

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

				Peak Hour Directional				
					No-Build		Build	
Route	Termini From	Termini To	Year	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	С	-	-
I-77	SC 12	I-20	2017	4,452	3	D	4	С
I-77	SC 12	I-20	2027	4,942	3	D	4	С
I-77	SC 12	I-20	2037	5,432	3	Е	4	С
I-77	I-20	SC 277	2013	2,902	2	D	-	-
I-77	I-20	SC 277	2017	3,018	2	D	3	В
I-77	I-20	SC 277	2027	3,350	2	D	3	С
I-77	I-20	SC 277	2037	3,682	2	Е	3	С
I-77	SC 277	Killian Road	2013	4,952	3	D	-	-
I-77	SC 277	Killian Road	2017	5,150	3	Е	4	С
I-77	SC 277	Killian Road	2027	5,717	3	Е	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

<u>Preferred Alternative – Widening Inside to the Median</u>

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).

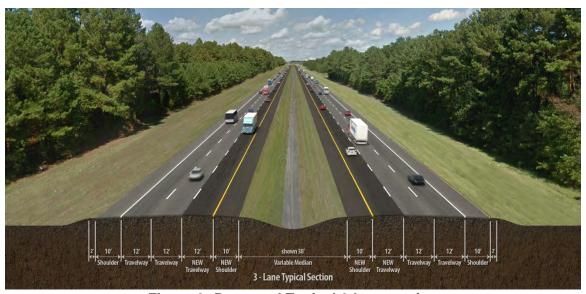


Figure 3: Proposed Typical 6-lane section *1-20 to SC 277*

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.

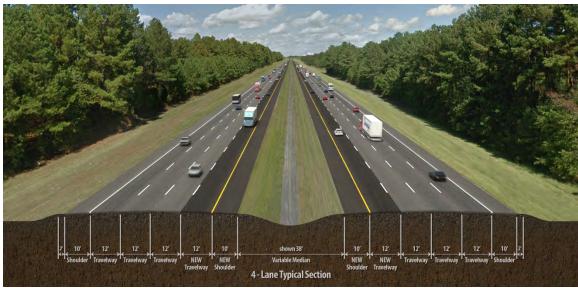


Figure 4: Proposed Typical 8-lane section
Percival Road (SC 12) to I-20 and SC 277 to Killian Road

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	2010	2009	2010	2020	2030	% Growth 2000-2030
Census	Census	Projection	Projection	Projection	Projection	
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).

<u>Permitting</u>

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	2.1 acres	0.07 acre	0.78
(lakes/ponds)			
Jurisdictional	5,580 linear feet	317 linear feet	1,457
streams			

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

^{*}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 (\$40-83). 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/metho dology00.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

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 (cm²) 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/cm²) 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.

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 CE-C

I-77 Roadway Widening and Improvements

Categorical Exclusion Type C

Project ID: P027002

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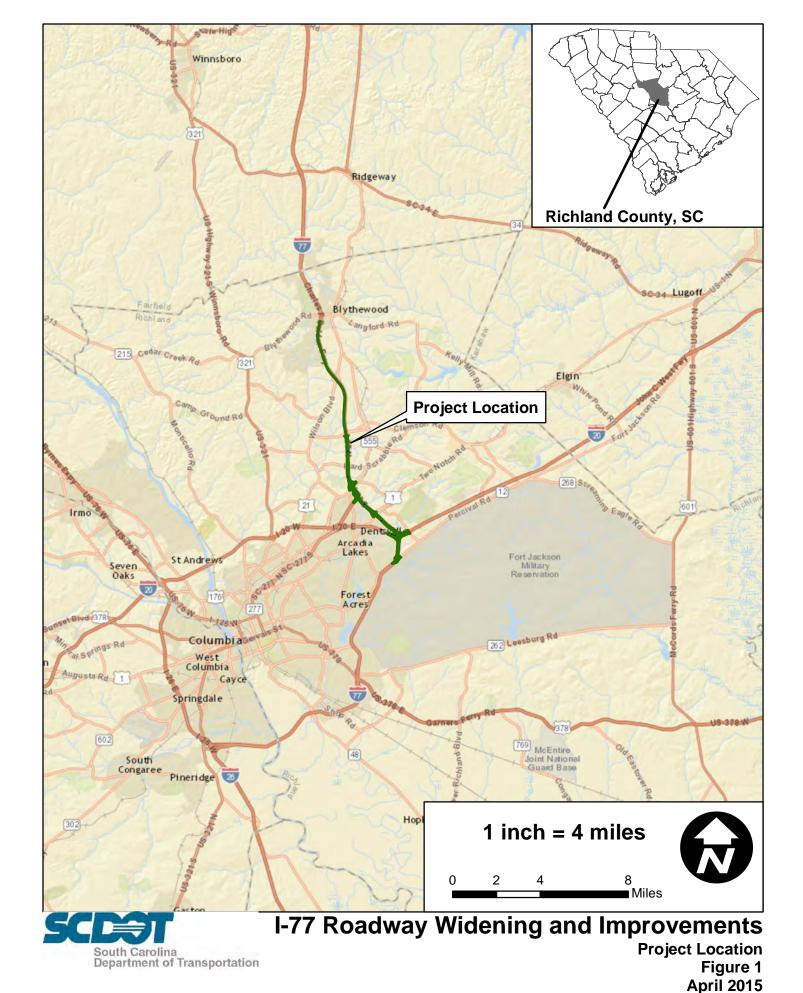
Appendix I – Noise Analysis Report

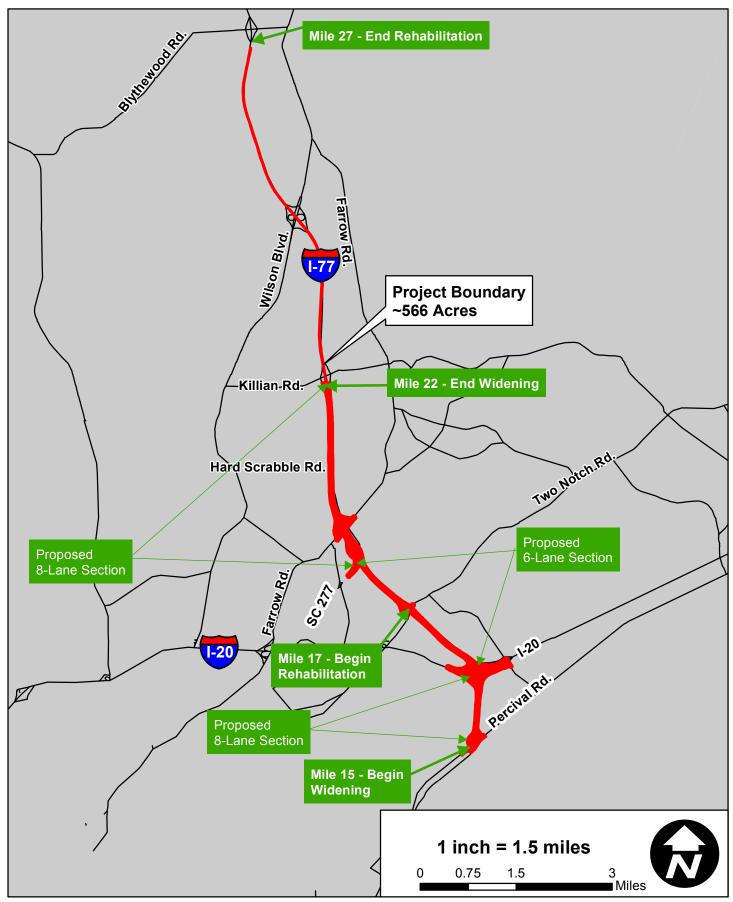
Appendix J – Farmlands Worksheet

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

Appendix A

Project Location Maps







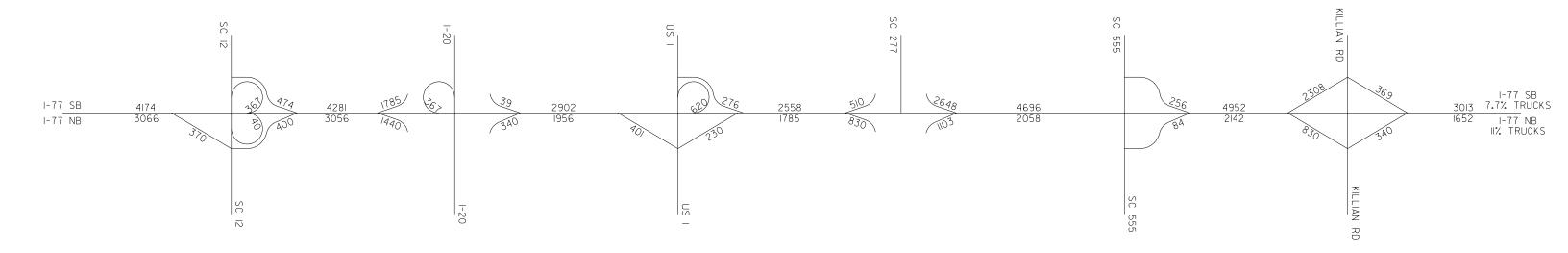
I-77 Roadway Widening and Improvements

I-77 Project Limits Figure 2 April 2015

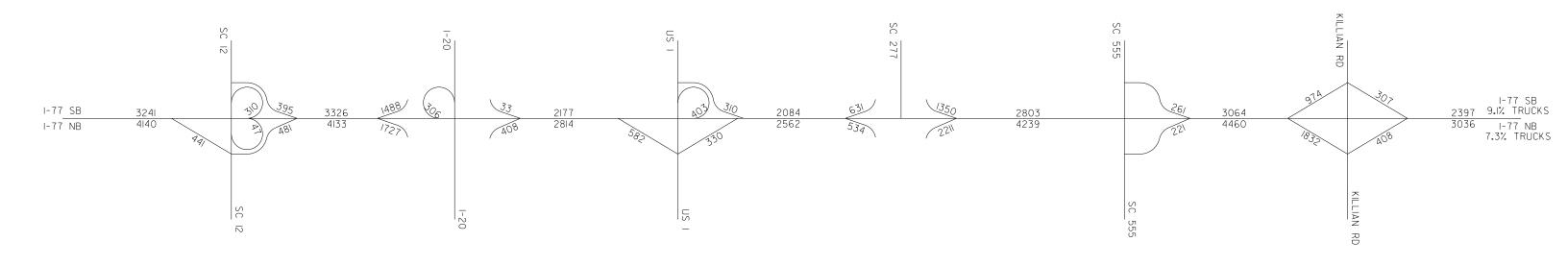
Appendix B

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

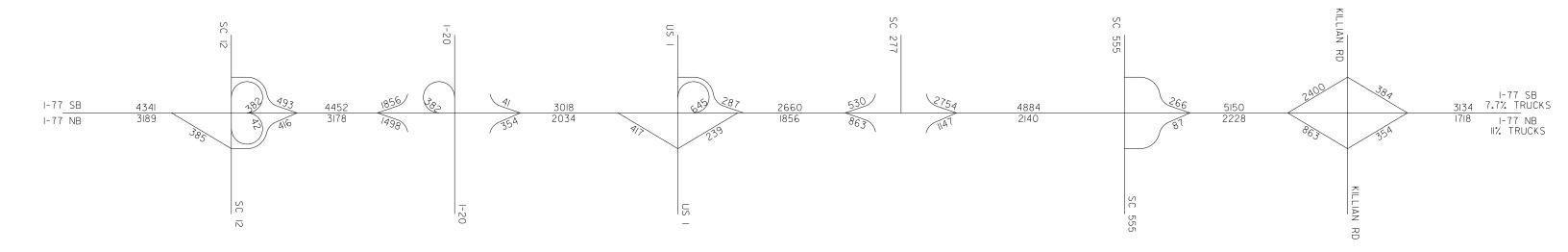
EXISTING 2013 AM VOLUMES



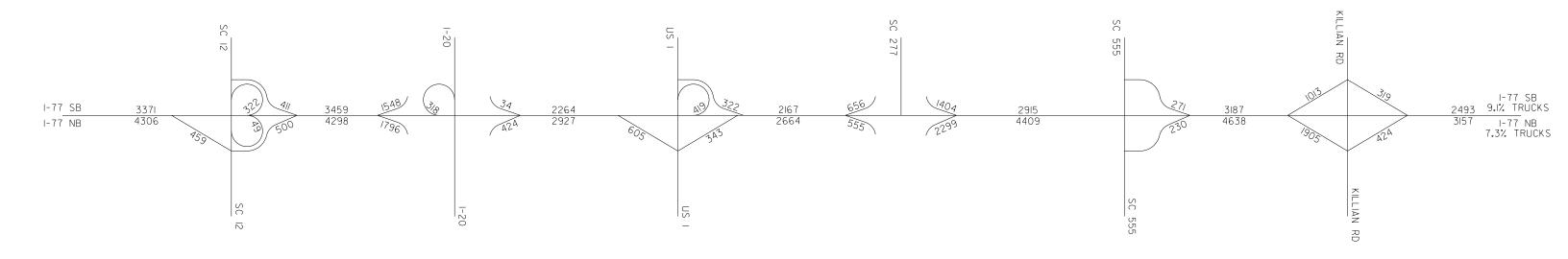
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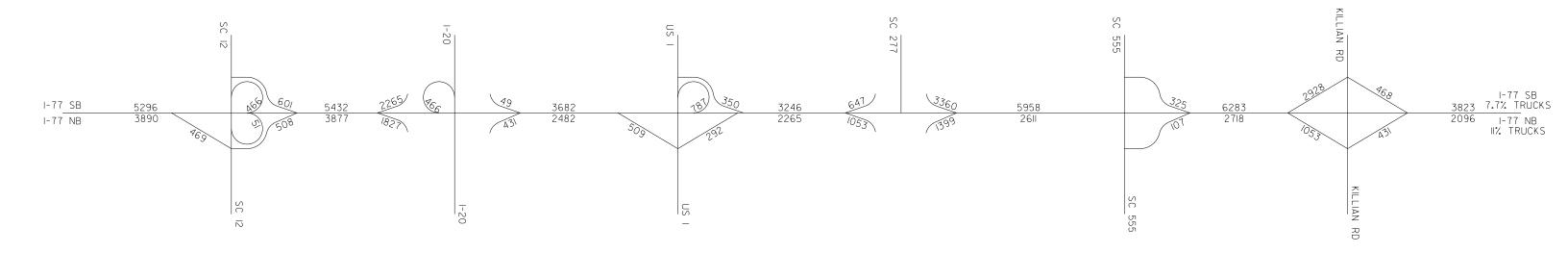
BUILD/NO BUILD 2017 AM VOLUMES



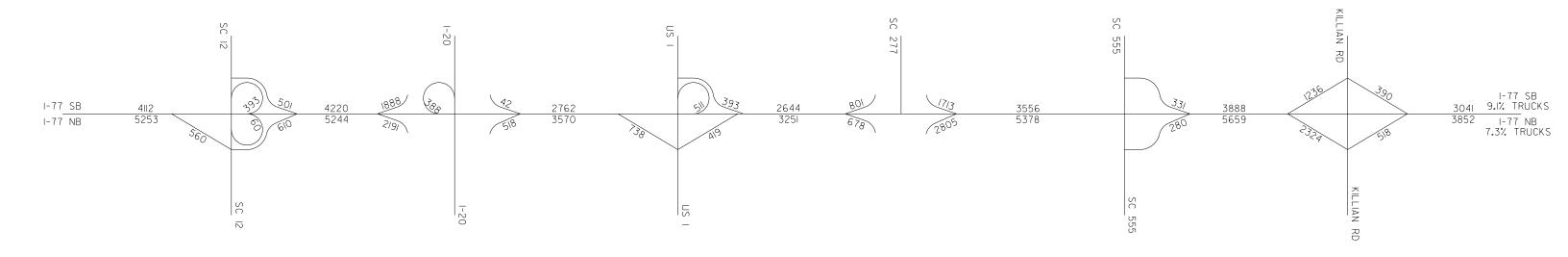
BUILD/NO BUILD 2017 PM VOLUMES



BUILD/NO BUILD 2037 AM VOLUMES

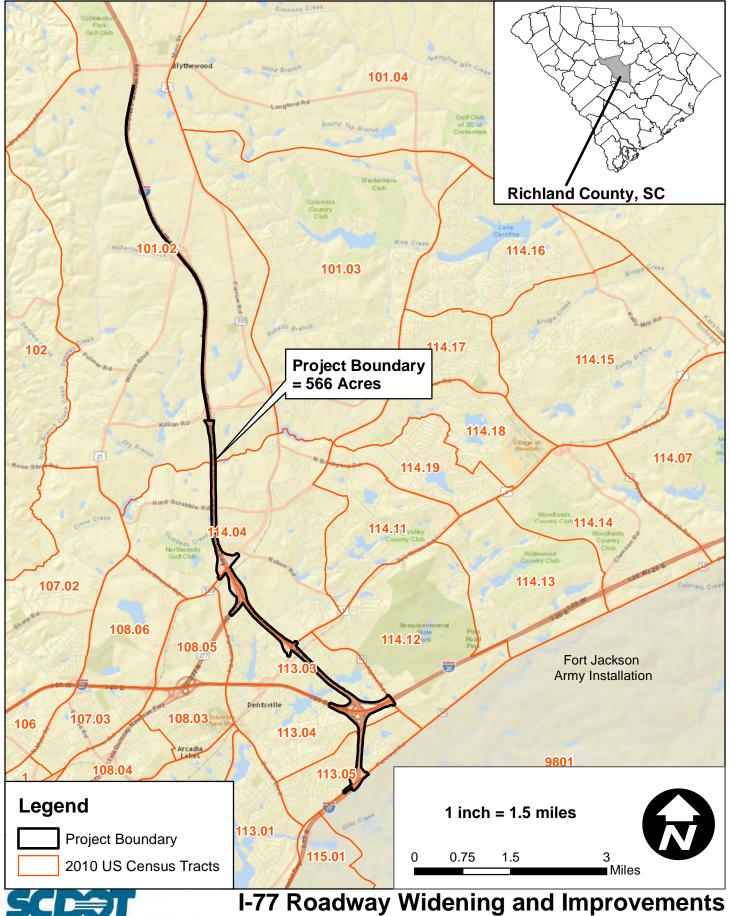


BUILD/NO BUILD 2037 PM VOLUMES



Appendix C

Socioeconomic Data



South Carolina Department of Transportation I-// Roadway Widening and Improvements

Census Tracts

Figure 5 April 2015 Table 6: Socioeconomic Characteristics

	<u>-</u>	ubic 0. 000		Characteri	31103	1	1		
	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 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+ YEAR	S IN AGE (B	Y PERCEN	T)					
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

^{*}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 COUN	CIL					
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	nts					
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	s						
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	vents					
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

I-77 Design Build On Call

*Filtered to show only Open events

Name	SUTTON, SANDRA	Mailing Address	301 ALLAIRE CT COLUMBIA, SC 29229				
Owner Phone		Owner Email					
Organizations							
Related People							
Tax Parcels							
Events	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						



I-77 Design Build On Call

*Filtered to show only Open events

Name	RAMSEY, ART	Mailing Address	8 WIDO CT COLA, SC 29223				
Owner Phone		Owner Email					
Organizations							
Related People							
Tax Parcels							
Events	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						



I-77 Design Build On Call

*Filtered to show only Open events

Name	GALLO, DALE	Mailing Address	314 HILLRIDGE WAY COLUMBIA, SC 29229			
Owner Phone		Owner Email				
Organizations						
Related People						
Tax Parcels						
Events	rents					
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					



I-77 Design Build On Call

*Filtered to show only Open events

Name	KLINE, JOE	Mailing Address	811 POLO RD COLUMBIA, SC 29223			
Owner Phone		Owner Email				
Organizations						
Related People						
Tax Parcels						
Events	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					



I-77 Design Build On Call

*Filtered to show only Open events

Name	SCOTT, LULLIE	Mailing Address	866 KILLIAN STATION DR COLA, SC 29229				
Owner Phone		Owner Email					
Organizations							
Related People							
Tax Parcels							
Events	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						



I-77 Design Build On Call

^{*}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 Convers	sation: 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

I-77 Design Build On Call

^{*}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							



^{*}Filtered to show only Open events

DAN MOSES DANIEL MOSES@STVINC.COM SC STV MALE WHITE, NON-HISPANIE EDWARD PARLER EDWARD.PARLER@GMAIL.COM 12 LYNCHLOCK LN BLYTHEWOOD SC TOWN OF BLYTHWOOD MALE WHITE, NON-HISPANIE EDWARD.PARLER@GMAIL.COM 421 RUNNING BEAR CT BLYTHEWOOD SC TOWN OF BLYTHWOOD MALE WHITE, NON-HISPANIE WHITE, NON-HISPANIE MALE AFRICAN AMERICAN MALE WHITE, NON-HISPANIE WHITE, NON-HISPAN	FirstNa	me ddleNa LastNar	e Suffix	EmailAddress	AddressLine1	AddressLine2	City	State	PostalCode	Organization Department Title	Gender	Ethnicity
ROLAND	BOB	MASSA		rpm rpm47@hotmail.com	105 FAIR RIDGE RD		BLYTHEWOOD	SC	29016	BLYTHEWOOD TOWN COUNCIL	MALE	WHITE, NON-HISPANIC
EDWARD	DAN									STV	MALE	WHITE, NON-HISPANIC
EARLY WILKINS	ROLAN	D BART		RBART@CMCOG.COM				SC		CENTRAL MIDLANDS COUNPLANNER	RMALE	WHITE, NON-HISPANIC
FREDDY	EDWAF	RD PARLEF		EDWARD.PARLER@GMAIL.COM	12 LYNCHLOCK LN		BLYTHEWOOD	SC		TOWN OF BLYTHWOOD	MALE	WHITE, NON-HISPANIC
MARY GOUGH ANDY GILLIS ANDY GILLIS@ICE-ENG.COM 1021 BRIARGATE CIR COLUMBIA SC 29223 SC 29223 SC 29223 MALE WHITE, NON-HISPANIR MALE	EARLY	WILKIN		EARLYANDTACOA@YAHOO.COM	421 RUNNING BEAR CT		BLYTHEWOOD	SC			MALE	AFRICAN AMERICAN
ANDY GILLIS ANDY-GILLIS@ICE-ENG.COM 1021 BRIARGATE CIR COLUMBIA SC 29210 ICE ENGINEERING MALE WHITE, NON-HISPANIR MICHAEL DAVIS MICHAEL DAVIS MICHAEL DAVIS@AECOM.COM 200 TIDWELL RD ELGIN SC 29045 AECOM MALE WHITE, NON-HISPANIR JOE CLINE JOMO221@YAHOO.COM 811 POLO RD COLUMBIA SC FHWA MALE WHITE, NON-HISPANIR MALE WHITE, NON-HISPANIR STEVE IKERD FHWA MALE WHITE, NON-HISPANIR FEMALE AFRICAN AMERICAN RENEE TISON RTISON@MBAKERINTL.MI DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALE WHITE, NON-HISPANIR DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALE WHITE, NON-HISPANIR MALCOM PORDGES MALCOMPG3@SC.RR.COM 219 WINDING OAK WAY BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIR SANDRA HOPKINS 2329 OLD SATCHELFORD RD COLA SC 29223 FEMALE WHITE, NON-HISPANIR ALONZO SMITH SMITHAW@RCGOV.US 1410 LAWRENCE ST COLUMBIA SC 29204 RICHLAND COUNTY COUNCIL MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1430 SEGUNDO RD FORT MILL SC MALE WHITE, NON-HISPANIR WHITE, NON-HISPANIR SC 29203 MALE WHITE, NON-HISPANIR WHITE, NON-HISPANIR SC 29203 MALE WHITE, NON-HISPANIR SC 29203 MALE WHITE, NON-HISPANIR SC 29203 MALE WHITE, NON-HISPANIR WHITE, NON-HISPANIR WHITE, NON-HISPANIR WHITE, NON-HISPANIR SC 29203 MALE WHI	FREDD'	Y KICKLIG	HTER	FRED.KICKLIGHTER@ICE-ENG.CO	1021 BRIAR GATE CIRC		COLUMBIA		29210	ICE ENGINEERING	MALE	WHITE, NON-HISPANIC
DAVID MCKNIGHT MICHAEL DAVIS MICHAEL.DAVIS@AECOM.COM 200 TIDWELL RD ELGIN SC 29045 AECOM MALE WHITE, NON-HISPANIR MICHAEL DAVIS MICHAEL.DAVIS@AECOM.COM 811 POLO RD COLUMBIA SC FHWA MALE WHITE, NON-HISPANIR STEVE IKERD LATONYA DERRICK LATONYADERRICK@GMAIL.COM RISON@MBAKERINTL.M DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALE WHITE, NON-HISPANIR MALCOM PORDGES MALCOMPG3@SC.RR.COM 219 WINDING OAK WAY BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIR SANDRA HOPKINS 2329 OLD SATCHELFORD RD COLA SC 29223 FEMALE WHITE, NON-HISPANIR ALONZO SMITH SMITHAW@RCGOV.US 1410 LAWRENCE ST COLUMBIA SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29011 MALE WHITE, NON-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SUBHASH PATEL 2109 SEGUNDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR SUBHASH PATEL 2109 SEGUNDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 190 BERRYTREE LANE COLA SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191 SERGINDO RD FORT MILL SC 29223 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 191	MARY	GOUGH			2333 OLD SATCHELFORD RD		COLUMBIA		29223		FEMALE	WHITE, NON-HISPANIC
MICHAEL DAVIS MICHAEL.DAVIS@AECOM.COM 200 TIDWELL RD ELGIN SC 29045 AECOM MALE WHITE, NON-HISPANI	ANDY	GILLIS		ANDY.GILLIS@ICE-ENG.COM	1021 BRIARGATE CIR		COLUMBIA	SC	29210	ICE ENGINEERING	MALE	WHITE, NON-HISPANIC
JOE CLINE JOMO221@YAHOO.COM 811 POLO RD COLUMBIA SC FHWA MALE WHITE, NON-HISPANIC FEMALE FEMA	DAVID	MCKNIC	HT								MALE	WHITE, NON-HISPANIC
STEVE IKERD LATONYA DERRICK LATONYADERRICK@GMAIL.COM ROWNEL ATKINSON DANIEL ATKINSON DANIEL MALCOMPG3@SC.RR.COM EDWARD SANDRA HOPKINS ALONZO SMITH SMITHAW@RCGOV.US MICHAEL MALE WHITE, NON-HISPANI SUBJECT MALCOM MALE WHITE, NON-HISPANI MAL	MICHAE	EL DAVIS		MICHAEL.DAVIS@AECOM.COM	200 TIDWELL RD		ELGIN		29045	AECOM	MALE	WHITE, NON-HISPANIC
LATONYA DERRICK RENEE TISON RTISON@MBAKERINTL.M DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALCOM PORDGES MALCOMPG3@SC.RR.COM SANDRA HOPKINS ALONZO SMITH MICHAEL BAKER INTERNATIONAL MICHAEL BAKER INTERNATIONAL MALE WHITE, NON-HISPANIR BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIR SANDRA HOPKINS ALONZO SMITH MICHAEL SMITHAW@RCGOV.US 1410 LAWRENCE ST COLUMBIA SC 29223 FEMALE WHITE, NON-HISPANIR SVIBHASH PATEL 2109 SEGUNDO RD FORT MILL SC POLUMBIA SC 29223 MALE WHITE, NON-HISPANIR SC 29201 MALE WHITE, NON-HISPANIR MALE WHITE, NON-HISPANIR SC 29203 MALE WHITE, NON-HISPANIR MALE WHITE, NON-HISP	JOE	CLINE		JOMO221@YAHOO.COM	811 POLO RD		COLUMBIA	SC			MALE	WHITE, NON-HISPANIC
RENEE TISON RTISON@MBAKERINTL.M DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALCOM PORDGES MALCOMPG3@SC.RR.COM EDWARD GARRISON EDGARRISON1@GMAIL.COM SANDRA HOPKINS ALONZO SMITH SMITHAW@RCGOV.US MICHAEL BAKER INTERNATIONAL MALE WHITE, NON-HISPANI MALE AFRICAN AMERICAN COLUMBIA SC 292016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANI COLUMBIA SC 29223 FEMALE WHITE, NON-HISPANI MALE WHITE, NON-HISPANI MALE WHITE, NON-HISPANI COLUMBIA SC 29204 RICHLAND COUNTY COUNCIL MALE AFRICAN AMERICAN MICHAEL CRISS MCRISS@SC.RR.COM MALE WHITE, NON-HISPANI SUBHASH PATEL SUBHASH PATEL WHITE, NON-HISPANI COLUMBIA SC 29201 MALE WHITE, NON-HISPANI MALE WHITE, NON-HISPANI COLUMBIA SC 29201 MALE WHITE, NON-HISPANI MALE WHITE, NON-HISPANI COLUMBIA SC 29201 MALE WHITE, NON-HISPANI MALE WHITE, NON-HISPANI SUBHASH PATEL SUBHASH PATEL WHITE, NON-HISPANI MALE WHITE, NON	STEVE	IKERD								FHWA	MALE	WHITE, NON-HISPANIC
DANIEL ATKINSON DMATKINSON@MBAKERINTL.COM MALCOM PORDGES MALCOMPG3@SC.RR.COM 219 WINDING OAK WAY BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE AFRICAN AMERICAN EDWARD GARRISON EDGARRISON1@GMAIL.COM 207 LAKE ASHLEY DRIVE BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIR SANDRA HOPKINS 2329 OLD SATCHELFORD RD COLA SC 29223 FEMALE WHITE, NON-HISPANIR 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-HISPANIR SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIR SUBHASH PATEL 1209 SEGUNDO RD FORT MILL SC MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 119 DERRYTREE LANE COLA SC 2923 MALE WHITE, NON-HISPANIR WILLY AMAKER WAANABET@GMAIL.COM 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	LATON'	YA DERRIC	<	LATONYADERRICK@GMAIL.COM	105 HYER CT		COLUMBIA	SC	29223		FEMALE	AFRICAN AMERICAN
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-HISPANI SANDRA HOPKINS 2329 OLD SATCHELFORD COLA SC 29223 FEMALE WHITE, NON-HISPANI 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-HISPANI SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANI SUBHASH PATEL 2109 SEGUNDO RD FORT MILL SC MALE MIDDLE EASTERN RANDY BELLMAN CRBELLMANN@GMAIL.COM 190 BERRYTREE LANE COLA SC 2923 MALE WHITE, NON-HISPANI WILLY AMAKER WAANABET@GMAIL.COM 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	RENEE	TISON		RTISON@MBAKERINTL.M						MICHAEL BAKER INTERNATIONAL	FEMALE	WHITE, NON-HISPANIC
EDWARD GARRISON EDGARRISON 0 COLAKE ASHLEY DRIVE BLYTHEWOOD SC 29016 TOWN OF BLYTHEWOOD MALE WHITE, NON-HISPANIC SANDRA HOPKINS ALONZO SMITH SMITHAW@RCGOV.US 1410 LAWRENCE ST COLUMBIA SC 29223 FEMALE WHITE, NON-HISPANIC SMICHAEL CRISS MCRISS@SC.RR.COM 108 GOLD RD LEXINGTON SC 29072 MALE WHITE, NON-HISPANIC SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29072 MALE WHITE, NON-HISPANIC SUBHASH PATEL 2109 SEGUNDO RD FORT MILL SC MALE WHITE, NON-HISPANIC SC 2923 MALE WHITE, NON-HISPANIC SC 29203 MALE AFRICAN AMERICAN SC 29203 MALE AFRICA	DANIEL	_ ATKINS	N	DMATKINSON@MBAKERINTL.COM						MICHAEL BAKER INTERNATIONAL	MALE	WHITE, NON-HISPANIC
SANDRA HOPKINS ALONZO SMITH SMITHAW@RCGOV.US 1410 LAWRENCE ST COLUMBIA SC 29223 FEMALE WHITE, NON-HISPANIA 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-HISPANIA SKIP JOHNSON 1230 SUMTER ST COLUMBIA SC 29201 MALE WHITE, NON-HISPANIA SUBHASH PATEL 2109 SEGUNDO RD FORT MILL SC MALE WHITE, NON-HISPANIA RANDY BELLMAN CRBELLMANN@GMAIL.COM 190 BERRYTREE LANE COLA SC 29223 MALE WHITE, NON-HISPANIA WILLY AMAKER WAANABET@GMAIL.COM 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	MALCO	M PORDG	S	MALCOMPG3@SC.RR.COM	219 WINDING OAK WAY		BLYTHEWOOD	SC	29016		MALE	AFRICAN AMERICAN
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 MICHAEL SC 29223 MALE WHITE, NON-HISPANIC WILLY AMAKER WAANABET@GMAIL.COM 110 BERRYTREE LANE COLA SC 29203 MALE WHITE, NON-HISPANIC WHILLY AMAKER WAANABET@GMAIL.COM 110 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	EDWAF	RD GARRIS	NC	EDGARRISON1@GMAIL.COM	207 LAKE ASHLEY DRIVE		BLYTHEWOOD	SC	29016	TOWN OF BLYTHEWOOD	MALE	WHITE, NON-HISPANIC
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	SANDR	A HOPKIN	3		2329 OLD SATCHELFORD RD		COLA		29223		FEMALE	WHITE, NON-HISPANIC
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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-HISPANI WILLY AMAKER WAANABET@GMAIL.COM 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	MICHAE	EL CRISS		MCRISS@SC.RR.COM	108 GOLD RD		LEXINGTON	SC	29072		MALE	WHITE, NON-HISPANIC
RANDY BELLMAN <u>CRBELLMANN@GMAIL.COM</u> 190 BERRYTREE LANE COLA SC 29223 MALE WHITE, NON-HISPANI WILLY AMAKER <u>WAANABET@GMAIL.COM</u> 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	SKIP	JOHNS	N		1230 SUMTER ST		COLUMBIA	SC	29201		MALE	WHITE, NON-HISPANIC
WILLY AMAKER <u>WAANABET@GMAIL.COM</u> 11 JASMINE PLACE CT COLA SC 29203 MALE AFRICAN AMERICAN	SUBHA	SH PATEL			2109 SEGUNDO RD		FORT MILL				MALE	MIDDLE EASTERN
	RANDY	BELLMA	V	CRBELLMANN@GMAIL.COM	190 BERRYTREE LANE		COLA	SC	29223		MALE	WHITE, NON-HISPANIC
PHILLIP MARTIN 15 VARSITY LN BLYTHEWOOD SC 29016 MALE WHITE, NON-HISPANIA	WILLY	AMAKEI		WAANABET@GMAIL.COM	11 JASMINE PLACE CT		COLA		29203		MALE	AFRICAN AMERICAN
	PHILLIF	P MARTIN			15 VARSITY LN		BLYTHEWOOD	SC	29016		MALE	WHITE, NON-HISPANIC
LEWIS SUTTON 301 ALLAIRE CT COLUMBIA SC 29229 MALE AFRICAN AMERICAN	LEWIS	SUTTO			301 ALLAIRE CT		COLUMBIA	SC	29229		MALE	AFRICAN AMERICAN
SANDRA SUTTON 301 ALLAIRE CT COLUMBIA SC 29229 FEMALE AFRICAN AMERICAN	SANDR	A SUTTO			301 ALLAIRE CT		COLUMBIA		29229		FEMALE	AFRICAN AMERICAN
ART RAMSEY 8 WIDO CT COLA SC 29223 MALE AFRICAN AMERICAN	ART	RAMSE	•		8 WIDO CT		COLA	SC	29223		MALE	AFRICAN AMERICAN
EVALINA RAMSEY 8 WIDO CT COLUMBIA SC 29223 FEMALE AFRICAN AMERICAN	EVALIN	IA RAMSE	•		8 WIDO CT		COLUMBIA	SC	29223		FEMALE	AFRICAN AMERICAN
DALE GALLO 314 HILLRIDGE WAY COLUMBIA SC 29229 MALE WHITE, NON-HISPANI	DALE	GALLO			314 HILLRIDGE WAY		COLUMBIA	SC	29229		MALE	WHITE, NON-HISPANIC
JOE KLINE 811 POLO RD COLUMBIA SC 29223 MALE WHITE, NON-HISPANI	JOE	KLINE			811 POLO RD		COLUMBIA	SC	29223		MALE	WHITE, NON-HISPANIC
DALE BRANHAN 663 TILLMAN CIR ELGIN SC 29048 MALE WHITE, NON-HISPANI	DALE	BRANH	N		663 TILLMAN CIR		ELGIN	SC	29048		MALE	WHITE, NON-HISPANIC
LULLIE B SCOTT 866 KILLIAN STATION DR COLA SC 29229 MALE AFRICAN AMERICAN	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 - 7 ROADWAY WIDENING AND IMPROVEMENTS PROJECT

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

Project ID P027002 Richland County, SC

Public Information Meeting

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.





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:

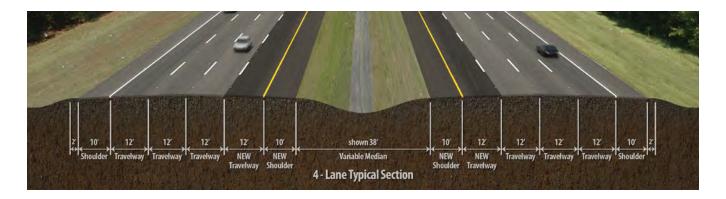
William "Tyke" Redfearn III, PE 955 Park Street Columbia, SC 29202-0191 Phone: 803.737.1430 redfearnwt@scdot.org

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 0 4 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 (descent in the above determination.

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





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:

Weworsh & Have Do

Date: 3/17/

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 RECEIVED

MAR 2 3 2015

Environmental Management SCDOT



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

<u>REFERENCE FOR SOILS INFORMATION</u>: 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.

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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 woodframe 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 twoover-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 twostory, 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 47, 2015

REFERENCES CITED

Braley, Chad and Gerald Ledbetter

1991 Cultural Resources Survey of Selected (FY91) Timber Harvesting Areas on Fort Jackson, Richland County, South Carolina. Prepared for The U.S. Army Corps of Engineers, Savannah District and The Directorate of Engineering and Housing, Fort Jackson, South Carolina. Prepared by Gulf Engineers & Consultants, Inc., Baton Rouge, Louisiana, and Southeastern Archeological Services, Inc., Athens, Georgia.

Caballero, Olga

1986 Archaeological Survey of the Trenholm Road, O'Neil Court, and King's Street Extensions. Prepared by the South Carolina Department of Transportation, Columbia.

Drucker, Leslie

2003 Cultural Resources Inventory Survey of the Carolina Crossing Apartments Tract. Prepared by AF Consultants, Columbia.

Lawrence, Carl B.

1978 Soil Survey of Richland County, South Carolina. US Department of Agriculture, Soil Conservation Service, Washington, DC.

Roberts, Wayne

1993 Intensive Archaeological and Architectural Survey of the Proposed S-52 Widening Project. Prepared by the South Carolina Department of Transportation, Columbia.

South Carolina Department of Archives and History (SCDAH)

2013 Survey Manual: South Carolina Statewide Survey of Historic Properties. South Carolina Department of Archives and History, Columbia.

Trinkley, Michael

2000 Cultural Resources Survey of a Portion of the Kaiser Tract, Richland County, South Carolina. Prepared by Chicora Foundation, Inc., Columbia. Chicora Research Contribution 303. Prepared for Central Carolina Economic Development Alliance, Columbia.

Trinkley, Michael and Debi Hacker

2013 Long Time Gone: Fort Jackson's Disinterred Cemeteries. Prepared by Chicora Foundation, Inc., Columbia.

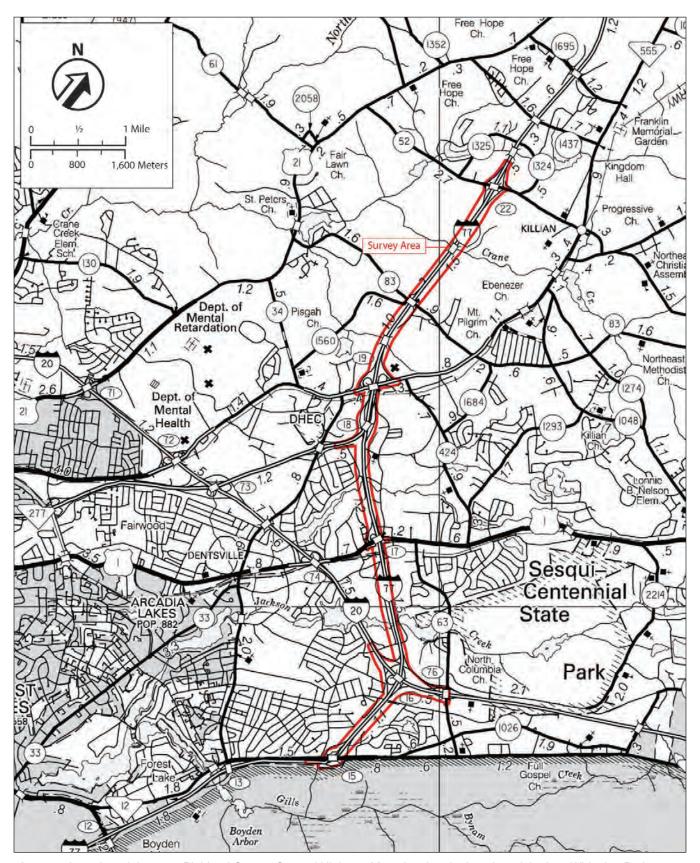


Figure 1. A portion of the 2005 Richland County General Highway Map showing the location of the I-77 Widening Project.

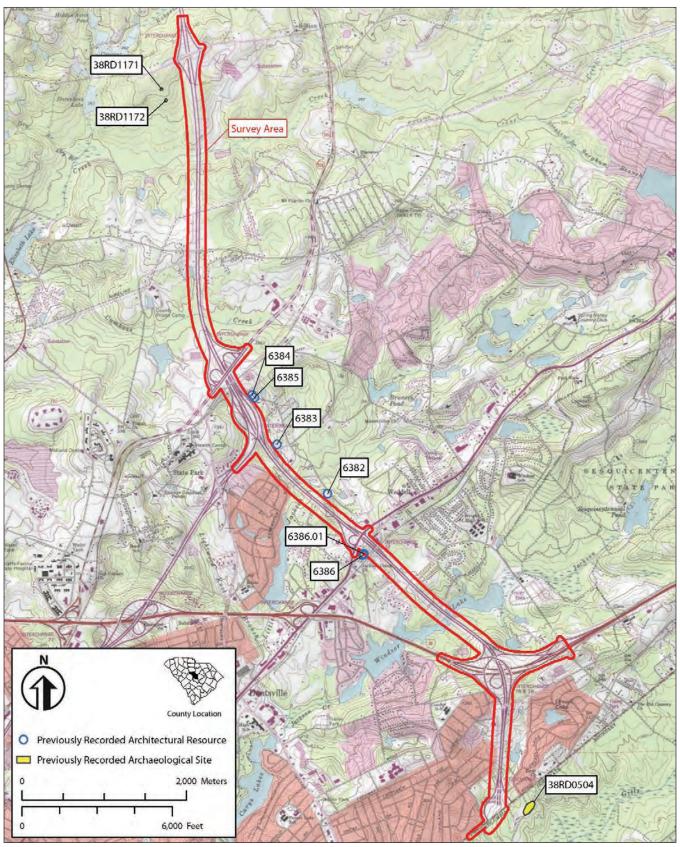


Figure 2. The location of the I-77 Widening Project and all identified cultural resources (USGS 1971/p.r. 1990 *Blythewood*, *SC* and 1972/p.r. 1990 *Fort Jackson North*, *SC* quadrangles).

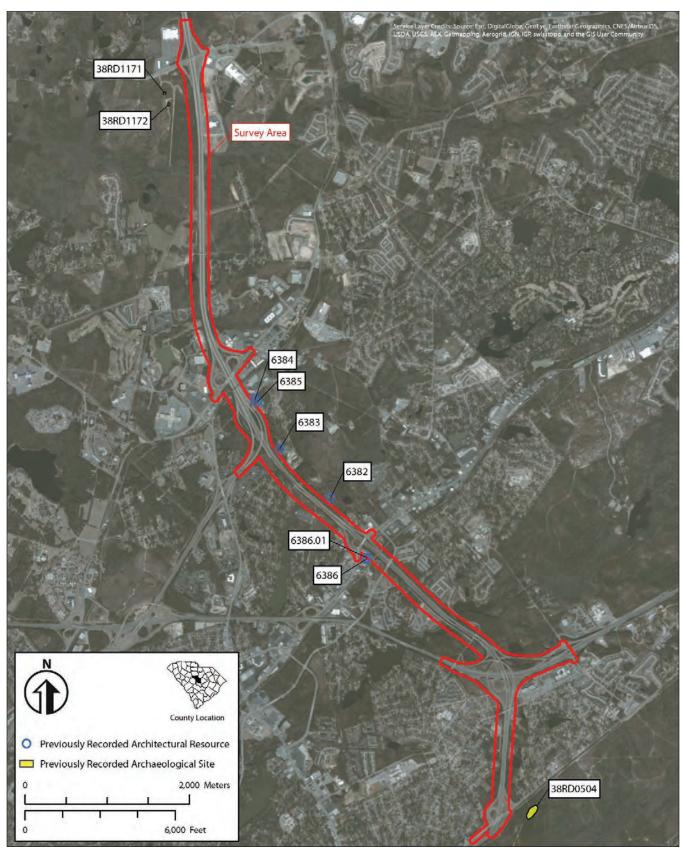


Figure 3. The location of the I-77 Widening Project and all identified cultural resources on a modern aerial photograph.



Figure 4. View of Resource 6382, looking northeast.



Figure 5. View of Resource 6382.01, looking southwest.

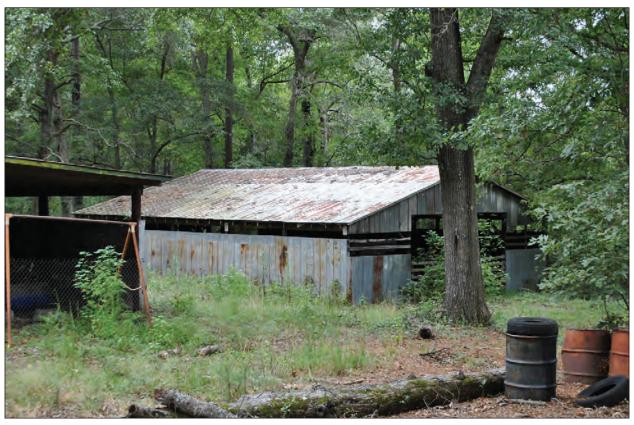


Figure 6. View of Resource 6382.02, looking northwest.



Figure 7. View of Resource 6383, looking north.



Figure 8. View of Resource 6383.01, looking north.

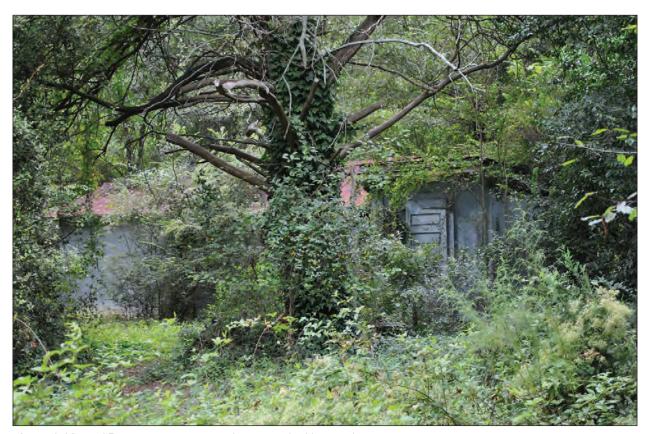


Figure 9. View of Resources 6383.02 and 6383.03, looking northwest.



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** Control Number: U **1**79 *I* 6382 South Carolina Department of Archives and History Status County No Site No Quad Name: Fort Jackson 8301 Parklane Rd. Columbia, SC 29223-4905 (803) 896-6100 Tax Map R17110-03-04 Intensive Documentation Form Identification Historic Unidentified House Common Address/Location: 1723 Legrand Rd. Columbia City: County: Richland Vicinity of: Ownership: Private Category: building Historical Domestic Domestic Current **National Register of Historic Places** SHPO National Register Notes on National Register Other Designation: **Property Description** Commercial Construction c. 1955 Stories: 1 story Alteration Historic Core L Roof Features Porch Features Shape: Porch Width: facade Materials: composition shingle Shape: hip Construction frame **Exterior Walls:** brick veneer Foundation: not visible Significant Architectural Entry centered on SW facade; 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)

Windows; door; porch; deck Alterations:

Architect(s)/Builder(s):

Site 6382

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 Control Number: U **1**79 **/** 6382.01 South Carolina Department of Archives and History Status County No Site No Quad Name: Fort Jackson 8301 Parklane Rd. Columbia, SC 29223-4905 (803) 896-6100 Tax Map R17110-03-04 Intensive Documentation Form Identification Historic Unidentified Barn Common Address/Location: 1723 Legrand Rd. Columbia City: County: Richland Vicinity of: Ownership: Private Category: building Historical Agriculture/Subsistence Vacant/Not In Use Current **National Register of Historic Places** SHPO National Register Notes on National Register Other Designation: **Property Description** Commercial Stories: 1 1/2 stories Construction c. 1957 Alteration Historic Core rectangular Roof Features Porch Features Shape: gable, end to front Porch Width: Materials: other metal Shape: Construction frame **Exterior Walls:** shiplap not visible Foundation: 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 facade shed additions along each

lateral side, one enclosed, one open with further shed extension; exposed rafter ends

extended shed roof 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

State Historic I	Preservation Con Department of Rd. 29223-4905 Decumentation Unidentified S	of Archives and Histor (803) 896-6100 In Form	y	Control Number: Fort Jackson Tax Map	U / 79 / 6382.02 Status County No Site No R17110-03-04
City: Vicinity of:	Columbia		County:	Richland	
Ownership: Historical Current	Private Agriculture/Subs		Category:	building	
National Regis SHPO National R Notes on National Other Designation	egister I Register	Places			
Property Desci					
Construction	c. 1960	Commercial			Stories: 1 story
Alteration	0. 1000	Historic Core	rectangular		Giorios. 1 Story
Roof Features Shape:	s gable, end to fro	Porch Fe	_		
Materials:	other metal	Shape:			
Construction	frame				
Exterior Walls:	other				
Foundation:	not visible				
Significant Archite	ectural				open-aired design with gap al siding; exposed rafter ends
Alterations:					
Architect(s)/Builde	er(s):				

South Carolina Statewide Survey of Historic Properties *Intensive Documentation Form*

Page 2 Site 6382.02

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

Status County No Site No

I 6383

179

R17107-02-06

Control Number: U

Fort Jackson

Tax Map

Quad Name:

8301 Parklane Rd.

Columbia, SC 29223-4905 (803) 896-6100

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 Porch Features

Shape: gable, lateral Porch Width: entrance bay only

Materials: composition shingle 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.

State Historic	Survey of Histor Preservation Offic a Department of A Rd.	e	ry	Control Number: Fort Jackson	U / 79 / 6383.01 Status County No Site No
Columbia, SC Intensive D	29223-4905 (8 ocumentation F	803) 896-6100 Form		Тах Мар	R17107-02-06
Identification Historic	Unidentified Gara	ge			
Common					
Address/Location	n: 506 Ross Rd.				
City:	Columbia		County:	Richland	
Vicinity of:					
Ownership:	Private		Category:	building	
Historical	Transportation				
Current	Vacant/Not In Use				
SHPO National I Notes on National Other Designation	al Register				
Property Desc					
Construction	c. 1945	Commercial			Stories: 1 story
Alteration	0. 10 10	Historic Core	rectangular		Clemes elely
Roof Feature	2 S	Porch F	_		
Shape:	gable, end to front		h Width:		
Materials:	other metal	Shape	:		
Construction	masonry				
Exterior Walls:	other				
Foundation:	not visible				
Significant Archi		ncrete block garage w ng sash	ith shiplap siding	within th egable er	nd; 2/2 windows, seem to be double
Alterations:					
Architect(s)/Build	der(s):				

South Carolina Statewide Survey of Historic Properties *Intensive Documentation Form*

Page 2 Site 6383.01

Historical Information

Historical Information:

Source of

Photographs Use Grid for Sketching



Program Management

Recorded by: S. Owens, Brockington and Assc.

State Historic South Carolina Quad Name: 8301 Parklane Columbia, SC	Preservation Of a Department of Rd. 29223-4905 Ocumentation Unidentified Oc	Archives and History (803) 896-6100 A Form		Control Number: Fort Jackson Tax Map	U / 79 / 6383.02 Status County No Site No R17107-02-06
City: Vicinity of:	Columbia		County:	Richland	
Ownership: Historical Current	Private Unknown Vacant/Not In Us	e	Category:	building	
National Regis SHPO National R Notes on National Other Designation	l Register	Places			
_					
Property Desc	•				
Construction	c. 1950	Commercial			Stories: 1 story
Alteration		Historic Core	rectangular		
Roof Feature Shape:	s gable, lateral	Porch Fea	a <i>tures</i> Width:		
Materials:	other metal	Shape:	vvidui.		
Construction	frame	опарс.			
Exterior Walls:	other				
Foundation:	not visible				
Significant Archite		Corrugated metal siding; 5	Verimo metal re	oofing panels	
Alterations:					
Architect(s)/Build	er(s):				

South Carolina Statewide Survey of Historic Properties *Intensive Documentation Form*

Page 2 Site 6383.02

Historical Information

Historical Information:

Source of

Photographs Use Grid for Sketching



Program Management

Recorded by: S. Owens, Brockington and Assc.

State Historic I South Carolina Quad Name: 8301 Parklane Columbia, SC	29223-4905 (803 ocumentation Fo	hives and History 3) 896-6100 rm		Control Number: Fort Jackson Tax Map	U / 79 / 6383.03 Status County No Site No R17107-02-06
City: Vicinity of:	Columbia		County:	Richland	
Ownership: Historical Current	Private Unknown Vacant/Not In Use		Category:	building	
National Regis SHPO National R Notes on National Other Designation	l Register	es			
Property Desci	ription				
Construction Alteration	c. 1950	Commercial Historic Core	rectangular		Stories: 1 story
Roof Features Shape:	s other	<i>Porch Fea</i> Porch			
Materials: Construction Exterior Walls: Foundation: Significant Archite	other metal frame other not visible	Shape:		od siding; historic v	vood panel door
Alterations:					
Architect(s)/Builde	er(s):				

South Carolina Statewide Survey of Historic Properties *Intensive Documentation Form*

Page 2 Site 6383.03

Historical Information

Historical Information:

Source of

Photographs Use Grid for Sketching



Program Management

Recorded by: S. Owens, Brockington and Assc.

Statewide Survey of Historic Properties//

State Historic Preservation Office

South Carolina Department of Archives and History

Status County No Site No

/ 6384

179

R17108-01-02

Control Number: U

Fort Jackson

Tax Map

Quad Name:

8301 Parklane Rd.

Columbia, SC 29223-4905 (803) 896-6100

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 Porch Features

Shape: gable, lateral Porch Width: entrance bay only

Materials: other metal 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):

Site

Historical Information

Historical Information:

Source of

Photographs Use Grid for Sketching





Program Management

Recorded by: S. Owens, Brockington and Assc.

Statewide Survey of Historic Properties// State Historic Preservation Office Control Number: U **1**79 *I* 6385 South Carolina Department of Archives and History Status County No Site No Quad Name: Fort Jackson 8301 Parklane Rd. Columbia, SC 29223-4905 (803) 896-6100 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 Domestic Current **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 Porch Features Shape: gable, lateral Porch Width: over 1 bay but less than full Materials: composition shingle 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):

Site 6385

Historical Information

Historical Information:

Source of

Photographs Use Grid for Sketching





Program Management

Recorded by: S. Owens, Brockington and Assc.

Statewide Survey of Historic Properties//

State Historic Preservation Office

South Carolina Department of Archives and History

Fort Jackson

Tax Map

Control Number: U

16386

Status County No Site No

179

R17016-02-02

Quad Name: 8301 Parklane Rd.

Columbia, SC 29223-4905 (803) 896-6100

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 Porch Features

Shape: gable, end to front Porch Width: facade

Materials: composition shingle 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

Page 2

Site 6386

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.

State Historic F	Preservation Control Department of Rd. 29223-4905 ocumentation Dackson Cree	of Archives and History (803) 896-6100 In Form k Baptist Church Cemetery		Control Number: Fort Jackson Tax Map	U / 79 / 6386.01 Status County No Site No R17016-02-02
•	Columbia		County:	Richland	
Vicinity of: Ownership: Historical Current	Private Funerary Funerary		Category:	site	
National Regist SHPO National R Notes on National	egister	Places			
Other Designation	n:				
Property Descr	ription				
Construction	1840-present	Commercial			Stories:
Alteration		Historic Core			
Roof Features	3	Porch Fea			
Shape:			Width:		
Materials:		Shape:			
Construction					
Exterior Walls: Foundation:					
Significant Archite	ectural	concrete wall and chain fe	ncing; approxim i; the graveyard	nately 350 headston I is on a lightly slopi	ne family plot (Shannon) with low nes of various types, all facing in ng hill, with multiple shrubs and
Alterations:					
Architect(s)/Builde	er(s):				

Page 2 6386.01

Site

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.

Appendix F Permit Determination Form and Jurisdictional Determination

Date: 5/12/2015

PERMIT DETERMINATION

FROM Rene	ee Mulho	olland	COMPANY	HDR, Inc.	
CONTACT IN	JFO (phone a	and/or email) 84	3.414.3734;	renee.mulhol	land@hdrinc.com
		NEER Jae Ma			
		PG 3 Permits C			
Project Descrip	into	erstate widening		tation	
Route or Road	No. <u>I-77</u>		Coun	ty Richland	
CONST. PIN	P027002 ₍	OTHER PINS or	STRUCTURE	Ξ#	
RESPONSE:					
OIt has been	n determined	that no permits a	are required be	ecause:	
	• •	s) is/are necessary h type(s) of perm		will need)	
USAC	E Permit	GP	✓ IP	401	JD
OCRM	l Permit	CAP	CZC		
Naviga	ıble				Vor USACE navigable permit NEPA and Permitting stages.
Other	**It is anticip	ated that stream ir	mpacts will be n	ninimized to stay	within the GP threshold.
Water Classifi	cation: FW		Print and att	ach the SCDHI	EC water quality report
303(d)	listed	Ono Oyes	, for *		
TMDL	developed	Ono yes	, for * FC, D)O	ne SCDHEC abbreviations
Comments:	and Crane		ation within 2 River). No in	2 TMDL waters	sheds (Gills Creek s were identified
		tion and is subjec	et to change if mulholland@ Digit rene		mation at the time. This are project is modified. 5/12/15
			ologist, SCDO		Date

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 SC0001864

SCE&G/PARR HYDRO STA. MINOR INDUSTRIAL

PIPE #: 001 FLOW: 0.035

BROAD RIVER SCG730066

MARTIN MARIETTA/N. COLUMBIA QUARRY MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R

BROAD RIVER SC0039055

RAINTREE ACRES SD/MIDLANDS UTILITIES MINOR DOMESTIC

PIPE #: 001 FLOW: 0.14

BROAD RIVER SC0040631

TOWN OF CHAPIN WWTP MAJOR DOMESTIC

PIPE #: 001 FLOW: 1.2

PIPE #: 001 FLOW: 2.4, 5.0 (PROPOSED)

BROAD RIVER SC0046621

RICHLAND COUNTY BROAD RIVER WWTP MAJOR DOMESTIC

PIPE #: 001 FLOW: 2.5 (6.0 PROPOSED)

MAYO CREEK (TO BROAD RIVER) SC0030856

SCE&G/SUMMER NUCLEAR STA. MAJOR INDUSTRIAL

PIPE #: 013 FLOW: 0.015

MAYO CREEK SC0038407

SCE&G/SUMMER NUCLEAR TRAINING CTR MINOR INDUSTRIAL

PIPE #: 001 FLOW: 0.0004

(PIPE #: 002 FLOW: 0.0105 PROPOSED)

CRANE CREEK SC0031640

HANSON BRICK COLUMBIA MINOR INDUSTRIAL

PIPE #: 001 FLOW: 0.0065

NIPPER CREEK SCG730052

VULCAN MATERIALS CO./DREYFUS QUARRY MINOR INDUSTRIAL

PIPE #: 001, 002 FLOW: M/R

BEASLEY CREEK TRIBUTARY SCG250182

BOSE CORPORATION MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R

BURGESS CREEK SCG730509

HANSON BRICK EAST.MANNING PIT MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R

BROAD RIVER TRIBUTARY SCG730588

MARTIN MARIETTA/HARBISON QUARRY MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R

BROAD RIVER TRIBUTARY SCG730639

BORAL BRICKS/LABORDE MINE MINOR INDUSTRIAL

PIPE #: 001 FLOW: M/R

Nonpoint Source Management Program

Land Disposal Activities

Landfill Activities

SOLID WASTE LANDFILL NAME PERMIT #
FACILITY TYPE STATUS

RICHLAND COUNTY SANITARY LANDFILL 401001-1101 DOMESTIC CLOSED

RICHLAND COUNTY 401001-1201, 1202

C&D LANDFILL ACTIVE

OLD CITY OF COLUMBIA LANDFILL

DOMESTIC

CLOSED

DOMESTIC

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 PROPOSED

C&D ------

COUNTY LINE C&D LF PROPOSED C&D ------

CAROLINA WRECKING ST C&D LC LANDFILL 402451-1301 C&D LANDFILL CLOSED

SHEALY LC&D 402405-1701 C&D LANDFILL INACTIVE

BILLY MEETZ 402463-1701 C&D LANDFILL ACTIVE

WHITAKER AIR CURTAIN INCINERATOR 402769-4001 INCINERATOR ACTIVE

EARGLES COMPOSTING 402706-3001 COMPOSTING INACTIVE

LOVELESS & LOVELESS, INC. 402428-6001 C&D LANDFILL INACTIVE

BROAD RIVER LANDSCAPING 402467-1701 C&D LANDFILL ACTIVE

MUNGO HOMES INC. 402645-8001 LAND APPLICATION 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 STREAM	REGULATED CAP. (MGD) 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

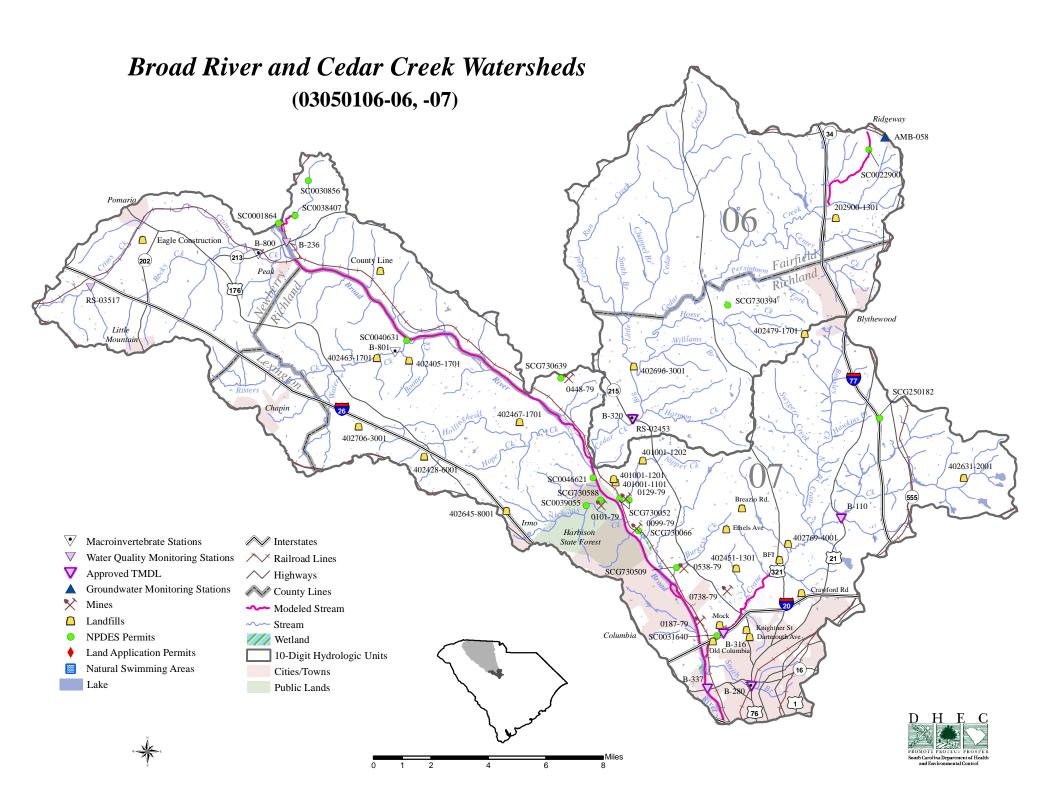
Total Maximum Daily Loads (TMDLs)

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.



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	<u>Description</u>
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
SESQUICENTENIAL STATE PARK
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 NPDES# FACILITY NAME 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
MS4 PHASE
RESPONSIBLE PARTY
MS4 SIZE

IMPLEMENTING PARTY

 GILLS CREEK
 SCS400001

 ------ PHASE I

 RICHLAND COUNTY
 MEDIUM MS4

RICHLAND COUNTY

GILLS CREEK SCS790001
CITY OF COLUMBIA PHASE II
CITY OF COLUMBIA SMALL MS4
CITY OF COLUMBIA

GILLS CREEK SCR037901 CITY OF COLUMBIA PHASE II FORT JACKSON SMALL MS4

FORT JACKSON

GILLS CREEK SC\$400001 CITY OF ARCADIA LAKES PHASE II RICHLAND COUNTY SMALL M\$4

RICHLAND COUNTY

GILLS CREEK SC\$400001
CITY OF FOREST ACRES PHASE II
RICHLAND COUNTY SMALL M\$4

RICHLAND COUNTY

GILLS CREEK SCS400001 UNINCORPORATED AREAS PHASE I RICHLAND COUNTY MEDIUM MS4

RICHLAND COUNTY

Nonpoint Source Permitted Activities

Land Disposal Activities

Landfill Facilities

LANDFILL NAME PERMIT #
FACILITY TYPE STATUS

ANCHOR CONTINENTAL, INC. ------INDUSTRIAL CLOSED

ANCHOR CONTINENTAL, INC. -----INDUSTRIAL CLOSED

INTERTAPE POLYMER GROUP (ANCHOR CONTINENTAL) 403326-1601 INDUSTRIAL ACTIVE

BALDWIN ROAD C&D DUMP

C&D LANDFILL

CLOSED

COLUMBIA LANDFILL ------MUNICIPAL INACTIVE

CITY OF COLUMBIA COMPOSTING FACILITY 401002-3001 COMPOSTING ACTIVE

TRAPP L/C DEBRIS & YT LANDFILL 402468-1701 C&D LANDFILL INACTIVE

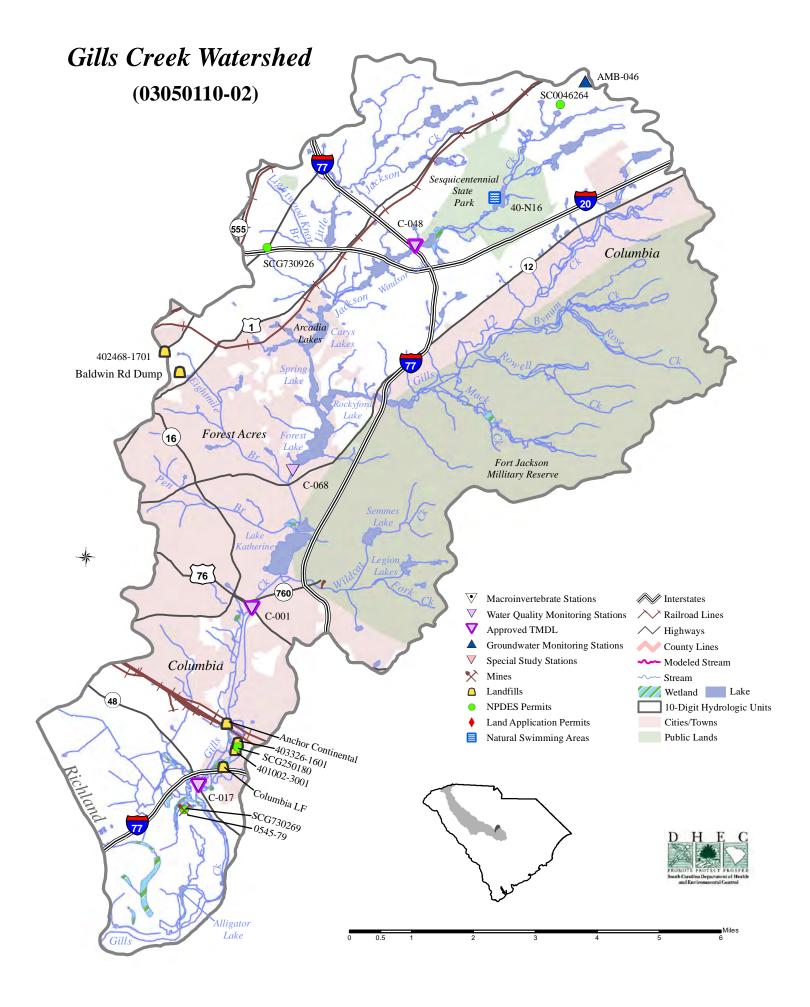
Mining Activities

MINING COMPANY PERMIT #
MINE NAME MINERAL

THE JORDAN COMPANY 0545-79
CONGAREE SAND PIT 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.



JD Checklist*

Action	SCI Confin	OOT mation		Consultant Confirmation	
1 Is the Jurisdictional Determiniation Request Form completed and signed?	Υ	N	Y	N	
2 Does the JD packet include:	Y	N	Y	N	
a) Location Map	Υ	N	Y	N	
b) Aerial photograph with project boundary?	Υ	N	Y	N	
c) Topographic map with project boundary?	Υ	N	Y	N	
d) Soil survey map with project boundary?	Υ	N	Y	N	
e) Photographs of the site, wetlands, streams, ditches, etc?	Υ	N	Y	N	
f) Table with Latitude and Longitude for each jurisdictional feature (wetland, stream pond, etc.)?	Υ	N	Y	N	
Is the project boundary large enough to encompass all potential impacts including construction access?	Υ	N	Y	N	
4 Is the acerage for the project area included on the wetland map?	Υ	N	Y	N	
5 Are all wetlands and streams identified on a map or drawing?	Υ	N	Y	N	
Is there a map included showing the surface connection of how the stream, wetland, or ditch connects to a downstream (named) tributary?	Υ	N	Y	N	
b) Do all identified streams contain a clear line or polygon with linear footage?	Υ	N	Y	N	
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?	Υ	N	Y	N	
8 Data Sheets:					
a) Are data sheets included?	Υ	N	Y	N	
b) Is a refrence map included to indicate where the data points are located?	Υ	N	Y	N	

SCDOT

Consultant

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





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
S 5	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
S 7	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

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)		ı			
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

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 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.

<u>Sand-Bottomed Intermittent Streambed Riverine System (R4SB4)</u> 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).

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

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 4A & 4B. NRCS Soil Survey for Richland County, S 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

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

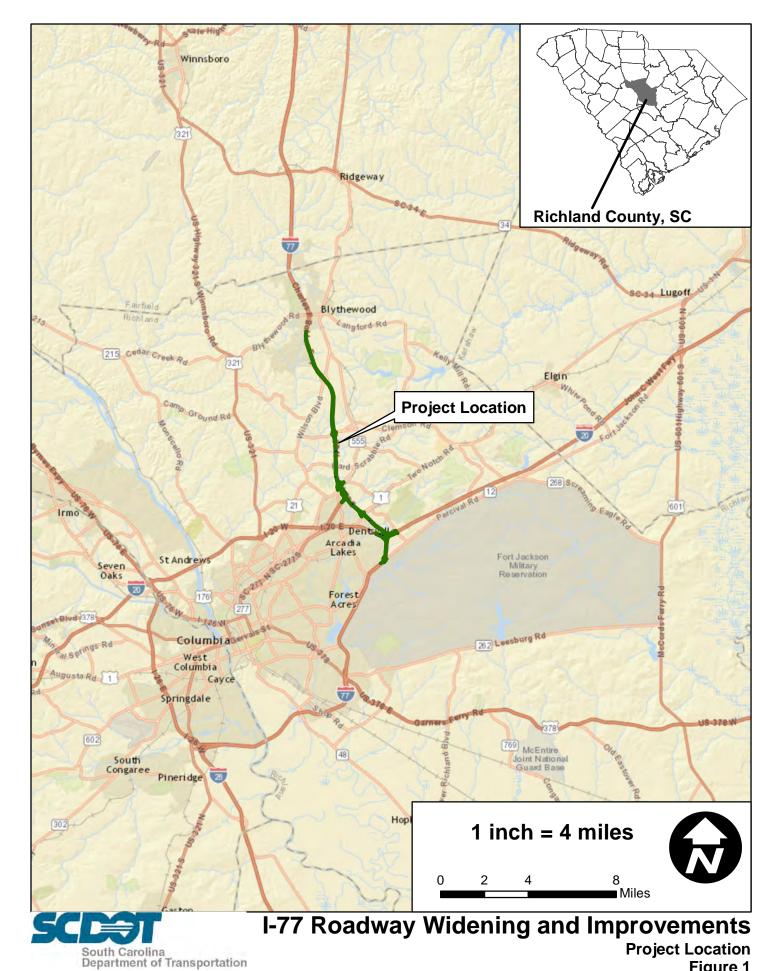
JURISDICTIONAL DETERMINATION REQUEST

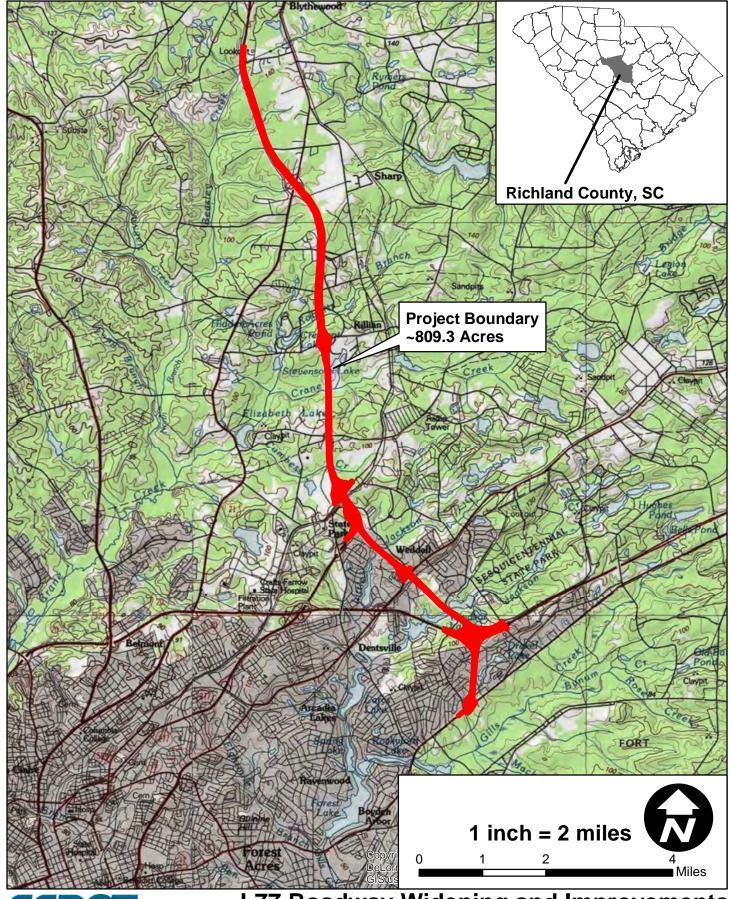
For Identifying Waters of the U.S., Including Wetlands and Tributaries

Project Name & Location Address	I-77 Roadway and Bridge Widening		
County: Richland	Total Acreage of Trac	t:	Date:
Property Owner : SCDOT	Ag	ent: HDR	
Address: 955 Park Street	Add	3955 Faber Place Dr., Sdress:	Suite 300
Columbia, SC 29202		North Charleston, SC 2	
803-737-1337 Phone:		843-414-3734 one:	
Email: GordonSO@scdot.org		ail:ail:	.com
property from a nearby n Copy of Survey Plat or T Additional information su description of the propos I am submitting a wetland delines "Information Required in a Wetland	expedite the wetland delineate first two following items must from County Map, USGS Quanajor intersection. The first two following items must from County Map, USGS Quanajor intersection. The first two following items must be county from the county from	ion process, property over accompany your requed described Sheet, etc.), street ad photograph, topographi roject, etc, may also be	whers are encouraged to hire st: dress and directions to ic survey, conceptual site plan, provided but are not required.
2) Select the Type of Jurisdictional Accurate-Approved A	pproximate-Approved	Accurate-Preliminary	Approximate-Preliminary
Refer to the below definitions: <u>Preliminary</u> – Preliminary determinations wi jurisdictional; therefore, a Preliminary can o			
<u>Approved</u> – Approved determinations will id jurisdictional status.	entify whether wetlands or other wate	rs are present on the site and	will include a determination of their
Accurate: Verified location and extent of all or represented by a tax map (or by GPS po			r. Project boundary must be surveyed
Approximate: Verified location and extent represented by a tax map or GPS coordinates		approximately on a sketch. P	roject boundary may be surveyed or
MPORTANT NOTE: Legible printed present property owner or have the employees or their agents to enter on the sign this form unless you are	specific authority of the pro into the property for on-site	perty owner to authorized investigations if such	ze Corps of Engineers is deemed necessary.
PRINTED NAME of person signing t	nis form, below: Renee Mulholla	nd	
Signature of Property Owner or Auth	norized Agent: renee.mulholla	and@hdrinc.com Dh: cn=rene Date: 2014.	ned by renee mulholland @hdrinc.com ee.mulholland @hdrinc.com 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

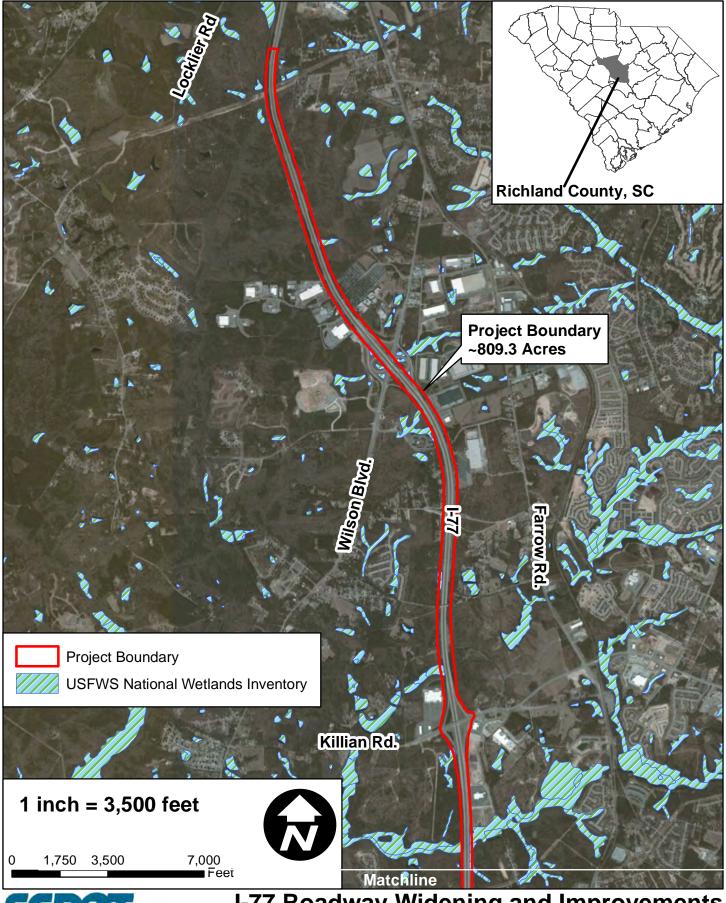
Northwest Branch 1835 Assembly St., Room 865-B1 Columbia, SC 29201 803-253-3444





I-77 Roadway Widening and Improvements
USGS Blythewood & Fort Jackson North Quadrangles, SC
Figure 2

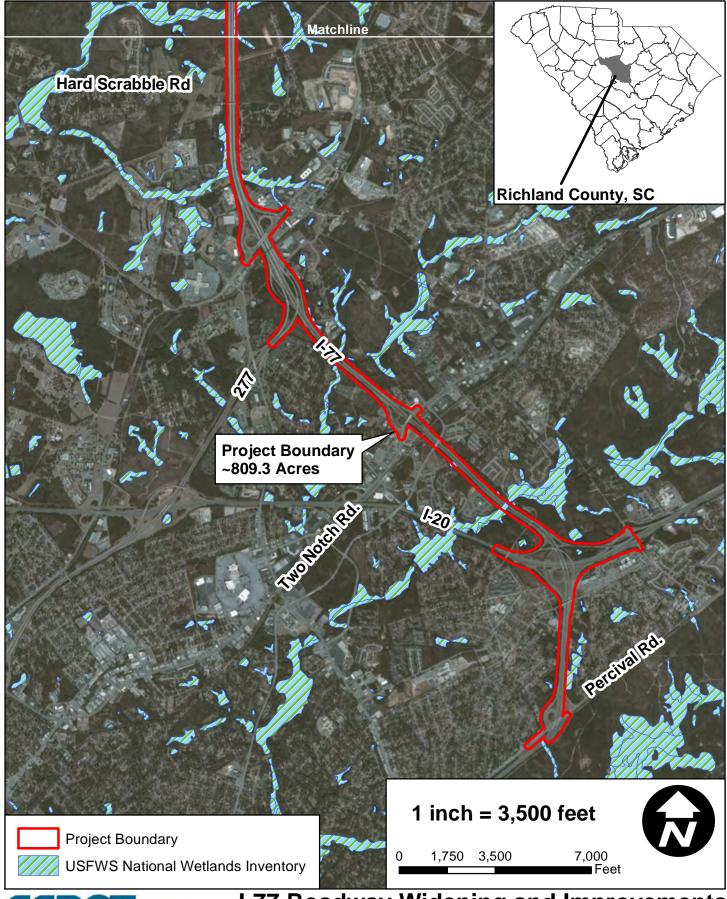
Figure 2 Dec. 2014



South Carolina Department of Transportation

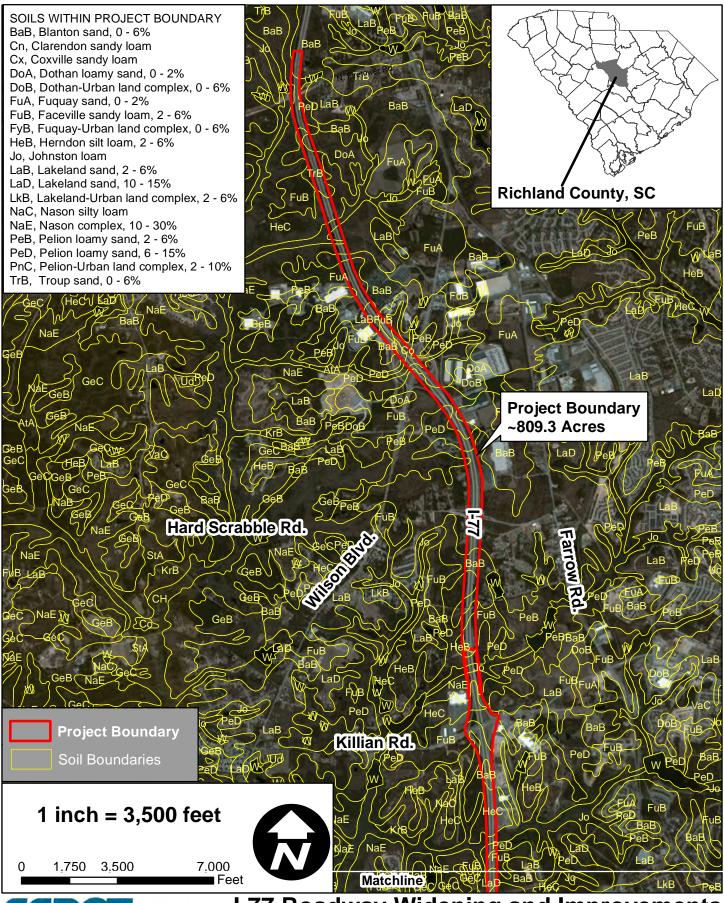
I-77 Roadway Widening and Improvements

USFWS National Wetlands Inventory Figure 3A





USFWS National Wetlands Inventory
Figure 3B

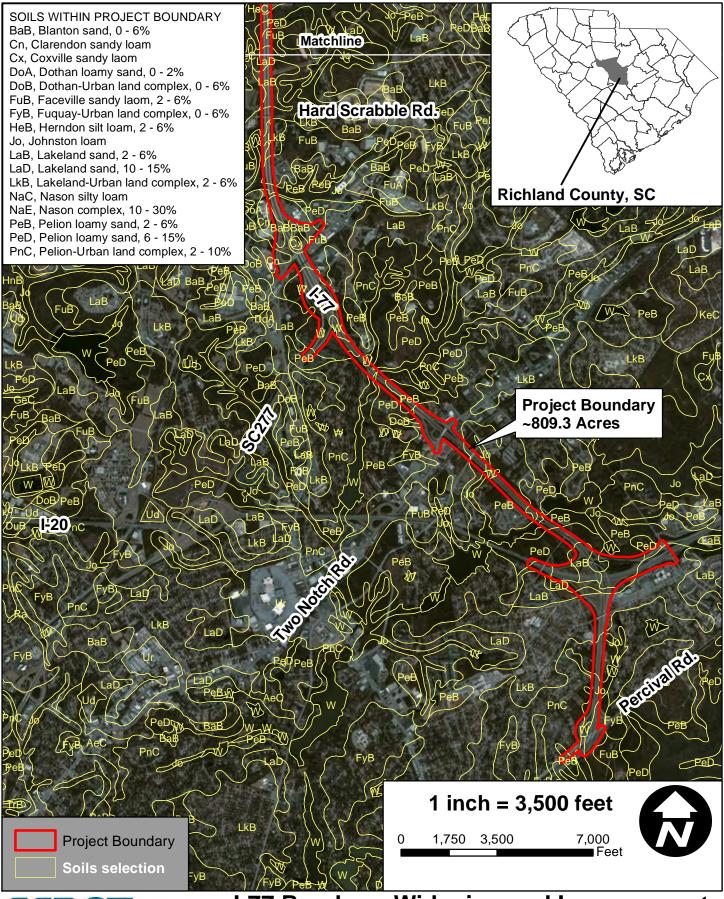


South Carolina
Department of Transportation

I-77 Roadway Widening and Improvements

NRCS Soil Survey for Richland County, SC Figure 4A

Dec. 2014

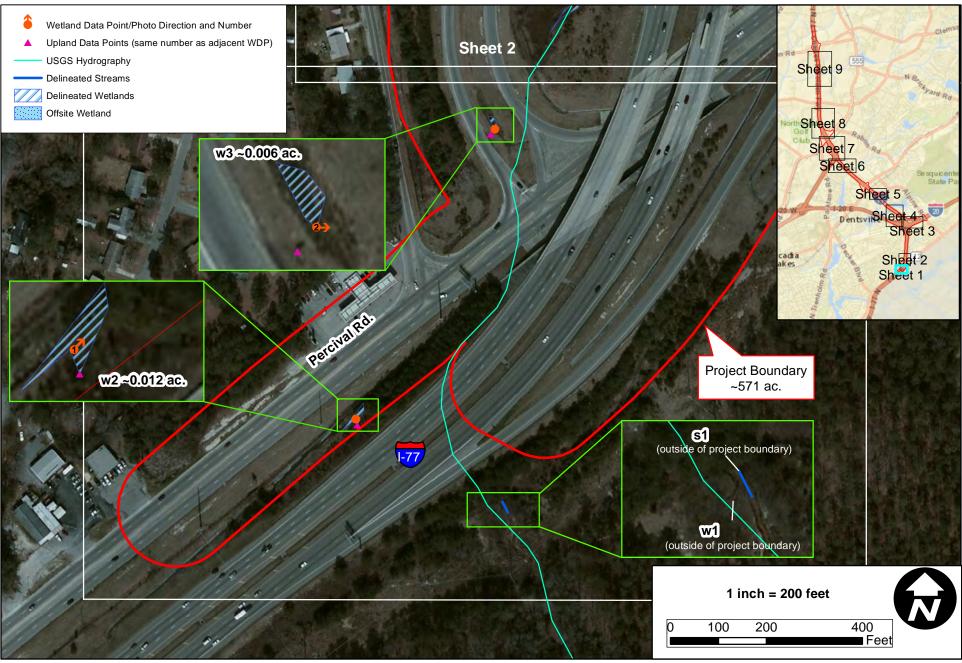


South Carolina
Department of Transportation

I-77 Roadway Widening and Improvements

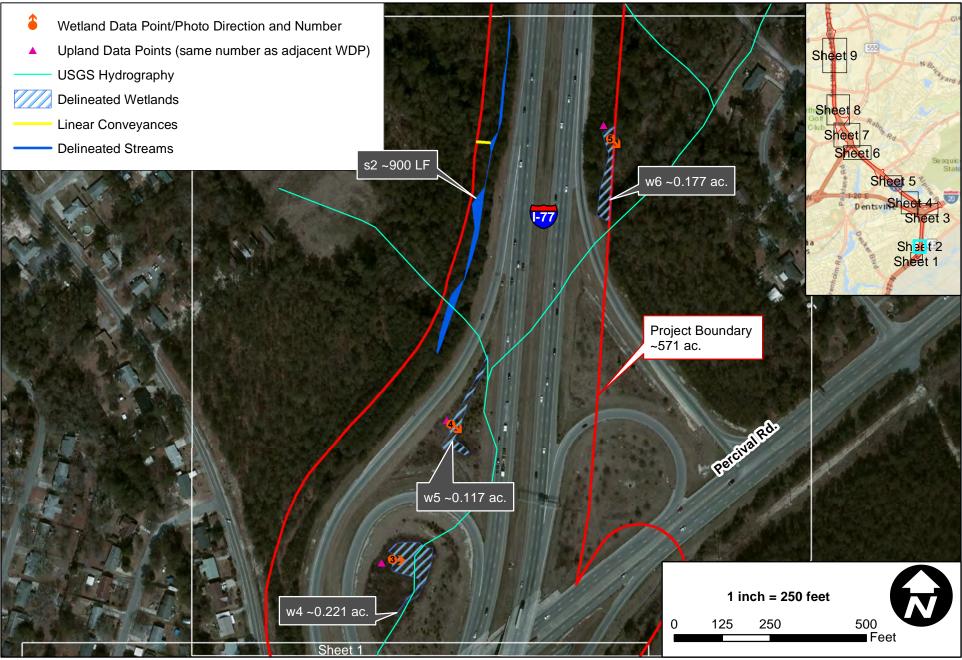
NRCS Soil Survey for Richland County, SC Figure 4B

