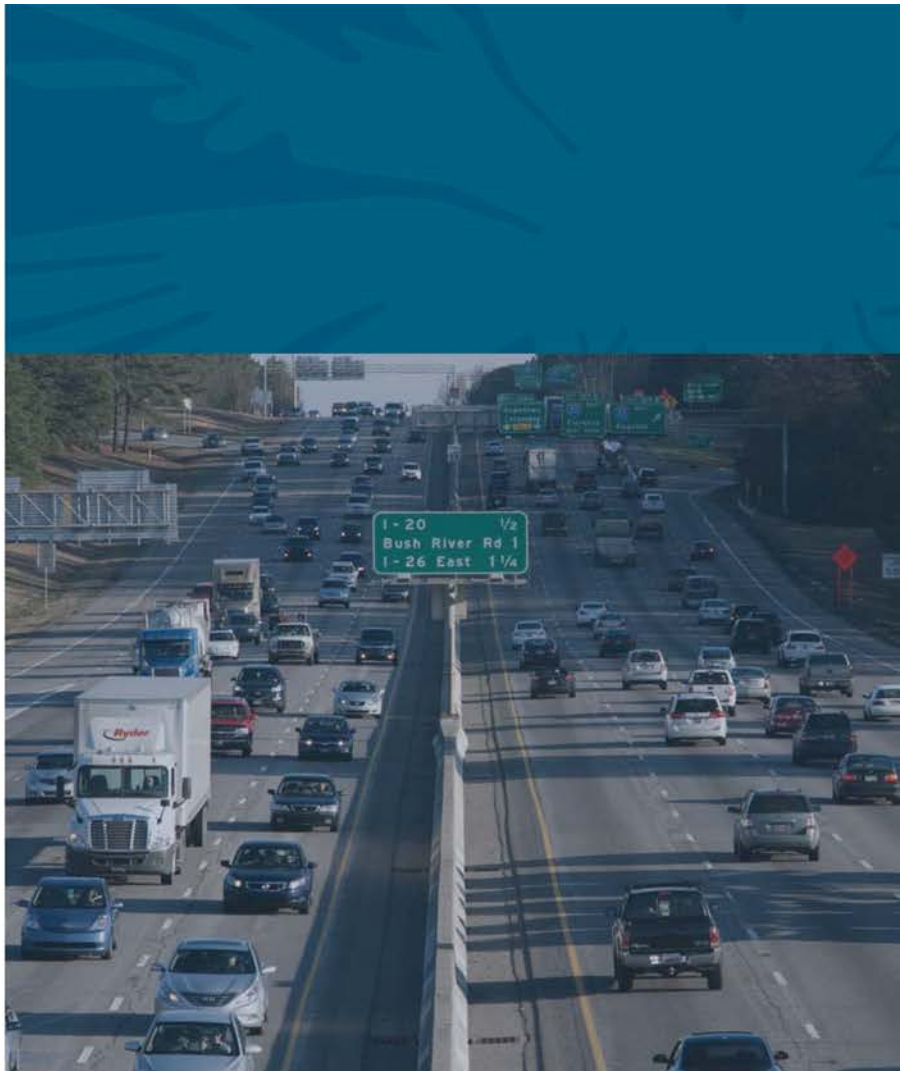


## **APPENDIX E**

### **Carolina Crossroads I-20/26/126**

### **Corridor Project Congestion Management**

### **Process Technical Memorandum**



# Congestion Management Process Technical Memorandum

*Carolina Crossroads*

*I-20/26/126 Corridor Project*

*Lexington and Richland Counties, South Carolina*





# Congestion Management Process Technical Memorandum

Carolina Crossroads

I-20/ 26/ 126 Corridor Project

Lexington and Richland Counties, South Carolina

Final Draft February 16, 2018

Prepared for  
South Carolina Department of Transportation,  
and the Federal Highway Administration

Prepared by



## Congestion Management Process

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# Congestion Management Process

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# Congestion Management Process

## 1 Introduction

Congestion management is the application of strategies to improve transportation system performance and reliability. FHWA's Congestion Management Process (CMP) is a systematic approach for managing congestion that provides accurate, up-to-date information on transportation system performance and assesses alternative strategies for congestion management that meet state and local needs. CMP is intended to move these congestion management strategies into the funding and implementation stages.<sup>1</sup>

A CMP is required for all metropolitan areas with a population over 200,000. The intent of the CMP is to outline a decision-making that is fully integrated into the metropolitan transportation planning process.

FHWA's CMP model defines eight actions of a successful CMP, which are outlined in the text box.

FHWA also defines the types of strategies that could aid in congestion management which *"will contribute to the more effective use and improved safety of existing and future transportation systems based on the established performance measures"*<sup>2</sup>; these strategies include:

### Congestion Management Process (CMP)

- Develop regional objectives for congestion management.
- Define CMP Network.
- Develop multimodal performance measures.
- Collection of data and monitor system performance to define the extent and duration of congestion.
- Analyze Congestion Problems and Needs.
- Identify and assess congestion management strategies.
- Program and implement strategies.
- Evaluate strategy effectiveness.

- Travel demand management (TDM) - strategies that reduce demand for single occupancy vehicle trips (SOV) or to shift demand out of the peak travel periods. Examples include: non-automotive travel modes (bicycle/pedestrian), ride-sharing, land use controls, flexible work patterns, and managed lanes.
- Traffic operations - strategies that aim to optimize the safe, efficient, and reliable use of existing transportation infrastructure. Examples include: HOV lanes, ramp metering, signal optimization, interchange reconfigurations, geometric improvements to roads and intersections.
- ITS technologies/Incident Management - strategies that apply technological solutions to improve the operation, safety and security of existing transportation systems. Examples include incident management, crash investigation areas.
- Public transportation improvements – strategies that improve transit operations, improving access to transit, and expanding transit service can help reduce the number of vehicles on the road by making transit more attractive or accessible. Examples include: expanded service, enhanced transit amenities, bike/pad connection accommodations at interchanges, improved access, bus rapid transit, and reserved travel lanes during peak hours.

<sup>1</sup> FHWA's *Congestion Management Process Guidebook*, April 2011

[https://www.fhwa.dot.gov/planning/congestion\\_management\\_process/cmp\\_guidebook/chap01.cfm#sec1.1](https://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/chap01.cfm#sec1.1)

<sup>2</sup> 23 CFR 450.320 (c)4



# Congestion Management Process

- Addition system capacity – strategies that add more capacity to the road network, such as additional lanes and new highways, as well as redesigning specific bottlenecks (such as interchanges and intersections) to increase their capacity.

## 2 Existing CMP Documents Relevant to the Study Area

### 2.1 COATS Congestion Management Plan

The Columbia Area Transportation Study (COATS) Metropolitan Planning Organization (MPO) developed their *2015 Congestion Management Plan* to meet the unique needs of the Columbia metropolitan area, in conjunction with development of the Long-Range Transportation Plan (LRTP), Transportation Improvement Program (TIP) and corridor studies.

The COATS CMP identified strategies consistent with federal guidance that could be assessed for congested corridor and intersections within the CMP network. Five congestion mitigation strategies included:

- Decreasing the need for trip making (strategies at regional level versus corridor level) – land use policies and regulations, flexible work hours.
- Shifting trips from automobiles to other modes – transit improvements, transit operational improvements, non-motorized modes (sidewalks, bicycle facilities, transit park and ride).
- Increasing the use of High Occupancy Vehicles (HOV) – vanpooling, ride share matching services.
- Enhancing operations on existing roadway facilities – intersection improvements, signal coordination, incident management, and access management.
- Increasing roadway capacity through additional arterial roadway capacity – widening and new roads.

The CMP network included approximately 500 miles of arterial roads, major collectors and minor collectors with the COATS MPO boundary. Interstates were not included in the plan because all performance monitoring, analysis and funding for interstate projects is programmed and implemented by SCDOT.

The CMP network overlaps sections of the Carolina Crossroads I-20/26/126 Corridor Project study area. Although the I-26 and I-20 interstates, themselves are not included, several of the crossing routes within study area were included in the network, including St Andrews Road, Bush River Road, Broad River Road, Harbison Boulevard and Lake Murray Boulevard. One transit corridor identified in the CMP also crosses through the study area– Corridor #7: Broad River/Harbison.

Based on the CMP assessment of congestion of the network, sections of Broad River Road, Bush River Road, Harbison Boulevard and Lake Murray Boulevard met the criteria for LOS E or LOS F near the interchanges of I-26 and/or I-20 and were considered congested.

### 2.2 Columbia Corridors Corridor Management Plan

The Columbia Corridors Corridor Management Plan is a planning-level study that considered approximately 90 miles of interstate corridors and 50 interchanges around the Columbia area, including I-26, I-126, I-20, I-77 and SC 277, with the intent of planning and prioritizing projects for the region that would improve traffic conditions

# Congestion Management Process

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through 2040. This study area focused on the entire Columbia area but overlapped the Carolina Crossroads I-20/26/126 Corridor Project study area; coordination occurred between the project teams on traffic data collection, development of the traffic model (Transmodeler), growth projections, et cetera.

The Columbia Corridors plan was intended to establish plans of action to address the corridors' existing and anticipated traffic volume and associated congestion. The plan accounted for the regions' economic development and the existing environmental restrictions of the surrounding area while assessing effective methods to manage new and existing facilities through the development and implementation of Transportation Demand Management (TDM) Strategies; Alternate Mode Strategies; Traffic Operational Projects and Programs, and Capacity Improvements.

## 3 CMP Strategies

### 3.1 Travel Demand Management (TDM)

Travel Demand Management (TDM) is a general term referring to a set of strategies to increase the overall transportation system efficiency by reducing demands for single occupancy vehicle trips (SOV) or to shift demand out of the peak travel periods. These strategies are behavior-based and aim to discourage driving by increasing the cost to drive or to incentivize participation by providing other mobility options at a lower cost than driving a SOV. Since the approach is behavior-based, true success will be gauged by how well the users of the transportation network utilize TDM strategies to solve transportation issues.

A brief description of the TDM strategies considered are presented below:

- Regional TDM/Employer-based:
  - Work Flextime provides employees flexibility to adjust their work schedules to avoid peak hour congestion.
  - Telecommuting allows employees to work from the convenience of their home rather than working in a centralized office.
  - Compressed Work Week allows employees to work a full work week in fewer than five days. The direct benefit is the removal of vehicles on the roadway network during the peak hours.
  - Transit incentives are employer-based subsidized programs with the local transit providers to provide pretax or paid-in-full programs to encourage transit usage for travel to and from work.
- Park and Ride Facilities are commuter- based strategies that provide convenient and centralized parking for commuters to park to access transit, ridesharing, or vanpooling.
- Managed Lanes are defined as highway facilities or a set of lanes where operational strategies are proactively implemented and managed in response to changing conditions.<sup>3</sup> These are operational strategies and examples of operating managed lane projects include high-occupancy vehicle (HOV) lanes, value priced lanes, high-occupancy toll (HOT) lanes, or exclusive or special use lanes (tolling).<sup>4</sup>

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<sup>3</sup> FHWA Office of Operations, [https://ops.fhwa.dot.gov/publications/managelanes\\_primer/](https://ops.fhwa.dot.gov/publications/managelanes_primer/), accessed 1/29/18

<sup>4</sup> Ibid.

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Because managed lanes considered are operational in nature, they are addressed under Section 3.2 Traffic Operations for this corridor analysis.

## OTHER TDM STRATEGIES

### Land use:

TDM can also include long-term planning strategies/policies that are designed to blend a variety of strategies into new development patterns through zoning and development regulations, including transit-oriented development. The focus of these strategies is regional and is intended to encourage the majority of trips to occur within the development and not on the adjacent roadway network. This strategy can include requirements for sidewalks, greenways, density thresholds, location of development around transit corridors and nodes, and mixtures of uses (office, retail, and residential) in a single development. These regional strategies are the responsibility of local planning bodies and are further discussed in the COATS CMP.

### Bicycle/Pedestrian:

Pedestrian and bicycle amenities are facilities such as sidewalks, bicycle lanes, and sidepaths that encourage walking or riding a bicycle as a mode of transportation. These are commuter-based strategies. The placement of pedestrian and bicycle facilities depends on many factors including land use, travel patterns, and vehicle and pedestrian characteristics. This TDM strategy can be focused towards commuting for work, but also for general mobility. Traditional strategies include providing sidewalks, greenways, bikeways, and shared use paths. Non-traditional strategies include providing showers and changing facilities at work.

This corridor study focused on interstate and freeway facilities where bicycle and pedestrian activities are prohibited by state law. However, sidewalks are provided along many arterial streets and local streets within the study area, though some arterials and local streets do not have sidewalks on one or both sides of the road.

SCDOT is prepared to assist the City of Columbia and CMCOG efforts through such measures as evaluating the recommendations from the *Walk Bike Columbia* plan that may be appropriate for inclusion in the Carolina Crossroads I-20/26/126 Corridor Project at crossing routes and interchanges and accommodating recommendations if warranted and feasible.

## 3.1.1 EXISTING TDM WITHIN THE CAROLINA CROSSROADS I-20/26/126 CORRIDOR PROJECT STUDY AREA

As described previously, there are existing park and ride facilities identified within the Carolina Crossroads I-20/26/126 Corridor Project study area or that provide access to previously provided commuter transit services that traveled through the I-26/I-126 and I-20 corridors. These sites have been unofficially adopted as park and rideshare opportunities and are located at private business facilities within communities and the surrounding study area. Public agency sponsored park and ride facilities providing rideshare or commuter transit components serving the study area were identified at the following locations:

1. US 378 at Riverchase Way- I-20 Exit 61– Rideshare opportunity only – provides 46 parking spaces.

# Congestion Management Process

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2. Newberry Shopping Center – (previously SmartRide access)
3. Gazebo Parking Lot – Little Mountain – (previously SmartRide access)
4. Exxon Gas Station – Chapin – (previously SmartRide access; now labeled as No Parking)

Ridership for the previous SmartRide service (Newberry Express) ranged from 12,000 in 2010 to 10,000 in 2015. Peak ridership numbers were in 2012 at approximately 14,000 riders per year. This service is not currently active but may be reactivated if funding becomes available.

For input into the Columbia Corridors Management Plan, forty-nine (49) employers were surveyed for the study to determine the travel demand strategies currently being offered to employees in the region. Seven of the employers provided TDM options including:

- Telecommute
- Compressed Work Week/Flextime
- Transit Subsidy
- Guaranteed ride home
- Carpool/vanpool

## EMPLOYER AND PUBLIC INPUT ON TDM

The Columbia Corridors Management Plan also conducted Steering and Stakeholder meetings, surveyed major employers in the area and surveyed the public to determine which TDM strategies may be supported in the area.

Surveys, meetings and stakeholder workshops were used to gauge the interest and viability of specific TDM strategies in the area. Ridesharing and flexible work weeks were the two strategies that emerged as the most viable and most effective tools for the region.

The employer survey showed the existing TDM options most frequently offered by the area employers:

- Information on alternative commuting opportunities;
- Flextime; and
- Remote worksite.

The TDM strategies most valued by employers when asked what improvements would change employee commuting habits were:

- None – employees are not interested;
- Park and Ride opportunities;
- More bus routes; and
- Free or discounted transit passes.

In the public survey, 5,700 respondents provided the following as their most preferred TDM options that would encourage them to change their commuting habits:

- Convenient park and ride lots (35%); and
- Flexible work hours (30%).

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## 3.1.2 ANALYSIS OF TDM STRATEGIES

### REGIONAL TDM ANALYSIS

In the Columbia Corridors Plan, for analysis purposes of analyzing TDM strategies on a regional level for employer based initiatives, the TRIMMS (Trip Reduction Impacts of Mobility Management Strategies) model was utilized. TRIMMS evaluates:

- Strategies affecting the cost of travel, (public transportation subsidies, parking pricing, pay-as-you-go pricing). Subsidies are provided to the employee by the employer to reduce the costs associated with the use of a particular method of commuting.
- Strategies impact on access and travel times and a host of employer-based program support strategies such as alternative work schedules, telecommuting and flexible work hours, and worksite amenities.

TRIMMS predicts mode share, vehicle miles of travel (VMT), and peak hour trip changes brought about by the above TDM initiatives using constant elasticity of substitution trip demand functions. These functions estimate changes from baseline trip demands, taking into account users' responsiveness to changes in pricing and travel times.

TDM program support includes rideshare matching services, the provision of guaranteed ride home or emergency ride home for vanpool and carpool users, vanpool formation support, program promotion, and employee transportation coordinators. Alternative work schedules include compressed work week, flexible working hours, and telecommuting. Worksite amenities with the presence of sidewalks providing connection to transit stops within or nearby the worksite.

The TDM strategies analyzed in TRIMMS were:

1. Compressed work week/ flextime
2. Transit incentives – match existing agency subsidy of \$0.25. Note: this subsidy was increased to \$0.50 to account for inflation to the 2040 horizon.

To assess the impacts that various TDM strategies could have on the study area network, the Columbia Corridors project team studied the output from the 2040 TRIMMS Model run results were compiled and organized according to each strategy. The summarized results are shown in Table 3.1.

**Table 3.1. TDM Strategies**

TDM Strategy	Peak Change in Trips	AM Peak Trips	AM Peak Trips % Reduction	PM Peak Trips	PM Peak Trips % Reduction	Total AM + PM Trip Reduction	Total AM + PM % Reduction
Compressed Work	5,687	142,588	4.0%	152,209	3.7%	11,374	3.9%



# Congestion Management Process

TDM Strategy	Peak Change in Trips	AM Peak Trips	AM Peak Trips % Reduction	PM Peak Trips	PM Peak Trips % Reduction	Total AM + PM Trip Reduction	Total AM + PM % Reduction
Week/ Flextime							
Transit Incentive - \$0.50 Subsidy	6,753	142,588	4.7%	152,209	4.4%	13,505	4.6%
Overall	12,440	142,588	8.7%	152,209	8.1%	24,879	8.5%

All TDM strategies included in the TRIMMS Model were found to have an expected traffic reduction greater than 3% during the peak hours for the entire network. The strategy with the greatest anticipated traffic reduction is Transit Incentive - \$0.50 Subsidy, which shows an anticipated reduction in overall model trips of 4.7% in the AM peak, 4.4% in the PM peak, and 4.6% if the two peak hours are combined.

While regional TDM strategies may be warranted within the area, they are not considered as a part of the Carolina Crossroads I-20/26/126 Corridor project.

SCDOT will coordinate with the CMCOG, which is the planning organization housing the COATS MPO, on future updates to their federally required congestion management plan to assess and implement recommended demand management strategies for the Interstate 26 corridor, if warranted and feasible.

## PARK AND RIDE ANALYSIS

For the Columbia Corridors Management Plan, the evaluation of park and ride facilities, the peak hour volumes at each interchange were analyzed to determine the greatest influx into the roadway network within the corridor based on the network traffic model. Utilizing the entering AM and exiting PM volumes for each interchange due to the heavy commuter pattern identified, the interchanges were prioritized for possible park and ride facilities.

To measure the anticipated effectiveness of each park and ride location, it is assumed that each parking space will reduce the adjacent mainline volume by one (1) trip each during the AM and PM peak hours.

Due to the short length (approximately 3 miles) and system functionality of I-126, (interstate connection into the City of Columbia), no park and ride locations were proposed. The majority of I-126 traffic is loaded from the terminus of I-26 and Huger Street/Elmwood Avenue interchanges and then carried over the entire segment.

**I-20:** A review of the 2040 AM peak entering volume for all interchanges along I-20 revealed five interchanges where the entering volume accounts for 25 percent or greater of the I-20 mainline volume after the interchange when traveling toward the project corridor/I-20/26 interchange. For the 2040 PM peak, these same

# Congestion Management Process

interchanges represented 17 to 42 percent of the exiting mainline volume. These interchanges are all outside of the Carolina Crossroads I-20/26/126 Corridor Project area but traffic would travel through the corridor to the downtown area. These interchanges are noted below, in order of exit numbering:

- Exit 51 – Longs Pond Road
- Exit 55 – SC 6
- Exit 58 – US 1
- Exit 61 – US 378
- Exit 80 – Clemson Road

For the Columbia Corridors plan, specific parcels were identified to accommodate the development of park and ride facilities at each interchange and a maximum number of parking spaces were estimated. For further detail on the specific locations at each interchange, see the *Columbia Corridors Travel Demand Strategies Report*.

Table 3.2 provides a summary of these locations and their potential reduction of peak hour trips on adjacent mainline segments.

**Table 3.2. I-20 Potential Park and Ride Volume Reductions**

Exit/Roadway	Park and Ride Spaces	AM Base Volume	AM PnR Build Volume	AM % Reduction (based on full capacity)	PM Base Volume	PM PnR Build Volume	PM % Reduction (based on full capacity)
Exit 51/Longs Pond Rd	550	3,486	2,936	16%	2,673	2,123	21%
Exit 55/SC 6	450	4,781	4,331	9%	4,099	3,649	11%
Exit 58/US 1	300	5,678	5,378	5%	3,907	3,607	8%
Exit 61/US 378	150	5,755	5,605	3%	4,539	4,389	3%
Exit 80/Clemson Rd	550	5,118	4,568	11%	4,649	4,099	12%
Total	2,000	24,818	22,818	8%	19,867	17,867	10%

The volume reductions summarized in Table 3.2 were derived based on an assumption that 100% of the park and ride spaces would be used and the lot at capacity. Based on this assumption, it was found that if each potential park and ride location were to be utilized to its maximum capacity, total traffic reductions of 8% and 10% could be expected in the AM and PM peak hours, respectively, along the I-20 corridor.

**I-26:** A review of the 2040 AM peak entering volume for all interchanges along the I-26 study corridor, excluding system to system interchanges, revealed three interchanges where the entering volume account for 16 percent

# Congestion Management Process

or greater of the I-26 mainline volume after the interchange when traveling toward the center of the study area, and toward downtown Columbia. For the 2040 PM peak, these same interchanges represented 23 to 29 percent of the exiting mainline volume. The listing of the interchanges is noted below in order of the exit numbering (note that Exit 101 and Exit 102 are within the Carolina Crossroad project corridor):

- Exit 91 – Columbia Avenue (Chapin)
- Exit 97 – US 176 (Peak)
- Exit 101 – US 76/176
- Exit 102 – SC 60 - included because of previous park and ride use at this interchange location

Each of these interchanges exhibits a typical commuting pattern of heavy AM inbound flow toward the center of the study area and return flow during the PM period. This flow pattern is conducive for rideshare facilities. Noting that the Newberry SmartRide previously utilized I-26 for routing, these interchanges could serve as an extension of the SmartRide routing if the service was reinitiated.

For the Columbia Corridors plan, specific parcels were identified to accommodate the development of park and ride facilities at each interchange and a maximum number of parking spaces were estimated. For further detail on the specific locations at each interchange, see the *Columbia Corridors Travel Demand Strategies Report*.

Table 3.3 provides a summary of these locations and their potential reduction of peak hour trips on adjacent mainline segments.

**Table 3.3. I-26 Potential Park and Ride Volume Reductions**

Exit/Roadway	Park and Ride Spaces	AM Base Volume	AM PnR Build Volume	AM % Reduction*	PM Base Volume	PM PnR Build Volume	PM % Reduction*
Exit 91/Columbia Ave	500	3,182	2,682	16%	3,534	3,034	14%
Exit 97/Peak	500	4,173	3,673	12%	4,255	3,755	12%
Exit 101/US 1	550	5,033	4,483	11%	5,047	4,497	11%
Exit 102/US 378	100	4,987	4,887	2%	5,271	5,171	2%
<b>Total</b>	<b>1,650</b>	<b>17,375</b>	<b>15,725</b>	<b>9%</b>	<b>18,107</b>	<b>16,457</b>	<b>9%</b>

*\*Based on 100% occupancy of spaces*

The summarized data provided in Table 3.3 was derived based on an assumption that each park and ride lot would be at capacity. Based on this assumption it was found that if each potential park and ride location were to

# Congestion Management Process

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be utilized to its maximum capacity, total traffic reductions of 12% and 11% could be expected in the AM and PM peak hours, respectively, along the I-26 corridor.

Park and ride locations were evaluated for the *Central Midlands RTA Park-and-Ride Study* within the project study area, including the I-26 and Broad River Road interchange and the I-26 at St. Andrews Road interchange, which were recommended for implementation. Regional objectives in the COATS CMP include the addition of transit park-and-ride facilities at location(s) on Lake Murray Boulevard between SC 6 and Broad River Road, which crosses I-26; and at Bush River Road in a location(s) between St. Andrews Road and Broad River, which crosses I-20 and I-26.

As part of the Carolina Crossroads I-20/26/126 Corridor Project, SCDOT will continue to evaluate park and ride locations in the next phase of the project to validate the data summarized above and to explore potential sites for future consideration of inclusion in the RPA.

## 3.2 Traffic Operations

Overall, freeway operations and traffic management involves the proactive management of freeway facilities to balance the capacity of the transportation system and the prevailing demands, and response to out-of-the-ordinary conditions (e.g., incidents, adverse weather, work zones, special events, and emergency evacuations).<sup>5</sup> Traffic operations encompasses a broad set of strategies that aim to optimize the safe, efficient, and reliable use of the existing system.

### 3.2.1 ANALYSIS OF TRAFFIC OPERATIONS STRATEGIES

#### 3.2.1.1 Interchange Reconfigurations

For the Carolina Crossroads I-20/26/126 Corridor Project, the majority of the traffic congestion and safety concerns occur at or near to the interchange locations along the I-20/26/126 corridor. The project team initially focused on these locations by developing potential interchange improvement options for each of the 12 interchanges located in the corridor. The project team selected potential interchange alternatives from common interchange types. Each of the interchange options were evaluated at every interchange location. Interchange types included the following, or variations of the following:

- Trumpet interchange
- Fully directional interchange
- Diamond interchange
- Diverging diamond interchange
- Partial Cloverleaf Interchange (Parclo)
- Roundabout interchange
- Single Point Urban interchange
- Turbine interchange

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<sup>5</sup> FHWA Office of Operations, *Highway Traffic Operations and Freeway Management, State-of-the-Practice*: [https://ops.fhwa.dot.gov/freewaymgmt/publications/documents/frwy\\_mgmtSOPv7\\_2\\_1.htm](https://ops.fhwa.dot.gov/freewaymgmt/publications/documents/frwy_mgmtSOPv7_2_1.htm), accessed 1/16/18

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Based on the purpose and need for the project, the following criteria were established for assessing the effectiveness of each interchange design:

1. Reduce the number of conflict points
2. Improve operations on the mainline
3. Improve the connections to/from the mainline
4. Reduce geometric deficiencies currently on the mainline and/or crossing roadway
5. Interchanges under, at, or over capacity in the design year

Interchange designs were not required to meet all of these criteria to be incorporated into representative alternatives but had to show an overall improvement in traffic operations and congestion.

To further ascertain the merits of each interchange option, the project team also developed lists of pros and cons for each option. Pros and cons typically included, but was not limited to, the footprint, traffic operations, and public feedback. With this exercise, the project team also noted any fatal flaws which could stem from the answers to the screening criteria and/or the pros/cons discussions. For further information on the interchange screening process, please see the Carolina Crossroads I-20/26/126 Corridor Project *Alternatives Development and Screening Report* in Appendix X.

Improved interchange configurations were found to be warranted to meet the purpose and need of the project and were incorporated the Reasonable Alternatives. 32 interchange options were carried forward, 6 were added (to account for no-action options and to accommodate the potential elimination of the I-126/Bush River Road interchange), and 16 were eliminated. For further information on the methodology on the evaluation of interchange options, refer to Alternatives Development and Screening Report.

## 3.2.1.2 High Occupancy Vehicles Lanes (HOV)

HOV or managed lanes are strategies that control lane usage along a roadway, typically interstates, during the peak hour period or throughout the entirety of the day. The vehicle restrictions can also apply for vehicles types, transit, ridesharing, fuel efficient vehicles (hybrid and motorcycle), and providing priority over single occupancy vehicles.

High Occupancy Vehicle (HOV) facilities serve to increase the total number of people moved through a congested corridor by offering two kinds of travel incentives: a substantial savings in travel time, along with a reliable and predictable travel time. Because HOV lanes carry vehicles with a higher number of occupants, they move significantly more people during congested periods, even if the number of vehicles that use the HOV lane is lower than on the adjoining general purpose lanes. In general, carpoolers, vanpoolers, and bus patrons are the primary beneficiaries of HOV lanes by allowing them to move through congestion.

FHWA's *Program Guidance on HOV Facilities* (2016) and the NCHRP, Report 414, *HOV Systems Manual* (1998), identifies the following key criteria for HOV lanes:

1. Anticipated Use of the HOV Lane: Prefer 400 to 800 vehicles per hour per HOV lane during operating hours of the HOV in order to avoid underutilization.



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2. **Travel Time Savings:** The HOV lane should result in travel time savings of 1 minute per mile over mixed use lanes and have an overall travel time savings of at least 5 minutes, preferably 8 minutes or more.
3. **Congestion Levels:** If congestion results in a LOS D or E and average speeds are less than 30 mph, an HOV lane may be warranted.
4. **Constraints:** If the corridor is either at or near capacity and the physical and/or financial feasibility of expanding the roadway capacity is limited, an HOV lane may be justified.

The alternatives being considered for the I-26 corridor and their associated benefits to LOS, speeds and travel time, as detailed in the *Carolina Crossroads Alternatives Development and Screening Report*, are anticipated to provide the benefits that an HOV facility could potentially provide and therefore negate the need for an HOV facility. Specifically:

1. Regarding anticipated use of an HOV lane, there could be 400 to 800 vehicles per hour (VPH) usage, but this is highly subject to the exceptions associated with the types of vehicles and the occupancy requirements imposed for the HOV lane. Beyond vehicle occupancy of 2+ or 3+, other exceptions may include electric vehicles, transit vehicles, over-the-road buses, energy efficient vehicles, motorcycles, low-emission vehicles, etc. These exceptions can be added or subtracted in order to get the proper amount of lane use.
2. Regarding travel time savings, the projected travel time savings for RA1 and RA5 range from 13 to 14.5 minutes along the length of the I-26 study corridor during the peak periods. This would meet or exceed the suggested travel time savings benefit of an HOV lane.
3. Regarding congestion levels, the projected LOS in the design year 2040 would generally be a LOS C during the AM peak and both LOS C and LOS D during the PM peak on I-26. In addition, average projected speeds would be approximately 55mph on I-26 during the peak periods, for the general purpose lanes. At 55 mph, the general purpose lanes will function at close to free-flow conditions since the design speed of the corridor is 60mph and would not be signed any higher than that. Redesignating one of the general purpose lanes into a managed lane would not result in the managed lane achieving significantly higher speeds or reduced travel times. Therefore, the minimum criteria above would not be met.
4. Regarding physical constraints with designating an HOV or managed lane, the I-26 corridor is currently not unduly limited physically from being expanded. Sufficient physical space is available, as indicated in the preliminary design, to accommodate the expansion of the existing facilities. Regarding financial constraints, the current project budget is capable of supporting the proposed alternatives.

There are several design conditions factors in the proposed Reasonable Alternatives that complicate designating continuous HOV or managed lanes through the study area as part of the proposed alternatives. The proposed alternatives reconfigure the alignment of I-26 and I-126.

With the existing alignment, eastbound and westbound managed lanes could run adjacent to the medians of I-26 and I-126 between the western project limits to downtown Columbia. A managed lane

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continuing on I-26 would have to run along the outside of the interstate, coming into conflict with on- and off-ramp movements of the service interchanges.

Under the proposed alignments, the I-26/I-126 system interchange is being reconfigured to allow I-26 to continue as the through-corridor movement. This change treats I-126 as three-lane ramps exiting and entering to the right of the I-26 mainline lanes. Eastbound I-126 separates to the right of eastbound I-26 in the vicinity of the I-20 system interchange, and would require an outside managed lane for traffic traveling to downtown Columbia, creating conflicts with on- and off-ramp movements of the service interchanges west of the split. In the opposite direction, westbound I-126 merges to the right side of I-26, again requiring an outside managed lane and creating conflicts with service interchange ramp traffic upstream and downstream of the merge location.

Based on this preliminary analysis and geometric problems with an outside managed lane, further examination of the inclusion of an HOV lane as an alternative or as a part of the Reasonable Alternatives within the project corridor is not warranted. The benefits to LOS, travel time, and speeds derived from the planned improvements to the corridor via RA1 and RA5 are projected to offset the need or benefit of including an HOV lane at this time.

## 3.2.1.3 High Occupancy Toll (HOT) & other managed lanes

As described above, due to the reconfiguration of the I-26 and I-126 interchange, I-26 lanes will continue as the thru-movement of the corridor and the I-126 lanes will exit the corridor on the right to continue downtown. Because of this configuration, an HOT or other managed lane continuing on I-126 would have to run along the outside of the interstate, coming into conflict with on- and off-ramp movements of the service interchanges.

With these geometric complications and the fact that proposed reasonable alternative designs offer LOS C through the project corridor, there would be no significant advantage of proposing managed lanes for this movement. HOT lanes and other managed lanes are not considered warranted for the project.

## 3.2.1.4 Geometry

Geometric design includes the design of cross sections, horizontal alignment, vertical alignment, intersections, and various design details, including sight distances and shoulder width. These design elements “combine to create a facility that serves traffic safely and efficiently, consistent with the facility’s intended function.”<sup>6</sup>

### SIGHT DISTANCES:

Sight distance is a length of road that a driver can see with an acceptable level of clarity. Sight distance plays an important role in geometric highway design because it establishes an acceptable design speed, based on a driver's ability to see and stop for an unforeseen roadway hazard. Throughout the project study area, areas of insufficient sight distances were documented along the mainline and within interchanges.

As proposed designs were developed, sight distance was evaluated for all movements. Sight distance criteria have been met with the proposed alternatives.

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<sup>6</sup> AASHTO *A Policy on Geometric Design of Highways and Streets*, 6<sup>th</sup> Edition, 2011.

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## SHOULDER WIDTHS:

The shoulder is the portion of the roadway adjacent to the travel way for accommodation of stopped vehicles for emergency use. The paving and width of the shoulder is related to improved traffic operations and enhanced highway safety. Throughout the project study area, sub-standard interior shoulder widths currently exist along the interstate.

Based on the purpose and need for the project, one of the criteria established for assessing the alternatives was the alternatives ability to reduce geometric deficiencies currently found on the mainline and/or crossing roadways.

Design Criteria have been established to include full shoulder widths throughout the corridor.

**Table 3.4 Design Criteria**

Facility Type	Inside Paved Shoulder	Inside Earth Shoulder	Inside Total Shoulder	Outside Paved Shoulder	Outside Earth Shoulder	Outside Total Shoulder
<b>Mainline Freeway</b>	12 ft	2 ft	14 ft	12 ft	2 ft	14 ft
<b>Collector-Distributor Roadways</b>	10 ft	2 ft	12 ft	10 ft	2 ft	12 ft
<b>Ramps (Single Lane)</b>	4 ft	6 ft	10 ft	6 ft	4 ft	10 ft
<b>Ramps (Multi-Lane)</b>	4 ft	6 ft	10 ft	6 ft	4 ft	10 ft

## CONFLICT POINTS

One of the major operational issues within the existing corridor is conflicting/weaving movements. With 12 interchanges, including two system-to-system interchanges within the corridor, ramp spacing is considerably tight. In addition, the interchange at I-26/I-20 currently includes a full-cloverleaf design with tight ramp spacing and significant weaving issues. Over 69 weaving movements and conflict points have been identified in the existing corridor.

Based on the purpose and need for the project, reduction of the number of conflict points currently being experienced by users of the mainline and/or the crossing roadway was established as criteria for evaluating alternatives.

One of the primary focuses while developing alternative was to eliminate as many weaving conflicts as possible. The purpose and need included criteria for “reduction in conflict points, improved traffic operations, improved connections, and reduction/elimination of geometric deficiencies. As a result, proposed designs incorporate current design standards, minimize conflicts throughout the corridor and significantly improve geometric deficiencies. Through the use of collector-distributor (CD) routes, revisions to interchange types, braided ramps, and other design features, the proposed designs offer enhancements over existing conditions to meet the purpose and need.

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Improved geometric designs, including sight distances, improved shoulder widths and reduced conflict points were found to be warranted to meet the purpose and need of the project and were incorporated the Reasonable Alternatives.

## 3.2.1.5 Ramp Metering

Ramp meters are traffic signals installed on freeway on-ramps to control the frequency at which vehicles enter the flow of traffic on the freeway. As seen in the diagram below, vehicles traveling from an adjacent arterial onto the ramp form a queue behind the stop line. The vehicles are then individually released onto the mainline, often at a rate that is dependent on the mainline traffic volume and speed at that time.<sup>7</sup>

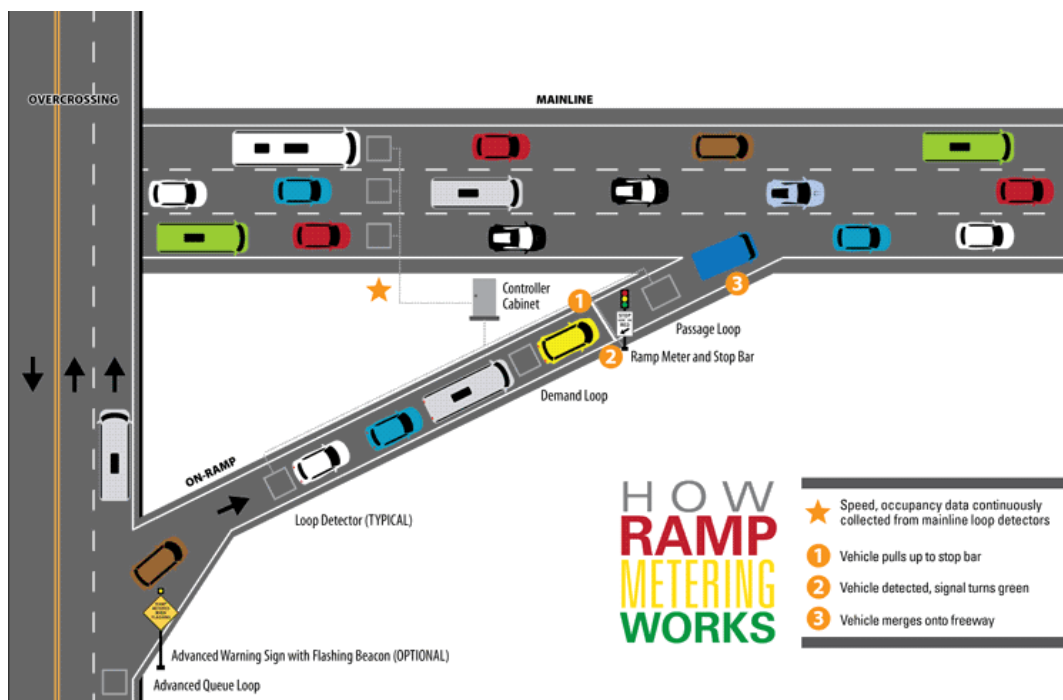


Figure 1.1

Ramp metering is used to manage volumes entering the mainline and to avoid overloading and creating issues with mainline traffic flow.

