7.6%	10.20%	15.70%

Sources:

Richland County, South Carolina. 2007. The Renaissance Plan: Decker Boulevard/Woodfield Park Area. The Lawrence Group Architects of North Carolina, Inc.
http://www.richlandonline.com/Portals/0/Departments/Planning/NeighborhoodPlanning/MasterPlans/Decker.pdf

Army Bases. Accessed April 6, 2015. Available from: http://armybases.org/fort-jackson-sc-south-carolina/

Appendix D

Public Involvement Documents

PERSON EVENT REPORT

I-77 Design Build On Call

*Filtered to show only Open events

*Filtered to show only Comment events

Name	MASSA, BOB	**Mailing Address**	105 FAIR RIDGE RD BLYTHEWOOD, SC 29016
Owner Phone		**Owner Email**	rpm_rpm47@hotmail.com
Organizations	BLYTHEWOOD TOWN COUNCIL		
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Bob Massa Comment**		
03/17/2015 17639 Comment Open	**Event Summary** I appreciate the opportunity to view mock-ups and discuss the project.I was hoping the project would extend to exit 27 Blythewood Rd since growth is continuing. DR Horton was just approved to build an additional 600-800 homes in Cobblestone. Plus the Bridge deck over I-77 at exit 27 needs major work (terrible potholes) and traffic because of the new schools has increased greatly at this exit. Again, thank you for the opportunity to discuss this. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	WILKINS, EARLY	**Mailing Address**	421 RUNNING BEAR CT BLYTHEWOOD, SC
Owner Phone		**Owner Email**	EARLYANDTACOA@YAHOO.COM
Organizations			
Related People			
Tax Parcels			

Events

Event Details	**Event Title: Early Wilkins Comment**
03/17/2015 17642 Comment Open	**Event Summary** I was hoping to get 4-lane construction to get extended to exit 27. With the merging of 18 wheeler trucks and cars from 3-lanes down to two lanes after exit 24, it also causes a jam because most vehicles stay in the left lane including the trucks. I believe Blythewood is up-and-coming as well. I believe Blythewood would have more increased traffic in the next 3 years with the added business from Killian crossing as well as added housing required from the increase in jobs and recreation. **Event Notes**

*Filtered to show only Open events

*Filtered to show only Comment events

Name	DAVIS, MICHAEL	**Mailing Address**	200 TIDWELL RD ELGIN, SC 29045
Owner Phone		**Owner Email**	MICHAEL.DAVIS@AECOM.COM
Organizations	AECOM		
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Michael Davis Comment**		
03/17/2015 17640 Comment Open	**Event Summary** 1. Rehab needed both North and South bound lanes to exit 27. Northbound lanes seem for worry. I was told today it would only be Southbound lanes. Not mentioned in handout or online. 2. Further improvements needed at Killian to keep cars from backing up onto interstate. Additional storage on interstate.3. Bridge from 277 to I-77 needs help as well as Farrow Road bridge. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	GARRISON, EDWARD	**Mailing Address**	207 LAKE ASHLEY DRIVE BLYTHEWOOD, SC 29016
Owner Phone		**Owner Email**	EDGARRISON1@GMAIL.COM
Organizations	TOWN OF BLYTHEWOOD		
Related People			
Tax Parcels			

Events

Event Details	Event Title: Edward Garrison Comment
03/17/2015 17641 Comment Open	**Event Summary** Should widen to three lanes up to Blythewood Rd (currently goes from three lanes to two between Killian and Blythewood). Lots of backup getting onto I-77 from Blthewood Road as well.I have lived in Blythewood for 30 years. **Event Notes**

*Filtered to show only Open events

*Filtered to show only Comment events

Name	SUTTON, SANDRA	**Mailing Address**	301 ALLAIRE CT COLUMBIA, SC 29229
Owner Phone		**Owner Email**	
Organizations			
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Sandra Sutton Survey Comment**		
03/17/2015 17647 Comment Open	**Event Summary** Exit 22 Killian Road exit. I am concerned that traffic congestion on Killian Road will further back up traffic on the I-77 exit ramp at Killian. It is currently doing that today. The dual left turn lane from Killian onto I-77 SB backs up traffic all along Killian. I initially wonder why a loop interchange could not be put in place but a young man showed me that one would not fit. Really would prefer that traffic be alleviated at Killian Road or the improvements on 77 will be for nought. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	RAMSEY, ART	**Mailing Address**	8 WIDO CT COLA, SC 29223
Owner Phone		**Owner Email**	
Organizations			
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Art Ramsey Survey Comment**		
03/17/2015 17646 Comment Open	**Event Summary** Concerned about traffic congestion on local arterial roads such as Hard Scrabble that causes traffic to back up onto I-77. Would prefer to improve traffic on local roads in addition to interstate. At least on local roads to a mile or two back inland from 77. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	GALLO, DALE	**Mailing Address**	314 HILLRIDGE WAY COLUMBIA, SC 29229
Owner Phone		**Owner Email**	
Organizations			
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: David Gallo Survey Comment**		
03/17/2015 17644 Comment Open	**Event Summary** I was not very impressed with the I-20 reconstruction project. I have many comments and concerns with the I-77 project that I hope are not repeated from the I-20 project. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	KLINE, JOE	**Mailing Address**	811 POLO RD COLUMBIA, SC 29223
Owner Phone		**Owner Email**	
Organizations			
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Joe Kline Survey Comment**		
03/17/2015 17645 Comment Open	**Event Summary** Spoke to James Mattox. Recommended to post. Concern over pavement project exit off I-77N Alpine Exit. Pavement is uneven and holes develop less than two months after paving. **Event Notes**		

*Filtered to show only Open events

*Filtered to show only Comment events

Name	SCOTT, LULLIE	**Mailing Address**	866 KILLIAN STATION DR COLA, SC 29229
Owner Phone		**Owner Email**	
Organizations			
Related People			
Tax Parcels			
Events			
Event Details	**Event Title: Lullie Scott Survey Comment**		
03/17/2015 17643 Comment Open	**Event Summary** Insufficient taper length of lane. Need additional advanced warning for lane drop at 277 interchange. Need to review geometry. 18 wheelers are forced to make quick decision. Exit sign has been knocked over several instances. **Event Notes**		

*Filtered to show only Open events
*Filtered to show only Phone Call events

Name	GOFF, MARY	**Mailing Address**	2333 OLD SATCHELFORD RD COLUMBIA, SC 29223
Owner Phone		**Owner Email**	
Organizations			
Related People	698139 – Gary Goff		
Tax Parcels			
Events			
Event Details	**Event Title: Phone Conversation: Mary Goff**		
03/11/2015 17649 Phone Call Open	**Event Summary** Ms. Mulholland received a call from Ms. Mary Goff, a resident/homeowner along the northbound side of I-77 near the south end of the project. She heard that there is a public meeting next week from her son, who heard about the meeting on TV but didn't catch the time or place. (Ms. Mulholland gave her business card she was doing the noise monitoring field work in August, so that's how she reached me). Besides the info from her son regarding the meeting, she said she has not received any notices about the meeting or seen any signs and was wondering as an affected homeowner, when she is going to receive notices. Ms. Mulholland informed her that an ad was placed in The State last week, and signs have been placed up along the corridor. She said she doesn't get the paper and hasn't seen any signs about the project meeting. Ms. Mulholland informed her of the meeting place and time and encouraged her to come to the meeting and talk to project representatives, review project displays/info, and provide her comments. She is very concerned that the project will be taking a big part of her driveway and backyard. She saw surveyors out there on her property who put flags in her yard and is concerned that they are taking part of her property or at least her water house, etc. Ms. Mullholland assured her that no new Right-Of-Way would be taken with this project, so none of her property or utilities would be taken and that the surveyors were out there surveying existing pipes/culverts/utilities, etc. Ms. Mullholland followed up with a call to Heather Robbins at SCDOT and forwarded this to Tyke Redfearn and Heather. Tyke will follow up with a call to Ms. Goff. **Event Notes**		

*Filtered to show only Open events
*Filtered to show only Phone Call events

Name	GOFF, GARY	**Mailing Address**	2333 OLD SATCHELFORD RD COLUMBIA, SC 29201
Owner Phone		**Owner Email**	
Organizations			
Related People	697763 – Mary Goff		
Tax Parcels			
Events			
Event Details	**Event Title: Phone Conversation: Gary Goff**		
03/11/2015 17650 Phone Call Open	**Event Summary** Mr. Goff said that he and his wife are concerned that the proposed improvements will result in loss of their property. Mr. Goff stated that he is opposed to any improvements that cause him to lose his property and Mr. Goff pointed out that his driveway is between his home and the interstate fencing. He noted that taking any new right-of-way towards his home would result in the loss of his driveway. Mr. Redfearn informed Mr. Goff that SCDOT does not expect to acquire new right-of-way for this project. Mr. Goff then said that, as long as SCDOT does not take right-of-way on his side of the interstate, he is okay with the project. Mr. Redfearn invited Mr. Goff to attend the PIM and Mr. Goff said that he planned to do so. **Event Notes**		

FirstName	ddleNa	LastName	Suffix	EmailAddress	AddressLine1	AddressLine2	City	State	PostalCode	Organization	Department	Title	Gender	Ethnicity
BOB		MASSA		rpm_rpm47@hotmail.com	105 FAIR RIDGE RD		BLYTHEWOOD	SC	29016	BLYTHEWOOD TOWN COUNCIL			MALE	WHITE, NON-HISPANIC
DAN		MOSES		DANIEL.MOSES@STVINC.COM				SC		STV			MALE	WHITE, NON-HISPANIC
ROLAND		BART		RBART@CMCOG.COM				SC		CENTRAL MIDLANDS COUI		PLANNER	MALE	WHITE, NON-HISPANIC
EDWARD		PARLER		EDWARD.PARLER@GMAIL.COM	12 LYNCHLOCK LN		BLYTHEWOOD	SC		TOWN OF BLYTHWOOD			MALE	WHITE, NON-HISPANIC
EARLY		WILKINS		EARLYANDTACOA@YAHOO.COM	421 RUNNING BEAR CT		BLYTHEWOOD	SC					MALE	AFRICAN AMERICAN
FREDDY		KICKLIGHTER		FRED.KICKLIGHTER@ICE-ENG.COI	1021 BRIAR GATE CIRC		COLUMBIA	SC	29210	ICE ENGINEERING			MALE	WHITE, NON-HISPANIC
MARY		GOUGH			2333 OLD SATCHELFORD RD		COLUMBIA	SC	29223				FEMALE	WHITE, NON-HISPANIC
ANDY		GILLIS		ANDY.GILLIS@ICE-ENG.COM	1021 BRIARGATE CIR		COLUMBIA	SC	29210	ICE ENGINEERING			MALE	WHITE, NON-HISPANIC
DAVID		MCKNIGHT											MALE	WHITE, NON-HISPANIC
MICHAEL		DAVIS		MICHAEL.DAVIS@AECOM.COM	200 TIDWELL RD		ELGIN	SC	29045	AECOM			MALE	WHITE, NON-HISPANIC
JOE		CLINE		JOMO221@YAHOO.COM	811 POLO RD		COLUMBIA	SC					MALE	WHITE, NON-HISPANIC
STEVE		IKERD								FHWA			MALE	WHITE, NON-HISPANIC
LATONYA		DERRICK		LATONYADERRICK@GMAIL.COM	105 HYER CT		COLUMBIA	SC	29223				FEMALE	AFRICAN AMERICAN
RENEE		TISON		RTISON@MBAKERINTL.M						MICHAEL BAKER INTERNATIONAL			FEMALE	WHITE, NON-HISPANIC
DANIEL		ATKINSON		DMATKINSON@MBAKERINTL.COM						MICHAEL BAKER INTERNATIONAL			MALE	WHITE, NON-HISPANIC
MALCOM		PORDGES		MALCOMPG3@SC.RR.COM	219 WINDING OAK WAY		BLYTHEWOOD	SC	29016				MALE	AFRICAN AMERICAN
EDWARD		GARRISON		EDGARRISON1@GMAIL.COM	207 LAKE ASHLEY DRIVE		BLYTHEWOOD	SC	29016	TOWN OF BLYTHEWOOD			MALE	WHITE, NON-HISPANIC
SANDRA		HOPKINS			2329 OLD SATCHELFORD RD		COLA	SC	29223				FEMALE	WHITE, NON-HISPANIC
ALONZO		SMITH		SMITHAW@RCGOV.US	1410 LAWRENCE ST		COLUMBIA	SC	29204	RICHLAND COUNTY COUNCIL			MALE	AFRICAN AMERICAN
MICHAEL		CRISS		MCRISS@SC.RR.COM	108 GOLD RD		LEXINGTON	SC	29072				MALE	WHITE, NON-HISPANIC
SKIP		JOHNSON			1230 SUMTER ST		COLUMBIA	SC	29201				MALE	WHITE, NON-HISPANIC
SUBHASH		PATEL			2109 SEGUNDO RD		FORT MILL	SC					MALE	MIDDLE EASTERN
RANDY		BELLMAN		CRBELLMANN@GMAIL.COM	190 BERRYTREE LANE		COLA	SC	29223				MALE	WHITE, NON-HISPANIC
WILLY		AMAKER		WAANABET@GMAIL.COM	11 JASMINE PLACE CT		COLA	SC	29203				MALE	AFRICAN AMERICAN
PHILLIP		MARTIN			15 VARSITY LN		BLYTHEWOOD	SC	29016				MALE	WHITE, NON-HISPANIC
LEWIS		SUTTON			301 ALLAIRE CT		COLUMBIA	SC	29229				MALE	AFRICAN AMERICAN
SANDRA		SUTTON			301 ALLAIRE CT		COLUMBIA	SC	29229				FEMALE	AFRICAN AMERICAN
ART		RAMSEY			8 WIDO CT		COLA	SC	29223				MALE	AFRICAN AMERICAN
EVALINA		RAMSEY			8 WIDO CT		COLUMBIA	SC	29223				FEMALE	AFRICAN AMERICAN
DALE		GALLO			314 HILLRIDGE WAY		COLUMBIA	SC	29229				MALE	WHITE, NON-HISPANIC
JOE		KLINE			811 POLO RD		COLUMBIA	SC	29223				MALE	WHITE, NON-HISPANIC
DALE		BRANHAN			663 TILLMAN CIR		ELGIN	SC	29048				MALE	WHITE, NON-HISPANIC
LULLIE	B	SCOTT			866 KILLIAN STATION DR		COLA	SC	29229				MALE	AFRICAN AMERICAN

PROPOSED I-77 ROADWAY WIDENING AND REHABILITATION

Richland County

Public Information Meeting

Project:
The South Carolina Department of Transportation (SCDOT) plans to widen a portion of I-77, in both directions, beginning at Percival Road (mile marker 15) and extending to Killian Road (mile marker 22) and to rehabilitate pavement on existing lanes from Killian Road to Blythewood Road (mile marker 27). The purpose of the project is to aid in improving operational efficiency and accommodating future traffic along the I-77 corridor. The project will include adding a single travel lane in each direction, improving various exit ramps, widening or replacing ten (10) bridges, and rehabilitating pavement within existing lanes.

Meeting:
SCDOT invites citizens to attend a public information meeting on Tuesday, March 17, 2015, from 5:00 p.m. to 7:00 p.m., at the Centura College located at 7500 Two Notch Road, Columbia, SC 29223. The meeting will be held in an open house format where guests are welcome to drop-in at their convenience to view project displays and other information related to the project and to talk with the I-77 team. Informal, written and verbal comments will be collected during the meeting, and the project team will consider these comments while preparing the design. A formal presentation will not be given at this meeting.

Purpose of the Meeting:
The purpose of the meeting is to provide information and solicit feedback from area residents concerning the proposed I-77 Widening and Pavement Rehabilitation project. Another purpose of the meeting is to gather information from the public or any interested organization about historic or cultural resources in the area. Engineering and environmental personnel from SCDOT and its consultant will be available to discuss the project with interested citizens on an individual basis. Maps and drawings of the proposed improvements will be available and attendees may ask questions and provide comments regarding the possible social, economic, and environmental effects of the project.

Contact:
One (1) day after the meeting, related maps, displays, comment forms, and other pertinent data will be available for public review online at http://www.scdot.org/inside/public_hearings.aspx . Additional information concerning the project may be obtained by contacting Tyke Redfearn, SCDOT Assistant Program Manager, at 803-737-1430 in Columbia, SC. Persons with disabilities who may require special accommodations should contact Heather Robbins at 803-737-1399.

South Carolina Department of Transportation
and Federal Highway Administration

PROPOSED **I-77** ROADWAY WIDENING AND IMPROVEMENTS PROJECT

Public Information Meeting

SCDOT

Centura College
Tues. March 17, 2015
5:00-7:00 PM

Project ID P027002
Richland County, SC

Project Overview

The South Carolina Department of Transportation (SCDOT) plans to widen seven miles of I-77, in both directions, beginning at Percival Road (mile marker 15) and extending to Killian Road (mile marker 22). Rehabilitation of pavement on existing lanes from Two Notch Road (mile marker 17) to Blythewood Road (mile marker 27) is also included in this project.

The project will include:

- Adding a single travel lane to the existing median in each direction from Percival Road to Killian Road
- Improving various exit ramps
- Widening and/or replacing ten (10) bridges along mainline I-77
- Rehabilitating pavement within existing lanes from Two Notch Road to Blythewood Road

The purpose of the proposed project is to improve operational efficiency and accommodate future traffic volumes along the interstate corridor. The proposed project is needed because the existing facility does not provide enough travel lanes for traffic through the area, resulting in traffic congestion starting as early as year 2017 when the segment of I-77 between SC-277 and Killian Road reaches its projected traffic capacity.

SCDOT
South Carolina
Department of Transportation

Purpose of the Meeting

The purpose of the meeting is to allow the local community, concerned citizens, and project stakeholders an opportunity to:

- Gather input from the public or any interested organization about historic or cultural resources in the area
- Solicit feedback from area residents concerning the project
- Gather information on the planned improvements

This meeting is being conducted in an informal, open house format. You are encouraged to review the various displays and discuss your questions or concerns with any of the SCDOT representatives. We invite you to provide written comments on the comment forms provided or by using an iPad at one of the iPad stations.

We appreciate your attendance at this meeting, and look forward to the opportunity to serve you throughout the development of this very important project.

Comments must be post marked or e-mailed by **April 1, 2015.**

Comments can be placed in the comment box, mailed, or submitted electronically to:

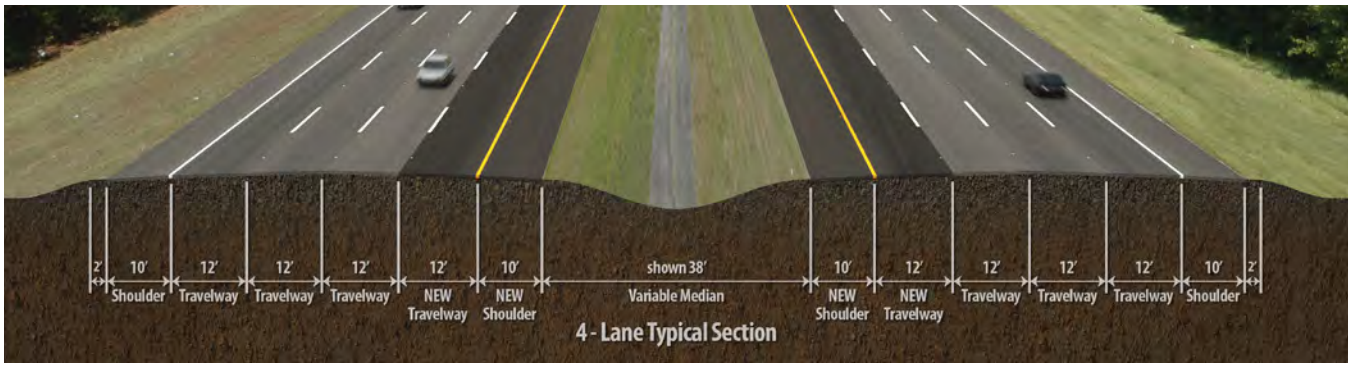
William "Tyke" Redfearn III, PE
955 Park Street
Columbia, SC 29202-0191
Phone: 803.737.1430
redfearnwt@scdot.org

Anticipated Project Schedule and Cost

A tentative timeline of the project development process is detailed below. No new right-of-way is anticipated.

ACTIVITY	2014	2015	2016	2017	2018	2019
Environmental Studies						
Design-Build Procurement						
Design and Construction						

Estimated construction cost: $62.6 Million. Proposed funding: State (Act 98) and Federal (FHWA) Interstate Program



Contact Information

SCDOT is the contact organization for the development of this project. Please direct all questions or comments to Tyke Redfearn, SCDOT Program Manager, who's contact information is provided above. If you would like to review materials from the meeting, please go to http://www.scdot.org/inside/public_hearings.aspx.

Appendix E

Archaeological Field Report and Concurrence Letters

South Carolina
Department of Transportation

MAR 04 2015

March 3, 2015

Ms. Elizabeth Johnson
Deputy State Historic Preservation Officer
South Carolina Department of Archives and History
8301 Parklane Road
Columbia, SC 29223-4905

RE: Cultural Resources Survey of I-77 Widening Project, Richland County, South Carolina.
Project ID: **P027002**

Dear Ms. Johnson:

Enclosed are two copies of a report that describes cultural resource investigations in Richland County, South Carolina. The investigations were conducted in advance of the proposed widening of Interstate 77 from Percival Road to Killian Road. The proposed project includes adding a travel lane in each direction, improving various exit ramps, and replacing or widening ten bridges.

As a result of the survey, five new historic architectural resources (Resources 6382, 6383, 6384, 6385, and 6386) were identified within the project's Area of Potential Effects. None of these resources were determined eligible for listing in the National Register of Historic Places. Since the majority of the project will be constructed within previously disturbed portions of the project corridor, no archaeological investigations were conducted. Based on the results of the survey, the Department has determined that **no historic properties will be affected** by the proposed undertaking.

Per the terms of the Section 106 Programmatic Agreement executed on December 13, 2011, the Department is providing this information on behalf of the Federal Highway Administration. It is requested that you review the enclosed material and, if appropriate, indicate your concurrence in the Department's findings. Please respond within 30 days if you have any objections or if you have need of additional information.

Sincerely,

Chad C. Long
Archaeologist/Environmental Project Manager

I [redacted] concur in the above determination.

Signed: _____ Date: 03/06/15

Enclosure

cc: Shane Belcher, FHWA
Dr. Wenonah Haire, CIN-THPO
Lisa LaRue Stopp, United Keetowah Band of Cherokee
Keith Derting, SCIAA

ec: Russell Townsend, EBCI
Tyler Howe, EBCI

Post Office Box 191
Columbia, South Carolina 29202-0191

Phone: (803) 737-2314
TTY: (803) 737-3870

SCDOT

South Carolina
Department of Transportation

March 3, 2015

Ms. Elizabeth Johnson
Deputy State Historic Preservation Officer
South Carolina Department of Archives and History
8301 Parklane Road
Columbia, SC 29223-4905

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Sincerely,

Chad C. Long
Archaeologist/Environmental Project Manager

I (~~do not~~) concur in the above determination.

Signed: Wenonah G Haire, DO Date: 3/17/15

Enclosure

cc: Shane Belcher, FHWA
Dr. Wenonah Haire, CIN-THPO
Lisa LaRue Stopp, United Keetowah Band of Cherokee
Keith Derting, SCIAA

ec: Russell Townsend, EBCI
Tyler Howe, EBCI

Post Office Box 191
Columbia, South Carolina 29202-0191

Phone: (803) 737-2314
TTY: (803) 737-3870

ARCHAEOLOGICAL FIELD REPORT
SCDOT ENVIRONMENTAL SECTION

TITLE: Cultural Resources Survey of I-77 Widening Project County, South Carolina
PROJECT NUMBER: P027002
CONSULTANT: Brockington and Associates, Inc.
DATE OF RESEARCH: February 2015
ARCHITECTURAL HISTORIAN: Sheldon Owens
ARCHAEOLOGIST: Josh Fletcher
COUNTY: Richland
PROJECT I-77 Widening Project

DESCRIPTION: The South Carolina Department of Transportation (SCDOT) proposes to widen approximately seven miles of Interstate 77 (I-77) from mile point 15 (Percival Road) to approximately mile point 22 (Killian Road) and rehabilitate the I-77 southbound lanes from mile point 22 (Killian Road) to mile point 27. The segment of I-77 within the project limits consists of three northbound lanes and three southbound lanes in two sections: from Percival Road to Interstate 20 (I-20) and from SC 277 to Killian Road. The segment of I-77 within the project limits from I-20 to SC 277 consists of two northbound lanes and two southbound lanes. The widening includes adding one travel lane in each direction, improving various exit ramps, and replacing or widening ten bridges. The purpose of the proposed project is to improve operational efficiency and accommodate future traffic volumes along the interstate corridor by increasing I-77's capacity. The existing project limits do not provide enough travel lanes for the traffic through the area, resulting in traffic congestion starting as early as year 2017 when the segment of I-77 between SC 277 and Killian Road is projected to operate at level of service (LOS) E. The proposed widening project will provide the required number of lanes to operate at LOS D or better for the entire project corridor through design year 2037. The goals and objectives of the proposed project are to promote economic development, while avoiding and minimizing environmental impacts, and improving habitat through mitigation of unavoidable impacts. Figure 1 presents the location of the project on the 2005 Richland County highway map. Figure 2 presents the project location and nearby cultural resources on the USGS 1971/p.r. 1990 *Blythewood, SC* and 1972/p.r. 1990 *Fort Jackson North, SC* quadrangles. Figure 3 presents the project location and all identified cultural resources on a modern aerial photograph.

All proposed improvements will take place within existing right-of-way (ROW). No archaeological survey was conducted for this project. An archaeological investigation will be required for all undisturbed areas that will be affected by project improvements. The architectural survey area extends at least 300 feet on either side of the road centerlines and is at least 600 feet wide as agreed upon by the SCDOT and the South Carolina State Historic Preservation Office. During the current investigations, the architectural historian identified five historic architectural resources within the architectural survey area.

LOCATION: The project is located along I-77, in the City of Columbia, South Carolina.

USGS QUADRANGLE: *Blythewood, SC* and *Fort Jackson North, SC*
DATES: 1971/p.r. 1990 and 1972/p.r. 1990 **SCALE:** 7.5' **UTM: ZONE:** 17 **DATUM**: NAD27
NORTHERN END: EASTING: 503273 **NORTHING:** 3777441
SOUTHERN END: EASTING: 506742 **NORTHING:** 3767444

ENVIRONMENTAL SETTING: The project is located along I-77 from mile point 15 (Percival Road) to approximately mile point 22 (Killian Road). The road passes through fairly undulating topography, crossing (from north to south) Crane Creek, Cumbess Creek, Jackson Creek, and Windsor Lake. The project area is fairly heavily residentially and commercially developed, with several pockets of undeveloped wooded areas immediately adjacent to the roadway.

NEAREST RIVER/STREAM AND DISTANCE: The project corridor crosses Crane Creek, Cumbess Creek, Jackson Creek, and Windsor Lake.

SOIL TYPES: Blanton sand, 0 to 6 percent slopes
Clarendon sandy loam
Coxville fine sandy loam
Fuquay sand, 2 to 6 percent slopes
Fuquay-Urban land complex, 0 to 6 percent slopes
Herndon silt loam, 6 to 10 percent slopes
Johnston loam
Lakeland sand, 2 to 6 percent slopes
Lakeland sand, 10 to 15 percent slopes
Nason complex, 10 to 30 percent slopes
Pelion loamy sand, 2 to 6 percent slopes
Pelion loamy sand, 6 to 15 percent slopes
Pelion-Urban land complex, 2 to 10 percent slopes

REFERENCE FOR SOILS INFORMATION: Lawrence, Carl B./1978/*Soil Survey of Richland County, South Carolina*. USDA, Soil Conservation Service, Washington, DC.

GROUND SURFACE VISIBILITY: **0% __ 1-25% _X_ 26-50% __ 51-75% __ 76-100% __**

CURRENT VEGETATION: The project area is completely within the existing ROW, with vegetation consisting of manicured grass in the medians and shoulders and mixed pines and hardwoods within the ROW to the outside of the north and southbound lanes.

INVESTIGATION: On September 8, 2014, the project architectural historian consulted the ArchSite program to determine if previous cultural resources investigations and previously identified archaeological sites are located in the project vicinity. Three previously identified archaeological sites (38RD504, 38RD1171, and 38RD1172) are located within 0.25 mile of the project area (Table 1). The architectural historian visited the South Carolina Institute of Archaeology and Anthropology (SCIAA) on September 25, 2014 to make copies of information on file for the three previously recorded archaeological sites. There have been five previous cultural resources investigations within 0.25 mile of the project area. The SCDOT (Caballero 1986) conducted an archaeological survey of the Trenholm Road, O'Neil Court, and King's Street extensions; no cultural resources were recorded within 0.25 mile of the current project. Southeast Archeological Services, Inc. (Braley and Ledbetter 1991) conducted an archaeological survey of 11 separate forestry compartments scattered across Fort Jackson and identified one archaeological site (38RD504) within 0.25 mile of the current project area. The SCDOT (Roberts 1993) conducted an intensive archaeological and architectural survey of the Proposed S-52 Widening Project; no cultural resources were recorded within 0.25 mile of the current project. Chicora Foundation, Inc. (Trinkley 2000) conducted a cultural resources survey of a portion of the Kaiser Tract and identified two archaeological sites (38RD1171 and 38RD1172) within 0.25 mile of the current project area. AF Consultants (Drucker 2003) conducted a cultural resources inventory survey of the Carolina Crossing Apartments Tract; no cultural resources were identified during this survey. On September 8, 2014, the National Register of Historic Places (NRHP) files of the South Carolina Department of Archives and History (SCDAH) were searched for previous investigations and previously identified resources using the ArchSite program. No previously identified historic architectural resources are located within 0.25 mile of the project area.

Table 1. Previously Identified Archaeological Sites Located Within 0.25 Mile of the Project Area.

SITE	SOURCE	PRE-CONTACT	POST-CONTACT	TIME PERIOD	ELIGIBILITY
38RD504	Braley and Ledbetter (1991)	lithic scatter		Early Archaic	Not eligible
38RD1171	Trinkley (2000)	lithic scatter		Early Archaic	Not eligible
38RD1172	Trinkley (2000)	lithic scatter	scatter	nondiagnostic; early 20th century	Not eligible

ARCHITECTURAL SURVEY: Brockington and Associates, Inc. conducted an intensive architectural survey of the project area on September 26, 2014. The architectural investigations consisted of a windshield survey of the project area to identify any potential historic architectural resources. The project architectural historian recorded any buildings, structures, objects, or landscapes within 300 feet of the project area that are over 50 years of age and that

retain sufficient integrity using the Statewide Survey of Historic Properties Intensive Documentation Form and digital photography. The architectural survey area includes four residential resources (Resources 6382-6385) and one church (Resource 6386). Outbuildings are associated with two of the residential resources, and a cemetery is associated with the church. All bridges within the architectural survey area are less than 50 years old, so do not meet the age requirements for listing in the NRHP, and were thus not surveyed. The resources identified in the architectural survey are discussed below, and the Intensive Survey Forms are attached as Appendix A.

Resource 6382 (1723 Legrand Road). Resource 6382 is a one-story wood-frame house constructed circa 1955. The house has an L-shaped form and exhibits elements of the Modern movement. The house is covered by a hipped roof of composition shingles with wide overhanging eaves. The exterior cladding is of brick veneer that obscures the foundation. The primary entry is centered on the southwest façade with a replacement door. The porch wing located west of the entry was once likely an integrated garage, but is now a screened porch. The majority of the windows are two-over-two double-hung, wood sash with a horizontal configuration, and some are paired. There are also a few six-over-six vinyl replacement windows. There is one brick chimney with a terra cotta pipe just north of the primary roof ridge. There is a modern wood deck addition located off of the northwest side of the porch. Figure 4 provides a view of Resource 6382. There are two ancillary buildings that appear to be historic age. The first building, a barn, (Resource 6382.01) is approximately 250 feet northwest of the house and was constructed circa 1957. The wood-frame barn is one-and-a-half-stories in height with a rectangular plan, and is clad with wood siding. The barn has a Dutch door, which is centered on the main gable end. The barn has knee-braces with exposed roof beams within the gable ends, and the rafter tails are exposed. The roof section of the gable end has wide overhangs, while the entire roof is covered in 5V crimp metal sheets. The building has shiplap siding. The barn also has a hayloft with double doors above the entrance. There are one-story, full-length, shed-roofed additions on the side elevations of the barn; the south addition is enclosed, and the north addition is open with a further shed extension. Figure 5 provides a view of Resource 6382.01. The second building, that appears to be an equipment shed (Resource 6382.02), is approximately 350 feet northwest of the house and was constructed circa 1960. The wood-frame shed is one story in height with a rectangular plan. The shed has a wide entry that is centered on the gable end with a wooden fence to secure the opening. The shed has an open-air design with gaps between the top of the walls and the roof. A 5V crimp metal sheeting material is used as both roofing and siding for the shed. The building's rafter tails are exposed. Figure 6 provides a view of Resource 6382.02. The project architectural historian assessed Resource 6382 and the associated ancillary outbuildings using the NRHP criteria. The house and outbuildings are typical examples of the vernacular mid-century residential/agricultural architecture of Columbia, SC, and they do not possess any unique architectural characteristics that would make them eligible for the NRHP; therefore, Brockington and Associates, Inc. recommends Resource 6382 not eligible for the NRHP.

Resource 6383 (506 Ross Road). Resource 6383 is a one-story wood-frame house constructed circa 1945. The house and its outbuildings are mostly obscured by vegetation, therefore, description is limited. The rectangular core of the house is covered by a lateral gable roof of composition shingles and sits atop a concrete block foundation. The entry porch is centered on the historic core of the house with a gable roof supported by plain turned wood columns and a metal hand rail. Shiplap clapboard is still present within the gable end of the entry porch, and is likely still present beneath the asbestos shingle siding that covers the rest of the house. The door is wood panel with fixed lights. There is a screened in, engaged porch on the southwest end of the house with an added metal awning around the roofline. There is a large hipped rear addition that may have been part of the original core of the house. The windows are three-over-one double-hung, wood sash windows, some paired. There is one brick chimney within the slope of the rear addition. Figure 7 provides a view of Resource 6383. There are three historic outbuildings associated with the house. The first outbuilding (Resource 6383.01) is a one story, rectangular plan, gable end to front garage built of concrete blocks constructed circa 1945. The garage is directly northwest of the house. The garage has shiplap siding within the gable end and corrugated metal sheets as roofing material. The garage has two-over-two double-hung, wood sash windows with a horizontal configuration. Figure 8 provides a view of Resource 6383.01. The other two outbuildings are mostly obscured by vegetation, therefore, description is limited. The second outbuilding (Resource 6383.02) is a long gable lateral building of unknown use directly north of the house. The outbuilding is of wood-frame construction with corrugated metal siding and 5V crimp metal roofing panels. The third outbuilding (Resource 6383.03) is just northeast of the house and is a single unit shed of unknown use. The outbuilding has corrugated metal sheets covering the shed roof and plywood siding. The outbuilding has a historic wood panel door. Figure 9 provides a view of Resources 6383.02 and 6383.03. The project architectural historian assessed Resource 6383 and the associated ancillary outbuildings using the NRHP criteria. The house and outbuildings are typical examples of the vernacular mid-century residential/agricultural architecture of rural

Columbia, SC, and they do not possess any unique architectural characteristics that would make them eligible for the NRHP. Additionally, the house has gone through multiple changes that compromise its historic fabric; therefore, Brockington and Associates, Inc. recommends Resource 6383 not eligible for the NRHP.

Resource 6384 (2266 Legrand Road). Resource 6384 is a one-story wood-frame house constructed circa 1935. The house exhibits elements of the Modern movement. The rectangular core of the house is covered by a lateral gable roof of 5V crimp sheet metal and rests on a concrete block foundation. The house includes a historic rear addition that creates a T-shape plan, and cross gable roof system. The house has a central entry porch with decorative metal supports, while the door is not discernable from the public ROW. The building has exposed rafter tails and asbestos shingle siding. There are six-over-six double-hung, wood sash windows, some paired. There are two brick chimneys, one of gray brick on the northwest gable end exterior, and one of red brick within the northwest slope of the rear addition. Figure 10 provides a view of Resource 6384. The project architectural historian assessed this resource using the NRHP criteria. The house is a typical example of a vernacular mid-century house in rural Columbia, SC, and does not possess any unique architectural characteristics that would make it eligible for the NRHP. Additionally, the house has gone through multiple changes that compromise its historic fabric; therefore, Brockington and Associates, Inc. recommends Resource 6384 not eligible for the NRHP.

Resource 6385 (2250 Legrand Road). Resource 6385 is a one-story wood-frame house constructed circa 1940. The house exhibits elements of the Modern movement. The rectangular core of the house is covered by a lateral gable roof of composition shingles and rests on a foundation obscured by a brick veneer. The entry is just west of center with a historic wood panel door that has three fixed lights. The single-bay entry porch has decorative metal supports and is covered by a gable roof. The house has six-over-six double-hung, wood sash windows, some paired along with asbestos shingle siding. There is a brick chimney in the south slope of the roof. There is a full-length rear shed addition with an entry and stoop on the east end. There is also a one-car garage addition at the northeast corner of the house. Figure 11 provides a view of Resource 6385. The project architectural historian assessed Resource 6385 using the NRHP criteria. The house is a typical example of a vernacular mid-century house in rural Columbia, SC, and does not possess any unique architectural characteristics that would make it eligible for the NRHP. Not being the best example of a type does not preclude NRHP eligibility; therefore, Brockington and Associates, Inc. recommends Resource 6385 not eligible for the NRHP.

Resource 6386 (Jackson Creek Baptist Church, 7778 Two Notch Road). Resource 6386 (Jackson Creek Baptist Church) was built in 1943 by W. G. Brazil according to its cornerstone. The church is a frame building (framing elements visible through foundation vents) with a brick veneer cladding that obscures the foundation. The rectangular core of the building is covered by an end to front gable roof of composition shingles. The front-gable projecting bay on the façade appears to have originally been an open portico with three arches that have been infilled and covered with stucco. Now, the main entries are to either side of the enclosed porch with a wheelchair ramp on the northeast side and a staircase on the southwest side, and modern glass doors. Both the main block and projecting bay have closed pediments. The upper gable end of the enclosed porch is clad with vinyl siding. There is a steeple on the ridge of the primary roof towards the front (northwest) of the gable. A row of six arched windows spans each lateral side of the main building, and the windows are sectioned into six fixed lights by metal frames. The exterior windows seem to be modern protection for original stained glass windows that may now only be visible from the interior of the church. There is one brick chimney on the south lateral exterior, towards the rear. There is a two-story, rear addition off of the southeast corner that dates to 1964, according to a cornerstone. The brick veneer, flat roof addition has some Colonial Revival elements such as a door surround with pilasters and entablature. Also, there are decorative cornice and parapet details along the roof-line, quoins at the corners, and an attempt at symmetrically balanced windows along the sides. The windows are double casement with two, 16 light segments below four fixed lights. There is another smaller rear addition south of the first one with a gable on hip roof, brick veneer upper level, and concrete block lower level. Figure 12 provides a view of Resource 6386.

A cemetery (Resource 6386.01) known as Jackson Creek Baptist Church Cemetery is associated with the church, and was established in 1840. The cemetery is directly northeast of the church building, and covers an area of approximately two and a half acres with a chain-link fence perimeter. The cemetery is positioned on a lightly sloping hill with multiple shrubs and small trees such as holly, crape myrtles, hydrangea, oak, etc. There are approximately 350 headstones of various types, all facing in a general eastern direction. The markers are made primarily of marble, granite, and concrete. The common family names within the cemetery are LeGrand, Aughtry, Shannon, Martin, Dennis, Dent, Goins, Lee, and Nates. One family plot (Shannon) has a low, formed concrete wall

with chain fencing. There are commemorative markers for soldiers from the Civil War, World War I, and the Korean War. Also, Woodsmen of the World and Masonic markers are present within the cemetery. Several graves within the cemetery were relocated from original sites on Fort Jackson during the 1950s (Trinkley 2013). While only the cemetery falls within the architectural survey area for the project, the church building was also surveyed in order to adhere with the Survey Manual and its guidelines for assigning site numbers to associated resources (SCDAH 2013). Figure 13 provides a view of Resource 6386.01. The church building is a typical example of a vernacular mid-century church in rural Columbia, SC and the aboveground components of the associated cemetery do not possess any unique architectural characteristics that would make them eligible for the NRHP; therefore, Brockington and Associates, Inc. recommends Resource 6386 not eligible for the NRHP.

REMARKS AND RECOMMENDATIONS: Brockington and Associates, Inc. identified five historic architectural resources (Resources 6382, 6383, 6384, 6385, and 6386) during these investigations. We recommend these resources not eligible for the NRHP. The proposed widening of I-77 will have no effect on historic properties. However, if current proposed road plans change, additional survey may be necessary. An archaeological investigation will be required for all undisturbed areas that will be affected by project improvements.

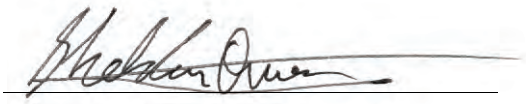
SIGNATURE:  **DATE:** February 25, 2015

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Figure 1. A portion of the 2005 Richland County General Highway Map showing the location of the I-77 Widening Project.

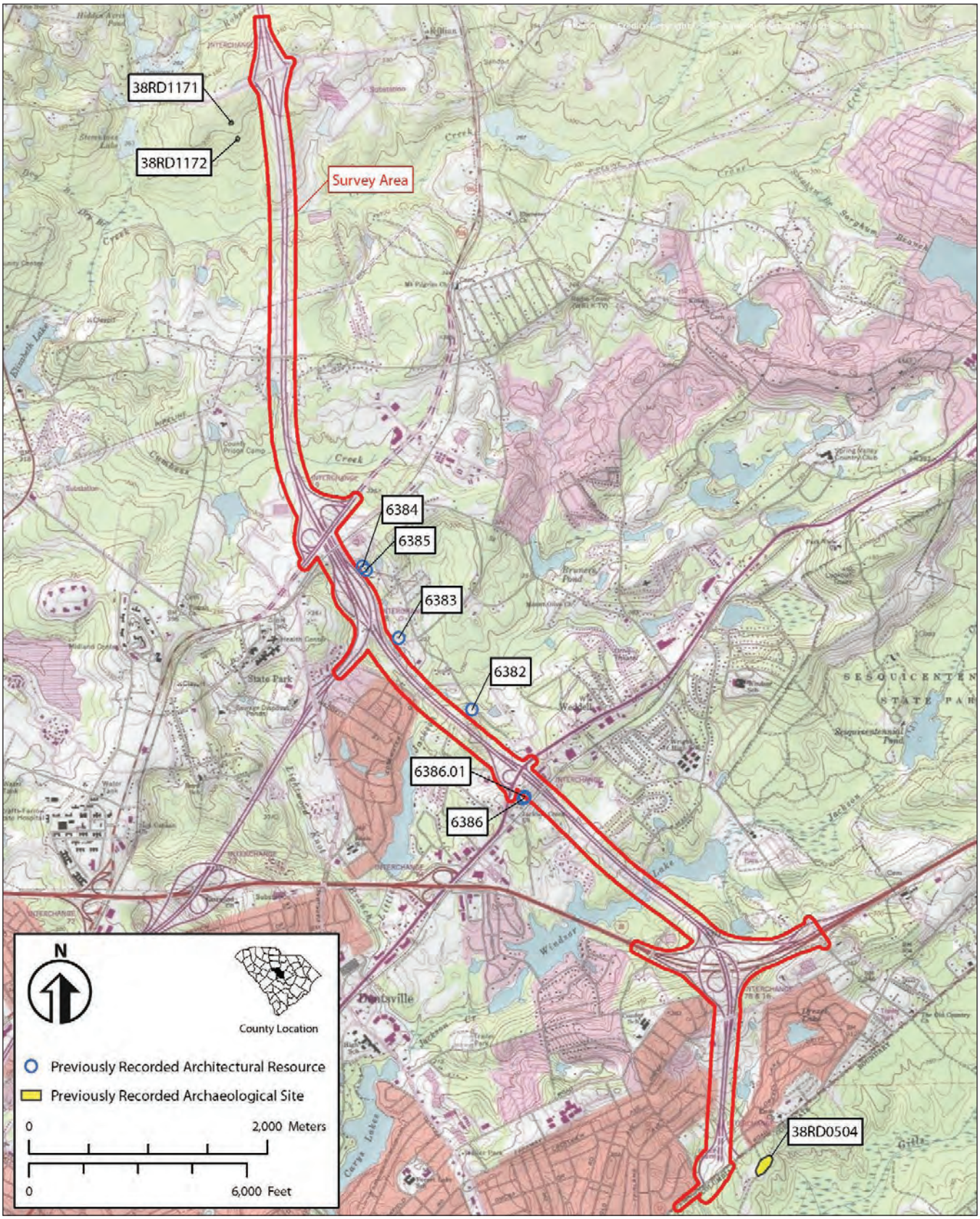


Figure 2. The location of the I-77 Widening Project and all identified cultural resources (USGS 1971/p.r. 1990 *Blythewood*, *SC* and 1972/p.r. 1990 *Fort Jackson North*, *SC* quadrangles).

Figure 3. The location of the I-77 Widening Project and all identified cultural resources on a modern aerial photograph.

Figure 4. View of Resource 6382, looking northeast.

Figure 5. View of Resource 6382.01, looking southwest.

Figure 6. View of Resource 6382.02, looking northwest.

Figure 7. View of Resource 6383, looking north.

Figure 8. View of Resource 6383.01, looking north.

Figure 9. View of Resources 6383.02 and 6383.03, looking northwest.

Figure 10. View of Resource 6384, looking southeast.

Figure 11. View of Resource 6385, looking north.

Figure 12. View of Resource 6386, looking east.

Figure 13. View of Resource 6386.01, looking southwest.

Appendix A.

Statewide Survey Forms

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6382
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17110-03-04

Intensive Documentation Form

Identification

Historic Unidentified House

Common

Address/Location: 1723 Legrand Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Domestic

Current Domestic

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1955 Commercial Stories: 1 story

Alteration Historic Core L

Roof Features
Shape: hip
Materials: composition shingle

Porch Features
Porch Width: facade
Shape: hip

Construction frame

Exterior Walls: brick veneer

Foundation: not visible

Significant Architectural: Entry centered on SW façade; wide overhanging eaves; L footprint includes a porch wing on the W end of the SW façade that may have originally been a porte cochere; 2/2 double hung sash windows, some paired; brick chimney with terra cotta pipe; modern, wood deck addition off of NW of porch; 2 historic outbuildings (barns)

Alterations: Windows; door; porch; deck

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of http://www.richlandmaps.com/apps/gmap/

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6382.01
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17110-03-04

Intensive Documentation Form

Identification

Historic Unidentified Barn

Common

Address/Location: 1723 Legrand Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Agriculture/Subsistence

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1957 Commercial Stories: 1 1/2 stories

Alteration Historic Core rectangular

Roof Features
Shape: gable, end to front
Materials: other metal

Porch Features
Porch Width:
Shape:

Construction frame

Exterior Walls: shiplap

Foundation: not visible

Significant Architectural: Two part barn door with separately hinged upper section, door centered on the main gable end; knee-braces with exposed roof beams within the gable ends; roof of gable end with wide overhangs; hay-loft double doors above the entrance; full façade shed additions along each lateral side, one enclosed, one open with further shed extension; exposed rafter ends

Alterations: extended shed roof

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6382.02
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17110-03-04

Intensive Documentation Form

Identification

Historic Unidentified Stable

Common

Address/Location: 1723 Legrand Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Agriculture/Subsistence

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1960 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, end to front
Materials: other metal

Porch Features
Porch Width:
Shape:

Construction frame

Exterior Walls: other

Foundation: not visible

Significant Architectural Wide entry centered on gable end with wooden fence closer; open-aired design with gap between the top of the walls and the roof; 5v crimp sheet metal siding; exposed rafter ends

Alterations:

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6383
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17107-02-06

Intensive Documentation Form

Identification

Historic Undidentified House

Common

Address/Location: 506 Ross Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Domestic

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1945 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, lateral
Materials: composition shingle

Porch Features
Porch Width: entrance bay only
Shape: gable

Construction frame

Exterior Walls: asbestos shingle

Foundation: concrete block

Significant Architectural: Entry centered on historic core of house with historic wood panel door with fixed lights; gable end of front porch shows likely the original shiplap siding and has simple wood columns; engaged, screened porch on W end of house; metal awnings around porch; large hipped rear addition, possibly part of historic core; brick chimney within roof of hip addition; 3/1 double hung sash windows, some paired; 3 historic outbuildings

Alterations: Siding; additions; porch

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6383.01
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17107-02-06

Intensive Documentation Form

Identification

Historic Unidentified Garage

Common

Address/Location: 506 Ross Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Transportation

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1945 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, end to front
Materials: other metal

Porch Features
Porch Width:
Shape:

Construction masonry

Exterior Walls: other

Foundation: not visible

Significant Architectural Concrete block garage with shiplap siding within th egable end; 2/2 windows, seem to be double hung sash

Alterations:

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6383.02
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17107-02-06

Intensive Documentation Form

Identification

Historic Unidentified Outbuilding

Common

Address/Location: 506 Ross Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Unknown

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1950 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, lateral
Materials: other metal

Porch Features
Porch Width:
Shape:

Construction frame

Exterior Walls: other

Foundation: not visible

Significant Architectural Corrugated metal siding; 5Vcrimp metal roofing panels

Alterations:

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6383.03
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17107-02-06

Intensive Documentation Form

Identification

Historic Unidentified Outbuilding

Common

Address/Location: 506 Ross Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Unknown

Current Vacant/Not In Use

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1950 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: other
Materials: other metal

Porch Features
Porch Width:
Shape:

Construction frame

Exterior Walls: other

Foundation: not visible

Significant Architectural Small single unit with shed roof and plywood siding; historic wood panel door

Alterations:

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6384
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17108-01-02

Intensive Documentation Form

Identification

Historic Unidentified House

Common

Address/Location: 2266 Legrand Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Domestic

Current Domestic

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1935 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, lateral
Materials: other metal

Porch Features
Porch Width: entrance bay only
Shape: gable

Construction frame

Exterior Walls: asbestos shingle

Foundation: concrete block

Significant Architectural: Small entry porch centered on façade with decorative metal supports; exposed rafter ends; 6/6 double hung sash windows, some paired; historic rear central addition forms T footprint, same siding and roof 5v crimp metal roofing material; 2 brick chimneys, one older in north slope of rear addition, one addition on NW gable end exterior of original core; mobile home directly in front of house

Alterations: Siding; foundation; addition; porch; chimney

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6385
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17108-01-05

Intensive Documentation Form

Identification

Historic Unidentified House

Common

Address/Location: 2250 Legrand Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Domestic

Current Domestic

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction c. 1940 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features

Shape: gable, lateral

Materials: composition shingle

Porch Features

Porch Width: over 1 bay but less than full

Shape: gable

Construction frame

Exterior Walls: asbestos shingle

Foundation: not visible

Significant Architectural: Entry porch just west of center with decorative metal supports; brick veneer obscures view of foundation; 6/6 double hung sash windows, some paired; historic wood panel door with fixed lights; brick chimney in south slope of roof; full length rear addition with entry and stoop on east side; one car garage addition at northeast corner

Alterations: Additions; siding

Architect(s)/Builder(s):

Historical Information

Historical Information:

Source of

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6386
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17016-02-02

Intensive Documentation Form

Identification

Historic

Common Jackson Creek Baptist Church

Address/Location: 7778 Two Notch Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: building

Historical Religion

Current Religion

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction 1943 Commercial Stories: 1 story

Alteration Historic Core rectangular

Roof Features
Shape: gable, end to front
Materials: composition shingle

Porch Features
Porch Width: facade
Shape: gable

Construction frame

Exterior Walls: brick veneer

Foundation: not visible

Significant Architectural: Porch seems to have been an entry porch with 3 arches that is now enclosed with a stucco and cross decorations, so that the main entries are now to either side of the porch with wheelchair ramps and modern double glass doors; there is a steeple on the ridge of the primary roof towards the front of the gable; there is vinyl siding within the gable end of the enclosed porch; there are 6 arched windows along each lateral side of the main building sectioned into 6 lights by a metal frame, the exterior windows may be modern protection for an original stained glass window now only visible from the interior; there is one brick chimney on the south lateral exterior towards the rear; There is a large rear 2 story addition that has a

Alterations: Porch; windows; additions; entries

Architect(s)/Builder(s): W.G. Brazil

Historical Information

Historical Information: Cornerstone indicates that church was "rebuilt 1943"; rear addition "1964"

Source of Cornerstones

Photographs *Use Grid for Sketching*

Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Statewide Survey of Historic Properties//

State Historic Preservation Office
South Carolina Department of Archives and History
8301 Parklane Rd.
Columbia, SC 29223-4905 (803) 896-6100

Control Number: U / 79 / 6386.01
Status County No Site No

Quad Name: Fort Jackson

Tax Map R17016-02-02

Intensive Documentation Form

Identification

Historic

Common Jackson Creek Baptist Church Cemetery

Address/Location: 7778 Two Notch Rd.

City: Columbia County: Richland

Vicinity of:

Ownership: Private Category: site

Historical Funerary

Current Funerary

National Register of Historic Places

SHPO National Register

Notes on National Register

Other Designation:

Property Description

Construction 1840-present Commercial Stories:

Alteration Historic Core

Roof Features *Porch Features*

Shape: Porch Width:

Materials: Shape:

Construction

Exterior Walls:

Foundation:

Significant Architectural Approximately 2.5 acres with a chain-link fence perimeter; one family plot (Shannon) with low concrete wall and chain fencing; approximately 350 headstones of various types, all facing in a general eastern direction; the graveyard is on a lightly sloping hill, with multiple shrubs and small trees: holly, crape myrtles, hydrangea, oak, etc.

Alterations:

Architect(s)/Builder(s):

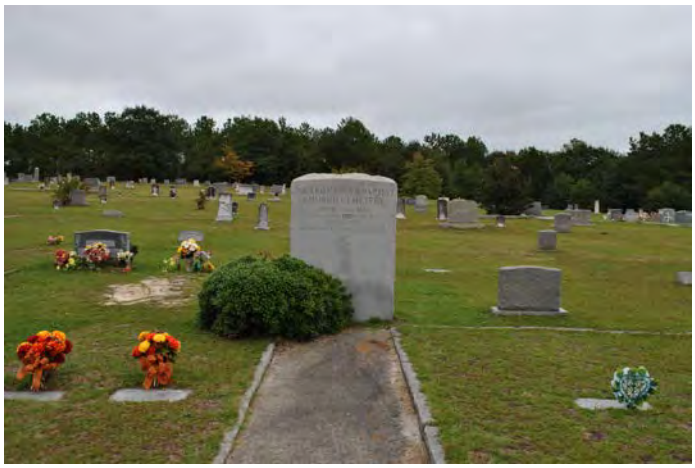
Historical Information

Historical Information: Common family names: LeGrand, Aughtry, Shannon, Martin, Dennis, Dent, Goins, Lee, Nates; CSA, Korean War, WWI, Woodsmen of the World, and Masonic markers

Source of Headstones and cemetery signage

Photographs

Use Grid for Sketching



Program Management

Recorded by: S. Owens, Brockington and Assc.
Date Recorded: 9/26/2014

Appendix F

Permit Determination Form and

Jurisdictional Determination

Date: 5/12/2015

PERMIT DETERMINATION

FROM Renee Mulholland COMPANY HDR, Inc.

CONTACT INFO (phone and/or email) 843.414.3734; renee.mulholland@hdrinc.com

SCDOT PROJECT ENGINEER Jae Mattox

TO Siobhan Gordon - RPG 3 Permits Coordinator

Project Description interstate widening and rehabilitation

Route or Road No. I-77 County Richland

CONST. PIN P027002 OTHER PINS or STRUCTURE #

RESPONSE:

○ It has been determined that no permits are required because:

● The following permit(s) is/are necessary:
(Please check which type(s) of permit the project will need)

USACE Permit	☐ GP	☑ IP	☐ 401	☐ JD
OCRM Permit	☐ CAP	☐ CZC		
Navigable	☐ SCDHEC NAVGP – if checked a USCG and/or USACE navigable permit may also be required, but will be determined during the NEPA and Permitting stages.			
Other	**It is anticipated that stream impacts will be minimized to stay within the GP threshold.			

Water Classification: FW *Print and attach the SCDHEC water quality report*

303(d) listed ● no ○ yes, for *

TMDL developed ○ no ● yes, for * FC, DO

*List all that apply using the SCDHEC abbreviations

Comments: The project corridor is location within 2 TMDL watersheds (Gills Creek and Crane Creek - Broad River). No impaired waters were identified within 1/4 mile of the project.

The determination above was based on the most recently available information at the time. This is a preliminary determination and is subject to change if the design of the project is modified.

renee.mulholland@hdrinc.com
Digitally signed by renee.mulholland@hdrinc.com
DN: cn=renee.mulholland@hdrinc.com
Date: 2015.05.12 17:04:46 -04'00'

Biologist, SCDOT/Consultant

5/12/15
Date

Revised 04/2013

03050106-07

(Broad River)

General Description

Watershed 03050106-07 (formerly 03050106-060) is located Newberry, Fairfield, and Richland Counties and consists primarily of the ***Broad River*** and its tributaries from the Parr Shoals dam to its confluence with the Saluda River. The watershed occupies 148,599 acres of the Piedmont region of South Carolina. Land use/land cover in the watershed includes: 59.4% forested land, 21.4% urban land, 13.0% agricultural land, 3.0% forested wetland, 2.0% water, 0.8% barren land, and 0.4% scrub/shrub land.

This section of the Broad River accepts drainage from its upper reaches, together with Mayo Creek, Crims Creek (Rocky Creek, Summers Branch), Wateree Creek (Risters Creek), Boone Creek, Freshley Branch, Mussel Creek, and the Little River Watershed. Hollingshead Creek (Boyd Branch, Wildhorse Branch, Metz Branch, Hope Creek, Bookman Creek) enters the river next followed by the Cedar Creek Watershed, Nipper Creek, Nicholas Creek (Swygert Branch, Moccasin Branch), Slatestone Creek, and Burgess Creek. Crane Creek and Smith Branch enter the river at the base of the watershed near the City of Columbia. Sorghum Branch, Dry Branch (Crescent Lake, Stevensons Lake, Roberts Branch), Elizabeth Lake, and Cumbess Creek drain into Crane Creek followed by North Branch Crane Creek. North Branch Cane Creek accepts drainage from Beasley Creek (Robertson Branch, Lot Branch, Hawkins Branch), Swygert Creek, Dry Fork Creek, and Long Branch. A portion of the Broad River is diverted into the Broad River Canal in Columbia before flowing into the Congaree River. Although depicted in the upper Congaree River Watershed (03050110-01), the canal is associated with this lower Broad River watershed; therefore any facilities or stations in this area will be included in this watershed. The Harbison State Forest is located next to the Broad River just downstream of Nicholas Creek and a Heritage Trust Preserve is located along Nipper Creek. There are a total of 274.1 stream miles and 671.3 acres of lake waters.

Surface Water Quality

Station #	Type	Class	Description
B-236	P/W	FW	BROAD RIVER AT SC 213, 2.5 MI SW OF JENKINSVILLE
RS-03517	RS03	FW	CRIMS CREEK TRIBUTARY AT S-36-25
B-800	BIO	FW	CRIMS CREEK AT SC 213
B-801	BIO	FW	WATEREE CREEK AT SR 698
B-110	S	FW	ELIZABETH LAKE AT SPILLWAY ON US 21
B-316	P	FW	CRANE CREEK AT S-40-43 UNDER I-20, NORTH COLUMBIA
B-280	P/BIO	FW	SMITH BRANCH AT N MAIN ST (US 21) IN COLUMBIA
B-337	W	FW	BROAD RIVER AT US 176 (BROAD RIVER ROAD) IN COLUMBIA
B-080	P/W	FW	BROAD RIVER DIVERSION CANAL AT COLUMBIA WATER PLANT

Broad River – There are two SCDHEC monitoring sites along this section of the Broad River. At the upstream site ***(B-236)***, aquatic life uses are not supported due to occurrences of copper in excess of the aquatic life chronic criterion. There is a significant increasing trend in pH. A very high concentration of lead was measured in the 2000 sediment sample and chrysenes, fluoranthenes, DDE (a metabolite of DDT), and pyrene were detected in the sample. A very high

concentration of cadmium was measured in the 2004 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are fully supported at this site and a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter. Aquatic life uses are fully supported at the downstream site ***(B-337)***, but recreational uses are partially supported due to fecal coliform bacteria excursions.

Broad River Diversion Canal (B-080) – Aquatic life uses are fully supported, but recreational uses are partially supported due to fecal coliform bacteria excursions.

Crims Creek Tributary (RS-03517) – Aquatic life uses are fully supported. A very high concentration of cadmium was measured in the 2003 sediment sample. Recreational uses are not supported due to fecal coliform bacteria excursions.

Crims Creek (B-800) – Aquatic life uses are partially supported based on macroinvertebrate community data.

Wateree Creek (B-801) – Aquatic life uses are fully supported based on macroinvertebrate community data.

Elizabeth Lake (B-110) – Aquatic life uses are fully supported. There is a significant increasing trend in pH. A significant increasing trend in dissolved oxygen concentration suggests improving conditions for this parameter. Recreational uses are partially supported due to fecal coliform bacteria excursions.

Crane Creek (B-316) – Aquatic life uses are partially supported based on macroinvertebrate community data. There is a significant increasing trend in pH. A significant decreasing trend in turbidity suggests improving conditions for this parameter. A very high concentration of cadmium was measured in the 2000 sediment sample and dieldrin, DDE (a metabolite of DDT), and DDT were also detected in the sample. Benzoic acid and bis(n-octyl) phthalate were detected in the 2004 sediment sample. Although the use of DDT was banned in 1973, it is very persistent in the environment. Recreational uses are partially supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

Smith Branch (B-280) – Aquatic life uses are fully supported; however, there is a significant increasing trend in total phosphorus concentration. There is a significant increasing trend in pH. Significant increasing trends in dissolved oxygen concentration and decreasing trends in turbidity suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

NPDES Program

Active NPDES Facilities

RECEIVING STREAM ***FACILITY NAME*** ***PERMITTED FLOW @ PIPE (MGD)***	***NPDES#*** ***TYPE*** ***COMMENT***
BROAD RIVER SCE&G/PARR HYDRO STA. PIPE #: 001 FLOW: 0.035	SC0001864 MINOR INDUSTRIAL
BROAD RIVER MARTIN MARIETTA/N. COLUMBIA QUARRY PIPE #: 001 FLOW: M/R	SCG730066 MINOR INDUSTRIAL
BROAD RIVER RAINTREE ACRES SD/MIDLANDS UTILITIES PIPE #: 001 FLOW: 0.14	SC0039055 MINOR DOMESTIC
BROAD RIVER TOWN OF CHAPIN WWTP PIPE #: 001 FLOW: 1.2 PIPE #: 001 FLOW: 2.4, 5.0 (PROPOSED)	SC0040631 MAJOR DOMESTIC
BROAD RIVER RICHLAND COUNTY BROAD RIVER WWTP PIPE #: 001 FLOW: 2.5 (6.0 PROPOSED)	SC0046621 MAJOR DOMESTIC
MAYO CREEK (TO BROAD RIVER) SCE&G/SUMMER NUCLEAR STA. PIPE #: 013 FLOW: 0.015	SC0030856 MAJOR INDUSTRIAL
MAYO CREEK SCE&G/SUMMER NUCLEAR TRAINING CTR PIPE #: 001 FLOW: 0.0004 (PIPE #: 002 FLOW: 0.0105 PROPOSED)	SC0038407 MINOR INDUSTRIAL
CRANE CREEK HANSON BRICK COLUMBIA PIPE #: 001 FLOW: 0.0065	SC0031640 MINOR INDUSTRIAL
NIPPER CREEK VULCAN MATERIALS CO./DREYFUS QUARRY PIPE #: 001, 002 FLOW: M/R	SCG730052 MINOR INDUSTRIAL
BEASLEY CREEK TRIBUTARY BOSE CORPORATION PIPE #: 001 FLOW: M/R	SCG250182 MINOR INDUSTRIAL
BURGESS CREEK HANSON BRICK EAST.MANNING PIT PIPE #: 001 FLOW: M/R	SCG730509 MINOR INDUSTRIAL
BROAD RIVER TRIBUTARY MARTIN MARIETTA/HARBISON QUARRY PIPE #: 001 FLOW: M/R	SCG730588 MINOR INDUSTRIAL
BROAD RIVER TRIBUTARY BORAL BRICKS/LABORDE MINE PIPE #: 001 FLOW: M/R	SCG730639 MINOR INDUSTRIAL

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME *FACILITY TYPE*	*PERMIT #* *STATUS*
RICHLAND COUNTY SANITARY LANDFILL DOMESTIC	401001-1101 CLOSED
RICHLAND COUNTY C&D LANDFILL	401001-1201, 1202 ACTIVE
OLD CITY OF COLUMBIA LANDFILL DOMESTIC	-------- CLOSED
DARTMOUTH AVENUE C&D DUMP DOMESTIC	-------- CLOSED
KNIGHTNER STREET C&D DUMP C&D LANDFILL	-------- CLOSED
CRAWFORD ROAD C&D DUMP C&D LANDFILL	-------- CLOSED
BREAZIO ROAD C&D DUMP C&D LANDFILL	-------- CLOSED
ETHELS AVENUE C&D DUMP C&D LANDFILL	-------- CLOSED
EAGLE CONSTRUCTION C&D	PROPOSED ---------
COUNTY LINE C&D LF C&D	PROPOSED ---------
CAROLINA WRECKING ST C&D LC LANDFILL C&D LANDFILL	402451-1301 CLOSED
SHEALY LC&D C&D LANDFILL	402405-1701 INACTIVE
BILLY MEETZ C&D LANDFILL	402463-1701 ACTIVE
WHITAKER AIR CURTAIN INCINERATOR INCINERATOR	402769-4001 ACTIVE
EARGLES COMPOSTING COMPOSTING	402706-3001 INACTIVE
LOVELESS & LOVELESS, INC. C&D LANDFILL	402428-6001 INACTIVE
BROAD RIVER LANDSCAPING C&D LANDFILL	402467-1701 ACTIVE
MUNGO HOMES INC. LAND APPLICATION	402645-8001 ACTIVE

BILL MOCK DUMP	----------
DOMESTIC	CLOSED
BFI WASTESTREAM	--------
DOMESTIC	INACTIVE
BLYTHEWOOD CONSTRUCTION CO., INC.	402479-1701
C&D LANDFILL	ACTIVE
ELMWOOD AVE. SITE	402631-2001
C&D LANDFILL	INACTIVE

Mining Activities

MINING COMPANY	***PERMIT #***
MINE NAME	***MINERAL***
MARTIN MARIETTA MATERIALS INC.	0099-79
NORTH COLUMBIA QUARRY	GRANITE
MARTIN MARIETTA MATERIALS INC.	0101-79
HARBISON QUARRY	SHALE
RICHARDSON CONSTRUCTION CO.	0738-79
RICHARDSON'S MONTICELLO FILL	CLAY
BORAL BRICK, INC.	0448-79
LABORDE MINE	CLAY
HANSON BRICK COLUMBIA	0187-79
BROAD RIVER MINE	SHALE
HANSON BRICK COLUMBIA	0538-79
MANNING	SHALE
VULCAN CONSTRUCTION MATERIALS LP	0129-79
DREYFUS QUARRY	GRANITE

Water Quantity

WATER USER	***REGULATED CAP. (MGD)***
STREAM	***PUMPING CAP. (MGD)***
CITY OF COLUMBIA	71.0
BROAD RIVER CANAL	91.0

Growth Potential

There is a high potential for growth in this watershed, which contains the northwest portion of the Greater Columbia Metropolitan Area and ample water and sewer service. In addition, the watershed contains the Town of Peak and portions of the Towns of Irmo, Chapin, Little Mountain, and Blythewood. The I-26, I-20, and I-77 corridors, along with the U.S. Hwy. 321, U.S. Hwy. 21, and U.S. Hwy. 176 corridors, will serve to increase residential, commercial, and industrial growth in the Greater Columbia Area. The northwest portion of the city (St. Andrews, Irmo, and Harbison) will continue to develop as a regional commercial hub for the area. Industrial development along the I-77 corridor is expected to remain strong due to the aggressive economic development policy by the City of Columbia and Richland County. The Killian and

Blythewood areas in particular are expected to see increased construction activity. There is a high potential for growth on the eastern edge of the watershed, in Northeast Richland County. New commercial developments (The Village at Sandhills, Rice Creek Village, Sparkleberry Square, Sparkleberry Crossing) are expected to further increase the growth of a rapidly growing residential area.