Dec. 2014



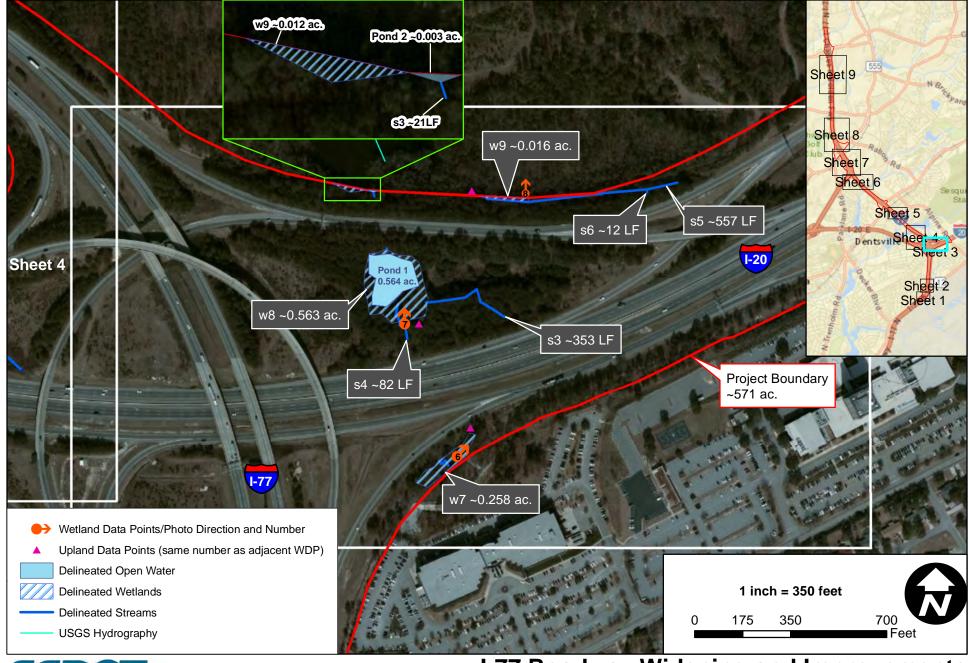


Delineated Streams & Wetlands Figure 5 (Sheet 1 of 9) Dec. 2014



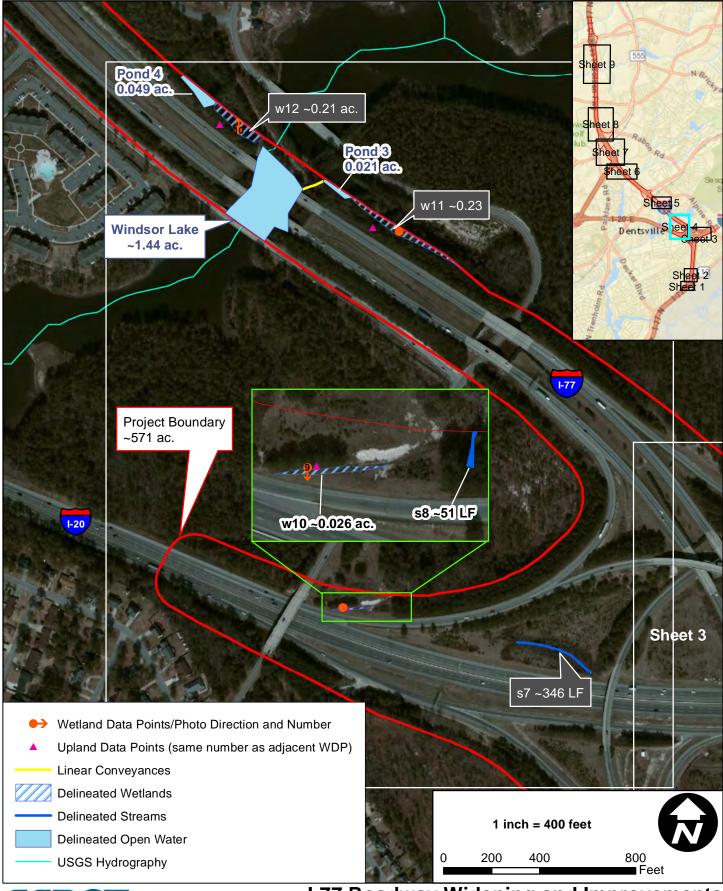


Delineated Streams & Wetlands Figure 5 (Sheet 2 of 9) Dec. 2014



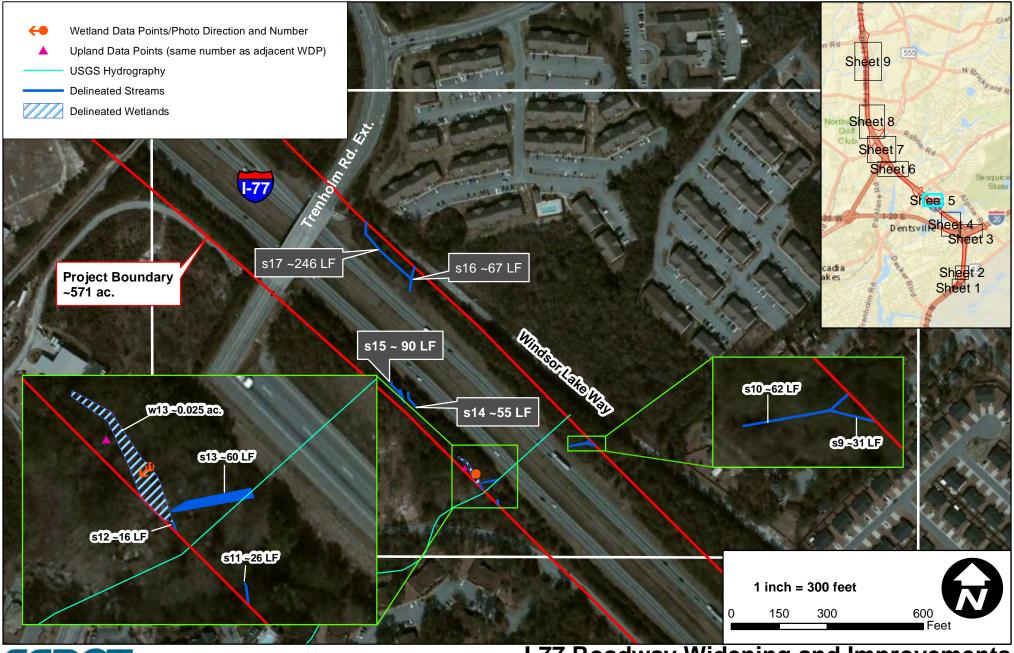


Delineated Streams & Wetlands Figure 5 (Sheet 3 of 9) Dec. 2014





Delineated Streams & Wetlands Figure 5 (Sheet 4 of 9)



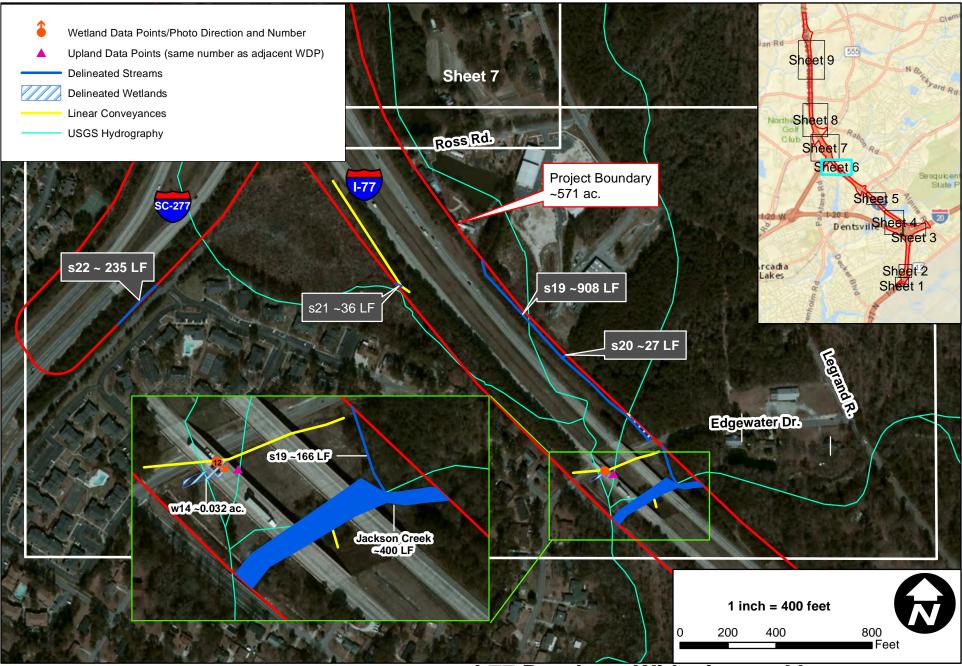


I-77 Roadway Widening and Improvements

Delineated Streams & Wetlands

Figure 5 (Sheet 5 of 9)

Dec. 2014



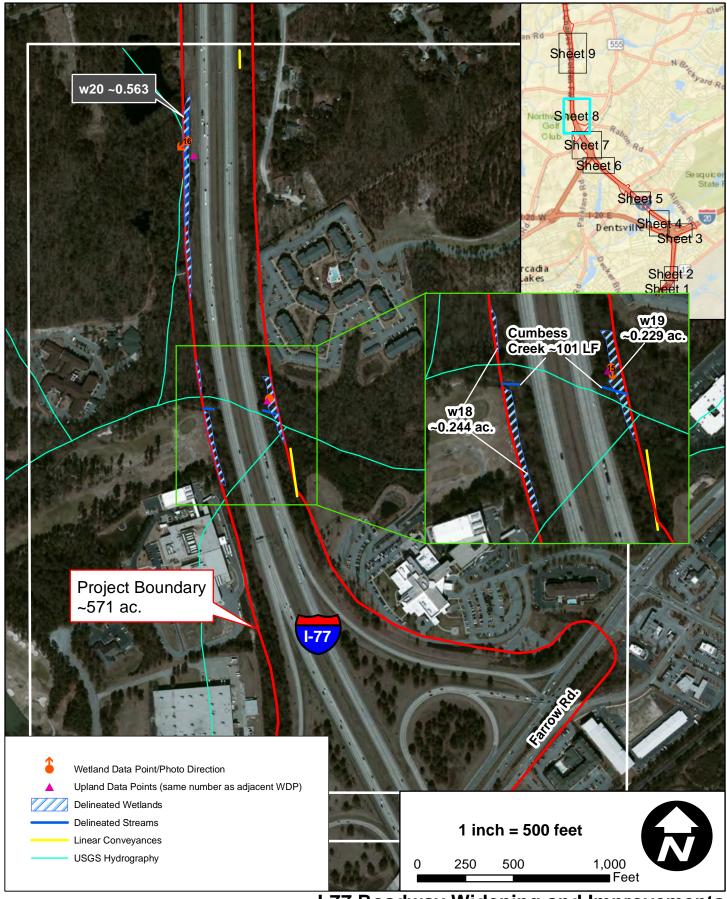


Delineated Streams & Wetlands Figure 5 (Sheet 6 of 9) Dec. 2014





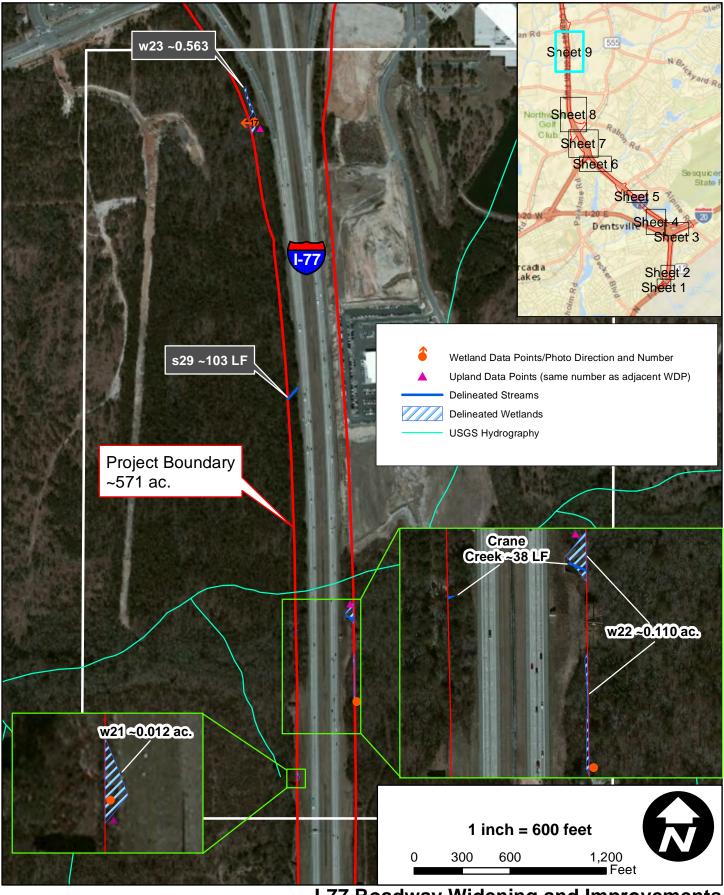
Delineated Streams & Wetlands Figure 5 (Sheet 7 of 9) Dec. 2014





I-77 Roadway Widening and Improvements
Delineated Streams & Wetlands

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





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: Colu	umbia	_ Sampling Date: 8/4/2014
Applicant/Owner: SCDOT		State: SC	_ Sampling Point: <u>W2</u>
	Section, Township		
Landform (hillslope, terrace, etc.):			Slope (%): <2%
Subregion (LRR or MLRA): LRR T			
Soil Map Unit Name: PnC		NWI classif	
Are climatic / hydrologic conditions on the site typic			
Are Vegetation, Soil, or Hydrology _			present? Yes <u>√</u> No
Are Vegetation, Soil, or Hydrology _		(If needed, explain any answ	
SUMMARY OF FINDINGS – Attach site			
			o, important router oo, oto:
	No Is the Sam	pled Area	
Hydric Soil Present? Yes	within a W	etland? Yes	No
Wetland Hydrology Present? Yes Remarks:	/ No		
Wetland is the result of drainage	from concrete drainage str	ucture	
vvettaria is the result of drainage	Trom concrete dramage str	dotaro.	
HYDROLOGY			
Wetland Hydrology Indicators:		Secondary India	cators (minimum of two required)
Primary Indicators (minimum of one is required; ch	neck all that apply)	Surface So	il Cracks (B6)
✓ Surface Water (A1)	Water-Stained Leaves (B9)		egetated Concave Surface (B8)
	Aquatic Fauna (B13)	✓ Drainage P	
Saturation (A3)	Marl Deposits (B15) (LRR U)	Moss Trim	Lines (B16)
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Dry-Seasor	n Water Table (C2)
Sediment Deposits (B2)	Oxidized Rhizospheres on Living	Roots (C3) Crayfish Bu	ırrows (C8)
Drift Deposits (B3)	Presence of Reduced Iron (C4)	Saturation	Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled So		c Position (D2)
1 — · · · · ·	Thin Muck Surface (C7)	Shallow Aq	
	Other (Explain in Remarks)	FAC-Neutra	al Test (D5)
Field Observations:	5 4 6 4 A inches		
Surface Water Present? Yes _ V No _	Depth (inches): 4 inches		
	Depth (inches): >16 inche		
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):	Wetland Hydrology Prese	ent? Yes V No No
Describe Recorded Data (stream gauge, monitoring	ng well, aerial photos, previous inspec	tions), if available:	
Remarks:			

VECETATION _	I lee scientific names of plants	

/EGETATION – Use scientific names of plants	S.			Sampling Point: W2
	Absolute			Dominance Test worksheet:
<u>Tree Stratum</u> (Plot sizes: <u>30-ft</u>) 1. <u>Pinus glabra</u>		Species? yes	Status FACW	Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)
2.				Total Number of Dominant
3				Species Across All Strata: 5 (B)
4				Percent of Dominant Species That Are ORL FACW or FAC: 100 (A/R)
5				That Are OBL, FACW, or FAC: 100 (A/B)
7				Prevalence Index worksheet:
		= Total Co	over	Total % Cover of: Multiply by:
Sapling Stratum (30-ft)				OBL species x 1 =
1				FACW species x 2 =
2				FAC species x 3 = FACU species x 4 =
3				UPL species x 5 =
4 5				Column Totals: (A) (B)
6				(2)
7.				Prevalence Index = B/A =
		= Total Co	over	Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)				✓ Dominance Test is >50%
1. Glottidium vesicarium				Prevalence Index is ≤3.0¹
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				¹ Indicators of hydric soil and wetland hydrology must
4			·	be present.
5				
6 7				Definitions of Vegetation Strata:
	20	= Total Co	over	3
Herb Stratum (15-ft)				Tree – Woody plants, excluding woody vines,
1. Carex walterana	30	yes	OBL	approximately 20 ft (6 m) or more in height and
2. Clethra alnifolia		yes	FACW	3 in. (7.6 cm) or larger in diameter at breast height (DBH).
3. Polygonum hydropiperoides		yes	OBL OBL	
4. Cyperus erythrorhizos	<u>5</u> 5		OBL FAC	Sapling – Woody plants, excluding woody vines,
5. Juncus tenuis6. Eupatorium capillifolium		no no	FACU	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Eupatorium capillifolium 7				than 3 iii. (7.0 cm) DDH.
8.				Shrub – Woody plants, excluding woody vines,
9.				approximately 3 to 20 ft (1 to 6 m) in height.
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12				woody plants, except woody vines, less than
W 1 1 1 2 2 4 4	82	= Total Co	over	approximately 3 ft (1 m) in height.
Woody Vine Stratum ()				Woody vine – All woody vines, regardless of height.
1				Troody vine 7 in woody vinee, regardless of noight.
3				
4				
5.				Hydrophytic Vegetation
		= Total Co	over	Present? Yes No
Remarks: (If observed, list morphological adaptations be				
Tremains. (II observed, list morphological adaptations be	510W).			

SOIL Sampling Point: <u>W2</u>

Profile Desc	cription: (Describe	to the depth	needed to documen	t the indicator or confi	rm the absence	of indicato	rs.)	
Depth	Matrix		Redox Fe	atures	_			
(inches)	Color (moist)	<u>%</u>	Color (moist)	% Type ¹ Loc ²			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=Co	oncentration, D=De	oletion, RM=R	educed Matrix, CS=C	overed or Coated Sand	Grains. ² Lo	cation: PI =	Pore Lining, M	=Matrix
Hydric Soil		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	<u> </u>				matic Hydric S	
Histosol	(A1)		Polyvalue Below	Surface (S8) (LRR S, T	', U) 1 cm N	Лuck (A9) (L	RR O)	
	pipedon (A2)			e (S9) (LRR S, T, U)		Лuck (A10) (
Black Hi	istic (A3)		Loamy Mucky Mi	neral (F1) (LRR O)	Reduc	ed Vertic (F	18) (outside M	LRA 150A,B)
	en Sulfide (A4)		Loamy Gleyed M				ain Soils (F19)	
	d Layers (A5)		Depleted Matrix				Loamy Soils (F	(20)
	Bodies (A6) (LRR I		Redox Dark Surf	, ,		RA 153B)	. I (TEO)	
	ucky Mineral (A7) (L esence (A8) (LRR I		Depleted Dark S	, ,		arent Materi) (I BB T II)
	ick (A9) (LRR P, T)		Redox Depression Marl (F10) (LRR	. ,	•	nallow Dark (Explain in F	Surface (TF12	.) (LKK 1, U)
	d Below Dark Surface		_ ` ' `	(F11) (MLRA 151)	Other	(Explain in r	Remarks)	
	ark Surface (A12)	,		Masses (F12) (LRR O,	P, T) ³ Indic	ators of hyd	rophytic vegeta	tion and
Coast P	rairie Redox (A16) (MLRA 150A)	Umbric Surface (F13) (LRR P, T, U)			ogy must be pre	
-	Mucky Mineral (S1)	LRR O, S)	Delta Ochric (F1				- g, p	
-	Bleyed Matrix (S4)			F18) (MLRA 150A, 150				
	Redox (S5)			lain Soils (F19) (MLRA				
	Matrix (S6)	C T II)	Anomalous Brigh	t Loamy Soils (F20) (MI	LRA 149A, 153C	, 153D)		
	rface (S7) (LRR P, Layer (if observed)							
	Layer (II Observed)	'-						
Type:	ah a a \		_		Usalaia Cail	Dracanta	V ✓	No
	ches):				Hydric Soil	Present?	Yes	NO
Remarks:								

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: 1-77	City/County: Colu	umbia	_ Sampling Date: 8/4/2014
Applicant/Owner: SCDOT		State: SC	_ Sampling Point: Up2
Investigator(s): McMaster/Mulholland	Section, Township		
	Local relief (conca		Slope (%): 5%
Subregion (LRR or MLRA):			
Soil Map Unit Name: PnC			ication: none
Are climatic / hydrologic conditions on the site typic	_		<u> </u>
Are Vegetation, Soil, or Hydrology			present? Yes _ ✓ No
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any answ	rers in Remarks.)
SUMMARY OF FINDINGS - Attach site	e map showing sampling poi	nt locations, transect	s, important features, etc.
Hydrophytic Vegetation Present? Yes Hydric Soil Present? Yes Wetland Hydrology Present? Yes Remarks:	No ✓ Is the Sam within a W	-	No <u>√</u>
Adjacent to w2 wetland data point	. Area adjacent to concret	e flume within ROW	
HYDROLOGY			
Wetland Hydrology Indicators:			cators (minimum of two required)
Primary Indicators (minimum of one is required; c		Surface So	
	Water-Stained Leaves (B9)		egetated Concave Surface (B8)
	Aquatic Fauna (B13)		atterns (B10)
Saturation (A3)	Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1)	Moss Trim	n Water Table (C2)
Water Marks (B1) Sediment Deposits (B2)	Oxidized Rhizospheres on Living		
Orift Deposits (B3)	Presence of Reduced Iron (C4)		Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled So		c Position (D2)
Iron Deposits (B5)	Thin Muck Surface (C7)	Shallow Aq	
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Remarks)	FAC-Neutra	
Field Observations:			
Surface Water Present? Yes No	Depth (inches):		
Water Table Present? Yes No	Depth (inches):		
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):	Wetland Hydrology Prese	ent? Yes No
Describe Recorded Data (stream gauge, monitori	ng well, aerial photos, previous inspec	tions), if available:	
Remarks:			
Remarks:			

7 0 4 70 4	Absolute	Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot sizes: <u>30-ft</u>) 1	% Cover			Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant Species Across All Strata: 6 (B)
4				Percent of Dominant Species That Are OBL, FACW, or FAC:
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Continue Charles (30-ft		= Total Co	over	OBL species x 1 =
Sapling Stratum (30-ft) 1. Rhus copallina	25	VOC	UPL	FACW species x 2 =
 Rhus copallina Liquidambar styraciflua 			FAC	FAC species x 3 =
				FACU species x 4 =
3. Celtis laevigata			<u>FACW</u>	
4				UPL species x 5 =
5				Column Totals: (A) (B)
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)	_40	= Total Co	over	✓ Dominance Test is >50%
1. Rubus trivialis	20	ves	FACU	Prevalence Index is ≤3.0 ¹
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				¹ Indicators of hydric soil and wetland hydrology must
4				be present.
5				
6				Definitions of Vegetation Strata:
7				Definitions of Vegetation Strata.
Herb Stratum (_15-ft)	_20	= Total Co	over	Tree – Woody plants, excluding woody vines,
1. Panicum hemitomon	20	yes	OBL	approximately 20 ft (6 m) or more in height and
2. Panicum commutatum	10	yes	FAC	3 in. (7.6 cm) or larger in diameter at breast
3. Eleocharis parvula		no	OBL	height (DBH).
4				Sapling – Woody plants, excluding woody vines,
5				approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
6				than 3 in. (7.0 cm) DBn.
7				Shrub – Woody plants, excluding woody vines,
8				approximately 3 to 20 ft (1 to 6 m) in height.
9				
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12				woody plants, except woody vines, less than
Woody Vine Stratum (15-ft)	_35	= Total Co	over	approximately 3 ft (1 m) in height.
,	10	V/00	EACH	Woody vine – All woody vines, regardless of height.
1. Rubus trivialis				vvoody viito 7 iii woody viitos, regardiess of fielgrit.
2				
3				
4				Hydrophytic
5				Vegetation
	_10	= Total Co	over	Present? Yes No
Remarks: (If observed, list morphological adaptations	below).			I.
	•			

SOIL Sampling Point: Up2

Profile Desc	ription: (Describe	to the depth	needed to docun	nent the in	ndicator	or confirm	the absence of	indicato	rs.)	
Depth	Matrix			K Features		. 2	_			
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	Type ¹	<u>Loc²</u>	Texture		Remarks	
0-2	10 YR: 4/1	100								
2-12	10 YR: 5/4	100								
12-20	10 YR: 5/6	100								
	oncentration, D=Dep	oletion, RM=Re	educed Matrix, CS	=Covered	or Coate	d Sand Gra			Pore Lining,	
Hydric Soil I			Dalamba Da		(00) (1)	DD 0 T 11	Indicators fo		•	5 Solis":
Histosol	(A1) pipedon (A2)		Polyvalue Be Thin Dark Su) 1 cm Mu 2 cm Mu	. , .		
Black His			Loamy Mucky							MLRA 150A,B)
	n Sulfide (A4)		Loamy Gleye			-,			, .	9) (LRR P, S, T)
	Layers (A5)		Depleted Mat				Anomalo			
_	Bodies (A6) (LRR P		Redox Dark S	•	•		(MLRA			
	cky Mineral (A7) (LI		Depleted Dar				Red Pare			
	esence (A8) (LRR L	J)	Redox Depre		3)					⁻ 12) (LRR T, U)
	ck (A9) (LRR P, T) Below Dark Surfac	- (Δ11)	Marl (F10) (L Depleted Och		MI RA 15	(1)	Other (E	xplain in F	Remarks)	
	ark Surface (A12)	·C (A11)	Iron-Mangan				T) 311:4-			
	airie Redox (A16) (I	VILRA 150A)	_				maioate		rophytic vego ogy must be	
	lucky Mineral (S1) (I		Delta Ochric			•	wetiai	ia riyarok	bgy mast be	present.
	leyed Matrix (S4)		Reduced Ver							
	edox (S5)		Piedmont Flo							
	Matrix (S6)		Anomalous B	right Loan	ny Soils (F	²⁰) (MLRA	A 149A, 153C, 1	53D)		
	face (S7) (LRR P, S -ayer (if observed)						1			
Type:	ayer (ii observed)									
	ches):						Hydric Soil P	resent?	Yes	No ✓
Remarks:							Tryunc con T	C3CIII:	103	
Nemaiks.										

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77	City/County: Colu	umbia	Sampling Date: 8/4/2014
Applicant/Owner: SCDOT		State: SC	_ Sampling Point: <u>W3</u>
Investigator(s): McMaster/Mulholland	Section, Township		0
Landform (hillslope, terrace, etc.):			ve Slope (%): <1
Subregion (LRR or MLRA): LRR T			
Soil Map Unit Name: JO, W		NWI classi	
Are climatic / hydrologic conditions on the site typica	,		
	•		" present? Yes ✓ No
Are Vegetation, Soil, or Hydrology _			· — —
Are Vegetation, Soil, or Hydrology _		(If needed, explain any answ	
SUMMARY OF FINDINGS – Attach site	map showing sampling poi	nt locations, transect	ts, important features, etc.
Hydrophytic Vegetation Present? Yes _ ✓ Hydric Soil Present? Yes _ ✓ Wetland Hydrology Present? Yes _ ✓ Remarks:	within a W		✓ No
Area exists in median of I-77 Sou	th bound exit ramp.		
HYDROLOGY			
Wetland Hydrology Indicators:			cators (minimum of two required)
Primary Indicators (minimum of one is required; ch		Surface So	
	Water-Stained Leaves (B9)		egetated Concave Surface (B8)
	Aquatic Fauna (B13) Marl Deposits (B15) (LRR U)		Patterns (B10) Lines (B16)
	Hydrogen Sulfide Odor (C1)		n Water Table (C2)
	Oxidized Rhizospheres on Living		urrows (C8)
	Presence of Reduced Iron (C4)		Visible on Aerial Imagery (C9)
	Recent Iron Reduction in Tilled So		ic Position (D2)
	Thin Muck Surface (C7)	Shallow Ac	
	Other (Explain in Remarks)	FAC-Neutr	
Field Observations:			, ,
Surface Water Present? Yes <u>✓</u> No	Depth (inches): .5		
Water Table Present? Yes <u>✓</u> No	Depth (inches): 6.0		
	Depth (inches):	Wetland Hydrology Pres	ent? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monitorin	g well, aerial photos, previous inspec	tions), if available:	
Remarks:			
I .			

VEGETATION – Use scientific names of plants	
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EGETATION – Use scientific names of plants				Sampling Point: <u>w3</u>
00.5	Absolute	Dominant		Dominance Test worksheet:
<u>Free Stratum</u> (Plot sizes: <u>30-ft</u>) I		Species?		Number of Dominant Species That Are OBL, FACW, or FAC:3 (A)
2. 3.				Total Number of Dominant Species Across All Strata:5 (B)
i. 5.				Percent of Dominant Species That Are OBL, FACW, or FAC: 60 (A/B)
5				Prevalence Index worksheet:
7		= Total Co	wer	Total % Cover of: Multiply by:
Sapling Stratum(30-ft)		- Total Oc	7701	OBL species x 1 =
l				FACW species x 2 =
2.				FAC species x 3 =
3.				FACU species x 4 =
l				UPL species x 5 =
i				Column Totals: (A) (B)
5.				
				Prevalence Index = B/A =
7		= Total Co	wer	Hydrophytic Vegetation Indicators:
Shrub Stratum(30-ft)		- Total CC	7761	✓ Dominance Test is >50%
. Glottidium vesicarium	10	ves	FAC	Prevalence Index is ≤3.0 ¹
2.				Problematic Hydrophytic Vegetation ¹ (Explain)
3.				
				¹ Indicators of hydric soil and wetland hydrology must
				be present.
5				
5				Definitions of Vegetation Strata:
·	10			Definitions of Vegetation Strata.
Herb Stratum(_15-ft)	_10	= Total Co	over	Tree – Woody plants, excluding woody vines,
1. Juncus effusus	20	yes	OBL	approximately 20 ft (6 m) or more in height and
z. Lespedeza cuneata	10	yes	FACU	3 in. (7.6 cm) or larger in diameter at breast
B. Panicum hematomon	10	yes	OBL	height (DBH).
Setaria geniculata			FACW	
s. Rhexia virginica	5	no	FACW	Sapling – Woody plants, excluding woody vines,
·		no	FACW	approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
S. <u>Verbena brasiliensis</u> 7.				
3				Shrub – Woody plants, excluding woody vines,
)				approximately 3 to 20 ft (1 to 6 m) in height.
10				Harb All bank account (non-woods) plants including
11.				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes
2.				woody plants, except woody vines, less than
	55			approximately 3 ft (1 m) in height.
Noody Vine Stratum(15-ft)		. otal ot		, , ,
I Ipomoea purpurea	10	yes	UPL	Woody vine – All woody vines, regardless of height.
2.				
3.				
4				
		-		Hydrophytic
5		- Total Co		Vegetation Present? Yes No
5	_10	- Total CC	over	163

SOIL Sampling Point: w3

Profile Desc	ription: (Describe	to the dep	oth needed to docu	ment the i	indicator	or confirm	m the absence	e of indicators.)
Depth	Matrix		Rede	ox Feature	s			
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0-4	10YR: 4/3	85	10YR: 6/8	15	С	M	Clay	Loam
4-7	10YR: 6/3	100					Sandy	Loam
7-18	10YR: 5/4	70	10R: 4/8	30	С	M	Sandy	Loam
18-20	10YR: 4/2	95	10YR: 5/8	5	С	М	Clay	Loam
			-	_			· -	
		oletion, RM	=Reduced Matrix, C	S=Covere	d or Coate	d Sand G		ocation: PL=Pore Lining, M=Matrix.
Hydric Soil			Daharaha D	-1 Of-	(00) (1	DD C T		s for Problematic Hydric Soils ³ :
Histosol	(A1) pipedon (A2)		Polyvalue B Thin Dark S					Muck (A9) (LRR O) Muck (A10) (LRR S)
Black Hi			Loamy Mucl					ced Vertic (F18) (outside MLRA 150A,B)
	en Sulfide (A4)		Loamy Gley			-,		nont Floodplain Soils (F19) (LRR P, S, T)
	d Layers (A5)		Depleted Ma				Anom	alous Bright Loamy Soils (F20)
	Bodies (A6) (LRR P		✓ Redox Dark					.RA 153B)
	icky Mineral (A7) (LI		· ·					Parent Material (TF2)
	esence (A8) (LRR U Ick (A9) (LRR P, T)	(1)	Redox Depr Marl (F10) (8)		-	Shallow Dark Surface (TF12) (LRR T, U)
	d Below Dark Surfac	e (A11)	Depleted Oc		(MLRA 1	51)	Other	(Explain in Remarks)
	ark Surface (A12)	` ,	Iron-Mangai				, T) ³ Indic	cators of hydrophytic vegetation and
			A) Umbric Surf			U)		etland hydrology must be present.
-	Mucky Mineral (S1) (LRR O, S)				0.4.4.5.0.0		
-	Bleyed Matrix (S4) Redox (S5)		Reduced Ve					
	Matrix (S6)		Anomalous					C. 153D)
	rface (S7) (LRR P, \$	S, T, U)	/	goa.	, (.	_0) (,	, 133_/
	Layer (if observed)							
Type:								
Depth (inc	ches):						Hydric Soi	I Present? Yes <u></u> No
Remarks:							\L	

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: I-77	City/County: Col	umbia	Sampling Date: 8/4/2014			
Applicant/Owner: SCDOT			Sampling Point: Up3			
• • • • • • • • • • • • • • • • • • • •	Section, Township					
	Local relief (conca		Slope (%): 5%			
Subregion (LRR or MLRA): LRR T						
Soil Map Unit Name: J0		NWI class				
Are climatic / hydrologic conditions on the site typica						
			,			
Are Vegetation, Soil, or Hydrology			" present? Yes No _✓			
Are Vegetation, Soil, or Hydrology	naturally problematic?	(If needed, explain any ansv	wers in Remarks.)			
SUMMARY OF FINDINGS – Attach site	map showing sampling poi	nt locations, transec	ts, important features, etc.			
Wetland Hydrology Present? Yes	No √ No √ No √ No √		No <u> </u>			
Remarks:		(
Adjacent to w3 wetland data point.	Area exists in median o	r I-77 South bound	exit ramp and is regula			
HYDROLOGY						
Wetland Hydrology Indicators:		Secondary Ind	icators (minimum of two required)			
Primary Indicators (minimum of one is required; che	eck all that apply)	Surface So	oil Cracks (B6)			
Surface Water (A1)	Water-Stained Leaves (B9)	Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2)	Aquatic Fauna (B13)	Drainage I	Drainage Patterns (B10)			
	Mooo Trim	Moss Trim Lines (B16)				
	Marl Deposits (B15) (LRR U)					
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Dry-Seaso	on Water Table (C2)			
Water Marks (B1) Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)Oxidized Rhizospheres on Living	Dry-Seaso Roots (C3) Crayfish B	on Water Table (C2) urrows (C8)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Hydrogen Sulfide Odor (C1)Oxidized Rhizospheres on LivingPresence of Reduced Iron (C4)	Dry-Seaso Roots (C3) Crayfish B Saturation	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc	Dry-Season Roots (C3) Crayfish B Saturation pils (C6) Geomorph	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) iic Position (D2)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	 Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled So Thin Muck Surface (C7) 	Crayfish B Saturation Dils (C6) Geomorph Shallow A	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) uic Position (D2) quitard (D3)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc	Dry-Season Roots (C3) Crayfish B Saturation pils (C6) Geomorph	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) uic Position (D2) quitard (D3)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations:	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled So Thin Muck Surface (C7) Other (Explain in Remarks)	Crayfish B Saturation Dils (C6) Geomorph Shallow A	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) uic Position (D2) quitard (D3)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled So Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches):	Crayfish B Saturation Dils (C6) Geomorph Shallow A	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) uic Position (D2) quitard (D3)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Sc Thin Muck Surface (C7) Other (Explain in Remarks) Depth (inches): Depth (inches):	Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ar FAC-Neut	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe)		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe)		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
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Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
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Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
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Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			
Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Field Observations: Surface Water Present? Yes No Water Table Present? Yes No Saturation Present? Yes No (includes capillary fringe) Describe Recorded Data (stream gauge, monitoring		Dry-Seaso Roots (C3) Crayfish B Saturation oils (C6) Geomorph Shallow Ac FAC-Neut Wetland Hydrology Pres	on Water Table (C2) urrows (C8) Visible on Aerial Imagery (C9) nic Position (D2) quitard (D3) ral Test (D5)			

	VEGETATIOI	N - Use	scientific	names	of r	olants.
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EGETATION – Use scientific names of plan	nts.			Sampling Point: Up3
- 0	Absolute		t Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 30-ft) 1.	<u>% Cover</u>			Number of Dominant Species That Are OBL, FACW, or FAC:0 (A)
2				Total Number of Dominant
3				Species Across All Strata: 3 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 0 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Sapling Stratum (_30-ft)		= Total C	over	OBL species x 1 =
1				FACW species x 2 =
2.				FAC species x 3 =
3.				FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: (A) (B)
6				(-)
7				Prevalence Index = B/A =
··-			over	Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)		- rotar o	OVOI	Dominance Test is >50%
1				Prevalence Index is ≤3.0 ¹
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				
4				¹ Indicators of hydric soil and wetland hydrology must
5				be present.
6				
7				Definitions of Vegetation Strata:
45.6		= Total C	over	_
Herb Stratum (15-ft)	40		EAOU.	Tree – Woody plants, excluding woody vines,
1. Cynodon dactylon		yes	FACU	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast
2. Sorghum halepense		yes	FACU	height (DBH).
3. Digitaria sanguinalis		yes	FACU	
4. Panicum commutatum	5	no	FAC	Sapling – Woody plants, excluding woody vines,
5				approximately 20 ft (6 m) or more in height and less
6				than 3 in. (7.6 cm) DBH.
7				Shrub – Woody plants, excluding woody vines,
8				approximately 3 to 20 ft (1 to 6 m) in height.
9				
10				Herb – All herbaceous (non-woody) plants, including
11			-	herbaceous vines, regardless of size. Includes
12				woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody Vine Stratum (_15-ft)	65	= Fotal C	over	approximately 5 it (1 iii) iii lielyliit.
1				Woody vine – All woody vines, regardless of height.
2.				, , , ,
3				
4				
5			 	Hydrophytic
o			over	Vegetation Present? Yes No
		- Total C	0 7 0 1	100
Remarks: (If observed, list morphological adaptations	below).		<u> </u>	
Area is regularly mowed.				

SOIL Sampling Point: Up3

Profile Desc	ription: (Describe	to the dep	th needed to docu	ment the	indicator	or confirn	n the absence	of indicate	ors.)	
Depth	Matrix			x Feature	s					
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>		Remarks	
0-5	10YR: 1/1	100					Sandy	Loam		
5-16	10YR: 6/6	60	2/2	40	С	M	Sandy	Loam		
16-22	10YR: 7/8	100					Sandy	Loam		_
	-			_						
				_	· 					
1							. 2.			
	oncentration, D=Dep	letion, RM:	=Reduced Matrix, C	S=Covere	d or Coate	ed Sand G			=Pore Lining, N	
Hydric Soil I									matic Hydric	Solis":
Histosol			Polyvalue B					Muck (A9) (I		
	pipedon (A2)		Thin Dark S					Muck (A10)		41 D A 450 A D)
Black His			Loamy Mucl			(0)				/LRA 150A,B)
	n Sulfide (A4) I Layers (A5)		Loamy Gley		(FZ)				ain Soils (F19)	
	Bodies (A6) (LRR P	T 11\	Depleted Ma Redox Dark		-6)			aious Brigrii RA 153B)	Loamy Soils (F20)
	cky Mineral (A7) (LI							arent Mater	ial (TF2)	
	esence (A8) (LRR L		Redox Depr		. ,				s Surface (TF1	2) (I BB T II)
	ck (A9) (LRR P, T)	''	Marl (F10) (0)		•	(Explain in	•	2) (LIXIX 1, 0)
	Below Dark Surfac	e (A11)	Depleted Oc		(MLRA 1	51)	Other	(Lxpiaiii iii	ixemarks)	
	rk Surface (A12)	,	Iron-Mangar				T) 3 _{Indic}	ators of hyd	rophytic veget	ation and
	airie Redox (A16) (I	MLRA 150	_				indic		ogy must be pi	
Sandy M	lucky Mineral (S1) (I	LRR O, S)	Delta Ochric					liana ny aroi	ogy maor bo pi	000111.
Sandy G	leyed Matrix (S4)		Reduced Ve	rtic (F18)	(MLRA 15	0A, 150B))			
	edox (S5)		Piedmont FI	oodplain S	Soils (F19)	(MLRA 14	49A)			
	Matrix (S6)		Anomalous	Bright Loa	my Soils (F20) (MLF	RA 149A, 1530	;, 153D)		
	rface (S7) (LRR P, S									
Restrictive L	ayer (if observed)	:								
Туре:										
Depth (inc	ches):						Hydric Soi	Present?	Yes	No <u></u> ✓
Remarks:							'			

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: _I-77	City/County: Col	umbia	Sampling Date: 8/5/2014		
Applicant/Owner: SCDOT		State: SC			
• •	Section, Township				
Landform (hillslope, terrace, etc.):			e Slone (%): <2		
	Lat: 34°3'9.922"N				
147					
			ication: None		
Are climatic / hydrologic conditions on the site typical					
Are Vegetation, Soil, or Hydrology _	significantly disturbed?	Are "Normal Circumstances"	present? Yes No		
Are Vegetation, Soil, or Hydrology _	naturally problematic?	(If needed, explain any answe	ers in Remarks.)		
SUMMARY OF FINDINGS - Attach site	map showing sampling po	int locations, transect	s, important features, etc.		
Hydrophytic Vegetation Present? Yes _ ▼	No Is the Sam				
	/ No		/		
-	No within a W	'etland? Yes <u>▼</u>	/ No		
Remarks:					
Area exists in median of I-77 Sou	th bound and exit ramp.				
HYDROLOGY					
Wetland Hydrology Indicators:			eators (minimum of two required)		
Primary Indicators (minimum of one is required; ch	eck all that apply)	Surface Soi			
✓ Surface Water (A1)	Water-Stained Leaves (B9)	Sparsely Vegetated Concave Surface (B8)			
✓ High Water Table (A2)	Aquatic Fauna (B13)		atterns (B10)		
Saturation (A3)	Marl Deposits (B15) (LRR U)	Moss Trim L			
Water Marks (B1)	Hydrogen Sulfide Odor (C1)		Water Table (C2)		
	✓ Oxidized Rhizospheres on Living				
	Presence of Reduced Iron (C4)		/isible on Aerial Imagery (C9)		
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled So		C Position (D2)		
Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7) Other (Explain in Remarks)	Shallow Aqu FAC-Neutra			
Field Observations:	Other (Explain in Remarks)	1 AC-Neutra	ii Test (D3)		
Surface Water Present? Yes _ ✓ No	Depth (inches): 1				
	Depth (inches): 8				
	Depth (inches):	Wetland Hydrology Prese	nt? Yes ✓ No		
(includes capillary fringe)			10310		
Describe Recorded Data (stream gauge, monitoring	ig well, aerial photos, previous inspec	tions), if available:			
Remarks:					
Water source is from roadway drai	nage.				

١	/EGETATION -	مءا ا	scientific	namae	of plants
١	VEGETATION -	use	scientific	names	oi biants.

'EGETATION – Use scientific names of plar	nts.			Sampling Point: <u>W4</u>
T 01 1 (7) 1 20 #	Absolute		Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot sizes: <u>30-ft</u>) 1)	% Cover		Status	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2 3				Total Number of Dominant Species Across All Strata: (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 100 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Sapling Stratum(30-ft		= Total Co	over	OBL species x 1 =
1				FACW species x 2 =
2.				FAC species x 3 =
3.				FACU species x 4 =
4.				UPL species x 5 =
5.				Column Totals: (A) (B)
6.				
7				Prevalence Index = B/A =
			over	Hydrophytic Vegetation Indicators:
Shrub Stratum(30-ft)				✓ Dominance Test is >50%
1				Prevalence Index is ≤3.0 ¹
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				1
4				¹ Indicators of hydric soil and wetland hydrology must be present.
5				
6				Definitions of Vegetation Strate:
7				Definitions of Vegetation Strata:
Herb Stratum (15-ft)		= Total Co	over	Tree – Woody plants, excluding woody vines,
Rhynchospora inexpansa	25	yes	FACW	approximately 20 ft (6 m) or more in height and
2. Juncus effusus	25	yes	OBL	3 in. (7.6 cm) or larger in diameter at breast
3. Scirpus cyperinus	15	no	OBL	height (DBH).
4. Dichanthelium aciculare	10	no	FACU	Sapling – Woody plants, excluding woody vines,
5. Solidago altissima	5	no	FAC	approximately 20 ft (6 m) or more in height and less
6. <u>Juncus tenuis</u>		no	FAC	than 3 in. (7.6 cm) DBH.
7 8				Shrub – Woody plants, excluding woody vines,
9.				approximately 3 to 20 ft (1 to 6 m) in height.
10.				Hark Ann Control of the Control of t
11.				Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes
12.				woody plants, except woody vines, less than
		= Total Co	over	approximately 3 ft (1 m) in height.
Woody Vine Stratum (15-ft)				
1				Woody vine – All woody vines, regardless of height.
2				
3				
4				Hydrophytic
5				Vegetation
		= Total Co	over	Present? Yes No
Remarks: (If observed, list morphological adaptations	below).			1

SOIL Sampling Point: <u>w4</u>

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)											
Depth		Matrix			Redo	x Features	3				
(inches)	Color (ı		<u></u> %	Color (%	Type ¹	Loc ²	Texture	Remarks	
0-4	10YR:	4/2	75	10YR:	5/6	25	С	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	С	M	Sand/silt	Loam	
16-19	10YR:	4/2	80	10YR:	8/1	20	С	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			ietion, Rivi=	Reduced	Matrix, C	S=Covered	or Coate	a Sana G		cation: PL=Pore Lining, M=Matrix. for Problematic Hydric Soils ³ :	
Histosol				Pol	walue Be	elow Surfac	ne (S8) (I	RR S T I		Muck (A9) (LRR O)	
	oipedon (A2	2)				urface (S9)				Muck (A10) (LRR S)	
Black Hi		,				xy Mineral (ed Vertic (F18) (outside MLRA 150A,B)	
	n Sulfide (A					ed Matrix (I	F2)			ont Floodplain Soils (F19) (LRR P, S, T)	
	Layers (A		_		pleted Ma					alous Bright Loamy Soils (F20)	
_	Bodies (A6					Surface (F			-	RA 153B)	
	icky Minera esence (A8					rk Surface essions (F8				arent Material (TF2) hallow Dark Surface (TF12) (LRR T, U)	
	ick (A9) (L F		,		rl (F10) (L		3)		-	(Explain in Remarks)	
	d Below Dai		e (A11)			hric (F11)	(MLRA 1	51)		(Explain in Normanie)	
	ark Surface					ese Masse			, T) ³ Indica	ators of hydrophytic vegetation and	
	rairie Redox							, U)	wet	land hydrology must be present.	
-	lucky Miner Bleyed Matri		.KK (), (S)			(F17) (ML rtic (F18) (0Δ 150B	١		
-	ledox (S5)	IX (O4)				oodplain S					
	Matrix (S6))							RA 149A, 153C	, 153D)	
	rface (S7) (, T, U)					, -		·	
Restrictive I	Layer (if ob	served):									
Type:										/	
Depth (inc	ches):								Hydric Soil	Present? Yes No	
Remarks:											

Project/Site: 1-77			City/C	ounty: Colu	ımbia		Sampling D	ate: 8/5/2014		
Applicant/Owner: SCDOT State: SC Sampling Point: Up-										
Investigator(s): McMaster/M	ulholland		Section			·	pg			
Landform (hillslope, terrace, etc.			Local					Slone (%): 5		
Subregion (LRR or MLRA): LR	, -			•		, -				
	1	L	at: <u>34 3 3.04 1</u>	111	Long: _00					
Soil Map Unit Name: W						_ NWI classific)		
Are climatic / hydrologic condition	ons on the site typ	ical for this	s time of year? Ye							
Are Vegetation, Soil	, or Hydrology	/ s	significantly disturb	ped?	Are "Normal Ci	rcumstances" p	resent? Yes	s No		
Are Vegetation, Soil	, or Hydrology	/ r	naturally problema	ntic? (If needed, exp	lain any answe	rs in Remark	s.)		
SUMMARY OF FINDING	S – Attach si	te map	showing sam	pling poi	nt locations	s, transects	, importar	nt features, etc.		
Hydrophytic Vegetation Preser	nt? Yes	N	o ✓							
Hydric Soil Present?	Yes _	N	0	Is the Sam		V	N-	./		
Wetland Hydrology Present?		N	o /	within a We	etiand?	Yes	No	<u> </u>		
Remarks:			l							
Adjacent to w4 wetla	ınd data poir	nt.								
HYDROLOGY										
Wetland Hydrology Indicator	rs:				Se	econdary Indica	tors (minimu	m of two required)		
Primary Indicators (minimum o	of one is required;	check all	that apply)			_ Surface Soil	Cracks (B6)			
Surface Water (A1)		Wat	er-Stained Leaves	s (B9)	_	_ Sparsely Ve	getated Conc	ave Surface (B8)		
High Water Table (A2)		Aqu	atic Fauna (B13)		Drainage Patterns (B10)					
Saturation (A3)		Mar	l Deposits (B15) (LRR U)	_	Moss Trim Lines (B16)				
Water Marks (B1)		Hyd	rogen Sulfide Odd	or (C1)		_ Dry-Season	Water Table	(C2)		
Sediment Deposits (B2)			dized Rhizosphere	_	Roots (C3)	oots (C3) Crayfish Burrows (C8)				
Drift Deposits (B3)			sence of Reduced					al Imagery (C9)		
Algal Mat or Crust (B4)			ent Iron Reduction		ils (C6)		Position (D2))		
Iron Deposits (B5)	(==)		Muck Surface (C		_	_ Shallow Aqu				
Inundation Visible on Aeria	al Imagery (B7)	Oth	er (Explain in Rem	narks)	_	_ FAC-Neutral	Test (D5)			
Field Observations:	V. a. N.	/ 5	ode Cook oo							
Surface Water Present?			pth (inches):							
Water Table Present?			pth (inches):		Made and Head	l	10 V	No_ ✓		
Saturation Present? (includes capillary fringe)	Yes No _	y De	pth (inches):		wetiand Hyd	Irology Preser	it? Yes	No <u>*</u>		
Describe Recorded Data (stream	am gauge, monito	ring well,	aerial photos, pre	vious inspect	tions), if availat	ble:				
Remarks:										

VEGETATION –	Use	scientific	names	of	plants.

EGETATION – Use scientific names of plan	nts.			Sampling Point: Up4
	Absolute	Dominant		Dominance Test worksheet:
Tree Stratum (Plot sizes: <u>30-ft</u>) 1	<u>% Cover</u>			Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant
3				Species Across All Strata: 6 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 33 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Sapling Stratum(30-ft		= Total Co	ver	OBL species x 1 =
1. Rhus copallina	20	ves	FACU	FACW species x 2 =
2. Diospyros virginiana			FAC	FAC species x 3 =
3				FACU species x 4 =
4				UPL species x 5 =
5.				Column Totals: (A) (B)
6.				()
7				Prevalence Index = B/A =
	25	= Total Co	ver	Hydrophytic Vegetation Indicators:
Shrub Stratum(30-ft				Dominance Test is >50%
1. Rubus trivialis	5	yes	<u>FACU</u>	Prevalence Index is ≤3.0 ¹
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				
4				¹ Indicators of hydric soil and wetland hydrology must
5				be present.
6				
7				Definitions of Vegetation Strata:
	5	= Total Co	over	
Herb Stratum (15-ft)	0.5		ODI	Tree – Woody plants, excluding woody vines,
1. Panicum hemitomon		yes	OBL	approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast
2. Ambrosia artemisiifolia		ves	FACU	height (DBH).
3. Lespedeza cuneata		ves	FACU	
4. Eupatorium capillifolium	5	no	FACU	Sapling – Woody plants, excluding woody vines,
5				approximately 20 ft (6 m) or more in height and less
6				than 3 in. (7.6 cm) DBH.
7				Shrub – Woody plants, excluding woody vines,
8				approximately 3 to 20 ft (1 to 6 m) in height.
9				
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12	65			woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody Vine Stratum (15-ft)	_65	= Total Co	over	approximately on (1 m) minergine
1				Woody vine – All woody vines, regardless of height.
2.				
3				
4				
5				Hydrophytic
~·			ver	Vegetation Present? Yes No✓
		_ 10tai 00		
Remarks: (If observed, list morphological adaptations	below).			

SOIL Sampling Point: Up4

Profile Desc	ription: (Describe	to the dep	th needed to do	ocument the	indicator	or confir	m the absence	e of indicators.)
Depth	Matrix			tedox Feature			•	
(inches)	Color (moist)		Color (moist)	%	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							. 2	
Hydric Soil I	oncentration, D=Dep	oletion, RM:	=Reduced Matrix	c, CS=Covere	ed or Coate	d Sand G		ocation: PL=Pore Lining, M=Matrix. s for Problematic Hydric Soils³:
•			Dobacolu	o Polovy Curfe	200 (50) (1	DDCT		•
Histosol	oipedon (A2)			e Below Surfa k Surface (S9				Muck (A9) (LRR O) Muck (A10) (LRR S)
Black Hi				lucky Mineral				iced Vertic (F18) (outside MLRA 150A,B)
Hydroge	n Sulfide (A4)			Bleyed Matrix			Piedr	mont Floodplain Soils (F19) (LRR P, S, T)
	Layers (A5)			Matrix (F3)				nalous Bright Loamy Soils (F20)
	Bodies (A6) (LRR F			ark Surface (LRA 153B)
	icky Mineral (A7) (L esence (A8) (LRR (Depleted Redox D	Dark Surface	, ,			Parent Material (TF2) Shallow Dark Surface (TF12) (LRR T, U)
	ick (A9) (LRR P, T)	·)		0) (LRR U)	0)			r (Explain in Remarks)
	Below Dark Surface	e (A11)	Depleted		(MLRA 1	51)	0.1101	(Explain in Romano)
	ark Surface (A12)		Iron-Man	-	. , .		, T) ³ Indio	cators of hydrophytic vegetation and
	rairie Redox (A16) (, U)	We	etland hydrology must be present.
	lucky Mineral (S1) (Bleyed Matrix (S4)	LRR O, S)	Delta Oc Reduced			0A 150B		
	edox (S5)			t Floodplain S				
	Matrix (S6)						RA 149A, 1530	C, 153D)
	rface (S7) (LRR P,	S, T, U)		-	,	, ,		
Restrictive I	_ayer (if observed)	:						
Type:								
Depth (inc	ches):						Hydric So	il Present? Yes No
Remarks:								

Project/Site: 1-77	City/C	county: Columbia	s	Sampling Date: 8/5/2014			
Applicant/Owner: SCDOT		S	state: SC s	Sampling Point: W5			
Investigator(s): McMaster/Mulholland	Section						
Landform (hillslope, terrace, etc.):				Slope (%): 0			
Subregion (LRR or MLRA): LRR T							
Soil Map Unit Name: _JO		Long					
Are climatic / hydrologic conditions on the site	typical for this time of year? Y	es ✓ No (I	— If no. explain in Rer	marks.)			
Are Vegetation, Soil, or Hydrol				esent? Yes No			
Are Vegetation, Soil, or Hydrol			xplain any answers				
SUMMARY OF FINDINGS – Attach		•	•	· ·			
SOMMAN OF FINDINGS - Attach	site map snowing san	ipining point location	iis, transects,				
Hydrophytic Vegetation Present? Ye	s No	Is the Sampled Area					
1 ,	s No	within a Wetland?	Yes ✓	No			
Wetland Hydrology Present? Ye Remarks:	s No						
HYDROLOGY							
Wetland Hydrology Indicators:				ors (minimum of two required)			
Primary Indicators (minimum of one is requir			Surface Soil C				
✓ Surface Water (A1)	Water-Stained Leave		Sparsely Vegetated Concave Surface (B8)				
High Water Table (A2)	Aquatic Fauna (B13) Marl Deposits (B15) (Drainage Patterns (B10) Moss Trim Lines (B16)				
Saturation (A3) Water Marks (B1)		Moss Hill Lifes (B10) Dry-Season Water Table (C2)					
Sediment Deposits (B2)	Hydrogen Sulfide Od ✓ Oxidized Rhizosphere						
Drift Deposits (B3)	Presence of Reduced	-	-	ble on Aerial Imagery (C9)			
Algal Mat or Crust (B4)	Recent Iron Reductio						
Iron Deposits (B5)	√ Thin Muck Surface (0		Shallow Aquitard (D3)				
Inundation Visible on Aerial Imagery (B7) Other (Explain in Rer	narks)	FAC-Neutral T	est (D5)			
Field Observations:							
	lo Depth (inches): 1						
	lo Depth (inches): 12						
Saturation Present? Yes N (includes capillary fringe)	No Depth (inches):	Wetland Hy	ydrology Present?	? Yes <u>▼</u> No			
Describe Recorded Data (stream gauge, mo	nitoring well, aerial photos, pre	vious inspections), if avail	lable:				
Demodes							
Remarks:							

VEGETATION -	Use scientific n	ames of plants.
---------------------	------------------	-----------------

EGETATION – Use scientific names of plants	o.			Sampling Point: <u>W5</u>
20.4	Absolute			Dominance Test worksheet:
ree Stratum (Plot sizes: 30-ft)	· · · · · · · · · · · · · · · · · · ·	Species?		Number of Dominant Species That Are OBL, FACW, or FAC: (A)
				Total Number of Dominant Species Across All Strata:3 (B)
				Percent of Dominant Species That Are OBL, FACW, or FAC: 66 (A/E
				Prevalence Index worksheet:
1. O. 4. 20 ft		= Total Co	over	Total % Cover of: Multiply by:
apling Stratum(30-ft				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 =
		= Total Co		Hydrophytic Vegetation Indicators:
nrub Stratum(30-ft				✓ Dominance Test is >50%
Glottidium vesicarium	5	yes	FAC	Prevalence Index is ≤3.0 ¹
				Problematic Hydrophytic Vegetation ¹ (Explain)
				¹ Indicators of hydric soil and wetland hydrology must be present.
				be present.
				Definitions of Vegetation Strata:
erb Stratum(_15-ft)	5	= Total Co	over	Troo Weeds plants evaluating weeds since
_Dichanthelium_aciculare	35	yes	FACU	Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and
Rhychospora inexpansa	30	yes	FACW	3 in. (7.6 cm) or larger in diameter at breast
Juncus tenuis			FAC	height (DBH).
Eupatorium capillifolium			FACU	
<u> Capilliolium</u>			17100	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.
).				
1				Herb – All herbaceous (non-woody) plants, includin
·· 2.		-		herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than
	75	= Total Co	over	approximately 3 ft (1 m) in height.
/oody Vine Stratum (15-ft)			-	
				Woody vine – All woody vines, regardless of heigh
				Hydrophytic
				Hydrophytic Vegetation
		= Total Co	over	Present? Yes Vo No
				•

SOIL Sampling Point: <u>w5</u>

Profile Desc	ription: (E	Describe 1	to the dept	h needed	to docui	ment the i	ndicator	or confirm	n the absence	of indicato	ors.)	
Depth		Matrix				x Feature						
(inches)	Color (<u>%</u>	Color (%	Type ¹	Loc ²	Texture		Remarks	
0-12	10YR:		95	10YR:		5	С	PL	Sand	Loam		
12-16	10YR:	3/2	80	10YR:	7/3	20	С	M	Silt	Loam		
16-22	10YR:	2/1	95	10YR:	7/1	5	С	M	Silt	Loam		
	•											
										-		
4												
¹ Type: C=Co			etion, RM=	Reduced	Matrix, C	S=Covered	d or Coate	d Sand G			=Pore Lining, M matic Hydric S	
Hydric Soil I				D-I	l D.	. I O f -	(00) (1	DD C T I			_	oolis :
Histosol	(AT) pipedon (A2	2)				elow Surfa urface (S9)				Muck (A9) (L Muck (A10) (
Black His		-)				y Mineral					18) (outside N	ILRA 150A,B)
	n Sulfide (A	1 4)			-	ed Matrix (•			ain Soils (F19)	
	l Layers (A				pleted Ma					_	Loamy Soils (F	⁵ 20)
_	Bodies (A6			· · · · · · · · · · · · · · · · · · ·		Surface (F	•			RA 153B)	(===)	
	icky Minera esence (A8	. , .	-			rk Surface essions (F				Parent Mater	ial (TF2) < Surface (TF12	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
✓ 1 cm Mu	•		,		rl (F10) (L		0)		· · · · · · · · · · · · · · · · · · ·	(Explain in I	•	2) (LKK 1, U)
	Below Da		e (A11)			hric (F11)	(MLRA 1	51)	Other	(Explain iii i	(Ciriarks)	
	ark Surface				_	ese Mass			, T) ³ Indic	ators of hyd	rophytic vegeta	ition and
			ILRA 150A					, U)	we	tland hydrol	ogy must be pro	esent.
-	lucky Mine leyed Matr		.RR O, S)			(F17) (ML rtic (F18) (0Δ 150R	١			
	edox (S5)	IX (O4)				oodplain S						
-	Matrix (S6)							RA 149A, 1530	C, 153D)		
	rface (S7) (
Restrictive L	_ayer (if ob	served):										
Type:											ſ	
	ches):								Hydric Soi	I Present?	Yes	No
Remarks:												

Project/Site: 1-77		City/County: C	olumbia	Sampling Date: 8/5/2014				
Applicant/Owner: SCDOT		State: SC Sampling Point: Up5						
Investigator(s): McMaster/Mulholland Section, Township, Range: Columbia								
• • • •		Local relief (con		Slope (%): 0				
		"W Datum: NAD83						
Soil Map Unit Name: JO		Lat		sification: none				
	one on the cite tunio	al for this time of year? Vac						
		al for this time of year? Yes						
Are Vegetation, Soil				s" present? Yes No				
Are Vegetation, Soil	, or Hydrology _	naturally problematic?	(If needed, explain any ans	wers in Remarks.)				
SUMMARY OF FINDING	S - Attach site	e map showing sampling p	oint locations, transec	cts, important features, etc.				
Hydrophytic Vegetation Prese Hydric Soil Present?	ent? Yes Yes	No 🗸	ampled Area	/				
Wetland Hydrology Present?	Yes	No <u>√</u> within a	Wetland? Yes	No				
Remarks:		1						
Adjacent to w5 wetla	and data point							
HYDROLOGY								
Wetland Hydrology Indicato				dicators (minimum of two required)				
Primary Indicators (minimum				Soil Cracks (B6)				
Surface Water (A1)		Water-Stained Leaves (B9)		Vegetated Concave Surface (B8)				
High Water Table (A2)		Aquatic Fauna (B13)		Drainage Patterns (B10)				
Saturation (A3)	-	Marl Deposits (B15) (LRR U)		Moss Trim Lines (B16)				
Water Marks (B1)	-	Hydrogen Sulfide Odor (C1)	Dry-Season Water Table (C2) Roots (C3) Crayfish Burrows (C8)					
Sediment Deposits (B2) Drift Deposits (B3)		Presence of Reduced Iron (C4)						
Algal Mat or Crust (B4)	-	Recent Iron Reduction in Tilled		Saturation Visible on Aerial Imagery (C9)Geomorphic Position (D2)				
Iron Deposits (B5)	-	Thin Muck Surface (C7)		Aquitard (D3)				
Inundation Visible on Aer		Other (Explain in Remarks)		FAC-Neutral Test (D5)				
Field Observations:								
Surface Water Present?	Yes No	Depth (inches):	_					
Water Table Present?	Yes No	Depth (inches):	_					
Saturation Present?	Yes No	Depth (inches):	_ Wetland Hydrology Pres	sent? Yes No				
(includes capillary fringe) Describe Recorded Data (stre	am gauge, monitori	ng well, aerial photos, previous insp	ections), if available:					
(***	33.,	3	,,					
Remarks:								

VEGETATION –	Use	scientific	names	of	plants.

EGETATION – Use scientific names of plants	٥.			Sampling Point: Up5
00.6		Dominant		Dominance Test worksheet:
Tree Stratum (Plot sizes: <u>30-ft</u>) 1	% Cover	Species?	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
2				Total Number of Dominant Species Across All Strata: 5 (B)
l				(2)
				Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)
i				Prevalence Index worksheet:
. <u> </u>				Total % Cover of: Multiply by:
Sapling Stratum (30-ft)		= Total Co	ver	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 =
		= Total Co	ver	Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)				Dominance Test is >50% Prevalence Index is ≤3.0¹
·				Prevalence index is \$3.0 Problematic Hydrophytic Vegetation ¹ (Explain)
<u> </u>				Froblematic Hydrophytic Vegetation (Explain)
3				¹ Indicators of hydric soil and wetland hydrology must
l				be present.
5				
S 7				Definitions of Vegetation Strata:
		= Total Co	ver	3
Herb Stratum(15-ft)				Tree – Woody plants, excluding woody vines,
. Verbena brasiliensis	20	_yes	<u>FACW</u>	approximately 20 ft (6 m) or more in height and
Lespedeza capitata	20	yes	FACU	3 in. (7.6 cm) or larger in diameter at breast height (DBH).
s. Eupatorium capillifolium	15	ves	FACU	g. ii (2 2 : 1).
Heterotheca graminifolia	10	<u>no</u>	UPL	Sapling – Woody plants, excluding woody vines,
. Lespedeza cuneata	<u>10</u>	no	FACU	approximately 20 ft (6 m) or more in height and less
Erigeron annuus		no	FACU	than 3 in. (7.6 cm) DBH.
r. Ambrosia artemisiifolia		_no	<u>FACU</u>	Shrub – Woody plants, excluding woody vines,
3				approximately 3 to 20 ft (1 to 6 m) in height.
)				
0 1				Herb – All herbaceous (non-woody) plants, including
2.				herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than
		= Total Co	ver	approximately 3 ft (1 m) in height.
Noody Vine Stratum (15-ft)				
. Parthenocissus quinquefolia		<u>yes</u>	<u>FACU</u>	Woody vine – All woody vines, regardless of height
z. <u>Toxicodendron radicans</u>		yes	FAC	
3				
l				Hydrophytic
-				Vegetation
5		= Total Co	WΩr	Present? Yes No *

SOIL Sampling Point: Up5

Profile Desc	ription: (Describe	to the dep	th needed to docu	ment the	indicator	or confirm	the absence	of indicate	ors.)	
Depth	Matrix			ox Feature	1					
(inches)	Color (moist)	%	Color (moist)	%	Type'	Loc ²	Texture		Remarks	
0-10	10YR: 5/3	100					Sand/silt	Loam		_
10-18	10YR: 5/3	80	7/3	20	С		Sand/Silt	Loam		
								'		_
				_				•		
					<u> </u>					
										
¹ Type: C=Co	ncentration, D=Dep	letion. RM=	=Reduced Matrix. C	S=Covere	d or Coate	ed Sand Gr	ains. ² Lo	cation: PL:	=Pore Lining,	M=Matrix.
Hydric Soil I		,	, -						matic Hydric	
Histosol	(A1)		Polyvalue B	elow Surfa	ice (S8) (L	.RR S, T, L	J) 1 cm N	Лuck (A9) (I	LRR O)	
Histic Ep	ipedon (A2)		Thin Dark S					Лиск (A10)	(LRR S)	
Black His			Loamy Mucl			(O)				MLRA 150A,B)
	n Sulfide (A4)		Loamy Gley		(F2)) (LRR P, S, T)
	Layers (A5)		Depleted Ma		>			-	Loamy Soils	(F20)
-	Bodies (A6) (LRR P		Redox Dark	,	,			RA 153B)	ial (TE2)	
	cky Mineral (A7) (Li esence (A8) (LRR U		Depleted Da Redox Depr					arent Mater		12) (LRR T, U)
	ck (A9) (LRR P, T)	')	Marl (F10) (0)			(Explain in		12) (LKK 1, 0)
	Below Dark Surfac	e (A11)	Depleted Oc		(MLRA 1	51)	Other	(Explain in	ixemarks)	
Thick Da	rk Surface (A12)		Iron-Mangai				T) ³ Indica	ators of hyd	Irophytic vege	tation and
	airie Redox (A16) (I		A) Umbric Surf	ace (F13)	(LRR P, T	, U)			ogy must be p	
	ucky Mineral (S1) (I	LRR O, S)	Delta Ochrid					•		
	leyed Matrix (S4)		Reduced Ve							
	edox (S5)		Piedmont FI					4E2D)		
	Matrix (S6) face (S7) (LRR P, \$. T II)	Anomalous	Bright Loa	my Solis (F20) (WILK	A 149A, 153C	, าองบ)		
	ayer (if observed):									
Type:	,									
	thes):						Hydric Soil	Present?	Yes	No ✓
Remarks:							11,410 00			
rtomanto.										

Project/Site: I-77		City/County: Richla	and Co	Sampling Date: 8/4/2014
Applicant/Owner: SCDOT			State: SC	Sampling Point: w6
Investigators: Jamison		Section	ı, Township, Range	e 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	3 Long: -	-80 55.33	Datum:
Soil Map Unit Name:			NWI Classific	cation: PFO
Are climatic / hydrologic conditions on the	e site typical for this time	of year? Yes X No	 (If No, ex	plain in Remarks)
Are Vegetation, Soil, Hydr	ology, significantly	disturbed? Are "No	rmal Circumstance	es" present? Yes X No
Are Vegetation, Soil, Hydr	ology, naturally pro	oblematic? (If nee	ded explain any a	answers in Remarks.)
SUMMARY OF FINDINGS - Att		(•
Hydrophytic Vegetation Present? Y	es X No			
11 11 0 11 0	'es X No	Is the Sampled Area		
Wotland Hydrology Propent?	es X No	within a Wetland?	Yes	X No
Remarks:				
HYDROLOGY				
Wetland Hydrology Indicators:			Secondary	Indicators (minimum of two required)
Primary Indicators (minimum of one is re	equired; check all that app	oly)		e Soil Cracks (B6)
Surface Water (A1)	Aquatic Fa	una (B13)		ely Vegetated Concave Surface (B8)
High Water Table (A2)		sits (B15) (LRR U)	Draina	ge Patterns (B10)
Saturation (A3)		Sulfide Odor (C1)	☐ Moss 7	Trim Lines (B16)
Water Marks (B1)		thizospheres along Living Roots (C3)	Dry-Se	eason Water Table (C2)
Sediment Deposits (B2)	Presence of	of Reduced Iron (C4)	·	sh Burrows (C8)
Drift Deposits (B3)	Recent Iro	n Reduction in Tilled Soils (C6)		tion Visible on Aerial Imag.(C9)
Algal Mat or Crust (B4)	☐ Thin Muck	Surface (C7)		orphic Position (D2)
☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7)	Other (Exp	lain in Remarks)		w Aquitard (D3)
Water-Stained Leaves (B9)				leutral Test (D5) num moss (D8) (LRR T,U)
				Hulli filoss (Do) (LRK 1,0)
Field Observations:	No. V. Doubl	. Construction		
Surface Water Present? Yes Water Table Present? Yes	 .	n (inches):		
		n (inches):	Wetland Hydrol	ogy Present? Yes <u>X</u> No
(includes capillary fringe)		, ,		
Describe Recorded Data (stream gauge, monito	oring well, aerial photos, previ	ous inspections), if available:		
Remarks:				



EGETATION Use scientific names of plants.				Sampling F	oint: w6	(aka wzc)1)
	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksh	eet:		
Tree Stratum (Plot size: 30 Ft)				Number of Dominant Spe		4	(4
Acer rubrum	40	Υ	FAC	That Are OBL, FACW, or	FAC: _	4	_ '
Pinus taeda	30	Y	FAC	Total Number of Dominant			
Magnolia grandiflora	10	Y	FAC	Species Across all Strata:		4	(B
Nyssa sylvatica	5	N	FAC	Percent of Dominant Spec	ies	100.00/	/Λ
	85	=Total Cover		That Are OBL, FACW, or F		100.0%	- (A
hrub Stratum (Plot size: <u>30 Ft</u>)				Prevalence Index Worksl	neet:		
Arundinaria gigantea	10	Υ	FACW	Total % Cover of:	Mul	tiply by:	
	10	=Total Cover		OBL species 0	x 1 =		
lerb Stratum				FACW species 12	x 2 =	= 24	
ine Stratum (Plat size: 20 5th				1 ACVV species	 x 3 =		
(Plot size: <u>30 Ft</u>) Smilax laurifolia	2	N	FACW	FAC species	x 4 =	-	
Smilax rotundifolia		– N	FAC	FACO species	^ . · x 5 =		
Vitis rotundifolia		– N	FAC	OFL species			
	6	=Total Cover		Column Totals: 101	(A)	291	<u>(</u> E
				Prevalence Index = I	B/A=	2.88	
				Hydrophytic Vegetation Ir	dicators:		=
				1 - Rapid Test for Hyd			
				X 2 - Dominance Test >		ogotation	
				Z - Dominance rest >	30 %		
				X 3 - Prevalence Index ≤	3.0		
				Problematic Hydrophy	tic Vegeta	tion (Exp	plair
				Indicators of hydric soil and w be present, unless disturbed of			
				Definitions of Vegetation S	trata:		
				Tree – Woody plants, exclude approximately 20 ft (6 m) or (7.6 cm) or larger in diameter	more in h	eight and	
				Sapling – Woody plants, excapproximately 20 ft (6 m) or than 3 in. (7.6 cm) DBH.			
				Shrub – Woody plants, excluapproximately 3 to 20 ft (1 to			
				Herb – All herbaceous (non- herbaceous vines, regardles plants, except woody vines, 3 ft (1 m) in height.	s of size.	Includes v	woo
				Woody vine – All woody vine	es, regard	ess of he	ight
				Hydrophytic Vegetation Present?	Yes X	No	_

SOIL Sampling Point: w6 (aka W201)

		Desci	iption. (Des	Matrix	иерит пе	reaca to aocamen		Features	COMMIN	the absence of indicators.		
	epth nche	s)	Colo	r (moist)	%	Color (moist)	%	Type ¹	Loc ²	 Texture	Remarks	
0	to	2	10YR	5/4	100					SANDY CLAY LOAM		
2	to		10YR	3 / 1	100					FINE SANDY LOAM		
5	to	8	10YR	2/1	100					FINE SANDY LOAM	_	
8		15	10YR	6 / 2	100					LOAMY SAND	_	
1Ty	pe: (C=Con	centration, [D=Depletion,	RM=Red	uced Martix, CS=Co	overed o	r Coated	Sand Gra	ains. ² Location: PL=Pore Lining	g, M=Matrix.	
Ну	dric	Soil I	ndicators:			Polyvalue Below	Surface (9	28) (I DD S	T 11)	Indicators for Problematic H	Iydric Soils: 3	
	Histo	osol (A	1)			Thin Dark Surface	,		1, 0)	1 cm Muck (A9) (LRR O)		
	Histi	c Epipe	edon (A2)			Loamy Mucky Mir	, , ,			2 cm Muck (A10) (LRR S)		
		k Histic	` '			Loamy Gleyed Ma		(2.4.0)		Reduced Vertic (F18) (outside	MI RA 150A B)	
	-	-	Sulfide (A4)							Piedmont Floodplain Soils (F1		
			ayers (A5)			✓ Depleted Matrix (I				Anomalous Bright Loamy Soil		
	_		dies (A6) (LRF			Redox Dark Surfa	, ,			(MLRA 153B)	, ,	
				(LRR P, T, U)		Depleted Dark Su	ırface (F7)		Red Parent Material (TF2)		
			ence (A8) (LRF	,		Redox Depression	ns (F8)			✓ Very Shallow Dark Surface (T	F12) (LRR T, U)	
			(A9) (LRR P,			Marl (F10) (LRR l	J)			Other (Explain in Remarks)		
			elow Dark Sur Surface (A12)	, ,		Depleted Ochric (F11) (ML	RA 151)		³ Indicators of hydrophytic ve	egetation and wetland	d
			, ,	i) (MLRA 150A)		Iron-Manganese I	Masses (F	12) (LRR C), P, T)	hydrology must be present unless disturbed or probler	,	
Н			ky Mineral (S1			Umbric Surface (F	F13) (LRF	R P, T, U)		driless disturbed or probler	nauc.	
П		-	ed Matrix (S4)			Delta Ochric (F17						
П			ox (S5)	•		Reduced Vertic (F			(0B)			
		-	atrix (S6)			Piedmont Floodpl	, ,					
	Dark	· Surfac	ce (S7) (LRR F	P, S, T, U)					•	A 4500 450D)		
						Anomalous Bright	Loamy S	OIIS (F2U) (WLRA 149	9A, 153C, 153D)		
	Res	strict	ive Layer (if observed):							
	Тур	e:								Hydric Soil Present?	Yes X No	
	Dep	th (inch	ies):							riyunc don r resent:		
Rem	arks:											

Project/Site: I-	77			City/County:	Richland Co	S	ampling Date:	8/4/2014	
Applicant/Owner:	SCDOT				State:	SC Sa	ampling Point:	up6	
Investigators:	Jamison				Section, Townshi	ip, Range	S T	R	
Landform (hillslope	, terrace, etc.):	Toe of S	Slope	Local Relie	f (concave, convex, r	none): Con	ncave	Slope(%)
Subregion (LRRor	MLRA): P		Lat: 80°	55'20.007"W	Long: 34°3'23	1.077"N	Datun	_ 1:]	NAD 198
Soil Map Unit Nam	e:				NWI	Classificati	on: up	_	
Are climatic / hydro	ologic conditions or	n the site typic	al for this tim	e of year? Yes	No X (If No, explai	in in Remarks)		
Are Vegetation _	, Soil, ⊦	lydrology	_, significan	tly disturbed?	Are "Normal Circu	umstances"	present? Yes	1 X e	No
Are Vegetation _	, Soil, F	Hydrology	_, naturally p	problematic?	(If needed, expla	ain any ansv	wers in Remark	s.)	
SUMMARY O	F FINDINGS - A	Attach a si	te map sh	owing sampling p	oint locations, t	transects	s, important	features	, etc.
Hydrophytic Vege	etation Present?	Yes X	No						
Hydric Soil Prese		Yes	No X	Is the Sampled A					
Wetland Hydrolog	gy Present?	Yes	No X	within a Wetland	•	Yes	No X	_	
Remarks: Adjace	 nt to w6 wetland da	ata point.							
HWDDOL OCV									
HYDROLOGY					Cod	aandam, ladi	icatora (minimu	m of two roa	auirod)
Wetland Hydrolo	gy Indicators: s (minimum of one i	is required: ch	eck all that a	nnly)			icators (minimu	n or two rec	quirea)
		is required, on				_	oil Cracks (B6) /egetated Concav	o Surfaco (B9	2)
Surface Water (A	*			Fauna (B13)		= -	Patterns (B10)	5 Surface (Do)
Saturation (A3)	, (, L)			posits (B15) (LRR U)			Lines (B16)		
Water Marks (B1)		_ , ,	n Sulfide Odor (C1) I Rhizospheres along Living	g Poots (C3)		on Water Table (C	2)	
Sediment Depos	•			e of Reduced Iron (C4)	y Roots (C3)	_	urrows (C8)	,	
Drift Deposits (B	` '			ron Reduction in Tilled Soil	ls (C6)	Saturation	Visible on Aerial	mag.(C9)	
Algal Mat or Crus	st (B4)			ck Surface (C7)	[Geomorph	nic Position (D2)		
Iron Deposits (B5	i)			Explain in Remarks)		Shallow A	quitard (D3)		
Inundation Visible	e on Aerial Imagery (B	37)		,		FAC-Neutr	ral Test (D5)		
Water-Stained Le	eaves (B9)					Sphagnum	n moss (D8) (LRR	T,U)	
Field Observation	IS:								
Surface Water Pre	sent? Yes	s No	_X De	pth (inches):					
Water Table Prese	nt? Yes	s No	_X_ De	pth (inches):					
Saturation Present		s No	_X_ De	pth (inches):	Wetland	d Hydrology	y Present?	Yes I	No_X_
(includes capillary to Describe Recorded D		onitoring well, as	erial photos, pre	evious inspections), if availa	able:				
Remarks:									



						T.				
			Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Wo	rksheet:			
Tree Stratum	(Plot size: 30 Ft	1	70 00101	Opocioo	<u> </u>	Number of Dominant			_	(4)
Acer rubrum	(FIOUSIZE: <u>3011</u>	/	50	Υ	FAC	That Are OBL, FACV	V, or FA	D:	5	_ (A)
Pinus taeda			40		FAC	Total Number of Dom	inant			
			90	=Total Cover		Species Across all Str	rata:		5	(B)
Shrub Stratum	(Plot size: 30 Ft	1				Percent of Dominant	Species		100.00/	(A (D)
Ligustrum sinense	-	/	20	Υ	FAC	That Are OBL, FACW		: —	100.0%	_ (A/B)
 I			20	=Total Cover		Prevalence Index Wo	orkshee	t:		
Herb Stratum	(Plot size: 6 Ft)				Total % Cover of:		Multi	iply by:	
Microstegium vimi	· ·		15	Υ	FAC	OBL species	0	x 1 =	0	
			15	=Total Cover		FACW species	0	x 2 =	0	
Vine Stratum	(Plot size: 30 Ft	1				FAC species	137	x 3 =	411	
Vitis rotundifolia	(1 10t 312e. <u>30 1 t</u>	/	12	Υ	FAC	FACU species	0	x 4 =	0	
-			12	=Total Cover	-	UPL species	0	x 5 =	0	
						Column Totals:	137	(A)	411	(B)
						Prevalence Inde	ex = B/A:	=	3.00	
						Hydrophytic Vegetati	on Indic	ators:		
						1 - Rapid Test for	Hydroph	nytic Ve	getation	
						X 2 - Dominance Te	est > 50%	6		
						X 3 - Prevalence Inc	dex < 3.0)		
						Problematic Hydro	opnytic \	/egetati	ion (Exp	olain)
						Indicators of hydric soil a be present, unless distur				
						Definitions of Vegetat	ion Stra	ta:		
						Tree – Woody plants, e approximately 20 ft (6 n (7.6 cm) or larger in dia	n) or moi	e in he	ight and	
						Sapling – Woody plants approximately 20 ft (6 n than 3 in. (7.6 cm) DBH	n) or moi			
						Shrub – Woody plants, approximately 3 to 20 ft				
						Herb – All herbaceous (herbaceous vines, rega plants, except woody vi 3 ft (1 m) in height.	rdless of	size. Ir	ncludes v	woody
						Woody vine – All woody	/ vines, r	egardle	ess of he	ight.
Remarks: (Include photo	o numbers here or on a	separate sheet)			Hydrophytic Vegetation Present?	? Yes	Х	No	

SOIL Sampling Point: up6

Project/Site: I-77					City/County:	Richla	ind Co	Sampling Date	: 8/4/2014
Applicant/Owner: S	CDOT						State: SC	Sampling Point	: w7
Investigators: Jam	ison					Section	, Township, Ran	ge S T	R
Landform (hillslope, ter	race, etc.):	То	e of S	Slope	Local R	elief (concave,	convex, none):	Concave	Slope(%) 2
Subregion (LRRor MLR	(A): P			Lat: 34 4.0	03	Long: -	80 55 19	Datu	 um:
Soil Map Unit Name:	· -						NWI Classit	fication: PFO	-
Are climatic / hydrologic	c conditions on '	the site	typica	al for this time	e of year? Yes	No	— X (If No, e	explain in Remarks	 ;)
Are Vegetation,			• •		-			ces" present? Y	•
Are Vegetation,									
								answers in Rema	
SUMMARY OF FI	NDINGS - A	itach	a sii	te map sno	owing sampiin	g point loca	ations, transe	ects, importar	it reatures, etc.
Hydrophytic Vegetation	on Present?	Yes	Χ	No	la tha Camada	d A			
Hydric Soil Present?		Yes	Χ	No	Is the Sample within a Wetla		Yes	X No	
Wetland Hydrology P	resent?	Yes	Χ	No			103	<u> </u>	
Remarks:									
HYDROLOGY									
Wetland Hydrology I	ndicators:						Secondary	/ Indicators (minim	num of two required)
Primary Indicators (min) 2)) Aerial Imagery (B7	·	ed; ch	Aquatic I Marl Dep Hydroge Oxidized Presence Recent I Thin Mu	pply) Fauna (B13) posits (B15) (LRR U) in Sulfide Odor (C1) il Rhizospheres along L ie of Reduced Iron (C4) ron Reduction in Tilled ick Surface (C7) ixplain in Remarks)		Spars Drain Moss Dry-S Crayf Satur Geon Shall	ace Soil Cracks (B6) sely Vegetated Conca page Patterns (B10) s Trim Lines (B16) Season Water Table of fish Burrows (C8) ration Visible on Aeria morphic Position (D2) ow Aquitard (D3) Neutral Test (D5) agnum moss (D8) (LR	(C2) al Imag.(C9)
Field Observations:									
Surface Water Present?	Yes		No	_X_ Dep	oth (inches):				
Water Table Present?	Yes		No	_X_ Dep	oth (inches):				
Saturation Present?	Yes	X	No	Dep	oth (inches):	10	Wetland Hydro	ology Present?	Yes X No
(includes capillary fringe Describe Recorded Data (s		nitoring v	vell. ae	erial photos, pre	vious inspections), if a	vailable:			
Remarks:									



		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet	:		
Tree Stratum	(Plot size: 30 Ft)				Number of Dominant Species		5	(/
Pinus taeda	(* 1868) <u>-88 * 1</u>	50	Υ	FAC	That Are OBL, FACW, or FA	C:	<u> </u>	_ '
Acer rubrum		20		FAC	Total Number of Dominant			
Liriodendron tuli	pifera	10	Y	FACU	Species Across all Strata:		6	(E
Shrub Stratum	(Plot size: 30 Ft)	80	=Total Cover		Percent of Dominant Species That Are OBL, FACW, or FAC	D:	33.3%	(A
Rubus argutus	(1 lot 312e. <u>30 l t</u>)	30	Υ	FAC	Prevalence Index Workshee	\t-		
Arundinaria giga	 ıntea			FACW	Total % Cover of:		hr by	
Liriodendron tuli	pifera			FACU	45	$\frac{\text{Multip}}{\text{x 1 =}}$	15 15	
Morella cerifera		5		FAC	OBL species			
		60	=Total Cover		FACW species20	_ x 2 =	40	
lerb Stratum	(5)	-	10tal 00vel		FAC species128	_ x 3 =	384	
	(Plot size: <u>6 Ft</u>)		.,	0.51	FACU species15	x 4 =	60	
Osmunda spect	abilis	15	Y	OBL	UPL species 0	x 5 =	0	
carex sp.			N =Total Cover	-	Column Totals: 178	(A)	499	(
ine Stratum_	(Plot size: <u>30 Ft</u>)				Prevalence Index = B/A	= .	2.80	
Rubus argutus		10	N	FAC				
Smilax bona-no	·	8	N	FAC	Hydrophytic Vegetation Indic			
Campsis radicar	าร	5	N	FAC	1 - Rapid Test for Hydrop	hytic Veg	etation	
		23	=Total Cover		X 2 - Dominance Test > 50°	%		
					X 3 - Prevalence Index ≤ 3.	n		
					Trevalence mack 2 s.	O		
					Problematic Hydrophytic	Vegetatio	n (Exp	la
					Indicators of hydric soil and wetla be present, unless disturbed or pr		gy must	
					Definitions of Vegetation Stra	ıta:		
					Tree – Woody plants, excluding approximately 20 ft (6 m) or mo (7.6 cm) or larger in diameter a	re in heig	ht and	
					Sapling – Woody plants, excludapproximately 20 ft (6 m) or mothan 3 in. (7.6 cm) DBH.			
					Shrub – Woody plants, excludir approximately 3 to 20 ft (1 to 6			
					Herb – All herbaceous (non-wo herbaceous vines, regardless o plants, except woody vines, les 3 ft (1 m) in height.	f size. Inc	cludes v	0
					Woody vine – All woody vines,	regardles	s of he	gh

SOIL Sampling Point: w7 (aka W202)

Pro	ofile	e De	escr	iption: (De	scribe to the	depth n	eeded to documen	t the ind	icator or	r confirm	the absence of Indicators.)								
С	ept	h			Matrix		_, -		Features										
_(i	nch	es)		Cold	or (moist)	%	Color (moist)		Type ´	Loc 2	Texture		Rem	arks					
0	to) 4	<u> </u>	10YR	2/2	100					SANDY LOAM								
4	to	8 0	3	10YR	2/1	100					LOAMY SAND								
8	to	1:	2	10YR	3 / 1	100					LOAMY SAND	- —							
1T)	/pe:	C=	Con	centration,	D=Depletion,	RM=Red	luced Martix, CS=Co	overed o	r Coated	Sand Gra	ains. ² Location: PL=Pore Lining	ı, M=N	√latrix.						
Hy			oil I ol (A	ndicators:			Polyvalue Below S				Indicators for Problematic H	<u>ydric</u>	Soils:	3					
	His	stic E	Ξpipe	don (A2)			Thin Dark Surface				1 cm Muck (A9) (LRR O)								
	Bla	ack l	Histic	(A3)			Loamy Mucky Min		(LRR O)		2 cm Muck (A10) (LRR S)		1501	D \					
	Ну	drog	jen S	ulfide (A4)			Loamy Gleyed Ma				Reduced Vertic (F18) (outside Piedmont Floodplain Soils (F1			•					
	Str	atifie	ed La	yers (A5)			✓ Depleted Matrix (F	,			Anomalous Bright Loamy Soils			')					
	Organic Bodies (A6) (LRR P, T, U)						Redox Dark Surfa	ce (F6)			(MLRA 153B)	, (1 20)							
Ц	5 cm Mucky Mineral (A7) (LRR P, T, U)						Depleted Dark Su	rface (F7)	,		Red Parent Material (TF2)								
	Muck Presence (A8) (LRR U) 1 cm Muck (A9) (LRR P, T)						Redox Depression	าร (F8)			☐ Very Shallow Dark Surface (T	=12) (L	.RR T, !	U)					
	,			`	,		Marl (F10) (LRR U	Other (Explain in Remarks)											
	☐ Depleted Below Dark Surface (A11) ☐ Depleted Ochric (F11) (MLRA 151) ☐ Thick Dark Surface (A12) ☐ Depleted Ochric (F11) (MLRA 151)								RA 151)		³ Indicators of hydrophytic vegetation and wetland								
	Coast Prairie Redox (A16) (MLRA 150A) Iron-Manganese Masses (F12) (LRR O, P								O, P, T)	hydrology must be present,									
П				•	1) (LRR O, S)	•)	Umbric Surface (F	-13) (LRR	P, T, U)		unless disturbed or problem	iauc.							
П		•		ed Matrix (S	, , , ,		Delta Ochric (F17) (MLRA 1	151)										
	,	-	-	x (S5)	,		Reduced Vertic (F	:18) (MLR	A 150A, 1	50B)									
	Str	ippe	ed Ma	atrix (S6)			Piedmont Floodpl	, ,		•									
	Da	ırk S	urfac	e (S7) (LRR	P, S, T, U)		Anomalous Bright	,	. , ,	,)A. 153C. 153D)								
	1									(=.									
	Re	esti	ricti	ve Layer	(if observe	d):													
	Ту	pe:									Hydric Soil Present?	′ es	x	No					
		•	(inch	es):							Tiyano com raccine.								
Rem	narks	S:																	

Project/Site: I-77					City/County:		Richlan	nd Co	_ Sa	ampling Da	ate: 8/	4/2014	
Applicant/Owner:	SCDOT						St	tate: SC	Sa	mpling Po	oint: w	8	
Investigators: Jan	nison					S	ection,	Township, Ra	inge S	3 Т		R	
Landform (hillslope, te	rrace, etc.):	То	e of S	Slope	Loc	al Relief (con	ncave, c	convex, none)	Con	cave		Slope(%	6) 0
Subregion (LRRor ML	RA): P			Lat: 34 4	.14	Le	ong: -8	30 55.22		D	atum:		
Soil Map Unit Name:								NWI Clas	sificatio	n: PFO		_	
Are climatic / hydrolog	ic conditions of	n the site	typic	al for this tim	ne of year? Y	'es	No	– X (If No,	explair	n in Rema	rks)		
Are Vegetation	, Soil , H	Hydrology	v .	, significar	itly disturbed?	Ar	re "Norr	mal Circumsta	nces" p	resent?	Yes	X	No
Are Vegetation											_		
								led, explain ar				ot	oto
SUMMARY OF F	INDINGS -	Allacii	a SII	te map sn	lowing Samp	ning point	LIOCA	uons, nan	secis	, import	ant ie	alures	, etc.
Hydrophytic Vegetat		Yes	Х	No	Is the San	nnled Area							
Hydric Soil Present?		Yes	Х	No	within a W	•		Yes	х	No			
Wetland Hydrology F	Present?	Yes	Χ	No						_			
Remarks:					1								
HYDROLOGY Wetland Hydrology Primary Indicators (m Surface Water (A1) High Water Table (A. ✓ Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Drift Deposits (B3) Algal Mat or Crust (B	inimum of one 2) 32)	is require	ed; ch	Aquatic Marl De Hydroge Oxidize Present Recent Thin Me	Fauna (B13) eposits (B15) (LRR en Sulfide Odor (C d Rhizospheres ald ce of Reduced Iron Iron Reduction in T uck Surface (C7)	1) ong Living Root (C4) Filled Soils (C6)		Sur Spr Spr Spr Spr Spr Spr Spr Spr Spr Sp	rface So arsely Vo ainage P ss Trim r-Seasor ayfish Bu turation '	cators (mir il Cracks (B egetated Co atterns (B16) in Water Tab errows (C8) Visible on A c Position (I uitard (D3)	6) oncave S O) ole (C2) erial Ima	urface (B8	
Inundation Visible on	Aerial Imagery (F	37)		U Other (Explain in Remarks	5)		=		al Test (D5)			
Water-Stained Leave	es (B9)							☐ Spl	nagnum	moss (D8)	(LRR T,L	J)	
Field Observations:													
Surface Water Present	:? Ye	s	No	_X_ De	epth (inches):		_						
Water Table Present?	Ye	es X	No	De	epth (inches):	12	_ _		_				
Saturation Present?	Ye	s <u>X</u>	No	De	epth (inches):	7	_	Wetland Hyd	rology	Present?	Ye	s <u>X</u>	No
(includes capillary fring Describe Recorded Data		onitorina v	vell. ae	erial photos, pr	evious inspections), if available:							
	(- · · - · · · · · · g - · · · · g - · · · ·	y	,		- · · · · · · · · · · · · · · · · · · ·	,,							
Remarks:													
remains.													