An important consideration when considering ramp metering is the available storage for the metered vehicles and the geometry of the existing facility. “Key geometric issues include inadequate acceleration length, mainline weaving problems because of closely spaced ramps, and limited sight distances on a horizontal or crest vertical curve.”<sup>8</sup> These geometric issues exist within the project corridor, limiting the ability to implement ramp metering effectively under existing conditions.

<sup>7</sup> FHWA Office of Operations [https://ops.fhwa.dot.gov/freewaymgmt/ramp\\_metering/about.htm](https://ops.fhwa.dot.gov/freewaymgmt/ramp_metering/about.htm), accessed 1/16/18

<sup>8</sup> FHWA Research and Technology, *Public Roads, Stop or Go?* Colyar, Klein, Jacobsen <https://www.fhwa.dot.gov/publications/publicroads/16janfeb/02.cfm>, accessed 2/1/18

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Another challenge related to ramp metering is “...ramps that are shorter in length or have less storage space are at a higher risk of arterial backup than longer ramps with similar demand. If the meter’s release rate is less than the rate at which vehicles approach the ramp, the queue will lengthen. If too long, a queue could spill onto arterials and result in inefficient arterial operations.”<sup>9</sup> All service interchanges west of the system to system interchange have high volumes of traffic (600-1200 vehicles per hour) entering the I-26 corridor during the AM peak hour. Queue lengths at ramp meters at these locations could further impact the operation of the arterial streets that are already congested, including St. Andrews Road, Piney Grove Road and Harbison Boulevard.

Given the additional lane proposed in the designs for the Reasonable Alternatives, ramp metering is not warranted to achieve acceptable levels of service in the design year for mainline traffic under Build conditions and it is not recommended to be pursued on this corridor.

## 3.3 Public Transportation Improvements

The purpose of this transit analysis in the Columbia Corridors Management Plan was to identify and evaluate transit modal strategies that may provide alternative transportation choices and serve as a catalyst for decreasing automobile traffic along the interstate corridor assessed in the study, including I-20, I-26, and I-126.

In addition to a traffic analysis of the area, a community assessment was conducted to better understand socio-economic factors that are known to impact transit ridership, including a review of population, housing, and employment densities as well as indicators of transit dependency – elderly and youth populations, low-income populations, as well as zero-vehicle households. These factors all provide insights into where services are most needed to meet overall transportation needs, help to target transit improvements that may assist in relieving congestion from the study area corridors and identify gaps in service and where transit modal options and improvements are most needed.

### 3.3.1 EXISTING TRANSIT WITHIN THE CORRIDOR

#### 3.3.1.1 Rail Service

There are currently no premium transit (commuter rail, light rail) services available in the region.

The only regional/interstate passenger rail services in the Central Midlands region is provided by Amtrak.

#### 3.3.1.2 Fixed-Route Bus Service

The Central Midlands Regional Transit Authority (CMRTA), known as the COMET, is currently the only public transit service provider that operates in the vicinity of the Carolina Crossroads I-20/26/126 Corridor Project study area. The CMRTA provides fixed-route bus service, and though CMRTA routes do not travel directly within the I-20/26/126 corridor, they do parallel and/or cross it via major arterials such Broad River Road, Piney Grove Road and others. CMRTA is currently in the process of developing a plan for a more connected and accessible

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<sup>9</sup> Ibid



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transit system, including development of high frequency service along high-capacity corridors and limited stop express routes, as well as restructuring of service to lower density routes such as neighborhoods.

Two existing COMET routes cross I-20, I-26 and I-126 within the Carolina Crossroads I-20/26/126 Corridor Project study area:

- Route 34 – Saint Andrews: This route travels from the Columbiana Centre to downtown Columbia at hourly headways on the weekdays.
- Route 34B – Saint Andrews: This route travels from the Dutch Square mall to downtown Columbia at hourly headways on the weekdays. It also connects with Route 34 on St. Andrews Road.

These routes are two of eight routes which comprise approximately sixty percent of COMET’s annual ridership, carrying approximately 14,284 weekday passengers or 8.90% of the total weekday ridership as of January 2017. This core route was analyzed for transit improvement opportunities due to its intersection and proximity with the interstate.

## POPULATION

The Institute of Transportation Engineers (ITE), has developed guidelines for successful transit service frequency based on residential densities that was reviewed alongside study area housing densities and existing services. The ITE guidelines, provided in Table 3-4, help to focus in on locations within the study area where additional transit service frequency or new services may be useful based on existing residential densities.

**Table 3.5. Transit Service Frequency Guidelines**

Service type	Transit frequency (minutes)	Dwelling units per acre	Dwelling units per square feet
Bus	60	4-5	2,560-3,200
Bus	30	7	4,480
Bus	10	15	9,600
Light rail or Bus Rapid Transit	5-10	30-50	22,400-32,000

The neighborhoods where there is a significant amount of housing density are Arthurtown, Forest Acres and Seven Oaks. Of these, Seven Oaks is the only community near the Carolina Crossroads I-20/26/126 Corridor Project study area, off of the St. Andrews Road interchange.

## EMPLOYMENT

Employment densities were also examined to understand concentrations of commuting needs. there are three main areas that lend themselves to increased frequency for bus service. The St. Andrews, Forest Acres and downtown areas could potentially have bus service increased to 30-minute frequencies. Of these three areas, only St. Andrews is within the Carolina Crossroads I-20/26/126 Corridor Project corridor. In the future as the

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population increases and more jobs are needed, more areas may require higher frequencies or newer types of public transportation service.

## TRANSIT-DEPENDENT POPULATIONS

Elderly population density of the study area. This population is defined by the amount of person who are sixty-five years of age or older that are living within a specific census block group. The Forest Acres and Seven Oaks neighborhoods have overall significant densities for the elderly population. While there are a significant number of routes in these areas as well, more frequent service could be helpful to this population demographic.

As the elderly population continues to grow, more frequent service may be required, as well as additional routes, particularly to the St. Andrews area.

Youth populations within the study area often lack the ability to use other modes to meet their

transportation needs. There were no areas of significant densities of youth populations found within the Carolina Crossroads I-20/26/126 Corridor Project study area.

Low-income populations in the study area are defined as those who are currently living under the poverty line, which for a four-person household was \$24,257 a year. The Seven Oaks and St. Andrews areas were noted as having high densities of low-income households.

Currently, portions of St. Andrews have higher density areas of low-income populations, and more service may be necessary for Route 34 and 34B to provide better mobility for this population.

Vehicle availability directly influence transportations decisions and is a primary indicator of transit usage. Based on the number of households that do not have access to a personal vehicle, no areas within the Carolina Crossroads I-20/26/126 Corridor Project study area have this issue.

Based on the findings of the community assesement, the St. Andrews/Irmo areas along the intersection of I-20, I-26 and I-126 were found to have high densities of transit dependent populations. While there is currently transit service within these areas, investments in public transportation to and along these corridors could provide benefits to the populations which rely on these services.

## 3.3.2 ANALYSIS OF PUBLIC TRANSPORTATION STRATEGIES

A variety of transit modal opportunities were investigated to complement roadway improvements and enhance existing transit services. These types of strategies included:

- Operational improvements - Improvements to Existing Routes, Bus-On-Shoulder Improvements, High Occupancy Vehicle Lanes, Improvements to Bus Shelters/Stations, Technology Improvements
- Adding transit capacity - Interstate Express Bus Services, Bus Rapid Transit (BRT) Improvements, Park-and-Ride Lot Improvements, Other Regional and Multimodal Improvements Identified

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- Coordinated strategies to enhance the transit environment - Promote Travel Demand Management (TDM) Strategies, First- and Last-Mile Improvements, Land Use Decisions, Other Built Environment Strategies (roads, sidewalks, parking, bus stops, bicycle lanes, etc.)

Consideration of strategies for the I-26/126 Corridor in these categories include:

**IMPROVEMENTS TO EXISTING SERVICE:** COMET Route 34 currently serves portions of the Irmo/St. Andrews/Seven Oaks area of Columbia, which were areas that were previously identified as having potentially dense populations of transit dependent populations. There is a significant amount of low-income and youth populations in this area, as well as significant housing and population densities. It was also found to be one of the COMET's "core routes," which is one of the eight routes that make up a bulk of their overall ridership. Finally, this route was in one of the noted transit corridors from the LRTP and the 2015 CMP that should have transit improvements.

Decreasing the headways for this route could have a significant impact on the traffic congestion within this area and provide greater connectivity and mobility for this portion of the region. Route 34 has sixty-minute headways, leaving from the transit center in downtown and arriving near the Columbiana Centre on weekdays, which is also near Exit 103 on I-26.

**EXPRESS BUS SERVICE ON INTERSTATES AND PARK-AND-RIDE LOTS:** Exits 91, 97, and 101 were identified as having sufficient land available for the construction of park-and-ride lots; further details can be seen in the *Columbia Corridors Travel Demand Management Strategies Report*. These park-and-ride lots could be used in conjunction with other services to provide options for commuters to travel into downtown Columbia. An express bus service that operates mainly in the peak periods of the day could travel from Exit 97 near the Columbiana Centre and into the downtown area. Headways would likely be fifteen minutes to provide a sufficient level of service.

**BRT ON PARALLEL FACILITIES:** U.S. 176 is a candidate for developing a parallel BRT line, beginning from where it crosses I-26 at Exit 101 and terminating at the downtown transfer center. This would be a 12-mile BRT line and would likely require stations every half mile. The headways should be 15 minutes during the peak periods, and if there is service during the non-peak period, it should be 30 minutes. This type of improvement was also suggested within the Newberry – Columbia Alternatives Analysis (AA) that was conducted by the CMCOG.

## **RAIL SERVICE**

In the last decade, there have been several regional studies on mass transit services, including rail service, that include the Carolina Crossroads I-20/26/126 Corridor Project study area as a portion of their areas of evaluation. In 2006, the CMCOG published the Commuter Rail Feasibility Study and assessed three corridors for rail investment. One of the three corridors was a 48-mile Newberry-to-Columbia corridor that largely runs parallel to I-26 and US 76, within an active freight railroad corridor, adjacent to the I-26 portion of the Carolina Crossroads I-20/26/126 Corridor Project. The other two corridors – the Camden corridor and Batesburg-Leesville corridor – largely parallel I-20, but include only small sections of the I-20/26/126 Carolina Crossroads project study area. In this study, the Camden corridor scored the highest and was recommended for priority consideration. The Newberry and Batesburg-Leesville corridors were not recommended for priority consideration. Many preliminary development recommendations resulted from the study including seeking a "champion" for transit

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advocacy in the region. SCDOT can support and accommodate what initiatives other organizations are doing progressing in an effort to develop transit supportive roadway facilities that do not preclude future enhanced transit services.

In 2008, CMCOG updated the Central Midlands Regional Transit & Coordination Plan Update identified the Commuter Rail Feasibility Study, focusing on the three rail corridors identified in the 2006 study. The 2008 update concluded that the region should strengthen local transit service, and place focus on implementing interim express bus service as an impetus for future higher-capacity services.

In 2015, CMCOG completed a Regional Transit Needs Assessment and Feasibility Study. Rail was ranked as a “best” option, but the implementation assessment, which factored in several elements including capital and operating costs, determined that it would be more realistic as a long-term option.

The project team for the Carolina Crossroads I-20/26/126 Corridor Project met with COMET leadership in April 2016. COMET indicated that the premium transit (rail) is not yet feasible in the area due to relatively high cost of implementation and operation and low ridership projections. Commuter rail ridership projections are estimated at 1,200-1,500 boardings daily. Compared to number of vehicles that travel the I-20/26/126 corridor each day (approximately 133,600), elimination of 1,500 vehicles would offer a reduction of less than 2 percent. As noted, in lieu of premium transit (rail), CMRTA has a stronger interest in expanding the existing bus service.

## 3.3.3 EVALUATION OF STRATEGIES FOR THE I-26/I-126 CORRIDOR

Transit strategies are typically evaluated through various elements, such as increased transit ridership and reduced automobile traffic and vehicle miles traveled (VMT). The cost of transit improvements can then be compared to benefits associated with reducing automobile travel to understand the overall impact of an improvement.

Transit improvement costs include annual fleet operating and maintenance, fleet purchase, roadway infrastructure, stations/stops, infrastructure maintenance, and fare revenue. Transit improvement benefits include reduced personal vehicle operations costs, taxi usage, congestion costs, roadway fatalities, and pollution emissions.

The costs, ridership-based variables, and benefits were calculated for each transit strategy. Results for individual transit strategies, by year, are included in Appendix A.

Table 3.6 and Table 3.7 present the total average weekday AM and PM peak ridership, automobile VMT reduction, automobile trips, and automobile VMT for the total program in 2018 and 2040, respectively. The 2018 and 2040 automobile trips and VMT were taken from the SCSWM model output.

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**Table 3.6. 2018 Average Weekday AM and PM Peak Ridership-Based Variables**

	Total Transit	Total Automobile	% Change in Automobile trips
<b>AM Peak Unlinked Passenger Trips</b>	50,292	5,051,476	-1.0%
<b>PM Peak Unlinked Passenger Trips</b>	71,845	7,336,268	-1.0%
<b>AM Peak Automobile VMT Reduction</b>	29,001	1,488,088	-1.9%
<b>PM Peak Automobile VMT Reduction</b>	41,429	2,160,888	-1.9%

**Table 3.7. 2040 Average Weekday AM and PM Peak Ridership-Based Variables**

	Total Transit	Total Automobile	% Change in Automobile trips
<b>AM Peak Unlinked Passenger Trips</b>	95,340	6,082,819	-1.6%
<b>PM Peak Unlinked Passenger Trips</b>	136,200	8,813,509	-1.5%
<b>AM Peak Automobile VMT Reduction</b>	54,978	1,814,839	-3.0%
<b>PM Peak Automobile VMT Reduction</b>	78,540	2,607,737	-3.0%

The results indicate that implementation of the total program in 2018 would result in a 1.0 percent decrease and a 1.9 percent decrease in automobile trips and VMT, respectively, in both the 2018 AM and PM peaks. Similarly, implementation of the total program in 2018 through 2040 would result in a 1.5-1.6 percent decrease and a 3.0 percent decrease in automobile trips and VMT, respectively, in both the 2040 AM and PM peaks.

There are numerous short-term transit strategies that may be warranted to enhance existing transit service and increase overall ridership. Existing services could be enhanced during the short-term and increases in service could be targeted based on the overall benefits that were identified for each route, including those within the corridor. CMRTA would be responsible for implementation of these strategies.

SCDOT will continue to coordinate with CMRTA on future updates to their regional transit plan and CMCOG on future updates to their Long Range Plan. SCDOT will also continue to coordinate with CMRTA and CMCOG on the implementation of any recommended transit strategies within the corridor.

## 3.4 ITS/Incident Management

Intelligent Transportation Systems (ITS) is the application of technology (electronic sensing, computer processing and communications) to manage transportation on roadways. The goals are to increase throughput, improve safety, and reduce adverse impacts to the environment. ITS technologies collect and fuse traffic data into meaningful information that can be used to actively manage traffic: provide on-going monitoring of the transportation network; provide traveler information; reduce incident response times; and optimize the use of transportation assets.

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Incident Management consists of a planned and coordinated multi-disciplinary process to detect, respond to, and clear traffic incidents so that traffic flow may be restored as safely and quickly as possible. Effective incident management reduces the duration and impacts of traffic incidents and improves the safety of motorists, crash victims and emergency responders.

## 3.4.1 EXISTING ITS/INCIDENT MANAGEMENT WITHIN THE STUDY AREA

**TRAFFIC MANAGEMENT CENTER:** Traffic operations center owned by SCDOT that is responsible for traffic management activities within the location of the TMC. SCDOT currently has a TMC in Columbia that covers the Carolina Crossroads I-20/26/126 Corridor Project study area. The typical activities include traffic monitoring, traffic data collection, operation of ITS elements (CCTV, DMS, etc.), detection and verification of incidents, traffic signal monitoring, and other traffic management related activities.

**FIRST RESPONDERS:** Law enforcement agencies include South Carolina State Highway Patrol, Lexington and Richland County Sheriffs, City of Columbia Police and other agencies which have officers sworn to enforce traffic laws. Law enforcement agencies are first responders at traffic incident scenes, providing 24-hour emergency response and incident investigation.

Fire and rescue services are provided by county and municipal fire departments. Typical roles and responsibilities at traffic incidents assumed by fire and departments include protecting the scene, providing medical care, rescuing crash victims, and providing incident clearance.

The primary responsibilities of Emergency Medical Services (EMS) are the triage, treatment, and transport of crash victims. Emergency medical services have evolved as primary care givers to individuals needing medical care in emergencies. They focus on providing patient care, crash victim rescue, and ensuring the safety of their personnel.

**STATE HIGHWAY EMERGENCY PROGRAM (SHEP):** SCDOT provides assistance to motorists whose vehicles are experiencing mechanical problems and providing support, traffic control and assistance to emergency response teams during incidents. SHEP currently patrols the entire project corridor for disabled vehicles and provides assistance with traffic control for crashes.

SCDOT plans to expand SHEP, ITS, Work Zone ITS and changeable message signs along the I-26 corridor between Exit 101 and Exit 85, under the ongoing I-26 widening/improvement project.

## 3.4.2 ANALYSIS OF ITS/INCIDENT MANAGEMENT STRATEGIES

**TMC/SHEP** As the project develops, the Carolina Crossroads I-20/26/126 Corridor project team will continue to coordinate with both TMC and SHEP for the incorporation of appropriate ITS and Incident Management into the project.

**CRASH INVESTIGATION SITES (CIS)** can be established along heavily traveled freeways. These bump-outs provide a safe refuge for vehicles that have been involved in a minor crash, getting them out of the way of freeway traffic

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while crash reporting is conducted. CIS can assist with the timely removal of incidents, the safety of motorists and responders, and the reduction of secondary crashes.

There were a total of 2,370 crashes reported along I-26 from January 1, 2012 to December 31, 2014 (Figure 1.7). These were split nearly evenly in the eastbound (1,171 accidents) and westbound (1,199 accidents) directions. Overall, crashes are uniformly distributed through both the I-26 and I-20 corridors. Two locations accounted for 15-25 percent of collisions within the corridor – I-26 eastbound between Piney Grove Road and St. Andrews Road and I-20 eastbound near the Bush River Road interchange. One location accounted for greater than 25 percent of the collisions within the corridor – I-20 westbound at the Broad River Road interchange. See Figure 1.2.

Improved traffic operations throughout the corridor, including reduced conflict points and weaving movements and improved traffic flow should reduce the number of crashes experienced at these locations. Under build conditions, if crash concentrations continue to occur, CIS consideration may be warranted in the future.

## VISUAL BARRIERS

Concrete barrier wall currently exists through the entire project corridor along I-26, I-126 and I-20. The height of the existing barrier wall varies through the corridor. Old-style low wall exists for the majority of the corridor; however, there are small section of high wall on I-26 between Exits 101 and 102 and on I-20 between the I-26 interchange and Bush River Road. Glare paddles/screens currently exist along I-126 in interstate curves to deflect headlight glare.

Engineering design standards for median barrier walls have changed and median barrier walls are currently constructed at a height of 4'8" tall. The height of new walls would eliminate the need for the glare screens to improve night time visibility for motorists and reduce rubber necking at crash sites on the other side of the interstate within the corridor. This strategy is considered warranted for the corridor.

All proposed Reasonable Alternatives would include the new standards for median barrier walls.



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Figure 2.2

## MOVE ACCIDENT FROM TRAVEL LANE SIGNS

**Driver Removal** laws require drivers involved in typically minor incidents to move the vehicles from the travel lanes, exchange information, and report the crash information as required. These laws are intended "to expedite removal of damaged or disabled vehicles from the travel lanes to enhance the overall level of safety on the roadway and reduce associated congestion and delay. Drivers remaining in a travel lane put themselves, as well as approaching motorists, at risk. When responders arrive on-scene, they too are at a greater risk in the travel lane; particularly when outside their vehicles because of the threat of being struck by a passing vehicle."<sup>10</sup> Few states actively publicize or enforce these laws, limiting their overall potential for effectiveness.

The state of South Carolina does have a driver removal law (Title 56, Chapter 5 §56-5-1220) however, there are no notification signs currently within the project corridor.

<sup>10</sup> FHWA Office of Operations, [https://ops.fhwa.dot.gov/publications/fhwahop09005/driv\\_removal.htm](https://ops.fhwa.dot.gov/publications/fhwahop09005/driv_removal.htm)

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This strategy may be warranted within the corridor as a part of the signing plan for the RPA.

## 3.5 Capacity Improvements

This strategy considers increasing roadway capacity where it is deficient and all previous mitigation strategies do not provide the most effective solution or do not provide for a timely solution to existing deficiencies. These projects involve construction additional general purpose lanes and/or the construction of new roads.

Based on project development for the Carolina Crossroads I-20/26/126 Corridor Project, the purpose of the project is to implement a transportation solution(s) that would improve mobility and enhance traffic operations by reducing existing traffic congestion within the I-20/26/126 corridor while accommodating future traffic needs. Other CMP strategies were assessed for the corridor however, only capacity improvement alternatives met the overall purpose and need for the project. The reasonable alternatives under consideration are all capacity improvements that incorporate other operational improvements (interchange reconfigurations, geometric improvements) within the corridor. The Reasonable Alternatives are further assessed within the DEIS.

## 3.6 Recommendations for the Carolina Crossroads I-20/26/126 Corridor Project

### 3.6.1 TDM RECOMMENDATIONS

**ALTERNATIVE WORK SCHEDULES:** Alternative work schedules include compressed work week, flexible working hours, and telecommuting. From workshop participant and public survey responses, compressed work week/flextime and rideshare were identified as the most viable and effective of the TDM strategies discussed.

- Work Flextime provides employees flexibility to adjust their work schedules to avoid peak hour congestion.
- Telecommuting allows employees to work from the convenience of their home rather than working in a centralized office.
- Compressed Work Week allows employees to work a full work week in fewer than five days.

The direct benefit is the removal of vehicles on the roadway network during the peak hours. Applying these TDM strategies across the major employment sectors could result in an overall trip reduction on the 2040 network by up to 3.9%.

This regional strategy would require stakeholder/employer coordination and buy-in.

**PARK AND RIDE FACILITIES:** As part of the TDM strategies for the Carolina Corridors analysis, it was recommended that park and ride facilities be implemented along the study area corridors. Assuming that each parking space within a park and ride facility will reduce the mainline interstate volumes by one (1) trip each in the AM and PM peak hours, ridesharing and/or transit at park and ride lots can cumulatively have a significant impact on the total traffic volumes within the study area.

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Overall, if all park and ride locations are implemented, it is estimated that there could be a reduction in travel demand of up to 9% in the AM peak hour and 10% in the PM peak hour within the study area.

CMRTA completed a *Park-and-Ride Study* in 2010 to determine which areas and specific locations would be best suited for such facilities. Many locations were evaluated within the I-20/26/126 project corridor, including the I-26 and Broad River Road interchange and the I-26 at St. Andrews Road interchange, which were recommended for implementation.

The COATS 2015 CMP recommended the addition of transit park-and-ride facilities at location(s) on Lake Murray Boulevard between SC 6 and Broad River Road, which crosses I-26; and at Bush River Road in a location(s) between St. Andrews Road and Broad River, which crosses I-20 and I-26.

As part of the Carolina Crossroads I-20/26/126 Corridor Project, SCDOT will continue to evaluate park-and-ride locations consistent with both the COATS CMP and Columbia Corridors Management Plan, including improvement to existing facilities in the study area and will develop a plan to identify and recommend preliminary sites for future implementation to service rideshare commuters. However, benefits to LOS, travel time, and speeds derived from the planned improvements to the corridor via RA1 and RA5 are projected to offset the need of park and ride facilities.

## 3.6.2 OPERATIONS RECOMMENDATIONS

Improved interchange configurations have been incorporated into the overall design in order to meet the purpose and need of the project.

Geometric improvements, including improved sight distances and shoulder widths, have been incorporated into the design to meet the purpose and need of the project.

## 3.6.3 PUBLIC TRANSPORTATION RECOMMENDATIONS

With the support of funding from the penny sales tax in Richland County, the COMET has developed a transit vision for public transportation which would create a more connected accessible system. A primary component of this includes the development of high frequency service along high capacity corridors to provide added convenience for riders during peak hours so they can get to work, school and retail in a more efficient manner. The planned high capacity and enhanced local routes that were the focus of the CMP included one route within the Carolina Crossroads I-20/26/126 Corridor Project study area:

Corridor #7: Broad River/Harbison: Enhanced with 30 minute peak frequencies; enhanced evening and weekend service, including Sundays. Expanded frequency to Dutch Square Mall, state employment centers and Harbison Boulevard retail/employment sites. High ridership would build toward a downtown shopping weekend express service. Operational improvements in service would be enhanced by the implementation of transit based ITS solutions, including:

- CMRTA will take the next step in technology by adding automated vehicle location (AVL) to allow real time arrival and departure information for customers at stops or on smart phones.

# Congestion Management Process

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- GPS tracking on buses can help trigger lights to turn green on major corridors helping push the buses through clogged city traffic and speed up commute times.
- New technology will text passengers when their buses will arrive (with user defined settings) and even let them track the closest bus while waiting on the street corner and use web based trip planning on the new CMRTA website.
- Smartphone apps for visitors can link them to transit and QRT/bar code technology around town can tell tourists about routes and services on-the-go.
- Smartcard fare payment technology will allow customers to ride with the tap of their card and can recharge their transit passes at terminals (similar to an ATM). This also provides real-time bus arrival information, general passenger information and advertising revenue for the system.

SCDOT is prepared to assist COMET/CMRTA efforts through such measures as accommodating transit (bus) stops at interchange locations, if warranted and feasible.

## 3.6.4 ITS/INCIDENT MANAGEMENT RECOMMENDATIONS

Accident Investigation Sites – Improved traffic operations throughout the corridor, including reduced conflict points and weaving movements and improved traffic flow should reduce the number of accidents experience at these locations. Under build conditions, if accidents concentrations continue to occur, AIS consideration may be warranted.

Visual Barriers – Current design standards would require increased height of the median barrier walls, reducing glare from oncoming traffic and reducing rubber necking during crashes. The project would incorporate new standards for median barrier walls.

Move Vehicles From Lane Signs – Consider placement signs within project corridor as part of signing plan for RPA.

# Congestion Management Process

**Table 3.8 Congestion Management Toolbox for Carolina Crossroads Corridor**

Congestion Management Strategy		Performance Measures	Under Consideration for RPA	Responsible Party
TDM	Flextime, Compressed Workweek, Transit subsidy	Peak hour Reduction in Trips	Regional, ongoing coordination	Local Employers
	Park and Ride	Reduction in Traffic Volumes	Additional evaluation	
Operations	Interchange Reconfiguration	Reduce conflict points Improve operations on mainline Improve connection to/from mainline Reduce geometric deficiencies Interchange under, at, or over capacity	Yes	SCDOT
	HOV/HOT lanes	Benefits to LOS, speeds and travel time; geometric considerations	No	
	Geometry	Reduce geometric deficiencies	Yes	SCDOT
	Ramp Metering	N/A	No	
Public Transportation	Improved Existing Service	Percent reduction in Automobile trips	Ongoing coordination	CMRTA/COMET
	Express Bus		No	
	BRT		No	
	Rail	N/A	No	
ITS/Incident Management	TMC/SHEP	N/A	Ongoing coordination	SCDOT
	Accident Investigation Sites	N/A	No	
	Move Vehicle Signs	N/A	Yes	SCDOT
	Visual Barrier		Yes	

# Congestion Management Process

Capacity	Add general purpose lanes	Improve mobility and enhance traffic operations by reducing existing traffic congestion	Yes	SCDOT
----------	---------------------------	-----------------------------------------------------------------------------------------	-----	-------

## 4 References

*Columbia Area Transportation Study Metropolitan Planning Organization Congestion Management Plan*, September 24, 2015

*Columbia Corridors Travel Demand Management Strategies Report*, CDM Smith, October 2017

*Columbia Corridors Transit Modal Strategies*, CDM Smith, September 2017

*Central Midlands RTA Park-and-Ride Study*, Connetics Transportation Group, January 2010

## Appendix A—COATS CMP Recommendations for Roads within the project area.



# Congestion Management Process

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The COATS CMP recommended the following congestion mitigation strategies for each of these roads that intersect the Carolina Crossroads I-20/26/126 Corridor Project corridor:

## Broad River Road:

- Regional growth management through land use policies
- Transportation demand management (vanpool, ride share, telecommuting)
- Transit service enhancement/expansion or commuter express buses
- Intersection widening/channelization and turn lanes
- Signal coordination
- Traffic surveillance and control systems
- Driveway control
- Deceleration lanes
- Arterial lanes
- Interchange improvements

## Bush River Road:

- Transit park and ride facilities
- Transit marketing
- Service enhancement
- Sidewalks
- Transportation demand management (vanpool, ride share, telecommuting)
- Signal Coordination

## Lake Murray Boulevard:

- Commuter-oriented transit services (express)
- Transit park and ride facilities
- Transit marketing
- Transportation demand management (vanpool, ride share, telecommuting)
- Pedestrian grade separation between major trip generators
- Signal coordination
- Access management (driveway control)

Harbison Boulevard: No mitigation strategies were included.



# Congestion Management Process

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## Appendix B—title

# **APPENDIX F**

## **Richland County Conservation Easement Letter**

# KEN DRIGGERS

ATTORNEY AT LAW | CONSULTANT

January 11, 2018

Ms. Nancy Stone-Collum  
Conservation Coordinator  
Richland County Conservation Division  
2020 Hampton St. Room 3063A  
Columbia, SC 29204

Re: Ganus and Troutman Conservation Easements

Dear Nancy:

I am responding to your inquiry concerning possible encroachment for a highway expansion on the referenced conservation easements.

Richland County Conservation Commission cannot under the terms of the easements allow the encroachment on the Protected Properties. The easements restrict paving and related activities. Extensive clearing of a right-of-way for infrastructure expansion will also violate the conservation values clause of the easement.

Such activity will require the right-of-way be acquired under eminent domain. Condemnation of a conservation easement is allowed under South Carolina law for valid public purposes. A transfer of the property to be taken can be accomplished without legal proceedings if conducted in lieu of condemnation. The relevant documents should reference this and a recordable release from the easement executed by the Commission will be required.

A conservation easement entitles the Conservation Commission, as grantee, to a proportional share of any proceeds resulting for the condemnation. The Commission also has the right to intercede in proceeding or negotiations establishing the value of the taken property. The proportional share is determined by applying the ratio of the easement's value to the value of the fee title at time of the easement's execution.

I hope this answers your questions. Please let me know if further questions arise or if you would like for me to draft the appropriate documents.

Sincerely,



Ken Driggers

**APPENDIX G**

**Farmland Impact Conversion**

**Rating Form**

**FARMLAND CONVERSION IMPACT RATING  
FOR CORRIDOR TYPE PROJECTS**

<b>PART I (To be completed by Federal Agency)</b>		3. Date of Land Evaluation Request <b>9/26/17</b>	4. Sheet 1 of <b>1</b>
1. Name of Project <b>I-26 Design Build Widening MM85-MM101</b>		5. Federal Agency Involved <b>US Federal Highway Administration / SCDOT</b>	
2. Type of Project <b>New Loc, Widening, Interchange Improve.</b>		6. County and State <b>Lexington, Newberry, Richland, SC</b>	
<b>PART II (To be completed by NRCS)</b>		1. Date Request Received by NRCS	2. Person Completing Form
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form). YES <input type="checkbox"/> NO <input type="checkbox"/>		4. Acres Irrigated   Average Farm Size	
5. Major Crop(s)	6. Farmable Land in Government Jurisdiction Acres: %	7. Amount of Farmland As Defined in FPPA Acres: %	
8. Name Of Land Evaluation System Used	9. Name of Local Site Assessment System	10. Date Land Evaluation Returned by NRCS	

<b>PART III (To be completed by Federal Agency)</b>	<b>Alternative Corridor For Segment</b>			
	<b>Corridor A</b>	<b>Corridor B</b>	<b>Corridor C</b>	<b>Corridor D</b>
A. Total Acres To Be Converted Directly	<b>136</b>			
B. Total Acres To Be Converted Indirectly, Or To Receive Services	<b>0</b>			
C. Total Acres In Corridor	<b>1,053</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>PART IV (To be completed by NRCS) Land Evaluation Information</b>				
A. Total Acres Prime And Unique Farmland				
B. Total Acres Statewide And Local Important Farmland				
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted				
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
<b>PART V (To be completed by NRCS) Land Evaluation Information Criterion Relative value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)</b>	<b>100</b>			

<b>PART VI (To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))</b>	<b>Maximum Points</b>				
1. Area in Nonurban Use	15	<b>11</b>			
2. Perimeter in Nonurban Use	10	<b>7</b>			
3. Percent Of Corridor Being Farmed	20	<b>0</b>			
4. Protection Provided By State And Local Government	20	<b>0</b>			
5. Size of Present Farm Unit Compared To Average	10	<b>3</b>			
6. Creation Of Nonfarmable Farmland	25	<b>0</b>			
7. Availability Of Farm Support Services	5	<b>5</b>			
8. On-Farm Investments	20	<b>0</b>			
9. Effects Of Conversion On Farm Support Services	25	<b>0</b>			
10. Compatibility With Existing Agricultural Use	10	<b>4</b>			
<b>TOTAL CORRIDOR ASSESSMENT POINTS</b>	<b>160</b>	<b>30</b>	<b>0</b>	<b>0</b>	<b>0</b>

<b>PART VII (To be completed by Federal Agency)</b>					
Relative Value Of Farmland (From Part V)	100	100			
Total Corridor Assessment (From Part VI above or a local site assessment)	160	30	0	0	0
<b>TOTAL POINTS (Total of above 2 lines)</b>	<b>260</b>	<b>130</b>	<b>0</b>	<b>0</b>	<b>0</b>

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>
-----------------------	---------------------------------------------------------	-----------------------	--------------------------------------------------------------------------------------------------

5. Reason For Selection:

Signature of Person Completing this Part:  DATE **12 JANUARY 2018**  
**1/9/17**

NOTE: Complete a form for each segment with more than one Alternate Corridor

# **APPENDIX H**

## **Natural Resources**

### **Technical Memorandum**

# **NATURAL RESOURCES TECHNICAL MEMORANDUM**

## **Interstate 26 Widening and Improvements**

**MM85 to MM101**

**NEWBERRY, LEXINGTON, RICHLAND COUNTIES, SOUTH CAROLINA**

PREPARED FOR



**South Carolina Department of Transportation**

**SOUTH CAROLINA DEPARTMENT OF TRANSPORTATION**

**COLUMBIA, SOUTH CAROLINA**

PREPARED BY:



**Civil Engineering  
Consulting Services, Inc.**

**January 2018**



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**Natural Resources Technical Memorandum**  
**SCDOT I-26 Widening, Newberry, Lexington, and Richland Counties, SC**

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## **1.0 INTRODUCTION**

### **1.1 Project Description**

This Natural Resources Technical Memorandum (NRTM) was prepared to assist the South Carolina Department of Transportation (SCDOT) in conjunction with the Environmental Assessment (EA) regarding infrastructure improvements and widening of Interstate 26 (I-26) from mile marker (MM) 101 to mile marker 85 in Lexington, Newberry, and Richland Counties. This document serves to outline the natural resources and environment surrounding the project corridor. Project biologists evaluated the project study area (PSA) to determine the potential presence and location of any jurisdictional waters of the U.S. (WOUS) regulated under the Clean Water Act (CWA); and to determine the presence, or potential presence, of any protected species that are listed as threatened, endangered, or proposed for listing pursuant to Section 7 of the Endangered Species Act (ESA). The location and nature of potential impacts to resources within the project area and recommendations to minimize impacts are discussed, when applicable. Additional investigations may be necessary if the PSA is altered or expanded.

SCDOT proposes multiple improvements to the I-26 corridor to increase capacity to address the projected increased traffic volumes and to upgrade the facility to current state and federal design standards. Improvements would take place from 1.6 miles west of the SC 202 (Exit 85) interchange to the US 176 (Exit 101) interchange. The improvements would widen the mainline of I-26, providing an additional through travel lane in both directions from near Exit 101 to Exit 85. From near Exit 101 to Exit 97, an additional through travel lane would be added for a total of four lanes in each direction of this segment. Interchange improvements would be provided at Exits 85, 91, and 97. Overpass bridge structures that cross I-26 would be replaced. Ramp termini intersections with arterial roadways would be improved. Several frontage roads adjacent to the interstate, and roadways crossing the interstate that may also be affected are also included in the analysis. The PSA location is shown in Figure 1 in Appendix A.

At the request of SCDOT, an EA is being completed, which outlines potential alignment alternatives to satisfy the purpose and need of the project, including improvements to existing roadways, new location roadways, and combinations of existing and new location roadways. These alternatives are being assessed to determine the least damaging practicable alternative with respect to construction impacts on the human and natural environment, while maintaining appropriate design criteria.

In association with the EA, Civil Engineering Consulting Services, Inc. (CECS) has been contracted to provide an environmental review of the proposed PSA, including documentation of existing natural resources within the PSA. This NRTM summarizes the findings of the environmental review.

This report provides an overall description of the project vicinity, and specifically describes natural resources within the PSA, including wetlands, water resources, plant communities, and protected species.

## **1.2 Purpose**

The purpose of the project is to increase capacity to address the projected increased traffic volumes and to upgrade the facility to current state and federal design standards.