Watershed Protection and Restoration Strategies

Total Maximum Daily Loads (TMDLs)

A TMDL was developed for SCDHEC and approved by EPA for fecal coliform bacteria in the **Broad River** at Columbia (***B-337***). There are eight facilities that have fecal coliform limits in their NPDES permits that discharge into this long section of the Broad River. Part of the City of Columbia Municipal Separate Storm Sewer System (MS4) is in this section of the Broad River watershed. Possible sources of fecal coliform bacteria in the Broad River, identified in the TMDL, include MS4 stormwater runoff, leaking sewers, SSOs, failing onsite wastewater disposal systems, land application of manure, cattle watering in the creek, pets, and wildlife. The TMDL specifies a reduction in the load of fecal coliform bacteria into this section of the Broad River of 62% in order for the river to meet the recreational use standard.

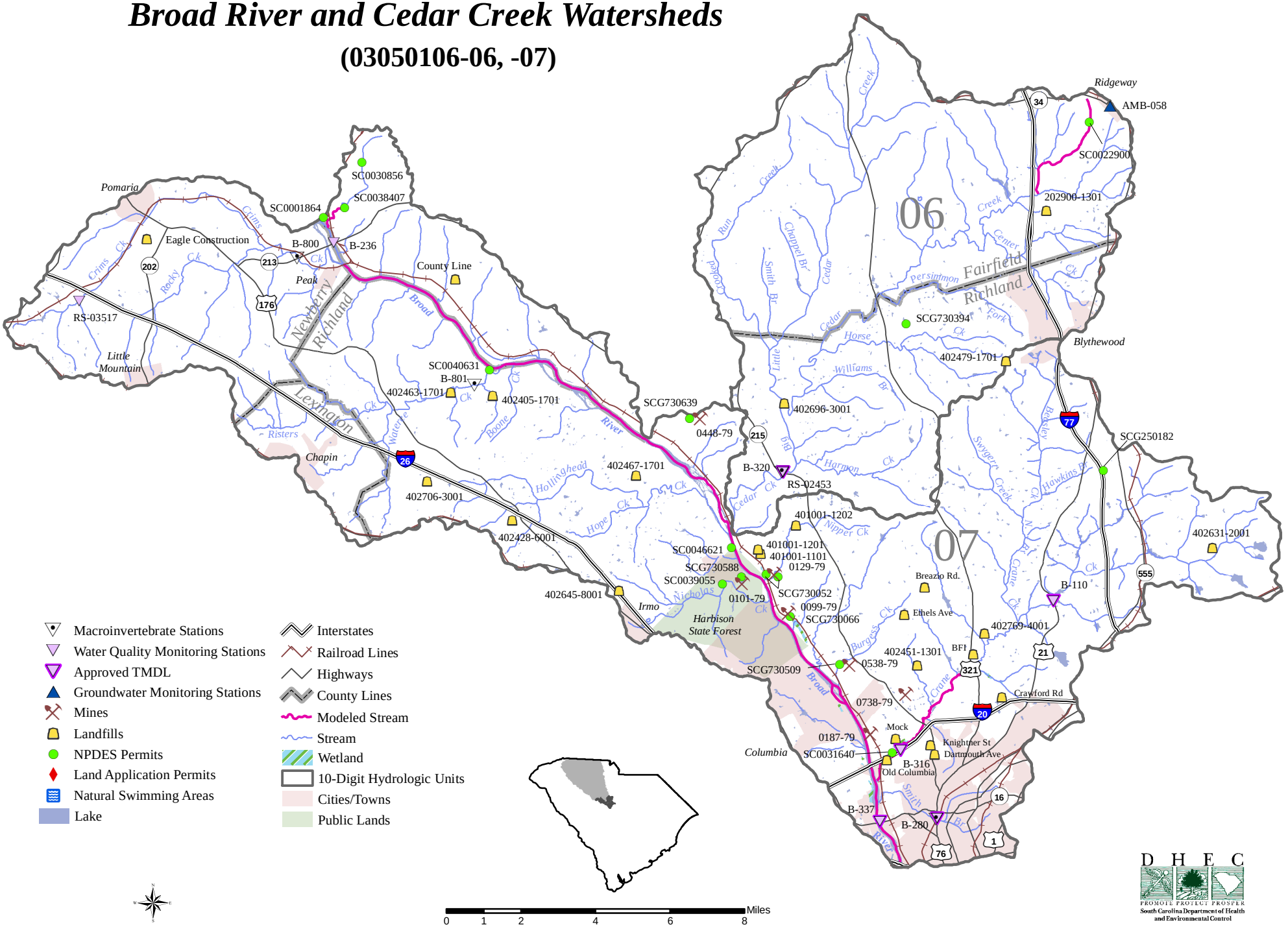
TMDLs were also developed for SCDHEC and approved by EPA for fecal coliform bacteria in **Crane Creek** at water quality monitoring sites ***B-110*** (the Elizabeth Lake spillway) and ***B-316***. Hanson Brick Corporation (SC0031640) has fecal coliform limits in its NPDES permit. It discharges into Crane Creek downstream of Elizabeth Lake. The City of Columbia Phase I Municipal Separate Storm Sewer System (MS4) extends into the Crane Creek watershed. Possible sources of fecal coliform bacteria in Crane Creek identified in the TMDL include Stormwater from the MS4 areas, leaking sewers, failing onsite wastewater disposal systems, pets, and wildlife. The TMDLs specify reductions in the load of fecal coliform bacteria into Crane Creek above Elizabeth Lake of 48% and downstream of Lake Elizabeth of 92 % in order for the creek to meet the recreational use standard.

A TMDL was developed for SCDHEC and approved by EPA for fecal coliform bacteria in **Smith Branch** at water quality monitoring site ***B-280***. There are no facilities that have fecal coliform limits in their NPDES permits that discharge into Smith Branch. However, the creek drains a highly urbanized area of Columbia, which is designated as the City of Columbia Municipal Separate Storm Sewer System (MS4). Possible sources of fecal coliform bacteria in the branch, identified in the TMDL, include MS4 runoff, leaking sewers, failing onsite wastewater disposal systems, pets and wildlife. The TMDL specifies a reduction in the load of fecal coliform bacteria into Smith Branch of 99% in order for the creek to meet the recreational use standard.

Funding for TMDL implementation activities is currently available. For more information, see the Bureau of Water web page www.scdhec.gov/water or call the Watershed Program at (803) 898-4300.

Broad River and Cedar Creek Watersheds

(03050106-06, -07)



- Macroinvertebrate Stations
- Water Quality Monitoring Stations
- Approved TMDL
- Groundwater Monitoring Stations
- Mines
- Landfills
- NPDES Permits
- Land Application Permits
- Natural Swimming Areas
- Lake
- Interstates
- Railroad Lines
- Highways
- County Lines
- Modeled Stream
- Stream
- Wetland
- 10-Digit Hydrologic Units
- Cities/Towns
- Public Lands

0 1 2 4 6 8 Miles

D H E C

PROMOTE PROTECT PROSPER

South Carolina Department of Health and Environmental Control

03050110-02

(Gills Creek)

General Description

Watershed 03050110-02 (formerly 03050110-030) is located in Richland County and consists primarily of ***Gills Creek*** and its tributaries. The watershed occupies 47,683 acres of the Sandhills region of South Carolina. Land use/land cover in the watershed includes: 51.0% urban land, 25.1% forested land, 13.4% agricultural land, 8.1% forested wetland (swamp), 2.1% water, and 0.3% nonforested wetland (marsh).

Gills Creek flows through the northeastern section of the City of Columbia and drains into the Congaree River. Gills Creek originates near Sesquicentennial State Park and accepts the drainage of Bynum Creek (Rose Creek), Rowell Creek, and Mack Creek before flowing through Rockyford Lake and Forest Lake. Jackson Creek also originates near Sesquicentennial State Park and flows through Sesquicentennial Pond and Windsor Lake before accepting the drainage of Little Jackson Creek (Lightwood Knot Branch). Jackson Creek then flows through Carys Lakes (Arcadia Lakes) and Spring Lake before flowing into Gills Creek in Forest Lake. Downstream of Forest Lake, Gills Creek accepts the drainage of Eightmile Branch and Pen Branch (Orphanage Branch) before flowing through Lake Katherine. Wildcat Creek (Semmes Lake, Fork Creek, Upper Legion Lake, Lower Legion Lake) drains into Gills Creek downstream of Lake Katherine. Gills Creek and its associated wetlands drain into the Congaree River. Several oxbow lakes, including Alligator Lake, drain into Gills Creek near the river. There are a total of 117.5 stream miles and 1,120.0 acres of lake waters in this watershed, all classified FW.

Surface Water Quality

Station #	Type	Class	Description
C-068	W	FW	FOREST LAKE AT DAM
C-001	W	FW	GILLS CREEK AT BRIDGE ON US 76 (GARNERS FERRY ROAD)
C-017	INT	FW	GILLS CREEK AT SC 48 (BLUFF ROAD)

Forest Lake (C-068) – Aquatic life and recreational uses are fully supported. There is a significant increasing trend in pH. A significant decreasing trend in turbidity suggests improving conditions for this parameter.

Gills Creek - There are two SCDHEC monitoring stations along Gills Creek. Aquatic life uses are fully supported at the upstream site ***(C-001)***; however, there is a significant increasing trend in five-day biochemical oxygen demand. There is a significant increasing trend in pH. Significant decreasing trends in turbidity, total phosphorus concentration, and total nitrogen concentration suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter. Aquatic life uses are partially supported at the downstream site ***(C-017)*** due to dissolved oxygen excursions, which are

compounded by a significant decreasing trend in dissolved oxygen concentration. There is a significant increasing trend in pH. Significant decreasing trends in turbidity, total phosphorus concentration, and total suspended solids suggest improving conditions for these parameters. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significant decreasing trend in fecal coliform bacteria concentration suggests improving conditions for this parameter.

A fish consumption advisory has been issued by SCDHEC for mercury and includes Sesquicentennial State Park Lake, Carys Lake, Forest Lake, and Windsor Lake within this watershed (see advisory p.131).

Natural Swimming Areas

FACILITY NAME / ***RECEIVING STREAM***	***PERMIT #*** / ***STATUS***
SESQUICENTENIAL STATE PARK	40-N16
SESQUICENTENIAL STATE PARK LAKE	ACTIVE

Groundwater Quality

Well #	Class	Aquifer	Location
AMB-046	GB	MIDDENDORF	SPRING VALLEY

All water samples collected from ambient monitoring well ***AMB-046*** met standards for Class GB groundwater.

NPDES Permitted Activities

Active NPDES Facilities

RECEIVING STREAM / ***FACILITY NAME***	***NPDES#*** / ***TYPE***
GILLS CREEK	SCG250180
CENTRAL PRODUCTS CO. DBA IPG	MINOR INDUSTRIAL
JACKSON CREEK	SC0046264
AMPHENOL CORP.	MINOR INDUSTRIAL
GILLS CREEK TRIBUTARY	SCG730269
JORDAN CO./CONGAREE SAND PIT	MINOR INDUSTRIAL
LIGHTWOOD KNOT BRANCH TRIBUTARY	SCG730926
SCDOT/I-20 PIT	MINOR INDUSTRIAL

Municipal Separate Storm Sewer Systems (MS4)

RECEIVING STREAM / ***MUNICIPALITY*** / ***RESPONSIBLE PARTY*** / ***IMPLEMENTING PARTY***	***NPDES#*** / ***MS4 PHASE*** / ***MS4 SIZE***
GILLS CREEK	SCS400001
----------	PHASE I
RICHLAND COUNTY	MEDIUM MS4
RICHLAND COUNTY	

GILLS CREEK CITY OF COLUMBIA CITY OF COLUMBIA CITY OF COLUMBIA	SCS790001 PHASE II SMALL MS4
GILLS CREEK CITY OF COLUMBIA FORT JACKSON FORT JACKSON	SCR037901 PHASE II SMALL MS4
GILLS CREEK CITY OF ARCADIA LAKES RICHLAND COUNTY RICHLAND COUNTY	SCS400001 PHASE II SMALL MS4
GILLS CREEK CITY OF FOREST ACRES RICHLAND COUNTY RICHLAND COUNTY	SCS400001 PHASE II SMALL MS4
GILLS CREEK UNINCORPORATED AREAS RICHLAND COUNTY RICHLAND COUNTY	SCS400001 PHASE I MEDIUM MS4

Nonpoint Source Permitted Activities

Land Disposal Activities

Landfill Facilities

LANDFILL NAME ***FACILITY TYPE***	***PERMIT #*** ***STATUS***
ANCHOR CONTINENTAL, INC. INDUSTRIAL	---------- CLOSED
ANCHOR CONTINENTAL, INC. INDUSTRIAL	---------- CLOSED
INTERTAPE POLYMER GROUP (ANCHOR CONTINENTAL) INDUSTRIAL	403326-1601 ACTIVE
BALDWIN ROAD C&D DUMP C&D LANDFILL	---------- CLOSED
COLUMBIA LANDFILL MUNICIPAL	---------- INACTIVE
CITY OF COLUMBIA COMPOSTING FACILITY COMPOSTING	401002-3001 ACTIVE
TRAPP L/C DEBRIS & YT LANDFILL C&D LANDFILL	402468-1701 INACTIVE

Mining Activities

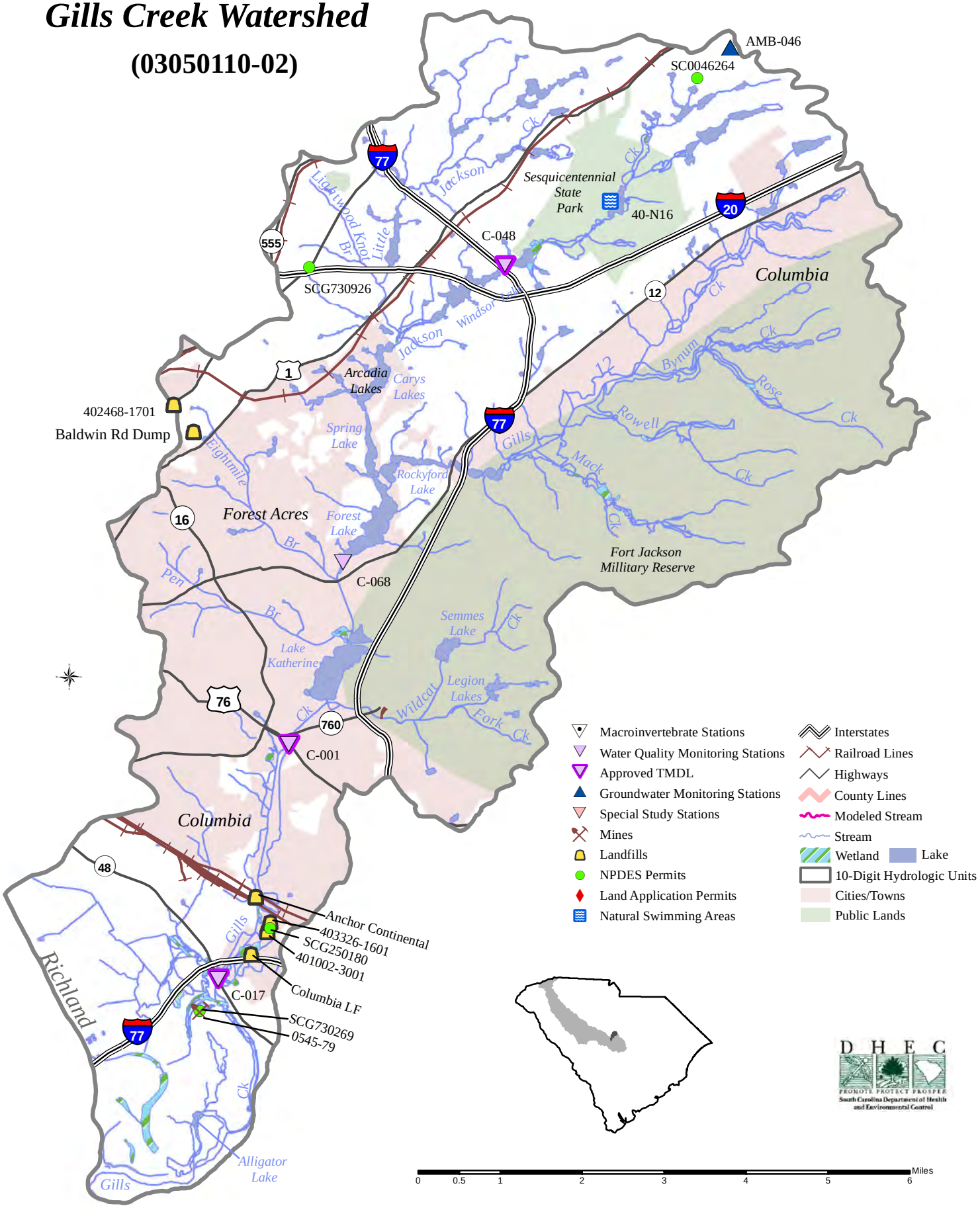
MINING COMPANY ***MINE NAME***	***PERMIT #*** ***MINERAL***
THE JORDAN COMPANY CONGAREE SAND PIT	0545-79 SAND

Growth Potential

There is a high potential for continued growth in this urban watershed, which contains a portion of the City of Columbia. Although primarily residential, there are a substantial number of commercial and industrial areas. Almost the entire watershed, which runs through the City of Columbia, has water and sewer readily available. Growth has been steady in the Southeast Columbia area along the I-77 beltway and is expected to continue to be a strong growth corridor for residential and industrial development.

Gills Creek Watershed

(03050110-02)



JD Checklist*

Action	SCDOT Confirmation		Consultant Confirmation	
1 Is the *Jurisdictional Determiniation Request* Form completed and signed?	Y	N	Y	N
2 Does the JD packet include:	Y	N	Y	N
a) Location Map	Y	N	Y	N
b) Aerial photograph with project boundary?	Y	N	Y	N
c) Topographic map with project boundary?	Y	N	Y	N
d) Soil survey map with project boundary?	Y	N	Y	N
e) Photographs of the site, wetlands, streams, ditches, etc?	Y	N	Y	N
f) Table with Latitude and Longitude for each jurisdictional feature (wetland, stream pond, etc.)?	Y	N	Y	N
3 Is the project boundary large enough to encompass all potential impacts including construction access?	Y	N	Y	N
4 Is the acerage for the project area included on the wetland map?	Y	N	Y	N
5 Are all wetlands and streams identified on a map or drawing?	Y	N	Y	N
6 Is there a map included showing the surface connection of how the stream, wetland, or ditch connects to a downstream (named) tributary?	Y	N	Y	N
b) Do all identified streams contain a clear line or polygon with linear footage?	Y	N	Y	N
7 Could you use the maps and drawings to easily locate the site and the boundaries of the wetlands within the project area *without the consultant present*?	Y	N	Y	N
8 Data Sheets:				
a) Are data sheets included?	Y	N	Y	N
b) Is a refrence map included to indicate where the data points are located?	Y	N	Y	N

SCDOT

Consultant

* This checklist includes information that is not necessarily required for a Jurisdictional Determiniation but will ensure a streamlined review

Jurisdictional Determination Approval Letter to be inserted here

January 14, 2015

U.S. Army Corps of Engineers
Charleston District, Regulatory Division
69A Hagood Avenue
Charleston, South Carolina 29403

RE: **I-77 Roadway Widening and Improvements**
SCDOT Project Number P027002
Approximate-Preliminary Jurisdictional Determination Request
Richland County, South Carolina

The South Carolina Department of Transportation (SCDOT) has authorized HDR, Inc. (HDR) as its agent to submit the enclosed jurisdictional determination request for the proposed improvement project on I-77 in Richland County, South Carolina (Figure 1). The proposed roadway widening project will take place within existing right-of-way and includes widening approximately seven miles of I-77 from mile marker 15 (Percival Road) to mile marker 22 (Killian Road). No new right-of-way will be required. The approximately 571 acre Project Boundary for the jurisdictional waters survey was based on the existing right-of-way corridor width - approximately 120 feet from the centerline of the northbound and southbound lanes and the median area between the northbound and southbound lanes - as provided by SCDOT (Figure 5, sheets 1-9). In addition, approximately five miles of the I-77 southbound lanes from mile marker 22 (Killian Road) to mile marker 27 will be rehabilitated. No drainage work and no work outside the shoulders will occur; therefore, the jurisdictional delineation for the rehabilitation area is based off a desktop survey using National Wetland Inventory maps. The total Project Boundary, including the rehabilitation area is approximately 809 acres, as shown on Figures 1 through 4. The wetland delineation field survey includes the widening area from Percival Road to Killian Road, as shown in Figure 5.

Jurisdictional Waters of the U.S.

HDR environmental scientists John Jamison (PWS), Renee Mulholland, and Jason McMaster reviewed the Project Boundary for jurisdictional waters of the U.S. under Section 404 of the Clean Water Act from August 4 to August 7, 2014. The Project Boundary was examined according to the methodology described in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual, USACE Post-Rapanos guidance, and the USACE Atlantic and Gulf Coastal Plain Regional Supplement. The on-site review revealed that 24 perennial Relatively Permanent Waters (pRPW), 5 Non-RPWs, and 23 wetlands are located within the Project Boundary. Attached to this submittal are completed USACE Wetland Determination Data forms, stream assessment data sheets, and representative photographs. **Table 1** provides a summary of the delineated features.

Table 1. Summary of Waters of the U.S.

Site Number or Name	Latitude (degrees decimal minutes)	Longitude (degrees decimal minutes)	Cowardin Class	Estimated Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
Streams (S)					
S1	32 2.97	-80 55.46	R2UB2	3 LF	non section 10 – non-tidal
S2	34 3.33	-80 55.39	R2UB1	900 LF	non section 10 – non-tidal
S3	34 4.13	-80 55.19	R4SB2	374 LF	non section 10 – non-tidal
S4	34 4.12	-80 55.22	R2UB2	82 LF	non section 10 – non-tidal
S5	34 4.19	-80 55.11	R4SB5	557 LF	non section 10 – non-tidal
S6	34 4.19	-80 55.04	R4SB5	12 LF	non section 10 – non-tidal
S7	34 4.10	-80 55.52	R2UB3	346 LF	non section 10 – non-tidal
S8	34 4.14	-80 55.65	R4SB2	51 LF	non section 10 – non-tidal
S9	34 4.69	-80 56.07	R2UB1	31 LF	non section 10 – non-tidal
S10	34 4.69	-80 56.08	R4SB5	62 LF	non section 10 – non-tidal
S11	34 4.66	-80 56.13	R2UB3	26 LF	non section 10 – non-tidal
S12	34 4.67	-80 56.14	R2UB3	16 LF	non section 10 – non-tidal
S13	34 4.67	-80 56.13	R2UB3	60 LF	non section 10 – non-tidal
S14	34 4.71	-80 56.18	R2UB3	55 LF	non section 10 – non-tidal
S15	34 4.72	-80 56.19	R4SB4	90 LF	non section 10 – non-tidal
S16	34 4.78	-80 56.18	R2UB1	67 LF	non section 10 – non-tidal
S17	34 4.79	-80 56.20	R2UB3	246 LF	non section 10 – non-tidal
S18 (Jackson Creek)	34 5.29	-80 56.95	R2UB2	400 LF	non section 10 – non-tidal

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S19	34 5.65	-80 57.21	R2UB2	1,672 LF	non section 10 – non-tidal
S20	34 5.38	-80 57.02	R2UB4	27 LF	non section 10 – non-tidal
S21	34 5.43	-80 57.16	R2UB3	36 LF	non section 10 – non-tidal
S22	34 5.41	-80 57.38	R2UB2	235 LF	non section 10 – non-tidal
S23 (Cumbess Creek)	34 6.39	-80 57.67	R2UB2	42 LF	non section 10 – non-tidal
S24 (Cumbess Creek)	34 6.40	-80 57.74	R2UB2	49 LF	non section 10 – non-tidal
S25	34 6.60	-80 57.76	R2UB2	0 LF	non section 10 – non-tidal
S26 (Crane Creek)	34 7.41	-80 57.77	R2UB2	26 LF	non section 10 – non-tidal
S27 (Crane Creek)	34 7.42	-80 57.78	R4SB3	0 LF	non section 10 – non-tidal
S28 (Crane Creek)	34 7.42	-80 57.71	R2UB2	12 LF	non section 10 – non-tidal
S29	34 7.65	-80 57.78	R2UB4	103 LF	non section 10 – non-tidal
Lakes/Ponds					
Windsor Lake	34 4.41	-80 55.76	L1UB2	~1.44 acre (ac)	non section 10 – non-tidal
Pond 1	34 4.14	-80 55.22	L2UB3	~0.564 ac	non section 10 – non-tidal
Pond 2	34 4.19	-80 55.25	L2UB3	~0.003 ac	non section 10 – non-tidal
Pond 3	34 4.48	-80 55.70	L2UB3	~0.021 ac	non section 10 – non-tidal
Pond 4	34 4.48	-80 55.82	L2UB3	~0.049 ac	non section 10 – non-tidal
Wetlands (W)					
W1	34 2.97	-80 55.46	PEM/PSS	~0.037 ac	non section 10 – non-tidal
W2	34 3.01	-80 55.52	PSS	~0.012 ac	non section 10 – non-tidal
W3	34 3.11	-80 55.46	PEM	~0.006 ac	non section 10 – non-tidal
W4	34 3.17	-80 55.46	PEM	~0.221 ac	non section 10 – non-tidal

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W5	34 3.23	-80 55.40	PEM	~0.117 ac	non section 10 – non-tidal
W6	34 3.33	-80 55.33	PFO	~0.177 ac	non section 10 – non-tidal
W7	34 4.03	-80 55.19	PFO	~0.259 ac	non section 10 – non-tidal
W8	34 4.14	-80 55.22	PFO	~0.563 ac	non section 10 – non-tidal
W9	34 4.19	-80 55.17	PSS/PFO	~0.494 ac	non section 10 – non-tidal
W10	34 4.13	-80 55.69	PEM	~0.026 ac	non section 10 – non-tidal
W11	34 4.38	-80 55.63	PFO	~0.269 ac	non section 10 – non-tidal
W12	34 4.47	-80 55.78	PEM/PSS	~0.221 ac	non section 10 – non-tidal
W13	34 4.67	-80 56.146	PFO1C	~0.025 ac	non section 10 – non-tidal
W14	34 5.30	-80 56.99	PFO1C	~0.032 ac	non section 10 – non-tidal
W15	34 5.33	-80 56.95	PFO	~0.032 ac	non section 10 – non-tidal
W16	34 5.79	-80 57.47	PFO/PSS	~0.177 ac	non section 10 – non-tidal
W17	34 6.01	-80 57.65	PEM	~0.058 ac	non section 10 – non-tidal
W18	34 6.39	-80 57.74	PFO	~0.530 ac	non section 10 – non-tidal
W19	34 6.40	-80 57.67	PSS/PFO	~0.336 ac	non section 10 – non-tidal
W20	34 6.58	-80 57.76	PFO/PSS	~0.692 ac	non section 10 – non-tidal
W21	34 7.26	-80 57.77	PEM	~0.013 ac	non section 10 – non-tidal
W22	34 7.38	-80 57.69	PFO	~0.111 ac	non section 10 – non-tidal
W23	34 7.95	-80 57.83	PEM/PFO	~0.135 ac	non section 10 – non-tidal

Descriptions of Jurisdictional Waters

Sandy-Bottomed Lower Perennial Riverine Systems (R2UB2)

Stream 1 (s1), Stream 4 (s4), Stream 18/Jackson Creek (s18), Stream 19 (s19), Stream 22 (s22), Stream 23/Cumbess Creek (s23), Stream 24/Cumbess Creek (s24), Stream 25 (s25), Stream 26/Crane Creek (s26), and Stream 28/Crane Creek (s28) were identified as perennial riverine systems with unconsolidated stream bottoms composed primarily of sands and therefore meet the criteria to be considered Relatively

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Permanent Waters (RPWs). The width of the riparian buffers along the assessed tributaries varies substantially as does the depth, sinuosity, pool variability, and stream bank stability. Please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Mud-Bottomed Lower Perennial Riverine Systems (R2UB3)
Stream 7 (s7), Stream 11 (s11), Stream 12 (s12), Stream 13 (s13), Stream 14 (s14), Stream 17 (s17), and Stream 21 (s21) were identified as perennial riverine systems with unconsolidated stream bottoms composed primarily of mud and therefore meet the criteria to be considered RPWs. The width of the riparian buffers along the assessed tributaries varies substantially as does the depth, sinuosity, pool variability, and stream bank stability. Please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Gravel-Bottomed Lower Perennial Riverine Systems (R2UB1)
Stream 2 (s2), Stream 9 (s9), and Stream 16 (s16) were identified as perennial riverine systems with unconsolidated stream bottoms composed primarily of cobble/gravel and therefore meet the criteria to be considered RPWs. The width of the riparian buffers along these features varies substantially as does the depth, sinuosity, pool variability, and stream bank stability. Please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Organic-Bottomed Lower Perennial Riverine Systems (R2UB4)
Stream 20 (s20) and Stream 29 (s29)were identified as perennial riverine systems withunconsolidated stream bottoms composed primarily of organic matter and therefore meet the criteria to be considered RPWs. The width of the riparian buffers along these features varies substantially as does the depth, sinuosity, pool variability, and stream bank stability. Please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Mud-Bottomed Intermittent Riverine Systems (R4SB5)
Stream 5 (s5), Stream 6 (s6), and Stream 10 (s10) were identified as intermittent riverine systems with streambeds composed primarily of mud. The width of the riparian buffers along these features varies substantially as does the depth, sinuosity, pool variability, and stream bank stability. Please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Rubble-Bottomed Intermittent Streambed Riverine Systems (R4SB2)
Stream 3 (s3) and Stream 8 (s8) were identified as intermittent riverine systems with streambeds composed primarily of rubble. Both streams vary substantially in their assessment characteristics. Therefore, please refer to low gradient stream assessment data sheets (attached) for a more detailed analysis of these streams.

Sand-Bottomed Intermittent Streambed Riverine System (R4SB4) Stream 15 (s15) was identified as an intermittent riverine system with a streambed composed primarily of sand. Stream 15 is characterized by heavy sediment deposition, low pool variability, low sinuousity, moderately unstable stream banks, and a large riparian zone (>18 meters).

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Cobble/Gravel-Bottomed Intermittent Riverine System (R4SB3)
Stream 27 (s27) was identified as an intermittent riverine system with a streambed composed primarily of cobble/gravel. Stream 27 is characterized by very low pool variability, high sediment deposition, low sinuosity, very low bank stability, and a narrow riparian buffer (6 to 12 meters).

Streams in Wetlands
Stream 25 (s25) is fully encompassed by wetlands; therefore, its features were not described in Table 1.

Windsor Lake
Windsor Lake was identified as a lacustrine limnetic system with an unconsolidated bottom consisting primarily of sand.

Ponds
Pond 1, Pond 2, Pond 3, and Pond 4 were identified as lacustrine littoral systems with unconsolidated bottoms consisting primarily of mud.

Palustrine Emergent Wetlands (PEM)
Wetland 3 (w3), Wetland 4 (w4), Wetland 5 (w5), Wetland 10 (w10), and Wetland 17 (w17) were identified as palustrine emergent wetlands. Lacking a tree and sapling/shrub stratum, the herbaceous stratum consisted primarily of soft rush (*Juncus effusus*), tender rush (*Juncus tenuis*), sericea (*Lespedeza cuneata*), tearthumb (*Polygonum arifolium*.), swamp smartweed (*Polygonum hydropiperoides*), nodding beakrush (*Rhynchospora inexpansa*), netted chain fern (*Woodwardia areolata*), ebony spleenwort (*Aplenium platyneuron* var. *incisum*), wool grass (*Scirpus cyperinus*), cattail (*Typha latifolia*) and needleleaf witchgrass (*Dicanthelium aciculare*). Wetland hydrology indicators include surface water, high water table, saturation, oxidized rhizospheres, and a thin muck surface. Hydric soils indicators include depleted matrix, 1 centimeter (cm) of muck, redox dark surface, dark surface, and redox features in the upper 12 inches of the soil profile.

Palustrine Forested Wetlands (PFO)
Wetland 6 (w6), Wetland 7 (w7), Wetland 8 (w8), Wetland 11 (w11), Wetland 15 (w15), and Wetland 22 (w22) were identified as palustrine forested wetlands. The tree stratum consists of red maple (*Acer rubrum*), loblolly pine (*Pinus taeda*), swamp tupelo (*Nyssa biflora*), black tupelo (*Nyssa sylvatica*), southern magnolia (*Magnolia grandiflora*), tulip poplar (*Liriodendron tulipifera*), and sweetgum (*Liquidambar styraciflua*). Sapling/shrub stratum includes giant cane (*Arundinaria gingantea*), tulip poplar, sawtooth blackberry (*Rubus argutus*), wax myrtle (*Myrica cerifera*), sweetgum, smooth alder (*Alnus serrulata*), and sweetbay magnolia (*Magnolia virginiana*). The herbaceous stratum of these wetlands includes royal fern (*Osmunda spectabilis*), sedges (*Carex sp.*), Japanese stiltgrass (*Microstegium vimineum*), netted chain fern, and cinnamon fern (*Osmundastrum cinnamomeum*). Species of the vine stratum include laurelleaf greenbrier (*Smilax laurifolia*), common greenbrier (*Smilax rotundifolia*), muscadine (*Vitis rotundifolia*), saw greenbrier (*Smilax bona-nox*), and trumpet vine (*Campsis radicans*). Hydrology indicators include saturation, high water

table, and oxidized rhizospheres. Hydric soil indicators include depleted matrix and redox features within the upper 12 inches of the soil profile.

Palustrine Scrub-Shrub and Forested Wetlands (PSS/PFO)
Wetland 9 (w9), Wetland 18 (w18), and Wetland 19 (w19) were identified as palustrine scrub shrub/palustrine forested wetlands. The tree stratum consists of red maple, loblolly pine, and sweetgum. Sapling/shrub stratum includes giant cane, Chinese privet (*Ligustrum sinense*), red bay (*Persea borbonia*), smooth alder, and black willow (*Salix nigra*). Herbaceous stratum includes cinnamon fern, knotweed (*Polygonum plebeium*), and soft rush. Vine stratum species consists of crossvine (*Bignonia capreolata*) and laurelleaf greenbrier. Wetland hydrology indicators include saturation and hydric soil indicators include a sandy mucky mineral layer, depleted matrix, and redox features within the upper 12 inches of the soil profile.

Palustrine Forested and Palustrine Scrub-Shrub Wetland (PFO/PSS)
Wetland 16 (w16) and Wetland 20 (w20) were identified as palustrine forested/palustrine scrub shrub wetlands. The tree stratum consists of red maple, loblolly pine, black tupelo, tulip poplar, willow oak (*Quercus phellos*), sweetgum, and American holly (*Ilex opaca*). Sapling/shrub stratum includes Chinese privet and sweetgum. Herbaceous stratum includes poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), and netted chain fern. Species of the vine stratum include muscadine and common greenbrier. Wetland hydrology indicators include saturation and hydric soil indicators include depleted matrix and redox features within the upper 12 inches of the soil profile.

Palustrine Scrub-Shrub Wetlands (PSS)
Wetland 2 (w2) and Wetland 21 (w21) were identified as palustrine scrub shrub wetlands. Tree stratum species include pond pine (*Pinus glabra*). Sapling/shrub stratum species include bladder pod (*Glottidium vesicarium*), black willow, sweetgum, Chinese privet, and giant cane. The herbaceous stratum consists of bracken fern (*Pteridium aquilinum*), walters sedge (*Carex walteriana*), soapbush (*Clethra alnifolia*), swamp smartweed, red-root flatsedge (*Cyperus erythrorhizos*), soft rush, and dogfennel (*Eupatorium capillifolium*). Wetland hydrology indicators include surface water, drainage patterns, and saturation. Hydric soil indicators include depleted matrix and one cm of muck.

Palustrine Emergent and Palustrine Scrub-Shrub Wetlands (PEM/PSS)
Wetland 12 (w12) was identified as a palustrine emergent/palustrine scrub shrub wetland. Its tree stratum species consists entirely of red maple and its sapling/shrub layer contained both smooth alder and black willow. The herbaceous stratum includes Bermuda grass (*Cynodon dactylon*), false nettle (*Boehmeria cylindrical*), and knotweed. Wetland hydrology indicators consists of saturated soil and hydric soil indicators include depleted matrix and redox features within the upper 12 inches of the soil profile.

Palustrine Emergent and Palustrine Forested Wetlands (PEM/PFO)
Wetland 23 (w23) was identified as a palustrine emergent/palustrine forested wetland. Tree stratum species include tulip poplar, loblolly pine, eastern red cedar (*Juniperus virginiana*), and sourwood (*Oxydendrum arboretum*). The sapling/shrub stratum

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consists primarily of sweetbay magnolia and the vine stratum contains primarily muscadine. Wetland hydrology indicators include sparsely vegetated concave surface and drainage patterns and hydric soil indicators include both depleted matrix and redox features within the upper 12 inches of the soil profile.

Wetlands Outside of Project Boundary
Wetland 1 is located entirely outside of the proposed project boundary, therefore, its features were not listed in Table 1.

Linear Conveyances
Eight linear conveyances are present within the proposed project boundary, depicted as yellow lines on the accompanying figures.

Features within Pavement Rehabilitation Limits
No jurisdictional features were observed within the road shoulder of the proposed pavement rehabilitation limits. Jurisdictional features are present beyond the road shoulder, but would not be expected to be affected by the project activities. If drainage structures (pipes, drop inlets, flumes) become part of the rehabilitation project, further investigation will be required, as there are jurisdictional features at the outfalls of many of the pipes and flumes.

SCDOT is hereby requesting an Approximate-Preliminary Jurisdictional Determination for the jurisdictional waters identified within the Project Boundary. Additionally, SCDOT requests that any onsite visit to verify delineated jurisdictional waters be scheduled with HDR. Should you have any questions or require additional information following your review of the enclosed materials, or if you would like to schedule a site visit, please contact Renee Mullholland (HDR) at (843) 414-3734 or renee.mulholand@hdrinc.com.

Sincerely,

Renee C. Mulholland
Environmental Scientist
HDR

Attachments: JD Checklist
USACE Jurisdictional Determination Request Form
Figure 1. Project Location
Figure 2. USGS Blythewood & Fort Jackson North Quadrangles, SC
Figure 3A & 3B. USFWS National Wetlands Inventory
Figure 4A & 4B. NRCS Soil Survey for Richland County, SC
Figure 5 (sheets 1-9). Jurisdictional Waters Survey
USACE Wetland Determination Data Forms
USACE Stream Assessment Forms
Site Photographs (Wetlands, Streams, and Pavement Rehabilitation Area)

Cc: Siobhan Gordon, SCDOT
Sean Connolly, SCDOT
David Kinard, HDR
Shannon Meder, HDR

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U.S. Army Corps of Engineers – Charleston District - Regulatory Division

JURISDICTIONAL DETERMINATION REQUEST

For Identifying Waters of the U.S., Including Wetlands and Tributaries

Project Name & Location Address: I-77 Roadway and Bridge Widening

County: Richland **Total Acreage of Tract:** ~809 acres **Date:** 12/31/14

Property Owner : SCDOT
Address: 955 Park Street
Address: Columbia, SC 29202
Phone: 803-737-1337
Email: GordonSO@scdot.org

Agent: HDR
Address: 3955 Faber Place Dr., Suite 300
Address: North Charleston, SC 29405
Phone: 843-414-3734
Email: renee.mulholland@hdrinc.com

1) Select the Type of Request:

☐ I am requesting that the Corps investigate the above property for the presence or absence of wetlands, tributaries, or other Waters of the U.S., and establish the limits of these areas. *Please note that while the Corps offers wetland delineation services, time frames to fulfill requests are dependent on property size, property conditions, workload priorities, and staffing levels. To expedite the wetland delineation process, property owners are encouraged to hire an environmental consultant*. The first two following items must accompany your request:

- Accurate location maps (from County Map, USGS Quad Sheet, etc.), street address and directions to property from a nearby major intersection.
- Copy of Survey Plat or Tax Map of Property.
- Additional information such as soil survey sheet, aerial photograph, topographic survey, conceptual site plan, description of the proposed use of property, status of project, etc, may also be provided but are not required.

☑ I am submitting a wetland delineation for review and verification by the Corps. Please refer to page 2 for the "Information Required in a Wetland Delineation Submittal."

2) Select the Type of Jurisdictional Determination Requested:

☐ Accurate-Approved ☐ Approximate-Approved ☐ Accurate-Preliminary ☑ Approximate-Preliminary

Refer to the below definitions:

Preliminary – Preliminary determinations will identify whether wetlands or other waters are present on the site and will presume that they are jurisdictional; therefore, a Preliminary can often be completed more quickly than an Approved jurisdictional determination.

Approved – Approved determinations will identify whether wetlands or other waters are present on the site and will include a determination of their jurisdictional status.

Accurate: Verified location and extent of all Waters of the U.S. must be surveyed by a registered land surveyor. Project boundary must be surveyed or represented by a tax map (or by GPS points if no Waters of the U.S. are present).

Approximate: Verified location and extent of all Waters of the U.S. are depicted approximately on a sketch. Project boundary may be surveyed or represented by a tax map or GPS coordinates.

IMPORTANT NOTE: Legible printed name and signature required. The person signing this form must be the present property owner or have the specific authority of the property owner to authorize Corps of Engineers employees or their agents to enter onto the property for on-site investigations if such is deemed necessary. Do not sign this form unless you are the owner, or have the specific authority of the property owner.

PRINTED NAME of person signing this form, below: Renee Mulholland

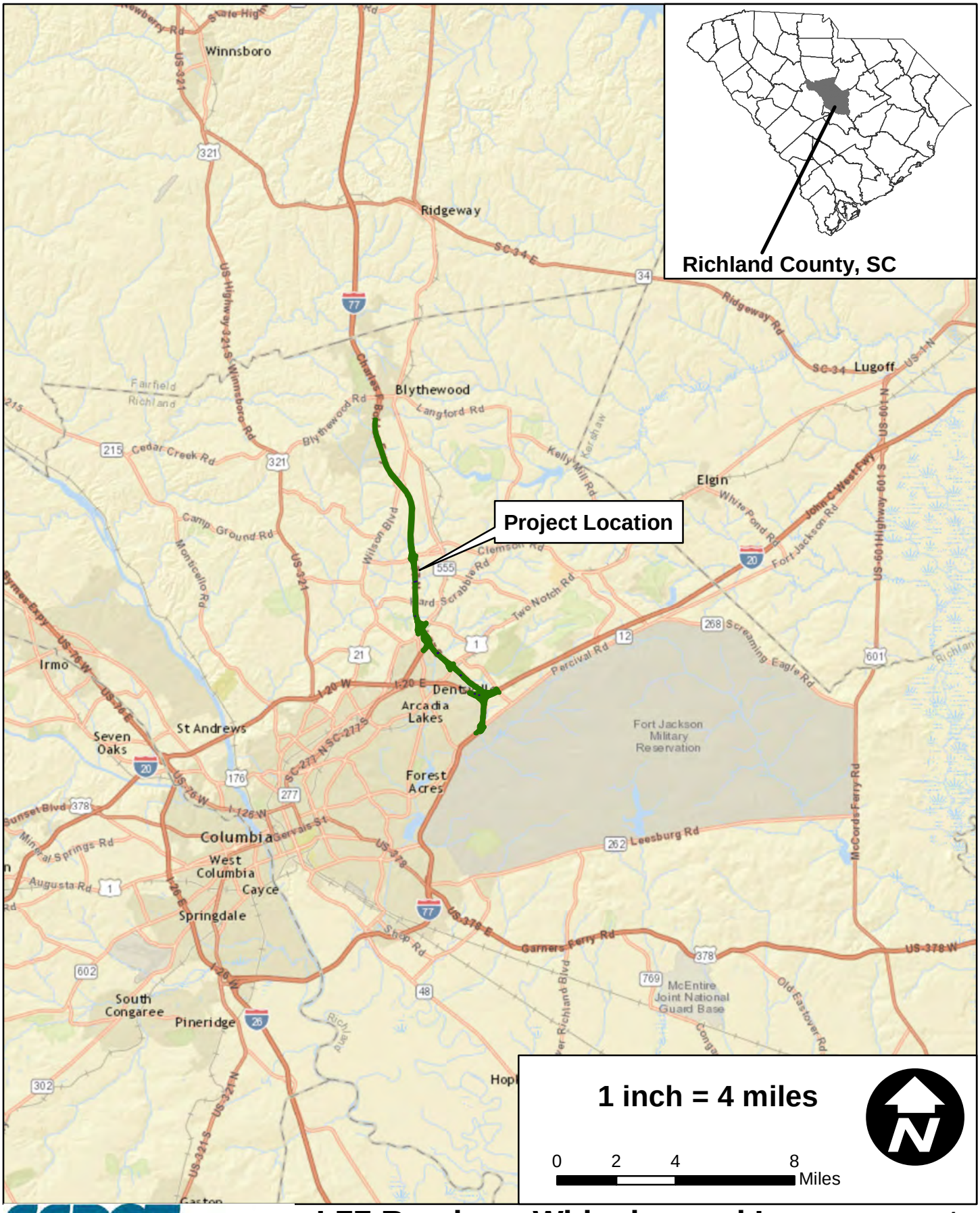
Signature of Property Owner or Authorized Agent: renee.mulholland@hdrinc.com Digitally signed by renee.mulholland@hdrinc.com DN: cn=renee.mulholland@hdrinc.com Date: 2014.12.30 17:08:27 -05'00'

HQ and South Branch
69-A Hagood Avenue
Charleston, SC 29403
843-329-8044

Northeast Branch
1949 Industrial Park Rd, Room 140
Conway, SC 29526
843-365-4239

Northwest Branch
1835 Assembly St., Room 865-B1
Columbia, SC 29201
803-253-3444

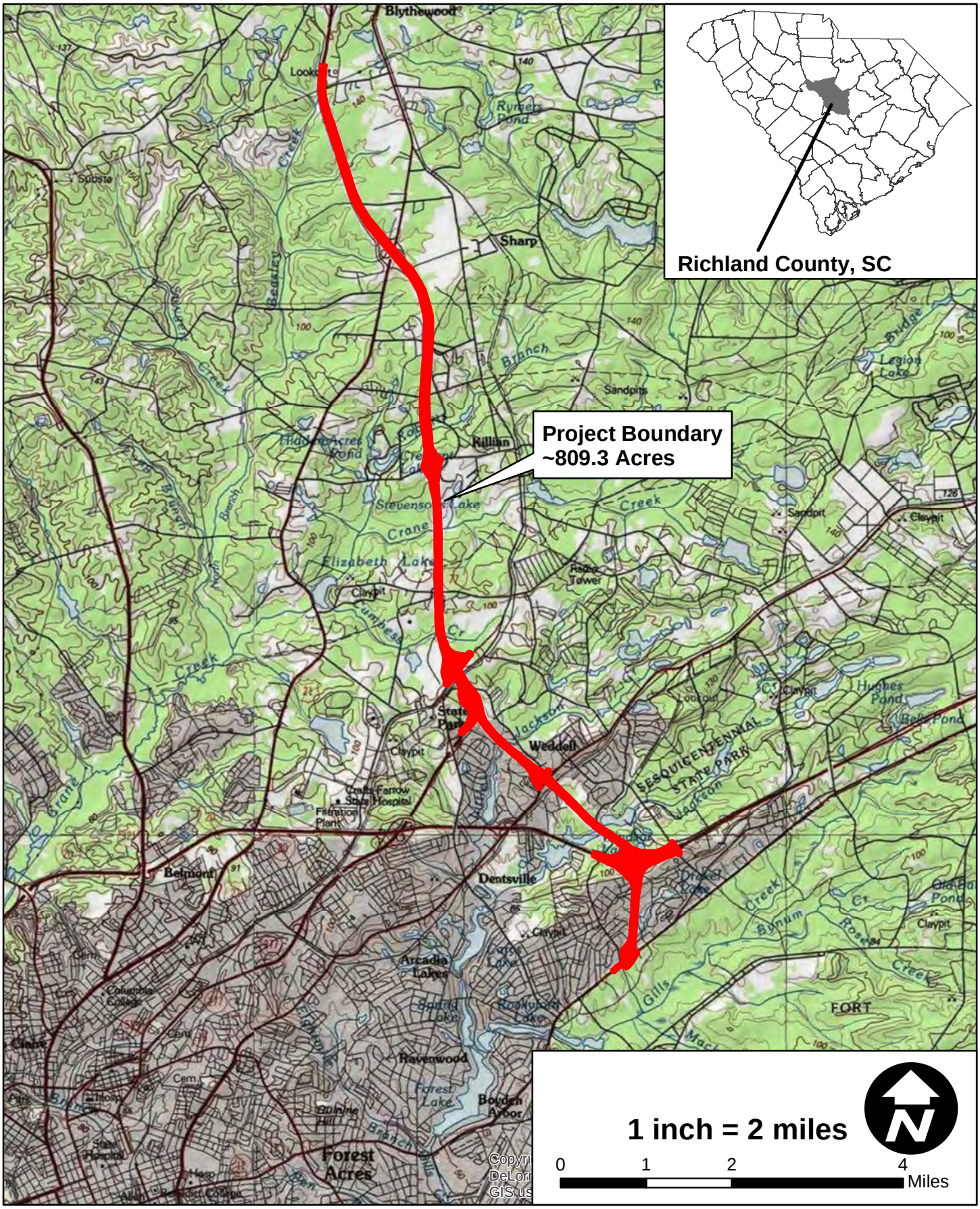
Copies of this form may be obtained at: http://www.sac.usace.army.mil Form Last Revised: November 2013



SCDOT
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Project Location
Figure 1
Dec. 2014



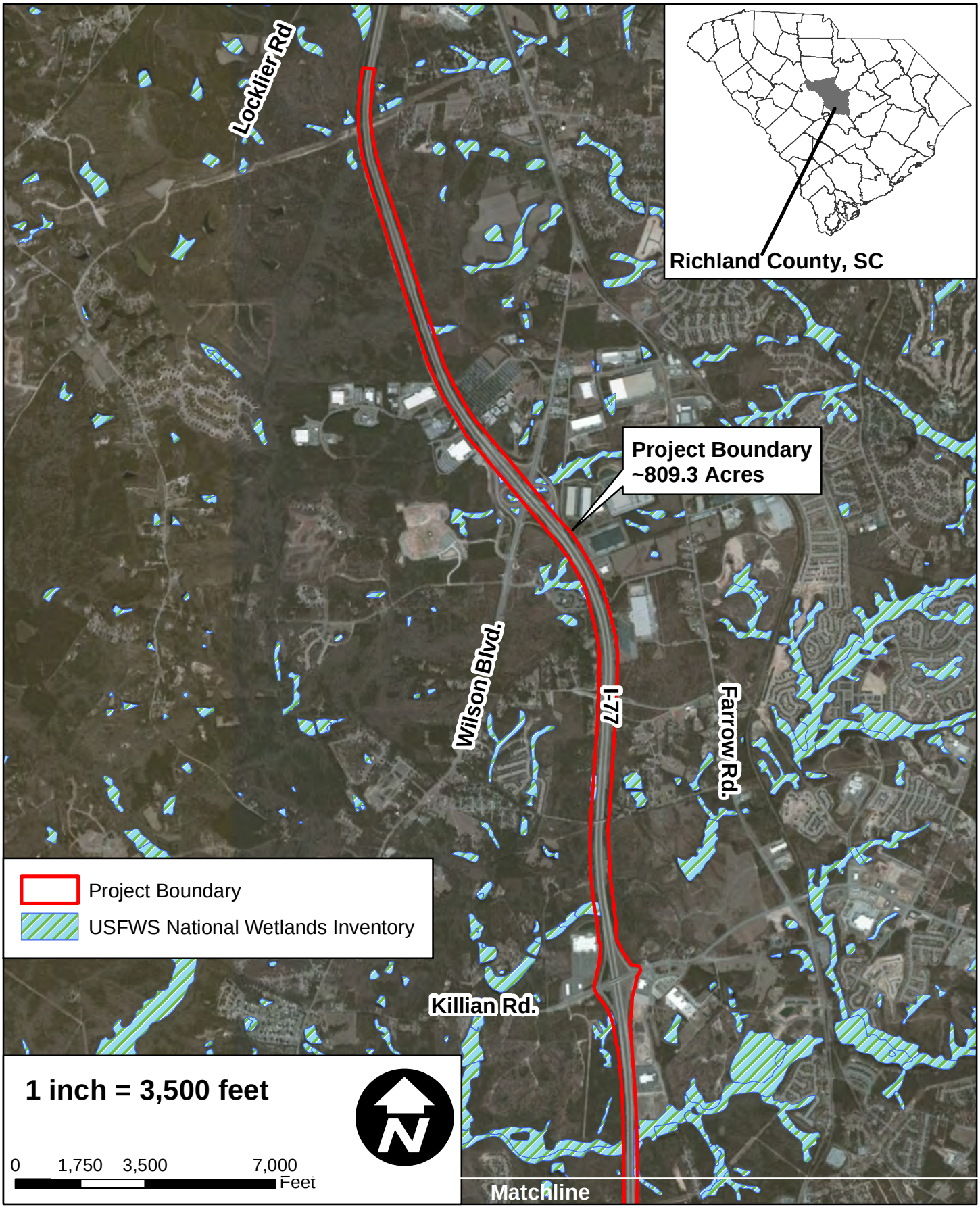
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

USGS Blythewood & Fort Jackson North Quadrangles, SC

Figure 2

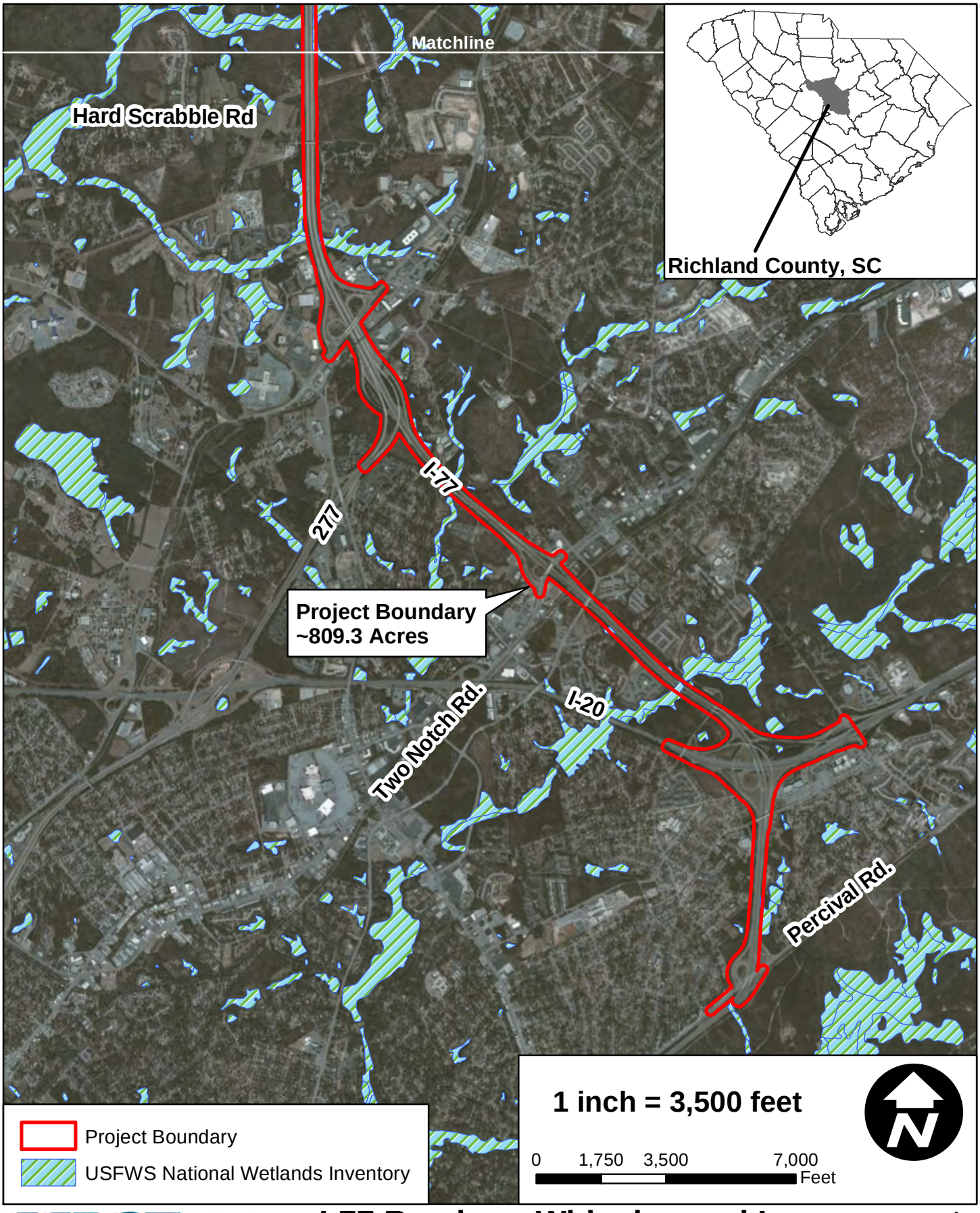
Dec. 2014



SCDOT
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

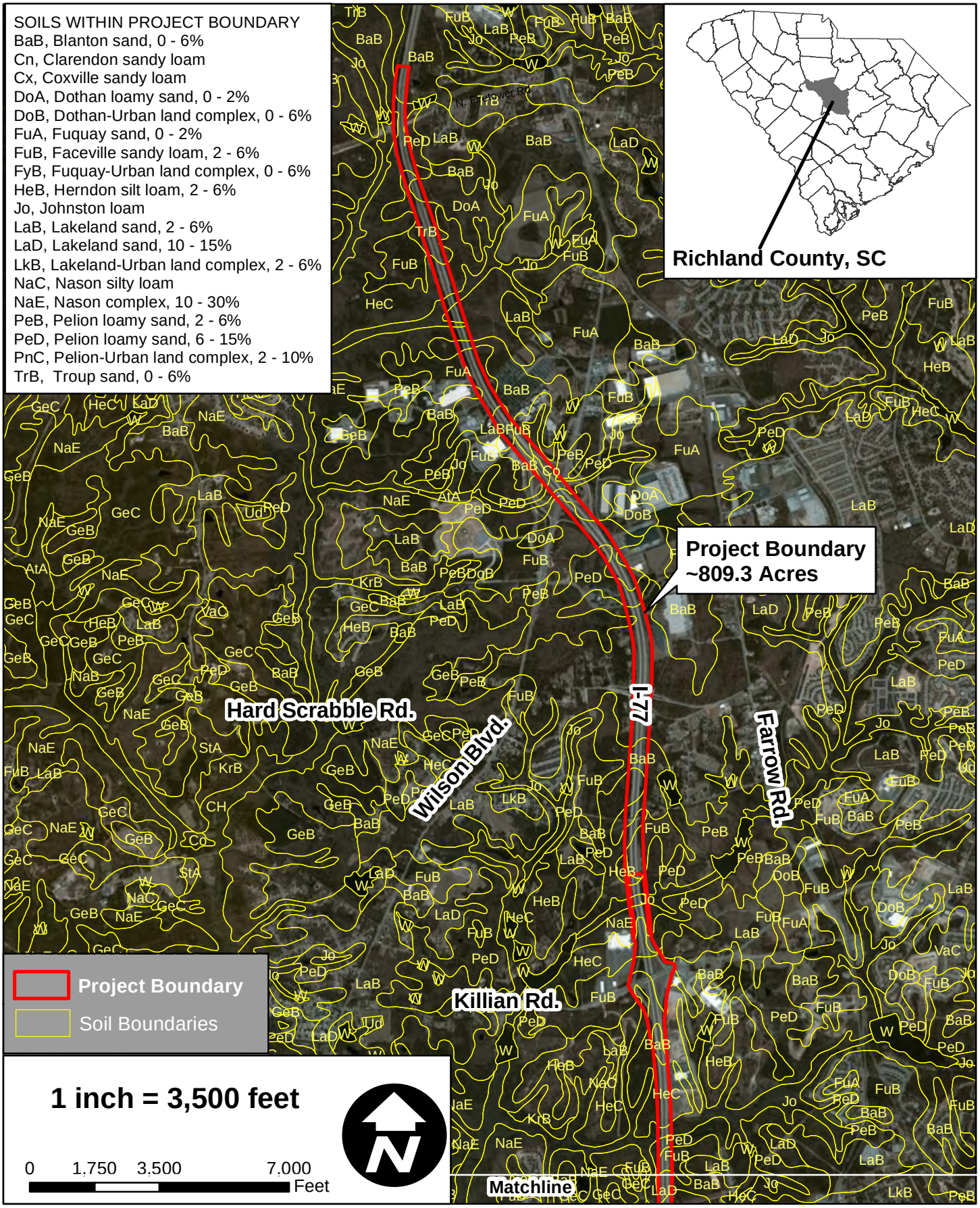
USFWS National Wetlands Inventory
Figure 3A
Dec. 2014