		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Workshee	et:	
Tree Stratum	(Plot size: <u>30 Ft</u>)		.,		Number of Dominant Specie That Are OBL, FACW, or FA	es AC:3	(A)
Acer rubrum		90	_ <u>Y</u>	FAC	Tatal Number of Densiness		
Pinus taeda			Y =Total Cover	FAC	Total Number of Dominant Species Across all Strata:	3	B (B)
Shrub Stratum Liquidambar styra	(Plot size: <u>30 Ft</u>)	2	N	FAC	Percent of Dominant Specie That Are OBL, FACW, or FA		.0% (A/B)
		2	=Total Cover		Prevalence Index Workshe	et:	
Herb Stratum	(Plot size: 6 Ft)				Total % Cover of:	Multiply I	oy:
Microstegium vim		40	Υ	FAC	OBL species 0	x 1 =	0
		40	=Total Cover		FACW species0	x 2 =	0
Vine Stratum	(Plot size: 30 Ft)				FAC species 157	x 3 = 4	171
Campsis radicans		5	N	FAC	FACU species 0	x 4 =	0
Vitis rotundifolia	<u> </u>		N	FAC	UPL species 0	x 5 =	0
		10	=Total Cover		Column Totals: 157	(A) 4	71 (B)
					Prevalence Index = B/	A= 3.0	00
					Hydrophytic Vegetation Ind	icators:	
					1 - Rapid Test for Hydro	phytic Vegeta	ition
					X 2 - Dominance Test > 50)%	
					X 3 - Prevalence Index ≤ 3		
					Problematic Hydrophytic	: Vegetation	(Explain)
					Indicators of hydric soil and wetl be present, unless disturbed or		nust
					Definitions of Vegetation Str	ata:	
					Tree – Woody plants, excludir approximately 20 ft (6 m) or m (7.6 cm) or larger in diameter	ore in height	and 3 in
					Sapling – Woody plants, excluapproximately 20 ft (6 m) or m than 3 in. (7.6 cm) DBH.		
					Shrub – Woody plants, exclud approximately 3 to 20 ft (1 to 6		
					Herb – All herbaceous (non-weigherbaceous vines, regardless plants, except woody vines, le 3 ft (1 m) in height.	of size. Includ	des woody
					Woody vine – All woody vines	, regardless c	of height.
	o numbers here or on a separate shee	·+ \			Hydrophytic Vegetation Present? Ye	es X No	

SOIL Sampling Point: w8 (aka W203)

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	Rem	arks			
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	М	SAND					
¹Type: C=Conc	entration, D	=Depletion,	RM=Rec	duced Martix, CS=Co	overed o	or Coated	Sand Gra	ains. ² Location: PL=Pore Lining	g, M=Matrix	-			
5 cm Mucky Muck Presen 1 cm Muck (A	lon (A2) (A3) Ifide (A4) ers (A5) es (A6) (LRR Mineral (A7) (I ce (A8) (LRR A9) (LRR P, T ow Dark Surfa	_RR P, T, U) U))		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surfa Depleted Dark Su Redox Depression Marl (F10) (LRR L Depleted Ochric (e (S9) (LF neral (F1) atrix (F2) F3) ace (F6) arface (F7 ms (F8) J)	RR S, T, U) (LRR O)		Indicators for Problematic Hydric Soils: 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) Indicators of hydrophytic vegetation and wetland hydrology must be present.					
Coast Prairie Sandy Mucky Sandy Gleyer Sandy Redox Stripped Matr Dark Surface	/ Mineral (S1) d Matrix (S4) ((S5) rix (S6)	(LRR O, S) S, T, U)		Iron-Manganese M Umbric Surface (F Delta Ochric (F17 Reduced Vertic (F Piedmont Floodpl Anomalous Bright	=13) (LRF) (MLRA =18) (MLF ain Soils	R P, T, U) 151) RA 150A, 15 (F19) (MLR	50B) A 149A)	unless disturbed or problematic. A, 153C, 153D)					
Туре:								Hydric Soil Present?	Yes X	No			
Depth (inches	s):							nyunc Son Fresent?	Yes X	NO			
Remarks:													

Project/Site: I-77		City/Co	ounty: Richla	and Co	Sampling Date:	8/5/2014	
Applicant/Owner: SCDOT				State: SC	Sampling Point:	w9	
Investigators: Jamison			Section	n, Township, Rang	e S T	R	
Landform (hillslope, terrace, et	tc.): Toe of Slo	pe	Local Relief (concave		· -	Slope(%)	
Subregion (LRRor MLRA): P	· -	Lat: 34 4.19	•	-80 55.17	Datum:	- ' ' ' 	
Soil Map Unit Name:	 -	<u> </u>			ication: PEM		
Are climatic / hydrologic condit	tions on the site typical	for this time of year?	Yes No		xplain in Remarks)		
Are Vegetation, Soil _	2.	•			es" present? Yes	X No	
Are Vegetation, Soil _			:-0		•		
SUMMARY OF FINDIN			(11 1100		answers in Remarks ects, important 1	•	
Hydrophytic Vegetation Pres		lo					
Hydric Soil Present?		Is the	e Sampled Area				
Wetland Hydrology Present?			in a Wetland?	Yes	X No	_	
Remarks:	Yes X N	10					
HYDROLOGY							
Wetland Hydrology Indicato	nrs•			Secondary	Indicators (minimum	n of two required)	
Primary Indicators (minimum		k all that apply)			ce Soil Cracks (B6)		
Surface Water (A1)			n	\sqsubseteq	ely Vegetated Concave	Surface (B8)	
High Water Table (A2)		Aquatic Fauna (B13Marl Deposits (B15)	•		age Patterns (B10)		
Saturation (A3)		Hydrogen Sulfide O	•		Trim Lines (B16)		
Water Marks (B1)			eres along Living Roots (C3)	Dry-Se	eason Water Table (C2)	
Sediment Deposits (B2)		Presence of Reduce	= = : :		sh Burrows (C8)		
Drift Deposits (B3)			ion in Tilled Soils (C6)	Satura	ation Visible on Aerial In	nag.(C9)	
Algal Mat or Crust (B4)		Thin Muck Surface	` '	Geom	orphic Position (D2)		
Iron Deposits (B5)		Other (Explain in Re	emarks)	Shallo	ow Aquitard (D3)		
Inundation Visible on Aerial Im	agery (B7)				Neutral Test (D5)		
Water-Stained Leaves (B9)				Sphag	gnum moss (D8) (LRR T	ī,U)	
Field Observations:							
Surface Water Present?	Yes No _	X Depth (inches)	:				
Water Table Present?	Yes X No	Depth (inches)	: <u>6</u>	Marala and Disabasi	I D 40	/ V N-	
Saturation Present?	Yes X No	Depth (inches)):3	Wetland Hydrol	ogy Present?	res <u>X</u> No	
(includes capillary fringe) Describe Recorded Data (stream ga	аuge, monitoring well, aeria	Il photos, previous inspe	ections), if available:				
Remarks:							
nearby pond provides hydrology							



(Plot size: 30 Ft)

(Plot size: 6 Ft)

Tree Stratum

Shrub Stratum

Herb Stratum

Vine Stratum

Alnus serrulata

Polygonum plebeium

Juncus effusus

Salix nigra

<u>Absolute</u>

% Cover

5 13

40

30

70

Dominant

Species

Ν

Ν

=Total Cover

Υ

Υ

=Total Cover

Indicator

Status

FACW

OBL

FACW

OBL

Prevalence Index = B/A=
Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Veg
X 2 - Dominance Test > 50%
X 3 - Prevalence Index ≤ 3.0
Problematic Hydrophytic Vegetation
Indicators of hydric soil and wetland hydrolog be present, unless disturbed or problematic.
Definitions of Vegetation Strata:
Tree – Woody plants, excluding woody vi approximately 20 ft (6 m) or more in heig (7.6 cm) or larger in diameter at breast h
Sapling – Woody plants, excluding wood approximately 20 ft (6 m) or more in heig than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody approximately 3 to 20 ft (1 to 6 m) in heig

s of Vegetation Strata: oody plants, excluding woody vines,

ately 20 ft (6 m) or more in height and 3 in. r larger in diameter at breast height (DBH).

Woody plants, excluding woody vines, ately 20 ft (6 m) or more in height and less (7.6 cm) DBH.

loody plants, excluding woody vines, ately 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: (Include photo numbers here or on a separate sheet.)

SOIL Sampling Point: w9 (aka W204)

Depth _	ion. (Des	Matrix	acptii net		Redox F			the absence of Indicators.)	
(inches)	Color	(moist)	%	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	
¹Type: C=Conce	ntration, D	=Depletion,	RM=Redu	iced Martix, CS=Co	vered or	Coated S	Sand Gra	ins. ² Location: PL=Pore Lin	ing, M=Matrix.
Hydric Soil Ind Histosol (A1) Histic Epipedol Black Histic (A Hydrogen Sulfi Stratified Layer Organic Bodies 5 cm Mucky M Muck Presence 1 cm Muck (AS Depleted Belov Thick Dark Sur Coast Prairie F Sandy Mucky N Sandy Gleyed	on (A2) (A3) (A4) (A5) (A6) (A7) (A7) (A7) (A8) (A8) (LRR P, 1 (A8) (LRR P, 1 (A8) (LRR P, 1 (A8) (LRR P, 1 (A8) ((LRR P, T, U) (LRR P, T, U) (LRR P, T, U) (LRR P, T, U) (ACC) (ACC]]]]	Polyvalue Below S Thin Dark Surface Loamy Mucky Mind Loamy Gleyed Ma Pepleted Matrix (F Redox Dark Surface Depleted Dark Surface Depleted Dark Surface Marl (F10) (LRR U Depleted Ochric (F Iron-Manganese N Umbric Surface (F Delta Ochric (F17)	(S9) (LRF eral (F1) (i trix (F2) (3) ce (F6) rface (F7) is (F8) (i) fasses (F1) (MLR fasses (F1) (13) (LRR (MLRA 1)	R S, T, U) LRR O) 12) (LRR O P, T, U) 51)	, P, T)	Indicators for Problematic 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outsi Piedmont Floodplain Soils (Anomalous Bright Loamy S (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface Other (Explain in Remarks) Indicators of hydrophytic hydrology must be prese unless disturbed or problematical (ITF2)	de MLRA 150A,B) F19) (LRR P, S, T) oils (F20) (TF12) (LRR T, U) vegetation and wetland nt,
Sandy Redox (` '		Ĺ	Reduced Vertic (F					
Stripped Matrix Dark Surface (. S T II)	L	Piedmont Floodpla	,	, ,	•		
Dark Surface ((37) (LKK F	, 3, 1, 0)	L	Anomalous Bright	Loamy So	oils (F20) (I	MLRA 149	A, 153C, 153D)	
Restrictive	e Layer (i	f observed	d):						
Depth (inches)):							Hydric Soil Present?	Yes X No
Remarks:									

Project/Site: 1-77		City/Ci	Dunty: Richia	and Co	Sampling Date:	3/4/2014
Applicant/Owner: SCD0	TC			State: SC	Sampling Point:	.p7-8-9
Investigators: Jamison			Section	n, Township, Rang	e S T	R
Landform (hillslope, terrace	, etc.): Toe of S	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 Classific		
Are climatic / hydrologic cor	nditions on the site typic	al for this time of year?	Yes No		plain in Remarks)	
Are Vegetation, Soi						V No
				imai Circumstance	es" present? Yes	X No
Are Vegetation, Soi	l, Hydrology	, naturally problemat	IC? (If nee	eded, explain any a	inswers in Remarks.)
SUMMARY OF FIND	INGS - Attach a si	te map showing s	sampling point loc	ations, transe	cts, important f	eatures, etc.
		No			-	
Hydrophytic Vegetation Programmer Hydric Soil Present?		ls th	e Sampled Area			
Wetland Hydrology Prese	Yes		in a Wetland?	Yes	No X	
Welland Hydrology Frese	Yes	No X				
Remarks: Adjacent to w7/	w8/w9 at I-77/I-20 interc	hange.				
HYDROLOGY						
Wetland Hydrology Indic	ators:			Secondary	Indicators (minimum	of two required)
Primary Indicators (minimu	m of one is required; ch	eck all that apply)		Surfac	e Soil Cracks (B6)	
Surface Water (A1)		Aquatic Fauna (B13	3)	Sparse	ely Vegetated Concave	Surface (B8)
High Water Table (A2)		Marl Deposits (B15		Draina	ge Patterns (B10)	
Saturation (A3)		Hydrogen Sulfide O	dor (C1)		Γrim Lines (B16)	
Water Marks (B1)		Oxidized Rhizosphe	eres along Living Roots (C3)		eason Water Table (C2)	
Sediment Deposits (B2)		Presence of Reduce	ed Iron (C4)		sh Burrows (C8)	(00)
Drift Deposits (B3) Algal Mat or Crust (B4)			ion in Tilled Soils (C6)		tion Visible on Aerial Im	ag.(C9)
Iron Deposits (B5)		☐ Thin Muck Surface			orphic Position (D2) w Aquitard (D3)	
Inundation Visible on Aeria	I Imagery (R7)	Other (Explain in Re	emarks)		leutral Test (D5)	
Water-Stained Leaves (B9)	=				num moss (D8) (LRR T	.U)
Field Observations:						,
Surface Water Present?	Yes No	X Depth (inches)	١٠.			
Water Table Present?	Yes No	X Depth (inches)				
Saturation Present?	Yes No	X Depth (inches)		Wetland Hydrol	ogy Present? Y	es No_X_
(includes capillary fringe)						
Describe Recorded Data (stream	n gauge, monitoring well, ac	erial photos, previous inspe	ections), if available:			
Remarks:						



ZEGETATION=	Use scientific names of plants.	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test V	Vorksheet:			
Tree Stratum Pinus taeda	(Plot size: <u>30 Ft</u>)	60	Y	FAC	Number of Domina That Are OBL, FA			3	(A)
Liriodendron tu	lipifera	50	Y	FACU	Total Number of Do	ominant			
Acer rubrum		40	Υ	FAC	Species Across all	Strata:		4	(B)
Liquidambar st	yraciflua	20	Y	FAC	Percent of Dominar	nt Snecies			_
		170	=Total Cover		That Are OBL, FAC		: <u> </u>	75.0%	(A/B)
Shrub Stratum	(Plot size: <u>30 Ft</u>)				Prevalence Index	Workshee	t:		
llex opaca		7	N	FAC	Total % Cover	of:	Mult	iply by:	
		7	=Total Cover		OBL species	0	x 1 =	0	
Herb Stratum					FACW species	0	x 2 =	0	
Vine Stratum					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 Ir	ndex = B/A:	=	3.28	
					Hydrophytic Vegeta	ation Indic	ators:		
					1 - Rapid Test	for Hydroph	hytic Ve	egetation	
					X 2 - Dominance	Test > 50%	6		
					3 - Prevalence	Index ≤ 3.0)		
					Problematic Hy	/drophytic \	√egetat	ion (Ex	plain)
					Indicators of hydric so be present, unless dis				
					Definitions of Veget	tation Stra	ta:		
					Tree – Woody plants approximately 20 ft (6 (7.6 cm) or larger in 6	6 m) or moi	re in he	ight and	
					Sapling – Woody pla approximately 20 ft (6 than 3 in. (7.6 cm) DI	6 m) or moi			
					Shrub – Woody plant approximately 3 to 20				
					Herb – All herbaceou herbaceous vines, re plants, except woody 3 ft (1 m) in height.	gardless of	f size. I	ncludes	woody
					Woody vine – All woo	ody vines, r	regardle	ess of he	ight.
					Hydrophytic Vegetation Prese	nt? Yes	. X	No	

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

SOIL Sampling Point: up7-8-9

Project/Site: I-77		City/C	county: Columbi	а	Sampling Date	e: <u>8/6/2014</u>		
Applicant/Owner: SCDOT				State: SC	Sampling Point	t: w10		
Investigator(s): McMaster/Mulholl	and	Section	on, Township, Ran					
Landform (hillslope, terrace, etc.):					Slo	ope (%):		
Subregion (LRR or MLRA): LRR T								
Soil Map Unit Name: LaD					sification: none			
Are climatic / hydrologic conditions on	the site typical for	r this time of year? V	'es 🗸 No					
Are Vegetation, Soil, or				Normal Circumstance		✓ No		
Are Vegetation, Soil, or			•	eded, explain any an	,			
SUMMARY OF FINDINGS – A	Attach site ma	ap showing sam	ipling point lo	cations, transe	cts, important	teatures, etc.		
Hydrophytic Vegetation Present?	Yes <u>√</u>	No	Is the Sampled	Δrea				
Hydric Soil Present?	Yes <u>√</u>	No	within a Wetland		✓ No			
Wetland Hydrology Present?	Yes <u>√</u>	No	within a wetland	u: 163_	<u> </u>	_		
Remarks:								
HYDROLOGY								
Wetland Hydrology Indicators:				Secondary In	dicators (minimum d	of two required)		
Primary Indicators (minimum of one i	s required; check	all that apply)			Soil Cracks (B6)			
✓ Surface Water (A1)	-	Water-Stained Leave	s (B9)			e Surface (B8)		
✓ High Water Table (A2)		Aquatic Fauna (B13)			Sparsely Vegetated Concave Surface (B8)Drainage Patterns (B10)			
Saturation (A3)		Marl Deposits (B15) (Moss Trim Lines (B16)			
Water Marks (B1)		Hydrogen Sulfide Odd			son Water Table (C2	2)		
Sediment Deposits (B2)		Oxidized Rhizosphere			Burrows (C8)	-/		
Drift Deposits (B3)		Presence of Reduced	-		n Visible on Aerial I	magery (C9)		
Algal Mat or Crust (B4)		Recent Iron Reductio			phic Position (D2)			
Iron Deposits (B5)		Thin Muck Surface (C			Aquitard (D3)			
Inundation Visible on Aerial Imag		Other (Explain in Ren			ıtral Test (D5)			
Field Observations:		<u>`</u>			<u> </u>			
Surface Water Present? Yes _	√ No	Depth (inches): 0.5	5					
		Depth (inches): 1.0)					
	✓ No	Depth (inches): 0	Wet	land Hydrology Pre	sent? Yes <u>√</u>	No		
(includes capillary fringe) Describe Recorded Data (stream gau	ge, monitoring w	ell, aerial photos, pre	vious inspections)	, if available:				
,								
Remarks:								

١	/EGETATION -	مءا ا	scientific	names	of plants
١	VEGETATION -	use	scientific	names	oi biants.

EGETATION – Use scientific names of pla	nts.		Sampling Point: w10
20.4	Absolute	Dominant Indicato	
Г <u>ree Stratum</u> (Plot sizes: <u>30-ft</u>) I	· · · · · · · · · · · · · · · · · · ·	Species? Status	Number of Dominant Species That Are OBL, FACW, or FAC: (A)
2			Total Number of Dominant
3			Species Across All Strata:3 (B)
l			Percent of Dominant Species
5			That Are OBL, FACW, or FAC: 100 (A/B)
S			Prevalence Index worksheet:
7			Total % Cover of: Multiply by:
Sapling Stratum (30-ft)		= Total Cover	OBL species x 1 =
			FACW species x 2 =
)			FAC species x 3 =
3			FACU species x 4 =
k			UPL species x 5 =
i			_ Column Totals: (A) (B)
i			- Dravelance Index - D/A -
·			Prevalence Index = B/A =
		= Total Cover	Hydrophytic Vegetation Indicators: ✓ Dominance Test is >50%
Shrub Stratum(30-ft)			Dominance Test is >50% Prevalence Index is ≤3.0¹
			Problematic Hydrophytic Vegetation ¹ (Explain)
). 			- Froblematic Trydrophytic Vegetation (Explain)
3			 Indicators of hydric soil and wetland hydrology must
ł			be present.
5			-
5			Definitions of Vegetation Strata:
7		= Total Cover	_ Domittonio or Vogetation Girata.
Herb Stratum(15-ft)		- Total Cover	Tree – Woody plants, excluding woody vines,
ı. Polygonum hydropiperoides	30	yes OBL	approximately 20 ft (6 m) or more in height and
2. Typha latifolia	25	ves OBL	3 in. (7.6 cm) or larger in diameter at breast
3. <u>Juncus effusus</u>	20	ves OBL	─
I. Polygonum arifolium	15	no OBL	Sapling – Woody plants, excluding woody vines,
s. Pontedaria cordata	10	no OBL	approximately 20 ft (6 m) or more in height and less
S			_ than 3 in. (7.6 cm) DBH.
7			- Chrish W. J.
3			Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
)			-
0			Herb – All herbaceous (non-woody) plants, including
1			<u> </u>
2			woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Noody Vine Stratum(15-ft	100	= Total Cover	approximately 3 it (1 iii) iii height.
l			Woody vine – All woody vines, regardless of height.
2.			
3.			_
1.			_
5.			Hydrophytic Vegetation
		= Total Cover	Present? Yes No
Remarks: (If observed, list morphological adaptations	helow)		
Temarks. (II observed, list morphological adaptations	Delow).		

SOIL Sampling Point: w10

Profile Desc	ription: (Des	cribe to the d	lepth needed	l to docu	ment the i	ndicator	or confirn	n the absence	of indicators.)
Depth		atrix			ox Feature				
(inches)	Color (mo		Color (moist)	%	Type ¹	Loc ²	<u>Texture</u>	Remarks
0-2	10YR: 3/				_			Silt/clay	Loam
2-12	10YR: 5/	1 90	10YR:	6/8	10	С	M	Silt/clay	Loam
12-22	10YR: 7/	1 95	10YR:	5/8	5	С	M	Clay	Loam
					_				
	oncentration, D)=Depletion, F	RM=Reduced	Matrix, C	S=Covere	d or Coate	d Sand G		ocation: PL=Pore Lining, M=Matrix. s for Problematic Hydric Soils ³ :
Hydric Soil I			р.	harabra D	- l O f -	(00) (1	DD C T 1		-
Histosol	(A1) pipedon (A2)				elow Surfa urface (S9				Muck (A9) (LRR O) Muck (A10) (LRR S)
Black His					ky Mineral				ced Vertic (F18) (outside MLRA 150A,B)
	n Sulfide (A4)				ed Matrix (,		nont Floodplain Soils (F19) (LRR P, S, T)
	l Layers (A5)			pleted Ma					alous Bright Loamy Soils (F20)
_	Bodies (A6) (L				Surface (F	•			RA 153B)
	icky Mineral (A esence (A8) (L				ırk Surface essions (F	, ,			Parent Material (TF2) Shallow Dark Surface (TF12) (LRR T, U)
,	ick (A9) (LRR			ırl (F10) (I	•	0)			(Explain in Remarks)
	Below Dark S				hric (F11)	(MLRA 1	51)	Other	(Explain in Remarks)
	ark Surface (A				nese Mass			, T) ³ Indic	cators of hydrophytic vegetation and
	rairie Redox (A						, U)	we	tland hydrology must be present.
-	lucky Mineral (leyed Matrix (: (F17) (ML :rtic (F18) (0A 150R)	١	
	edox (S5)	04)			oodplain S				
	Matrix (S6)							RA 149A, 1530	C, 153D)
	rface (S7) (LR								
Restrictive I	_ayer (if obse	rved):							
Type:									./
	ches):							Hydric Soi	I Present? Yes <u>▼</u> No
Remarks:									

Project/Site: 1-77	City/Cou	_{unty:} Columbia		Sampling Date:	8/6/2014
Applicant/Owner: SCDOT		St	ate: SC	Sampling Point:	Up10
vestigator(s): McMaster/Mulholland Section, Township, Range: Columbia					
andform (hillslope, terrace, etc.): Local relief (concave, convex, none): _none Slope (%): _0					
Subregion (LRR or MLRA): LRR T					
Soil Map Unit Name: LaD	Lat	Long	NWI classifica		itum. <u></u>
· -	and for this time of warm? War		<u></u>		
Are climatic / hydrologic conditions on the site typic					/
Are Vegetation, Soil, or Hydrology			ircumstances" pr		▼ No
Are Vegetation, Soil, or Hydrology	naturally problemation	:? (If needed, exp	olain any answers	s in Remarks.)	
SUMMARY OF FINDINGS - Attach site	e map showing samp	ling point location	s, transects,	important fe	eatures, etc.
Hydric Soil Present? Yes	No 🗸	s the Sampled Area vithin a Wetland?	Yes	No <u></u> ✓	_
Adjacent to w10 wetland data poi	nt.				
HYDROLOGY					
Wetland Hydrology Indicators:		S	econdary Indicat	ors (minimum of	two required)
Primary Indicators (minimum of one is required; c	heck all that apply)		_ Surface Soil C		
Surface Water (A1)	Water-Stained Leaves (Sparsely Vegetated Concave Surface (B8)		
High Water Table (A2)	Aquatic Fauna (B13)	, =	Drainage Patt		,
Saturation (A3)	Marl Deposits (B15) (LF	₹R U)	Moss Trim Lin		
Water Marks (B1)	Hydrogen Sulfide Odor	(C1) _	Dry-Season W	Vater Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres	on Living Roots (C3) _	Crayfish Burro	ows (C8)	
Drift Deposits (B3)	Presence of Reduced Ir	on (C4)	Saturation Vis	ible on Aerial Im	nagery (C9)
Algal Mat or Crust (B4)	Recent Iron Reduction i	n Tilled Soils (C6)	Geomorphic F	Position (D2)	
Iron Deposits (B5)	Thin Muck Surface (C7)	<u> </u>	Shallow Aquit	ard (D3)	
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Rema	rks)	FAC-Neutral 1	Test (D5)	
Field Observations:					
Surface Water Present? Yes No					
	Depth (inches):			o v	🗸
(includes capillary fringe)	Depth (inches):		drology Present	? Yes	No <u>√</u>
Describe Recorded Data (stream gauge, monitori	ng well, aerial photos, previo	ous inspections), if availa	ıble:		
Barrada					
Remarks:					

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 30-ft)		Species?		Number of Dominant Species
1. Pinus taeda	60	yes	FAC	That Are OBL, FACW, or FAC: 4 (A)
2				Total Newhord Charitant
3.				Total Number of Dominant Species Across All Strata: 7 (B)
4.				Openies Anioss Aniostata.
				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 57 (A/B)
6				Prevalence Index worksheet:
7				
_	60	= Total Co	over	Total % Cover of: Multiply by:
Sapling Stratum (30-ft)				OBL species x 1 =
1. Pinus taeda	10	yes	FAC	FACW species x 2 =
2				FAC species x 3 =
3.				FACU species x 4 =
				UPL species x 5 =
4				
5				Column Totals: (A) (B)
6				Prevalence Index = B/A =
7				
	10	= Total Co	over	Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)				✓ Dominance Test is >50%
1. Sassafras albidum	1	yes	FACU	Prevalence Index is ≤3.0 ¹
2.				Problematic Hydrophytic Vegetation ¹ (Explain)
3				¹ Indicators of hydric soil and wetland hydrology must
4				be present.
5				
6				
7				Definitions of Vegetation Strata:
		= Total Co	over	
Herb Stratum (15-ft)		_ 1010101	3101	Tree – Woody plants, excluding woody vines,
1. Lespedeza cuneata	10	ves	FACU	approximately 20 ft (6 m) or more in height and
2. Sorghum halepense			FACU	3 in. (7.6 cm) or larger in diameter at breast
				height (DBH).
3. Pannicum commutatum				
4				Sapling – Woody plants, excluding woody vines,
5				approximately 20 ft (6 m) or more in height and less
6				than 3 in. (7.6 cm) DBH.
7				
8.				Shrub – Woody plants, excluding woody vines,
				approximately 3 to 20 ft (1 to 6 m) in height.
9				
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12.				woody plants, except woody vines, less than
	25	= Total Co	over	approximately 3 ft (1 m) in height.
Woody Vine Stratum (15-ft)				
1. Gelsemium sempervirens	15	yes	FAC	Woody vine – All woody vines, regardless of height.
2				
3.				
4				Hydrophytic
5				Vegetation
	_15	= Total Co	over	Present? Yes No
Remarks: (If observed, list morphological adaptations bel	OW)			
Remarks. (ii observed, list morphological adaptations bei	Ow).			

SOIL Sampling Point: Up10

Profile Desc	ription: (Describe	to the dep	th needed to docu	ment the	indicator	or confirr	n the absenc	e of indicate	ors.)	
Depth Matrix			Redox Features							
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	_Loc ²	Texture	- <u>-</u>	Remarks	
0-3	10 YR: 4/3	80	10 YR: 6/4	20	С	M	Silt	Loam		
3-20	10 YR: 5/2	100					Silt	Loam		
										_
								-		
				_						_
		oletion, RM=	Reduced Matrix, C	S=Covere	d or Coate	d Sand G			=Pore Lining, I	
Hydric Soil I									matic Hydric	Soils":
Histosol	. ,		Polyvalue B					Muck (A9) (I	•	
Black His	ipedon (A2)		Thin Dark S Loamy Mucl					Muck (A10)		MLRA 150A,B)
	n Sulfide (A4)		Loamy Gley			. 0)				(LRR P, S, T)
	Layers (A5)		Depleted Ma		()				Loamy Soils	
Organic	Bodies (A6) (LRR F	P, T, U)	Redox Dark	Surface (I	- 6)			-RA 153B)		
	cky Mineral (A7) (L							Parent Mater		`
	esence (A8) (LRR I	J)	Redox Depr		⁽⁸⁾					12) (LRR T, U)
	ck (A9) (LRR P, T) I Below Dark Surfac	o (Δ11)	Marl (F10) (I		(MI DA 1	51)	Othe	r (Explain in	Remarks)	
	rk Surface (A12)	C (ATT)	Iron-Mangar				. T) 3 _{10 d} :	aatara of bu	drophytic vege	totion and
		MLRA 150	A) Umbric Surf				illai		logy must be p	
Sandy M	ucky Mineral (S1)	LRR O, S)	Delta Ochric	(F17) (M I	LRA 151)		***	Stiaria riyaroi	ogy mast bo p	resent.
	leyed Matrix (S4)		Reduced Ve							
	edox (S5)		Piedmont FI					0 450D)		
	Matrix (S6) face (S7) (LRR P,	S T II)	Anomalous	Bright Loa	my Soils (F20) (ML F	KA 149A, 1530	C, 153D)		
	ayer (if observed)									
Type:	, (,									
	ches):						Hydric So	il Present?	Yes	No ✓
Remarks:							11,5			
. torriaino.										

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, Rang	ge S T R		
Landform (hillslope, terrace, et	c.): Toe of Slope	Local Relief (d	concave, convex, none):	Concave Slope(%) 1		
Subregion (LRRor MLRA): P	Lat: 34	4.38	Long: -80 55.63	Datum:		
Soil Map Unit Name:			NWI Classi	fication: PFO		
· ———	ions on the site typical for this ti	me of year? Yes	No X (If No, e	explain in Remarks)		
	, HydrologyX_, significa		Are "Normal Circumstand			
_	, Hydrology, naturally	-		·		
Are vegetation, Soil _	, Hydrology, flaturally	y problematic?	(If needed, explain any	answers in Remarks.)		
SUMMARY OF FINDING	<u>GS - Attach a site map s</u>	howing sampling po	<u>int locations, trans</u> e	ects, important features, etc.		
Hydrophytic Vegetation Prese	ent? Yes X No					
Hydric Soil Present?	Yes X No	Is the Sampled Area	a			
Wetland Hydrology Present?	Yes X No	within a Wetland?	Yes _	X No		
Remarks:						
HYDROLOGY Wetland Hydrology Indicato Primary Indicators (minimum of	o rs: of one is required; check all that	apply)		r Indicators (minimum of two required) ce Soil Cracks (B6)		
Surface Water (A1)		ic Fauna (B13)		sely Vegetated Concave Surface (B8)		
✓ High Water Table (A2)		Deposits (B15) (LRR U)		age Patterns (B10)		
Saturation (A3)		gen Sulfide Odor (C1)	Moss	Trim Lines (B16)		
Water Marks (B1)		ed Rhizospheres along Living R	oots (C3)	Season Water Table (C2)		
Sediment Deposits (B2)	Prese	nce of Reduced Iron (C4)		ish Burrows (C8)		
Drift Deposits (B3)	Recer	nt Iron Reduction in Tilled Soils ((-6)	ration Visible on Aerial Imag.(C9)		
Algal Mat or Crust (B4)	☐ Thin M	Muck Surface (C7)		norphic Position (D2)		
Iron Deposits (B5) Inundation Visible on Aerial Ima		(Explain in Remarks)		ow Aquitard (D3) Neutral Test (D5)		
Water-Stained Leaves (B9)	agery (b7)		=	agnum moss (D8) (LRR T,U)		
Field Observations:	V N- V F	Nameth (implant)				
Surface Water Present? Water Table Present?		Depth (inches): Depth (inches): 9				
Saturation Present?		Depth (inches): 5	Wetland Hydro	ology Present? Yes X No		
(includes capillary fringe)						
Remarks: surface water present in ditch, no ap	auge, monitoring well, aerial photos, p	nevious inspections), il avaliable				



(Plot size: 30 Ft)

(Plot size: 6 Ft)

Tree Stratum

Shrub Stratum
Herb Stratum

Vine Stratum

Acer rubrum

Nyssa biflora

Pinus taeda

Osmundastrum cinnamomeum

<u>Absolute</u>

% Cover

30

20

15 65

12

12

Dominant

Species

Υ

=Total Cover

=Total Cover

Indicator

Status

FAC OBL

FAC

FACW

Remarks: (Include photo numbers here or on a separate sheet.)
not a lot of vegetation due to hydrologic fluctuations and ditching

Yes

No

Hydrophytic Vegetation Present? SOIL Sampling Point: w11 (aka w205)

ription: (Des		e depth ne	eded to document			confirm	the absence of Indicators.)	
Depth Matrix		0/	Redox Features			1 - 2		Dan 1
_ 			Color (moist)		Type 1	Loc ²	·	Remarks
10YR	2/1	100					CLAY LOAM	
ncentration, [=Depletion,	, RM=Redu	uced Martix, CS=Co	overed o	r Coated	Sand Gra	ins. ² Location: PL=Pore Lir	ning, M=Matrix.
y Mineral (A7) ence (A8) (LRF (A9) (LRR P, below Dark Sur Surface (A12) rie Redox (A16 cky Mineral (S1 yed Matrix (S4) lox (S5) atrix (S6)	(LRR P, T, U) R U) F) face (A11)) (MLRA 150A) (LRR O, S)		Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma ✓ Depleted Matrix (F Redox Dark Surfa Depleted Dark Su Redox Depressior Marl (F10) (LRR L Depleted Ochric (I Iron-Manganese N Umbric Surface (F Delta Ochric (F17) Reduced Vertic (F	(S9) (LR eral (F1) (trix (F2) F3) ce (F6) rface (F7) ns (F8) J) F11) (MLF Alasses (F F13) (LRR) (MLRA 1 F18) (MLR	R S, T, U) (LRR O) 12) (LRR C P, T, U) 151) A 150A, 15 F19) (MLR	D, P, T) 50B) A 149A)	1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outs Piedmont Floodplain Soils Anomalous Bright Loamy S (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface Other (Explain in Remarks) Indicators of hydrophytic hydrology must be press unless disturbed or prob	cide MLRA 150A,B) (F19) (LRR P, S, T) Soils (F20) (TF12) (LRR T, U)) C vegetation and wetland
		•					Hydric Soil Present?	Yes X No
nes):								
	Color 10YR 10YR 10YR 10YR 10YR 10YR 10YR 10YR	Matrix Color (moist) 10YR 3 / 1 10YR 2	Matrix Color (moist)	Matrix Color (moist)	Matrix Color (moist) 10YR 3 / 1 100 10YR 2 / 1 100 10Yelaus Below Surface (Septended) Surface (Sept	Matrix Color (moist) 10YR 3 / 1 100 10YR 2 / 10 10YR 2 / 10 10YR 2 / 10 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V 10V	Matrix Redox Features Color (moist) % Type ¹ Loc ² 10YR 3 / 1 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 100 10YR 2 / 1 100 100 100 10YR 2 / 1 100 100 100 10YR 2 / 1 100 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100 100 10YR 2 / 1 100	Color (moist)

Project/Site: I-77		City/County: Richl	and Co Sampling Date: 8/4/2014
Applicant/Owner: SCDO	Γ		State: SC Sampling Point: up11
Investigators: Jamison		Section	n, Township, Range S T R
Landform (hillslope, terrace, e	etc.): Toe of Slope	Local Relief (concave	e, convex, none): Concave Slope(%) 1
Subregion (LRRor MLRA):	P Lat: 80°	255'40.448"W Long:	34°4'23.634"N Datum: NAD 198
Soil Map Unit Name:			NWI Classification: up
· —	ditions on the site typical for this tir	me of year? Yes No	X (If No, explain in Remarks)
, ,	, Hydrology, significa	· · ·	
			· — —
Are vegetation, Soil	, Hydrology, naturally	problematic? (If nea	eded, explain any answers in Remarks.)
SUMMARY OF FINDIN	NGS - Attach a site map sl	nowing sampling point loc	cations, transects, important features, etc.
Hydrophytic Vegetation Pre	sent? Yes X No		
Hydric Soil Present?	Yes No X	Is the Sampled Area	
Wetland Hydrology Present		within a Wetland?	Yes NoX
	105 NO X		
Remarks: Adjacent to w11 v	wetland data point.		
HYDROLOGY			
Wetland Hydrology Indicat	tors:		Secondary Indicators (minimum of two required)
·	of one is required; check all that	apply)	<u>`</u>
			Surface Soil Cracks (B6)
Surface Water (A1)	Aquati	c Fauna (B13)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Marl D	eposits (B15) (LRR U)	Drainage Patterns (B10)
Saturation (A3)	☐ Hydroç	gen Sulfide Odor (C1)	Moss Trim Lines (B16)
Water Marks (B1)	Oxidize	ed Rhizospheres along Living Roots (C3)	
Sediment Deposits (B2)	Preser	nce of Reduced Iron (C4)	Crayfish Burrows (C8)
Drift Deposits (B3)	Recen	t Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial Imag.(C9)
Algal Mat or Crust (B4)	☐ Thin №	luck Surface (C7)	Geomorphic Position (D2)
Iron Deposits (B5)	Other	(Explain in Remarks)	Shallow Aquitard (D3)
Inundation Visible on Aerial I	magery (B7)		FAC-Neutral Test (D5)
Water-Stained Leaves (B9)			Sphagnum moss (D8) (LRR T,U)
Field Observations:			
Surface Water Present?	Yes No X D	epth (inches):	
Water Table Present?		epth (inches):	
Saturation Present?	Yes No X D	epth (inches):	Wetland Hydrology Present? Yes No_X_
(includes capillary fringe)			
Describe Recorded Data (stream	gauge, monitoring well, aerial photos, p	revious inspections), if available:	
Remarks:			



VEGETATION_ Us	se scientific names of plants.				Sampling Po	oint: up11		
		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksho	et:		
Tree Stratum Pinus taeda	(Plot size: <u>30 Ft</u>)	65	Y	FAC	Number of Dominant Spec That Are OBL, FACW, or		3	_ (A)
		65	=Total Cover		Total Number of Dominant Species Across all Strata:		4	(B)
Shrub Stratum	(Plot size: <u>30 Ft</u>)							- ' '
Smilax rotundifolia Rosa multiflora			Y	FACU FACU	Percent of Dominant Speci That Are OBL, FACW, or F		75.0%	(A/B)
Morella cerifera		12	Y	FAC	Prevalence Index Worksh	ieet:		
		47	=Total Cover		Total % Cover of:	Multi	ply by:	
Herb Stratum					OBL species 0	x 1 =	0	
Vine Stratum					FACW species 0	x 2 =	0	
					FAC species 97	x 3 =	291	
					FACU species 15	x 4 =	60	
					UPL species0	x 5 =	0	
					Column Totals:		351	(B)
					Prevalence Index = E	3/A=	3.13	
					Hydrophytic Vegetation In	dicators:		
					1 - Rapid Test for Hydr		actation	
					X 2 - Dominance Test >	. ,	getation	
					3 - Prevalence Index ≤	3.0		
					Problematic Hydrophyt	ic Vegetati	on (Exp	olain)
					Indicators of hydric soil and we be present, unless disturbed o	etland hydrolo r problematio	ogy must	
					Definitions of Vegetation S	trata:		
					Tree – Woody plants, exclud approximately 20 ft (6 m) or (7.6 cm) or larger in diamete	more in hei	ght and	
					Sapling – Woody plants, exc approximately 20 ft (6 m) or than 3 in. (7.6 cm) DBH.			
					Shrub – Woody plants, exclu approximately 3 to 20 ft (1 to			
					Herb – All herbaceous (non- herbaceous vines, regardles: plants, except woody vines, I 3 ft (1 m) in height.	s of size. In	cludes v	woody
					Woody vine – All woody vine	s, regardle	ss of he	ight.
					Hydrophytic Vegetation Present? դ	res X	No	
Remarks: (Include photo	numbers here or on a separate sheet.)						

SOIL Sampling Point: up11

	epti	n		Matrix r (moist)	%	Color (moist)		Features Type 1		Texture	Remarks	
_			-			Color (moist)		Туре				
0	to		10YR	4/2	100					SANDY CLAY LOAM		
2	to		10YR	3/3	100					SILTY CLAY LOAM		
7	to	13	10YR	3/3	100					SANDY CLAY LOAM		
				D=Depletion,	RM=Red	uced Martix, CS=Co	overed o	r Coated S	Sand Gra	ains. ² Location: PL=Pore Lining	, M=Matrix.	
	Hissississississississississississississ	tosol (A- tic Epipe ck Histic drogen S atified La ganic Bo m Mucky ck Prese m Muck pleted Bo ck Dark ast Prairi ndy Mucl ndy Gley ndy Redo	edon (A2) c (A3) sulfide (A4) ayers (A5) dies (A6) (LRI y Mineral (A7) ence (A8) (LRI (A9) (LRR P, elow Dark Sur Surface (A12) die Redox (A16 ky Mineral (S1 eed Matrix (S4 ox (S5)	(LRR P, T, U) R U) T) fface (A11)) (S) (MLRA 150A)		Polyvalue Below S Thin Dark Surface Loamy Mucky Mir Loamy Gleyed Ma Depleted Matrix (I Redox Dark Surfa Depleted Dark Su Redox Depression Marl (F10) (LRR U Depleted Ochric (I Iron-Manganese I) Umbric Surface (I Delta Ochric (F17) Reduced Vertic (F	e (S9) (LR neral (F1) atrix (F2) F3) ace (F6) arface (F7) ns (F8) J) F11) (MLF Masses (F F13) (LRR	RR S, T, U) (LRR O) RA 151) (12) (LRR C R P, T, U) (151)), P, T)	Indicators for Problematic Hy 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Piedmont Floodplain Soils (F19 Anomalous Bright Loamy Soils (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TF Other (Explain in Remarks) Indicators of hydrophytic veg hydrology must be present, unless disturbed or problem	MLRA 150A,B) 9) (LRR P, S, T) 6 (F20) F12) (LRR T, U) getation and wetland	
	,		atrix (S6) ce (S7) (LRR I	P, S, T, U)		Piedmont Floodpl Anomalous Bright				9A, 153C, 153D)		
	Ту			if observed):					Hydric Soil Present? Y	/es No	X
Ren	narks	:										

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, Ran	ge S T R
Landform (hillslope, terrace, et	c.): 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:				fication: PEM/PSS
· · · · · · · · · · · · · · · · · · ·	ions on the site typical for this t	ime of year? Yes		explain in Remarks)
	• •	· —		•
	, Hydrology, significa		Are "Normal Circumstand	ces" present? Yes X No
Are Vegetation, Soil _	, Hydrology, naturall	y problematic?	(If needed, explain any	answers in Remarks.)
SUMMARY OF FINDING	GS - Attach a site map s	howing sampling pe	oint locations, trans	ects, important features, etc.
Hudrophytic Vegetation Bree	ent? Yes X No			
Hydrophytic Vegetation Present?		Is the Sampled Ar	ea	
_	Yes X No	within a Wetland?	Yes	X No
Wetland Hydrology Present?	Yes X No		-	
Remarks:				
Wetland Hydrology Indicator Primary Indicators (minimum of the surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	of one is required; check all tha Aquat Marl Hydro Oxidi; Prese	t apply) tic Fauna (B13) Deposits (B15) (LRR U) ogen Sulfide Odor (C1) zed Rhizospheres along Living ence of Reduced Iron (C4) nt Iron Reduction in Tilled Soils Muck Surface (C7)	Surfa Surfa Spars Drain Moss Dry-S Crayl Satur	r Indicators (minimum of two required) ace Soil Cracks (B6) sely Vegetated Concave Surface (B8) age Patterns (B10) a Trim Lines (B16) aceason Water Table (C2) acish Burrows (C8) action Visible on Aerial Imag.(C9) anorphic Position (D2)
Iron Deposits (B5)	· · · · · · · · · · · · · · · · · · ·	(Explain in Remarks)		ow Aquitard (D3)
Inundation Visible on Aerial Im	agery (B7)			Neutral Test (D5)
Water-Stained Leaves (B9)			Spha	gnum moss (D8) (LRR T,U)
Field Observations:				
Surface Water Present?		Depth (inches):		
Water Table Present? Saturation Present?		Depth (inches): 8 Depth (inches): 3	Wastland I broken	ology Present? Yes X No
	165 <u>X</u> NO	Deptil (iliches).		<u></u>
· · · · · · · · · · · · · · · · · · ·	auge, monitoring well, aerial photos,	previous inspections), if availab	ole:	
(includes capillary fringe) Describe Recorded Data (stream ga	auge, monitoring well, aerial photos,	previous inspections), if availab	ple:	
Remarks:				
Nemarks.				



EGETATION_ Us	se scientific name	es of plants.				Sam	pling Point:	w12 ((aka W2	.06)
			Absolute % Cover	Dominant Species	Indicator Status	Dominance Test W				
Tree Stratum	(Plot size: 30 Ft)	_			Number of Domina That Are OBL, FAC):	5	(A)
Acer rubrum			25	_ <u>Y</u>	FAC	Total Number of Do	minant			
Charle Charles	(5)	,	25	=Total Cover		Species Across all			6	(B)
Shrub Stratum	(Plot size: 30 Ft)	4.5	V	E4 014/	Dorsont of Dominor	at Cassias			_
Alnus serrulata Salix nigra			<u>15</u> 15	_ <u>Y</u> _	— FACW OBL	Percent of Dominar That Are OBL, FAC			83.3%	(A/B
			30	=Total Cover		Prevalence Index	Worksheet	:		
Herb Stratum	(Plot size: <u>6 Ft</u>)				Total % Cover	of:	Multip	oly by:	
Polygonum plebei			40	Υ	FACW	OBL species	15	x 1 =	15	
Cynodon dactylon			20	Υ	FACU	FACW species	70	x 2 =	140	
Boehmeria cylindri	са		15	Y	FACW	FAC species	25	x 3 =	75	
			75	=Total Cover		FACU species	20	x 4 =	80	
Vine Stratum_						UPL species	0	x 5 =	0	
						Column Totals:	130	(A) _	310	(B)
						Prevalence In	ndex = B/A=	·	2.38	
						Hydrophytic Vegeta	ation Indica	ators:		
						1 - Rapid Test f	for Hydroph	ytic Veg	getation	
						X 2 - Dominance	Test > 50%)		
						X 3 - Prevalence	Index ≤ 3.0			
						Problematic Hy	drophytic V	egetatio	on (Exp	olain)
						Indicators of hydric so be present, unless dis				
						Definitions of Veget	ation Strat	a:		
						Tree – Woody plants approximately 20 ft (6 (7.6 cm) or larger in c	6 m) or mor	e in heig	ght and	
						Sapling – Woody plan approximately 20 ft (6 than 3 in. (7.6 cm) DB	6 m) or mor			
						Shrub – Woody plant approximately 3 to 20				
						Herb – All herbaceou herbaceous vines, re- plants, except woody 3 ft (1 m) in height.	gardless of	size. In	cludes v	voody
						Woody vine – All woo	ody vines, re	egardles	ss of hei	ght.
						Hydrophytic Vegetation Preser	nt? Yes	Х	No	
marks: (Include photo	numbers here or on	a separate sheet.)							

SOIL Sampling Point: w12 (aka W206)

Profile Description: (Describe to the	depth needed to docume			confirm	the absence of Indicators.)	
Depth Matrix			Features		<u> </u>	
(inches) Color (moist)	% 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, F	RM=Reduced Martix, CS=	Covered o	r Coated S	Sand Gra	ains. ² Location: PL=Pore Lini	ing, 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)	Umbric Surface Delta Ochric (F Reduced Vertic	ace (S9) (LR Mineral (F1) Matrix (F2) ((F3) Inface (F6) Surface (F7 Isions (F8) R U) C (F11) (MLI e Masses (F E (F13) (LRF IT) (MLRA IT	RR S, T, U) (LRR O) (LRR O) (LRR O) (LRR C) (LRR C) (LRR C) (P, T, U) (P19) (MLR)	0, P, T) 0B) A 149A)	Indicators for Problematic 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outsi Piedmont Floodplain Soils (Anomalous Bright Loamy St (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface Other (Explain in Remarks) Indicators of hydrophytic hydrology must be prese unless disturbed or problems.	de MLRA 150A,B) F19) (LRR P, S, T) oils (F20) (TF12) (LRR T, U) vegetation and wetland
Restrictive Layer (if observed Type: Depth (inches): Remarks:	1):				Hydric Soil Present?	Yes X No

Project/Site: I-77		City/County:	Richland Co Sampling Date: 8/4/2014
Applicant/Owner: SCDO	Т		State: SC Sampling Point: up12
Investigators: Jamison			Section, Township, Range S T R
Landform (hillslope, terrace,	etc.): Toe of Slope	Local Relief (d	concave, convex, none): Concave Slope(%) 3
Subregion (LRRor MLRA):	P L	at: 80°55'48.012"W	Long: 34°4'27.856"N Datum: NAD 198
Soil Map Unit Name:			NWI Classification: up
Are climatic / hydrologic cond	ditions on the site typical fc	r this time of year? Yes	No X (If No, explain in Remarks)
Are Vegetation, Soil			Are "Normal Circumstances" present? Yes No X
Are Vegetation, Soil			
			(If needed, explain any answers in Remarks.) sint locations, transects, important features, etc.
		nap snowing sampling po	int locations, transects, important leatures, etc.
Hydrophytic Vegetation Pre	esent? Yes X No	Is the Sampled Area	a
Hydric Soil Present?		× within a Wetland?	Yes No X
Wetland Hydrology Presen	t? YesNo	X	<u></u>
HYDROLOGY			
Wetland Hydrology Indica		all the at a scale of	Secondary Indicators (minimum of two required)
Primary Indicators (minimur	n or one is required; check	ан тпат арріу)	Surface Soil Cracks (B6)
Surface Water (A1)		Aquatic Fauna (B13)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	L	Marl Deposits (B15) (LRR U)	Drainage Patterns (B10)
Saturation (A3) Water Marks (B1)	L	Hydrogen Sulfide Odor (C1)	Moss Trim Lines (B16) Dry-Season Water Table (C2)
Sediment Deposits (B2)		Oxidized Rhizospheres along Living R	Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3)		Presence of Reduced Iron (C4)	Cotumbias Visible on Assist Issue (CO)
Algal Mat or Crust (B4)		Recent Iron Reduction in Tilled Soils ((C6) Geomorphic Position (D2)
Iron Deposits (B5)		Thin Muck Surface (C7)	Shallow Aquitard (D3)
Inundation Visible on Aerial	Imagery (R7)	Other (Explain in Remarks)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	magery (D7)		Sphagnum moss (D8) (LRR T,U)
Field Observations:			
Surface Water Present?	Yes No X	Depth (inches):	
Water Table Present?	Yes No		
Saturation Present?	Yes No >		Wetland Hydrology Present? Yes No_X_
(includes capillary fringe)			
Describe Recorded Data (stream	gauge, monitoring well, aerial p	photos, previous inspections), if available	e:
Remarks:			



VEOLITATION -	Use scientific names of plants.	Absolute	Dominant	Indicator	Dominance Test Work				
Tree Stratum	(Plot size: 30 Ft)	<u>% Cover</u>	<u>Species</u>	<u>Status</u>	Number of Dominant S That Are OBL, FACW,	Species		1	(A)
Pinus taeda		30	Υ	FAC	mat Ale OBL, I ACVV,	or rac.	-		_ ` '
Shrub Stratum		30	=Total Cover		Total Number of Domin Species Across all Stra			1	(B)
Herb Stratum					Percent of Dominant Sp	oecies		100.00/	- (A (D)
Vine Stratum					That Are OBL, FACW,			100.0%	(A/B)
viile Gtiataini					Prevalence Index Wor	ksheet:			
					Total % Cover of:		Multi	oly 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	n Indica	tors:		
					1 - Rapid Test for H	Hydrophy	tic Ve	getation	
					X 2 - Dominance Tes	t > 50%			
					X 3 - Prevalence Inde	ex ≤ 3.0			
					Problematic Hydrop	ohytic Ve	egetation	on (Exp	olain)
					Indicators of hydric soil and be present, unless disturbe				
					Definitions of Vegetatio	n Strata	1:		
					Tree – Woody plants, exc approximately 20 ft (6 m) (7.6 cm) or larger in diam	or more	in hei	ght and	
					Sapling – Woody plants, approximately 20 ft (6 m) than 3 in. (7.6 cm) DBH.				
					Shrub – Woody plants, exapproximately 3 to 20 ft (
					Herb – All herbaceous (not herbaceous vines, regard plants, except woody vines 3 ft (1 m) in height.	dless of s	size. In	cludes v	voody
					Woody vine – All woody v	vines, re	gardle	ss of hei	ight.
					Hydrophytic Vegetation Present?	Yes	х	No	

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

disturbed area between road shoulder and wetland

SOIL Sampling Point: up12

	iption: (Des	Matrix	depth ne	eded to document		eatures	COMMITM	the absence of indicators.)	
Depth (inches)	Colo	(moist)	%	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	
¹Type: C=Cor	ncentration, [D=Depletion,	RM=Redu	uced Martix, CS=Co	overed or	Coated S	Sand Gra	nins. ² Location: PL=Pore Lini	ng, M=Matrix.
5 cm Muck Muck Presi 1 cm Muck Depleted B Thick Dark Coast Praii Sandy Muc Sandy Gley Sandy Red Stripped M	1) edon (A2) c (A3) Sulfide (A4) ayers (A5) dies (A6) (LRF y Mineral (A7) ence (A8) (LRR (A9) (LRR P, elow Dark Sur Surface (A12) rie Redox (A16 eky Mineral (S1 yed Matrix (S4) ox (S5)	(LRR P, T, U) R U) T) face (A11)) (MLRA 150A)) (LRR O, S)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surfa Depleted Dark Su Redox Depression Marl (F10) (LRR L Depleted Ochric (I Iron-Manganese M Umbric Surface (F Delta Ochric (F17 Reduced Vertic (F Piedmont Floodpl. Anomalous Bright	e (S9) (LRi heral (F1) (atrix (F2) F3) hee (F6) hrface (F7) hrs (F8) J) F11) (MLR Masses (F7) F13) (LRR) (MLRA 1 F18) (MLRA 1 F18) (MLRA 1	R S, T, U) LRR O) 12) (LRR C P, T, U) 51) A 150A, 15 F19) (MLR	0, P, T) 00B) A 149A)	Indicators for Problematic 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outsic Piedmont Floodplain Soils (f Anomalous Bright Loamy Sc (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (Other (Explain in Remarks) 3 Indicators of hydrophytic hydrology must be preser unless disturbed or problematical (TF2)	de MLRA 150A,B) F19) (LRR P, S, T) bils (F20) (TF12) (LRR T, U) vegetation and wetland
Restrict Type: Depth (inch		if observed	i):					Hydric Soil Present?	Yes No _X
Remarks:									

Project/Site: 1-77	City/C	ounty: Columbia		Sampling Date: <u>8/6/2014</u>
Applicant/Owner: SCDOT	-		tate: SC	Sampling Point: w13
Investigator(s): McMaster/Mulholland	Section			
Landform (hillslope, terrace, etc.):				Slope (%): >2
Subregion (LRR or MLRA): LRR T				
Soil Map Unit Name: W		zong		ation: Freshwater Pond
Are climatic / hydrologic conditions on the site typ	ical for this time of year? V			
Are Vegetation, Soil, or Hydrology	_			resent? Yes No
Are Vegetation, Soil, or Hydrology			plain any answers	
SUMMARY OF FINDINGS – Attach si	te map showing sam	ipling point location	is, transects,	important features, etc.
Hydrophytic Vegetation Present? Yes _	✓ No	Is the Sampled Area		
Hydric Soil Present? Yes _	✓ No	within a Wetland?	Yes V	No
Wetland Hydrology Present? Yes _	✓ No	The state of the s		
Remarks:				
HYDROLOGY				
Wetland Hydrology Indicators:				ors (minimum of two required)
Primary Indicators (minimum of one is required;			Surface Soil C	
Surface Water (A1)	Water-Stained Leaves	s (B9)		etated Concave Surface (B8)
✓ High Water Table (A2)	Aquatic Fauna (B13)	-	Drainage Patt	
Saturation (A3)	Marl Deposits (B15) (Moss Trim Lir	
Water Marks (B1)	Hydrogen Sulfide Odd Oxidized Rhizosphere			Vater Table (C2)
Sediment Deposits (B2)✓ Drift Deposits (B3)	Presence of Reduced		Crayfish Burro	sible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Recent Iron Reduction		Geomorphic F	
Iron Deposits (B5)	Thin Muck Surface (C		Shallow Aquit	
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Ren	-	FAC-Neutral 1	
Field Observations:				
Surface Water Present? Yes No _	✓ Depth (inches):			
Water Table Present? Yes <u>✓</u> No _	Depth (inches): 8.0	<u> </u>		
	✓ Depth (inches):		drology Present	? Yes No
(includes capillary fringe) Describe Recorded Data (stream gauge, monito	ring well serial photos pre	vious inspections) if avail-	ahla:	
Describe Necorded Data (stream gauge, monito	ring well, aerial priotos, pre	vious irispections), ir avain	able.	
Remarks:				
This wetland is part of a comple	ex system of stream	ns and pools exte	nding into a	rea outside of project
Time wedana ie part er a cempie	or order	io and poole oxio	inding into a	Tou outside of project

VEGETATION -	Use scientific n	ames of plants.
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EGETATION – Use scientific names of plan	IS.		Sampling Point: <u>W13</u>
	Absolute	Dominant Indicator	Dominance Test worksheet:
ree Stratum (Plot sizes: <u>30-ft</u>).		Species? Status	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:
11 01 1 20 ft		= Total Cover	Total % Cover of: Multiply by: OBL species x 1 =
apling Stratum(30-ft)			FACW species x 2 =
			FAC species x 3 =
			FACU species x 4 =
			UPL species x 5 =
			Column Totals: (A) (B)
-			Column Totals (A) (B)
-			Prevalence Index = B/A =
		= Total Cover	Hydrophytic Vegetation Indicators:
hrub Stratum(_30-ft)		- Total Cover	✓ 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:
lerb Stratum(15-ft)			Tree – Woody plants, excluding woody vines,
Woodwardia areolata	<u>75</u>		approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast
Asplenium platyneuron var. incisum		·	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.
			, , ,
0			Herb – All herbaceous (non-woody) plants, including
1			herbaceous vines, regardless of size. Includes
2			woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Voody Vine Stratum(_15-ft)	00	= Total Cover	approximatory one (1 m) in noight.
			Woody vine – All woody vines, regardless of height
-			Hydrophytic Vegetation
		= Total Cover	Present? Yes No
	_	I Oldi Oovoi	

SOIL Sampling Point: w13

Profile Desc	ription: (Describe	to the dep	th needed to docu	ment the	indicator	or confirm	n the absence	ce of indicators.)
Depth	Matrix			x Feature				
(inches)	Color (moist)	<u>%</u>	Color (moist)	%	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	С	M	Silt	Loam
		-		-			-	
	oncentration, D=Depl	etion, RM:	=Reduced Matrix, C	S=Covere	d or Coate	d Sand G		Location: PL=Pore Lining, M=Matrix.
Hydric Soil			Daharahaa Da	- I O f -	(00) (1	DD C T I		rs for Problematic Hydric Soils ³ :
Histosol	(A1) pipedon (A2)		Polyvalue Be Thin Dark St					n Muck (A9) (LRR O) n Muck (A10) (LRR S)
Black Hi			Loamy Muck					uced Vertic (F18) (outside MLRA 150A,B)
	n Sulfide (A4)		Loamy Gleye			,		mont Floodplain Soils (F19) (LRR P, S, T)
	l Layers (A5)		✓ Depleted Ma	. ,				malous Bright Loamy Soils (F20)
_	Bodies (A6) (LRR P,		Redox Dark					LRA 153B)
	icky Mineral (A7) (LR esence (A8) (LRR U							Parent Material (TF2) Shallow Dark Surface (TF12) (LRR T, U)
	ick (A9) (LRR P, T))	Redox Depre Marl (F10) (I		0)		•	er (Explain in Remarks)
	Below Dark Surface	e (A11)	Depleted Oc		(MLRA 1	51)	Ouie	er (Explain in Remarks)
Thick Da	ark Surface (A12)		Iron-Mangan	ese Mass	es (F12) (LRR O, P	T) ³ Ind	licators of hydrophytic vegetation and
	rairie Redox (A16) (N					, U)		vetland hydrology must be present.
-	lucky Mineral (S1) (L	.RR O, S)	Delta Ochric Reduced Ve			0 A 4 E O D	١	
-	edox (S5)		Piedmont Flo					
	Matrix (S6)		Anomalous I					3C, 153D)
Dark Su	rface (S7) (LRR P, S							
Restrictive I	_ayer (if observed):							
Type:								./
Depth (inc	ches):						Hydric Sc	oil Present? Yes No
Remarks:								

Project/Site: <u>I-77</u>		City/C	ounty: Columbia		_ Sampling Date:	8/6/2014
Applicant/Owner: SCDOT				State: SC	_ Sampling Point:	Up13
Investigator(s): McMaster/Mulhollan	d	Section	on, Township, Range: _			
Landform (hillslope, terrace, etc.):					Slo	pe (%): 0
Subregion (LRR or MLRA): LRR T						
Soil Map Unit Name: W		Lat	Long.		cation: none	itum.
·			/			
Are climatic / hydrologic conditions on the						
Are Vegetation, Soil, or Hy				al Circumstances"		▼ No
Are Vegetation, Soil, or Hy	drology	naturally problema	atic? (If needed,	explain any answe	ers in Remarks.)	
SUMMARY OF FINDINGS - Att	ach site n	nap showing sam	pling point locati	ons, transects	s, important f	eatures, etc.
Hydrophytic Vegetation Present?	Yes	No <u></u>	Is the Sampled Area			
Hydric Soil Present?	Yes	No <u></u> ✓	within a Wetland?		No ✓	
Wetland Hydrology Present? Remarks:	Yes	No <u></u>				_
Adjacent to w13 wetland da	па ропп.					
HYDROLOGY						
Wetland Hydrology Indicators:					ators (minimum of	two required)
Primary Indicators (minimum of one is re	•		(5-1)	Surface Soil		
Surface Water (A1)		Water-Stained Leave	s (B9)		egetated Concave	Surface (B8)
High Water Table (A2) Saturation (A3)		Aquatic Fauna (B13) Marl Deposits (B15) (I PP II\	Moss Trim L	atterns (B10)	
Water Marks (B1)		Hydrogen Sulfide Odd			Water Table (C2))
Sediment Deposits (B2)			es on Living Roots (C3)			,
Drift Deposits (B3)		Presence of Reduced			/isible on Aerial In	nagery (C9)
Algal Mat or Crust (B4)		Recent Iron Reductio	n in Tilled Soils (C6)	Geomorphic	Position (D2)	
Iron Deposits (B5)		Thin Muck Surface (C	27)	Shallow Aqu	uitard (D3)	
Inundation Visible on Aerial Imagery	(B7)	Other (Explain in Ren	narks)	FAC-Neutra	l Test (D5)	
Field Observations:	/					
Surface Water Present? Yes	No <u>√</u>					
		Depth (inches): Depth (inches):		Hardwala aya Dua a a		No ✓
(includes capillary fringe)	No <u>▼</u> _	_ Deptn (Inches):	wetiand	Hydrology Prese	nt? Yes	_ NO <u>*</u>
Describe Recorded Data (stream gauge	monitoring	well, aerial photos, pre	vious inspections), if av	ailable:		
Remarks:						
Remarks.						
1						

- 20 ft	Absolute	Dominant		Dominance Test worksheet:
<u>Tree Stratum</u> (Plot sizes: <u>30-ft</u>)		Species?		Number of Dominant Species
1. Melia azedarach		yes	UPL	That Are OBL, FACW, or FAC: 3 (A)
2. Morus rubra		yes	<u>FACU</u>	Total Number of Dominant
3. Pinus taeda	_ 5	yes	FAC	Species Across All Strata: 7 (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 43 (A/B)
6				(42)
7				Prevalence Index worksheet:
	25	= Total Co	ver	Total % Cover of: Multiply by:
Sapling Stratum (30-ft)				OBL species x 1 =
1				FACW species x 2 =
2.				FAC species x 3 =
3.				FACU species x 4 =
4				UPL species x 5 =
				Column Totals: (A) (B)
5				Column Totals (A) (B)
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)		= Total Co	ver	Dominance Test is >50%
	_	1400	LIDI	Prevalence Index is ≤3.0¹
1. Ligustrum sinense				Problematic Hydrophytic Vegetation ¹ (Explain)
2				Problematic Hydrophytic Vegetation (Explain)
3				1
4				¹ Indicators of hydric soil and wetland hydrology must be present.
5				be present.
6				
7				Definitions of Vegetation Strata:
	5	= Total Co	ver	
Herb Stratum (15-ft)				Tree – Woody plants, excluding woody vines,
1. Asplenium platyneuron	3	yes	<u>FACU</u>	approximately 20 ft (6 m) or more in height and
2				3 in. (7.6 cm) or larger in diameter at breast
3				height (DBH).
4				Sapling – Woody plants, excluding woody vines,
5.				approximately 20 ft (6 m) or more in height and less
6				than 3 in. (7.6 cm) DBH.
				11.6.1.0 11.1 (1.10 0.11) 2 2 1 11
7				Shrub – Woody plants, excluding woody vines,
8				approximately 3 to 20 ft (1 to 6 m) in height.
9				
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12				woody plants, except woody vines, less than
West-Vise Obstance / 45 ft	3	= Total Co	over	approximately 3 ft (1 m) in height.
Woody Vine Stratum (15-ft)	-		E 4 0	Woody vino
1. Vitis rotundifolia			FAC	Woody vine – All woody vines, regardless of height.
2. Gelsemium sempervirens	_ 2	yes	<u>FAC</u>	
3				
4				Hydrophytic
5				Vegetation
	7	= Total Co	ver	Present? Yes No
Remarks: (If observed, list morphological adaptations be	low)			1
Tremains. (ii observed, iist morphological adaptations be	iowj.			

SOIL Sampling Point: Up13

Profile Desc	cription: (Describe	to the dep	th needed to docu	ment the	indicator	or confire	m the absence	of indicato	ors.)	
Depth	<u>Matrix</u>			ox Feature		. 2				
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture		Remarks	
0-20	10YR: 4/3	90	10YR: 8/2	10	С	M	Silt	Loam		
					-					
					-	-				
	-					-	· 			<u> </u>
						-				
1- 0.0							. 21		Б 11.1	
Hydric Soil	oncentration, D=Dep	oletion, Rivi	=Reduced Matrix, C	S=Covere	d or Coate	ed Sand G			=Pore Lining, matic Hydric	
•			D		(00) (1				•	Solis .
Histosol	, ,		Polyvalue B					Muck (A9) (L	•	
	pipedon (A2) istic (A3)		Thin Dark S Loamy Muck					Muck (A10)		MLRA 150A,B)
	en Sulfide (A4)		Loamy Muci			(0)				(LRR P, S, T)
	d Layers (A5)		Depleted Ma		(1-2)				Loamy Soils	
	Bodies (A6) (LRR F	P. T. U)	Redox Dark		F6)			RA 153B)	Loanly cons	(1 20)
-	ucky Mineral (A7) (L							arent Mater	ial (TF2)	
	resence (A8) (LRR I		Redox Depr							12) (LRR T, U)
· 	uck (A9) (LRR P, T)	,	Marl (F10) (I		,			(Explain in I		, (, - ,
Deplete	d Below Dark Surfac	ce (A11)	Depleted Oc		(MLRA 1	51)		V 1	,	
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	ses (F12) (LRR O, P	, T) ³ Indic	ators of hyd	rophytic vege	tation and
	rairie Redox (A16) (', U)			ogy must be p	
	Mucky Mineral (S1) (LRR O, S)	Delta Ochric							
	Gleyed Matrix (S4)		Reduced Ve							
	Redox (S5)		Piedmont FI					\ . 450D\		
	Matrix (S6)	C T II)	Anomalous	Bright Loa	my Soils (F20) (ML)	RA 149A, 153C	;, 153D)		
	rface (S7) (LRR P, Layer (if observed)						1			
Type:										🗸
	ches):						Hydric Soil	Present?	Yes	No
Remarks:										

Project/Site: I-77		City/C	ounty: Columbia		_ Sampling Date	8/7/2014
Applicant/Owner: SCDOT			-	State: SC	_ Sampling Point	t: w14
Investigator(s): McMaster/Mulhol	lland	Section	on, Township, Range: _			
Landform (hillslope, terrace, etc.):					Slo	ope (%): 0
Subregion (LRR or MLRA): LRR						
Soil Map Unit Name: Jo					fication: none	
Are climatic / hydrologic conditions on	the site typical for	r this time of year? Y			·	
Are Vegetation, Soil,				al Circumstances"		√ No
				, explain any answ		
Are Vegetation, Soil, C			,		,	footuroo oto
SUMMARY OF FINDINGS –	Attach Site in	ap snowing sair	iping point locat		S, important i	eatures, etc.
Hydrophytic Vegetation Present?	Yes <u>√</u>	No	Is the Sampled Area	1		
Hydric Soil Present?	Yes <u>√</u>		within a Wetland?		✓ No	
Wetland Hydrology Present?	Yes <u>√</u>	No	The state of the s			
HYDROLOGY						
Wetland Hydrology Indicators:				Secondary India	cators (minimum c	of two required)
Primary Indicators (minimum of one	is required; check	all that annly)		Surface So		<u> ir two required)</u>
✓ Surface Water (A1)	-	Water-Stained Leave	c (P0)		egetated Concave	Surface (B8)
✓ High Water Table (A2)		Aquatic Fauna (B13)	5 (13)		egetated Concave atterns (B10)	; Surface (Bo)
Saturation (A3)		Marl Deposits (B15) (LRR U)	Moss Trim		
Water Marks (B1)		Hydrogen Sulfide Od			n Water Table (C2	2)
Sediment Deposits (B2)			es on Living Roots (C3			,
Drift Deposits (B3)		Presence of Reduced	-	•	Visible on Aerial I	magery (C9)
Algal Mat or Crust (B4)	1	Recent Iron Reductio	n in Tilled Soils (C6)	Geomorphi	c Position (D2)	
Iron Deposits (B5)		Thin Muck Surface (C	•	Shallow Aq	uitard (D3)	
Inundation Visible on Aerial Ima	gery (B7)	Other (Explain in Ren	narks)	FAC-Neutra	al Test (D5)	
Field Observations:	/ N	5 " " 1 \ 1 C	,			
		Depth (inches): 1.0				
		Depth (inches): 2.0 Depth (inches): 1.0		l Hydrology Prese	n+2 Vaa ✓	No
(includes capillary fringe)					mer res	
Describe Recorded Data (stream ga	uge, monitoring w	ell, aerial photos, pre	vious inspections), if a	vailable:		
Remarks:						

VEGETATION -	Use scientific	names of plants.
---------------------	----------------	------------------

Absolute Cover Species Statum Cover Cover Statum Cover Cover	Number of Dominant Species
	I Number of Dominant Species
Sapling Stratum (30-ft	Illat Ale Obl., FACW, ULFAC (A)
= Total Cover	Total Number of Dominant
apling Stratum (30-ft	Percent of Dominant Species
apling Stratum (30-ft	Prevalence Index worksheet:
Stratum (30-ft Stratum (30-ft Stratum (30-ft Scirpus cyperinus Solito	Total % Cover of: Multiply by:
### Total Cover #### Stratum (30-ft	OBL species x 1 =
### Total Cover #### Stratum (30-ft	FACW species x 2 =
hrub Stratum (30-ft	FAC species x 3 =
hrub Stratum (30-ft	FACU species x 4 =
Total Cover	
Total Cover	
Total Cover	
Total Cover	Prevalence Index = B/A =
Shrub Stratum (30-ft	Hydrophytic Vegetation Indicators:
Scirpus cyperinus Some of the stratum of the st	✓ Dominance Test is >50%
Scirpus cyperinus Solution	
Scirpus cyperinus 80	Problematic Hydrophytic Vegetation ¹ (Explain)
Scirpus cyperinus Some of the stratum (15-ft	
Scirpus cyperinus Some of the stratum (15-ft	Indicators of hydric soil and wetland hydrology must be present.
Scirpus cyperinus 80	
15-ft 15-f	Definitions of Vegetation Strata:
Scirpus cyperinus 80 yes OB	
. Scirpus cyperinus 80 yes OB Typha latifolia 5 no OB . Typha latifolia 6	Tree – Woody plants, excluding woody vines,
Typha latifolia 5 no OB Typha latifolia 6 no	
0	3 in. (7.6 cm) or larger in diameter at breast
5	height (DBH).
5	—— Sapling – Woody plants, excluding woody vines,
0	approximately 20 ft (6 m) or more in height and less
8	than 3 in. (7.6 cm) DBH.
0	Shrub – Woody plants, excluding woody vines,
0	approximately 3 to 20 ft (1 to 6 m) in height.
1	—
2	Herb – All herbaceous (non-woody) plants, including
<u>85</u> = Total Cover Voody Vine Stratum (15-ft)	herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than
Voody Vine Stratum(_15-ft)	approximately 3 ft (1 m) in height.
·	, , , , , , , , , , , , , , , , , , ,
	Woody vine – All woody vines, regardless of heigh
N	
l	
·	
5	Hydrophytic
= Total Cover	— Vegetation Present? Yes No
Remarks: (If observed, list morphological adaptations below).	