## **1.3 Methodology**

Prior to conducting fieldwork, CECS reviewed the following reference material:

- U.S. Geological Survey (USGS) 7.5 minute topographic quadrangles. Irmo, South Carolina (1971, photo revised 1990); Richtex, South Carolina (1971, photo revised 1990); Chapin, South Carolina (1971), and Little Mountain (1971).
- Natural Resource Conservation Service (NRCS) Soil Data Mart, Soil Series Mapping. Lexington, Newberry, Richland Counties, South Carolina (1971)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Wetlands On-Line Mapper (via the internet)
- NRCS-USDA National List of Hydric Soils Database; National List, All States. (Last updated March 2014; reviewed: April 2017)
- USFWS South Carolina Field Office. Endangered, Candidate, and At-Risk Species. County Listings for Lexington, Newberry, Richland Counties (Last Updated: July 2017; Reviewed: July 2017)
- USFWS Information for Planning and Conservation (IPaC) web tool. Lexington, Newberry, Richland Counties (Reviewed April 2017)
- South Carolina Department of Natural Resources (SCDNR). Rare, Threatened, and Endangered Species and Communities Known to Occur in Lexington, Newberry, Richland Counties (Last Updated June 2014; Reviewed: July 2017)
- SCDNR South Carolina Heritage Trust (SCHT). Geographic Database of Rare, Threatened, and Endangered Species Inventory Species Found in Lexington, Newberry, Richland Counties (Last Updated January 2006; Reviewed: July 2017 via the internet)
- South Carolina Department of Health and Environmental Control (SCDHEC). Integrated Report for 2014. Part I: *Section 303(d) List of Impaired Waters*
- National Agriculture Imagery Program Aerial Photography. Lexington, Newberry, Richland Counties (2016)

Following review of available background data, site visits were conducted from May through June 2017 to document the potential of wetlands and/or other WOUS. In addition, field surveys identified and documented habitat communities within the PSA where potential for protected species may occur. WOUS were determined using the Routine On-Site Determination Method as outlined by the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual (USACE 1987) and the

Eastern Mountains and Piedmont Region Regional Supplement (USACE 2012). The delineated boundaries of potential jurisdictional waters were spatially recorded utilizing a Trimble GeoXH 7 handheld Global Positioning System (GPS) with Hurricane antennae for sub-meter accuracy. The GeoXH 7 settings used included a PDOP of 4.0, an elevation mask of 15-degrees and a minimum SNR of 33.0. GPS coordinates were validated using Trimble Pathfinder Office and analyzed through ESRI ArcGIS 10.5 software.

## **2.0 PHYSICAL RESOURCES**

### **2.1 Land Use**

The PSA encompasses approximately 16 miles of I-26, from MM 101 to MM 85. Analysis of the review area was conducted through creation of a large PSA buffer extending from the centerline of the right of way. Bridge overpasses were surveyed based upon a 75-foot buffer from centerline of the travel way.

Land use through the PSA is variable, ranging from urban developed commercial and residential to areas characterized by undeveloped woodlands with sparsely populated rural residences. Two of the three interchanges (MM 101 and MM 97) are typified by commercial developments that serve a vital connection to commuter access to I-26. The third interchange (MM 85) serves as access to rural communities and is absent of commercial development adjacent to the interstate.

The majority of land use adjacent to the main corridor of the interstate is comprised of undeveloped forestland, consisting of planted pine, mixed pine-hardwoods, bottomland hardwoods characterized by gently undulating hills which typify Piedmont upland habitats ecology. Waterways that cross the PSA are generally classified as first or second order streams.

### **2.2 Physiography and Topography**

The PSA is located in the Piedmont physiographic province of South Carolina, and is specifically situated within the Piedmont (45) Level III Ecoregion (Griffith, et al., 2002). The Piedmont is a transitional area between the mostly mountainous ecoregions of the Appalachian Mountains to the northwest and the relatively flat coastal plain to the southeast. The landform of the ecoregion is comprised of moderately dissected irregular plains and some hills.

Based on USGS topographic mapping (Appendix A), elevations in the PSA range from approximately 326 feet above National Geodetic Vertical Datum (NGVD) to 526 feet NGVD. The PSA drains to numerous waterbodies which include Crims Creek, Wateree Creek, Risters Creek, Rocky Creek, Summers Branch, Wildhorse Branch, Metz Branch, Hope Creek, and Moccasin Branch.

### **2.3 Geology and Soils**

The geological strata serves as the foundation to natural systems which occupy and support the area and is further refined by soils and those properties. The PSA is located in an area where geological

influences through time created an environment that has actively changed. The origins of soil parent material within the PSA are classified as residual as the parent materials have formed within saprolite through the weathering of the underlying dense rock. The substrate underlying these soils are comprised of gneissic granite and rocks known as “Carolina slates.” Carolina slates are metamorphosed shale, dominantly argillite, fine-grained sandstone, and muscovite mica. Weathered products of these rocks are high in silt and very fine sands (USDA, 1976).

Six geological units are mapped within the PSA as follows:

- Cap – Asbill Pond Formation (Middle Cambrian)
- CZpf – Persimmon Fork Formation (Cambrian to Neoproterozoic)
- OCr – Richtex Formation (Ordovician to Middle Cambrian)
- Ztl – Little Mountain metatonalite (Neoproterozoic)
- Am – Amphibolite and amphibolite gneiss (Paleozoic to Neoproterozoic)
- OZvf – Felsic metavolcanic rocks and felsic gneiss interpreted to the metavolcanics (Ordovician to Neoproterozoic)

The Farmland Protection Policy Act (FPPA) of 1981 requires evaluation of farmland conversions to nonagricultural uses. Farmland can be prime farmland, unique farmland, or farmland of statewide importance. The proposed project would likely require the acquisition of farmland soils; therefore, the project would be assessed under the provisions of the FPPA during the development of the EA.

According to the USDA NRCS Soil Survey of Lexington County (USDA, 1976), thirty-three (33) soil map units (SMU) are mapped within the PSA. The soils mapped within the PSA are depicted in Appendix A. Farmland Classification and Hydric Rating for each SMU is located in following tables (Tables 1, 2, 3).

**Table 1: Richland County Soils within Project Study Area**

RICHLAND COUNTY, SOUTH CAROLINA					
Map Symbol	Map Unit Name	Farmland Classification	Hydric Rating	Acres within PSA	Percentage within PSA
AtA	Altavista silt loam, 0 to 2 percent slopes	All areas are prime farmland	Not hydric	9.5	0.9
Ce	Chewacla loam, 0 to 2 percent slopes, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	Not hydric	3.7	0.4
Co	Congaree loam	Prime farmland if protected from flooding or not frequently flooded during the growing season	Not hydric	1	0.1
GeB	Georgeville silt loam, 2 to 6 percent slopes	All areas are prime farmland	Not hydric	115	10.9
GeC	Georgeville silt loam, 6 to 10 percent slopes	Farmland of statewide importance	Not hydric	11.6	1.1
KrB	Kirksey loam, 2 to 6 percent slopes	All areas are prime farmland	Not hydric	16.5	1.6
NaB	Nason silt loam, 2 to 6 percent slopes	Farmland of statewide importance	Not hydric	106.5	10.1
NaC	Nason silt loam, 6 to 10 percent slopes	Farmland of statewide importance	Not hydric	135.3	12.8
NaE	Nason complex, 10 to 30 percent slopes	Not prime farmland	Not hydric	35.3	3.3
OaB	Orange loam, 0 to 4 percent slopes	Not prime farmland	Not hydric	66.6	6.3
W	Water	Not prime farmland	N/A	1.6	0.1
SUBTOTALS FOR SOIL SURVEY AREA				502.6	47.6



**Table 2: Newberry County Soils within Project Study Area**

NEWBERRY COUNTY, SOUTH CAROLINA					
Map Symbol	Map Unit Name	Farmland Classification	Hydric Rating	Acres within PSA	Percentage within PSA
CfB2	Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded	All areas are prime farmland	Not hydric	139.7	13.3
CfC2	Cecil sandy clay loam, 6 to 10 percent slopes, moderately eroded	Farmland of statewide importance	Not hydric	99.6	9.5
GaB2	Georgeville silty clay loam, 2 to 6 percent slopes, moderately eroded	Farmland of statewide importance	Not hydric	1.6	0.1
GaC2	Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded	Farmland of statewide importance	Not hydric	1.9	0.1
HaC	Hard Labor sandy loam, 6 to 10 percent slopes	Farmland of statewide importance	Not hydric	11.3	101
HeB	Helena sandy loam, 2 to 6 percent slopes	All areas are prime farmland	Not hydric	1.3	.1
HeC	Helena sandy loam, 6 to 10 percent slopes	Farmland of statewide importance	Not hydric	2.7	0.3
PaD2	Pacolet sandy clay loam, 10 to 15 percent slopes, moderately eroded	Not prime farmland	Not hydric	6.8	0.6
PaE2	Pacolet sandy clay loam, 15 to 25 percent slopes, moderately eroded	Not prime farmland	Not hydric	58.9	5.6
PaF2	Pacolet sandy clay loam, 25 to 50 percent slopes, moderately eroded	Not prime farmland	Not hydric	3.8	0.4
RnE2	Rion sandy loam, 15 to 25 percent slopes, moderately eroded	Not prime farmland	Not hydric	2.7	0.3
ToA	Toccoa sandy loam, 0 to 3 percent slopes, frequently flooded	Prime farmland if protected from flooding or not frequently flooded during the growing season	Not hydric	27.4	2.6
WnB	Winnsboro sandy loam, 2 to 6 percent slopes	Farmland of statewide importance	Not hydric	2.4	0.2
WyB2	Wynott-Winnsboro complex, 2 to 6 percent slopes, moderately eroded	Farmland of statewide importance	Not hydric	1.9	0.2
WyC2	Wynott-Winnsboro complex, 6 to 10 percent slopes, moderately eroded	Not prime farmland	Not hydric	4.7	0.4
SUBTOTALS FOR SOIL SURVEY AREA				370.1	35

**Table 3: Lexington County Soils within Project Study Area**

LEXINGTON COUNTY, SOUTH CAROLINA					
Map Symbol	Map Unit Name	Farmland Classification	Hydric Rating	Acres within PSA	Percentage within PSA
EnB	Enon silt loam, 2 to 6 percent slopes	Farmland of statewide importance	Not hydric	2	0.2
GeB	Georgeville very fine sandy loam, 2 to 6 percent slopes	All areas are prime farmland	Not hydric	85.1	8.1
GeC	Georgeville very fine sandy loam, 6 to 10 percent slopes	Farmland of statewide importance	Not hydric	19	1.8
GeD	Georgeville very fine sandy loam, 10 to 15 percent slopes	Not prime farmland	Not hydric	23.8	2.3
HrB	Herndon silt loam, 2 to 6 percent slopes	All areas are prime farmland	Not hydric	17.6	1.7
NaD	Nason silt loam, 6 to 15 percent slopes	Not prime farmland	Not hydric	30.9	2.9
TaE	Tatum silt loam, 15 to 25 percent slopes	Not prime farmland	Not hydric	0	0
To	Toccoa fine sandy loam	Prime farmland if protected from flooding or not frequently flooded during the growing season	Not hydric	2.6	0.2
SUBTOTALS FOR SOIL SURVEY AREA				<b>181</b>	<b>17.2</b>

The following data describes the SMUs derived from the USDA SCS Soil Survey of Lexington, Newberry, and Richland Counties, South Carolina (USDA, 1976).

**Ata (Altavista silt loam, 0 to 2 percent slopes)** – is a deep, moderately well drained soil comprised of loamy marine and fluvial sediments. These soils are restricted to terraces and are not classified as hydric. Typical depth to bedrock ranges to 60-inches with an argillic horizon within the upper 24-inches. This soil comprises approximately 1.0% the PSA, accounting for a total of 9.3 acres. Site locality of the soil unit is found at the crossing of Wateree Creek near Shady Grove Road.

**Ce (Chewacla loam, 0 to 2 percent slopes, frequently flooded)** – is a deep, somewhat poorly drained soil with moderate permeability. Ce soils are found along lower landscape positions within floodplains. Parent material is comprised of alluvium and flood deposits. The soil unit is classified as prime farmland if drained and protected from frequent flooding. Within the PSA, CE soils comprise 3.6 acres, or 0.4%, and are found 0.49 miles to the east of the MM 97, Broad River Road interchange.

**CfB2 (Cecil sandy clay loam, 2 to 6 percent slopes, moderately eroded)** – is a very deep, well- drained soil found along ridges and hill slopes adjacent to drainage ways. Soils are comprised of red clay basal material characterized by a consociation formation. They are deep to saprolite and very deep to

bedrock. They formed in residuum weathered from felsic, igneous and high-grade metamorphic rocks of the Piedmont uplands. Slopes range from 0 to 25 percent. CfB2 soils are classified as farmland of statewide importance, and is not included on the hydric soils list for Lexington County, South Carolina. Within the PSA, the soil unit may be located within the area of Four Oaks Road crossing of Parr Road. CfB2 soils occupy approximately 131.3 acres, or 13.7% of the PSA.

**CfC2 (Cecil sandy clay loam, 6 to 10 percent slopes, moderately eroded)** – is a very deep, well- drained soil found along ridges and hill slopes adjacent to drainage ways. Soils are comprised of red clay basal material characterized by a consociation formation. They are deep to saprolite and very deep to bedrock. They formed in residuum weathered from felsic, igneous and high-grade metamorphic rocks of the Piedmont uplands. CfC2 soils are classified as farmland of statewide importance, and is not included on the hydric soils list. Within the PSA, the soil unit may be located within the area of the MM 85 interchange. CfC2 soils occupy approximately 88.0 acres, or 9.2% of the PSA.

**Co (Congaree loam)** – is a well-drained, flood plain soil unit found along lower slopes and within drainage bottoms. Within the PSA, Co soils are located solely within Wateree Creek drainage way and consists of 1.0 acres, or 0.1% of the PSA. Parent material of the soil unit is comprised of alluvium and floodplain deposits. The soil series is listed as prime farmland if drained and protected from frequent flooding.

**EnB (Enon silt loam, 2 to 6 percent slopes)** - consists of a very deep, well drained, slowly permeable soils on hillslopes and summits of ridgetops in the Piedmont. Parent material is classified as clayey residuum weather from mixed acid and basic igneous rock groups. Permeable restriction depth is 24-48 inches when over paralithic bedrock or 30-48 inches when over lithic bedrock. Soils within this group formed from weathered residuum of mafic or intermediate igneous and high-grade metamorphic rocks such as diorite, gabbro, diabase, or hornblende gneiss or schist. EnB soils comprise approximately 2.0 acres within the PSA, or 0.2%. This soil unit is located near the MM 91 interchange along Columbia Avenue.

**GaB2 (Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded)** – is a very deep, well-drained soil located along narrow ridges and side slopes adjacent to drainage ways. Parent material is consists residuum weathered from fine-grained metavolcanic rocks of the Carolina Slate Belt. Slopes are 2 to 50 percent. GaB2 soils are classified as prime farmland. Within the PSA, GaB2 soils occupy 2.0 acres, or 0.2%. This soil unit is located near the MM 97 interchange along Columbia Avenue.

**GaC2 (Georgeville silty clay loam, 6 to 10 percent slopes, moderately eroded)** – is a very deep, well-drained soil located along narrow ridges and side slopes adjacent to drainage ways. Parent material is consists residuum weathered from fine-grained metavolcanic rocks of the Carolina Slate Belt. GaB2 soils are classified as prime farmland. Within the PSA, GaB2 soils occupy 11.4 acres, or 1.2%. This soil unit is located near the MM 97 interchange along Columbia Avenue.

**GeB (Georgeville very fine sandy loam, 2 to 6 percent slopes)** – consists of very deep, somewhat poorly drained shallow loam to clay soils located along upland ridges. Parent material is classified as a clayey residuum weathered from slate. Restrictive base is greater than 80 inches. GeB soils are classified as prime farmland. Within the PSA, approximately 81 acres, or 8.5%, are classified. This soil typifies the area around the MM 91 interchange for Chapin, SC.

**GeC (Georgeville very fine sandy loam, 6 to 10 percent slopes)** - consists of very deep, somewhat poorly drained shallow loam to clay soils located along upland ridges. Parent material is classified as a clayey residuum weathered from slate. Restrictive base is greater than 80 inches. GeB soils are classified as prime farmland. Within the PSA, approximately 81 acres, or 8.5%, are classified. This soil typifies the area around the MM 91 interchange for Chapin, SC.

**GeD (Georgeville very fine sandy loam, 10 to 15 slopes)** - is similar to GeB soil in composition, and comprises narrow, irregular side slopes where the gradient is greater than GeB or GeC. The soil unit consists of 23.6 acres, or 2.5%, of the PSA. GeD is not classified as a farmland soil, and is not classified as hydric in nature. The soil unit occupies areas between the Peak Street overpass and MM 91 interchange.

**HaC (Hard Labor sandy loam, 6 to 10 percent slopes)** – is a very deep, moderately well-drained soil comprised of sandy clay loam along broad to narrow ridges and side slopes adjacent to drainage ways. The soil consists of slowly permeability formed in material weathered from felsic igneous and metamorphic rock, primarily granite and granite gneiss. HaC soils are on summits and side slopes of the Piedmont uplands. There is a perched water table in late winter and early spring. Slope ranges from 0 to 15 percent. HaC soils comprise 3.4 acres, or 0.4% within the PSA. The soil unit may be located in proximity to the MM 85 interchange.

**HeB (Helena sandy loam, 2 to 6 percent slopes)** – is a very deep, moderately well drained soil found along hill slopes and ridges. HeB soil parent material consists of residuum weathered from a mixture of felsic, intermediate, or mafic igneous or high-grade metamorphic rocks. Composition consists of a sandy loam to clay loam through the soil column. The soil is not listed as prime farmland or listed as hydric. The soil comprises 0.2 acres, or less than 1% of the PSA. HeB soils may be found adjacent to the MM 85 interchange.

**HeC (Helena sandy loam, 6 to 10 percent slopes)** – is a very deep, moderately well drained soil found along hill slopes and ridges. HeC soil parent material consists of residuum weathered from a mixture of felsic, intermediate, or mafic igneous or high-grade metamorphic rocks. Composition consists of a sandy loam to clay loam through the soil column. The soil is not listed as prime farmland or listed as hydric. The soil comprises 2.6 acres, or less than 0.3% of the PSA.

**HrB (Herndon silt loam, two to six percent slopes)** - is a deep, well-drained soil found on uplands of the Piedmont Plateau. HrB soils formed in material weathered from slate rocks. The soil has moderate

permeability, and the available water capacity is medium to high (NRCS, 1976). Within the PSA, HrB soil is mapped along Crooked Creek Road and the undeveloped area north towards Columbia Avenue. The soil unit comprises approximately five (5) percent of the PSA. HrB soil is classified as a prime farmland, and is not included on the hydric soils list for Lexington County, South Carolina (USDA, 2015).

**KrB (Kirksey loam, 2 to 6 percent slopes)** – is a deep, moderately slowly permeable soil found within Piedmont uplands. The soil occurs on saddles and lower slopes, weathered from slate and fine-grained rock. The soil series is listed as prime farmland. Representative location of KrB soils may be found on the southeast quadrant of Mount Vernon Church Road. KrB soils are listed as not hydric under normal conditions.

**OaB (Orange loam, 0 to 4 percent)** – is a somewhat poorly drained, to moderately well drained soil derived from crystalline residuum. OaB soils are located along summit, shoulder, and back slope areas within the Piedmont landscape. OaB soils comprise 66.6 acres, or 6.3% of the PSA. of the Representative location of OaB soils may be found on the southwest quadrant of Mount Vernon Church Road. OaB soils are listed as not hydric under normal conditions.

**NaB (Nason silt loam, two to six percent slopes)** - is a moderately deep, well-drained soil found on uplands of the Piedmont Plateau. NaB soils formed in material weathered from slate rocks. The soil has moderate permeability with high water capacity availability. Within the PSA, NaB soil is mapped to the northwest of the MM 91 interchange. NaB soils comprise 83.6 acres, or 8.8% of the PSA. The soil unit is classified as farmland of statewide importance. NaB soils are listed as not hydric under normal conditions.

**NaC (Nason silt loam, six to ten percent slopes)** – is a moderately deep, well-drained soil. The soil unit is found in uplands comprising material weathered from schist and slate rocks. NaC soils are found along slopes and terraces within the Piedmont Plateau. Representative location of NaC soils are mapped at 0.6 miles to the north of the Shady Grove overpass. NaC soils are listed as hydric under normal conditions.

**NaD (Nason silt loam, six to fifteen percent slopes)** - similar to NaB soils in basal composition, NaD soils are located along hillslopes with a higher topographic gradient. Representative location of NaD soils are mapped 0.2 miles east of the Peak Street Bridge overpass. NaD soils comprise 29 acres, or 3.0% of the PSA. The soil unit is not classified as prime farmland or farmland of state importance. NaD soils are not listed as hydric under normal conditions.

**PaD2 (Pacolet sandy clay loam, 10 to 15 percent slopes, moderately eroded)** - consists of very deep, well drained, moderately permeable soils that formed in residuum weathered mostly from felsic igneous and metamorphic rocks of the Piedmont uplands. Slopes commonly are 15 to 25 percent but range from 2 to 60 percent, PaD2 soils are located along ridges and hillslopes composed of loam and clay basal materials. PaD2 soils comprise approximately 6.8 acres, or 0.7% of the PSA.

**PaE2 (Pacolet sandy clay loam, 15 to 25 percent slopes, moderately eroded)** - consists of very deep, well drained, moderately permeable soils that formed in residuum weathered mostly from felsic igneous and metamorphic rocks of the Piedmont uplands. Slopes commonly are 15 to 25 percent but range from 2 to 60 percent. PaE2 soils comprise approximately 50.1 acres, or 5.2% of the PSA.

**PaF2 (Pacolet sandy clay loam, 25 to 50 percent slopes, moderately eroded)** - consists of very deep, well drained, moderately permeable soils that formed in residuum weathered mostly from felsic igneous and metamorphic rocks of the Piedmont uplands. Slopes commonly are 15 to 25 percent but range from 2 to 60 percent. PaF2 soils comprise approximately 3.8 acres, or 0.4% of the PSA.

**RnE2 (Rion sandy loam, 15 to 25 percent slopes, moderately eroded)** – Rion soils consist of very deep, well drained, moderate permeable soils formed as a result of weathering of crystalline rocks of the Piedmont Uplands. Type soils are located along steep slopes and hillsides. Rion soils drain quickly as a result of basal composition and geographic setting. RnE2 soils comprise approximately 2.7 acres, or 0.3% of the PSA. This SMU is not classified as hydric.

**TaE (Tatum silt loam, 15 to 25 percent slopes)** - is a moderately deep, well-drained soil found on uplands of the Piedmont Plateau. TaE soils formed in material weathered from slate rocks. The soil has moderate permeability, and the available water capacity is high (NRCS, 1976). Within the PSA, TaE soil is mapped in one small area in the eastern extent of the PSA. The SMU comprises less than one (1) percent of the PSA. TaE is not classified as a farmland soil, and is not included on the hydric soils list for Lexington County, South Carolina (USDA, 2015).

**To (Toccoa fine sandy loam)** – is a deep, well-drained loamy alluvium soil weathered from igneous and metamorphic parent materials. To soils are found in alluvial fans and flood plains. The soil series may be found along upper drainage slopes where seasonal flooding creates natural levees. To soils comprise 2.6 acres, or 0.2% of the PSA. Representative location of the soil may be found 1.05 miles to the north of Columbia Avenue, Exit 91 interchange.

**ToA (Toccoa sandy loam, 0 to 3 percent slopes, frequently flooded)** – Toccoa soils are comprised of a loamy fine sand formed in alluvial deposition from Piedmont Uplands. Saturation conductivity is described as high with frequent flooding where geographically found. The soils are moderately permeable and poorly drained. If the soils are not flooded during growing season, it may be classified as prime farmland. The SMU comprises 15.8 acres, or 1.7% of the PSA.

**WnB (Winnsboro sandy loam, 2 to 6 percent slopes)** – The Winnsboro soils are comprised of deep, well drained, fine soils that formed from weathered rocks of the Piedmont Uplands. Geographically, Winnsboro soils comprise gentle side slopes and hill sides to moderately steep slopes. When cleared, the soils are used for hay and pasture including soybean and corn production. The soils are listed as farmland of statewide importance. Winnsboro soils comprise 2.4 acres, or 0.3% of the land area within the PSA.



**WyB2 (Wynott-Winnsboro complex, 2 to 6 percent slopes, moderately eroded) –**

This soils series complex are located adjacent to drainages and alongside slopes of hills. These soils formed from denser rocks within the diorite and gabbro bases. Permeability is medium with a well-drained basal soil grouping. All areas where Wynott-Winnsboro soils are found are described as prime farmland. This soil occupies 0.7 acres or 0.1% of the PSA.

**WyC2 (Wynott-Winnsboro complex, 6 to 10 percent slopes, moderately eroded) -**

The Wynott-Winnsboro series complex are located along shoulder and back slope of ridges and low rolling hills. Drainage is high with a low saturation conductivity capacity. The soils are formed from Piedmont upland weathered diorite and residuum from gabbro. The soils are not considered prime farmland due to geographic position along slopes. This soil series comprises 2.4 acres, or 0.3% of the PSA.

The project would also have both short-term construction related impacts as well as long-term operational impacts on soils in the PSA; however, these impacts are not considered substantial.

**2.4.1 Water Resources and Water Quality**

SCDHEC conducts water quality assessments and provides 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 and 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.

**2.4.2 Water Resources**

The PSA is located entirely within the Broad River Basin, as defined by the SC Department of Health and Environmental Control (SCDHEC). The Broad River Basin, located immediately east of the Saluda River Basin, extends across the Piedmont of North Carolina and South Carolina. CECS reviewed the Basinwide Watershed Water Quality Assessment Reports for the Broad River Basin (SCDHEC, 2007) as well as the S.C. List of 303(d) Impaired Waters (SCDHEC, 2014) for information pertaining to water resources and water quality.

Within South Carolina, the Broad River Basin is subdivided into three sub-basins, including the Enoree River, the Tyger River, and the Broad River Sub-Basins. The eastern portion of the PSA is located within the Broad River Sub-Basin (HUCs 03050105 and 03050106).

The Broad River Sub-Basin is located in Cherokee, Spartanburg, York, Union, Chester, Fairfield, Newberry, and Richland Counties, and encompasses approximately 2,500 square miles within South



Carolina. Of the approximately 1.5 million acres, 60.6% is forested land, 23.8% is agricultural land, 1.2% is scrub/shrub land, 2.1% is forested wetland, 9.8% is urban land, 1.6% is water, and 0.9% is barren land. The urban land percentage is comprised chiefly of the Cities of Spartanburg, Gaffney, and Chester, and portions of the Cities of York, Union, and Columbia (SCDHEC, 2007).

### **2.4.3 Watersheds**

The Broad River Sub-Basin is divided into 17 watersheds. Of these, the PSA is located within the Lower Broad River Watershed (HUC 03050106-07). Watershed 03050106-07 is located in Newberry, Fairfield, and Richland Counties and consists 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 (SCDHEC, 2007). Within the PSA, numerous streams and drainages are present which convey storm water and perennial flows.

See Section 4.1 for detailed description regarding the delineated WOUS identified within the PSA.

### **2.4.3 303(d) List of Impaired Waters**

In accordance with Section 303(d) of the 1972 Federal CWA (CWA), SCDHEC evaluates water bodies identified as impaired for appropriate inclusion on the Section 303(d) list. The 303(d) list is a State list of waters that are not meeting water quality standards or have impaired uses. The 303(d) list targets water bodies that do not meet water quality standards set for the state for water quality management, as well as identifying the cause(s) of the impairment and the designated classifications.

According to SCDHEC's 2016 Section 303(d) List of Impaired Waters, Station B-801 (Hollinshead Creek), and B-800 (Crims Creek) are within the PSA and impaired for all uses based on macroinvertebrate community data (BIO). Station B-800 is located at latitude/longitude: 34.196044; -81.258691, at the S-698 crossing of Wateree Branch. Station B-801 is located at latitude/longitude: 34.245462; -81.341998, at SC-213 crossing of Crims Creek.

### **2.4.4 Total Maximum Daily Loads**

Total Maximum Daily Load (TMDL) is the amount of a single pollutant (e.g., bacteria, nutrients, metals) that can enter a waterbody on a daily basis and still meet water quality standards set forth by the State. "TMDL" refers to both a calculation of a pollutant entering a waterbody as well as a document that incorporates the calculation along with source assessments, watershed, land use information, pollutant reductions and allocation information, implementation and additional relevant information, maps, figures and pictures (SCDHEC, 2007). TMDLs are a requirement found in Section 303(d) of the CWA.

Once a site is included on the 303(d) list of impaired waters, a TMDL must be developed within two to thirteen years of initial listing. In South Carolina, TMDLs are developed and proposed by SCDHEC and then forwarded to EPA Region 4 for final approval.

TMDLs are calculated by adding all point and nonpoint sources for the pollutant which leads to the impairment. After a TMDL is calculated, the amount of load entering from point and nonpoint sources is compared to the water quality standards for that waterbody. The total loading is reduced to the levels where the water quality standards can be met. This reduced loading is then divided among all the point and nonpoint sources.

The goal of a TMDL is to identify potential pollution sources, calculate and quantify the reduction of those sources, and provide general implementation information needed in order to meet water quality standards and improve water quality. After the approval of the TMDL, an implementation plan can be developed to realize the goals of the written TMDL document. Implementation of a TMDL has a potential to reduce sources of pollution within a watershed and a potential to restore the full use of the waterbody.

According to the SCDHEC TMDL development for the Upper Broad River Basin, a TMDL has been developed by SCDHEC in 2005 and approved by the EPA for the Broad River Basin (HUC 03050106) to determine the maximum amount of fecal coliform it can receive from nonpoint sources and still meet water quality standards. There are eight facilities that have fecal coliform limits in their National Pollutant Discharge Elimination System (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 storm water runoff, leaking rural sewers lines, 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 (SCHEC, 2007). The report is located at the following address:

[http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl\\_lwrbrd\\_fc.pdf](http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_lwrbrd_fc.pdf)

#### **2.4.5 National Pollutant Discharge Elimination System**

Point source discharge means a discharge which is released to the waters of the State by a discernible, confined and discrete conveyance, including but not limited to a pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, vessel, or other floating craft from which waste is or may be discharged. The NPDES Permit Program was created by Section 402 of the CWA. In 1975, the Bureau of Water received authority from the EPA to administer the NPDES Permit Program in South Carolina. The SCDHEC Bureau of Water is responsible for the permitting, compliance, monitoring and enforcement activities of the program.

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Persons with point source discharges to surface waters are required to have NPDES permits. Typical regulated point source discharges are:

- discharges from wastewater treatment systems owned by municipalities, industries, private utilities, State and Federal government, etc.;
- discharges such as cooling water, boiler blow down, etc.;
- storm water discharges from municipal separate storm sewer systems (MS4s);
- storm water discharges associated with industrial activity; and,
- Storm water dischargers from construction sites.

According to the Water Quality Assessment Reports for the Saluda River Basin (SCDHEC, 2011) and the Broad River Basin (SCDHEC, 2007), no NPDES permitted facilities are authorized within the PSA. Additionally, no NPDES permitted facilities are operating upstream of the proposed project.

#### **2.4.6 Water Quality Summary**

SCDHEC's Watershed and Water Quality Information was reviewed through an online query in September 2017. Stations B-800 and B-801 are impaired based on macroinvertebrate community data. In addition, a TMDL for fecal coliform has been established within HUC 03050106, as stated in the Basinwide Watershed Water Quality Assessment Report for the Broad River Basin (SCDHEC, 2007). Please see Appendix C for a copy of the SCDHEC Watershed and Water Quality Information Reports and SCDOT Permit Determination Form. The report may be located at:

<http://www.scdhec.gov/HomeAndEnvironment/Water/ImpairedWaters/Overview/#4>

The proposed project and its derivatives are not anticipated to contribute to these impairments or have long term impacts on water quality within the watershed; however, due to the existing water quality impairments and approved TMDL within watershed 03050106, SCDHEC may require additional water quality protection and stormwater treatment measures during and after construction.

During construction activities, temporary siltation may occur in adjacent waters and erosion may be of a greater degree than presently occurring. Recommendations would be set forth that the contractor minimize this impact through implementation of construction best management practices, reflecting policies contained in 23 CFR 650 B and S.C. Code of Regulations 72-400. SCDOT has also issued an Engineering Directive Memorandum (Number 23), dated March 10, 2009, regarding Department procedures to be followed in order to ensure compliance with S.C. Code of 72-400, Standards for Stormwater Management and Sediment Reduction. Exposed areas may be stabilized by following the Department's Supplemental Technical Specification for Seeding (SCDOT Designation: SC-M-810-4(07/17)).

### **3.0 BIOTIC RESOURCES**

The PSA comprises a long, linear corridor that traverses numerous types of habitats and human influenced areas. The majority of PSA is comprised of existing roadway surfaces and the interstate thoroughfare. Areas which are not developed were classified based upon vegetation and land form types. Vegetative terrestrial communities within the PSA were distinguished by dominant plant species and community types, location in the landscape, past disturbances, and hydrologic characteristics. Only those habitats which were located directly within the PSA are characterized. The PSA was examined through current and historical Google Earth imagery, USDA ortho imagery, and USGS topographic maps to discern areas with similar signatures, and the data were verified and classified through on-site field review. A total of five terrestrial habitat community/land use types are present within the PSA which includes – maintained/urban development (roadsides, utility rights-of-way, lawns, commercial and residential property, mowed fields), mixed pine/hardwood forest, pine forest, bottomland hardwood forest, and successional forest. A brief summary of the terrestrial habitat communities found within the PSA follows:

#### **3.1 Habitat Types**

##### **Maintained Development**

Maintained developments were classified as areas or regions which have altered the native state of the land for consumptive human use. Man-maintained and disturbed communities within the PSA include areas routinely maintained or disturbed by man, including roadside shoulders and utility rights of way. Most of the naturally-occurring plants associated with these maintained or disturbed communities have been destroyed and replaced with cultivated grasses or taken over by naturally occurring opportunistic species characteristic of disturbed areas. These areas encompassed land uses such as residential homes, commercial developments, roadway surfaces, parking lots, and agricultural fields. The majority of maintained developments were located within urban centers and also serving as frontage roads to the mainline of travel. Agricultural fields were present within the PSA occupying areas outside of the mainline of travel. Most of the disturbed roadway edges are comprised of herbaceous species and a few shrubs, including various grasses such as common fescue (*Festuca sp.*), ryegrass (*Lolium perenne*), and bluegrass (*Poa sp.*).

##### **Pine Forest**

Pine forests consist of areas where timber has been harvested and re-planted for the production of pine trees. The systematic removal and planting of pine trees changes the landscape to function as a monoculture dominated by loblolly pine. Fast growing, opportunistic vegetation, such as red maple (*Acer rubrum*) and sweetgum (*Liquidambar styraciflua*) may be present within the early stages of re-growth. The disturbed habitat provides for other shrub species such as Chinese privet (*Ligustrum sinense*) until the pine trees are able to dominate. Groundcover vegetation is more prevalent in the early stages of growth and later may disappear with the dense coverage of pine needles deterring growth.

### **Mixed Pine/Hardwood Forest**

Mixed pine/hardwood forest is the dominant community type located throughout the majority of the PSA. Dominant vegetation consists of pine and hardwood tree species, including sweetgum, red maple, loblolly pine (*Pinus taeda*), water oak (*Quercus nigra*), eastern red cedar (*Juniperus virginiana*), and American holly (*Ilex opaca*).

### **Successional Forest**

Successional forests are sparsely scattered throughout portions of the PSA and include areas that have been logged or cleared within the past five years. Changes to the landscape as a result of logging or land clearing alter the climax community and the natural trend in forest succession. The community may experience an infiltration of non-native species adept at rapid colonization of disturbed regimes. Vegetation in successional forests experiences a quick colonization of rudimentary herbaceous species mixed with a shrub and sapling component. These species tend to be more widespread and occupy numerous habitat types. Successional forests include an early diverse array of herbaceous species within the initial phases of disturbance and transition towards the climax community, replacing primary colonizers.

### **Bottomland Hardwood Forest**

Bottomland hardwood forest are present in small locations within the limits of the PSA. These areas are confined to the floodplain zones of creeks and perennial tributaries where out of bank flooding seasonally inundates benches and terraces. These areas are typically mapped within flood zones of waterways. This community type within the PSA is comprised of dominant vegetation of hardwood tree species that includes red maple, tulip poplar (*Liriodendron tulipifera*), sweetgum, and water oak. Mid canopy species comprise a low density layer of younger individuals where gaps within the upper canopy allow for sunlight to penetrate. Shrub components within the community may be comprised of Chinese privet and giant cane (*Arundinaria gigantea*). Herbaceous ground cover is sparse to bare, with a dense duff layer holding moisture within the soil column for extended periods.

## **3.2 Migratory Birds**

The Migratory Bird Treaty Act (MBTA) makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to federal regulations (16 USC § 703–712). Executive Order 13186 “Responsibilities of Federal Agencies to Protect Migratory Birds” also directs and guides Federal agencies in implementing the MBTA. The migratory bird species protected by the MBTA are listed in 50 CFR § 10.13. The USFWS has statutory authority and responsibility for enforcing the MBTA. Any activity which results in the “take” of migratory birds or eagles is prohibited unless authorized by USFWS.

Ground nests, arboreal nests, and nests built on man-made structures could occur within the project area. Active nests of both the barn swallow (*Hirundo rustica*) and the Eastern phoebe (*Sayornis phoebe*) were documented on many box culverts and structures in the project corridor. To avoid impacts to nesting birds, the contractor shall notify the Resident Construction Engineer (RCE) at least four weeks prior to construction/demolition/maintenance of bridges and box culverts. The RCE would coordinate with SCDOT Environmental Services Office (ESO), Compliance Division, to determine if there are any active birds using structures. After this coordination, it would be determined when construction/demolition/maintenance can begin. If a nest is observed that was not discovered after construction/demolition/maintenance has begun, the contractor will cease work and immediately notify the RCE, who will notify the ESO Compliance Division. The ESO Compliance Division will determine the next course of action. The use of any deterrents by the contractor designed to prevent birds from nesting, shall be approved by the RCE with coordination from the ESO Compliance Division.