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

USFWS National Wetlands Inventory
Figure 3B
Dec. 2014



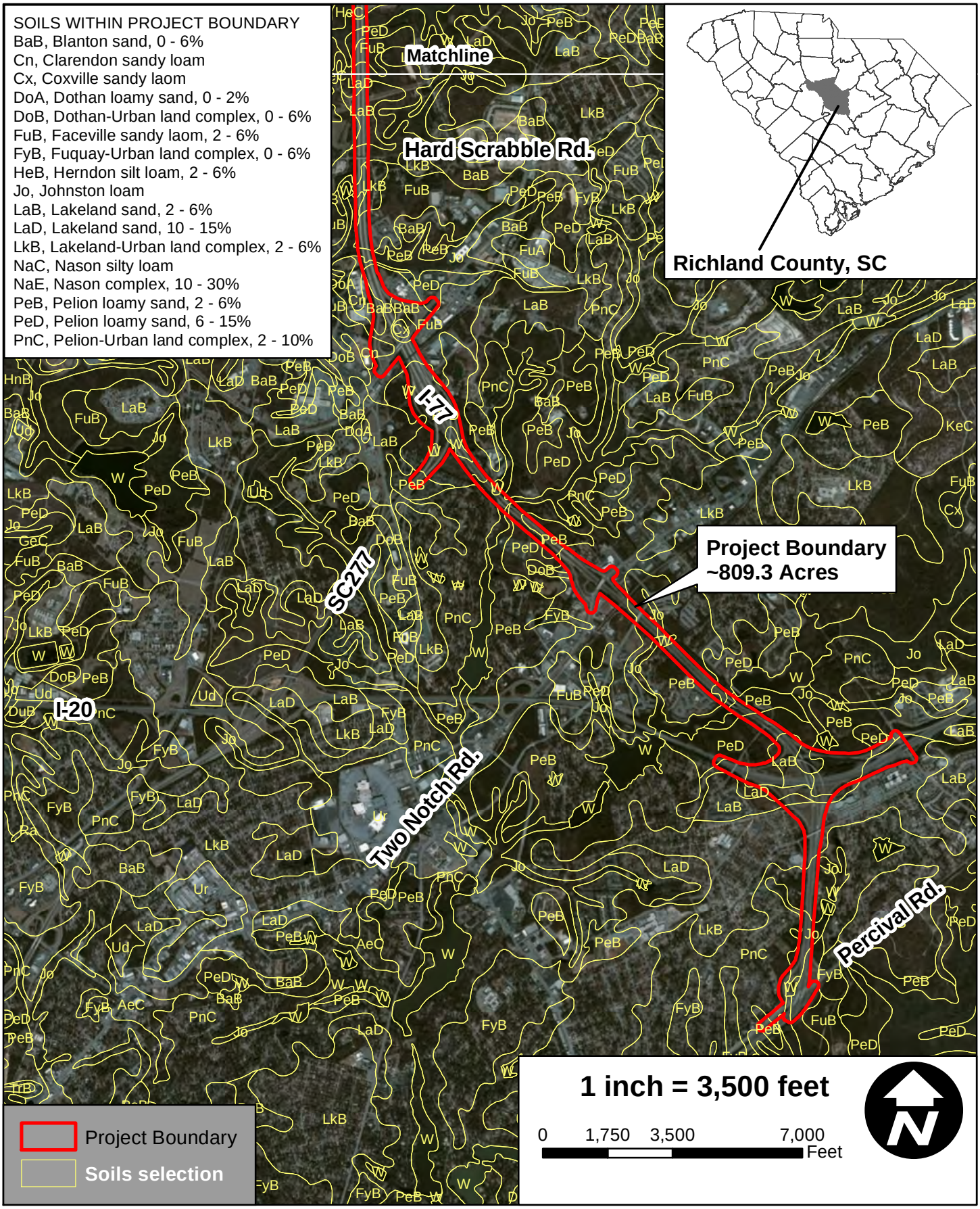
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

NRCS Soil Survey for Richland County, SC

Figure 4A

Dec. 2014



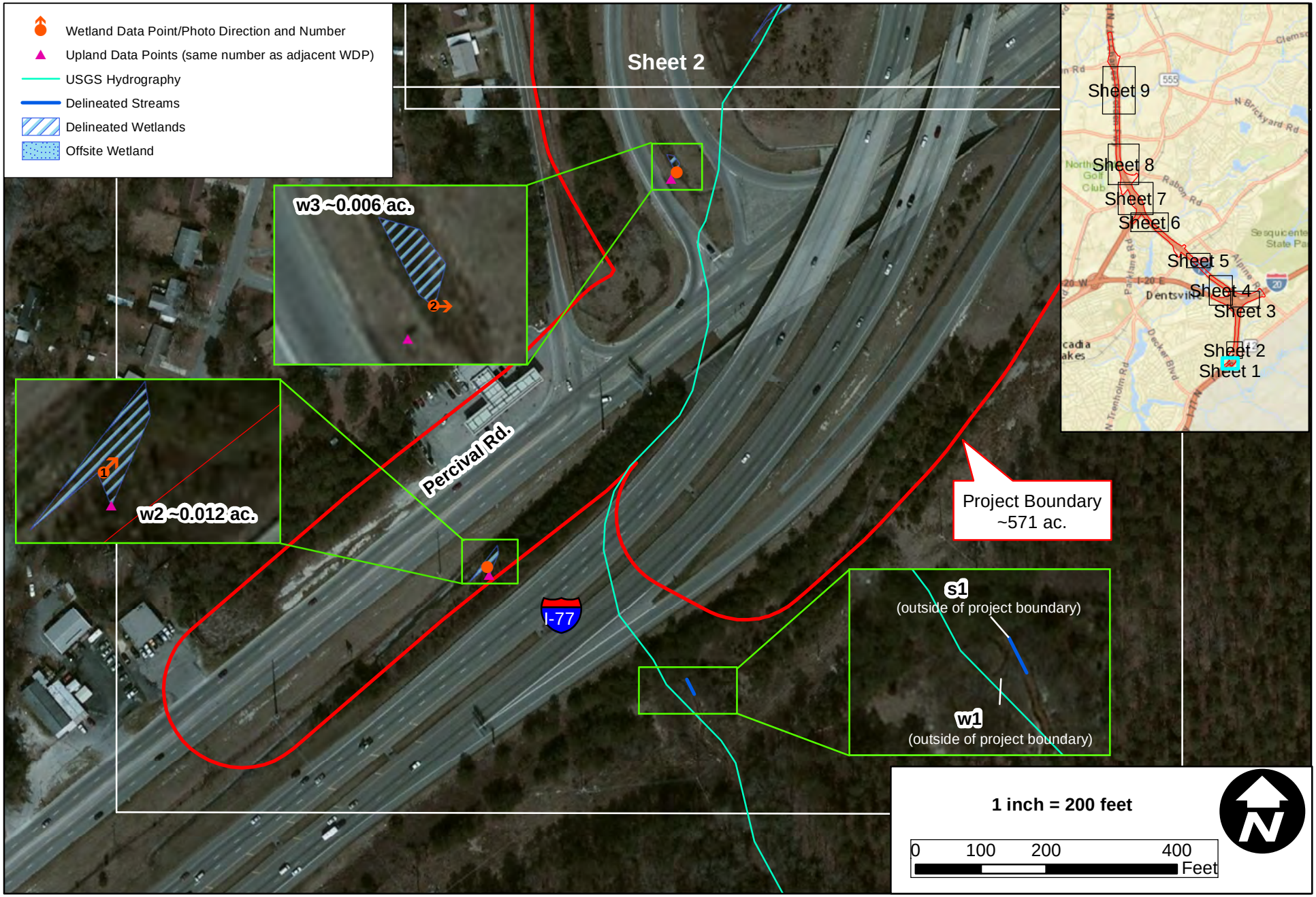
I-77 Roadway Widening and Improvements

NRCS Soil Survey for Richland County, SC

Figure 4B

Dec. 2014

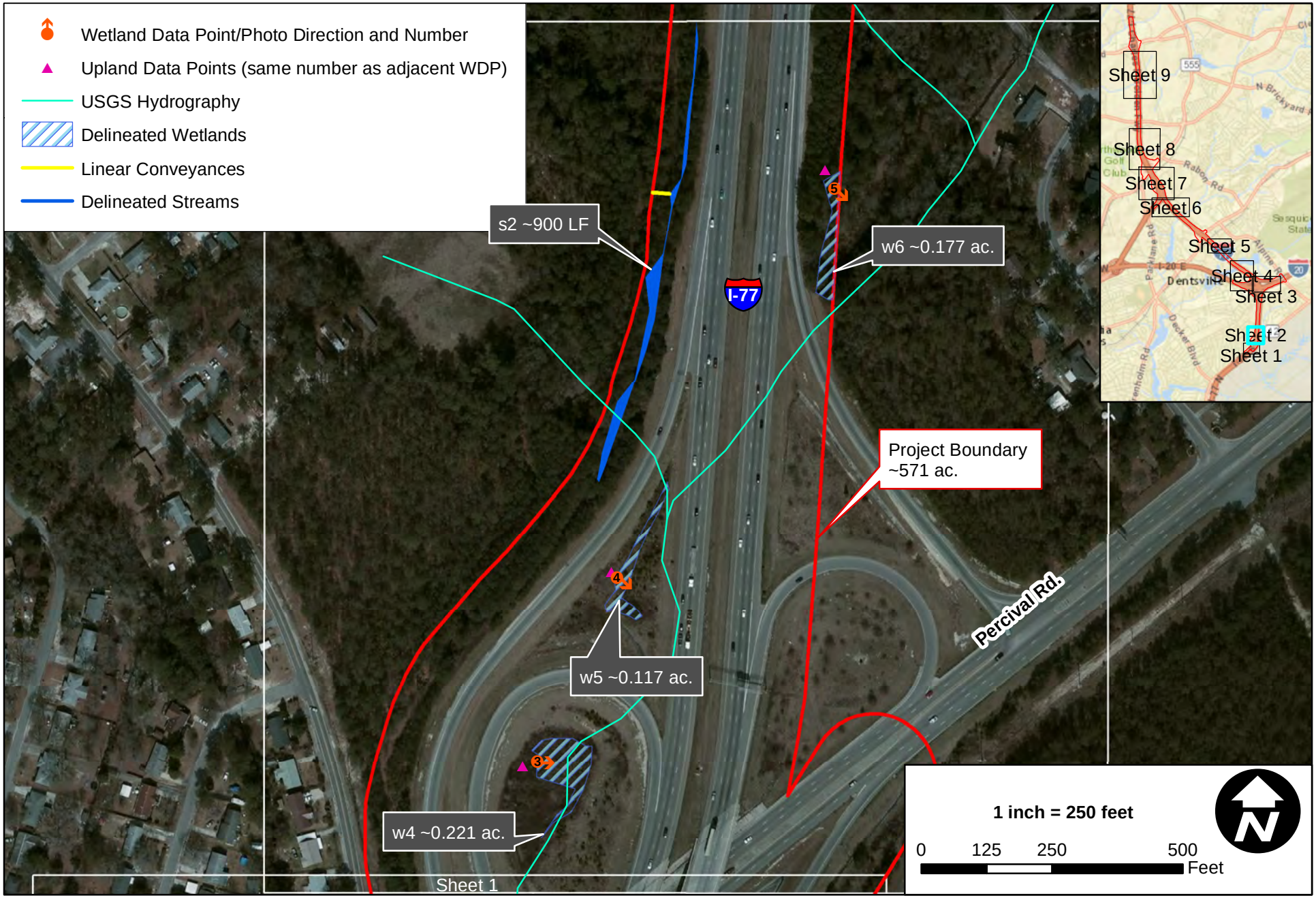
South Carolina Department of Transportation



I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands
Figure 5 (Sheet 1 of 9)
Dec. 2014

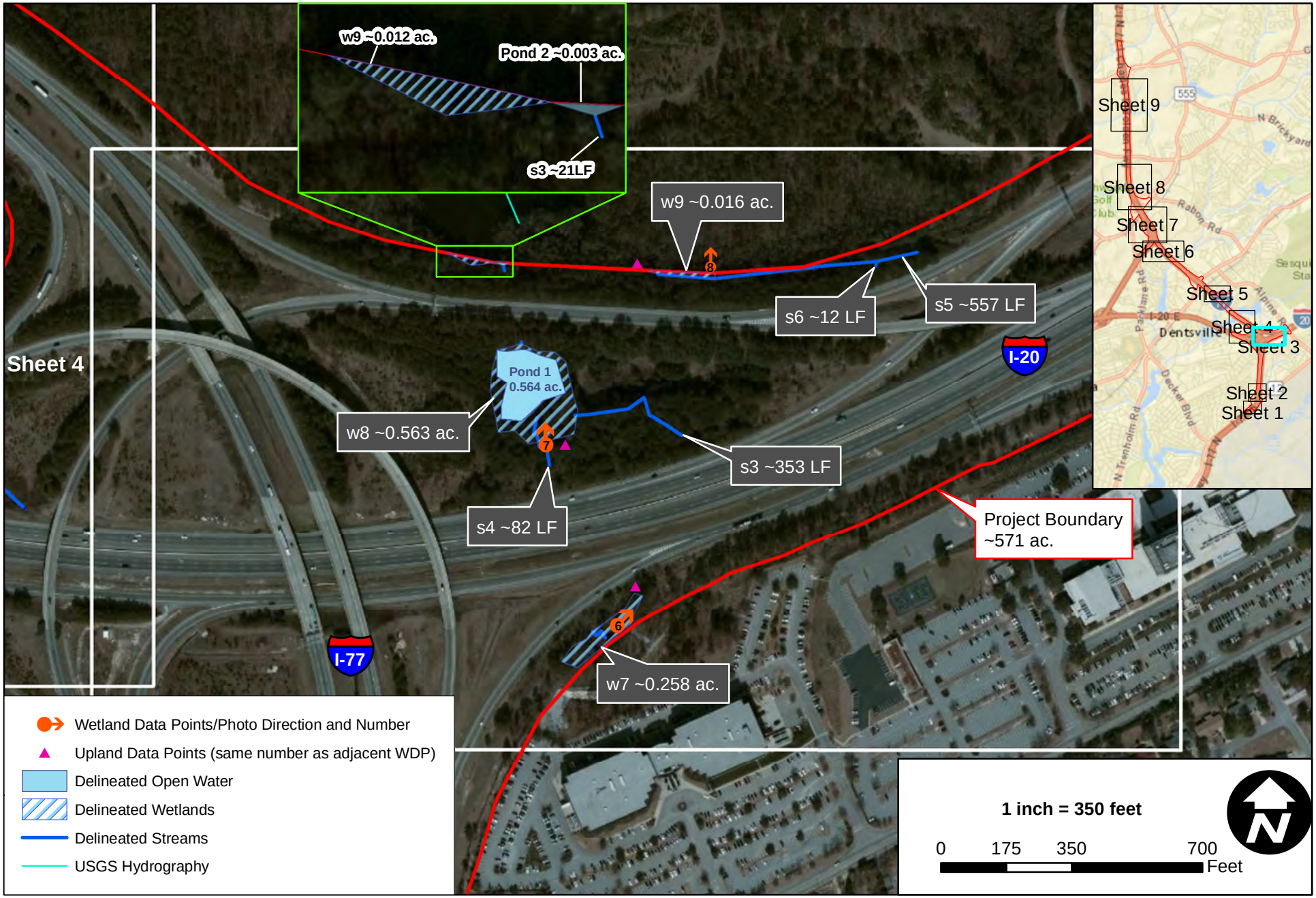
South Carolina Department of Transportation



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

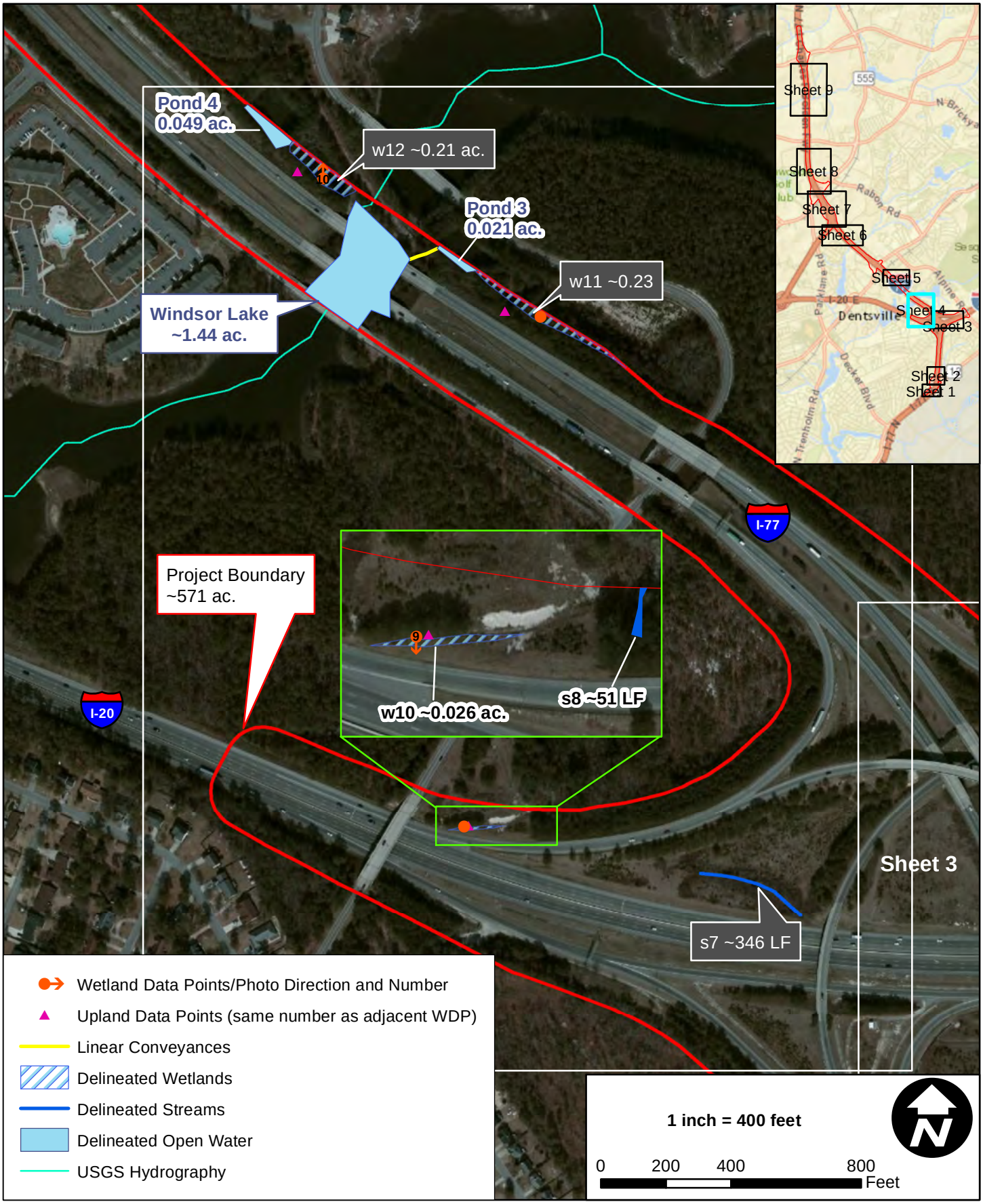
Delineated Streams & Wetlands
Figure 5 (Sheet 2 of 9)
Dec. 2014



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands
Figure 5 (Sheet 3 of 9)
Dec. 2014



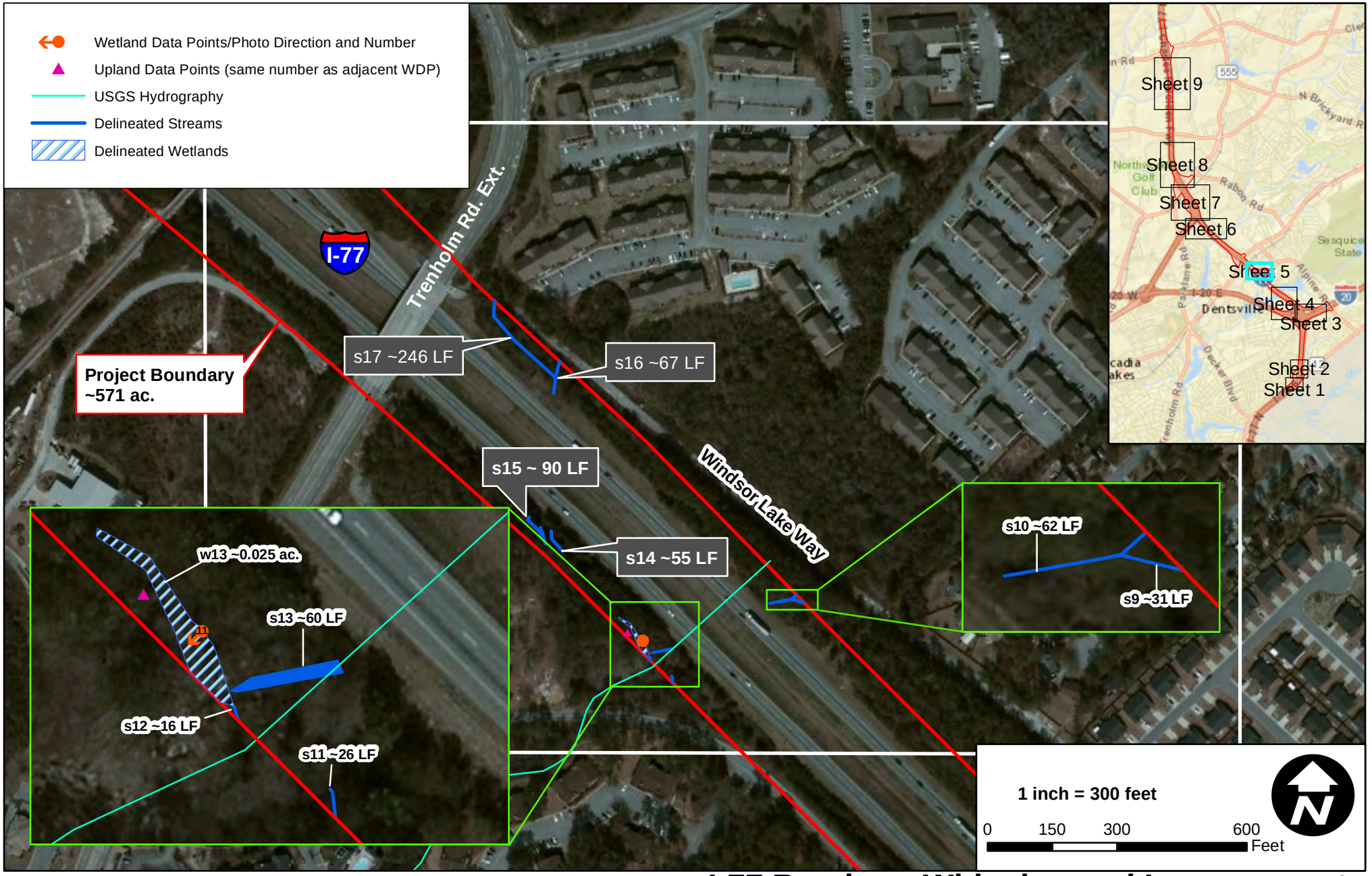
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands

Figure 5 (Sheet 4 of 9)

Dec. 2014



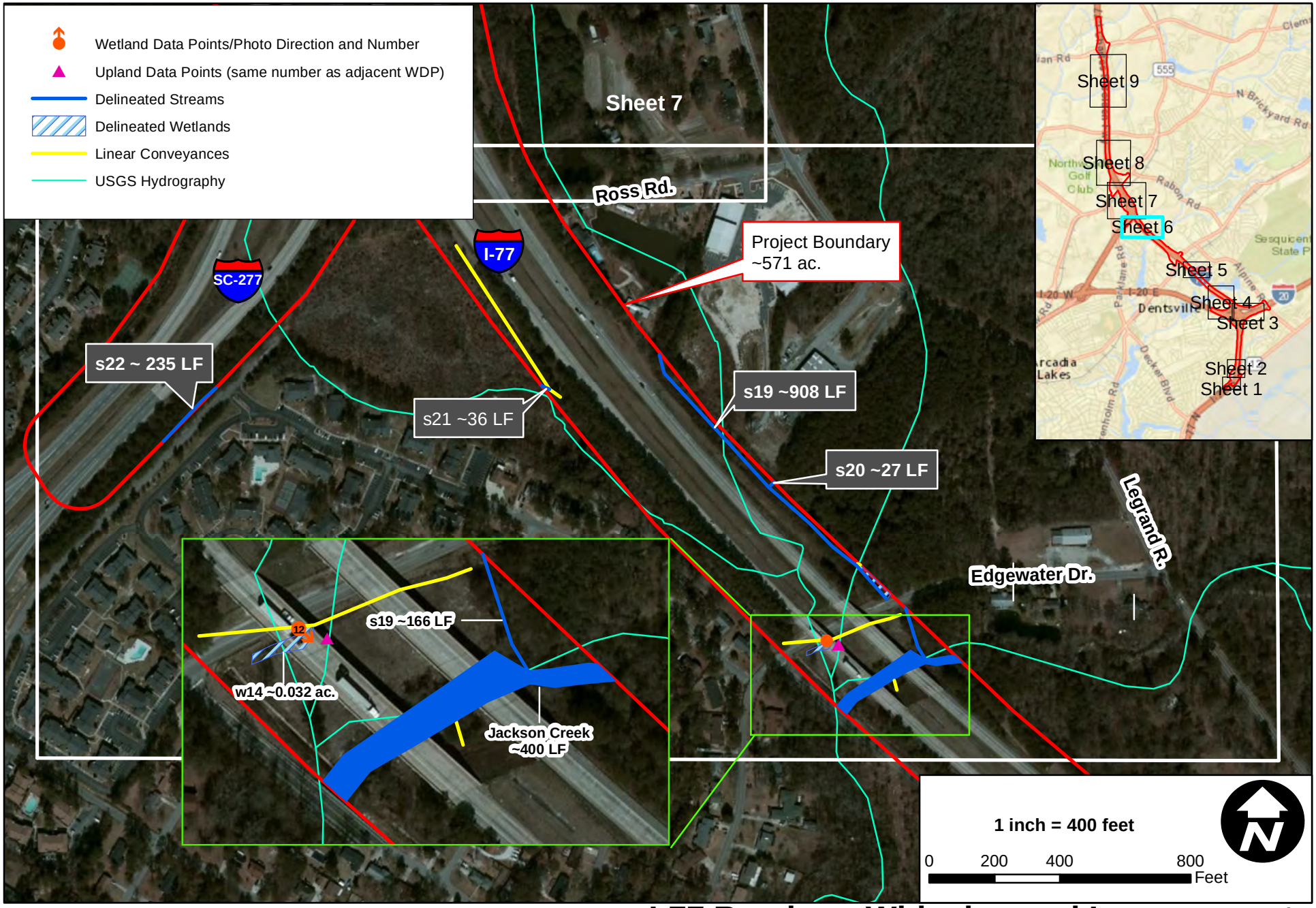
I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands

Figure 5 (Sheet 5 of 9)

Dec. 2014

South Carolina Department of Transportation



I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands

Figure 5 (Sheet 6 of 9)

Dec. 2014

South Carolina Department of Transportation

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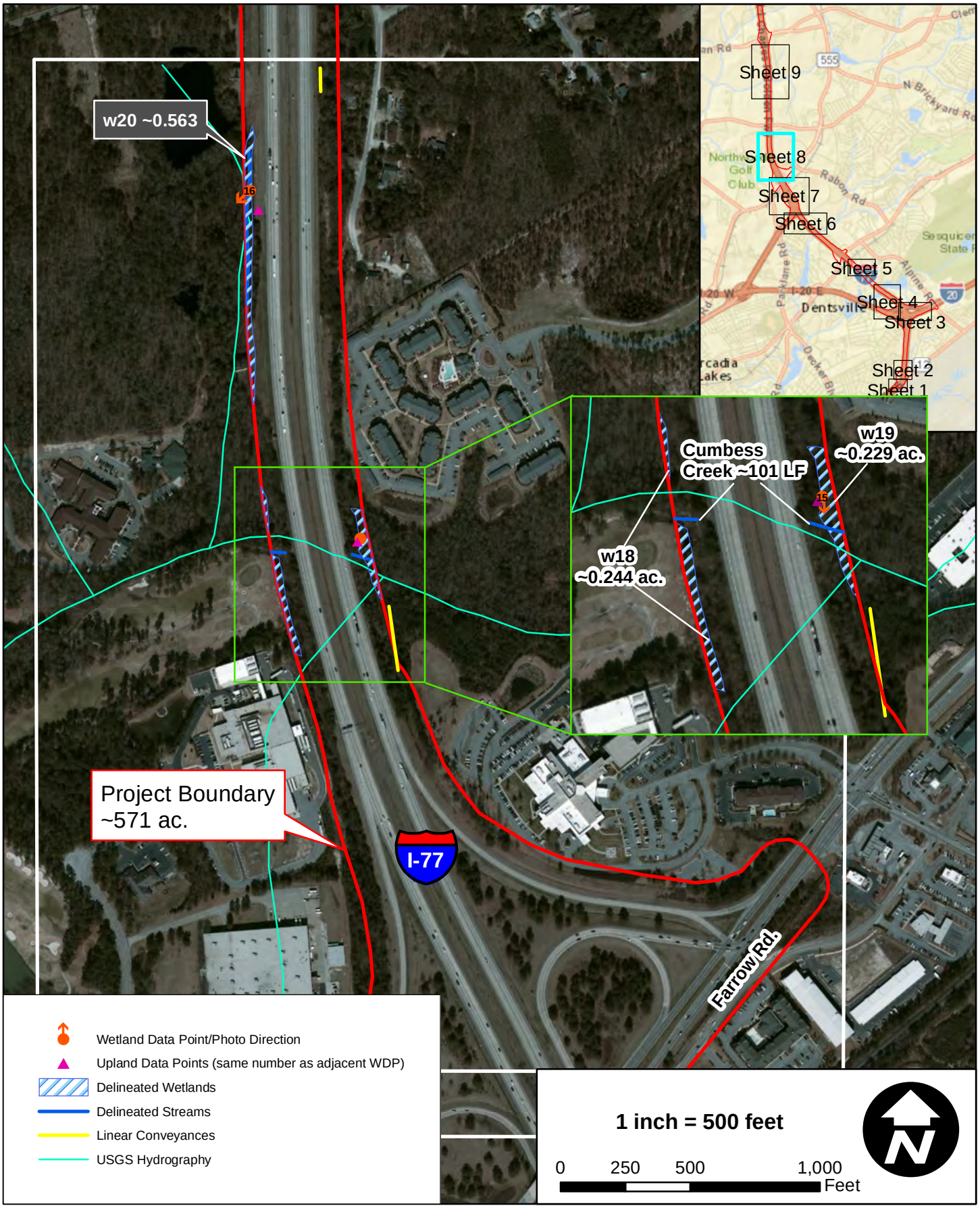
I-77 Roadway Widening and Improvements

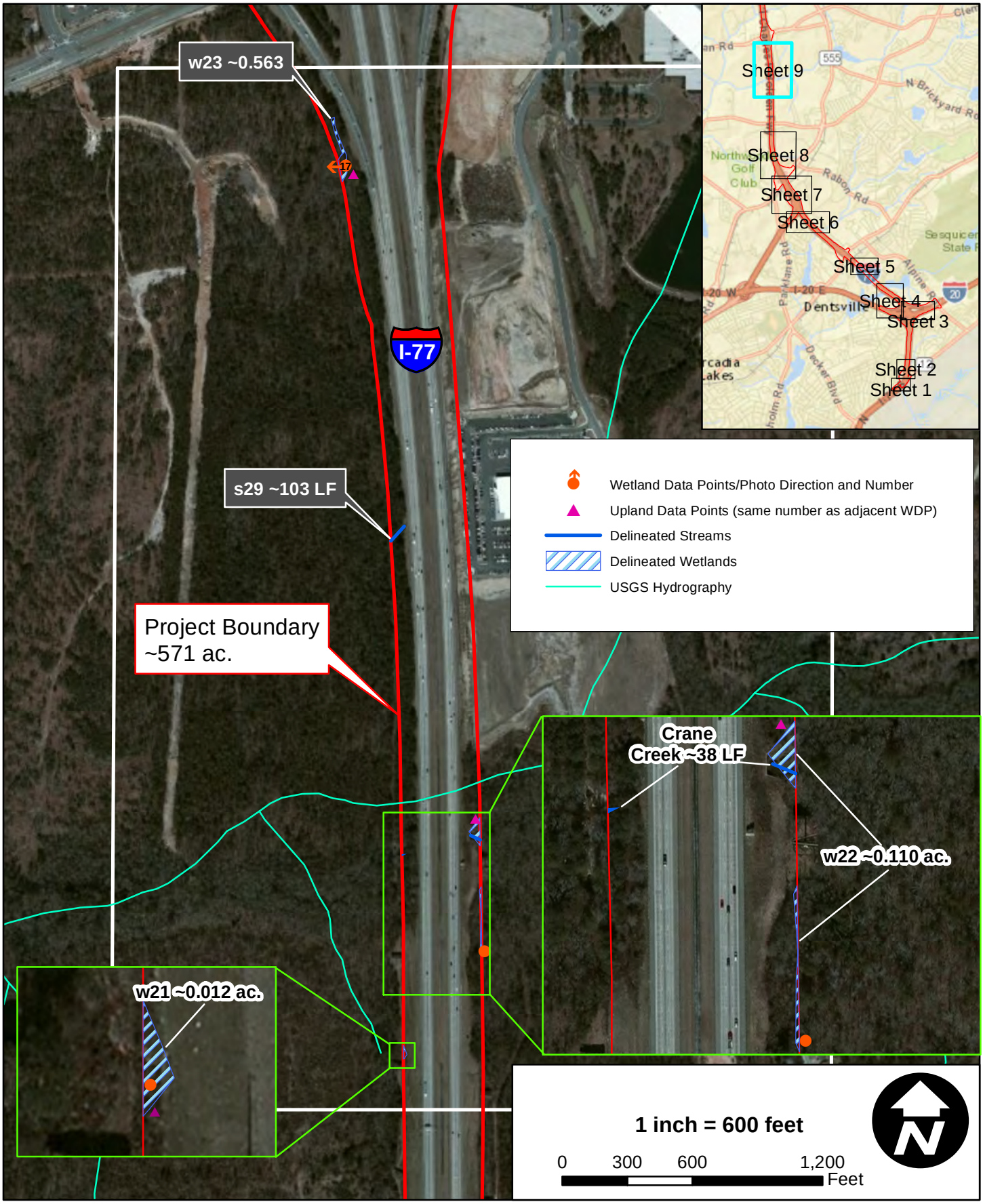
Delineated Streams & Wetlands
Figure 5 (Sheet 7 of 9)
Dec. 2014



I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands
Figure 5 (Sheet 8 of 9)
Dec. 2014

South Carolina Department of Transportation



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands
Figure 5 (Sheet 9 of 9)
Dec. 2014

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w2

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): <2%

Subregion (LRR or MLRA): LRR T Lat: 34°3'0.573"N Long: 80°55'31.236"W Datum: NAD83

Soil Map Unit Name: PnC NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Wetland is the result of drainage from concrete drainage structure.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ✓ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 4 inches
Water Table Present?	Yes _____	No ✓	Depth (inches): >16 inche
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w2

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus glabra	5	yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (30-ft)			
1. Glottidium vesicarium	20	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	20	= Total Cover	
Herb Stratum (15-ft)			
1. Carex walterana	30	yes	OBL
2. Clethra alnifolia	20	yes	FACW
3. Polygonum hydropiperoides	20	yes	OBL
4. Cyperus erythrorhizos	5	no	OBL
5. Juncus tenuis	5	no	FAC
6. Eupatorium capillifolium	2	no	FACU
7.			
8.			
9.			
10.			
11.			
12.			
	82	= Total Cover	
Woody Vine Stratum ( )			
1.			
2.			
3.			
4.			
5.			
		= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w2

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10 YR: 2/1	100					Silt/sand	Loam
12-14	10 YR: 4/4	100					Sandy	Loam
14-16	10 YR: 2/1	100					Silt/sand	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up2

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5%

Subregion (LRR or MLRA): Lat: 34°3'0.378"N Long: 80°55'31.252"W Datum: NAD83

Soil Map Unit Name: PnC NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ____	No ✓	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** ✓
Hydric Soil Present?	Yes ____	No ✓	
Wetland Hydrology Present?	Yes ____	No ✓	

Remarks:

Adjacent to w2 wetland data point. Area adjacent to concrete flume within ROW.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ____ No ✓ Depth (inches): ____

Water Table Present? Yes ____ No ✓ Depth (inches): ____

Saturation Present? (includes capillary fringe) Yes ____ No ✓ Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** ✓

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: Up2

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1. Rhus copallina	25	yes	UPL
2. Liquidambar styraciflua	10	yes	FAC
3. Celtis laevigata	5	no	FACW
4.			
5.			
6.			
7.			
	40 = Total Cover		
Shrub Stratum (30-ft)			
1. Rubus trivialis	20	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Herb Stratum (15-ft)			
1. Panicum hemitomon	20	yes	OBL
2. Panicum commutatum	10	yes	FAC
3. Eleocharis parvula	5	no	OBL
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	35 = Total Cover		
Woody Vine Stratum (15-ft)			
1. Rubus trivialis	10	yes	FACU
2.			
3.			
4.			
5.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10 YR: 4/1	100						
2-12	10 YR: 5/4	100						
12-20	10 YR: 5/6	100						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w3

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): LRR T Lat: 34°3'6.626"N Long: 80°55'27.873"W Datum: NAD83

Soil Map Unit Name: Jo, W NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

Area exists in median of I-77 South bound exit ramp.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): .5
Water Table Present?	Yes ✓	No _____	Depth (inches): 6.0
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w3

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1. Glottidium vesicarium	10	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10 = Total Cover		
Herb Stratum (15-ft)			
1. Juncus effusus	20	yes	OBL
2. Lespedeza cuneata	10	yes	FACU
3. Panicum hematomon	10	yes	OBL
4. Setaria geniculata	5	no	FACW
5. Rhexia virginica	5	no	FACW
6. Verbena brasiliensis	5	no	FACW
7.			
8.			
9.			
10.			
11.			
12.			
	55 = Total Cover		
Woody Vine Stratum (15-ft)			
1. Ipomoea purpurea	10	yes	UPL
2.			
3.			
4.			
5.			
	10 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR: 4/3	85	10YR: 6/8	15	C	M	Clay	Loam
4-7	10YR: 6/3	100					Sandy	Loam
7-18	10YR: 5/4	70	10R: 4/8	30	C	M	Sandy	Loam
18-20	10YR: 4/2	95	10YR: 5/8	5	C	M	Clay	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up3

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5%

Subregion (LRR or MLRA): LRR T Lat: 34°3'6.376"N Long: 80°55'27.935"W Datum: NAD83

Soil Map Unit Name: Jo NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No ✓

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Adjacent to w3 wetland data point. Area exists in median of I-77 South bound exit ramp and is regula

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Up3

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (15-ft)			
1. Cynodon dactylon	40	yes	FACU
2. Sorghum halepense	10	yes	FACU
3. Digitaria sanguinalis	10	yes	FACU
4. Panicum commutatum	5	no	FAC
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

Area is regularly mowed.

SOIL

Sampling Point: Up3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR: 1/1	100					Sandy	Loam
5-16	10YR: 6/6	60	2/2	40	C	M	Sandy	Loam
16-22	10YR: 7/8	100					Sandy	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w4

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): <2

Subregion (LRR or MLRA): LRR T Lat: 34°3'9.922"N Long: 80°55'25.934"W Datum: NAD83

Soil Map Unit Name: W NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:
Area exists in median of I-77 South bound and exit ramp.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 1
Water Table Present?	Yes ✓	No _____	Depth (inches): 8
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:
Water source is from roadway drainage.

VEGETATION – Use scientific names of plants. Sampling Point: w4

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (15-ft)			
1. Rhynchospora inexpansa	25	yes	FACW
2. Juncus effusus	25	yes	OBL
3. Scirpus cyperinus	15	no	OBL
4. Dichanthelium aciculare	10	no	FACU
5. Solidago altissima	5	no	FAC
6. Juncus tenuis	5	no	FAC
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR: 4/2	75	10YR: 5/6	25	C	PL	Clay/silt	Loam
4-12	10YR: 5/1	90	10YR: 3/6	10	D	M	Sand/silt	Loam
12-16	10YR: 3/2	90	10YR: 3/6	10	C	M	Sand/silt	Loam
16-19	10YR: 4/2	80	10YR: 8/1	20	C	M	Sand	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up4

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 5

Subregion (LRR or MLRA): LRR T Lat: 34°3'9.841"N Long: 80°55'26.879"W Datum: NAD83

Soil Map Unit Name: W NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:
Adjacent to w4 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Up4

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1. Rhus copallina	20	yes	FACU
2. Diospyros virginiana	5	yes	FAC
3.			
4.			
5.			
6.			
7.			
	25 = Total Cover		
Shrub Stratum (30-ft)			
1. Rubus trivialis	5	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Herb Stratum (15-ft)			
1. Panicum hemitomon	25	yes	OBL
2. Ambrosia artemisiifolia	20	yes	FACU
3. Lespedeza cuneata	15	yes	FACU
4. Eupatorium capillifolium	5	no	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	65 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-4	5YR: 3/4	100					Silt	Loam
4-12	10YR: 5/3	60	5YR: 4/6	40	C	M	Silt	Loam
12-20	10YR: 7/2	60	10YR: 4/2	40	C	M	Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w5

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°3'13.404"N Long: 80°55'24.589"W Datum: NAD83

Soil Map Unit Name: Jo NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ✓ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ✓ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 1
Water Table Present?	Yes ✓	No _____	Depth (inches): 12
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: w5

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1. Glottidium vesicarium	5	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Herb Stratum (15-ft)			
1. Dichanthelium aciculare	35	yes	FACU
2. Rhychospora inexpansa	30	yes	FACW
3. Juncus tenuis	5	no	FAC
4. Eupatorium capillifolium	5	no	FACU
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	75 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR: 4/1	95	10YR: 6/8	5	C	PL	Sand	Loam
12-16	10YR: 3/2	80	10YR: 7/3	20	C	M	Silt	Loam
16-22	10YR: 2/1	95	10YR: 7/1	5	C	M	Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up5

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°3'13.492"N Long: 80°55'24.88"W Datum: NAD83

Soil Map Unit Name: Jo NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Adjacent to w5 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No _____ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Up5

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (15-ft)			
1. Verbena brasiliensis	20	yes	FACW
2. Lespedeza capitata	20	yes	FACU
3. Eupatorium capillifolium	15	yes	FACU
4. Heterotheca graminifolia	10	no	UPL
5. Lespedeza cuneata	10	no	FACU
6. Erigeron annuus	5	no	FACU
7. Ambrosia artemisiifolia	1	no	FACU
8.			
9.			
10.			
11.			
12.			
	81 = Total Cover		
Woody Vine Stratum (15-ft)			
1. Parthenocissus quinquefolia	10	yes	FACU
2. Toxicodendron radicans	5	yes	FAC
3.			
4.			
5.			
	15 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up5

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR: 5/3	100					Sand/silt	Loam
10-18	10YR: 5/3	80	7/3	20	C		Sand/Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w6

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: 34 3.33 Long: -80 55.33 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	8

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w6 (aka W201)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	40	Y	FAC
Pinus taeda	30	Y	FAC
Magnolia grandiflora	10	Y	FAC
Nyssa sylvatica	5	N	FAC
	85	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Arundinaria gigantea	10	Y	FACW
	10	=Total Cover	
Herb Stratum			
Vine Stratum (Plot size: 30 Ft)			
Smilax laurifolia	2	N	FACW
Smilax rotundifolia	2	N	FAC
Vitis rotundifolia	2	N	FAC
	6	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	12	x 2 =	24
FAC species	89	x 3 =	267
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	101 (A)		291 (B)

Prevalence Index = B/A= 2.88

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w6 (aka W201)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 2	10YR 5 / 4	100					SANDY CLAY LOAM	
2 to 5	10YR 3 / 1	100					FINE SANDY LOAM	
5 to 8	10YR 2 / 1	100					FINE SANDY LOAM	
8 to 15	10YR 6 / 2	100					LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up6

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%)

Subregion (LRRor MLRA): P Lat: 80°55'20.007"W Long: 34°3'21.077"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification: up

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w6 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up6

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	50	Y	FAC
Pinus taeda	40	Y	FAC
	90	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Ligustrum sinense	20	Y	FAC
	20	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Microstegium vimineum	15	Y	FAC
	15	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	12	Y	FAC
	12	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	137	x 3 =	411
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	137 (A)		411 (B)

Prevalence Index = B/A= 3.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up6

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 4	10YR 4 / 4	100					SANDY CLAY LOAM	
4 to 12	10YR 3 / 3	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w7

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: 34 4.03 Long: -80 55.19 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) (LRR U)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imag.(C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	10

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w7 (aka W202)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	50	Y	FAC
Acer rubrum	20	Y	FAC
Liriodendron tulipifera	10	Y	FACU
	80	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Rubus argutus	30	Y	FAC
Arundinaria gigantea	20	Y	FACW
Liriodendron tulipifera	5	N	FACU
Morella cerifera	5	N	FAC
	60	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Osmunda spectabilis	15	Y	OBL
carex sp.	5	N	
	20	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Rubus argutus	10	N	FAC
Smilax bona-nox	8	N	FAC
Campsis radicans	5	N	FAC
	23	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	20	x 2 =	40
FAC species	128	x 3 =	384
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	178 (A)		499 (B)

Prevalence Index = B/A= 2.80

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w7 (aka W202)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 4	10YR 2 / 2	100					SANDY LOAM	
4 to 8	10YR 2 / 1	100					LOAMY SAND	
8 to 12	10YR 3 / 1	100					LOAMY SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w8

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 0

Subregion (LRRor MLRA): P Lat: 34 4.14 Long: -80 55.22 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) (LRR U)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imag.(C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	12
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	7

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w8 (aka W203)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	90	Y	FAC
Pinus taeda	15	Y	FAC
	105	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Liquidambar styraciflua	2	N	FAC
	2	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Microstegium vimineum	40	Y	FAC
	40	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Campsis radicans	5	N	FAC
Vitis rotundifolia	5	N	FAC
	10	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	157	x 3 =	471
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	157 (A)		471 (B)

Prevalence Index = B/A= 3.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w8 (aka W203)

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 2	7.5YR 4 / 2	90	7.5YR 5/8	10	RM	M	LOAM	
2 to 7	7.5YR 4 / 1	10	5YR 3/4	90	RM	M	SANDY LOAM	
7 to 10	7.5YR 4 / 2	60	5YR 3/4	40	RM	M	LOAMY SAND	
10 to 14	10YR 6 / 2	70	5YR 3/2	30	RM	M	SAND	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w9

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%)

Subregion (LRRor MLRA): P Lat: 34 4.19 Long: -80 55.17 Datum:

Soil Map Unit Name: NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	6
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	3

Wetland Hydrology Present? Yes X No

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

Remarks:

nearby pond provides hydrology

VEGETATION – Use scientific names of plants.

Sampling Point: w9 (aka W204)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size: 30 Ft)			
Alnus serrulata	8	N	FACW
Salix nigra	5	N	OBL
	13	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Polygonum plebeium	40	Y	FACW
Juncus effusus	30	Y	OBL
	70	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	48	x 2 =	96
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	83 (A)		131 (B)

Prevalence Index = B/A= 1.58

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w9 (aka W204)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 5	10YR 3 / 1	100					LOAMY FINE SAND	
5 to 13	10YR 2 / 1	100					LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up7-8-9

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%)

Subregion (LRRor MLRA): P Lat: 80°55'12.517"W Long: 34°4'7.013"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification: up

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w7/w8/w9 at I-77/I-20 interchange.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up7-8-9

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	60	Y	FAC
Liriodendron tulipifera	50	Y	FACU
Acer rubrum	40	Y	FAC
Liquidambar styraciflua	20	Y	FAC
	170	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Ilex opaca	7	N	FAC
	7	=Total Cover	
Herb Stratum			
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	127	x 3 =	381
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	177 (A)		581 (B)

Prevalence Index = B/A = 3.28

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up7-8-9

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 5	10YR 4 / 2	100					SILTY CLAY LOAM	
5 to 13	10YR 5 / 4	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/6/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w10

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): _____

Subregion (LRR or MLRA): LRR T Lat: 34°4'7.935"N Long: 80°55'41.532"W Datum: NAD83

Soil Map Unit Name: LaD NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 0.5
Water Table Present?	Yes ✓	No _____	Depth (inches): 1.0
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 0

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: w10

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (15-ft)			
1. Polygonum hydropiperoides	30	yes	OBL
2. Typha latifolia	25	yes	OBL
3. Juncus effusus	20	yes	OBL
4. Polygonum arifolium	15	no	OBL
5. Pontederia cordata	10	no	OBL
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species		x 1 =	
FACW species		x 2 =	
FAC species		x 3 =	
FACU species		x 4 =	
UPL species		x 5 =	
Column Totals:	(A)		(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w10

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR: 3/3	100					Silt/clay	Loam
2-12	10YR: 5/1	90	10YR: 6/8	10	C	M	Silt/clay	Loam
12-22	10YR: 7/1	95	10YR: 5/8	5	C	M	Clay	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/6/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up10

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°4'8.005"N Long: 80°55'41.8"W Datum: NAD83

Soil Map Unit Name: LaD NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Adjacent to w10 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

___ Surface Water (A1)	___ Water-Stained Leaves (B9)	___ Surface Soil Cracks (B6)
___ High Water Table (A2)	___ Aquatic Fauna (B13)	___ Sparsely Vegetated Concave Surface (B8)
___ Saturation (A3)	___ Marl Deposits (B15) **(LRR U)**	___ Drainage Patterns (B10)
___ Water Marks (B1)	___ Hydrogen Sulfide Odor (C1)	___ Moss Trim Lines (B16)
___ Sediment Deposits (B2)	___ Oxidized Rhizospheres on Living Roots (C3)	___ Dry-Season Water Table (C2)
___ Drift Deposits (B3)	___ Presence of Reduced Iron (C4)	___ Crayfish Burrows (C8)
___ Algal Mat or Crust (B4)	___ Recent Iron Reduction in Tilled Soils (C6)	___ Saturation Visible on Aerial Imagery (C9)
___ Iron Deposits (B5)	___ Thin Muck Surface (C7)	___ Geomorphic Position (D2)
___ Inundation Visible on Aerial Imagery (B7)	___ Other (Explain in Remarks)	___ Shallow Aquitard (D3)
		___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes _____ No ✓ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Up10

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus taeda	60	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	60	= Total Cover	
Sapling Stratum (30-ft)			
1. Pinus taeda	10	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	10	= Total Cover	
Shrub Stratum (30-ft)			
1. Sassafras albidum	1	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	1	= Total Cover	
Herb Stratum (15-ft)			
1. Lespedeza cuneata	10	yes	FACU
2. Sorghum halepense	10	yes	FACU
3. Pannicum commutatum	5	yes	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	25	= Total Cover	
Woody Vine Stratum (15-ft)			
1. Gelsemium sempervirens	15	yes	FAC
2.			
3.			
4.			
5.			
	15	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 57 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ✓ **No** __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10 YR: 4/3	80	10 YR: 6/4	20	C	M	Silt	Loam
3-20	10 YR: 5/2	100					Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w11

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 1

Subregion (LRRor MLRA): P Lat: 34 4.38 Long: -80 55.63 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology X, significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:
ditched along wet/up boundary near toe of slope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) (LRR U)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imag.(C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	9
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	5

Wetland Hydrology Present? Yes X No

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

Remarks:
surface water present in ditch, no apparent flow in ditch

VEGETATION – Use scientific names of plants.

Sampling Point: w11 (aka w205)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	30	Y	FAC
Nyssa biflora	20	Y	OBL
Pinus taeda	15	Y	FAC
	65	=Total Cover	
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Osmundastrum cinnamomeum	12	Y	FACW
	12	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	12	x 2 =	24
FAC species	45	x 3 =	135
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	77 (A)		179 (B)

Prevalence Index = B/A= 2.32

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

not a lot of vegetation due to hydrologic fluctuations and ditching

SOIL

Sampling Point: w11 (aka w205)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 3 / 1	100					SILTY CLAY LOAM	
3 to 7	10YR 2 / 1	100					SILTY CLAY LOAM	
7 to 13	10YR 2 / 1	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up11

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 1

Subregion (LRRor MLRA): P Lat: 80°55'40.448"W Long: 34°4'23.634"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification: up

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w11 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up11

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	65	Y	FAC
	65	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Smilax rotundifolia	20	Y	FAC
Rosa multiflora	15	Y	FACU
Morella cerifera	12	Y	FAC
	47	=Total Cover	
Herb Stratum			
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	97	x 3 =	291
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	112 (A)		351 (B)

Prevalence Index = B/A= 3.13

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up11

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 2	10YR 4 / 2	100					SANDY CLAY LOAM	
2 to 7	10YR 3 / 3	100					SILTY CLAY LOAM	
7 to 13	10YR 3 / 3	100					SANDY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w12

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 1

Subregion (LRRor MLRA): P Lat: 34 4.47 Long: -80 55.78 Datum:

Soil Map Unit Name: NWI Classification: PEM/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	8
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	3

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w12 (aka W206)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	25	Y	FAC
	25	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Alnus serrulata	15	Y	FACW
Salix nigra	15	Y	OBL
	30	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Polygonum plebeium	40	Y	FACW
Cynodon dactylon	20	Y	FACU
Boehmeria cylindrica	15	Y	FACW
	75	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	70	x 2 =	140
FAC species	25	x 3 =	75
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	130 (A)		310 (B)

Prevalence Index = B/A = 2.38

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w12 (aka W206)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 3 / 2	100					SANDY LOAM	
3 to 13	10YR 4 / 1	50	10YR 6/4	50	RM	M	FINE SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up12

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 3

Subregion (LRRor MLRA): P Lat: 80°55'48.012"W Long: 34°4'27.856"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification: up

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ____ No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology X, significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** ____ **No** **X**
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w12 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches): ____
Water Table Present?	Yes	____	No	X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes	____	No	X	Depth (inches): ____

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up12

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	30	Y	FAC
	30	=Total Cover	
Shrub Stratum			
Herb Stratum			
Vine Stratum			

Dominance Test Worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	30 (A)		90 (B)

Prevalence Index = B/A= 3.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

disturbed area between road shoulder and wetland

SOIL

Sampling Point: up12

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 6	10YR 5 / 4	100					CLAY LOAM	
6 to 13	10YR 3 / 3	100					CLAY	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/6/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w13

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): concave Slope (%): >2

Subregion (LRR or MLRA): LRR T Lat: 34°4'40.747"N Long: 80°56'8.846"W Datum: _____

Soil Map Unit Name: W NWI classification: Freshwater Pond

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ✓ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No ✓ Depth (inches): _____

Water Table Present? Yes ✓ No _____ Depth (inches): 8.0

Saturation Present? (includes capillary fringe) Yes _____ No ✓ Depth (inches): _____

Wetland Hydrology Present? Yes ✓ No _____

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

Remarks:

This wetland is part of a complex system of streams and pools extending into area outside of project

VEGETATION – Use scientific names of plants. Sampling Point: w13

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (15-ft)			
1. Woodwardia areolata	75	yes	OBL
2. Asplenium platyneuron var. incisum	5	no	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	80 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR: 3/2	100					Silt	Loam
2-18	2.5YR: 4/1	80	5YR: 3/4	20	D	M	Silt	Loam
18-20	2.5YR: 2.5/1	60	2.5YR: 5/2	40	C	M	Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/6/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up13

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°4'40.863"N Long: 80°56'8.697"W Datum: NAD83

Soil Map Unit Name: W NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Adjacent to w13 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: Up13

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Melia azedarach	10	yes	UPL
2. Morus rubra	10	yes	FACU
3. Pinus taeda	5	yes	FAC
4.			
5.			
6.			
7.			
	25	= Total Cover	
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
		= Total Cover	
Shrub Stratum (30-ft)			
1. Ligustrum sinense	5	yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
	5	= Total Cover	
Herb Stratum (15-ft)			
1. Asplenium platyneuron	3	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	3	= Total Cover	
Woody Vine Stratum (15-ft)			
1. Vitis rotundifolia	5	yes	FAC
2. Gelsemium sempervirens	2	yes	FAC
3.			
4.			
5.			
	7	= Total Cover	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ____ No ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up13

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-20	10YR: 4/3	90	10YR: 8/2	10	C	M	Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/7/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w14

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°5'18.21"N Long: 80°56'59.626"W Datum: NAD1983

Soil Map Unit Name: Jo NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes ✓	No _____	**Is the Sampled Area within a Wetland?** Yes ✓ No _____
Hydric Soil Present?	Yes ✓	No _____	
Wetland Hydrology Present?	Yes ✓	No _____	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ✓ Surface Water (A1)
- ✓ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ✓	No _____	Depth (inches): 1.0	
Water Table Present?	Yes ✓	No _____	Depth (inches): 2.0	
Saturation Present? (includes capillary fringe)	Yes ✓	No _____	Depth (inches): 1.0	**Wetland Hydrology Present?** Yes ✓ No _____

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

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: w14

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (30-ft)			
1. Baccharis halimifolia	5	yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
	5 = Total Cover		
Herb Stratum (15-ft)			
1. Scirpus cyperinus	80	yes	OBL
2. Typha latifolia	5	no	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	85 = Total Cover		
Woody Vine Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

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

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ✓ No __

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: w14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR: 1/2	100					Silt	Loam
3-22	10YR5/2	97	10YR: 6/6	3	C	M	Sand	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ✓ **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Columbia Sampling Date: 8/7/2014

Applicant/Owner: SCDOT State: SC Sampling Point: Up14

Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): 0

Subregion (LRR or MLRA): LRR T Lat: 34°5'18.338"N Long: 80°56'59.01"W Datum: NAD83

Soil Map Unit Name: Jo NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes _____	No ✓	**Is the Sampled Area within a Wetland?** Yes _____ No ✓
Hydric Soil Present?	Yes _____	No ✓	
Wetland Hydrology Present?	Yes _____	No ✓	

Remarks:

Adjacent to w14 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ Marl Deposits (B15) **(LRR U)**
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Moss Trim Lines (B16)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes _____	No ✓	Depth (inches): _____
Water Table Present?	Yes _____	No ✓	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes _____	No ✓	Depth (inches): _____

Wetland Hydrology Present? Yes _____ No ✓

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: Up14

Tree Stratum (Plot sizes: 30-ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (30-ft)			
1. Rhus copalina	15	yes	UPL
2. Liquidambar styraciflua	5	yes	FAC
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Shrub Stratum (30-ft)			
1. Rubus trivialis	20	yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
	20 = Total Cover		
Herb Stratum (15-ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	= Total Cover		
Woody Vine Stratum (15-ft)			
1. Vitis rotundifolia	10	yes	FAC
2. Ipmoea purpurea	10	yes	UPL
3.			
4.			
5.			
	20 = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** _____ **No** ✓

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: Up14

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-22	10YR: 4/3	80	10YR: 6/4	20	C	M	Silt	Loam

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** ✓

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w15

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%)

Subregion (LRRor MLRA): P Lat: 34 5.33 Long: -80 56.95 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes	X	No		Depth (inches):	6
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	1

Wetland Hydrology Present? Yes X No

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

Remarks:

within and near bankfull of stream

VEGETATION – Use scientific names of plants.