SOIL Sampling Point: w14

Profile Desc	ription: (Describe	to the dep	th needed to doc	ument the	indicator	or confirn	n the absence	e of indicators.)		
Depth	Matrix			dox Feature						
(inches)	Color (moist)		Color (moist)	%	Type ¹	Loc ²	Texture		marks	
0-3	10YR: 1/2	100					Silt	Loam		
3-22	10YR5/2	97	10YR: 6/6	3	C	M	Sand	Loam		
					- '					_
			-							
	-									
	-									
	oncentration, D=Dep	letion, RM=	Reduced Matrix,	CS=Covere	d or Coate	ed Sand G		ocation: PL=Pore I		
Hydric Soil I			Dalamakia	D = 1 = 1	(00) (1	DD C T I			=	olis :
Histosol	(A1) pipedon (A2)		Polyvalue I Thin Dark					Muck (A9) (LRR 0) Muck (A10) (LRR \$	-	
Black Hi			Loamy Mu					ced Vertic (F18) (o		LRA 150A,B)
	n Sulfide (A4)		Loamy Gle			-,		nont Floodplain Soi		
	l Layers (A5)		Depleted N	latrix (F3)			Anom	alous Bright Loam	y Soils (F	20)
	Bodies (A6) (LRR P		Redox Dar				-	.RA 153B)		
	cky Mineral (A7) (LI esence (A8) (LRR U							Parent Material (TF. Shallow Dark Surfa		\
	ck (A9) (LRR P, T)	')	Redox Dep Marl (F10)		-0)			รกลแอพ บลเห Suna ์ (Explain in Remar)(LRR 1, U)
	Below Dark Surfac	e (A11)	Depleted C		(MLRA 1	51)	Other	(Explain in Remai	N5)	
Thick Da	rk Surface (A12)		Iron-Manga	anese Mass	ses (F12) (LRR O, P,	, T) ³ Indic	cators of hydrophyt	ic vegetat	tion and
	airie Redox (A16) (I					, U)		etland hydrology mu	_	
-	lucky Mineral (S1) (I	LRR O, S)	Delta Ochr Reduced V			0A 150D)				
-	edox (S5)		Piedmont F							
-	Matrix (S6)		Anomalous					C, 153D)		
	face (S7) (LRR P, S									
Restrictive I	_ayer (if observed)									
Type:									/	
Depth (inc	ches):						Hydric Soi	I Present? Yes		No
Remarks:										

Project/Site: 1-77	City/County: _	Columbia	Sampling Date: 8/7/2014
Applicant/Owner: SCDOT		State: SC	Sampling Point: Up14
Investigator(s): McMaster/Mulholland	Section, Town		_ , , ,
Landform (hillslope, terrace, etc.):			Slope (%): 0
Subregion (LRR or MLRA): LRR T			
Soil Map Unit Name: _J0	Lat 1.0.1000 .		fication: none
· -	nicel for this time of year? Ves		<u> </u>
Are climatic / hydrologic conditions on the site ty			
Are Vegetation, Soil, or Hydrolo			" present? Yes No
Are Vegetation, Soil, or Hydrolo	y naturally problematic?	(If needed, explain any ansv	vers in Remarks.)
SUMMARY OF FINDINGS - Attach	ite map showing sampling	point locations, transec	ts, important features, etc.
Hydric Soil Present? Yes	No 🗸	Sampled Area a Wetland? Yes	No <u> </u>
Remarks:	·		
Adjacent to w14 wetland data p	oint.		
LIVER OF COMMENT			
HYDROLOGY		Canan dami la di	
Wetland Hydrology Indicators:	: chook all that apply)		cators (minimum of two required)
Primary Indicators (minimum of one is required		Surface So	
Surface Water (A1) High Water Table (A2)	Water-Stained Leaves (B9) Aquatic Fauna (B13)		regetated Concave Surface (B8) Patterns (B10)
Saturation (A3)	Marl Deposits (B15) (LRR U)		Lines (B16)
Water Marks (B1)	Hydrogen Sulfide Odor (C1)		n Water Table (C2)
Sediment Deposits (B2)	Oxidized Rhizospheres on Liv		urrows (C8)
Drift Deposits (B3)	Presence of Reduced Iron (C4		Visible on Aerial Imagery (C9)
Algal Mat or Crust (B4)	Recent Iron Reduction in Tille		ic Position (D2)
Iron Deposits (B5)	Thin Muck Surface (C7)		quitard (D3)
Inundation Visible on Aerial Imagery (B7)	Other (Explain in Remarks)	FAC-Neutr	
Field Observations:			
Surface Water Present? Yes No	Depth (inches):	_	
Water Table Present? Yes No	Depth (inches):	_	,
Saturation Present? Yes No (includes capillary fringe)	Depth (inches):	Wetland Hydrology Pres	ent? Yes No <u></u> ✓
Describe Recorded Data (stream gauge, moni	oring well, aerial photos, previous ins	pections), if available:	
Remarks:			

Tree Stratum (Plot sizes: 30-ft

1				That Are OBL, FACW, or FAC: (A)
2				Total Number of Dominant Species Across All Strata: 5 (B)
4.				(5)
5				Percent of Dominant Species That Are OBL, FACW, or FAC: 40 (A/B)
6				Prevalence Index worksheet:
7				Total % Cover of: Multiply by:
Continue Charatrans / 30-ft		_ = Total (Cover	OBL species x 1 =
Sapling Stratum (30-ft)	4.5	1400	LIDI	
1. Rhus copalina				FACW species x 2 =
2. <u>Liquidambar styraciflua</u>				FAC species x 3 =
3				FACU species x 4 =
4				UPL species x 5 =
5				Column Totals: (A) (B)
6				Prevalence Index = B/A =
7				Hydrophytic Vegetation Indicators:
Shrub Stratum (30-ft)	_20	_ = rotar (Cover	Dominance Test is >50%
1. Rubus trivialis	20	ves	Dominance Test is >50% FACU Prevalence Index is ≤3.0¹	
2				Problematic Hydrophytic Vegetation ¹ (Explain)
3				
4				¹ Indicators of hydric soil and wetland hydrology must
5.				be present.
6.				
7				Definitions of Vegetation Strata:
		= Total (Cover	ŭ
Herb Stratum (15-ft)		10101	00101	Tree – Woody plants, excluding woody vines,
1				approximately 20 ft (6 m) or more in height and
2				3 in. (7.6 cm) or larger in diameter at breast
3.				height (DBH).
4.				Conling West place and discuss during
5.				Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less
6.				than 3 in. (7.6 cm) DBH.
7				
				Shrub – Woody plants, excluding woody vines,
8 9.				approximately 3 to 20 ft (1 to 6 m) in height.
10				Herb – All herbaceous (non-woody) plants, including
11				herbaceous vines, regardless of size. Includes
12				woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody Vine Stratum (15-ft)		= Total (Cover	approximately on (1 m) in neight.
1. Vitis rotundifolia	10	ves	FAC	Woody vine – All woody vines, regardless of height.
2. Ipmoea purpurea		ves	UPL	
3				
4				Hydrophytic
				Vegetation Present? Yes No
5	_20	= Lotal (Cover	Present? Yes No

Absolute Dominant Indicator <u>% Cover Species? Status</u>

SOIL Sampling Point: Up14

Profile Desc	cription: (Describe	to the dep	th needed to docu	ment the	indicator	or confirm	m the absence	of indicate	ors.)	
Depth	Matrix			ox Feature		. 2				
(inches)	Color (moist)		Color (moist)	%	Type ¹	_Loc ²	Texture		Remarks	
0-22	10YR: 4/3	80	10YR: 6/4	20	С	M	Silt	Loam		
					-					
	-		-			-	· 			<u> </u>
1- 0.0							. 21		Б 1	
Hydric Soil	oncentration, D=De	pletion, Rivi	=Reduced Matrix, C	S=Covere	d or Coate	ed Sand G			=Pore Lining, matic Hydric	
•					(00) (1					Solis .
Histosol	, ,		Polyvalue B					Muck (A9) (L	•	
	pipedon (A2) istic (A3)		Thin Dark S Loamy Mucl					Muck (A10)		MI DA 150A DI
	en Sulfide (A4)		Loamy Gley			(0)				MLRA 150A,B) (LRR P, S, T)
	d Layers (A5)		Depleted Ma		(1-2)				Loamy Soils	
	Bodies (A6) (LRR I	P. T. U)	Redox Dark		F6)			RA 153B)	Loanly Colls	(1 20)
-	ucky Mineral (A7) (L							arent Mater	ial (TF2)	
	resence (A8) (LRR I		Redox Depr							12) (LRR T, U)
· 	uck (A9) (LRR P, T)	,	Marl (F10) (,			(Explain in		, (, - ,
Deplete	d Below Dark Surface	ce (A11)	Depleted Oc		(MLRA 1	51)		V 1	,	
Thick Da	ark Surface (A12)		Iron-Mangar	nese Mass	ses (F12) ((LRR O, P	, T) ³ Indic	ators of hyd	rophytic vege	tation and
	rairie Redox (A16) (ogy must be p	
	Mucky Mineral (S1)	LRR O, S)	Delta Ochric							
	Gleyed Matrix (S4)		Reduced Ve							
	Redox (S5)		Piedmont FI					\ . 450D\		
	Matrix (S6)	C T II)	Anomalous	Bright Loa	my Soils (F20) (IVILI	RA 149A, 153C	;, 153D)		
	rface (S7) (LRR P, Layer (if observed)						1			
Type:										🗸
	ches):						Hydric Soil	Present?	Yes	No
Remarks:										

Landform (hillslope, terrace, etc.): Toe of Slope Lat: 34 5.33 Long: Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation Soil Hydrology Are Vegetation, Soil Hydrology, naturally problematic? Are Vegetation Soil Hydrology, naturally problematic? (If ne SUMMARY OF FINDINGS - Attach a site map showing sampling point loce Hydrophytic Vegetation Present? Yes No Hydrology Present Sulfact Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3 Sediment Deposits (B2) Presence of Reduced Iron (C4) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Thin Muck Surface (C7) Thin Muck Surface (C7) Water-Stained Leaves (B9) Field Observations:	State: SC Sampling Point: w15 In, Township, Range S T R Inconvex, none): Concave Slope(%) 80 56.95 Datum: NWI Classification: PFO X (If No, explain in Remarks) In the state of the s
Landform (hillslope, terrace, etc.): Toe of Slope Lat: 34 5.33 Long: Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation Soil Hydrology Are Vegetation, Soil Hydrology Are Vegetation, Soil Hydrology Are Vegetation, Soil Hydrology Are Vegetation, Soil Hydrology Are No Are Vegetation, Soil Hydrology Are No Are Vegetation, Soil Hydrology Are No Are Vegetation Are Vegetation Present? Yes No Hydrology Are No Hydrology Present? Yes No Hydrology Present? Yes No Hydrology Present? Yes No Hydrology Present? Yes No Soul Hydrology Present? Yes No Hydrology Present (Solice Prince Wetland Hydrology Present) Hydrology Present (Solice Prince Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) Hydrogen Sulfide Odor (C1) Hydrology Saturation (A3) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) Presence of Reduced Iron (C4) Presence of Reduced Iron (C4) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Other (Explain in Remarks) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	convex, none): Concave Slope(%) 80 56.95 Datum: NWI Classification: PFO X (If No, explain in Remarks) rmal Circumstances" present? Yes X No eded, explain any answers in Remarks.) ations, transects, important features, etc.
Subregion (LRRor MLRA): P Lat: 34 5.33 Long: Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation Soil Hydrology significantly disturbed? Are "No Are Vegetation Soil Hydrology naturally problematic? (If ne SUMMARY OF FINDINGS - Attach a site map showing sampling point loce Hydrophytic Vegetation Present? Yes X No Is the Sampled Area within a Wetland? Hydrology Present? Yes X No Is the Sampled Area within a Wetland? Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3) Sediment Deposits (B2) Presence of Reduced non (C4) Presence of Reduced non (C4) Thin Muck Surface (C7) Info Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Other (Explain in Remarks) Hydroger Sulfide Observations:	NWI Classification: PFO X (If No, explain in Remarks) rmal Circumstances" present? Yes X No ded, explain any answers in Remarks.) ations, transects, important features, etc.
Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation , Soil , Hydrology , significantly disturbed? Are "No Are Vegetation , Soil , Hydrology , naturally problematic? (If ne SUMMARY OF FINDINGS - Attach a site map showing sampling point loc Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Aquatic Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3 Saturation (A3) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3 Sediment Deposits (B3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Other (Explain in Remarks) Field Observations:	NWI Classification: PFO X (If No, explain in Remarks) rmal Circumstances" present? Yes X No eded, explain any answers in Remarks.) ations, transects, important features, etc.
Soil Map Unit Name: Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation Soil Hydrology Significantly disturbed? Are "No Are Vegetation Soil Hydrology Indicators Attach a site map showing sampling point loce. Hydrophytic Vegetation Present? Yes X No Hydrology Present? Yes X No Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) Aquatic Fauna (B13) Hydrogen Sulfide Odor (C1) Water Marks (B1) Oxidized Rhizospheres along Living Roots (C3 Sediment Deposits (B2) Presence of Reduced Irro (C4) Presence of Reduced Irro (C4) Irron Deposits (B5) Other (Explain in Remarks) Field Observations:	X (If No, explain in Remarks) rmal Circumstances" present? Yes X No ded, explain any answers in Remarks.) ations, transects, important features, etc.
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No Are Vegetation , Soil , Hydrology , significantly disturbed? Are "No Are Vegetation , Soil , Hydrology , naturally problematic? (If ne SUMMARY OF FINDINGS - Attach a site map showing sampling point loc Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Qxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Qther (Explain in Remarks) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	X (If No, explain in Remarks) rmal Circumstances" present? Yes X No ded, explain any answers in Remarks.) ations, transects, important features, etc.
Are Vegetation, Soil, Hydrology, significantly disturbed? Are "No	rmal Circumstances" present? Yes X No ded, explain any answers in Remarks.) ations, transects, important features, etc.
Are Vegetation, Soil, Hydrology, naturally problematic? (If ne SUMMARY OF FINDINGS - Attach a site map showing sampling point loc Hydrophytic Vegetation Present? YesX No Hydric Soil Present? YesX No Wetland Hydrology Present? YesX No Butling a Wetland? Hydrology Present? YesX No Butling a Wetland?	ations, transects, important features, etc.
SUMMARY OF FINDINGS - Attach a site map showing sampling point loc Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No Wetland Hydrology Present? Yes X No His the Sampled Area within a Wetland? Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Vater Marks (B1) Oxidized Rhizospheres along Living Roots (C3 Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Iron Deposits (B5) Other (Explain in Remarks) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	ations, transects, important features, etc.
Hydrophytic Vegetation Present? Yes X No Hydric Soil Present? Yes X No Wetland Hydrology Present? Yes X No Wetland Hydrology Present? Yes X No HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) Aquatic Fauna (B13) High Water Table (A2) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Oxidized Rhizospheres along Living Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	
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Hydric Soil Present? Wetland Hydrology Present? Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) Water Marks (B1) 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) Field Observations:	Yes <u>X</u> 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) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	Yes <u>X</u> No
Remarks: HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Oxidized Rhizospheres along Living Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	
Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1)	
Primary Indicators (minimum of one is required; check all that apply) Surface Water (A1) High Water Table (A2) Marl Deposits (B15) (LRR U) Saturation (A3) Hydrogen Sulfide Odor (C1) Water Marks (B1) Oxidized Rhizospheres along Living Roots (C3) Sediment Deposits (B2) Presence of Reduced Iron (C4) Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Algal Mat or Crust (B4) Thin Muck Surface (C7) Iron Deposits (B5) Other (Explain in Remarks) Hundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9)	
High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Innudation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) 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)
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) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C3) Presence of Reduced Iron (C4) Presence of Reduced Iron (C4) Thin Muck Surface (C7) Other (Explain in Remarks)	Sparsely Vegetated Concave Surface (B8)
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) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Drainage Patterns (B10)
Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks)	Moss Trim Lines (B16)
Drift Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	Dry-Season Water Table (C2)
Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	Crayfish Burrows (C8)
☐ Iron Deposits (B5) ☐ Other (Explain in Remarks) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) Field Observations:	Saturation Visible on Aerial Imag.(C9) Geomorphic Position (D2)
Inundation Visible on Aerial Imagery (B7) Water-Stained Leaves (B9) Field Observations:	Shallow Aquitard (D3)
Water-Stained Leaves (B9) Field Observations:	FAC-Neutral Test (D5)
Field Observations:	Sphagnum moss (D8) (LRR T,U)
Surface Water Present? Yes No X Depth (inches):	
Surface Water Present? Yes No _X Depth (inches):	
Saturation Present? Yes X No Depth (inches): 1	Wetland Hydrology Present? Yes X No
(includes capillary fringe)	
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 Po	nt: w15	5 (aka W2	211)
		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Workshe	et:		
Tree Stratum Acer rubrum	(Plot size: <u>30 Ft</u>)	80	Y	FAC	Number of Dominant Speci That Are OBL, FACW, or F		3	(A)
		80	=Total Cover		Total Number of Dominant Species Across all Strata:		3	(B)
Shrub Stratum	(Plot size: <u>30 Ft</u>)					_		_ ` ´
Alnus serrulata		40	Y =Total Cover	FACW	Percent of Dominant Specie That Are OBL, FACW, or FA		100.0%	(A/B)
Herb Stratum	(Plot size: 6 Ft)				Prevalence Index Worksho	et:		
Woodwardia ar	,,	70	Υ	OBL	Total % Cover of:	Mulf	tiply by:	
		70	=Total Cover	-	OBL species 70	x 1 =	70	
Vine Stratum_					FACW species 40	x 2 =	80	
					FAC species 80	x 3 =	240	
					FACU species 0	x 4 =	= 0	
					UPL species0	x 5 =	0	
					Column Totals: 190	(A)	390	(B)
					Prevalence Index = B	⁄A=	2.05	
					Hydrophytic Vegetation Inc	licators:		
					1 - Rapid Test for Hydro	phytic Ve	egetation	
					X 2 - Dominance Test > 5	0%		
				X 3 - Prevalence Index ≤ 3	3.0			
					Problematic Hydrophytic		tion (Ev	nlain)
					Indicators of hydric soil and wet	land hydro	ology must	piairi)
					be present, unless disturbed or	•	ic.	
					Definitions of Vegetation St			
					Tree – Woody plants, excluding approximately 20 ft (6 m) or m (7.6 cm) or larger in diameter	nore in he	eight and	
					Sapling – Woody plants, exclusive approximately 20 ft (6 m) or m than 3 in. (7.6 cm) DBH.			
					Shrub – Woody plants, excludapproximately 3 to 20 ft (1 to			
					Herb – All herbaceous (non-wherbaceous vines, regardless plants, except woody vines, le 3 ft (1 m) in height.	of size.	Includes v	woody
					Woody vine – All woody vines	, regardl	ess of he	ight.
					Hydrophytic Vegetation Present? Υ	es X	No	
emarks: (Include ph	oto numbers here or on a separate shee	t.)						

SOIL Sampling Point: w15 (aka W211)

		City/County:	Richland Co Sampling Date: 8/4/2014
Applicant/Owner: SCDOT			State: SC Sampling Point: up15
Investigators: Jamison		S	ection, Township, Range S T R
Landform (hillslope, terrace, et	tc.): Toe of Slope	Local Relief (con	ncave, convex, none): Concave Slope(%) 6
Subregion (LRRor MLRA): P	Lat: 3	4 5.33 Lo	ong: -80 56.97 Datum: NAD 83
Soil Map Unit Name:			NWI Classification:
· ——	tions on the site typical for this t	ime of year? Yes	No X (If No, explain in Remarks)
	X_, Hydrology, signific		e "Normal Circumstances" present? Yes X No
		ly problematic?	· — —
Are vegetation, Soil _	, Hydrology, natural	ly problematic? ((If needed, explain any answers in Remarks.)
SUMMARY OF FINDIN	GS - Attach a site map s	showing sampling point	t locations, transects, important features, etc.
Hydrophytic Vegetation Pres	ent? Yes X No		
Hydric Soil Present?	Yes No X	Is the Sampled Area	
Wetland Hydrology Present?		within a Wetland?	Yes NoX
Remarks: Adjacent to w15 w	100 X	-	
HYDROLOGY Wetland Hydrology Indicator		t apply)	Secondary Indicators (minimum of two required)
Primary Indicators (minimum	of one is required; check all tha	t apply)	Surface Soil Cracks (B6)
Surface Water (A1)	Aqua	tic Fauna (B13)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)	Marl	Deposits (B15) (LRR U)	Drainage Patterns (B10)
Saturation (A3)		ogen Sulfide Odor (C1)	Moss Trim Lines (B16)
Water Marks (B1)		zed Rhizospheres along Living Root	Dry-Season Water Table (C2) Crayfish Burrows (C8)
Sediment Deposits (B2) Drift Deposits (B3)		ence of Reduced Iron (C4)	Saturation Visible on Aerial Imag (CO)
Algal Mat or Crust (B4)		ent Iron Reduction in Tilled Soils (C6)	Geomorphic Position (D2)
Iron Deposits (B5)		Muck Surface (C7)	Shallow Aquitard (D3)
Inundation Visible on Aerial Im		r (Explain in Remarks)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	agory (<i>D1</i>)		Sphagnum moss (D8) (LRR T,U)
Field Observations:			
	Yes No X	Depth (inches):	
			_
Saturation Present?		Depth (inches):	Wetland Hydrology Present? Yes No_X_
(includes capillary fringe)			
Surface Water Present? Water Table Present? Saturation Present? (includes capillary fringe)	Yes No X		Wetland Hydrology Present? Yes No_X



·	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet:	
<u>Tree Stratum</u> (Plot size: <u>30 Ft</u>)	<u> 78 COVEI</u>	<u>opecies</u>	Status	Number of Dominant Species That Are OBL, FACW, or FAC: 3	(A)
Pinus taeda	70	Y	FAC		
Shrub Stratum	70	=Total Cover		Total Number of Dominant Species Across all Strata: 3	(B)
Herb Stratum (Plot size: 6 Ft)				Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0%	(A/B)
Toxicodendron radicans	25	Y	FAC	Prevalence Index Worksheet:	
	25	=Total Cover		Total % Cover of: Multiply by:	
Vine Stratum (Plot size: 30 Ft)					
Smilax rotundifolia	15	Y	FAC	OBL species	
	15	=Total Cover		140 × 2 = 220	
				1 AC species	
				1 ACO species	
				Of L species	
				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 (Exp	olain)
				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 (7.6 cm) or larger in diameter at breast height (D	3 in.)BH).
				Sapling – Woody plants, excluding woody vines approximately 20 ft (6 m) or more in height and 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, incluherbaceous vines, regardless of size. Includes viplants, except woody vines, less than approxima 3 ft (1 m) in height.	voody
				Woody vine – All woody vines, regardless of hei	ght.
Remarks: (Include photo numbers here or on a separate she	et.)			Hydrophytic Vegetation Present? Yes X No	

SOIL Sampling Point: up15

Profile Descrip Depth	tion: (Describe to the o Matrix	lepth need	ded to document		icator or eatures	confirm t	the absence of Indicators.)	
(inches)	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
to	1							soil unavailable - riprapped
¹Type: C=Conce	entration, D=Depletion, F	RM=Reduc	ed Martix, CS=Co	vered or	Coated	Sand Grain	ns. ² Location: PL=Pore Lining	ı, M=Matrix.
5 cm Mucky N Muck Presence 1 cm Muck (A Depleted Below Thick Dark St Coast Prairie Sandy Mucky Sandy Gleyect Sandy Redox Stripped Matr	on (A2) A3) fide (A4) ers (A5) es (A6) (LRR P, T, U) dineral (A7) (LRR P, T, U) ee (A8) (LRR U) 9) (LRR P, T) ow Dark Surface (A11) urface (A12) Redox (A16) (MLRA 150A) Mineral (S1) (LRR O, S) I Matrix (S4) (S5) ix (S6)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surface Depleted Dark Surface Marl (F10) (LRR U Depleted Ochric (F Iron-Manganese M Umbric Surface (F Delta Ochric (F17) Reduced Vertic (F	e (S9) (LRI eral (F1) (trix (F2) F3) ce (F6) rface (F7) is (F8) J) F11) (MLF Masses (F F13) (LRR) (MLRA 1	R S, T, U) LRR O) 12) (LRR O P, T, U) 51) A 150A, 15	, P, T) 0B)	Indicators for Problematic H	MLRA 150A,B) 9) (LRR P, S, T) s (F20) =12) (LRR T, U) getation and wetland
Restrictive	e Layer (if observed)	:	Anomalous Bright	Loamy So	oils (F20) (I	MLRA 149A		res No X
Depth (inches Remarks: riprapped slope -	no soil readily-available							

Applicant/Owner: SCDOT		City/County: Rich	land Co Sampling Date: 8/4	/2014
			State: SC Sampling Point: w1	6
Investigators: Jamison		Section	on, Township, Range S T	R
Landform (hillslope, terrace, etc.	.): Toe of Slope	Local Relief (concav	e, 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 condition	one on the cite typical for this t	ime of year? Yes No	X (If No, explain in Remarks)	
	••	• ——		V Na
Are Vegetation, Soil			ormal Circumstances" present? Yes	X No
Are Vegetation, Soil	, Hydrology, natural	ly problematic? (If no	eded, explain any answers in Remarks.)	
SUMMARY OF FINDING	SS - Attach a site map s	showing sampling point lo	cations, transects, important fea	tures, etc.
Hydrophytic Vegetation Preser	nt? Yes X No			
Hydric Soil Present?		Is the Sampled Area		
Wetland Hydrology Present?	Yes X No	within a Wetland?	Yes X No	
Welland Hydrology Fresent?	Yes X No	-		
HYDROLOGY				
Wetland Hydrology Indicator	's:		Secondary Indicators (minimum of	two required)
Primary Indicators (minimum of	f one is required; check all tha	t apply)	Surface Soil Cracks (B6)	
Surface Water (A1)	Aqua	tic Fauna (B13)	Sparsely Vegetated Concave Sur	face (B8)
High Water Table (A2)	Marl	Deposits (B15) (LRR U)	Drainage Patterns (B10)	
Saturation (A3)	☐ Hydro	ogen Sulfide Odor (C1)	Moss Trim Lines (B16)	
Water Marks (B1)	Oxidi	zed Rhizospheres along Living Roots (C		
Sediment Deposits (B2)	Prese	ence of Reduced Iron (C4)	Crayfish Burrows (C8)	(00)
Drift Deposits (B3) Algal Mat or Crust (B4)		ent Iron Reduction in Tilled Soils (C6)	Saturation Visible on Aerial ImagGeomorphic Position (D2)	.(C9)
Iron Deposits (B5)		Muck Surface (C7)	Shallow Aquitard (D3)	
Inundation Visible on Aerial Imag		r (Explain in Remarks)	FAC-Neutral Test (D5)	
Water-Stained Leaves (B9)	y, (,		Sphagnum moss (D8) (LRR T,U)	
Field Observations:		Depth (inches):		
<u> </u>	Yes No X			
Field Observations: Surface Water Present? Water Table Present?		. , , ,		
Surface Water Present?	Yes No _X	Depth (inches): Depth (inches): 9	Wetland Hydrology Present? Yes	_X_ No
Water Table Present?	Yes No YesX No	Depth (inches): 9	Wetland Hydrology Present? Yes	_X_ No



·	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet:
<u>Tree Stratum</u> (Plot size: 30 Ft)	70 00101	Opcoics	<u> Otatus</u>	Number of Dominant Species
Acer rubrum	50	Υ	FAC	That Are OBL, FACW, or FAC:8 (A)
Pinus taeda		- ' <u>'</u>	FAC	Total Number of Dominant
Nyssa sylvatica		- <u>'</u>	FAC	Species Across all Strata: 8 (B)
Quercus phellos		- ' <u>'</u>	FACW	
Liquidambar styraciflua		N	FAC	Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)
	115	=Total Cover		· · ·
Shrub Stratum (Plot size: 30 Ft)				Prevalence Index Worksheet:
Shrub Stratum (Plot size: <u>30 Ft</u>) Liquidambar styraciflua	5	N	FAC	Total % Cover of: Multiply by:
				OBL species10 x 1 =10
		_=Total Cover		FACW species10 x 2 =20
Herb Stratum (Plot size: <u>6 Ft</u>)				FAC species160 x 3 =480
Toxicodendron radicans		Y	FAC	FACU species0 x 4 =0
Woodwardia areolata	10	Y	OBL	UPL species
	30	_=Total Cover		Of L species
Vine Stratum (Plot size: 30 Ft)				Column Totals: 180 (A) 510 (B)
Smilax rotundifolia	20	Y	FAC	Prevalence Index = B/A= 2.83
Vitis rotundifolia	10	Y	FAC	Hydrophytic Vegetation Indicators:
	30	_=Total Cover		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.
Remarks: (Include photo numbers here or on a separate sheet.)			Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point: w16 (aka W222)

Depth	iption: (Dec	Matrix	асрит по	eded to document		Features	0011111111	the absence of indicators.				
(inches)	Colo	r (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Rema	arks		
0 to 3	10YR	4/2	100					FINE SANDY LOAM		-		
3 to 13	10YR	2/1						SANDY CLAY LOAM				
¹Type: C=Con	centration, I	D=Depletion,	RM=Red	uced Martix, CS=Co	overed o	r Coated	Sand Gra	ins. ² Location: PL=Pore Lining,	M=Matrix.			
Hydric Soil I				Polyvalue Below S	Surface (S	88) (LRR S,	T, U)	Indicators for Problematic Hyd	dric Soils:	3		
Histosol (A	•			☐ Thin Dark Surface	e (S9) (LR	R S, T, U)		1 cm Muck (A9) (LRR O)				
Black Histic				Loamy Mucky Min	eral (F1)	(LRR O)		2 cm Muck (A10) (LRR S)				
Hydrogen S				Loamy Gleyed Ma	atrix (F2)			Reduced Vertic (F18) (outside M		•		
Stratified La				✓ Depleted Matrix (F	- 3)			Piedmont Floodplain Soils (F19)	•	Γ)		
	dies (A6) (LRI	R P, T, U)		Redox Dark Surfa	ce (F6)			Anomalous Bright Loamy Soils ((MLRA 153B)	F20)			
5 cm Mucky	y Mineral (A7)	(LRR P, T, U)		Depleted Dark Su	rface (F7)		Red Parent Material (TF2)				
☐ Muck Prese	ence (A8) (LRI	₹ U)		Redox Depression	ns (F8)			Very Shallow Dark Surface (TF1	2) (LRR T. U	J)		
1 cm Muck	(A9) (LRR P,	T)		Marl (F10) (LRR U	J)			Other (Explain in Remarks)	, ,	,		
Depleted Be	elow Dark Sur	face (A11)		Depleted Ochric (•	RΔ 151)		_ , ,				
	Surface (A12)			☐ Iron-Manganese N	, ,	,) D T)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present,				
	•	6) (MLRA 150A)		_	,), P, 1)	unless disturbed or problemat	tic.			
	ky Mineral (S1	, ,		Umbric Surface (F	, ,							
	red Matrix (S4)		Delta Ochric (F17								
Sandy Red				Reduced Vertic (F	, ,		,					
Stripped Ma	, ,	D C T II)		Piedmont Floodpl	ain Soils ((F19) (MLR	A 149A)					
Dark Suriac	ce (S7) (LRR I	2, 5, 1, 0)		Anomalous Bright	Loamy S	oils (F20) (MLRA 149	A, 153C, 153D)				
☐ Restricti	ive Layer (if observed):									
Type:								Hydric Soil Present? Ye	s X	No		
Depth (inch	ies):											
Remarks:												

Project/Site: I-77		City/County: Richla	and Co Sampling Date: 8/4/2014
Applicant/Owner: SCDOT			State: SC Sampling Point: up16
Investigators: Jamison		Section	n, Township, Range S T R
Landform (hillslope, terrace, et	tc.): 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 198
Soil Map Unit Name:			NWI Classification:
· ——	tions on the site typical for this tir	me of year? Yes No	X (If No, explain in Remarks)
, ,	, Hydrology, significa	· — –	ormal Circumstances" present? Yes X No
			·
Are vegetation, Soil _	, Hydrology, naturally	/ problematic? (If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDIN	GS - Attach a site map s	howing sampling point loc	ations, transects, important features, etc.
Hydrophytic Vegetation Pres	sent? Yes X No		
Hydric Soil Present?	Yes No X	Is the Sampled Area	
Wetland Hydrology Present?		within a Wetland?	Yes NoX
Remarks: Adjacent to w16 w	etiand data point.		
HYDROLOGY			
Wetland Hydrology Indicate	ors:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum	of one is required; check all that	apply)	Surface Soil Cracks (B6)
Surface Water (A1)	Aquati	c Fauna (B13)	Sparsely Vegetated Concave Surface (B8)
High Water Table (A2)			Drainage Patterns (B10)
Saturation (A3)		Deposits (B15) (LRR U)	Moss Trim Lines (B16)
Water Marks (B1)	_ ′ `	gen Sulfide Odor (C1) ed Rhizospheres along Living Roots (C3)	
Sediment Deposits (B2)		nce of Reduced Iron (C4)	Crayfish Burrows (C8)
Drift Deposits (B3)		, ,	Saturation Visible on Aerial Imag.(C9)
Algal Mat or Crust (B4)		t Iron Reduction in Tilled Soils (C6)	Geomorphic Position (D2)
Iron Deposits (B5)		Muck Surface (C7)	Shallow Aquitard (D3)
Inundation Visible on Aerial Im		(Explain in Remarks)	FAC-Neutral Test (D5)
Water-Stained Leaves (B9)	lagery (<i>D1</i>)		Sphagnum moss (D8) (LRR T,U)
			Springfrum mose (55) (ETAT 1,5)
Field Observations:	V N- V F	North (in the ca):	
Surface Water Present?		Depth (inches):	
Water Table Present? Saturation Present?		Depth (inches): Depth (inches):	Wetland Hydrology Present? Yes No_X_
(includes capillary fringe)	165 NO _X D		<u></u>
	auge, monitoring well, aerial photos, p	previous inspections), if available:	
Remarks:			



		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: <u>30 Ft</u>)			
Pinus taeda		65	Υ	FAC
		65	=Total Cover	
Shrub Stratum	(Plot size: 30 Ft)			
Ligustrum sinen	se	10	Υ	FAC
		10	=Total Cover	
Herb Stratum	(Plot size: <u>6 Ft</u>)			
Toxicodendron r	adicans	45	Υ	FAC
		45	=Total Cover	
Vine Stratum	(Plot size: 30 Ft)			
Vitis rotundifolia		35	Υ	FAC
		35	=Total Cover	

Prevalence Index Worksheet:

Total % Cover	Multi	oly 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	<u>(</u> 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 Desc	ription: (Des	cribe to the	e depth ne	eded to document	t the ind	icator or	confirm	the absence of Indicators.)			
Depth		Matrix				eatures					
(inches)	Color	(moist)	%	Color (moist)	<u>%</u>	Type ¹	Loc ²	Texture	Re	marks	
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			
¹Type: C=Cor	ncentration, D	=Depletion,	, RM=Redu	uced Martix, CS=Co	overed or	Coated	Sand Gra	ains. ² Location: PL=Pore Lir	ning, M=Matri	X.	
Stratified L Organic Bo 5 cm Muck Muck Pres 1 cm Muck Depleted E Thick Dark Coast Prai Sandy Muc Sandy Rec Stripped M	edon (A2) c (A3) Sulfide (A4) Layers (A5) codies (A6) (LRR cy Mineral (A7) (Lence (A8) (LRR c) (A9) (LRR P, 1) Below Dark Surf c Surface (A12) rie Redox (A16) cky Mineral (S1) yed Matrix (S4) dox (S5)	(LRR P, T, U) (R U) (F) (F) (F) (F) (F) (MLRA 150A (CRR O, S)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surfa Depleted Dark Surfa Redox Depression Marl (F10) (LRR L Depleted Ochric (F17) Iron-Manganese M Umbric Surface (F17) Reduced Vertic (F17) Reduced Vertic (F17) Piedmont Floodpl	e (S9) (LRI heral (F1) (heral (F1) (heral (F1) (heral (F2)) F3) hice (F6) hirface (F7) his (F8) J) F11) (MLR hisses (F1) hisse	R S, T, U) (LRR O) 12) (LRR C) P, T, U) 51) A 150A, 18 F19) (MLR	D, P, T) 50B) A 149A)	Indicators for Problematic 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outs Piedmont Floodplain Soils Anomalous Bright Loamy S (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface Other (Explain in Remarks Indicators of hydrophytic hydrology must be prese unless disturbed or prob	side MLRA 150/ (F19) (LRR P, F Goils (F20) e (TF12) (LRR T) c vegetation and	A,B) S, T)	
☐ Restrict	tive Layer (i	if observe	d):					Hydric Soil Present?	Yes	No	x
Depth (incl	hes):							Hydric Soil Fresent!	162		
Remarks:											

Project/Site: I-77				City/County:	Richla	ind Co	Sampling Date:	8/7/2014	
Applicant/Owner: S	CDOT				Ş	State: SC	Sampling Point:	w17 (aka W221)	
Investigators: Jamis	son				Section	, Township, Rang	e S T	R	
Landform (hillslope, terr	ace, etc.):	Toe of SI	ope	Local F	_	convex, none):		Slope(%) 2	
Subregion (LRRor MLR	-		Lat:		Long:	·	Datur	- ' ' ' 	
Soil Map Unit Name:	.,					NWI Classifi	cation: PEM		
Are climatic / hydrologic	conditions on the	site tynica	I for this time	of year? Yes	No	_	(plain in Remarks)		
Are Vegetation,				-			es" present? Ye		
Are Vegetation,	-		-						
SUMMARY OF FI							answers in Remark ects, important		
Hydrophytic Vegetatio	n Present? Ye	es X	No				•		
Hydric Soil Present?				Is the Sampled Area					
Wetland Hydrology Pr			No	within a Wetl	and?	Yes	X No		
Remarks:		.5 _ ^							
HYDROLOGY									
Wetland Hydrology Ir	dicators:					Secondary	Indicators (minimu	ım of two required)	
Primary Indicators (mir		quired; che	ck all that app	oly)			ce Soil Cracks (B6)		
Surface Water (A1)			Aquatic Fa	una (P13)		\sqsubseteq	ely Vegetated Concav	ve Surface (B8)	
High Water Table (A2)				sits (B15) (LRR U)		= '	age Patterns (B10)	,	
✓ Saturation (A3)				Sulfide Odor (C1)		Moss -	Trim Lines (B16)		
Water Marks (B1)			_ ′ ′	Rhizospheres along	Living Roots (C3)	☐ Dry-Se	eason Water Table (C	;2)	
Sediment Deposits (B2	<u>'</u>)			of Reduced Iron (C4		Crayfis	sh Burrows (C8)		
Drift Deposits (B3)				n Reduction in Tille		Satura	ation Visible on Aerial	Imag.(C9)	
Algal Mat or Crust (B4)	ı			Surface (C7)	a coc (co)	Geom	orphic Position (D2)		
Inco Deposits (DE)				Explain in Remarks) Shallow Aquitard (D3)					
Inundation Visible on Aerial Imagery (B7)							Neutral Test (D5)		
Water-Stained Leaves	(B9)					Sphag	num moss (D8) (LRR	! T,U)	
Field Observations:									
Surface Water Present?	Yes	No	_X Depti	n (inches):					
Water Table Present?	Yes	No		n (inches):		M - 41 1 1 1	D 10	V V N-	
Saturation Present?		X No	Depti	n (inches):	11	Wetland Hydrol	ogy Present?	Yes _X_ No	
(includes capillary fringe) Describe Recorded Data (st		ing well, aer	ial photos, previ	ous inspections), if a	available:				
Remarks:									



(Plot size: 6 Ft)

Tree Stratum

Shrub Stratum

Herb Stratum

Vine Stratum

Juncus effusus

Rubus argutus

Lespedeza cuneata

<u>Absolute</u>

% Cover

60

20

10

90

Dominant

Species

=Total Cover

Indicator

Status

OBL

FACU

FAC

Definitions of Vegetation Strata:

be present, unless disturbed or problematic.

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)

Redox Features

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

Matrix

(inches)	Color	(moist)	%	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	
¹Type: C=Con	centration, E)=Depletion	, RM=Redu	uced Martix, CS=Co	overed o	r Coated	Sand Gra	ains. ² Location: PL=Pore Lining	ı, M=Matrix.
5 cm Mucky Muck Prese 1 cm Muck Depleted Be Thick Dark	and the state of t	(LRR P, T, U) R U) F) face (A11)		Polyvalue Below S Thin Dark Surface Loamy Mucky Mir Loamy Gleyed Ma Pepleted Matrix (I Redox Dark Surfa Depleted Dark Surfa Redox Depression Marl (F10) (LRR U Depleted Ochric (Iron-Manganese I	e (S9) (LR neral (F1) atrix (F2) F3) ace (F6) urface (F7 ns (F8) J) F11) (MLI	RR S, T, U) (LRR O)) RA 151)		Indicators for Problematic H 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Piedmont Floodplain Soils (F1: Anomalous Bright Loamy Soils (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TF) Other (Explain in Remarks) Indicators of hydrophytic ve hydrology must be present, unless disturbed or problem	MLRA 150A,B) 9) (LRR P, S, T) s (F20) F12) (LRR T, U) getation and wetland
Sandy Gleye Sandy Redo Stripped Ma Dark Surface		P, S, T, U)	d):	Umbric Surface (f Delta Ochric (F17 Reduced Vertic (F Piedmont Floodpl Anomalous Bright	(MLRA) (MLR (ain Soils	151) RA 150A, 15 (F19) (MLR	A 149A)		res X No
Depth (inch	nes):							riyunc son Fresent:	NO
Remarks:									

Project/Site: I-77					City/County:	Richlan	d Co	Samp	oling Date:	8/4/2014	ŀ
Applicant/Owner: S	CDOT					St	tate: SC	Samp	ling Point:	up17	
Investigators: Jamis	son					Section,	Township, R	ange S	Т	R	
Landform (hillslope, terr	ace, etc.):	Toe o	of Slope		Local Reli	ief (concave, c	convex, none): Concav	е	Slope	(%) 2
Subregion (LRRor MLR	A): P		Lat	t: 80°5	57'38.829"W	Long: 3	34°6'1.26	3 "N	Datum	_ I:	NAD 1983
Soil Map Unit Name:	· ——			-				ssification:			
Are climatic / hydrologic	conditions	on the site tw	nical for	this time	e of year? Yes	No	=	o, explain in	Remarks)		
		• • • • • • • • • • • • • • • • • • • •			_						No
Are Vegetation X,						Are Norn	nal Circumst	ances pres	ent? res	S X	No
Are Vegetation,	Soil,	Hydrology _	, na	iturally p	roblematic?	(If neede	ed, explain a	ny answers	in Remarks	3.)	
SUMMARY OF FI	NDINGS	- Attach a	site m	ap sho	owing sampling	point locat	tions, trar	nsects, in	nportant	feature	s, etc.
Hydrophytic Vegetatio	n Dresent?	Yes	No	Х							
Hydric Soil Present?	iii ieseit:				Is the Sampled	Area					
Wetland Hydrology Pr	acant?	Yes	No	X	within a Wetlan	d?	Yes		No X		
Remarks:	esent:	Yes	No	X							
HYDROLOGY											
							Second	ary Indicato	ors (minimur	m of two	equired)
Wetland Hydrology Ir Primary Indicators (mir		e is required:	check a	ll that ar	(vlac			•	•	II OI tWO I	<u>cquircu</u>
Surface Water (A1)				·				urface Soil Cr narsely Veget	acks (B0) ated Concave	Surface (B8)
High Water Table (A2)					Fauna (B13)		=	rainage Patte		, ourrace (50)
Saturation (A3)				-	posits (B15) (LRR U)			oss Trim Line			
Water Marks (B1)					n Sulfide Odor (C1) Rhizospheres along Livi	ing Poots (C3)			ater Table (C2	2)	
Sediment Deposits (B2	2)				e of Reduced Iron (C4)	ing Roots (C3)		rayfish Burrov		,	
Drift Deposits (B3)	,				on Reduction in Tilled S	oils (C6)		-	ole on Aerial I	mag.(C9)	
Algal Mat or Crust (B4))				ck Surface (C7)	olis (Co)	G	eomorphic Po	sition (D2)		
Iron Deposits (B5)					xplain in Remarks)		SI	hallow Aquitai	rd (D3)		
Inundation Visible on A	erial Imagery	(B7)		Othor (E.	Apidin in Homano,		F/	AC-Neutral Te	est (D5)		
Water-Stained Leaves	(B9)						S	phagnum mos	ss (D8) (LRR	T,U)	
Field Observations:											
Surface Water Present?	١	res N	o X	Dep	oth (inches):						
Water Table Present?	١	/es N		_	oth (inches):						
Saturation Present?	١	res N	o X	Dep	oth (inches):		Wetland Hy	drology Pre	esent?	Yes	No_X_
(includes capillary fringe)											
Describe Recorded Data (st	tream gauge,	monitoring well	, aerial ph	iotos, pre	vious inspections), if ava	ilable:					
Remarks:											
. tomarno.											



'EGETATION Use scientific names of plants.				Sampling Point:	up17	
	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet:		
Tree Stratum				Number of Dominant Species That Are OBL, FACW, or FAC	: 0	(A)
Shrub Stratum				Total Number of Dominant		
Herb Stratum (Plot size: 6 Ft)			54011	Species Across all Strata:	0	(B)
misc grasses, maintained		=Total Cover	FACU	Percent of Dominant Species That Are OBL, FACW, or FAC:	0.0%	(A/B)
Vine Stratum				Prevalence Index Worksheet	:	
				Total % Cover of:	Multiply by:	
				OBL species 0	x 1 = 0	
				FACW species0	x 2 = 0	
				FAC species0	x 3 = 0	
				FACU species0	x 4 = 0	
				UPL species0	x 5 = 0	
				Column Totals: 0	(A) 0	<u>(</u> B)
				Prevalence Index = B/A=		
				Hydrophytic Vegetation Indica	itors:	
				1 - Rapid Test for Hydroph	ytic Vegetatio	n
				2 - Dominance Test > 50%		
				3 - Prevalence Index ≤ 3.0		
				Problematic Hydrophytic V	egetation (E	xplain)
				Indicators of hydric soil and wetland be present, unless disturbed or pro		st
				Definitions of Vegetation Strate	a:	
				Tree – Woody plants, excluding approximately 20 ft (6 m) or more (7.6 cm) or larger in diameter at	e in height and	d 3 in. (DBH).
				Sapling – Woody plants, excluding approximately 20 ft (6 m) or more than 3 in. (7.6 cm) DBH.		
				Shrub – Woody plants, excluding approximately 3 to 20 ft (1 to 6 m		,
				Herb – All herbaceous (non-wood herbaceous vines, regardless of plants, except woody vines, less 3 ft (1 m) in height.	size. Includes	woody
				Woody vine – All woody vines, re	gardless of h	eight.
				Hydrophytic Vegetation Present? γes	No	X

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

SOIL Sampling Point: up17

Depth	iption: (Bes	Matrix	чери п			Features	0011111111	the absence of malcators.	
(inches)	Color	(moist)	%	Color (moist)	%		Loc ²	Texture	Remarks
0 to 6	10YR	4/3	100		_			SANDY LOAM	_
6 to 13	10YR	5 / 4	100	1				SILTY CLAY LOAM	-
¹Type: C=Cor	ncentration, [D=Depletion,	RM=Red	uced Martix, CS=C	overed o	r Coated	Sand Gra	ains. ² Location: PL=Pore Lining	ı, M=Matrix.
Hydric Soil I				Polyvalue Below			T, U)	Indicators for Problematic H	ydric Soils: 3
Histic Epip	*			Thin Dark Surfac				1 cm Muck (A9) (LRR O)	
Black Histic				Loamy Mucky Mi	,	(LRR O)		2 cm Muck (A10) (LRR S)	
	Sulfide (A4)			Loamy Gleyed M	atrix (F2)			Reduced Vertic (F18) (outside	
Stratified L	ayers (A5)			Depleted Matrix (F3)			Piedmont Floodplain Soils (F1	, ,
Organic Bo	odies (A6) (LRF	R P, T, U)		Redox Dark Surfa	ace (F6)			Anomalous Bright Loamy Soils (MLRA 153B)	; (F20)
5 cm Muck	y Mineral (A7)	(LRR P, T, U)		Depleted Dark St	urface (F7)		Red Parent Material (TF2)	
Muck Pres	ence (A8) (LRF	RU)		Redox Depression	ns (F8)			Very Shallow Dark Surface (TF	F12) (LRR T, U)
1 cm Muck	(A9) (LRR P,	Τ)		Marl (F10) (LRR	U)			Other (Explain in Remarks)	
	elow Dark Sur			Depleted Ochric	(F11) (ML	RA 151)		³ Indicators of hydrophytic ve	actation and watland
	Surface (A12)			Iron-Manganese) P T)	hydrology must be present,	getation and wettand
	rie Redox (A16		a)	Umbric Surface (,	, ,	,,,,,,	unless disturbed or problem	atic.
	ky Mineral (S1	, ,		Delta Ochric (F17	, ,				
Sandy Gley	yed Matrix (S4)						OD)		
Stripped M				Reduced Vertic (
	ce (S7) (LRR F	PSTU)		Piedmont Floodp		. , ,	,		
		, 0, 1, 0,		Anomalous Brigh	t Loamy S	Soils (F20) (MLRA 149	A, 153C, 153D)	
	ive Layer (if observe	d):						
Type:	`							Hydric Soil Present? Y	res No X
Depth (inch	nes):								
Remarks:									

Project/Site: I-77		City/County:	Richland Co Sampling Date: 8/4/2014
Applicant/Owner: SCDO	PΤ		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 La	at: 34 6.40	Long: -80 57.67 Datum:
Soil Map Unit Name:			NWI Classification: PSS/PFO
Are climatic / hydrologic con-	ditions on the site typical for	r this time of year? Yes	No X (If No, explain in Remarks)
, ,		, <u> </u>	
Are Vegetation, Soil			Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil	, Hydrology, n	aturally problematic?	(If needed, explain any answers in Remarks.)
SUMMARY OF FINDI	NGS - Attach a site m	nap showing sampling po	oint locations, transects, important features, etc.
			•
Hydrophytic Vegetation Pro		Is the Sampled Are	ea
Hydric Soil Present?	Yes X No	within a Wetland?	
Wetland Hydrology Presen	Yes X No		
Remarks:			
Wetland Hydrology Indica Primary Indicators (minimur 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 Water-Stained Leaves (B9)	m of one is required; check a	all that apply) Aquatic Fauna (B13) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living I Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils Thin Muck Surface (C7) Other (Explain in Remarks)	Crayfish Burrows (C8)
Field Observations:			
Surface Water Present?	Yes No _X		—
Water Table Present?	Yes No _X		Wetland Hydrology Present? Yes X No
Saturation Present? (includes capillary fringe)	Yes X No	Depth (inches):11	Would Hydrology Frozent: Foo X No
	gauge, monitoring well, aerial p	hotos, previous inspections), if availab	le:
Damanica			
Remarks:			



	Absolute % Cover	<u>Dominant</u>	Indicator Status	Dominance Test Workshee	et:	<u> </u>
Tree Stratum (Plot size: 30 Ft)	70 COVEL	<u>Species</u>	Status	Number of Dominant Specie		
(1100 51201 <u>50 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1</u>	40	V	FAC	That Are OBL, FACW, or FA	AC: 4	(A)
Acer rubrum Pinus taeda	40 	- Y	FAC FAC	Total Number of Dominant		
Liquidambar styraciflua		- Y	FAC	Species Across all Strata:	4	(B)
Elquidambal Styracilida	70			-		- ` ´
Shrub Stratum (Plot size: 30 Ft)		=Total Cover		Percent of Dominant Species That Are OBL, FACW, or FA		_ (A/B)
Arundinaria gigantea	10	Υ	FACW	Prevalence Index Workshe	et:	
Ligustrum sinense	5	N	FAC	Total % Cover of:	Multiply by:	
Persea borbonia	5	N	FACW	OBL species 0	$\frac{1}{x} = 0$	
	20	=Total Cover		. 07	x 2 = 54	
Herb Stratum (Plot size: 6 Ft)				TACW species	x 3 = 231	
Arundinaria gigantea	5	N	FACW	FAC species		
Osmundastrum cinnamomeum		N	FACW	FACU species0	x 4 = 0	
		=Total Cover		UPL species0	x 5 = 0	
Vine Stratum (Plot size: 30 Ft)		= rotal Cover		Column Totals: 104	(A)285	(B)
Bignonia capreolata	2	N	FAC	Prevalence Index = B/	A= 2.74	
Smilax laurifolia	2	N	FACW			
	4	=Total Cover		Hydrophytic Vegetation Ind	icators:	
				1 - Rapid Test for Hydro	phytic Vegetation	l
				X 2 - Dominance Test > 50)%	
				X 3 - Prevalence Index ≤ 3	0	
				Problematic Hydrophytic	: Vegetation (Ex	plain)
				Indicators of hydric soil and wetl be present, unless disturbed or p		
				Definitions of Vegetation Str	ata:	
				Tree – Woody plants, excludin approximately 20 ft (6 m) or m (7.6 cm) or larger in diameter a	ore in height and	
				Sapling – Woody plants, exclu approximately 20 ft (6 m) or m than 3 in. (7.6 cm) DBH.		
				Shrub – Woody plants, exclud approximately 3 to 20 ft (1 to 6		
				Herb – All herbaceous (non-we herbaceous vines, regardless plants, except woody vines, le 3 ft (1 m) in height.	of size. Includes	woody
				Woody vine – All woody vines	, regardless of he	ight.
Demonstra (Include photo pumbors bars are a series of the	\			Hydrophytic Vegetation Present? Ye	es <u>X</u> 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.)

D	eptł	า		Matrix				reatures			
(ir	nche	es)	Col	or (moist)	%	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	С	M	SANDY LOAM	
8	to	10	10YR	3 / 1	90	10YR4/1	10	С	M	SANDY LOAM	
10	to	15	10YR	2/1	95	10YR 3/1	5	CS	М	VERY FINE SANDY LOAM	mucky modified
¹Ty	pe:	C=Con	centration	D=Depletion,	RM=Redu	ced Martix, CS=C	overed c	or Coated	Sand Gra	ains. ² Location: PL=Pore L	_ining, M=Matrix.
Hy	dric	c Soil I	ndicators		Г	Polyvalue Below	Surface (S8) (LRR S	T 11)	Indicators for Problemat	tic Hydric Soils: 3
	His	tosol (A	1)		[Thin Dark Surfac	,	, ,		1 cm Muck (A9) (LRR O)	1
			edon (A2)		[Loamy Mucky Mir	, , ,			2 cm Muck (A10) (LRR S	
Ш		ick Histic	` '			Loamy Gleyed M		,		Reduced Vertic (F18) (ou	
	-	-	Sulfide (A4)		-	✓ Depleted Matrix (, ,			Piedmont Floodplain Soil	· •
			ayers (A5)	DD T 11)	[Redox Dark Surfa	•			Anomalous Bright Loamy	
Н			dies (A6) (LI v Mineral (A	7) (LRR P, T, U)	[Depleted Dark Su	` '	·\		(MLRA 153B)	
П			ence (A8) (Li		L		•	,		Red Parent Material (TF2	•
П			(A9) (LRR F		L	Redox Depressio	. ,			☐ Very Shallow Dark Surface	
				urface (A11)	L	Marl (F10) (LRR □	•			Other (Explain in Remark	,
	Thi	ck Dark	Surface (A1	2)	L	Depleted Ochric	(F11) (ML	RA 151)		³ Indicators of hydrophy	tic vegetation and wetland
	Co	ast Prair	ie Redox (A	16) (MLRA 150A	.)	Iron-Manganese	Masses (F	F12) (LRR (D, P, T)	hydrology must be pre unless disturbed or pro	
✓	Sar	ndy Muc	ky Mineral (S	S1) (LRR O, S)		Umbric Surface (F13) (LRF	R P, T, U)			
	Sar	ndy Gley	ed Matrix (S	4)		Delta Ochric (F17	7) (MLRA	151)			
Ш		ndy Red				Reduced Vertic (F18) (MLF	RA 150A, 1	50B)		
Ц			atrix (S6)			Piedmont Floodp	lain Soils	(F19) (MLR	A 149A)		
Ш	Dai	rk Surfa	ce (S7) (LRF	R P, S, T, U)		Anomalous Brigh	t Loamy S	Soils (F20) (MLRA 149	9A, 153C, 153D)	
	Re	estrict	ive Layer	(if observe	d):						
	Тур		•	•	,						
		pth (inch	nes):							Hydric Soil Present?	Yes X No
Rem	arks	:									

Project/Site: I-77			City/County:	Richland Co	Sampling Date: 8/4/2014
Applicant/Owner: SCDO	Т			State: SC	Sampling Point: up18-19
Investigators: Jamison				Section, Township, Ran	ge S T R
Landform (hillslope, terrace,	etc.): Toe	of Slope	Local Relief	(concave, convex, none):	Concave Slope(%) 3
Subregion (LRRor MLRA):		Lat:		Long:	Datum:
Soil Map Unit Name:	•			NWI Classi	
Are climatic / hydrologic cond	litions on the site to	nical for this time	e of year? Yes	No X (If No, e	explain in Remarks)
Are Vegetation, Soil				Are "Normal Circumstan	
_		_		Ale Normal Circumstan	ces" present? Yes X No
Are Vegetation, Soil				(If needed, explain any	
SUMMARY OF FINDI	NGS - Attach a	site map sh	owing sampling p	oint locations, trans	ects, important features, etc.
Hydrophytic Vegetation Pre	esent? Yes	X No			
Hydric Soil Present?	Yes	No X	Is the Sampled Ar within a Wetland?		No. V
Wetland Hydrology Present	t? Yes	No X		162	NoX
HYDROLOGY					
Wetland Hydrology Indica	tors:			Secondary	y Indicators (minimum of two required)
Primary Indicators (minimum		; check all that a	pply)		ace Soil Cracks (B6)
Surface Water (A1)	•		Fauna (B13)		rsely Vegetated Concave Surface (B8)
High Water Table (A2)			posits (B15) (LRR U)		nage Patterns (B10)
Saturation (A3)			n Sulfide Odor (C1)	Moss	s Trim Lines (B16)
Water Marks (B1)		_ ′ ,	Rhizospheres along Living	Roots (C3)	Season Water Table (C2)
Sediment Deposits (B2)			e of Reduced Iron (C4)		fish Burrows (C8)
Drift Deposits (B3)		Recent I	ron Reduction in Tilled Soils	s (C6)	ration Visible on Aerial Imag.(C9)
Algal Mat or Crust (B4)		Thin Mu	ck Surface (C7)		morphic Position (D2)
Iron Deposits (B5)		Other (E	xplain in Remarks)		low Aquitard (D3)
Inundation Visible on Aerial I	magery (B7)				-Neutral Test (D5)
Water-Stained Leaves (B9)				Spha	agnum moss (D8) (LRR T,U)
Field Observations:					
Surface Water Present?	Yes I	No X De	oth (inches):		
Water Table Present?	Yes 1	No X De	oth (inches):		
Saturation Present?	Yes I	No X De	oth (inches):	Wetland Hydro	ology Present? Yes No_X_
(includes capillary fringe) Describe Recorded Data (stream	gauge monitoring we	Il aerial photos pre	vious inspections) if availal	hle·	
200000 . 10000 2 24.0 (0.100	gaage, mermering we	, admai priotos, pro	Troub inoposition, in available		
Remarks:					



VEGETATION = 0	se scientific flatfies of platfis.				camp	mig i onic.	up io		
		Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Wo	orksheet:			
Tree Stratum	(Plot size: 30 Ft)				Number of Dominan			4	(A)
Pinus taeda	,	60	Υ	FAC	That Are OBL, FAC	W, or FAC			_ (/ (/
Carpinus carolinia	na	10	Y	FAC	Total Number of Don				
		70	=Total Cover		Species Across all S	trata:	_	4	(B)
Shrub Stratum Arundinaria gigani	(Plot size: <u>30 Ft</u>)	5	N	FACW	Percent of Dominant That Are OBL, FACV			100.0%	(A/B
- Turidinana gigani			=Total Cover		Prevalence Index W	/orksheet:			
Herb Stratum			Total Cover		Total % Cover of			oly by:	
Vine Stratum					OBL species	0	x 1 =	0	
	(Plot size: <u>30 Ft</u>)	00	V	E40	FACW species	5	x 2 =	10	
Vitis rotundifolia Campsis radicans			_ <u>Y</u> _	FAC FAC	FAC species _	110	x 3 =	330	
Campsis radicaris	<u>'</u>	40	=Total Cover	TAC	FACU species	0	x 4 =	0	
			Total Covel		UPL species _	0	x 5 =	0	
					Column Totals:	115	(A)	340	(B)
					Prevalence Ind	lex = B/A=		2.96	
					Hydrophytic Vegetat	ion Indica	itors:		
					1 - Rapid Test fo	r Hydroph	ytic Ve	getation	
					X 2 - Dominance T	est > 50%			
					X 3 - Prevalence Ir	ndex ≤ 3.0			
					Problematic Hyd	rophytic V	egetatio	on (Exp	olain)
					Indicators of hydric soil be present, unless distr				
					Definitions of Vegeta	tion Strata	a:		
					Tree – Woody plants, approximately 20 ft (6 (7.6 cm) or larger in dia	m) or more	e in hei	ght and	3 in.)BH).
					Sapling – Woody plant approximately 20 ft (6 than 3 in. (7.6 cm) DBI	m) or more			
					l .				

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

Depth	iption: (Desc	Matrix	itn neede	ea to aocumen		eatures	confirm t	the absence of Indicators.)	
(inches)	Color	(moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0 to 12	10YR	3 / 3 10	00					CLAY LOAM	mixed fill dirt
¹Type: C=Con	centration, D	=Depletion, RM=	=Reduce	d Martix, CS=Co	overed or	Coated S	Sand Grain	ns. ² Location: PL=Pore Lining,	M=Matrix.
5 cm Mucky Muck Prese 1 cm Muck Depleted B Thick Dark Coast Prair Sandy Muc Sandy Gley Sandy Red Stripped Ma	edon (A2) c (A3) Sulfide (A4) ayers (A5) dies (A6) (LRR y Mineral (A7) (I ence (A8) (LRR (A9) (LRR P, T elow Dark Surfa Surface (A12) tie Redox (A16) ky Mineral (S1) yed Matrix (S4) ox (S5)	LRR P, T, U) U) ace (A11) (MLRA 150A) (LRR O, S)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surfa Depleted Dark Su Redox Depression Marl (F10) (LRR L Depleted Ochric (I Iron-Manganese M Umbric Surface (F Delta Ochric (F17 Reduced Vertic (F Piedmont Floodpla Anomalous Bright	e (S9) (LRi ereral (F1) (etrix (F2) F3) cce (F6) rface (F7) ns (F8) J) F11) (MLF Masses (F F13) (LRR) (MLRA 1 F18) (MLRA 1 F18) (MLRA 1	R S, T, U) LRR O) 12) (LRR O P, T, U) 51) A 150A, 151 F19) (MLRA	, P, T) 0B) A 149A)	Indicators for Problematic Hy 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Medical Price of the Price	MLRA 150A,B)) (LRR P, S, T) (F20) 12) (LRR T, U) etation and wetland
Restricti Type: Depth (inch Remarks: mixed roadway	nes):	f observed):						Hydric Soil Present? Yo	es No _X

Applicant/Owner: SCDOT Investigators: Jamison Landform (hillslope, terrace, etc.): Subregion (LRRor MLRA): P Soil Map Unit Name: Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present? Wetland Hydrology Present?	, Hydrology , Hydrology - Attach a sit	Lat: 34 6.58 al for this time of yea _, significantly distu _, naturally problem	Local Relief (concave Long: ar? Yes No urbed? Are "N	-80 57.76 NWI Classif X (If No, e		R Slope(%) 2
Landform (hillslope, terrace, etc.): Subregion (LRRor MLRA): P Soil Map Unit Name: Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	s on the site typic , Hydrology , Hydrology Attach a sit	Lat: 34 6.58 al for this time of yea _, significantly distu _, naturally problem	Local Relief (concave Long: ar? Yes No urbed? Are "N	e, convex, none):80 57.76	Concave Datu fication: PFO/PS: explain in Remarks)	Slope(%) 2
Subregion (LRRor MLRA): P Soil Map Unit Name: Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	s on the site typic , Hydrology , Hydrology Attach a sit	Lat: 34 6.58 al for this time of yea _, significantly distu _, naturally problem	Long: ar? Yes No irbed? Are "N	-80 57.76 NWI Classif X (If No, e	Datu fication:PFO/PS explain in Remarks)	m: S)
Soil Map Unit Name: Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	, Hydrology , Hydrology - Attach a sit	al for this time of yea _, significantly distu _, naturally problem	ar? Yes No	NWI Classii	fication: PFO/PS))
Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	, Hydrology , Hydrology - Attach a sit	_, significantly distu _, naturally problem	urbed? Are "N	X (If No, e	explain in Remarks))
Are climatic / hydrologic conditions Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	, Hydrology , Hydrology - Attach a sit	_, significantly distu _, naturally problem	urbed? Are "N	X (If No, e	explain in Remarks))
Are Vegetation, Soil Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	, Hydrology , Hydrology - Attach a sit	_, significantly distu _, naturally problem	urbed? Are "N			,
Are Vegetation, Soil SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	, Hydrology	_, naturally problem	-4:-0	iormai Circumstan	ces present? Y	es a no
SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Hydric Soil Present?	- Attach a si		natic? (If ne			
Hydrophytic Vegetation Present? Hydric Soil Present?			\ He	∍eded, explain any	answers in Remar	ks.)
Hydric Soil Present?		te map showing	յ sampling point lo	cations, transc	ects, importan	t features, etc.
Hydric Soil Present?	, ADC A	No				
•		ls	the Sampled Area			
	Yes X		thin a Wetland?	Yes	X No	
	Yes X	_No				
HYDROLOGY						
Wetland Hydrology Indicators:				Secondary	/ Indicators (minim	um of two required)
Primary Indicators (minimum of or 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 Imager Water-Stained Leaves (B9)		Aquatic Fauna (E Marl Deposits (B Hydrogen Sulfide Oxidized Rhizosp Presence of Red	at15) (LRR U) a Odor (C1) cheres along Living Roots (C3) duced Iron (C4) duction in Tilled Soils (C6) duce (C7)	Spars Drain Moss Dry-S Crayf Satur Geon Shall	ace Soil Cracks (B6) sely Vegetated Conca nage Patterns (B10) s Trim Lines (B16) Season Water Table (C fish Burrows (C8) ration Visible on Aerial morphic Position (D2) ow Aquitard (D3) -Neutral Test (D5) agnum moss (D8) (LR6	C2) al Imag.(C9)
Field Observations:						
	Yes No	_X_ Depth (inch	es):			
	Yes No	X Depth (inch	,	Wetlend Under	ology Broomt?	Vac V Na
	Yes X No	Depth (inch	es): <u>10</u>	Wetland Hydro	nogy Present?	Yes X No
(includes capillary fringe) Describe Recorded Data (stream gauge	monitoring well as	erial photos, previous ins	spections) if available:			
Remarks:						



	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet:
<u>Tree Stratum</u> (Plot size: 30 Ft)	·			Number of Dominant Species That Are OBL FACW or FAC: 4 (A)
Liquidambar styraciflua	40	Υ	FAC	That Are OBL, FACW, or FAC: 4 (A)
Liriodendron tulipifera	40		FACU	 Total Number of Dominant
Acer rubrum	15		FAC	Species Across all Strata: 5 (B)
llex opaca	4	N	FAC	Percent of Dominant Species
	99	=Total Cover		That Are OBL, FACW, or FAC: 80.0% (A/B)
Shrub Stratum (Plot size: 30 Ft)				Prevalence Index Worksheet:
Ligustrum sinense	5	N	FAC	Total % Cover of: Multiply by:
	5	=Total Cover		OBL species $10 x 1 = 10$
Herb Stratum (Plot size: 6 Ft)				FACW species 0 x 2 = 0
Woodwardia areolata	10	Υ	OBL	FAC species 74 x 3 = 222
Lonicera japonica	5	N	FACU	= 1 AC species
	2	N		17.00 species
	17	=Total Cover		UPL species0 x 5 =0
<u>Vine Stratum</u> (Plot size: <u>30 Ft</u>)				Column Totals: <u>134</u> (A) <u>432</u> (B)
Vitis rotundifolia	10	Y	FAC	Prevalence Index = B/A= 3.22
Lonicera japonica	5	N	FACU	Hydrophytic Vegetation Indicators:
	15	=Total Cover		
				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.
Remarks: (Include photo numbers here or on a separate she	ət.)			Hydrophytic Vegetation Present? Yes X No

SOIL Sampling Point: w20 (aka W218)

Profile	Descri	iption: (Des	scribe to the	depth ne	eded to documen	t the inc	licator o	confirm	the absence of Indicators.)	
Depth	1		Matrix		<u> </u>		Features			
(inche	es)	Colo	r (moist)		Color (moist)	%	Type	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	М	FINE SANDY LOAM	
7 to	13	10YR	2/1	100					FINE SANDY LOAM	
¹Type:	C=Con	centration, [D=Depletion,	RM=Red	uced Martix, CS=C	overed o	r Coated	Sand Gra	ains. ² Location: PL=Pore Linir	ıg, M=Matrix.
Hydric	Soil I	ndicators:			Polyvalue Below	Surface (S	S8) (I PP S	: T II)	Indicators for Problematic I	Hydric Soils: 3
Hist	tosol (A1	1)			Thin Dark Surfac	,	, ,		1 cm Muck (A9) (LRR O)	
Hist	tic Epipe	edon (A2)			Loamy Mucky Min	, , ,	,		2 cm Muck (A10) (LRR S)	
Blad	ck Histic	(A3)			Loamy Gleyed M		(LITTO)		Reduced Vertic (F18) (outsid	e ΜΙ RΔ 150Δ R)
Hyd	drogen S	Sulfide (A4)							Piedmont Floodplain Soils (F	
☐ Stra	atified La	ayers (A5)			Depleted Matrix (•			Anomalous Bright Loamy Soi	* * * * * * * * * * * * * * * * * * * *
U Org	anic Bo	dies (A6) (LRF	R P, T, U)		Redox Dark Surfa	ace (F6)			(MLRA 153B)	()
	•	` '	(LRR P, T, U)		Depleted Dark Su	urface (F7)		Red Parent Material (TF2)	
=		ence (A8) (LRI	,		Redox Depression	ns (F8)			☐ Very Shallow Dark Surface (⁻	ΓF12) (LRR T, U)
		(A9) (LRR P,	,		Marl (F10) (LRR	U)			Other (Explain in Remarks)	
= '		elow Dark Sur	` ,		Depleted Ochric	(F11) (MLI	RA 151)		³ Indicators of hydrophytic v	agatation and watland
_		Surface (A12)			Iron-Manganese	Massas (F	:12) (LRR () P T)	hydrology must be presen	t,
_		•	6) (MLRA 150A)	Umbric Surface (,	, ,	5,1,1)	unless disturbed or proble	matic.
	•	ky Mineral (S1	, ,							
		ed Matrix (S4))		Delta Ochric (F17		•			
	ndy Redo				Reduced Vertic (=18) (MLR	RA 150A, 1	50B)		
		atrix (S6)			Piedmont Floodp	lain Soils ((F19) (MLF	RA 149A)		
Dar	k Surfac	ce (S7) (LRR F	P, S, T, U)		Anomalous Brigh	t Loamy S	oils (F20)	(MLRA 149	PA, 153C, 153D)	
		ve Layer (if observed	d):						
Тур									Hydric Soil Present?	Yes X No
	oth (inch	es):								
Remarks:	:									

School Section, Township, Range S T R Ope, terrace, etc.): Toe of Slope Local Relief (concave, convex, none): Concave Slope(%) 5 Or MLRA): P Lat: 80 57' 45.313" W Long: 34 6' 37.221" N Datum: NAD 1983 Jame: NWI Classification: Ordrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks) X., Soil Hydrology Interval yer of Side Attach a site map showing sampling point locations, transects, important features, etc. OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc. Segetation Present? Yes No X No Seesent? Yes No X Within a Wetland? Yes No X Seesent? Yes No X Wetland data point. Wetland runs along toe of slope, upland likely in road fill and within mowing corridor
ope, terrace, etc.): Toe of Slope Lat: 80 57' 45.313" W Long: 34 6' 37.221" N Datum: NAD 1983 Datum: NA
Ror MLRA): P Lat: 80 57' 45.313" W Long: 34 6' 37.221" N Datum: NAD 1983 Ame: NWI Classification:
Ame:
Addrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks) X, Soil, Hydrology, significantly disturbed? Are "Normal Circumstances" present? Yes No, Soil, Hydrology, naturally problematic? (If needed, explain any answers in Remarks.) OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc. Regetation Present? Yes No Resent? Yes No Solicy Present? Yes No Yes No No No No Resent? Yes No No No No Resent? Yes No No Resent? Yes No No No No No No
Addrologic conditions on the site typical for this time of year? Yes No X (If No, explain in Remarks) X, Soil, Hydrology, significantly disturbed? Are "Normal Circumstances" present? Yes No, Soil, Hydrology, naturally problematic? (If needed, explain any answers in Remarks.) OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc. Regetation Present? Yes No Resent? Yes No Solicy Present? Yes No Yes No No No No Resent? Yes No No No No Resent? Yes No No Resent? Yes No No No No No No
OF FINDINGS - Attach a site map showing sampling point locations, transects, important features, etc. Yes X No Sesent? Yes No X Sology Present? Yes No X Ology Present? Yes No X Owetland data point. Wetland runs along toe of slope, upland likely in road fill and within mowing corridor
regetation Present? Yes X No X Is the Sampled Area within a Wetland? Yes No X Ves No
esent? Yes No X Is the Sampled Area within a Wetland? Yes No X No X
ology Present? Yes No X Within a Wetland? Yes No X Owetland data point. Wetland runs along toe of slope, upland likely in road fill and within mowing corridor
Pology Present? YesNo _ X O wetland data point. Wetland runs along toe of slope, upland likely in road fill and within mowing corridor
Connection (Indicators (minimum of two required)
ology Indicators: Secondary Indicators (minimum of two required)
tors (minimum of one is required; check all that apply)
er (A1) Aquatic Fauna (B13) Sparsely Vegetated Concave Surface (B8)
Table (A2) Marl Deposits (B15) (LRR U) Drainage Patterns (B10)
3) Hydrogen Sulfide Odor (C1) Moss Trim Lines (B16)
(B1) Oxidized Rhizospheres along Living Roots (C3) Ury-Season Water Table (C2)
posits (B2) Presence of Reduced Iron (C4) Crayfish Burrows (C8)
(B3) Recent Iron Reduction in Tilled Soils (C6) Saturation Visible on Aerial Imag.(C9)
Crust (B4)
(B5) Other (Explain in Remarks) Shallow Aquitard (D3)
sible on Aerial Imagery (B7) FAC-Neutral Test (D5)
d Leaves (B9) Sphagnum moss (D8) (LRR T,U)
tions:
Present? Yes No X Depth (inches):
resent? Yes No X Depth (inches):



Tree Stratum

Tree ottatam				That Are OBL, FA	CW, or FA	4C: _	3	(A)	
Shrub Stratum (Plot size: 30 Ft)									
Ligustrum sinense	25	Υ	FAC	Total Number of Do Species Across all			4	(B)	
Acer rubrum	15	Y	FAC	Species Across air	Oliala.	_		_ (D)	
	40	=Total Cover		Percent of Domina That Are OBL, FAC			75.0%	(A/B)	
Herb Stratum (Plot size: 6 Ft)				Prevalence Index Worksheet:					
Eupatorium capillifolium	40	_ <u>Y</u> -	FACU	Total % Cover			tiply by:		
Toxicodendron radicans		_ Y	FAC	_	0	x 1 =			
Nr. Old	60	=Total Cover		OBL species		x 2 =			
Vine Stratum				FACW species		^ 2 = _ x 3 =			
				FAC species	60	_			
				FACU species	40	x 4 =			
				UPL species	0	x 5 =	0		
				Column Totals:	100	(A)	340	(B)	
				Prevalence II	ndex = B//	4 =	3.40		
				Hydrophytic Veget	ation Ind	icators:			
				1 - Rapid Test for Hydrophytic Vegetation					
				X 2 - Dominance Test > 50%					
				3 - Prevalence Index ≤ 3.0 Problematic Hydrophytic Vegetation (Expl:					
				Indicators of hydric so be present, unless di					
				Definitions of Vege	tation Str	ata:			
				Tree – Woody plants approximately 20 ft ((7.6 cm) or larger in	6 m) or m	ore in he	eight and		
				Sapling – Woody pla approximately 20 ft (than 3 in. (7.6 cm) D	6 m) or m				
				Shrub – Woody plan approximately 3 to 2					
				Herb – All herbaceou herbaceous vines, re plants, except woody 3 ft (1 m) in height	egardless vines, le	of size. I	ncludes	woody	

Absolute Dominant

Species

% Cover

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

Yes X No

Hydrophytic **Vegetation Present?** SOIL Sampling Point: up20

Depth	ipiioii. (Des	Matrix	doptii ii	cucu to accumen		Features	0011111111	the absence of malcators.	
(inches)	Color	r (moist)	%	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	-
¹Type: C=Cor	ncentration, [D=Depletion,	, RM=Red	uced Martix, CS=Co	overed o	r Coated	Sand Gra	ins. ² Location: PL=Pore Lining	g, M=Matrix.
Stratified L. Organic Bc 5 cm Muck Muck Press 1 cm Muck Depleted B	.1) edon (A2) c (A3) Sulfide (A4)	(LRR P, T, U) R U) T) face (A11)		Polyvalue Below Thin Dark Surface Loamy Mucky Mir Loamy Gleyed Ma Depleted Matrix (I Redox Dark Surface Depleted Dark Surface Redox Depressio Marl (F10) (LRR U Depleted Ochric (I	e (S9) (LR neral (F1) atrix (F2) F3) ace (F6) urface (F7 ns (F8) J)	RR S, T, U) (LRR O)) RA 151)		Indicators for Problematic H	MLRA 150A,B) 9) (LRR P, S, T) s (F20) F12) (LRR T, U)
Coast Prair Sandy Muc Sandy Gley Sandy Red Stripped M Dark Surfa	rie Redox (A16 cky Mineral (S1 yed Matrix (S4) dox (S5) latrix (S6) ce (S7) (LRR F	9) (MLRA 150A) (LRR O, S)) P, S, T, U)		Iron-Manganese I Umbric Surface (I Delta Ochric (F17 Reduced Vertic (F17 Piedmont Floodpl Anomalous Bright	F13) (LRR 7) (MLRA F18) (MLR Iain Soils	R P, T, U) 151) RA 150A, 15 (F19) (MLR	50B) A 149A)	hydrology must be present, unless disturbed or problem	
Type: Depth (inch	rive Layer (if observe	d):					Hydric Soil Present?	res No _X
Remarks:									

Project/Site: I-77		City/County: Richla	and Co Sampling Date: 8/4/2014
Applicant/Owner: SCDOT		:	State: SC Sampling Point: w21
Investigators: Jamison		Section	n, 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 7.2	 26 Lona:	-80 57.77 Datum:
Soil Map Unit Name:		<u></u>	NWI Classification: PSS
· ———			
Are climatic / hydrologic conditions	· ·		X (If No, explain in Remarks)
Are Vegetation, Soil	, Hydrology, significantl	y disturbed? Are "No	ormal Circumstances" present? Yes X No _
Are Vegetation, Soil	, Hydrology, naturally p	roblematic? (If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS	- Attach a site map sho	owing sampling point loc	ations, transects, important features, etc
	-	mig camping point loo.	<u> </u>
Hydrophytic Vegetation Present?	P Yes X No	Is the Sampled Area	
Hydric Soil Present?	Yes X No	within a Wetland?	Yes X No
Wetland Hydrology Present?	Yes X No		100 <u>X</u> NO
Remarks:			
Wetland Hydrology Indicators: Primary Indicators (minimum of or 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 Water-Stained Leaves (B9)	Aquatic F Marl Dep Hydrogen Oxidized Presence Recent Irr Thin Muc	coply) Fauna (B13) Posits (B15) (LRR U) In Sulfide Odor (C1) Rhizospheres along Living Roots (C3) For Reduced Iron (C4) For Reduction in Tilled Soils (C6) For Surface (C7) 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 _ Dep	oth (inches):	
Water Table Present?	Yes No _X Dep	oth (inches):	
Saturation Present?	Yes X No Dep	oth (inches): 8	Wetland Hydrology Present? Yes X No_
(includes capillary fringe) Describe Recorded Data (stream gauge.		in a section of the section of	
Remarks:			



(Plot size: 30 Ft)

(Plot size: 6 Ft)

(Plot size: <u>30 Ft</u>)

Tree Stratum

Shrub Stratum

Herb Stratum

Vine Stratum

Salix nigra

Liquidambar styraciflua Ligustrum sinense

Arundinaria gigantea

Pteridium aquilinum

Bignonia capreolata

Vitis rotundifolia

<u>Absolute</u>

% Cover

40

20

15

5

5

10

10

5

15

Dominant

Species

Υ

Υ

=Total Cover

Ν

Ν

=Total Cover

Ν

=Total Cover

Status

OBL

FAC

FAC

FACW

FACU

FAC

FAC

	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)

	iption: (Des	Matrix	aeptii ne			eatures	COMMIN	the absence of indicators.)		
Depth (inches)	Colo	(moist)	%	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	_	
-										
Hydric Soil I		D=Depletion,	RM=Rea	uced Martix, CS=Co	vered or	Coated	Sand Gra	ins. ² Location: PL=Pore Linir	ng, M=Matrix.	
5 cm Muck	edon (A2) c (A3) Sulfide (A4)	(LRR P, T, U)		Polyvalue Below S Thin Dark Surface Loamy Mucky Mind Loamy Gleyed Mar Depleted Matrix (F Redox Dark Surface Depleted Dark Surface Redox Depression	(S9) (LRI eral (F1) (trix (F2) (3) ce (F6) face (F7)	₹ S, T, U)		1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outsid Piedmont Floodplain Soils (F Anomalous Bright Loamy So (MLRA 153B) Red Parent Material (TF2)	F19) (LRR P, S, T) iils (F20)	
	(A9) (LRR P,			Marl (F10) (LRR U	. ,			✓ Very Shallow Dark Surface (✓ Other (Explain in Remarks)	1F12) (LRR 1, 0)	
Thick Dark Coast Prair Sandy Muc Sandy Gley Sandy Red Stripped M	cky Mineral (S1 yed Matrix (S4) lox (S5)) (MLRA 150A)) (LRR O, S)		Depleted Ochric (F Iron-Manganese N Umbric Surface (F Delta Ochric (F17) Reduced Vertic (F Piedmont Floodpla Anomalous Bright	Masses (F 13) (LRR (MLRA 1 18) (MLR ain Soils (12) (LRR C P, T, U) 51) A 150A, 15 F19) (MLR	0B) A 149A)	³ Indicators of hydrophytic w hydrology must be presen unless disturbed or proble and the problem of the p	nt,	
Restrict	ive Layer (if observed	l):							
Depth (inch	nes):							Hydric Soil Present?	Yes X No	
Remarks:										

r on the site type, Hydrology Hydrology - Attach as Yes Yes Yes Yes	nical for this ti, significa, naturally site map sNoXNoXNoX	me of year? Yes antly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	No X (If No Are "Normal Circumsta (If needed, explain a point locations, trans	Concave 52 "N Dates ification: , explain in Remarks ances" present? ny answers in Remarks sects, important	R Slope(%) 5 um: NAD 19 s) Yes X No arks.) nt features, etc.
r on the site type, Hydrology Hydrology - Attach as Yes Yes Yes Yes	Lat: 80 Dical for this ti , signification, naturally Site map S No X No X No X	me of year? Yes antly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	f (concave, convex, none) Long: 34°7'15.4 NWI Class No X (If No Are "Normal Circumsta (If needed, explain a point locations, transparea (Pressure of the control of the	Concave 52 "N Dates ification: , explain in Remarks ances" present? ny answers in Remarks sects, important	Slope(%) 5 rum: NAD 19 s) y'es X No arks.) nt features, etc.
r on the site type, Hydrology Hydrology - Attach as Yes Yes Yes Yes	Lat: 80 Dical for this ti , signification, naturally Site map S No X No X No X	me of year? Yes antly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	Long: 34°7'15.4 NWI Class No X (If No Are "Normal Circumsta (If needed, explain a point locations, transparea ? Yes	52 "N Dates of State	wm: NAD 19 s) Yes X No arks.) nt features, etc.
, Hydrology _, , Hydrology Attach a s Yes Yes Yes	nical for this ti, significa, naturally site map sNoXNoXNoX	me of year? Yes antly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	NWI Class No X (If No Are "Normal Circumsta (If needed, explain a point locations, tran area ? Yes	esification: , explain in Remarks ances" present? ny answers in Rema sects, importal	s) Yes X No arks.) nt features, etc.
, Hydrology _, , Hydrology Attach a s Yes Yes Yes	nical for this ti, significa, naturally site map sNoXNoXNoX	me of year? Yes antly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	No X (If No Are "Normal Circumsta (If needed, explain a coint locations, transparea ?	, explain in Remarks ances" present? \ ny answers in Rema sects, importar	s) Yes X No arks.) nt features, etc.
, Hydrology _, , Hydrology Attach a s Yes Yes Yes	, significa , naturally site map s No X No X	nntly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	No X (If No Are "Normal Circumsta (If needed, explain a coint locations, transparea ?	, explain in Remarks ances" present? \ ny answers in Rema sects, importar	Yes X No Arks.) nt features, etc.
, Hydrology _, , Hydrology Attach a s Yes Yes Yes	, significa , naturally site map s No X No X	nntly disturbed? y problematic? howing sampling p Is the Sampled A within a Wetland	Are "Normal Circumsta (If needed, explain a point locations, transverea ? Yes	ances" present? No	Yes X No Arks.) nt features, etc.
- Attach a s Yes Yes Yes Yes	naturally site map s No X No X No X	y problematic? howing sampling p Is the Sampled A within a Wetland	(If needed, explain a point locations, transvera	ny answers in Rema	nt features, etc.
Yes Yes	No X No X No X	howing sampling placed is the Sampled Awithin a Wetland	ooint locations, tran	sects, importa	nt features, etc.
Yes Yes	No X No X No X	Is the Sampled A	rea ? Yes	No	<u>x</u>
Yes	No X No X	within a Wetland	? Yes		
Yes	No X No X	within a Wetland	? Yes		
Yes	No X		163		
		pe, receiving roadside dra	ainage; upland on intermit	ently maintained roa	ad shoulder slope
nt. Wetland at b	oottom of slop	pe, receiving roadside dra	ainage; upland on intermit	ently maintained roa	ad shoulder slope
			Seconda	ary Indicators (minin	num of two required)
ne is required;	check all that	apply)	Su	rface Soil Cracks (B6)	
	Aquat	ic Fauna (B13)	☐ Sp	arsely Vegetated Cond	cave Surface (B8)
	Marl [Deposits (B15) (LRR U)		=	
	Hydro	gen Sulfide Odor (C1)		, ,	(22)
		·	g 1100t3 (C3)		(C2)
				-	ial Imag (CO)
					- ' '
				· ·)
v (B7)	Otner	(Explain in Remarks)			
, ,				` '	RR T,U)
Yes No	o X [Depth (inches):			
	· · · · · · · · · · · · · · · · · · ·	Depth (inches):			
Yes No	0 <u>X</u> 0	Depth (inches):	Wetland Hyd	Irology Present?	Yes No_X_
, monitoring weil,	aenai priotos, j	лечова півресцогів, п ачап	aut.		
	y (B7) Yes N. Yes N. Yes N.	Aquat	Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soi Thin Muck Surface (C7) Other (Explain in Remarks) Yes No X Depth (inches): Yes No X Depth (inches): Yes No X Depth (inches):	ne is required; check all that apply) 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) Yes No X Depth (inches): Yes No X Depth (inches):	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) Yes No X Depth (inches): Yes Yes No X Depth (inches): Yes Yes No X Depth (inches): Yes Yes Yes Yes Yes Yes Yes Ye



	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test W	/orksheet	:		
Tree Stratum				Number of Domina			0	(A
Shrub Stratum				That Are OBL, FAC	JVV, OF FA	C:		_ (,,
				Total Number of Do				
Herb Stratum (Plot size: <u>6 Ft</u>) Eupatorium capillifolium	40	Y	FACU	Species Across all S	Strata:		4	(B)
Solidago canadensis	35	- <u>'</u>	FACU	Percent of Dominan			0.0%	(A/
Cynodon dactylon	25	Y	FACU	That Are OBL, FAC	W, or FAC): —	0.070	_ (, ,
Festuca rubra	15	Y	FACU	Prevalence Index \	Workshee	t:		
	115	=Total Cover		Total % Cover of	of:	Multi	ply by:	
Vine Stratum		_		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	(E
				Prevalence In	dex = B/A	=	4.00	
				Hydrophytic Vegeta	ation Indic	cators:		
				1 - Rapid Test f	or Hydrop	hytic Ve	getation	ı
				2 - Dominance	Test > 50 ⁹	%		
				3 - Prevalence	Index ≤ 3.0	0		
				Problematic Hy	drophytic '	Vegetati	on (Ex	plair
				Indicators of hydric so be present, unless dis				
				Definitions of Veget	ation Stra	ıta:		
				Tree – Woody plants, approximately 20 ft (6 (7.6 cm) or larger in d	m) or mo	re in hei	ght and	
				Sapling – Woody plar approximately 20 ft (6 than 3 in. (7.6 cm) DE	m) or mo			
				Shrub – Woody plants approximately 3 to 20				
				Herb – All herbaceous herbaceous vines, req plants, except woody 3 ft (1 m) in height.	gardless o	f size. In	cludes	woc

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

Woody vine – All woody vines, regardless of height.