### **3.3 Wetland Plant Communities**

The field site visits during May and June 2017 identified a total of five areas which met the criteria for wetland classification. Representative site photographs are included in Appendix B. Two types of wetlands were identified – palustrine emergent and palustrine forested. A total of acres of 0.1267 acres of palustrine emergent wetlands were mapped within the limits of the PSA. A total of 1.3856 acres of palustrine forested wetlands were mapped within the PSA. Wetlands identified in the field were associated with stream ecological baseline, deriving primary hydrological influences from seasonal overbank flooding.

The wetlands were mapped in the field and spatially referenced into ESRI ArcGIS 10.5 for creation of maps illustrating the boundaries and extents within the PSA. Maps and corresponding figures are referenced in Appendix A. Detailed information regarding the identified wetland areas, including approximate size, dominant vegetation, soils, indicators of hydrology, and hydric soils included in Section 4.0 Waters of the U.S.

#### **3.2.1 Palustrine Emergent Wetlands**

Emergent wetland classification is characterized by erect, rooted, herbaceous hydrophytic vegetation, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants such as grasses, sedges, and rushes. All hydrological regimes are included except subtidal and irregularly exposed. These habitats are found in association of lakes, rivers, streams, and ponds along margins as well as circular depressions which may be seasonally or permanently inundated. Emergent wetlands provide vital benefits to watersheds through prevention and/or reducing flooding risk, improving water quality through filtration, and habitat for unique plant and animal communities.



### **3.2.2 Palustrine Forested Wetlands**

Forested wetlands are characterized by woody vegetation 20 feet tall or taller with a diameter breast height (dbh) of three inches or greater. Under normal conditions, a forest stand is 20 years or more but may reach maturity at 15 years as dependent on dominant species. Within the Piedmont Region of South Carolina, forested wetlands are comprised of mixed hardwood species along riverine landscapes. Hydrological influence is typified by seasonal overbank flooding events with low drainage off-site.

### **3.4 Tributaries**

Tributaries were identified and classified during the site visits in May and June 2017 based upon ecological and morphological characteristics. Representative site photographs are included in Appendix B. Following Regulatory Guidance Letter 05-05, the limits of the Ordinary High Water Mark were mapped and spatially referenced into ESRI ArcGIS 10.5 for creation of maps illustrating the boundaries and extents within the PSA. Per guidance issued by the Charleston USACE Regulatory Office on April 2017, these features are classified as a single modifier labeled “Non-wetlands waters.”

#### **3.4.1 Perennial Streams**

The field site visit identified perennial streams along numerous portions of the PSA flowing perpendicular or horizontal to the alignment. These streams were characterized by continuous flowing water, defined bed and bank structure with bankfull discharge, and presence of aquatic fauna. As the alignment moved further northwest, changes within the ecological baseline exhibited trends towards higher number of perennial streams. Base flow within the streams is derived from groundwater discharge and supports an abundance of aquatic fauna such as crawfish, salamanders, macroinvertebrates, and anurans. A perennial stream exhibits the typical biological, hydrological, and physical characteristics commonly associated with the continuous conveyance of water.

#### **3.4.2 Intermittent Streams**

Intermittent streams are classified as waterways which flow only part of the year as a result of precipitation runoff, or high water table discharge in this region. These waterbodies may be classified as seasonal or ephemeral based upon hydrologic influences. Seasonal streams flow within a short time frame and cease conveyance of water in response to input of runoff. Morphology of seasonal streams are described as a well-defined channel with a bed and bank and observable sedimentation transport. Ephemeral streams are characterized by short duration, episodic flows as a result of precipitation events. An ephemeral stream may or may not have a well-defined channel, but exhibits characteristics of sediment transport. Typically, ephemeral streams lack the biological, hydrological, and physical characteristics associated with the continuous or intermittent conveyance of water.

### **3.4.3 Storm water Channels**

Construction of I-26 required implementation of measures necessary to manage and direct water during precipitation events. Channels and culvert crossings were constructed to assist in conveyance of storm water. Features which were constructed solely for the purpose of storm water conveyance were identified within the PSA in several areas.

### **3.4.4 Open Water Bodies**

Modification of the landscape through blocking surface runoff and/or stream flows for various agricultural, flood-related, or recreational purposes create bodies of standing water that may potentially meet the definition as a WOUS. Open waterbodies may derive hydrological influence from seeps, springs as a perennial source. The primary hydrological input to open waterbodies is sourced from surficial runoff during precipitation events. Areas identified were mapped as Non-wetlands waters with a sub designation as “pond.”



#### **4.0. WATERS OF THE U.S.**

WOUS are defined by 33 CFR 328.3(b) and protected by Section 404 of the CWA (33 U.S.C. 1344), which is administered and enforced in South Carolina by the USACE, Charleston District. The term “waters of the U.S.” is defined in 33 CFR Part 328 as:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
  - which are or could be used by interstate or foreign travelers for recreational or other purposes; or
  - from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
  - which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as waters of the United States under the definition;
5. Tributaries of waters identified in paragraphs 1 – 4 above;
6. The territorial seas; and
7. Wetlands adjacent to waters (other than waters that are themselves wetlands) identified in 1 – 6 above.

Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the CWA (other than cooling ponds as defined in 40 CFR 123.11(m) which also meet the criteria of this definition) are not WOUS. WOUS do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the CWA, the final authority regarding CWA jurisdiction remains with the EPA.

Wetlands are defined as those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands are defined in the field as areas that display positive evidence of three environmental parameters including dominance of hydrophytic vegetation, wetland hydrology, and hydric soils (USACE, 1987).

## **4.2 Aquatic Resources**

The boundaries of WOUS were delineated during May and June 2017. Wetlands were determined using the Routine On-Site Determination Method as defined in the Corps of Engineers Wetland Delineation Manual (USACE, 1987) and the Eastern Mountains and Piedmont Regional Supplement to the Manual (USACE, 2012). Limits of stream boundaries were determined through identification of characteristics as outlined through Regulatory Guidance Letter 05-05. Delineated WOUS in the field were identified and the boundaries demarcated with orange flagging tape with alpha and numeric numbering for unique identification. The boundaries of wetlands were additionally marked and recorded in the field using a Trimble Geo 7x data logger with a Hurricane L1 Pro X antennae. Data were post-processed and corrected for spatial accuracy through Pathfinder and analyzed using ESRI ArcGIS 10.5 to depict boundaries and limits of each aquatic resource. See Appendix A for extents of WOUS. In addition, representative photos of the identified aquatic features along with upland data points were recorded.

The final approximate determination and verification of WOUS boundaries by the USACE is pending.

### **4.2.1 Wetlands**

Prior to conducting fieldwork, CECS reviewed NWI Seamless Wetlands Data provided by the USFWS (USFWS, 2015) for areas with potential for wetland location. In addition, USGS topographic maps and aerial imagery data were analyzed to identify primary areas where the likelihood of aquatic resources would be found.

A total of 14 areas were identified within the PSA during site reviews which met the criteria for classification as wetlands. Wetlands were classified based upon type of hydrophytic species present along with percentage of cover within the recorded data point. Two types of wetlands were identified within the PSA – palustrine emergent and palustrine forested.

Field surveys identified six areas encompassing 0.10 acres exhibiting ecological characters consistent for designation as palustrine emergent wetland communities. Typical vegetation within the communities consisted of facultative wetland species within the genera of *Carex*, *Juncus*, *Polygonum*, and *Cyperus*.

**Table 4: Palustrine Emergent Wetlands Identified in the I-26 Project Study Area**

PALUSTRINE EMERGENT WETLANDS	
Wetland Identification	Acreage
Wetland A	0.01
Wetland C	0.01
Wetland F	0.02
Wetland K	0.06
<b>Total</b>	<b>0.10</b>

Field surveys identified nine areas encompassing 1.38 acres exhibiting ecological characters consistent for designation as palustrine forested wetland communities. Typical vegetation within these communities comprised species within the genera of *Acer*, *Fraxinus*, *Liquidambar*, and *Ulmus*.

**Table 5: Palustrine Forested Wetlands Identified in the I-26 Project Study Area**

PALUSTRINE FORESTED WETLANDS	
Wetland Identification	Acreage
Wetland B	0.11
Wetland D	0.22
Wetland E	0.63
Wetland G	0.03
Wetland H	0.09
Wetland I	0.02
Wetland J	0.03
Wetland L	0.11
Wetland M	0.11
Wetland N	0.03
<b>Total</b>	<b>1.38</b>

#### 4.2.2 Tributaries / Non-wetlands Waters

Non-wetlands waters identified within the PSA were evaluated in the field. Ecological and morphological characteristics pertaining to water body type, stream type, function, size, and extents were recorded. Streams and open waterbodies identified within the PSA exhibited perennial, seasonal, and ephemeral flows. Table 6 and Table 7 detail each feature and the size mapped within the PSA.

**Table 6: Open Waterbodies Identified in the I-26 Project Study Area**

NON-WETLANDS WATERS	
Open Waters	Acreage
Pond A	0.12
Pond B	0.15
<b>Total</b>	<b>0.27</b>

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**Table 7: Streams Identified in the I-26  
Project Study Area**

STREAM IDENTIFICATION	LENGTH (LF)	ACRES
Non-wetlands waters 1A	200.38	0.04
Non-wetlands waters 1B	42.30	0.002
Non-wetlands waters 1C	120.58	0.007
Non-wetlands waters 1D	43.67	0.002
Non-wetlands waters 2	74.02	0.008
Non-wetlands waters 4	46.15	0.03
Non-wetlands waters 6	66.23	0.002
Non-wetlands waters 7A	169.69	0.02
Non-wetlands waters 7B	113.24	0.02
Non-wetlands waters 8A	166.73	0.02
Non-wetlands waters 8B	83.93	0.001
Non-wetlands waters 8C	139.59	0.02
Non-wetlands waters 9	219.55	0.03
Non-wetlands waters 10	105.81	0.01
Non-wetlands waters 11	600.53	0.04
Non-wetlands waters 12	380.89	0.12
Non-wetlands waters 13	224.01	0.06
Non-wetlands waters 15	216.57	0.07
Non-wetlands waters 17	453.47	0.05
Non-wetlands waters 18	150.71	0.04
Non-wetlands waters 19A	425.58	0.29
Non-wetlands waters 19B	100.72	0.001
Non-wetlands waters 19C	165.89	0.02
Non-wetlands waters 20	320.47	0.18
Non-wetlands waters 24	603.82	0.06
Non-wetlands waters 25A	77.50	0.00
Non-wetlands waters 25B	28.99	0.01
Non-wetlands waters 26	264.54	0.09
Non-wetlands waters 27	398.88	0.07
Non-wetlands waters 28	96.39	0.07
Non-wetlands waters 29	432.88	0.22
Non-wetlands waters 30A	36.92	0.01
Non-wetlands waters 30B	156.00	0.00
Non-wetlands waters 31	831.61	0.03
Non-wetlands waters 32	291.66	0.08
Non-wetlands waters 33A	587.69	0.01
Non-wetlands waters 33B	752.77	0.04
Non-wetlands waters 33C	58.88	0.001

STREAM IDENTIFICATION	LENGTH (LF)	ACRES
Non-wetlands waters 33D	59.52	0.001
Non-wetlands waters 35	366.85	0.03
Non-wetlands waters 36A	383.44	0.03
Non-wetlands waters 36B	367.59	0.006
Non-wetlands waters 36C	96.40	0.006
Non-wetlands waters 36D	90.81	0.005
Non-wetlands waters 37	110.92	0.008
Non-wetlands waters 38A	27.12	0.01
Non-wetlands waters 38B	438.67	0.06
Non-wetlands waters 38C	60.87	0.002
Non-wetlands waters 38D	114.02	0.01
Non-wetlands waters 39A	79.36	0.001
Non-wetlands waters 40A	2291.55	0.59
Non-wetlands waters 40B	133.86	0.005
Non-wetlands waters 40C	232.07	0.01
Non-wetlands waters 40D	59.93	0.001
Non-wetlands waters 40E	267.75	0.00
Non-wetlands waters 43	259.83	0.03
Non-wetlands waters 44	249.92	0.01
Non-wetlands waters 45A	2287.53	0.90
Non-wetlands waters 45B	265.23	0.01
Non-wetlands waters 46	144.91	0.03
Non-wetlands waters 47	946.94	0.21
Non-wetlands waters 48	78.51	0.009
Non-wetlands waters 49	113.09	0.05
Non-wetlands waters 51A	854.21	0.04
Non-wetlands waters 51B	61.70	0.001
Non-wetlands waters 51C	168.65	0.001
Non-wetlands waters 54A	3032.02	0.13
Non-wetlands waters 54B	72.36	0.02
Non-wetlands waters 54C	422.29	0.02
Non-wetlands waters 54D	506.64	0.002
Non-wetlands waters 60	106.05	0.002
Non-wetlands waters 103	115.77	0.01
Non-wetlands waters 104	123.74	0.01
non-wetland waters 107	436.21	0.07
Non-wetlands waters 108	188.31	0.02
Non-wetlands waters 110	83.24	0.005
Non-wetlands waters D	241.41	0.04
Non-wetlands waters HB	169.00	0.03
Non-wetlands waters HA	148.88	0.02
Non-wetlands waters K	135.15	0.01
<b>PROJECT TOTAL</b>	<b>25,728.24</b>	<b>4.39</b>

### **4.3 Permitting**

Prior to commencement of construction, submittal and review of a CWA Section 404 permit to the USACE would be required for activities that may impact WOUS. The discharge of dredge and/or fill material is prohibited unless the type, quantity, and location has been approved. Regulated discharges would include, but are not necessarily limited to, the placement of fill material, riprap, pipes, culverts, etc., into WOUS. The extents of impacts of the proposed project will determine the level and type of permitting necessary for compliance. Section 404 permitting requirements range from activities considered exempt or preauthorized; to those requiring pre-construction notification under authorization of a Nationwide Permit; General Permit; or, Individual Permit (IP) from the USACE.

In addition to the Section 404 permit, SCDHEC must grant, deny, or waive a Water Quality Certification (WQC), in accordance with Section 401 of the CWA. Waters considered by SCDHEC to be sensitive may also require additional consideration during the 401 WQC process. These include, but are not limited to, Outstanding Resource Waters, Shellfish Harvesting Waters, trout waters, areas draining to waters included on the 303(d) list of impaired waters, and areas draining to waters with an approved TMDL. As discussed in Section 2.4.2, the PSA drains to waters listed as a water with an EPA approved TMDL. Depending on the type of impairments, extent of the project, and other factors, SCDHEC may require additional water quality protection and storm water treatment measures during and after construction.

Based upon preliminary review of the preferred alternative and the anticipated impacts to wetlands and/or streams, regulatory review pursuant to Individual Permitting requirements is anticipated. Specific permitting requirements and strategies for the project would be finalized once impacts to WOUS are quantified, following establishment of design and construction limits.

The permit application must include a delineation of affected WOUS, description of impact avoidance and minimization strategies, and measures to meet the requirements of compensatory mitigation. During final design, further measures to avoid and minimize impacts may reduce impacts to WOUS and could reduce compensatory mitigation requirements.

### **4.6 Compensatory Mitigation**

Compensatory mitigation is normally required to offset unavoidable losses of WOUS. The Council on Environmental Quality has defined mitigation in 40 CFR Part 1508.20 to include: avoiding impacts, minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts. Three general types of mitigation include avoidance, minimization, and compensatory mitigation. Compensatory mitigation usually consists of the restoration of existing degraded wetlands or waters, or the creation of wetlands/waters of equal or greater value than those to be impacted. This type of mitigation is only undertaken after avoidance and minimization actions are exhausted and should be undertaken, when practicable, in areas within the same watershed as where the impacts occur. The USACE typically requires compensatory mitigation for any wetland impacts for which a Section 404

permit application is submitted. It is anticipated that compensatory mitigation for permanent project impacts would be attained through purchase of mitigation credits from a USACE approved mitigation bank. Specific mitigation requirements would be established during the Section 404 permitting process.

In respect to the determination that construction activities for I-26 requiring authorization under the Individual Permit process, mitigation for impacts to streams and/or wetlands would be required prior to or concurrently with construction activities. Utilizing the online resource Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) there are several USACE approved mitigation banks service areas that cover, or partially cover, the PSA (Table 8). However, as of September 2017, these banks do not currently have enough credits to satisfy the estimated stream impacts from the widening project.

**Table 8: Mitigation Banks that Could Potentially Offset WOUS Impacts\***

MITIGATION BANK	SERVICE AREA	CREDIT TYPE
Arrowhead Farms	Secondary	Wetlands, Streams
Broad River	Primary	Wetlands
Grove Creek	Secondary (northern quarter of project only)	Wetlands, Streams
Hunting Creek (SCDOT)+	Primary	Wetlands, Streams
Sandy Fork	Primary (northern quarter of project only)	Streams
Taylor's Creek	Secondary (northern half of project only)	Streams
Turners Branch	Secondary (northern quarter of project only)	Streams

**\*Note:** Credit availability and bank status frequently changes without notification from the bank managers, the USACE, or updates to RIBITS. Additional coordination is required to determine if use of these banks would be feasible to offset impacts from the I-26 project.

+The Hunting Creek Mitigation Bank is not currently approved for use.

Plans to establish two new proposed banks have been submitted to the USACE. The Corley Mill Mitigation Bank intends to develop a site and sell both stream and wetland credits. This bank covers I-26 with a secondary service area. The Crane Creek Mitigation Bank intends to develop a site and also sell both stream and wetland credits. This bank covers I-26 with a primary service area. It is unknown at this time if these banks would be able to provide enough credits to offset the estimated I-26 impacts, or if the credits would be available in time for the construction schedule of I-26. Continued coordination with the bank managers and the USACE is recommended. If mitigation bank credits cannot be purchased, compensatory mitigation for unavoidable impacts to aquatic resources would require establishment of a permittee responsible mitigation plan approved by the USACE. This requires protection and restoration of a wetland and/or stream system, typically within the same watershed as the impact site.

## **5.0 FLOODPLAINS**

Floodplains are low-lying areas adjacent to rivers, streams, and other waterbodies that are susceptible to inundation during rain events. These areas provide important functions in the natural environment such as providing storage for flood waters, protecting the surrounding environment from erosion, and providing habitat for wildlife. As such, agencies are required to take actions that reduce the risk of impacts to floodplains and their associated floodway, or main channel of flow.

Floodplain and floodway protection is required under several federal, state, and local laws, including Executive Order 11988, entitled “Floodplain Management,” which requires federal agencies to avoid making modifications to and supporting development in floodplains wherever practical. Floodplains subject to inundation by the one-percent-annual-chance (100-year) flood event are regulated by the Federal Emergency Management Agency (FEMA).

FEMA publishes maps which depict areas of regulated floodplains and floodways. The Flood Insurance Rate Map (FIRM) is the most common of these flood maps. FIRMs depict the boundaries of flood hazard areas and differentiates them by Zone. Zone A and AE floodplains are areas subject to inundation by the 1-percent-annual-chance flood event and are generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, Base Flood Elevations (BFEs) or flood depths are not available for Zone A or Zone AE floodplains.

In accordance with Executive Order 11988, a hydraulic analysis must be conducted for an encroachment of a FEMA-regulated floodplain. The hydraulic analysis is used to determine if the project is likely to increase the risk of flooding within the floodplain.

Furthermore, SCDOT requires all Zone A and AE crossings to be analyzed for the 100-year flood to ensure that the floodplain encroachment does not cause one (1) foot or more of backwater when compared to unrestricted or natural conditions.

Based upon a review of the floodplain mapping and a GIS analysis of the PSA, the proposed project would cross or encroach on FEMA-regulated floodplains. The extent of floodplains in the vicinity of the project are illustrated in Appendix D. If project modifications are necessary that would require impacts to FEMA-regulated floodplains, a preliminary hydraulic analysis will be performed for each floodplain encroachment and a detailed hydraulic analysis would be performed during final design.



**Table 9: Mapped Floodplain Crossings**

FLOODPLAIN	FIRM PANEL ID	DATE EFFECTIVE	FEMA ZONE	EXISTING CROSSING
Metz Branch	45079C0090K	December 21, 2017	Zone AE	Culvert
Wateree Creek	45079C0090K	December 21, 2017	Zone AE	Culvert
Moccasin Branch	45079C0206L	December 21, 2017	Zone AE	Culvert
Risters Creek	45063C0040G	February 9, 2000	Zone A	Culvert
Unnamed Tributary	45063C0040G	February 9, 2000	Zone A	Culvert
Rocky Creek	45071C0410C	September 16, 2011	Zone A	Culvert
Crims Creek	45071C0410C	September 16, 2011	Zone A	Culvert
Unnamed Tributary	45071C0410C	September 16, 2011	Zone A	Culvert

The stream crossings that are in Newberry and Lexington County are located in special flood hazard area Zone A, areas of high risk for flooding subject to inundation by the 1 percent annual-chance flood. Stream crossings in Richland County were updated on December 21, 2017 and designation of flood zones was changed to Zone AE, area of high risk for flooding by the 1 percent annual-chance where base flood elevations are provided. Each of these crossings is eligible for “No-Rise” certifications since there would 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 FEMA.



## **6.0 THREATENED, ENDANGERED, AND PROTECTED SPECIES**

The Federal ESA of 1973 (50 CFR Part 402), as amended, is the federal regulatory tool that serves to administer permits, implement recovery plans, and monitor federally protected (endangered and threatened) species. The ESA is administered and regulated by the USFWS and/or National Oceanic and Atmospheric Administration-National Marine Fisheries Service.

Because of the federal nexus of the proposed project, consultation with the USFWS is required under Section 7 of the ESA, for proposed projects that “may affect” federally endangered and threatened species. This assessment analyzes potential impacts to federally endangered and threatened species associated with the proposed project, and is intended to initiate informal consultation, as needed.

Federal Protected Species - Species with the federal classification of Endangered (E) or Threatened (T) are protected under the ESA.) The term “endangered species” is defined as “any species which is in danger of extinction throughout all or a significant portion of its range”, and the term “threatened species” is defined as “any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range” (16 U.S.C. 1532).

“At-Risk Species” (ARS) is an informal term that refers to those species which may be in need of concentrated conservation actions, and have been petitioned for listing as threatened or endangered. The USFWS designations of ARS does not provide federal protection and require no Section 7 consultation under the ESA.

State Protected Species – Animal species that are on the South Carolina state protected species list receive protection under the South Carolina Nongame and Endangered Species Conservation Act (South Carolina Code, Title 50). State endangered species are defined as any species or subspecies of wildlife whose prospects of survival or recruitment within the state are in jeopardy or are likely within the foreseeable future to become so. It is unlawful for any person to take, possess, transport, export, process, sell or offer for sale or ship, and for any common or contract carrier knowingly to transport or receive for shipment any species or subspecies of wildlife appearing on the state list of protected species without appropriate authorization.

Pursuant to Section 7 of the ESA a field survey was conducted on the proposed project study corridor. The following list of protected species for Lexington, Newberry, and Richland Counties was obtained from the USFWS (updated 2017). This includes endangered, threatened, and species protected under the Bald and Golden Eagle Protection Act (BGEPA) of 1940.

A search of the USFWS database provided existing information concerning the potential occurrence of threatened or endangered species within Lexington, Newberry, and Richland Counties. This database identifies nine federally threatened or endangered species known to occur or to have formerly occurred in Lexington, Richland, and Newberry Counties, as listed in Table 10 (USFWS, 2017).

The SCDNR Rare, Threatened and Endangered Species Inventory database, updated August 2017, was also reviewed for information regarding species with state endangered or threatened status. No additional species are currently listed as state threatened or endangered in Lexington, Newberry, and Richland Counties.

State and/or federally-listed endangered, threatened, protected, and at risk species and their respective habitats are briefly described below:

**Amphibian**

**Chamberlain's dwarf salamander (*Eurycea chamberlaini*) – At Risk Species**

This species is very poorly documented and its natural history is not well known. Habitat selection of the species tends towards a preference for seepage areas near streams. Populations that are located within the South Carolina Piedmont are believed to be remnants of a once more widespread upland form that disappeared with the receding Coastal Plain. Prey likely consists of a similar diet than other *Eurycea* consisting of insects, spiders, mites, and ticks. It is likely that the species is a sit-and-wait predator based upon the projectile (boletoid) tongue.

**Avian**

**Bald eagle (*Haliaeetus leucocephalus*) – Bald and Golden Eagle Protection Act**

Adults tend to have a blackish-brown back and breast with a white head, neck, and tail and a yellow bill. Juveniles tend to be brown and white with a black bill. Female bald eagles are approximately 35 to 37 inches long while the male bald eagles are approximately 30 to 34 inches. This bird nests in mature live pines or cypress trees in the transition zone between mature forests and large bodies of water. Nests are very large, up to six feet in width, and constructed of large sticks and soft materials such as dead vegetation, grasses, and pine needles. Nesting trees are usually less than two miles from open water. Winter roosts are usually in mature trees, similar to nesting trees, but may be somewhat farther from water.

**Red-cockaded woodpecker (*Picoides borealis*) – Federal/State Endangered**

Adult red-cockaded woodpeckers are approximately 18 to 20 cm long with a wingspan of 35 to 38 cm. Adults have a black cap, throat, and stripe on the side of the neck and white cheeks and underparts. The back is barred with black and white horizontal stripes. Adult males have a small red spot on each side of the black cap. The bird is native to southern pine forest and typically nests within open pine stands containing trees 80 years or older. Habitat preference typically consists of long leaf pine stands with open grassland understory. Roosting cavities are excavated within live pines, which are often infected with a fungus which causes what is known as red-heart disease. Foraging may occur in pine and/or mixed pine/hardwood stands 30 years or older with trees 10" or larger in diameter at breast height.

**Wood stork (*Mycteria americana*) – Federal Threatened**

Wood storks are the largest wading bird and only stork species that breeds in the United States. These birds are large, long legged with a head to tail length of up to 45 inches and a wingspan of up to 65 inches. Adult wood storks are white except for the primary and secondary wing feathers and the tail feathers, which are black with a greenish sheen. Adults also have an unfeathered head and neck with a long, thick black bill. The breeding range of the wood stork extends down the southeastern coast of the United States, including South Carolina. Wood storks typically nest in extensive forested wetlands within the upper branches of swamp black gum (*Nyssa biflora*) or bald cypress trees in standing water.

**Crustacean**

**Broad River spiny crayfish (*Cambarus spicatus*) – At Risk Species**

The Broad River Spiny Crayfish is gray green with cream, pink, purple, and brown highlights. The chelae are green with orange tips and a double row of tubercles (NCWRC 2005). The Broad River Spiny Crayfish is restricted to the Broad River Basin. In South Carolina, it is found in Fairfield, Richland, and Spartanburg Counties. The streams in which the Broad River Spiny Crayfish has been found exhibit signs of flash flooding, including sand deposits and log jams. This species is usually found in or beneath debris (Eversole 1995).

**Newberry burrowing crayfish (*Distocambarus youngineri*) – At Risk Species**

The Newberry burrowing crayfish is a small species, 50 mm (2 inches) in total length, with small pigmented and faceted eyes. The rostrum is spatulate and lacks spines. The chelae are strongly depressed and the palm is studded with squamous tubercles (NatureServe 2011). The species is only from 19 locations within the Saluda River basin and one site on the Broad River basin. The species is found in moist terrestrial areas with leaf litter and a mixed hardwood overstory, usually near stream headwaters or intermittent streams (Eversole 1995). Although it is found in the general area of headwater streams, it is not found very close to streambanks and does not appear to be directly associated with the streams themselves. In areas where the species is found, the soil becomes saturated and may be covered with shallow water during periods of precipitation in the winter, spring, and sometimes into the early summer. Water has been found in the burrows even under drought conditions (Eversole 1995).

**Fish**

**American eel (*Anguilla rostrata*) – At Risk Species**

The American eel is a catadromous species found within watersheds of the Atlantic Ocean. Eels are long, slender fish that produce a mucous protective layers over their skin. Typical coloration ranges from olive green to brown with a light underside. Eels are catadromous species that reside in freshwater habitats and migrating to the Sargasso Sea to breed and subsequently die. The species grows to an average length of 4 feet and may weigh upwards of 8 lbs. Eels were once an abundant species in rivers, and were an important fishery for aboriginal people. The construction of hydroelectric dams has blocked their migrations and locally extirpated eels in many watersheds.

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**Blueback herring (*Alosa aestivalis*) – At Risk Species**

The blueback herring is an anadromous species found along the Atlantic Ocean from Florida to Nova Scotia, Canada. Average size of the species is 16 inches. This fish lives within marine systems where it migrates upstream in rivers to spawn near hard substrates. Adults spawn from March through Mid-May and return to the ocean. Their populations have declined through much of their original range as a result of construction of dams and degradation of habitat.

**Robust redhorse (*Moxostoma robustum*) – At Risk Species**

The robust redhorse is a ray-finned fish belonging to the family of sucker type species. Their distribution is localized and found in the Pee Dee, Savannah, and Santee River basins of South Carolina. Specific habitat is wide ranging and may incorporate rocky streams to reservoirs and large rivers. Typical size at maturity is 25 inches. Habitat loss and disruption of spawning migrations resulting from dams and impediments, predation by introduced nonnative species, and water quality deterioration due to increased sedimentation and pollution are believed to have contributed to the decline of the species.

**Atlantic Sturgeon (*Acipenser oxyrinchus*) – Federal Endangered**

The Atlantic sturgeon is an anadromous fish species, similar in habitat requirements and appearance to the shortnose sturgeon. The Atlantic sturgeon can be distinguished by their large size, smaller mouth, different snout shape and scutes. They can grow up to 14 feet in length and weigh up to 800 pounds. The Atlantic sturgeon is bluish-black or olive brown dorsally with paler sides and a white belly. The sides of its body also contain five rows of scutes. Adults are commonly found in brackish and estuarine waters along the coastline. The adult Atlantic sturgeon will migrate upstream to fresh water to spawn in the spring, and can go as far inland as the fall line in South Carolina to spawn, as long the stream is unobstructed. Suitable habitat for the shortnose sturgeon is not present within the PSA, since riverine, estuarine, or marine habitats are not present. Streams present within the PSA have been channelized, dammed, and/or blocked with pipes and culverts downstream, thereby preventing access to the portions of channel within the PSA.

**Shortnose sturgeon (*Acipenser b. revirostrum*) – Federal Endangered**

The shortnose sturgeon is an anadromous fish species which spends most of the year in brackish or salt water and moves into fresh water only to spawn. Spawning season for the shortnose sturgeon occurs from late winter to early spring. The shortnose sturgeon is dark-colored on its dorsal side and light on the ventral side. This species of sturgeon has a wide mouth pointed downward beneath a short snout and can grow up to three feet long. The sides of its body contain five rows of sharp, pointed plates. The shortnose sturgeon inhabits the lower portions of large rivers and coastal rivers along the Atlantic Coast. Suitable habitat for the shortnose sturgeon is not present within the PSA, since riverine, estuarine, or marine habitats are not present.

**Mammal**

**Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) – At Risk Species**

Rafinesque's big-eared bat is a medium-sized bat up to five inches in length. This bat is brown in color with white-tipped fur on its belly. The species gets its name from its large ears, approximately 1.25 inches long. Two large, conspicuous glands are located on either side of the nose. The species can be found in nearly all forest types within its range but tend to concentrate more heavily in forested swamps. Roosting sites consist of artificial and natural habitats, including unoccupied buildings or hollowed-out tree cavities, especially black gum trees, near water. Occurrences of roosts under bridges have further been documented. In some areas, hibernating bats can be found in caves, wells, and other similar habitats. Foraging habitat includes the foliage and surrounding airspace of swampland trees and the sides. Other distinguishing characteristics are white crescents above and below the eyes and two white wing bars.

**Tri-colored bat (*Perimyotis subflavus*) – At Risk Species**

The species is the smallest bat in South Carolina measuring at 7-8 cm (2.8 – 3.1 inches) with a total wingspan of 21-26 cm (8.3 -10.2 inches). The original species name was the eastern pipistrelle, but recent phylogenetic research showed that the species was only distantly related to pipistrelles. The species is distributed throughout the state with habitat preference being within mesic oak woodlands, roosting in leaf clusters in oak trees. During the winter, individuals prefer to roost within caves and abandoned mines as hibernacula. Feeding habits focus on small insects along forest edges and over streams.

**Mollusk**

**Savannah lilliput (*Toxolasma pullus*) – At Risk Species**

A unique member of the family Unionidae, the Savannah lilliput is restricted to approximately seven fragmented populations where only three locales are documented to be reproducing. The species is found within the Savannah, Cooper-Santee, and Pee Dee River basins. Habitat of the lilliput is typified by lotic streams and ponds where the bottom substrate consists of mud and sand along embankments. It is considered extirpated from the Wateree River in South Carolina but has been documented in Lake Marion.

**Plant**

**Canby's dropwort (*Oxypolis canbyi*) – Federal Endangered**

Canby's dropwort is a perennial herbaceous plant with tuberous roots and pale, fleshy rhizomes and erect stems up to 39 inches tall. The stems may be purplish at the base, and the leaves resemble quills. The flowers are small and white with five petals and grow in umbels or flat-topped clusters. Canby's dropwort grows in moist areas in the coastal plain and sandhills, including wet meadows, wet pineland savannas, ditches, sloughs, and around the edges of Cypress-pine ponds. The plant seems to be more prolific when the habitat has been burned.

**Bog spicebush (*Lindera subcoriacea*)- At Risk Species**

Bog spicebush is a rare species found within pocosins and bogs of the Coastal Plains, Sandhills, and Piedmont regions. The species range in the United States is usually in acidic seepage bogs, in very scattered places from Virginia or possibly New Jersey to Louisiana. Bog Spicebush is a rare native deciduous shrub. It differs in having somewhat more leathery leaves that are blunt tipped and only very faintly lemon scented rather than strongly aromatic spicy foliage. It is classified as an obligate wetland species for both the Atlantic Gulf Coastal Plains and Eastern Mountains and Piedmont regions. The species is a shrub that may reach up to 4 meters (13 feet) in height with broad elliptical leaves measuring up to 8 cm (3.2 inches) long. Flower coloration is yellow-green, produced in clusters of 3 to 4 at the ends of distinct paired stalks originating from the prior year's bud scars. Bog spicebush inhabits permanently moist to wet, shrub-dominated seepage wetlands, open, quaking bogs in pinelands, shrub thickets of seepages, usually near the heads of streams where peat moss is abundant and along the banks of small braided streams. In the south, it is usually not found outside of the wettest portions of rare sphagnum bog habitats. It is found on very acid soils that are high in organic matter and permanently saturated.

**Carolina bog mint (*Macbridea caroliniana*) – At Risk Species**

An inhabitant of bogs and marshes in North and South Carolina, specimens are approximately 1-2 feet erect, stoloniferous plants that slowly spread to create a colony of curious purplish-pink blooms. The 1-inch flowers are quite distinctive; lower petals have 3 spoon-like lips, and the top lip is depressed. Typical blooming period is August. Habitat of the species is consistent with blackwater swamp lowlands that are infrequently flooded, occupying open areas where light is able to penetrate through the upper canopy. The species reproduces vegetatively via rhizomes in addition to seeds.

**Ciliate-lead tickseed (*Coreopsis integrifolia*) – At Risk Species**

An herbaceous species inhabiting streambanks and floodplains of blackwater streams, the ciliate-lead tickseed is found traditionally along the coastal plain of Georgia, Florida, and South Carolina. Within the past four years, only four records have been documented. Specimens are 40-70 cm (16-28 inches) in height with few branches. The ends of each branch bear reproductive anatomy from August to November consisting of ray and disk flowers. Fruits are small 0.5 cm, (0.25 inches) and with scalloped wings for dispersal. The primary method of wide-range dispersal is through contact with mammalian hair.

**Georgia aster (*Symphotrichum georgianum*) – At Risk Species**

The Georgia aster is a perennial herb forming large colonies through rhizomatous propagation. Stems range from 50-100 cm (20-40 inches) and may be tall and hairy with limited branching. The aster is classified within the Asteraceae family and has bright purple ray flowers and reddish disk flowers. Although not federally listed, the species affords protection through listing as a state species of concern. As a sun loving plant, Georgia aster was once widespread across southeastern meadows and prairies, but is rare today because of habitat destruction and wildfire suppression. Georgia aster's



native habitat is open, sunny areas, where it grows along edges and openings in rocky, upland oak-hickory-pine forests, and rights-of-way. The primary aspect to distribution and its occurrence is reliant on the availability of sunlight.

**Michaux's sumac (*Rhus michauxii*) – Federal Endangered**

Michaux's sumac is a rhizomatous, densely hairy shrub, with erect stems from one to three feet in height. Most plants are unisexual; however, more recent observations have revealed plants with both male and female flowers on one plant. The flowers are small and colored greenish yellow to white. Flowering usually occurs from June to July; while the fruit is produced through the months of August to October. Michaux's sumac grows in sandy or rocky open woods in association with basic soils. This plant survives best in areas where some form of disturbance has provided an open area. Several populations in North Carolina are on highway rights-of way, roadsides, or on the edges of artificially maintained clearings. Two other populations are in areas with periodic fires, and two populations exist on sites undergoing natural succession. One population is situated in a natural opening on the rim of a Carolina bay. There are no known wild populations of Michaux's sumac known in South Carolina.

**Purple baldina (*Balduina atropurpurea*) – At Risk Species**

The purple baldina is a North American species of plants in the sunflower family, native to the southeastern United States (Florida, Georgia, Alabama, South Carolina, and North Carolina). The species is ranked as a perennial herb with branching stems. Each plant has 1-4 flower heads, each with yellow ray florets and purple disc florets. The species grows in wet pinelands and savannahs. The presence of managed fire regime is fundamental to the species propagation.

**Rough-leaved loosestrife (*Lysimachia asperulaefolia*) – Federal Endangered**

Rough-leaved loosestrife is a rhizomatous, perennial herb with slender stems at one or two feet tall. Whorls of three to four bluish-green leaves encircle the stem at intervals beneath the showy yellow flowers. The leaves are smooth and flowering occurs from mid-May through June, with fruits present from July through October. Rough-leaved loosestrife favors pocosins, especially on the edges (ecotones) between longleaf pine sandhills and pond pine pocosins. It has also been found on deep peat in the low shrub community of Carolina bays. It has been found in roadside depressions, firebreaks, and power line rights-of-way adjacent to pocosins. These habitats depend on naturally occurring fires to keep the understory clear.