Sampling Point: w15 (aka W211)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	80	Y	FAC
	80	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Alnus serrulata	40	Y	FACW
	40	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Woodwardia areolata	70	Y	OBL
	70	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	40	x 2 =	80
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	190 (A)		390 (B)

Prevalence Index = B/A= 2.05

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w15 (aka W211)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 7	10YR 2 / 1	100					LOAM	
7 to 13	10YR 3 / 1	100					FINE SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up15

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 6

Subregion (LRRor MLRA): P Lat: 34 5.33 Long: -80 56.97 Datum: NAD 83

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil X, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w15 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up15

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	70	Y	FAC
	70 =Total Cover		
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Toxicodendron radicans	25	Y	FAC
	25 =Total Cover		
Vine Stratum (Plot size: 30 Ft)			
Smilax rotundifolia	15	Y	FAC
	15 =Total Cover		

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	110 (A)		330 (B)

Prevalence Index = B/A= 3.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up15

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]		
to	/							soil unavailable - riprapped

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

riprapped slope - no soil readily-available

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w16

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 3

Subregion (LRRor MLRA): P Lat: 34 5.79 Long: -80 57.65 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	9

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w16 (aka W222)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	50	Y	FAC
Pinus taeda	40	Y	FAC
Nyssa sylvatica	10	Y	FAC
Quercus phellos	10	Y	FACW
Liquidambar styraciflua	5	N	FAC
	115	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Liquidambar styraciflua	5	N	FAC
	5	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Toxicodendron radicans	20	Y	FAC
Woodwardia areolata	10	Y	OBL
	30	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Smilax rotundifolia	20	Y	FAC
Vitis rotundifolia	10	Y	FAC
	30	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across all Strata: 8 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	10	x 2 =	20
FAC species	160	x 3 =	480
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	180 (A)		510 (B)

Prevalence Index = B/A= 2.83

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w16 (aka W222)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 4 / 2	100					FINE SANDY LOAM	
3 to 13	10YR 2 / 1						SANDY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up16

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 3

Subregion (LRRor MLRA): P Lat: 80°57'28.162"W Long: 34°5'47.682"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w16 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up16

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	65	Y	FAC
	65	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Ligustrum sinense	10	Y	FAC
	10	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Toxicodendron radicans	45	Y	FAC
	45	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	35	Y	FAC
	35	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	155	x 3 =	465
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	155 (A)		465 (B)

Prevalence Index = B/A= 3.00

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up16

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 3 / 2	100					SILTY CLAY LOAM	
3 to 7	10YR 4 / 3	100					SANDY CLAY LOAM	
7 to 13	10YR 5 / 3	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/7/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w17 (aka W221)

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: Long: Datum:

Soil Map Unit Name: NWI Classification: PEM

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	11

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w17 (aka W221)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Juncus effusus	60	Y	OBL
Lespedeza cuneata	20	Y	FACU
Rubus argutus	10	Y	FAC
	90	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across all Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	90 (A)		170 (B)

Prevalence Index = B/A= 1.89

Hydrophytic Vegetation Indicators:

- [ ] 1 - Rapid Test for Hydrophytic Vegetation
- [X] 2 - Dominance Test > 50%
- [X] 3 - Prevalence Index ≤ 3.0
- [ ] Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w17 (aka W221)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 4	10YR 3 / 2	100					SANDY CLAY LOAM	
4 to 10	10YR 3 / 1	100					SANDY LOAM	
10 to 15	10YR 3 / 1	70	10YR4/4	30	RM	M	SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up17

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: 80°57'38.829"W Long: 34°6'1.263"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation X, Soil , Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present?	Yes		No	X	

Remarks:
Adjacent to w17 wetland data point. Within interchange, upland mowed area adjacent to PEM/PSS wetland w17 (between two pipes, between ramps)

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up17

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
misc grasses, maintained			FACU
	=Total Cover		
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test > 50%

3 - Prevalence Index ≤ 3.0

Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up17

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 6	10YR 4 / 3	100					SANDY LOAM	
6 to 13	10YR 5 / 4	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w18 & w19

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: 34 6.40 Long: -80 57.67 Datum:

Soil Map Unit Name: NWI Classification: PSS/PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	11

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w19 (aka W214)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Acer rubrum	40	Y	FAC
Pinus taeda	20	Y	FAC
Liquidambar styraciflua	10	Y	FAC
	70	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Arundinaria gigantea	10	Y	FACW
Ligustrum sinense	5	N	FAC
Persea borbonia	5	N	FACW
	20	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Arundinaria gigantea	5	N	FACW
Osmundastrum cinnamomeum	5	N	FACW
	10	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Bignonia capreolata	2	N	FAC
Smilax laurifolia	2	N	FACW
	4	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	27	x 2 =	54
FAC species	77	x 3 =	231
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	104 (A)		285 (B)

Prevalence Index = B/A= 2.74

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w19 (aka W214)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 2 / 2	100					LOAM	
3 to 8	10YR 2 / 1	80	10YR 4/2	20	C	M	SANDY LOAM	
8 to 10	10YR 3 / 1	90	10YR4/1	10	C	M	SANDY LOAM	
10 to 15	10YR 2 / 1	95	10YR 3/1	5	CS	M	VERY FINE SANDY LOAM	mucky modified

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up18-19

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 3

Subregion (LRRor MLRA): P Lat: Long: Datum:

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Wetland Hydrology Present?	Yes		No	X	

Remarks:
upland point affiliated with w18 and w19 wetland data points (aka w214/220); lower road shoulder outside mow zone

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up18-19

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	60	Y	FAC
Carpinus caroliniana	10	Y	FAC
	70	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Arundinaria gigantea	5	N	FACW
	5	=Total Cover	
Herb Stratum			
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	30	Y	FAC
Campsis radicans	10	Y	FAC
	40	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		340 (B)

Prevalence Index = B/A= 2.96

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up18-19

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 12	10YR 3 / 3	100					CLAY LOAM	mixed fill dirt

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

mixed roadway fill

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/6/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w20

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 2

Subregion (LRRor MLRA): P Lat: 34 6.58 Long: -80 57.76 Datum:

Soil Map Unit Name: NWI Classification: PFO/PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☑ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	10

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w20 (aka W218)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Liquidambar styraciflua	40	Y	FAC
Liriodendron tulipifera	40	Y	FACU
Acer rubrum	15	Y	FAC
Ilex opaca	4	N	FAC
	99	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Ligustrum sinense	5	N	FAC
	5	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Woodwardia areolata	10	Y	OBL
Lonicera japonica	5	N	FACU
	2	N	
	17	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	10	Y	FAC
Lonicera japonica	5	N	FACU
	15	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
FACW species	0	x 2 =	0
FAC species	74	x 3 =	222
FACU species	50	x 4 =	200
UPL species	0	x 5 =	0
Column Totals:	134 (A)		432 (B)

Prevalence Index = B/A= 3.22

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w20 (aka W218)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 3	10YR 3 / 3	100					CLAY LOAM	
3 to 5	10YR 3 / 1	80	10YR 4/2	20	RM	M	CLAY LOAM	
5 to 7	10YR 2 / 1	95	10YR4/2	5	CS	M	FINE SANDY LOAM	
7 to 13	10YR 2 / 1	100					FINE SANDY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up20

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 5

Subregion (LRRor MLRA): P Lat: 80 57' 45.313" W Long: 34 6' 37.221" N Datum: NAD 1983

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation X, Soil , Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?**	**Yes** **No X**
Hydric Soil Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks:
Adjacent to w20 wetland data point. Wetland runs along toe of slope, upland likely in road fill and within mowing corridor

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes	No X	Depth (inches):		**Wetland Hydrology Present?** **Yes** **No X**
Water Table Present?	Yes	No X	Depth (inches):		
Saturation Present? (includes capillary fringe)	Yes	No X	Depth (inches):		

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up20

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size: 30 Ft)			
Ligustrum sinense	25	Y	FAC
Acer rubrum	15	Y	FAC
	40	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Eupatorium capillifolium	40	Y	FACU
Toxicodendron radicans	20	Y	FAC
	60	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	60	x 3 =	180
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	100 (A)		340 (B)

Prevalence Index = B/A= 3.40

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up20

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 8	10YR 5 / 6	100					SANDY CLAY LOAM	
8 to 12	10YR 4 / 4	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2] Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w21

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 1

Subregion (LRRor MLRA): P Lat: 34 7.26 Long: -80 57.77 Datum:

Soil Map Unit Name: NWI Classification: PSS

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- [ ] Surface Water (A1)
- [ ] High Water Table (A2)
- [x] Saturation (A3)
- [ ] Water Marks (B1)
- [ ] Sediment Deposits (B2)
- [ ] Drift Deposits (B3)
- [ ] Algal Mat or Crust (B4)
- [ ] Iron Deposits (B5)
- [ ] Inundation Visible on Aerial Imagery (B7)
- [ ] Water-Stained Leaves (B9)
- [ ] Aquatic Fauna (B13)
- [ ] Marl Deposits (B15) (LRR U)
- [ ] Hydrogen Sulfide Odor (C1)
- [ ] Oxidized Rhizospheres along Living Roots (C3)
- [ ] Presence of Reduced Iron (C4)
- [ ] Recent Iron Reduction in Tilled Soils (C6)
- [ ] Thin Muck Surface (C7)
- [ ] Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- [ ] Surface Soil Cracks (B6)
- [ ] Sparsely Vegetated Concave Surface (B8)
- [ ] Drainage Patterns (B10)
- [ ] Moss Trim Lines (B16)
- [ ] Dry-Season Water Table (C2)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imag.(C9)
- [ ] Geomorphic Position (D2)
- [ ] Shallow Aquitard (D3)
- [ ] FAC-Neutral Test (D5)
- [ ] Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):	
Water Table Present?	Yes		No	X	Depth (inches):	
Saturation Present? (includes capillary fringe)	Yes	X	No		Depth (inches):	8

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w21 (aka W217)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum (Plot size: 30 Ft)			
Salix nigra	40	Y	OBL
Liquidambar styraciflua	20	Y	FAC
Ligustrum sinense	15	Y	FAC
Arundinaria gigantea	10	Y	FACW
	85	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
	5	N	
Pteridium aquilinum	5	N	FACU
	10	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Bignonia capreolata	10	Y	FAC
Vitis rotundifolia	5	N	FAC
	15	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	10	x 2 =	20
FAC species	50	x 3 =	150
FACU species	5	x 4 =	20
UPL species	0	x 5 =	0
Column Totals:	105 (A)		230 (B)

Prevalence Index = B/A= 2.19

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w21 (aka W217)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 5	10YR 3 / 1	100					CLAY LOAM	
5 to 13	10YR 2 / 1	100					SILTY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up21

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 5

Subregion (LRRor MLRA): P Lat: 80°57'46.383"W Long: 34°7'15.452"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation X, Soil , Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation , Soil , Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present?	Yes		No	X	

Remarks:
Adjacent to w21 wetland data point. Wetland at bottom of slope, receiving roadside drainage; upland on intermittently maintained road shoulder slope

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up21

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum (Plot size: 6 Ft)			
Eupatorium capillifolium	40	Y	FACU
Solidago canadensis	35	Y	FACU
Cynodon dactylon	25	Y	FACU
Festuca rubra	15	Y	FACU
	115	=Total Cover	
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	115	x 4 =	460
UPL species	0	x 5 =	0
Column Totals:	115 (A)		460 (B)

Prevalence Index = B/A= 4.00

Hydrophytic Vegetation Indicators:

___ 1 - Rapid Test for Hydrophytic Vegetation

___ 2 - Dominance Test > 50%

___ 3 - Prevalence Index ≤ 3.0

___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ___ **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up21

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type [1]	Loc [2]	Texture	Remarks
0 to 12	10YR 5 / 4	100					SANDY CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w22

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Hillslope Local Relief (concave, convex, none): Concave Slope(%) 4

Subregion (LRRor MLRA): P Lat: 34 7.38 Long: -80 57.83 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☑ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches): ____
Water Table Present?	Yes	____	No	X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes	____	No	X	Depth (inches): ____

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w22 (aka W215)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Liquidambar styraciflua	65	Y	FAC
Nyssa sylvatica	15	Y	FAC
Liriodendron tulipifera	10	Y	FACU
Acer rubrum	5	N	FAC
	95	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Magnolia virginiana	5	N	FACW
Arundinaria gigantea	4	N	FACW
	9	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Woodwardia areolata	10	Y	OBL
Osmunda spectabilis	5	N	OBL
Osmundastrum cinnamomeum	2	N	FACW
Typha latifolia	2	N	OBL
	19	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	10	Y	FAC
	10	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	17	x 1 =	17
FACW species	11	x 2 =	22
FAC species	95	x 3 =	285
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	133 (A)		364 (B)

Prevalence Index = B/A= 2.74

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- X 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes X No ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: w22 (aka W215)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 4	7.5YR 4 / 2	70	7.5YR 4/6	30	D	M	CLAY LOAM	
4 to 6	10YR 4 / 1	80	10YR 4/6	20	D	M	SILTY CLAY LOAM	
6 to 9	10YR 5 / 1	60	)YR 7/4 & 10YR3,	40	D	M	SILTY CLAY LOAM	
9 to 14	10YR 4 / 1	90	10YR 4/6	10	D	PL	CLAY LOAM	concentrations as well

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up22

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 4

Subregion (LRRor MLRA): P Lat: 80°57'41.949"W Long: 34°7'20.332"N Datum: NAD 1983

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present?	Yes		No	X	

Remarks: Adjacent to w22 wetland data point.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** ____ **No** **X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up22

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Pinus taeda	80	Y	FAC
Acer rubrum	20	Y	FAC
	100	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Smilax rotundifolia	35	Y	FAC
	35	=Total Cover	
Herb Stratum (Plot size: 6 Ft)			
Eupatorium capillifolium	20	Y	FACU
	20	=Total Cover	
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	20	Y	FAC
Smilax rotundifolia	15	Y	FAC
	35	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across all Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83.3% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	170	x 3 =	510
FACU species	20	x 4 =	80
UPL species	0	x 5 =	0
Column Totals:	190 (A)		590 (B)

Prevalence Index = B/A= 3.11

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **X** **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up22

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 4	10YR 4 / 2	100					SILTY CLAY LOAM	
4 to 13	10YR 4 / 3	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/5/2014

Applicant/Owner: SCDOT State: SC Sampling Point: w23

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 3

Subregion (LRRor MLRA): P Lat: 34 7.95 Long: -80 57.83 Datum:

Soil Map Unit Name: NWI Classification: PFO

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation ____, Soil ____, Hydrology ____, significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation ____, Soil ____, Hydrology ____, naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes	X	No		
Hydric Soil Present?	Yes	X	No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Wetland Hydrology Present?	Yes	X	No		

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☑ Sparsely Vegetated Concave Surface (B8)
- ☑ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes	____	No	X	Depth (inches): ____
Water Table Present?	Yes	____	No	X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes	____	No	X	Depth (inches): ____

Wetland Hydrology Present? Yes X No

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: w23 (aka W216)

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum (Plot size: 30 Ft)			
Liriodendron tulipifera	30	Y	FACU
Oxydendrum arboreum	30	Y	FACU
Pinus taeda	30	Y	FAC
Juniperus virginiana	5	N	FACU
	2	N	UPL
	97	=Total Cover	
Shrub Stratum (Plot size: 30 Ft)			
Magnolia virginiana	8	Y	FACW
	8	=Total Cover	
Herb Stratum			
Vine Stratum (Plot size: 30 Ft)			
Vitis rotundifolia	25	Y	FAC
	25	=Total Cover	

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across all Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	8	x 2 =	16
FAC species	55	x 3 =	165
FACU species	65	x 4 =	260
UPL species	2	x 5 =	10
Column Totals:	130 (A)		451 (B)

Prevalence Index = B/A= 3.47

Hydrophytic Vegetation Indicators:

- ___ 1 - Rapid Test for Hydrophytic Vegetation
- X 2 - Dominance Test > 50%
- ___ 3 - Prevalence Index ≤ 3.0
- ___ Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks: (Include photo numbers here or on a separate sheet.)

no herbs, lots of drainage patterns, lots of shade

SOIL

Sampling Point: w23 (aka W216)

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 7	7.5YR 3 / 4	100					FINE SANDY LOAM	
7 to 10	7.5YR 3 / 2	20	7.5YR6/6	70	RM	M	FINE SANDY LOAM	7.5YR5/8 (10%) concentrations
10 to 12	10yr 2 / 1	100					FINE SANDY LOAM	mucky modified
12 to 15	10YR 3 / 2	10	10YR6/4	85	RM	M	SANDY CLAY	gravelly, 10YR5/8 (5%) concentrations

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

top 10" appears to be fill material

WETLAND DETERMINATION DATA FORM - Atlantic and Gulf Coastal Plain Region

Project/Site: I-77 City/County: Richland Co Sampling Date: 8/4/2014

Applicant/Owner: SCDOT State: SC Sampling Point: up23

Investigators: Jamison Section, Township, Range S T R

Landform (hillslope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%)

Subregion (LRRor MLRA): P Lat: 34 7.95073 Long: -80 57.82715 Datum:

Soil Map Unit Name: NWI Classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks)

Are Vegetation X, Soil X, Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes No X

Are Vegetation , Soil , Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes		No	X	**Is the Sampled Area within a Wetland?** **Yes** **No** **X**
Hydric Soil Present?	Yes		No	X	
Wetland Hydrology Present?	Yes		No	X	

Remarks:
In roadside fill and maintained area

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ Marl Deposits (B15) (LRR U)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imag.(C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) (LRR T,U)

Field Observations:

Surface Water Present?	Yes		No	X	Depth (inches):
Water Table Present?	Yes		No	X	Depth (inches):
Saturation Present? (includes capillary fringe)	Yes		No	X	Depth (inches):

Wetland Hydrology Present? **Yes** **No X**

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

Remarks:

VEGETATION – Use scientific names of plants.

Sampling Point: up23

	Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum			
Shrub Stratum			
Herb Stratum			
Vine Stratum			

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across all Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index Worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	0 (A)		0 (B)

Prevalence Index = B/A=

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test > 50%

3 - Prevalence Index ≤ 3.0

Problematic Hydrophytic Vegetation (Explain)

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

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** **No** **X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: up23

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 to 7	10YR 4 / 3	100					CLAY LOAM	
7 to 12	10YR 5 / 3	100					CLAY LOAM	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Martix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils: [3]

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

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

☐ **Restrictive Layer (if observed):**

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks:

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s1	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°2' 58.689" N	Longitude:	80°55' 27.591" W	County:	Richland
Date:	8-7-14	Time:	1100	Investigator:	Jamison
Stream width:	8-12'	Stream Depth:	1-2'	Length of Stream Reach:	~300'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 11

NOTES/COMMENTS: originally s200; parallel to I-77, flowing south away from I-77; limited riffle-pool habitat; perennial flow

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name: S2	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°3'19.37"N	Longitude: 80°55'23.725"W	County: Richland
Date: 8/4/14	Time: 3:00 pm	Investigator: McMaster/Mulholland
Stream width: 8.0'	Stream Depth: 1.5'	Length of Stream Reach: ~900'
Has it rained within the past 48 hours? Yes	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	(1.0)	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25

Total Score: 10.5

NOTES/COMMENTS: Stream is fed by one linear conveyance and terminates at a culvert.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s3	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 8.062" N	Longitude:	80°55' 10.210" W	County:	Richland
Date:	8-5-14	Time:	0830	Investigator:	Jamison
Stream width:	2-3'	Stream Depth:	1-2'	Length of Stream Reach:	~300'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	(1.0)	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25

Total Score: 10

NOTES/COMMENTS: *originally s203; parallel to I-26, flowing west into pond inside the interchange to the east of I-77 and north of I-26; limited riffle-pool habitat; intermittent transitioning to perennial flow, originating north of I-26 from a pipe outlet*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s4	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 6.975" N	Longitude:	80°55' 13.348" W	County:	Richland
Date:	8-5-14	Time:	0830	Investigator:	Jamison
Stream width:	3-5'	Stream Depth:	1-2'	Length of Stream Reach:	~200'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 13

NOTES/COMMENTS: *originally s202; parallel to I-77, flowing north inside the interchange to the east of I-77 and north of I-26; limited riffle-pool habitat; perennial flow, originating south of I-26 at a possible spring; feeds into pond inside the interchange*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s5/s6	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 11.579" N	Longitude:	80°55' 5.414" W	County:	Richland
Date:	8-5-14	Time:	0900	Investigator:	Jamison
Stream width:	3-5'	Stream Depth:	1-2'	Length of Stream Reach:	~300'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	0.50	(0.25)

Total Score: 8.25

NOTES/COMMENTS: *originally s204/205; parallel to I-26 westbound ramp toward I-77, flowing west; channel appears to be straightened and is riprap-lined; limited drop-pool habitat; intermittent flow; s6 is a very short reach before confluencing with the longer s5, and both have similar characteristics; therefore, they are lumped onto one form*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s7	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'6.245"N	Longitude: 80°55'31.226"W	County: Richland
Date: 8/6/14	Time: 10:00 am	Investigator: McMaster/Mulholland
Stream width: 5'	Stream Depth: 1.0'	Length of Stream Reach: 340'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 12.25

NOTES/COMMENTS: Stream is defined by intermittent breaks in canopy cover and subsequent herbaceous vegetation blooms.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s8	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'8.29"N	Longitude: 80°55'38.967"W	County: Richland
Date: 8/6/14	Time: 8:10 am	Investigator: McMaster/Mulholland
Stream width: 7.0'	Stream Depth: 0.5'	Length of Stream Reach: ~61'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	(1.5)	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	(1.0)	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank (1.0)	0.75	0.50	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25

Total Score: 12.5

NOTES/COMMENTS: Stream is defined by a rip rap bed and bank throughout much of its length.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s9/s10	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 41.696" N	Longitude:	80°56' 4.782" W	County:	Richland
Date:	8-5-14	Time:	1300	Investigator:	Jamison
Stream width:	3-5'	Stream Depth:	1-2'	Length of Stream Reach:	~150'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	(0.5)
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	(0.25)
SCORE	Right Bank 1.0	0.75	0.50	(0.25)
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 6.5

NOTES/COMMENTS: *originally s206/207; perpendicular to and east of I-77, flowing west; channel appears to be straightened and is concrete-lined; limited habitat; perennial flow; the two channels confluence at the outer edge of the study limits and have similar flow and characteristics before and after the confluence*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s11	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'39.796"N	Longitude: 80°56'7.954"W	County: Richland
Date: 8/6/14	Time: 2:30 pm	Investigator: McMaster/Mulholland
Stream width: 10.0'	Stream Depth: 1.5'	Length of Stream Reach: ~36'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	(1.5)	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	(1.5)	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank (1.0)	0.75	0.50	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25

Total Score: 14.5

NOTES/COMMENTS: Stream is defined by a large incongruous pool near its center.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name: s12	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'40.308"N	Longitude: 80°56'8.559"W	County: Richland
Date: 8/6/14	Time: 2:20 pm	Investigator: McMaster/Mulholland
Stream width: 3.0'	Stream Depth: 0.5'	Length of Stream Reach: ~34'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat Parameter	Condition Category: Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25

Total Score: 12.0 NOTES/COMMENTS: Stream terminates at culvert.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name: s13	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'40.54"N	Longitude: 80°56'8.206"W	County: Richland
Date: 8/6/14	Time: 1:00 pm	Investigator: McMaster/Mulholland
Stream width: 7.5'	Stream Depth: 1.0'	Length of Stream Reach: ~60'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	(1.5)	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	(1.5)	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	(2.0)	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank (1.0)	0.75	0.50	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25

Total Score: 14.5 NOTES/COMMENTS: No comments.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s14	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'43.047"N	Longitude: 80°56'11.222"W	County: Richland
Date: 8/6/14	Time: 4:10 pm	Investigator: McMaster/Mulholland
Stream width: 4.0'	Stream Depth: 0.5'	Length of Stream Reach: ~58'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat Parameter	Condition Category: Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 11.75 NOTES/COMMENTS: No comments.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s15	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°4'43.307"N	Longitude: 80°56'11.631"W	County: Richland
Date: 8/6/14	Time: 4:20 pm	Investigator: McMaster/Mulholland
Stream width: 6.0'	Stream Depth: 0.5'	Length of Stream Reach: ~111'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	(1.0)	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank (1.0)	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 10.5

NOTES/COMMENTS: Stream branches and consists of a 78.0 LF main channel and a 33.0 LF branch.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s16	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 46.922" N	Longitude:	80°56' 11.136" W	County:	Richland
Date:	8-5-14	Time:	1400	Investigator:	Jamison
Stream width:	3-5'	Stream Depth:	0.5-1'	Length of Stream Reach:	~150'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	(0.5)
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 7.5

NOTES/COMMENTS: *originally s208; perpendicular to I-77, flowing southwest to I-77; channel appears to be straightened and is concrete-lined; no riffle/pool complex; perennial flow*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s17	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°4' 47.750" N	Longitude:	80°56' 12.412" W	County:	Richland
Date:	8-5-14	Time:	1400	Investigator:	Jamison
Stream width:	3-5'	Stream Depth:	0.5-1'	Length of Stream Reach:	~300'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	(0.5)
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 7.5

NOTES/COMMENTS: *originally s209; parallels I-77, flowing south into s16; channel appears to be straightened and is a mix of concrete-lined and riprapped; little to no riffle/pool complex*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	Jackson Creek (s18)	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°5' 17.208" N	Longitude:	80°56' 57.215" W	County:	Richland
Date:	8-5-14	Time:	1600	Investigator:	Jamison
Stream width:	20-40'	Stream Depth:	5-8'	Length of Stream Reach:	~500'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 10.5

NOTES/COMMENTS: *originally s210; passes below I-77 bridge; channel appears to be dredged and straightened; little to no riffle/pool complex; flows west perpendicular to I-77*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s20/s19 downstream	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°5' 38.747" N	Longitude:	80°57' 11.935" W	County:	Richland
Date:	8-5-14	Time:	1700	Investigator:	Jamison
Stream width:	10-20'	Stream Depth:	5'	Length of Stream Reach:	~200'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	(2.0)	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	(1.5)	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	(1.5)	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 13.5

NOTES/COMMENTS: *originally s211/s212; downstream/southeast of I-277 interchange; channel has good riffle/pool complex; deeper pools; Fe-oxidizing bacteria; incised channel with little floodplain access; flows southeast parallel to I-77 and into Jackson Creek*

s19 and s20 confluence near the C/A fence, with s20 having less streamflow but similar characteristics, thus the "combined" form (a separate form is provided for s19 farther upstream)

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s19 upstream	Basin/Watershed:	Congaree (03050110)	USGS Quad:	Fort Jackson North
Latitude:	34°5' 45.835" N	Longitude:	80°57' 19.122" W	County:	Richland
Date:	8-7-14	Time:	0900	Investigator:	Jamison
Stream width:	6'	Stream Depth:	<1'	Length of Stream Reach:	~200'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	(0.5)
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	(1.0)	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	(0.5)
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	(0.25)
SCORE	Right Bank 1.0	0.75	0.50	(0.25)
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	(0.25)
SCORE	Right Bank 1.0	0.75	0.50	(0.25)
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	(0.25)
SCORE	Right Bank 1.0	0.75	0.50	(0.25)

Total Score: 5

NOTES/COMMENTS: *originally s211; inside the interchange; channel is concrete-lined with no riffle/pool complex; flows southeast*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name s21	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°5'26.094"N	Longitude: 80°57'9.609"W	County: Richland
Date: 8/7/14	Time: 9:00 am	Investigator: McMaster/Mulholland
Stream width: 6.0'	Stream Depth: 0.5'	Length of Stream Reach: ~27'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	(1.5)	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	(1.5)	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	(1.0)	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	(1.5)	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank (1.0)	0.75	0.50	0.25

Total Score: 13

NOTES/COMMENTS: Stream appears to be the result of a break in an offsite channelized drainage ditch.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name S22	Basin/Watershed: Congaree (03050110)	USGS Quad: Fort Jackson North
Latitude: 34°5'24.154"N	Longitude: 80°57'23.868"W	County: Richland
Date: 8/7/14	Time: 9:45 am	Investigator: McMaster/Mulholland
Stream width: 4.0'	Stream Depth: 0.5'	Length of Stream Reach: ~548'
Has it rained within the past 48 hours? No	Adjacent land use? (Industrial, agriculture, etc): Roadway	

Habitat Parameter	Condition Category: Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	(0.5)
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	(1.0)	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	(1.0)	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	(0.5)
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE Left Bank	1.0	0.75	(0.50)	0.25
SCORE Right Bank	1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE Left Bank	1.0	0.75	0.50	(0.25)
SCORE Right Bank	1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE Left Bank	(1.0)	0.75	0.50	0.25
SCORE Right Bank	1.0	0.75	0.50	(0.25)

Total Score: 8.5

NOTES/COMMENTS: Stream bottom is concrete but stream contains up to 20.0 inches of sediment in some places. Stream also contains minor meanders.

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	Cumbess Creek s23/s24	Basin/Watershed:	Lower Broad (03050106)	USGS Quad:	Fort Jackson North
Latitude:	34°6' 24.215" N	Longitude:	80°57' 44.581" W	County:	Richland
Date:	8-6-14	Time:	1730	Investigator:	Jamison
Stream width:	10-12'	Stream Depth:	1-3'	Length of Stream Reach:	~200'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	0.25

Total Score: 13.5

NOTES/COMMENTS: *originally s219/s214; some riffle/pool complex; flows west; adjacent golf course and some apparent past riparian disturbance*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s25	Basin/Watershed:	Lower Broad (03050106)	USGS Quad:	Fort Jackson North
Latitude:	34°6' 36.341" N	Longitude:	80°57' 45.906" W	County:	Richland
Date:	8-6-14	Time:	1600	Investigator:	Jamison
Stream width:	4'	Stream Depth:	1.5'	Length of Stream Reach:	~600'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	(2.0)	1.5	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	(1.5)	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	(2.0)	1.5	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	0.75	0.50	(0.25)

Total Score: 14.5

NOTES/COMMENTS: *originally s218; good riffle/poll complex with deep pools at times; lots of Fe-oxidizing bacteria; runs along fenceline; small perennial stream that parallels I-77, flowing south; tributary to Cumbess Creek*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	Crane Creek s26/s28	Basin/Watershed:	Lower Broad (03050106)	USGS Quad:	Fort Jackson North
Latitude:	34°7' 25.129" N	Longitude:	80°57' 47.324" W	County:	Richland
Date:	8-6-14	Time:	1100	Investigator:	Jamison
Stream width:	12-20'	Stream Depth:	1-4'	Length of Stream Reach:	~400'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	(1.5)	1.0	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	(1.5)	1.0	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	(1.5)	1.0	0.5
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	(1.5)	1.0	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	(1.5)	1.0	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	(1.5)	1.0	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	(0.75)	0.50	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	(0.75)	0.50	0.25

Total Score: 14.25

NOTES/COMMENTS: originally s215; large perennial stream with well-formed riffles and pools

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s27	Basin/Watershed:	Lower Broad (03050106)	USGS Quad:	Fort Jackson North
Latitude:	34°7' 25.305" N	Longitude:	80°57' 46.940" W	County:	Richland
Date:	8-6-14	Time:	1100	Investigator:	Jamison
Stream width:	4'	Stream Depth:	3'	Length of Stream Reach:	~400'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	(1.0)	0.5
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	1.0	(0.5)
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	(1.0)	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	0.50	(0.25)
SCORE	Right Bank 1.0	0.75	0.50	(0.25)
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 8.5

NOTES/COMMENTS: *originally s217; small intermittent stream that lies at bottom of concrete flume coming from roadside drainage; tributary to Crane Creek*

LOW GRADIENT STREAM ASSESSMENT DATA SHEET

Stream Name	s29	Basin/Watershed:	Lower Broad (03050106)	USGS Quad:	Blythewood
Latitude:	34°7' 38.252" N	Longitude:	80°57' 44.692" W	County:	Richland
Date:	8-6-14	Time:	1400	Investigator:	Jamison
Stream width:	4'	Stream Depth:	0.5'	Length of Stream Reach:	~200'
Has it rained within the past 48 hours?	no	Adjacent land use? (Industrial, agriculture, etc):		roadway, forested	

Habitat	Condition Category			
Parameter	Fully Functional	Partially Impaired	Impaired	Very Impaired
1.Epifaunal Substrate or Available Cover	Greater than 50% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e.logs/snags that are not new fall and not transient).	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	10-30% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0	1.5	(1.0)	0.5
2.Pool Substrate Characterization	Mix of substrate materials, with gravel and firm sand prevalent; root mats and submerged vegetation common.	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay or sand bottom; little or no root mat; no submerged vegetation.	Hard-pan, clay, or bedrock; no root mat or vegetation.
SCORE	2.0	1.5	(1.0)	0.5
3.Pool variability	Even mix of large-shallow, large-deep, small-shallow, small-deep pools present.	Majority of pools large-deep; very few shallow.	Shallow pools much more prevalent than deep pools.	Majority of pools small-shallow or pools absent.
SCORE	2.0	1.5	1.0	(0.5)
4.Sediment Deposition	Little or no enlargement of islands or point bars and less than 20% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 50-80%of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE	2.0	1.5	1.0	(0.5)
5.Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE	2.0	1.5	(1.0)	0.5
6.Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern	Some channelization present, usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or removed entirely.
SCORE	2.0	1.5	(1.0)	0.5
7.Channel Sinuosity	The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (If braided channel, this parameter is difficult to rate.)	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line.	Channel straight; waterway has been channelized for a long distance.
SCORE	2.0	1.5	1.0	(0.5)
8.Bank Stability	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosion scars.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
9.Vegetative Protection	>90% of SB surfaces and adjacent riparian zone covered by native vegetation, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or mowing; almost all plants allowed to grow naturally	70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.	<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less in average stubble height.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25
10.Riparian Veg Zone Width	Width of riparian zone>18 meters; human activities (roads, clear-cuts, lawns, crops, parking lots) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE	Left Bank 1.0	0.75	(0.50)	0.25
SCORE	Right Bank 1.0	0.75	(0.50)	0.25

Total Score: 8.5

NOTES/COMMENTS: *originally s216; stream is ditched at pipe outlet, with recent maintenance activities having affected bedload and vegetative cover; runs and pools have lots of sand deposition; perennial flow*

Photograph #1 – w2 (looking northeast)

Photograph #2 – w3 - (looking east)

Photograph #3– w4 (looking east)

Photograph #4 – w5 (looking southeast)

Photograph #5 – w6 (looking southeast)

Photograph #6 – w7 (looking northeast)

Photograph #7 – w8 (looking north to pond 1)

Photograph #8 – w9 (looking north)

Photograph #9 – w10 (looking south)

Photograph #10 – w12 (looking north)

Photograph #11 – w13 (looking southwest)

Photograph #12 – w14 (looking southeast)

Photograph #13 – w16 (looking north)

Photograph #14 – w17 (looking southwest)

Photograph #15 – w18 & w19 (looking south)

Photograph #16 – w20 (looking southwest)

Photograph #17 – w23 (looking west)

End of wetland photos

Photograph #1 – s2 (looking northeast)

Photograph #2 – s3 (looking northwest)

Photograph #3 – s4 (looking north, pond in background)

Photograph #4 – s7 (looking west)

Photograph #5 – s8 (looking north)

Photograph #6 – confluence of s9 and s10 (looking east)

Photograph #7 – s11 (looking southeast)

Photograph #8 – s12 (looking northwest)

Photograph #9 – s13 (looking northeast)

Photograph #10 – s14 (looking northwest)

Photograph #11 – s15 (looking northwest)

Photograph #12 – s17 (looking northwest)

Photograph #13 – s19 (looking north)

Photograph #14 – s20 (looking northeast)

Photograph #15 – s21 (looking northeast)

Photograph #16 – s22 (looking southwest)

Photograph #17 – s25 (looking south)

Photograph #18 – s29 (looking west)

End of stream photos

Looking west from the southbound (SB) side of I-77, north of Killian Road

Looking west from the SB side of I-77, north of N. Pines Road

Looking west from the SB side of I-77, north of Blythewood Crossing

Looking west from the SB side of I-77, north of Blythewood Crossing

Looking east from SB side of I-77, inside ramp median at Wilson Road interchange

Looking west from SB side of I-77, between ramps at Wilson Road interchange

Looking west from SB side of I-77, between ramps at Wilson Road interchange

Looking west from SB side of I-77, south of State Route S-40-1868

Looking north from northbound (NB) side of I-77, at Wilson Road interchange

Looking north from NB side of I-77, inside ramp median at Wilson Road interchange

Looking east from NB side of I-77, between ramps at Wilson Road interchange

Looking east from NB side of I-77, north of Northpoint Boulevard

End of photos

Appendix G

Floodplains and Drainage Information

South Carolina Department of Transportation
Location and Hydraulic Design of Encroachments on Floodplains Checklist

23 CFR 650, this regulation shall apply to all encroachments and to all actions which affect base floodplains, except for repairs made with emergency funds. Note: These studies shall be summarized in the environmental review documents prepared pursuant to 23 CFR 771.

I. PROJECT DESCRIPTION

The project involves widening approximately seven miles of Interstate 77 (I-77) from mile point 15 (Percival Road) to approximately mile point 22 (Killian Road) and rehabilitating the I-77 southbound lanes from approximately mile point 22 (Killian Road) to approximately mile point 27 in Richland County, SC. The widening includes adding one travel lane in each direction, improving various exit ramps, and widening or replacing ten mainline bridges.

Narrative Describing Purpose and Need for Project

a. Relevant Project History:
b. General Project Description and Nature of Work (attach Location and Project Map):

A Project Location Map (Figure 1) and FEMA Floodplain Maps (see Appendix E) are included with the Categorical Exclusion Type C

c. Major Issues and Concerns:

None. The project is located in Zone X, outside of the 0.1% and 0.2% annual chance flood area and Zone AE, areas of high risk for flooding by the 1% annual chance flood. All major bridge and culvert crossings contain the floods with no overtopping of the roadway; therefore, the propose project will have no impacts on the floodplains.

B. Are there any floodplain(s) regulated by FEMA located in the project area?
Yes☒ No☐

C. Will the placing of fill occur within a 100-year floodplain?
Yes☐ No☒

D. Will the existing profile grade be raised within the floodplain?

No.

E. If applicable, please discuss the practicability of alternatives to any longitudinal encroachments.

N/A

F. Please include a discussion of the following: commensurate with the significance of the risk or environmental impact for all alternatives containing encroachments and those actions which would support base floodplain development:
   a. What are the risks associated with implementation of the action?

      N/A

   b. What are the impacts on the natural and beneficial floodplain values?

      N/A

   c. The support of probable incompatible floodplain development.

      N/A

   d. What measures were used to minimize floodplain impacts associated with the action?

      N/A

   e. Were any measures used to restore and preserve the natural and beneficial floodplain values impacted by the action?

      N/A

G. Please discuss the practicability of alternatives to any significant encroachments or any support of incompatible floodplain development.

N/A

H. Were local, state, and federal water resources and floodplain management agencies consulted to determine if the proposed highway action is consistent with existing watershed and floodplain management programs and to obtain current information on development and proposed actions in the affected? Please include agency documentation.

N/A

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DNR

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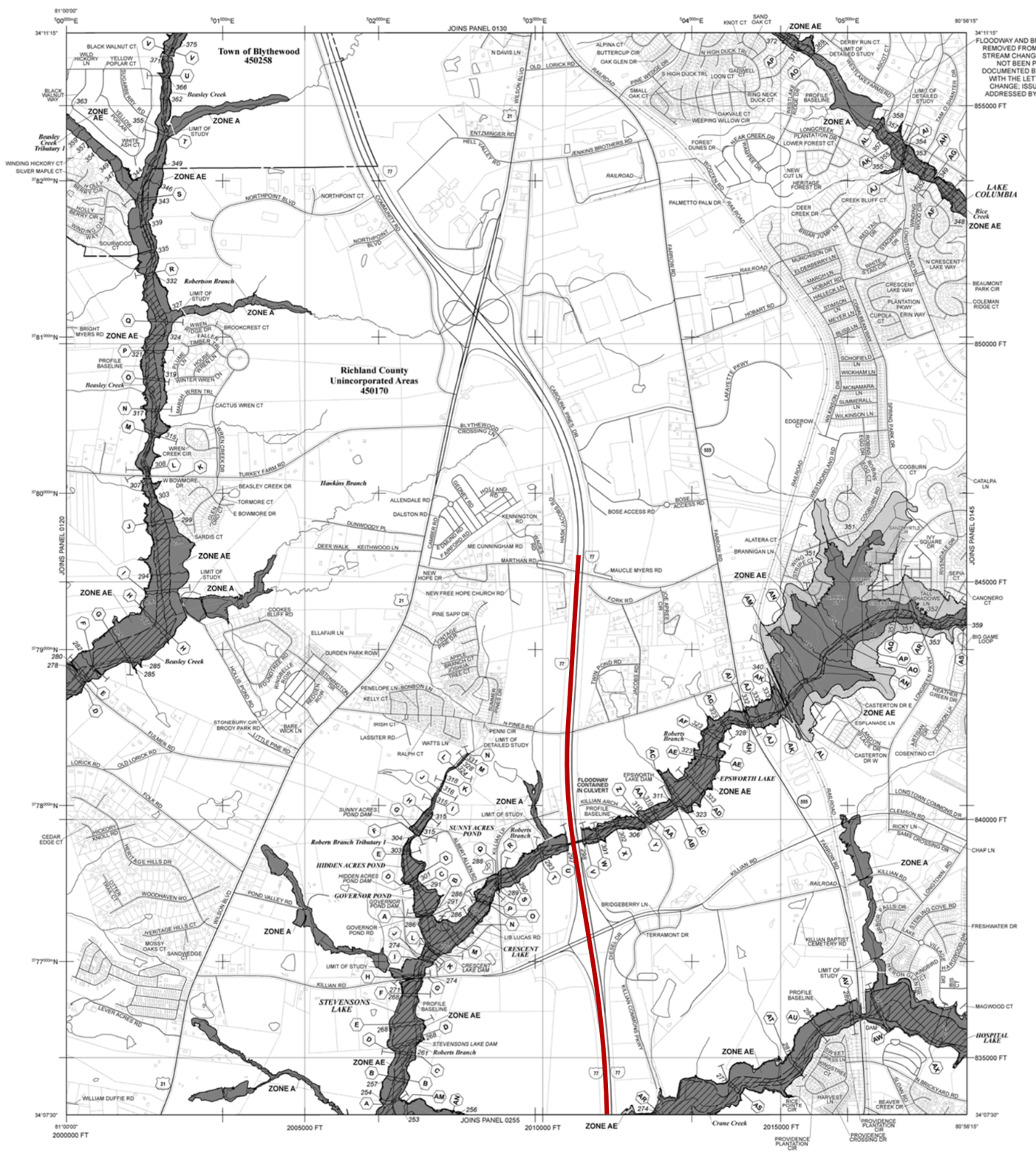
http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 (EL 987) — Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- (A)–(A) Cross section line
- (23)–(23) Transect line
- 97°07'30" 32°22'30" — Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4775000mE — 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT — 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 — Bench mark (see explanation in Notes to Users section of this FIRM panel)
- M1.5 — River Mile

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 20, 2002

September 29, 2010 – to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

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MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0140K

FIRM

FLOOD INSURANCE RATE MAP
RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 140 OF 650
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
TOWN OF BLYTHEWOOD	450258	0140	K
RICHLAND COUNTY	450170	0140	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0140K
MAP REVISED
SEPTEMBER 29, 2010

Federal Emergency Management Agency

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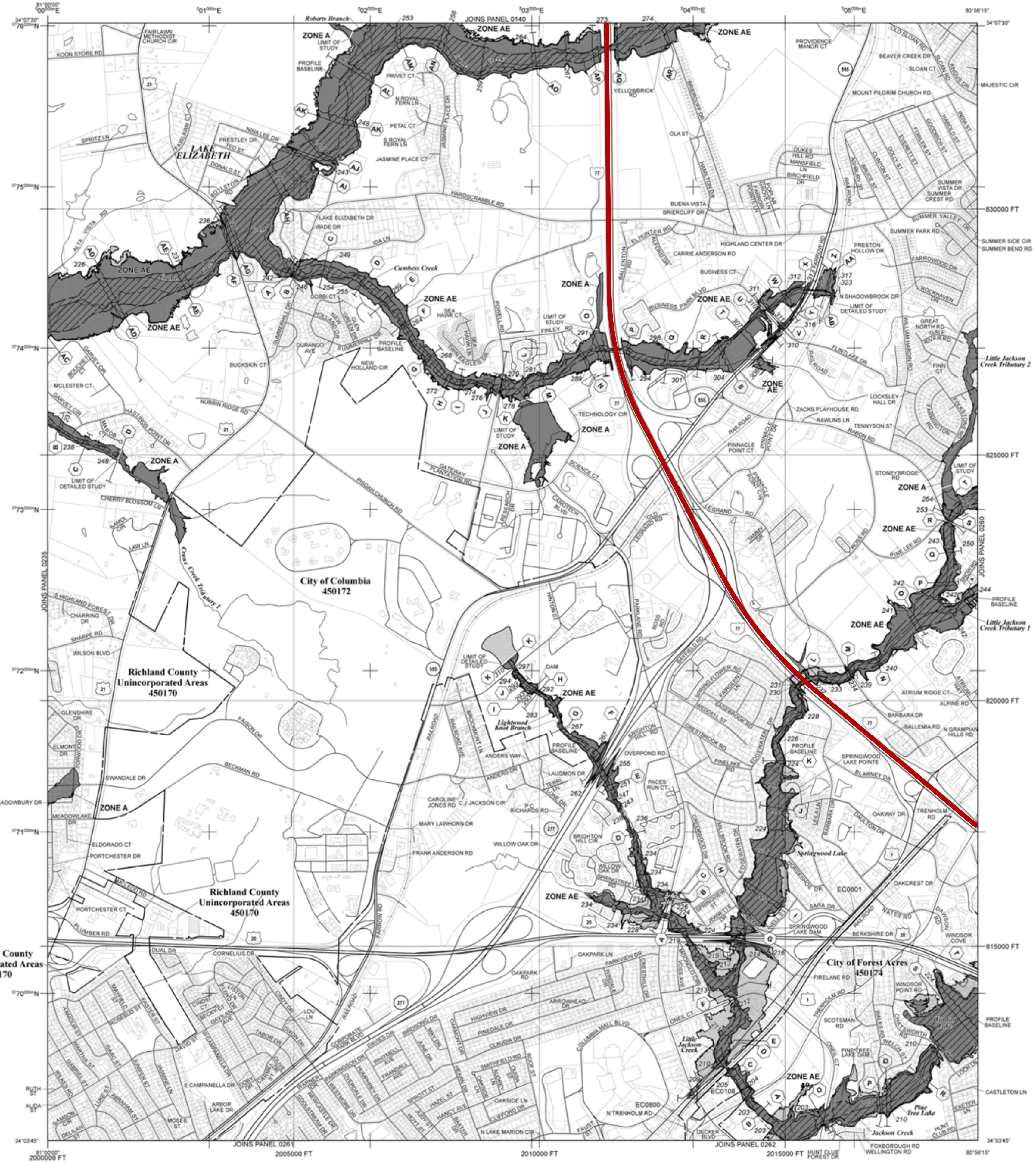

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NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0255K

FIRM

FLOOD INSURANCE RATE MAP

RICHLAND COUNTY, SOUTH CAROLINA

AND INCORPORATED AREAS

PANEL 255 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0255	K
FOREST ACRES, CITY OF	450174	0255	K
RICHLAND COUNTY	450170	0255	K

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45079C0255K

MAP REVISED
SEPTEMBER 29, 2010

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DNR

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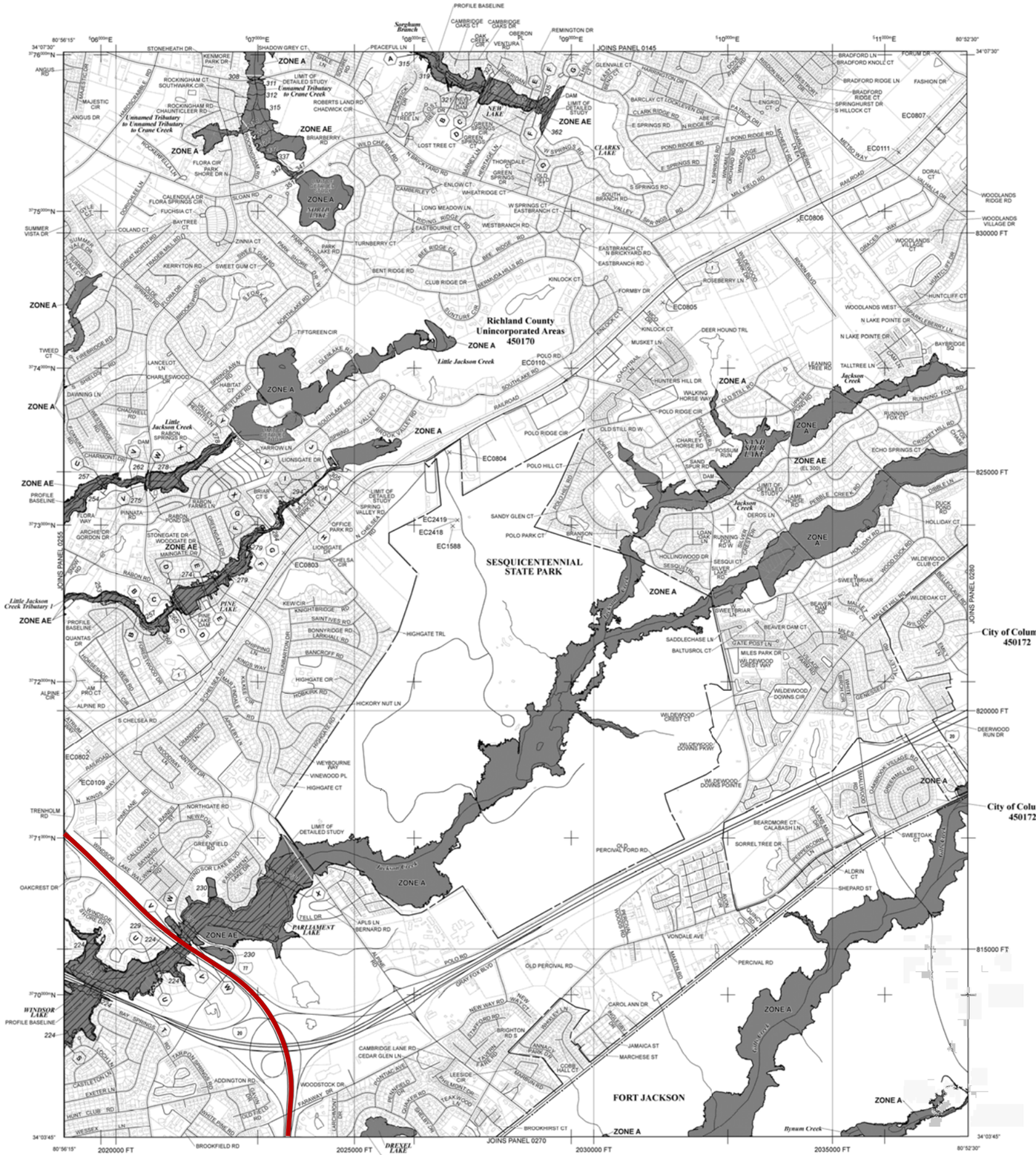
http://www.dnr.state.sc.us/



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- **ZONE A** No Base Flood Elevations determined.
- **ZONE AE** Base Flood Elevations determined.
- **ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- **ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- **ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- **ZONE A99** Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
- **ZONE V** Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- **ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

- **ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

- **ZONE X** Areas determined to be outside the 0.2% annual chance floodplain.
- **ZONE D** Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths, or flood velocities
- 513 (EL 987) Base Flood Elevation line and value; elevation in feet*
- Base Flood Elevation value where uniform within zone; elevation in feet*

* Referenced to the North American Vertical Datum of 1988

- A–A Cross section line
- 23–23 Transect line
- 97°07'30", 32°22'30" Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere
- 4°75'000"E 1000-meter Universal Transverse Mercator grid ticks, zone 17
- 6000000 FT 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection
- DX5510 Bench mark (see explanation in Notes to Users section of this FIRM panel)
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Refer to Map Repositories list on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL
February 20, 2002

September 29, 2010 – to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, to update map format, to add roads and road names, to incorporate previously issued Letters of Map Revision, and to reflect updated topographic information.

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

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MAP SCALE 1" = 1000'

500 0 500 1,000 1,500 2,000 FEET
300 0 300 600 METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0260K

FIRM

FLOOD INSURANCE RATE MAP
RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 260 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COLUMBIA, CITY OF	450172	0260	K
RICHLAND COUNTY	450170	0260	K

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
45079C0260K

MAP REVISED
SEPTEMBER 29, 2010

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevations** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data and/or Summary of Stillwater Elevations tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 0.0' North American Vertical Datum of 1988 (NAVD 88). Users of this FIRM should be aware that coastal flood elevations are also provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations shown in the Summary of Stillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures**. Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures for this jurisdiction.

The **projection** used in the preparation of this map was State Plane South Carolina FIPS 3900. The **horizontal datum** was NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or State Plane zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of this FIRM.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum**. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at http://www.ngs.noaa.gov/ or contact the National Geodetic Survey at the following address:

Spatial Reference System Division National Geodetic Survey, NOAA Silver Spring Metro Center 1315 East-West Highway Silver Spring, Maryland 20910 (301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242** or visit its website at http://www.ngs.noaa.gov/.

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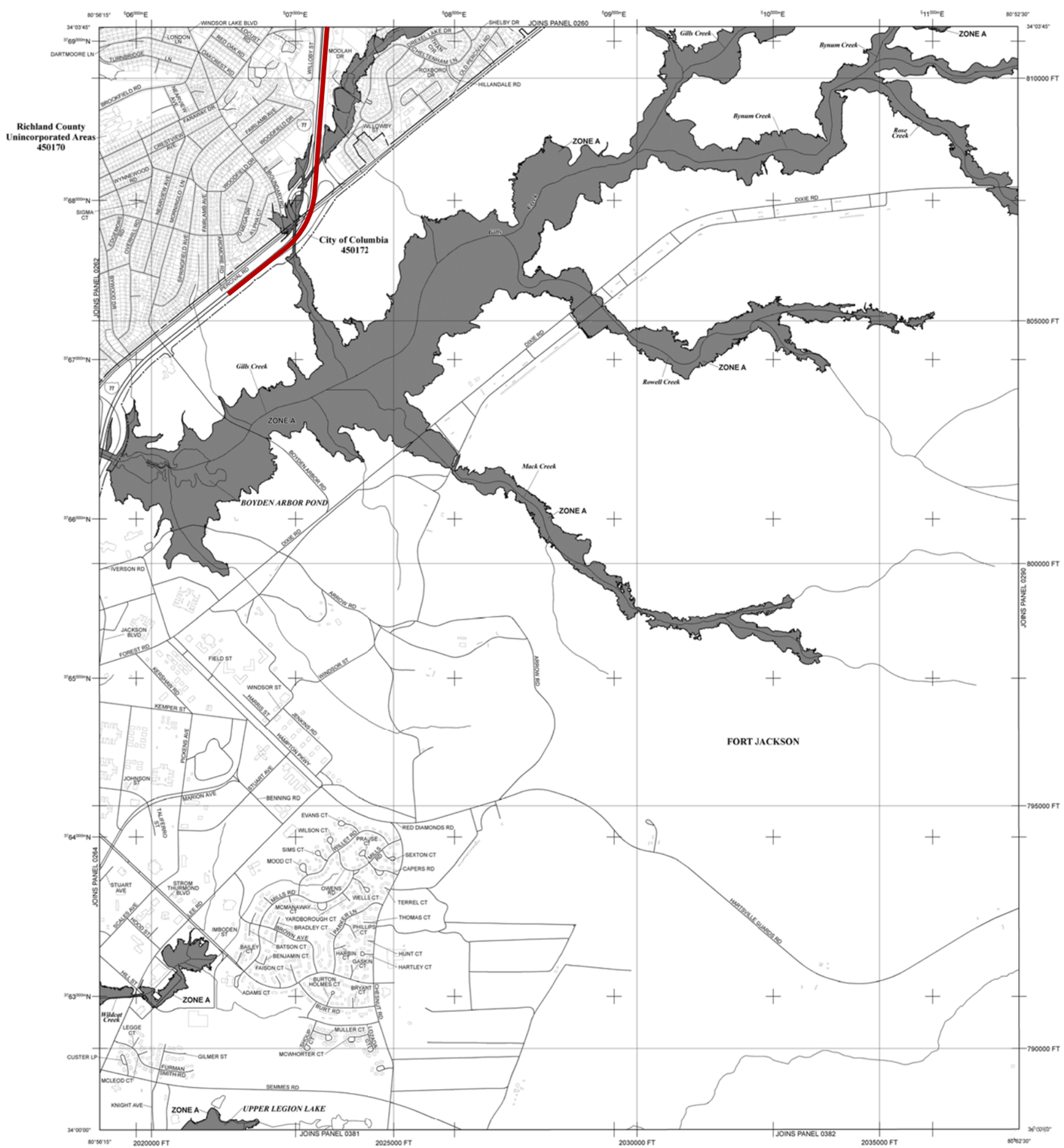

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ZONE A	No Base Flood Elevations determined.
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ZONE A99	Areas to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no Base Flood Elevations determined.
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NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0270K

FIRM

FLOOD INSURANCE RATE MAP
RICHLAND COUNTY, SOUTH CAROLINA
AND INCORPORATED AREAS

PANEL 270 OF 650
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

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MAP REVISED
SEPTEMBER 29, 2010

Federal Emergency Management Agency

4.0

Stormwater Analysis

4.1 Stormwater Analysis Overview

The hydrologic analysis for this project was performed in accordance with SCDOT's *Requirements for Hydraulic Design Studies*, dated May 26, 2009. This project includes the widening of existing interstate roadway and minor improvements to associated interchange ramps. The proposed construction will not significantly alter or impact existing drainage patterns.

Drainage areas were delineated using survey data provided by both SCDOT & CHE Surveying, USGS Quad maps for Richland County, Google Earth aerial imaging, and field visits to verify offsite flow patterns. The hydrologic methods used to determine peak discharges were selected upon watershed area and consisted of the Rational Method, the modified NRCS WinTR-55 Method, and USGS Regression Equations. Times of concentrations were computed using the SCS methodology outlined in the WinTR-55 manual, with a minimum time of concentration of 5 minutes. SCDOT-published Rainfall Intensity Value Charts for Columbia, SC were used to determine rainfall intensities (in/hr).

Drainage areas, drainage paths, flow lengths, and watercourse slopes were determined using surveyed contours and the USGS 7.5' Quadrangles for Blythewood, Elgin, Fort Jackson North and Messers Pond. Runoff coefficients and Manning's *n* values were estimated from aerial photography. Table 4.1 outlines the hydrologic methods used.

4.2 Drainage Design Criteria

			I-77	SOURCE
				Req. For Hydr. Design Studies
				Section
Hydrologic Method	Drainage Area	0 - 100 AC	Rational Method	2.2.15.1
		100 AC - 640 AC	NRCS WinTR-55 Method	2.2.15.2
		> 640 AC	USGS Regression Equations	2.2.15.3
Freeboard For Road Subgrades			1' Above Design High-Water Level	2.2.1
Design Storm	Cross-Line Pipes		50 year	2.2.2
			100 year	
	Closed Storm Sewer Systems	0 - 40 AC	10 year	2.2.3
		40 - 500 AC	25 year	
		> 500 AC	50 year	
	Median Overtopping		50 year	2.2.4
Preferred Headwater to Culvert Barrel Height Ratio			1.2	2.3 (Step 6, Sec. D, pg. 61)

4.3 Rainfall Depths (SCS Method)

Rainfall depths used in determining peak discharges through the SCS Method were obtained from the South Carolina DHEC Storm Water Management BMP Handbook. The 24-hour storm event rainfall depths for Richland County are shown below.

Table 4.3: 24-Hour Rainfall Depths for Richland County

Return Period (years)	Depth (inches)
1	3.1
2	3.6
5	4.5
10	5.3
25	6.4
50	7.3
100	8.3

4.4 Rainfall Intensity Values (Rational Method)

Coefficients used in the rational method for calculating rainfall intensity values were provided by SCDOT. The coefficients for Columbia are shown below.

TABLE 4.3: RAINFALL INTENSITY COEFFICIENTS

Frequency (years)	a	b	c
2	244.34492	34.95806	1.03155
5	258.50572	32.75684	1.01773
10	267.54247	31.39986	1.00904
25	279.77346	29.59043	0.99735
50	288.71309	28.26125	0.98879
100	296.66217	27.04859	0.98111

The coefficients are utilized in the following equation to calculate rainfall intensities.

Rainfall intensity equation: $i = \frac{a}{(b+tc)^c}$

4.5 Zoning Groups of Similar Surface Cover

In determining runoff flows from offsite areas, fully-developed conditions were assumed. A second assumption was that there will be no upstream detention upon development of the offsite areas. This method yields relatively large flows for those basins with substantial offsite areas (Major Basins 1-6).

In order to simulate fully-developed conditions, offsite areas were delineated based on Richland County zoning. Using the Richland County GIS website (http://www.richlandmaps.com/apps/gmap/), zoning maps for the offsite drainage basin areas were developed, scaled and overlaid upon the project survey area in Microstation. For ease of calculations, some zoning districts were assumed to have similar surface cover, and were grouped together accordingly. Those groups are listed below:

Zoning Group 1
Residential, Single Family - Medium Density District
Residential, Multi-Family - Medium Density District
Manufactured Home District
Light Industrial District

Zoning Group 2
Planned Development District
Residential, Single Family - Low Density District

Zoning Group 3
General Commercial District
Heavy Industrial District
Office & Institutional District

Zoning Group 4
Traditional Recreation Open Space District
Rural District

Surface cover characteristics were assigned to each of the zoning groups based on district ordinances and on aerial photography of representative developed areas within each group. Areas outside of the zoning groups were assigned surface cover designations based on provided surveys and aerial photography (See Figure 2.2).

4.6 Impervious Area by Zoning Group

Basins 2, 4 & 6 were modeled using the urban regression calculations detailed in USGS Water-Resources Investigations Report 92-4040 "Determination Of Flood Hydrographs For Streams In South Carolina: Volume 2 Estimation Of Peak-Discharge Frequency, Runoff Volumes, And Flood Hydrographs For Urban Watersheds." The equations in Table 9 and Supplement A of said report calculate flows based on two parameters: *A* (drainage area, in square miles) and *TIA* (total impervious area, in percent of total drainage area). *TIA* was calculated based on the assigned percentage of impervious area for each zoning group and from the provided surveys. A breakdown of the impervious area assigned to each zoning group is shown below:

Table 4.6:

Zoning Group #	% Impervious Area
1	27
2	53
3	68
4	15

A breakdown of the composite *TIA* for Basins 2, 4 & 6 can be found in Appendix B.

4.7 NRCS Method by Zoning Group

Basins 1, 3, 5 (NRCS Basins) were modeled using the modified NRCS WinTR-55 method. In accordance with NRCS methods, curve numbers (*CN*s) were determined for each drainage basin by delineating areas of different soil type and surface cover, for Pre-Construction conditions and Post-Construction conditions alike.

The soil classifications were determined through maps obtained from the Richland County GIS Website, which were overlaid onto the project area. See Appendix C for soil class delineation maps of the NRCS basins.

Composite *CN*s were calculated for each of the NRCS Basins based on surface cover and soil class. For offsite areas, the zoning groups described earlier were assigned *CN*s for each soil type (see Table 4.7 below).

	Curve Number per Hydrologic Soil Group			
Zoning Group #	A	B	C	D
1	77	85	90	92
2	57	72	81	86
3	89	92	94	95
4	49	69	79	84

Table 4.7: Curve Number per Zoning Group / Hydrologic Soil Group

A breakdown of the composite *CN*s for Basins 1, 3, & 5 can be found in Appendix C.

4.8 Pre- and Post-Construction Development Analysis

An analysis was performed to evaluate potential peak discharge rate increases of the major basins within the project limits based on Pre- and Post-Construction conditions related to the widening of I-77.

As previously discussed in Section 1, the increase in flow from the project's construction will be nearly negligible. Drainage basin delineation areas and flow paths are not expected to change as a result of this project's construction. The small increases in total impervious area and in composite curve numbers account for the increases in flows from Pre-Construction conditions to Post-Construction conditions.

Basin 1
Analysis Point = Outlet OP-0100 (Downstream end of Box Culverts EC-0102, EC-0103, & EC-0211)
I-77 Approx. Sta. 1151+00 RT
(See Plan Sheet 01)

Basin 1 is comprised of land on both sides of I-77 from approximate Sta. 1140+75 (immediately south of the I-77 NB off-ramp to Percival Road) to approximate Sta. 1212+00 (near the I-77 / I-20 interchange). Offsite areas to the east of I-77 generally drain to the southwest towards the Percival Road interchange. Likewise, offsite areas to the west of I-77 generally drain to the southeast towards the Percival Road interchange. The outfall point for Basin 1 is at the downstream end of three box culverts which pass

beneath the Percival Road interchange and terminate to the south of I-77 into an unnamed tributary to Gills Creek.

The total drainage area is approximately 571 acres of roadway and off-site areas. The most remote point in the watershed is approximately 7,975 feet from the outfall. Soils in this watershed are primarily classified as being in hydrologic soil groups A & B, with some D soils.

Peak flows in Basin 1 were estimated using the NRCS Method. The addition of new impervious area to the drainage basin by the construction of the proposed project will increase the Composite Curve Number from 74.02 to 74.14. Table 4.8.1 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 1.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	472.17	474.75	0.55
5-Year	729.70	732.73	0.41
10-Year	975.83	979.41	0.37
25-Year	1303.35	1306.68	0.25
50-Year	1587.76	1590.90	0.20
100-Year	1871.84	1875.14	0.18

Table 4.8.1: Summary of Basin 1 Pre-Construction Flows vs. Post-Construction Flows

See Appendix C for NRCS Delineation by Zoning Group / Surface Cover, Composite Curve Number, and Peak Flow calculations for Pre-Construction conditions vs. Post-Construction conditions, and for Time of Concentration calculations.

Basin 2
Analysis Point = I-77 NB Bridge Over Windsor Lake / Jackson Creek
I-77 Approx. Sta. 1249+00 RT
(See Plan Sheet 08)

Basin 2 is comprised of land to the northeast of I-20 and of I-77, including a large portion of Sesquicentennial State Park. The limits of the basin along I-77 are from approximate Sta. 1212+00 (prior to the I-77 / I-20 interchange) to approximate Sta. 1270+30. Flows generally drain to the west and south via Jackson Creek and its many connected lakes. The analysis point for this basin is the I-77 NB bridge over Windsor Lake / Jackson Creek.

The total drainage area is approximately 3,703 acres of roadway and off-site areas. The most remote point in the watershed is approximately 23,648 feet from the bridge. Soils in this watershed are generally classified as being in hydrologic soil groups A, B, & D.

Peak flows in Basin 2 were estimated using the USGS Rural Regression Equations. Due to construction of the proposed project, the basin's Total Impervious Area percentage will increase from 32.14% to 32.23%. Table 4.8.2 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 2.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	1147.79	1151.79	0.35
5-Year	1758.25	1764.03	0.33
10-Year	2178.39	2185.20	0.31
25-Year	2671.44	2679.24	0.29
50-Year	3036.95	3045.36	0.28
100-Year	3409.43	3418.34	0.26

Table 4.8.2: Summary of Basin 2 Pre-Construction Flows vs. Post-Construction Flows

See Appendix B for USGS Regression Equation and associated Total Basin Impervious Area calculations for Pre-Construction conditions vs. Post-Construction conditions.

Basin 3
Analysis Point = EX-0998 (Inlet of Box Culvert EC-0906)
I-77 Approx. Sta. 1272+60 RT
(See Plan Sheet 09)

Basin 3 is comprised of land to the east of I-77 and to the southeast of Two Notch Road. Runoff from I-77 approximate Sta. 1270+30 to approximate Sta. 1278+50 flows to this basin. Flows generally drain to the southwest in this basin. The analysis point for Basin 3 is the inlet of existing 7.5' x 5' box culvert EC-0906.

The total drainage area is approximately 140 acres of roadway and off-site areas. The most remote point in the watershed is approximately 3,944 feet from the outfall. Soils in this watershed are primarily classified as being in hydrologic soil group B, with some A & D soils.

Peak flows in Basin 3 were estimated using the NRCS Method. The conceptual design files provided by the Department show no new impervious area added within this basin. Thus, the Composite Curve Number remains a constant 80.90, and there is no increase in flows due to construction of the project. Table 4.8.3 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 3.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	138.88	138.88	0.00

5-Year	200.67	200.67	0.00
10-Year	258.88	258.88	0.00
25-Year	333.50	333.50	0.00
50-Year	397.43	397.43	0.00
100-Year	461.14	461.14	0.00

Table 4.8.3: Summary of Basin 3 Pre-Construction Flows vs. Post-Construction Flows

See Appendix C for NRCS Delineation by Zoning Group / Surface Cover, Composite Curve Number, and Peak Flow calculations for Pre-Construction conditions vs. Post-Construction conditions, and for Time of Concentration calculations.

Basin 4
Analysis Point = I-77 NB Bridge Over Little Jackson Creek
I-77 Approx. Sta. 1329+00
(See Plan Sheet 13)

Basin 4 is comprised of land to the northeast of I-77 roughly between Two-Notch Road and Hard Scrabble Road. A not insignificant offsite land area to the west of the I-77 / I-277 interchange flows into this basin. Drainage patterns generally flow to the west and south via Little Jackson Creek and its many connected lakes. The analysis point for this basin is the I-77 NB bridge over Little Jackson Creek.

The total drainage area is approximately 3,302 acres of roadway and off-site areas. The most remote point in the watershed is approximately 18,647 feet from the outfall. Soils in this watershed are generally classified as being in hydrologic soil groups A, B, & D.

Peak flows in Basin 4 were estimated using the USGS Rural Regression Equations. Due to construction of the proposed project, the basin's Total Impervious Area percentage will increase from 36.84% to 36.90%. Table 4.8.4 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 4.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	1241.63	1244.30	0.21
5-Year	1890.95	1894.77	0.20
10-Year	2329.70	2334.19	0.19
25-Year	2834.70	2839.80	0.18
50-Year	3202.79	3208.25	0.17
100-Year	3573.97	3579.73	0.16

Table 4.8.4: Summary of Basin 4 Pre-Construction Flows vs. Post-Construction Flows

See Appendix B for USGS Regression Equation and associated Total Basin Impervious Area calculations for Pre-Construction conditions vs. Post-Construction conditions.

Basin 5
Analysis Point = EX-1796 (Inlet of Box Culvert EC-1702)
I-77 Approx. Sta. 1407+00 RT
(See Plan Sheet 17)

Basin 5 is comprised of land to the east of I-77 beyond its interchange with Farrow Road. Flows generally drain to the west via Cumbess Creek. Runoff from I-77 collects within this basin from approximate Sta. 1390+15 (just beyond the interchange of I-77 with Farrow Road) to approximate Sta. 1415+90. The analysis point for Basin 5 is the inlet of existing triple 8' x 6' box culvert EC-1702, where Cumbess Creek crosses I-77.

The total drainage area is approximately 431 acres of roadway and off-site areas. The most remote point in the watershed is approximately 6,089 feet from the outfall. Soils in this watershed are generally classified as being in hydrologic soil groups A, B, & D.

Peak flows in Basin 5 were estimated using the NRCS Method. The addition of new impervious area to the drainage basin by the construction of the proposed project will increase the Composite Curve Number from 86.04 to 86.15. Table 4.8.5 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 5.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	313.11	314.16	0.33
5-Year	434.06	435.20	0.26
10-Year	547.10	548.16	0.19
25-Year	690.25	691.44	0.17
50-Year	813.19	814.31	0.14
100-Year	934.74	935.88	0.12

Table 4.8.5: Summary of Basin 5 Pre-Construction Flows vs. Post-Construction Flows

See Appendix C for NRCS Delineation by Zoning Group / Surface Cover, Composite Curve Number, and Peak Flow calculations for Pre-Construction conditions vs. Post-Construction conditions, and for Time of Concentration calculations.

Basin 6
Analysis Point = EX-2196 (Inlet of Box Culvert EC-2105)
I-77 Approx. Sta. 1469+50 RT
(See Plan Sheet 21)

Basin 6 is comprised of a large swath of land to the east of I-77 within the watershed of Crane Creek. Drainage patterns within this basin generally flow to the west via Crane Creek and its many lakes. Runoff from I-77 flows into Basin 6 from approximate Sta. 1459+20 to approximate Sta. 1475+45. The analysis

point for Basin 6 is the inlet of existing triple 12' x 12' box culvert EC-2105, where Crane Creek crosses I-77.