Yes

No X

Hydrophytic **Vegetation Present?** SOIL Sampling Point: up21

Depth	iption: (Des	Matrix	aeptn ne			eatures	contirm t	the absence of Indicators.)	
(inches)	Color	(moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0 to 12	10YR	5 / 4	100	-				SANDY CLAY LOAM	
¹Type: C=Con	centration, D	=Depletion,	RM=Redu	iced Martix, CS=Co	vered o	Coated S	and Grain	ns. ² Location: PL=Pore Lining	, M=Matrix.
5 cm Muck Muck Prese 1 cm Muck Depleted B Thick Dark	1) edon (A2) c (A3) Sulfide (A4)	LRR P, T, U) U) (U) (a) (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		Polyvalue Below S Thin Dark Surface Loamy Mucky Mind Loamy Gleyed Mar Depleted Matrix (F Redox Dark Surface Depleted Dark Surface Redox Depression Marl (F10) (LRR U Depleted Ochric (F Iron-Manganese N	(S9) (LR eral (F1) (F1) (F2) (F3) (F3) (F3) (F4) (F5) (F5) (F5) (F5) (F5) (F5) (F5) (F5	R S, T, U) (LRR O) RA 151) 12) (LRR O		Indicators for Problematic Hy 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Piedmont Floodplain Soils (F19 Anomalous Bright Loamy Soils (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TF Other (Explain in Remarks) 3 Indicators of hydrophytic veg hydrology must be present, unless disturbed or problem	MLRA 150A,B) 9) (LRR P, S, T) (F20)
Sandy Gley Sandy Red Stripped Ma		, S, T, U)	[[[[]	Umbric Surface (F Delta Ochric (F17) Reduced Vertic (F Piedmont Floodpla Anomalous Bright	(MLRA 1 18) (MLR ain Soils (51) A 150A, 15 F19) (MLR/	A 149A)	A, 153C, 153D)	
Depth (inch	es):							Hydric Soil Present? Y	es No X
Remarks:									

, Hydrology , Hydrology - Attach a Yes Yes	Lat: 34 7 /pical for this tim, significar, naturally	ne of year? Yesntly disturbed? problematic?	
on the site ty, Hydrology Hydrology - Attach a Yes Yes	Lat: 34 7 /pical for this tim, significar, naturally site map sh X No X No	ne of year? Yes	(concave, convex, none): Concave Slope(%) 4 Long:80 57.83 Datum: NWI Classification: PFO NoX (If No, explain in Remarks) Are "Normal Circumstances" present? YesX No (If needed, explain any answers in Remarks.) Dint locations, transects, important features, etc.
on the site ty, Hydrology Hydrology - Attach a Yes Yes	Lat: 34 7 /pical for this tim, significar, naturally site map sh X No X No	ne of year? Yes	Long:80 57.83
, Hydrology , Hydrology - Attach a Yes Yes	/pical for this tim, significar, naturally site map sh XNo	ne of year? Yes	Long:80 57.83
, Hydrology , Hydrology - Attach a Yes Yes	/pical for this tim, significar, naturally site map sh XNo	ne of year? Yes ntly disturbed? problematic? nowing sampling po	NWI Classification: PFO No X (If No, explain in Remarks) Are "Normal Circumstances" present? Yes X No (If needed, explain any answers in Remarks.) Dint locations, transects, important features, etc.
, Hydrology , Hydrology - Attach a Yes Yes	, significar , naturally site map sh X No	ntly disturbed? problematic? nowing sampling po	No X (If No, explain in Remarks) Are "Normal Circumstances" present? Yes X No (If needed, explain any answers in Remarks.) Dint locations, transects, important features, etc.
, Hydrology , Hydrology - Attach a Yes Yes	, significar , naturally site map sh X No	ntly disturbed? problematic? nowing sampling po	Are "Normal Circumstances" present? Yes X No (If needed, explain any answers in Remarks.) Dint locations, transects, important features, etc.
- Attach a Yes Yes	, naturally site map sh X No X No	problematic? nowing sampling po	(If needed, explain any answers in Remarks.) Dint locations, transects, important features, etc.
- Attach a	x No No	nowing sampling po	oint locations, transects, important features, etc.
Yes	X No	Is the Sampled Arc	ea
Yes	X No	Is the Sampled Arc	ea
Yes	X No	I	
		I	
Yes	XNo		
ne is required	Aquatic Marl De Hydroge Oxidize Presence Recent Thin Me	e Fauna (B13) eposits (B15) (LRR U) en Sulfide Odor (C1) ed Rhizospheres along Living ce of Reduced Iron (C4) Iron Reduction in Tilled Soils uck Surface (C7)	Crayfish Burrows (C8)
Yes 1	No X De	epth (inches):	
Yes N	No X De	epth (inches):	Westernal Headrels and Bureauto Vers V. No.
Yes N	No <u>X</u> De	epth (inches):	Wetland Hydrology Present? Yes <u>X</u> No
monitoring wol	II garial photos pr	covious inspections) if availab	No:
,	/ (B7) Yes Yes Yes	Aquatic Marl Di Hydrog ✓ Oxidize Presen Recent Thin M Other ((B7)	Yes No X Depth (inches): Yes No X Depth (inches):



	Absolute % Cover	Dominant Species	Indicator Status	Dominance Test Worksheet:
<u>rree Stratum</u> (Plot size: 30 Ft)	<u>,,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	<u> </u>	<u></u>	Number of Dominant Species
Liquidambar styraciflua	65	Υ	FAC	That Are OBL, FACW, or FAC: 4
Nyssa sylvatica	15	- <u>'</u>	FAC	Total Number of Dominant
Liriodendron tulipifera	10	- <u>'</u>	FACU	Species Across all Strata: 5 (E
Acer rubrum		N	FAC	 `
Acertubrum	95	=Total Cover		Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A
Shrub Stratum (Plot size: 30 Ft)				Prevalence Index Worksheet:
Magnolia virginiana	5	N	FACW	Total % Cover of: Multiply by:
Arundinaria gigantea	4	N	FACW	OBL species 17 x 1 = 17
	9	=Total Cover	-	OBL species
<u>Herb Stratum</u> (Plot size: 6 Ft)		_		TACVI species
Woodwardia areolata	10	Υ	OBL	FAC species95 x 3 =285
				FACU species10 x 4 =40
Osmunda spectabilis Osmundastrum cinnamomeum		- N	OBL FACW	UPL species0 x 5 =0
Typha latifolia		N	OBL	400 (4) 004 (
турпа ташона			-	Column Totals: 133 (A) 364 (B
/ine Stratum (DL-t-size) 20 5t	19	_=Total Cover		Prevalence Index = B/A= 2.74
(Plot size: <u>30 Ft</u>) Vitis rotundifolia	10	Y	FAC	Hydrophytic Vegetation Indicators:
Vitis Totalianolla			-	1 - Rapid Test for Hydrophytic Vegetation
		_=Total Cover		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 (DBF
				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,
				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, includir herbaceous vines, regardless of size. Includes woo plants, except woody vines, less than approximately

SOIL Sampling Point: w22 (aka W215)

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

Depth		Matrix			Redox F	eatures				
(inches)	Color	(moist)	%	Color (moist)	%	Туре	Loc 2	Texture	Remarks	
0 to 4	7.5YR	4/2	70	7.5YR 4/6	30	D	М	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	OYR 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=Conc	entration, D	=Depletion, F	RM=Red	duced Martix, CS=Co	vered or	Coated	Sand Gra	nins. ² Location: PL=Pore Linin	g, M=Matrix.	
5 cm Mucky Muck Preser 1 cm Muck (Depleted Bel Thick Dark S Coast Prairie	don (A2) (A3) ulfide (A4) vers (A5) ies (A6) (LRR Mineral (A7) (I nce (A8) (LRR A9) (LRR P, T low Dark Surfa surface (A12)	LRR P, T, U) U)) ace (A11) (MLRA 150A)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min. Loamy Gleyed Ma ✓ Depleted Matrix (F Redox Dark Surfar Depleted Dark Sur Redox Depression Marl (F10) (LRR U Depleted Ochric (F Iron-Manganese M Umbric Surface (F	(S9) (LRR eral (F1) (trix (F2) (3) ce (F6) rface (F7) as (F8) l) f=11) (MLR	R S, T, U) LRR O) (A 151) (12) (LRR (P, T, U)		□ 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.		
Sandy Redox Stripped Mat Dark Surface	rix (S6) e (S7) (LRR P,	S, T, U)):	Delta Ochric (F17) Reduced Vertic (F Piedmont Floodpla Anomalous Bright	18) (MLRA	A 150A, 1 F19) (MLF	RA 149A)	·		
Depth (inche	nches):						Hydric Soil Present?	Yes X No		
Remarks:										

Project/Site: I-77				City/County:	Richland (Co	Sampling Date	: 8/4/2014	1	
Applicant/Owner:	SCDOT				State	e: SC	Sampling Point	i: up22		
Investigators: Jar	mison				Section, To	wnship, Rang	je S T	R		
Landform (hillslope, to	errace, etc.):	Toe	of Slope	Local Relie	ef (concave, con	vex, none):	Concave	Slope	(%) 4	
Subregion (LRRor ML	.RA): P		Lat: 80	°57'41.949"W	Long: 34	- 7'20.332°	"N Date	um:	NAD	198
Soil Map Unit Name:	,				0	NWI Classifi				
Are climatic / hydrolog	nic conditions (on the site tw	nical for this tir	ne of year? Yes	No X		cplain in Remarks			
,		,	•	_			es" present? Y		No	~
Are Vegetation							·		No _	Х
Are Vegetation	_, Soil,	Hydrology	, naturally	problematic?	(If needed	explain any	answers in Rema	rks.)		
SUMMARY OF I	FINDINGS -	Attach a	site map sl	nowing sampling p	oint locatio	ns, transe	cts, importai	nt feature	s, etc	; <u>.</u>
Hydrophytic Vegeta	tion Present?	Yes >	X No							
Hydric Soil Present?				Is the Sampled A						
Wetland Hydrology		Yes	NoX	within a Wetland	l?	Yes	No	X		
		Yes	No X							
Remarks: Adjacent	to w22 wetland	l data point.								
HYDROLOGY									-	
Wetland Hydrology	Indicators					Secondary	Indicators (minin	num of two r	eauired	(t
Primary Indicators (n		e is required:	: check all that	apply)			ce Soil Cracks (B6)		- 4	
Surface Water (A1)				11.37			ely Vegetated Conc	ave Surface (B8)	
High Water Table (A	12)			c Fauna (B13)			age Patterns (B10)	ave Surface (30)	
Saturation (A3)	(Z)			eposits (B15) (LRR U)			Trim Lines (B16)			
Water Marks (B1)				gen Sulfide Odor (C1)			eason Water Table	(C2)		
Sediment Deposits ((B2)			ed Rhizospheres along Livin	g Roots (C3)		sh Burrows (C8)	(02)		
Drift Deposits (B3)	,DZ)			nce of Reduced Iron (C4)			ation Visible on Aeri	al Imag (C9)		
Algal Mat or Crust (E	34)			t Iron Reduction in Tilled Soi	ils (C6)	=	orphic Position (D2)	0 ()		
Iron Deposits (B5)	2.1)			luck Surface (C7)			w Aquitard (D3)	,		
Inundation Visible or	n Aerial Imagery ((B7)	Otner	(Explain in Remarks)			Neutral Test (D5)			
Water-Stained Leav	0 , .	(2.)				=	gnum moss (D8) (LF	RR T.U)		
							, (= -, (=:			
Field Observations:			L V 5	and Carley						
Surface Water Present				epth (inches):						
Water Table Present? Saturation Present?				epth (inches): epth (inches):	We	tland Hydro	logy Present?	Yes	No X	(
(includes capillary fring		cs i	NO _X_ D	ерит (птопез).			3, 11000000			_
		nonitoring wel	I, aerial photos, p	revious inspections), if availa	able:					-
Remarks:										



		Absolute % Cover	Dominant Species	Indicator Status
Tree Stratum	(Plot size: <u>30 Ft</u>)			
Pinus taeda		80	Υ	FAC
Acer rubrum		20	Y	FAC
		100	=Total Cover	
Shrub Stratum	(Plot size: 30 Ft)			
Smilax rotundifo		35	Υ	FAC
		35	=Total Cover	
Herb Stratum	(Plot size: <u>6 Ft</u>)			
Eupatorium capi	llifolium	20	Υ	FACU
		20	=Total Cover	
Vine Stratum	(Plot size: <u>30 Ft</u>)			
Vitis rotundifolia		20	Υ	FAC
Smilax rotundifo	lia	15	Y	FAC
		35	=Total Cover	-

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

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

SOIL Sampling Point: up22

	ription. (Des	Matrix	iepiii iie			Features	COMMIN	the absence of indicators.)	
Depth (inches)	Colo	r (moist)	%	Color (moist)	%	Type ¹	Loc ²	Texture	Remarks
0 to 4	10YR	4/2	100					SILTY CLAY LOAM	<u>-</u>
4 to 13	10YR	4/3	100					CLAY LOAM	
¹Type: C=Co	ncentration, I	D=Depletion, F	RM=Red	luced Martix, CS=Co	vered o	r Coated	Sand Gra	ins. ² Location: PL=Pore Lining	, M=Matrix.
Black Hist Hydrogen Stratified I Organic B 5 cm Mucl Muck Pres 1 cm Mucl Depleted I Thick Darl Coast Pra Sandy Mu Sandy Gle	A1) bedon (A2) ic (A3) Sulfide (A4) Layers (A5) odies (A6) (LRI ky Mineral (A7) bence (A8) (LR P, Below Dark Sun ky Surface (A12 irie Redox (A16 cky Mineral (S1 eyed Matrix (S4	(LRR P, T, U) R U) T) face (A11) b) (MLRA 150A)) (LRR O, S)		Polyvalue Below S Thin Dark Surface Loamy Mucky Min Loamy Gleyed Ma Depleted Matrix (F Redox Dark Surface Depleted Dark Surface Marl (F10) (LRR U Depleted Ochric (F Iron-Manganese M Umbric Surface (F	(S9) (LR eral (F1) trix (F2) (S3) cce (F6) rface (F7) as (F8) (b) fasses (F fasses (F1) (MLRA 1)	R S, T, U) (LRR O) RA 151) 12) (LRR C P, T, U)), P, T)	Indicators for Problematic Hy 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Piedmont Floodplain Soils (F18) Anomalous Bright Loamy Soils (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TF) Other (Explain in Remarks) Indicators of hydrophytic veg hydrology must be present, unless disturbed or problem.	MLRA 150A,B) 9) (LRR P, S, T) (F20) 12) (LRR T, U) getation and wetland
Sandy Re				Reduced Vertic (F	18) (MLR	A 150A, 15	50B)		
Stripped N	iatrix (S6) ace (S7) (LRR I) (T II)		Piedmont Floodpla	ain Soils (F19) (MLR	A 149A)		
Daik Suite	100 (37) (LKK)	-, 3, 1, 0)		Anomalous Bright	Loamy S	oils (F20) (MLRA 149.	A, 153C, 153D)	
Туре:		if observed):					Hydric Soil Present? Y	es No X
Depth (inc	nes):								

_, Hydrology _, Hydrology	Slope Lat: 34 7.95 ical for this time of , significantly o , naturally prot	Local Relief (concav	State: SC Sampling Point: w23 ion, Township, Range S T R ve, convex, none): Concave Slope(%) y: -80 57.83 Datum: NWI Classification: PFO X (If No, explain in Remarks) Normal Circumstances" present? Yes X
ns on the site typi _, Hydrology _, Hydrology	Lat: 34 7.95	Local Relief (concav	ve, convex, none): Concave Slope(%) y: -80 57.83 Datum: NWI Classification: PFO X (If No, explain in Remarks)
ns on the site typi _, Hydrology _, Hydrology	Lat: 34 7.95	Long:	NWI Classification: PFO X (If No, explain in Remarks)
_, Hydrology _, Hydrology	ical for this time of	f year? Yes No	NWI Classification: PFO X (If No, explain in Remarks)
_, Hydrology _, Hydrology	ical for this time of	f year? Yes No	NWI Classification: PFO X (If No, explain in Remarks)
_, Hydrology _, Hydrology	, significantly o	· —	X (If No, explain in Remarks)
_, Hydrology _, Hydrology	, significantly o	· —	
_, Hydrology		disturbed? Are "N	Normal Circumstances" present? Yes X N
	, naturally prob		
S - Attach a s		olematic? (If ne	eeded, explain any answers in Remarks.)
7 Attaon a s	ite man show	ing sampling point lo	ocations, transects, important features,
	nto map onon	ing camping point to	outions, transcoto, important routaros,
:? Yes X	No	Is the Sampled Area	
Yes X	No	within a Wetland?	Yes X No
Yes X	No		103 <u>X</u> 110
one is required; c	Aquatic Fau Marl Deposi Hydrogen St Oxidized Rh Presence of Recent Iron Thin Muck S	na (B13) ts (B15) (LRR U) ulfide Odor (C1) izospheres along Living Roots (C: Reduced Iron (C4) Reduction in Tilled Soils (C6) Surface (C7)	Secondary Indicators (minimum of two requestions of two requestions) 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)
Yes No	X Depth	(inches):	
	· · · · · ·	· · · · ———	
Yes No	_X_ Depth	(inches):	Wetland Hydrology Present? Yes X N
	: one is required; of ery (B7) Yes No Yes No Yes No	: one is required; check all that apply Aquatic Faur Marl Deposi Hydrogen State Oxidized Rh Presence of Recent Iron Thin Muck State Other (Explaint) Yes NoX Depth (Yes NoX Depth (: one is required; check all that apply) Aquatic Fauna (B13) Marl Deposits (B15) (LRR U) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres along Living Roots (C) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (Explain in Remarks) Yes NoX Depth (inches): Yes NoX Depth (inches):



VEGETATION Use scientific names of	Absolute	<u>Dominant</u>	Indicator		npling Point:			
	<u>% Cover</u>	Species	<u>Status</u>	Dominance Test \				
<u>Tree Stratum</u> (Plot size: <u>30 Ft</u> Liriodendron tulipifera	30	Υ	FACU	Number of Domin That Are OBL, FA			3	_ (A)
Oxydendrum arboreum	30	- <u>'</u>	FACU	Total Number of D	ominant			
Pinus taeda	30	Y	FAC	Species Across all			5	(B)
Juniperus virginiana	5	N	FACU	Doroont of Domina	ent Chaolas			_
	2	N	UPL	Percent of Domina That Are OBL, FAC		: —	60.0%	_ (A/B)
	97	=Total Cover		Prevalence Index	Worksheet			
Shrub Stratum (Plot size: 30 Ft	.)			Total % Cover	of:	Multip	oly by:	
Magnolia virginiana	8	Y	FACW	OBL species	0	x 1 =	0	
	8	=Total Cover		FACW species	8	x 2 =	16	
Herb Stratum				FAC species	55	x 3 =	165	
Vine Stratum (Plot size: 30 Ft	1			·	65	x 4 =	260	
Vitis rotundifolia	. <i>1</i> 25	Υ	FAC	FACU species UPL species	2	x 5 =	10	<u> </u>
	25	=Total Cover		Column Totals:	130	(A)	451	(B)
						_		
				Prevalence I	ndex = B/A=	<u> </u>	3.47	
				Hydrophytic Veget	ation Indica	ators:		
				1 - Rapid Test	for Hydroph	ytic Veg	jetation	
				X 2 - Dominance	: Test > 50%	, D		
				3 - Prevalence	Index ≤ 3.0			
				Problematic H	ydrophytic V	egetation	on (Exp	olain)
				Indicators of hydric s be present, unless di				
				Definitions of Vege	tation Strat	a:		
				Tree – Woody plants approximately 20 ft ((7.6 cm) or larger in	(6 m) or mor	e in héig	ght and	
				Sapling – Woody pla approximately 20 ft (than 3 in. (7.6 cm) D	(6 m) or mor			
				Shrub – Woody plan approximately 3 to 2				
				Herb – All herbaceon herbaceous vines, re plants, except woody 3 ft (1 m) in height.	egardless of	size. In	cludes v	woody
				Woody vine – All wo	ody vines, r	egardles	ss of he	ight.
				Hydrophytic Vegetation Prese	ent? 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		Matrix			Redox	Features			
(inches)	Color	(moist)	%	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	М	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	М	SANDY CLAY	gravelly, 10YR5/8 (5%) concentrations
¹ Type: C=Cor	ncentration, D	=Depletion,	RM=Redu	uced Martix, CS=Co	overed o	or Coated	Sand Gra	ains. ² Location: PL=Pore Linin	g, M=Matrix.
Hydric Soil I Histosol (A Histic Epip Black Histii Hydrogen S Stratified L Organic Bo 5 cm Muck Muck Presi 1 cm Muck Depleted B Thick Dark Coast Prain Sandy Muc Sandy Gley Sandy Red Stripped M Dark Surfa	indicators: 1) edon (A2) c (A3) Sulfide (A4) ayers (A5) dies (A6) (LRR y Mineral (A7) ence (A8) (LRR P, 1 delow Dark Surf surface (A12) rie Redox (A16 eky Mineral (S1) yed Matrix (S4) lox (S5) atrix (S6) ce (S7) (LRR P ive Layer (interes):	R P, T, U) (LRR P, T, U) R U) (F) Face (A11) (MLRA 150A) (LRR O, S) P, S, T, U)		Polyvalue Below Thin Dark Surface Loamy Mucky Mir Loamy Gleyed Ma Depleted Matrix (i Redox Dark Surface Redox Depressio Marl (F10) (LRR i Depleted Ochric (i Iron-Manganese i Umbric Surface (ii Delta Ochric (F17 Reduced Vertic (fi Piedmont Floodpi Anomalous Brigh	Surface (: e (S9) (LF eral (F1) atrix (F2) F3) ace (F6) urface (F7 ns (F8) U) (F11) (ML Masses (I F13) (LRF ') (MLRA F18) (MLF lain Soils	S8) (LRR S RR S, T, U) (LRR O) (LRR O) (T) (LRR O) (T) (R P, T, U) (T) (F19) (MLR	O, P, T) 50B) RA 149A)	Indicators for Problematic F 1 cm Muck (A9) (LRR O) 2 cm Muck (A10) (LRR S) Reduced Vertic (F18) (outside Piedmont Floodplain Soils (FAnomalous Bright Loamy Soil (MLRA 153B) Red Parent Material (TF2) Very Shallow Dark Surface (TOther (Explain in Remarks) Indicators of hydrophytic very hydrology must be present unless disturbed or problem	Ivdric Soils: 3 MLRA 150A,B) 19) (LRR P, S, T) Is (F20) F12) (LRR T, U) egetation and wetland

		City/County: Richla	and Co	Sampling Date:	0/4/2014
Т			State: SC	Sampling Point:	up23
		Section	n, Township, Ran	ge S T	R
etc.): Toe of Slo	эре	Local Relief (concave	, convex, none):	Concave	Slope(%)
 P	Lat: 34 7.9	95073 Long:	-80 57.82715	Datu	m:
				ication:	
ditions on the site typics	I for this time	of year? Von No			\
			rmai Circumstano	ces" present? Y	es No X
, Hydrology	, naturally pr	oblematic? (If nee	eded, explain any	answers in Remar	ks.)
NGS - Attach a site	map sho	wing sampling point loc	ations, transe	ects, importan	t features, etc.
	-			· •	
		Is the Sampled Area			
		within a Wetland?	Yes	No X	
YesI	No X		_		
n of one is required; che	Aquatic Fa Marl Depo Hydrogen Oxidized F Presence Recent Iro Thin Muck	auna (B13) ssits (B15) (LRR U) Sulfide Odor (C1) Rhizospheres along Living Roots (C3) of Reduced Iron (C4) In Reduction in Tilled Soils (C6) Surface (C7)	Spars Drain Moss Dry-S Crayf Satur Geon Shall	sely Vegetated Conca age Patterns (B10) Trim Lines (B16) season Water Table (ish Burrows (C8) ation Visible on Aeria norphic Position (D2) ow Aquitard (D3)	C2) I Imag.(C9)
			Брпа	grium moss (Do) (Erv	K 1,0)
			Брпа	gridin moss (50) (Erc	K 1,0)
· · · · · · · · · · · · · · · · · · ·		h (inches):	Брпа	gridin moss (DO) (Erv	K 1,0)
Yes No	X Dept	h (inches):			
Yes No Yes No	X Dept	` '	Wetland Hydro		Yes No_X_
t e	ditions on the site typical X , Hydrology , Hydrology NGS - Attach a site sent? Yes! Yes! Yes! ed area tors: n of one is required; che	tors: n of one is required; check all that app Aquatic Fa Marl Depo Hydrogen Oxidized F Presence Recent Iro Thin Muck	tors: n of one is required; check all that apply) Aquatic Fauna (B13)	Section, Township, Rangetc.): Toe of Slope Local Relief (concave, convex, none): P Lat: 34 7.95073 Long: -80 57.82715 NWI Classif ditions on the site typical for this time of year? Yes No X (If No, example of the site typical for this time of year? Yes No X (If No, example of the site typical for this time of year? Yes No X (If needed, explain any or the site of year) Are "Normal Circumstance" Hydrology naturally problematic? Hydrology naturally problematic? Hydrology naturally problematic? Is the Sampled Area within a Wetland? Yes No X Is the Sampled Area within a Wetland? Yes No X Aquatic Fauna (B13) Aquatic	Section, Township, Range S T etc.): Toe of Slope



SOIL Sampling Point: up23

	LOW	/ GRADIEN	NT STREAM ASSESSMEN	NT DATA	SHEET	
Stream Name s1		Basin/Wate	ershed: Congaree (03050110)) (JSGS Quad: Fort Ja	ackson North
Latitude: 34°2′5	58.689" N	Longitude:	80°55′ 27.591″ W	(County: Richle	and
Date: 8-7-14	1	Time:	1100		nvestigator: Jamis	on
Stream width: 8-12'		Stream De	oth: 1-2'		ength of Stream Re	
Has it rained within th	ne past 48 hours? no				al, agriculture, etc)	
Habitat			Condition Ca			
Parameter	Fully Functio	nal	Partially Impaired	T ,	Impaired	Very Impaired
1.Epifaunal	Greater than 50% of substi	ate favorable	30-50% mix of stable habitat; well	10-30% mi		Less than 10% stable
Substrate or	for epifaunal colonization : mix of snags, submerged lo		suited for full colonization potential; adequate habitat for	habitat; ha	ibitat availability	habitat lack of habitat is obvious; substrate
Available Cover	banks, cobble or other stal		maintenance of populations;	substrate		unstable or lacking.
	at stage to allow full colon		presence of additional	disturbed	or removed.	
	potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for			
	,		colonization			
SCORE	2.0		1.5		1.0	0.5
2.Pool Substrate	Mix of substrate materials		Mix of soft sand, mud, or clay;		clay or sand bottom;	Hard-pan, clay, or bedrock; no
Characterization	and firm sand prevalent; re		mud may be dominant; some	1	root mat; no	root mat or vegetation.
	submerged vegetation con	mion.	root mats and submerged vegetation present.	Submerge	d vegetation.	
SCORE	2.0		1.5)		1.0	0.5
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very		ools much more	Majority of pools small-shallow or
•	small-shallow, small-deep	pools present.	few shallow.	prevalent	than deep pools.	pools absent.
SCORE	2.0 Little or no enlargement		1.5 Some new increase in bar	Madan	deposition of	0.5 Heavy deposits of fine
4.Sediment	of islands or point bars		formation, mostly from gravel,	1	l, sand or fine	material, increased bar
Deposition	and less than 20% of the b		sand or fine sediment. 20-50% of	sediment	on old and new	development; more than
	affected by sediment depo	sition.	the bottom affected; slight deposition in pools.)%of the bottom ediment deposits at	80% of the bottom changing frequently;
			deposition in pools.	obstructions, constrictions, and		pools almost absent due to
				bends; mo	derate deposition of	substantial sediment deposition.
SCORE	2.0		1.5	poors prev	1.0	0.5
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available	1	25-75% of the available	Very little water in channel and
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, ar are mostly	nd/or riffle substrates exposed	mostly present as standing pools.
SCORE	2.0		1.5	(1.0)		0.5
6.Channel	Channelization or dredging		Some channelization present,		tion may be extensive;	Banks shored with gabion or
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		ents or shoring present on both banks;	cement; over 80% of the stream reach channelized and disrupted.
			channelization (greater than past		6 of stream reach	In stream habitat greatly altered or
			20 yr.) may be present, but recent	channelize	d and disrupted.	removed entirely.
SCORE	2.0		channelization not present.		1.0	0.5
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The bends	in the stream increase	Channel straight; waterway has
7.Chamiler Sindosity	stream length 3-4X longer t	han if it was in	the stream length 2-3X longer	the stream	length 2 to 1 times	been channelized for a long
	a straight line (If braided ch parameter is difficult to rat		than if it was in a straight line.	longer that line.	n if it was in a straight	distance.
SCORE	2.0	E. J	1.5	iiie.	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of e	rosion or bank	Moderately stable; infrequent,	Moderate	y unstable; 30-60% of	Unstable; many eroded areas;
o.bank stability	failure absent or minimal; l	ttle potential	small areas of erosion mostly	bank in rea	ch has areas of erosion;	"raw" areas frequent along
	for future problems. < 5% of affected.	f bank	healed over; 5-30% of bank in reach has areas of erosion.	high erosic floods.	n potential during	straight sections and bends; obvious bank sloughing; 60-100%
	arrected.		. Casil has areas of Closion.	noous.		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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		SB covered by	<50% of SB surfaces covered by
Protection	zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;		; disruption obvious; bare soil or closely	vegetation; disruption of SB vegetation is very high; vegetation
	non-woody macrophytes. r	ninimal or no	disruption evident but not	cropped ve	getation common; less	has been removed to 5 cm. or less
	evidence of grazing or mow plants allowed to grow nati		affecting full plant growth	than ½ pot height rem	ential plant stubble	in average stubble height.
	piants anowed to grow hat	arany	potential more than ½ of potential plant stubble height	neight rem	anillig.	
CODE			remaining		0.50	0.25
SCORE	Left Bank 1.0		0.75		0.50	0.25
SCORE	Right Bank 1.0		0.75	Marine C.	0.50	0.25
10.Riparian Veg	Width of riparian zone>18 activities (roads, clear-cuts,		Width of riparian zone 12-18 meters; human activities have		parian zone 6-12 man activities have	Width of riparian zone < 6 meters; little or no riparian vegetation due
Zone Width	parking lots) have not impa		impacted zone only minimally.		one a great deal.	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	CONANAENIT	S: originally \$200: parall			

Total Score: _______11 NOTES/COMMENTS: originally s200; parallel to I-77, flowing south away from I-77; limited riffle-pool habitat; perennial flow

	LOW	GRADIEN	NT STREAM ASSESSMEN	IT DAT	A SHEET	
Stream Name \$2		Basin/Wate	ershed: Congaree (0305	0110)	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:	mq 00:		Investigator: MCMa	aster/Mulholland
Stream width: 8.0'		Stream De	oth: 1.5'		Length of Stream Re	each: ~900'
Has it rained within th	e past 48 hours?	/es		? (Indus	trial, agriculture, etc)	
Habitat			Condition Ca		, , ,	110 Grawary
Parameter	Fully Functio	nal	Partially Impaired	T .	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 10-30% mix of sta		habitat availability n desirable; te frequently	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.
SCORE	2.0		colonization 1.5		(1.0)	0.5
2.Pool Substrate	Mix of substrate materials,	with gravel	Mix of soft sand, mud, or clay;	All mud	or clay or sand bottom;	Hard-pan, clay, or bedrock; no
Characterization	and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged vegetation present.		no root mat; no ged vegetation.	root mat or vegetation.
SCORE	2.0		1.5		1.0	0.5
3.Pool variability	Even mix of large-shallow, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		pools much more nt 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 bo affected by sediment depo		Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	new gra sedimer bars; 50 affected obstruct bends; r	ite deposition of invel, sand or fine to not and new -80% of the bottom d; sediment deposits at tions, constrictions, and moderate deposition of revalent.	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 and minimal amount of cha is exposed.		Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	channel	ills 25-75% of the available , and/or riffle substrates tly 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 minimal; stream with norm		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.	embank structur and 40-8	lization may be extensive; ments or shoring res present on both banks; 30% of stream reach ized 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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	ds in the stream increase am length 2 to 1 times han if it was in a straight	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 er failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% of reach has areas of erosion; ssion potential during	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 adj zone covered by native veg- including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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	V.30 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.
			0.75		0.50	0.25
SCORE	Left Bank 1.0				$\overline{}$	
SCORE			0.75		(0.50)	0.25
SCORE	Right Bank 1.0	neters: human	0.75 Width of riparian zone 12-18	Widtho	0.50 f riparian zone 6-12	0.25 Width of riparian zone < 6 meters:
		lawns, crops,	0.75 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	meters;	f riparian zone 6-12 human activities have d zone a great deal.	0.25 Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.
SCORE 10.Riparian Veg	Right Bank 1.0 Width of riparian zone>18 r activities (roads, clear-cuts,	lawns, crops,	Width of riparian zone 12-18 meters; human activities have	meters;	f riparian zone 6-12 human activities have	Width of riparian zone < 6 meters; little or no riparian vegetation due

Total Score: _______NOTES/COMMENTS: Stream is fed by one linear conveyance and terminates at a culvert.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DATA SH	EET	
Stream Name \$3		Basin/Wate	ershed: Congaree (03050110)	USGS	Quad: Fort Ja	ackson North
Latitude: 34°4′ 8	8.062" N	Longitude:	80°55′ 10.210″ W	Cour	ty: Richla	ınd
Date: 8-5-14	1	Time:	0830	Inves	tigator: Jamis	on
Stream width: 2-3'		Stream De	oth: 1-2'		th of Stream Re	
Has it rained within th	ne past 48 hours? no		Adjacent land use			
Habitat	1		Condition Ca		, ,	
Parameter	Fully Functio	nal	Partially Impaired		aired	Very Impaired
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	10-30% mix of st		Less than 10% stable
Substrate or	for epifaunal colonization		suited for full colonization	habitat; habitat		habitat lack of habitat is
Available Cover	mix of snags, submerged lo banks, cobble or other stal		potential; adequate habitat for maintenance of populations;	less than desiral substrate freque		obvious; substrate unstable or lacking.
	at stage to allow full coloni	zation	presence of additional	disturbed or ren		
	potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for			
	new run and <u>not</u> transient,	•	colonization			
SCORE	2.0		1.5	(1	0)	0.5
2.Pool Substrate	Mix of substrate materials		Mix of soft sand, mud, or clay;	All mud or clay o		Hard-pan, clay, or bedrock; no
Characterization	and firm sand prevalent; ro submerged vegetation con		mud may be dominant; some root mats and submerged	little or no root submerged vege		root mat or vegetation.
SCORE	2.0		vegetation present.	(1	.0)	0.5
3.Pool variability	Even mix of large-shallow,	large-deep,	Majority of pools large-deep; very	Shallow pools m		Majority of pools small-shallow or
<u> </u>	small-shallow, small-deep		few shallow.	prevalent than o	leep pools.	pools absent.
SCORE	2.0		1.5		0)	0.5
4.Sediment	Little or no enlargement of islands or point bars		Some new increase in bar formation, mostly from gravel,	Moderate depos new gravel, sand		Heavy deposits of fine material, increased bar
Deposition	and less than 20% of the bo	ottom	sand or fine sediment. 20-50% of	sediment on old		development; more than
	affected by sediment depo	sition.	the bottom affected; slight	bars; 50-80%of t		80% of the bottom
			deposition in pools.	affected; sedime obstructions, co		changing frequently; pools almost absent due to
				bends; moderate deposition of		substantial sediment deposition.
SCORE	2.0		1.5	pools prevalent. 1.0		0.5
5.Channel Flow	Water reaches base of both	lower banks,	Water fills > 75% of the available		% of the available	Very little water in channel and
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, and/or are mostly expos		mostly present as standing pools.
SCORE	2.0		1.5	1.0		0.5
6.Channel	Channelization or dredging	absent or	Some channelization present,		nay be extensive;	Banks shored with gabion or
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge	embankments o		cement; over 80% of the stream
			abutments; evidence of past channelization (greater than past	and 40-80% of st	nt on both banks; ream reach	reach channelized and disrupted. In stream habitat greatly altered or
			20 yr.) may be present, but recent	channelized and		removed entirely.
CCORE	2.0		channelization not present.		0	0.5
SCORE	2.0 The bends in the stream inc	raasa tha	1.5 The bends in the stream increase	The bends in the	0)	0.5 Channel straight; waterway has
7.Channel Sinuosity	stream length 3-4X longer t		the stream length 2-3X longer	the stream lengt		been channelized for a long
	a straight line (If braided ch	annel, this	than if it was in a straight line.	longer than if it v		distance.
CCORE	parameter is difficult to rat	e.)	1.5	line.	0	0.5
SCORE	2.0 Banks stable; evidence of e	rocion or bank	1.5 Moderately stable; infrequent,	Moderately unst	0	0.5 Unstable; many eroded areas;
8.Bank Stability	failure absent or minimal; li		small areas of erosion mostly		s areas of erosion;	"raw" areas frequent along
	for future problems. < 5% o	f bank	healed over; 5-30% of bank in	high erosion pot	ential during	straight sections and bends;
	affected.		reach has areas of erosion.	floods.		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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered	50-70% of SB cov		<50% of SB surfaces covered by
Protection	zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;	vegetation; disru patches of bare		vegetation; disruption of SB vegetation is very high; vegetation
	non-woody macrophytes. n	ninimal or no	disruption evident but not	cropped vegetat	ion common; less	has been removed to 5 cm. or less
	evidence of grazing or mow plants allowed to grow nati		affecting full plant growth potential more than ½ of	than ½ potential height remaining		in average stubble height.
	Piants anowed to Brow hatt	y	potential plant stubble height	neigni remaining	,.	
SCORE	Left Bank 1.0		remaining 0.75	(1)	50)	0.25
SCORE	Right Bank 1.0		0.75	<u> </u>	50	0.25
	Width of riparian zone>18	neters: human	Width of riparian zone 12-18	Width of ripariar		Width of riparian zone < 6 meters;
10. Riparian Veg	activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters; human a	ctivities have	little or no riparian vegetation due
Zone Width	parking lots) have not impa	cted zone.	impacted zone only minimally.	impacted zone a	_	to human activities.
SCORE	Left Bank 1.0		(0.75)	.	50	0.25
SCORE	Right Bank 1.0		0.75	l	50	0.25
Total Score:	10 NOTES/	CONTRACT	St. originally \$203: parall	1-14-100 51	1 1 1 1 1	4 12 24 4

Total Score:

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	GRADIEN	NT STREAM ASSESSMEN	IT DATA SHEET	
Stream Name \$4		Basin/Wate	ershed: Congaree (03050110)	USGS Quad: Fort	Jackson North
Latitude: 34°4′6	6.975" N	Longitude:	80°55′ 13.348″ W	County: Rich	land
Date: 8-5-14		Time:	0830	Investigator: Jam.	ison
Stream width: 3-5'		Stream Dep	oth: 1-2'	Length of Stream F	
Has it rained within th	e past 48 hours? no	<u>'</u>	Adjacent land use	? (Industrial, agriculture, etc	
Habitat	· .		Condition Ca	ategory	-
Parameter	Fully Functio	nal	Partially Impaired	Impaired	Very Impaired
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	10-30% mix of stable	Less than 10% stable
Substrate or	for epifaunal colonization a mix of snags, submerged lo		suited for full colonization potential; adequate habitat for	habitat; habitat availability less than desirable;	habitat lack of habitat is obvious; substrate
Available Cover	banks, cobble or other stab		maintenance of populations;	substrate frequently	unstable or lacking.
	at stage to allow full coloni		presence of additional	disturbed or removed.	
	potential (i.e.logs/snags the new fall and <u>not</u> transient).		substrate in the form of new fall, but not yet prepared for		
	,		colonization		
SCORE	2.0		1.5	1.0	0.5
2.Pool Substrate	Mix of substrate materials,		Mix of soft sand, mud, or clay;	All mud or clay or sand bottom;	Hard-pan, clay, or bedrock; no
Characterization	and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged	little or no root mat; no submerged vegetation.	root mat or vegetation.
	Juniner geu vegetation com		vegetation present.	Submergeu vegetation.	
SCORE	2.0		1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very	Shallow pools much more	Majority of pools small-shallow or
•	small-shallow, small-deep p	ools present.	few shallow.	prevalent than deep pools.	pools absent.
SCORE	2.0		1.5	1.0	0.5
4.Sediment	Little or no enlargement of islands or point bars		Some new increase in bar formation, mostly from gravel,	Moderate deposition of new gravel, sand or fine	Heavy deposits of fine material, increased bar
Deposition	and less than 20% of the bo		sand or fine sediment. 20-50% of	sediment on old and new	development; more than
	affected by sediment depo:	sition.	the bottom affected; slight deposition in pools.	bars; 50-80% of the bottom affected; sediment deposits at	80% of the bottom changing frequently;
			deposition in pools.	obstructions, constrictions, and	pools almost absent due to
				bends; moderate deposition of	substantial sediment deposition.
SCORE	2.0		1.5	pools prevalent.	0.5
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available	Water fills 25-75% of the available	Very little water in channel and
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, and/or riffle substrates are mostly exposed.	mostly present as standing pools.
SCORE	2.0		1.5	1.0	0.5
6.Channel	Channelization or dredging	absent or	Some channelization present,	Channelization may be extensive;	Banks shored with gabion or
Alteration	minimal; stream with norma	al pattern	usually in areas of bridge	embankments or shoring	cement; over 80% of the stream
			abutments; evidence of past channelization (greater than past	structures present on both banks; and 40-80% of stream reach	reach channelized and disrupted. In stream habitat greatly altered or
			20 yr.) may be present, but recent	channelized and disrupted.	removed entirely.
CCORE	2.0		channelization not present.	1.0	0.5
SCORE	2.0 The bends in the stream inc		The bends in the stream increase	1.0 The bends in the stream increase	0.5 Channel straight; waterway has
7.Channel Sinuosity	stream length 3-4X longer to		the stream length 2-3X longer	the stream length 2 to 1 times	been channelized for a long
	a straight line (If braided ch	annel, this	than if it was in a straight line.	longer than if it was in a straight	distance.
CODE	parameter is difficult to rate	2.)	1 [line.	٥٢
SCORE	2.0 Banks stable; evidence of er	osion or bank	1.5 Moderately stable; infrequent,	1.0 Moderately unstable; 30-60% of	0.5 Unstable; many eroded areas;
8.Bank Stability	failure absent or minimal; li		small areas of erosion mostly	bank in reach has areas of erosion;	
	for future problems. < 5% o	f bank	healed over; 5-30% of bank in	high erosion potential during	straight sections and bends;
	affected.		reach has areas of erosion.	floods.	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	>90% of SB surfaces and adj		70-90% of the SB surfaces covered	50-70% of SB covered by	<50% of SB surfaces covered by
Protection	zone covered by native vege including trees, understory:		by native vegetation but one class of plants is not well-represented;	vegetation; disruption obvious; patches of bare soil or closely	vegetation; disruption of SB vegetation is very high; vegetation
	non-woody macrophytes. m		disruption evident but not	cropped vegetation common; less	has been removed to 5 cm. or less
	evidence of grazing or mow		affecting full plant growth	than ½ potential plant stubble	in average stubble height.
	plants allowed to grow natu	raily	potential more than ½ of potential plant stubble height	height remaining.	
			remaining		1
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	Width of riparian zone>18 n activities (roads, clear-cuts,		Width of riparian zone 12-18 meters; human activities have	Width of riparian zone 6-12 meters; human activities have	Width of riparian zone < 6 meters; little or no riparian vegetation due
Zone Width	parking lots) have not impa		impacted zone only minimally.	impacted zone a great deal.	to human activities.
SCORE	Left Bank 1.0		0.75	0.50	0.25
	Right Bank 1.0		0.75	0.50	0.25
SCORE	Right Bank 1.0		(0.75)		

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	/ GRADIEN	IT STREAM ASSESSMEN	IT DATA SHEET			
Stream Name \$5/s6		Basin/Wate	ershed: Congaree (03050110)	USGS Quad: Fort	lackson North		
	11.579" N	Longitude:	80°55′ 5.414″ W	County: Rich	land		
Date: 8-5-14		Time:	0900		Investigator: Jamison		
Stream width: 3-5'		Stream De	oth: 1-2'	Length of Stream R			
Has it rained within th	e nast 48 hours? no	otream be		? (Industrial, agriculture, etc			
Habitat	e past to flours.		Condition Ca		j		
Parameter	Fully Functio	nal	Partially Impaired	Impaired	Very Impaired		
1.Epifaunal Substrate or Available Cover	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged lo banks, cobble or other stal at stage to allow full coloni potential (i.e.logs/snags th new fall and not transient).	ate favorable and fish cover; gs, undercut ale habitat and zation at are <u>not</u>	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, and firm sand prevalent; ro submerged vegetation com	ot mats and	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, small-shallow, small-deep		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 and minimal amount of cha 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 minimal; stream with norm		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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	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	<u>-</u>	1.5	1.0	0.5		
8.Bank Stability	Banks stable; evidence of er failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	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 adj zone covered by native veg- including trees, understory non-woody macrophytes n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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 r activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	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		

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

Characterization Characterization Characterization Characterization Characterization Characterization Characterization Common submerged vegetation common. Common submerged vegetation present. Common submerged vegetation. Moderate deposition of pools previewer previewer than bard of five sediment. 26-50% of the substance of pools prevalent. Common submerged vegetation. Common submerged vegetation. Common submerged vegetation. Moderate deposition of pools previewer deposition of pools prevalent. Common submerged vegetation. Common submerged vegetation. Moderate deposition of pools previewer deposition of pools prevalent. Common submerged vegetation. Common submerged vegetation. Common submerged vegetation. Moderated position of five sedement 26-50% of the substance of pools of the substance of pools prevalent. Common submerged vegetation. Moderated valuation greater than past obstitutions, constrictions, and fries deposition of pools prevalent. Common submerged vegetation. Common submerged ve		LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	A SHEET		
Latitude: 34 of 16 - 24 5 °N	Stream Name 57		Basin/Wate	ershed: Congaree (0305)	0110)	USGS Quad: Fort	Jackson North	
Steram Width: 5 Stream Depth: 1.0 Legislator Condition Category Legislator Condition Category Parameter Fully Functional Partially impaired Impaired Turbinal Tur		.245"N				- i		
Stream width: 51		-				· '		
Habitat Parameter Fully Functional Substrate or Available Cover Will and aggit samient). SCORE 2.0 (a.5.) 3.Pool variability Even mis of large-shallow, large-deep, and shallow, and sheep pool present. SCORE 3.3.Pool variability Even mis of large-shallow, large-deep, and shallow, and sheep pool present. SCORE 3.4.Sediment Deposition Deposition Cover Will or on enhancement and shallow, and sheep pool present. SCORE 2.0 (b.5.) 3.Pool variability Even mis of large-shallow, large-deep, and shallow, and sheep pool present. SCORE 3.5.Channel Flow Score 2.0 (b.5.) 3.Pool variability Even mis of large-shallow, large-deep, and shallow, and sheep pool present. SCORE 3.Channel Flow Score 4.Sediment Deposition Cover and shallow, and sheep pool present. SCORE 4.Sediment Deposition Cover and shallow, and sheep pool present. SCORE 4.Sediment Deposition Cover and shallow, and sheep pool present. SCORE 5.Channel Flow Score 4.Cover and shallow, and sheep pool present. SCORE 5.Channel Flow Status Score 4.Cover and shallow, and sheep pool present. Score 5.Cover and shallow, and sheep pool present. Score 5.Cover and shallow, and sheep pool present. Score and shallow, and sheep pool sheep the shallow. Score and shallow, and sheep pool present. Score and shallow, and sheep pool sheep the shallow. Score and shallow, and sheep pool sheep the shallow. Score and shallow, and sheep pool sheep the shallow. Score and shallow, and sheep pool sheep the shallow. Score and shallow, and sheep pool sheep the shallow. Score and shallow and sheep pool sh						0.4.0.1		
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substrate or Available Cover for epifeanial colonization and fish cover more of anges, submered logs, sundercut banks, cobble or other stable habitat and a stage to a loss full colonization potential (it. legis/mags that are not enew full and not get rannish, and and stage to a loss full colonization and at stage to a loss full colonization potential (it. legis/mags that are not enew full and not get rannish, with gravel and full many for enem full many for even full many for full many for even full many for even full many for even full ma				, ·	10-30%			
All mud are elsy or sand buttom, interest on the control of substrate Characterization of this mand prevenient root mats and submerged vegetation common. SCORE	Substrate or	for epifaunal colonization a mix of snags, submerged lo banks, cobble or other stak at stage to allow full coloni potential (i.e.logs/snags th	and fish cover; igs, undercut ile habitat and zation at are <u>not</u>	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	habitat less tha substra	; habitat availability n desirable; te frequently	habitat lack of habitat is obvious; substrate	
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SCORE 3. Pool variability small-shallow, small-dep pools prevent. SCORE 4. Sediment Deposition D		and firm sand prevalent; ro	ot mats and	mud may be dominant; some root mats and submerged	little or	no root mat; no	Hard-pan, clay, or bedrock; no root mat or vegetation.	
SCORE 2.0 (1.5) 1.0 0.5	SCORE	2.0				(1.0)	0.5	
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Little or ne enlargement of islands or point har's and less than 20% of the bottom affected by sediment deposition.	on our variability							
of islands or point bars and less than 20% of the bottom affected by sediment deposition. SCORE 2.0 Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE 3.0 Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE 3.0 Water reaches base of both lower banks, and minimal amount of channel substrate is exposed. SCORE 3.0 Channel Flow Status SCORE 4.0 Channel substrate is exposed. SCORE 5.Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern with normal pattern Alteration 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) SCORE 3.0 The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (if braided thannel, this parameter is difficult to rate) SCORE 3.0 3.5 SCORE 3.0 4.5 5.0 5.0 5.0 5.0 5.0 6.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) SCORE 3.0 5.0 5.0 5.0 5.0 6.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) SCORE 3.8 3.8 3.8 3.0 3.0 3.0 3.0 3.0	SCORE	2.0		(1.5)	<u> </u>	1.0	0.5	
Score		of islands or point bars and less than 20% of the bottom		formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight	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		material, increased bar development; more than 80% of the bottom	
Status status schannel substrate is exposed. SCORE 2.0 1.5 (1.0) 0.5 6.Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern Score 2.0 (1.5) Some channelization present, usually in areas of bridge abutments; evidence of past channelization not present. Usually in a present but recent channelization may be extensive; embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and dis in stream habitat greatly a removed entirely. SCORE 2.0 (1.5) 1.0 0.5 SCORE 3.0 (1.5) 1.0 0.5 SCORE 3.0 (1.5) 1.0 0.5 SCORE 3.0 1.5	SCORE	2.0		1.5		(1.0)	0.5	
SCORE 6.Channel Alteration Channelization or dredging absent or minimal; stream with normal pattern with normal pattern minimal; stream with normal pattern with normal pattern minimal; stream with normal pattern with normal pattern minimal; stream with normal pattern minimal; stream with normal pattern with n		and minimal amount of cha		channel or < 25% of channel	channe	, and/or riffle substrates	Very little water in channel and mostly present as standing pools.	
Channel Alteration Channel Zation or dredging absent or minimal; stream with normal pattern Alteration Channel Zation or dredging absent or minimal; stream with normal pattern Alteration Channel Zation or dredging absent or minimal; stream with normal pattern Zo yr.) may be present, but recent channelized and disrupted. SCORE 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.] SCORE Z.0 3. 5 The bends in the stream increase the stream length 2-3X longer than if it was in a straight line. [If braided channel, this parameter is difficult to rate.] SCORE 3. 6 3. 6 3. 6 3. 7 3. 7 4. 7 4. 8 4. 8 4. 9 4. 9 5. 9 5. 9 6. 5 6. 7 6.	SCORE			'	aremos		0.5	
Alteration minimal; stream with normal pattern usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present channelized and distributive problems of the stream increase the stream length 3-4X longer than if it was in a straight line. SCORE 7. Channel Sinuosity The bends in the stream increase the stream length 3-4X longer than if it was in a straight line (lif braided channel, this parameter is difficult to rate.) SCORE 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, including trees, understory shrubs, or non-woody macrophytes. minimal or no evidence of grazing or moming; almost all plants allowed to grow naturally Banks allowed t			ahsent or	-	Channe			
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.) SCORE 2.0 1.5 Moderately stable; infrequent, small areas of erosion. SCORE SCORE Left Bank 1.0 SCORE Right Bank 1.0 SCORE Right Bank 1.0 SCORE 9.Vegetative Protection The bends in the stream increase the stream length 2-3X longer than if it was in a straight line. Dinameter is difficult to rate.) The bends in the stream increase the stream length 2-3X longer than if it was in a straight line. Ine. Channel Straight; waterwas the stream length 2 to 1 times longer than if it was in a straight line. Ine. Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. SCORE SCORE Right Bank 1.0 0.75 0.50 0.25 SCORE 9.Vegetative Protection The bends in the stream increase the stream length 2 to 1 times longer than if it was in a straight line. Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. Unstable; many eroded are "raw" areas frequent along straight sections and bend obvious bank sloughing; of of bank has erosion scars. 7.0-90% of the SB surfaces 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 The bends in the stream length 2 to 1 times longer than if it was in a straight line. Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods. Score Score Sign than in reach has areas of erosion; high erosion potential during floods. Score Score Sign than in reach has areas of erosion; high erosion potential during floods. Score Sign than in reach has areas of erosion; high erosion potential during floods. Score Sign than in reach ha				usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent	embankments or shoring structures present on both banks; and 40-80% of stream reach		cement; over 80% of the stream reach channelized and disrupted. In stream habitat greatly altered or	
stream length 3-4X longer than if it was in a straight line. (If braided channel, this parameter is difficult to rate.) SCORE 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. SCORE Left Bank 1.0 0.75 Moderately unstable; 30-60% of bank in reach has areas of erosion obvious bank sloughing; 6 of bank in reach has areas of erosion scars. SCORE Right Bank 1.0 0.75 0.50 0.25 SCORE 9.Vegetative Protection Protection To-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 stream length 2-3X longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to 1 times longer than if it was in a straight line. In the stream length 2 to	SCORE	2.0		(1.5)		1.0	0.5	
SCORE 8.Bank Stability Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. SCORE Left Bank 1.0 0.75 O.50 O	7.Channel Sinuosity	stream length 3-4X longer t a straight line (If braided ch	han if it was in annel, this	the stream length 2-3X longer	the stre	am length 2 to 1 times	Channel straight; waterway has been channelized for a long distance.	
Bank Stability Bank Stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. < 5% of bank affected. SCORE Left Bank 1.0 Q.75 C.75 Q.75 Q.75 Q.75 Q.75 Q.75 Q.75 Q.75 Q.70 Q.75	SCORE			1.5		(1.0)	0.5	
SCORE Right Bank 1.0 9. Vegetative Protection Protection Right Bank 2.0 9.0% 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 Protection Right Bank 1.0 0.75 0.50 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. Solution: Protection O.50 O.25 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.		Banks stable; evidence of er failure absent or minimal; li for future problems. < 5% o	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in	bank in high ere	itely unstable; 30-60% of reach has areas of erosion;	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100%	
Protection Protec	SCORE	Left Bank 1.0		(0.75)		0.50	0.25	
Protection >9. Vegetative Protection >9. Vegetation	SCORE	Right Bank 1.0				0.50	0.25	
	9.Vegetative	>90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow	etation, shrubs, or ninimal or no ing; almost all	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	50-70% of SB covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble		<50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less	
THE LEGIDAGE AND A LOT I WAS I WAS I WAS I WAS INCOME.	SCORE	Left Bank 1.0		0.75		0.50	0.25	
		4.0						
SCORE Right Bank 1.0 0.75 0.50 0.25 10 Pick Width of decide access 12 modes in page 4.0 Width of decide access 12 modes in page 4.0 Width of decide access 12 modes in page 4.0			n atara h		\A1:_i. i.			
		activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters	human activities have	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	Left Bank 1.0		0.75		0.50	(0.25)	
SCORE Right 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	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT			
Stream Name 58		Basin/Wate	ershed: Congaree (0305	0110)	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	1	Stream Depth: 0.5' Length of Stream Reach: ~61'				each: ~61'	
Has it rained within th	ne past 48 hours? No		Adjacent land use	? (Indus	trial, agriculture, etc):	Roadway	
Habitat			Condition Ca			, , , , , , , , , , , , , , , , , , ,	
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal Substrate or Available Cover	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged lo banks, cobble or other stal	ınd fish cover; gs, undercut	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for maintenance of populations;	habitat less tha	mix of stable ; habitat availability n desirable; te frequently	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.	
	at stage to allow full coloni potential (i.e.logs/snags th new fall and <u>not</u> transient)	zation at are <u>not</u>	presence of additional substrate in the form of new fall, but not yet prepared for colonization		ed or removed.	and and an arrangement of the second	
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate Characterization	Mix of substrate materials, and firm sand prevalent; ro submerged vegetation con	ot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or	l or clay or sand bottom; no root mat; no ged 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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		pools much more nt than deep pools.	Majority of pools small-shallow or pools absent.	
SCORE	2.0		1.5		1.0	0.5	
4.Sediment	Little or no enlargement of islands or point bars		Some new increase in bar		ate deposition of	Heavy deposits of fine material, increased bar	
Deposition	and less than 20% of the be affected by sediment depo			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		development; more than 80% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.	
				pools p	revalent.	·	
SCORE	2.0		1.5		1.0	0.5	
5.Channel Flow Status	Water reaches base of both and minimal amount of cha is exposed.		Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	channel	ills 25-75% of the available l, and/or riffle substrates stly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	2.0		(1.5)		1.0	0.5	
6.Channel	Channelization or dredging	absent or	Some channelization present,	Channe	lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	embankments or shoring structures present on both banks; and 40-80% of stream reach channelized and disrupted.		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 ind stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rat-	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	nds in the stream increase nam length 2 to 1 times han if it was in a straight	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 e failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% of reach has areas of erosion; osion potential during	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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		of SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow nati	shrubs, or ninimal or no ing; almost all	by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than 1/2 of potential plant stubble height remaining	vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.		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			0.75		0.50	0.25	
	Right Bank 1.0 Width of riparian zone>18 i	neters: human	Width of riparian zone 12-18	Width	of riparian zone 6-12	Width of riparian zone < 6 meters;	
10.Riparian Veg Zone Width	activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters;	human activities have	little or no riparian vegetation due	
	parking lots) have not impa	cted zone.	impacted zone only minimally.	Impacte	ed zone a great deal.	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.

	LOV	V GRADIEN	T STREAM ASSESSMEN	IT DATA SHEFT	
Stream Name \$9/s			ershed: <i>Congaree (03050110)</i>		rt Jackson North
	4' 41.696" N	Longitude:	80°56′ 4.782″ W		chland
Date: 8-5		Time:	1300	Investigator: Ja	-
Stream width: 3-5				Length of Stream	
		Stream De	Juli.	? (Industrial, agriculture, e	
Has it rained within	The past 46 hours?				etc): Toadway, Torested
Habitat	Fulls Forest	1	Condition Ca		V - m · l · · · · · · · · · · · · · · · · ·
Parameter	Fully Function Greater than 50% of subst		Partially Impaired 30-50% mix of stable habitat; well	Impaired 10-30% mix of stable	Very Impaired Less than 10% stable
1.Epifaunal Substrate or Available Cover	for epifaunal colonization mix of snags, submerged I banks, cobble or other sta at stage to allow full color potential (i.e. logs/snags ti new fall and not transient	and fish cover; ogs, undercut ble habitat and iization hat are <u>not</u>	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	habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	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 and firm sand prevalent; r submerged vegetation co	oot mats and	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 small-shallow, small-deep		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 b affected by sediment dep		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.	1 '
SCORE	2.0		1.5	1.0	0.5
5.Channel Flow Status	Water reaches base of bot and minimal amount of ch is exposed.		Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	Water fills 25-75% of the availal channel, and/or riffle substrates are mostly exposed.	1 '
SCORE	2.0		1.5	1.0	0.5
6.Channel	Channelization or dredging	absent or	Some channelization present,	Channelization may be extensiv	
Alteration	minimal; stream with norm		usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	embankments or shoring structures present on both banl and 40-80% of stream reach channelized and disrupted.	cement; over 80% of the stream
SCORE	2.0		1.5	1.0	0.5
7.Channel Sinuosit	The bends in the stream in stream length 3-4X longer a straight line (If braided c parameter is difficult to ra	than if it was in hannel, this	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 increas the stream length 2 to 1 times longer than if it was in a straigh line.	been channelized for a long
SCORE	2.0		1.5	1.0	0.5
8.Bank Stability	Banks stable; evidence of tailure absent or minimal; for future problems. < 5% affected.	little potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% o bank in reach has areas of erosi high erosion potential during floods.	
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 ar zone covered by native ve- including trees, understory non-woody macrophytes. evidence of grazing or mos plants allowed to grow nat	getation, / shrubs, or minimal or no ving; almost all	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; le 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 activities (roads, clear-cuts parking lots) have not imp.	, lawns, crops,	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	1.0		0.75	0.50	0.25
Total Score:	0.5	/CONANAENIT	S: originally \$206/207: n		

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	/ GRADIEN	NT STREAM ASSESSMEN	IT DAT	A SHEET		
Stream Name S11			ershed: Congaree (0305)			Jackson North	
	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 Dep	Stream Depth: 1.5' Length of Stream Reach: ~36'				
Has it rained within th	e past 48 hours? No		Adjacent land use	? (Indus	trial, agriculture, etc):	Roadway	
Habitat			Condition Ca	ategory			
Parameter	Fully Functio		Partially Impaired		Impaired	Very Impaired	
1.Epifaunal Substrate or Available Cover	Greater than 50% of substr for epifaunal colonization ; mix of snags, submerged lo banks, cobble or other stal at stage to allow full coloni potential (i.e.logs/snags th	and fish cover; egs, undercut ble habitat and zation	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	habitat less tha substra	mix of stable ; habitat availability n desirable; te frequently ed or removed.	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.	
	new fall and <u>not</u> transient)		fall, but not yet prepared for colonization				
SCORE	2.0		(1.5)		1.0	0.5	
2.Pool Substrate Characterization	Mix of substrate materials, and firm sand prevalent; ro submerged vegetation con	oot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or	l or clay or sand bottom; no root mat; no ged 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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		pools much more nt than deep pools.	Majority of pools small-shallow or pools absent.	
SCORE	2.0	5 p 55-1111	1.5	p. c. vale	1.0	0.5	
4.Sediment	Little or no enlargement		Some new increase in bar		ate deposition of	Heavy deposits of fine	
Deposition	of islands or point bars and less than 20% of the bottom affected by sediment deposition.		formation, mostly from gravel, sand or fine sediment. 20-50% of the bottom affected; slight deposition in pools.	new gravel, sand or fine sediment on old and new bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and beds; moderate deposition of pools prevalent.		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 and minimal amount of cha is exposed.		Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	channe	ills 25-75% of the available , and/or riffle substrates stly 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 minimal; stream with norm		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.	embanl structur and 40-	lization may be extensive; kments or shoring res present on both banks; 80% of stream reach lized 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 ind stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rat	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	ds in the stream increase am length 2 to 1 times han if it was in a straight	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 e failure absent or minimal; li for future problems. < 5% c affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% of reach has areas of erosion; osion potential during	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 ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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	vegetat patches cropped than ½	of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	<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 r activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	meters	of riparian zone 6-12 human activities have ed 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	F-300	0.50	0.25	
SCORE	Right Bank (1.0)		0.75		0.50	0.25	
Total Score: 14 F		CONANAENIT	Stream is define	d by		_	

Total Score: 14.5 NOTES/COMMENTS: Stream is defined by a large incongruous pool near its center.

	LOW	/ GRADIEN	NT STREAM ASSESSMEN	IT DAT	A SHEET		
Stream Name \$12		Basin/Wate	ershed: Congaree (0305)	0110)	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	1	Stream Dep	oth: 0.5'		Length of Stream Re	ach: ~34'	
Has it rained within th	e past 48 hours? No		Adjacent land use	? (Indus	trial, agriculture, etc):	Roadway	
Habitat			Condition Ca		-		
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	1	mix of stable	Less than 10% stable	
Substrate or Available Cover	for epifaunal colonization a mix of snags, submerged It banks, cobble or other stal at stage to allow full coloni potential (i.e.logs/snags th new fall and <u>not</u> transient)	egs, undercut ble habitat and zation at are <u>not</u>	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	less tha substra	habitat availability n desirable; te frequently ed or removed.	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, and firm sand prevalent; ro submerged vegetation con	oot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or	or clay or sand bottom; no root mat; no ged 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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		pools much more nt 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.	channel	ills 25-75% of the available , and/or riffle substrates tly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	2.0		1.5	are mos	1.0	0.5	
6.Channel	Channelization or dredging minimal; stream with norm		Some channelization present, usually in areas of bridge		lization may be extensive;	Banks shored with gabion or cement; over 80% of the stream	
Alteration	minimal, Stream with norm	ai patterii	abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	structur and 40-	res present on both banks; 80% of stream reach ized and disrupted.	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 ind stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rat	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	ds in the stream increase am length 2 to 1 times han if it was in a straight	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 e failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% of reach has areas of erosion; ssion potential during	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 ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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	Width of riparian zone>18	neters; human	Width of riparian zone 12-18		f riparian zone 6-12	Width of riparian zone < 6 meters;	
Zone Width	activities (roads, clear-cuts, parking lots) have not impa		meters; human activities have impacted zone only minimally.		human activities have d zone a great deal.	little or no riparian vegetation due to human activities.	
SCORE	Left Bank 1.0		0.75		0.50	0.25	
SCORE 12	Right Bank 1.0	CONTRACTION	0.75		0.50	0.25	

Total Score: 12.0 NOTES/COMMENTS: Stream terminates at culvert.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	TA SHEET		
Stream Name \$13		Basin/Wate	ershed: Congaree (0305	0110)	USGS Quad: Fort	Jackson North	
Latitude: 34°4'40	.54"N	Longitude: 80°56'8.206"W			County: Richland		
Date: 8/6/14					Investigator: McMaster/Mulholland		
Stream width: 7.5	.1	Stream Dei	Stream Depth: 1.0' Length of Stream Reach: ~60'				
Has it rained within th	e past 48 hours? No			? (Indus	strial, agriculture, etc):		
Habitat			Condition Ca			Rodaway	
Parameter	Fully Functio	nal	Partially Impaired	<u> </u>	Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substi	ate favorable	30-50% mix of stable habitat; well		mix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization : mix of snags, submerged lo	,	suited for full colonization potential; adequate habitat for		; habitat availability ın desirable;	habitat lack of habitat is obvious; substrate	
Available Cover	banks, cobble or other stal		maintenance of populations;		te frequently	unstable or lacking.	
	at stage to allow full colon potential (i.e.logs/snags th		presence of additional substrate in the form of new	disturb	ed or removed.		
	new fall and not transient)		fall, but not yet prepared for				
			colonization				
SCORE	2.0		1.5)		1.0	0.5	
2.Pool Substrate	Mix of substrate materials		Mix of soft sand, mud, or clay;		d or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; re submerged vegetation con		mud may be dominant; some root mats and submerged		no root mat; no rged vegetation.	root mat or vegetation.	
	Submerged vegetation con		vegetation present.	Jubille	ged vegetation.		
SCORE	2.0		1.5		1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very few shallow.		v pools much more ent than deep pools.	Majority of pools small-shallow or	
SCORE	small-shallow, small-deep	poois pi esent.	1.5	prevale	1.0	pools absent.	
4.Sediment	Little or no enlargement		Some new increase in bar	Modera	ate deposition of	Heavy deposits of fine	
Deposition	of islands or point bars		formation, mostly from gravel,		avel, sand or fine	material, increased bar	
200000000	and less than 20% of the be affected by sediment depo		sand or fine sediment. 20-50% of the bottom affected; slight	1	nt on old and new 0-80%of the bottom	development; more than 80% of the bottom	
	anected by seament depo	Jicion.	deposition in pools.	affecte	d; sediment deposits at	changing frequently;	
					tions, constrictions, and	pools almost absent due to substantial sediment deposition.	
					moderate deposition of revalent.	substantial sediment deposition.	
SCORE	2.0		(1.5)		1.0	0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available	1	fills 25-75% of the available	Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnei substrate	channel or < 25% of channel substrate is exposed.	1	l, and/or riffle substrates stly exposed.	mostly present as standing pools.	
SCORE	2.0		1.5		1.0	0.5	
6.Channel	Channelization or dredging		Some channelization present,		lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		kments or shoring res present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past		80% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent channelization not present.	channe	lized and disrupted.	removed entirely.	
SCORE	2.0		1.5		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The ber	nds in the stream increase	Channel straight; waterway has	
•	stream length 3-4X longer t a straight line (If braided ch		the stream length 2-3X longer than if it was in a straight line.		eam length 2 to 1 times than if it was in a straight	been channelized for a long distance.	
	parameter is difficult to rat		than ii it was iii a straight niie.	line.	than in it was in a straight	distance.	
SCORE	2.0		1.5		1.0	0.5	
8.Bank Stability	Banks stable; evidence of e failure absent or minimal; l		Moderately stable; infrequent, small areas of erosion mostly		ately unstable; 30-60% of reach has areas of erosion;	Unstable; many eroded areas; "raw" areas frequent along	
	for future problems. < 5% of		healed over; 5-30% of bank in		osion potential during	straight sections and bends;	
	affected.		reach has areas of erosion.	floods.		obvious bank sloughing; 60-100%	
SCORE	Left Bank (1.0)		0.75		0.50	of bank has erosion scars. 0.25	
SCORE	Right Bank (1.0)		0.75		0.50	0.25	
9.Vegetative	>90% of SB surfaces and ad	jacent riparian	70-90% of the SB surfaces covered	50-70%	of SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg	etation,	by native vegetation but one class		ion; disruption obvious;	vegetation; disruption of SB	
FIOLECTION	including trees, understory non-woody macrophytes. r		of plants is not well-represented; disruption evident but not		s of bare soil or closely d vegetation common; less	vegetation is very high; vegetation has been removed to 5 cm. or less	
	evidence of grazing or mow	ing; almost all	affecting full plant growth	than ½	potential plant stubble	in average stubble height.	
	plants allowed to grow nat	urally	potential more than ½ of potential plant stubble height	height i	remaining.		
			remaining				
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	Width of riparian zone>18		Width of riparian zone 12-18		of riparian zone 6-12	Width of riparian zone < 6 meters;	
Zone Width	activities (roads, clear-cuts, parking lots) have not impa		meters; human activities have impacted zone only minimally.		; human activities have ed zone a great deal.	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		CONANAENIT	s. No comments	ı		1 3.23	

Total Score: 14.5 NOTES/COMMENTS: No comments.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	A SHEET		
Stream Name \$14		Basin/Wate	ershed: Congaree (0305	0110)	USGS Quad: Fort	Jackson North	
Latitude: 34°4'4	43.047"N		80°56'11.222"W		County: Richland		
Date: 8/6/14						gator: McMaster/Mulholland	
Stream width: 4.0'		Stream Depth: 0.5' Length of Stream Re					
Has it rained within th		0 11 0 0 11 11 11		? (Indus	trial, agriculture, etc):		
Habitat			Condition Ca		, 46. 104.14.0, 010/.	Roadway	
Parameter	Fully Functio	nal	Partially Impaired	l	Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	10-30%	mix of stable	Less than 10% stable	
Substrate or Available Cover	for epifaunal colonization a mix of snags, submerged lo banks, cobble or other stat at stage to allow full coloni potential (i.e. logs/snags th new fall and not transient)	egs, undercut ble habitat and zation at are <u>not</u>	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	habitat; habitat availability less than desirable; substrate frequently disturbed or removed.		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, and firm sand prevalent; ro submerged vegetation com	oot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or	or clay or sand bottom; no root mat; no ged 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,		Majority of pools large-deep; very		pools much more	Majority of pools small-shallow or	
·	small-shallow, small-deep	pools present.	few shallow.	prevale	nt than deep pools.	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 and minimal amount of cha is exposed.		Water fills > 75% of the available channel or < 25% of channel substrate is exposed.	channel	ills 25-75% of the available , and/or riffle substrates tly exposed.	Very little water in channel and mostly present as standing pools.	
SCORE	2.0		1.5	aremos	1.0	0.5	
6.Channel	Channelization or dredging	absent or	Some channelization present,	Channe	lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm		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.		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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	ds in the stream increase am length 2 to 1 times han if it was in a straight	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 ei failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% of reach has areas of erosion; ssion potential during	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 ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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	vegetat patches cropped than ½	of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	<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	4.0		0.75		0.50	0.25	
	Right Bank 1.0 Width of riparian zone>18 r	neters: human	Width of riparian zone 12-18	Width	f riparian zone 6-12	Width of riparian zone < 6 meters;	
10.Riparian Veg Zone Width	activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	meters; human activities have impacted zone only minimally.	meters;	human activities have ed zone a great deal.	little or no riparian vegetation due to human activities.	
SCORE	Left Bank (1.0)		0.75		0.50	0.25	

Total Score: 11.75 NOTES/COMMENTS: No comments.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DA1	TA SHEFT		
Stream Name \$15			ershed: Congaree (0305			Jackson North	
	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	ı	Stream Dep	Stream Depth: 0.5' Length of Stream Reach: ~111'				
Has it rained within th	e past 48 hours? No		Adjacent land use	? (Indus	strial, agriculture, etc):		
Habitat			Condition Ca				
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well suited for full colonization		mix of stable ; habitat availability	Less than 10% stable habitat lack of habitat is	
Substrate or	mix of snags, submerged lo		potential; adequate habitat for		in desirable;	obvious; substrate	
Available Cover	banks, cobble or other stat		maintenance of populations;		te frequently ed or removed.	unstable or lacking.	
	at stage to allow full coloni potential (i.e.logs/snags th		presence of additional substrate in the form of new	disturb	ed or removed.		
	new fall and <u>not</u> transient)		fall, but not yet prepared for colonization				
CCORF	2.0				1.0	0.5	
SCORE 2.Pool Substrate	2.0 Mix of substrate materials,	with gravel	1.5 Mix of soft sand, mud, or clay;	All muc	1.0 d or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro		mud may be dominant; some	little or	no root mat; no	root mat or vegetation.	
Cital acterization	submerged vegetation con	nmon.	root mats and submerged vegetation present.	subme	rged vegetation.		
SCORE	2.0		1.5		1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very few shallow.		v pools much more	Majority of pools small-shallow or	
SCORE	small-shallow, small-deep	poois present.	1.5	prevale	1.0	pools absent. 0.5	
4.Sediment	Little or no enlargement		Some new increase in bar	Modera	ate deposition of	Heavy deposits of fine	
Deposition	of islands or point bars		formation, mostly from gravel,	new gr	avel, sand or fine	material, increased bar	
zeposition	and less than 20% of the bo affected by sediment depo		sand or fine sediment. 20-50% of the bottom affected; slight		nt on old and new 0-80%of the bottom	development; more than 80% of the bottom	
	anseted by seament depo	31110111	deposition in pools.	affecte	d; sediment deposits at	changing frequently;	
					tions, constrictions, and moderate deposition of	pools almost absent due to substantial sediment deposition.	
					revalent.	substantial seuffiert deposition.	
SCORE	2.0		1.5	1.0		0.5	
5.Channel Flow	Water reaches base of both and minimal amount of cha		Water fills > 75% of the available channel or < 25% of channel	1	fills 25-75% of the available	Very little water in channel and	
Status	is exposed.	nnei substrate	substrate is exposed.	channel, and/or riffle substrates are mostly exposed.		mostly present as standing pools.	
SCORE	2.0		1.5		1.0	0.5	
6.Channel	Channelization or dredging		Some channelization present,		lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	ai pattern	usually in areas of bridge abutments; evidence of past		kments or shoring res present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past		80% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent channelization not present.	cnanne	lized and disrupted.	removed entirely.	
SCORE	2.0		(1.5)		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc		The bends in the stream increase	1	nds in the stream increase	Channel straight; waterway has	
	stream length 3-4X longer t a straight line (If braided ch		the stream length 2-3X longer than if it was in a straight line.		eam length 2 to 1 times than if it was in a straight	been channelized for a long distance.	
	parameter is difficult to rat			line.			
SCORE	2.0		1.5		1.0	0.5	
8.Bank Stability	Banks stable; evidence of e failure absent or minimal; li		Moderately stable; infrequent, small areas of erosion mostly		reach has areas of erosion;	Unstable; many eroded areas; "raw" areas frequent along	
	for future problems. < 5% o		healed over; 5-30% of bank in	high er	osion potential during	straight sections and bends;	
	affected.		reach has areas of erosion.	floods.		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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		of SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;		ion; disruption obvious; s of bare soil or closely	vegetation; disruption of SB vegetation is very high; vegetation	
	non-woody macrophytes. n	ninimal or no	disruption evident but not	croppe	d vegetation common; less	has been removed to 5 cm. or less	
	evidence of grazing or mow plants allowed to grow nati		affecting full plant growth potential more than ½ of		potential plant stubble remaining.	in average stubble height.	
		•	potential plant stubble height		-		
SCORE	Left Bank 1.0		remaining 0.75		0.50	0.25	
SCORE	Right Bank 1.0		0.75		0.50	0.25	
10.Riparian Veg	Width of riparian zone>18 i	meters; human	Width of riparian zone 12-18	Width	of riparian zone 6-12	Width of riparian zone < 6 meters;	
Zone Width	activities (roads, clear-cuts, parking lots) have not impa		meters; human activities have		; human activities have ed zone a great deal.	little or no riparian vegetation due	
SCORE	Left Bank 1.0	стей допе.	impacted zone only minimally. 0.75	impacte	0.50	to human activities.	
SCORE	1.0		0.75		0.50	0.25	
Total Score: 10.		COMMENT	l .	<u> </u>	$\overline{}$	f a 79 0 L E main	

Total Score: _______NOTES/COMMENTS: Stream branches and consists of a 78.0 LF main channel and a 33.0 LF branch.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	NT DAT	A SHEET		
Stream Name \$16		Basin/Wate	ershed: Congaree (03050110))	USGS Quad: Fort Ja	ackson North	
	46.922" N	Longitude:	80°56′ 11.136″ W		County: Richland		
Date: 8-5-14	!	Time:	1400		Investigator: Jamison		
Stream width: 3-5'		Stream De	oth: 0.5-1'		Length of Stream Reach: ~150'		
Has it rained within th	ne past 48 hours? no	01100111-0		? (Indust	rial, agriculture, etc)		
Habitat	le past to hours.		Condition Ca		rial, agriculture, etc)		
Parameter	Fully Functio	nal	Partially Impaired	l	Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	10-30% n	nix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization a		suited for full colonization		habitat availability	habitat lack of habitat is	
Available Cover	mix of snags, submerged lo banks, cobble or other stat	• .	potential; adequate habitat for maintenance of populations;		desirable; efrequently	obvious; substrate unstable or lacking.	
	at stage to allow full coloni	zation	presence of additional		d or removed.	unstable of factorig.	
	potential (i.e.logs/snags th		substrate in the form of new				
	new fall and <u>not</u> transient)	•	fall, but not yet prepared for colonization				
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate	Mix of substrate materials		Mix of soft sand, mud, or clay;	All mud o	or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro submerged vegetation con		mud may be dominant; some root mats and submerged vegetation present.		o root mat; no ed vegetation.	root mat or vegetation.	
SCORE	2.0		1.5		1.0	0.5	
3.Pool variability	Even mix of large-shallow,	large-deep,	Majority of pools large-deep; very	Shallow	pools much more	Majority of pools small-shallow or	
•	small-shallow, small-deep	oools present.	few shallow.	prevalen	t than deep pools.	pools absent.	
SCORE	2.0		1.5	ļ	1.0	0.5	
4.Sediment	Little or no enlargement of islands or point bars		Some new increase in bar formation, mostly from gravel,		e deposition of el. sand or fine	Heavy deposits of fine material, increased bar	
Deposition	and less than 20% of the bo	ottom	sand or fine sediment. 20-50% of	- 0 -	t on old and new	development; more than	
	affected by sediment depo	sition.	the bottom affected; slight		80%of the bottom	80% of the bottom	
			deposition in pools.		sediment deposits at ions, constrictions, and	changing frequently;	
				bends; m	oderate deposition of	substantial sediment deposition.	
SCORE	2.0		1.5	pools pre	1.0	0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available		ls 25-75% of the available	Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.		and/or riffle substrates ly exposed.	mostly present as standing pools.	
SCORE	2.0		1.5	aremost	1.0	0.5	
6.Channel	Channelization or dredging	absent or	Some channelization present,	Channelia	zation may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge		nents or shoring	cement; over 80% of the stream	
			abutments; evidence of past channelization (greater than past		s present on both banks; 0% of stream reach	reach channelized and disrupted. In stream habitat greatly altered or	
			20 yr.) may be present, but recent		ed and disrupted.	removed entirely.	
			channelization not present.				
SCORE	2.0		1.5		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc stream length 3-4X longer t		The bends in the stream increase the stream length 2-3X longer		ls in the stream increase m length 2 to 1 times	Channel straight; waterway has been channelized for a long	
	a straight line (If braided ch		than if it was in a straight line.		an if it was in a straight	distance.	
	parameter is difficult to rat	2.)		line.			
SCORE	2.0		1.5	ļ., .	1.0	0.5	
8.Bank Stability	Banks stable; evidence of e failure absent or minimal; li		Moderately stable; infrequent, small areas of erosion mostly		ely unstable; 30-60% of each has areas of erosion;	Unstable; many eroded areas; "raw" areas frequent along	
	for future problems. < 5% o		healed over; 5-30% of bank in		ion potential during	straight sections and bends;	
	affect ed.		reach has areas of erosion.	floods.		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	1	0.50	0.25	
9.Vegetative	>90% of SB surfaces and ad	acent riparian	70-90% of the SB surfaces covered	50-70% c	of SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg	etation,	by native vegetation but one class		n; disruption obvious;	vegetation; disruption of SB	
Fiotection	including trees, understory non-woody macrophytes. n		of plants is not well-represented; disruption evident but not		of bare soil or closely vegetation common; less	vegetation is very high; vegetation has been removed to 5 cm. or less	
	evidence of grazing or mow		affecting full plant growth		otential plant stubble	in average stubble height.	
	plants allowed to grow nati	ırally	potential more than ½ of	height re	maining.		
			potential plant stubble height remaining				
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	Width of riparian zone>18 i		Width of riparian zone 12-18		riparian zone 6-12	Width of riparian zone < 6 meters;	
Zone Width	activities (roads, clear-cuts,		meters; human activities have		numan activities have I zone a great deal.	little or no riparian vegetation due	
	parking lots) have not impa	crea zone.	impacted zone only minimally.	impacted	0.50	to human activities.	
SCORE			0.75 0.75	-	0.50	0.25	
SCORE Total Score:		0014145::-	S: originally \$208: perne	L		l.	