**Sandhills lily (*Lilium pyrophilum*) – At Risk Species**

The sandhills lily is a member of the Liliaceae family, found in the sandhills regions of southern Virginia, North Carolina and northern South Carolina, in the eastern United States. As a member of the lily family, the plant grows to 0.6-1.6 m in height and characterized by long narrow, slightly pointed leaves arranged in a variable number of whorls around the stem. Phenology of the species is late July and into August. *Lilium pyrophilum* is narrowly endemic to the Sandhills region of southern Virginia, North Carolina, and northern South Carolina. The most ecologically intact populations occur on military bases

in the Carolinas that are carefully managed to ensure that frequent fires promote propagation of the fire-dependent lily.

**Long Beach seedbox (*Ludwigia brevipes*) – At Risk Species**

Long Beach seedbox is a perennial herb with reproduction that may be through sexual transfer of pollen or through asexual self-propagation. The species is a member of the primrose family - Onagraceae. The species is known from six counties in South Carolina. It is an herbaceous, wetland species found within riparian zones and shallow depressions. The species grows prostrate to the ground with an erect flowering stem. As a result of wetland loss and the reduction in water quality within streams, the species has declined throughout its range.

**Smooth coneflower (*Echinacea laevigata*) – Federal Endangered**

The smooth coneflower is an herbaceous perennial that is characterized by light pink to purple drooping flowers from May to July. The plant has smooth stems and few leaves. It is usually restricted to open sites with low competition that are maintained by fire, grazing, mowing, or other methods. Historically the plant was associated with prairie-like habitats or oak-savannas, but today most often occurs in openings in woods (i.e. clear-cuts), along roadsides, utility line rights-of-way, and on dry limestone bluffs. In addition, the plant is typically found on magnesium and calcium rich soils associated with diabase and marble. The project area includes open areas associated with transportation and utility right-of-way; however, the soil along the project is not particularly magnesium or calcium rich.

**Spathulate seedbox (*Ludwigia spathulata*) – At Risk Species**

An herbaceous wetland species that forms extensive mats as a result of stoloniferous rooting capabilities, the seedbox is a perennial herb, with creeping stems that are prostrate to the ground. The spathulate seedbox is found in South Carolina, Georgia, Northern Florida, and southern Alabama. The species is found in exposed shores and sinkholes, small depressional landforms and meadows of the Aiken Plateau. Primary threats to the species are from fire suppression, habitat loss, and draining of wetlands for agricultural land use. Phenology of the species is generally June to October.

**Wire-leaved dropseed (*Sporobolus teretifolius*) – At Risk Species**

Wireleaf dropseed is a warm season grass. The species is found within long leaf pine moist savannahs with active seepage. The growing season is defined as summer months pending seasonal fire regimes. Reproduction is through wind dispersal and seeds drop during the cooler, fall months. The species grows up to 20 inches in height and forms tufted clumps. The species has small, localized populations that have declined as a result of habitat conversion, altered hydrological, and fire suppression.

**Reptile**

**Southern hognose snake (*Heterodon simus*) – At Risk Species**

The Southern hognose snake is a member of the Dipsadidae family and is endemic to North America. The species is a heavy-bodied snake that may reach up to 24 inches in length. The key defining feature



of the species and genera is the upturned snout. Hognose snakes are characterized as fossorial, and may reside under the surface for long periods of time. Habitat and distribution of the species is primarily within the coastal plain of the eastern United States where soils are comprised of deep sand and dune habitats. Diet consists primarily of toads (*Anaxyrus sp.*) where enlarged teeth in the rear of the mouth allow are used to puncture inflated toads. The species has declined in population as habitat conversion and the introduction of fire ants have had adverse effects.

**Spotted turtle (*Gemmys guttata*) – At Risk Species**

The spotted turtle is small, only reaching lengths of up to 5 inches. The shell or carapace is black and sprinkled with numerous orange-yellow dots. The head and neck also have orange-yellow blotches.. The spotted turtle is a semi-aquatic species that inhabits a variety of wetland types including small shallow ponds, small streams, swamps, and flooded forests.

**6.2 Results**

The data collected from online resources and databases, in addition to the field site visits indicated that a single species, Northern long-eared bat, identified as threatened, may be found within or directly adjacent to the PSA. Habitat conducive to seasonal occupation is located within the vicinity of the PSA. In compliance with the Endangered Species Act, the USFWS issued a final rule that identifies protections for the northern long-eared bat. The final 4(d) rule outlines conservation measures and clarifications of what actions merit definition as “take.” In respect to the 4(d) rule, streamlined consultation with the USFWS has been initiated regarding the USFWS intra-service Programmatic Biological Opinion for the northern long-eared bat. This form is provided in Appendix E.

As the PSA traverses undeveloped as well as urban land use, no foraging habitat for the bald eagle is located within the PSA. The nearest known bald eagle nest is located approximately 1 mile from the PSA in Chapin, near Lake Murray (SCDNR 2016).

In part with development of project scoping, a Letter of Intent was sent to the USFWS to solicit comments regarding planning and development of the project. The USFWS responded with preliminary comments and concerns related to potential impacts. The response letter from the USFWS is included in Appendix F.

**6.3 Biological Conclusions**

Construction activities along the existing right-of-way corridor are anticipated to lead to temporary, localized disturbances within the vicinity of the PSA and clearing of trees would be required for specific project aspects. Table 10 provides a summary of all federally protected species and potential project impacts to these species.

**Table 10: Federally Protected Species and Potential Project Impacts**

SPECIES	PROTECTION STATUS	COUNTY	SUITABLE HABITAT	POTENTIAL PROJECT IMPACTS
Atlantic sturgeon ( <i>Acipenser oxyrinchus</i> )	Endangered	Lexington, Richland	Not Present	No effect
American wood stork ( <i>Mycteria Americana</i> )	Threatened	Richland	Not Present	No effect
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	BGEPA	Lexington, Newberry,	Not Present	No effect
Canby's dropwort ( <i>Oxypolis canbyi</i> )	Endangered	Richland	Not Present	No effect
Michaux's sumac ( <i>Rhus michauxii</i> )	Endangered	Richland	Not Present	No effect
Red-cockaded woodpecker ( <i>Picoides borealis</i> )	Endangered	Newberry, Richland	Not Present	No effect
Rough-leaved loosestrife ( <i>Lysimachia asperulaefolia</i> )	Endangered	Richland	Not Present	No effect
Shortnose sturgeon ( <i>Acipenser brevirostrum</i> )	Endangered	Richland	Not Present	No effect
Smooth coneflower ( <i>Echinacea laevigata</i> )	Endangered	Lexington, Richland	Not Present	No effect

Based on the literature and field reviews, it is determined that the project would have a biological conclusion of 'no effect' on American wood stork, bald eagle, red-cockaded woodpecker, or smooth coneflower. At-Risk Species do not currently receive legal protection from the ESA; therefore, a biological conclusion for these species is not provided. In the event additional species are listed as federally threatened or endangered prior to the construction of the project, SCDOT would consult with USFWS on the results of the surveys performed, if necessary, and would follow any USFWS regulations/requirements resulting from that consultation.

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**Natural Resources Technical Memorandum**  
**Interstate 26 Widening MM 85-MM101, Newberry, Lexington, and Richland Counties, SC**

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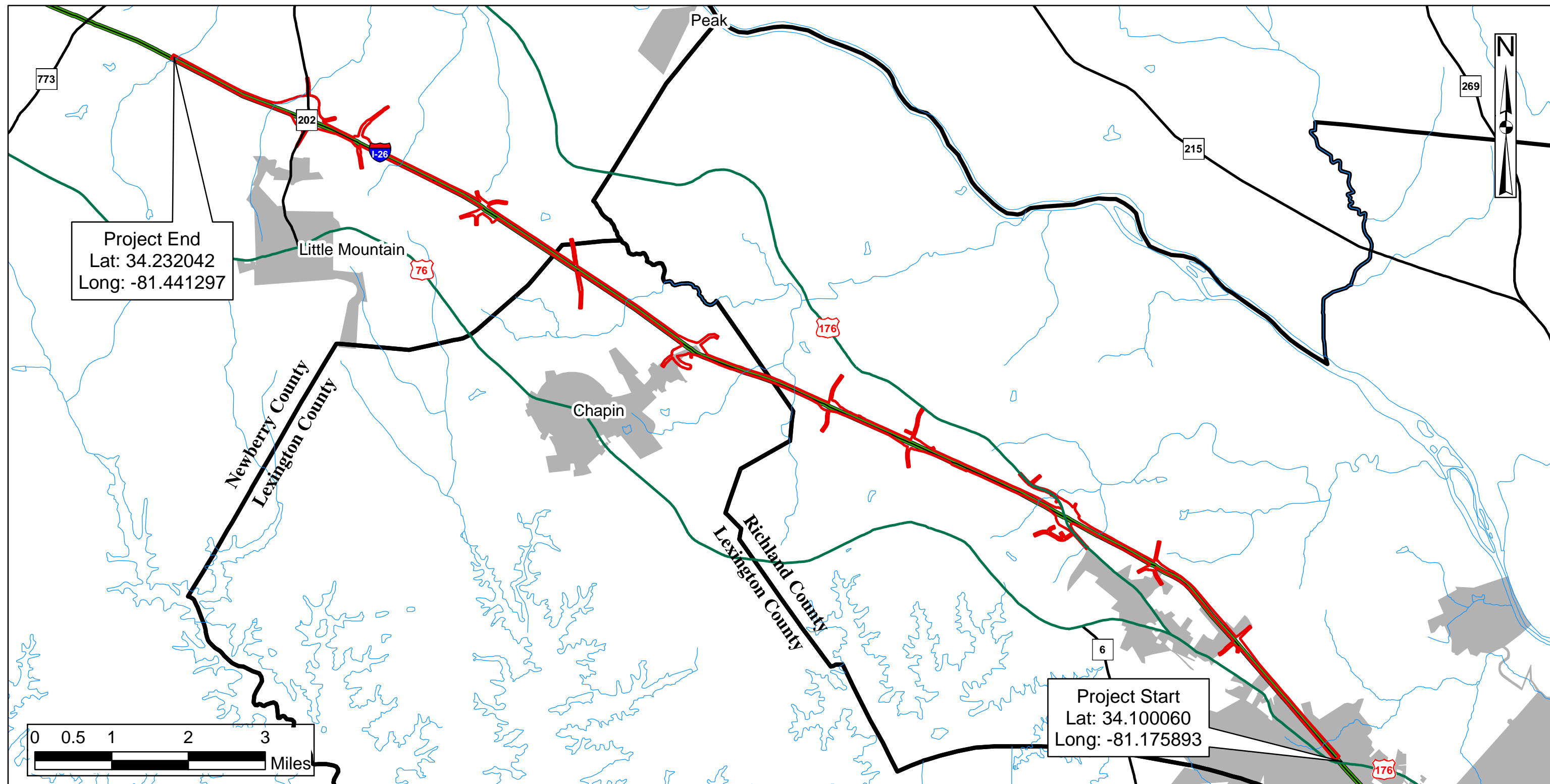
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# **APPENDIX A**

## **FIGURES**



**Legend**

- SC Route
- US Route
- Waterbodies
- Interstate
- Project Study Area
- County Line

**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

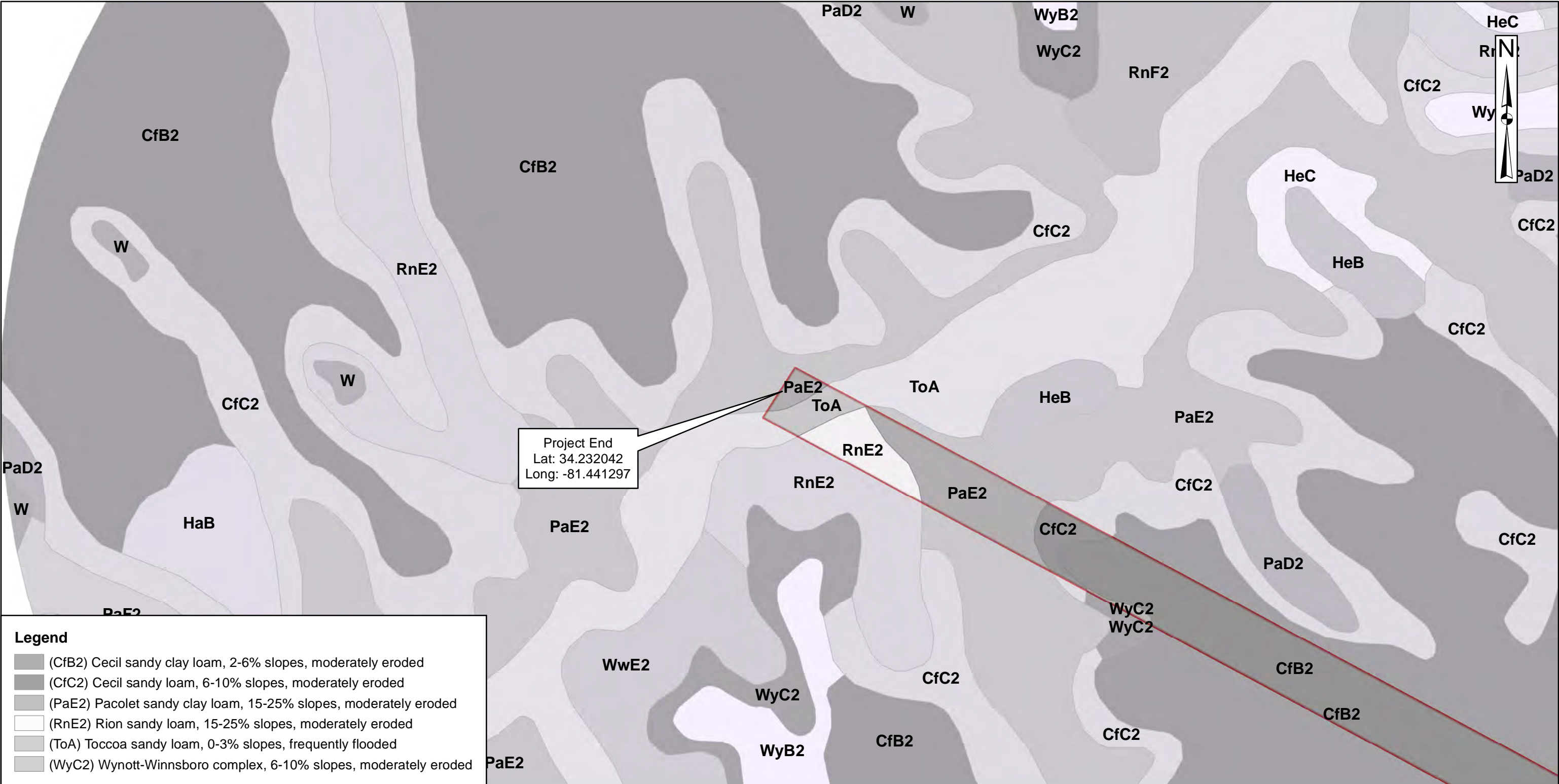
Source:  
Composite County  
Roadway Data  
2015

**PROJECT LOCATION**

Drawn By: RHH  
QA/QC: KLM  
January 2018

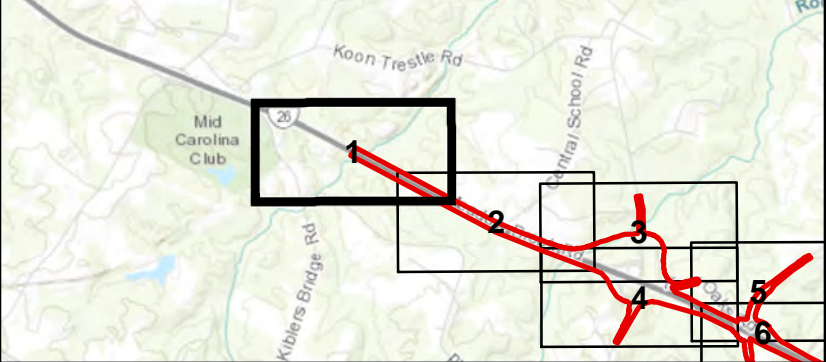
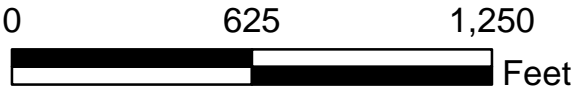
Figure 1





**Legend**

- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (RnE2) Rion sandy loam, 15-25% slopes, moderately eroded
- (ToA) Toccoa sandy loam, 0-3% slopes, frequently flooded
- (WyC2) Wynott-Winnsboro complex, 6-10% slopes, moderately eroded



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

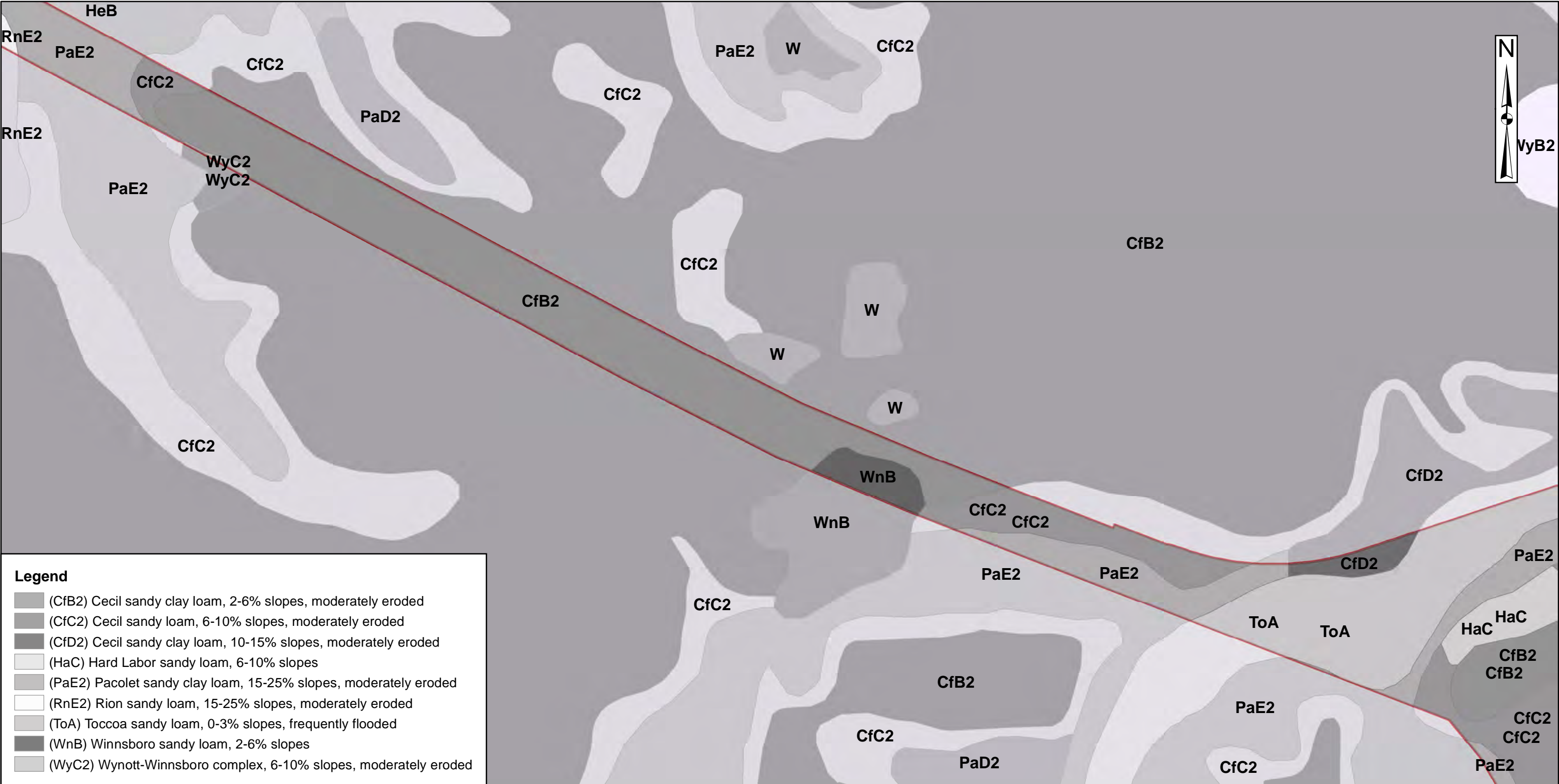
Source:  
 Lexington, Newberry,  
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 1976


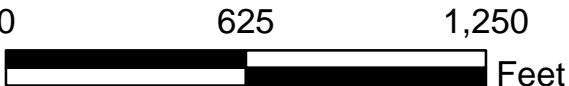
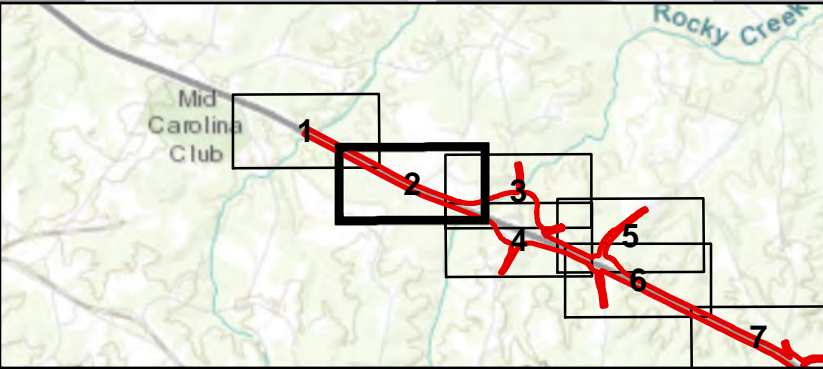
**NRCS SOILS MAP**

Drawn By: RHH  
 QA/QC: KLM

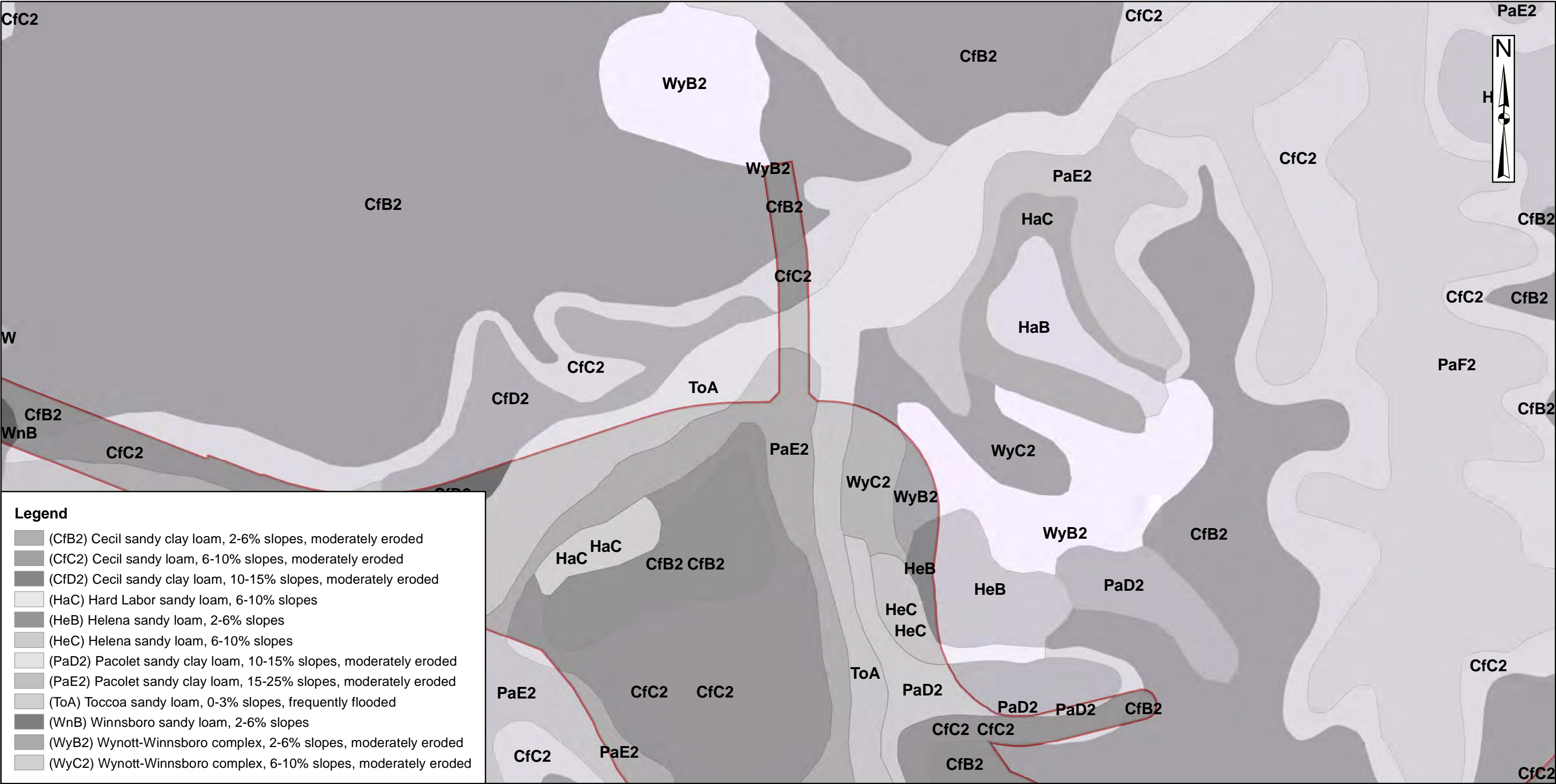
January 2018





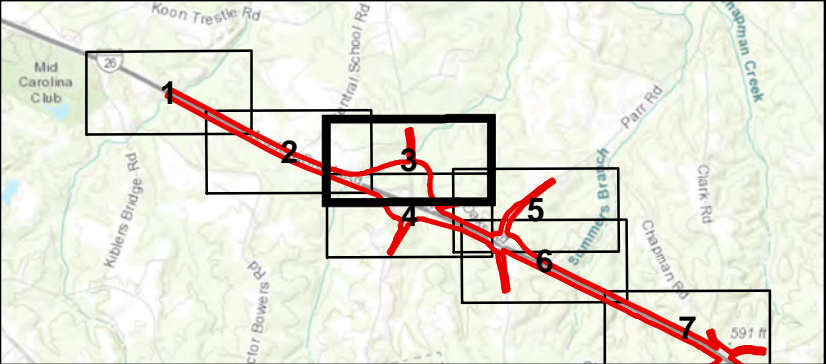
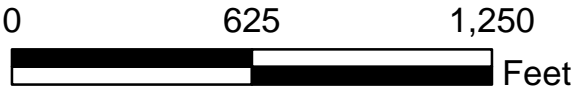
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			Source: Lexington, Newberry, Richland Soils Survey 1976	<b>NRCS SOILS MAP</b>  Drawn By: RHH QA/QC: KLM  January 2018	Page 2 of 26





**Legend**

- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (CfD2) Cecil sandy clay loam, 10-15% slopes, moderately eroded
- (HaC) Hard Labor sandy loam, 6-10% slopes
- (HeB) Helena sandy loam, 2-6% slopes
- (HeC) Helena sandy loam, 6-10% slopes
- (PaD2) Pacolet sandy clay loam, 10-15% slopes, moderately eroded
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (ToA) Toccoa sandy loam, 0-3% slopes, frequently flooded
- (WnB) Winnsboro sandy loam, 2-6% slopes
- (WyB2) Wynott-Winnsboro complex, 2-6% slopes, moderately eroded
- (WyC2) Wynott-Winnsboro complex, 6-10% slopes, moderately eroded



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

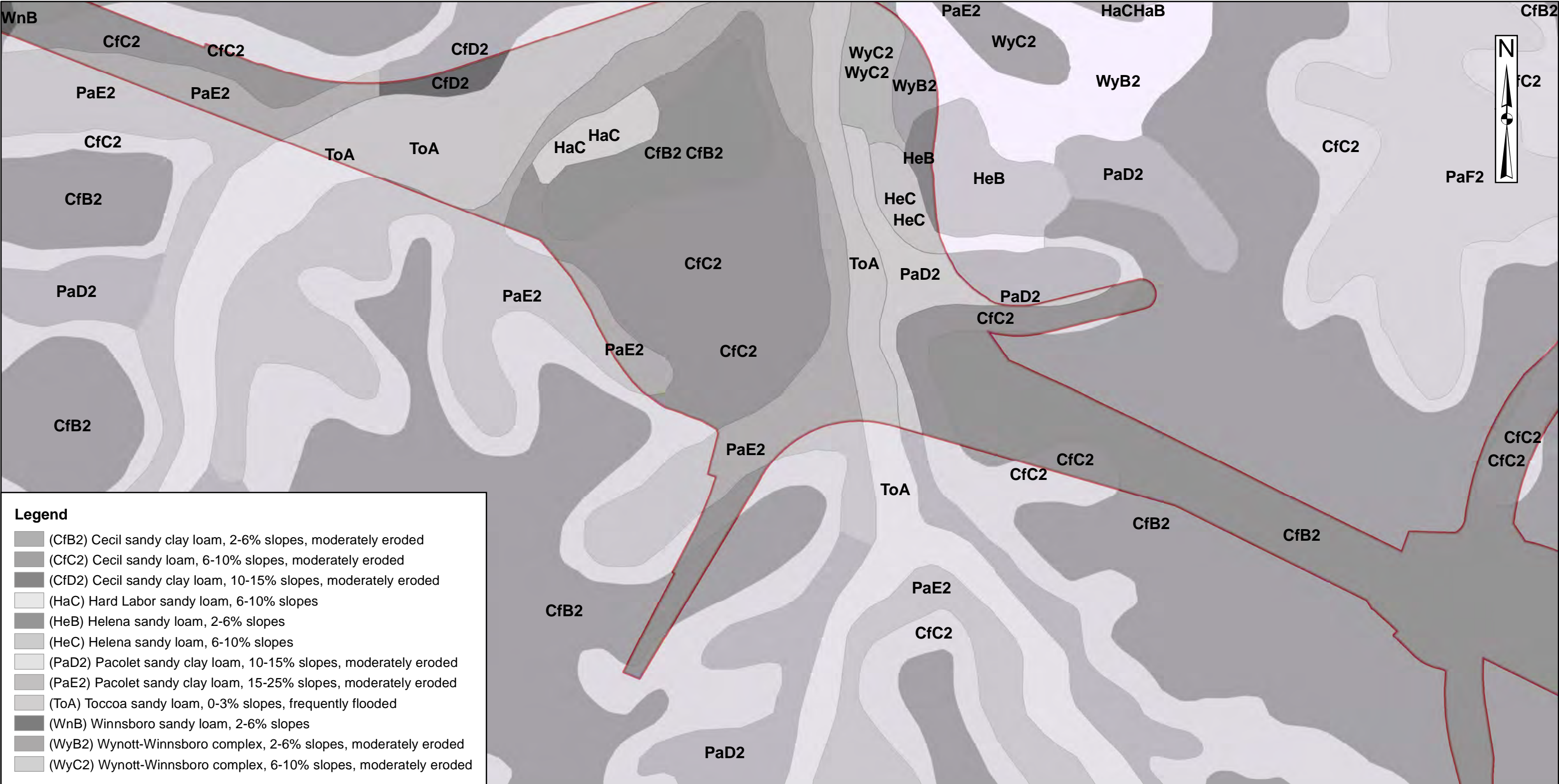
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Lexington, Newberry,  
Richland Soils Survey  
1976


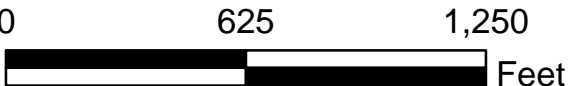
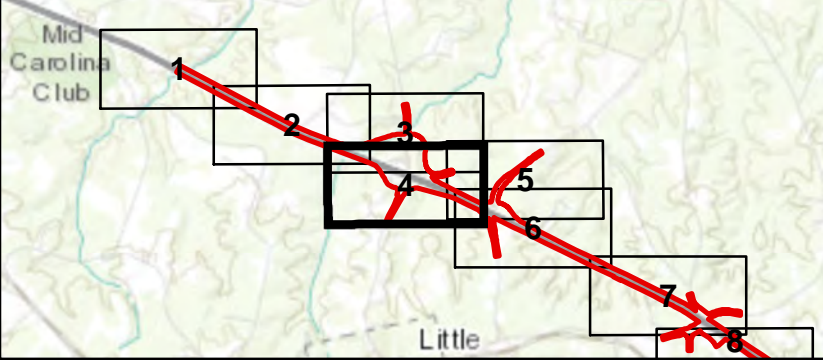
**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

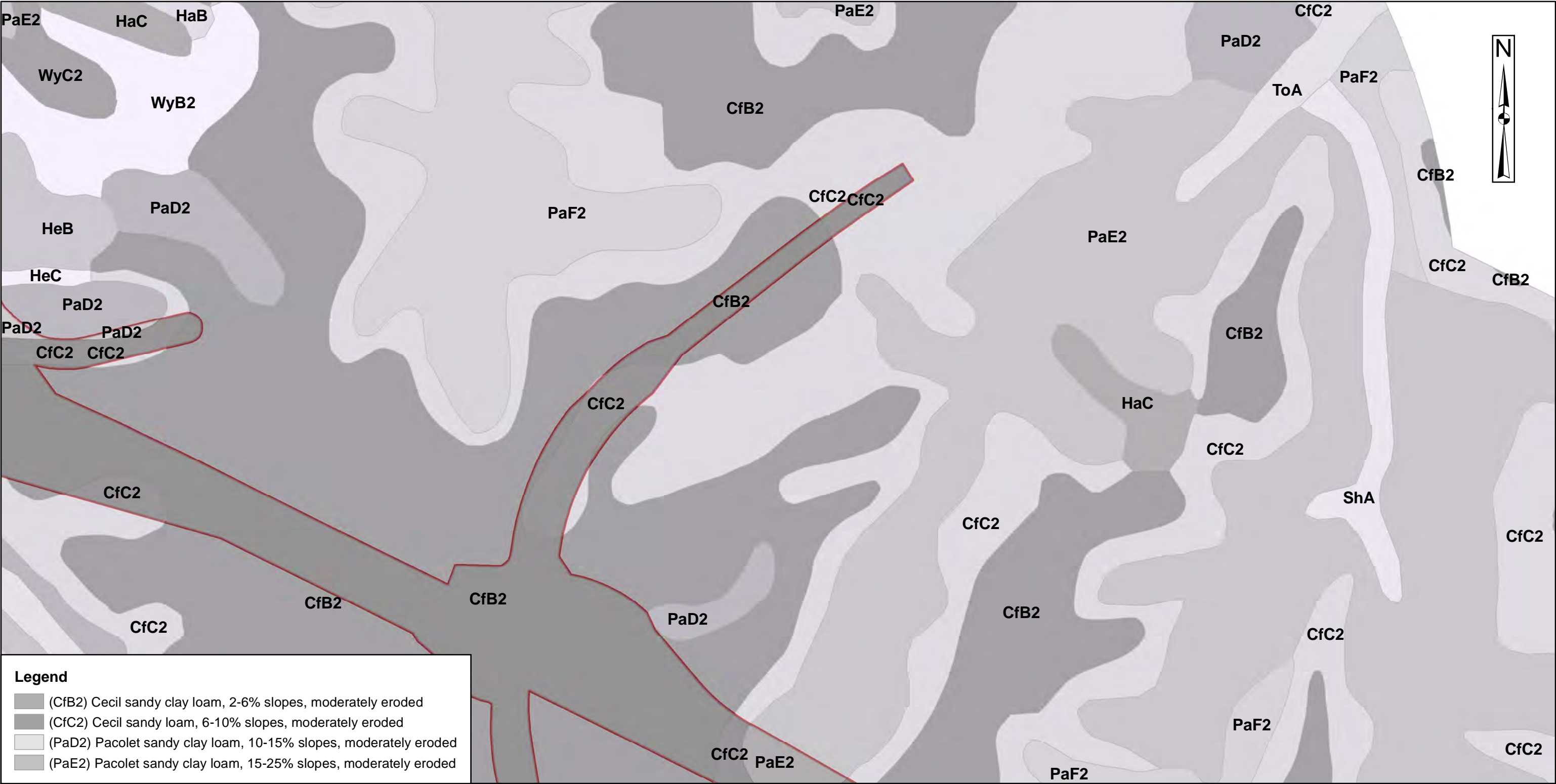
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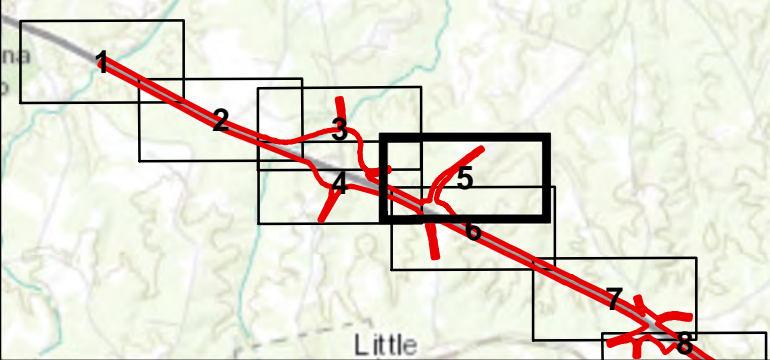
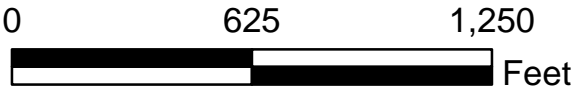


 South Carolina Department of Transportation			<b>I-26 Design Build Widening MM 85 to MM 101</b> Newberry, Lexington, Richland Counties SCDOT P029208		
			Source: Lexington, Newberry, Richland Soils Survey 1976	<b>NRCS SOILS MAP</b>  Drawn By: RHH QA/QC: KLM  January 2018	Page 4 of 26





- Legend**
- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
  - (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
  - (PaD2) Pacolet sandy clay loam, 10-15% slopes, moderately eroded
  - (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