The total drainage area is approximately 7,125 acres of roadway and off-site areas. The most remote point in the watershed is approximately 27,915 feet from the outfall. Soils in this watershed are primarily classified as being in hydrologic soil groups A, B, & D, with some type C soils.

Peak flows in Basin 6 were estimated using the USGS Rural Regression Equations. The conceptual design files provided by the Department show a relatively infinitesimal increase in impervious area within this basin, with the basin's Total Impervious Area percentage increasing from 38.4776% to 38.4777%. This results in negligible increases in flow as a result of this project's construction. Table 4.8.6 below shows a summary of Pre-Construction flows versus Post-Construction flows for Basin 6.

Design Storm Event	Pre-Developed Flows (cfs)	Post-Developed Flows (cfs)	% Increase
2-Year	2411.48	2411.48	0.00
5-Year	3567.47	3567.48	0.00
10-Year	4328.86	4328.88	0.00
25-Year	5170.91	5170.92	0.00
50-Year	5780.89	5780.90	0.00
100-Year	6371.93	6371.94	0.00

Table 4.8.6: Summary of Basin 6 Pre-Construction Flows vs. Post-Construction Flows

See Appendix B for USGS Regression Equation and associated Total Basin Impervious Area calculations for Pre-Construction conditions vs. Post-Construction conditions.

4.9 Existing Cross-Line Culvert Analysis

HY-8 version 7.2 (build date January 17, 2012) was used to analyze the headwaters at existing box culverts and open-ended pipe culverts. Culvert analyses were based on a maximum 1.2 headwater to depth (HW/D) ratio for the 50-year rainfall event.

For those box culverts which connect to a downstream structure, tailwater elevations were estimated as the elevation of the normal depth in the pipe immediately prior to the downstream structure. Normal depth of flow in these cases was estimated using the FHWA Hydraulic Toolbox 2.1. For those pipes which connect to a downstream structure, tailwater elevation was assumed as the soffit elevation of the pipe at the downstream structure.

For those culverts that did not connect to a downstream structure but rather outfall into a stream or ditch, the outfall characteristics were used for tailwater elevation estimation. A Manning's "n" value of 0.04 was used for the outfall ditches.

The geometries of the existing inlet openings and head walls were measured in the field and applied accordingly in the HY-8 program.

The analysis results for each culvert opening are listed in Table 4.9 below.

I-77 Station	Pipe ID	Basin	Culvert Shape	Diam-eter (ft)	Span (ft)	Rise (ft)	50-yr HW / D	Over-topping Elev. (ft)	50-yr HW Elev. (ft.)	100-yr HW Elev. (ft.)
1168+32	EC-0102	EX-0399	Box		6	6	1.41	255.00	244.55	247.99
1172+32	EC-0211	EX-0308	Box		8	6	0.79	256.00	249.73	251.31
1272+60	EC-0906	EX-0998 (3)	Box		7.5	5	1.53	254.00	249.52	250.79
1279+53	EP-0908	EX-0993	Circ.	3			1.79	259.00	253.79	254.33
1342+08	EP-1303	EX-1395	Circ.	1.5			1.76	259.00	257.74	258.05
1360+01	EC-1407	EX-1491	Box		6	5	0.58	284.00	271.78	271.94
1369+17	EC-1503	EX-1597	Box		4	4	0.88	303.50	295.47	295.68
1395+12	EP-1799	EX-1798	Circ.	2			0.93	316.80	315.35	315.46
1407+01	EC-1702	EX-1796 (5)	Box		8	6	0.89	308.50	291.32	291.84
1424+12	EP-1804	EX-1894	Circ.	2.5			2.08	312.50	312.53	312.57
1434+60	EP-1999	EX-1997	Circ.	2			0.91	321.50	319.71	319.80
1434+63	EP-1998	EX-1996	Circ.	2.5			1.33	321.50	321.23	321.51
1458+57	EP-2101	EX-2198	Circ.	3			1.45	310.80	308.56	308.94
1469+54	EC-2103	EX-2196 (6)	Box		12	12	1.26	292.50	274.82	276.19

Table 4.9: HY-8 Results for Existing Open-Ended Pipes & Box Culverts

As can be seen in the table above, Culverts EC-0102, EC-0906, EP-0908, EP-1303, EP-1804, EP-1998, EP-2101, & EC-2103 have headwater to depth (HW/D) ratios for the 50-year event that are above the maximum design standard of 1.2. Construction of this project, however, will not affect upstream headwater elevations significantly, and will not have a detrimental effect on upstream properties.

There are potential subgrade issues with freeboard at the inlets of Culverts EP-1303, EP-1709, EP-1999 & EP-1998, and overtopping concerns with EP-1804 & EP-1998. These culverts may need abandoning and replacement.

More detailed HY-8 analysis results can be found in Appendix D.

4.10 Existing Closed Drainage System Analysis

Existing storm drainage systems were analyzed using GEOPak Drainage. The 10-year design storm was used to analyze all storm drainage systems whose elevations were known or which could be reasonably estimated. GEOPak Drainage Area, Link and Node calculations can be found in Appendix E.

Based on preliminary analysis, some of the pipes are flowing at greater than 94% flow depth for the 10-year storm event.

Median ditch inlets located in sag areas were analyzed for the 50-year storm event to determine if there were hydraulic gradeline blowouts that would overtop the roadway shoulder. Table 4.10 lists the sag inlets, the 10-year and 50-year storm event hydraulic gradeline elevations, and the highway shoulder elevation at the inlet.

Inlet ID	10-Year Upstream Hydraulic Gradeline Elevation (ft)	50-Year Upstream Hydraulic Gradeline Elevation (ft)	Highway Shoulder Elevation (ft)
EX-0302	254.58	259.39	256.50
EX-0601	334.42	334.74	338.50
EX-0605	319.37	320.33	323.00
EX-0701	276.03	277.62	280.00
EX-0702	242.17	243.60	245.75
EX-0801	239.48	242.54	242.90
EX-0803	244.59	245.48	249.00
EX-0901	248.42	249.45	254.50
EX-1202	247.59	248.05	253.90
EX-1301	251.94	252.50	256.00
EX-1501	283.87	284.94	290.50
EX-1801	302.58	304.11	309.00
EX-2102	287.04	291.91	291.70

Table 4.10: Summary of 10-Year & 50-Year Storm Events HGL Elevations at Median Sag Inlet Locations

Inlets EX-0302 and EX-2102 are showing to overtopping of the shoulder during the 50-year storm event. These locations also have possible hydraulic gradeline concerns during the 10-year storm event. These inlets could have potential freeboard issues regarding the subgrade.

While it is expected that water at inlet EX-0801 would overtop the median embankment at the bridge instead of overtopping the shoulder, the hydraulic gradeline during the 50-year storm event is a concern. There could be potential freeboard issues at the subgrade in the vicinity of this inlet.

Existing median inlets were also visually inspected at the surface level for structural integrity. The inlets were all Type 112, and most appeared to be in good condition. Those inlets found to have structural or other concerns are listed below.

Median Inlet EX-0801
I-77 Sta. 1252+01 (See Plan Sheet 8)
The surrounding ground adjacent to EX-0801 appears to have sunken in to roughly 4” to 6” below the rim of the inlet. No evidence of this issue was found in the video survey inspection (detailed in the next section) of connecting existing pipe EP-0801, which was in good condition.

If this inlet is to be retained, the existing ground should be brought up to the rim elevation in order to reduce ponding. A paved apron could also be installed at this inlet.

EX-0801

Median Inlet EX-0901
I-77 Sta. 1270+50 (See Plan Sheet 9)
The paved apron for EX-0901 has some minor cracking. If this inlet is retained, the apron should be repaired or replaced.

EX-0901

Median Inlet EX-1404
I-77 Sta. 1355+38 (See Plan Sheet 14)

A severe collapse of the paved apron and subgrade has occurred at EX-1404, and a large cavity is visible adjacent to the box. No evidence of this issue was found in the video survey inspection of connecting existing pipes EP-1404 & EP-1405, which were in good condition at the inlet. In the video inspection of EP-1406, it appears that the first segment of pipe (upstream from the inlet) is slightly offset from the second segment. This offset appears to be related to the apron collapse.

If this inlet is to be retained, the subgrade adjacent to the box should be excavated and replaced, and the paved apron should be removed and replaced. The pipe video inventory survey detailed in the next section contains recommendations for the connecting pipe.

EX-1404

Median Inlet EX-1501
I-77 Sta. 1362+46 (See Plan Sheet 15)
The paved apron of EX-1501 has a significant hole in its northeast corner, where the subgrade has apparently collapsed. No evidence of this issue was found in the video survey of connecting existing pipe EP-1501, which was in good condition.

If this inlet is to be retained, the subgrade adjacent to the box should be excavated and replaced, and the paved apron should be removed and replaced, at least in the northeast corner where the hole was found.

EX-1501

Median Inlet EX-1607
I-77 Sta. 1383+64 (See Plan Sheet 16)
There has been significant vegetative growth adjacent to EX-1607 that could possibly impede flow to the inlet. In the pipe video survey, major root issues were found in connecting existing pipes EP-1608 & EP-1609 on either side of the box.

If this inlet is to be retained, the area adjacent to the inlet should be cleared and grubbed. A paved apron could also be installed at this inlet. The pipe video inventory survey detailed in the next section contains recommendations for the connecting pipes.

EX-1607

Median Inlet EX-1701
I-77 Sta. 1399+91 (See Plan Sheet 17)

A significant collapse of the paved apron and subgrade has occurred at EX-1404. No evidence of this issue was found in the video survey inspection of connecting existing pipe EP-1701, which was in good condition at the inlet.

If this inlet is to be retained, the subgrade adjacent to the box should be excavated and replaced, and the paved apron should be removed and replaced.

EX-1701

4.11 Video Inventory Survey of Existing Pipes & Culverts

AET Robotic Inspection Services performed a video inventory survey of all accessible pipes which crossed I-77 or crossed any of the associated ramps. Evaluations and recommendations are based on visual review of the videos. A detailed structural inspection has not been performed. The findings of the survey and subsequent evaluations are listed in Table 4.11 below:

See Appendix F for reports of individual pipes.

File No.	Pipe ID	I-77 Station	Pipe / Culvert Type	Measured Footage (ft)	Evaluation of Pipe
	EC-0102	1152+00	6' x 6' Conc. Box Culvert	1660	Patch cracks in culvert (approximately 94 locations).
	EC-0103	1152+00	6' x 6' Conc. Box Culvert	596	Clean sediment buildup throughout. Patch cracks in culvert (approximately 17 locations).
	EC-0211	1152+00	8' x 6' Conc. Box Culvert	2087	Headwall in good condition. Patch cracks in culvert (approximately 140 locations). Clean sediment buildup from 2080' to end.
	EP-0302	1173+55	18" RCP	153.1	If existing pipe is to remain, repair last joint located 8' prior to downstream end. Preliminary hydro analysis indicates that additional capacity may be needed at this location.

	EP-0305	1181+00	18" RCP	124.3	Pipe in good condition.
	EP-0306	1187+35	48" RCP	673.3	Pipe in good condition.
	EP-0401	1187+80	24" RCP	79.7	Remove root issue at first joint 5' from downstream end.
	EP-0402	1192+50	42" RCP	512.9	Remove medium root issue at joint approx. 323' from downstream end. Remove and replace cracked pipe from approx. 387'-403' from downstream end.
	EP-0403	1187+65	18" RCP	101.9	Pipe in good condition.
	EP-0404	1201+10	42" RCP	376.7	Slip line existing pipe due to joint deficiencies and minor root issues.
	EP-0405	1198+00	18" RCP	133.4	Pipe in good condition.
	EP-0406	1198+60	18" RCP	136.9	Repair first joint of existing pipe 8' from upstream end.
	EP-0407	1192+85	18" RCP	111.4	8' of existing pipe prior to downstream end shall be replaced.
	EP-0408	1197+40	42" RCP	492.6	Slip line existing pipe due to joint deficiencies and minor root issues.
	EP-0503	1204+40	42" RCP	332	Slip line existing pipe due to joint deficiencies.
	EP-0504	1204+25	36" RCP	30.9	Pipe in good condition.
	EP-0505	1204+70	24" RCP	85.3	Slip line existing pipe due to cracks and joint separations.
	EP-0506	1205+05	18" RCP	107	Pipe in good condition.
	EP-0507	1206+10	18" RCP	129.9	Pipe in good condition.
	EP-0508	1205+90	18" RCP	68.5	Pipe in good condition. Clean debris from both ends.
	EP-0613	1229+50	18" RCP	101.2	Replace existing pipe section between approx. 23' and 31' from upstream end and repair separated/broken joint at approx. 88' from upstream end.
	EP-0614	1230+00	18" RCP	69.3	Pipe in good condition.
	EP-0701	1236+00	18" RCP	195.6	Slip line existing pipe due to joint deficiencies and cracks
	EP-0702	1246+60	18" RCP	104.1	76' of existing pipe prior to outlet shall be replaced due to cracks in pipe and major joint separations.
	EP-0801	1252+00	18" RCP	180	Pipe in good condition.
	EP-0802	1253+25	24" RCP	242.8	Slip line existing pipe due to joint separations.
	EP-0803	1261+45	18" RCP	199.2	Pipe in good condition. Clean out.
	EP-0901	1270+50	18" RCP	167.7	8' of existing pipe prior to outlet shall be replaced due to cracked pipe with hole in it.
	EC-0906	1273+15	7.5' x 5' Conc. Box Culvert	240	Patch cracks in culvert (approximately 13 locations).
	EP-1002	1286+60	30" RCP	367.3	Pipe in good condition.
	EP-1003	1286+45	24" RCP	84.9	Pipe in good condition.
	EP-1004	1286+35	24" RCP	84.8	Pipe in good condition.
	EP-1005	1286+40	24" RCP	62.2	Pipe in good condition.

	EP-1006	1289+60	24" RCP	305	Replace first 32' of existing pipe from upstream end due to root issues and broken pipe.
	EP-1007	1290+50	18" RCP	108	Pipe in good condition.
	EP-1008	1290+05	18" RCP	99.5	Pipe in good condition.
	EP-1010	1283+70	30" RCP	384.5	Clean out.
	EP-1101	1297+50	18" RCP	97.7	Slip line existing pipe due to joint separations.
	EP-1102	1297+50	24" RCP	91.3	Pipe in good condition.
	EP-1103	1296+55	18" RCP	16.8	20' of existing pipe from upstream end shall be replaced due to collapse and deficiencies. Clean pipe.
	EP-1104	1297+45	24" RCP	111.7	Replace pipe due to cracks, major root issues, and joint separations.
	EP-1105	1298+55	24" RCP	65.8	Replace pipe due to joint deficiencies and major root issues.
	EP-1106	1299+15	24" RCP	53.9	Pipe in good condition. Clean downstream pipe end and drop inlet.
	EP-1111	1304+40	24" RCP	266.9	Pipe in good condition.
	EP-1114	1303+60	24" RCP	312.6	Pipe in good condition.
	EP-1201	1320+10	24" RCP	108.2	Clean out.
	EP-1202	1320+00	18" RCP	110.5	Pipe in good condition.
	EP-1203	1323+40	36" RCP	686	Pipe in good condition.
	EP-1204	1327+70	36" RCP	93.4	Slip line existing pipe due to joint deficiencies.
	EP-1301	1332+20	24" RCP	171.5	Pipe in good condition.
	EP-1302	1341+90	24" RCP	116.1	Pipe in good condition.
	EP-1303	1342+10	18" RCP	115.8	If retained, clean pipe (large debris item near 75' from upstream end). Preliminary hydro analysis indicates that additional capacity may be needed at this location.
	EP-1401	1350+05	18" RCP	264.6	Pipe in good condition.
	EP-1402	1352+05	18" RCP	224.7	Pipe in good condition.
	EP-1403	1353+85	30" RCP	127.8	Pipe in good condition.
	EP-1404	1355+00	30" RCP	101.6	Pipe in good condition.
	EP-1405	1355+40	36" RCP	187.8	Clean out.
	EP-1406	1357+50	24" RCP	363.4	Replace first section of pipe due to major joint offset. Pipe in good condition otherwise. Clean out.
	EC-1407	1358+00	6' x 5' Conc. Box Culvert	440	Headwalls in good condition. Patch cracks in culvert (approximately 35 locations). Clean downstream sediment buildup.
	EP-1408	1357+85	18" RCP	180.5	Slip line existing pipe due to joint deficiencies and major root issues.
	EP-1409	1358+25	18" RCP	214.8	Slip line existing pipe due to joint separations.
	EP-1501	1362+45	18" RCP	136.7	Pipe in good condition.
	EC-1503	1366+80	4' x 4' Conc. Box Culvert	680.5	Patch cracks in culvert (approximately 41 locations). Repair connection with EP-1599 at approx. 385' from downstream end.

	EP-1506	1372+00	18" RCP	134.5	Pipe in good condition.
	EP-1507	1372+00	18" RCP	51.1	Pipe in good condition.
	EP-1601	1379+80	18" RCP	35.9	Pipe in good condition. Clean debris from pipe and box catch basin at upstream end.
	EP-1602	1379+80	18" RCP	106.2	Remove root issues at first joint approx. 8' from downstream end and second joint approx. 16' from downstream end. Clean pipe.
	EP-1603	1379+85	18" RCP	121.9	Pipe in good condition.
	EP-1604	1379+85	24" RCP	50.1	Pipe in good condition.
	EP-1606	1383+85	30" RCP	400.6	Pipe in good condition.
	EP-1607	1383+45	18" RCP	39.8	Slip line existing pipe due to joint separations.
	EP-1608	1383+50	18" RCP	105.4	Remove and replace pipe 13' from downstream end to repair major root issues in joints. Clean pipe.
	EP-1609	1383+65	18" RCP	122.1	Remove and replace pipe between 30' from upstream end to repair major root issues in joints. Clean pipe.
	EP-1610	1383+80	24" RCP	53.5	Pipe in good condition.
	EP-1701	1399+90	18" RCP	171	10' of existing pipe prior to downstream end shall be replaced due to joint separations and offsets.
	EC-1702	1407+70	8' x 6' Conc. Box Culvert	280	Headwall in good condition. From upstream end, repair top of culvert where square block of concrete is giving way at approx. 70'. Patch cracks in culvert (approximately 6 locations).
	EC-1703	1407+70	8' x 6' Conc. Box Culvert	280	Headwalls in good condition. Patch cracks in culvert (approximately 8 locations).
	EC-1704	1407+70	8' x 6' Conc. Box Culvert	280	Headwalls in good condition. Patch cracks in culvert (approximately 4 locations). Clean sediment buildup at downstream end.
	EP-1801	1416+20	24" RCP	147.9	Pipe in good condition. Clean pipe. Standing water and sediment in pipe from outfall OP-1896 silting in.
	EP-1802	1416+50	24" RCP	115.5	Repair joint separations at approx. 16' and 24' from upstream end.
	EP-1803	1423+70	30" RCP	154.5	Pipe in good condition. Clean pipe. Standing water and sediment in pipe from outfall OP-1895 silting in.
	EP-1804	1424+10	30" RCP	122.2	Pipe in good condition. Preliminary hydro analysis indicates that additional capacity may be needed at this location.
	EP-1806	1410+75	24" RCP	130.4	Pipe in good condition.
	EP-2101	1458+55	36" RCP	133.7	Pipe in good condition. Preliminary hydro analysis indicates that additional capacity may be needed at this location.
	EP-2102	1459+00	36" RCP	101.4	Pipe in good condition. If retained, clean pipe. Standing water and sediment in pipe from outfall OP-2199 silting in. Preliminary hydro analysis indicates that additional capacity may be needed at this location.

	EC-2103	1468+95	12' x 12' Conc. Box Culvert	288	Headwall in good condition. Patch cracks in culvert (approximately 6 locations).
	EP-2104	1471+90	18" RCP	156.2	Repair joint separations at approx. 4' and 12' from downstream end.
	EC-2105	1468+95	12' x 12' Conc. Box Culvert	288	Headwall in good condition. Patch cracks in culvert (approximately 9 locations).
	EC-2106	1468+95	12' x 12' Conc. Box Culvert	288	Headwall in good condition. Patch cracks in culvert (approximately 7 locations). Clean sediment buildup throughout culvert.
	EP-2201	1475+65	24" RCP	159.2	Pipe in good condition.
	EP-2202	1476+70	24" RCP	152.2	Pipe in good condition.
	EP-2203	1485+00	36" RCP	145.8	Pipe in good condition.
	EP-2204	1485+95	36" RCP	138.9	Pipe in good condition. Large HDPE pipe debris inside of drop inlet EX-2204 and upstream end of EP-2204. If retained, clean entire pipe of sediment and debris.
	EP-2301	1500+90	24" RCP	43.5	Pipe in good condition. Clean pipe. Standing water and sediment in pipe from outfall OP-2399 silting in.
	EP-2303	1503+95	18" RCP	142.3	8' of existing pipe prior to outlet shall be replaced due to collapse. Slip line existing pipe due to joint separations and deficiencies.
	EP-2403	1499+95	24" RCP	21.3	Pipe in good condition. Clean pipe. Standing water in pipe.
	EP-2404	1522+40	18" RCP	61.7	Remove and replace last segment of pipe at downstream end to repair major root issues in joint.

Table 4.11 Pipe Video Inventory Survey Results / Evaluation

4.12 Existing Outfalls

Existing pipe outfalls were inspected in the field. Most of the outfalls were clear of debris.

The following outfalls will some amount of need cleaning / clearing:

OP-0100 (Outfall of existing 8’ x 6’ concrete box culvert EC-0211)
Approx. Sta. 1151+85, Offset 188’ RT

The inlet of box culvert EC-0211 is adjacent to the WB Percival Road ramp onto I-77 NB. This culvert and two others (EC-0102 & EC-0103) outfall at OP-0100 into an unnamed tributary of Gill’s Creek to the south of the interchange. At the time of a field visit, the existing outfall beyond the culvert was clear, but the box itself had accumulated sediment for approximately 75’ into the culvert, and should be cleaned out as noted in the previous section.

OP-0100

OP-0286 (Outfall of existing 18" RCP EP-0289)
Approx. Sta. 1167+30, Offset 146' RT

EP-0289 crosses the I-77 NB off-ramp loop to WB Percival Road. At the time of the field visit, the end of the pipe was buried. The outfall should be excavated for several feet to ensure positive drainage from the pipe. There are no concerns associated with right-of-way for this outfall as it is located within the interchange loop.

OP-0286

OP-0394 (Outfall of existing 48” RCP EP-0303)
Approx. Sta. 1177+35, Offset 118’ LT

EP-0303 parallels I-77 SB and outfalls approximately 200' after the beginning of the taper for the Percival Road exit. At the time of the field visit, standing water was observed. The existing ditch that parallels I-77 SB, into which EP-0303 outfalls, should be cleared of debris as necessary to restore downstream flow. There should not be any right-of-way issues associated with clearing the ditch.

OP-0394

OP-0398 (Outfall of existing 18” RCP EP-0301)
Approx. Sta. 1171+30, Offset 200’ RT

EP-0301 crosses the WB Percival Road ramp onto I-77 NB and outfalls just to the southeast of EX-0308 (inlet of EC-0211). At the time of the field visit, the pipe was mostly buried and the outfall ditch was covered in vegetation. The outfall should be excavated and cleared of debris for several feet to ensure positive drainage from the pipe. Right-of-way issues may exist downstream of this outfall.

OP-0398

OP-0683 (Outfall of existing 18” RCP EP-0612)
Approx. Sta. 1224+45, Offset 115’ RT

EP-0612 parallels the loop ramp from I-20 WB / Alpine Road onto I-77 SB beneath the I-77 NB bridge overpass. The outfall was not located in the field and is assumed to be buried. The outfall needs to be located. If the outfall location is where the asbuilts imply, the outfall should be excavated to ensure positive drainage. There are no concerns with right-of-way for this outfall as it is located well within the interchange.

OP-0683 (not located, assumed as buried)

OP-0798 (Outfall of existing 18” RCP EP-0702)
Approx. Sta. 1246+60, Offset 155’ RT

EP-0702 crosses I-77 NB approximately 50' before the I-77 bridge over Windsor Lake. The pipe has collapsed, and therefore the outfall was not located. The pipe should be replaced due to the collapse and other issues found during the video inspection. There should not be any right-of-way issues associated with the pipe replacement.

OP-0798 (not located, collapsed)

OP-0897 (Outfall of existing 18” RCP EP-0803)
Approx. Sta. 1259+70, Offset 93’ RT

EP-0803 crosses I-77 NB approximately 1,000' after the I-77 bridge over Windsor Lake. At the time of the field visit, the existing concrete channel downstream of the outfall had accumulated sediment, causing water to pond. The concrete channel should be cleaned for approximately 470’. There should not be any right-of-way issues associated with clearing the channel.

OP-0897

OP-0995 (Outfall of existing 36” RCP EP-0907)
Approx. Sta. 1278+00, Offset 119’ LT

EP-0907 crosses I-77 SB approximately 500' before the Trenholm Road bridge over I-77. At the time of the field visit, the pipe outfall and associated ditch were fill with vegetation and debris and will require cleaning. The ditch should be cleared and re-excavated to the edge of the right-of-way.

OP-0995

OP-0999 (Outfall of existing 18” RCP EP-0901)
Approx. Sta. 1271+65, Offset 118’ LT

EP-0901 crosses I-77 SB approximately 1,250' before the Trenholm Road bridge over I-77. At the time of the field visit, standing water was observed. The pipe outfall and associated ditch were partially silted in and will require cleaning. The ditch should be cleared and re-excavated to the edge of the right-of-way.

OP-0999

OP-1010 (Outfall of existing 30” RCP EP-1010)
Approx. Sta. 1281+80, Offset 117’ LT

EP-1010 parallels I-77 SB beneath the Trenholm Road bridge overpass and outfalls approximately 75’ south of the bridge. At the time of the field visit, the pipe outfall and associated ditch were partially silted in and had accumulated debris. Cleaning will be required and re-excavate the ditch as necessary. Clearing can take place within the existing right-of-way.

OP-1010

OP-1396 (Outfall of existing 24” RCP EP-1301)
Approx. Sta. 1332+10, Offset 166’ RT

EP-1301 crosses I-77 NB approximately 50' after the I-77 bridge over Little Jackson Creek / Edgewater Drive. At the time of the field visit, a tree was growing immediately downstream of the outfall. This tree should be removed to prevent future damage and/or blockage to the pipe. There should not be any right-of-way issues associated with removing the tree.

OP-1396

OP-1499 (Outfall of existing 18” RCP EP-1401)
Approx. Sta. 1347+75, Offset 134’ LT

EP-1401 crosses I-77 SB in the merging lane from the EB Farrow Road onramp. At the time of the field visit, the outfall ditch for the pipe was overgrown with vegetation and will need to be cleared to re-establish positive drainage from the outfall. Clearing can take place within the existing right-of-way.

OP-1499

OP-1598 (Outfall of existing 4’ x 4’ concrete box culvert EC-1503)
Approx. Sta. 1364+80, Offset 129’ RT

EC-1503 outfalls between I-77 NB and the ramp from SC-277 EB. At the time of the field visit, debris had collected at the baffles along the concrete outlet apron of this box culvert and could further accumulate to impede flow. The baffles should be cleared of debris. This outfall is within the I-77 / SC-277 interchange area, and all clearing can take place within the existing right-of-way.

OP-1598

OP-1699 (Outfall of existing 36” RCP EP-1605)
Approx. Sta. 1379+05, Offset 263’ RT

There is some uncertainty regarding the location of this outfall. EP-1605 is assumed to cross under Legrand Road approximately 100' after the railroad bridge over I-77. It was not located in the field and is assumed to be buried. The outfall needs to be located. If the outfall location is where assumed, the outfall should be excavated to ensure positive drainage. Right-of-way issues may exist near this outfall.

OP-1698 (not located, assumed as buried)

OP-1799 (Outfall of existing 24” RCP EP-1799)
Approx. Sta. 1396+05, Offset 201’ RT

EP-1799 crosses the ramp from Farrow Road to I-77 NB. At the time of the field visit, the end of the pipe was partially buried and the outfall ditch was silted in. The ditch should be excavated for approximately 25’ between the pipe end and the concrete lined channel downstream. There should not be any right-of-way issues associated with clearing the ditch.

OP-1799

OP-1895 (Outfall of existing 30” RCP EP-1803)
Approx. Sta. 1423+20, Offset 148’ LT

EP-1803 crosses I-77 SB approximately 1,050' before the Hard Scrabble Road bridge over I-77. At the time of the field visit, the outfall was silted in and retaining water at the pipe end. The outfall ditch should be excavated for approximately 20’ between the pipe end and the receiving ditch downstream. There should not be any right-of-way issues associated with clearing the ditch.

OP-1895

OP-1896 (Outfall of existing 24” RCP EP-1801)
Approx. Sta. 1451+70, Offset 170’ LT

EP-1801 crosses I-77 SB approximately 1,800' before the Hard Scrabble Road bridge over I-77. At the time of the field visit, the outfall ditch was silted in and retaining water at the pipe end. The outfall should be excavated to ensure positive drainage from the pipe. The pipe outfall is located only a couple of feet from right-of-way and permissions may be needed for excavation.

OP-1896

OP-1998 (Outfall of existing 30” RCP EP-1998)
Approx. Sta. 1433+15, Offset 123’ RT

EP-1998 parallels I-77 NB beneath the Hard Scrabble Road overpass and outfalls approximately 75' south of the bridge. At the time of the field visit, the outfall ditch was filled with debris and needs to be cleaned to promote positive drainage. Right-of-way is not an issue in this area.

OP-1998

OP-1999 (Outfall of existing 24” RCP EP-1999)
Approx. Sta. 1433+10, Offset 121’ LT

EP-1999 parallels I-77 SB beneath the Hard Scrabble Road overpass and outfalls approximately 75' south of the bridge. At the time of the field visit, the pipe was partially buried and the outfall ditch was covered in vegetation and debris. The outfall should be excavated and cleared of debris to ensure positive drainage from the pipe. Right-of-way is not an issue in this area.

OP-1999

OP-2199 (Outfall of existing 36” RCP EP-2102)
Approx. Sta. 1459+55, Offset 162’ LT

EP-2102 crosses I-77 SB approximately 2,550' after the Hard Scrabble Road bridge over I-77. At the time of the field visit, standing water was observed. The outfall was partially buried and the downstream channel was filled with silt. The outfall needs to be excavated to ensure positive drainage. Right-of-way issues may exist downstream of this outfall.

OP-2199

OP-2298 (Outfall of existing 36” RCP EP-2203)
Approx. Sta. 1459+55, Offset 162’ LT

EP-2203 crosses I-77 SB approximately 2,650' before the Killian Road bridge over I-77. At the time of the field visit, the outfall was slightly silted in with minimal positive drainage. The outfall ditch should be excavated as necessary to restore downstream flow. Right-of-way may be a concern if excavation occurs for several feet.

OP-2298

OP-2299 (Outfall of existing 24” RCP EP-2201)
Approx. Sta. 1474+60, Offset 114’ LT

EP-2201 crosses I-77 SB approximately 3,600' before the Killian Road bridge over I-77. A fallen tree limb is currently draped over the outfall ditch of this pipe. While it is not currently impeding flow, it should be cleared from the outfall. Clearing can take place within the existing right-of-way.

OP-2299

OP-2396 (Outfall of existing 18" RCP EP-2305)
Approx. Sta. 1505+50, Offset 310' LT

EP-2305 crosses the onramp from Killian Road to I-77 SB, approximately 570' before Killian Road bridge. At the time of the field visit, standing water was observed and the downstream channel was silted and established with grass. The channel should be excavated for several feet to restore downstream flow. There are no concerns associated with right-of-way in this area.

OP-2396

OP-2397 (Outfall of existing 18" RCP EP-2303)
Approx. Sta. 1503+15, Offset 239' LT

EP-2303 crosses the onramp from Killian Road to I-77 SB, approximately 800' before Killian Road bridge. At the time of the field visit, standing water was observed and the downstream channel was silted and filled with vegetation. In addition, the pipe end is slightly damaged. The outfall should be excavated for to restore positive drainage and the last pipe joint may need to be repaired or replaced. There are no concerns associated with right-of-way at this outfall.

OP-2397

OP-2398 (Outfall of existing 18" RCP EP-2304)
Approx. Sta. 1499+65, Offset 175' LT

EP-2304 crosses the onramp from Killian Road to I-77 SB, approximately 1,150' before the Killian Road bridge. The outfall was not located in the field and is assumed to be buried. The outfall needs to be located. If the outfall location is where assumed, the pipe end should be excavated to ensure positive drainage. There are no concerns associated with right-of-way at this outfall.

OP-2398 (not located, assumed as buried)

OP-2399 (Outfall of existing 24" RCP EP-2301)
Approx. Sta. 1500+30, Offset 147' RT

EP-2301 crosses the Killian Road exit off-ramp from I-77 NB, approximately 1,090' before Killian Road bridge. At the time of the field visit, the outfall was partially buried and the downstream ditch was silted had accumulated sediment, causing water to pond. The outfall and ditch should be excavated and cleaned to promote positive drainage. There should be no right-of-way issues in this area.

OP-2399

4.13 HEC-RAS Analysis

Four Federal Emergency Management Agency (FEMA) regulated streams cross I-77 within the project limits. These four streams have detailed studies. The streams lie in the Upper Coastal Plains physiographic province.

A Flood Insurance Study (FIS) for Richland County, South Carolina and incorporated areas, dated September 29, 2010, was obtained from FEMA. Volume 1 of the FIS is numbered 45079CV001A and volume 2 is numbered 45079CV002A. Pages of the FEMA FIS that pertain to each of the streams crossing I-77 within the project limits can be found in the individual stream sections below. The corresponding Flood Insurance Rate Maps (FIRM) are numbered 45079C0140K, 45079C0255K, 45079C0260K, and 45079C0270K. The maps have been merged into one map that can be seen in Figure 2.4.

FEMA provided HEC-2 models for each of the streams. These models were produced in the NGVD 29 datum and included input data for the existing conditions and output data for the flood plains runs and encroachment runs. The HEC-2 data was input into HEC-RAS Version 4.1.0 and then analyzed to compare pre- and post- construction conditions.

It was determined that the modeling of I-77 at the triple barrel culvert crossings located at Crane Creek and Cumbess Creek will not need to be extended since no widening will occur to the outside of I-77. Also, the bridge widenings at Jackson Creek and Little Jackson Creek will not impact the water surface elevations because the widening is only occurring on the inside towards the median.

The stream crossings at Crane Creek, Cumbess Creek, Jackson Creek, and Little Jackson Creek are all located in special flood hazard zone AE. Each of these crossings should be eligible for “No-Rise” certifications since there will be no anticipated change in the 100-year flood elevations.

Appendix H

Biological Assessment and USFWS Concurrence Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

February 20, 2015

Mr. Edward W. Frierson
South Carolina Department of Transportation
P.O. Box 191
Columbia, SC 29202-0191

Re: Biological Assessment, I-77 Widening, Richland County, South Carolina
FWS Log No. 2015-I-0216

Dear Mr. Frierson:

The U.S. Fish and Wildlife Service (Service) has reviewed your January 21, 2015, Biological Assessment (BA) concerning the proposed widening of U.S. Interstate 77 (I-77) in Columbia, Richland County, South Carolina. The South Carolina Department of Transportation (SCDOT) prepared and submitted the BA in accordance with requirements set forth under section 7 of the Endangered Species Act (16 U.S.C. 1536 (c) (ESA). The BA evaluated potential impacts to threatened and endangered (T&E) species protected under the ESA and now seeks the Service's concurrence on SCDOT's affect determination.

As proposed, the project will widen and rehabilitate approximately seven miles of I-77 starting at Percival Road and progressing north to Killian Road. The proposed work will consist of adding a travel lane for the north and south bound routes, improving existing exit ramps, and widening ten existing bridges. The SCDOT correctly determined that the project area does not contain any federally designated critical habitat but recognized that the area may contain suitable habitat for some federally T&E species.

As described in the BA, a survey to determine the presence of eight T&E species (listed in the BA) was performed August 4-7, 2014. Please note that the Carolina heelsplitter (*Lasmigona decorata*) is no longer considered as potentially occurring in Richland County. Until their presence is confirmed, future SCDOT projects in Richland County do not need to survey for or consider potential effects to the Carolina heelsplitter. The Service recommends that SCDOT contact the National Marine Fisheries Service for consultation requirements regarding the Atlantic and shortnose sturgeon. Three of the remaining five T&E species considered in the BA, Canby's dropwort, red-cockaded woodpecker, and the American wood stork, are known to inhabit Richland County but do not occur within the project area, due to the lack of suitable habitat. SCDOT concluded the project will have no effect upon these species; therefore no further consultation with the Service is required.

Suitable habitat for the rough-leaved loosestrife and smooth coneflower does occur along the maintained road right-of-ways along I-77. SCDOT performed the survey during the optimal time period for both species and did not observe any individual plants of either the rough-leaved loosestrife or smooth coneflower. As such, SCDOT concluded that that the project may affect, but is not likely to adversely affect both plant species. The Service concurs with your conclusion. Please note that due to obligations under the ESA, the potential impacts of this project must be reconsidered if: (1) new information reveals impacts of this identified action may affect any 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 designated that may be affected by the identified action.

For informational purposes only, the Service has included an updated list of species that have been petitioned for listing under the ESA 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 Richland County, South Carolina. Although there are no Federal protections afforded to ARS, please consider including them in future project efforts. 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

Please contact the South Carolina Department of Natural Resources regarding potential impacts that may have occurred to State protected species. If the project may impact wetlands, contact the U.S. Army Corps of Engineers, Charleston District. If you have any questions regarding the Service's determination, please contact Mr. Mark Caldwell at (843) 727-4707, ext. 215 and reference FWS Log No. 2015-I-0216.

Sincerely,

Thomas D. McCoy

Thomas D. McCoy
Acting Field Supervisor

TDM/MAC

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Richland County

CATEGORY	COMMON NAME/STATUS	SCIENTIFIC NAME	SURVEY WINDOW/ TIME PERIOD	COMMENTS
Amphibian	Chamberlain's dwarf salamander (ARS)	*Eurycea chamberlaini*	Spring/Fall surveys	Breeding survey: November to February
Bird	American wood stork (T)	*Mycteria americana*	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	*Haliaeetus leucocephalus*	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	*Picoides borealis*	April 1-July 31	Nesting season
Crustacean	Broad River spiny crayfish (ARS)	*Cambarus spicatus*	November-April	
Fish	American eel (ARS)	*Anguilla rostrata*	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Atlantic sturgeon* (E)	*Acipenser oxyrinchus**	February 1-April 30	Spawning migration
	Blueback herring (ARS)	*Alosa aestivalis*	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	*Moxostoma robustum*	Late April-early May	Temperature dependent: 16-24°C
	Shortnose sturgeon* (E)	*Acipenser brevirostrum**	February 1-April 30	Spawning migration
Insect	None Found			
Mammal	Rafinesque's big-eared bat (ARS)	*Corynorthinus rafinesquii*	Year round	Found in mines, caves, large hollow trees, buildings, and bat towers
	Tri-colored bat (ARS*)	*Perimyotis subflavus*	Year round	Found in mines and caves in the winter
Mollusk	Savannah lilliput (ARS)	*Toxolasma pullus*	March 1-September 30	
Plant	Bog spicebush (ARS)	*Lindera subcoriacea*	March-August	
	Canby's dropwort (E)	*Oxypolis canbyi*	Mid-July-September	
	Ciliate-leaf tickseed (ARS)	*Coreopsis integrifolia*	August-November	
	Georgia aster (ARS*)	*Symphyotrichum georgianum*	Early October-mid November	
	Purple balduina (ARS)	*Balduina atropurpurea*	August-November	
	Rough-leaved loosestrife (E)	*Lysimachia asperulaefolia*	Mid May-September	
	Sandhills lily (ARS*)	*Lilium pyrophilum*	Late July-August	
	Smooth coneflower (E)	*Echinacea laevigata*	Late May-October	
	Spathulate seedbox (ARS)	*Ludwigia spathulata*	June-October	
	Wire-leaved dropseed (ARS)	*Sporobolus teretifolius*	August-September	Following fire
Reptile	Southern hognose snake (ARS)	*Heterdon simus*	Most of the year	

South Carolina List of At-Risk, Candidate, Endangered, and Threatened Species - Richland County

*	Contact National Marine Fisheries Service (NMFS) for more information on this species
**	The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species
ARS	Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist.
ARS*	Species that are either former Candidate Species or are emerging conservation priority species
BGEPA	Federally protected under the Bald and Golden Eagle Protection Act
C	FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species
CH	Critical Habitat
E	Federally Endangered
P or P - CH	Proposed for listing or critical habitat in the Federal Register
S/A	Federally protected due to similarity of appearance to a listed species
T	Federally Threatened

These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.

For a list of State endangered, threatened, and species of concern, please visit https://www.dnr.sc.gov/species/index.html.

South Carolina
Department of Transportation

February 3, 2015

Mr. Jay Harrington
Field Supervisor
Endangered Species Field Office
US Fish and Wildlife Service
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

RE: Biological Assessment for I-77 Widening from Percival Road (mile marker 15) to Killian Road (mile marker 22) and rehabilitation of existing I-77 southbound lanes from mile marker 22 to mile marker 27.

Mr. Harrington:

On behalf of US Federal Highway Administration (FHWA), the South Carolina Department of Transportation (SCDOT) has prepared the following Biological Assessment for the proposed widening of I-77 from Percival Road (mile marker 15) to Killian Road (mile marker 22), and rehabilitation of existing I-77 southbound lanes from mile marker 22 to mile marker 27, Richland County, SC.

It has been determined through field surveys that this project should not jeopardize any species protected under 50 CFR 402. However, due to the finding of "may affect, not likely to adversely affect" for the rough-leaved loosestrife and smooth coneflower, your concurrence is requested. If you agree with this conclusion, upon completion of informal consultation, SCDOT proposes to proceed with the project development with the understanding that the project is in full compliance with Section 7 of the Endangered Species Act of 1973, as amended.

If you concur with our biological determination, please send your concurrence letter to our office. If you need additional information, you can contact Edward Frierson at FriersonEW@scdot.org or 803-737-1861. Thank you very much for your cooperation and assistance in this matter.

Sincerely,

Edward W. Frierson

Edward W. Frierson
SCDOT Biologist

JM/ef
Enclosures

Ec: Siobhan Gordon, SCDOT
Shane Belcher, FHWA
Renee Mulholland, HDR

Biological Assessment of I-77

Roadway Widening and Improvements

South Carolina Department of Transportation

Richland County, SC

SCDOT Project Number: P027002

January 2015

Contact Person: Ed Frierson Phone Number: 803-737-1861

Prepared by: _____ _**01/21/2015**_____

HDR Biologist Date

Introduction

The purpose of this biological assessment is to review the proposed I-77 roadway widening from Percival Road (mile marker 15) to Killian Road (mile marker 22) in sufficient detail to determine whether the proposed action may affect any of the threatened, endangered, candidate, or sensitive species listed below. This biological assessment is prepared in accordance with the legal requirements set forth under Section 7 of the Endangered Species Act (16 United States Code [US.C] 1536 (c)), and follows the standards established in Federal Highway Administration (FHWA) and SCDOT National Environmental Policy Act (NEPA) Guidance.

The species considered in this document are:

Endangered (E) and Threatened (T) Species

Atlantic sturgeon	Acipenser oxyrinchus oxyrinchus	E
Canby's dropwort	*Oxypolis canbyi*	E
Carolina heelsplitter	Lasmigona decorata	E
Red-cockaded woodpecker	*Picoides borealis*	E
Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E
Shortnose sturgeon	*Acipenser brevirostrum*	E
Smooth coneflower	*Echinacea laevigata*	E
Wood stork	*Myceteria americana*	T

Candidate (C) Species

Georgia aster	*Symphyotrichum georgianum*	C

Sensitive Species and Species of Concern

Bald Eagle, *Haliaeetus leucocephalus*, Bald and Golden Eagle Protection Act (BGEPA)

Critical Habitat

The action addressed within this biological assessment does not fall within Critical Habitat for any federally-listed species.

Description of the Proposed Action

The proposed project is to widen approximately 7 miles of I-77 from mile marker 15 (Percival Road) to mile marker 22 (Killian Road) and to rehabilitate the I-77 southbound lanes from mile marker 22 (Killian Road) to mile marker 27 and rehabilitate the existing I-77 southbound lanes from mile marker 22 to mile marker 27 (See Location Map – **Figure 1** and Vicinity Map – **Figure 2**, both located in **Appendix A**). This segment of I-77 consists of two northbound lanes and two southbound lanes. The widening includes adding one travel lane in each direction, improving exit ramps, and widening ten bridges. The bridges include: four over I-20 and I-20 exit ramps near mile marker 16; two over Windsor Lake Boulevard (S-1196) near mile marker 16; two over Windsor Lake near mile marker 16.6; one over Edgewater Drive (S-1722); and one over Jackson Creek near mile marker 18.

Species Accounts

Atlantic Sturgeon (*Acipenser oxyrinchus*) – E

The Atlantic sturgeon is considered a large fish, reaching up to 14.0 feet in length. It has a characteristic shovel shaped snout with fleshy barbells. Adults spawn between February and March in southern U.S. fresh waters, and then move into brackish and fully saline waters when not spawning. In salt water, adults have been documented migrating 1,500 miles to find spawning areas (NMFS 2007). When in salt waters, they occupy benthic near shore habitats, feeding primarily on invertebrates and small fishes. In South Carolina the Atlantic sturgeon has been found in the Edisto, Pee Dee, Savannah, Cooper, Congaree, Santee, Winyah, and Waccamaw Rivers (NatureServe 2014a).

Canby's dropwort (*Oxypolis canbyi*) – E

Canby's dropwort is a perennial plant found in the South Carolina Coastal Plain with erect stems from 2.6 to 3.9 feet tall (U.S. Fish and Wildlife Service [USFWS] 2010). The leaves are slender, hollow and quill-like, and the flowers are compound umbels with white petals that appear from mid-August to early October, giving off a slight dill odor. The flowers' fruits are 0.16 to 0.24 inches long, with prominent wings, and will split into multiple single seeded parts upon maturation. Canby's dropwort reproduces primarily via asexual means through rhizomes. Approximately 53 populations have been documented over the past 30 years in Georgia, Maryland, North Carolina, and South Carolina in pond cypress wetlands, pineland savannas, Carolina bays, and along the edges of cypress-pine ponds. There have been 33 documented findings in the following South Carolina counties: Allendale, Bamberg, Barnwell, Berkeley, Clarendon, Colleton, Florence, Hampton, Richland, Sumter, and Williamsburg (NatureServe 2014b).

Carolina heelsplitter (*Lasmigona decorata*) – E

The Carolina heelsplitter is a freshwater mussel with an ovate trapezoid greenish brown to dark brown shell that may contain a slight wing. Its present preferred habitat is considered to be creeks and small rivers in the transition zone between the Piedmont and the Coastal Plain/Sandhills physiographic regions of South Carolina. It's generally found in waters without significant silt accumulations along stable, well-shaded stream banks. It should be noted that historic data contains findings of the Carolina heelsplitter in small ponds as well (Alderman 1998). Spawning occurs in late summer or fall, with the releasing of glochidia (larvae) in late winter or in the spring of the following year. Effective fish hosts have included bluehead chub (*Nocomis leptocephalus*), bluegill (*Lepomis macrochirus*), bullhead (*Ameiurus natalis*), fantail darter (*Etheostoma flabellare*), golden shiner (*Notemigonus crysoleucas*), highfin shiner (*Notropis altipinnis*), largemouth bass (*Micropterus salmoides*), satinfin shiner (*Cyprinella analostana*), spottail shiner (*Notropis hudsonius*), and whitemouth shiner (*Notropis alborus*) (NatureServe 2014c).

Red-cockaded woodpecker (*Picoides borealis*) – E

The red-cockaded woodpecker (RCW) is approximately 7.1 to 7.9 inches in length with a 13.8 to 15.0 inch wingspan. It has a dull white breast with black spots, barred back feathers of black and white, black wings, a black cap, and a tell-tale large white patch on both cheeks. It gets its name from the distinctive red streaks or "cockades" on the sides of the head which are more visible on females and juveniles than on adult males (Chadwick 2003).

The RCW requires mature stands of longleaf and/or loblolly pine to excavate a living cavity and encircles the cavity with small holes to encourage the flow of tree sap which is believed to protect it from predators (USFWS 2003). This habitat requires burning, which eliminates scrub oaks and other hardwoods which discourage nesting of RCWs. RCWs lay their eggs between April and June and fledge their offspring between 26 and 29 days after hatching. The RCW's historic range extends from New Jersey to Texas and inland to Missouri, but its current range excludes New Jersey, Maryland, and Missouri (NatureServe 2014d).

Rough-leaved loosestrife (*Lysimachia asperulaefolia*) – E

Rough-leaved loosestrife is an erect perennial herb growing 11.8 to 23.6 inches tall, and blooms in spring with showy yellow star-shaped flowers. The leaves are whorled and in groups of three around the stem with a lanceolate to ovate-lanceolate shape. It most often occurs in the ecotones between longleaf pine uplands and pond pine pocosins, in moist, sandy, or peaty soils with low vegetation that allows for abundant sunlight to penetrate the herbaceous stratum. The historic range of rough-leaved loosestrife is from the outer coastal plain of North Carolina to the sandhills region of South Carolina and inland from Beaufort County, North Carolina to Richland County, South Carolina. One extant population has been verified in Richland County, South Carolina (NatureServe 2014e).

Shortnose sturgeon (*Acipenser brevirostrum*) – E

The shortnose sturgeon can reach up to 3.3 feet in length, has a heterocercal tail, a short shovel-shaped blunted snout, ventral mouth, and large bony scutes on the head, back, and sides. Adults feed at the freshwater/saltwater boundary in their southern range and swim upstream to spawn. Spawning generally begins in late winter or early spring and lasts a few days to several weeks, and usually does not occur in consecutive years. Females can live up to 67 years and males up to 30 years (NatureServe 2014f).

The shortnose sturgeon's historic range is along the Atlantic Coast of North America from the Saint John River in New Brunswick to the Saint Johns River in Florida. The federal recovery plan (National Marine Fisheries Service 1998) identified four distinct populations in South Carolina; Winyah Bay, Santee River Basin, Cooper River, and the Ace Basin.

Smooth coneflower (*Echinacea laevigata*) – E

Smooth coneflower is a perennial herb with smooth stems, few leaves, and has pink to purplish flowers that appear from May to mid-July. It generally reproduces asexually through rhizomes and grows to an average height of 5.0 feet and fruits from June to October but seldom produces viable seeds. Its historic preferred habitat was prairies or oak savannas that were maintained through prescribed burning. Today, the smooth coneflower can be found in woodland clearings, along roadsides, utility right-of-ways, and on dry limestone bluffs. It requires full or partial sun and is usually found in soils high in magnesium and calcium alongside eastern red cedar (*Juniperus virginiana*) and rattlesnake master (*Eryngium yuccifolium*) (NatureServe 2014g).

Wood stork (*Myceteria americana*) – T

Adult wood storks are one of the largest wading birds in North America with a wingspan of 4.9 to 5.4 feet and a head-to-tail length of 2.8 to 3.7 feet (USFWS 1997). They are all white in color except for the black primary and secondary wing and tail feathers, and a long thick black bill. Their habitats consist of cypress swamps, bottomland hardwood forests, tidally influenced freshwater wetlands, and abandoned rice fields maintained for water fowl, but they also feed in salt marshes (Brooks 2007). Wood storks generally nest in colonies from February to April and lay eggs from March to late May. Hatchlings usually emerge from early May to mid-June and fledge in July or August.

The wood storks historic breeding range is from South Carolina and Florida to Mexico, Central America, Cuba, and Northern Argentina. Today's North American populations are increasing in South Carolina primarily due to migration from Florida as a result of decreasing habitat (Florida). South Carolina's Department of Natural Resources (SCDNR) conducts a wood stork monitoring program aimed at improving habitats and encouraging year long residents as opposed to the transient populations that have traditionally returned to Florida for breeding. During the late 1980's and early 1990's, South Carolina nesting pairs have increased from 11 pairs to 829 pairs (USFWS 1997), and eventually 2,010 pairs in 2006 (USFWS 2007). The wood stork species was recently reclassified to threatened when an average of 6,000 nesting pairs were

recorded and more than 1.5 chicks per year reached fledgling age, over a 3 year period (USFWS 2014; Rodgers et al. 2008).

Georgia aster (*Symphyotrichum georgianum*) – C

Georgia aster is a perennial herb standing 1.5 to 2.6 feet tall with dark purple ray flowers surrounding white disk flowers blooming in early October to mid-November. It generally reproduces asexually through rhizomes and occupies dry open woodlands and roadsides. USFWS (2001) suggests that this species is "likely a relict species of the post oak (*Quercus stellata*) – savanna communities that existed in the region prior to fire suppression and the eradication of large grazing animals". Its historic range is from south-central North Carolina to central Georgia and west to central Alabama. A disjoined population has been observed on the coastal plain of southwest Georgia extending into the eastern panhandle of Florida (NatureServe 2014h).

Bald Eagle (*Haliaeetus leucocephalus*) – BGEPA

The bald eagle gets its name from the distinctive white head of mature adults (6 years of age). Adults' tails are also white but their remaining plumage is dark, yet they have a bright yellow bill and yellow eyes. Bald eagles are found in all 48 contiguous US states as well as Alaska (NatureServe 2014i). Their body length ranges from 2.6 to 3.1 feet with a wingspan of 5.8 to 7.5 feet (National Geographic Society [NGS] 1983) and weighing upwards of 14 pounds. Bald eagles in South Carolina are smaller than their northern brethren; however, with a mean weight of 7.14 pounds and a mean wing span of 6.2 feet (SCDNR 2010). Bald eagle breeding habitat is generally near (~2.5 miles) waterbodies including rivers, lakes, reservoirs, bays, and other coastal areas with abundant fish and/or waterfowl populations - their primary diet. Nesting areas usually occur in large tall trees able to support their 4 to 6-foot-wide nests, and may be used year after year or may be alternated with another nest in successive years. Additionally, nesting sites are primarily chosen in areas with limited disturbance. Eggs are laid between October and March with clutch sizes of 1 to 3 eggs. Chicks usually fledge by 12 weeks but often remain in the same territory for an additional 6 weeks as they are still dependent on the adults for food (NatureServe 2014i).

Existing Environment

The proposed project corridor was initially field-surveyed between August 4 and August 7, 2014, for endangered, threatened, candidate, and sensitive species. Prior to the survey, the USFWS Trust Resources List for the proposed project area was examined to determine if any known occurrences of such species were likely to occur. Nine species of endangered, threatened and candidate species were listed as possibly existing near the proposed project corridor. Potential effects to these species and to bald eagles (sensitive species of concern) are detailed in the "Effects" section, below. Additionally, a Mexican free-tailed bat (*Tadarida brasilensis*) was observed within the proposed project corridor. This species however, is not listed as endangered, threatened, or as a candidate for listing.

A survey of bird species nesting under bridges within the proposed project corridor was conducted on August 20, 2014, in compliance with the Migratory Bird Treaty Act. During the survey, barn swallow nests were found under bridges at the following locations: I-20, Two Notch Road, 277 Ramp, Farrow Road, and Hard Scrabble Road (S40-83). In accordance with the Migratory Bird Treaty Act, a full survey of these nests and coordination with the USFWS will be performed prior to any permit submittal and/or construction activity.

The project corridor is a developed area consisting primarily of roadways, bridges, and accompanying infrastructure. Several residential neighborhoods abut the east and west project boundaries and approximately 23 freshwater wetlands, 29 creeks (including Jackson, Cumbess and Crane Creeks), four ponds, and portions of Windsor Lake encroach upon or are wholly included within the proposed project corridor. The freshwater wetlands mostly contain a mixture of nodding beakrush (*Rhychospora inexpansa*), rushes (*Juncus spp*), maiden cane (*Panicum hematomon*), woolgrass (*Scirpus cyperinus*), and cattail (*Typha latifolia*). Upland areas contain mostly loblolly pine (*Pinus taeda*), winged sumac (*Rhus copallina*), blackberry (*Rubus spp.*), muscadine (*Vitis rotundifolia*), panic grass (*Pannicum spp*) and *Lespedeza spp.* Wetland and stream impacts are unknown at this time.

Effects

Atlantic sturgeon (*Acipenser oxyrinchus*) – E

The Atlantic sturgeon breeds in freshwater rivers and streams but returns to fully marine waters outside of breeding season. This species has been documented in the Congaree River of South Carolina which is approximately 8.6 miles from the proposed project area. However, there appears to be no connectivity to the documented waterbodies within the proposed project corridor and certainly none that could accommodate a fish of this size. Therefore the proposed project will have no effect on this species.

Canby's dropwort (*Oxypolis canbyi*) – E

Canby's dropwort occurs in pond cypress and pineland savannas, Carolina bays and along edges of cypress-pine ponds. The proposed project will not impact such habitats and there are no records of recent observations of the species within the proposed project corridor. No individuals of Canby's dropwort were observed during the species habitat survey conducted in August 2014 for this project. Therefore the proposed project will have no effect on this species.

Carolina heelsplitter (*Lasmigona decorata*) – E

The Carolina heelsplitter is generally found in waters without significant silt accumulations with stable well-shaded stream banks. The proposed project will not impact such habitats. Although there are four ponds within the project area and historic

data contains findings of the Carolina heelsplitter in small ponds, these ponds appear to have been constructed for stormwater detention and do not appear to contain water quality sufficient to sustain this species. Therefore, the proposed project will have no effect on this species. A separate field survey confirming the findings for the Carolina heelsplitter was conducted on December 12, 2014 (see Appendix B for survey results).

Red-cockaded woodpecker (Picoides borealis) – E

The red-cockaded woodpecker (RCW) requires mature stands of longleaf and/or loblolly pine to excavate a living cavity and encircles the cavity with small holes to encourage the flow of tree sap which is believed to protect it from predators. This habitat requires burning which eliminates scrub oaks and other hardwoods that discourage nesting of RCWs. SCDNR data indicates that RCWs were historically observed within 1.3 miles of the southern section of the proposed project boundary. However, the last recorded observance of this species in this location was in December 1993, and as determined through the aforementioned project survey, no such habitat currently exists within the proposed project corridor and no RCWs were observed during the survey. Therefore the proposed project will have no effect on this species.

Rough-leaved loosestrife (*Lysimachia asperulaefolia*) – E

Rough-leaved loosestrife occurs most often in ecotones between longleaf pine uplands and pond pine pocosins in moist, sandy or peaty soils with light canopy cover, thus allowing abundant sunlight to the herb layer. SCDNR data indicates that the southern section of the proposed project boundary does contain habitat for this species. However, the last recorded observance of the species near the project boundary was in 1800. Therefore the proposed project may affect, but is not likely to adversely affect this species.

Shortnose sturgeon (*Acipenser brevirostrum*) – E

The shortnose sturgeon lives in riverine and marine ecosystems and the proposed project will not impact such habitats. Therefore the proposed project will have no effect on this species.

Smooth coneflower (*Echinacea laevigata*) – E

Smooth coneflower occurs in woodland clearings, along roadsides, utility right-of-ways, and on dry limestone bluffs. Although no individuals were observed during the survey, construction activity is likely to occur along roadsides; therefore, the proposed project may affect, but is not likely to adversely affect this species.

Wood stork (*Myceteria americana*) – T

Wood stork habitat consists of cypress swamps, bottomland hardwood forests, tidally influenced freshwater wetlands, and abandoned rice fields maintained for water fowl. The proposed project will not impact such habitats and there have been no records of recent observations in the proposed project corridor. Therefore the proposed project will have no effect on this species.

Georgia aster (*Symphyotrichum georgianum*) – C

Georgia aster habitat consists primarily of fire maintained savanna-like woodlands. Although it has also been observed in openings such as roadsides, no individuals of Georgia aster were observed during the species habitat survey conducted in August 2014. Additionally, SCDNR data indicates that the closest population of this species exists approximately 4.5 miles west of the proposed project corridor. Therefore the proposed project will have no effect on this species.

Bald Eagle (*Haliaeetus leucocephalus*) – BGEPA

Bald eagle nesting sites consist of large tall pine trees in generally less disturbed areas, near waterbodies containing sufficient amounts of fish and/or waterfowl. Although a portion of Windsor Lake exists within the proposed project corridor, this area is considered highly disturbed due to its proximity to an existing interstate highway (I-77). Additionally, no bald eagles or nests were observed during the species habitat survey conducted in August 2014 and SCDNR indicates that the closest known species occurrence is approximately 7.7 miles southwest of the proposed project boundary. Therefore the proposed project will have no effect on this species.

Cumulative Effects

The proposed project will not have any cumulative impacts to federally endangered, threatened, or candidate species.

Conclusions and Determination

Rough-leaved loosestrife and smooth coneflower are the only species which may be affected by the proposed project. For the rough-leaved loosestrife, although no individuals were identified during the survey, this plant was past its seasonal flowering stage (spring); thus identification may have proved difficult. Additionally, SCDNR GIS data indicates that an area of potential habitat does exist in the southern portion of the proposed project corridor. Therefore, the proposed project may affect, but is not likely to adversely affect this species. For the smooth coneflower, although no individuals were identified during the survey, this plant was past its seasonal flowering stage (May through July); thus identification may have proved difficult. Additionally, one of its preferred habitats is along roadsides; therefore, this project may affect, but is not likely to adversely affect this species.

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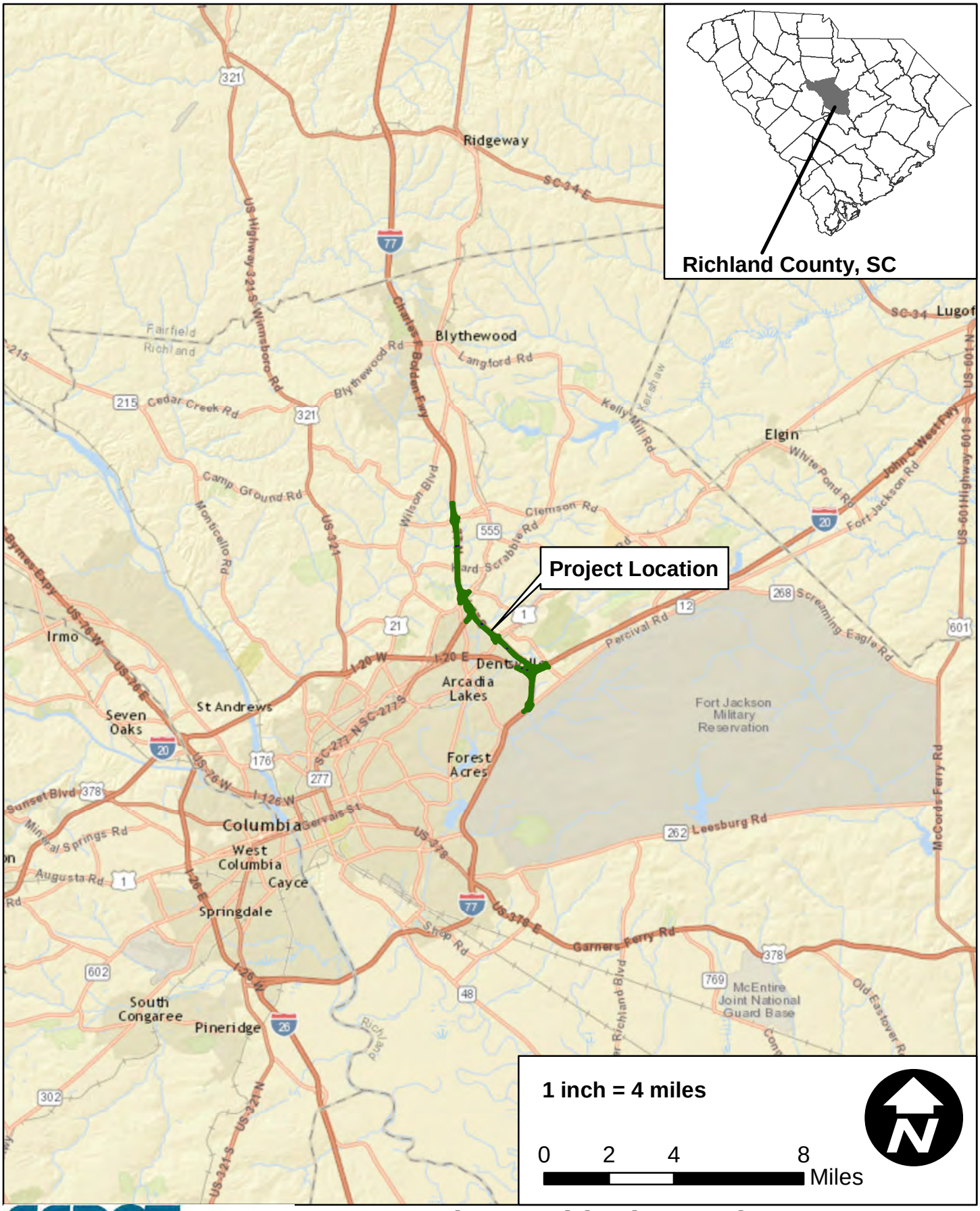
Appendix A

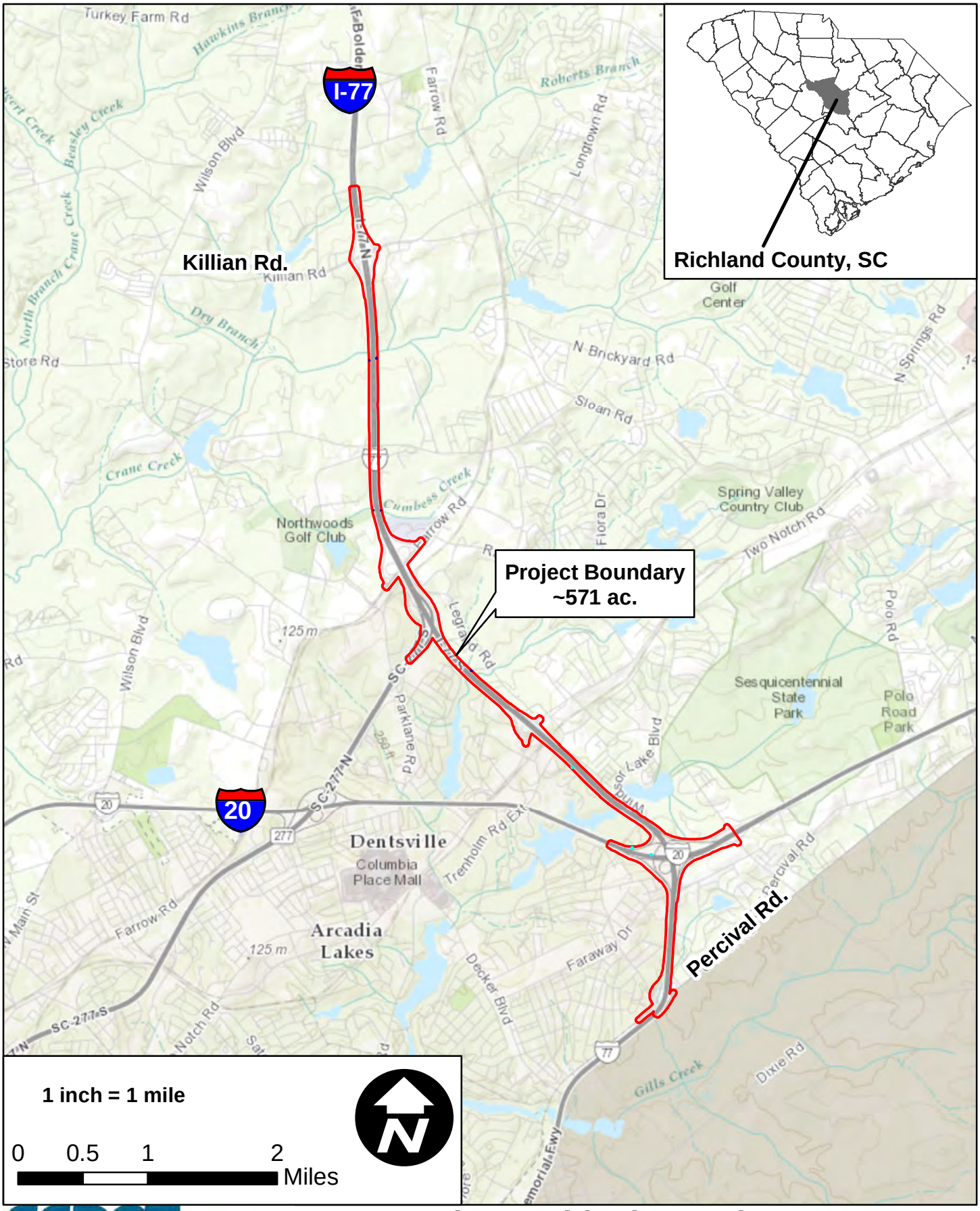
Figures



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Project Location
Figure 1
Jan. 2015



SCDOT
South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Vicinity Map
Figure 2
Jan. 2015

Appendix B

Carolina Heelsplitter Survey

Carolina Heelsplitter Survey of
I-77 Widening from Percival Road to Killian Road in
Richland County, S.C.
P027002
January 2, 2015

By Jeffrey West
USFWS Permit Number TE178643-1

Pursuant to Section 7 of the Endangered Species Act a field survey was conducted on the proposed project for the Carolina heelsplitter (*Lasmigona decorata*).