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	/ GRADIEN	IT STREAM ASSESSMEN				
Stream Name	s17		Basin/Wate	ershed: Congaree (03050110)	US	GS Quad: Fort Ja	ackson North	
Latitude:	34°4′ 4	!7.750" N	Longitude:	80°56′ 12.412″ W	Co	County: Richland		
Date:	8-5-14		Time:	1400	Inv	Investigator: Jamison		
Stream width:	3-5'		Stream Dep	oth: 0.5-1'		ngth of Stream Re		
		e past 48 hours? no		Adjacent land use				
Habitat				Condition Ca		, , ,		
Parameter	r	Fully Functio	nal	Partially Impaired	, 	npaired	Very Impaired	
1.Epifaunal		Greater than 50% of substr		30-50% mix of stable habitat; well	10-30% mix o	•	Less than 10% stable	
Substrate or		for epifaunal colonization		suited for full colonization		tat availability	habitat lack of habitat is	
Available Cov	ver	mix of snags, submerged lo banks, cobble or other stal		potential; adequate habitat for maintenance of populations;	less than des substrate fre		obvious; substrate unstable or lacking.	
		at stage to allow full coloni	ization	presence of additional	disturbed or			
		potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for				
		new ran and <u>not</u> transient,	•	colonization				
SCORE		2.0		1.5		1.0	0.5	
2.Pool Substrat	te	Mix of substrate materials		Mix of soft sand, mud, or clay;		ay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterizat	tion	and firm sand prevalent; ro submerged vegetation con		mud may be dominant; some root mats and submerged	little or no ro		root mat or vegetation.	
		Judiner Ben Aekeration Con		vegetation present.	submerged v			
SCORE		2.0		1.5		1.0	0.5	
3.Pool variabili	ty	Even mix of large-shallow,		Majority of pools large-deep; very		s much more	Majority of pools small-shallow or	
		small-shallow, small-deep	pools present.	few shallow.	prevalent that	an deep pools.	pools absent.	
SCORE 4.Sediment		2.0 Little or no enlargement		1.5 Some new increase in bar	Moderate de	1.0	0.5 Heavy deposits of fine	
		of islands or point bars		formation, mostly from gravel,	new gravel, s	•	material, increased bar	
Deposition		and less than 20% of the bo		sand or fine sediment. 20-50% of	sediment on		development; more than	
		affected by sediment depo	sition.	the bottom affected; slight deposition in pools.		of the bottom iment deposits at	80% of the bottom changing frequently;	
				deposition in pools.		constrictions, and	pools almost absent due to	
					bends; mode	rate deposition of	substantial sediment deposition.	
SCORE		2.0		1.5	Poors brevare	1.0	0.5	
5.Channel Flow	v	Water reaches base of both		Water fills > 75% of the available		-75% of the available	Very little water in channel and	
Status		and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, and are mostly ex	or riffle substrates	mostly present as standing pools.	
SCORE		2.0		1.5	are mostly ex	1.0	0.5	
6.Channel		Channelization or dredging	absent or	Some channelization present,	Channelizatio	on may be extensive;	Banks shored with gabion or	
Alteration		minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past	embankment	s or shoring esent on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
				channelization (greater than past		of stream reach	In stream habitat greatly altered or	
				20 yr.) may be present, but recent	channelized a	and disrupted.	removed entirely.	
SCORE		2.0		channelization not present.		1.0	0.5	
7.Channel Sinu	ocitu	The bends in the stream inc	rease the	The bends in the stream increase	The hends in	the stream increase	Channel straight; waterway has	
7.Ciiaiinei Sinu	osity	stream length 3-4X longer t	han if it was in	the stream length 2-3X longer	the stream le	ngth 2 to 1 times	been channelized for a long	
		a straight line (If braided ch parameter is difficult to rat		than if it was in a straight line.	longer than it line.	fit was in a straight	distance.	
SCORE		2.0	E. J	1.5	mie.	1.0	0.5	
8.Bank Stability	v	Banks stable; evidence of e	rosion or bank	Moderately stable; infrequent,	Moderately u	I.U Instable; 30-60% of	Unstable; many eroded areas;	
o.bank stability	y	failure absent or minimal; li	ttle potential	small areas of erosion mostly	bank in reach	has areas of erosion;	"raw" areas frequent along	
		for future problems. < 5% of affected.	t bank	healed over; 5-30% of bank in reach has areas of erosion.	high erosion floods.	potential during	straight sections and bends; obvious bank sloughing; 60-100%	
				. 2237 has areas of crosion.			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		>90% of SB surfaces and ad		70-90% of the SB surfaces covered	50-70% of SB		<50% of SB surfaces covered by	
Protection		zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;		isruption obvious; ire soil or closely	vegetation; disruption of SB vegetation is very high; vegetation	
		non-woody macrophytes. n	ninimal or no	disruption evident but not	cropped vege	etation common; less	has been removed to 5 cm. or less	
		evidence of grazing or mow plants allowed to grow nati		affecting full plant growth potential more than ½ of	than ½ poten height remain	tial plant stubble ning.	in average stubble height.	
			,	potential plant stubble height	3	ū		
SCORE		Left Bank 1.0		remaining 0.75	1	0.50	0.25	
SCORE				0.75		0.50	0.25	
	/	Right Bank 1.0 Width of riparian zone>18 i	meters: human	Width of riparian zone 12-18	Width of ring	rian zone 6-12	U.25 Width of riparian zone < 6 meters;	
10. Riparian V	-	activities (roads, clear-cuts,		meters; human activities have		an activities have	little or no riparian vegetation due	
Zone Widt	th	parking lots) have not impa	cted zone.	impacted zone only minimally.		ne a great deal.	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	CONTRACTI	S: originally \$200 narall		4 1 41 1		

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	GRADIEN	NT STREAM ASSESSMEN	IT DATA SHEET	
Stream Name Jackson	Creek (s18)	Basin/Wate	ershed: Congaree (03050110)	USGS Quad: Fort	lackson North
Latitude: 34°5′	17.208" N	Longitude:	80°56′ 57.215″ W	County: Richi	land
Date: 8-5-14	1	Time:	1600	Investigator: Jami	son
Stream width: 20-40	1	Stream De	oth: 5-8'	Length of Stream R	
Has it rained within th	ne past 48 hours? no			? (Industrial, agriculture, etc): roadway, forested
Habitat			Condition Ca		•
Parameter	Fully Functio	nal	Partially Impaired	Impaired	Very Impaired
1.Epifaunal	Greater than 50% of substr	ate favorable	30-50% mix of stable habitat; well	10-30% mix of stable	Less than 10% stable
Substrate or	for epifaunal colonization a mix of snags, submerged lo		suited for full colonization potential; adequate habitat for	habitat; habitat availability less than desirable;	habitat lack of habitat is obvious; substrate
Available Cover	banks, cobble or other stab	•	maintenance of populations;	substrate frequently	unstable or lacking.
	at stage to allow full coloni		presence of additional	disturbed or removed.	
	potential (i.e.logs/snags the new fall and <u>not</u> transient).		substrate in the form of new fall, but not yet prepared for		
	,		colonization		
SCORE	2.0		1.5	1.0	0.5
2.Pool Substrate	Mix of substrate materials,		Mix of soft sand, mud, or clay;	All mud or clay or sand bottom;	Hard-pan, clay, or bedrock; no
Characterization	and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged	little or no root mat; no submerged vegetation.	root mat or vegetation.
		- 	vegetation present.		
SCORE	2.0		1.5	1.0	0.5
3.Pool variability	Even mix of large-shallow, small-shallow, small-deep p		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	oon present.	1.5	1.0	0.5
4.Sediment	Little or no enlargement		Some new increase in bar	Moderate deposition of	Heavy deposits of fine
Deposition	of islands or point bars		formation, mostly from gravel,	new gravel, sand or fine	material, increased bar
Deposition	and less than 20% of the bo affected by sediment depo:		sand or fine sediment. 20-50% of the bottom affected; slight	sediment on old and new bars; 50-80%of the bottom	development; more than 80% of the bottom
	arrected by sediment depos	sition.	deposition in pools.	affected; sediment deposits at	changing frequently;
				obstructions, constrictions, and	pools almost absent due to
				bends; moderate deposition of pools prevalent.	substantial sediment deposition.
SCORE	2.0		1.5	1.0	0.5
5.Channel Flow	Water reaches base of both and minimal amount of cha		Water fills > 75% of the available channel or < 25% of channel	Water fills 25-75% of the available channel, and/or riffle substrates	Very little water in channel and mostly present as standing pools.
Status	is exposed.	illiei substrate	substrate is exposed.	are mostly exposed.	mostry present as standing pools.
SCORE	2.0		1.5	1.0	0.5
6.Channel	Channelization or dredging		Some channelization present,	Channelization may be extensive;	Banks shored with gabion or
Alteration	minimal; stream with norms	al pattern	usually in areas of bridge abutments; evidence of past	embankments or shoring structures present on both banks;	cement; over 80% of the stream reach channelized and disrupted.
			channelization (greater than past	and 40-80% of stream reach	In stream habitat greatly altered or
			20 yr.) may be present, but recent channelization not present.	channelized and disrupted.	removed entirely.
SCORE	2.0		1.5	1.0	0.5
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The bends in the stream increase	Channel straight; waterway has
7. Chamier Sindosity	stream length 3-4X longer to		the stream length 2-3X longer	the stream length 2 to 1 times	been channelized for a long
	a straight line (If braided cha parameter is difficult to rate		than if it was in a straight line.	longer than if it was in a straight line.	distance.
SCORE	2.0	,	1.5	(1.0)	0.5
8.Bank Stability	Banks stable; evidence of er		Moderately stable; infrequent,	Moderately unstable; 30-60% of	Unstable; many eroded areas;
•	failure absent or minimal; lift for future problems. < 5% of		small areas of erosion mostly healed over; 5-30% of bank in	bank in reach has areas of erosion; high erosion potential during	"raw" areas frequent along straight sections and bends;
	affected.	. Jank	reach has areas of erosion.	floods.	obvious bank sloughing; 60-100%
COORE			0.75	(0.50)	of bank has erosion scars.
SCORE	Left Bank 1.0		0.75	0.50	0.25
SCORE	Right Bank 1.0	and the second	0.75	0.50	0.25
9 Vegetative	>90% of SB surfaces and adj zone covered by native vege		70-90% of the SB surfaces covered by native vegetation but one class	50-70% of SB covered by vegetation; disruption obvious;	<50% of SB surfaces covered by vegetation; disruption of SB
Protection	including trees, understory	shrubs, or	of plants is not well-represented;	patches of bare soil or closely	vegetation is very high; vegetation
	non-woody macrophytes. m evidence of grazing or mow		disruption evident but not affecting full plant growth	cropped vegetation common; less than ½ potential plant stubble	has been removed to 5 cm. or less in average stubble height.
	plants allowed to grow natu		potential more than ½ of	height remaining.	average stabble fielgitt.
			potential plant stubble height remaining		
SCORE	Left Bank 1.0		0.75	0.50	0.25
SCORE	Right Bank 1.0		0.75	0.50	0.25
JCOILE					Width of riparian zone < 6 meters;
10 Pinarian Vac		neters: human	Width of riparian zone 12-18	Width of riparian zone 6-12	
10. Riparian Veg	Width of riparian zone>18 n activities (roads, clear-cuts,	lawns, crops,	Width of riparian zone 12-18 meters; human activities have	Width of riparian zone 6-12 meters; human activities have	little or no riparian vegetation due
Zone Width	Width of riparian zone>18 n activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	meters; human activities have impacted zone only minimally.	meters; human activities have impacted zone a great deal.	little or no riparian vegetation due to human activities.
	Width of riparian zone>18 n activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters; human activities have	little or no riparian vegetation due

Total Score: ________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	/ GRADIEN	IT STREAM ASSESSMEN	IT DATA	SHEET			
Stream Name \$20/s19 d	ownstream	Basin/Wate	Basin/Watershed: Congaree (03050110) USGS Quad: Fort Jackson North					
Latitude: 34°5′ 3	38.747" N	Longitude:	80°57′ 11.935″ W	County: Richland				
Date: 8-5-14		Time:	Time: 1700 Investigator: Jamison					
Stream width: 10-20'		Stream De	oth: 5'		ength of Stream Re			
Has it rained within th	e past 48 hours? no				al, agriculture, etc)			
Habitat			Condition Ca		<u>, , , , , , , , , , , , , , , , , , , </u>			
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired		
1.Epifaunal Substrate or	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged lo	ate favorable and fish cover; gs, undercut	30-50% mix of stable habitat; well suited for full colonization potential; adequate habitat for	less than de	bitat availability esirable;	Less than 10% stable habitat lack of habitat is obvious; substrate		
Available Cover	banks, cobble or other stak at stage to allow full coloni potential (i.e.logs/snags th new fall and <u>not</u> transient)	zation at are <u>not</u>	maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	substrate fi disturbed o		unstable or lacking.		
SCORE	2.0		1.5		1.0	0.5		
2.Pool Substrate Characterization	Mix of substrate materials, and firm sand prevalent; ro submerged vegetation con	ot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or no	clay or sand bottom; root mat; no 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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		ols much more han deep pools.	Majority of pools small-shallow or pools absent.		
SCORE	2.0		1.5		1.0	0.5		
4.Sediment	Little or no enlargement		Some new increase in bar	l l	deposition of	Heavy deposits of fine		
Deposition	of islands or point bars and less than 20% of the bo	ottom	formation, mostly from gravel, sand or fine sediment. 20-50% of		, sand or fine n old and new	material, increased bar development; more than		
	affected by sediment depo		the bottom affected; slight	bars; 50-80	%of the bottom	80% of the bottom		
			deposition in pools.		ediment deposits at	changing frequently; pools almost absent due to		
				obstructions, constrictions, and bends; moderate deposition of pools prevalent.		substantial sediment deposition.		
SCORE	2.0		1.5	1.0		0.5		
5.Channel Flow Status	Water reaches base of both lower ba and minimal amount of channel subs 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	Channelization or dredging	absent or	Some channelization present,	Channelizat	ion may be extensive;	Banks shored with gabion or		
Alteration	minimal; stream with norm		usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	embankme structures p and 40-80%	nts or shoring present on both banks; , of stream reach d and disrupted.	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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stream	n the stream increase length 2 to 1 times if it was in a straight	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 ei failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in rea	vunstable; 30-60% of ch has areas of erosion; n potential during	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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		B covered by	<50% of SB surfaces covered by		
Protection	zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;		disruption obvious;	vegetation; disruption of SB vegetation is very high; vegetation		
	non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	ninimal or no ing; almost all	disruption evident but not affecting full plant growth potential more than ½ of potential plant stubble height remaining	patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.		vegetations very ringry, 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	Width of riparian zone>18 r	neters; human	Width of riparian zone 12-18		parian zone 6-12	Width of riparian zone < 6 meters;		
Zone Width	activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters; hu	man activities have	little or no riparian vegetation due		
SCORE	parking lots) have not impa	cceu zone.	impacted zone only minimally. 0.75	impacted zo	0.50	to human activities.		
	1.0		0.75	-	\sim			
SCORE Total Score:	Right Bank 1.0	001111	0.75 S: originally s211/s212:	<u> </u>	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)

			IT STREAM ASSESSMEN		A SHEET		
Stream Name \$19 ups	stream	Basin/Wate	ershed: Congaree (03050110))	USGS Quad: Fort Ja	ackson North	
	45.835" N	Longitude:	itude: 80°57′ 19.122″ W County: Richl			land	
Date: 8-7-14	1	Time:	0900		Investigator: Jamis	on	
Stream width: 6'		Stream De	oth: <1'		Length of Stream Re		
Has it rained within th	ne past 48 hours? no			? (Indust	rial, agriculture, etc)		
Habitat	I e		Condition Ca		, , , ,		
Parameter	Fully Functio	nal	Partially Impaired	T .	Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr	ate favorable	30-50% mix of stable habitat; well		nix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization a mix of snags, submerged lo		suited for full colonization potential; adequate habitat for		nabitat availability desirable;	habitat lack of habitat is obvious; substrate	
Available Cover	banks, cobble or other stak		maintenance of populations;		frequently	unstable or lacking.	
	at stage to allow full coloni		presence of additional	disturbe	d or removed.		
	potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for				
	,		colonization				
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate	Mix of substrate materials,		Mix of soft sand, mud, or clay;		or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged vegetation present.		o root mat; no ed vegetation.	root mat or vegetation.	
SCORE	2.0		1.5		1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very		oools much more	Majority of pools small-shallow or	
•	small-shallow, small-deep	oools present.	few shallow.	prevalen	t than deep pools.	pools absent.	
SCORE	2.0 Little or no enlargement		1.5	84-3 -	1.0	0.5	
4.Sediment	of islands or point bars		Some new increase in bar formation, mostly from gravel,		e deposition of rel, sand or fine	Heavy deposits of fine material, increased bar	
Deposition	and less than 20% of the bo		sand or fine sediment. 20-50% of	sedimen	t on old and new	development; more than	
	affected by sediment depo	sition.	the bottom affected; slight deposition in pools.		80%of the bottom sediment deposits at	80% of the bottom changing frequently;	
			deposition in pools.		ons, constrictions, and	pools almost absent due to	
					oderate deposition of	substantial sediment deposition.	
SCORE	2.0		1.5	pools prevalent.		0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available		s 25-75% of the available	Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.		and/or riffle substrates ly exposed.	mostly present as standing pools.	
SCORE	2.0		1.5	1.0		0.5	
6.Channel	Channelization or dredging		Some channelization present,		zation may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		nents or shoring s present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past		3% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent	channeliz	ed and disrupted.	removed entirely.	
SCORE	2.0		channelization not present.		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The bend	ls in the stream increase	Channel straight; waterway has	
7. Channel Sinuosity	stream length 3-4X longer t		the stream length 2-3X longer	the strea	m length 2 to 1 times	been channelized for a long	
	a straight line (If braided ch		than if it was in a straight line.		an if it was in a straight	distance.	
SCORE	parameter is difficult to rate	2. j	1.5	line.	1.0	0.5	
	Banks stable; evidence of e	osion or bank	L.3 Moderately stable; infrequent,	Moderate	ely unstable; 30-60% of	Unstable; many eroded areas;	
8.Bank Stability	failure absent or minimal; li	ttle potential	small areas of erosion mostly	bank in re	each has areas of erosion;	"raw" areas frequent along	
	for future problems. < 5% o affected.	f bank	healed over; 5-30% of bank in reach has areas of erosion.	high eros floods.	ion potential during	straight sections and bends; obvious bank sloughing; 60-100%	
	anecteu.		reacti ilas areas of erosion.	noous.		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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		f SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg- including trees, understory		by native vegetation but one class of plants is not well-represented;		n; disruption obvious; of bare soil or closely	vegetation; disruption of SB vegetation is very high; vegetation	
	non-woody macrophytes. n	ninimal or no	disruption evident but not	cropped	vegetation common; less	has been removed to 5 cm. or less	
	evidence of grazing or mow plants allowed to grow natu		affecting full plant growth potential more than ½ of	than ½ po	otential plant stubble	in average stubble height.	
	plants anowed to grow flatt	u y	potential plant stubble height	neight fe			
SCORE	Left Bank 1.0		remaining 0.75		0.50	0.25	
SCORE	Right Bank 1.0		0.75	1	0.50	0.25	
	Width of riparian zone>18 r	neters: human	Width of riparian zone 12-18	Width of	riparian zone 6-12	Width of riparian zone < 6 meters;	
10. Riparian Veg	activities (roads, clear-cuts,		meters; human activities have	meters; h	numan activities have	little or no riparian vegetation due	
Zone Width	parking lots) have not impa	cted zone.	impacted zone only minimally.	impacted	zone a great deal.	to human activities.	
SCORE	Left Bank 1.0		0.75	ļ	0.50	0.25	
SCORE	Right Bank 1.0		0.75	<u> </u>	0.50	0.25	
Total Score:	5 NOTES/	CONTRACT	S: originally \$211 inside	- 41 11		1.1 ()	

Total Score: 5 NOTES/COMMENTS: originally s211; inside the interchange; channel is concrete-lined with no riffle/pool complex; flows southeast

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	A SHEET		
Stream Name S21			ershed: Congaree (0305)			Jackson North	
	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	1	Stream De	Stream Depth: 0.5' Length of Stream Reach: ~27'				
Has it rained within th	e past 48 hours? No			? (Indus	trial, agriculture, etc):		
Habitat	,		Condition Ca		, , ,	nodaway	
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr	ate favorable	30-50% mix of stable habitat; well		mix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization a mix of snags, submerged lo		suited for full colonization		habitat availability	habitat lack of habitat is	
Available Cover	banks, cobble or other stat		potential; adequate habitat for maintenance of populations;		n desirable; te frequently	obvious; substrate unstable or lacking.	
	at stage to allow full coloni		presence of additional	disturb	ed or removed	_	
	potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for				
	new ran and <u>not</u> ransient,	•	colonization				
SCORE	2.0		(1.5)		1.0	0.5	
2.Pool Substrate	Mix of substrate materials		Mix of soft sand, mud, or clay;		or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro submerged vegetation con		mud may be dominant; some root mats and submerged		no root mat; no ged vegetation.	root mat or vegetation.	
	submerged vegetation con	imon.	vegetation present.	submer	ged vegetation.		
SCORE	2.0		(1.5)		1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very		pools much more	Majority of pools small-shallow or	
SCORE	small-shallow, small-deep	pools present.	few shallow.	prevale	nt than deep pools.	pools absent.	
4.Sediment	Z.U Little or no enlargement		1.5 Some new increase in bar	Moder	ite deposition of	U.5 Heavy deposits of fine	
	of islands or point bars		formation, mostly from gravel,		evel, sand or fine	material, increased bar	
Deposition	and less than 20% of the bo		sand or fine sediment. 20-50% of	1	nt on old and new	development; more than	
	affected by sediment depo	sition.	the bottom affected; slight deposition in pools.)-80%of the bottom d; sediment deposits at	80% of the bottom changing frequently;	
				obstruc	tions, constrictions, and	pools almost absent due to	
					moderate deposition of revalent.	substantial sediment deposition.	
SCORE	2.0		1.5	(1.0)		0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available	Water fills 25-75% of the available		Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	1	, and/or riffle substrates tly exposed.	mostly present as standing pools.	
SCORE	2.0		(1.5)	1.0		0.5	
6.Channel	Channelization or dredging		Some channelization present,		lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		ments or shoring es present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past		80% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent	channel	ized and disrupted.	removed entirely.	
SCORE	2.0		channelization not present.		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The ben	ds in the stream increase	Channel straight; waterway has	
7.Chaimer Sindosity	stream length 3-4X longer t	han if it was in	the stream length 2-3X longer	the stre	am length 2 to 1 times	been channelized for a long	
	a straight line (If braided ch parameter is difficult to rat		than if it was in a straight line.	longer t line.	han if it was in a straight	distance.	
SCORE	2.0	~·· _I	1.5	mie.	(1.0)	0.5	
8.Bank Stability	Banks stable; evidence of e	rosion or bank	Moderately stable; infrequent,	Modera	tely unstable; 30-60% of	Unstable; many eroded areas;	
	failure absent or minimal; li		small areas of erosion mostly	1	reach has areas of erosion;	"raw" areas frequent along	
	for future problems. < 5% of affected.	u pank	healed over; 5-30% of bank in reach has areas of erosion.	floods.	osion potential during	straight sections and bends; obvious bank sloughing; 60-100%	
			reacii ilas areas or erosion.	noous.			
SCORE				1100 43.		of bank has erosion scars.	
SCORE	Left Bank 1.0		0.75	noous.	0.50	of bank has erosion scars.	
0.1/	Right Bank 1.0		0.75 0.75		0.50	of bank has erosion scars. 0.25 0.25	
9. Vegetative	Right Bank 1.0		0.75 0.75 70-90% of the SB surfaces covered	50-70%	0.50 of SB covered by	of bank has erosion scars. 0.25 0.25 <som 0.25<="" begin{center}="" th=""></som>	
9.Vegetative Protection	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory	etation, shrubs, or	0.75 0.75 70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented;	50-70% vegetat patches	0.50 of SB covered by ion; disruption obvious; of bare soil or closely	of bank has erosion scars. 0.25 0.25 <50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation	
	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n	etation, shrubs, or ninimal or no	0.75 0.75 70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented; disruption evident but not	50-70% vegetat patches cropped	of SB covered by ion; disruption obvious; of bare soil or closely I vegetation common; less	of bank has erosion scars. 0.25 0.25 <50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less	
	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory	etation, shrubs, or ninimal or no ring; almost all	0.75 0.75 70-90% of the SB surfaces covered by native vegetation but one class of plants is not well-represented;	50-70% vegetat patches cropped than ½	0.50 of SB covered by ion; disruption obvious; of bare soil or closely	of bank has erosion scars. 0.25 0.25 <50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation	
	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow	etation, shrubs, or ninimal or no ring; almost all	0.75 0.75 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	50-70% vegetat patches cropped than ½	0.50 of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble	of bank has erosion scars. 0.25 0.25 <50% of SB surfaces covered by vegetation; disruption of SB vegetation is very high; vegetation has been removed to 5 cm. or less	
Protection	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow nati	etation, shrubs, or ninimal or no ring; almost all	0.75 0.75 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% vegetat patches cropped than ½	0.50 of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	of bank has erosion scars. 0.25 0.25 <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.	
Protection SCORE	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow nati	etation, shrubs, or ninimal or no ring; almost all	0.75 0.75 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% vegetat patches cropped than ½	0.50 of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	of bank has erosion scars. 0.25 0.25 <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. 0.25	
Protection SCORE SCORE	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow nati	etation, shrubs, or ninimal or no ing; almost all urally	0.75 0.75 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% vegetat patches cropped than ½ height r	0.50 of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	of bank has erosion scars. 0.25 0.25 <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 SCORE 10.Riparian Veg	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. In evidence of grazing or mow plants allowed to grow national states and the series of the	etation, shrubs, or ninimal or no ing; almost all urally meters; human lawns, crops,	0.75 0.75 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 0.75 0.75 Width of riparian zone 12-18 meters; human activities have	50-70% vegetat patches cropped than ½ height r	of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	of bank has erosion scars. 0.25 0.25 <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. 0.25 0.25 Width of riparian zone < 6 meters; little or no riparian vegetation due	
SCORE SCORE 10.Riparian Veg Zone Width	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. In evidence of grazing or mow plants allowed to grow national states and the states of the	etation, shrubs, or ninimal or no ing; almost all urally meters; human lawns, crops,	0.75 0.75 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 0.75 Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	50-70% vegetat patches cropped than ½ height r	of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining. 0.50 0.50 friparian zone 6-12 human activities have de zone a great deal.	of bank has erosion scars. 0.25 0.25 <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. 0.25 0.25 Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.	
SCORE SCORE 10.Riparian Veg	Right Bank 1.0 >90% of SB surfaces and ad zone covered by native veg including trees, understory non-woody macrophytes. In evidence of grazing or mow plants allowed to grow national states and the series of the	etation, shrubs, or ninimal or no ing; almost all urally meters; human lawns, crops,	0.75 0.75 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 0.75 0.75 Width of riparian zone 12-18 meters; human activities have	50-70% vegetat patches cropped than ½ height r	of SB covered by ion; disruption obvious; of bare soil or closely d vegetation common; less potential plant stubble emaining.	of bank has erosion scars. 0.25 0.25 <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. 0.25 0.25 Width of riparian zone < 6 meters; little or no riparian vegetation due	

Total Score: 13 NOTES/COMMENTS: Stream appears to be the result of a break in an offsite channelized drainage ditch.

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	TA SHEET		
Stream Name \$22		Basin/Wate	ershed: Congaree (0305	0110)	USGS Quad: Fort	Jackson North	
Latitude: 34°5'	24.154"N	Longitude: 80°57'23.868"\			County: Richland		
Date: 8/7/14		Time: 9:45 am			Investigator: McMaster/Mulholland		
Stream width: 4.0	1	Stream De	oth: 0.5'		Length of Stream Re		
Has it rained within th	ne past 48 hours? No		Adjacent land use	? (Indus	strial, agriculture, etc)	: Roadway	
Habitat			Condition Ca			•	
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well suited for full colonization	1	mix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization a mix of snags, submerged lo		potential; adequate habitat for		; habitat availability ın desirable;	habitat lack of habitat is obvious; substrate	
Available Cover	banks, cobble or other stal		maintenance of populations;		te frequently	unstable or lacking.	
	at stage to allow full coloni potential (i.e.logs/snags th		presence of additional substrate in the form of new	disturb	ed or removed.		
	new fall and <u>not</u> transient)		fall, but not yet prepared for				
			colonization				
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate	Mix of substrate materials,		Mix of soft sand, mud, or clay;		d or clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro submerged vegetation con		mud may be dominant; some root mats and submerged		no root mat; no rged vegetation.	root mat or vegetation.	
	Sabine gea vegetation con		vegetation present.	Subme	Sea regeration		
SCORE	2.0		1.5	L	1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very		v pools much more	Majority of pools small-shallow or	
SCORE	small-shallow, small-deep	pools present.	few shallow.	prevale	ent than deep pools.	pools absent.	
4.Sediment	2.0 Little or no enlargement		1.5 Some new increase in bar	Moder	1.0	0.5 Heavy deposits of fine	
	of islands or point bars		formation, mostly from gravel,		avel, sand or fine	material, increased bar	
Deposition	and less than 20% of the bo		sand or fine sediment. 20-50% of		nt on old and new	development; more than	
	affected by sediment depo	sition.	the bottom affected; slight deposition in pools.		0-80%of the bottom d; sediment deposits at	80% of the bottom changing frequently;	
			45,000	obstruc	tions, constrictions, and	pools almost absent due to	
				bends; moderate deposition of pools prevalent.		substantial sediment deposition.	
SCORE	2.0		1.5	1.0		0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available	1	fills 25-75% of the available	Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, and/or riffle substrates are mostly exposed.		mostly present as standing pools.	
SCORE	2.0		1.5	(1.0)		0.5	
6.Channel	Channelization or dredging		Some channelization present,		lization may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		kments or shoring res present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past		-80% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent	channe	lized and disrupted.	removed entirely.	
SCORE	2.0		channelization not present.		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The her	nds in the stream increase	Channel straight; waterway has	
7. Channel Sinuosity	stream length 3-4X longer t		the stream length 2-3X longer	the stre	eam length 2 to 1 times	been channelized for a long	
	a straight line (If braided ch		than if it was in a straight line.		than if it was in a straight	distance.	
SCORE	parameter is difficult to rate	e. ₁	1.5	line.	1.0	0.5	
8.Bank Stability	Banks stable; evidence of e	rosion or bank	Moderately stable; infrequent,	Modera	ately unstable; 30-60% of	Unstable; many eroded areas;	
ט.שמווג אוומט.ט	failure absent or minimal; li	ttle potential	small areas of erosion mostly	bank in	reach has areas of erosion;	"raw" areas frequent along	
	for future problems. < 5% of affected.	f bank	healed over; 5-30% of bank in reach has areas of erosion.	high ere	osion potential during	straight sections and bends; obvious bank sloughing; 60-100%	
	anecteu		reactifias areas of erosion.	noous.		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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered		of SB covered by	<50% of SB surfaces covered by	
Protection	zone covered by native veg including trees, understory		by native vegetation but one class of plants is not well-represented;		ion; disruption obvious; s of bare soil or closely	vegetation; disruption of SB vegetation is very high; vegetation	
	non-woody macrophytes. n	ninimal or no	disruption evident but not	croppe	d vegetation common; less	has been removed to 5 cm. or less	
	evidence of grazing or mow plants allowed to grow nati		affecting full plant growth potential more than ½ of		potential plant stubble remaining.	in average stubble height.	
	piants anowed to grow natt	arany	potential more than ½ of potential plant stubble height	neight i	cmaning.		
SCODE	1.60 1. 1.0		remaining 0.75		0.50	0.25	
SCORE	Left Bank 1.0		0.75		0.50	0.25	
SCORE	Right Bank 1.0		0.75	140.21	0.50	0.25	
10.Riparian Veg	Width of riparian zone>18 activities (roads, clear-cuts,		Width of riparian zone 12-18 meters; human activities have		of riparian zone 6-12 ; human activities have	Width of riparian zone < 6 meters; little or no riparian vegetation due	
Zone Width	parking lots) have not impa		impacted zone only minimally.		ed zone a great deal.	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		CONTRACTION				eam contains un to	

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	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	A SHEET			
Stream Name Cumbess	Creek s23/s24		ershed: Lower Broad (030501)			ackson North		
Latitude: 34°6′	24.215" N	Longitude: 80°57′ 44.581″ W			County: Richland			
Date: 8-6-14		Time:	1730		Investigator: Jamis	on		
Stream width: 10-12	1	Stream Dep	oth: 1-3'		Length of Stream Reach: ~200'			
Has it rained within th	ne past 48 hours? no		Adjacent land use	? (Indust	rial, agriculture, etc):	roadway, forested		
Habitat			Condition Ca	ategory				
Parameter	Fully Functio		Partially Impaired		Impaired	Very Impaired		
1.Epifaunal Substrate or Available Cover	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged le banks, cobble or other stat at stage to allow full coloni potential (i.e.logs/snags th new fall and not transient)	and fish cover; ags, undercut ale habitat and zation at are <u>not</u>	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	habitat; less thar substrat	nix of stable habitat availability desirable; e frequently d 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, and firm sand prevalent; ro submerged vegetation com	ot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or r	or clay or sand bottom; no root mat; no ged 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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.		pools much more It 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 bo affected by sediment depo		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 and minimal amount of cha 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 minimal; stream with norm		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.	embankı structure and 40-8	zation may be extensive; ments or shoring es present on both banks; 0% of stream reach zed 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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the strea	ds in the stream increase am length 2 to 1 times nan if it was in a straight	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 er failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in r	ely unstable; 30-60% of each has areas of erosion; sion potential during	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 adzone covered by native ver- including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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 r activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	meters;	riparian zone 6-12 human activities have d 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:		COMMENT	S: originally s219/s214:	como i		v: flows west: adjacent		

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	/ GRADIEN	IT STREAM ASSESSMEN	NT DATA	SHEET		
Stream Name \$25		Basin/Wate	ershed: Lower Broad (030501)	(06)	USGS Quad: Fort Ja	ackson North	
	36.341" N	Longitude:	80°57′ 45.906″ W		County: Richle	nd	
Date: 8-6-14	1	Time:	1600		Investigator: Jamis	on	
Stream width: 4'		Stream De	oth: 1.5'		Length of Stream Re		
Has it rained within th	ne past 48 hours? no				ial, agriculture, etc)		
Habitat	1		Condition Ca		, , ,		
Parameter	Fully Functio	nal	Partially Impaired		Impaired	Very Impaired	
1.Epifaunal	Greater than 50% of substr		30-50% mix of stable habitat; well	10-30% m	ix of stable	Less than 10% stable	
Substrate or	for epifaunal colonization a		suited for full colonization		abitat availability	habitat lack of habitat is	
Available Cover	mix of snags, submerged lo banks, cobble or other stak		potential; adequate habitat for maintenance of populations;	less than substrate	desirable; frequently	obvious; substrate unstable or lacking.	
	at stage to allow full coloni		presence of additional		or removed.	_	
	potential (i.e.logs/snags th new fall and <u>not</u> transient)		substrate in the form of new fall, but not yet prepared for				
	incommunity in the state of the		colonization				
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate	Mix of substrate materials,		Mix of soft sand, mud, or clay;		r clay or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterization	and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged vegetation present.		o root mat; no d vegetation.	root mat or vegetation.	
SCORE	2.0		(1.5)		1.0	0.5	
3.Pool variability	Even mix of large-shallow,		Majority of pools large-deep; very		ools much more	Majority of pools small-shallow or	
•	small-shallow, small-deep	oools present.	few shallow.	prevalent	than deep pools.	pools absent.	
SCORE	2.0		1.5		1.0	0.5	
4.Sediment	Little or no enlargement of islands or point bars		Some new increase in bar formation, mostly from gravel,		deposition of el, sand or fine	Heavy deposits of fine material, increased bar	
Deposition	and less than 20% of the bo		sand or fine sediment. 20-50% of		on old and new	development; more than	
	affected by sediment depo	sition.	the bottom affected; slight deposition in pools.		0%of the bottom sediment deposits at	80% of the bottom changing frequently;	
			deposition in pools.		ons, constrictions, and	pools almost absent due to	
				bends; m	oderate deposition of	substantial sediment deposition.	
SCORE	2.0		1.5	1.0		0.5	
5.Channel Flow	Water reaches base of both		Water fills > 75% of the available		25-75% of the available	Very little water in channel and	
Status	and minimal amount of cha is exposed.	nnel substrate	channel or < 25% of channel substrate is exposed.	channel, a are mostly	nd/or riffle substrates / exposed.	mostly present as standing pools.	
SCORE	2.0		1.5	1.0		0.5	
6.Channel	Channelization or dredging		Some channelization present,		ation may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past		ents or shoring present on both banks;	cement; over 80% of the stream reach channelized and disrupted.	
			channelization (greater than past	and 40-80	% of stream reach	In stream habitat greatly altered or	
			20 yr.) may be present, but recent channelization not present.	channelize	ed and disrupted.	removed entirely.	
SCORE	2.0		1.5		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc	rease the	The bends in the stream increase	The bends	in the stream increase	Channel straight; waterway has	
7. Chamilei Sindosity	stream length 3-4X longer t	han if it was in	the stream length 2-3X longer	the stream	n length 2 to 1 times	been channelized for a long	
	a straight line (If braided ch parameter is difficult to rate		than if it was in a straight line.	longer tha	n if it was in a straight	distance.	
SCORE	2.0	1	1.5	inic.	1.0)	0.5	
8.Bank Stability	Banks stable; evidence of e	osion or bank	Moderately stable; infrequent,	Moderate	ly unstable; 30-60% of	Unstable; many eroded areas;	
,	failure absent or minimal; li		small areas of erosion mostly		ach has areas of erosion;	"raw" areas frequent along	
	for future problems. < 5% o affected.	TDank	healed over; 5-30% of bank in reach has areas of erosion.	floods.	on potential during	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	>90% of SB surfaces and ad zone covered by native veg		70-90% of the SB surfaces covered by native vegetation but one class		SB covered by n; disruption obvious;	<50% of SB surfaces covered by vegetation; disruption of SB	
Protection	including trees, understory		of plants is not well-represented;		f bare soil or closely	vegetation is very high; vegetation	
	non-woody macrophytes. n		disruption evident but not		egetation common; less	has been removed to 5 cm. or less	
	evidence of grazing or mow plants allowed to grow natu	-	affecting full plant growth potential more than ½ of	than ½ po height rer	tential plant stubble naining.	in average stubble height.	
		•	potential plant stubble height		-		
SCORE	Left Bank 1.0		remaining 0.75		0.50	0.25	
SCORE	Right Bank 1.0		0.75	1	0.50	0.25	
10.Riparian Veg	Width of riparian zone>18 r	neters; human	Width of riparian zone 12-18	Width of	iparian zone 6-12	Width of riparian zone < 6 meters;	
	activities (roads, clear-cuts,	lawns, crops,	meters; human activities have	meters; h	uman activities have	little or no riparian vegetation due	
Zone Width	parking lots) have not impa	cted zone.	impacted zone only minimally.	impacted	zone a great deal.	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: _______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	/ GRADIEN	IT STREAM ASSESSMEN	IT DAT	A SHEET		
Stream Name Crane C	reek s26/s28	Basin/Watershed: Lower Broad (03050106)			6) USGS Quad: Fort Jackson North		
Latitude: 34°7′2	25.129" N	Longitude: 80°57′ 47.324″ W			County: Richland		
Date: 8-6-14		Time:	1100		Investigator: Ja	amison	
Stream width: 12-20'		Stream Dep	oth: 1-4'		Length of Strear	m Reach: ~400′	
Has it rained within th	e past 48 hours? no		Adjacent land use	? (Indus	trial, agriculture,	etc): roadway, forested	
Habitat			Condition Ca	tegory			
Parameter	Fully Functio		Partially Impaired		Impaired	Very Impaired	
1.Epifaunal Substrate or Available Cover	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged lo banks, cobble or other stat at stage to allow full coloni potential (i.e.logs/snags th new fall and not transient).	and fish cover; igs, undercut ile habitat and zation at are <u>not</u>	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	habitat; less tha substra	mix of stable : habitat availability n desirable; te frequently ed 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, and firm sand prevalent; ro submerged vegetation com	ot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	little or	or clay or sand bottom no root mat; no ged vegetation.	n; 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, small-shallow, small-deep p		Majority of pools large-deep; very few shallow.		pools much more nt than deep pools.	Majority of pools small-shallow 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 bo affected by sediment depo		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.		d pools almost absent due to	
SCORE	2.0		1.5	1.0		0.5	
5.Channel Flow Status	Water reaches base of both and minimal amount of cha 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.		1 :	
SCORE	2.0		(1.5)	1.0		0.5	
6.Channel Alteration	Channelization or dredging minimal; stream with norm		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.		cement; over 80% of the stream	
SCORE	2.0		1.5		1.0	0.5	
7.Channel Sinuosity	The bends in the stream inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stre	ds in the stream increa am length 2 to 1 times han if it was in a straigh	been channelized for a long	
SCORE	2.0		1.5		1.0	0.5	
8.Bank Stability	Banks stable; evidence of er failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in	tely unstable; 30-60% o reach has areas of eros osion potential during	"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 adj zone covered by native veg- including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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.		vegetation is very high; vegetati less has been removed to 5 cm. or le	
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 r activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	meters;	f riparian zone 6-12 human activities have ed zone a great deal.	Width of riparian zone < 6 mete	
SCORE	Left Bank 1.0		0.75		0.50	0.25	
SCORE	Right Bank 1.0		(0.75)		0.50	0.25	
		COMMENT	S: originally \$215 large				

Total Score: 14.25 NOTES/COMMENTS: originally s215; large perennial stream with well-formed riffles and pools

	LOW	/ GRADIEN	IT STREAM ASSESSMEN	IT DATA SI	HEET		
Stream Name \$27		Basin/Wate	ershed: Lower Broad (030501)	06) USG	S Quad: Fort Ja	ackson North	
	25.305" N	5" N Longitude: 80°57′ 46.940" W County: Richl			inty: Richla	and	
Date: 8-6-14	!	Time:	1100		estigator: Jamis	on	
Stream width: 4'		Stream Dep	oth: 3'		gth of Stream Re		
Has it rained within th	e past 48 hours? no	01100111 = 0	Adjacent land use				
Habitat			Condition Ca		<u> </u>		
Parameter	Fully Functio	nal	Partially Impaired		paired	Very Impaired	
1.Epifaunal Substrate or	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged lo	ate favorable and fish cover;	30-50% mix of stable habitat; well suited for full colonization	10-30% mix of habitat; habita less than desir	stable st availability	Less than 10% stable habitat lack of habitat is obvious; substrate	
Available Cover	banks, cobble or other stal at stage to allow full coloni potential (i.e.logs/snags th new fall and not transient)	ole habitat and zation at are <u>not</u>	potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of new fall, but not yet prepared for colonization	substrate freq disturbed or re	uently	unstable or lacking.	
SCORE	2.0		1.5		1.0	0.5	
2.Pool Substrate Characterization	Mix of substrate materials, and firm sand prevalent; ro submerged vegetation com	ot mats and	Mix of soft sand, mud, or clay; mud may be dominant; some root mats and submerged vegetation present.	All mud or clay little or no roo submerged ve		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, small-shallow, small-deep		Majority of pools large-deep; very few shallow.	Shallow pools prevalent thar		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 bo	ottom	Some new increase in bar formation, mostly from gravel, sand or fine sediment. 20-50% of	Moderate dep new gravel, sa sediment on o	nd or fine	Heavy deposits of fine material, increased bar development; more than	
	affected by sediment depo		the bottom affected; slight deposition in pools.	bars; 50-80% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.		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 and minimal amount of cha 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	Channelization or dredging	absent or	Some channelization present,	Channelization	may be extensive;	Banks shored with gabion or	
Alteration	minimal; stream with norm	al pattern	usually in areas of bridge abutments; evidence of past channelization (greater than past 20 yr.) may be present, but recent channelization not present.	embankments structures pres and 40-80% of channelized an	ent on both banks; stream reach	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 inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stream len	ne stream increase gth 2 to 1 times t was in a straight	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 ei failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.		stable; 30-60% of nas areas of erosion; otential during	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	>90% of SB surfaces and ad		70-90% of the SB surfaces covered	50-70% of SB c	overed by	<50% of SB surfaces covered by	
Protection	zone covered by native veg- including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	shrubs, or ninimal or no ing; almost all	by native vegetation but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential more than 1/2 of potential plant stubble height remaining	vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than ½ potential plant stubble height remaining.		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	1.0		0.75		0.50	0.25	
	Right Bank 1.0 Width of riparian zone>18 r	neters: human	Width of riparian zone 12-18	Width of ripari		Width of riparian zone < 6 meters;	
10.Riparian Veg Zone Width	activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	meters; human activities have impacted zone only minimally.	meters; humar impacted zone	activities have a great deal.	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:		CONTRACTION	S: originally s217 small				

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	GRADIEN	IT STREAM ASSESSMEN	IT DATA S	HEET		
Stream Name S2	29		Basin/Wate	ershed: Lower Broad (030501)	06) US(GS Quad: Blythe	wood	
		8.252" N	Longitude:	80°57′ 44.692″ W		unty: Richla	nd	
Date: 8	8-6-14		Time:	1400	lnv	estigator: Jamis	on	
Stream width: 4	4'		Stream Dep	oth: 0.5'	Len	igth of Stream Re	each: ~200'	
Has it rained wit		e past 48 hours? no	'	Adjacent land use				
Habitat				Condition Ca				
Parameter		Fully Functio	nal	Partially Impaired	Im	paired	Very Impaired	
1.Epifaunal Substrate or Available Cove	er	Greater than 50% of substr for epifaunal colonization a mix of snags, submerged le banks, cobble or other stak at stage to allow full coloni potential (i.e.logs/snags th new fall and not transient)	nd fish cover; gs, undercut le habitat and zation at are <u>not</u>	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	10-30% mix of habitat; habit: less than desir substrate freq disturbed or re	at availability ·able; uently	Less than 10% stable habitat lack of habitat is obvious; substrate unstable or lacking.	
SCORE		2.0		colonization 1.5	(1.0	0.5	
2.Pool Substrate		Mix of substrate materials,	with gravel	Mix of soft sand, mud, or clay;		y or sand bottom;	Hard-pan, clay, or bedrock; no	
Characterizati		and firm sand prevalent; ro submerged vegetation com		mud may be dominant; some root mats and submerged vegetation present.	little or no roc submerged ve		root mat or vegetation.	
SCORE		2.0		1.5		1.0	0.5	
3.Pool variability	у	Even mix of large-shallow, small-shallow, small-deep		Majority of pools large-deep; very few shallow.	Shallow pools prevalent that		Majority of pools small-shallow or pools absent.	
SCORE	[2.0		1.5	<u> </u>	1.0	0.5	
4.Sediment Deposition		Little or no enlargement of islands or point bars and less than 20% of the bo affected by sediment depo		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 and minimal amount of cha 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 minimal; stream with norm		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.	embankments	sent on both banks; stream reach	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 Sinuo	sity	The bends in the stream inc stream length 3-4X longer t a straight line (If braided ch parameter is difficult to rate	han if it was in annel, this	The bends in the stream increase the stream length 2-3X longer than if it was in a straight line.	the stream len	he stream increase igth 2 to 1 times it was in a straight	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 ei failure absent or minimal; li for future problems. < 5% o affected.	ttle potential	Moderately stable; infrequent, small areas of erosion mostly healed over; 5-30% of bank in reach has areas of erosion.	bank in reach l	nstable; 30-60% of has areas of erosion; otential during	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 ad zone covered by native veg including trees, understory non-woody macrophytes. n evidence of grazing or mow plants allowed to grow natu	etation, shrubs, or ninimal or no ing; almost all	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 Ve Zone Width	- 1	Width of riparian zone>18 r activities (roads, clear-cuts, parking lots) have not impa	lawns, crops,	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of ripar	ian zone 6-12 n activities have	Width of riparian zone < 6 meters; little or no riparian vegetation due to human activities.	
SCORE		Left Bank 1.0		0.75	<u> </u>	0.50	0.25	
SCORE		Right Bank 1.0		0.75		0.50	0.25	
Total Score:			CON AN AENIT	S: originally s216: stream		$\overline{}$		

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)



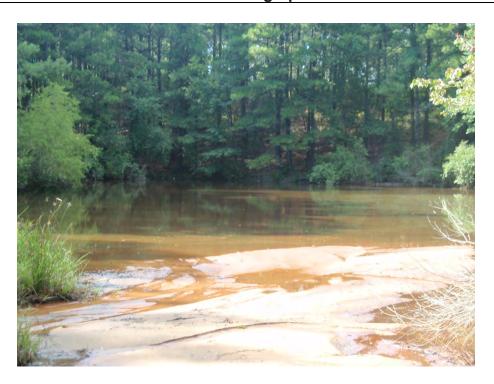


Photograph #5 - w6 (looking southeast)



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)

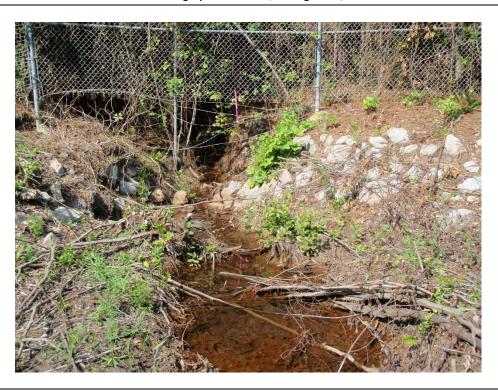


Photograph #12 – s17 (looking northwest)





Photograph #13 - s19 (looking north)



Photograph #14 - s20 (looking northeast)





Photograph #15 - s21 (looking northeast)



Photograph #16 – s22 (looking southwest)





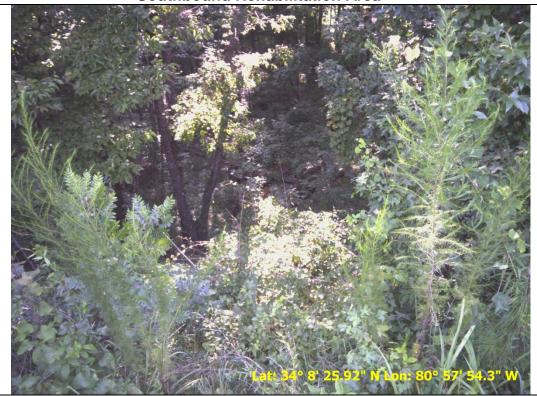
Photograph #17 - s25 (looking south)



Photograph #18 - s29 (looking west)

End of stream photos



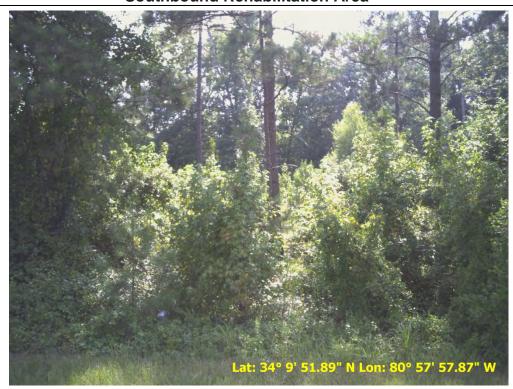


Looking west from the southbound (SB) side of I-77, north of Killian Road



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

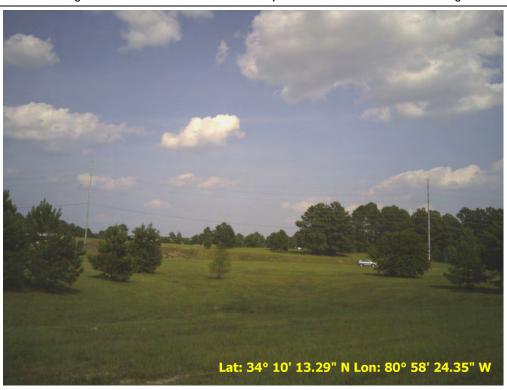


Looking west from the SB side of I-77, north of Blythewood Crossing





Looking east from SB side of I-77, inside ramp median at Wilson Road interchange

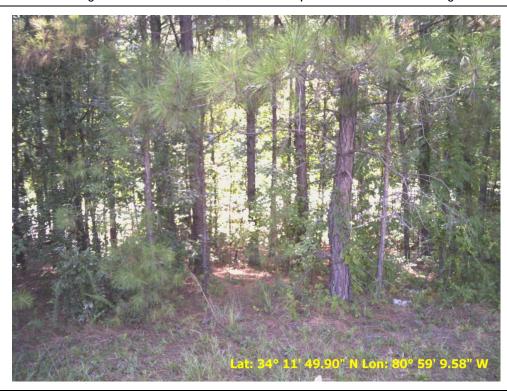


Looking west from SB side of I-77, between ramps at Wilson Road interchange





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

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.

F.

G.



N/A	
risk o	include a discussion of the following: commensurate with the significance of the environmental impact for all alternatives containing encroachments and those is which would support base floodplain development: 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
	e discuss the practicability of alternatives to any significant encroachments or any ort of incompatible floodplain development.
N/A	
Were	local, state, and federal water resources and floodplain management agencies

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.

South Carolin	na Department of Transportation
I-77 Roadway	y Widening and Improvements

99	
3	الحا

Ī	N/A		

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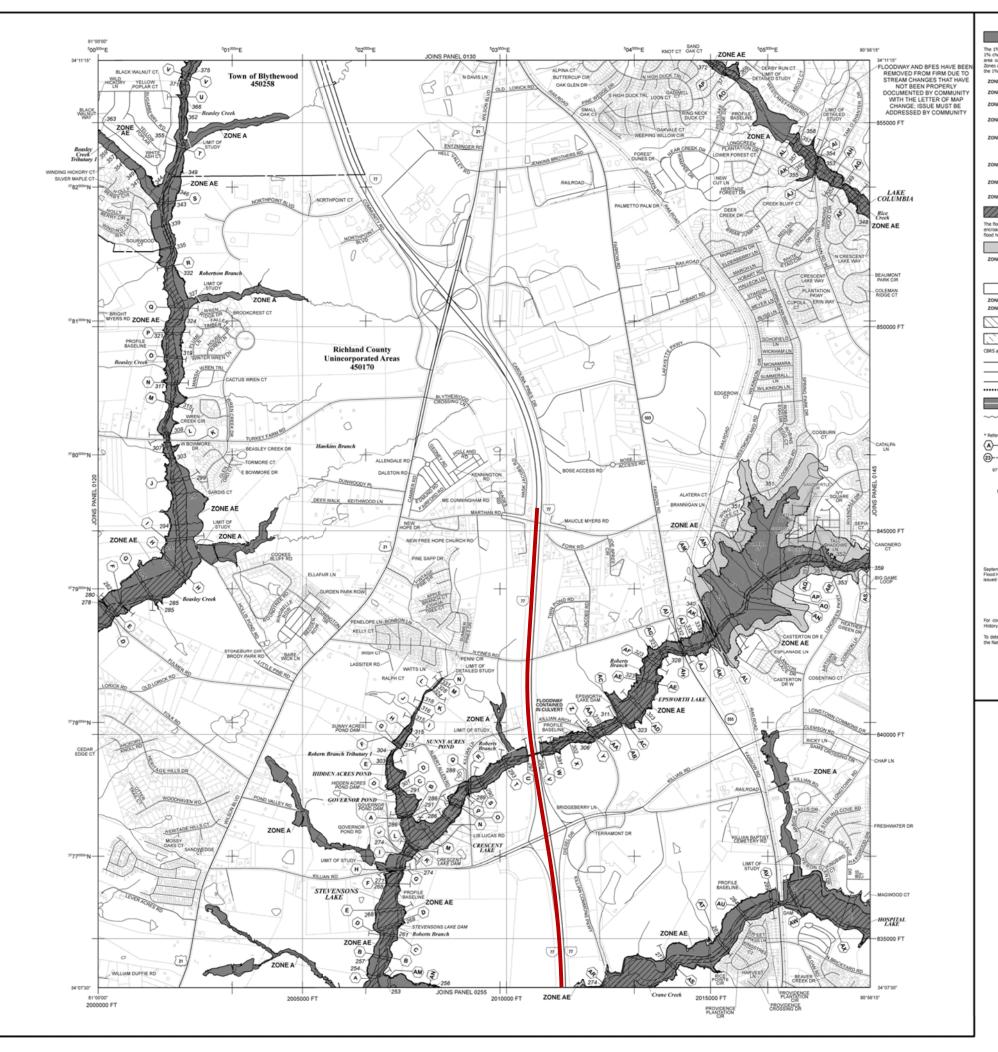
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LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual cleance food (LIO)-eart Food, also income as the base food, is the food that has in the case of being equaled or exceeded in any given year. The Servicel Food House has as the area subject to fooding by the "like manual chance food," Access of Secolar Food House date is the area subject to fooding by the "like manual chance food. Access of Secolar Food House Access and the Contract Contract

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 Elevation determined.

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.

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.

Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation

Coastal flood zone with velocity hazard (wave action); Base Flood Elevation

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free or encroachment so that the 1% annual chance flood can be carried without substantial increases in flood beinbri.

OTHER FLOOD AREAS

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.

~~ 513 ~~~

(EL 987)

6000000 FT

DX5510_×

ZONE X

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)

Floodway boundar

Zone D boundary

CRRS and CPA boundary

Boundary dividing Special Flood Hazard Area Zones and boundary dividing Special Flood Hazard Areas of different Base Plood Bleatbons, flood depths, or flood velocities Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet* al Dahum of 1988

(A)——(A) Cross section line

--23 97'07'30", 32'22'30" 4275000°E

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere

1000-meter Universal Transverse Mercator grid ticks, zone 17
5000-foot grid values: South Carolina State Plane coordinate
system (FIPSZONE = 3900), Lambert projection
Bench mark (see explanation in Notes to Users section of this
FIRM panel)

MAP REPOSITORIES Refer to Map Repositories list on Map Index EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP January 19, 1994

EFFECTIVE DATE(\$) OF REVISION(\$) TO THIS PANEL February 20, 2002
September 29, 2010 – to update corporate limits, to change Base Flood Elevation Plood Hazard Areas, to update map format, to add roads and road names, to inco. suced Letters of May Revision, and to reflect updated the glogogaphic 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.



MAP SCALE 1" = 1000' 0 500 1,000 1,500 2,000 FEET

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)

TOWN OF BLYTHEWOOD 450258 0140 K RICHLAND COUNTY 450170 0140 K



MAP NUMBER 45079C0140K MAP REVISED SEPTEMBER 29, 2010

Federal Emergency Management Agency



DNR

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Apency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/

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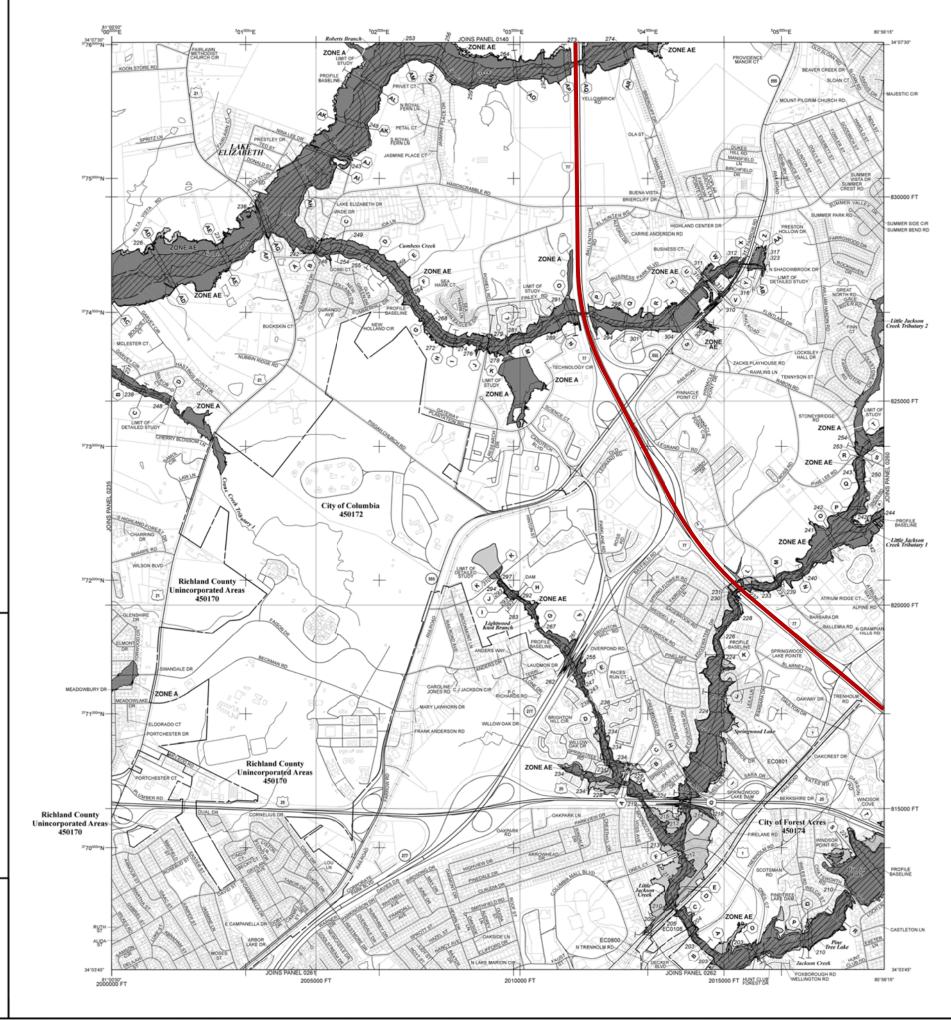
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Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

~~ 513 ~~~

(EL 987)

6000000 FT

23--

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ZONE X Areas determined to be outside the 0.2% annual chance floodplain ZONE D

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OTHERWISE PROTECTED AREAS (OPAs)

____ Floodway boundar Zone D boundary

ZORG to occurranty
CBRS and CPA 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 Base Flood Elevation line and value; elevation in feet* Base Flood Elevation value where uniform within zone; elevation in feet*

al Dahum of 1988 Cross section line

(A)——(A) --23

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1000-meter Universal Transverse Mercator grid ticks, zone 17
5000-foot grid values: South Carolina State Plane coordinate
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EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP January 19, 1994

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL February 20, 2010 – to update corporate limits, to change Base Flood Elevations and Special Flood Hazard Areas, 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 previous issued Letters of Map Revision, and to reflect updated topographic information.

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MAP SCALE 1" = 1000" 0 500 1,000 1,500 2,000 FEET

FIRM FLOOD INSURANCE RATE MAP

> RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS

PANEL 0255K

PANEL 255 OF 650

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COLUMBIA, CITY OF 450172 0255 K
FOREST ACRES, CITY OF 450174 0255 K
RICHLAND COUNTY 450170 0255 K



MAP NUMBER 45079C0255K MAP REVISED SEPTEMBER 29, 2010

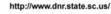
Federal Emergency Management Agency







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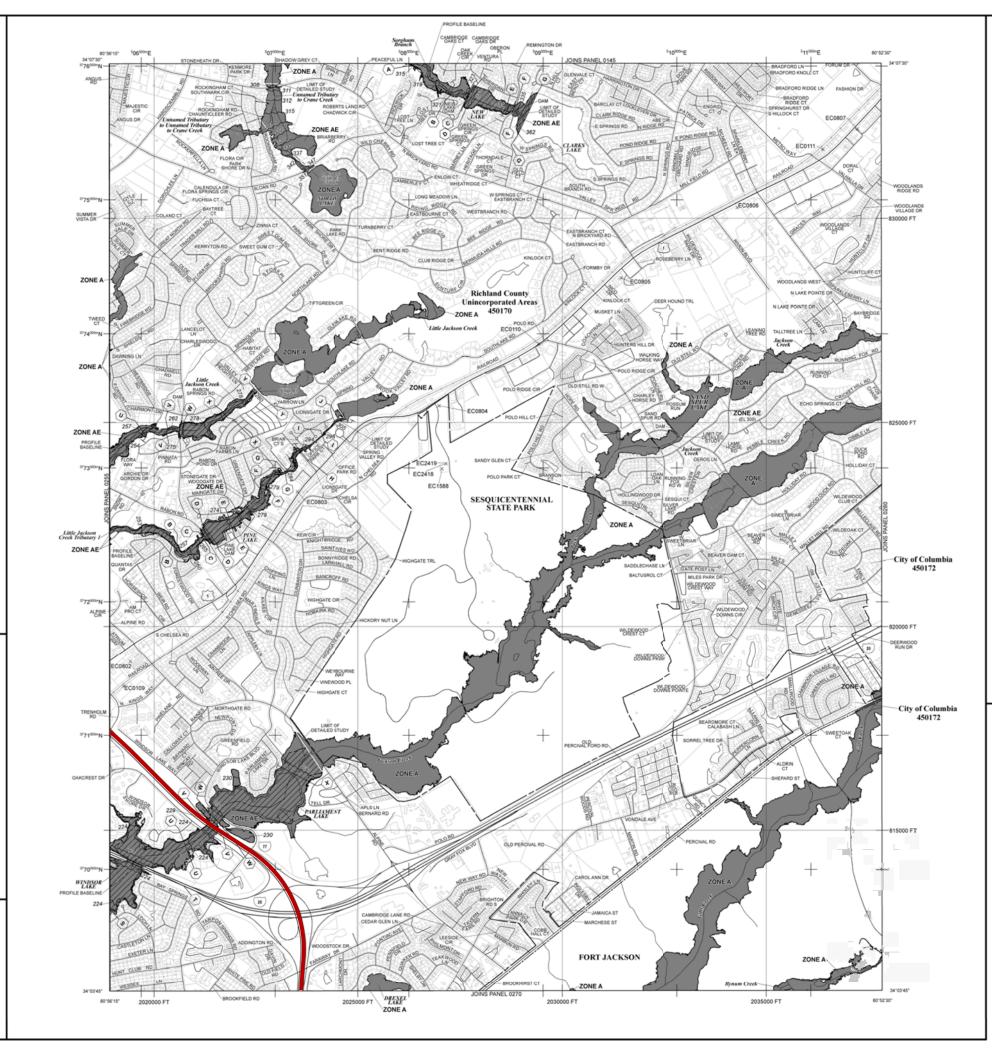
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If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2527) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The IN-annual chance food (LID-year food), also known as the lease food, is the food that has a 1% share of heining equated or exceeded in any given year. The Special Food Hassel Anal is the Analysis of the Special Food Hassel Anal is the Seathers of the Special Food Hassel Anal is the A, AE, AH, AD, AR, APD, 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 sheet flow on sloping terrain); average depth determined. For areas of alluvial fan flooding, velocities also determined.

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.

Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation

Coastal flood zone with velocity hazard (wave action); Base Flood Elevation

FLOODWAY AREAS IN ZONE AE

dway is the channel of a stream plus any adjacent floodplain areas that must be kept free of three to other the 1% annual chance flood can be carried without substantial increases in

OTHER FLOOD AREAS

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

~~~ 513 ~~~

(EL 987)

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

Zone D boundary

ZORE or DOUN-MATE CERS 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 Base Flood Elevation line and value; elevation in feet\* Base Flood Elevation value where uniform within zone; elevatio in feet\*

al Dahum of 1988 (A)——(A) Cross section line

--23)

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere 97'07'30", 32'22'30" <7500nE

1000-meter Universal Transverse Mercator grid ticks, zone 17 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection Bench mark (see explanation in Notes to Users section of this FIRM panel) 6000000 FT DX5510<sub>x</sub>

MAP REPOSITORIES
Refer to Map Repositories list on Map Index

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 Spec Hazard Areas, to update map format, to add roads and road names, to incorporate previously. Letters of Map Revision, and to refer dupdated flooppoince 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.



0 500 1,000 1,500 2,000 FEET

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

450172 0260 K 450170 0260 K

MAP NUMBER 45079C0260K MAP REVISED SEPTEMBER 29, 2010

Federal Emergency Management Agency

This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Apency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/

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 counded whole-lood elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the soles source of flood elevation; information. Accordingly, flood elevation information. Accordingly flood elevation information accordingly flood elevation information and contained to the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevations (BFEs) shown on this map apply only landward of 1.0° North American Vertical Datum of 1988 (NAVO 88). Users of this FiRM should be aware that coastal flood elevations are also provided in the Summary of Sillwater Elevations table in the Flood Insurance Study report for this jurisdiction. Elevations thown in the Summary of Sillwater Elevations table should be used for construction and/or floodplain management purposes when they are higher than the elevations hown 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 adjunct jurisdictions may result in sight 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 Flood elevations on this map are referenced to the North Artherican vertical Dutam's of 1968. 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 1958, visit the National Geodetic Survey website at http://www.nps.noaa.gov/ or contact the National Geodetic Survey at the following

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/.

Base map information shown on this FIRM was provided in digital format by Richland County, South Carolina.

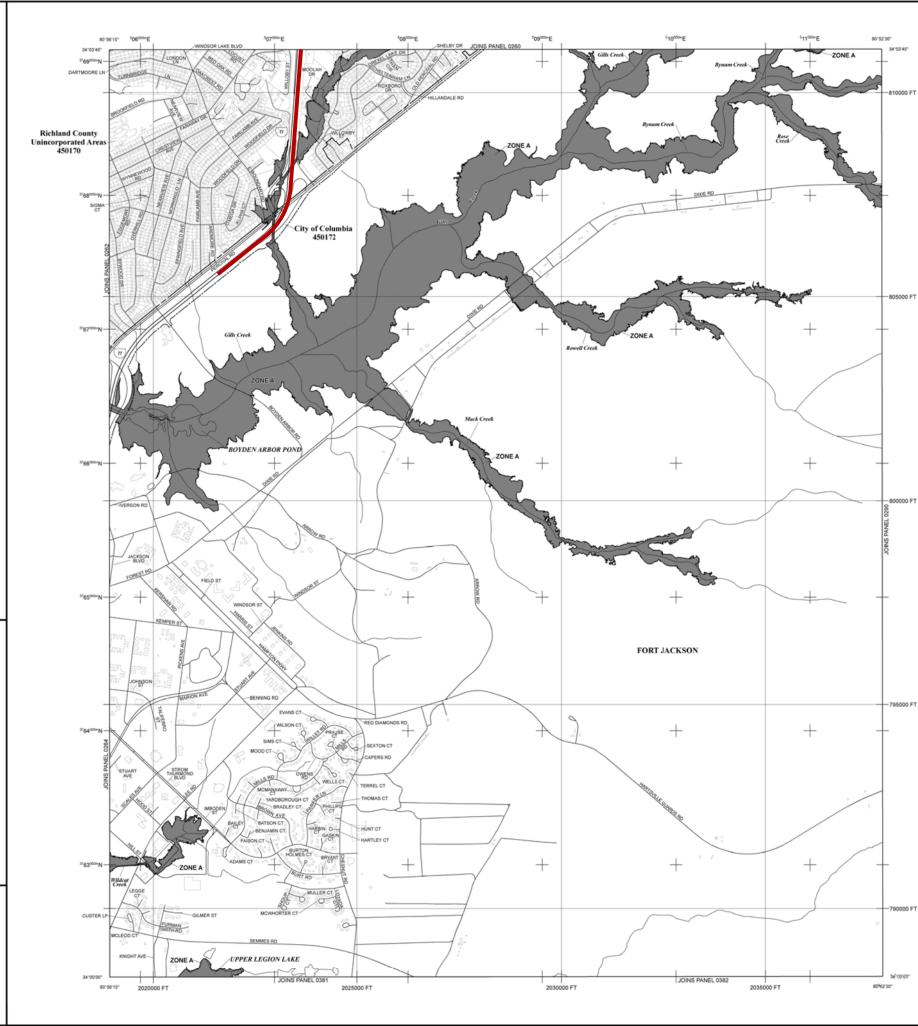
This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodpains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have socurred after this map was published, map users should contact appropriate ommunity officials to verify current corporate limit locations.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is

Contact the FEMA Map Service Center at 1-800-358-9616 for information on available products associated with this FIRM. Available products may include previously issued Letters of Map Change, a Flood insurance Study report, and/or digital versions of this map. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and its subsite at http://www.mscfema.gov.

If you have questions about this map or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at http://www.fema.gov/.



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year feot), also known as the base flood, is the flood that has a 1% Chance of being equated or exceeded in any yearn year. The Special Flood Hausel Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hausel Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hausel chanked floods. A, AE, AH, AD, AR, ARO, V, and VE. The Base Flood Bevation is the water-surface elevation of the 1% annual chance flood.

ZONE A No Base Flood Elevations determined.

ZONE AE Base Flood Elevations determined.

Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevation ZONE AH

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.

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.

Coastal flood zone with velocity hazard (wave action); no Base Flood Elevation

Coastal flood zone with velocity hazard (wave action); Base Flood Elevation

FLOODWAY AREAS IN ZONE AE

dway is the channel of a stream plus any adjacent floodplain areas that must be kept free o hment so that the 1% annual chance flood can be carried without substantial increases is

OTHER FLOOD AREAS

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

~~~ 513 ~~~

(EL 987)

DX5510_x

ZONE X

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

Zone D boundary

ZORG to OCHORATY
CERS 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 Base Flood Elevation line and value; elevation in feet*

Base Flood Elevation value where uniform within zone; elevation in feet* cal Datum of 1988 (A)——(A)

Cross section line

--23) Geographic coordinates referenced to the North American Datum of 1983 (NAD 83), Western Hemisphere 97'07'30", 32'22'30" <7500nE

1000-meter Universal Transverse Mercator grid ticks, zone 17 5000-foot grid values: South Carolina State Plane coordinate system (FIPSZONE = 3900), Lambert projection Bench mark (see explanation in Notes to Users section of this FIRM panel) 6000000 FT

> 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

METEURINE, UNITED UP: NEUTRINGUES TO THIS PANEL February 20, 2002
September 29, 2010 – to update corporate limits, to change Base Flood Elevations and Special Fill Hazard Areas, to update map format, to add roads and road names, to incorporate previously issuiteters 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.



MAP SCALE 1" = 1000" 500 0 500 1,000 1,500 2,000 FEET

PANEL 0270K FIRM FLOOD INSURANCE RATE MAP RICHLAND COUNTY, SOUTH CAROLINA AND INCORPORATED AREAS PANEL 270 OF 650 CONTAINS:

000

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

COMMUNITY COLUMBIA, CITY OF RICHLAND COUNTY 450172 0270 K 450170 0270 K



MAP NUMBER 45079C0270K MAP REVISED SEPTEMBER 29, 2010

Federal Emergency Management Agency







This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of South Carolina and the Federal Emergency Management Apency (FEMA). The State of South Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the state of South Carolina has joined in a Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

http://www.dnr.state.sc.us/



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

| | | | | SOURCE |
|---|--------------------|--------------------|-------------------------------------|----------------------------------|
| | | | I-77 | Req. For Hydr.
Design Studies |
| | | | | Section |
| | | 0 - 100 AC | Rational Method | 2.2.15.1 |
| Hydrologic
Method | Drainage Area | 100 AC -
640 AC | NRCS WinTR-55
Method | 2.2.15.2 |
| ivietiloa | | > 640 AC | USGS Regression
Equations | 2.2.15.3 |
| Freeboard For Road Subgrades | | grades | 1' Above Design
High-Water Level | 2.2.1 |
| | Cross-Line Pipes | | 50 year | 2.2.2 |
| | | | 100 year | 2.2.2 |
| Docian | Clased Starm | 0 - 40 AC | 10 year | |
| Design
Storm | | 40 - 500
AC | 25 year | 2.2.3 |
| | | > 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 | Depth |
|---------------|----------|
| (years) | (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) | а | b | С |
|----------------------|-----------|----------|---------|
| 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 (*CNs*) 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 # | А | В | С | 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 CNs 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.

3955 Faber Place Drive, Suite 300, North Charleston, SC 29405-8580

(843) 414-3700



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

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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 | Вох | | 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) | Вох | | 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.

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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. |



| 5D 4006 | 1200 50 | 2.411.0.00 | 205 | Replace first 32' of existing pipe from upstream end |
|---------|---------|------------------------------|-------|---|
| EP-1006 | 1289+60 | 24" RCP | 305 | 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. |



| - | 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)

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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. Cleaning 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 reestablish 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

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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

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3955 Faber Place Drive, Suite 300, North Charleston, SC 29405-8580 (843) 414-3700



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

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 | | | |
| | American wood stork (T) | Mycteria americana | February 15-September 1 | Nesting season | | | |
| Bird | Bald eagle (BGEPA) | Haliaeetus leucocephalus | October 1-May 15 | Nesting season | | | |
| | Interpetion Interpetion Interpetion American wood stork (T) Bald eagle (BGEPA) Red-cockaded woodpecker (E) Picoides borealis American eel (ARS) American eel (ARS) Anguilla rostrata Allantic sturgeon* (E) Blueback herring (ARS) Alosa aestivalis Robust redhorse (ARS) Shortnose sturgeon* (E) Acipenser brevirostrum* Rafinesque's big-eared bat (ARS) Tri-colored bat (ARS*) Areinan eel (ARS) Bog spicebush (ARS) Areinan eel (ARS) Areinan eel (ARS) Aripenser brevirostrum None Found Found in mines, caves, trees, buildings, and b lollusk Savannah lilliput (ARS) Aripenser oxypolis canbyi Toxolasma pullus March 1-May 30; Corypolis canbyi March 1-May 30; Cotober 1-December 15 April 1-July 31 Nesting season November-April March 1-May 30; Cotober 1-December 15 20°C); can be found be cotober 1-December 15 Acipenser oxyrinchus* February 1-April 30 Spawning migration Mid-January-mid May Peak: March-April None Found Found in mines, caves, trees, buildings, and b found in mines and cather trees, buildings, a | Nesting season | | | | | |
| Crustacean | Broad River spiny crayfish (ARS) | Cambarus spicatus | November-April | | | | |
| | A | A | March 1-May 30; | Temperature dependent: normally (17- | | | |
| | American eei (AKS) | Anguilla rostrata | October 1-December 15 | 20°C); can be found between 13-25°C | | | |
| Amphibian Bird Crustacean Fish Insect Mammal Mollusk Plant | Atlantic sturgeon* (E) | Acipenser oxyrinchus* | February 1-April 30 | | | | |
| | 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 | | | | | | | |
| 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 | | | | |
| | Bog spicebush (ARS) | Lindera subcoriacea | March-August | | | | |
| | Canby's dropwort (E) | Oxypolis canbyi | Mid-July-September | | | | |
| | Ciliate-leaf tickseed (ARS) | Coreopsis integrifolia | August-November | · | | | |
| Plant | 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 | the same | | | |
| | 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

| k | 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 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 | | | | | | |
| RS | | | | | | | |
| | is provided only for conservation actions a | s no Federal protections currently exist | | | | | |
| RS* | Species that are either former Candidate Species or are emerging conservation priority species | | | | | | |
| GEPA | Federally protected under the Bald and Go | lden Eagle Protection Act | | | | | |
| | FWS or NMFS has on file sufficient informa | tion on biological vulnerability and thre | eat(s) to support proposals to list these | species | | | |
| Н | Critical Habitat | | | | | | |
| | Federally Endangered | | | : | | | |
| or P - CH | Proposed for listing or critical habitat in the | | Mark of the year | | | | |
| / A | Federally protected due to similarity of app | pearance to a listed species | | Foliciate fine | | | |
| | Federally Threatened | cuoling againmen | June-October | | | | |
| nese lists s | should be used only as a guideline, not as the | final authority. The lists include known | occurrences and areas where the spec | cies has a high possibility of | | | |
| ccurring. I | Records are updated as deemed necessary an | d may differ from earlier lists. | using how August | | | | |
| - CONTROL - | Itonitings of a possitius (e) | systemates aspenialefolic | Ivua May-Suptember | | | | |
| or a list of | State endangered, threatened, and species of | | .sc.gov/species/index.html. | | | | |
| | | Symposition unique grandianum | | | | | |
| | | | | | | | |
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| | (Balt sp) countr (ARS) | Undera subcorta na | Warch August | | | | |
| | (Savarnal) Tillian (A.25) | | | | | | |
| | | | | Found in mines and caves in the winter | | | |
| | folinesous's big-enter cut (ARS) | Corynomhlaus rafinesquii | | | | | |
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Peak: Next thap it
remarrature dependents 16-24°s. | | | |
| 17 11 1065 | Eroad River spiny only left (A195) | (Challabring Aplication) | Moserober-April | | | | |
| | filled anchaded woodpeaks (1) | Prisoides carealis | April 3-405y 33 | Missing reason | | | |
| | [Raid easie (BUPPA)] | Πανοθυτήν (επευορή Ισίας | October 1-May 15 | | | | |
| | emercentation stort (T) | Myc. pho macheman | Seutern, Assignment 1 | Distrible Society | | | |
| | | Enther spinistreaming | | A STATE OF THE STA | | | |



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 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

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 | Ε |
|--------------------------|---------------------------------|---|
| Canby's dropwort | Oxypolis canbyi | Ε |
| Carolina heelsplitter | Lasmigona decorata | Ε |
| Red-cockaded woodpecker | Picoides borealis | Ε |
| Rough-leaved loosestrife | Lysimachia asperulaefolia | Ε |
| Shortnose sturgeon | Acipenser brevirostrum | Ε |
| Smooth coneflower | Echinacea laevigata | Ε |
| Wood stork | Myceteria americana | Т |
| | | |
| Candidate (C) Species | | |

Sensitive Species and Species of Concern

Bald Eagle, Haliaeetus leucocephalus, Bald and Golden Eagle Protection Act (BGEPA)

Symphyotrichum georgianum

C

Critical Habitat

Georgia aster

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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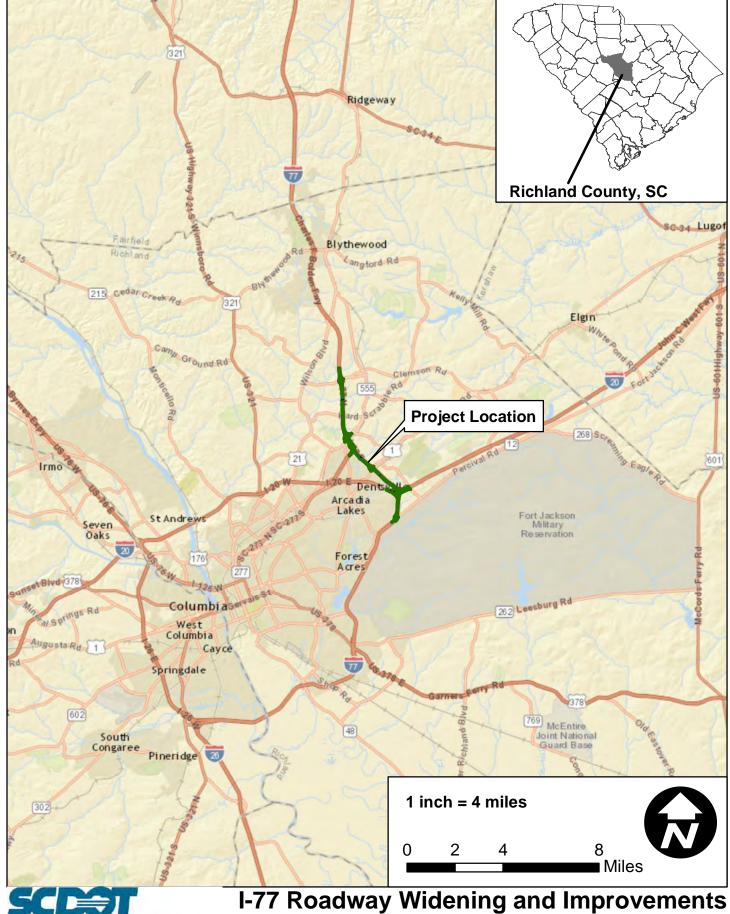
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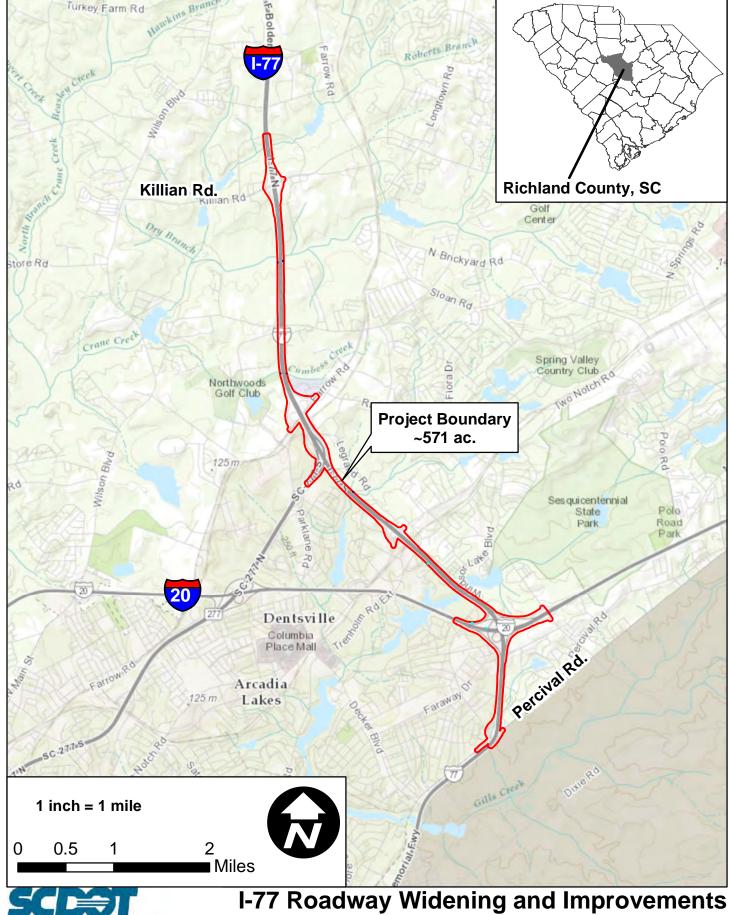
Appendix A

Figures



South Carolina Department of Transportation Project Location Figure 1

Jan. 2015



South Carolina Department of Transportation

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.