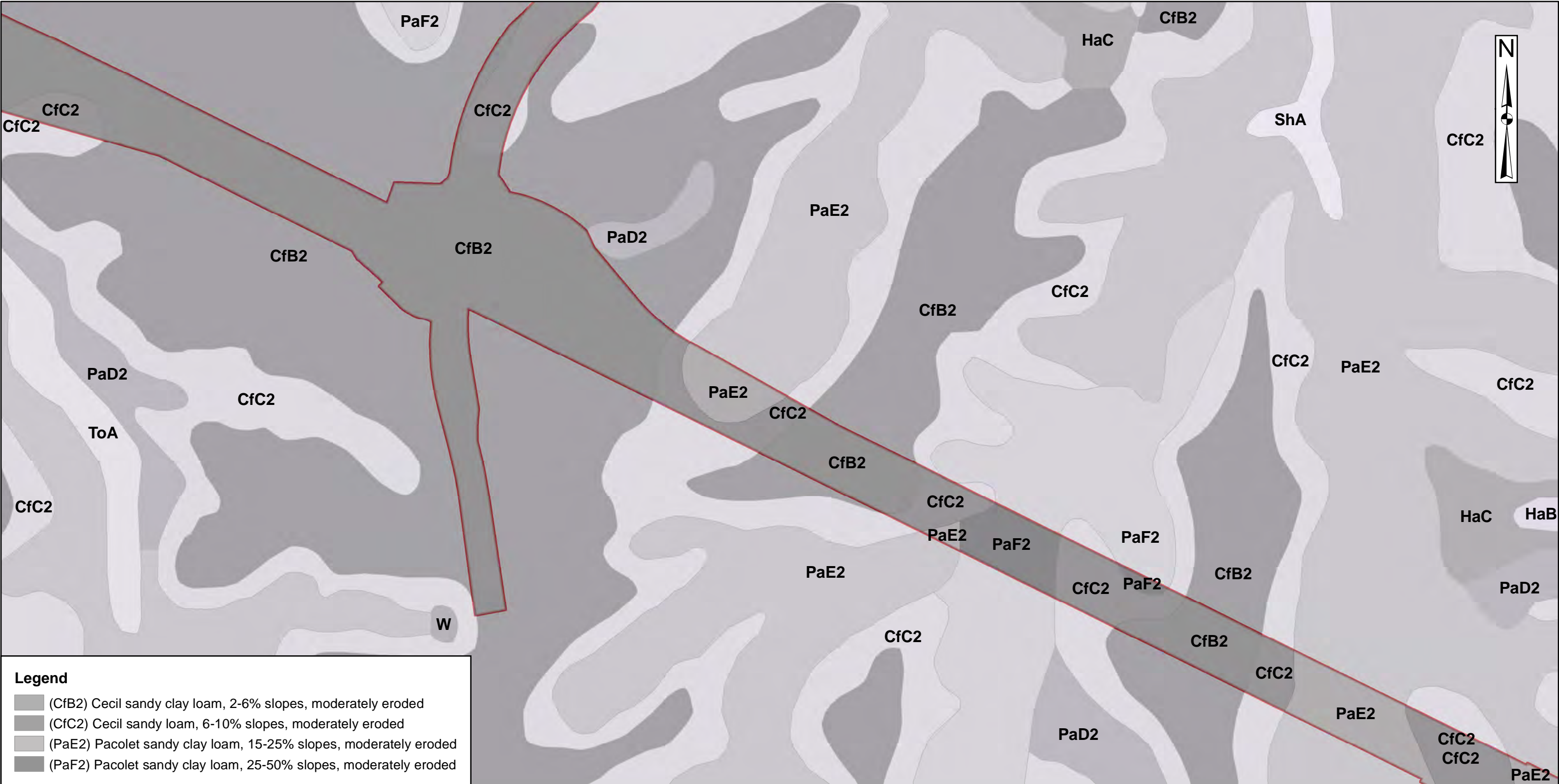
Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

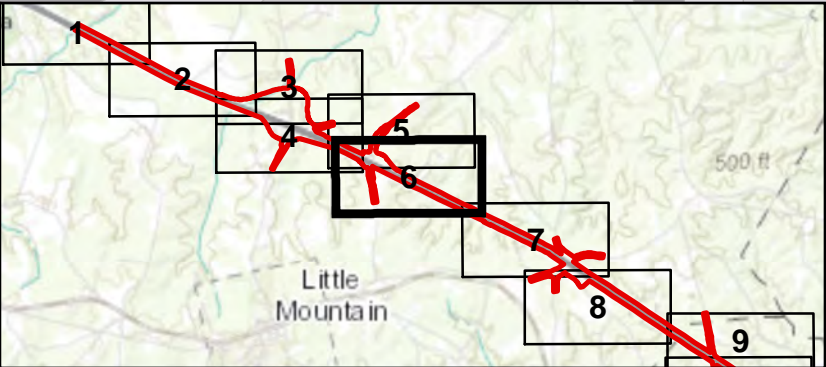
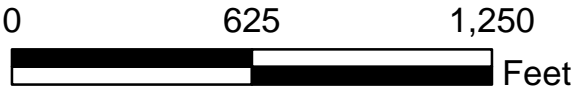
January 2018





**Legend**

- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (PaF2) Pacolet sandy clay loam, 25-50% slopes, moderately eroded



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

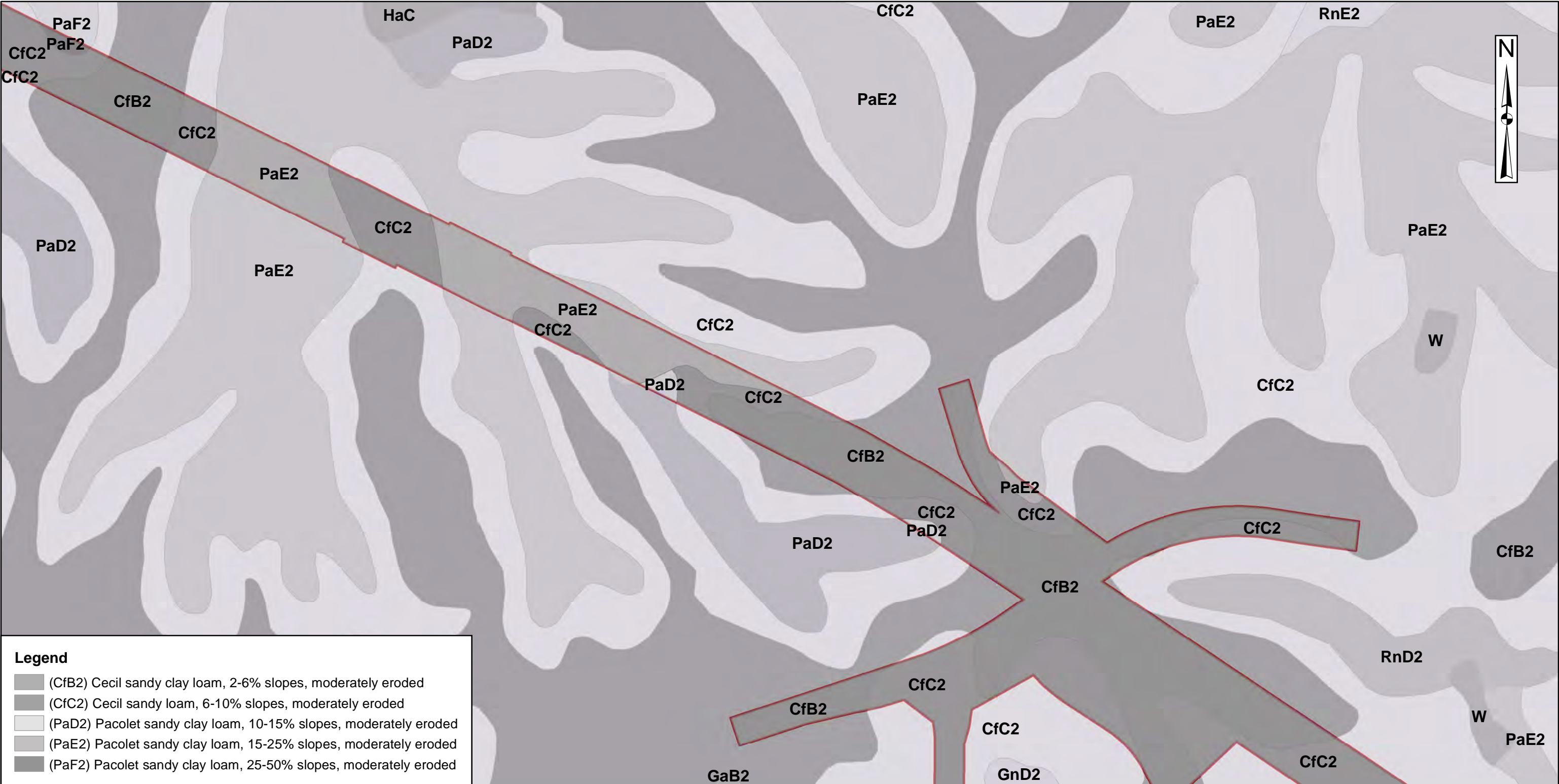
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Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

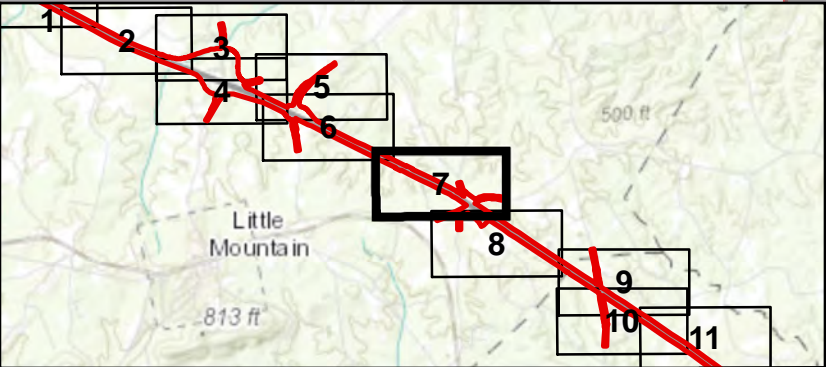
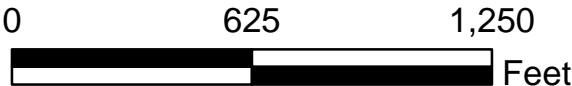
January 2018





**Legend**

- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (PaD2) Pacolet sandy clay loam, 10-15% slopes, moderately eroded
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (PaF2) Pacolet sandy clay loam, 25-50% slopes, moderately eroded



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

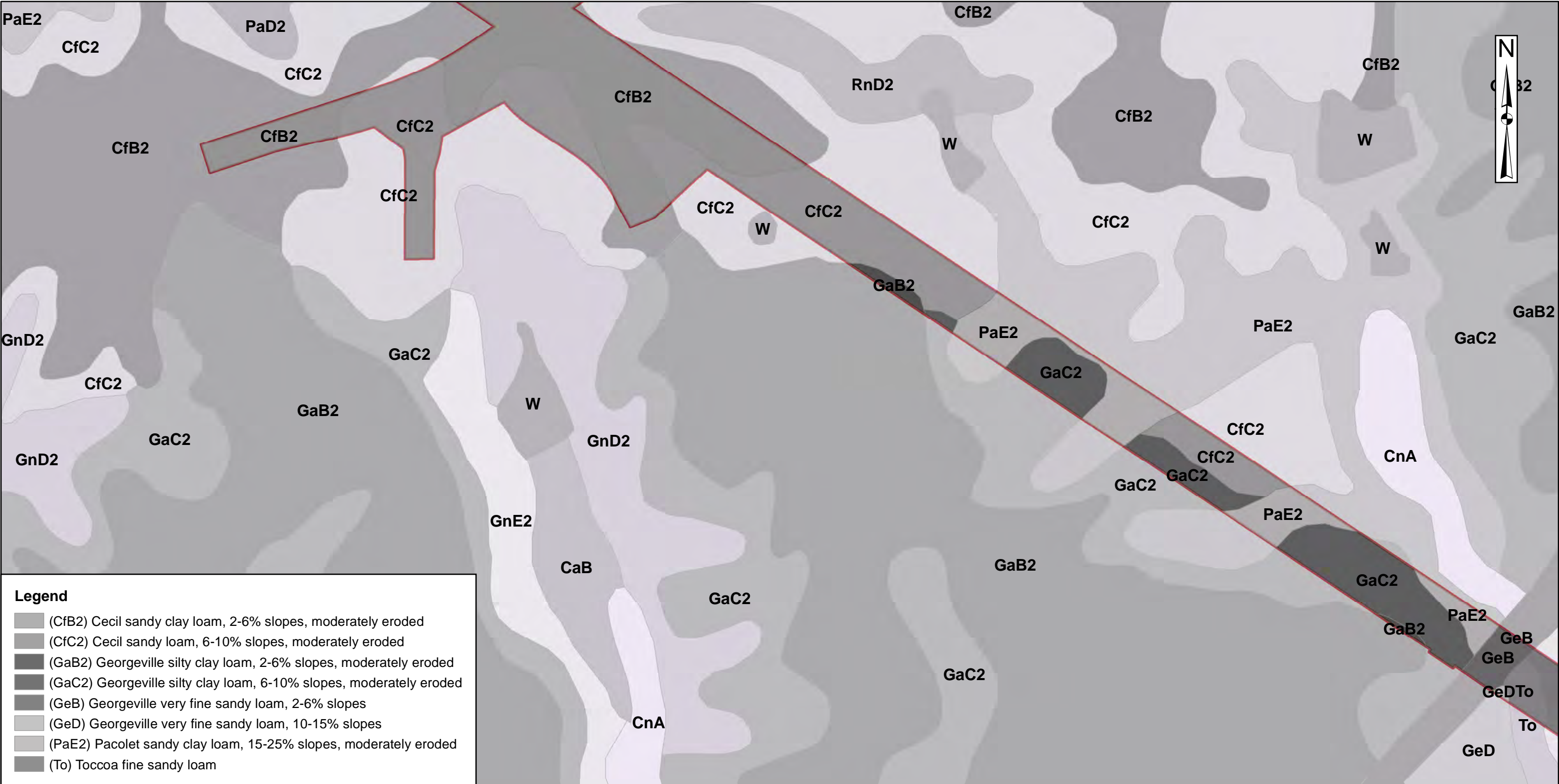
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Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

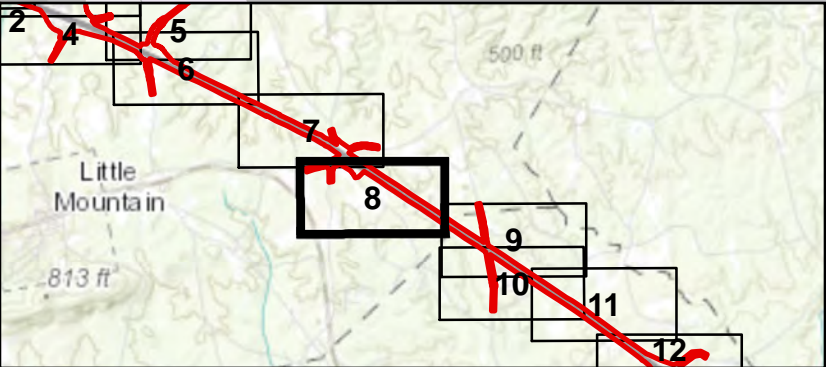
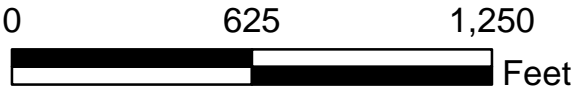
January 2018





**Legend**

- (CfB2) Cecil sandy clay loam, 2-6% slopes, moderately eroded
- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (GaB2) Georgeville silty clay loam, 2-6% slopes, moderately eroded
- (GaC2) Georgeville silty clay loam, 6-10% slopes, moderately eroded
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (To) Toccoa fine sandy loam



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

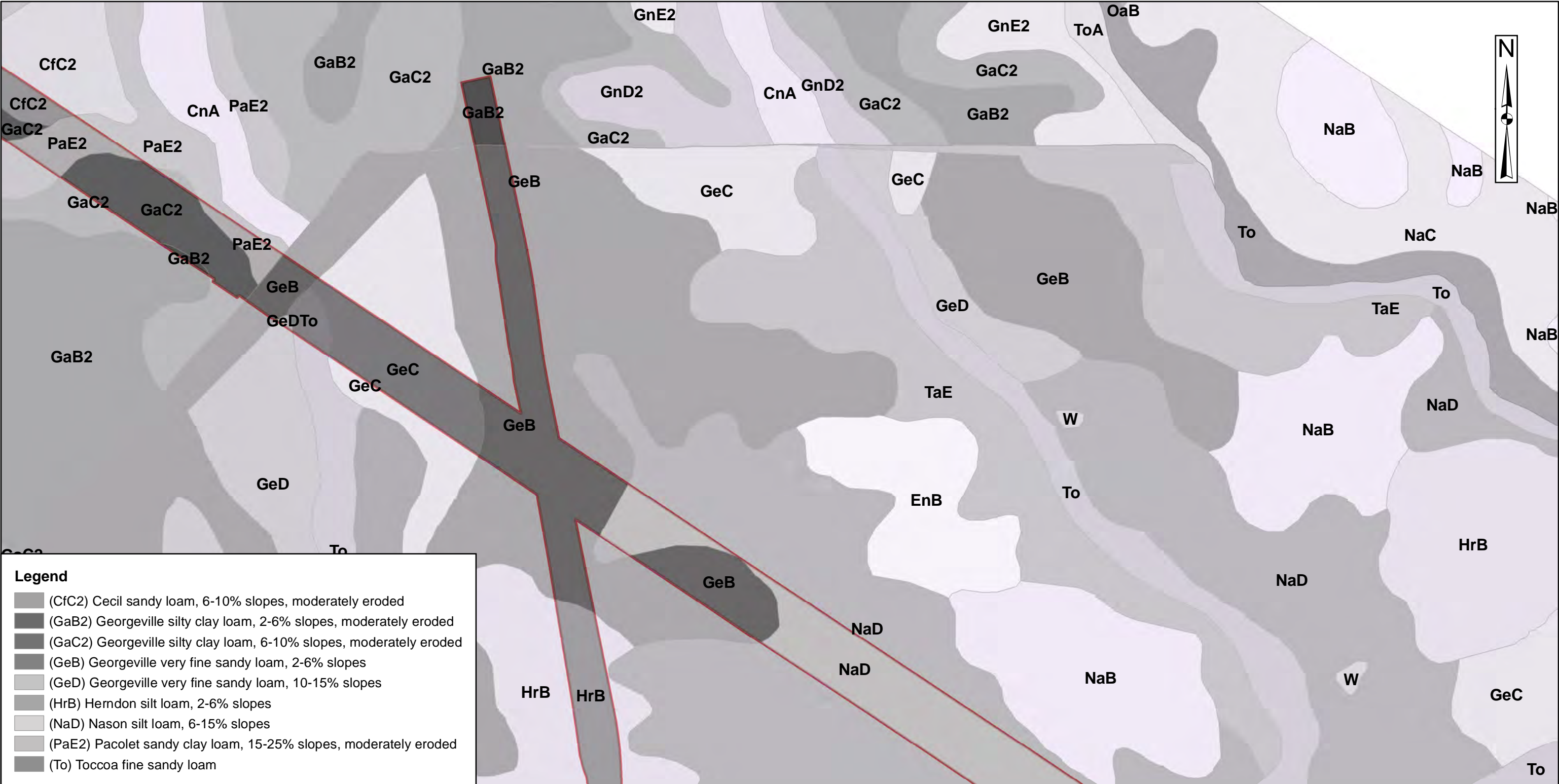
Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM


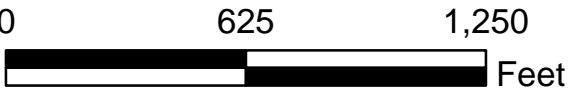
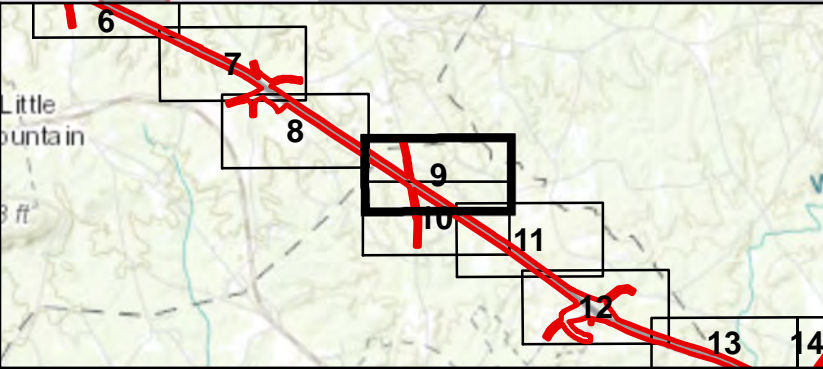
January 2018



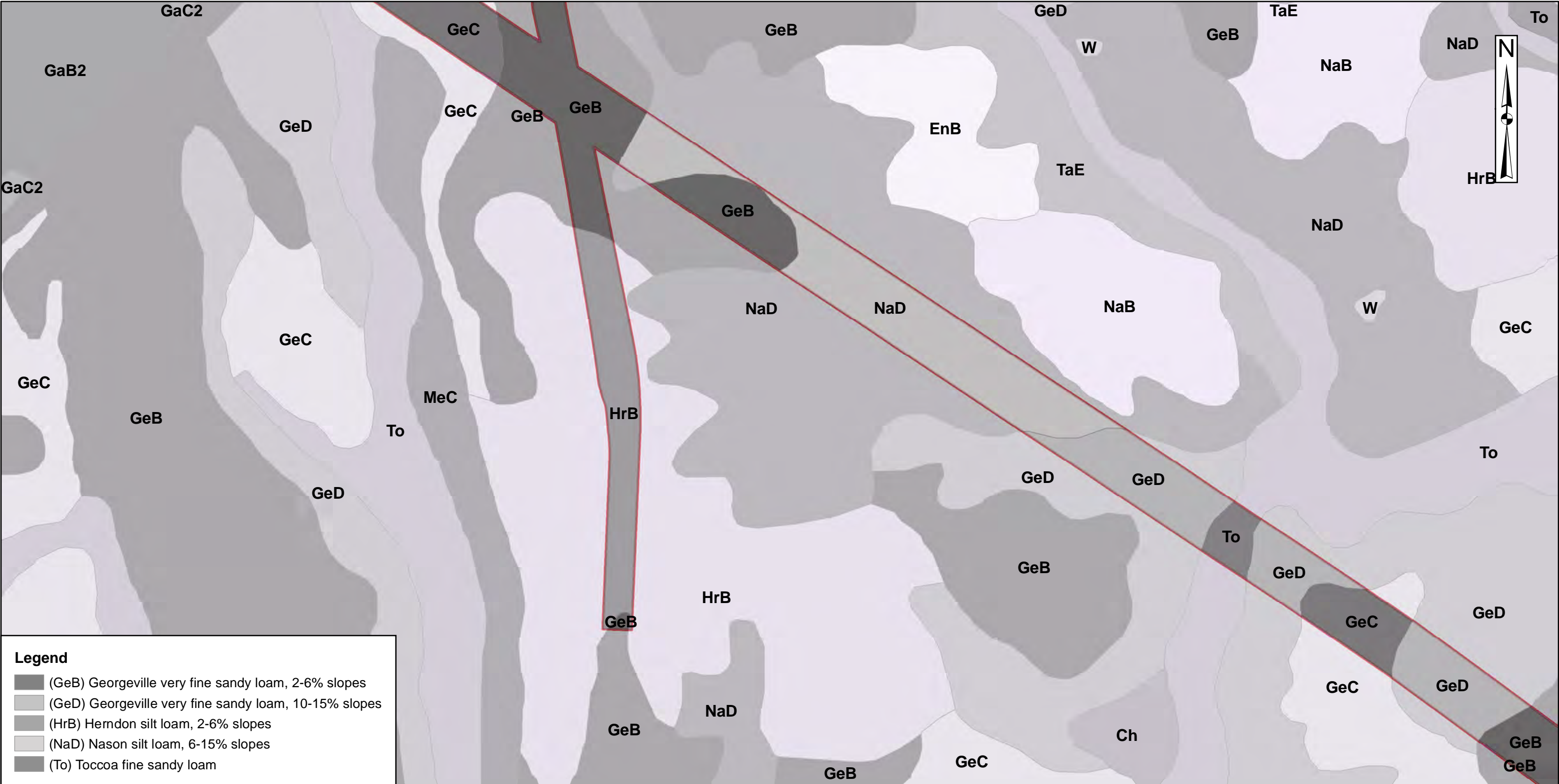


**Legend**

- (CfC2) Cecil sandy loam, 6-10% slopes, moderately eroded
- (GaB2) Georgeville silty clay loam, 2-6% slopes, moderately eroded
- (GaC2) Georgeville silty clay loam, 6-10% slopes, moderately eroded
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (HrB) Herndon silt loam, 2-6% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (PaE2) Pacolet sandy clay loam, 15-25% slopes, moderately eroded
- (To) Toccoa fine sandy loam

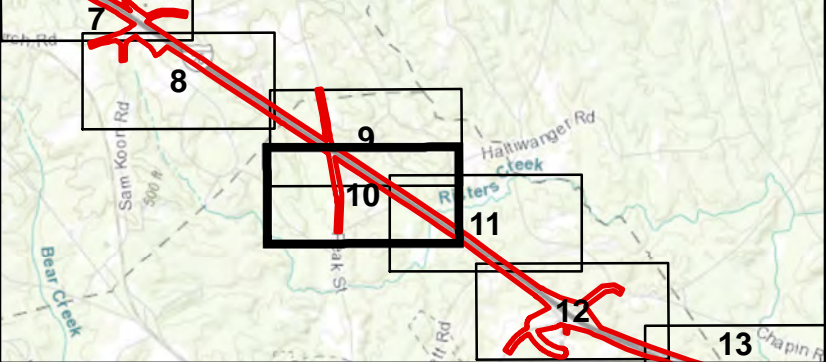
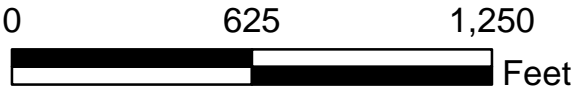
 South Carolina Department of Transportation			<b>I-26 Design Build Widening MM 85 to MM 101</b> Newberry, Lexington, Richland Counties SCDOT P029208		
			Source: Lexington, Newberry, Richland Soils Survey 1976	<b>NRCS SOILS MAP</b>  Drawn By: RHH QA/QC: KLM  January 2018	Page 9 of 26





**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (HrB) Herndon silt loam, 2-6% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (To) Toccoa fine sandy loam



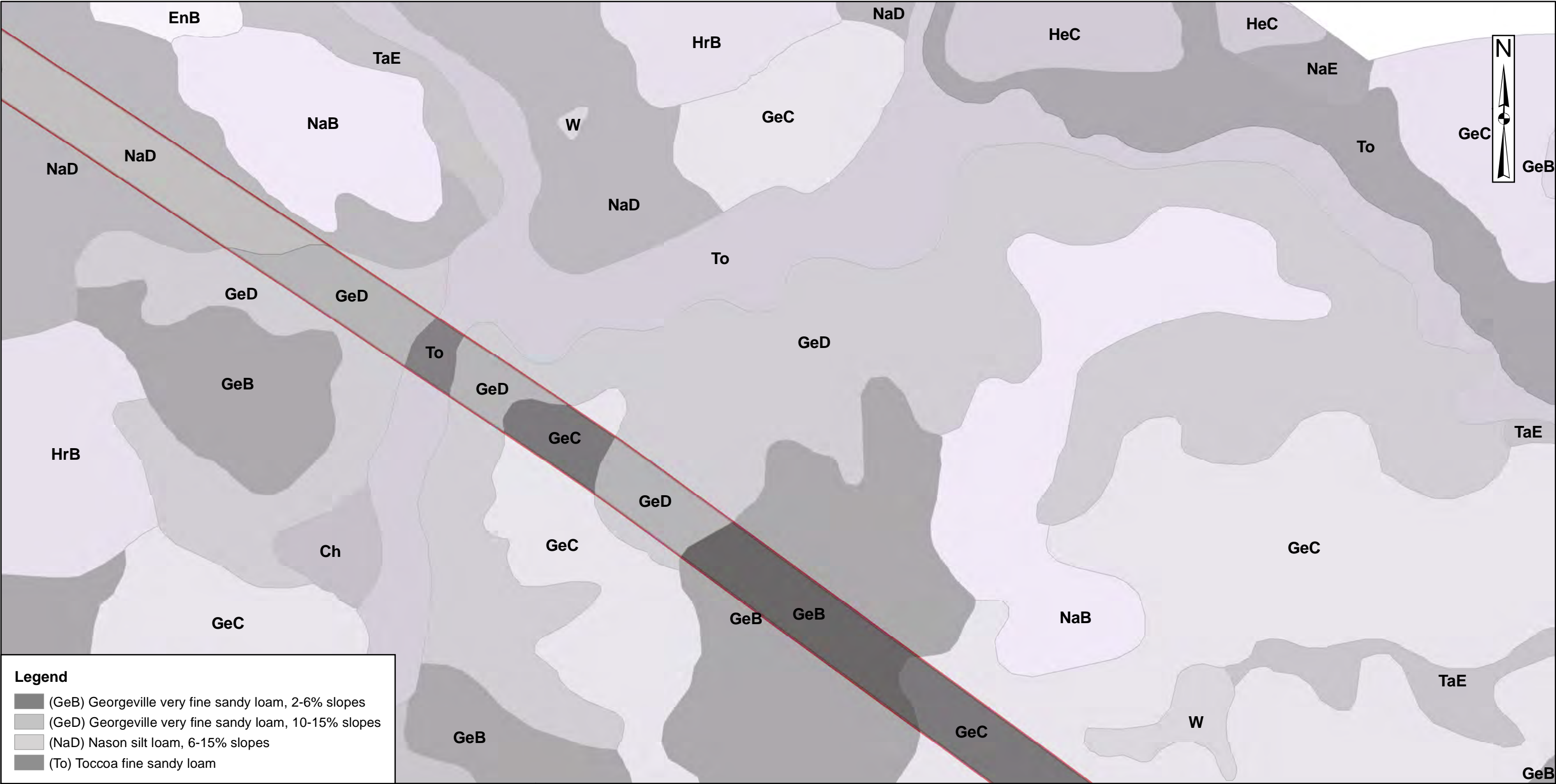
I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

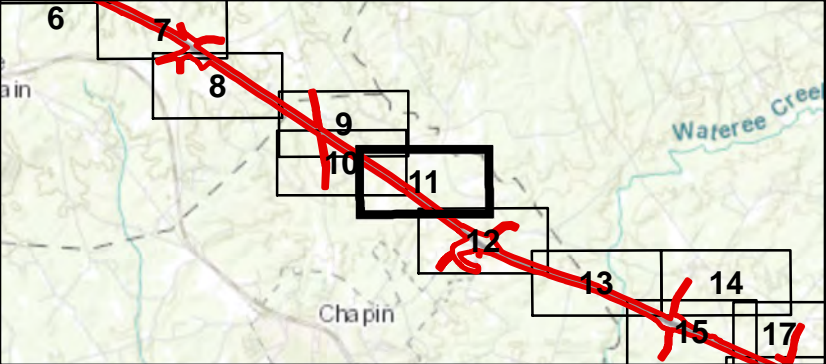
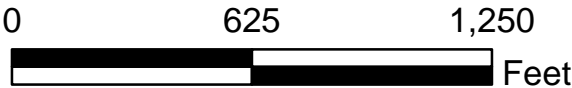
Drawn By: RHH  
QA/QC: KLM

January 2018



**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (To) Toccoa fine sandy loam



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

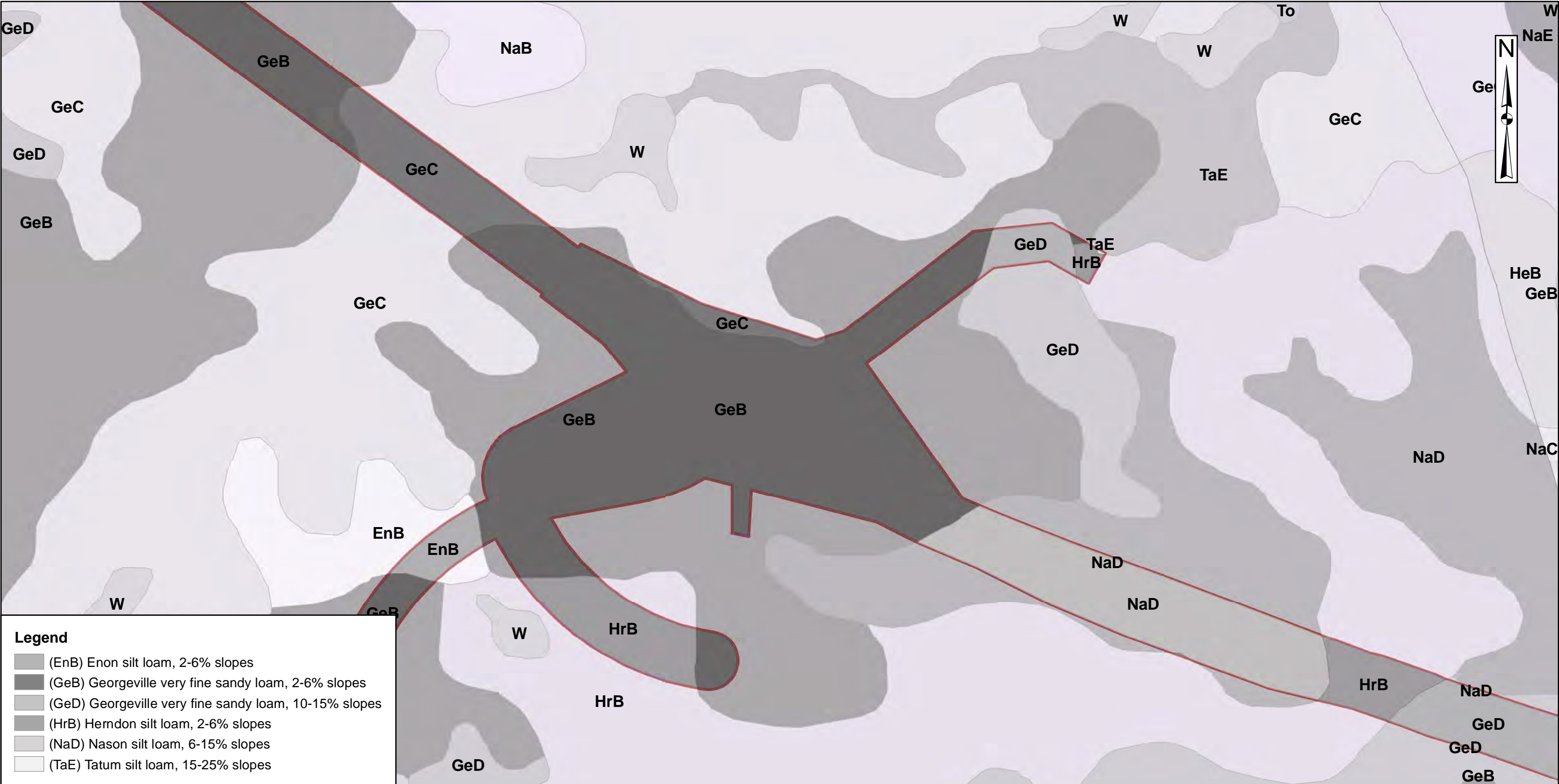
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 Lexington, Newberry,  
 Richland Soils Survey  
 1976

**NRCS SOILS MAP**

Drawn By: RHH  
 QA/QC: KLM

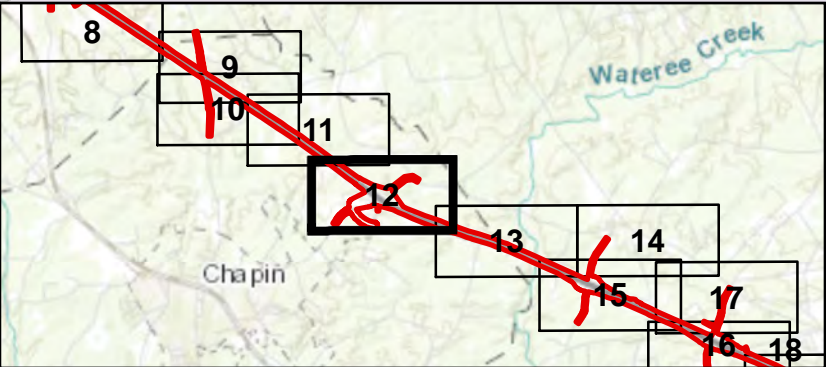
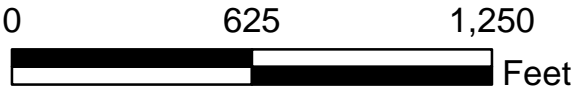
January 2018





**Legend**

- (EnB) Enon silt loam, 2-6% slopes
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (HrB) Herndon silt loam, 2-6% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (TaE) Tatum silt loam, 15-25% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