Methods

The project area was examined by reconnaissance methods on December 12, 2014.

Results

The project corridor contains several typical acidic sandhills streams and manmade impoundments which are not habitat for the Carolina heelsplitter. Therefore, based on the lack of suitable habitat the proposed action will not affect the Carolina heelsplitter.

Jeffrey West January 2, 2015

Appendix I

Noise Analysis Report

Noise Analysis Report

I-77 Roadway Widening and Improvements

Project #: P027002

South Carolina Department of Transportation
955 Park Street
Columbia, South Carolina 29201

Richland County, South Carolina

The South Carolina Department of Transportation proposes to widen approximately seven miles of Interstate 77 from Percival Road to approximately Killian Road and rehabilitate the I-77 southbound lanes from Killian Road to mile point 27.

February 2015

Noise Analysis Report

I-77 Roadway Widening and Improvements

Project #: P027002

South Carolina Department of Transportation
955 Park Street
Columbia, South Carolina 29201

Richland County, South Carolina

The South Carolina Department of Transportation proposes to widen approximately seven miles of Interstate 77 from Percival Road to approximately Killian Road and rehabilitate the I-77 southbound lanes from Killian Road to mile point 27.

February 2015

Prepared by:

Mike Parsons, P.E.
HDR, Inc.

EXECUTIVE SUMMARY

HDR Engineering, Inc. (HDR) conducted a noise analysis to evaluate the potential noise impacts associated with the proposed widening of seven miles of Interstate 77 (I-77) from mile point 15 (Percival Road) to approximately mile point 22 (Killian Road). The project also proposes to rehabilitate the I-77 southbound lanes from mile point 22 (Killian Road) to mile point 27. The purpose of this analysis is to fulfill the requirements of Title 23 of the Code of Federal Regulations (CFR) Part 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," and the South Carolina Department of Transportation (SCDOT) *Traffic Noise Abatement Policy*.

This Noise Analysis Report has been completed consistent with the updated noise regulations at 23 CFR 772 effective July 2011. Based on the noise analysis performed to date, the project is anticipated to generate noise impacts at 249 of the 459 noise sensitive receptors found to exist along the project corridor.

Noise abatement was evaluated for the impacted receptors. The noise abatement measures were found to be not feasible and reasonable per SCDOT guidelines (see Section 3.5).

Based on the noise analysis performed to date, there appears to be no feasible and reasonable solutions available to mitigate the noise impacts at the locations identified.

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1.0 INTRODUCTION

The South Carolina Department of Transportation (SCDOT) Traffic Noise Abatement Policy constitutes the official SCDOT noise policy and procedures for the purpose of meeting the requirements of Title 23 of the Code of Federal Regulations (CFR) Part 772 and applicable state laws. This analysis conforms with Federal Highway Administration (FHWA) Regulation 23 CFR 772, "Procedures for Abatement of Highway Traffic Noise and Construction Noise," and all applicable state laws.

1.1 Purpose

This analysis was conducted to evaluate the potential noise impacts associated with the proposed widening and rehabilitation of Interstate 77 (I-77) in Columbia, South Carolina. The purpose of the proposed project is to improve operational efficiency and accommodate future traffic volumes along the interstate corridor by increasing I-77's capacity.

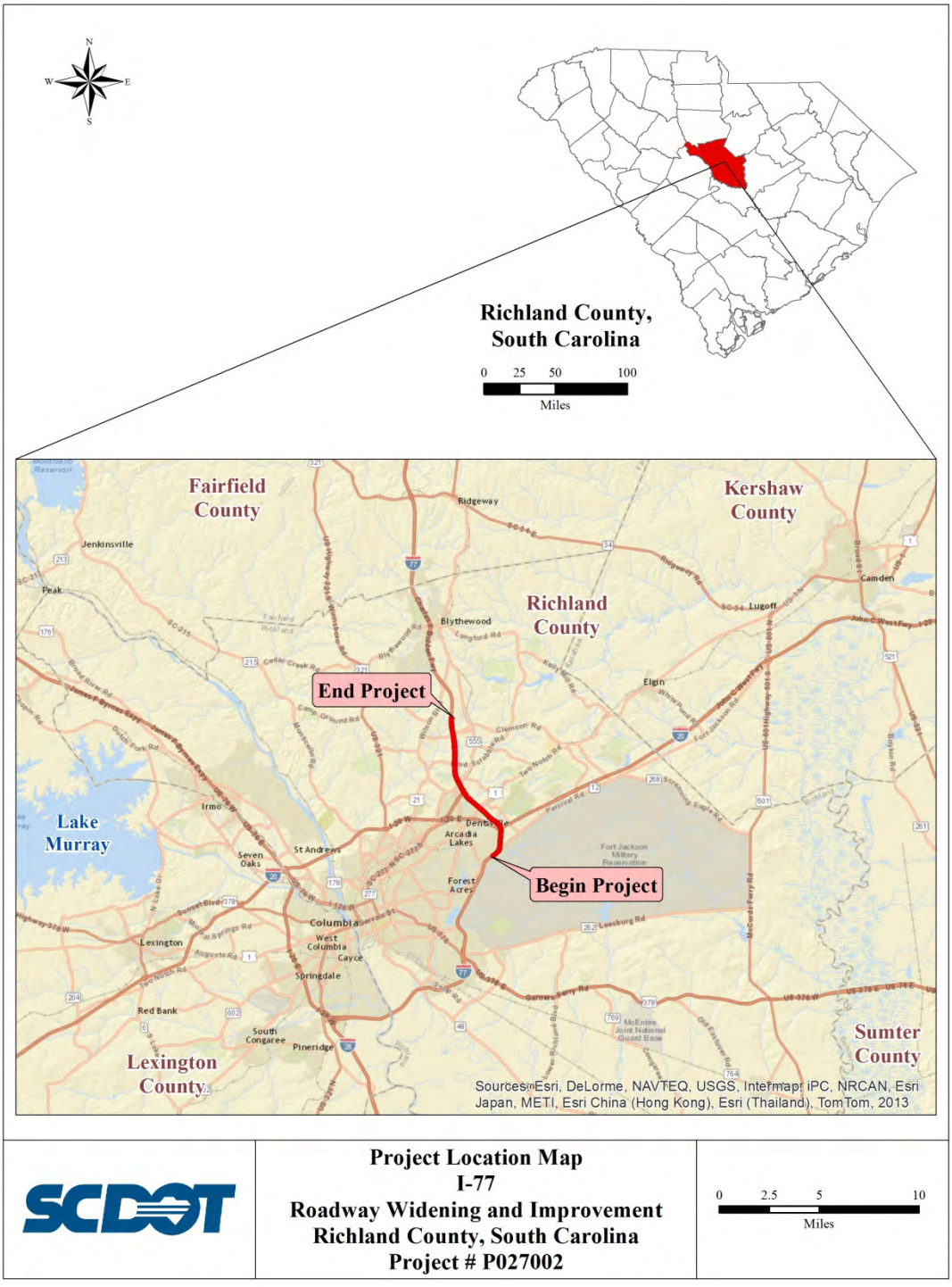
1.2 Project Description

The SCDOT proposes to widen approximately seven miles of I-77 from mile point 15 (Percival Road) to approximately mile point 22 (Killian Road) and rehabilitate the I-77 southbound lanes from mile point 22 (Killian Road) to mile point 27. All proposed improvements will take place within the existing right-of-way (ROW). Figure 1 shows the project location.

1.3 Need for Improvement

The existing project limits do not provide enough travel lanes for the traffic through the area, resulting in traffic congestion starting as early as year 2017 when the segment of I-77 between SC 277 and Killian Road is projected to operate at level of service (LOS) E. The proposed widening project will provide the required number of lanes to operate at LOS D or better for the entire project corridor through design year 2037. The goals and objectives of the proposed project are to promote economic development, while avoiding and minimizing environmental impacts, and improving habitat through mitigation of unavoidable impacts.

Figure 1: Project Location Map



2.0 METHODOLOGY

The noise analysis for this project was prepared in accordance with the SCDOT *Traffic Noise Abatement Policy*, dated August 2014 (effective September 1, 2014) to comply with the amended 23 CFR 772 which became effective July 2011.

The noise analysis includes three distinct scenarios consisting of the current year (2017) Existing Alternative, design year (2037) No-Build Alternative, and design year (2037) Build Alternative.

2.1 Model and Noise Metrics

The decibel (dB) is a unit of measure of sound level.[1] For traffic noise purposes the A-weighted scale, which closely approximates the range of frequencies a human ear can hear, is used. The A-weighted decibel is abbreviated dBA.

The noise level descriptor used by SCDOT is the L_{eq}. L_{eq} is the equivalent steady-state sound level, which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq\,(h)}$ being the hourly value of the $L_{eq.}$ Figure 2 illustrates how traffic noise levels relate to other sound sources.

The Federal Highway Administration (FHWA) Traffic Noise Model (TNM), version 2.5, was used to predict noise levels, perform noise barrier analysis if needed, and develop noise contours.

[1] The number of decibels is calculated as ten times the base-10 logarithm of the square of the ratio of the mean-square sound pressure (often frequency weighted), and the reference mean-squared sound pressure of 20 µPa, the threshold of human hearing.

Figure 2: Typical Noise Levels

Common Outdoor Activities	Noise Level dBA	Common Indoor Activities
	-110-	Rock Band
Jet Fly-over at 1000 ft		
	-100-	
Gas Lawn Mower at 3 ft		
	-90-	
Diesel Truck at 50 ft, at 50 mph		Food Blender at 1 m (3 ft)
	-80-	Garbage Disposal at 1 m (3 ft)
Noisy Urban Area (Daytime)		
Gas Lawn Mower at 100 ft	-70-	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	-60-	
		Large Business Office
Quiet Urban Daytime	-50-	Dishwasher Next Room
Quiet Urban Nighttime	-40-	Theater, Large Conference Room (Background)
Quiet Suburban Nighttime		
	-30-	Library
Quiet Rural Nighttime		Bedroom at Night, Concert Hall (Background)
	-20-	
		Broadcast/Recording Studio
	-10-	
Lowest Threshold of Human Hearing	-0-	Lowest Threshold of Human Hearing

Source: California Dept. of Transportation Technical Noise Supplement, Oct. 1998, Page 18.

2.2 Traffic Data

The existing (2017) and design year (2037) traffic noise levels for the Existing, No-Build, and Build Alternatives were predicted for 459 noise sensitive sites (each representing 1 noise sensitive receptor) using the FHWA's latest traffic noise modeling software, TNM, version 2.5. The traffic volume, vehicle mix and vehicle speeds were based on information supplied by SCDOT. For both the existing (2017) and the design year (2037), the lesser of either the LOS C or the maximum peak hourly traffic, along with posted speeds, were used as input data in the noise prediction model. This technique allows the maximum volume of vehicles at the highest (posted) speed to be modeled, giving the most conservative (worst-case) estimate of future noise levels. The traffic parameters used in the noise model for prediction of future noise levels are presented in Appendix B.

Conceptual design plans overlaid on project aerials were used in conjunction with field reviews to develop the horizontal and vertical coordinate input data required by TNM. Roadway coordinates were placed down the center of each roadway lane (and shoulders) in both the north and south directions. Receptor locations were identified from both project aerials and from driving the corridor.

3.0 TRAFFIC NOISE ANALYSIS

3.1 Noise Sensitive Sites

A receptor is a discrete or representative location of a noise sensitive site or area for any of the land use categories listed in Table 1.

In determining traffic noise impacts, primary consideration is given to exterior areas where frequent human use occurs, unless no exterior activities are likely based on field observation. All of the noise sensitive sites modeled are within 500 feet of the nearest edge of the roadway, a sufficient distance to identify all potential impacts. The location of each receptor is shown in Appendix A.

Existing land uses within the corridor are mainly residential (Category B) with various Category C (golf course/cemetery), D (church/hospital), and E (hotel/office) land uses in the corridor. There are no Category A land uses in the corridor and there were no unusual features observed that could significantly influence the noise propagation environment.

The FHWA Noise Abatement Criteria (NAC), summarized in Table 1, establish criteria for traffic noise impact assessment with respect to various land uses. If one or more receptors are affected by project-related traffic noise levels that approach or exceed the abatement criteria, or that substantially exceed existing noise levels, then abatement measures must be considered. By SCDOT policy, as approved by FHWA, approaching the criteria means within 1 dBA of the appropriate FHWA abatement criteria. A substantial noise increase is defined as an increase in noise levels of 15 dBA or more in the design year above the existing noise level as a direct result of the transportation improvement project in question. If the abatement criteria is not approached or exceeded, or if projected traffic noise levels do not substantially exceed existing noise levels, abatement measures will not be considered.

Table 1: Noise Abatement Criteria

[Hourly A-Weighted Sound Level – decibels (dBA)]				
Activity Category	Activity $L_{eq(h)}$ [1]		Evaluation Location	Description of Activity Category
	FHWA	SCDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67	66	Exterior	Residential
C[2]	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[2]	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	--	Undeveloped lands that are not permitted.

(Based on Table 1 of 23 CFR Part 772)

[1] *The $L_{eq(h)}$ Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.*
[2] *Includes undeveloped lands permitted for this activity category.*

3.2 Measured Noise Levels

Existing traffic noise levels were measured in the field and then compared against TNM results to verify the accuracy of the traffic noise model. If the modeled and measured levels are within plus or minus 3 dBA of one another, this is an indication that the model is within the accepted level of accuracy.

Field Testing Procedure

On August 20, 2014, HDR staff measured traffic noise at locations that are representative of nearby noise-sensitive sites along I-77, on both sides of the roadway. Traffic noise measurements were conducted in accordance with the FHWA-PD-96-046 Measurement of Highway Related Noise (May 1996). The average meteorological conditions were reported as shown in Table 2 below.

Table 2: Meteorological Conditions

Temperature	≅ 82-93 ° F.
Humidity	≅ 44-69%
Wind	< 6 mph
Conditions	Clear
Barometric Pressure	≅ 29.99 inches

Instrumentation

Noise monitoring was conducted using a Larson Davis 824 Sound Level Meter (SLM). The meter was set at a height of approximately 5 feet for all measurements. The microphone was covered with a windscreen. Table 3 summarizes the instruments used to collect the monitoring data for this noise analysis report.

Table 3: Noise Analysis Instrumentation Summary

Instrument	Make	Model	Serial Number
Sound Analyzer 1	Larson Davis	824	2636
Calibrator	Larson Davis	CAL200	3722

Field Measurement Methods

The SLM was programmed to compute the equivalent sound level (L_{eq}). L_{eq} is the steady-state, A-weighted sound level that contains the same amount of acoustic energy as the actual time varying, A-weighted sound level over the measurement period. L_{eq} is measured in A-weighted decibels (dBA), which closely approximates the range of frequencies a human ear can hear.

The following procedures were used for noise monitoring:

- The duration of the L_{eq} measurements was 15 minutes.
- The SLM was calibrated before and after monitoring. No significant calibration drifts were detected during the analysis.
- The microphone was mounted on a tripod 5 feet above the ground.
- The microphone was covered with a windscreen.
- Traffic was counted manually, classified by vehicle type, and used as input in the validation of the FHWA Traffic Noise Model.
- Vehicle speeds were determined in the field using a radar gun.

Field Measurement Locations

Table 4 describes the locations of each of the validation sites along I-77.

Table 4: Noise Validation Location Summary

Measurement Location	Description
A	≈ 81 feet east of outside edge of I-77 nearest lane
B	≈ 68 feet east of outside edge of I-77 nearest lane
C	≈ 75 feet east of outside edge of I-77 nearest lane
D	≈ 193 feet east of outside edge of I-77 nearest lane
E	≈ 90 feet east of outside edge of I-77 nearest lane

Validation locations are shown in Appendix A, and are within 68 to193 feet of the nearest I-77 lane.

Model Validation Results

The measured and predicted noise levels for each of the monitoring sites selected along the project corridor are presented in Table 5. Each set of predicted and measured data was found to be within the acceptable plus or minus 3 dBA tolerance.

Table 5: Model Validation Results

Measurement Location	L_{Aeq1h} (dBA)		
	Measured	Predicted	Difference
A	65.5	66.8	+1.3
B	67.3	70.3	+3.0
C	69.0	71.9	+2.9
D	72.8	70.0	-2.8
E	77.9	75.2	-2.7

3.3 Modeled Noise Levels

The results of the noise analysis are presented in Table 6. The modeled noise levels reflect the existing field conditions, elevation differences, and the proposed roadway alignment in relation to the noise sensitive sites.

Table 6: Modeled Noise Levels along I-77

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W1	B	149	66	68.5	69.3	70.5	2.0
W2	B	110	66	69.7	70.5	70.4	0.7
W3	B	228	66	65.6	66.4	68.0	2.4
W4	B	454	66	60.5	61.2	63.1	2.6
W5	B	356	66	62.8	63.4	63.4	0.6
W6	C	189	66	65.3	66.0	65.2	-0.1
W7	B	139	66	72.3	73.1	73.2	0.9
W8	B	298	66	67.1	67.8	68.7	1.6
W9	B	454	66	60.2	60.9	61.3	1.1
W10 (2ND LEVEL)	B	448	66	64.0	64.6	65.3	1.3
W11	B	422	66	60.7	61.4	61.8	1.1
W12 (2ND LEVEL)	B	444	66	64.1	64.8	65.5	1.4
W13	B	402	66	61.3	62.0	62.3	1.0
W14 (2ND LEVEL)	B	421	66	64.5	65.1	65.9	1.4
W15	B	476	66	59.9	60.6	61.0	1.1
W16 (2ND LEVEL)	B	491	66	63.4	64.1	64.8	1.4
W17	B	446	66	60.2	61.0	61.6	1.4
W18 (2ND LEVEL)	B	466	66	63.9	64.5	65.2	1.3
W19	B	330	66	62.4	63.2	64.3	1.9
W20	B	285	66	63.3	64.1	64.9	1.6
W21	B	248	66	64.4	65.2	65.5	1.1
W22	B	219	66	64.9	65.7	65.9	1.0
W23	B	166	66	65.7	66.5	66.0	0.3
W24	B	152	66	66.1	66.9	66.5	0.4
W25	B	145	66	66.1	66.9	66.4	0.3
W26	B	144	66	66.3	67.1	66.5	0.2
W27	B	137	66	66.1	66.9	65.9	-0.2
W28	B	134	66	66.7	67.5	66.3	-0.4
W29	B	387	66	60.9	61.7	62.4	1.5
W30	B	345	66	61.9	62.7	63.0	1.1
W31	B	325	66	62.1	62.9	63.1	1.0
W32	B	301	66	62.8	63.6	63.3	0.5
W33	B	304	66	62.7	63.5	63.2	0.5
W34	B	305	66	62.9	63.8	63.3	0.4
W35	B	296	66	63.4	64.2	63.7	0.3
W36	B	362	66	62.5	63.3	63.0	0.5

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W37	B	223	66	65.9	66.8	66.1	0.2
W38	B	330	66	64.6	65.4	64.4	-0.2
W39	B	375	66	64.1	65.0	63.8	-0.3
W40	B	458	66	59.7	60.5	61.7	2.0
W41 (2ND LEVEL)	B	456	66	63.9	64.7	66.2	2.3
W42	B	482	66	59.3	60.1	61.5	2.2
W43 (2ND LEVEL)	B	479	66	63.5	64.3	65.8	2.3
W44	B	398	66	60.8	61.6	63.1	2.3
W45 (2ND LEVEL)	B	394	66	65.2	66.0	67.3	2.1
W46	B	416	66	60.5	61.3	62.7	2.2
W47 (2ND LEVEL)	B	415	66	64.8	65.6	67.0	2.2
W48	B	370	66	61.5	62.3	63.7	2.2
W49 (2ND LEVEL)	B	371	66	65.7	66.6	67.7	2.0
W50	B	402	66	60.9	61.7	63.1	2.2
W51	B	454	66	60.0	60.8	62.1	2.1
W52	B	475	66	59.6	60.4	61.7	2.1
W53	B	258	66	64.6	65.4	67.2	2.6
W54	B	446	66	60.3	61.1	62.5	2.2
W55	E	139	71	65.4	66.0	65.6	0.2
W56	C	133	66	71.2	71.7	72.7	1.5
W57	D	464	71	41.8	42.3	43.5	1.7
W58	B	177	66	68.2	68.8	70.7	2.5
W59	B	350	66	61.9	62.5	64.3	2.4
W60	B	386	66	60.9	61.5	62.9	2.0
W61 (2ND LEVEL)	B	388	66	65.2	65.9	67.5	2.3
W62	B	453	66	59.7	60.2	61.8	2.1
W63 (2ND LEVEL)	B	453	66	64.1	64.7	66.4	2.3
W64	B	390	66	60.8	61.4	62.9	2.1
W65 (2ND LEVEL)	B	389	66	65.2	65.9	67.5	2.3
W66	B	457	66	59.4	60.0	61.6	2.2
W67 (2ND LEVEL)	B	459	66	64.0	64.6	66.2	2.2
W68	B	272	66	63.3	63.9	65.4	2.1
W69 (2ND LEVEL)	B	274	66	67.5	68.2	69.7	2.2
W70	B	248	66	64.1	64.7	66.0	1.9
W71 (2ND LEVEL)	B	252	66	68.1	68.7	70.2	2.1
W72	B	337	66	61.9	62.5	64.0	2.1
W73 (2ND LEVEL)	B	334	66	66.3	66.9	68.5	2.2

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W74	B	315	66	62.4	63.0	64.5	2.1
W75 (2ND LEVEL)	B	310	66	66.7	67.4	69.0	2.3
W76	B	414	66	60.5	61.0	62.4	1.9
W77 (2ND LEVEL)	B	416	66	64.8	65.4	67.0	2.2
W78	B	397	66	60.9	61.4	62.7	1.8
W79 (2ND LEVEL)	B	398	66	65.1	65.7	67.4	2.3
W80	B	482	66	59.3	59.8	61.3	2.0
W81 (2ND LEVEL)	B	481	66	63.5	64.2	65.9	2.4
W82	B	458	66	59.8	60.3	61.6	1.8
W83 (2ND LEVEL)	B	456	66	64.0	64.6	66.3	2.3
W84	B	349	66	61.4	62.0	63.7	2.3
W85 (2ND LEVEL)	B	347	66	65.8	66.5	68.2	2.4
W86	B	325	66	62.0	62.6	64.4	2.4
W87 (2ND LEVEL)	B	321	66	66.3	67.0	68.7	2.4
W88	B	303	66	62.6	63.2	65.0	2.4
W89 (2ND LEVEL)	B	298	66	66.8	67.4	69.1	2.3
W90	B	276	66	63.3	63.9	65.8	2.5
W91 (2ND LEVEL)	B	272	66	67.4	68.0	69.7	2.3
W92	B	410	66	60.5	61.0	62.3	1.8
W93 (2ND LEVEL)	B	405	66	64.7	65.3	67.1	2.4
W94	B	385	66	60.6	61.2	62.9	2.3
W95 (2ND LEVEL)	B	376	66	65.2	65.8	67.6	2.4
W96	B	361	66	61.1	61.7	63.5	2.4
W97 (2ND LEVEL)	B	358	66	65.5	66.1	68.0	2.5
W98	B	336	66	61.7	62.3	64.0	2.3
W99 (2ND LEVEL)	B	330	66	66.1	66.8	68.5	2.4
W100	B	260	66	63.8	64.4	66.3	2.5
W101 (2ND LEVEL)	B	265	66	67.6	68.2	69.8	2.2
W102	B	260	66	63.8	64.4	66.1	2.3
W103 (2ND LEVEL)	B	262	66	67.6	68.3	69.8	2.2
W104	B	260	66	63.9	64.5	66.1	2.2
W105 (2ND LEVEL)	B	264	66	67.6	68.2	69.7	2.1
W106	B	261	66	63.9	64.5	66.1	2.2
W107 (2ND LEVEL)	B	268	66	67.6	68.2	69.6	2.0
W108	B	336	66	61.8	62.4	64.1	2.3
W109 (2ND LEVEL)	B	338	66	66.0	66.6	68.3	2.3
W110	B	338	66	61.9	62.5	64.1	2.2

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W111 (2ND LEVEL)	B	338	66	65.9	66.5	68.3	2.4
W112	B	335	66	62.0	62.5	64.1	2.1
W113 (2ND LEVEL)	B	337	66	65.9	66.5	68.3	2.4
W114	B	343	66	62.0	62.5	63.8	1.8
W115 (2ND LEVEL)	B	339	66	65.9	66.5	68.2	2.3
W116	B	288	66	63.5	64.1	64.9	1.4
W117 (2ND LEVEL)	B	290	66	67.0	67.6	69.0	2.0
W118	B	325	66	62.6	63.2	64.0	1.4
W119 (2ND LEVEL)	B	324	66	66.3	66.9	68.3	2.0
W120	B	367	66	61.9	62.4	63.1	1.2
W121 (2ND LEVEL)	B	367	66	65.4	66.0	67.5	2.1
W122	B	404	66	61.1	61.6	62.4	1.3
W123 (2ND LEVEL)	B	407	66	64.7	65.3	66.8	2.1
W124	B	298	66	63.5	64.1	64.8	1.3
W125 (2ND LEVEL)	B	301	66	66.8	67.4	68.7	1.9
W126	B	342	66	62.4	62.9	63.7	1.3
W127 (2ND LEVEL)	B	342	66	65.9	66.5	67.9	2.0
W128	B	379	66	61.7	62.3	63.0	1.3
W129 (2ND LEVEL)	B	379	66	65.2	65.8	67.2	2.0
W130	B	422	66	60.8	61.3	62.2	1.4
W131 (2ND LEVEL)	B	421	66	64.5	65.1	66.5	2.0
W132	B	220	66	65.6	66.2	66.9	1.3
W133 (2ND LEVEL)	B	222	66	68.8	69.5	70.3	1.5
W134	B	263	66	64.4	65.0	65.7	1.3
W135 (2ND LEVEL)	B	264	66	67.7	68.3	69.2	1.5
W136	B	298	66	63.5	64.1	64.9	1.4
W137 (2ND LEVEL)	B	300	66	66.8	67.4	68.5	1.7
W138	B	342	66	62.5	63.1	63.9	1.4
W139 (2ND LEVEL)	B	338	66	66.0	66.6	67.8	1.8
W140	B	235	66	65.4	66.0	66.7	1.3
W141 (2ND LEVEL)	B	239	66	68.4	69.0	69.8	1.4
W142	B	274	66	64.3	64.9	65.6	1.3
W143 (2ND LEVEL)	B	277	66	67.4	68.0	68.9	1.5
W144	B	318	66	63.0	63.5	64.5	1.5
W145 (2ND LEVEL)	B	316	66	66.5	67.1	68.1	1.6
W146	B	358	66	62.4	62.9	63.7	1.3
W147 (2ND LEVEL)	B	355	66	65.7	66.3	67.4	1.7

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W148	B	478	66	59.8	60.3	61.4	1.6
W149 (2ND LEVEL)	B	476	66	63.6	64.2	65.2	1.6
W150	B	103	66	70.4	71.2	71.4	1.0
W151	B	115	66	69.9	70.6	71.0	1.1
W152	B	181	66	67.7	68.4	69.1	1.4
W153	B	114	66	70.8	71.6	72.0	1.2
W154	B	189	66	66.5	67.1	67.6	1.1
W155	B	252	66	65.2	65.8	66.5	1.3
W156	B	324	66	64.2	64.8	65.8	1.6
W157	B	347	66	64.1	64.7	65.8	1.7
W158	B	233	66	66.4	67.1	68.2	1.8
W159	B	319	66	65.0	65.7	66.9	1.9
W160	B	326	66	63.9	64.4	65.1	1.2
W161	B	399	66	62.9	63.4	64.2	1.3
W162	B	461	66	62.2	62.7	63.7	1.5
W163	B	494	66	62.0	62.5	63.6	1.6
W164	B	420	66	63.1	63.7	64.9	1.8
W165	B	414	66	63.7	64.4	65.5	1.8
W166	B	449	66	63.5	64.1	65.2	1.7
W167	B	456	66	63.4	64.0	65.2	1.8
W168	B	382	66	65.2	65.8	66.9	1.7
W169	B	364	66	65.6	66.2	67.3	1.7
W170	B	401	66	64.3	64.9	66.1	1.8
W171	B	435	66	63.4	64.0	65.3	1.9
W172	B	462	66	62.8	63.4	64.8	2.0
W173	B	237	66	68.1	68.8	70.5	2.4
W174	B	420	66	62.9	63.5	65.0	2.1
W175	B	322	66	65.1	65.7	67.4	2.3
W176	B	161	66	70.3	71.0	72.6	2.3
W177	B	79	66	73.8	74.5	75.1	1.3
W178	B	59	66	74.9	75.7	76.7	1.8
W179	B	127	66	71.8	72.6	73.7	1.9
W180	B	193	66	69.7	70.3	71.9	2.2
W181	B	247	66	68.1	68.7	70.5	2.4
W182	B	311	66	66.0	66.6	68.6	2.6
W183	B	363	66	64.4	65.0	66.8	2.4
W184	B	423	66	63.2	63.8	65.6	2.4

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
W185	B	387	66	64.0	64.6	66.3	2.3
W186	B	449	66	62.7	63.3	64.6	1.9
W187	B	408	66	60.8	61.4	63.7	2.9
W188	B	348	66	61.3	61.9	64.4	3.1
W189	B	272	66	61.9	62.5	65.1	3.2
W190	B	236	66	62.3	63.0	65.8	3.5
W191	B	210	66	62.8	63.5	66.5	3.7
W192	B	199	66	62.9	63.5	66.9	4.0
W193	B	187	66	63.1	63.8	67.3	4.2
W194	B	475	66	60.2	60.8	63.1	2.9
W195	B	474	66	59.5	60.0	63.1	3.6
W196	B	353	66	60.6	61.2	64.6	4.0
W197	B	381	66	60.4	61.0	64.8	4.4
W198	B	412	66	60.1	60.7	65.0	4.9
W199	B	439	66	59.9	60.6	65.2	5.3
W200	B	409	66	60.8	61.4	66.5	5.7
W201	B	371	66	61.8	62.4	67.8	6.0
W202	B	394	66	61.9	62.5	68.6	6.7
E1	B	324	66	66.9	67.4	69.5	2.6
E2	B	281	66	68.1	68.4	70.9	2.8
E3	B	133	66	72.5	72.7	74.8	2.3
E4	B	291	66	67.2	67.6	69.9	2.7
E5	B	285	66	67.4	67.8	70.0	2.6
E6	B	445	66	63.3	63.7	65.5	2.2
E7	B	264	66	67.7	68.0	70.3	2.6
E8	B	132	66	72.6	72.9	74.6	2.0
E9	B	255	66	67.9	68.2	70.4	2.5
E10	B	212	66	69.4	69.6	71.8	2.4
E11	B	346	66	65.6	65.8	67.8	2.2
E12	B	344	66	65.7	66.0	67.9	2.2
E13	B	227	66	68.5	68.7	70.9	2.4
E14 (2ND LEVEL)	B	226	66	71.2	71.5	72.8	1.6
E15	B	238	66	68.2	68.4	70.6	2.4
E16 (2ND LEVEL)	B	239	66	70.9	71.1	72.4	1.5
E17	B	256	66	67.5	67.7	69.9	2.4
E18 (2ND LEVEL)	B	256	66	70.5	70.8	72.1	1.6
E19	B	269	66	67.2	67.4	69.5	2.3

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E20 (2ND LEVEL)	B	270	66	70.2	70.5	71.7	1.5
E21	B	322	66	66.1	66.3	68.2	2.1
E22 (2ND LEVEL)	B	321	66	69.4	69.6	71.0	1.6
E23	B	371	66	64.9	65.1	66.9	2.0
E24 (2ND LEVEL)	B	372	66	68.5	68.8	70.2	1.7
E25	B	405	66	64.0	64.3	66.0	2.0
E26 (2ND LEVEL)	B	406	66	67.9	68.2	69.6	1.7
E27	B	430	66	63.4	63.7	65.4	2.0
E28 (2ND LEVEL)	B	432	66	67.4	67.7	69.2	1.8
E29	B	275	66	67.0	67.3	69.4	2.4
E30 (2ND LEVEL)	B	279	66	70.1	70.3	71.7	1.6
E31	B	293	66	66.6	66.8	68.9	2.3
E32 (2ND LEVEL)	B	296	66	69.7	70.0	71.4	1.7
E33	B	310	66	66.2	66.4	68.4	2.2
E34 (2ND LEVEL)	B	313	66	69.4	69.7	71.0	1.6
E35	B	323	66	65.9	66.1	68.0	2.1
E36 (2ND LEVEL)	B	325	66	69.2	69.5	70.8	1.6
E37	B	314	66	66.1	66.3	68.1	2.0
E38 (2ND LEVEL)	B	312	66	69.4	69.7	70.8	1.4
E39	B	347	66	65.4	65.6	67.2	1.8
E40 (2ND LEVEL)	B	349	66	68.8	69.1	70.2	1.4
E41	B	346	66	65.3	65.5	67.2	1.9
E42 (2ND LEVEL)	B	346	66	68.8	69.1	70.3	1.5
E43	B	376	66	64.7	64.9	66.5	1.8
E44 (2ND LEVEL)	B	374	66	68.4	68.6	69.8	1.4
E45	B	373	66	64.8	65.0	66.5	1.7
E46 (2ND LEVEL)	B	373	66	68.4	68.7	69.8	1.4
E47	B	409	66	63.9	64.1	65.6	1.7
E48 (2ND LEVEL)	B	410	66	67.7	67.9	69.2	1.5
E49	B	412	66	63.7	64.0	65.3	1.6
E50 (2ND LEVEL)	B	414	66	67.6	67.8	69.1	1.5
E51	B	444	66	63.1	63.3	64.8	1.7
E52 (2ND LEVEL)	B	444	66	67.1	67.3	68.6	1.5
E53	B	181	66	69.7	69.9	71.7	2.0
E54 (2ND LEVEL)	B	180	66	72.5	72.7	73.4	0.9
E55	B	195	66	69.2	69.3	71.1	1.9
E56 (2ND LEVEL)	B	195	66	72.0	72.2	72.9	0.9

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E57	B	214	66	68.5	68.7	70.4	1.9
E58 (2ND LEVEL)	B	214	66	71.4	71.6	72.3	0.9
E59	B	226	66	68.1	68.3	69.9	1.8
E60 (2ND LEVEL)	B	225	66	71.1	71.3	72.0	0.9
E61	B	238	66	67.8	68.0	69.8	2.0
E62 (2ND LEVEL)	B	235	66	70.9	71.1	72.1	1.2
E63	B	253	66	67.3	67.5	69.3	2.0
E64 (2ND LEVEL)	B	251	66	70.5	70.7	71.7	1.2
E65	B	275	66	66.8	67.0	68.6	1.8
E66 (2ND LEVEL)	B	276	66	69.9	70.2	71.1	1.2
E67	B	287	66	66.5	66.7	68.2	1.7
E68 (2ND LEVEL)	B	287	66	69.7	69.9	70.8	1.1
E69	B	388	66	64.3	64.5	65.9	1.6
E70 (2ND LEVEL)	B	387	66	68.0	68.2	69.3	1.3
E71	B	369	66	64.6	64.8	66.1	1.5
E72 (2ND LEVEL)	B	369	66	68.3	68.5	69.6	1.3
E73	B	357	66	64.9	65.1	66.4	1.5
E74 (2ND LEVEL)	B	356	66	68.5	68.7	69.7	1.2
E75	B	341	66	65.3	65.5	66.8	1.5
E76 (2ND LEVEL)	B	339	66	68.8	69.0	69.9	1.1
E77	B	436	66	63.2	63.4	64.7	1.5
E78 (2ND LEVEL)	B	436	66	67.1	67.3	68.5	1.4
E79	B	422	66	63.5	63.7	64.8	1.3
E80 (2ND LEVEL)	B	422	66	67.2	67.5	68.7	1.5
E81	B	409	66	63.7	63.9	65.1	1.4
E82 (2ND LEVEL)	B	407	66	67.5	67.8	68.8	1.3
E83	B	401	66	63.8	64.0	65.1	1.3
E84 (2ND LEVEL)	B	400	66	67.5	67.8	68.9	1.4
E85	D	306	71	44.4	44.6	45.1	0.7
E86	E	368	71	69.0	69.6	70.0	1.0
E87	B	171	66	69.9	70.6	70.8	0.9
E88	B	227	66	68.4	69.0	69.3	0.9
E89	B	116	66	70.2	70.9	71.2	1.0
E90	D	87	71	49.7	50.5	50.4	0.7
E91	B	373	66	63.6	64.4	64.3	0.7
E92	B	391	66	62.6	63.3	63.2	0.6
E93	B	360	66	62.7	63.5	63.4	0.7

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E94	B	427	66	61.3	62.0	61.9	0.6
E95	B	343	66	63.7	64.3	65.0	1.3
E96	B	107	66	69.0	69.7	70.5	1.5
E97	B	405	66	61.7	62.4	63.0	1.3
E98	B	290	66	65.2	66.1	65.2	0.0
E99	B	362	66	63.5	64.3	63.5	0.0
E100	B	401	66	61.1	61.8	62.6	1.5
E101	B	155	66	69.1	69.2	70.2	1.1
E102	B	137	66	68.8	68.9	69.9	1.1
E103	B	113	66	69.2	69.4	70.7	1.5
E104	B	98	66	69.5	69.6	71.4	1.9
E105	B	96	66	69.1	69.3	70.9	1.8
E106	B	79	66	69.5	69.8	71.6	2.1
E107	B	305	66	63.8	64.1	64.3	0.5
E108	B	293	66	64.4	64.5	65.3	0.9
E109	B	298	66	64.0	64.2	65.0	1.0
E110	B	250	66	64.8	65.0	66.1	1.3
E111	B	229	66	64.9	65.2	66.6	1.7
E112	B	162	66	66.0	66.3	68.1	2.1
E113	B	387	66	60.5	60.9	61.5	1.0
E114	B	334	66	61.2	61.6	62.2	1.0
E115	E	350	71	61.6	62.0	62.2	0.6
E116	E	355	71	63.1	63.5	64.6	1.5
E117	B	407	66	61.6	61.8	63.0	1.4
E118 (2ND LEVEL)	B	409	66	64.7	64.9	66.8	2.1
E119	B	436	66	60.7	61.0	62.2	1.5
E120 (2ND LEVEL)	B	437	66	64.1	64.4	66.3	2.2
E121	B	377	66	61.9	62.1	63.4	1.5
E122 (2ND LEVEL)	B	377	66	65.1	65.4	67.3	2.2
E123	B	406	66	61.3	61.5	62.8	1.5
E124 (2ND LEVEL)	B	404	66	64.7	64.9	66.9	2.2
E125	B	228	66	66.2	66.3	67.7	1.5
E126 (2ND LEVEL)	B	226	66	68.4	68.7	70.4	2.0
E127	B	249	66	65.5	65.7	67.1	1.6
E128 (2ND LEVEL)	B	248	66	67.9	68.1	69.9	2.0
E129	B	305	66	63.8	64.0	65.3	1.5
E130 (2ND LEVEL)	B	307	66	66.5	66.8	68.7	2.2

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E131	B	333	66	63.0	63.2	64.6	1.6
E132 (2ND LEVEL)	B	334	66	66.0	66.3	68.2	2.2
E133	B	211	66	66.7	66.8	68.3	1.6
E134 (2ND LEVEL)	B	211	66	69.0	69.2	70.9	1.9
E135	B	233	66	66.0	66.2	67.6	1.6
E136 (2ND LEVEL)	B	235	66	68.3	68.5	70.3	2.0
E137	B	295	66	64.1	64.3	65.7	1.6
E138 (2ND LEVEL)	B	300	66	66.7	66.9	68.9	2.2
E139	B	324	66	63.3	63.5	64.9	1.6
E140 (2ND LEVEL)	B	326	66	66.2	66.4	68.4	2.2
E141	B	451	66	60.8	61.1	62.0	1.2
E142 (2ND LEVEL)	B	448	66	64.0	64.3	66.3	2.3
E143	B	420	66	61.5	61.8	62.4	0.9
E144 (2ND LEVEL)	B	418	66	64.5	64.7	66.8	2.3
E145	B	352	66	62.5	62.7	64.2	1.7
E146 (2ND LEVEL)	B	352	66	65.8	66.1	68.2	2.4
E147	B	377	66	61.9	62.2	63.7	1.8
E148 (2ND LEVEL)	B	374	66	65.4	65.7	67.8	2.4
E149	B	429	66	60.8	61.0	62.5	1.7
E150 (2ND LEVEL)	B	431	66	64.5	64.8	66.8	2.3
E151	B	454	66	60.3	60.5	62.0	1.7
E152 (2ND LEVEL)	B	453	66	64.1	64.4	66.4	2.3
E153	B	330	66	63.1	63.3	65.0	1.9
E154 (2ND LEVEL)	B	330	66	66.2	66.5	68.6	2.4
E155	B	355	66	62.4	62.7	64.3	1.9
E156 (2ND LEVEL)	B	354	66	65.8	66.1	68.2	2.4
E157	B	399	66	61.4	61.6	63.1	1.7
E158 (2ND LEVEL)	B	398	66	65.0	65.3	67.4	2.4
E159	B	429	66	60.8	61.0	62.5	1.7
E160 (2ND LEVEL)	B	427	66	64.4	64.7	66.8	2.4
E161	B	292	66	64.2	64.5	65.6	1.4
E162 (2ND LEVEL)	B	293	66	66.8	67.1	69.2	2.4
E163	B	308	66	63.8	64.1	65.1	1.3
E164 (2ND LEVEL)	B	308	66	66.5	66.8	69.0	2.5
E165	B	360	66	62.2	62.5	63.9	1.7
E166 (2ND LEVEL)	B	361	66	65.5	65.8	67.9	2.4
E167	B	380	66	62.2	62.5	63.3	1.1

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E168 (2ND LEVEL)	B	377	66	65.3	65.5	67.6	2.3
E169	B	269	66	64.7	64.9	66.3	1.6
E170 (2ND LEVEL)	B	270	66	67.3	67.6	69.8	2.5
E171	B	286	66	64.2	64.4	65.8	1.6
E172 (2ND LEVEL)	B	284	66	67.0	67.3	69.5	2.5
E173	B	338	66	62.9	63.2	64.3	1.4
E174 (2ND LEVEL)	B	341	66	65.9	66.2	68.3	2.4
E175	B	361	66	62.4	62.7	63.8	1.4
E176 (2ND LEVEL)	B	361	66	65.5	65.8	68.0	2.5
E177	B	414	66	61.2	61.5	62.6	1.4
E178 (2ND LEVEL)	B	416	66	64.7	64.9	67.0	2.3
E179	B	417	66	61.3	61.6	62.3	1.0
E180 (2ND LEVEL)	B	419	66	64.6	64.8	67.0	2.4
E181	B	423	66	61.1	61.5	62.3	1.2
E182 (2ND LEVEL)	B	424	66	64.5	64.8	66.9	2.4
E183	B	425	66	61.1	61.5	62.3	1.2
E184 (2ND LEVEL)	B	426	66	64.5	64.8	66.9	2.4
E185	B	471	66	60.5	60.9	61.5	1.0
E186 (2ND LEVEL)	B	472	66	63.7	64.0	66.0	2.3
E187	B	472	66	60.4	60.7	61.5	1.1
E188 (2ND LEVEL)	B	473	66	63.6	63.9	66.0	2.4
E189	B	473	66	60.3	60.6	61.2	0.9
E190 (2ND LEVEL)	B	472	66	63.7	64.0	66.0	2.3
E191	B	476	66	60.2	60.6	61.4	1.2
E192 (2ND LEVEL)	B	477	66	63.7	63.9	66.0	2.3
E193	B	350	66	62.7	63.0	64.0	1.3
E194 (2ND LEVEL)	B	348	66	65.9	66.1	68.3	2.4
E195	B	340	66	63.0	63.3	64.3	1.3
E196 (2ND LEVEL)	B	333	66	66.1	66.4	68.6	2.5
E197	B	305	66	63.9	64.1	65.4	1.5
E198 (2ND LEVEL)	B	303	66	66.7	67.0	69.2	2.5
E199	B	287	66	64.2	64.5	65.9	1.7
E200 (2ND LEVEL)	B	284	66	67.2	67.4	69.6	2.4
E201	B	390	66	61.7	62.1	63.1	1.4
E202 (2ND LEVEL)	B	387	66	65.2	65.5	67.6	2.4
E203	B	375	66	62.1	62.4	63.4	1.3
E204 (2ND LEVEL)	B	371	66	65.5	65.8	67.9	2.4

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E205	B	340	66	62.9	63.1	64.3	1.4
E206 (2ND LEVEL)	B	337	66	66.1	66.4	68.6	2.5
E207	B	324	66	63.2	63.5	64.8	1.6
E208 (2ND LEVEL)	B	317	66	66.5	66.8	69.0	2.5
E209	B	452	66	60.2	60.5	61.8	1.6
E210	B	346	66	62.7	63.0	64.2	1.5
E211	B	300	66	64.3	64.5	65.7	1.4
E212	B	330	66	63.6	63.9	65.0	1.4
E213	B	408	66	61.6	61.9	63.0	1.4
E214	B	424	66	61.3	61.6	62.7	1.4
E215	B	372	66	62.7	63.1	64.1	1.4
E216	B	360	66	63.2	63.6	64.6	1.4
E217	B	443	66	61.2	61.5	62.6	1.4
E218	B	361	66	63.2	63.6	64.7	1.5
E219	B	405	66	62.1	62.4	63.5	1.4
E220	B	450	66	61.0	61.4	62.4	1.4
E221	B	486	66	60.3	60.7	61.7	1.4
E222	B	391	66	62.0	62.4	63.5	1.5
E223	B	433	66	61.1	61.4	62.6	1.5
E224	B	479	66	60.2	60.5	61.6	1.4
E225	B	399	66	61.8	62.1	63.3	1.5
E226	B	437	66	60.9	61.3	62.4	1.5
E227	B	487	66	59.9	60.3	61.4	1.5
E228	B	401	66	61.5	61.8	63.0	1.5
E229	B	438	66	60.7	61.0	62.2	1.5
E230	B	485	66	59.8	60.1	61.4	1.6
E231	B	407	66	61.4	61.7	62.9	1.5
E232	B	441	66	60.7	61.0	62.2	1.5
E233	B	495	66	59.7	60.0	61.3	1.6
E234	B	380	66	62.2	62.5	63.4	1.2
E235	B	412	66	61.5	61.8	62.8	1.3
E236	B	467	66	60.5	60.8	61.9	1.4
E237	B	453	66	61.3	61.6	62.7	1.4
E238	B	489	66	60.5	60.8	62.0	1.5
E239	B	264	66	67.2	67.4	67.8	0.6
E240	B	154	66	71.7	72.0	72.3	0.6
E241	B	131	66	72.7	73.1	73.5	0.8

Noise Receptor	NAC Category	Approximate Distance from Closest Shoulder (feet)	SCDOT NAC dBA	2017 Existing dBA	2037 No-Build dBA	2037 Build dBA	Difference between Existing/Build dBA
E242	B	101	66	69.9	70.2	71.4	1.5
E243	B	126	66	72.1	72.4	73.9	1.8
E244	B	101	66	73.1	73.4	75.1	2.0
E245	B	86	66	73.9	74.1	75.9	2.0
E246	B	233	66	67.0	67.3	69.2	2.2
E247	B	211	66	67.9	68.2	70.3	2.4
E248	B	183	66	69.0	69.3	71.5	2.5
E249	B	120	66	72.4	72.7	74.4	2.0
E250	B	74	66	74.7	75.0	76.7	2.0
E251	B	100	66	73.2	73.5	75.4	2.2
E252	B	396	66	65.2	65.5	65.3	0.1
E253	B	370	66	65.8	66.1	65.9	0.1
E254	B	380	66	65.6	66.0	66.3	0.7
E255	B	385	66	65.0	65.4	66.1	1.1
E256	B	380	66	64.1	64.6	65.1	1.0
E257	B	386	66	63.5	64.1	64.7	1.2

3.4 Noise Impact Analysis

Currently (2017 Existing), 155 sensitive receptors approach or exceed the NAC; 452 of the 459 noise sensitive sites can be expected to experience noise level increases as a result of the proposed (2037) Build Alternative.

As a result of the (2037) "No-Build" Alternative, 181 sensitive receptors approach or exceed the NAC. Traffic noise levels resulting from the design year (2037) No-Build alternative are expected to increase from 0.1 to 0.9 dBA over the (2017) Existing Alternative.

As a result of the (2037) "Build" Alternative, 249 sensitive receptors approach or exceed the NAC. Traffic noise levels resulting from the design year (2037) Build alternative are expected to increase from 0.1 to 6.7 dBA.

Table 7 lists a summary of the noise impacts associated with the proposed project.

Table 7: Modeled Noise Impacts along I-77

Alternative	# of Impacts	Type of Impact
2017 Existing	155	Approach/Exceed NAC
2037 No-Build	181	Approach/Exceed NAC
2037 Build	249	Approach/Exceed NAC

Noise impacts also occur when future noise levels are predicted to increase substantially over existing noise levels even if resulting noise levels do not approach or exceed the FHWA NAC. A substantial noise increase occurs when the existing noise level is predicted to increase by 15 dBA or more as a result of the proposed transportation improvement project. These impacts occur primarily when proposed roadway improvements are planned near noise sensitive areas, where existing noise levels are relatively low. Review of the modeled traffic noise levels presented in Table 6 indicates the proposed project will not cause substantial increases in traffic noise levels.

3.5 Noise Abatement Measures

When traffic noise impacts are identified, FHWA and SCDOT require that noise abatement shall be evaluated for feasibility and reasonableness. In accordance with SCDOT Policy, the following traffic noise measures will be considered as a means to reduce or eliminate traffic noise impacts.

- Traffic Management Measures: Traffic management measures such as traffic control devices, signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations were considered as possible traffic noise impact abatement

measures. The purpose of the I-77 Roadway Widening and Improvement project is to increase the functional capacity of the highway. Prohibition of truck traffic, traffic control devices, speed limit reduction, etc. would diminish the functional capacity of the highway facility and are not considered practical.

- Alteration of Horizontal or Vertical Alignments: Alignment modifications generally involve orienting and/or siting the roadway sufficient distances from noise sensitive areas so as to minimize noise impacts. This project is being built to maximize use of available right-of-way, through an existing corridor, with little to no room for alignment modifications on either side. Therefore, additional alignment modifications are not considered a feasible or reasonable measure.

- Acquisition of Property Rights (either in fee or lesser interest) for Construction of Noise Barriers: Existing right-of-way is sufficient for evaluation of noise barriers.

- Buffer Zones: Buffer zones are typically not practical and/or cost effective for noise mitigation due to the substantial amount of right-of-way required, and are not a feasible noise mitigation measure for this project. Furthermore, if the acquisition of a suitable buffer zone had been feasible, the associated costs would exceed the SCDOT Policy reasonable abatement cost threshold per benefited receptor.

- Noise Insulation of Public Use or Nonprofit Institutional Structures: Noise impacts are not predicted at any of these types of structures in the project area.

- Construction of Noise Barriers: Noise barriers reduce noise levels by blocking the sound path between a roadway and noise sensitive area. A noise barrier evaluation was performed for this project to determine whether feasible and reasonable barriers could be constructed at the noise sensitive sites predicted to approach or exceed the Noise Abatement Criteria or substantially increase above exiting levels as a result of the Build alternative.

3.5.1 Noise Barriers

When considering noise barriers, the following feasibility and reasonableness factors must be evaluated relative to each noise barrier.

“Feasibility” primarily addresses engineering considerations (physical constraints affecting barrier construction, ability to provide a substantial noise reduction given certain design and construction factors, safety factors, access factors, right-of-way factors, maintenance factors, drainage factors, and utility factors).

Acoustic Feasibility. It is SCDOT's policy that a noise reduction of 5 dBA must be achieved for 75% of those receivers determined to be impacted for the noise abatement measure to be acoustically feasible.

"Reasonableness" addresses the use of common sense and good judgment when considering noise abatement. Factors such as the viewpoint of benefited receptors, cost of abatement, visual impacts, absolute noise levels, change in predicted noise levels, and adjacent development are all important. SCDOT has three mandatory reasonableness factors that must be met for a noise abatement measure to be considered reasonable. The three mandatory reasonableness factors must be collectively achieved in order for a noise abatement measure to be deemed reasonable. Failure to achieve any one of the reasonable factors will results in the noise abatement measure being deemed not reasonable.

1. *Noise reduction design goal.* It is SCDOT's policy that noise reduction of at least 8 dBA must be achieved for 80% of those receivers determined to be in the first two building rows and considered benefited. The first two building rows will only be applicable if they are within 500 feet from the edge of the pavement noise source.

2. *Cost effectiveness.* The allowable cost of the abatement will be based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost will be divided by the number of benefited receptors. If the cost per benefited receptor is less than $30,000 then the barrier is determined to be cost effective.

3. *Viewpoints of the property owners and residents of the benefited receptors.* If a noise barrier meets all of the feasible and reasonable criteria listed above, SCDOT shall solicit the viewpoints of all of the benefited receptors and document a decision on either desiring or not desiring the noise abatement measure. The viewpoints will be solicited as part of the public involvement process through a voting procedure. The method of obtaining votes is determined on a project-by-project basis, but may include flyers, door-to-door surveys, a public meeting, or a mailing. The voting ballot will explain that the noise abatement shall be considered unless a majority (greater than 50% of the benefited receptors) of votes not desiring noise abatement is received.

   For non-owner occupied benefited receptors, both the property owner and the renter may vote on whether the noise abatement is desired. One owner ballot and one resident ballot shall be solicited for each benefited receptor. Home owner associations or local governments cannot be given authority over the desirability for abatement. The viewpoints of the abatement must be solicited from the property owners and tenants.

Sixteen areas were evaluated for noise barriers. All evaluated barriers are shown on the figures in Appendix A. The noise abatement measures were found to be not feasible and reasonable per SCDOT guidelines (see Section 3.5) and are not proposed.

Based on the noise analysis performed to date, there appears to be no feasible and reasonable solutions available to mitigate the noise impacts at the locations identified.

Noise Sensitive Area A

Traffic noise impacts are projected to occur in Noise Sensitive Area (NSA) A. An approximately 600-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 600-foot long barrier provides a reduction that varies from 1.7 dBA to 13.2 dBA.

The approximately 600-foot long, 25 foot high modeled Barrier A is unable to achieve a 5 dBA reduction for at least 75% or more impacted receptors. Per SCDOT guidance, Barrier A is not considered feasible, and is not proposed.

Results of the noise barrier analysis are summarized in Table 8.

Table 8: Summary of Noise Barrier Analysis – Barrier A

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier A														
W1	Residential	B	70.5	59.8	10.7	1	1	1	1	67%	600	15,000	$525,000	Note 1
W2	Residential	B	70.4	57.2	13.2	1	1	1	1					
W3	Residential	B	68.0	63.5	4.5	1	1	0	0					
W4	Residential	B	63.1	61.4	1.7	1	0	0	0					
						4	3	2	2					

Note 1: SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustical feasible.

Noise Sensitive Area B

Traffic noise impacts are projected to occur in NSA B. An approximately 744-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 744-foot long barrier provides a reduction that varies from 4.5 dBA to 4.9 dBA.

The approximately 744-foot long, 25 foot high modeled Barrier B is unable to achieve a 5 dBA reduction for at least 75% or more impacted receptors. Per SCDOT guidance, Barrier B is not considered feasible, and is not proposed.

Results of the noise barrier analysis are summarized in Table 9.

Table 9: Summary of Noise Barrier Analysis – Barrier B

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier B														
W7	Residential	B	73.5	69.0	4.5	1	1	0	0	0%	744	18,600	$651,000	Note 1
W8	Residential	B	68.9	64.0	4.9	1	1	0	0					
						2	2	0	0					

Note 1: SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustical feasible.

Noise Sensitive Area C

Traffic noise impacts are projected to occur in NSA C. An approximately 4,272-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 4,272-foot long barrier provides a reduction that varies from 2.0 dBA to 8.0 dBA.

The approximately 4,272-foot long, 25 foot high modeled Barrier C is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier C only provides an 8 dBA reduction to 8% of the benefited receptors. Per SCDOT guidance, Barrier C is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 10.

Table 10: Summary of Noise Barrier Analysis – Barrier C

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier C														
W9	Residential	B	61.6	58.7	2.9	1	0	0	0	93%	4,272	106,800	$3,738,000	$149,520
W10	Residential	B	65.7	61.2	4.5	1	0	0	0					
W11	Residential	B	62.3	58.8	3.5	1	0	0	0					
W12	Residential	B	65.9	61.1	4.8	1	0	0	0					
W13	Residential	B	62.8	59.1	3.7	1	0	0	0					
W14	Residential	B	66.3	61.3	5.0	1	1	1	0					
W15	Residential	B	61.3	58.4	2.9	1	0	0	0					
W16	Residential	B	65.2	60.9	4.3	1	0	0	0					
W17	Residential	B	62.2	58.9	3.3	1	0	0	0					
W18	Residential	B	65.7	61.2	4.5	1	0	0	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier C														
W19	Residential	B	65.4	60.8	4.6	1	0	0	0					
W20	Residential	B	66.3	60.8	5.5	1	1	1	0					
W21	Residential	B	66.6	60.7	5.9	1	1	1	0					
W22	Residential	B	66.9	60.7	6.2	1	1	1	0					
W23	Residential	B	67.0	60.3	6.7	1	1	1	0					
W24	Residential	B	67.5	60.3	7.2	1	1	1	0					
W25	Residential	B	67.0	60.1	6.9	1	1	1	0					
W26	Residential	B	67.2	60.4	6.8	1	1	1	0					
W27	Residential	B	66.5	59.9	6.6	1	1	1	0					
W28	Residential	B	66.7	60.7	6.0	1	1	1	0					
W29	Residential	B	63.4	59.7	3.7	1	0	0	0					
W30	Residential	B	63.9	59.7	4.2	1	0	0	0					
W31	Residential	B	64.1	59.8	4.3	1	0	0	0					
W32	Residential	B	64.1	60.0	4.1	1	0	0	0					
W33	Residential	B	63.7	60.0	3.7	1	0	0	0					
W34	Residential	B	63.5	60.3	3.2	1	0	0	0					
W35	Residential	B	63.9	61.0	2.9	1	0	0	0					
W36	Residential	B	62.8	60.8	2.0	1	0	0	0					
W37	Residential	B	66.4	63.8	2.6	1	1	0	0					
W38	Residential	B	63.7	60.6	3.1	1	0	0	0					
W39	Residential	B	62.7	59.4	3.3	1	0	0	0					
W40	Residential	B	61.0	55.9	5.1	1	0	1	0					
W41	Residential	B	65.5	58.3	7.2	1	0	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier C														
W42	Residential	B	60.9	55.8	5.1	1	0	1	0					
W43	Residential	B	65.0	58.1	6.9	1	0	1	0					
W44	Residential	B	62.4	56.7	5.7	1	0	1	0					
W45	Residential	B	66.4	58.8	7.6	1	1	1	0					
W46	Residential	B	62.2	56.6	5.6	1	0	1	0					
W47	Residential	B	66.2	58.8	7.4	1	1	1	0					
W48	Residential	B	63.1	57.1	6.0	1	0	1	0					
W49	Residential	B	66.9	58.9	8.0	1	1	1	1					
W50	Residential	B	62.6	56.9	5.7	1	0	1	0					
W51	Residential	B	61.7	56.5	5.2	1	0	1	0					
W52	Residential	B	61.3	56.2	5.1	1	0	1	0					
W53	Residential	B	66.0	58.0	8.0	1	1	1	1					
W54	Residential	B	62.0	56.7	5.3	1	0	1	0					
						46	15	25	2					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier C only provides an 8 dBA reduction to 8% of the benefited receptors.

Noise Sensitive Area D

Traffic noise impacts are projected to occur in NSA D. An approximately 576-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 576-foot long barrier provides a reduction that varies from 1.4 dBA to 3.9 dBA.

The approximately 576-foot long, 25 foot high modeled Barrier D is unable to achieve a 5 dBA reduction for at least 75% or more impacted receptors. Per SCDOT guidance, Barrier D is not considered feasible, and is not proposed.

Results of the noise barrier analysis are summarized in Table 11.

Table 11: Summary of Noise Barrier Analysis – Barrier D

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier D														
W56	Cemetery	B	72.7	68.8	3.9	1	1	0	0	0%	576	14,400	$504,000	Note 1
W57	Church	D	43.1	41.7	1.4	1	0	0	0					
						2	1	0	0					

Note 1: SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustical feasible.

Noise Sensitive Area E

Traffic noise impacts are projected to occur in NSA E. An approximately 1,776-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,776-foot long barrier provides a reduction that varies from 5.3 dBA to 10.0 dBA.

The approximately 1,776-foot long, 25 foot high modeled Barrier E is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier E only provides an 8 dBA reduction to 42% of the benefited receptors. Per SCDOT guidance, Barrier E is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 12.