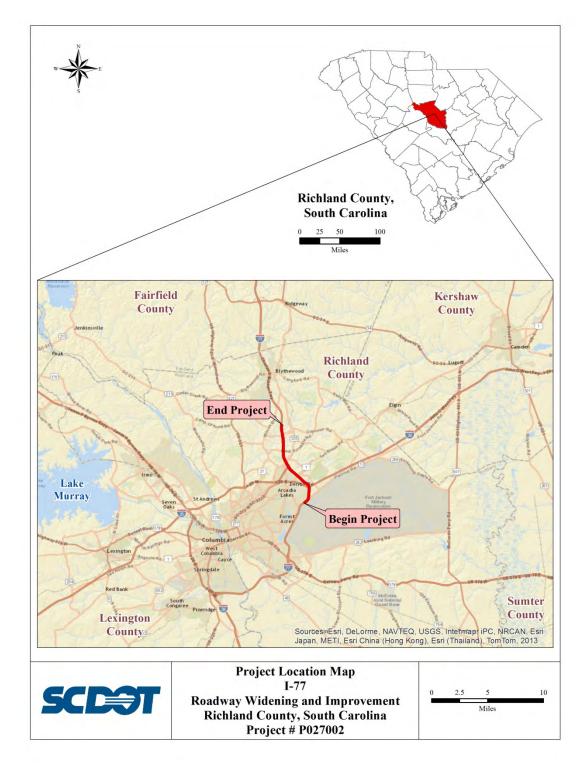


Figure 1: Project Location Map

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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. 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.

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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 μ Pa, the threshold of human hearing.

Figure 2: Typical Noise Levels

| Common Outdoor | Noise Level | Common Indoor |
|-----------------------------------|-------------|---|
| Activities | dBA | Activities |
| | | |
| | -110- | Rock Band |
| Jet Fly-over at 1000 ft | -100- | |
| Gas Lawn Mower at 3 ft | -100- | |
| Gas Lawii Mower at 3 it | -90- | |
| Diesel Truck at 50 ft, at 50 mph | 30 | Food Blender at 1 m (3 ft) |
| Biocor Frank at 60 ft, at 60 mph | -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- | |
| Out at Habana Day time | 50 | Large Business Office |
| Quiet Urban Daytime | -50- | Dishwasher Next Room |
| Quiet Urban Nighttime | -40- | Theater, Large Conference Room (Background) |
| Quiet Suburban Nighttime | 40 | Thouser, Earge Comercines Result (Background) |
| | -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 Haaring |
| Lowest Threshold of Human Healing | -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.

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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 | Activ | vity L _{eq(h)} 1 | Evaluation
Location | Description of Activity Category | | | |
| А | 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 | | <u>-</u> | | 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)

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.

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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.

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:

- \bullet 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 |
| В | ≈ 68 feet east of outside edge of I-77 nearest lane |
| С | ≈ 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 to 193 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 | | L _{Aeq1h} (dBA) | | | |
|-------------|----------|--------------------------|------------|--|--|
| Location | Measured | Predicted | Difference | | |
| А | 65.5 | 66.8 | +1.3 | | |
| В | 67.3 | 70.3 | +3.0 | | |
| С | 69.0 | 71.9 | +2.9 | | |
| D | 72.8 | 70.0 | -2.8 | | |
| E | E 77.9 | | -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.

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Table 6: Modeled Noise Levels along I-77

| | | | | | | -100 | |
|-----------------|-----------------|--|---------------------|-------------------------|-------------------------|----------------------|--|
| 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 | В | 149 | 66 | 68.5 | 69.3 | 70.5 | 2.0 |
| W2 | В | 110 | 66 | 69.7 | 70.5 | 70.4 | 0.7 |
| W3 | В | 228 | 66 | 65.6 | 66.4 | 68.0 | 2.4 |
| W4 | В | 454 | 66 | 60.5 | 61.2 | 63.1 | 2.6 |
| W5 | В | 356 | 66 | 62.8 | 63.4 | 63.4 | 0.6 |
| W6 | С | 189 | 66 | 65.3 | 66.0 | 65.2 | -0.1 |
| W7 | В | 139 | 66 | 72.3 | 73.1 | 73.2 | 0.9 |
| W8 | В | 298 | 66 | 67.1 | 67.8 | 68.7 | 1.6 |
| W9 | В | 454 | 66 | 60.2 | 60.9 | 61.3 | 1.1 |
| W10 (2ND LEVEL) | В | 448 | 66 | 64.0 | 64.6 | 65.3 | 1.3 |
| W11 | В | 422 | 66 | 60.7 | 61.4 | 61.8 | 1.1 |
| W12 (2ND LEVEL) | В | 444 | 66 | 64.1 | 64.8 | 65.5 | 1.4 |
| W13 | В | 402 | 66 | 61.3 | 62.0 | 62.3 | 1.0 |
| W14 (2ND LEVEL) | В | 421 | 66 | 64.5 | 65.1 | 65.9 | 1.4 |
| W15 | В | 476 | 66 | 59.9 | 60.6 | 61.0 | 1.1 |
| W16 (2ND LEVEL) | В | 491 | 66 | 63.4 | 64.1 | 64.8 | 1.4 |
| W17 | В | 446 | 66 | 60.2 | 61.0 | 61.6 | 1.4 |
| W18 (2ND LEVEL) | В | 466 | 66 | 63.9 | 64.5 | 65.2 | 1.3 |
| W19 | В | 330 | 66 | 62.4 | 63.2 | 64.3 | 1.9 |
| W20 | В | 285 | 66 | 63.3 | 64.1 | 64.9 | 1.6 |
| W21 | В | 248 | 66 | 64.4 | 65.2 | 65.5 | 1.1 |
| W22 | В | 219 | 66 | 64.9 | 65.7 | 65.9 | 1.0 |
| W23 | В | 166 | 66 | 65.7 | 66.5 | 66.0 | 0.3 |
| W24 | В | 152 | 66 | 66.1 | 66.9 | 66.5 | 0.4 |
| W25 | В | 145 | 66 | 66.1 | 66.9 | 66.4 | 0.3 |
| W26 | В | 144 | 66 | 66.3 | 67.1 | 66.5 | 0.2 |
| W27 | В | 137 | 66 | 66.1 | 66.9 | 65.9 | -0.2 |
| W28 | В | 134 | 66 | 66.7 | 67.5 | 66.3 | -0.4 |
| W29 | В | 387 | 66 | 60.9 | 61.7 | 62.4 | 1.5 |
| W30 | В | 345 | 66 | 61.9 | 62.7 | 63.0 | 1.1 |
| W31 | В | 325 | 66 | 62.1 | 62.9 | 63.1 | 1.0 |
| W32 | В | 301 | 66 | 62.8 | 63.6 | 63.3 | 0.5 |
| W33 | В | 304 | 66 | 62.7 | 63.5 | 63.2 | 0.5 |
| W34 | В | 305 | 66 | 62.9 | 63.8 | 63.3 | 0.4 |
| W35 | В | 296 | 66 | 63.4 | 64.2 | 63.7 | 0.3 |
| W36 | В | 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 | В | 223 | 66 | 65.9 | 66.8 | 66.1 | 0.2 |
| W38 | В | 330 | 66 | 64.6 | 65.4 | 64.4 | -0.2 |
| W39 | В | 375 | 66 | 64.1 | 65.0 | 63.8 | -0.3 |
| W40 | В | 458 | 66 | 59.7 | 60.5 | 61.7 | 2.0 |
| W41 (2ND LEVEL) | В | 456 | 66 | 63.9 | 64.7 | 66.2 | 2.3 |
| W42 | В | 482 | 66 | 59.3 | 60.1 | 61.5 | 2.2 |
| W43 (2ND LEVEL) | В | 479 | 66 | 63.5 | 64.3 | 65.8 | 2.3 |
| W44 | В | 398 | 66 | 60.8 | 61.6 | 63.1 | 2.3 |
| W45 (2ND LEVEL) | В | 394 | 66 | 65.2 | 66.0 | 67.3 | 2.1 |
| W46 | В | 416 | 66 | 60.5 | 61.3 | 62.7 | 2.2 |
| W47 (2ND LEVEL) | В | 415 | 66 | 64.8 | 65.6 | 67.0 | 2.2 |
| W48 | В | 370 | 66 | 61.5 | 62.3 | 63.7 | 2.2 |
| W49 (2ND LEVEL) | В | 371 | 66 | 65.7 | 66.6 | 67.7 | 2.0 |
| W50 | В | 402 | 66 | 60.9 | 61.7 | 63.1 | 2.2 |
| W51 | В | 454 | 66 | 60.0 | 60.8 | 62.1 | 2.1 |
| W52 | В | 475 | 66 | 59.6 | 60.4 | 61.7 | 2.1 |
| W53 | В | 258 | 66 | 64.6 | 65.4 | 67.2 | 2.6 |
| W54 | В | 446 | 66 | 60.3 | 61.1 | 62.5 | 2.2 |
| W55 | Е | 139 | 71 | 65.4 | 66.0 | 65.6 | 0.2 |
| W56 | С | 133 | 66 | 71.2 | 71.7 | 72.7 | 1.5 |
| W57 | D | 464 | 71 | 41.8 | 42.3 | 43.5 | 1.7 |
| W58 | В | 177 | 66 | 68.2 | 68.8 | 70.7 | 2.5 |
| W59 | В | 350 | 66 | 61.9 | 62.5 | 64.3 | 2.4 |
| W60 | В | 386 | 66 | 60.9 | 61.5 | 62.9 | 2.0 |
| W61 (2ND LEVEL) | В | 388 | 66 | 65.2 | 65.9 | 67.5 | 2.3 |
| W62 | В | 453 | 66 | 59.7 | 60.2 | 61.8 | 2.1 |
| W63 (2ND LEVEL) | В | 453 | 66 | 64.1 | 64.7 | 66.4 | 2.3 |
| W64 | В | 390 | 66 | 60.8 | 61.4 | 62.9 | 2.1 |
| W65 (2ND LEVEL) | В | 389 | 66 | 65.2 | 65.9 | 67.5 | 2.3 |
| W66 | В | 457 | 66 | 59.4 | 60.0 | 61.6 | 2.2 |
| W67 (2ND LEVEL) | В | 459 | 66 | 64.0 | 64.6 | 66.2 | 2.2 |
| W68 | В | 272 | 66 | 63.3 | 63.9 | 65.4 | 2.1 |
| W69 (2ND LEVEL) | В | 274 | 66 | 67.5 | 68.2 | 69.7 | 2.2 |
| W70 | В | 248 | 66 | 64.1 | 64.7 | 66.0 | 1.9 |
| W71 (2ND LEVEL) | В | 252 | 66 | 68.1 | 68.7 | 70.2 | 2.1 |
| W72 | В | 337 | 66 | 61.9 | 62.5 | 64.0 | 2.1 |
| W73 (2ND LEVEL) | В | 334 | 66 | 66.3 | 66.9 | 68.5 | 2.2 |

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| 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 | В | 315 | 66 | 62.4 | 63.0 | 64.5 | 2.1 |
| W75 (2ND LEVEL) | В | 310 | 66 | 66.7 | 67.4 | 69.0 | 2.3 |
| W76 | В | 414 | 66 | 60.5 | 61.0 | 62.4 | 1.9 |
| W77 (2ND LEVEL) | В | 416 | 66 | 64.8 | 65.4 | 67.0 | 2.2 |
| W78 | В | 397 | 66 | 60.9 | 61.4 | 62.7 | 1.8 |
| W79 (2ND LEVEL) | В | 398 | 66 | 65.1 | 65.7 | 67.4 | 2.3 |
| W80 | В | 482 | 66 | 59.3 | 59.8 | 61.3 | 2.0 |
| W81 (2ND LEVEL) | В | 481 | 66 | 63.5 | 64.2 | 65.9 | 2.4 |
| W82 | В | 458 | 66 | 59.8 | 60.3 | 61.6 | 1.8 |
| W83 (2ND LEVEL) | В | 456 | 66 | 64.0 | 64.6 | 66.3 | 2.3 |
| W84 | В | 349 | 66 | 61.4 | 62.0 | 63.7 | 2.3 |
| W85 (2ND LEVEL) | В | 347 | 66 | 65.8 | 66.5 | 68.2 | 2.4 |
| W86 | В | 325 | 66 | 62.0 | 62.6 | 64.4 | 2.4 |
| W87 (2ND LEVEL) | В | 321 | 66 | 66.3 | 67.0 | 68.7 | 2.4 |
| W88 | В | 303 | 66 | 62.6 | 63.2 | 65.0 | 2.4 |
| W89 (2ND LEVEL) | В | 298 | 66 | 66.8 | 67.4 | 69.1 | 2.3 |
| W90 | В | 276 | 66 | 63.3 | 63.9 | 65.8 | 2.5 |
| W91 (2ND LEVEL) | В | 272 | 66 | 67.4 | 68.0 | 69.7 | 2.3 |
| W92 | В | 410 | 66 | 60.5 | 61.0 | 62.3 | 1.8 |
| W93 (2ND LEVEL) | В | 405 | 66 | 64.7 | 65.3 | 67.1 | 2.4 |
| W94 | В | 385 | 66 | 60.6 | 61.2 | 62.9 | 2.3 |
| W95 (2ND LEVEL) | В | 376 | 66 | 65.2 | 65.8 | 67.6 | 2.4 |
| W96 | В | 361 | 66 | 61.1 | 61.7 | 63.5 | 2.4 |
| W97 (2ND LEVEL) | В | 358 | 66 | 65.5 | 66.1 | 68.0 | 2.5 |
| W98 | В | 336 | 66 | 61.7 | 62.3 | 64.0 | 2.3 |
| W99 (2ND LEVEL) | В | 330 | 66 | 66.1 | 66.8 | 68.5 | 2.4 |
| W100 | В | 260 | 66 | 63.8 | 64.4 | 66.3 | 2.5 |
| W101 (2ND LEVEL) | В | 265 | 66 | 67.6 | 68.2 | 69.8 | 2.2 |
| W102 | В | 260 | 66 | 63.8 | 64.4 | 66.1 | 2.3 |
| W103 (2ND LEVEL) | В | 262 | 66 | 67.6 | 68.3 | 69.8 | 2.2 |
| W104 | В | 260 | 66 | 63.9 | 64.5 | 66.1 | 2.2 |
| W105 (2ND LEVEL) | В | 264 | 66 | 67.6 | 68.2 | 69.7 | 2.1 |
| W106 | В | 261 | 66 | 63.9 | 64.5 | 66.1 | 2.2 |
| W107 (2ND LEVEL) | В | 268 | 66 | 67.6 | 68.2 | 69.6 | 2.0 |
| W108 | В | 336 | 66 | 61.8 | 62.4 | 64.1 | 2.3 |
| W109 (2ND LEVEL) | В | 338 | 66 | 66.0 | 66.6 | 68.3 | 2.3 |
| W110 | В | 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) | В | 338 | 66 | 65.9 | 66.5 | 68.3 | 2.4 |
| W112 | В | 335 | 66 | 62.0 | 62.5 | 64.1 | 2.1 |
| W113 (2ND LEVEL) | В | 337 | 66 | 65.9 | 66.5 | 68.3 | 2.4 |
| W114 | В | 343 | 66 | 62.0 | 62.5 | 63.8 | 1.8 |
| W115 (2ND LEVEL) | В | 339 | 66 | 65.9 | 66.5 | 68.2 | 2.3 |
| W116 | В | 288 | 66 | 63.5 | 64.1 | 64.9 | 1.4 |
| W117 (2ND LEVEL) | В | 290 | 66 | 67.0 | 67.6 | 69.0 | 2.0 |
| W118 | В | 325 | 66 | 62.6 | 63.2 | 64.0 | 1.4 |
| W119 (2ND LEVEL) | В | 324 | 66 | 66.3 | 66.9 | 68.3 | 2.0 |
| W120 | В | 367 | 66 | 61.9 | 62.4 | 63.1 | 1.2 |
| W121 (2ND LEVEL) | В | 367 | 66 | 65.4 | 66.0 | 67.5 | 2.1 |
| W122 | В | 404 | 66 | 61.1 | 61.6 | 62.4 | 1.3 |
| W123 (2ND LEVEL) | В | 407 | 66 | 64.7 | 65.3 | 66.8 | 2.1 |
| W124 | В | 298 | 66 | 63.5 | 64.1 | 64.8 | 1.3 |
| W125 (2ND LEVEL) | В | 301 | 66 | 66.8 | 67.4 | 68.7 | 1.9 |
| W126 | В | 342 | 66 | 62.4 | 62.9 | 63.7 | 1.3 |
| W127 (2ND LEVEL) | В | 342 | 66 | 65.9 | 66.5 | 67.9 | 2.0 |
| W128 | В | 379 | 66 | 61.7 | 62.3 | 63.0 | 1.3 |
| W129 (2ND LEVEL) | В | 379 | 66 | 65.2 | 65.8 | 67.2 | 2.0 |
| W130 | В | 422 | 66 | 60.8 | 61.3 | 62.2 | 1.4 |
| W131 (2ND LEVEL) | В | 421 | 66 | 64.5 | 65.1 | 66.5 | 2.0 |
| W132 | В | 220 | 66 | 65.6 | 66.2 | 66.9 | 1.3 |
| W133 (2ND LEVEL) | В | 222 | 66 | 68.8 | 69.5 | 70.3 | 1.5 |
| W134 | В | 263 | 66 | 64.4 | 65.0 | 65.7 | 1.3 |
| W135 (2ND LEVEL) | В | 264 | 66 | 67.7 | 68.3 | 69.2 | 1.5 |
| W136 | В | 298 | 66 | 63.5 | 64.1 | 64.9 | 1.4 |
| W137 (2ND LEVEL) | В | 300 | 66 | 66.8 | 67.4 | 68.5 | 1.7 |
| W138 | В | 342 | 66 | 62.5 | 63.1 | 63.9 | 1.4 |
| W139 (2ND LEVEL) | В | 338 | 66 | 66.0 | 66.6 | 67.8 | 1.8 |
| W140 | В | 235 | 66 | 65.4 | 66.0 | 66.7 | 1.3 |
| W141 (2ND LEVEL) | В | 239 | 66 | 68.4 | 69.0 | 69.8 | 1.4 |
| W142 | В | 274 | 66 | 64.3 | 64.9 | 65.6 | 1.3 |
| W143 (2ND LEVEL) | В | 277 | 66 | 67.4 | 68.0 | 68.9 | 1.5 |
| W144 | В | 318 | 66 | 63.0 | 63.5 | 64.5 | 1.5 |
| W145 (2ND LEVEL) | В | 316 | 66 | 66.5 | 67.1 | 68.1 | 1.6 |
| W146 | В | 358 | 66 | 62.4 | 62.9 | 63.7 | 1.3 |
| W147 (2ND LEVEL) | В | 355 | 66 | 65.7 | 66.3 | 67.4 | 1.7 |

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| 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 | В | 478 | 66 | 59.8 | 60.3 | 61.4 | 1.6 |
| W149 (2ND LEVEL) | В | 476 | 66 | 63.6 | 64.2 | 65.2 | 1.6 |
| W150 | В | 103 | 66 | 70.4 | 71.2 | 71.4 | 1.0 |
| W151 | В | 115 | 66 | 69.9 | 70.6 | 71.0 | 1.1 |
| W152 | В | 181 | 66 | 67.7 | 68.4 | 69.1 | 1.4 |
| W153 | В | 114 | 66 | 70.8 | 71.6 | 72.0 | 1.2 |
| W154 | В | 189 | 66 | 66.5 | 67.1 | 67.6 | 1.1 |
| W155 | В | 252 | 66 | 65.2 | 65.8 | 66.5 | 1.3 |
| W156 | В | 324 | 66 | 64.2 | 64.8 | 65.8 | 1.6 |
| W157 | В | 347 | 66 | 64.1 | 64.7 | 65.8 | 1.7 |
| W158 | В | 233 | 66 | 66.4 | 67.1 | 68.2 | 1.8 |
| W159 | В | 319 | 66 | 65.0 | 65.7 | 66.9 | 1.9 |
| W160 | В | 326 | 66 | 63.9 | 64.4 | 65.1 | 1.2 |
| W161 | В | 399 | 66 | 62.9 | 63.4 | 64.2 | 1.3 |
| W162 | В | 461 | 66 | 62.2 | 62.7 | 63.7 | 1.5 |
| W163 | В | 494 | 66 | 62.0 | 62.5 | 63.6 | 1.6 |
| W164 | В | 420 | 66 | 63.1 | 63.7 | 64.9 | 1.8 |
| W165 | В | 414 | 66 | 63.7 | 64.4 | 65.5 | 1.8 |
| W166 | В | 449 | 66 | 63.5 | 64.1 | 65.2 | 1.7 |
| W167 | В | 456 | 66 | 63.4 | 64.0 | 65.2 | 1.8 |
| W168 | В | 382 | 66 | 65.2 | 65.8 | 66.9 | 1.7 |
| W169 | В | 364 | 66 | 65.6 | 66.2 | 67.3 | 1.7 |
| W170 | В | 401 | 66 | 64.3 | 64.9 | 66.1 | 1.8 |
| W171 | В | 435 | 66 | 63.4 | 64.0 | 65.3 | 1.9 |
| W172 | В | 462 | 66 | 62.8 | 63.4 | 64.8 | 2.0 |
| W173 | В | 237 | 66 | 68.1 | 68.8 | 70.5 | 2.4 |
| W174 | В | 420 | 66 | 62.9 | 63.5 | 65.0 | 2.1 |
| W175 | В | 322 | 66 | 65.1 | 65.7 | 67.4 | 2.3 |
| W176 | В | 161 | 66 | 70.3 | 71.0 | 72.6 | 2.3 |
| W177 | В | 79 | 66 | 73.8 | 74.5 | 75.1 | 1.3 |
| W178 | В | 59 | 66 | 74.9 | 75.7 | 76.7 | 1.8 |
| W179 | В | 127 | 66 | 71.8 | 72.6 | 73.7 | 1.9 |
| W180 | В | 193 | 66 | 69.7 | 70.3 | 71.9 | 2.2 |
| W181 | В | 247 | 66 | 68.1 | 68.7 | 70.5 | 2.4 |
| W182 | В | 311 | 66 | 66.0 | 66.6 | 68.6 | 2.6 |
| W183 | В | 363 | 66 | 64.4 | 65.0 | 66.8 | 2.4 |
| W184 | В | 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 | В | 387 | 66 | 64.0 | 64.6 | 66.3 | 2.3 |
| W186 | В | 449 | 66 | 62.7 | 63.3 | 64.6 | 1.9 |
| W187 | В | 408 | 66 | 60.8 | 61.4 | 63.7 | 2.9 |
| W188 | В | 348 | 66 | 61.3 | 61.9 | 64.4 | 3.1 |
| W189 | В | 272 | 66 | 61.9 | 62.5 | 65.1 | 3.2 |
| W190 | В | 236 | 66 | 62.3 | 63.0 | 65.8 | 3.5 |
| W191 | В | 210 | 66 | 62.8 | 63.5 | 66.5 | 3.7 |
| W192 | В | 199 | 66 | 62.9 | 63.5 | 66.9 | 4.0 |
| W193 | В | 187 | 66 | 63.1 | 63.8 | 67.3 | 4.2 |
| W194 | В | 475 | 66 | 60.2 | 60.8 | 63.1 | 2.9 |
| W195 | В | 474 | 66 | 59.5 | 60.0 | 63.1 | 3.6 |
| W196 | В | 353 | 66 | 60.6 | 61.2 | 64.6 | 4.0 |
| W197 | В | 381 | 66 | 60.4 | 61.0 | 64.8 | 4.4 |
| W198 | В | 412 | 66 | 60.1 | 60.7 | 65.0 | 4.9 |
| W199 | В | 439 | 66 | 59.9 | 60.6 | 65.2 | 5.3 |
| W200 | В | 409 | 66 | 60.8 | 61.4 | 66.5 | 5.7 |
| W201 | В | 371 | 66 | 61.8 | 62.4 | 67.8 | 6.0 |
| W202 | В | 394 | 66 | 61.9 | 62.5 | 68.6 | 6.7 |
| E1 | В | 324 | 66 | 66.9 | 67.4 | 69.5 | 2.6 |
| E2 | В | 281 | 66 | 68.1 | 68.4 | 70.9 | 2.8 |
| E3 | В | 133 | 66 | 72.5 | 72.7 | 74.8 | 2.3 |
| E4 | В | 291 | 66 | 67.2 | 67.6 | 69.9 | 2.7 |
| E5 | В | 285 | 66 | 67.4 | 67.8 | 70.0 | 2.6 |
| E6 | В | 445 | 66 | 63.3 | 63.7 | 65.5 | 2.2 |
| E7 | В | 264 | 66 | 67.7 | 68.0 | 70.3 | 2.6 |
| E8 | В | 132 | 66 | 72.6 | 72.9 | 74.6 | 2.0 |
| E9 | В | 255 | 66 | 67.9 | 68.2 | 70.4 | 2.5 |
| E10 | В | 212 | 66 | 69.4 | 69.6 | 71.8 | 2.4 |
| E11 | В | 346 | 66 | 65.6 | 65.8 | 67.8 | 2.2 |
| E12 | В | 344 | 66 | 65.7 | 66.0 | 67.9 | 2.2 |
| E13 | В | 227 | 66 | 68.5 | 68.7 | 70.9 | 2.4 |
| E14 (2ND LEVEL) | В | 226 | 66 | 71.2 | 71.5 | 72.8 | 1.6 |
| E15 | В | 238 | 66 | 68.2 | 68.4 | 70.6 | 2.4 |
| E16 (2ND LEVEL) | В | 239 | 66 | 70.9 | 71.1 | 72.4 | 1.5 |
| E17 | В | 256 | 66 | 67.5 | 67.7 | 69.9 | 2.4 |
| E18 (2ND LEVEL) | В | 256 | 66 | 70.5 | 70.8 | 72.1 | 1.6 |
| E19 | В | 269 | 66 | 67.2 | 67.4 | 69.5 | 2.3 |

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| 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) | В | 270 | 66 | 70.2 | 70.5 | 71.7 | 1.5 |
| E21 | В | 322 | 66 | 66.1 | 66.3 | 68.2 | 2.1 |
| E22 (2ND LEVEL) | В | 321 | 66 | 69.4 | 69.6 | 71.0 | 1.6 |
| E23 | В | 371 | 66 | 64.9 | 65.1 | 66.9 | 2.0 |
| E24 (2ND LEVEL) | В | 372 | 66 | 68.5 | 68.8 | 70.2 | 1.7 |
| E25 | В | 405 | 66 | 64.0 | 64.3 | 66.0 | 2.0 |
| E26 (2ND LEVEL) | В | 406 | 66 | 67.9 | 68.2 | 69.6 | 1.7 |
| E27 | В | 430 | 66 | 63.4 | 63.7 | 65.4 | 2.0 |
| E28 (2ND LEVEL) | В | 432 | 66 | 67.4 | 67.7 | 69.2 | 1.8 |
| E29 | В | 275 | 66 | 67.0 | 67.3 | 69.4 | 2.4 |
| E30 (2ND LEVEL) | В | 279 | 66 | 70.1 | 70.3 | 71.7 | 1.6 |
| E31 | В | 293 | 66 | 66.6 | 66.8 | 68.9 | 2.3 |
| E32 (2ND LEVEL) | В | 296 | 66 | 69.7 | 70.0 | 71.4 | 1.7 |
| E33 | В | 310 | 66 | 66.2 | 66.4 | 68.4 | 2.2 |
| E34 (2ND LEVEL) | В | 313 | 66 | 69.4 | 69.7 | 71.0 | 1.6 |
| E35 | В | 323 | 66 | 65.9 | 66.1 | 68.0 | 2.1 |
| E36 (2ND LEVEL) | В | 325 | 66 | 69.2 | 69.5 | 70.8 | 1.6 |
| E37 | В | 314 | 66 | 66.1 | 66.3 | 68.1 | 2.0 |
| E38 (2ND LEVEL) | В | 312 | 66 | 69.4 | 69.7 | 70.8 | 1.4 |
| E39 | В | 347 | 66 | 65.4 | 65.6 | 67.2 | 1.8 |
| E40 (2ND LEVEL) | В | 349 | 66 | 68.8 | 69.1 | 70.2 | 1.4 |
| E41 | В | 346 | 66 | 65.3 | 65.5 | 67.2 | 1.9 |
| E42 (2ND LEVEL) | В | 346 | 66 | 68.8 | 69.1 | 70.3 | 1.5 |
| E43 | В | 376 | 66 | 64.7 | 64.9 | 66.5 | 1.8 |
| E44 (2ND LEVEL) | В | 374 | 66 | 68.4 | 68.6 | 69.8 | 1.4 |
| E45 | В | 373 | 66 | 64.8 | 65.0 | 66.5 | 1.7 |
| E46 (2ND LEVEL) | В | 373 | 66 | 68.4 | 68.7 | 69.8 | 1.4 |
| E47 | В | 409 | 66 | 63.9 | 64.1 | 65.6 | 1.7 |
| E48 (2ND LEVEL) | В | 410 | 66 | 67.7 | 67.9 | 69.2 | 1.5 |
| E49 | В | 412 | 66 | 63.7 | 64.0 | 65.3 | 1.6 |
| E50 (2ND LEVEL) | В | 414 | 66 | 67.6 | 67.8 | 69.1 | 1.5 |
| E51 | В | 444 | 66 | 63.1 | 63.3 | 64.8 | 1.7 |
| E52 (2ND LEVEL) | В | 444 | 66 | 67.1 | 67.3 | 68.6 | 1.5 |
| E53 | В | 181 | 66 | 69.7 | 69.9 | 71.7 | 2.0 |
| E54 (2ND LEVEL) | В | 180 | 66 | 72.5 | 72.7 | 73.4 | 0.9 |
| E55 | В | 195 | 66 | 69.2 | 69.3 | 71.1 | 1.9 |
| E56 (2ND LEVEL) | В | 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 | В | 214 | 66 | 68.5 | 68.7 | 70.4 | 1.9 |
| E58 (2ND LEVEL) | В | 214 | 66 | 71.4 | 71.6 | 72.3 | 0.9 |
| E59 | В | 226 | 66 | 68.1 | 68.3 | 69.9 | 1.8 |
| E60 (2ND LEVEL) | В | 225 | 66 | 71.1 | 71.3 | 72.0 | 0.9 |
| E61 | В | 238 | 66 | 67.8 | 68.0 | 69.8 | 2.0 |
| E62 (2ND LEVEL) | В | 235 | 66 | 70.9 | 71.1 | 72.1 | 1.2 |
| E63 | В | 253 | 66 | 67.3 | 67.5 | 69.3 | 2.0 |
| E64 (2ND LEVEL) | В | 251 | 66 | 70.5 | 70.7 | 71.7 | 1.2 |
| E65 | В | 275 | 66 | 66.8 | 67.0 | 68.6 | 1.8 |
| E66 (2ND LEVEL) | В | 276 | 66 | 69.9 | 70.2 | 71.1 | 1.2 |
| E67 | В | 287 | 66 | 66.5 | 66.7 | 68.2 | 1.7 |
| E68 (2ND LEVEL) | В | 287 | 66 | 69.7 | 69.9 | 70.8 | 1.1 |
| E69 | В | 388 | 66 | 64.3 | 64.5 | 65.9 | 1.6 |
| E70 (2ND LEVEL) | В | 387 | 66 | 68.0 | 68.2 | 69.3 | 1.3 |
| E71 | В | 369 | 66 | 64.6 | 64.8 | 66.1 | 1.5 |
| E72 (2ND LEVEL) | В | 369 | 66 | 68.3 | 68.5 | 69.6 | 1.3 |
| E73 | В | 357 | 66 | 64.9 | 65.1 | 66.4 | 1.5 |
| E74 (2ND LEVEL) | В | 356 | 66 | 68.5 | 68.7 | 69.7 | 1.2 |
| E75 | В | 341 | 66 | 65.3 | 65.5 | 66.8 | 1.5 |
| E76 (2ND LEVEL) | В | 339 | 66 | 68.8 | 69.0 | 69.9 | 1.1 |
| E77 | В | 436 | 66 | 63.2 | 63.4 | 64.7 | 1.5 |
| E78 (2ND LEVEL) | В | 436 | 66 | 67.1 | 67.3 | 68.5 | 1.4 |
| E79 | В | 422 | 66 | 63.5 | 63.7 | 64.8 | 1.3 |
| E80 (2ND LEVEL) | В | 422 | 66 | 67.2 | 67.5 | 68.7 | 1.5 |
| E81 | В | 409 | 66 | 63.7 | 63.9 | 65.1 | 1.4 |
| E82 (2ND LEVEL) | В | 407 | 66 | 67.5 | 67.8 | 68.8 | 1.3 |
| E83 | В | 401 | 66 | 63.8 | 64.0 | 65.1 | 1.3 |
| E84 (2ND LEVEL) | В | 400 | 66 | 67.5 | 67.8 | 68.9 | 1.4 |
| E85 | D | 306 | 71 | 44.4 | 44.6 | 45.1 | 0.7 |
| E86 | Е | 368 | 71 | 69.0 | 69.6 | 70.0 | 1.0 |
| E87 | В | 171 | 66 | 69.9 | 70.6 | 70.8 | 0.9 |
| E88 | В | 227 | 66 | 68.4 | 69.0 | 69.3 | 0.9 |
| E89 | В | 116 | 66 | 70.2 | 70.9 | 71.2 | 1.0 |
| E90 | D | 87 | 71 | 49.7 | 50.5 | 50.4 | 0.7 |
| E91 | В | 373 | 66 | 63.6 | 64.4 | 64.3 | 0.7 |
| E92 | В | 391 | 66 | 62.6 | 63.3 | 63.2 | 0.6 |
| E93 | В | 360 | 66 | 62.7 | 63.5 | 63.4 | 0.7 |

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| 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 | В | 427 | 66 | 61.3 | 62.0 | 61.9 | 0.6 |
| E95 | В | 343 | 66 | 63.7 | 64.3 | 65.0 | 1.3 |
| E96 | В | 107 | 66 | 69.0 | 69.7 | 70.5 | 1.5 |
| E97 | В | 405 | 66 | 61.7 | 62.4 | 63.0 | 1.3 |
| E98 | В | 290 | 66 | 65.2 | 66.1 | 65.2 | 0.0 |
| E99 | В | 362 | 66 | 63.5 | 64.3 | 63.5 | 0.0 |
| E100 | В | 401 | 66 | 61.1 | 61.8 | 62.6 | 1.5 |
| E101 | В | 155 | 66 | 69.1 | 69.2 | 70.2 | 1.1 |
| E102 | В | 137 | 66 | 68.8 | 68.9 | 69.9 | 1.1 |
| E103 | В | 113 | 66 | 69.2 | 69.4 | 70.7 | 1.5 |
| E104 | В | 98 | 66 | 69.5 | 69.6 | 71.4 | 1.9 |
| E105 | В | 96 | 66 | 69.1 | 69.3 | 70.9 | 1.8 |
| E106 | В | 79 | 66 | 69.5 | 69.8 | 71.6 | 2.1 |
| E107 | В | 305 | 66 | 63.8 | 64.1 | 64.3 | 0.5 |
| E108 | В | 293 | 66 | 64.4 | 64.5 | 65.3 | 0.9 |
| E109 | В | 298 | 66 | 64.0 | 64.2 | 65.0 | 1.0 |
| E110 | В | 250 | 66 | 64.8 | 65.0 | 66.1 | 1.3 |
| E111 | В | 229 | 66 | 64.9 | 65.2 | 66.6 | 1.7 |
| E112 | В | 162 | 66 | 66.0 | 66.3 | 68.1 | 2.1 |
| E113 | В | 387 | 66 | 60.5 | 60.9 | 61.5 | 1.0 |
| E114 | В | 334 | 66 | 61.2 | 61.6 | 62.2 | 1.0 |
| E115 | Е | 350 | 71 | 61.6 | 62.0 | 62.2 | 0.6 |
| E116 | Е | 355 | 71 | 63.1 | 63.5 | 64.6 | 1.5 |
| E117 | В | 407 | 66 | 61.6 | 61.8 | 63.0 | 1.4 |
| E118 (2ND LEVEL) | В | 409 | 66 | 64.7 | 64.9 | 66.8 | 2.1 |
| E119 | В | 436 | 66 | 60.7 | 61.0 | 62.2 | 1.5 |
| E120 (2ND LEVEL) | В | 437 | 66 | 64.1 | 64.4 | 66.3 | 2.2 |
| E121 | В | 377 | 66 | 61.9 | 62.1 | 63.4 | 1.5 |
| E122 (2ND LEVEL) | В | 377 | 66 | 65.1 | 65.4 | 67.3 | 2.2 |
| E123 | В | 406 | 66 | 61.3 | 61.5 | 62.8 | 1.5 |
| E124 (2ND LEVEL) | В | 404 | 66 | 64.7 | 64.9 | 66.9 | 2.2 |
| E125 | В | 228 | 66 | 66.2 | 66.3 | 67.7 | 1.5 |
| E126 (2ND LEVEL) | В | 226 | 66 | 68.4 | 68.7 | 70.4 | 2.0 |
| E127 | В | 249 | 66 | 65.5 | 65.7 | 67.1 | 1.6 |
| E128 (2ND LEVEL) | В | 248 | 66 | 67.9 | 68.1 | 69.9 | 2.0 |
| E129 | В | 305 | 66 | 63.8 | 64.0 | 65.3 | 1.5 |
| E130 (2ND LEVEL) | В | 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 | В | 333 | 66 | 63.0 | 63.2 | 64.6 | 1.6 |
| E132 (2ND LEVEL) | В | 334 | 66 | 66.0 | 66.3 | 68.2 | 2.2 |
| E133 | В | 211 | 66 | 66.7 | 66.8 | 68.3 | 1.6 |
| E134 (2ND LEVEL) | В | 211 | 66 | 69.0 | 69.2 | 70.9 | 1.9 |
| E135 | В | 233 | 66 | 66.0 | 66.2 | 67.6 | 1.6 |
| E136 (2ND LEVEL) | В | 235 | 66 | 68.3 | 68.5 | 70.3 | 2.0 |
| E137 | В | 295 | 66 | 64.1 | 64.3 | 65.7 | 1.6 |
| E138 (2ND LEVEL) | В | 300 | 66 | 66.7 | 66.9 | 68.9 | 2.2 |
| E139 | В | 324 | 66 | 63.3 | 63.5 | 64.9 | 1.6 |
| E140 (2ND LEVEL) | В | 326 | 66 | 66.2 | 66.4 | 68.4 | 2.2 |
| E141 | В | 451 | 66 | 60.8 | 61.1 | 62.0 | 1.2 |
| E142 (2ND LEVEL) | В | 448 | 66 | 64.0 | 64.3 | 66.3 | 2.3 |
| E143 | В | 420 | 66 | 61.5 | 61.8 | 62.4 | 0.9 |
| E144 (2ND LEVEL) | В | 418 | 66 | 64.5 | 64.7 | 66.8 | 2.3 |
| E145 | В | 352 | 66 | 62.5 | 62.7 | 64.2 | 1.7 |
| E146 (2ND LEVEL) | В | 352 | 66 | 65.8 | 66.1 | 68.2 | 2.4 |
| E147 | В | 377 | 66 | 61.9 | 62.2 | 63.7 | 1.8 |
| E148 (2ND LEVEL) | В | 374 | 66 | 65.4 | 65.7 | 67.8 | 2.4 |
| E149 | В | 429 | 66 | 60.8 | 61.0 | 62.5 | 1.7 |
| E150 (2ND LEVEL) | В | 431 | 66 | 64.5 | 64.8 | 66.8 | 2.3 |
| E151 | В | 454 | 66 | 60.3 | 60.5 | 62.0 | 1.7 |
| E152 (2ND LEVEL) | В | 453 | 66 | 64.1 | 64.4 | 66.4 | 2.3 |
| E153 | В | 330 | 66 | 63.1 | 63.3 | 65.0 | 1.9 |
| E154 (2ND LEVEL) | В | 330 | 66 | 66.2 | 66.5 | 68.6 | 2.4 |
| E155 | В | 355 | 66 | 62.4 | 62.7 | 64.3 | 1.9 |
| E156 (2ND LEVEL) | В | 354 | 66 | 65.8 | 66.1 | 68.2 | 2.4 |
| E157 | В | 399 | 66 | 61.4 | 61.6 | 63.1 | 1.7 |
| E158 (2ND LEVEL) | В | 398 | 66 | 65.0 | 65.3 | 67.4 | 2.4 |
| E159 | В | 429 | 66 | 60.8 | 61.0 | 62.5 | 1.7 |
| E160 (2ND LEVEL) | В | 427 | 66 | 64.4 | 64.7 | 66.8 | 2.4 |
| E161 | В | 292 | 66 | 64.2 | 64.5 | 65.6 | 1.4 |
| E162 (2ND LEVEL) | В | 293 | 66 | 66.8 | 67.1 | 69.2 | 2.4 |
| E163 | В | 308 | 66 | 63.8 | 64.1 | 65.1 | 1.3 |
| E164 (2ND LEVEL) | В | 308 | 66 | 66.5 | 66.8 | 69.0 | 2.5 |
| E165 | В | 360 | 66 | 62.2 | 62.5 | 63.9 | 1.7 |
| E166 (2ND LEVEL) | В | 361 | 66 | 65.5 | 65.8 | 67.9 | 2.4 |
| E167 | В | 380 | 66 | 62.2 | 62.5 | 63.3 | 1.1 |

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| 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) | В | 377 | 66 | 65.3 | 65.5 | 67.6 | 2.3 |
| E169 | В | 269 | 66 | 64.7 | 64.9 | 66.3 | 1.6 |
| E170 (2ND LEVEL) | В | 270 | 66 | 67.3 | 67.6 | 69.8 | 2.5 |
| E171 | В | 286 | 66 | 64.2 | 64.4 | 65.8 | 1.6 |
| E172 (2ND LEVEL) | В | 284 | 66 | 67.0 | 67.3 | 69.5 | 2.5 |
| E173 | В | 338 | 66 | 62.9 | 63.2 | 64.3 | 1.4 |
| E174 (2ND LEVEL) | В | 341 | 66 | 65.9 | 66.2 | 68.3 | 2.4 |
| E175 | В | 361 | 66 | 62.4 | 62.7 | 63.8 | 1.4 |
| E176 (2ND LEVEL) | В | 361 | 66 | 65.5 | 65.8 | 68.0 | 2.5 |
| E177 | В | 414 | 66 | 61.2 | 61.5 | 62.6 | 1.4 |
| E178 (2ND LEVEL) | В | 416 | 66 | 64.7 | 64.9 | 67.0 | 2.3 |
| E179 | В | 417 | 66 | 61.3 | 61.6 | 62.3 | 1.0 |
| E180 (2ND LEVEL) | В | 419 | 66 | 64.6 | 64.8 | 67.0 | 2.4 |
| E181 | В | 423 | 66 | 61.1 | 61.5 | 62.3 | 1.2 |
| E182 (2ND LEVEL) | В | 424 | 66 | 64.5 | 64.8 | 66.9 | 2.4 |
| E183 | В | 425 | 66 | 61.1 | 61.5 | 62.3 | 1.2 |
| E184 (2ND LEVEL) | В | 426 | 66 | 64.5 | 64.8 | 66.9 | 2.4 |
| E185 | В | 471 | 66 | 60.5 | 60.9 | 61.5 | 1.0 |
| E186 (2ND LEVEL) | В | 472 | 66 | 63.7 | 64.0 | 66.0 | 2.3 |
| E187 | В | 472 | 66 | 60.4 | 60.7 | 61.5 | 1.1 |
| E188 (2ND LEVEL) | В | 473 | 66 | 63.6 | 63.9 | 66.0 | 2.4 |
| E189 | В | 473 | 66 | 60.3 | 60.6 | 61.2 | 0.9 |
| E190 (2ND LEVEL) | В | 472 | 66 | 63.7 | 64.0 | 66.0 | 2.3 |
| E191 | В | 476 | 66 | 60.2 | 60.6 | 61.4 | 1.2 |
| E192 (2ND LEVEL) | В | 477 | 66 | 63.7 | 63.9 | 66.0 | 2.3 |
| E193 | В | 350 | 66 | 62.7 | 63.0 | 64.0 | 1.3 |
| E194 (2ND LEVEL) | В | 348 | 66 | 65.9 | 66.1 | 68.3 | 2.4 |
| E195 | В | 340 | 66 | 63.0 | 63.3 | 64.3 | 1.3 |
| E196 (2ND LEVEL) | В | 333 | 66 | 66.1 | 66.4 | 68.6 | 2.5 |
| E197 | В | 305 | 66 | 63.9 | 64.1 | 65.4 | 1.5 |
| E198 (2ND LEVEL) | В | 303 | 66 | 66.7 | 67.0 | 69.2 | 2.5 |
| E199 | В | 287 | 66 | 64.2 | 64.5 | 65.9 | 1.7 |
| E200 (2ND LEVEL) | В | 284 | 66 | 67.2 | 67.4 | 69.6 | 2.4 |
| E201 | В | 390 | 66 | 61.7 | 62.1 | 63.1 | 1.4 |
| E202 (2ND LEVEL) | В | 387 | 66 | 65.2 | 65.5 | 67.6 | 2.4 |
| E203 | В | 375 | 66 | 62.1 | 62.4 | 63.4 | 1.3 |
| E204 (2ND LEVEL) | В | 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 | В | 340 | 66 | 62.9 | 63.1 | 64.3 | 1.4 |
| E206 (2ND LEVEL) | В | 337 | 66 | 66.1 | 66.4 | 68.6 | 2.5 |
| E207 | В | 324 | 66 | 63.2 | 63.5 | 64.8 | 1.6 |
| E208 (2ND LEVEL) | В | 317 | 66 | 66.5 | 66.8 | 69.0 | 2.5 |
| E209 | В | 452 | 66 | 60.2 | 60.5 | 61.8 | 1.6 |
| E210 | В | 346 | 66 | 62.7 | 63.0 | 64.2 | 1.5 |
| E211 | В | 300 | 66 | 64.3 | 64.5 | 65.7 | 1.4 |
| E212 | В | 330 | 66 | 63.6 | 63.9 | 65.0 | 1.4 |
| E213 | В | 408 | 66 | 61.6 | 61.9 | 63.0 | 1.4 |
| E214 | В | 424 | 66 | 61.3 | 61.6 | 62.7 | 1.4 |
| E215 | В | 372 | 66 | 62.7 | 63.1 | 64.1 | 1.4 |
| E216 | В | 360 | 66 | 63.2 | 63.6 | 64.6 | 1.4 |
| E217 | В | 443 | 66 | 61.2 | 61.5 | 62.6 | 1.4 |
| E218 | В | 361 | 66 | 63.2 | 63.6 | 64.7 | 1.5 |
| E219 | В | 405 | 66 | 62.1 | 62.4 | 63.5 | 1.4 |
| E220 | В | 450 | 66 | 61.0 | 61.4 | 62.4 | 1.4 |
| E221 | В | 486 | 66 | 60.3 | 60.7 | 61.7 | 1.4 |
| E222 | В | 391 | 66 | 62.0 | 62.4 | 63.5 | 1.5 |
| E223 | В | 433 | 66 | 61.1 | 61.4 | 62.6 | 1.5 |
| E224 | В | 479 | 66 | 60.2 | 60.5 | 61.6 | 1.4 |
| E225 | В | 399 | 66 | 61.8 | 62.1 | 63.3 | 1.5 |
| E226 | В | 437 | 66 | 60.9 | 61.3 | 62.4 | 1.5 |
| E227 | В | 487 | 66 | 59.9 | 60.3 | 61.4 | 1.5 |
| E228 | В | 401 | 66 | 61.5 | 61.8 | 63.0 | 1.5 |
| E229 | В | 438 | 66 | 60.7 | 61.0 | 62.2 | 1.5 |
| E230 | В | 485 | 66 | 59.8 | 60.1 | 61.4 | 1.6 |
| E231 | В | 407 | 66 | 61.4 | 61.7 | 62.9 | 1.5 |
| E232 | В | 441 | 66 | 60.7 | 61.0 | 62.2 | 1.5 |
| E233 | В | 495 | 66 | 59.7 | 60.0 | 61.3 | 1.6 |
| E234 | В | 380 | 66 | 62.2 | 62.5 | 63.4 | 1.2 |
| E235 | В | 412 | 66 | 61.5 | 61.8 | 62.8 | 1.3 |
| E236 | В | 467 | 66 | 60.5 | 60.8 | 61.9 | 1.4 |
| E237 | В | 453 | 66 | 61.3 | 61.6 | 62.7 | 1.4 |
| E238 | В | 489 | 66 | 60.5 | 60.8 | 62.0 | 1.5 |
| E239 | В | 264 | 66 | 67.2 | 67.4 | 67.8 | 0.6 |
| E240 | В | 154 | 66 | 71.7 | 72.0 | 72.3 | 0.6 |
| E241 | В | 131 | 66 | 72.7 | 73.1 | 73.5 | 0.8 |

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| 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 | В | 101 | 66 | 69.9 | 70.2 | 71.4 | 1.5 |
| E243 | В | 126 | 66 | 72.1 | 72.4 | 73.9 | 1.8 |
| E244 | В | 101 | 66 | 73.1 | 73.4 | 75.1 | 2.0 |
| E245 | В | 86 | 66 | 73.9 | 74.1 | 75.9 | 2.0 |
| E246 | В | 233 | 66 | 67.0 | 67.3 | 69.2 | 2.2 |
| E247 | В | 211 | 66 | 67.9 | 68.2 | 70.3 | 2.4 |
| E248 | В | 183 | 66 | 69.0 | 69.3 | 71.5 | 2.5 |
| E249 | В | 120 | 66 | 72.4 | 72.7 | 74.4 | 2.0 |
| E250 | В | 74 | 66 | 74.7 | 75.0 | 76.7 | 2.0 |
| E251 | В | 100 | 66 | 73.2 | 73.5 | 75.4 | 2.2 |
| E252 | В | 396 | 66 | 65.2 | 65.5 | 65.3 | 0.1 |
| E253 | В | 370 | 66 | 65.8 | 66.1 | 65.9 | 0.1 |
| E254 | В | 380 | 66 | 65.6 | 66.0 | 66.3 | 0.7 |
| E255 | В | 385 | 66 | 65.0 | 65.4 | 66.1 | 1.1 |
| E256 | В | 380 | 66 | 64.1 | 64.6 | 65.1 | 1.0 |
| E257 | В | 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.

| | 1 0 | | | | | | | |
|---------------|--------------|---------------------|--|--|--|--|--|--|
| 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 | | | | | | |

Table 7: Modeled Noise Impacts along I-77

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

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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.

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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

| | | | | ise Level
BA) | | | | | | % of | | | | |
|----------------|-----------------|---|--|--|--|------------------------|------------------------------------|---|---|--|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That Would
Achieve a 5
dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrier | · A | • | • | | | | • | | • | | | | |
| W1 | Residential | В | 70.5 | 59.8 | 10.7 | 1 | 1 | 1 | 1 | | | | | |
| W2 | Residential | В | 70.4 | 57.2 | 13.2 | 1 | 1 | 1 | 1 | 670/ | 600 | 45.000 | ć525.000 | No. of |
| W3 | Residential | В | 68.0 | 63.5 | 4.5 | 1 | 1 | 0 | 0 | 67% | 600 | 15,000 | \$525,000 | Note 1 |
| W4 | Residential | В | 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.

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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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|-----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrier | В | | | | | | | | | | | | |
| W7 | Residential | В | 73.5 | 69.0 | 4.5 | 1 | 1 | 0 | 0 | 00/ | 744 | 10.000 | ¢651 000 | Nata 1 |
| W8 | Residential | В | 68.9 | 64.0 | 4.9 | 1 | 1 | 0 | 0 | 0% | 744 | 18,600 | \$651,000 | Note 1 |
| | · | | | · | | 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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|-----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrier | ·c | 1 | 1 | | | | | | | | | | |
| W9 | Residential | В | 61.6 | 58.7 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| W10 | Residential | В | 65.7 | 61.2 | 4.5 | 1 | 0 | 0 | 0 | | | | | |
| W11 | Residential | В | 62.3 | 58.8 | 3.5 | 1 | 0 | 0 | 0 | | | | | |
| W12 | Residential | В | 65.9 | 61.1 | 4.8 | 1 | 0 | 0 | 0 | | | | | |
| W13 | Residential | В | 62.8 | 59.1 | 3.7 | 1 | 0 | 0 | 0 | 93% | 4,272 | 106,800 | \$3,738,000 | \$149,520 |
| W14 | Residential | В | 66.3 | 61.3 | 5.0 | 1 | 1 | 1 | 0 | 3370 | 4,272 | 100,800 | 73,730,000 | Ş1 4 3,320 |
| W15 | Residential | В | 61.3 | 58.4 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| W16 | Residential | В | 65.2 | 60.9 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| W17 | Residential | В | 62.2 | 58.9 | 3.3 | 1 | 0 | 0 | 0 | | | | | |
| W18 | Residential | В | 65.7 | 61.2 | 4.5 | 1 | 0 | 0 | 0 | | | | | |

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| | | | | ise Level
BA) | | | | | | % of | | | | |
|----------------|-----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrier | ·c | | | | | | | | | | | | |
| W19 | Residential | В | 65.4 | 60.8 | 4.6 | 1 | 0 | 0 | 0 | | | | | |
| W20 | Residential | В | 66.3 | 60.8 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| W21 | Residential | В | 66.6 | 60.7 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| W22 | Residential | В | 66.9 | 60.7 | 6.2 | 1 | 1 | 1 | 0 | | | | | |
| W23 | Residential | В | 67.0 | 60.3 | 6.7 | 1 | 1 | 1 | 0 | | | | | |
| W24 | Residential | В | 67.5 | 60.3 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| W25 | Residential | В | 67.0 | 60.1 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| W26 | Residential | В | 67.2 | 60.4 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| W27 | Residential | В | 66.5 | 59.9 | 6.6 | 1 | 1 | 1 | 0 | | | | | |
| W28 | Residential | В | 66.7 | 60.7 | 6.0 | 1 | 1 | 1 | 0 | | | | | |
| W29 | Residential | В | 63.4 | 59.7 | 3.7 | 1 | 0 | 0 | 0 | | | | | |
| W30 | Residential | В | 63.9 | 59.7 | 4.2 | 1 | 0 | 0 | 0 | | | | | |
| W31 | Residential | В | 64.1 | 59.8 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| W32 | Residential | В | 64.1 | 60.0 | 4.1 | 1 | 0 | 0 | 0 | | | | | |
| W33 | Residential | В | 63.7 | 60.0 | 3.7 | 1 | 0 | 0 | 0 | | | | | |
| W34 | Residential | В | 63.5 | 60.3 | 3.2 | 1 | 0 | 0 | 0 | | | | | |
| W35 | Residential | В | 63.9 | 61.0 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| W36 | Residential | В | 62.8 | 60.8 | 2.0 | 1 | 0 | 0 | 0 | | | | | |
| W37 | Residential | В | 66.4 | 63.8 | 2.6 | 1 | 1 | 0 | 0 | | | | | |
| W38 | Residential | В | 63.7 | 60.6 | 3.1 | 1 | 0 | 0 | 0 | | | | | |
| W39 | Residential | В | 62.7 | 59.4 | 3.3 | 1 | 0 | 0 | 0 | | | | | |
| W40 | Residential | В | 61.0 | 55.9 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| W41 | Residential | В | 65.5 | 58.3 | 7.2 | 1 | 0 | 1 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|-----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a
5 dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrier | ·c | | | | | | | | | | | | |
| W42 | Residential | В | 60.9 | 55.8 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| W43 | Residential | В | 65.0 | 58.1 | 6.9 | 1 | 0 | 1 | 0 | | | | | |
| W44 | Residential | В | 62.4 | 56.7 | 5.7 | 1 | 0 | 1 | 0 | | | | | |
| W45 | Residential | В | 66.4 | 58.8 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| W46 | Residential | В | 62.2 | 56.6 | 5.6 | 1 | 0 | 1 | 0 | | | | | |
| W47 | Residential | В | 66.2 | 58.8 | 7.4 | 1 | 1 | 1 | 0 | | | | | |
| W48 | Residential | В | 63.1 | 57.1 | 6.0 | 1 | 0 | 1 | 0 | | | | | |
| W49 | Residential | В | 66.9 | 58.9 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| W50 | Residential | В | 62.6 | 56.9 | 5.7 | 1 | 0 | 1 | 0 | | | | | |
| W51 | Residential | В | 61.7 | 56.5 | 5.2 | 1 | 0 | 1 | 0 | | | | | |
| W52 | Residential | В | 61.3 | 56.2 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| W53 | Residential | В | 66.0 | 58.0 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| W54 | Residential | В | 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.

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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

| | | | • | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall r | nodeled barrie | er D | | | | | | | | | | | • | |
| W56 | Cemetery | В | 72.7 | 68.8 | 3.9 | 1 | 1 | 0 | 0 | 00/ | F76 | 14 400 | ¢504.000 | Nata 1 |
| W57 | Church | D | 43.1 | 41.7 | 1.4 | 1 | 0 | 0 | 0 | 0% | 576 | 14,400 | \$504,000 | Note 1 |
| | | | | | | 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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r E | | | | | | | | | | | | |
| W58 | Residence | В | 70.9 | 62.7 | 8.2 | 1 | 1 | 1 | 1 | | | | | |
| W59 | Residence | В | 64.7 | 58.1 | 6.6 | 1 | 0 | 1 | 0 | | | | | |
| W60 | Residence | В | 62.5 | 56.1 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| W61 | Residence | В | 66.9 | 58.4 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| W62 | Residence | В | 61.3 | 55.7 | 5.6 | 1 | 0 | 1 | 0 | 100% | 1,776 | 44,400 | \$1,554,000 | Note 1 |
| W63 | Residence | В | 65.7 | 57.9 | 7.8 | 1 | 0 | 1 | 0 | 100% | 1,770 | 44,400 | \$1,334,000 | Note 1 |
| W64 | Residence | В | 62.5 | 56.1 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| W65 | Residence | В | 66.9 | 58.4 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| W66 | Residence | В | 60.9 | 55.4 | 5.5 | 1 | 0 | 1 | 0 | | | | | |
| W67 | Residence | В | 65.6 | 57.9 | 7.7 | 1 | 0 | 1 | 0 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rE | i | i | 1 | 1 | 1 | 1 | 1 | | | | | |
| W68 | Residence | В | 65.3 | 57.0 | 8.3 | 1 | 0 | 1 | 1 | | | | | |
| W69 | Residence | В | 69.1 | 59.1 | 10.0 | 1 | 1 | 1 | 1 | | | | | |
| W70 | Residence | В | 65.8 | 57.2 | 8.6 | 1 | 0 | 1 | 1 | | | | | |
| W71 | Residence | В | 69.6 | 59.7 | 9.9 | 1 | 1 | 1 | 1 | | | | | |
| W72 | Residence | В | 63.6 | 56.5 | 7.1 | 1 | 0 | 1 | 0 | | | | | |
| W73 | Residence | В | 67.9 | 58.8 | 9.1 | 1 | 1 | 1 | 1 | | | | | |
| W74 | Residence | В | 64.1 | 56.6 | 7.5 | 1 | 0 | 1 | 0 | | | | | |
| W75 | Residence | В | 68.3 | 59.1 | 9.2 | 1 | 1 | 1 | 1 | | | | | |
| W76 | Residence | В | 61.9 | 55.9 | 6.0 | 1 | 0 | 1 | 0 | | | | | |
| W77 | Residence | В | 66.3 | 58.2 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| W78 | Residence | В | 62.2 | 56.1 | 6.1 | 1 | 0 | 1 | 0 | | | | | |
| W79 | Residence | В | 66.6 | 58.5 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| W80 | Residence | В | 60.8 | 55.5 | 5.3 | 1 | 0 | 1 | 0 | | | | | |
| W81 | Residence | В | 65.1 | 57.8 | 7.3 | 1 | 0 | 1 | 0 | | | | | |
| W82 | Residence | В | 61.2 | 55.7 | 5.5 | 1 | 0 | 1 | 0 | | | | | |
| W83 | Residence | В | 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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r F | | | | T | T | T | T | | T | T | T | |
| W84 | Residence | В | 63.2 | 57.3 | 5.9 | 1 | 0 | 1 | 0 | | | | | |
| W85 | Residence | В | 67.4 | 60.1 | 7.3 | 1 | 1 | 1 | 0 | | | | | |
| W86 | Residence | В | 64.0 | 57.4 | 6.6 | 1 | 0 | 1 | 0 | | | | | |
| W87 | Residence | В | 68.0 | 60.2 | 7.8 | 1 | 1 | 1 | 0 | | | | | |
| W88 | Residence | В | 64.6 | 57.6 | 7.0 | 1 | 0 | 1 | 0 | 100% | 1,872 | 46,800 | \$1,638,000 | Note 1 |
| W89 | Residence | В | 68.6 | 60.4 | 8.2 | 1 | 1 | 1 | 1 | 100% | 1,872 | 40,800 | \$1,038,000 | Note 1 |
| W90 | Residence | В | 65.5 | 57.9 | 7.6 | 1 | 0 | 1 | 0 | | | | | |
| W91 | Residence | В | 69.2 | 60.6 | 8.6 | 1 | 1 | 1 | 1 | | | | | |
| W92 | Residence | В | 61.9 | 56.7 | 5.2 | 1 | 0 | 1 | 0 | | | | | |
| W93 | Residence | В | 66.3 | 59.8 | 6.5 | 1 | 1 | 1 | 0 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r F | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | |
| W94 | Residence | В | 62.7 | 57.0 | 5.7 | 1 | 0 | 1 | 0 | | | | | |
| W95 | Residence | В | 66.9 | 59.8 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| W96 | Residence | В | 63.3 | 57.2 | 6.1 | 1 | 0 | 1 | 0 | | | | | |
| W97 | Residence | В | 67.3 | 59.8 | 7.5 | 1 | 1 | 1 | 0 | | | | | |
| W98 | Residence | В | 63.9 | 57.5 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| W99 | Residence | В | 67.9 | 60.1 | 7.8 | 1 | 1 | 1 | 0 | | | | | |
| W100 | Residence | В | 66.2 | 58.3 | 7.9 | 1 | 1 | 1 | 1 | | | | | |
| W101 | Residence | В | 69.4 | 60.7 | 8.7 | 1 | 1 | 1 | 1 | | | | | |
| W102 | Residence | В | 66.4 | 58.3 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| W103 | Residence | В | 69.4 | 60.6 | 8.8 | 1 | 1 | 1 | 1 | | | | | |
| W104 | Residence | В | 66.4 | 59.1 | 7.3 | 1 | 1 | 1 | 0 | | | | | |
| W105 | Residence | В | 69.3 | 60.9 | 8.4 | 1 | 1 | 1 | 1 | | | | | |
| W106 | Residence | В | 66.4 | 58.6 | 7.8 | 1 | 1 | 1 | 0 | | | | | |
| W107 | Residence | В | 69.3 | 60.8 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| W108 | Residence | В | 64.0 | 57.8 | 6.2 | 1 | 0 | 1 | 0 | | | | | |
| W109 | Residence | В | 67.7 | 60.0 | 7.7 | 1 | 1 | 1 | 0 | | | | | |
| W110 | Residence | В | 64.0 | 57.8 | 6.2 | 1 | 0 | 1 | 0 | | | | | |
| W111 | Residence | В | 67.8 | 60.1 | 7.7 | 1 | 1 | 1 | 0 | | | | | |
| W112 | Residence | В | 64.1 | 58.0 | 6.1 | 1 | 0 | 1 | 0 | | | | | |
| W113 | Residence | В | 67.7 | 60.1 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| W114 | Residence | В | 63.9 | 57.9 | 6.0 | 1 | 0 | 1 | 0 | | | | | |
| W115 | Residence | В | 67.7 | 60.1 | 7.6 | 1 | 1 | 1 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r F | i | i | | i | i | i | i | | | | | |
| W116 | Residence | В | 64.8 | 58.8 | 6.0 | 1 | 0 | 1 | 0 | | | | | |
| W117 | Residence | В | 68.5 | 60.8 | 7.7 | 1 | 1 | 1 | 0 | | | | | |
| W118 | Residence | В | 63.8 | 58.5 | 5.3 | 1 | 0 | 1 | 0 | | | | | |
| W119 | Residence | В | 67.8 | 60.7 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| W120 | Residence | В | 62.8 | 58.0 | 4.8 | 1 | 0 | 0 | 0 | | | | | |
| W121 | Residence | В | 66.9 | 60.2 | 6.7 | 1 | 1 | 1 | 0 | | | | | |
| W122 | Residence | В | 62.1 | 57.6 | 4.5 | 1 | 0 | 0 | 0 | | | | | |
| W123 | Residence | В | 66.2 | 59.9 | 6.3 | 1 | 1 | 1 | 0 | | | | | |
| W124 | Residence | В | 64.6 | 59.2 | 5.4 | 1 | 0 | 1 | 0 | | | | | |
| W125 | Residence | В | 68.3 | 61.0 | 7.3 | 1 | 1 | 1 | 0 | | | | | |
| W126 | Residence | В | 63.5 | 58.7 | 4.8 | 1 | 0 | 0 | 0 | | | | | |
| W127 | Residence | В | 67.4 | 60.6 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| W128 | Residence | В | 62.7 | 58.3 | 4.4 | 1 | 0 | 0 | 0 | | | | | |
| W129 | Residence | В | 66.7 | 60.3 | 6.4 | 1 | 1 | 1 | 0 | | | | | |
| W130 | Residence | В | 61.8 | 57.8 | 4.0 | 1 | 0 | 0 | 0 | | | | | |
| W131 | Residence | В | 65.9 | 59.9 | 6.0 | 1 | 0 | 1 | 0 | | | | | |
| W132 | Residence | В | 66.9 | 60.8 | 6.1 | 1 | 1 | 1 | 0 | | | | | |
| W133 | Residence | В | 70.2 | 63.0 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| W134 | Residence | В | 65.6 | 60.4 | 5.2 | 1 | 0 | 1 | 0 | | | | | |
| W135 | Residence | В | 69.0 | 62.2 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| W136 | Residence | В | 64.7 | 60.0 | 4.7 | 1 | 0 | 0 | 0 | | | | | |
| W137 | Residence | В | 68.2 | 61.8 | 6.4 | 1 | 1 | 1 | 0 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r F | 1 | 1 | | 1 | 1 | 1 | 1 | | | | | |
| W138 | Residence | В | 63.6 | 59.4 | 4.2 | 1 | 0 | 0 | 0 | | | | | |
| W139 | Residence | В | 67.3 | 61.4 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| W140 | Residence | В | 66.5 | 61.4 | 5.1 | 1 | 1 | 1 | 0 | | | | | |
| W141 | Residence | В | 69.6 | 63.2 | 6.4 | 1 | 1 | 1 | 0 | | | | | |
| W142 | Residence | В | 65.4 | 61.0 | 4.4 | 1 | 0 | 0 | 0 | | | | | |
| W143 | Residence | В | 68.7 | 62.5 | 6.2 | 1 | 1 | 1 | 0 | | | | | |
| W144 | Residence | В | 63.9 | 60.1 | 3.8 | 1 | 0 | 0 | 0 | | | | | |
| W145 | Residence | В | 67.8 | 62.0 | 5.8 | 1 | 1 | 1 | 0 | | | | | |
| W146 | Residence | В | 63.3 | 59.8 | 3.5 | 1 | 0 | 0 | 0 | | | | | |
| W147 | Residence | В | 67.0 | 61.5 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| W148 | Residence | В | 60.8 | 57.9 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| W149 | Residence | В | 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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a 5
dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r G | | | | T | 1 | T | 1 | | | | | |
| W150 | Residence | В | 68.0 | 57.5 | 10.5 | 1 | 1 | 1 | 1 | | | | | |
| W151 | Residence | В | 68.4 | 59.2 | 9.2 | 1 | 1 | 1 | 1 | | | | | |
| W152 | Residence | В | 67.9 | 60.7 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| W153 | Residence | В | 71.6 | 62.1 | 9.5 | 1 | 1 | 1 | 1 | | | | | |
| W154 | Residence | В | 64.1 | 57.8 | 6.3 | 1 | 0 | 1 | 0 | | | | | |
| W155 | Residence | В | 64.4 | 58.7 | 5.7 | 1 | 0 | 1 | 0 | 67% | 1,198 | 29,950 | \$1,048,250 | Note 1 |
| W156 | Residence | В | 64.6 | 59.9 | 4.7 | 1 | 0 | 0 | 0 | | | | | |
| W157 | Residence | В | 64.9 | 60.6 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| W158 | Residence | В | 67.4 | 63.1 | 4.3 | 1 | 1 | 0 | 0 | | | | | |
| W159 | Residence | В | 66.5 | 63.4 | 3.1 | 1 | 1 | 0 | 0 | | | | | |
| W160 | Residence | В | 63.1 | 58.8 | 4.3 | 1 | 0 | 0 | 0 | | | | | |

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| | | | - | ise Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r G | i | 1 | | | | | | | | | | |
| W161 | Residence | В | 62.8 | 58.7 | 4.1 | 1 | 0 | 0 | 0 | | | | | |
| W162 | Residence | В | 62.6 | 59.2 | 3.4 | 1 | 0 | 0 | 0 | | | | | |
| W163 | Residence | В | 62.7 | 59.7 | 3.0 | 1 | 0 | 0 | 0 | | | | | |
| W164 | Residence | В | 64.3 | 61.9 | 2.4 | 1 | 0 | 0 | 0 | | | | | |
| W165 | Residence | В | 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

| | | | | se Level
BA) | | | | | | % of
Impacted | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|--|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r H | _ | | | | | | | | | | | |
| W166 | Residence | В | 63.3 | 60.0 | 3.3 | 1 | 0 | 0 | 0 | | | | | |
| W167 | Residence | В | 63.5 | 59.5 | 4.0 | 1 | 0 | 0 | 0 | | | | | |
| W168 | Residence | В | 65.2 | 60.5 | 4.7 | 1 | 0 | 0 | 0 | | | | | |
| W169 | Residence | В | 65.7 | 60.9 | 4.8 | 1 | 0 | 0 | 0 | 0% | 1,032 | 25,800 | \$903,000 | Note 1 |
| W170 | Residence | В | 63.9 | 60.6 | 3.3 | 1 | 0 | 0 | 0 | | | | | |
| W171 | Residence | В | 63.6 | 60.8 | 2.8 | 1 | 0 | 0 | 0 | | | | | |
| W172 | Residence | В | 63.3 | 60.8 | 2.5 | 1 | 0 | 0 | 0 | | | | | |

7 0 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.

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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

| | | | | se Level
3A) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rl | | | | | | | | | | | | |
| W173 | Residence | В | 70.6 | 62.4 | 8.2 | 1 | 1 | 1 | 1 | | | | | |
| W174 | Residence | В | 65.3 | 58.9 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| W175 | Residence | В | 67.7 | 59.6 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| W176 | Residence | В | 72.9 | 60.8 | 12.1 | 1 | 1 | 1 | 1 | | | | | |
| W177 | Residence | В | 75.4 | 60.7 | 14.7 | 1 | 1 | 1 | 1 | 100% | 1,680 | 42,000 | \$1,470,000 | Note 1 |
| W178 | Residence | В | 77.0 | 60.6 | 16.4 | 1 | 1 | 1 | 1 | 100% | 1,000 | 42,000 | 71,470,000 | Note 1 |
| W179 | Residence | В | 74.1 | 60.9 | 13.2 | 1 | 1 | 1 | 1 | | | | | |
| W180 | Residence | В | 72.4 | 61.7 | 10.7 | 1 | 1 | 1 | 1 | | | | | |
| W181 | Residence | В | 71.0 | 61.9 | 9.1 | 1 | 1 | 1 | 1 | | | | | |
| W182 | Residence | В | 69.2 | 61.5 | 7.7 | 1 | 1 | 1 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rl | | | • | | | • | | | | | | |
| W183 | Residence | В | 67.4 | 60.0 | 7.4 | 1 | 1 | 1 | 0 | | | | | |
| W184 | Residence | В | 66.3 | 60.1 | 6.2 | 1 | 1 | 1 | 0 | | | | | |
| W185 | Residence | В | 67.0 | 60.8 | 6.2 | 1 | 1 | 1 | 0 | | | | | |
| W186 | Residence | В | 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.

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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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rJ | | | T | T | T | | T | T | | T | T | |
| W187 | Residence | В | 64.0 | 60.2 | 3.8 | 1 | 0 | 0 | 0 | | | | | |
| W188 | Residence | В | 64.5 | 59.7 | 4.8 | 1 | 0 | 0 | 0 | | | | | |
| W189 | Residence | В | 65.1 | 58.6 | 6.5 | 1 | 0 | 1 | 0 | | | | | |
| W190 | Residence | В | 65.6 | 58.7 | 6.9 | 1 | 0 | 1 | 0 | | | | | |
| W191 | Residence | В | 66.3 | 59.3 | 7.0 | 1 | 1 | 1 | 0 | 79% | 3,454 | 86,350 | \$3,022,250 | Note 1 |
| W192 | Residence | В | 66.6 | 59.5 | 7.1 | 1 | 1 | 1 | 0 | 7970 | 3,434 | 60,550 | \$3,022,230 | Note 1 |
| W193 | Residence | В | 67.2 | 60.0 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| W194 | Residence | В | 63.4 | 60.6 | 2.8 | 1 | 0 | 0 | 0 | | | | | |
| W195 | Residence | В | 63.2 | 58.9 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| W196 | Residence | В | 64.6 | 59.3 | 5.3 | 1 | 0 | 1 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rJ | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 | |
| W197 | Residence | В | 64.8 | 60.1 | 4.7 | 1 | 0 | 0 | 0 | | | | | |
| W198 | Residence | В | 65.0 | 60.4 | 4.6 | 1 | 0 | 0 | 0 | | | | | |
| W199 | Residence | В | 65.2 | 60.7 | 4.5 | 1 | 0 | 0 | 0 | | | | | |
| W200 | Residence | В | 66.6 | 61.9 | 4.7 | 1 | 1 | 0 | 0 | | | | | |
| W201 | Residence | В | 67.9 | 63.3 | 4.6 | 1 | 1 | 0 | 0 | | | | | |
| W202 | Residence | В | 68.6 | 63.9 | 4.7 | 1 | 1 | 0 | 0 | | | | | |
| J1 | Residence | В | 68.1 | 62.3 | 5.8 | 1 | 1 | 1 | 0 | | | | | |
| J2 | Residence | В | 68.0 | 62.2 | 5.8 | 1 | 1 | 1 | 0 | | | | | |
| J3 | Residence | В | 68.0 | 62.1 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| J4 | Residence | В | 67.9 | 61.9 | 6.0 | 1 | 1 | 1 | 0 | | | | | |
| J5 | Residence | В | 67.9 | 61.8 | 6.1 | 1 | 1 | 1 | 0 | | | | | |
| J6 | Residence | В | 67.6 | 61.1 | 6.5 | 1 | 1 | 1 | 0 | | | | | |
| J7 | Residence | В | 67.2 | 60.3 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| J8 | Residence | В | 67.0 | 59.5 | 7.5 | 1 | 1 | 1 | 0 | | | | | |
| J9 | Residence | В | 66.8 | 58.6 | 8.2 | 1 | 1 | 1 | 1 | | | | | |
| J10 | Residence | В | 66.2 | 57.7 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| J11 | Residence | В | 66.5 | 57.1 | 9.4 | 1 | 1 | 1 | 1 | | | | | |
| J12 | Residence | В | 67.5 | 55.9 | 11.6 | 1 | 1 | 1 | 1 | | | | | |
| J13 | Residence | В | 68.2 | 56.1 | 12.1 | 1 | 1 | 1 | 1 | | | | | |
| J14 | Residence | В | 68.3 | 56.7 | 11.6 | 1 | 1 | 1 | 1 | | | | | |
| J15 | Residence | В | 68.1 | 57.5 | 10.6 | 1 | 1 | 1 | 1 | | | | | |
| J16 | Residence | В | 67.7 | 57.9 | 9.8 | 1 | 1 | 1 | 1 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a
5 dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rJ | | | 1 | 1 | 1 | 1 | 1 | | | | | |
| J17 | Residence | В | 66.2 | 63.5 | 2.7 | 1 | 1 | 0 | 0 | | | | | |
| J18 | Residence | В | 65.8 | 63.3 | 2.5 | 1 | 0 | 0 | 0 | | | | | |
| J19 | Residence | В | 65.5 | 63.2 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J20 | Residence | В | 65.0 | 62.7 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J21 | Residence | В | 64.7 | 62.4 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J22 | Residence | В | 64.6 | 62.3 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J23 | Residence | В | 64.5 | 62.2 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J24 | Residence | В | 64.5 | 62.2 | 2.3 | 1 | 0 | 0 | 0 | | | | | |
| J25 | Residence | В | 64.7 | 62.3 | 2.4 | 1 | 0 | 0 | 0 | | | | | |
| J26 | Residence | В | 64.9 | 62.4 | 2.5 | 1 | 0 | 0 | 0 | | | | | |
| J27 | Residence | В | 65.1 | 62.5 | 2.6 | 1 | 0 | 0 | 0 | | | | | |
| J28 | Residence | В | 65.5 | 62.6 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| J29 | Residence | В | 65.8 | 62.6 | 3.2 | 1 | 0 | 0 | 0 | | | | | |
| J30 | Residence | В | 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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rK | | | T | | 1 | | T | T | 1 | T | | |
| E1 | Residence | В | 69.2 | 64.1 | 5.1 | 1 | 1 | 1 | 0 | | | | | |
| E2 | Residence | В | 71.5 | 61.9 | 9.6 | 1 | 1 | 1 | 1 | | | | | |
| E3 | Residence | В | 75.2 | 61.0 | 14.2 | 1 | 1 | 1 | 1 | | | | | |
| E4 | Residence | В | 70.9 | 61.0 | 9.9 | 1 | 1 | 1 | 1 | | | | | |
| E5 | Residence | В | 71.0 | 61.3 | 9.7 | 1 | 1 | 1 | 1 | 99% | 2,952 | 73,800 | \$2,583,000 | Note 1 |
| E6 | Residence | В | 66.4 | 59.0 | 7.4 | 1 | 1 | 1 | 0 | 3376 | 2,332 | 73,800 | \$2,383,000 | Note 1 |
| E7 | Residence | В | 70.9 | 60.5 | 10.4 | 1 | 1 | 1 | 1 | | | | | |
| E8 | Residence | В | 74.9 | 61.2 | 13.7 | 1 | 1 | 1 | 1 | | | | | |
| E9 | Residence | В | 70.6 | 60.1 | 10.5 | 1 | 1 | 1 | 1 | | | | | |
| E10 | Residence | В | 71.9 | 60.5 | 11.4 | 1 | 1 | 1 | 1 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r K | | • | 1 | 1 | 1 | 1 | 1 | Γ | | T | 1 | |
| E11 | Residence | В | 67.9 | 59.4 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| E12 | Residence | В | 68.1 | 59.6 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| E13 | Residence | В | 70.9 | 60.7 | 10.2 | 1 | 1 | 1 | 1 | | | | | |
| E14 | Residence | В | 72.9 | 62.8 | 10.1 | 1 | 1 | 1 | 1 | | | | | |
| E15 | Residence | В | 70.7 | 60.9 | 9.8 | 1 | 1 | 1 | 1 | | | | | |
| E16 | Residence | В | 72.5 | 62.6 | 9.9 | 1 | 1 | 1 | 1 | | | | | |
| E17 | Residence | В | 70.0 | 60.6 | 9.4 | 1 | 1 | 1 | 1 | | | | | |
| E18 | Residence | В | 72.1 | 62.8 | 9.3 | 1 | 1 | 1 | 1 | | | | | |
| E19 | Residence | В | 69.7 | 60.9 | 8.8 | 1 | 1 | 1 | 1 | | | | | |
| E20 | Residence | В | 71.8 | 63.0 | 8.8 | 1 | 1 | 1 | 1 | | | | | |
| E21 | Residence | В | 68.3 | 60.3 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E22 | Residence | В | 71.1 | 62.2 | 8.9 | 1 | 1 | 1 | 1 | | | | | |
| E23 | Residence | В | 67.1 | 59.9 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| E24 | Residence | В | 70.2 | 61.9 | 8.3 | 1 | 1 | 1 | 1 | | | | | |
| E25 | Residence | В | 66.1 | 59.5 | 6.6 | 1 | 1 | 1 | 0 | | | | | |
| E26 | Residence | В | 69.7 | 61.5 | 8.2 | 1 | 1 | 1 | 1 | | | | | |
| E27 | Residence | В | 65.5 | 59.3 | 6.2 | 1 | 0 | 1 | 0 | | | | | |
| E28 | Residence | В | 69.3 | 61.3 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E29 | Residence | В | 69.2 | 60.2 | 9.0 | 1 | 1 | 1 | 1 | | | | | |
| E30 | Residence | В | 71.7 | 62.1 | 9.6 | 1 | 1 | 1 | 1 | | | | | |
| E31 | Residence | В | 68.8 | 60.4 | 8.4 | 1 | 1 | 1 | 1 | | | | | |
| E32 | Residence | В | 71.4 | 62.2 | 9.2 | 1 | 1 | 1 | 1 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r K | | • | 1 | 1 | 1 | 1 | 1 | Г | T | T | 1 | |
| E33 | Residence | В | 68.5 | 60.5 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E34 | Residence | В | 71.1 | 62.5 | 8.6 | 1 | 1 | 1 | 1 | | | | | |
| E35 | Residence | В | 68.2 | 60.6 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| E36 | Residence | В | 70.8 | 62.5 | 8.3 | 1 | 1 | 1 | 1 | | | | | |
| E37 | Residence | В | 68.7 | 61.3 | 7.4 | 1 | 1 | 1 | 0 | | | | | |
| E38 | Residence | В | 70.9 | 63.8 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| E39 | Residence | В | 68.0 | 61.7 | 6.3 | 1 | 1 | 1 | 0 | | | | | |
| E40 | Residence | В | 70.3 | 63.7 | 6.6 | 1 | 1 | 1 | 0 | | | | | |
| E41 | Residence | В | 67.6 | 60.7 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E42 | Residence | В | 70.3 | 62.8 | 7.5 | 1 | 1 | 1 | 0 | | | | | |
| E43 | Residence | В | 67.2 | 61.0 | 6.2 | 1 | 1 | 1 | 0 | | | | | |
| E44 | Residence | В | 69.9 | 63.0 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E45 | Residence | В | 67.4 | 61.5 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| E46 | Residence | В | 69.9 | 63.6 | 6.3 | 1 | 1 | 1 | 0 | | | | | |
| E47 | Residence | В | 66.4 | 60.8 | 5.6 | 1 | 1 | 1 | 0 | | | | | |
| E48 | Residence | В | 69.2 | 62.6 | 6.6 | 1 | 1 | 1 | 0 | | | | | |
| E49 | Residence | В | 66.2 | 60.7 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E50 | Residence | В | 69.1 | 63.0 | 6.1 | 1 | 1 | 1 | 0 | | | | | |
| E51 | Residence | В | 65.5 | 60.4 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| E52 | Residence | В | 68.7 | 62.6 | 6.1 | 1 | 1 | 1 | 0 | | | | | |
| E53 | Residence | В | 72.2 | 61.5 | 10.7 | 1 | 1 | 1 | 1 | | | | | |
| E54 | Residence | В | 73.5 | 64.3 | 9.2 | 1 | 1 | 1 | 1 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r K | | | | i | i | | | | | | | |
| E55 | Residence | В | 71.7 | 61.9 | 9.8 | 1 | 1 | 1 | 1 | | | | | |
| E56 | Residence | В | 73.0 | 64.9 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| E57 | Residence | В | 71.2 | 62.3 | 8.9 | 1 | 1 | 1 | 1 | | | | | |
| E58 | Residence | В | 72.4 | 65.5 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E59 | Residence | В | 70.9 | 62.8 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| E60 | Residence | В | 72.1 | 66.1 | 6.0 | 1 | 1 | 1 | 0 | | | | | |
| E61 | Residence | В | 70.4 | 61.2 | 9.2 | 1 | 1 | 1 | 1 | | | | | |
| E62 | Residence | В | 72.2 | 63.8 | 8.4 | 1 | 1 | 1 | 1 | | | | | |
| E63 | Residence | В | 70.0 | 61.5 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| E64 | Residence | В | 71.8 | 64.2 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| E65 | Residence | В | 69.5 | 61.9 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| E66 | Residence | В | 71.2 | 64.7 | 6.5 | 1 | 1 | 1 | 0 | | | | | |
| E67 | Residence | В | 69.2 | 62.2 | 7.0 | 1 | 1 | 1 | 0 | | | | | |
| E68 | Residence | В | 70.9 | 65.1 | 5.8 | 1 | 1 | 1 | 0 | | | | | |
| E69 | Residence | В | 66.9 | 61.4 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E70 | Residence | В | 69.4 | 63.5 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| E71 | Residence | В | 67.3 | 61.7 | 5.6 | 1 | 1 | 1 | 0 | | | | | |
| E72 | Residence | В | 69.7 | 64.1 | 5.6 | 1 | 1 | 1 | 0 | | | | | |
| E73 | Residence | В | 67.7 | 62.0 | 5.7 | 1 | 1 | 1 | 0 | | | | | |
| E74 | Residence | В | 69.8 | 64.5 | 5.3 | 1 | 1 | 1 | 0 | | | | | |
| E75 | Residence | В | 68.1 | 62.6 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E76 | Residence | В | 70.0 | 65.2 | 4.8 | 1 | 1 | 0 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | r K | I | i | | | | 1 | 1 | | | | | |
| E77 | Residence | В | 65.7 | 60.8 | 4.9 | 1 | 0 | 1 | 0 | | | | | |
| E78 | Residence | В | 68.6 | 63.1 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E79 | Residence | В | 66.0 | 61.0 | 5.0 | 1 | 1 | 1 | 0 | | | | | |
| E80 | Residence | В | 68.7 | 63.2 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E81 | Residence | В | 66.4 | 61.4 | 5.0 | 1 | 1 | 1 | 0 | | | | | |
| E82 | Residence | В | 69.0 | 63.6 | 5.4 | 1 | 1 | 1 | 0 | | | | | |
| E83 | Residence | В | 66.5 | 61.4 | 5.1 | 1 | 1 | 1 | 0 | | | | | |
| E84 | Residence | В | 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.