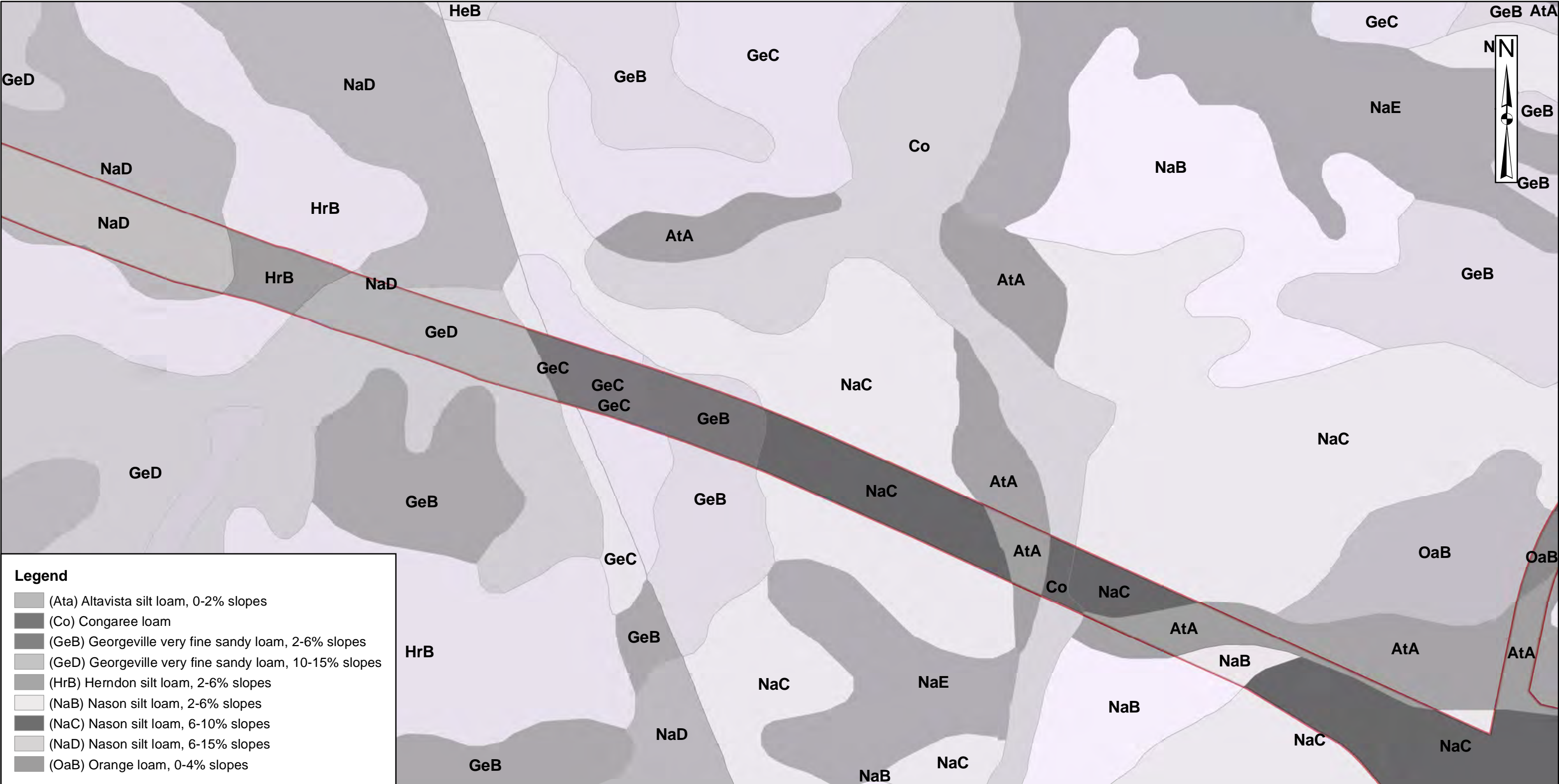
Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

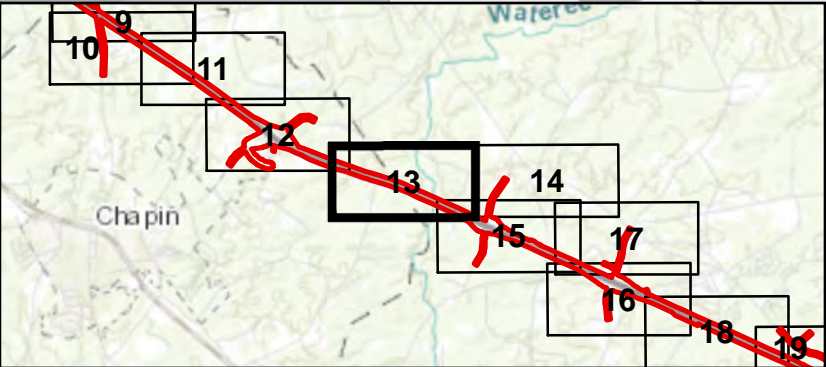
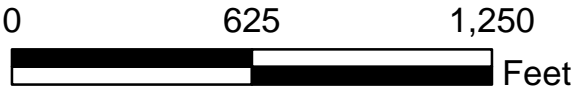
January 2018





**Legend**

- (Ata) Altavista silt loam, 0-2% slopes
- (Co) Congaree loam
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (GeD) Georgeville very fine sandy loam, 10-15% slopes
- (HrB) Herndon silt loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (OaB) Orange loam, 0-4% slopes



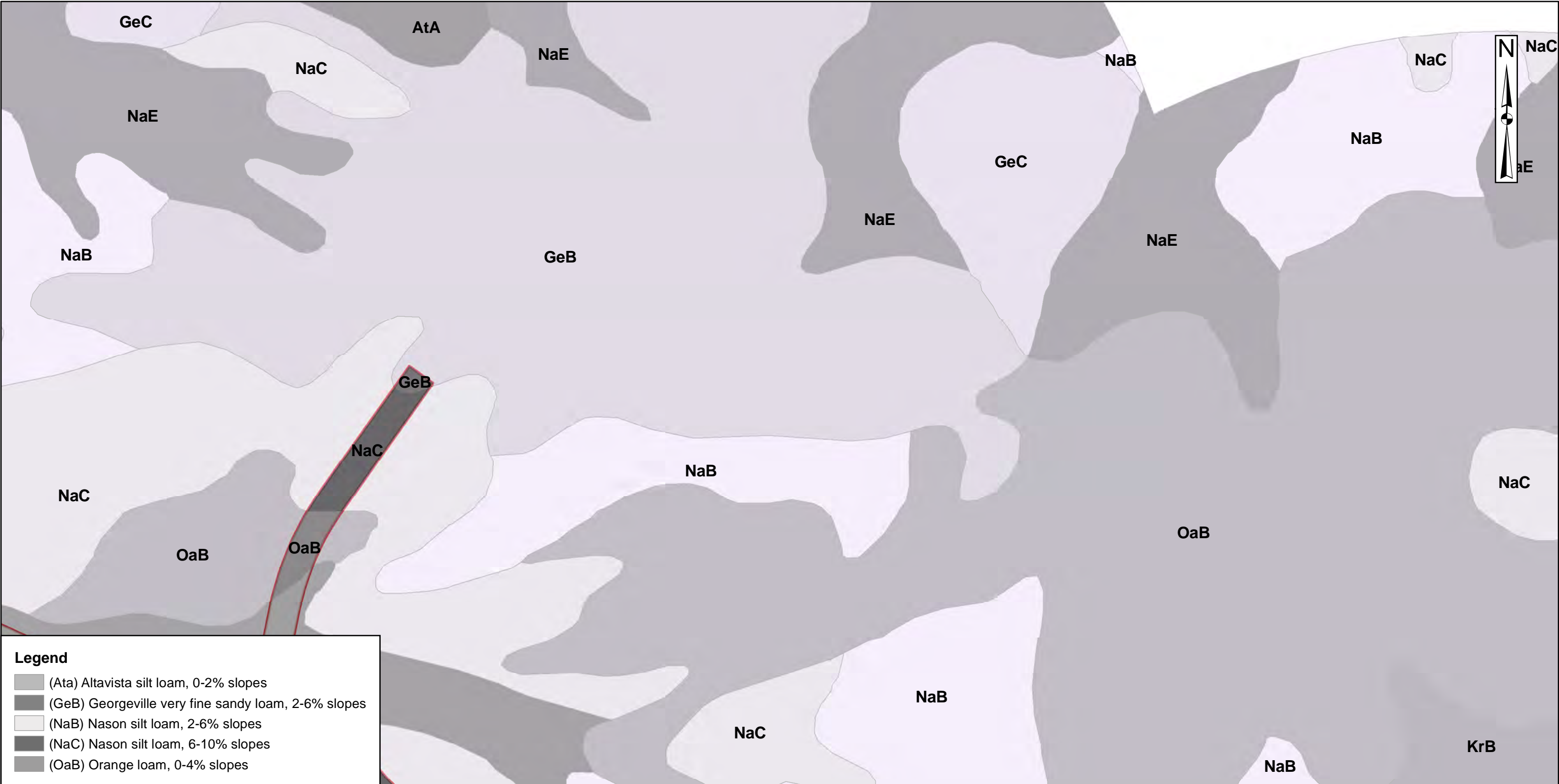
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

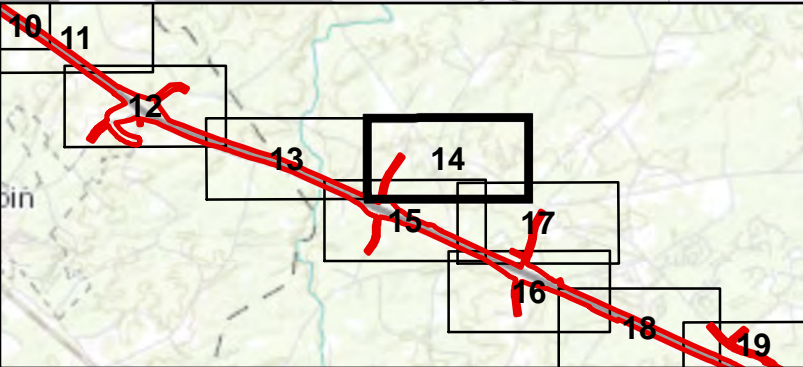
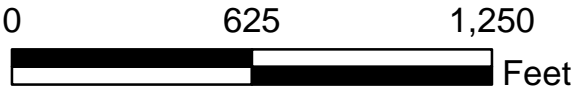
Drawn By: RHH  
QA/QC: KLM

January 2018



**Legend**

- (Ata) Altavista silt loam, 0-2% slopes
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (OaB) Orange loam, 0-4% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

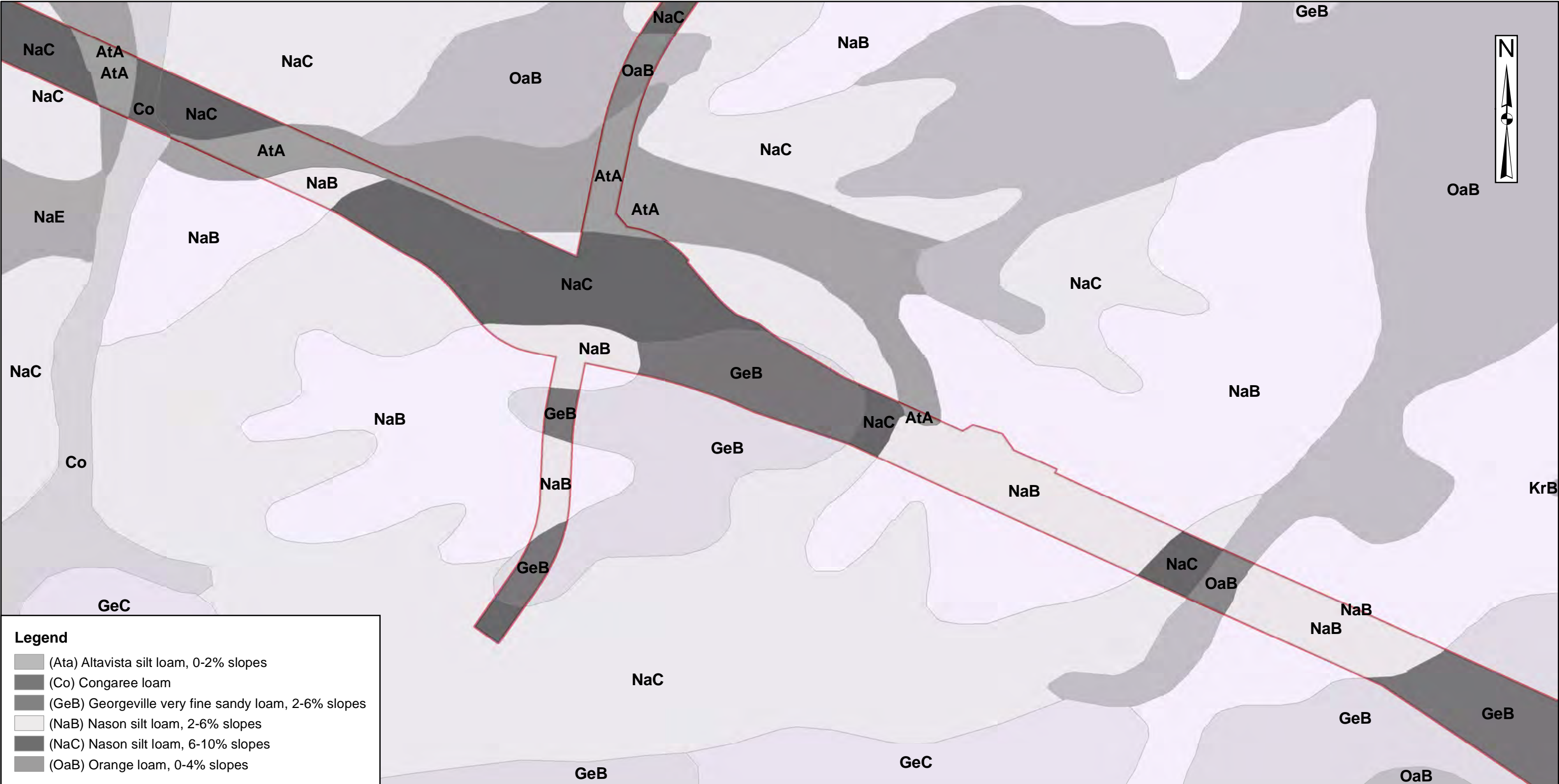
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Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

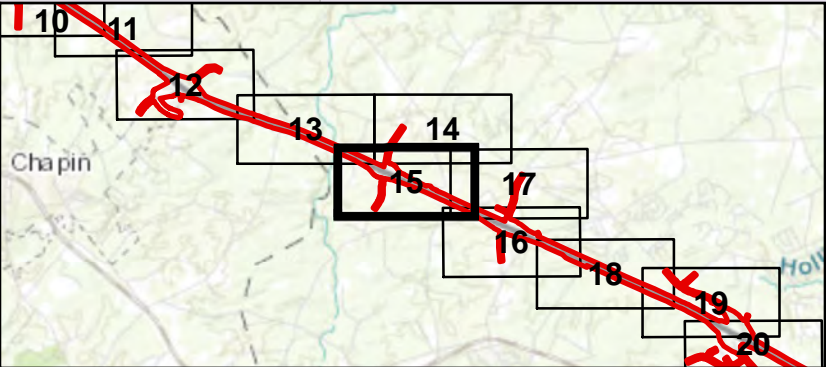
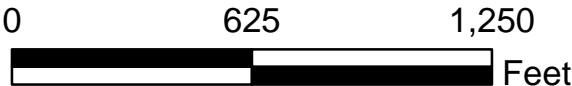
January 2018





**Legend**

- (Ata) Altavista silt loam, 0-2% slopes
- (Co) Congaree loam
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (OaB) Orange loam, 0-4% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

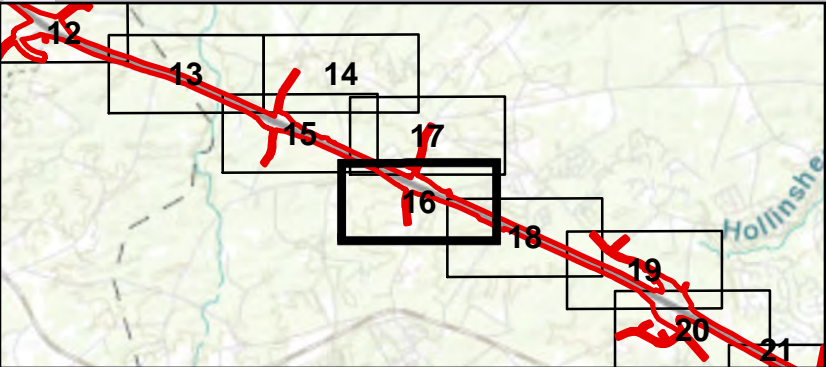
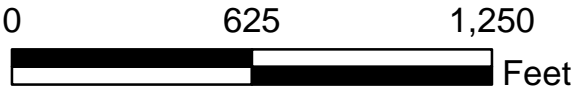
Drawn By: RHH  
QA/QC: KLM

January 2018



**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (KrB) Kirksey loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (OaB) Orange loam, 0-4% slopes
- (W) Water



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

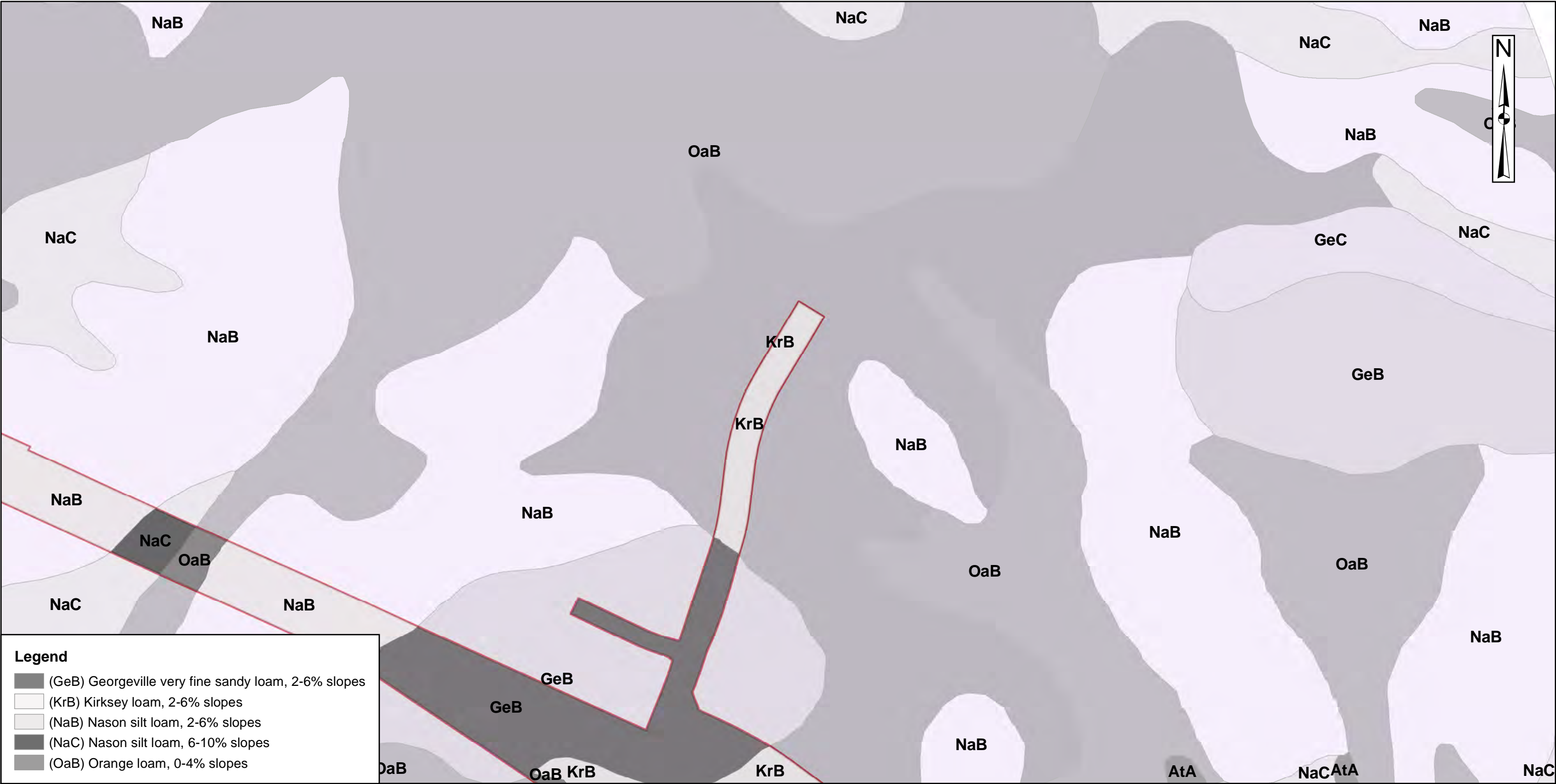
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Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

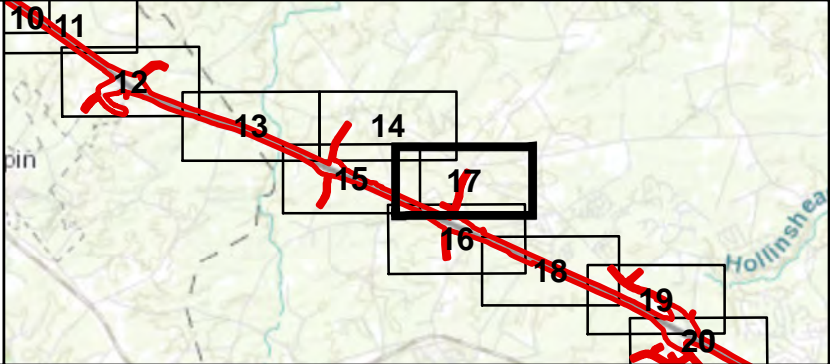
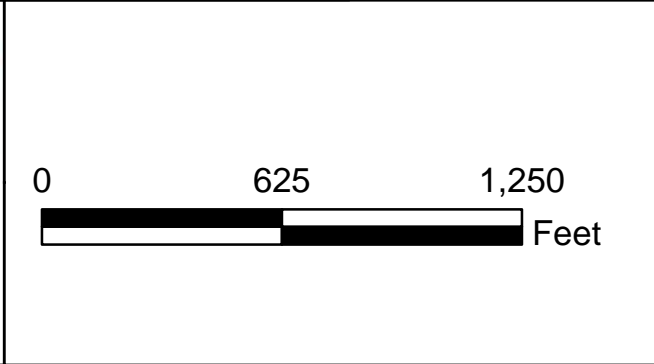
January 2018



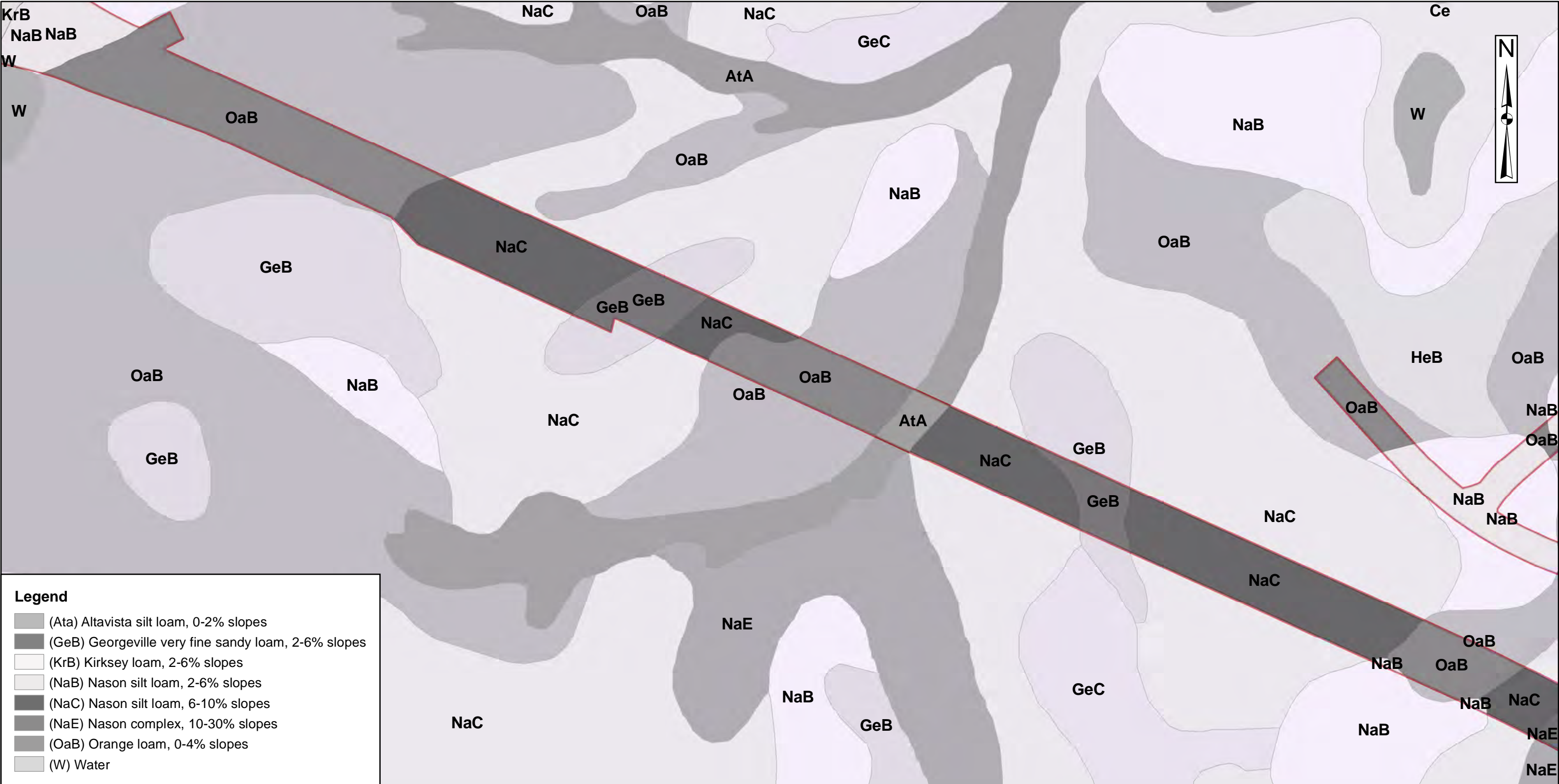


**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (KrB) Kirksey loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (OaB) Orange loam, 0-4% slopes

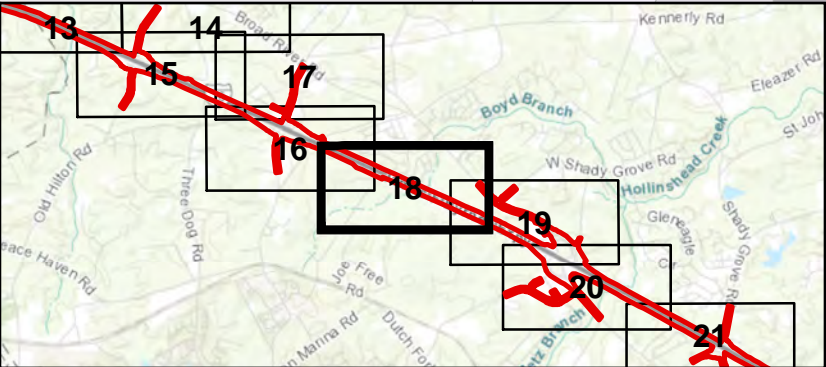
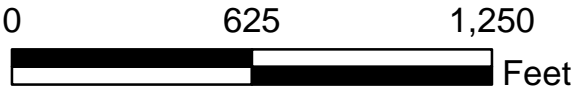


<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: Lexington, Newberry, Richland Soils Survey 1976	<b>NRCS SOILS MAP</b>  Drawn By: RHH QA/QC: KLM  January 2018	Page 17 of 26



**Legend**

- (Ata) Altavista silt loam, 0-2% slopes
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (KrB) Kirksey loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes
- (OaB) Orange loam, 0-4% slopes
- (W) Water



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

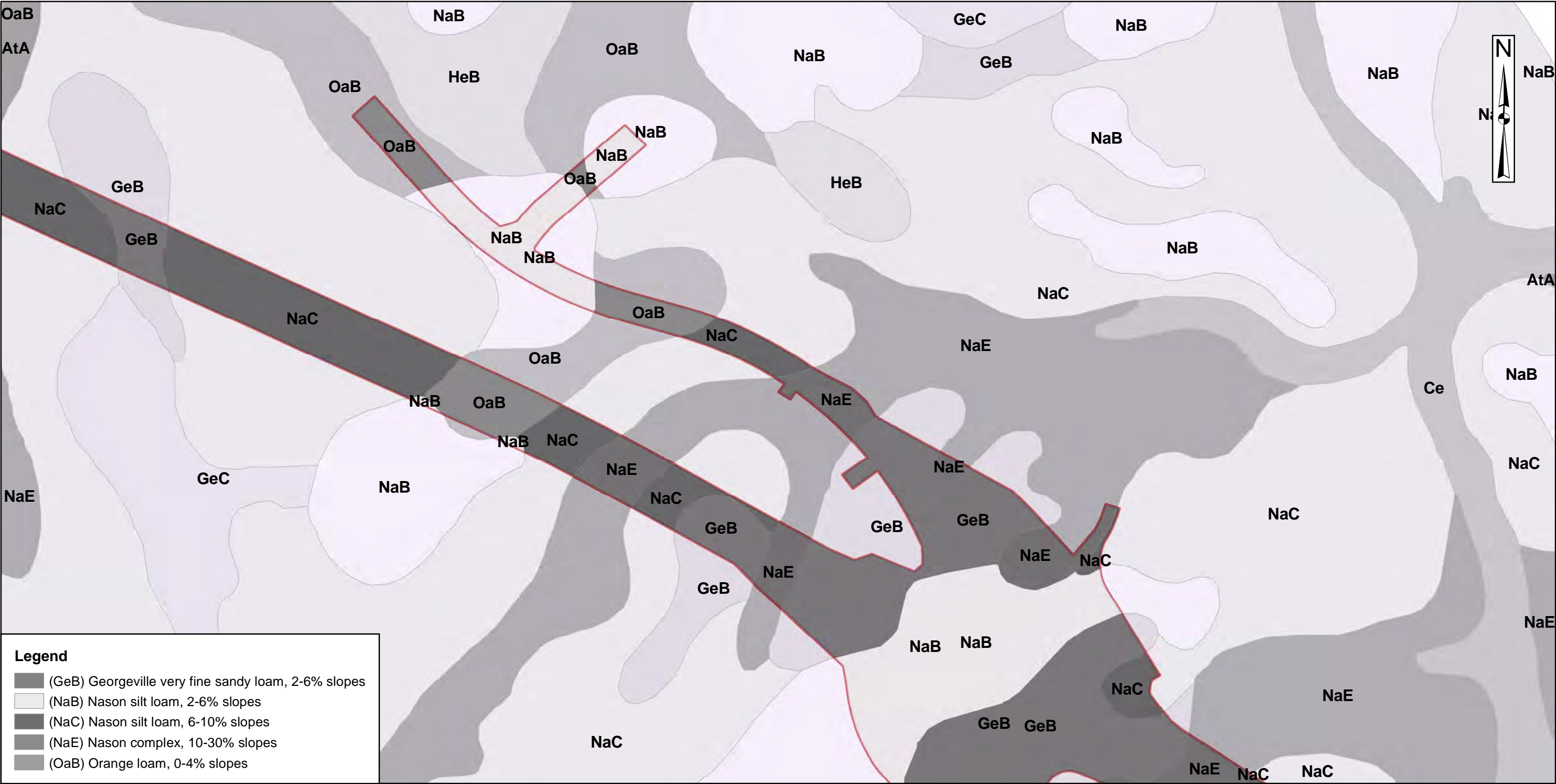
Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

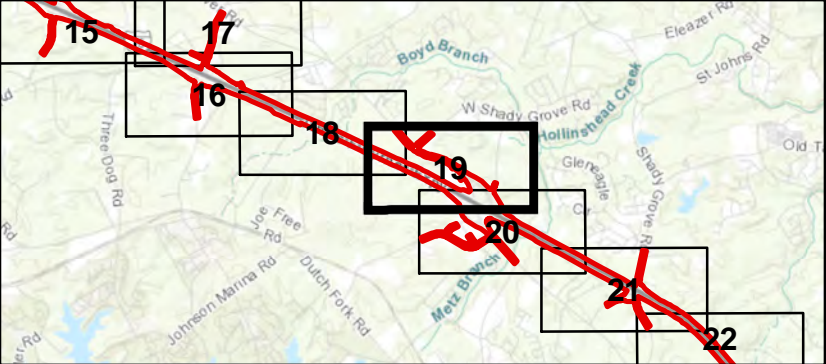
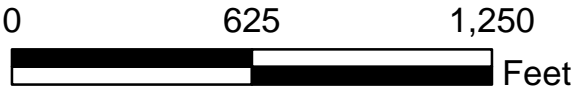
January 2018





**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes
- (OaB) Orange loam, 0-4% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

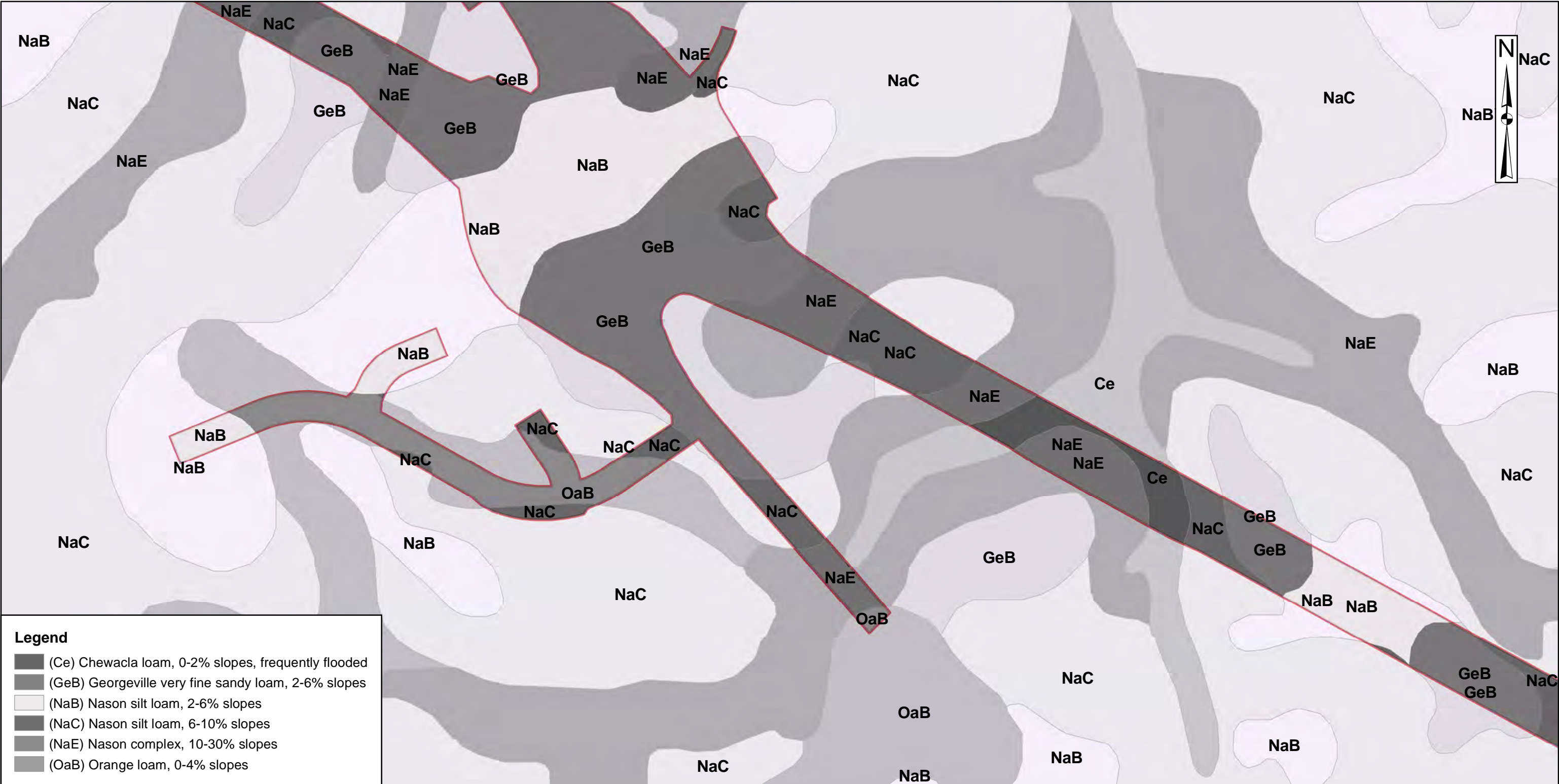
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Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

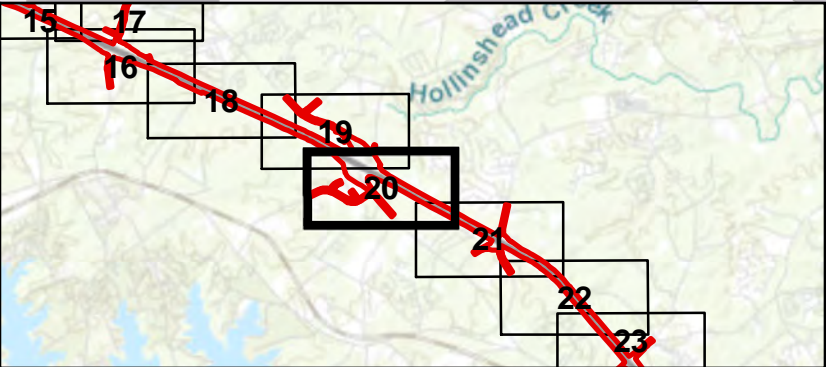
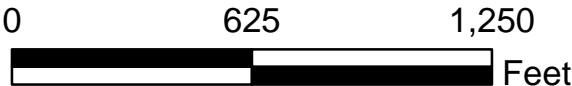
January 2018





**Legend**

- (Ce) Chewacla loam, 0-2% slopes, frequently flooded
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes
- (OaB) Orange loam, 0-4% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