Table 12: Summary of Noise Barrier Analysis – Barrier E

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier E														
W58	Residence	B	70.9	62.7	8.2	1	1	1	1	100%	1,776	44,400	$1,554,000	Note 1
W59	Residence	B	64.7	58.1	6.6	1	0	1	0					
W60	Residence	B	62.5	56.1	6.4	1	0	1	0					
W61	Residence	B	66.9	58.4	8.5	1	1	1	1					
W62	Residence	B	61.3	55.7	5.6	1	0	1	0					
W63	Residence	B	65.7	57.9	7.8	1	0	1	0					
W64	Residence	B	62.5	56.1	6.4	1	0	1	0					
W65	Residence	B	66.9	58.4	8.5	1	1	1	1					
W66	Residence	B	60.9	55.4	5.5	1	0	1	0					
W67	Residence	B	65.6	57.9	7.7	1	0	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier E														
W68	Residence	B	65.3	57.0	8.3	1	0	1	1					
W69	Residence	B	69.1	59.1	10.0	1	1	1	1					
W70	Residence	B	65.8	57.2	8.6	1	0	1	1					
W71	Residence	B	69.6	59.7	9.9	1	1	1	1					
W72	Residence	B	63.6	56.5	7.1	1	0	1	0					
W73	Residence	B	67.9	58.8	9.1	1	1	1	1					
W74	Residence	B	64.1	56.6	7.5	1	0	1	0					
W75	Residence	B	68.3	59.1	9.2	1	1	1	1					
W76	Residence	B	61.9	55.9	6.0	1	0	1	0					
W77	Residence	B	66.3	58.2	8.1	1	1	1	1					
W78	Residence	B	62.2	56.1	6.1	1	0	1	0					
W79	Residence	B	66.6	58.5	8.1	1	1	1	1					
W80	Residence	B	60.8	55.5	5.3	1	0	1	0					
W81	Residence	B	65.1	57.8	7.3	1	0	1	0					
W82	Residence	B	61.2	55.7	5.5	1	0	1	0					
W83	Residence	B	65.5	58.1	7.4	1	0	1	0					
						26	9	26	11					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier E only provides an 8 dBA reduction to 42% of the benefited receptors.

Noise Sensitive Area F

Traffic noise impacts are projected to occur in NSA F. An approximately 1,873-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,873-foot long barrier provides a reduction that varies from 2.9 dBA to 8.8 dBA.

The approximately 1,873-foot long, 25 foot high modeled Barrier F is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier F only provides an 8 dBA reduction to 15% of the benefited receptors. Per SCDOT guidance, Barrier F is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 13.

Table 13: Summary of Noise Barrier Analysis – Barrier F

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier F														
W84	Residence	B	63.2	57.3	5.9	1	0	1	0	100%	1,872	46,800	$1,638,000	Note 1
W85	Residence	B	67.4	60.1	7.3	1	1	1	0					
W86	Residence	B	64.0	57.4	6.6	1	0	1	0					
W87	Residence	B	68.0	60.2	7.8	1	1	1	0					
W88	Residence	B	64.6	57.6	7.0	1	0	1	0					
W89	Residence	B	68.6	60.4	8.2	1	1	1	1					
W90	Residence	B	65.5	57.9	7.6	1	0	1	0					
W91	Residence	B	69.2	60.6	8.6	1	1	1	1					
W92	Residence	B	61.9	56.7	5.2	1	0	1	0					
W93	Residence	B	66.3	59.8	6.5	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier F														
W94	Residence	B	62.7	57.0	5.7	1	0	1	0					
W95	Residence	B	66.9	59.8	7.1	1	1	1	0					
W96	Residence	B	63.3	57.2	6.1	1	0	1	0					
W97	Residence	B	67.3	59.8	7.5	1	1	1	0					
W98	Residence	B	63.9	57.5	6.4	1	0	1	0					
W99	Residence	B	67.9	60.1	7.8	1	1	1	0					
W100	Residence	B	66.2	58.3	7.9	1	1	1	1					
W101	Residence	B	69.4	60.7	8.7	1	1	1	1					
W102	Residence	B	66.4	58.3	8.1	1	1	1	1					
W103	Residence	B	69.4	60.6	8.8	1	1	1	1					
W104	Residence	B	66.4	59.1	7.3	1	1	1	0					
W105	Residence	B	69.3	60.9	8.4	1	1	1	1					
W106	Residence	B	66.4	58.6	7.8	1	1	1	0					
W107	Residence	B	69.3	60.8	8.5	1	1	1	1					
W108	Residence	B	64.0	57.8	6.2	1	0	1	0					
W109	Residence	B	67.7	60.0	7.7	1	1	1	0					
W110	Residence	B	64.0	57.8	6.2	1	0	1	0					
W111	Residence	B	67.8	60.1	7.7	1	1	1	0					
W112	Residence	B	64.1	58.0	6.1	1	0	1	0					
W113	Residence	B	67.7	60.1	7.6	1	1	1	0					
W114	Residence	B	63.9	57.9	6.0	1	0	1	0					
W115	Residence	B	67.7	60.1	7.6	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier F														
W116	Residence	B	64.8	58.8	6.0	1	0	1	0					
W117	Residence	B	68.5	60.8	7.7	1	1	1	0					
W118	Residence	B	63.8	58.5	5.3	1	0	1	0					
W119	Residence	B	67.8	60.7	7.1	1	1	1	0					
W120	Residence	B	62.8	58.0	4.8	1	0	0	0					
W121	Residence	B	66.9	60.2	6.7	1	1	1	0					
W122	Residence	B	62.1	57.6	4.5	1	0	0	0					
W123	Residence	B	66.2	59.9	6.3	1	1	1	0					
W124	Residence	B	64.6	59.2	5.4	1	0	1	0					
W125	Residence	B	68.3	61.0	7.3	1	1	1	0					
W126	Residence	B	63.5	58.7	4.8	1	0	0	0					
W127	Residence	B	67.4	60.6	6.8	1	1	1	0					
W128	Residence	B	62.7	58.3	4.4	1	0	0	0					
W129	Residence	B	66.7	60.3	6.4	1	1	1	0					
W130	Residence	B	61.8	57.8	4.0	1	0	0	0					
W131	Residence	B	65.9	59.9	6.0	1	0	1	0					
W132	Residence	B	66.9	60.8	6.1	1	1	1	0					
W133	Residence	B	70.2	63.0	7.2	1	1	1	0					
W134	Residence	B	65.6	60.4	5.2	1	0	1	0					
W135	Residence	B	69.0	62.2	6.8	1	1	1	0					
W136	Residence	B	64.7	60.0	4.7	1	0	0	0					
W137	Residence	B	68.2	61.8	6.4	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier F														
W138	Residence	B	63.6	59.4	4.2	1	0	0	0					
W139	Residence	B	67.3	61.4	5.9	1	1	1	0					
W140	Residence	B	66.5	61.4	5.1	1	1	1	0					
W141	Residence	B	69.6	63.2	6.4	1	1	1	0					
W142	Residence	B	65.4	61.0	4.4	1	0	0	0					
W143	Residence	B	68.7	62.5	6.2	1	1	1	0					
W144	Residence	B	63.9	60.1	3.8	1	0	0	0					
W145	Residence	B	67.8	62.0	5.8	1	1	1	0					
W146	Residence	B	63.3	59.8	3.5	1	0	0	0					
W147	Residence	B	67.0	61.5	5.5	1	1	1	0					
W148	Residence	B	60.8	57.9	2.9	1	0	0	0					
W149	Residence	B	64.8	60.0	4.8	1	0	0	0					
						66	37	54	8					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier F only provides an 8 dBA reduction to 15% of the benefited receptors.

Noise Sensitive Area G

Traffic noise impacts are projected to occur in NSA G. An approximately 1,198-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,198-foot long barrier provides a reduction that varies from 1.0 dBA to 10.5 dBA.

The approximately 1,198-foot long, 25 foot high modeled Barrier G is unable to achieve a 5 dBA reduction for at least 75% or more impacted receptors. Per SCDOT guidance, Barrier G is not considered feasible, and is not proposed.

Results of the noise barrier analysis are summarized in Table 14.

Table 14: Summary of Noise Barrier Analysis – Barrier G

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier G														
W150	Residence	B	68.0	57.5	10.5	1	1	1	1					
W151	Residence	B	68.4	59.2	9.2	1	1	1	1					
W152	Residence	B	67.9	60.7	7.2	1	1	1	0					
W153	Residence	B	71.6	62.1	9.5	1	1	1	1					
W154	Residence	B	64.1	57.8	6.3	1	0	1	0					
W155	Residence	B	64.4	58.7	5.7	1	0	1	0	67%	1,198	29,950	$1,048,250	Note 1
W156	Residence	B	64.6	59.9	4.7	1	0	0	0					
W157	Residence	B	64.9	60.6	4.3	1	0	0	0					
W158	Residence	B	67.4	63.1	4.3	1	1	0	0					
W159	Residence	B	66.5	63.4	3.1	1	1	0	0					
W160	Residence	B	63.1	58.8	4.3	1	0	0	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier G														
W161	Residence	B	62.8	58.7	4.1	1	0	0	0					
W162	Residence	B	62.6	59.2	3.4	1	0	0	0					
W163	Residence	B	62.7	59.7	3.0	1	0	0	0					
W164	Residence	B	64.3	61.9	2.4	1	0	0	0					
W165	Residence	B	65.3	64.3	1.0	1	0	0	0					
						16	6	6	3					

Note 1: SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustical feasible.

Noise Sensitive Area H

Traffic noise impacts are projected to occur in NSA G. An approximately 1,032-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,032-foot long barrier provides a reduction that varies from 2.5 dBA to 4.8 dBA.

The approximately 1,032-foot long, 25 foot high modeled Barrier H is unable to achieve a 5 dBA reduction for at least 75% or more impacted receptors. Per SCDOT guidance, Barrier H is not considered feasible, and is not proposed.

Results of the noise barrier analysis are summarized in Table 15.

Table 15: Summary of Noise Barrier Analysis – Barrier H

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier H														
W166	Residence	B	63.3	60.0	3.3	1	0	0	0	0%	1,032	25,800	$903,000	Note 1
W167	Residence	B	63.5	59.5	4.0	1	0	0	0					
W168	Residence	B	65.2	60.5	4.7	1	0	0	0					
W169	Residence	B	65.7	60.9	4.8	1	0	0	0					
W170	Residence	B	63.9	60.6	3.3	1	0	0	0					
W171	Residence	B	63.6	60.8	2.8	1	0	0	0					
W172	Residence	B	63.3	60.8	2.5	1	0	0	0					
						7	0	0	0					

Note 1: SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustical feasible.

Noise Sensitive Area I

Traffic noise impacts are projected to occur in NSA I. An approximately 1,680 foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,680-foot long barrier provides a reduction that varies from 5.0 dBA to 16.4 dBA.

The approximately 1,680-foot long, 25 foot high modeled Barrier I is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier I only provides an 8 dBA reduction to 57% of the benefited receptors. Per SCDOT guidance, Barrier I is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 16.

Table 16: Summary of Noise Barrier Analysis – Barrier I

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier I														
W173	Residence	B	70.6	62.4	8.2	1	1	1	1	100%	1,680	42,000	$1,470,000	Note 1
W174	Residence	B	65.3	58.9	6.4	1	0	1	0					
W175	Residence	B	67.7	59.6	8.1	1	1	1	1					
W176	Residence	B	72.9	60.8	12.1	1	1	1	1					
W177	Residence	B	75.4	60.7	14.7	1	1	1	1					
W178	Residence	B	77.0	60.6	16.4	1	1	1	1					
W179	Residence	B	74.1	60.9	13.2	1	1	1	1					
W180	Residence	B	72.4	61.7	10.7	1	1	1	1					
W181	Residence	B	71.0	61.9	9.1	1	1	1	1					
W182	Residence	B	69.2	61.5	7.7	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier I														
W183	Residence	B	67.4	60.0	7.4	1	1	1	0					
W184	Residence	B	66.3	60.1	6.2	1	1	1	0					
W185	Residence	B	67.0	60.8	6.2	1	1	1	0					
W186	Residence	B	65.2	60.2	5.0	1	0	1	0					
						14	12	14	8					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited.

Barrier I only provides an 8 dBA reduction to 57% of the benefited receptors.

Noise Sensitive Area J

Traffic noise impacts are projected to occur in NSA J. An approximately 3,454 foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 3,454-foot long barrier provides a reduction that varies from 2.3 dBA to 12.1 dBA.

The approximately 3,454-foot long, 25 foot high modeled Barrier J is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier J only provides an 8 dBA reduction to 36% of the benefited receptors. Per SCDOT guidance, Barrier J is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 17.

Table 17: Summary of Noise Barrier Analysis – Barrier J

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier J														
W187	Residence	B	64.0	60.2	3.8	1	0	0	0	79%	3,454	86,350	$3,022,250	Note 1
W188	Residence	B	64.5	59.7	4.8	1	0	0	0					
W189	Residence	B	65.1	58.6	6.5	1	0	1	0					
W190	Residence	B	65.6	58.7	6.9	1	0	1	0					
W191	Residence	B	66.3	59.3	7.0	1	1	1	0					
W192	Residence	B	66.6	59.5	7.1	1	1	1	0					
W193	Residence	B	67.2	60.0	7.2	1	1	1	0					
W194	Residence	B	63.4	60.6	2.8	1	0	0	0					
W195	Residence	B	63.2	58.9	4.3	1	0	0	0					
W196	Residence	B	64.6	59.3	5.3	1	0	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier J														
W197	Residence	B	64.8	60.1	4.7	1	0	0	0					
W198	Residence	B	65.0	60.4	4.6	1	0	0	0					
W199	Residence	B	65.2	60.7	4.5	1	0	0	0					
W200	Residence	B	66.6	61.9	4.7	1	1	0	0					
W201	Residence	B	67.9	63.3	4.6	1	1	0	0					
W202	Residence	B	68.6	63.9	4.7	1	1	0	0					
J1	Residence	B	68.1	62.3	5.8	1	1	1	0					
J2	Residence	B	68.0	62.2	5.8	1	1	1	0					
J3	Residence	B	68.0	62.1	5.9	1	1	1	0					
J4	Residence	B	67.9	61.9	6.0	1	1	1	0					
J5	Residence	B	67.9	61.8	6.1	1	1	1	0					
J6	Residence	B	67.6	61.1	6.5	1	1	1	0					
J7	Residence	B	67.2	60.3	6.9	1	1	1	0					
J8	Residence	B	67.0	59.5	7.5	1	1	1	0					
J9	Residence	B	66.8	58.6	8.2	1	1	1	1					
J10	Residence	B	66.2	57.7	8.5	1	1	1	1					
J11	Residence	B	66.5	57.1	9.4	1	1	1	1					
J12	Residence	B	67.5	55.9	11.6	1	1	1	1					
J13	Residence	B	68.2	56.1	12.1	1	1	1	1					
J14	Residence	B	68.3	56.7	11.6	1	1	1	1					
J15	Residence	B	68.1	57.5	10.6	1	1	1	1					
J16	Residence	B	67.7	57.9	9.8	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier J														
J17	Residence	B	66.2	63.5	2.7	1	1	0	0					
J18	Residence	B	65.8	63.3	2.5	1	0	0	0					
J19	Residence	B	65.5	63.2	2.3	1	0	0	0					
J20	Residence	B	65.0	62.7	2.3	1	0	0	0					
J21	Residence	B	64.7	62.4	2.3	1	0	0	0					
J22	Residence	B	64.6	62.3	2.3	1	0	0	0					
J23	Residence	B	64.5	62.2	2.3	1	0	0	0					
J24	Residence	B	64.5	62.2	2.3	1	0	0	0					
J25	Residence	B	64.7	62.3	2.4	1	0	0	0					
J26	Residence	B	64.9	62.4	2.5	1	0	0	0					
J27	Residence	B	65.1	62.5	2.6	1	0	0	0					
J28	Residence	B	65.5	62.6	2.9	1	0	0	0					
J29	Residence	B	65.8	62.6	3.2	1	0	0	0					
J30	Residence	B	66.0	61.7	4.3	1	1	0	0					
						46	24	22	8					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier J only provides an 8 dBA reduction to 36% of the benefited receptors.

Noise Sensitive Area K

Traffic noise impacts are projected to occur in NSA K. An approximately 2,952 foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 2,952-foot long barrier provides a reduction that varies from 4.8 dBA to 14.2 dBA.

The approximately 2,952-foot long, 25 foot high modeled Barrier K is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier K only provides an 8 dBA reduction to 47% of the benefited receptors. Per SCDOT guidance, Barrier K is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 18.

Table 18: Summary of Noise Barrier Analysis – Barrier K

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier K														
E1	Residence	B	69.2	64.1	5.1	1	1	1	0	99%	2,952	73,800	$2,583,000	Note 1
E2	Residence	B	71.5	61.9	9.6	1	1	1	1					
E3	Residence	B	75.2	61.0	14.2	1	1	1	1					
E4	Residence	B	70.9	61.0	9.9	1	1	1	1					
E5	Residence	B	71.0	61.3	9.7	1	1	1	1					
E6	Residence	B	66.4	59.0	7.4	1	1	1	0					
E7	Residence	B	70.9	60.5	10.4	1	1	1	1					
E8	Residence	B	74.9	61.2	13.7	1	1	1	1					
E9	Residence	B	70.6	60.1	10.5	1	1	1	1					
E10	Residence	B	71.9	60.5	11.4	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier K														
E11	Residence	B	67.9	59.4	8.5	1	1	1	1					
E12	Residence	B	68.1	59.6	8.5	1	1	1	1					
E13	Residence	B	70.9	60.7	10.2	1	1	1	1					
E14	Residence	B	72.9	62.8	10.1	1	1	1	1					
E15	Residence	B	70.7	60.9	9.8	1	1	1	1					
E16	Residence	B	72.5	62.6	9.9	1	1	1	1					
E17	Residence	B	70.0	60.6	9.4	1	1	1	1					
E18	Residence	B	72.1	62.8	9.3	1	1	1	1					
E19	Residence	B	69.7	60.9	8.8	1	1	1	1					
E20	Residence	B	71.8	63.0	8.8	1	1	1	1					
E21	Residence	B	68.3	60.3	8.0	1	1	1	1					
E22	Residence	B	71.1	62.2	8.9	1	1	1	1					
E23	Residence	B	67.1	59.9	7.2	1	1	1	0					
E24	Residence	B	70.2	61.9	8.3	1	1	1	1					
E25	Residence	B	66.1	59.5	6.6	1	1	1	0					
E26	Residence	B	69.7	61.5	8.2	1	1	1	1					
E27	Residence	B	65.5	59.3	6.2	1	0	1	0					
E28	Residence	B	69.3	61.3	8.0	1	1	1	1					
E29	Residence	B	69.2	60.2	9.0	1	1	1	1					
E30	Residence	B	71.7	62.1	9.6	1	1	1	1					
E31	Residence	B	68.8	60.4	8.4	1	1	1	1					
E32	Residence	B	71.4	62.2	9.2	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier K														
E33	Residence	B	68.5	60.5	8.0	1	1	1	1					
E34	Residence	B	71.1	62.5	8.6	1	1	1	1					
E35	Residence	B	68.2	60.6	7.6	1	1	1	0					
E36	Residence	B	70.8	62.5	8.3	1	1	1	1					
E37	Residence	B	68.7	61.3	7.4	1	1	1	0					
E38	Residence	B	70.9	63.8	7.1	1	1	1	0					
E39	Residence	B	68.0	61.7	6.3	1	1	1	0					
E40	Residence	B	70.3	63.7	6.6	1	1	1	0					
E41	Residence	B	67.6	60.7	6.9	1	1	1	0					
E42	Residence	B	70.3	62.8	7.5	1	1	1	0					
E43	Residence	B	67.2	61.0	6.2	1	1	1	0					
E44	Residence	B	69.9	63.0	6.9	1	1	1	0					
E45	Residence	B	67.4	61.5	5.9	1	1	1	0					
E46	Residence	B	69.9	63.6	6.3	1	1	1	0					
E47	Residence	B	66.4	60.8	5.6	1	1	1	0					
E48	Residence	B	69.2	62.6	6.6	1	1	1	0					
E49	Residence	B	66.2	60.7	5.5	1	1	1	0					
E50	Residence	B	69.1	63.0	6.1	1	1	1	0					
E51	Residence	B	65.5	60.4	5.1	1	0	1	0					
E52	Residence	B	68.7	62.6	6.1	1	1	1	0					
E53	Residence	B	72.2	61.5	10.7	1	1	1	1					
E54	Residence	B	73.5	64.3	9.2	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier K														
E55	Residence	B	71.7	61.9	9.8	1	1	1	1					
E56	Residence	B	73.0	64.9	8.1	1	1	1	1					
E57	Residence	B	71.2	62.3	8.9	1	1	1	1					
E58	Residence	B	72.4	65.5	6.9	1	1	1	0					
E59	Residence	B	70.9	62.8	8.1	1	1	1	1					
E60	Residence	B	72.1	66.1	6.0	1	1	1	0					
E61	Residence	B	70.4	61.2	9.2	1	1	1	1					
E62	Residence	B	72.2	63.8	8.4	1	1	1	1					
E63	Residence	B	70.0	61.5	8.5	1	1	1	1					
E64	Residence	B	71.8	64.2	7.6	1	1	1	0					
E65	Residence	B	69.5	61.9	7.6	1	1	1	0					
E66	Residence	B	71.2	64.7	6.5	1	1	1	0					
E67	Residence	B	69.2	62.2	7.0	1	1	1	0					
E68	Residence	B	70.9	65.1	5.8	1	1	1	0					
E69	Residence	B	66.9	61.4	5.5	1	1	1	0					
E70	Residence	B	69.4	63.5	5.9	1	1	1	0					
E71	Residence	B	67.3	61.7	5.6	1	1	1	0					
E72	Residence	B	69.7	64.1	5.6	1	1	1	0					
E73	Residence	B	67.7	62.0	5.7	1	1	1	0					
E74	Residence	B	69.8	64.5	5.3	1	1	1	0					
E75	Residence	B	68.1	62.6	5.5	1	1	1	0					
E76	Residence	B	70.0	65.2	4.8	1	1	0	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier K														
E77	Residence	B	65.7	60.8	4.9	1	0	1	0					
E78	Residence	B	68.6	63.1	5.5	1	1	1	0					
E79	Residence	B	66.0	61.0	5.0	1	1	1	0					
E80	Residence	B	68.7	63.2	5.5	1	1	1	0					
E81	Residence	B	66.4	61.4	5.0	1	1	1	0					
E82	Residence	B	69.0	63.6	5.4	1	1	1	0					
E83	Residence	B	66.5	61.4	5.1	1	1	1	0					
E84	Residence	B	68.9	63.7	5.2	1	1	1	0					
						84	81	83	39					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited.

Barrier K only provides an 8 dBA reduction to 47% of the benefited receptors.

Noise Sensitive Area L

Traffic noise impacts are projected to occur in NSA L. An approximately 1,128-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,128-foot long barrier provides a reduction that varies from 2.9 dBA to 11.5 dBA.

The approximately 1,128-foot long, 25 foot high modeled Barrier L has a cost per benefited receptor of $246,750. Per SCDOT guidance, Barrier L is not considered cost-effective/reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 19.

Table 19: Summary of Noise Barrier Analysis – Barrier L

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier L														
E87	Residence	B	70.8	62.0	8.8	1	1	1	1	100%	1,128	28,200	$987,000	$246,750
E88	Residence	B	69.3	61.3	8.0	1	1	1	1					
E89	Residence	B	71.2	59.7	11.5	1	1	1	1					
E90	Church	D	50.4	40.9	9.5	1	0	1	1					
E91	Residence	B	64.3	61.4	2.9	1	0	0	0					
						5	3	4	4					

Note 1: SCDOT Policy indicates that this barrier is not cost effective. The available cost of the abatement is based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost is divided by the number of benefited receptors. If the cost per benefited receptor is more than $30,000 then the barrier is determined to not be cost effective.

Noise Sensitive Area M

Traffic noise impacts are projected to occur in NSA M. An approximately 522-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 522-foot long barrier provides a reduction that varies from 2.5 dBA to 8.0 dBA.

The approximately 522-foot long, 25 foot high modeled Barrier M has a cost per benefited receptor of $483,000. Per SCDOT guidance, Barrier M is not considered cost-effective/reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 20.

Table 20: Summary of Noise Barrier Analysis – Barrier M

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier M														
E96	Residential	B	70.7	62.7	8.0	1	1	1	1	100%	552	13,800	$483,000	$483,000
E97	Residential	B	63.2	60.7	2.5	1	0	0	0					
						2	1	1	1					

Note 1: SCDOT Policy indicates that this barrier is not cost effective. The available cost of the abatement is based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost is divided by the number of benefited receptors. If the cost per benefited receptor is more than $30,000 then the barrier is determined to not be cost effective.

Noise Sensitive Area N

Traffic noise impacts are projected to occur in NSA N. An approximately 1,152-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,152-foot long barrier provides a reduction that varies from 1.0 dBA to 13.1 dBA.

The approximately 1,152-foot long, 25 foot high modeled Barrier N has a cost per benefited receptor of $84,000. Per SCDOT guidance, Barrier N is not considered cost-effective/reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 21.

Table 21: Summary of Noise Barrier Analysis – Barrier N

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier N														
E101	Residential	B	70.4	62.4	8.0	1	1	1	1	100%	1,152	28,800	$1,008,000	$84,000
E102	Residential	B	70.0	60.0	10.0	1	1	1	1					
E103	Residential	B	70.8	58.7	12.1	1	1	1	1					
E104	Residential	B	71.6	58.6	13.0	1	1	1	1					
E105	Residential	B	71.1	58.3	12.8	1	1	1	1					
E106	Residential	B	71.8	58.7	13.1	1	1	1	1					
E107	Residential	B	63.7	58.5	5.2	1	0	1	0					
E108	Residential	B	65.4	57.8	7.6	1	0	1	0					
E109	Residential	B	65.2	57.1	8.1	1	0	1	1					
E110	Residential	B	66.4	57.5	8.9	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier N														
E111	Residential	B	66.9	58.2	8.7	1	1	1	1					
E112	Residential	B	68.3	60.3	8.0	1	1	1	1					
E113	Residential	B	61.5	58.3	3.2	1	0	0	0					
E114	Residential	B	62.3	59.5	2.8	1	0	0	0					
E115	Hotel	E	62.2	61.2	1.0	1	0	0	0					
						15	9	12	10					

Note 1: SCDOT Policy indicates that this barrier is not cost effective. The available cost of the abatement is based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost is divided by the number of benefited receptors. If the cost per benefited receptor is more than $30,000 then the barrier is determined to not be cost effective.

Noise Sensitive Area O

Traffic noise impacts are projected to occur in NSA O. An approximately 1,272-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,272-foot long barrier provides a reduction that varies from 2.4 dBA to 9.6 dBA.

The approximately 1,272-foot long, 25 foot high modeled Barrier O is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier O only provides an 8 dBA reduction to 16% of the benefited receptors. Per SCDOT guidance, Barrier O is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 22.

Table 22: Summary of Noise Barrier Analysis – Barrier O

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier O														
E117	Residence	B	63.1	60.7	2.4	1	0	0	0	83%	1,272	31,800	$1,113,000	Note 1
E118 (2ND LEVEL)	Residence	B	66.6	63.6	3.0	1	1	0	0					
E119	Residence	B	62.2	59.7	2.5	1	0	0	0					
E120 (2ND LEVEL)	Residence	B	66.2	62.9	3.3	1	1	0	0					
E121	Residence	B	63.3	60.2	3.1	1	0	0	0					
E122 (2ND LEVEL)	Residence	B	67.1	63.4	3.7	1	1	0	0					
E123	Residence	B	62.7	59.6	3.1	1	0	0	0					
E124 (2ND LEVEL)	Residence	B	66.7	62.9	3.8	1	1	0	0					
E125	Residence	B	67.5	62.5	5.0	1	1	1	0					
E126 (2ND LEVEL)	Residence	B	70.0	65.0	5.0	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier O														
E127	Residence	B	66.9	62.2	4.7	1	1	0	0					
E128 (2ND LEVEL)	Residence	B	69.6	64.8	4.8	1	1	0	0					
E129	Residence	B	65.4	60.9	4.5	1	0	0	0					
E130 (2ND LEVEL)	Residence	B	68.5	63.7	4.8	1	1	0	0					
E131	Residence	B	64.6	60.5	4.1	1	0	0	0					
E132 (2ND LEVEL)	Residence	B	68.0	63.4	4.6	1	1	0	0					
E133	Residence	B	68.2	61.1	7.1	1	1	1	0					
E134 (2ND LEVEL)	Residence	B	70.6	63.7	6.9	1	1	1	0					
E135	Residence	B	67.5	61.0	6.5	1	1	1	0					
E136 (2ND LEVEL)	Residence	B	70.1	63.7	6.4	1	1	1	0					
E137	Residence	B	65.6	60.2	5.4	1	0	1	0					
E138 (2ND LEVEL)	Residence	B	68.8	62.9	5.9	1	1	1	0					
E139	Residence	B	64.9	59.8	5.1	1	0	1	0					
E140 (2ND LEVEL)	Residence	B	68.3	62.6	5.7	1	1	1	0					
E141	Residence	B	61.9	58.2	3.7	1	0	0	0					
E142 (2ND LEVEL)	Residence	B	66.2	61.3	4.9	1	1	0	0					
E143	Residence	B	62.4	58.1	4.3	1	0	0	0					
E144 (2ND LEVEL)	Residence	B	66.7	61.2	5.5	1	1	1	0					
E145	Residence	B	64.5	58.1	6.4	1	0	1	0					
E146 (2ND LEVEL)	Residence	B	68.2	61.0	7.2	1	1	1	0					
E147	Residence	B	63.9	58.0	5.9	1	0	1	0					
E148 (2ND LEVEL)	Residence	B	67.8	60.9	6.9	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier O														
E149	Residence	B	62.7	57.4	5.3	1	0	1	0					
E150 (2ND LEVEL)	Residence	B	66.8	60.4	6.4	1	1	1	0					
E151	Residence	B	62.2	57.1	5.1	1	0	1	0					
E152 (2ND LEVEL)	Residence	B	66.5	60.1	6.4	1	1	1	0					
E153	Residence	B	65.3	58.2	7.1	1	0	1	0					
E154 (2ND LEVEL)	Residence	B	68.6	60.9	7.7	1	1	1	0					
E155	Residence	B	64.6	58.0	6.6	1	0	1	0					
E156 (2ND LEVEL)	Residence	B	68.2	60.7	7.5	1	1	1	0					
E157	Residence	B	63.4	57.5	5.9	1	0	1	0					
E158 (2ND LEVEL)	Residence	B	67.4	60.4	7.0	1	1	1	0					
E159	Residence	B	62.7	57.2	5.5	1	0	1	0					
E160 (2ND LEVEL)	Residence	B	66.8	60.0	6.8	1	1	1	0					
E161	Residence	B	65.9	57.6	8.3	1	0	1	1					
E162 (2ND LEVEL)	Residence	B	69.2	60.3	8.9	1	1	1	1					
E163	Residence	B	65.4	57.5	7.9	1	0	1	0					
E164 (2ND LEVEL)	Residence	B	69.0	60.2	8.8	1	1	1	1					
E165	Residence	B	64.2	57.3	6.9	1	0	1	0					
E166 (2ND LEVEL)	Residence	B	68.0	60.0	8.0	1	1	1	1					
E167	Residence	B	63.4	57.0	6.4	1	0	1	0					
E168 (2ND LEVEL)	Residence	B	67.7	60.0	7.7	1	1	1	0					
E169	Residence	B	66.7	57.8	8.9	1	1	1	1					
E170 (2ND LEVEL)	Residence	B	69.8	60.2	9.6	1	1	1	1					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier O														
E171	Residence	B	66.1	57.6	8.5	1	1	1	1					
E172 (2ND LEVEL)	Residence	B	69.5	60.2	9.3	1	1	1	1					
E173	Residence	B	64.6	57.2	7.4	1	0	1	0					
E174 (2ND LEVEL)	Residence	B	68.4	60.1	8.3	1	1	1	1					
E175	Residence	B	64.0	57.0	7.0	1	0	1	0					
E176 (2ND LEVEL)	Residence	B	68.0	60.0	8.0	1	1	1	1					
E177	Residence	B	62.7	56.6	6.1	1	0	1	0					
E178 (2ND LEVEL)	Residence	B	67.1	59.8	7.3	1	1	1	0					
E179	Residence	B	62.4	56.5	5.9	1	0	1	0					
E180 (2ND LEVEL)	Residence	B	67.0	59.8	7.2	1	1	1	0					
E181	Residence	B	62.4	56.5	5.9	1	0	1	0					
E182 (2ND LEVEL)	Residence	B	67.0	59.9	7.1	1	1	1	0					
E183	Residence	B	62.4	56.6	5.8	1	0	1	0					
E184 (2ND LEVEL)	Residence	B	67.0	60.0	7.0	1	1	1	0					
E185	Residence	B	61.5	56.2	5.3	1	0	1	0					
E186 (2ND LEVEL)	Residence	B	66.1	59.5	6.6	1	1	1	0					
E187	Residence	B	61.5	56.2	5.3	1	0	1	0					
E188 (2ND LEVEL)	Residence	B	66.1	59.4	6.7	1	1	1	0					
E189	Residence	B	61.3	56.1	5.2	1	0	1	0					
E190 (2ND LEVEL)	Residence	B	66.1	59.6	6.5	1	1	1	0					
E191	Residence	B	61.3	56.2	5.1	1	0	1	0					
E192 (2ND LEVEL)	Residence	B	66.1	59.7	6.4	1	1	1	0					

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier O														
E193	Residence	B	64.4	57.5	6.9	1	0	1	0					
E194 (2ND LEVEL)	Residence	B	68.4	60.8	7.6	1	1	1	0					
E195	Residence	B	64.8	57.6	7.2	1	0	1	0					
E196 (2ND LEVEL)	Residence	B	68.7	61.2	7.5	1	1	1	0					
E197	Residence	B	65.9	58.2	7.7	1	0	1	0					
E198 (2ND LEVEL)	Residence	B	69.3	61.4	7.9	1	1	1	0					
E199	Residence	B	66.6	58.6	8.0	1	1	1	1					
E200 (2ND LEVEL)	Residence	B	69.7	61.6	8.1	1	1	1	1					
E201	Residence	B	63.4	57.2	6.2	1	0	1	0					
E202 (2ND LEVEL)	Residence	B	67.7	60.9	6.8	1	1	1	0					
E203	Residence	B	63.8	57.4	6.4	1	0	1	0					
E204 (2ND LEVEL)	Residence	B	68.0	61.1	6.9	1	1	1	0					
E205	Residence	B	64.8	58.0	6.8	1	0	1	0					
E206 (2ND LEVEL)	Residence	B	68.6	61.5	7.1	1	1	1	0					
E207	Residence	B	65.4	58.3	7.1	1	0	1	0					
E208 (2ND LEVEL)	Residence	B	69.0	61.9	7.1	1	1	1	0					
						92	53	75	12					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited.
Barrier O only provides an 8 dBA reduction to 16% of the benefited receptors.

Noise Sensitive Area P

Traffic noise impacts are projected to occur in NSA P. An approximately 840-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 840-foot long barrier provides a reduction that varies from 3.1 dBA to 10.3 dBA.

The approximately 840-foot long, 25 foot high modeled Barrier P is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier P only provides an 8 dBA reduction to 33% of the benefited receptors. Per SCDOT guidance, Barrier P is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 23.

Table 23: Summary of Noise Barrier Analysis – Barrier P

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier P														
E239	Residential	B	67.8	64.7	3.1	1	1	0	0	75%	840	21,000	$735,000	Note 1
E240	Residential	B	72.5	65.3	7.2	1	1	1	0					
E241	Residential	B	73.7	63.4	10.3	1	1	1	1					
E242	Residential	B	71.4	63.5	7.9	1	1	1	0					
						4	4	3	1					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier P only provides an 8 dBA reduction to 33% of the benefited receptors.

Noise Sensitive Area Q

Traffic noise impacts are projected to occur in NSA Q. An approximately 864-foot long, 20 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 864-foot long barrier provides a reduction that varies from 6.9 dBA to 12.3 dBA.

The approximately 864-foot long, 20 foot high modeled Barrier Q has a cost per benefited receptor of $67,200. Per SCDOT guidance, Barrier N is not considered cost-effective/reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 24.

Table 24: Summary of Noise Barrier Analysis – Barrier Q

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
20-foot tall modeled barrier Q														
E243	Residential	B	74.0	64.4	9.6	1	1	1	1					
E244	Residential	B	75.2	64.1	11.1	1	1	1	1					
E245	Residential	B	75.9	63.6	12.3	1	1	1	1					
E246	Residential	B	69.2	62.3	6.9	1	1	1	0					
E247	Residential	B	70.3	62.3	8.0	1	1	1	1	100%	864	17,280	$604,800	$67,200
E248	Residential	B	71.6	63.2	8.4	1	1	1	1					
E249	Residential	B	74.4	63.9	10.5	1	1	1	1					
E250	Residential	B	76.9	64.7	12.2	1	1	1	1					
E251	Residential	B	75.5	66.5	9.0	1	1	1	1					
						9	9	9	8					

Note 1: SCDOT Policy indicates that this barrier is not cost effective. The available cost of the abatement is based on $35.00 per square foot. This allowable cost is based on actual construction costs on recent SCDOT projects. This construction cost is divided by the number of benefited receptors. If the cost per benefited receptor is more than $30,000 then the barrier is determined to not be cost effective.

Noise Sensitive Area R

Traffic noise impacts are projected to occur in NSA R. An approximately 1,440-foot long, 25 foot high noise barrier was evaluated shielding these impacted receptors. The approximately 1,440-foot long barrier provides a reduction that varies from 4.3 dBA to 7.0 dBA.

The approximately 1,440-foot long, 25 foot high modeled Barrier R is unable to achieve an 8 dBA reduction for at least 80% of the benefited receptors. Barrier R does not provide an 8 dBA reduction to any of the benefited receptors. Per SCDOT guidance, Barrier R is not considered reasonable, and is not proposed.

Results of the noise barrier analysis are summarized in Table 25.

Table 25: Summary of Noise Barrier Analysis – Barrier R

Receptors	Type	NAC: Noise Area Classification	Leq Noise Level (dBA)		Reduction (in dBA) with Noise Barrier	Number of Receptors	Number of Impacted Receptors	Number of Benefited Receptors >5 dBA	Number of Benefited Receptors >8 dBA	% of Impacted Receivers That Would Achieve a 5 dBA Reduction	Length of Barrier (feet)	Barrier Area (ft^2)	Total Cost of Barrier $35/$ft^2$	Cost/ Benefited Receptor
			Build year 2037 (no barrier)	Build year 2037 (with barrier)										
25-foot tall modeled barrier R														
E252	Residential	B	65.1	59.3	5.8	1	0	1	0	100%	1,440	36,000	$1,260,000	Note 1
E253	Residential	B	66.2	59.4	6.8	1	1	1	0					
E254	Residential	B	66.8	59.8	7.0	1	1	1	0					
E255	Residential	B	66.5	60.0	6.5	1	1	1	0					
E256	Residential	B	65.5	59.7	5.8	1	0	1	0					
E257	Residential	B	64.9	60.6	4.3	1	0	0	0					
						6	3	5	0					

Note 1: SCDOT Policy indicates that a noise reduction of at least 8 dBA must be achieved for 80% of the receivers determined to be in the first two building rows and considered benefited. Barrier R only provides an 8 dBA reduction to 0% of the benefited receptors.

4.0 CONCLUSIONS

Of the 459 individual noise sensitive receptors found to exist along the project corridor, analysis results indicate that traffic noise impacts will occur at 249 receptors as a result of 2037 Build Alternative.

Modeled traffic noise levels resulting from the design year (2037) Build alternative are expected to increase from 0.1 to 6.7 dBA. Currently (2017), 155 of the noise sensitive receptors exceed the FHWA NAC.

Noise abatement was evaluated for the impacted receptors. The noise abatement measures were found to be not feasible and reasonable per SCDOT guidelines (see Section 3.5).

Based on the noise analysis performed to date, there appears to be no feasible and reasonable solutions available to mitigate the noise impacts at the locations identified.

5.0 CONSTRUCTION NOISE AND VIBRATION

The predominant construction activities associated with this project are expected to be earth removal, hauling, grading, and paving. Temporary and localized construction noise impacts may occur as a result of these activities (refer to table 26). During daytime hours, the predicted effects of these impacts will be temporary speech interference for passers-by and those individuals living or working near the project. During evening and nighttime hours, steady-state construction noise emissions such as from paving operations will be audible, and may affect activities such as sleep. Sporadic evening and nighttime construction equipment noise emissions such as from backup alarms, lift gate closures ("slamming" of dump truck gates), etc., will be perceived as distinctly louder than the steady-state acoustic environment, and will likely cause adverse effects to the general peace and usage of noise sensitive areas – particularly residences, hospitals, and hotels.

Construction noise activities such as usage of pile-drivers and impact-hammers (jack hammer, hoe-ram) will provide sporadic, temporary, and loud construction noise affects in the vicinity of those activities (refer to table 26). It is the recommendation of this Noise Analysis Report that construction activities of this kind be scheduled during times of the day when such noises will create as minimal disturbance as possible.

Generally, low-cost and easily implemented construction noise control measures should be incorporated into the project plans and specifications to the extent possible, These measures include, but are not limited to, work-hour limits, equipment exhaust muffler requirements, haul-

road locations, elimination of "tail gate banging", ambient-sensitive backup alarms, construction noise complaint mechanisms, and consistent and transparent community communication.

While discrete construction noise level prediction is difficult for a particular receiver or group of receivers, it can be assessed in a general capacity with respect to distance from known or likely project activities. For this project, earth removal, grading, hauling, and paving is anticipated to occur near two residential neighborhoods. Pile-driving is anticipated to occur in the vicinity of one residential neighborhood. Although construction noise impact mitigation should not place an undue burden upon the financial cost of the project or the project construction schedule, pursuant to the requirements of 23 CFR 772.19, it is the recommendation of this traffic noise analysis that:

- Earth removal, grading, hauling, and paving activities near residences should be limited to weekday daytime hours.

- If meeting the project schedule requires that earth removal, grading, hauling and/or paving must occur during evening, nighttime and/or weekend hours near residential neighborhoods, the Contractor shall notify SCDOT as soon as possible. In such instance(s), all reasonable attempts shall be made to notify and to make appropriate arrangements for the mitigation of the predicted construction noise effects upon the affected property owners and/or residents.

- If construction noise activities must occur during context-sensitive hours near noise-sensitive areas, discrete construction noise abatement measures including, but not limited to portable noise barriers and/or other equipment-quieting devices shall be considered.

- Some construction activities will create very loud noise at nearby noise-sensitive land uses. For example, pile driving activities can create noise impacts for distances of up to one-quarter mile. It is the recommendation of this traffic noise analysis that considerations be made for any nearby residences for all evening and/or nighttime periods (7:00 p.m. – 7:00 a.m.), and for all weekend hours throughout which extremely loud construction activities might occur.

For additional information on construction noise, please refer to the FHWA Construction Noise Handbook (FHWA-HEP-06-015) and the Roadway Construction Noise Model (RCNM), available online at: http://www.fhwa.dot/gov/environment/noise/cnstr_ns.htm.

Table 26: Construction Equipment Typical Noise Level Emissions[1]

Equipment	Noise Level Emissions (dB(A)) at 50 Feet From Equipment[2]
	70 80 90 100
Pile Driver[3]	
Jack Hammer	
Tractor	
Road Grader	
Backhoe	
Truck	
Paver	
Pneumatic Wrench	
Crane	
Concrete Mixer	
Compressor	
Front-End Loader	
Generator	
Saws	
Roller (Compactor)	

1. Adapted from *Noise Construction Equipment and Operations, Building Equipment, and Home Appliances*. U.S. Environmental Protection Agency. Washington D.C. 1971.
2. Cited noise level ranges are typical for the equipment cited. Noise energy dissipates as a function of distance between the source and the receptor. For example, if the noise level from a pile driver at a distance of 50 feet = 100 decibels (dB(A)), then at 400 feet, it might be 82 decibels (dB(A)) or less.
3. Due to project safety and potential construction noise concerns, pile driving activities are typically limited to daytime hours.

6.0 PUBLIC COORDINATION

SCDOT shall inform the appropriate local government officials within whose jurisdiction the highway project is located of the distances from the roadway at which the noise levels become acceptable for various types of land uses. After the "Date of Public Knowledge," the SCDOT is no longer responsible for providing noise abatement for new development which occurs adjacent to the proposed highway project.

The width of the FHWA Noise Abatement Criteria noise contour is provided in Table 27. Local planning agencies can use this information as a guide to ensure that noise impacts are minimized in the event of land use changes. A copy of this report will be provided to the appropriate local planning authorities in order to assist in the development of compatible land use criteria.

Table 27: Noise Isopleths

Roadway Segment	Approximate Width of SCDOT Noise Abatement Criteria (Distance in feet from edge of Proposed Roadway) 2037 Build Alternative		
	Activity Category A	Activity Categories B & C	Activity Category E
	Noise Level Leq(h) 56 dBA	Noise Level Leq(h) 66 dBA	Noise Level Leq(h) 71 dBA
I-77 (south of SC 12/Percival)	≈ 1,100	≈ 495	≈ 335
I-77 (SC 12/Percival to I-20)	≈ 1,165	≈ 520	≈ 350
I-77 (I-20 to US 1 (Two Notch Road)	≈ 1,015	≈ 455	≈ 310
I-77 (US 1 to SC 277)	≈ 950	≈ 430	≈ 285
I-77 (SC 277 to SC 555 (Farrow Road)	≈ 1,180	≈ 525	≈ 355
I-77 (SC 555 to Killian Road)	≈ 1,205	≈ 535	≈ 360
I-77 (north of Killian Road)	≈ 1,165	≈ 540	≈ 370

7.0 BIBLIOGRAPHY

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U.S. Department of Transportation, Federal Highway Administration. FHWA Traffic Noise Model: User's Guide. FHWA Report Number FHWA-PD-96-009. January, 1998.

U.S. Department of Transportation, Federal Highway Administration. FHWA Traffic Noise Model: User's Guide (Version 2.5 Addendum). April 2004.

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8.0 APPENDICES

Appendix A: Figures

Appendix B: Traffic Data Sheets

Appendix C: Field Data Sheets

Appendix D: Feasible/Reasonable Worksheets

Appendix E: TNM Data Files (CD)

APPENDIX A:

RECEPTOR LOCATION MAP FIGURES

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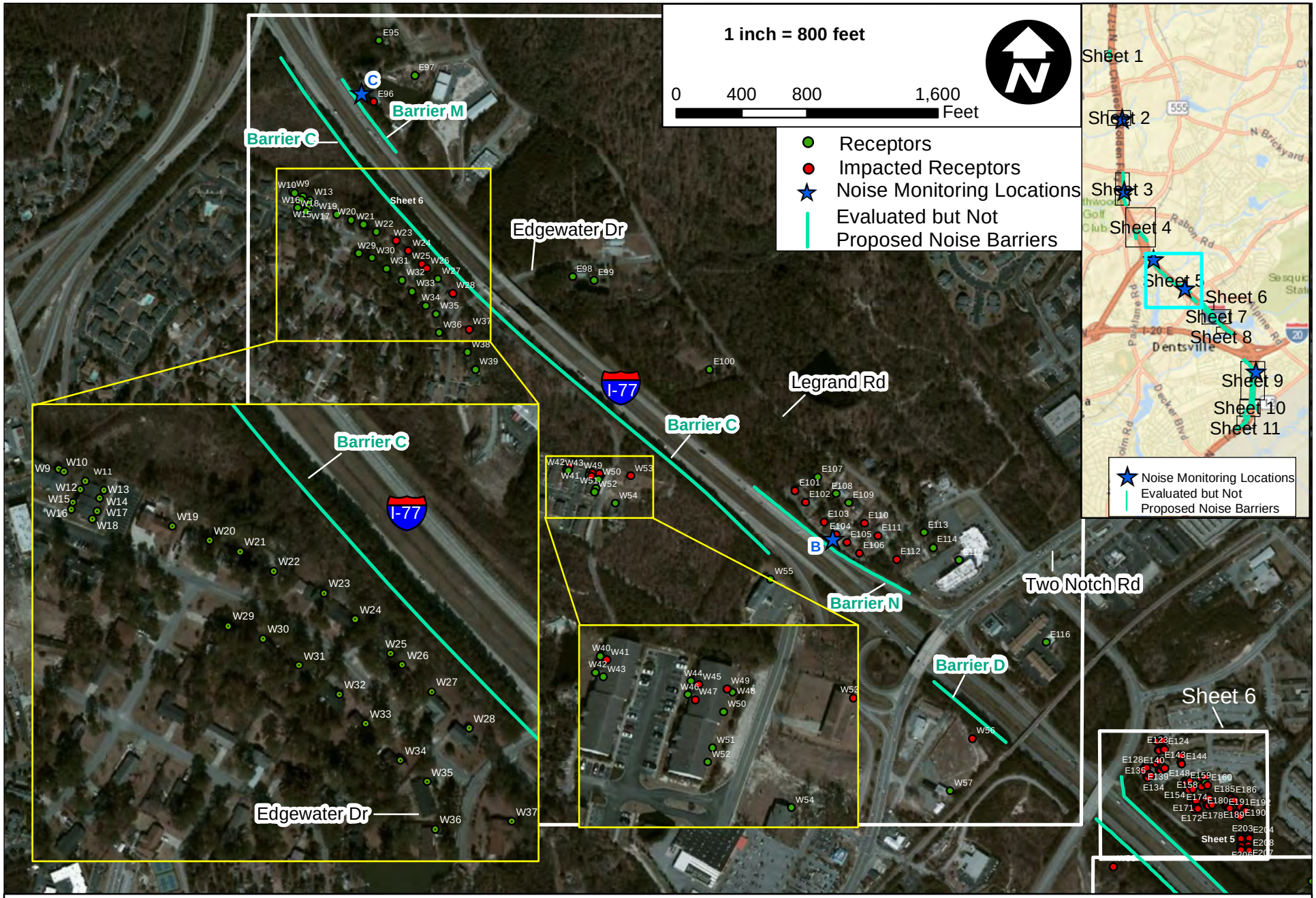

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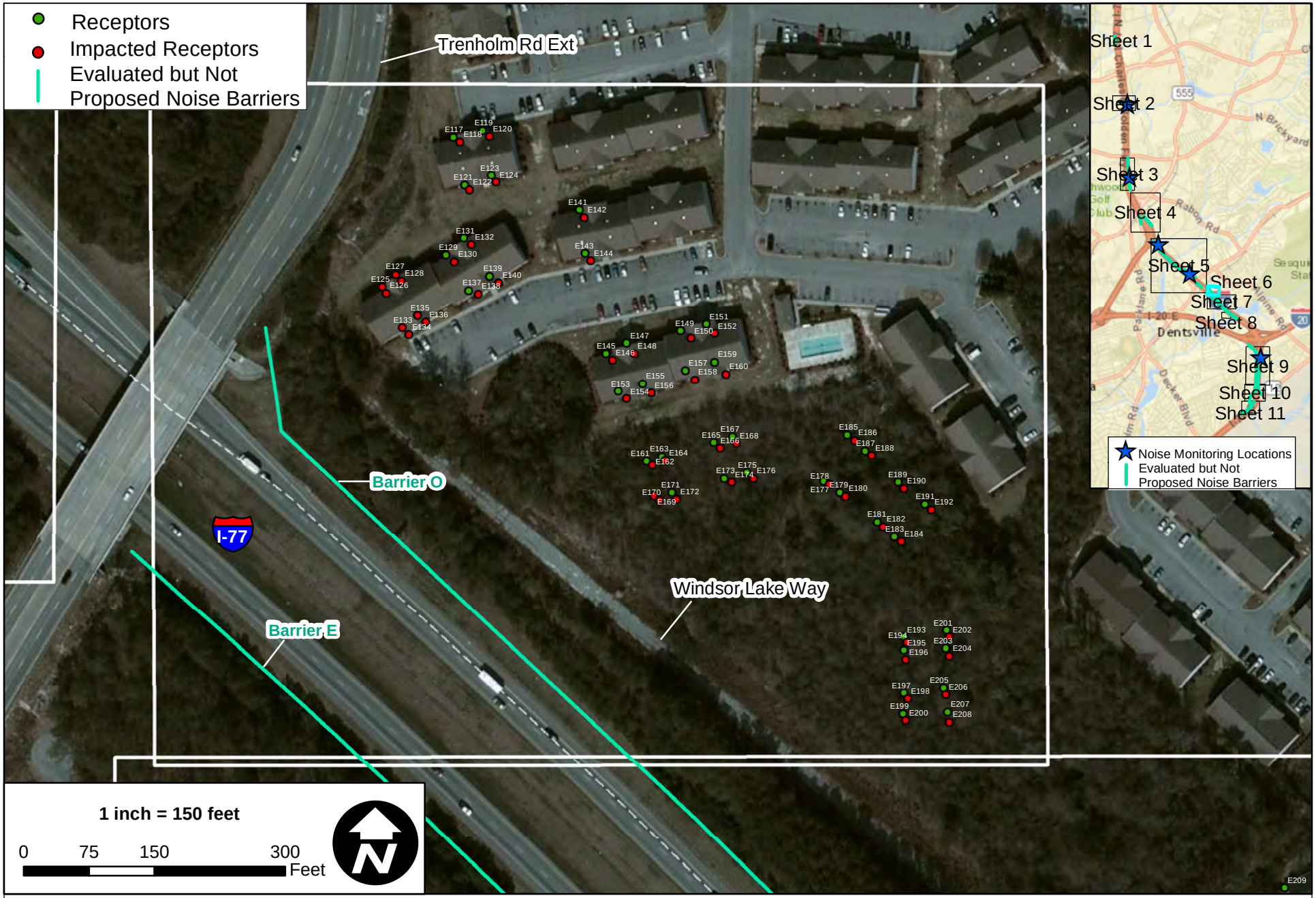

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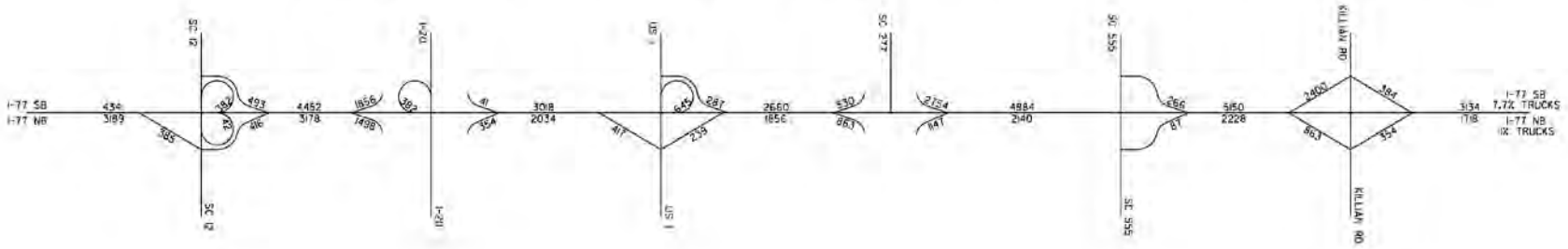
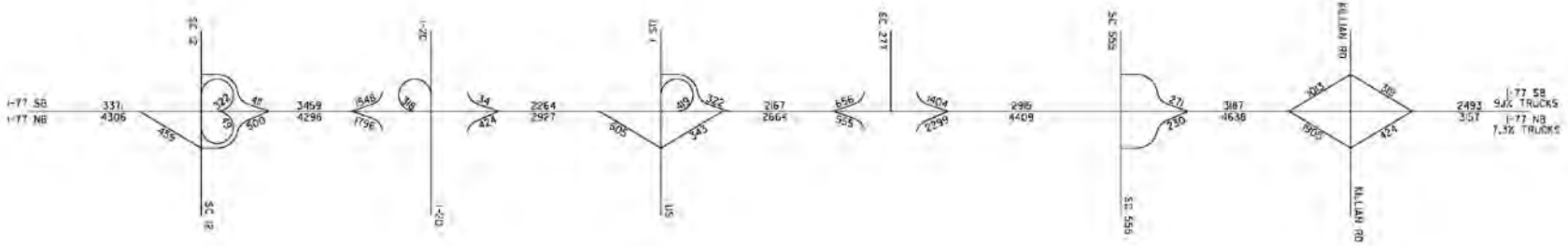
APPENDIX B:

TRAFFIC DATA SHEETS

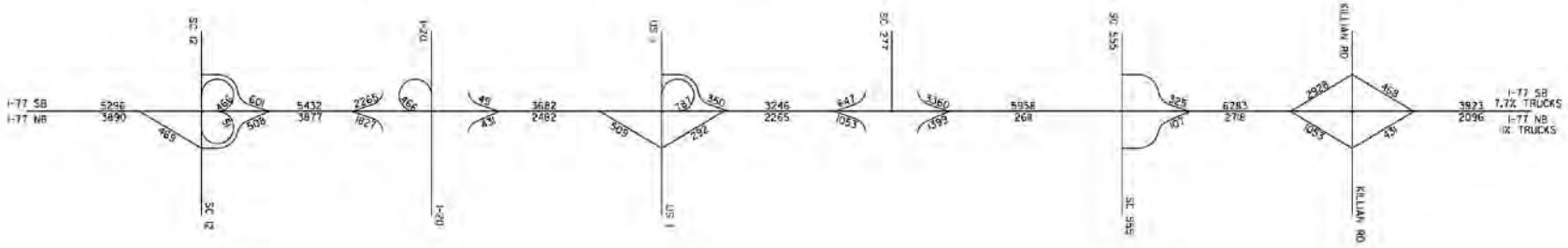
BUILD/NO BUILD 2017 AM VOLUMES



BUILD/NO BUILD 2017 PM VOLUMES



BUILD/NO BUILD 2037 AM VOLUMES



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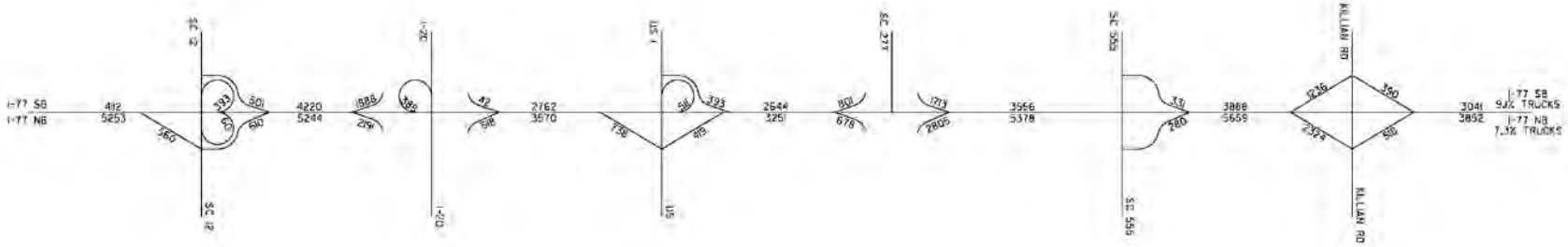


2017 EXISTING									
Roadway		**Speed (mph)**	**2017 PM PEAK**	**2017 LOS C**	*Vehicle Mix*				
					91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
					Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB I-77	south of SC 12	60	4306	4470	3952	53	278	17	6
	SC 12 to I-20	60	4298	4470	3944	53	277	17	6
	I-20 to US 1	60	2927	2980	2686	36	189	12	4
	US 1 to SC 277	60	2664	2980	2445	33	172	11	4
	SC 277 to SC 555	60	4409	4470	4046	55	284	18	6
	SC 555 to Killian Rd	60	4638	4470	4102	55	288	18	6
	north of Killian Rd	70	3157	4470	2897	39	204	13	4
SB I-77	north of Killian Rd	70	2493	4470	2288	31	161	10	3
	Killian Rd to SC 555	60	3187	4470	2925	40	206	13	4
	SC 555 to SC 277	60	2915	4470	2675	36	188	12	4
	SC 277 to US 1	60	2167	2980	1989	27	140	9	3
	US 1 to I-20	60	2264	2980	2078	28	146	9	3
	I-20 to SC 12	60	3459	4470	3174	43	223	14	5
	south of SC 12	60	3371	4470	3094	42	217	13	5

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB77 to Percival offramp (outside)	60	1077	988	13	69	4	2
NB77 to Percival offramp (middle1)	60	1077	988	13	69	4	2
NB77 to Percival offramp (middle2)	60	1077	988	13	69	4	2
NB77 to Percival offramp (inside)	60	1077	988	13	69	4	2
NB77 btn Percival ramps (outside)	60	1282	1177	16	83	5	2
NB77 btn Percival ramps (middle)	60	1282	1177	16	83	5	2
NB77 btn Percival ramps (inside)	60	1282	1177	16	83	5	2
NB off-ramp to Percival Road	45	459	421	6	30	2	1
NB on-ramp from Percival Road	45	500	459	6	32	2	1
SB off-ramp to Percival Road	45	411	377	5	27	2	1
SB on-ramp from Percival Road	45	322	295	4	21	1	0
NB77 Percival on-ramp to I-20off (outside)	60	1433	1315	18	92	6	2
NB77 Percival on-ramp to I-20off (middle)	60	1433	1315	18	92	6	2
NB77 Percival on-ramp to I-20off (inside)	60	1433	1315	18	92	6	2
NB77 Percival on to I20 off (outside)	60	1075	986	13	69	4	2
NB77 Percival on to I20 off (middle1)	60	1075	986	13	69	4	2
NB77 Percival on to I20 off (middle2)	60	1075	986	13	69	4	2
NB77 Percival on to I20 off (inside)	60	1075	986	13	69	4	2
NB77 I20 offramp to I20 onramp (outside)	60	1251	1148	16	81	5	2
NB77 I20 offramp to I20 onramp (inside)	60	1251	1148	16	81	5	2
NB off-ramp to I-20 East1 (outside)	60	898	824	11	58	4	1
NB off-ramp to I-20 East1 (inside)	60	898	824	11	58	4	1
NB off-ramp to I-20 East2	60	898	824	11	58	4	1
NB off-ramp to I-20 West	60	898	824	11	58	4	1

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB on-ramp from I-20	60	424	389	5	27	2	1
SB off-ramp to I-20 west	60	34	31	0	2	0	0
SB on-ramp from I-20 west1 (outside)	60	212	195	3	14	1	0
SB on-ramp from I-20 west1 (inside)	60	212	195	3	14	1	0
SB on-ramp from I-20 west2	60	212	195	3	14	1	0
SB on-ramp from I-20 east1	60	1548	1421	19	100	6	2
SB on-ramp from I-20 east2	60	1548	1421	19	100	6	2
SB off-ramp to I-20 east	45	318	292	4	21	1	0
NB77 I-20 onR to US1 offR (outside)	60	1464	1343	18	94	6	2
NB77 I-20 onR to US1 offR (inside)	60	1464	1343	18	94	6	2
NB77 btn US1 ramps (outside)	60	1161	1065	14	75	5	2
NB77 btn US1 ramps (inside)	60	1161	1065	14	75	5	2
NB off-ramp to US1	45	605	555	8	39	2	1
NB on-ramp from US1	45	343	315	4	22	1	0
SB off-ramp to US1	45	322	295	4	21	1	0
SB on-ramp from US1	45	419	385	5	27	2	1
NB77 US1 onR to Farrow offR (outside)	60	1332	1222	17	86	5	2
NB77 US1 onR to Farrow offR (inside)	60	1332	1222	17	86	5	2
NB77 Farrow offR to SC277 onR (outside)	60	1055	968	13	68	4	1
NB77 Farrow offR to SC277 onR (inside)	60	1055	968	13	68	4	1
NB offR to Farrow Road1 (outside)	60	555	509	7	36	2	1
NB offR to Farrow Road1 (inside)	60	1280	1175	16	83	5	2
NB offR to Farrow Road2 (outside)	45	278	255	3	18	1	0
NB offR to Farrow Road2 (inside)	45	278	255	3	18	1	0

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB onR from EB SC277-1 (outside)	60	766	703	10	49	3	1
NB onR from EB SC277-1 (middle)	60	766	703	10	49	3	1
NB onR from EB SC277-1 (inside)	60	766	703	10	49	3	1
NB onR from EB SC277-2 (outside)	60	1150	1055	14	74	5	2
NB onR from EB SC277-2 (inside)	60	1150	1055	14	74	5	2
NB onR from Farrow	45	230	211	3	15	1	0
SB offR to Farrow	45	271	249	3	17	1	0
SB onR from Farrow1	45	656	602	8	42	3	1
SB onR from Farrow2	60	656	602	8	42	3	1
SB onR to SC277	60	1404	1288	17	91	6	2
NB77 SC277 onR to Farrow onR (outside)	60	1470	1349	18	95	6	2
NB77 SC277 onR to Farrow onR (middle)	60	1470	1349	18	95	6	2
NB77 SC277 onR to Farrow onR (inside)	60	1470	1349	18	95	6	2
NB77 Farrow onR to Killian offR (outside)	60/70	1490	1367	18	96	6	2
NB77 Farrow onR to Killian offR (middle)	60/70	1490	1367	18	96	6	2
NB77 Farrow onR to Killian offR (inside)	60/70	1490	1367	18	96	6	2
NB77 btn Kililan ramps (outside)	70	855	785	11	55	3	1
NB77 btn Kililan ramps (middle)	70	855	785	11	55	3	1
NB77 btn Kililan ramps (inside)	70	855	785	11	55	3	1
NB77 Killian onR to the north (outside)	70	1052	966	13	68	4	1
NB77 Killian onR to the north (middle)	70	1052	966	13	68	4	1
NB77 Killian onR to the north (inside)	70	1052	966	13	68	4	1
NB off-ramp to Killian Road	45	1905	1748	24	123	8	3
NB on-ramp from Killian Road	45	424	389	5	27	2	1