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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

| | | | | ise Level
BA) | | | | | | % of | | | | |
|----------------|----------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall n | nodeled barrie | rL | | | | | | | | | | | | |
| E87 | Residence | В | 70.8 | 62.0 | 8.8 | 1 | 1 | 1 | 1 | | | | | |
| E88 | Residence | В | 69.3 | 61.3 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E89 | Residence | В | 71.2 | 59.7 | 11.5 | 1 | 1 | 1 | 1 | 100% | 1,128 | 28,200 | \$987,000 | \$246,750 |
| E90 | Church | D | 50.4 | 40.9 | 9.5 | 1 | 0 | 1 | 1 | | | | | |
| E91 | Residence | В | 64.3 | 61.4 | 2.9 | 1 | 0 | 0 | 0 | | | | | |
| | | | | | | _ | 2 | | | | | | | |

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 | Туре | NAC:
Noise
Area
Classification | - | Se Level Build year 2037 (with barrier) | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|------|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 25-foot tall n | nodeled barrier | M | | | | | | | | | | | | |
| E96 | Residential | В | 70.7 | 62.7 | 8.0 | 1 | 1 | 1 | 1 | 1000/ | 552 | 12.000 | ¢402.000 | ¢402.000 |
| E97 | Residential | В | 63.2 | 60.7 | 2.5 | 1 | 0 | 0 | 0 | 100% | 552 | 13,800 | \$483,000 | \$483,000 |
| | | | | | | 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.

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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 | Туре | NAC:
Noise
Area
Classification | | se Level
BA)
Build
year
2037
(with
barrier) | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|------|---|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 25-foot tall n | nodeled barrier | N | | | | <u> </u> | | | <u> </u> | | | | | |
| E101 | Residential | В | 70.4 | 62.4 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E102 | Residential | В | 70.0 | 60.0 | 10.0 | 1 | 1 | 1 | 1 | | | | | |
| E103 | Residential | В | 70.8 | 58.7 | 12.1 | 1 | 1 | 1 | 1 | | | | | |
| E104 | Residential | В | 71.6 | 58.6 | 13.0 | 1 | 1 | 1 | 1 | | | | | |
| E105 | Residential | В | 71.1 | 58.3 | 12.8 | 1 | 1 | 1 | 1 | 4000/ | 4.452 | 20.000 | ć4 000 000 | ¢04.000 |
| E106 | Residential | В | 71.8 | 58.7 | 13.1 | 1 | 1 | 1 | 1 | 100% | 1,152 | 28,800 | \$1,008,000 | \$84,000 |
| E107 | Residential | В | 63.7 | 58.5 | 5.2 | 1 | 0 | 1 | 0 | | | | | |
| E108 | Residential | В | 65.4 | 57.8 | 7.6 | 1 | 0 | 1 | 0 | | | | | |
| E109 | Residential | В | 65.2 | 57.1 | 8.1 | 1 | 0 | 1 | 1 | | | | | |
| E110 | Residential | В | 66.4 | 57.5 | 8.9 | 1 | 1 | 1 | 1 | | _ | | _ | |

| Receptors | Туре | NAC:
Noise
Area
Classification | Leq Noi
(dE
Build
year
2037
(no
barrier) | | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|--|------|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 25-foot tall n | nodeled barrier | N | | 1 | • | | • | i | · | | | | | |
| E111 | Residential | В | 66.9 | 58.2 | 8.7 | 1 | 1 | 1 | 1 | | | | | |
| E112 | Residential | В | 68.3 | 60.3 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E113 | Residential | В | 61.5 | 58.3 | 3.2 | 1 | 0 | 0 | 0 | | | | | |
| E114 | Residential | В | 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.

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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

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------------|-------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall modeled | d barrier O | | | | | | | | | | | | | |
| E117 | Residence | В | 63.1 | 60.7 | 2.4 | 1 | 0 | 0 | 0 | | | | | |
| E118 (2ND LEVEL) | Residence | В | 66.6 | 63.6 | 3.0 | 1 | 1 | 0 | 0 | | | | | |
| E119 | Residence | В | 62.2 | 59.7 | 2.5 | 1 | 0 | 0 | 0 | | | | | |
| E120 (2ND LEVEL) | Residence | В | 66.2 | 62.9 | 3.3 | 1 | 1 | 0 | 0 | | | | | |
| E121 | Residence | В | 63.3 | 60.2 | 3.1 | 1 | 0 | 0 | 0 | 83% | 1,272 | 31,800 | \$1,113,000 | Note 1 |
| E122 (2ND LEVEL) | Residence | В | 67.1 | 63.4 | 3.7 | 1 | 1 | 0 | 0 | 83% | 1,272 | 31,800 | \$1,113,000 | Note 1 |
| E123 | Residence | В | 62.7 | 59.6 | 3.1 | 1 | 0 | 0 | 0 | | | | | |
| E124 (2ND LEVEL) | Residence | В | 66.7 | 62.9 | 3.8 | 1 | 1 | 0 | 0 | | | | | |
| E125 | Residence | В | 67.5 | 62.5 | 5.0 | 1 | 1 | 1 | 0 | | | | | |
| E126 (2ND LEVEL) | Residence | В | 70.0 | 65.0 | 5.0 | 1 | 1 | 1 | 0 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------------|-------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a
5 dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall modeled | l barrier O | 1 | | | 1 | 1 | 1 | 1 | | | | | | |
| E127 | Residence | В | 66.9 | 62.2 | 4.7 | 1 | 1 | 0 | 0 | | | | | |
| E128 (2ND LEVEL) | Residence | В | 69.6 | 64.8 | 4.8 | 1 | 1 | 0 | 0 | | | | | |
| E129 | Residence | В | 65.4 | 60.9 | 4.5 | 1 | 0 | 0 | 0 | | | | | |
| E130 (2ND LEVEL) | Residence | В | 68.5 | 63.7 | 4.8 | 1 | 1 | 0 | 0 | | | | | |
| E131 | Residence | В | 64.6 | 60.5 | 4.1 | 1 | 0 | 0 | 0 | | | | | |
| E132 (2ND LEVEL) | Residence | В | 68.0 | 63.4 | 4.6 | 1 | 1 | 0 | 0 | | | | | |
| E133 | Residence | В | 68.2 | 61.1 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| E134 (2ND LEVEL) | Residence | В | 70.6 | 63.7 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E135 | Residence | В | 67.5 | 61.0 | 6.5 | 1 | 1 | 1 | 0 | | | | | |
| E136 (2ND LEVEL) | Residence | В | 70.1 | 63.7 | 6.4 | 1 | 1 | 1 | 0 | | | | | |
| E137 | Residence | В | 65.6 | 60.2 | 5.4 | 1 | 0 | 1 | 0 | | | | | |
| E138 (2ND LEVEL) | Residence | В | 68.8 | 62.9 | 5.9 | 1 | 1 | 1 | 0 | | | | | |
| E139 | Residence | В | 64.9 | 59.8 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| E140 (2ND LEVEL) | Residence | В | 68.3 | 62.6 | 5.7 | 1 | 1 | 1 | 0 | | | | | |
| E141 | Residence | В | 61.9 | 58.2 | 3.7 | 1 | 0 | 0 | 0 | | | | | |
| E142 (2ND LEVEL) | Residence | В | 66.2 | 61.3 | 4.9 | 1 | 1 | 0 | 0 | | | | | |
| E143 | Residence | В | 62.4 | 58.1 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| E144 (2ND LEVEL) | Residence | В | 66.7 | 61.2 | 5.5 | 1 | 1 | 1 | 0 | | | | | |
| E145 | Residence | В | 64.5 | 58.1 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| E146 (2ND LEVEL) | Residence | В | 68.2 | 61.0 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| E147 | Residence | В | 63.9 | 58.0 | 5.9 | 1 | 0 | 1 | 0 | | | | | |
| E148 (2ND LEVEL) | Residence | В | 67.8 | 60.9 | 6.9 | 1 | 1 | 1 | 0 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------------|-------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a
5 dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall modeled | l barrier O | 1 | | | | 1 | | 1 | 1 | | | | | |
| E149 | Residence | В | 62.7 | 57.4 | 5.3 | 1 | 0 | 1 | 0 | | | | | |
| E150 (2ND LEVEL) | Residence | В | 66.8 | 60.4 | 6.4 | 1 | 1 | 1 | 0 | | | | | |
| E151 | Residence | В | 62.2 | 57.1 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| E152 (2ND LEVEL) | Residence | В | 66.5 | 60.1 | 6.4 | 1 | 1 | 1 | 0 | | | | | |
| E153 | Residence | В | 65.3 | 58.2 | 7.1 | 1 | 0 | 1 | 0 | | | | | |
| E154 (2ND LEVEL) | Residence | В | 68.6 | 60.9 | 7.7 | 1 | 1 | 1 | 0 | | | | | |
| E155 | Residence | В | 64.6 | 58.0 | 6.6 | 1 | 0 | 1 | 0 | | | | | |
| E156 (2ND LEVEL) | Residence | В | 68.2 | 60.7 | 7.5 | 1 | 1 | 1 | 0 | | | | | |
| E157 | Residence | В | 63.4 | 57.5 | 5.9 | 1 | 0 | 1 | 0 | | | | | |
| E158 (2ND LEVEL) | Residence | В | 67.4 | 60.4 | 7.0 | 1 | 1 | 1 | 0 | | | | | |
| E159 | Residence | В | 62.7 | 57.2 | 5.5 | 1 | 0 | 1 | 0 | | | | | |
| E160 (2ND LEVEL) | Residence | В | 66.8 | 60.0 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| E161 | Residence | В | 65.9 | 57.6 | 8.3 | 1 | 0 | 1 | 1 | | | | | |
| E162 (2ND LEVEL) | Residence | В | 69.2 | 60.3 | 8.9 | 1 | 1 | 1 | 1 | | | | | |
| E163 | Residence | В | 65.4 | 57.5 | 7.9 | 1 | 0 | 1 | 0 | | | | | |
| E164 (2ND LEVEL) | Residence | В | 69.0 | 60.2 | 8.8 | 1 | 1 | 1 | 1 | | | | | |
| E165 | Residence | В | 64.2 | 57.3 | 6.9 | 1 | 0 | 1 | 0 | | | | | |
| E166 (2ND LEVEL) | Residence | В | 68.0 | 60.0 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E167 | Residence | В | 63.4 | 57.0 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| E168 (2ND LEVEL) | Residence | В | 67.7 | 60.0 | 7.7 | 1 | 1 | 1 | 0 | | | | | |
| E169 | Residence | В | 66.7 | 57.8 | 8.9 | 1 | 1 | 1 | 1 | | | | | |
| E170 (2ND LEVEL) | Residence | В | 69.8 | 60.2 | 9.6 | 1 | 1 | 1 | 1 | | | | | |

| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------------|-------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted
Receivers
That
Would
Achieve a
5 dBA
Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall modeled | d barrier O | i | | | | | i | | | | | | | |
| E171 | Residence | В | 66.1 | 57.6 | 8.5 | 1 | 1 | 1 | 1 | | | | | |
| E172 (2ND LEVEL) | Residence | В | 69.5 | 60.2 | 9.3 | 1 | 1 | 1 | 1 | | | | | |
| E173 | Residence | В | 64.6 | 57.2 | 7.4 | 1 | 0 | 1 | 0 | | | | | |
| E174 (2ND LEVEL) | Residence | В | 68.4 | 60.1 | 8.3 | 1 | 1 | 1 | 1 | | | | | |
| E175 | Residence | В | 64.0 | 57.0 | 7.0 | 1 | 0 | 1 | 0 | | | | | |
| E176 (2ND LEVEL) | Residence | В | 68.0 | 60.0 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E177 | Residence | В | 62.7 | 56.6 | 6.1 | 1 | 0 | 1 | 0 | | | | | |
| E178 (2ND LEVEL) | Residence | В | 67.1 | 59.8 | 7.3 | 1 | 1 | 1 | 0 | | | | | |
| E179 | Residence | В | 62.4 | 56.5 | 5.9 | 1 | 0 | 1 | 0 | | | | | |
| E180 (2ND LEVEL) | Residence | В | 67.0 | 59.8 | 7.2 | 1 | 1 | 1 | 0 | | | | | |
| E181 | Residence | В | 62.4 | 56.5 | 5.9 | 1 | 0 | 1 | 0 | | | | | |
| E182 (2ND LEVEL) | Residence | В | 67.0 | 59.9 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| E183 | Residence | В | 62.4 | 56.6 | 5.8 | 1 | 0 | 1 | 0 | | | | | |
| E184 (2ND LEVEL) | Residence | В | 67.0 | 60.0 | 7.0 | 1 | 1 | 1 | 0 | | | | | |
| E185 | Residence | В | 61.5 | 56.2 | 5.3 | 1 | 0 | 1 | 0 | | | | | |
| E186 (2ND LEVEL) | Residence | В | 66.1 | 59.5 | 6.6 | 1 | 1 | 1 | 0 | | | | | |
| E187 | Residence | В | 61.5 | 56.2 | 5.3 | 1 | 0 | 1 | 0 | | | | | |
| E188 (2ND LEVEL) | Residence | В | 66.1 | 59.4 | 6.7 | 1 | 1 | 1 | 0 | | | | | |
| E189 | Residence | В | 61.3 | 56.1 | 5.2 | 1 | 0 | 1 | 0 | | | | | |
| E190 (2ND LEVEL) | Residence | В | 66.1 | 59.6 | 6.5 | 1 | 1 | 1 | 0 | | | | | |
| E191 | Residence | В | 61.3 | 56.2 | 5.1 | 1 | 0 | 1 | 0 | | | | | |
| E192 (2ND LEVEL) | Residence | В | 66.1 | 59.7 | 6.4 | 1 | 1 | 1 | 0 | | | | | |

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| | | | | se Level
BA) | | | | | | % of | | | | |
|----------------------|-------------|---|--|--|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| Receptors | Туре | NAC:
Noise
Area
Classification | Build
year
2037
(no
barrier) | Build
year
2037
(with
barrier) | 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 | Impacted Receivers That Would Achieve a 5 dBA Reduction | Length of
Barrier
(feet) | Barrier
Area
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
| 25-foot tall modeled | l barrier O | <u>'</u> | i
I | i | 1 | 1 | <u>'</u> | 1 | <u>'</u> | | | | | |
| E193 | Residence | В | 64.4 | 57.5 | 6.9 | 1 | 0 | 1 | 0 | | | | | |
| E194 (2ND LEVEL) | Residence | В | 68.4 | 60.8 | 7.6 | 1 | 1 | 1 | 0 | | | | | |
| E195 | Residence | В | 64.8 | 57.6 | 7.2 | 1 | 0 | 1 | 0 | | | | | |
| E196 (2ND LEVEL) | Residence | В | 68.7 | 61.2 | 7.5 | 1 | 1 | 1 | 0 | | | | | |
| E197 | Residence | В | 65.9 | 58.2 | 7.7 | 1 | 0 | 1 | 0 | | | | | |
| E198 (2ND LEVEL) | Residence | В | 69.3 | 61.4 | 7.9 | 1 | 1 | 1 | 0 | | | | | |
| E199 | Residence | В | 66.6 | 58.6 | 8.0 | 1 | 1 | 1 | 1 | | | | | |
| E200 (2ND LEVEL) | Residence | В | 69.7 | 61.6 | 8.1 | 1 | 1 | 1 | 1 | | | | | |
| E201 | Residence | В | 63.4 | 57.2 | 6.2 | 1 | 0 | 1 | 0 | | | | | |
| E202 (2ND LEVEL) | Residence | В | 67.7 | 60.9 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| E203 | Residence | В | 63.8 | 57.4 | 6.4 | 1 | 0 | 1 | 0 | | | | | |
| E204 (2ND LEVEL) | Residence | В | 68.0 | 61.1 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E205 | Residence | В | 64.8 | 58.0 | 6.8 | 1 | 0 | 1 | 0 | | | | | |
| E206 (2ND LEVEL) | Residence | В | 68.6 | 61.5 | 7.1 | 1 | 1 | 1 | 0 | | | | | |
| E207 | Residence | В | 65.4 | 58.3 | 7.1 | 1 | 0 | 1 | 0 | | | | | |
| E208 (2ND LEVEL) | Residence | В | 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 | Туре | NAC:
Noise
Area
Classification | | se Level
BA)
Build
year
2037
(with
barrier) | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|------|---|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 25-foot tall n | nodeled barrier | P | | | | | | | | | | | | |
| E239 | Residential | В | 67.8 | 64.7 | 3.1 | 1 | 1 | 0 | 0 | | | | | |
| E240 | Residential | В | 72.5 | 65.3 | 7.2 | 1 | 1 | 1 | 0 | 75% | 840 | 21 000 | ¢725 000 | Note 1 |
| E241 | Residential | В | 73.7 | 63.4 | 10.3 | 1 | 1 | 1 | 1 | /5% | 840 | 21,000 | \$735,000 | Note 1 |
| E242 | Residential | В | 71.4 | 63.5 | 7.9 | 1 | 1 | 1 | 0 | | | | | |
| _ | • | • | | | | | 4 | 2 | 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.

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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 | Туре | NAC:
Noise
Area
Classification | • | se Level
BA)
Build
year
2037
(with
barrier) | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|------|---|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 20-foot tall m | nodeled barrier | ·Q | I | I | | | | I. | I. | | | | | I |
| E243 | Residential | В | 74.0 | 64.4 | 9.6 | 1 | 1 | 1 | 1 | | | | | |
| E244 | Residential | В | 75.2 | 64.1 | 11.1 | 1 | 1 | 1 | 1 | | | | | |
| E245 | Residential | В | 75.9 | 63.6 | 12.3 | 1 | 1 | 1 | 1 | | | | | |
| E246 | Residential | В | 69.2 | 62.3 | 6.9 | 1 | 1 | 1 | 0 | | | | | |
| E247 | Residential | В | 70.3 | 62.3 | 8.0 | 1 | 1 | 1 | 1 | 100% | 864 | 17,280 | \$604,800 | \$67,200 |
| E248 | Residential | В | 71.6 | 63.2 | 8.4 | 1 | 1 | 1 | 1 | | | | | |
| E249 | Residential | В | 74.4 | 63.9 | 10.5 | 1 | 1 | 1 | 1 | | | | | |
| E250 | Residential | В | 76.9 | 64.7 | 12.2 | 1 | 1 | 1 | 1 | | | | | |
| E251 | Residential | В | 75.5 | 66.5 | 9.0 | 1 | 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 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 | Туре | NAC:
Noise
Area
Classification | Leq Noi
(di
Build
year
2037
(no
barrier) | se Level
BA)
Build
year
2037
(with
barrier) | 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
(ft²) | Total Cost
of Barrier
\$35/ft ² | Cost/
Benefited
Receptor |
|----------------|-----------------|---|--|---|--|------------------------|------------------------------------|---|---|---|--------------------------------|--------------------------|--|--------------------------------|
| 25-foot tall n | nodeled barrier | R | | | | | | | | | | | | |
| E252 | Residential | В | 65.1 | 59.3 | 5.8 | 1 | 0 | 1 | 0 | | | | | |
| E253 | Residential | В | 66.2 | 59.4 | 6.8 | 1 | 1 | 1 | 0 | | | | | |
| E254 | Residential | В | 66.8 | 59.8 | 7.0 | 1 | 1 | 1 | 0 | 100% | 1 440 | 26,000 | ¢1 260 000 | Note 1 |
| E255 | Residential | В | 66.5 | 60.0 | 6.5 | 1 | 1 | 1 | 0 | 100% | 1,440 | 36,000 | \$1,260,000 | Note 1 |
| E256 | Residential | В | 65.5 | 59.7 | 5.8 | 1 | 0 | 1 | 0 | | | | | |
| E257 | Residential | В | 64.9 | 60.6 | 4.3 | 1 | 0 | 0 | 0 | | | | | |
| | • | • | • | • | | 6 | 2 | | 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.

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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-

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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 noisesensitive 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.

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Noise Level Emissions (dB(A)) at 50 Feet From Equipment² Equipment 80 90 Pile Driver³ Jack Hammer Tractor Road Grader Backhoe Truck Paver Pneumatic Wrench Crane Concrete Mixer Compressor Front-End Loader Generator Saws Roller (Compactor)

Table 26: Construction Equipment Typical Noise Level Emissions¹

- Adapted from Noise Construction Equipment and Operations, Building Equipment, and Home Appliances. U.S. Environmental Protection Agency. Washington D.C. 1971.
- 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.
- Due to project safety and potential construction noise concerns, pile driving activities are typically limited to daytime hours.

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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 | | Width of SCDOT Noise Abate
in feet from edge of Proposed
2037 Build Alternative | | | | |
|--------------------------------------|---------------------------|---|---------------------------|--|--|--|
| , , | Activity Category A | Activity Category A | | | | |
| | 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 | | | |

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7.0 BIBLIOGRAPHY

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- U.S. Department of Transportation, Federal Highway Administration. <u>Measurement of Highway-Related Noise</u>. FHWA Report Number FHWA-PD-96-046. May 1996.
- U.S. Department of Transportation, Federal Highway Administration. <u>FHWA Traffic Noise Model: User's Guide</u>. FHWA Report Number FHWA-PD-96-009. January, 1998.
- U.S. Department of Transportation, Federal Highway Administration. <u>FHWA Traffic Noise Model: User's Guide (Version 2.5 Addendum)</u>. April 2004.
- U.S. National Archives and Records Administration, Office of the Federal Register. Title 23, Code of Federal Regulations, Part 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise.

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)

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APPENDIX A:

RECEPTOR LOCATION MAP FIGURES





I-77 Roadway Widening and Improvements

Noise Analysis Sheet 1 of 11 Feb. 2015





I-77 Roadway Widening and Improvements

Noise Analysis Sheet 2 of 11 Feb. 2015



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

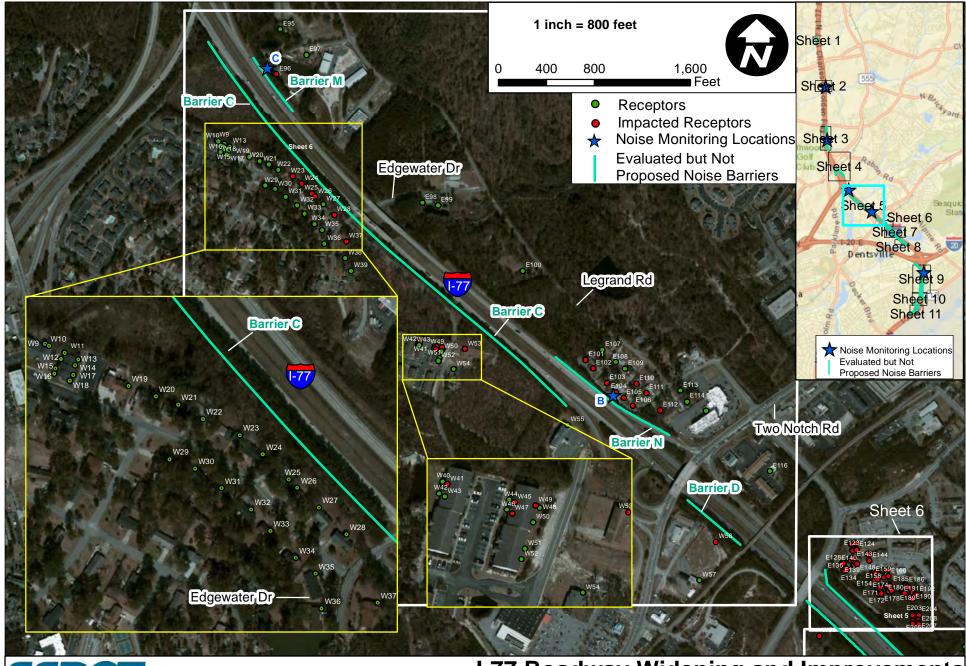
Noise Analysis Sheet 3 of 11 Feb. 2015





I-77 Roadway Widening and Improvements

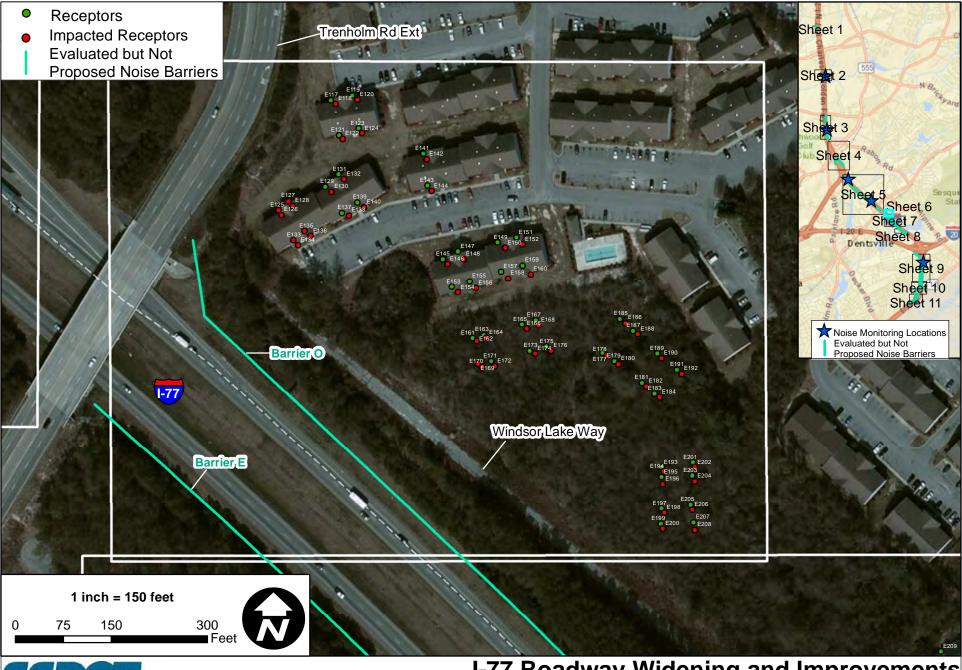
Noise Analysis Sheet 4 of 11 Feb. 2015





I-77 Roadway Widening and Improvements

Noise Analysis Sheet 5 of 11 Feb. 2015





I-77 Roadway Widening and Improvements Noise Analysis

Noise Analysis Sheet 6 of 11 Feb. 2015



South Carolina Department of Transportation

I-77 Roadway Widening and Improvements

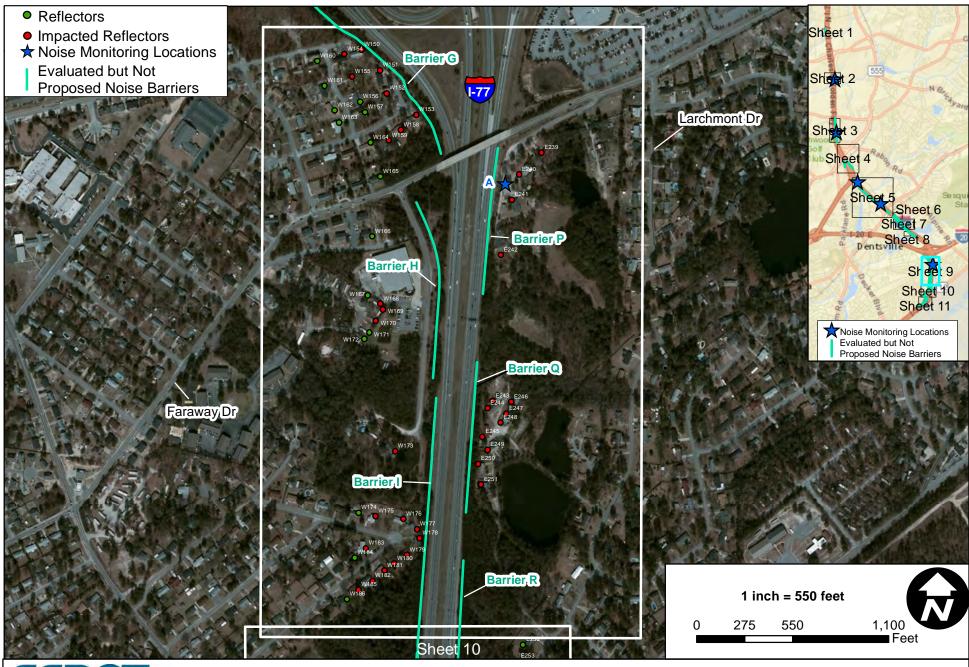
Noise Analysis Sheet 7 of 11 Feb. 2015





I-77 Roadway Widening and Improvements

Noise Analysis Sheet 8 of 11 Feb. 2015





I-77 Roadway Widening and Improvements Noise Analysis

Noise Analysis Sheet 9 of 11 Feb. 2015



South Carolina Department of Transportation I-77 Roadway Widening and Improvements

Noise Analysis Sheet 10 of 11 Feb. 2015



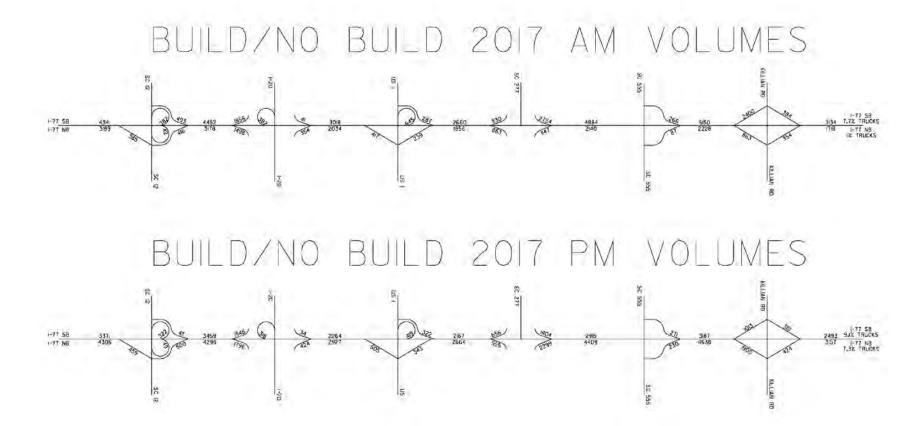


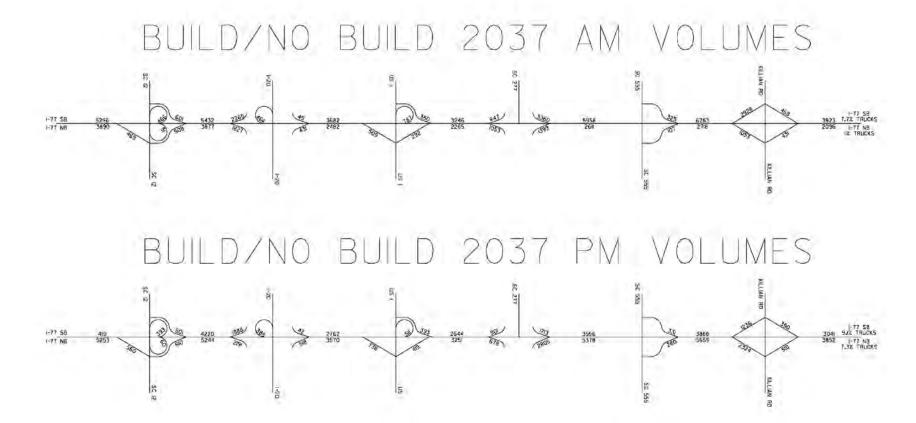
I-77 Roadway Widening and Improvements Noise Analysis

Noise Analysis Sheet 11 of 11 Feb. 2015

APPENDIX B:

TRAFFIC DATA SHEETS





| | 2017 EXISTING | | | | | | | | | | | | |
|---------|----------------------|-------------|-----------------|---------------|-------------|-------|-------|-------|-------------|--|--|--|--|
| | | | 2017 | 2017 | Vehicle Mix | | | | | | | | |
| | Roadway | Speed (mph) | 2017
PM PEAK | 2017
LOS C | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | | | |
| | | | TIVITEAR | 103 C | Autos | MT | HT | Buses | Motorcycles | | | | |
| | 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 | | | | |
| NB I-77 | 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 | | | | |
| | 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 | | | | |
| SB I-77 | 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 | | | | | | | | | | |
|--|-------------|--------------------|--------|-------|---------|-------|-------------|--|--|--|
| | | Tueffie | | | Vehicle | Mix | | | | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | | |
| | | volumes | 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 | | | | | | | | | |
|---|-------------|--------------------|--------|-------|---------|-------|-------------|--|--|
| | | T (C: - | | | Vehicle | Mix | | | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | |
| | | Volumes | Autos | MT | НТ | 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 EXIS | TING | | | | | |
|---|-------------|--------------------|--------|-------|---------|-------|-------------|
| | | Tueff: e | | | Vehicle | Mix | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% |
| | | Volunics | 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 | | | | | | | | | |
|--|---------------|--------------------|--------|-------|---------|-------|-------------|--|--|--|
| | | Tueff: e | | | Vehicle | Mix | | | | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | | |
| | | Volumes | 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 | | | | | | | | | |
|--|-------------|--------------------|--------|-------|---------|-------|-------------|--|--|
| | | Tueff: e | | | Vehicle | Mix | | | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | |
| | | Volumes | 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 EXIS | TING | | | | | |
|---------------------------------------|-------------|--------------------|--------|-------|---------|-------|-------------|
| | | Tueffie | | | Vehicle | Mix | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% |
| | | Volumes | 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 | | | | | | | | | | |
|--|---------------|----------|--------|-------|---------|-------|-------------|--|--|--|--|
| | | Traffic | | | Vehicle | Mix | | | | | |
| Roadway | Speed (mph) | Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | | | |
| | | Volunics | 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 | | | | | | | |
|---------|----------------------|-------------|-----------------|---------------|-------------|-------|-------|-------|-------------|--|--|
| | | | 2027 | 2027 | Vehicle Mix | | | | | | |
| | Roadway | Speed (mph) | 2037
PM PEAK | 2037
LOS C | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | |
| | | | I WI I LAK | 103 € | Autos | MT | HT | Buses | Motorcycles | | |
| | 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 | | |
| NB I-77 | 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 | | |
| | 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 | | |
| SB I-77 | 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 | | | | | | | | | | |
|--|---------------|--------------------|--------|-------|---------|-------|-------------|--|--|--|--|
| | | T (C) | | | Vehicle | Mix | | | | | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | | | | |
| | | volumes | 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 (n | Speed (mph) | Traffic
Volumes | Vehicle Mix | | | | | |
| | | | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% | |
| | | volunies | 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 Sp. | 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-B | UILD | | | | | |
|--|-------------|--------------------|--------|-------|---------|-------|-------------|
| | | Tueff: a | | | Vehicle | Mix | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% |
| | | Volunics | 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 |

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| | | | 2037 E | BUILD | | | | | |
|---------|----------------------|-------------|-----------------|---------------|--------|-------|---------|-------|-------------|
| | | | 2027 | 2027 | | | Vehicle | е Міх | |
| | Roadway | Speed (mph) | 2037
PM PEAK | 2037
LOS C | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% |
| | | | I WI I EAR | 103 C | Autos | MT | HT | Buses | Motorcycles |
| _ | 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 |
| NB I-77 | 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 |
| | 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 |
| SB I-77 | 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 |

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| | 2037 BU | JILD | | | | | |
|--|-------------|--------------------|--------|-------|---------|-------|-------------|
| | | T (C) . | | | Vehicle | Mix | |
| Roadway | Speed (mph) | Traffic
Volumes | 91.77% | 1.24% | 6.45% | 0.40% | 0.14% |
| | | voluilles | 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 |

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| 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 |

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| 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 |

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| 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 |

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| | ı | 1 | | | r | 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 |

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| | 60 | 000 | 050 | 4.0 | 60 | | 4 |
|--|----|------|------|-----|----|---|---|
| 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 |

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| 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 |

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| 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 |

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APPENDIX C: FIELD DATA SHEETS

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| Proj | ect Description: | -97 | LOCA /-10 | (h 2) | Para File |
|---------------------------------------|---|------------------------------|-----------------------------|-----------------|-------------|
| 2.75 | Number: 235 | 849 | Noise Source: | Traffic | |
| Date | e: 8/20/14 | | Den | EMARIA | |
| Equ | ipment make/model | /serial # | 824 Data | File: File: | |
| Loc | ation Description: | old Satche | HOTA RD. | | |
| | 1325 | old Satel | nelford Roll | L | |
| | ation Diagram: Traffic counts no | eed to be direction | nal | | |
| c | Start Time: | IA IA | top Time: | Je to Kord Kd | L.S |
| | 12:35 AM.PM |) | 2: 50 AM PM | | Mad (|
| | C - 2 / MIVINE IVI | _ | | Wind Direction: | N |
| | | wh | | | 1 2 |
| Wir | nd Speed: (o M | | | | 103% |
| Wir | nd Speed: (o M | Speed | 70 mph | Humidity: | 103%.
BA |
| Wir
Ten
Cali | nd Speed: 10 pm | Speed | 70 mph | Humidity: | BA |
| Wir
Ten
Cali | ind Speed: 10 pm
inperature: 28
ibration results before
15.5 dBA | Speed_ | 70 mph | Humidity: | BA |
| Wir
Ten
Cali
Ob-8 Leq
L10 | ibration results before US.5 dBA | Speed_re: 11 - 7 | 70 mph dBA and after _ | Humidity: | BA
BA |
| Wir
Ten
Cali
WM Leq | ibration results before US.5 dBA | Speed_re: 11 - 2 Lmin 55 L50 | 70 mph dBA and after dBAdBA | Humidity: | BA
BA |

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TRAFFIC NOISE MONITORING LOG SHEET

| | | Description: | (1) | Noise Source: | Tarea | Data |
|-------|----------|-----------------------|----------------------|---------------|-----------------|----------|
| | | mber: 235 | 811 | | mis RM + Mull | ovision |
| | _ | | l/serial # | Data l | | O (SOUL) |
| | Location | n Description:_ | BALLEMIA | RAD | | |
| | | n Diagram: | need to be direction | nal s | | |
| | | 1 | | 3/2 | | |
| | | Tra | 1/30/01/8 | 18/ | | |
| | | / | 10/1/3 | E / 14 | 15-4 | |
| | | t Time: | | Stop Time: | Duration | n: |
| | | : 05 AM (M) | | 13: 80 AMPM | 2.1 | |
| | | peed: 6 | | 70 mph | Wind Direction: | |
| | | rature: 84° | | | 1/4 dB | |
| TNM | | $\frac{1.3}{1.3}$ dBA | Lmin 49, | | Lmax 80,1 dBA | |
| 70.3 | L10 | dBA | L50 | | L90 dB. | |
| Direc | / | Autos | Medium Trucks | Heavy Trucks | Motorcycles | Buses |
| | 1 | | MIMIM | MAMM | | |
| 1 |) | 244 | 0 | THE WINDS | | |
| | | 976 | (4) 56 | 111 11 192 | | |
| (| | | Hry | WHITH | (| |
| |) [| 140 | 1 711 | HH HY AH | | |
| | | 400 | (10) | 州州州 | 4 | |
| | | | 10 | WA UB | | |
| | | | | 41 00 | | |

Appendix C February 2015

| | TRA | FFIC NOISE M | ONITORING LO | G SHEET | Potabl |
|--------------|----------------------|--|--|-----------------|--------|
| Proje | ect Description: | 1-77 | Local | ron C | DW-1 |
| Job N | Number: UF | 849 | Noise Source: | walke | |
| Date | \$1710 | | Ву:_ 🤄 | em tru | |
| Equi | pment make/model | /serial # | Data F | ile: #5 | 5 |
| Loca | tion Description: | RUSS R | muse Rd. | (Loc. | D)_ |
| 17 | n drive w | ay | | | |
| | tion Diagram: | 9 | | | |
| | Traffic counts n | | | | |
| | | 1-7765B | 2 | | |
| | 22.3 | -72 -> MT | 25 rood and | | |
| | N. A. | TO drive way | ~ | | |
| | -mouse, | VO SUR WAR | 400 | | |
| | 13 | pond) | 2 | | |
| 9 | tart Time: | | Stop Time: | Durati | on: |
| 5 | 2: 10 AM 6N | | 2:25AMPM) | | CIMI |
| Win | d Speed: 6 m | | 0 | /ind Direction: | 77 |
| | perature: 91° | | 70 mph | Humidity: | |
| Calil | bration results befo | The state of the s | dBA and after | Secretary I | ВА |
| TIVIN |) A,D dBA | Limin 57 | | | BA |
| 71.9 (Leq | dBA | 150 | / | - | BA |
| 10 | Autos | Medium Trucks | | Motorcycles | Buses |
| Direction | | MICHIGHT LIGHT | | | |
| Direction | 1100 | //H/11×1/1 | HT W | 1 | 1 |
| Direction | 200 | 州州川 | Hinter WI | 1 | 1 |
| Direction | 311 | 14 HJIII 117) 68 | THI WITH | 1 | 1 |
| Direction | 377 | 州州川 | HI LITTURE LAND LAND LAND LAND LAND LAND LAND LAND | 1 | 1 |
| Direction | 311 | 州州川 | HILLIAN HI | 1 | \$ |
| Direction | 311 | 州州川 | HILLIAN HIS | 4 | * |
| Direction S | 311 | 州州川 | HILLIAN HI
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| | TR | AFFIC NOISE M | ONITORING LO | G SHEET | Data A | |
|------------------|-----------------------|--|--|-------------|---------|--|
| Proje | ect Description: | 1-77 | | -01 | D | |
| | Number: 235 | 849 | Noise Source: tvalaic. | | | |
| Date | 2/2-1 | | By: | 10.011 | | |
| | pment make/mod | el/scrial # | Data I | 111 - | | |
| Loca | ation Description: | ang- THA | Gy. — | | | |
| S | tart Time: | D | top Time: | Duration: | Mun | |
| | perature: 9 | | dBA and after | | BA | |
| as Call | bration results be | | 1 | Tmax 83.7dB | | |
| TVM (Lea | ARA | / min / 1 / 1 | W dBA | | | |
| 70.0 (Leq | dBA dBA | [Lmin] [p] | 1 | | ВА | |
| 70.0 Leq
Lib | dBA dBA | L50 Medium Trucks | _dBA | | BA Buse | |
| 70.0 (Leq
L10 | dBA | 1.50 | _dBA | 1.90 d1 | | |
| 70.0 (Leq
L10 | dBA Autos | Medium Trucks HT 1H W Medium Trucks | dBA Heavy Trucks | Motorcycles | Buse | |
| Direction | dBA Autos | Medium Trucks HT 1H (4) | Heavy Trucks HI H | Motorcycles | | |
| Direction | dBA Autos 530 /viiii | Medium Trucks HT 1H W IF IT IN | dBA Heavy Trucks | Motorcycles | Buse | |

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TRAFFIC NOISE MONITORING LOG SHEET

| - | ct Description: | 111 | | Locatio | n | |
|----------------------------|--|---|--|---|--------------------------|--|
| Job N | lumber: 2358 | N9 | Noise Source: | traffic | | |
| Date: | 8130 | | By: | | | |
| Equip | oment make/mod | del/serial # | Data I | File: | | |
| Loca | tion Description: | 15:00 | mobility | passyrge) | n- M | |
| Locat | tion Diagram: | | | | | |
| • | Traffic counts | need to be direction | nal | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| St | art Time: | \$ | Stop Time: | Durat | ion: | |
| | | | are not as the same of | | | |
| Q | S: SOAMPA | A) " | 3: CTAMPM | K | 1110 | |
| | 5: 80 AM @ | | 3:45 AM PM | | N | |
| Wind | Speed: | ngn_ | V | Wind Direction: | N | |
| Wind | | ngn_ | | | N | |
| Wind
Temp
Calib | Speed: | Speed | V | Wind Direction:
Humidity: | N | |
| Wind
Temp
Calib | Speed: | Speed_ | 75 mph dBA and after | Wind Direction:
Humidity:d | N
HH
BA | |
| Wind Temp Calib | ocrature: 4 ration results be | Speed_fore: \\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75_mph
dBA and after
.9_dBA | Wind Direction: Humidity: d Lmax | N
BA
BA | |
| Wind Temp Calib | ocrature: 4 ration results be 779dBA dBA | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax | N
H
BA
BA
BA | |
| Wind Temp Calib | ocrature: 4 ration results be | Speed_fore: \\\\ \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75_mph
dBA and after
.9_dBA | Wind Direction: Humidity: d Lmax | N
BA
BA | |
| Wind Temp Calib NM Leq L10 | ocrature: 4 ration results be 779dBA dBA | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax | N
H
BA
BA
BA | |
| Wind Temp Calib | ocrature: 4 ration results be 779dBA dBA | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be 7.9dBA dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax | N
H
BA
BA
BA | |
| Wind Temp Calib NM Leq L10 | ocrature: 4 ration results be 779dBA dBA | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax) d Wind Direction: d d Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be 7.9dBA dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax) d Wind Direction: d d Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be 7.9dBA dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax) d Wind Direction: d d Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib | ration results be 7.9dBA dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | TS mph dBA and after 9 dBA dBA Heavy Trucks HH HH HH HH HH HH HH HH HH | Wind Direction: Humidity: d Lmax Add Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib | ration results be 7.9dBA dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 75 mph dBA and after 9 dBAdBA | Wind Direction: Humidity: d Lmax) d Wind Direction: d d Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be dBA Autos | Speed fore: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | TS mph dBA and after 9 dBA dBA Heavy Trucks HH HH HH HH HH HH HH HH HH | Wind Direction: Humidity: d Lmax Add Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be 7.9dBA dBA Autos | Speed fore: \\\ \Lmin \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | TS mph dBA and after S.9 dBA dBA Heavy Trucks HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI HI | Wind Direction: Humidity: d Lmax Add Motorcycles | BA
BA
BA
Buses | |
| Wind Temp Calib NM Leq L10 | ration results be dBA Autos | Speed fore: \\\\ \Lmin \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | TS mph dBA and after 9 dBA dBA Heavy Trucks HH HH HH HH HH HH HH HH HH | Wind Direction: Humidity: d Lmax Add Motorcycles | BA
BA
BA
Buses | |

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APPENDIX D: FEASIBLE/REASONABLE WORKSHEETS

Appendix D February 2015

Feb 4, 2015 Date: 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 Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed 67 noise abatement measure Is the proposed noise abatement measure acoustically feasible? ☐ Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? □ Yes Topography Yes No Safety Drainage Yes Utilities Yes Maintenance Access Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | | | |
|---|-------------------------|---|---|
| Number of Benefited Receivers | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | |
| | E: SCDOT Policy i | hat would achieve at least a 8 dBA reduction from ndicates that 80% of the benefited receivers in the or it to be reasonable. | |
| Does the proposed noise abatement measure n | | | |
| If "Yes" is marked, continue to |) #2. If "No" is mar | ked, 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 B NOTE: SCDOT Policy states that the preliminary a specific construction cost should be applied at a cost | noise analysis is based | on \$35.00 per square foot and a more project- Yes No | |
| If "Yes" is marked, continue to |) #3. If "No" is mar | ked, 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 | ve) | | |
| 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 owner abatement measure be reasonable? NOTE: So constructed unless greater than 50% of the ber | CDOT Policy indica | ites that the noise abatement shall be Yes No | 0 |
| Final Determination for Noise Abatement Measur | ·e | | |
| | | | |
| | | | |
| | | | |

| TT 1 /T 00 PT 4 | 41 4 | 134 | -! D ' | D | | | | |
|---|------------|-----------------------|--------------|-----------|-----------|-------------|-----------|------------------|
| Highway Traffic Nois | e Abaten | ient Measure No | oise Barri | er B | | | | |
| Feasibility | | | | | | | | |
| Number of Impacted R | eceivers | 2 | | Number o | of Benefi | ed Receive | ers 0 | |
| Percentage of Impacted noise abatement measurement | | rs that would achie | ve a 5 dBA | reduction | from the | proposed | 0 | |
| Is the proposed noise ab
NOTE:SCDOT Policy i
achieve at least a 5 dBA | ndicates t | hat 75% of the imp | acted recei | | | Yes | \times | No |
| Would any of | he follow | ring issues limit the | ability of t | he abatem | nent meas | ure to achi | eve the n | oise reduction g |
| | Topog | raphy | | Yes | | No | | |
| | Safety | | | Yes | | No | | |
| | Draina | age | | Yes | | No | | |
| | Utiliti | es | | Yes | | □ No | | |
| | Maint | enance | | Yes | | No | | |
| | Acces | S | | Yes | | No | | |
| | Expos | ed Height of Wall | | Yes | | No | | |
| If | "Yes" v | was marked for a | any of the | question | ıs above | , please e | xplain b | elow. |
| escription | | | | | | | | |
| • | | | | | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | |
|---|-------------------------|---|---|
| Number of Benefited Receivers | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | |
| | E: SCDOT Policy i | hat would achieve at least a 8 dBA reduction from ndicates that 80% of the benefited receivers in the or it to be reasonable. | |
| Does the proposed noise abatement measure n | | | |
| If "Yes" is marked, continue to |) #2. If "No" is mar | ked, 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 B NOTE: SCDOT Policy states that the preliminary a specific construction cost should be applied at a cost | noise analysis is based | on \$35.00 per square foot and a more project- Yes No | |
| If "Yes" is marked, continue to |) #3. If "No" is mar | ked, 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 | ve) | | |
| 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 owner abatement measure be reasonable? NOTE: So constructed unless greater than 50% of the ber | CDOT Policy indica | ites that the noise abatement shall be Yes No | 0 |
| Final Determination for Noise Abatement Measur | ·e | | |
| | | | |
| | | | |
| | | | |

Feb 4, 2015 Date: 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 93 noise abatement measure Is the proposed noise abatement measure acoustically feasible? × Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? Topography No Yes No Safety Drainage \times No Utilities Yes Maintenance No Access □ Yes No Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | |
|---|--|
| Number of Benefited Receivers 25 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| | g rows that would achieve at least a 8 dBA reduction from Policy indicates that 80% of the benefited receivers in the auction for it to be reasonable. |
| Does the proposed noise abatement measure meet the nois | |
| 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 Rec
NOTE: SCDOT Policy states that the preliminary noise analysis
specific construction cost should be applied at a cost per square f | s is based on \$35.00 per square foot and a more project- 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 resid | ents 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 reside abatement measure be reasonable? NOTE: SCDOT Polic constructed unless greater than 50% of the benefited reception. | ey indicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
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| | | 27.1 | | | |
|--|---------------------|----------------------|---------------------|----------------------|--------------------------|
| Highway Traffic No | oise Abatement 1 | Measure Noise | Barrier D | | |
| Feasibility | | | | | |
| Number of Impacted | Receivers 1 | | Number of | Benefited Receiver | s 0 |
| Percentage of Impac
noise abatement mea | | t would achieve a | 5 dBA reduction fr | om the proposed | 0 |
| Is the proposed noise
NOTE:SCDOT Polic
achieve at least a 5 dl | y indicates that 7 | 5% of the impacte | d receivers must | ☐ Yes | ⊠ No |
| Would any o | of the following is | ssues limit the abil | ity of the abatemer | nt measure to achiev | ve the noise reduction g |
| | Topograph | y | Yes | □ No | |
| | Safety | | Yes | □ No | |
| | Drainage | | Yes | No No | |
| | Utilities | | Yes | No No | |
| | Maintenand | ce | Yes | No No | |
| | Access | | Yes | □ No | |
| | Exposed H | eight of Wall | ☐ Yes | □ No | |
| | If "Yes" was 1 | marked for any | of the questions | above, please ex | plain below. |
| | | | | | |
| escription | | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | |
|---|-------------------------|---|---|
| Number of Benefited Receivers | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | |
| | E: SCDOT Policy i | hat would achieve at least a 8 dBA reduction from ndicates that 80% of the benefited receivers in the or it to be reasonable. | |
| Does the proposed noise abatement measure n | | | |
| If "Yes" is marked, continue to |) #2. If "No" is mar | ked, 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 B NOTE: SCDOT Policy states that the preliminary a specific construction cost should be applied at a cost | noise analysis is based | on \$35.00 per square foot and a more project- Yes No | |
| If "Yes" is marked, continue to |) #3. If "No" is mar | ked, 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 | ve) | | |
| 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 owner abatement measure be reasonable? NOTE: So constructed unless greater than 50% of the ber | CDOT Policy indica | ites that the noise abatement shall be Yes No | 0 |
| Final Determination for Noise Abatement Measur | ·e | | |
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Feb 4, 2015 Date: 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 100 noise abatement measure Is the proposed noise abatement measure acoustically feasible? × Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? Topography No Yes No Safety Drainage \times No Utilities Yes Maintenance No Access □ Yes No Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | |
|---|---|
| Number of Benefited Receivers 26 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rother proposed noise abatement measure. NOTE: SCDOT Polifirst two building rows must achieve at least a 8 dBA reduction | icy indicates that 80% of the benefited receivers in the 42 |
| Does the proposed noise abatement measure meet the noise re
If "Yes" is marked, continue to #2. If "No" is | eduction design goal? Yes No 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 Receiv NOTE: SCDOT Policy states that the preliminary noise analysis is be specific construction cost should be applied at a cost per square foot | pased on \$35.00 per square foot and a more project- 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 resident | s 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 abatement measure be reasonable? NOTE: SCDOT Policy in constructed unless greater than 50% of the benefited receptors | ndicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
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| Highway Traffic Noise Abaten | nent Measure N | oise Barrier | F
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|---|----------------------|------------------|-------------------|--------------|---------------------|
| <u>Feasibility</u> | | | | | |
| Number of Impacted Receivers | 37 | Nui | nber of Benefite | d Receivers | 54 |
| Percentage of Impacted Receiver
noise abatement measure | rs that would achie | ve a 5 dBA red | uction from the p | roposed | 100 |
| Is the proposed noise abatement in NOTE:SCDOT Policy indicates the achieve at least a 5 dBA reduction | hat 75% of the imp | acted receivers | must | Yes | □ No |
| Would any of the follow | ing issues limit the | ability of the a | batement measu | e to achieve | the noise reduction |
| Topog | raphy | | Yes 🗵 | No | |
| Safety | | | Yes 🔀 | No | |
| Draina | ige | | Y es 🔀 | No | |
| Utiliti | es | | Y es 🔀 | No | |
| Mainte | enance | | Yes × | No | |
| Acces | S | | Yes × | No | |
| Expos | ed Height of Wall | | Yes 🔀 | No | |
| If "Yes" v | was marked for a | any of the qu | estions above, | please exp | lain below. |
| escription | | | | | |
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Reasonableness

| #1: Noise Reduction Design Goal | |
|--|---|
| Number of Benefited Receivers 54 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| | ding rows that would achieve at least a 8 dBA reduction from DT Policy indicates that 80% of the benefited receivers in the eduction for it to be reasonable. |
| Does the proposed noise abatement measure meet the n | |
| If "Yes" is marked, continue to #2. If "I | 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 I
NOTE: SCDOT Policy states that the preliminary noise analy
specific construction cost should be applied at a cost per squa | ysis is based on \$35.00 per square foot and a more project- Yes No |
| If "Yes" is marked, continue to #3. If "I | No" is marked, then abatement is determined NOT to be reasonable. |
| #3: Viewpoints of the property owners and res | sidents 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 resabatement measure be reasonable? NOTE: SCDOT Poconstructed unless greater than 50% of the benefited reasonable. | olicy indicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
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|---|---------------|-----------------------|----------------------|-------------|-----------------|---------------------------|
| Highway Traffic | Noise Abaten | nent Measure N | oise Barrier | Ĵ
 | | |
| <u>Feasibility</u> | | | | | | |
| Number of Impacted Receivers 6 | | | Nu | nber of Ben | rs 6 | |
| Percentage of Impanoise abatement m | | rs that would achie | →
eve a 5 dBA red | uction from | the proposed | 67 |
| Is the proposed noi
NOTE:SCDOT Pol
achieve at least a 5 | icy indicates | that 75% of the imp | pacted receivers | must | ☐ Yes | × No |
| Would any | of the follow | ving issues limit the | e ability of the a | batement m | easure to achie | eve the noise reduction g |
| | Тород | raphy | | Yes | □ No | |
| | Safety | , | | Yes | □ No | |
| | Drains | age | | Yes | No | |
| | Utiliti | es | | Yes | No No | |
| | Maint | enance | | Yes | □ No | |
| | Acces | S | | Yes | □ No | |
| | Expos | ed Height of Wall | | Yes | □ No | |
| | If "Yes" | was marked for | any of the qu | estions abo | ove, please ex | xplain below. |
| | | | | | | |
| escription | | | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | |
|---|-------------------------|---|---|
| Number of Benefited Receivers | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | |
| | E: SCDOT Policy i | hat would achieve at least a 8 dBA reduction from ndicates that 80% of the benefited receivers in the or it to be reasonable. | |
| Does the proposed noise abatement measure n | | | |
| If "Yes" is marked, continue to |) #2. If "No" is mar | ked, 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 B NOTE: SCDOT Policy states that the preliminary a specific construction cost should be applied at a cost | noise analysis is based | on \$35.00 per square foot and a more project- Yes No | |
| If "Yes" is marked, continue to |) #3. If "No" is mar | ked, 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 | ve) | | |
| 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 owner abatement measure be reasonable? NOTE: So constructed unless greater than 50% of the ber | CDOT Policy indica | ites that the noise abatement shall be \square Yes \square No | o |
| Final Determination for Noise Abatement Measur | ·e | | |
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|---|---------------------------|--------------------------|--------------------|---------------------------|
| Highway Traffic Noise Al | patement Measure No | oise Barrier H | | |
| Feasibility | | | | |
| Number of Impacted Recei | vers 4 | Number of E | rs 0 | |
| Percentage of Impacted Renoise abatement measure | ceivers that would achiev | ve a 5 dBA reduction fro | om the proposed | 0 |
| Is the proposed noise abater
NOTE:SCDOT Policy indic
achieve at least a 5 dBA red | ates that 75% of the imp | acted receivers must | ☐ Yes | × No |
| Would any of the f | ollowing issues limit the | ability of the abatemen | t measure to achie | eve the noise reduction g |
| Т | Copography | ☐ Yes | □ No | |
| S | Safety | Yes | □ No | |
| Ι | Orainage | Yes | □ No | |
| J | Jtilities | Yes | □ No | |
| N | Maintenance | Yes | □ No | |
| A | Access | Yes | □ No | |
| F | Exposed Height of Wall | Yes | □ No | |
| If "Y | es" was marked for a | any of the questions a | above, please ex | xplain below. |
| escription | | | | |
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Reasonableness

| #1: Noise Reduction Design Goal | | | |
|---|-------------------------|---|---|
| Number of Benefited Receivers | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | |
| | E: SCDOT Policy i | hat would achieve at least a 8 dBA reduction from ndicates that 80% of the benefited receivers in the or it to be reasonable. | |
| Does the proposed noise abatement measure n | | | |
| If "Yes" is marked, continue to |) #2. If "No" is mar | ked, 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 B NOTE: SCDOT Policy states that the preliminary a specific construction cost should be applied at a cost | noise analysis is based | on \$35.00 per square foot and a more project- Yes No | |
| If "Yes" is marked, continue to |) #3. If "No" is mar | ked, 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 | ve) | | |
| 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 owner abatement measure be reasonable? NOTE: So constructed unless greater than 50% of the ber | CDOT Policy indica | ites that the noise abatement shall be \square Yes \square No | o |
| Final Determination for Noise Abatement Measur | ·e | | |
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| Highway Traffic Noise Abatemo | ont Massura No | oise Barrier | Г | | |
|---|---------------------|------------------|-------------------------|---------------|-----------------------|
| mgnway Traine Noise Abatem | ent ivieasure inc | JISC Dairiei | L | | |
| Feasibility | | | | | |
| Number of Impacted Receivers | 12 | Nuı | 14 | | |
| Percentage of Impacted Receivers noise abatement measure | that would achiev | ve a 5 dBA red | uction from the J | proposed | 100 |
| Is the proposed noise abatement m
NOTE:SCDOT Policy indicates th
achieve at least a 5 dBA reduction | at 75% of the imp | acted receivers | must | Yes | □ No |
| Would any of the following | ng issues limit the | ability of the a | batement measu | re to achieve | e the noise reduction |
| Topogr | aphy | | Yes | No | |
| Safety | | | Yes × | No | |
| Drainag | ge | | Yes $\overline{\times}$ | No | |
| Utilities | 5 | | Yes $\overline{\times}$ | No | |
| Mainte | nance | | Yes X | No | |
| Access | | | Yes $\overline{\times}$ | No | |
| Expose | d Height of Wall | | Yes | No | |
| If "Yes" w | as marked for a | any of the qu | estions above, | please exp | lain below. |
| escription | | | | | |
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Reasonableness

| #1: Noise Reduction Design Goal | |
|--|---|
| Number of Benefited Receivers 14 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rother proposed noise abatement measure. NOTE: SCDOT Pofirst two building rows must achieve at least a 8 dBA reduction. | on for it to be reasonable. |
| Does the proposed noise abatement measure meet the noise re 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 Receiv NOTE: SCDOT Policy states that the preliminary noise analysis is specific construction cost should be applied at a cost per square foot | based on \$35.00 per square foot and a more project- 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 resident | ts 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 abatement measure be reasonable? NOTE: SCDOT Policy in constructed unless greater than 50% of the benefited receptors | ndicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
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| Highway Traffic N | oise Abaten | nent Measure No | oise Barrie | er J | | | | |
|--|---------------|----------------------|---------------|-------------|------------|--------------|------------------|-----|
| | | | | | | | | |
| <u>Feasibility</u> | | | _ | | | | | |
| Number of Impacted Receivers 24 | | | 1 | Number of | 22 | | | |
| Percentage of Impac | | rs that would achiev | ue a 5 dBA 1 | eduction fi | rom the p | roposed | 79 | |
| noise abatement mea | isure | | | | | | | |
| Is the proposed noise
NOTE:SCDOT Polic
achieve at least a 5 d. | y indicates | that 75% of the imp | acted receiv | | \times | Yes | □ No | |
| | | | • | | | | | |
| Would any | of the follow | ing issues limit the | ability of th | e abateme | nt measur | e to achieve | the noise reduct | ion |
| | Тород | graphy | | Yes | \times | No | | |
| | Safety | 7 | | Yes | \times | No | | |
| | Drain | age | | Yes | \times | No | | |
| | Utiliti | es | | Yes | \times | No | | |
| | Maint | enance | | Yes | \times | No | | |
| | Acces | S | | Yes | \times | No | | |
| | Expos | ed Height of Wall | | Yes | $[\times]$ | No | | |
| | If "Yes" | was marked for a | any of the | questions | above, p | olease exp | lain below. | |
| | | | | | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | | | |
|--|---|--|--|--|--|
| Number of Benefited Receivers 22 | Number of Benefited Receivers that achieve at least an 8 dBA reduction | | | | |
| Percentage of Benefited Receivers in the first two building root the proposed noise abatement measure. NOTE: SCDOT Polifirst two building rows must achieve at least a 8 dBA reduction | icy indicates that 80% of the benefited receivers in the 36 | | | | |
| Does the proposed noise abatement measure meet the noise red If "Yes" is marked, continue to #2. If "No" is n | duction design goal? Yes No 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. | | | | | |
| 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 | s 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. | | | | | |
| Final Determination for Noise Abatement Measure | | | | | |
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Feb 4, 2015 Date: 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 Is the proposed noise abatement measure acoustically feasible? × Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? Topography No Yes No Safety Drainage \times No Utilities Yes Maintenance No Access □ Yes No Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | |
|---|---|
| Number of Benefited Receivers 83 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rother proposed noise abatement measure. NOTE: SCDOT Pol first two building rows must achieve at least a 8 dBA reduction | icy indicates that 80% of the benefited receivers in the 47 |
| Does the proposed noise abatement measure meet the noise re If "Yes" is marked, continue to #2. If "No" is | eduction design goal? Yes No 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 Receiv NOTE: SCDOT Policy states that the preliminary noise analysis is be specific construction cost should be applied at a cost per square foot | pased on \$35.00 per square foot and a more project- 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 resident | s 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 abatement measure be reasonable? NOTE: SCDOT Policy in constructed unless greater than 50% of the benefited receptors | ndicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
| | |
| | |

Feb 4, 2015 Date: 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 Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed 100 noise abatement measure Is the proposed noise abatement measure acoustically feasible? × Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? Topography No Yes No Safety Drainage \times No Utilities Yes Maintenance No Access □ Yes No Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | | | | | |
|--|------------------------|--|---------|--|--|
| Number of Benefited Receivers 4 | | Number of Benefited Receivers th achieve at least an 8 dBA reductio | 1/1 | | |
| | NOTE: SCDOT Policy is | hat would achieve at least a 8 dBA reduction ndicates that 80% of the benefited receivers i r it to be reasonable. | | | |
| Does the proposed noise abatement mean If "Yes" is marked, conti | | ion design goal? Xes No | | | |
| #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 ov | vners and residents of | the benefitted receivers | | | |
| Number of Benefited Receivers (same a | s above) | | | | |
| Number of Benefited Receivers in support of noise abatement measure | | Percentage of Benefited Receivers in support of noise abatement mea | | | |
| Number of Benefited Receivers opposed to noise abatement measure | | Percentage of Benefited Receivers opposed to noise abatement measurement measu | | | |
| Number of Benefited Receivers that die respond to solicitation on noise abatem measure | | Percentage of Benefited Receivers did not respond to solicitation on 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. | | | | | |
| Final Determination for Noise Abatement N | 1easure | | | | |
| | | | | | |
| | | | | | |

| Highway Traffic Noise A | Abatement Measure N | Toise Barrier M | | |
|---|----------------------------|---------------------------|-----------------------|-------------------------|
| <u>Feasibility</u> | | | | |
| Number of Impacted Reco | eivers 1 | Number of | Benefited Receivers | 1 |
| Percentage of Impacted R noise abatement measure | eceivers that would achie | eve a 5 dBA reduction fi | rom the proposed | 100 |
| Is the proposed noise abate
NOTE:SCDOT Policy ind
achieve at least a 5 dBA re | icates that 75% of the imp | pacted receivers must | × Yes | □ No |
| Would any of the | following issues limit the | e ability of the abatemen | nt measure to achieve | e the noise reduction g |
| | 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 exp | lain below. |
| escription | | | | |
| _ | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | | | |
|--|-----------------------|---|--|--|--|
| Number of Benefited Receivers 1 | | Number of Benefited Receivers that achieve at least an 8 dBA reduction | | | |
| | NOTE: SCDOT Policy in | nat would achieve at least a 8 dBA reduction from adicates that 80% of the benefited receivers in the tit to be reasonable. | | | |
| Does the proposed noise abatement measur If "Yes" is marked, continu | | on design goal? Xes No ed, then abatement is determined NOT to be reasonable. | | | |
| | | | | | |
| #2: Cost Effectiveness | | | | | |
| Estimated cost per square foot for noise abatement measure | 5 | Estimated construction cost for noise abatement measure 483,000 | | | |
| Estimated cost per Benefited Receiver 48 | 83,000 | | | | |
| 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 own | ners and residents of | the benefitted receivers | | | |
| Number of Benefited Receivers (same as a | 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 respond to solicitation on noise abatemen 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. | | | | | |
| Final Determination for Noise Abatement Mea | asure | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

| Highway Traffic Noise | Abatement Measure | Noise Barrie | r N | | | | |
|---|---|-------------------|--------------|-----------|--------------|-----------|-----------|
| | | | | | | | |
| <u>Feasibility</u> | | | | | | | |
| Number of Impacted Re | ceivers 9 | N | umber of B | senefited | Receivers | 12 | |
| Percentage of Impacted noise abatement measur | Receivers that would achi | eve a 5 dBA re | eduction fro | m the p | roposed | 100 | |
| NOTE:SCDOT Policy in | tement measure acoustica
dicates that 75% of the im
reduction for it to be acou | npacted receive | | \times | Yes | |) |
| Would any of th | e following issues limit th | ne ability of the | e abatement | measur | e to achieve | the noise | reduction |
| | Topography | | Yes | \times | No | | |
| | Safety | | Yes | \times | No | | |
| | Drainage | | Yes | \times | No | | |
| | Utilities | | Yes | \times | No | | |
| | Maintenance | | Yes | \times | No | | |
| | Access | | Yes | \times | No | | |
| | Exposed Height of Wall | 1 | Yes | \times | No | | |
| If | 'Yes" was marked for | any of the q | uestions a | ıbove, p | olease expl | ain belov | v. |
| scription | | | | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | | | | | | |
|--|-----------------------|--|-----------|--|--|--|
| Number of Benefited Receivers 12 | | Number of Benefited Receivers the achieve at least an 8 dBA reduction | 110 | | | |
| 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 measur If "Yes" is marked, continu | | on design goal? Xes No | | | | |
| #2: Cost Effectiveness | | | | | | |
| Estimated cost per square foot for noise abatement measure | 5 | Estimated construction cost for noise abatement measure | 1,008,000 | | | |
| Estimated cost per Benefited Receiver 84 | 4,000 | | | | | |
| 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 own | ners and residents of | the benefitted receivers | | | | |
| Number of Benefited Receivers (same as a | above) | | | | | |
| Number of Benefited Receivers in support of noise abatement measure | | Percentage of Benefited Receivers in support of noise abatement mea | | | | |
| Number of Benefited Receivers opposed to noise abatement measure | | Percentage of Benefited Receivers opposed to noise abatement measurement measu | | | | |
| Number of Benefited Receivers that did n respond to solicitation on noise abatemen measure | I | Percentage of Benefited Receivers did not respond to solicitation on 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. | | | | | | |
| Final Determination for Noise Abatement Mea | asure | | | | | |
| | | | | | | |
| | | | | | | |

| Highway Traffic Noise Aba | tement Measure No | oise Barrier O | | |
|---|--------------------------|--------------------------|-------------------|-------------------------|
| | | | | |
| Feasibility | | _ | | |
| Number of Impacted Received | ers 53 | Number of B | Benefited Receive | 75 75 |
| Percentage of Impacted Rece | vivers that would achiev | re a 5 dBA reduction fro | m the proposed | 83 |
| Is the proposed noise abateme
NOTE:SCDOT Policy indicat
achieve at least a 5 dBA reduce | tes that 75% of the impa | acted receivers must | × Yes | □ No |
| Would any of the fol | lowing issues limit the | ability of the abatement | measure to achi | eve the noise reduction |
| То | pography | □ Yes | × No | |
| Sa | fety | ☐ Yes | \bowtie No | |
| Dr | ainage | ☐ Yes | \bowtie No | |
| Ut | ilities | ☐ Yes | × No | |
| Ma | aintenance | ☐ Yes | \times No | |
| Ac | cess | ☐ Yes | \times No | |
| Ex | posed Height of Wall | Yes | × No | |
| If "Yes | s" was marked for a | ny of the questions a | ibove, please e | xplain below. |
| scription | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | |
|---|---|
| Number of Benefited Receivers 75 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rother proposed noise abatement measure. NOTE: SCDOT Polifirst two building rows must achieve at least a 8 dBA reduction | icy indicates that 80% of the benefited receivers in the 16 |
| Does the proposed noise abatement measure meet the noise re
If "Yes" is marked, continue to #2. If "No" is | eduction design goal? Yes No 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 Receiv NOTE: SCDOT Policy states that the preliminary noise analysis is be specific construction cost should be applied at a cost per square foot | pased on \$35.00 per square foot and a more project- 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 resident | s 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 abatement measure be reasonable? NOTE: SCDOT Policy in constructed unless greater than 50% of the benefited receptors | ndicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
| | |
| | |

| Highway Traffic Noise Abatement Measure | Noise Barrier P | | |
|--|----------------------------|------------------------|--------------------------|
| <u>Feasibility</u> | | | |
| Number of Impacted Receivers 4 | Number of | Benefited Receivers | 3 |
| Percentage of Impacted Receivers that would acl noise abatement measure | hieve a 5 dBA reduction f | from the proposed | 75 |
| Is the proposed noise abatement measure acoustic NOTE:SCDOT Policy indicates that 75% of the inachieve at least a 5 dBA reduction for it to be acoustic. | mpacted receivers must | × Yes | □ No |
| Would any of the following issues limit | the ability of the abateme | ent measure to achieve | e the noise reduction go |
| Topography | Yes | × No | |
| Safety | Yes | × No | |
| Drainage | Yes | × No | |
| Utilities | Yes Yes | × No | |
| Maintenance | Yes | ⊠ No | |
| Access | Yes | × No | |
| Exposed Height of Wa | all Yes | × No | |
| If "Yes" was marked fo | or any of the questions | s above, please exp | lain below. |
| Description | | | |
| | | | |

Reasonableness

| #1: Noise Reduction Design Goal | |
|--|---|
| Number of Benefited Receivers 3 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rethe proposed noise abatement measure. NOTE: SCDOT Pofirst two building rows must achieve at least a 8 dBA reduction. | olicy indicates that 80% of the benefited receivers in the 33 |
| Does the proposed noise abatement measure meet the noise r If "Yes" is marked, continue to #2. If "No" is | reduction design goal? Yes No s 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 Received NOTE: SCDOT Policy states that the preliminary noise analysis is specific construction cost should be applied at a cost per square foot | based on \$35.00 per square foot and a more project- 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 residen | ts 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 abatement measure be reasonable? NOTE: SCDOT Policy is constructed unless greater than 50% of the benefited receptor | indicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
| | |
| | |

Feb 4, 2015 Date: 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 Percentage of Impacted Receivers that would achieve a 5 dBA reduction from the proposed 100 noise abatement measure Is the proposed noise abatement measure acoustically feasible? × Yes No NOTE:SCDOT Policy indicates that 75% of the impacted receivers must achieve at least a 5 dBA reduction for it to be acoustically feasible. Would any of the following issues limit the ability of the abatement measure to achieve the noise reduction goal? Topography No Yes No Safety Drainage \times No Utilities Yes Maintenance No Access □ Yes No Exposed Height of Wall If "Yes" was marked for any of the questions above, please explain below. Detailed Description

Reasonableness

| #1: Noise Reduction Design Goal | | | | | |
|--|-----------------------|--|---------|--|--|
| Number of Benefited Receivers 9 | | Number of Benefited Receivers th
achieve at least an 8 dBA reduction | IX I | | |
| | NOTE: SCDOT Policy in | nat would achieve at least a 8 dBA reduction ndicates that 80% of the benefited receivers i r it to be reasonable. | | | |
| Does the proposed noise abatement measure of "Yes" is marked, conti | | on design goal? Xes No | | | |
| #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 a | as above) | | | | |
| Number of Benefited Receivers in support of noise abatement measure | | Percentage of Benefited Receivers in support of noise abatement me | | | |
| Number of Benefited Receivers opposed to noise abatement measure | | Percentage of Benefited Receivers opposed to noise abatement measurement measu | | | |
| Number of Benefited Receivers that div respond to solicitation on noise abatem measure | | Percentage of Benefited Receivers did not respond to solicitation on 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. | | | | | |
| Final Determination for Noise Abatement M | 1easure | | | | |
| | | | | | |
| | | | | | |

| Γ | | | | |
|---|---------------------------|-------------------------------|-----------------------|--|
| Highway Traffic Noise Abatement Measure | Noise Barrier R | | | |
| Feasibility | | | | |
| Number of Impacted Receivers 3 | Number of | Number of Benefited Receivers | | |
| Percentage of Impacted Receivers that would achi noise abatement measure | ieve a 5 dBA reduction f | rom the proposed | 100 | |
| Is the proposed noise abatement measure acoustical NOTE:SCDOT Policy indicates that 75% of the intachieve at least a 5 dBA reduction for it to be acousticated the second | npacted receivers must | × Yes | □ No | |
| Would any of the following issues limit the | he ability of the abateme | nt measure to achieve | e the noise reduction | |
| Topography | ☐ Yes | × No | | |
| Safety | Yes | × No | | |
| Drainage | Yes | × No | | |
| Utilities | ☐ Yes | × No | | |
| Maintenance | Yes | × No | | |
| Access | Yes | × No | | |
| Exposed Height of Wal | 1 Yes | × No | | |
| If "Yes" was marked for | any of the questions | above, please exp | lain below. | |
| escription | | | | |
| escription | | | | |

Reasonableness

| #1: Noise Reduction Design Goal | |
|---|---|
| Number of Benefited Receivers 5 | Number of Benefited Receivers that achieve at least an 8 dBA reduction |
| Percentage of Benefited Receivers in the first two building rother proposed noise abatement measure. NOTE: SCDOT Polifirst two building rows must achieve at least a 8 dBA reduction | icy indicates that 80% of the benefited receivers in the 0 |
| Does the proposed noise abatement measure meet the noise re If "Yes" is marked, continue to #2. If "No" is | eduction design goal? Yes No 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 Receiv NOTE: SCDOT Policy states that the preliminary noise analysis is be specific construction cost should be applied at a cost per square foot | pased on \$35.00 per square foot and a more project- Yes We 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 resident | s 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 abatement measure be reasonable? NOTE: SCDOT Policy in constructed unless greater than 50% of the benefited receptors | ndicates that the noise abatement shall be Yes No |
| Final Determination for Noise Abatement Measure | |
| | |
| | |

February 2015 Appendix D

APPENDIX E: TNM DATA FILES

Appendix E February 2015

Appendix J

Farmlands Worksheet

(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 | | 5. Federal Agency Involved | | | | | | | |
| 2. Type of Project | | 6. County and State | | | | | | | |
| PART II (To be completed by NRCS) | | Date Request Received by NRCS | | | 2. Person Completing Form | | | | |
| 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 I I NO I I | | | Acres Irrigated Average Farm Size | | | | |
| 5. Major Crop(s) | 6. Farmable Land | | nment Jurisdiction 7. Amount of Farmland As De | | | | nland As De | fined in FPPA | |
| | Acres: | | % | | 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) | | | Alternativ
Corridor A | idor For Segment ridor B | | | | | |
| A. Total Acres To Be Converted Directly | | | Corridor A | Corr | idor B | Cori | laor C | Corridor D | |
| B. Total Acres To Be Converted Indirectly, Or To Receive S | 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 | t To Be Converted | | | | | | | | |
| D. Percentage Of Farmland in Govt. Jurisdiction With Same | Or Higher Relativ | e Value | | | | | | | |
| PART V (To be completed by NRCS) Land Evaluation Info
value of Farmland to Be Serviced or Converted (Scale of | | Relative | | | | | | | |
| PART VI (To be completed by Federal Agency) Corrido | — í | aximum | | | | | | | |
| Assessment Criteria (These criteria are explained in 7 | | Points | | | | | | | |
| 1. Area in Nonurban Use | | 15 | | | | | | | |
| 2. Perimeter in Nonurban Use | | 10 | | | | | | | |
| Percent Of Corridor Being Farmed | | 20 | | | | | | | |
| Protection Provided By State And Local Government | | 20 | | | | | | | |
| 5. Size of Present Farm Unit Compared To Average | | 10 | | | | | | | |
| Creation Of Nonfarmable Farmland | | 25 | | | | | | | |
| 7. Availablility Of Farm Support Services | | 5 | | | | | | | |
| 8. On-Farm Investments | | 20 | | | | | | | |
| Effects Of Conversion On Farm Support Services | | 25 | | | | | | | |
| 10. Compatibility With Existing Agricultural Use | | 10 | | | | | | | |
| TOTAL CORRIDOR ASSESSMENT POINTS | | 160 | | | | | | | |
| PART VII (To be completed by Federal Agency) | | | | | | | | | |
| Relative Value Of Farmland (From Part V) | | 100 | | | | | | | |
| Total Corridor Assessment (From Part VI above or a local site assessment) | | 160 | | | | | | | |
| TOTAL POINTS (Total of above 2 lines) | | 260 | | | | | | | |
| Corridor Selected: 2. Total Acres of Farm | nlands to be 3. | Date Of S | Selection: | 4. Was | A Local Sit | e Assess | sment Used | l? | |
| Converted by Proje | ect: | | | | | | | | |
| | | | | | YES | NO | | | |
| 5. Reason For Selection: | <u> </u> | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Signature of Pers 2. of whole | | | | | DATE | | | | |
| O | - | | | | • | | | | |
| NOTE: Complete a form for each segment with r | more than one / | Alternat | e Corridor | | | | | | |

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.

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?

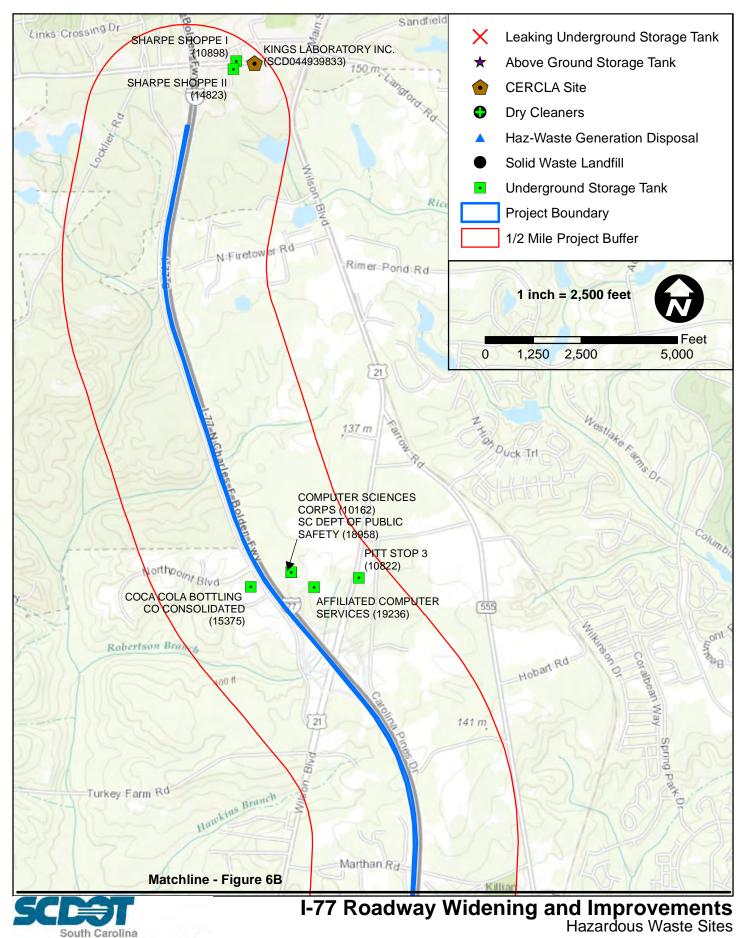
Proposed project is incompatible to existing agricultural use of surrounding farmland - 10 points

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

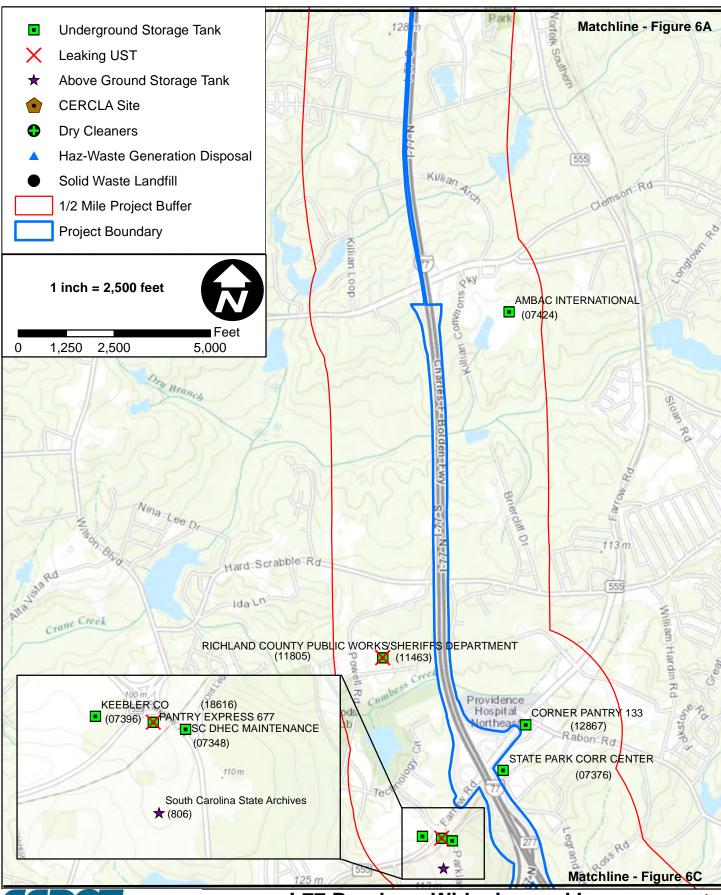
Appendix K

Hazardous Waste Sites Map



South Carolina Department of Transportation

Figure 6A

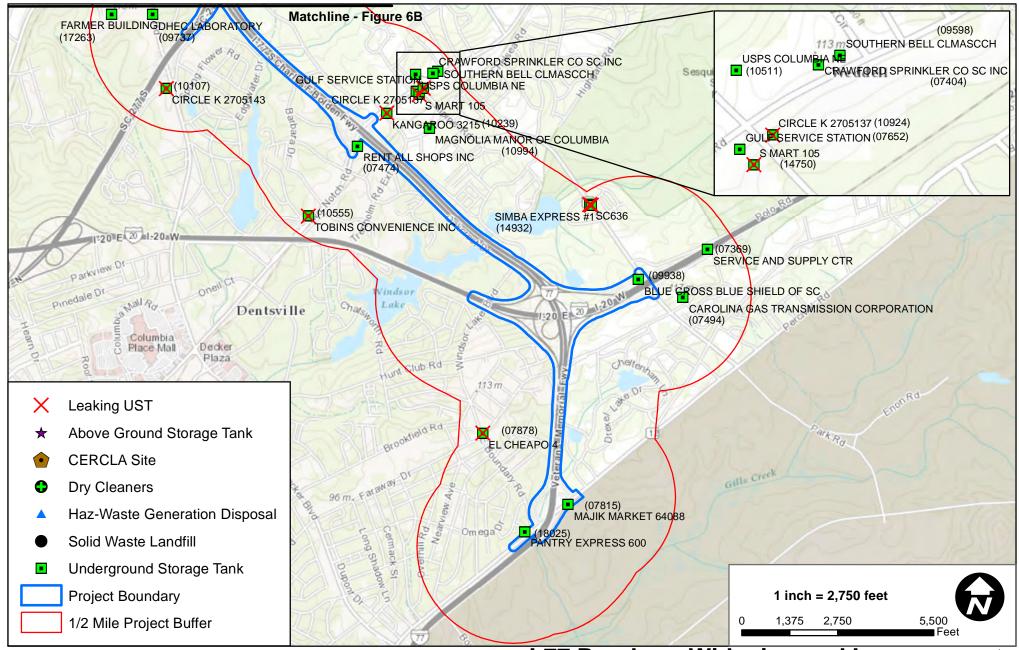


South Carolina

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