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
SB off-ramp to Killian Road	45	319	293	4	21	1	0
SB on-ramp from Killian Road	45	1013	930	13	65	4	1
SB77 north of Killian Road (outside)	70	831	763	10	54	3	1
SB77 north of Killian Road (middle)	70	831	763	10	54	3	1
SB77 north of Killian Road (inside)	70	831	763	10	54	3	1
SB77 Killian offR to Killian onR (outside)	70	725	665	9	47	3	1
SB77 Killian offR to Killian onR (middle)	70	725	665	9	47	3	1
SB77 Killian offR to Killian onR (inside)	70	725	665	9	47	3	1
SB77 Killian onR to Farrow offR (outside)	60/70	1062	975	13	69	4	1
SB77 Killian onR to Farrow offR (middle)	60/70	1062	975	13	69	4	1
SB77 Killian onR to Farrow offR (inside)	60/70	1062	975	13	69	4	1
SB77 Farrow offR to SC277 offR (outside)	60	972	892	12	63	4	1
SB77 Farrow offR to SC277 offR (middle)	60	972	892	12	63	4	1
SB77 Farrow offR to SC277 offR (inside)	60	972	892	12	63	4	1
SB offR to Farrow onR (outside)	60	1458	1338	18	94	6	2
SB offR to Farrow onR (inside)	60	1458	1338	18	94	6	2
SB277 offR (outside)	60	468	429	6	30	2	1
SB277 offR (middle)	60	468	429	6	30	2	1
SB277 offR (inside)	60	468	429	6	30	2	1
SB77 SC277 offR to Farrow onR (outside)	60	756	693	9	49	3	1
SB77 SC277 offR to Farrow onR (inside)	60	756	693	9	49	3	1
SB77 Farrow onR to US1 offR (outside)	60	1084	994	13	70	4	2
SB77 Farrow onR to US1 offR (inside)	60	1084	994	13	70	4	2
SB77 US1 offR to US1 onR (outside)	60	923	847	11	60	4	1

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
SB77 US1 offR to US1 onR (inside)	60	923	847	11	60	4	1
SB77 US1 onR to I20 offR (outside)	60	1132	1039	14	73	5	2
SB77 US1 onR to I20 offR (inside)	60	1132	1039	14	73	5	2
SB77 I-20 offR to I-20 offR (outside)-1	60	1115	1023	14	72	4	2
SB77 I-20 offR to I-20 offR (inside)-1	60	1115	1023	14	72	4	2
SB77 I-20 offR to I-20 offR (outside)-2	60	743	682	9	48	3	1
SB77 I-20 offR to I-20 offR (middle)-2	60	743	682	9	48	3	1
SB77 I-20 offR to I-20 offR (inside)-2	60	743	682	9	48	3	1
SB77 EB I-20 offR to EB I-20 onR (outside)	60	956	877	12	62	4	1
SB77 EB I-20 offR to EB I-20 onR (inside)	60	956	877	12	62	4	1
SB77 EB I-20 onR to Percival offR (outside)	60	1153	1058	14	74	5	2
SB77 EB I-20 onR to Percival offR (middle)	60	1153	1058	14	74	5	2
SB77 EB I-20 onR to Percival offR (inside)	60	1153	1058	14	74	5	2
SB77 Percival offR to Percival onR (outside)	60	1016	932	13	66	4	1
SB77 Percival offR to Percival onR (middle)	60	1016	932	13	66	4	1
SB77 Percival offR to Percival onR (inside)	60	1016	932	13	66	4	1
EB Killian - west of I-77 (outside)	45	332	304	4	21	1	0
EB Killian - west of I-77 (inside)	45	332	304	4	21	1	0
WB Killian - west of I-77 (outside)	45	332	304	4	21	1	0
WB Killian - west of I-77 (inside)	45	332	304	4	21	1	0
EB Killian - east of I-77 (outside)	45	740	679	9	48	3	1
EB Killian - east of I-77 (inside)	45	740	679	9	48	3	1
WB Killian - east of I-77 (outside)	45	740	679	9	48	3	1
WB Killian - east of I-77 (inside)	45	740	679	9	48	3	1

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
EB Hardscrabble Road - west of I-77	45	212	194	3	14	1	0
EB Hardscrabble Road - east of I-77	45	212	194	3	14	1	0
WB Hardscrabble Road - east of I-77	45	212	194	3	14	1	0
WB Hardscrabble Road - west of I-77	45	212	194	3	14	1	0
EB Farrow - west of I-77 (outside)	45	595	546	7	38	2	1
EB Farrow - west of I-77 (inside)	45	595	546	7	38	2	1
EB Farrow - east of I-77 (outside)	45	723	663	9	47	3	1
EB Farrow - east of I-77 (inside)	45	723	663	9	47	3	1
WB Farrow - east of I-77 (outside)	45	723	663	9	47	3	1
WB Farrow - east of I-77 (inside)	45	723	663	9	47	3	1
WB Farrow - west of I-77 (outside)	45	595	546	7	38	2	1
WB Farrow - west of I-77 (inside)	45	595	546	7	38	2	1
EB Two Notch - west of I-77 (outside)	40	728	668	9	47	3	1
EB Two Notch - west of I-77 (inside)	40	728	668	9	47	3	1
EB Two Notch - east of I-77 (outside)	40	928	852	12	60	4	1
EB Two Notch - east of I-77 (inside)	40	928	852	12	60	4	1
WB Two Notch - east of I-77 (outside)	40	928	852	12	60	4	1
WB Two Notch - east of I-77 (inside)	40	928	852	12	60	4	1
WB Two Notch - west of I-77 (outside)	40	728	668	9	47	3	1
WB Two Notch - west of I-77 (inside)	40	728	668	9	47	3	1
EB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
EB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
EB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)1	55	683	627	8	44	3	1

2017 EXISTING							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
EB I20 - east of I-77 (middle)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (inside)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)2	55	1025	941	13	66	4	1
EB I20 - east of I-77 (inside)2	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (inside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (middle)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (inside)2	55	683	627	8	44	3	1
WB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
WB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
WB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB Percival - west of I-77 (outside)	40	382	351	5	25	2	1
EB Percival - west of I-77 (inside)	40	382	351	5	25	2	1
EB Percival - east of I-77 (outside)	40	335	307	4	22	1	0
EB Percival - east of I-77 (inside)	40	335	307	4	22	1	0
EB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1
WB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1
WB Percival - east of I-77 (outside)	40	335	307	4	22	1	0
WB Percival - east of I-77 (inside)	40	335	307	4	22	1	0
WB Percival - west of I-77 (outside)	40	382	351	5	25	2	1
WB Percival - west of I-77 (inside)	40	382	351	5	25	2	1

2037 NO-BUILD									
Roadway		Speed (mph)	2037 PM PEAK	2037 LOS C	*Vehicle Mix*				
					91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
					Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB I-77	south of SC 12	60	5253	4470	4102	55	288	18	6
	SC 12 to I-20	60	5244	4470	4102	55	288	18	6
	I-20 to US 1	60	3570	2980	2735	37	192	12	4
	US 1 to SC 277	60	3251	2980	2735	37	192	12	4
	SC 277 to SC 555	60	5378	4470	4102	55	288	18	6
	SC 555 to Killian Rd	60	5659	4470	4102	55	288	18	6
	north of Killian Rd	70	3852	4470	3535	48	248	15	5
SB I-77	north of Killian Rd	70	3041	4470	2791	38	196	12	4
	Killian Rd to SC 555	60	3888	4470	3568	48	251	16	5
	SC 555 to SC 277	60	3556	4470	3263	44	229	14	5
	SC 277 to US 1	60	2644	2980	2426	33	171	11	4
	US 1 to I-20	60	2762	2980	2535	34	178	11	4
	I-20 to SC 12	60	4220	4470	3873	52	272	17	6
	south of SC 12	60	4112	4470	3774	51	265	16	6

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB77 to Percival offramp (outside)	60	1118	1026	14	72	4	2
NB77 to Percival offramp (middle1)	60	1118	1026	14	72	4	2
NB77 to Percival offramp (middle2)	60	1118	1026	14	72	4	2
NB77 to Percival offramp (inside)	60	1118	1026	14	72	4	2
NB77 btn Percival ramps (outside)	60	1303	1196	16	84	5	2
NB77 btn Percival ramps (middle)	60	1303	1196	16	84	5	2
NB77 btn Percival ramps (inside)	60	1303	1196	16	84	5	2
NB off-ramp to Percival Road	45	560	514	7	36	2	1
NB on-ramp from Percival Road	45	610	560	8	39	2	1
SB off-ramp to Percival Road	45	501	460	6	32	2	1
SB on-ramp from Percival Road	45	393	361	5	25	2	1
NB77 Percival on-ramp to I-20off (outside)	60	1490	1367	18	96	6	2
NB77 Percival on-ramp to I-20off (middle)	60	1490	1367	18	96	6	2
NB77 Percival on-ramp to I-20off (inside)	60	1490	1367	18	96	6	2
NB77 Percival on to I20 off (outside)	60	1118	1026	14	72	4	2
NB77 Percival on to I20 off (middle1)	60	1118	1026	14	72	4	2
NB77 Percival on to I20 off (middle2)	60	1118	1026	14	72	4	2
NB77 Percival on to I20 off (inside)	60	1118	1026	14	72	4	2
NB77 I20 offramp to I20 onramp (outside)	60	1140	1046	14	73	5	2
NB77 I20 offramp to I20 onramp (inside)	60	1140	1046	14	73	5	2
NB off-ramp to I-20 East1 (outside)	60	1096	1005	14	71	4	2
NB off-ramp to I-20 East1 (inside)	60	1096	1005	14	71	4	2
NB off-ramp to I-20 East2	60	1096	1005	14	71	4	2
NB off-ramp to I-20 West	60	1096	1005	14	71	4	2

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB on-ramp from I-20	60	518	475	6	33	2	1
SB off-ramp to I-20 west	60	42	39	1	3	0	0
SB on-ramp from I-20 west1 (outside)	60	259	238	3	17	1	0
SB on-ramp from I-20 west1 (inside)	60	259	238	3	17	1	0
SB on-ramp from I-20 west2	60	259	238	3	17	1	0
SB on-ramp from I-20 east1	60	1888	1733	23	122	8	3
SB on-ramp from I-20 east2	60	1888	1733	23	122	8	3
SB off-ramp to I-20 east	45	388	356	5	25	2	1
NB77 I-20 onR to US1 offR (outside)	60	1490	1367	18	96	6	2
NB77 I-20 onR to US1 offR (inside)	60	1490	1367	18	96	6	2
NB77 btn US1 ramps (outside)	60	1121	1029	14	72	4	2
NB77 btn US1 ramps (inside)	60	1121	1029	14	72	4	2
NB off-ramp to US1	45	738	677	9	48	3	1
NB on-ramp from US1	45	419	385	5	27	2	1
SB off-ramp to US1	45	393	361	5	25	2	1
SB on-ramp from US1	45	511	469	6	33	2	1
NB77 US1 onR to Farrow offR (outside)	60	1626	1492	20	105	7	2
NB77 US1 onR to Farrow offR (inside)	60	1626	1492	20	105	7	2
NB77 Farrow offR to SC277 onR (outside)	60	1151	1056	14	74	5	2
NB77 Farrow offR to SC277 onR (inside)	60	1151	1056	14	74	5	2
NB offR to Farrow Road1 (outside)	60	678	622	8	44	3	1
NB offR to Farrow Road1 (inside)	60	1280	1175	16	83	5	2
NB offR to Farrow Road2 (outside)	45	339	311	4	22	1	0
NB offR to Farrow Road2 (inside)	45	339	311	4	22	1	0

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB onR from EB SC277-1 (outside)	60	935	858	12	60	4	1
NB onR from EB SC277-1 (middle)	60	935	858	12	60	4	1
NB onR from EB SC277-1 (inside)	60	935	858	12	60	4	1
NB onR from EB SC277-2 (outside)	60	1403	1287	17	90	6	2
NB onR from EB SC277-2 (inside)	60	1403	1287	17	90	6	2
NB onR from Farrow	45	230	211	3	15	1	0
SB offR to Farrow	45	331	304	4	21	1	0
SB onR from Farrow1	45	801	735	10	52	3	1
SB onR from Farrow2	60	801	735	10	52	3	1
SB onR to SC277	60	1713	1572	21	110	7	2
NB77 SC277 onR to Farrow onR (outside)	60	1490	1367	18	96	6	2
NB77 SC277 onR to Farrow onR (middle)	60	1490	1367	18	96	6	2
NB77 SC277 onR to Farrow onR (inside)	60	1490	1367	18	96	6	2
NB77 Farrow onR to Killian offR (outside)	60/70	1490	1367	18	96	6	2
NB77 Farrow onR to Killian offR (middle)	60/70	1490	1367	18	96	6	2
NB77 Farrow onR to Killian offR (inside)	60/70	1490	1367	18	96	6	2
NB77 btn Kililan ramps (outside)	70	715	656	9	46	3	1
NB77 btn Kililan ramps (middle)	70	715	656	9	46	3	1
NB77 btn Kililan ramps (inside)	70	715	656	9	46	3	1
NB77 Killian onR to the north (outside)	70	1284	1178	16	83	5	2
NB77 Killian onR to the north (middle)	70	1284	1178	16	83	5	2
NB77 Killian onR to the north (inside)	70	1284	1178	16	83	5	2
NB off-ramp to Killian Road	45	2324	2133	29	150	9	3
NB on-ramp from Killian Road	45	518	475	6	33	2	1

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
SB off-ramp to Killian Road	45	390	358	5	25	2	1
SB on-ramp from Killian Road	45	1236	1134	15	80	5	2
SB77 north of Killian Road (outside)	70	1014	930	13	65	4	1
SB77 north of Killian Road (middle)	70	1014	930	13	65	4	1
SB77 north of Killian Road (inside)	70	1014	930	13	65	4	1
SB77 Killian offR to Killian onR (outside)	70	884	811	11	57	4	1
SB77 Killian offR to Killian onR (middle)	70	884	811	11	57	4	1
SB77 Killian offR to Killian onR (inside)	70	884	811	11	57	4	1
SB77 Killian onR to Farrow offR (outside)	60/70	1296	1189	16	84	5	2
SB77 Killian onR to Farrow offR (middle)	60/70	1296	1189	16	84	5	2
SB77 Killian onR to Farrow offR (inside)	60/70	1296	1189	16	84	5	2
SB77 Farrow offR to SC277 offR (outside)	60	1186	1088	15	76	5	2
SB77 Farrow offR to SC277 offR (middle)	60	1186	1088	15	76	5	2
SB77 Farrow offR to SC277 offR (inside)	60	1186	1088	15	76	5	2
SB offR to Farrow onR (outside)	60	857	786	11	55	3	1
SB offR to Farrow onR (inside)	60	857	786	11	55	3	1
SB277 offR (outside)	60	571	524	7	37	2	1
SB277 offR (middle)	60	571	524	7	37	2	1
SB277 offR (inside)	60	571	524	7	37	2	1
SB77 SC277 offR to Farrow onR (outside)	60	922	846	11	59	4	1
SB77 SC277 offR to Farrow onR (inside)	60	922	846	11	59	4	1
SB77 Farrow onR to US1 offR (outside)	60	1322	1213	16	85	5	2
SB77 Farrow onR to US1 offR (inside)	60	1322	1213	16	85	5	2
SB77 US1 offR to US1 onR (outside)	60	1136	1042	14	73	5	2

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
SB77 US1 offR to US1 onR (inside)	60	1136	1042	14	73	5	2
SB77 US1 onR to I20 offR (outside)	60	1381	1267	17	89	6	2
SB77 US1 onR to I20 offR (inside)	60	1381	1267	17	89	6	2
SB77 I-20 offR to I-20 offR (outside)-1	60	1360	1248	17	88	5	2
SB77 I-20 offR to I-20 offR (inside)-1	60	1360	1248	17	88	5	2
SB77 I-20 offR to I-20 offR (outside)-2	60	907	832	11	58	4	1
SB77 I-20 offR to I-20 offR (middle)-2	60	907	832	11	58	4	1
SB77 I-20 offR to I-20 offR (inside)-2	60	907	832	11	58	4	1
SB77 EB I-20 offR to EB I-20 onR (outside)	60	1166	1070	14	75	5	2
SB77 EB I-20 offR to EB I-20 onR (inside)	60	1166	1070	14	75	5	2
SB77 EB I-20 onR to Percival offR (outside)	60	1407	1291	17	91	6	2
SB77 EB I-20 onR to Percival offR (middle)	60	1407	1291	17	91	6	2
SB77 EB I-20 onR to Percival offR (inside)	60	1407	1291	17	91	6	2
SB77 Percival offR to Percival onR (outside)	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (middle)	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (inside)	60	1240	1138	15	80	5	2
EB Killian - west of I-77 (outside)	45	455	418	6	29	2	1
EB Killian - west of I-77 (inside)	45	455	418	6	29	2	1
WB Killian - west of I-77 (outside)	45	455	418	6	29	2	1
WB Killian - west of I-77 (inside)	45	455	418	6	29	2	1
EB Killian - east of I-77 (outside)	45	1015	931	13	65	4	1
EB Killian - east of I-77 (inside)	45	1015	931	13	65	4	1
WB Killian - east of I-77 (outside)	45	1015	931	13	65	4	1
WB Killian - east of I-77 (inside)	45	1015	931	13	65	4	1

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
EB Hardscrabble Road - west of I-77	45	500	459	6	32	2	1
EB Hardscrabble Road - east of I-77	45	500	459	6	32	2	1
WB Hardscrabble Road - east of I-77	45	500	459	6	32	2	1
WB Hardscrabble Road - west of I-77	45	500	459	6	32	2	1
EB Farrow - west of I-77 (outside)	45	653	599	8	42	3	1
EB Farrow - west of I-77 (inside)	45	653	599	8	42	3	1
EB Farrow - east of I-77 (outside)	45	858	787	11	55	3	1
EB Farrow - east of I-77 (inside)	45	858	787	11	55	3	1
WB Farrow - east of I-77 (outside)	45	858	787	11	55	3	1
WB Farrow - east of I-77 (inside)	45	858	787	11	55	3	1
WB Farrow - west of I-77 (outside)	45	653	599	8	42	3	1
WB Farrow - west of I-77 (inside)	45	653	599	8	42	3	1
EB Two Notch - west of I-77 (outside)	40	838	769	10	54	3	1
EB Two Notch - west of I-77 (inside)	40	838	769	10	54	3	1
EB Two Notch - east of I-77 (outside)	40	1025	941	13	66	4	1
EB Two Notch - east of I-77 (inside)	40	1025	941	13	66	4	1
WB Two Notch - east of I-77 (outside)	40	1025	941	13	66	4	1
WB Two Notch - east of I-77 (inside)	40	1025	941	13	66	4	1
WB Two Notch - west of I-77 (outside)	40	838	769	10	54	3	1
WB Two Notch - west of I-77 (inside)	40	838	769	10	54	3	1
EB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
EB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
EB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)1	55	683	627	8	44	3	1

2037 NO-BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
EB I20 - east of I-77 (middle)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (inside)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)2	55	1025	941	13	66	4	1
EB I20 - east of I-77 (inside)2	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (inside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (middle)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (inside)2	55	683	627	8	44	3	1
WB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
WB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
WB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB Percival - west of I-77 (outside)	40	460	422	6	30	2	1
EB Percival - west of I-77 (inside)	40	460	422	6	30	2	1
EB Percival - east of I-77 (outside)	40	488	447	6	31	2	1
EB Percival - east of I-77 (inside)	40	488	447	6	31	2	1
EB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1
WB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1
WB Percival - east of I-77 (outside)	40	488	447	6	31	2	1
WB Percival - east of I-77 (inside)	40	488	447	6	31	2	1
WB Percival - west of I-77 (outside)	40	460	422	6	30	2	1
WB Percival - west of I-77 (inside)	40	460	422	6	30	2	1

2037 BUILD									
Roadway		Speed (mph)	2037 PM PEAK	2037 LOS C	*Vehicle Mix*				
					91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
					Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB I-77	south of SC 12	60	5253	4470	4102	55	288	18	6
	SC 12 to I-20	60	5244	4470	4102	55	288	18	6
	I-20 to US 1	60	3570	2980	2735	37	192	12	4
	US 1 to SC 277	60	3251	2980	2735	37	192	12	4
	SC 277 to SC 555	60	5378	4470	4102	55	288	18	6
	SC 555 to Killian Rd	60	5659	4470	4102	55	288	18	6
	north of Killian Rd	70	3852	4470	3535	48	248	15	5
SB I-77	north of Killian Rd	70	3041	4470	2791	38	196	12	4
	Killian Rd to SC 555	60	3888	4470	3568	48	251	16	5
	SC 555 to SC 277	60	3556	4470	3263	44	229	14	5
	SC 277 to US 1	60	2644	2980	2426	33	171	11	4
	US 1 to I-20	60	2762	2980	2535	34	178	11	4
	I-20 to SC 12	60	4220	4470	3873	52	272	17	6
	south of SC 12	60	4112	4470	3774	51	265	16	6

2037 BUILD							
Roadway	**Speed (mph)**	**Traffic Volumes**	*Vehicle Mix*				
			91.77%	*1.24%*	*6.45%*	*0.40%*	*0.14%*
			Autos	**MT**	**HT**	**Buses**	**Motorcycles**
NB77 to Percival offramp (outside)	60	1490	1367	18	96	6	2
NB77 to Percival offramp (middle)	60	1490	1367	18	96	6	2
NB77 to Percival offramp (inside)	60	1490	1367	18	96	6	2
NB77 btn Percival ramps (outside)	60	1303	1196	16	84	5	2
NB77 btn Percival ramps (middle)	60	1303	1196	16	84	5	2
NB77 btn Percival ramps (inside)	60	1303	1196	16	84	5	2
NB77 btn Percival ramps (outside2)	60	1173	1077	15	76	5	2
NB77 btn Percival ramps (middle1)	60	1173	1077	15	76	5	2
NB77 btn Percival ramps (middle2)	60	1173	1077	15	76	5	2
NB77 btn Percival ramps (inside2)	60	1173	1077	15	76	5	2
NB off-ramp to Percival Road east	45	560	514	7	36	2	1
NB off-ramp to Percival Road west	45	60	55	1	4	0	0
NB on-ramp from Percival Road	45	610	560	8	39	2	1
SB off-ramp to Percival Road	45	501	460	6	32	2	1
SB on-ramp from Percival Road	45	393	361	5	25	2	1
NB77 btn Percival ramps (outside3)	60	1283	1178	16	83	5	2
NB77 btn Percival ramps (middle3)	60	1283	1178	16	83	5	2
NB77 btn Percival ramps (inside3)	60	1283	1178	16	83	5	2
NB77 Percival on to I20 off (outside)	60	1311	1203	16	85	5	2
NB77 Percival on to I20 off (middle1)	60	1311	1203	16	85	5	2
NB77 Percival on to I20 off (middle2)	60	1311	1203	16	85	5	2
NB77 Percival on to I20 off (inside)	60	1311	1203	16	85	5	2
NB77 I20 offramp to I20 onramp (outsid	60	1018	934	13	66	4	1
NB77 I20 offramp to I20 onramp (middle	60	1018	934	13	66	4	1

NB77 I20 offramp to I20 onramp (inside	60	1018	934	13	66	4	1
NB off-ramp to I-20 East1 (outside)	60	1096	1005	14	71	4	2
NB off-ramp to I-20 East1 (inside)	60	1096	1005	14	71	4	2
NB off-ramp to I-20 East2	60	1096	1005	14	71	4	2
NB off-ramp to I-20 West	60	1096	1005	14	71	4	2
NB on-ramp from I-20	60	518	475	6	33	2	1
SB off-ramp to I-20 west	60	42	39	1	3	0	0
SB on-ramp from I-20 west1 (outside)	60	259	238	3	17	1	0
SB on-ramp from I-20 west1 (inside)	60	259	238	3	17	1	0
SB on-ramp from I-20 west2	60	259	238	3	17	1	0
SB on-ramp from I-20 east1	60	1888	1733	23	122	8	3
SB on-ramp from I-20 east2	60	1888	1733	23	122	8	3
SB off-ramp to I-20 east	45	388	356	5	25	2	1
NB77 I-20 onR to US1 offR (outside)	60	1190	1092	15	77	5	2
NB77 I-20 onR to US1 offR (middle)	60	1190	1092	15	77	5	2
NB77 I-20 onR to US1 offR (inside)	60	1190	1092	15	77	5	2
NB77 btn US1 ramps (outside)	60	944	866	12	61	4	1
NB77 btn US1 ramps (middle)	60	944	866	12	61	4	1
NB77 btn US1 ramps (inside)	60	944	866	12	61	4	1
NB off-ramp to US1	45	738	677	9	48	3	1
NB on-ramp from US1	45	419	385	5	27	2	1
SB off-ramp to US1	45	393	361	5	25	2	1
SB on-ramp from US1	45	511	469	6	33	2	1
NB77 US1 onR to Farrow offR (outside)	60	1084	994	13	70	4	2
NB77 US1 onR to Farrow offR (middle)	60	1084	994	13	70	4	2
NB77 US1 onR to Farrow offR (inside)	60	1084	994	13	70	4	2
NB77 Farrow offR to SC277 onR (outsi	60	858	787	11	55	3	1
NB77 Farrow offR to SC277 onR (middl	60	858	787	11	55	3	1

NB77 Farrow offR to SC277 onR (inside	60	858	787	11	55	3	1
NB offR to Farrow Road1 (outside)	60	678	622	8	44	3	1
NB offR to Farrow Road1 (inside)	60	1280	1175	16	83	5	2
NB offR to Farrow Road2 (outside)	45	339	311	4	22	1	0
NB offR to Farrow Road2 (inside)	45	339	311	4	22	1	0
NB onR from EB SC277-1 (outside)	60	935	858	12	60	4	1
NB onR from EB SC277-1 (middle)	60	935	858	12	60	4	1
NB onR from EB SC277-1 (inside)	60	935	858	12	60	4	1
NB onR from EB SC277-2 (outside)	60	1403	1287	17	90	6	2
NB onR from EB SC277-2 (inside)	60	1403	1287	17	90	6	2
NB onR from EB SC277-2	60	2805	2574	35	181	11	4
NB onR from Farrow	45	230	211	3	15	1	0
SB offR to Farrow	45	331	304	4	21	1	0
SB onR from Farrow1	45	801	735	10	52	3	1
SB onR from Farrow2	60	801	735	10	52	3	1
SB onR to SC277	60	1713	1572	21	110	7	2
NB77 SC277 onR to Farrow onR (outsid	60	768	705	10	50	3	1
NB77 SC277 onR to Farrow onR (middl1	60	768	705	10	50	3	1
NB77 SC277 onR to Farrow onR (middl2	60	768	705	10	50	3	1
NB77 SC277 onR to Farrow onR (inside	60	768	705	10	50	3	1
NB77 Farrow onR to Killian offR (outsid	60/70	1415	1298	18	91	6	2
NB77 Farrow onR to Killian offR (middl1	60/70	1415	1298	18	91	6	2
NB77 Farrow onR to Killian offR (middl2	60/70	1415	1298	18	91	6	2
NB77 Farrow onR to Killian offR (inside)	60/70	1415	1298	18	91	6	2
NB77 btn Kililan ramps (outside)	70	715	656	9	46	3	1
NB77 btn Kililan ramps (middle)	70	715	656	9	46	3	1
NB77 btn Kililan ramps (inside)	70	715	656	9	46	3	1
NB77 north of Killian Road (outside)	70	1284	1178	16	83	5	2

NB77 north of Killian Road (middle)	70	1284	1178	16	83	5	2
NB77 north of Killian Road (inside)	70	1284	1178	16	83	5	2
NB off-ramp to Killian Road	45	2324	2133	29	150	9	3
NB on-ramp from Killian Road	45	518	475	6	33	2	1
SB off-ramp to Killian Road	45	390	358	5	25	2	1
SB on-ramp from Killian Road (outside)	45	618	567	8	40	2	1
SB on-ramp from Killian Road (inside)	45	618	567	8	40	2	1
SB77 north of Killian Road (outside)	70	1014	930	13	65	4	1
SB77 north of Killian Road (middle)	70	1014	930	13	65	4	1
SB77 north of Killian Road (inside)	70	1014	930	13	65	4	1
SB77 Killian offR to Killian onR (outside)	70	884	811	11	57	4	1
SB77 Killian offR to Killian onR (middle)	70	884	811	11	57	4	1
SB77 Killian offR to Killian onR (inside)	70	884	811	11	57	4	1
SB77 Killian onR to Farrow offR (outsid	60/70	972	892	12	63	4	1
SB77 Killian onR to Farrow offR (middl1	60/70	972	892	12	63	4	1
SB77 Killian onR to Farrow offR (middl2	60/70	972	892	12	63	4	1
SB77 Killian onR to Farrow offR (inside)	60/70	972	892	12	63	4	1
SB77 Farrow offR to SC277 offR (outsi	60	889	816	11	57	4	1
SB77 Farrow offR to SC277 offR (mid1	60	889	816	11	57	4	1
SB77 Farrow offR to SC277 offR (mid2	60	889	816	11	57	4	1
SB77 Farrow offR to SC277 offR (insid	60	889	816	11	57	4	1
SB offR to Farrow onR (outside)	60	857	786	11	55	3	1
SB offR to Farrow onR (inside)	60	857	786	11	55	3	1
SB277 offR (outside)	60	571	524	7	37	2	1
SB277 offR (middle)	60	571	524	7	37	2	1
SB277 offR (inside)	60	571	524	7	37	2	1
SB77 SC277 offR to Farrow onR (outsi	60	614	564	8	40	2	1
SB77 SC277 offR to Farrow onR (middl	60	614	564	8	40	2	1

SB77 SC277 offR to Farrow onR (inside	60	614	564	8	40	2	1
SB77 Farrow onR to US1 offR (outside)	60	881	809	11	57	4	1
SB77 Farrow onR to US1 offR (middle)	60	881	809	11	57	4	1
SB77 Farrow onR to US1 offR (inside)	60	881	809	11	57	4	1
SB77 US1 offR to US1 onR (outside)	60	750	689	9	48	3	1
SB77 US1 offR to US1 onR (middle)	60	750	689	9	48	3	1
SB77 US1 offR to US1 onR (inside)	60	750	689	9	48	3	1
SB77 US1 onR to I20 offR (outside)	60	921	845	11	59	4	1
SB77 US1 onR to I20 offR (middle)	60	921	845	11	59	4	1
SB77 US1 onR to I20 offR (inside)	60	921	845	11	59	4	1
SB77 I-20 offR to I-20 offR (outside)-1	60	907	832	11	58	4	1
SB77 I-20 offR to I-20 offR (middle)-1	60	907	832	11	58	4	1
SB77 I-20 offR to I-20 offR (inside)-1	60	907	832	11	58	4	1
SB77 I-20 offR to I-20 offR (outside)-2	60	680	624	8	44	3	1
SB77 I-20 offR to I-20 offR (middle1)-2	60	680	624	8	44	3	1
SB77 I-20 offR to I-20 offR (middle2)-2	60	680	624	8	44	3	1
SB77 I-20 offR to I-20 offR (inside)-2	60	680	624	8	44	3	1
SB77 EB I-20 offR to EB I-20 onR (outsi	60	777	713	10	50	3	1
SB77 EB I-20 offR to EB I-20 onR (middl	60	777	713	10	50	3	1
SB77 EB I-20 offR to EB I-20 onR (inside	60	777	713	10	50	3	1
SB77 EB I-20 onR to Percival offR (outsi	60	1055	968	13	68	4	1
SB77 EB I-20 onR to Percival offR (mid1	60	1055	968	13	68	4	1
SB77 EB I-20 onR to Percival offR (mid2	60	1055	968	13	68	4	1
SB77 EB I-20 onR to Percival offR (insid	60	1055	968	13	68	4	1
SB77 Percival offR to Percival onR (ou1	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (mi1	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (ins1	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (ou2	60	930	853	12	60	4	1

SB77 Percival offR to Percival onR (m12	60	930	853	12	60	4	1
SB77 Percival offR to Percival onR (m22	60	930	853	12	60	4	1
SB77 Percival offR to Percival onR (ins2	60	930	853	12	60	4	1
SB77 Percival offR to Percival onR (ou3	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (mi3	60	1240	1138	15	80	5	2
SB77 Percival offR to Percival onR (ins3	60	1240	1138	15	80	5	2
EB Killian - west of I-77 (outside)	45	455	418	6	29	2	1
EB Killian - west of I-77 (inside)	45	455	418	6	29	2	1
WB Killian - west of I-77 (outside)	45	455	418	6	29	2	1
WB Killian - west of I-77 (inside)	45	455	418	6	29	2	1
EB Killian - east of I-77 (outside)	45	1015	931	13	65	4	1
EB Killian - east of I-77 (inside)	45	1015	931	13	65	4	1
WB Killian - east of I-77 (outside)	45	1015	931	13	65	4	1
WB Killian - east of I-77 (inside)	45	1015	931	13	65	4	1
EB Hardscrabble Road - west of I-77	45	500	459	6	32	2	1
EB Hardscrabble Road - east of I-77	45	500	459	6	32	2	1
WB Hardscrabble Road - east of I-77	45	500	459	6	32	2	1
WB Hardscrabble Road - west of I-77	45	500	459	6	32	2	1
EB Farrow - west of I-77 (outside)	45	653	599	8	42	3	1
EB Farrow - west of I-77 (inside)	45	653	599	8	42	3	1
EB Farrow - east of I-77 (outside)	45	858	787	11	55	3	1
EB Farrow - east of I-77 (inside)	45	858	787	11	55	3	1
WB Farrow - east of I-77 (outside)	45	858	787	11	55	3	1
WB Farrow - east of I-77 (inside)	45	858	787	11	55	3	1
WB Farrow - west of I-77 (outside)	45	653	599	8	42	3	1
WB Farrow - west of I-77 (inside)	45	653	599	8	42	3	1
EB Two Notch - west of I-77 (outside)	40	838	769	10	54	3	1
EB Two Notch - west of I-77 (inside)	40	838	769	10	54	3	1

EB Two Notch - east of I-77 (outside)	40	1025	941	13	66	4	1
EB Two Notch - east of I-77 (inside)	40	1025	941	13	66	4	1
WB Two Notch - east of I-77 (outside)	40	1025	941	13	66	4	1
WB Two Notch - east of I-77 (inside)	40	1025	941	13	66	4	1
WB Two Notch - west of I-77 (outside)	40	838	769	10	54	3	1
WB Two Notch - west of I-77 (inside)	40	838	769	10	54	3	1
EB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
EB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
EB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (middle)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (inside)1	55	683	627	8	44	3	1
EB I20 - east of I-77 (outside)2	55	1025	941	13	66	4	1
EB I20 - east of I-77 (inside)2	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (inside)1	55	1025	941	13	66	4	1
WB I20 - east of I-77 (outside)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (middle)2	55	683	627	8	44	3	1
WB I20 - east of I-77 (inside)2	55	683	627	8	44	3	1
WB I20 - west of I-77 (outside)	55	683	627	8	44	3	1
WB I20 - west of I-77 (middle)	55	683	627	8	44	3	1
WB I20 - west of I-77 (inside)	55	683	627	8	44	3	1
EB Percival - west of I-77 (outside)	40	460	422	6	30	2	1
EB Percival - west of I-77 (inside)	40	460	422	6	30	2	1
EB Percival - east of I-77 (outside)	40	488	447	6	31	2	1
EB Percival - east of I-77 (inside)	40	488	447	6	31	2	1
EB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1
WB Percival - east of I-77 (single lane)	40	520	477	6	34	2	1

WB Percival - east of I-77 (outside)	40	488	447	6	31	2	1
WB Percival - east of I-77 (inside)	40	488	447	6	31	2	1
WB Percival - west of I-77 (outside)	40	460	422	6	30	2	1
WB Percival - west of I-77 (inside)	40	460	422	6	30	2	1

APPENDIX C:
FIELD DATA SHEETS

TRAFFIC NOISE MONITORING LOG SHEET

Data file #14

Project Description: I-77 Loc A (10 of 12)

Job Number: 235849 Noise Source: Traffic

Date: 8/20/14 By: EM & RM

Equipment make/model/serial # Larson Davis Sys 824 Data File: 14

Location Description: Old Satchelford Rd.
1325 old Satchelford Rd.

Location Diagram:

- Traffic counts need to be directional

Start Time: 12:35 AM/PM Stop Time: 12:50 AM PM Duration:

Wind Speed: 6 mph Wind Direction: N

Temperature: 88° Speed 70 mph Humidity: 63%

Calibration results before: 114.2 dBA and after 114.1 dBA

TNM 66.8 ±1.3 Leq 65.5 dBA Lmin 55.4 dBA Lmax 81.5 dBA

L10 dBA L50 dBA L90 dBA

Direction	Autos	Medium Trucks	Heavy Trucks	Motorcycles	Buses
N	478 1912	11 (17) 68	11		11 (3) 17
S	437 1748	(25) 100	212 49 NB 53 SB		

TRAFFIC NOISE MONITORING LOG SHEET

Project Description: I-77 Loc. B Data for Int 3

Job Number: 235899 Noise Source: TRAFFIC

Date: 8/20/14 By: EM's RM + Muller (scoot)

Equipment make/model/serial # _____ Data File: #3

Location Description: BALLENTINE ROAD

Location Diagram:

- Traffic counts need to be directional

Start Time: 12:05 AM (PM)

Stop Time: 12:20 AM (PM)

Duration: _____

Wind Speed: 6 mph Wind Direction: N

Temperature: 84° Speed 70 mph Humidity: 63%

Calibration results before: 113.8 dBA and after 114.1 dBA

TNM 70.3 +3.0

Leq 67.3 dBA Lmin 49.8 dBA Lmax 80.1 dBA

L10 _____ dBA L50 _____ dBA L90 _____ dBA

Direction	Autos	Medium Trucks	Heavy Trucks	Motorcycles	Buses
N	244 976	(14) 56	19		
S	240 960	(10) 42	24	1 4	

48 NB
61 SB

TRAFFIC NOISE MONITORING LOG SHEET

Data file #5

Project Description: I-77 Location C

Job Number: 735849 Noise Source: traffic

Date: 8/7/13 By: RM & RM

Equipment make/model/serial # _____ Data File: #5

Location Description: Ross Downer Rd. (Loc D) in driveway

Location Diagram:

- Traffic counts need to be directional

Start Time: 2:10 AM PM Stop Time: 2:25 AM PM Duration: 15 min

Wind Speed: 6 mph Wind Direction: E NE

Temperature: 91° Speed 70 mph Humidity: 58%

Calibration results before: 113.8 dBA and after 114.1 dBA

TNM 71.9 Leq 69.0 dBA Lmin 57.0 dBA Lmax 79.4 dBA

L10 _____ dBA L50 _____ dBA L90 _____ dBA

Direction	Autos	Medium Trucks	Heavy Trucks	Motorcycles	Buses
N	377 1500	(17) 68	172 43 NB	1 4	1 4
S	313 1252	(10) 40	129 32 SB	1 4	

TRAFFIC NOISE MONITORING LOG SHEET

Data file #6

Project Description: I-77 Lot D

Job Number: 235849 Noise Source: traffic

Date: 8/20/14 By: EM & BM

Equipment make/model/serial # _____ Data File: #6

Location Description: [illegible]

Location Diagram:

- Traffic counts need to be directional

Start Time: 2:55 AM PM

Stop Time: 3:05 AM/PM

Duration: 15 min

Wind Speed: 8 mph Wind Direction: N

Temperature: 91 Speed 70 mph Humidity: 48°

Calibration results before: 113.8 dBA and after 114.1 dBA

TNM 70.0 -2.3

Leq 72.8 dBA Lmin 60.6 dBA Lmax 83.2 dBA

L10 _____ dBA L50 _____ dBA L90 _____ dBA

Direction	Autos	Medium Trucks	Heavy Trucks	Motorcycles	Buses
N	530 1060	14 56		1 4	
S	386 1544	15 60			1 4

200 72 NB
276 69 SB

TRAFFIC NOISE MONITORING LOG SHEET

Project Description: I-77 Location E

Job Number: 235849 Noise Source: traffic

Date: 8/20 By:

Equipment make/model/serial # Data File: #7

Location Description: Toyota Dealership parking lot MP 21

Location Diagram:

- Traffic counts need to be directional

Start Time: 3:30 AM PM Stop Time: 3:45 AM PM Duration: 15 min

Wind Speed: Straight Wind Direction: N

Temperature: 93 Speed 75 mph Humidity: 44

Calibration results before: 113.8 dBA and after dBA

TNM 75.2 -2.7

Leq 77.9 dBA Lmin 63.9 dBA Lmax 92.8 dBA

L10 dBA L50 dBA L90 dBA

Direction	Autos	Medium Trucks	Heavy Trucks	Motorcycles	Buses
N	611 2444	30 120		11 5	1 4
S	438 1752	19 76	216 54 NB 204 51 SB	11 8	

APPENDIX D:
FEASIBLE/REASONABLE WORKSHEETS

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier A

Feasibility

Number of Impacted Receivers: 3

Number of Benefited Receivers: 2

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 67

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☐ Yes ☒ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☐ No
Safety	☐ Yes	☐ No
Drainage	☐ Yes	☐ No
Utilities	☐ Yes	☐ No
Maintenance	☐ Yes	☐ No
Access	☐ Yes	☐ No
Exposed Height of Wall	☐ Yes	☐ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers

Number of Benefited Receivers that achieve at least an 8 dBA reduction

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure

Estimated construction cost for noise abatement measure

Estimated cost per Benefited Receiver

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above)

Number of Benefited Receivers in **support** of noise abatement measure

Percentage of Benefited Receivers in **support** of noise abatement measure

Number of Benefited Receivers **opposed** to noise abatement measure

Percentage of Benefited Receivers **opposed** to noise abatement measure

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier B

Feasibility

Number of Impacted Receivers: 2

Number of Benefited Receivers: 0

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 0

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☐ Yes ☒ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☐ No
Safety	☐ Yes	☐ No
Drainage	☐ Yes	☐ No
Utilities	☐ Yes	☐ No
Maintenance	☐ Yes	☐ No
Access	☐ Yes	☐ No
Exposed Height of Wall	☐ Yes	☐ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers

Number of Benefited Receivers that achieve at least an 8 dBA reduction

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure

Estimated construction cost for noise abatement measure

Estimated cost per Benefited Receiver

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above)

Number of Benefited Receivers in **support** of noise abatement measure

Percentage of Benefited Receivers in **support** of noise abatement measure

Number of Benefited Receivers **opposed** to noise abatement measure

Percentage of Benefited Receivers **opposed** to noise abatement measure

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier C

Feasibility

Number of Impacted Receivers: 15

Number of Benefited Receivers: 25

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 93

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 25

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 2

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 8

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier D

Feasibility

Number of Impacted Receivers: 1

Number of Benefited Receivers: 0

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 0

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☐ Yes ☒ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☐ No
Safety	☐ Yes	☐ No
Drainage	☐ Yes	☐ No
Utilities	☐ Yes	☐ No
Maintenance	☐ Yes	☐ No
Access	☐ Yes	☐ No
Exposed Height of Wall	☐ Yes	☐ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers

Number of Benefited Receivers that achieve at least an 8 dBA reduction

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure

Estimated construction cost for noise abatement measure

Estimated cost per Benefited Receiver

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above)

Number of Benefited Receivers in **support** of noise abatement measure

Percentage of Benefited Receivers in **support** of noise abatement measure

Number of Benefited Receivers **opposed** to noise abatement measure

Percentage of Benefited Receivers **opposed** to noise abatement measure

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier E

Feasibility

Number of Impacted Receivers: 9

Number of Benefited Receivers: 26

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 26

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 11

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 42

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier F

Feasibility

Number of Impacted Receivers: 37

Number of Benefited Receivers: 54

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 54

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 8

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 15

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier G

Feasibility

Number of Impacted Receivers: 6

Number of Benefited Receivers: 6

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 67

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☐ Yes ☒ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☐ No
Safety	☐ Yes	☐ No
Drainage	☐ Yes	☐ No
Utilities	☐ Yes	☐ No
Maintenance	☐ Yes	☐ No
Access	☐ Yes	☐ No
Exposed Height of Wall	☐ Yes	☐ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers

Number of Benefited Receivers that achieve at least an 8 dBA reduction

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure

Estimated construction cost for noise abatement measure

Estimated cost per Benefited Receiver

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above)

Number of Benefited Receivers in **support** of noise abatement measure

Percentage of Benefited Receivers in **support** of noise abatement measure

Number of Benefited Receivers **opposed** to noise abatement measure

Percentage of Benefited Receivers **opposed** to noise abatement measure

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier H

Feasibility

Number of Impacted Receivers: 4

Number of Benefited Receivers: 0

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 0

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☐ Yes ☒ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☐ No
Safety	☐ Yes	☐ No
Drainage	☐ Yes	☐ No
Utilities	☐ Yes	☐ No
Maintenance	☐ Yes	☐ No
Access	☐ Yes	☐ No
Exposed Height of Wall	☐ Yes	☐ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers

Number of Benefited Receivers that achieve at least an 8 dBA reduction

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure

Estimated construction cost for noise abatement measure

Estimated cost per Benefited Receiver

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above)

Number of Benefited Receivers in **support** of noise abatement measure

Percentage of Benefited Receivers in **support** of noise abatement measure

Number of Benefited Receivers **opposed** to noise abatement measure

Percentage of Benefited Receivers **opposed** to noise abatement measure

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier I

Feasibility

Number of Impacted Receivers: 12

Number of Benefited Receivers: 14

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 14

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 8

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 57

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier J

Feasibility

Number of Impacted Receivers: 24

Number of Benefited Receivers: 22

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 79

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 22

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 8

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 36

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier K

Feasibility

Number of Impacted Receivers: 81

Number of Benefited Receivers: 83

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 99

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 83

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 39

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 47

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier L

Feasibility

Number of Impacted Receivers: 3

Number of Benefited Receivers: 4

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 4

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 4

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 100

Does the proposed noise abatement measure meet the noise reduction design goal? ☒ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure: 35

Estimated construction cost for noise abatement measure: 987,000

Estimated cost per Benefited Receiver: 246,750

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☒ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier M

Feasibility

Number of Impacted Receivers: 1

Number of Benefited Receivers: 1

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 1

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 1

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 100

Does the proposed noise abatement measure meet the noise reduction design goal? ☒ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure: 35

Estimated construction cost for noise abatement measure: 483,000

Estimated cost per Benefited Receiver: 483,000

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☒ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier N

Feasibility

Number of Impacted Receivers: 9

Number of Benefited Receivers: 12

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 12

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 10

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 83

Does the proposed noise abatement measure meet the noise reduction design goal? ☒ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure: 35

Estimated construction cost for noise abatement measure: 1,008,000

Estimated cost per Benefited Receiver: 84,000

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☒ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier O

Feasibility

Number of Impacted Receivers: 53

Number of Benefited Receivers: 75

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 83

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 75

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 12

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 16

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier P

Feasibility

Number of Impacted Receivers: 4

Number of Benefited Receivers: 3

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 75

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 3

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 1

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 33

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☒ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier Q

Feasibility

Number of Impacted Receivers: 9

Number of Benefited Receivers: 9

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 9

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 8

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 89

Does the proposed noise abatement measure meet the noise reduction design goal? ☒ Yes ☐ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure: 35

Estimated construction cost for noise abatement measure: 604,800

Estimated cost per Benefited Receiver: 67,200

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☒ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

SCDOT Feasibility and Reasonableness Worksheet

Date: Feb 4, 2015

Project Name SCDOT I-77 Widening and Improvements

Highway Traffic Noise Abatement Measure Noise Barrier R

Feasibility

Number of Impacted Receivers: 3

Number of Benefited Receivers: 5

Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed noise abatement measure: 100

Is the proposed noise abatement measure acoustically feasible?
NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible.

☒ Yes ☐ No

Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal?

Topography	☐ Yes	☒ No
Safety	☐ Yes	☒ No
Drainage	☐ Yes	☒ No
Utilities	☐ Yes	☒ No
Maintenance	☐ Yes	☒ No
Access	☐ Yes	☒ No
Exposed Height of Wall	☐ Yes	☒ No

If "Yes" was marked for any of the questions above, please explain below.

Detailed Description

Reasonableness

According to 23 CFR 772.13(d)(2)(iv) the abatement measure must collectively achieve each of these criteria to be reasonable. Therefore if any of the three mandatory reasonable factors are not achieved, then the abatement measure is determined NOT to be reasonable. When completing the form it is not necessary to detail each of the criteria if one was determined not to be reasonable.

#1: Noise Reduction Design Goal

Number of Benefited Receivers: 5

Number of Benefited Receivers that achieve at least an 8 dBA reduction: 0

Percentage of Benefited Receivers in the first two building rows that would achieve at least a 8 dBA reduction from the proposed noise abatement measure. NOTE: SCDOT Policy indicates that 80% of the benefited receivers in the first two building rows must achieve at least a 8 dBA reduction for it to be reasonable.: 0

Does the proposed noise abatement measure meet the noise reduction design goal? ☐ Yes ☒ No

If "Yes" is marked, continue to #2. If "No" is marked, then abatement is determined NOT to be reasonable.

#2: Cost Effectiveness

Estimated cost per square foot for noise abatement measure:

Estimated construction cost for noise abatement measure:

Estimated cost per Benefited Receiver:

Based on the SCDOT policy of $30,000 per Benefited Receiver, would the abatement measure be reasonable? NOTE: SCDOT Policy states that the preliminary noise analysis is based on $35.00 per square foot and a more project-specific construction cost should be applied at a cost per square foot basis during the detailed noise abatement evaluation. ☐ Yes ☐ No

If "Yes" is marked, continue to #3. If "No" is marked, then abatement is determined NOT to be reasonable.

#3: Viewpoints of the property owners and residents of the benefitted receivers

Number of Benefited Receivers (same as above):

Number of Benefited Receivers in **support** of noise abatement measure:

Percentage of Benefited Receivers in **support** of noise abatement measure:

Number of Benefited Receivers **opposed** to noise abatement measure:

Percentage of Benefited Receivers **opposed** to noise abatement measure:

Number of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Percentage of Benefited Receivers **that did not respond** to solicitation on noise abatement measure:

Based on the viewpoints of the property owners and residents of the Benefited Receivers, would the abatement measure be reasonable? NOTE: SCDOT Policy indicates that the noise abatement shall be constructed unless greater than 50% of the benefited receptors are opposed to noise abatement. ☐ Yes ☐ No

Final Determination for Noise Abatement Measure

APPENDIX E:
TNM DATA FILES

Appendix J

Farmlands Worksheet

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*	3. Date of Land Evaluation Request	4. Sheet 1 of _____
1. Name of Project **I-77 Roadway Widening and Improvements**	5. Federal Agency Involved	
2. Type of Project **Interstate widening and pavement rehab**	6. County and State **Richland County, South Carolina**	

PART II *(To be completed by NRCS)*	1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES ☐ NO ☐		4. Acres Irrigated | Average Farm Size
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment _____			
	Corridor A	**Corridor B**	**Corridor C**	**Corridor D**
A. Total Acres To Be Converted Directly				
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	15			

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	**Maximum Points**				
1. Area in Nonurban Use	15	15			
2. Perimeter in Nonurban Use	10	0			
3. Percent Of Corridor Being Farmed	20	0			
4. Protection Provided By State And Local Government	20	0			
5. Size of Present Farm Unit Compared To Average	10	0			
6. Creation Of Nonfarmable Farmland	25	0			
7. Availablility Of Farm Support Services	5	5			
8. On-Farm Investments	20	10			
9. Effects Of Conversion On Farm Support Services	25	0			
10. Compatibility With Existing Agricultural Use	10	5			
TOTAL CORRIDOR ASSESSMENT POINTS	160	35	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	15	0	0	0
Total Corridor Assessment (From Part VI above or a local site assessment)	160	35	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	50	0	0	0

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Pers [signature] DATE **4/8/15**

NOTE: Complete a form for each segment with more than one Alternate Corridor

Clear Form

CORRIDOR - TYPE SITE ASSESSMENT CRITERIA

The following criteria are to be used for projects that have a linear or corridor - type site configuration connecting two distant points, and crossing several different tracts of land. These include utility lines, highways, railroads, stream improvements, and flood control systems. Federal agencies are to assess the suitability of each corridor - type site or design alternative for protection as farmland along with the land evaluation information.

(1) How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?
More than 90 percent - 15 points
90 to 20 percent - 14 to 1 point(s)
Less than 20 percent - 0 points

(2) How much of the perimeter of the site borders on land in nonurban use?
More than 90 percent - 10 points
90 to 20 percent - 9 to 1 point(s)
Less than 20 percent - 0 points

(3) How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last 10 years?
More than 90 percent - 20 points
90 to 20 percent - 19 to 1 point(s)
Less than 20 percent - 0 points

(4) Is the site subject to state or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?
Site is protected - 20 points
Site is not protected - 0 points

(5) Is the farm unit(s) containing the site (before the project) as large as the average - size farming unit in the County ? (Average farm sizes in each county are available from the NRCS field offices in each state. Data are from the latest available Census of Agriculture, Acreage or Farm Units in Operation with $1,000 or more in sales.)
As large or larger - 10 points
Below average - deduct 1 point for each 5 percent below the average, down to 0 points if 50 percent or more below average - 9 to 0 points

(6) If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?
Acreage equal to more than 25 percent of acres directly converted by the project - 25 points
Acreage equal to between 25 and 5 percent of the acres directly converted by the project - 1 to 24 point(s)
Acreage equal to less than 5 percent of the acres directly converted by the project - 0 points

(7) Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?
All required services are available - 5 points
Some required services are available - 4 to 1 point(s)
No required services are available - 0 points

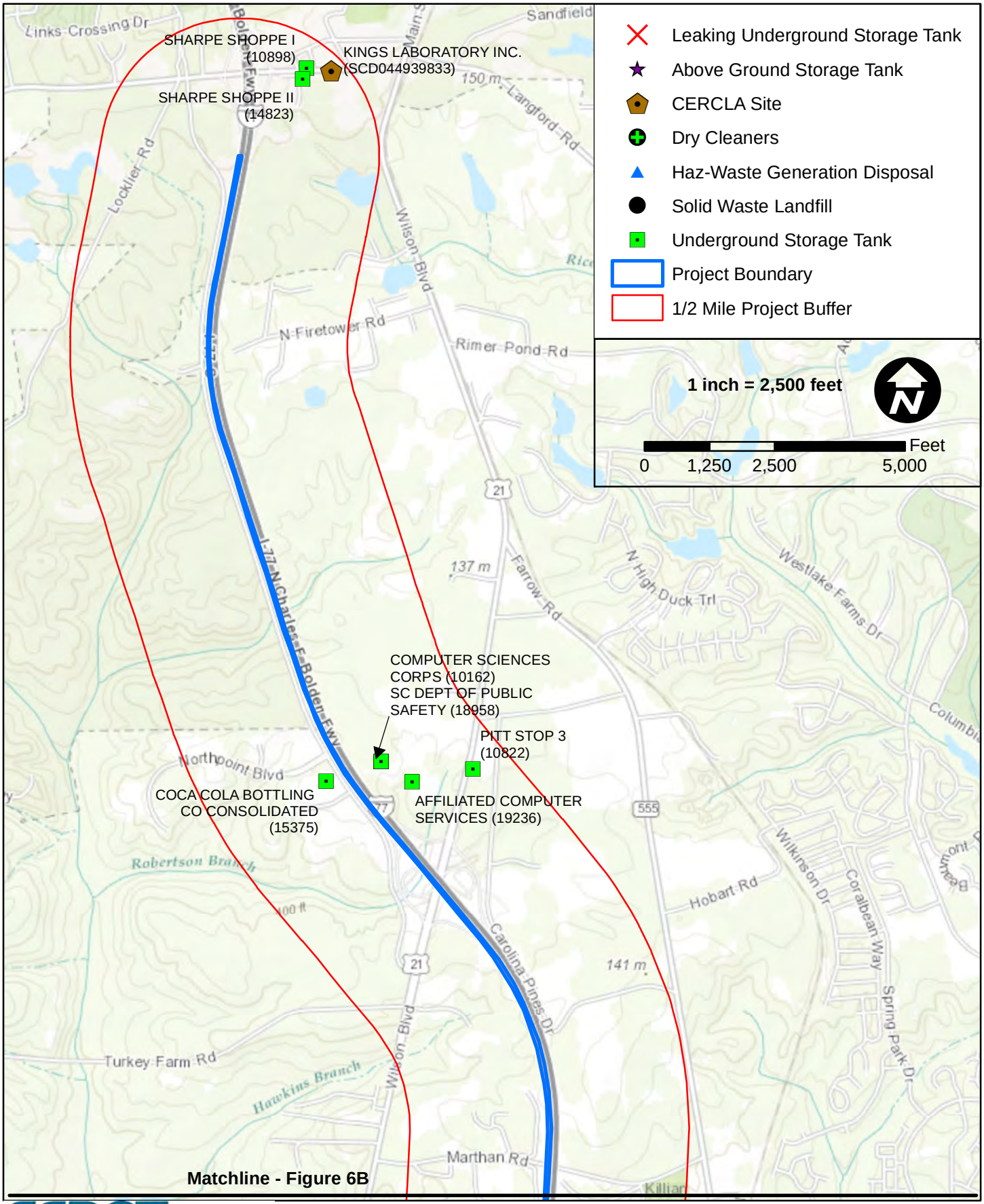
(8) Does the site have substantial and well-maintained on-farm investments such as barns, other storage building, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?
High amount of on-farm investment - 20 points
Moderate amount of on-farm investment - 19 to 1 point(s)
No on-farm investment - 0 points

(9) Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?
Substantial reduction in demand for support services if the site is converted - 25 points
Some reduction in demand for support services if the site is converted - 1 to 24 point(s)
No significant reduction in demand for support services if the site is converted - 0 points

(10) Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points
Proposed project is tolerable to existing agricultural use of surrounding farmland - 9 to 1 point(s)
Proposed project is fully compatible with existing agricultural use of surrounding farmland - 0 points

Appendix K

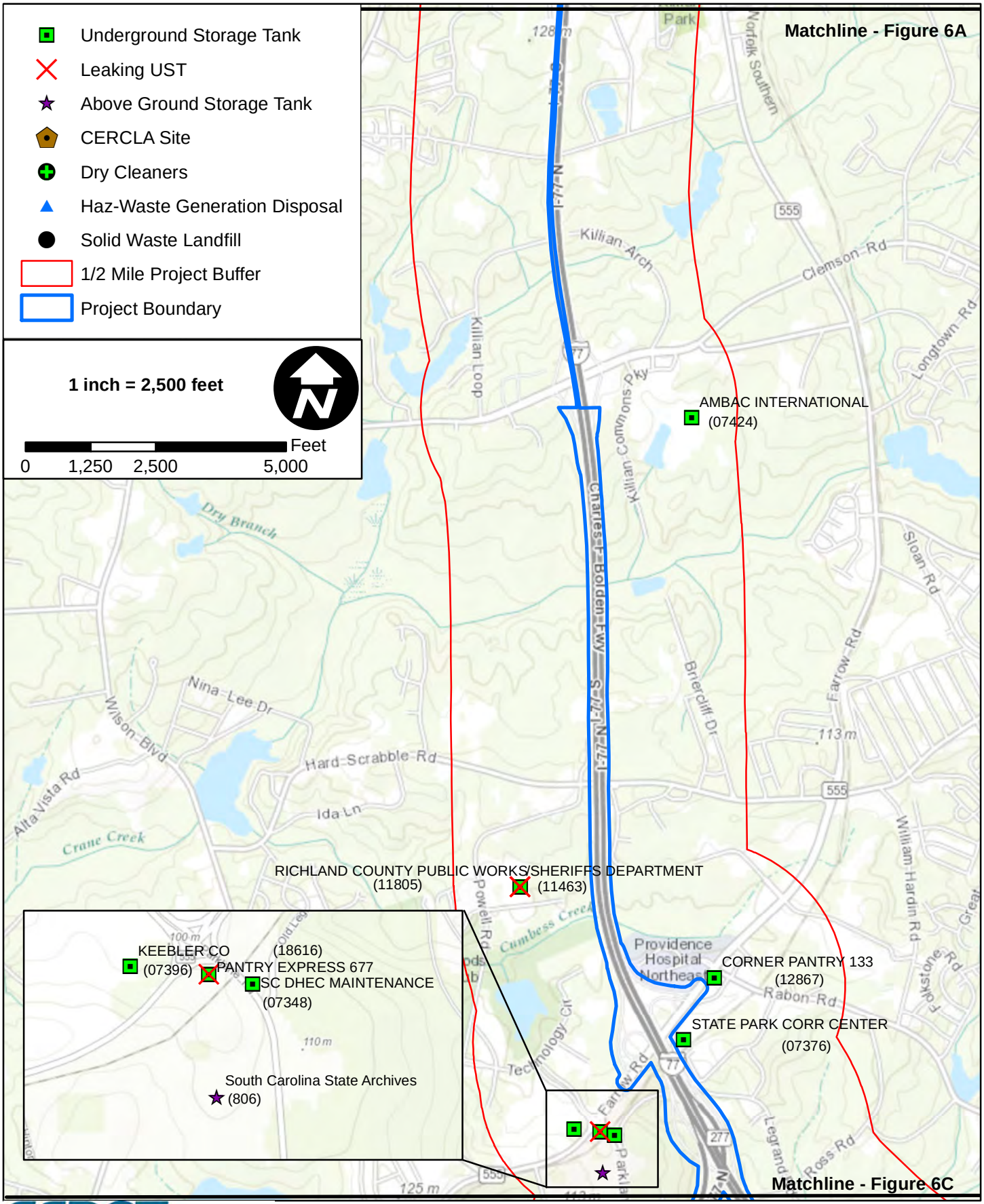
Hazardous Waste Sites Map



I-77 Roadway Widening and Improvements

Hazardous Waste Sites
Figure 6A
April 2015

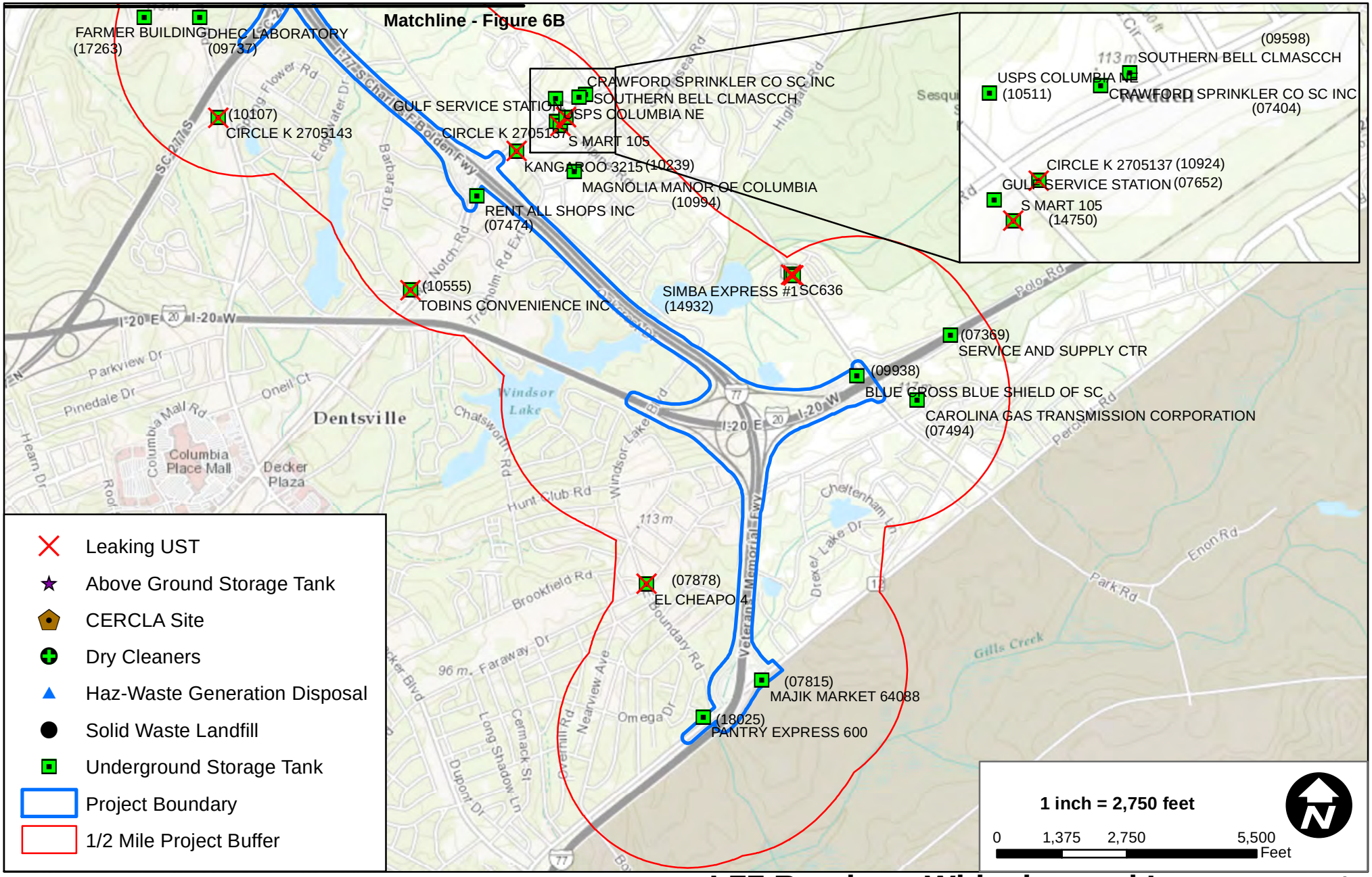
South Carolina Department of Transportation



SCDOT South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

Hazardous Waste Sites
Figure 6B
April 2015



I-77 Roadway Widening and Improvements

Hazardous Waste Sites
Figure 6C
April 2015

South Carolina Department of Transportation