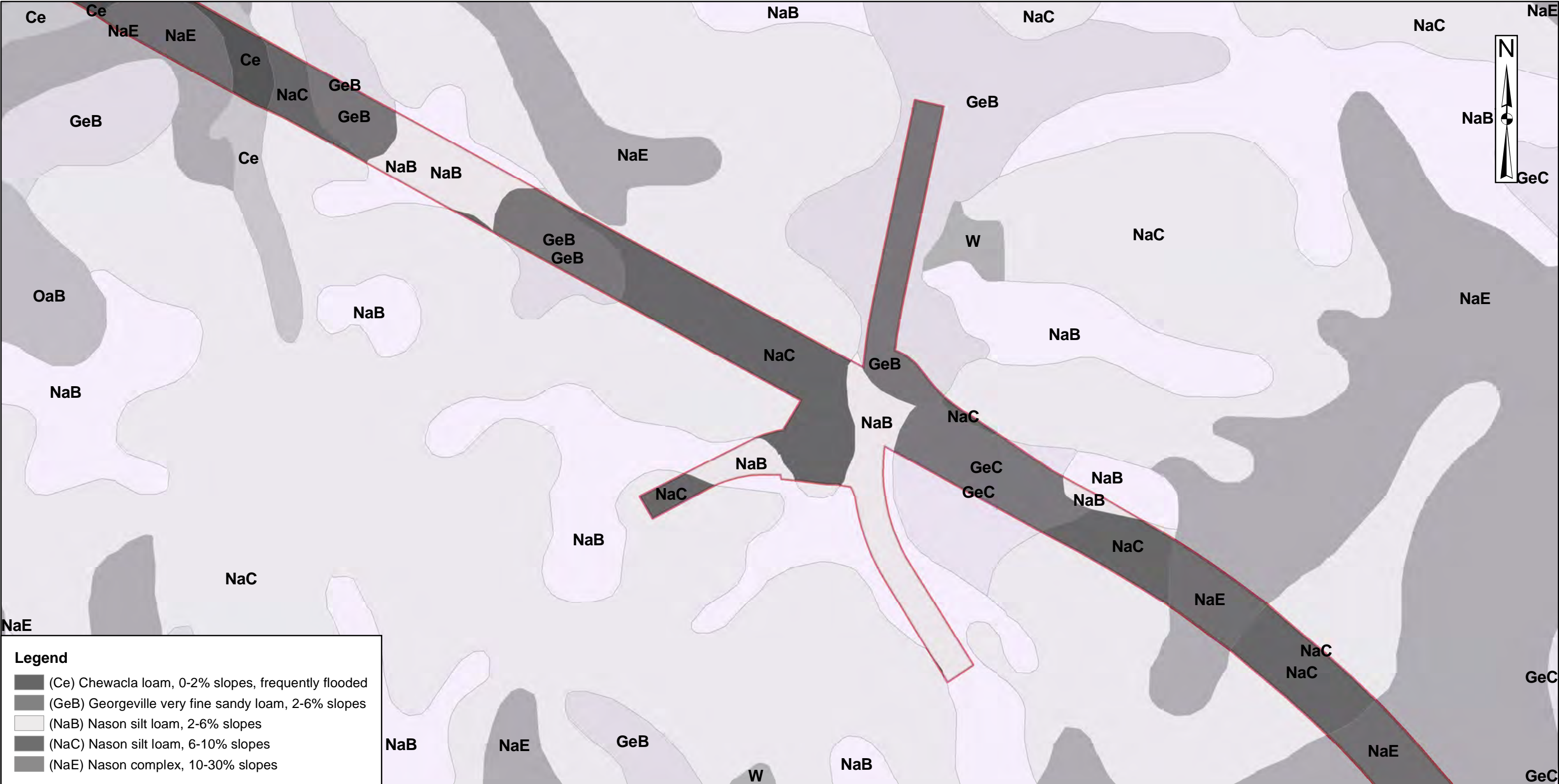
Source:  
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Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

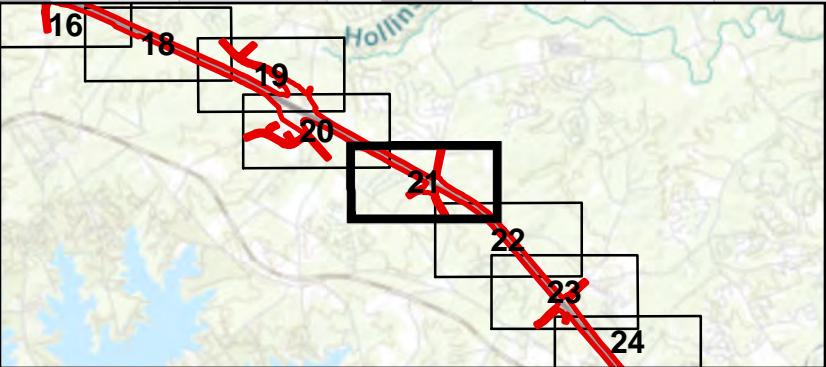
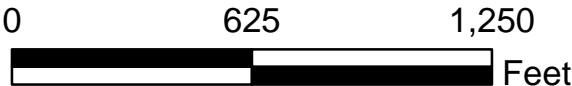
January 2018





**Legend**

- (Ce) Chewacla loam, 0-2% slopes, frequently flooded
- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
Lexington, Newberry,  
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1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

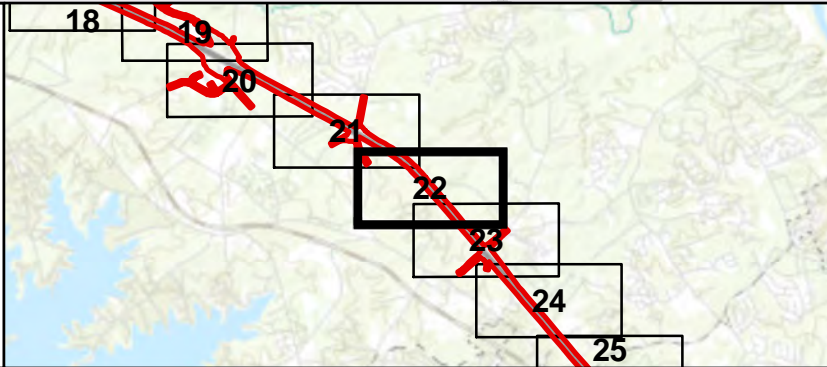
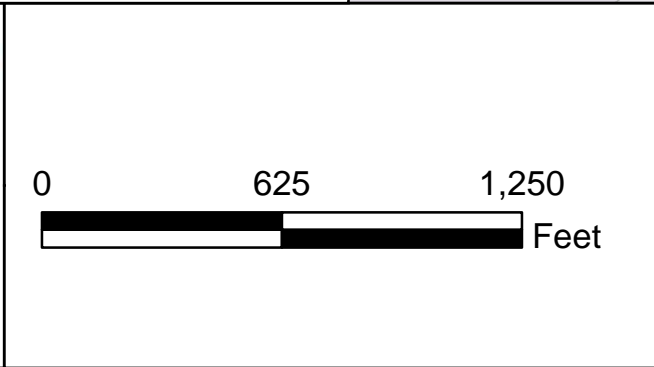
January 2018





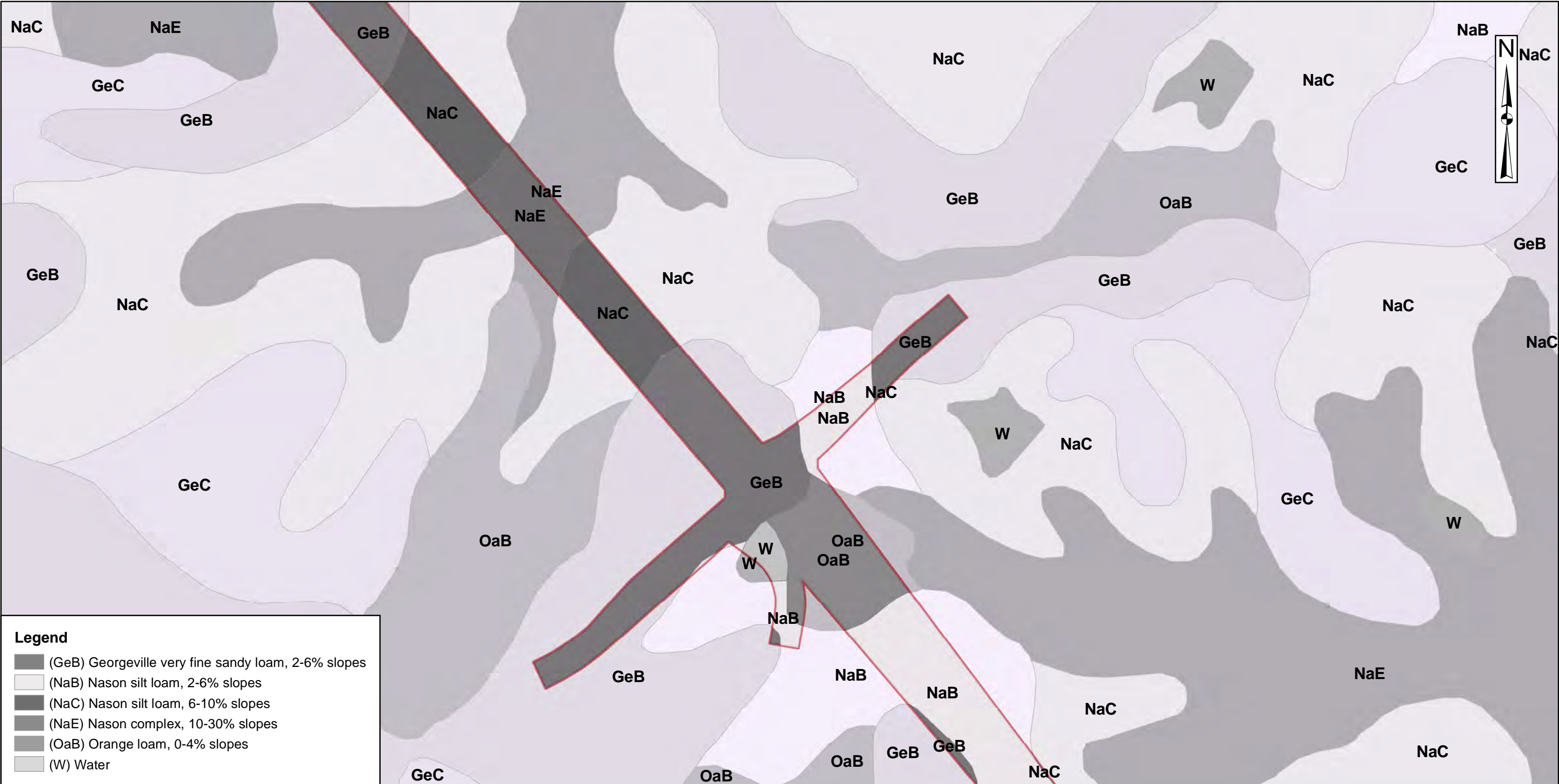
**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes



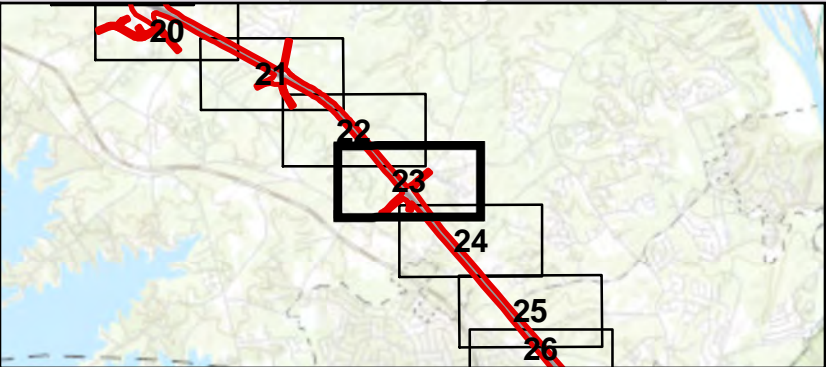
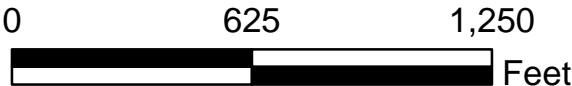
<p><b>I-26 Design Build Widening MM 85 to MM 101</b>  <b>Newberry, Lexington, Richland Counties</b>  <b>SCDOT P029208</b></p>		
<p>Source:  Lexington, Newberry,  Richland Soils Survey  1976</p>	<p><b>NRCS SOILS MAP</b></p> <p>Drawn By: RHH  QA/QC: KLM</p> <p>January 2018</p>	<p>Page 22 of 26</p>





**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaE) Nason complex, 10-30% slopes
- (OaB) Orange loam, 0-4% slopes
- (W) Water



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

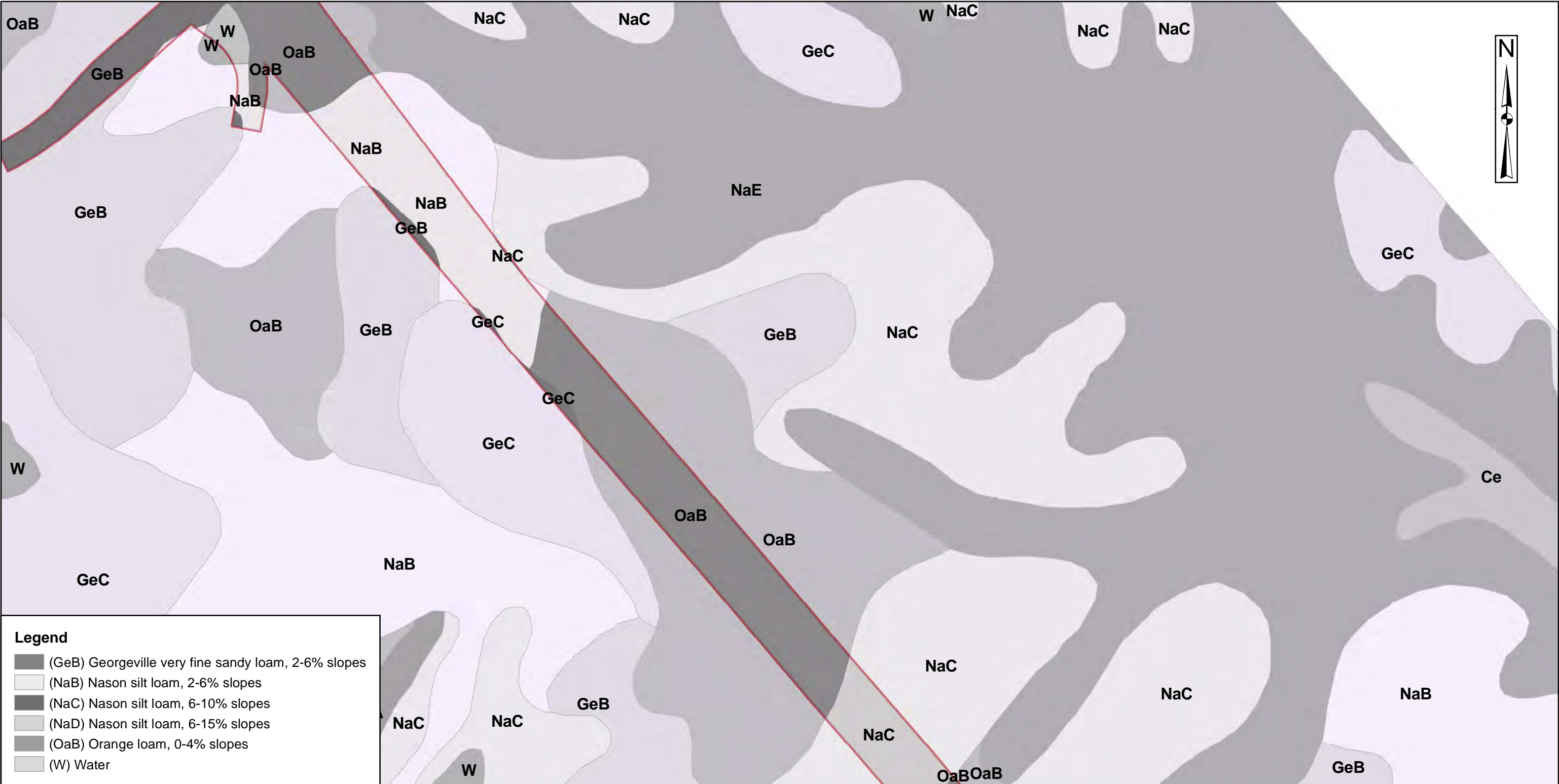
Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

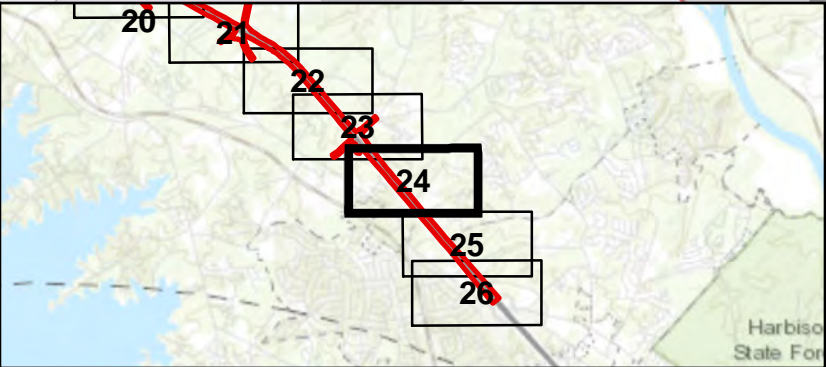
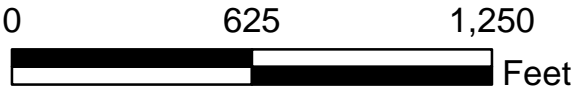
January 2018





**Legend**

- (GeB) Georgeville very fine sandy loam, 2-6% slopes
- (NaB) Nason silt loam, 2-6% slopes
- (NaC) Nason silt loam, 6-10% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (OaB) Orange loam, 0-4% slopes
- (W) Water



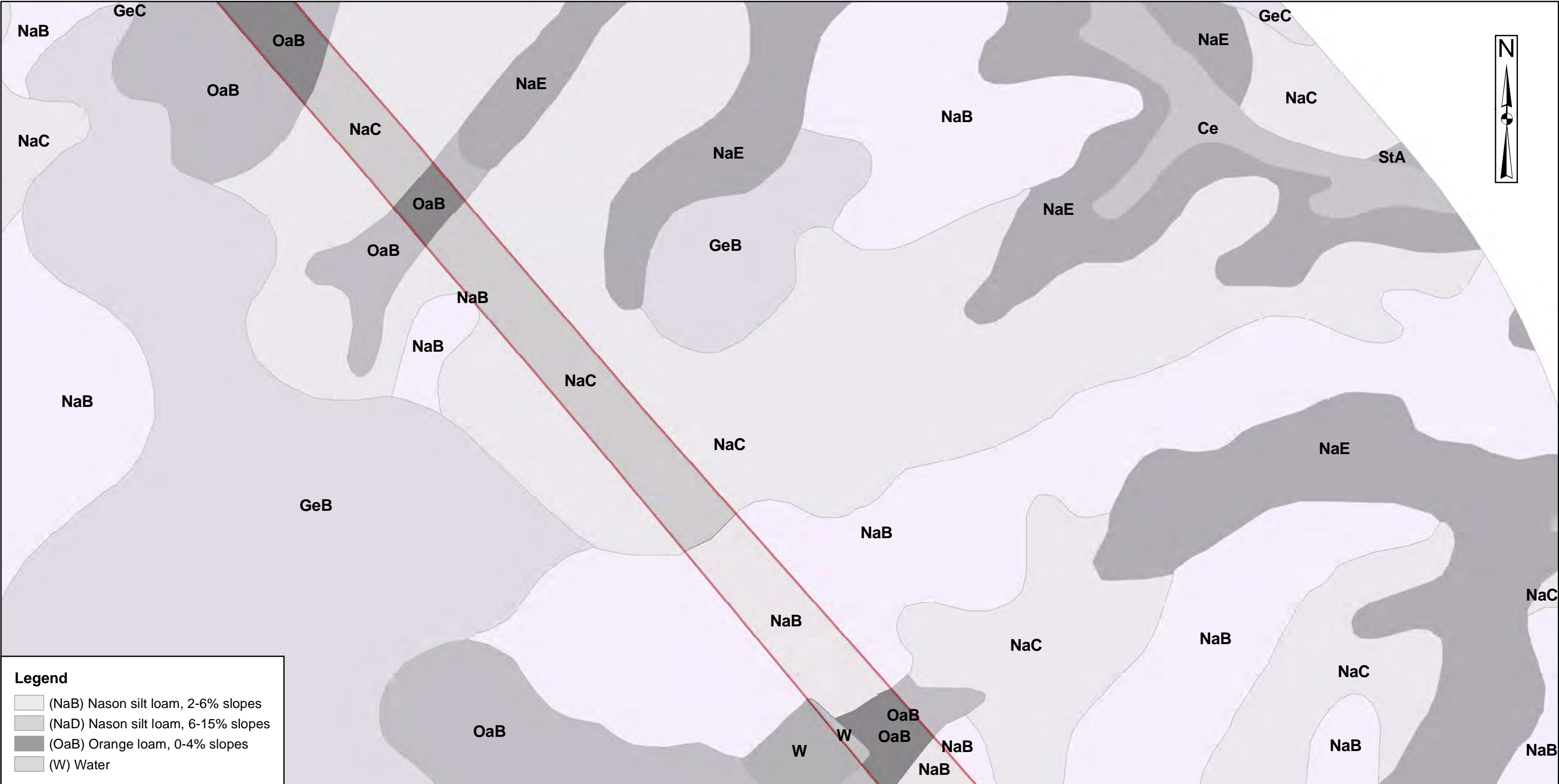
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

January 2018

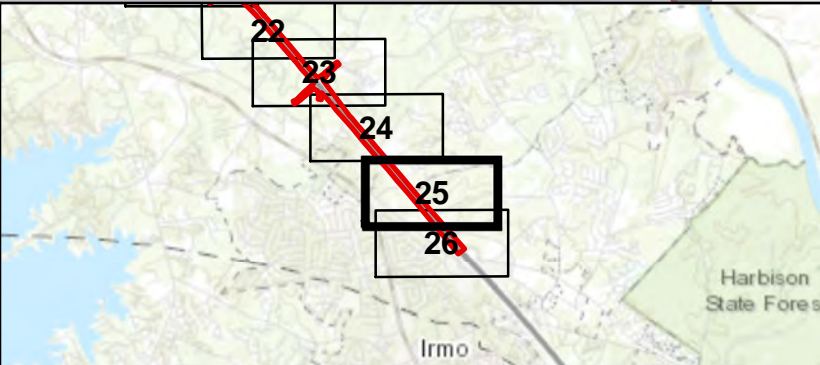


**Legend**

- (NaB) Nason silt loam, 2-6% slopes
- (NaD) Nason silt loam, 6-15% slopes
- (OaB) Orange loam, 0-4% slopes
- (W) Water



0 625 1,250  
Feet



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

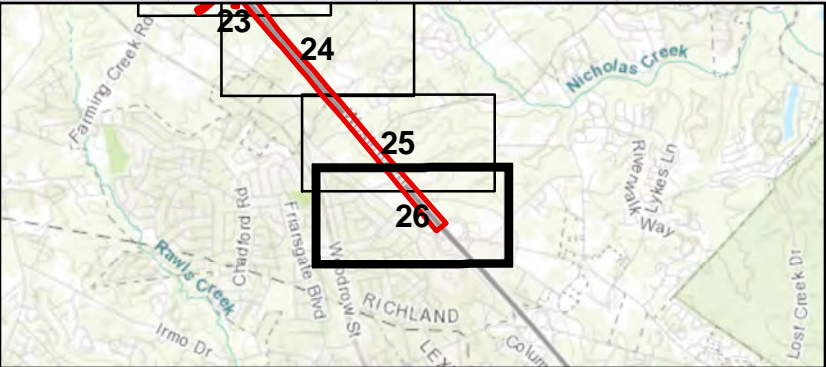
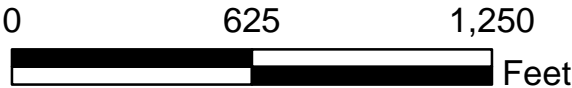
Source:  
Lexington, Newberry,  
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1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

January 2018





I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
Lexington, Newberry,  
Richland Soils Survey  
1976

**NRCS SOILS MAP**

Drawn By: RHH  
QA/QC: KLM

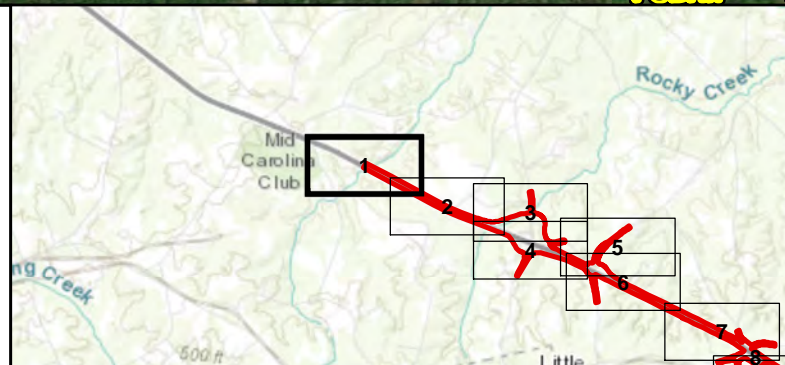
January 2018





### Legend

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Other
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

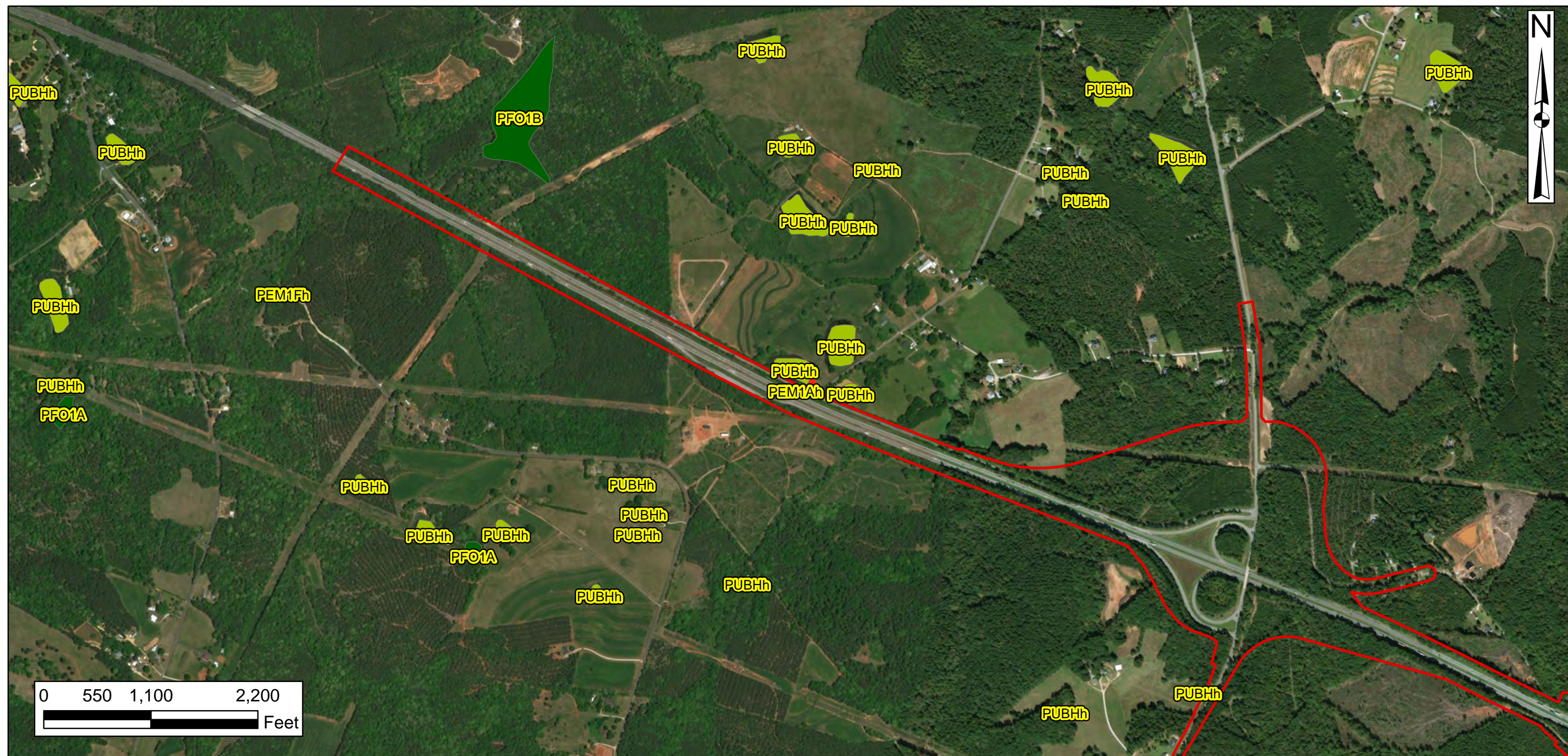
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 USFWS NWI  
 ESRI Base Map Aerial  
 Photography

### NWI MAP

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 QA/QC: KLM

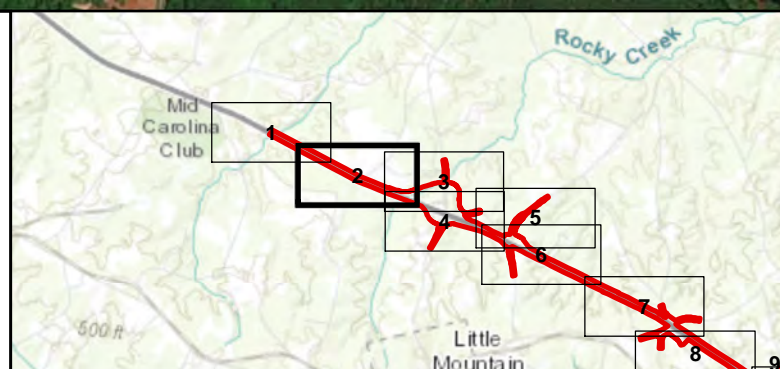
January 2018





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I-26 Design Build Widening MM 85 to MM 101  
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SCDOT P029208

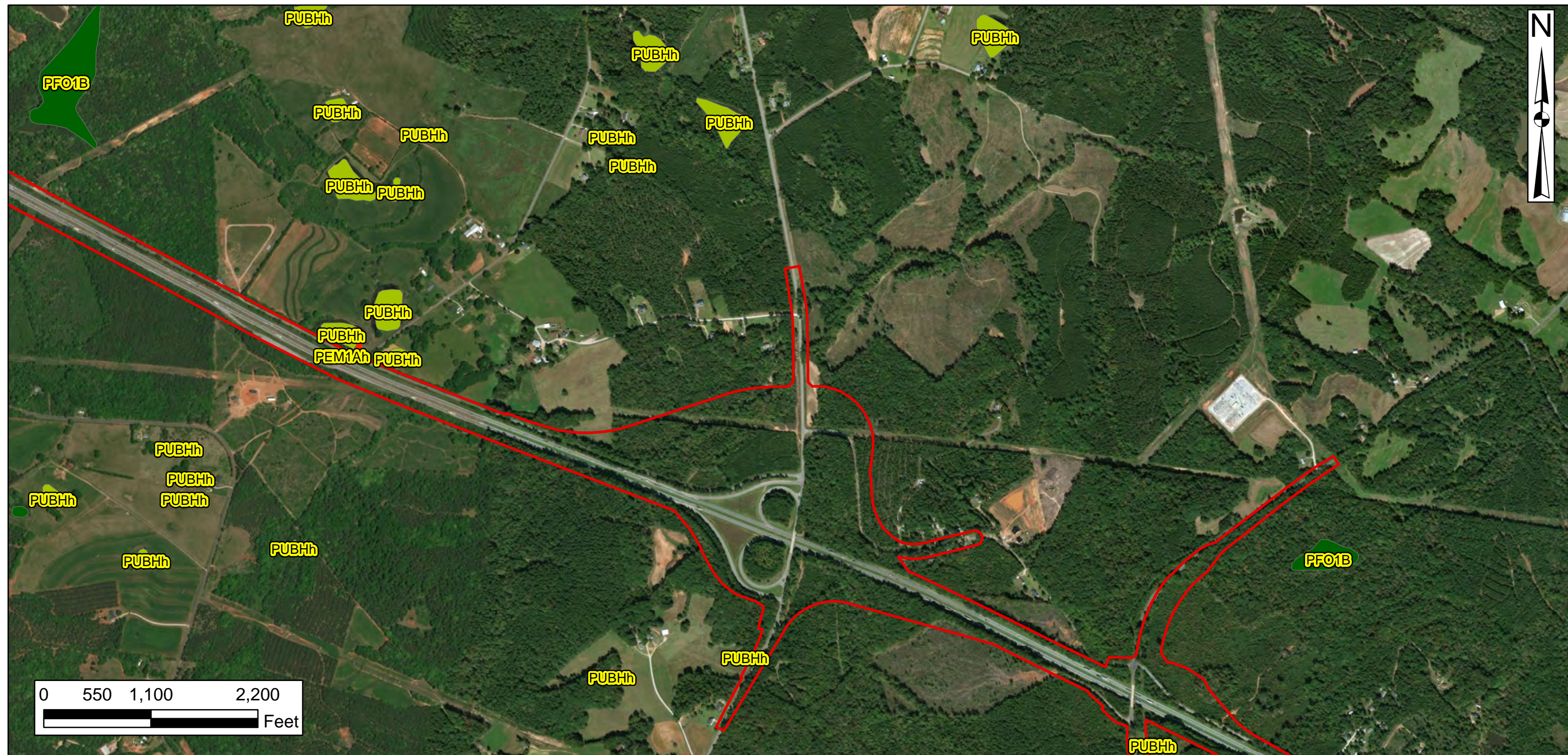
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## NW I MAP

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QA/QC: KLM

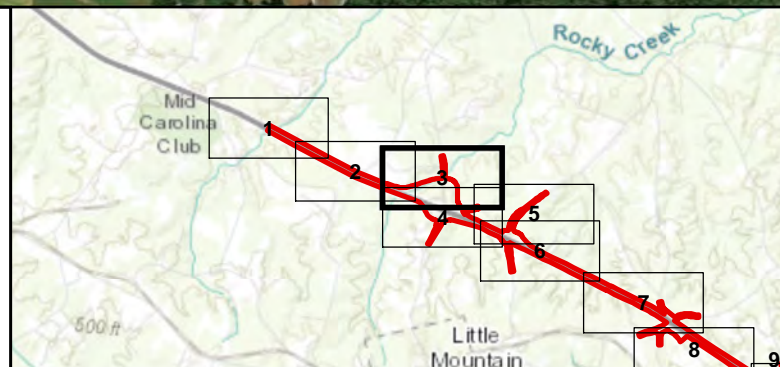
January 2018





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**Newberry, Lexington, Richland Counties**  
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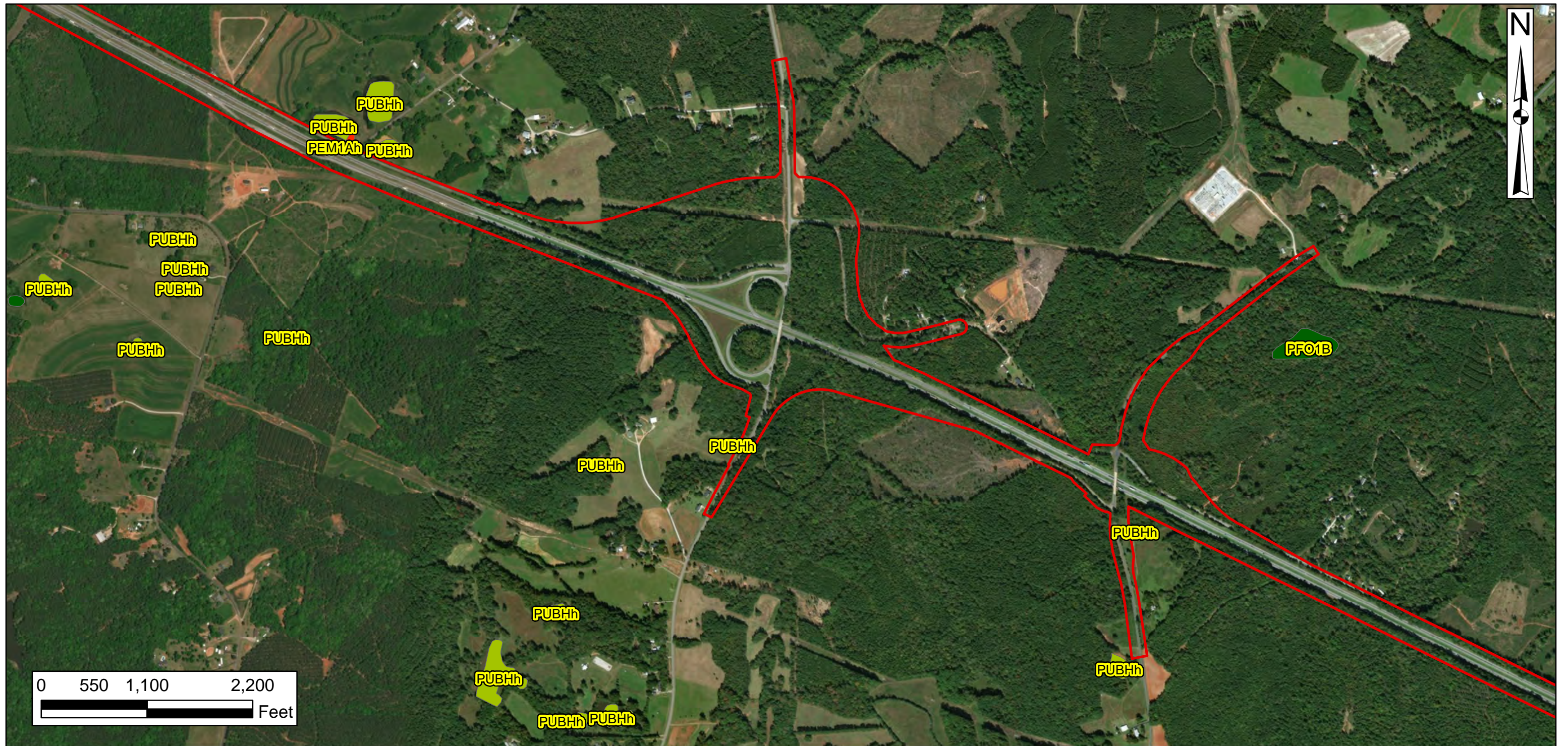
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QA/QC: KLM

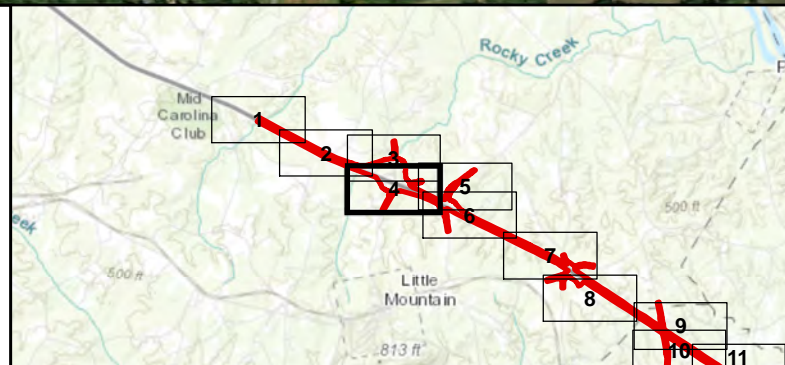
January 2018





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**Newberry, Lexington, Richland Counties**  
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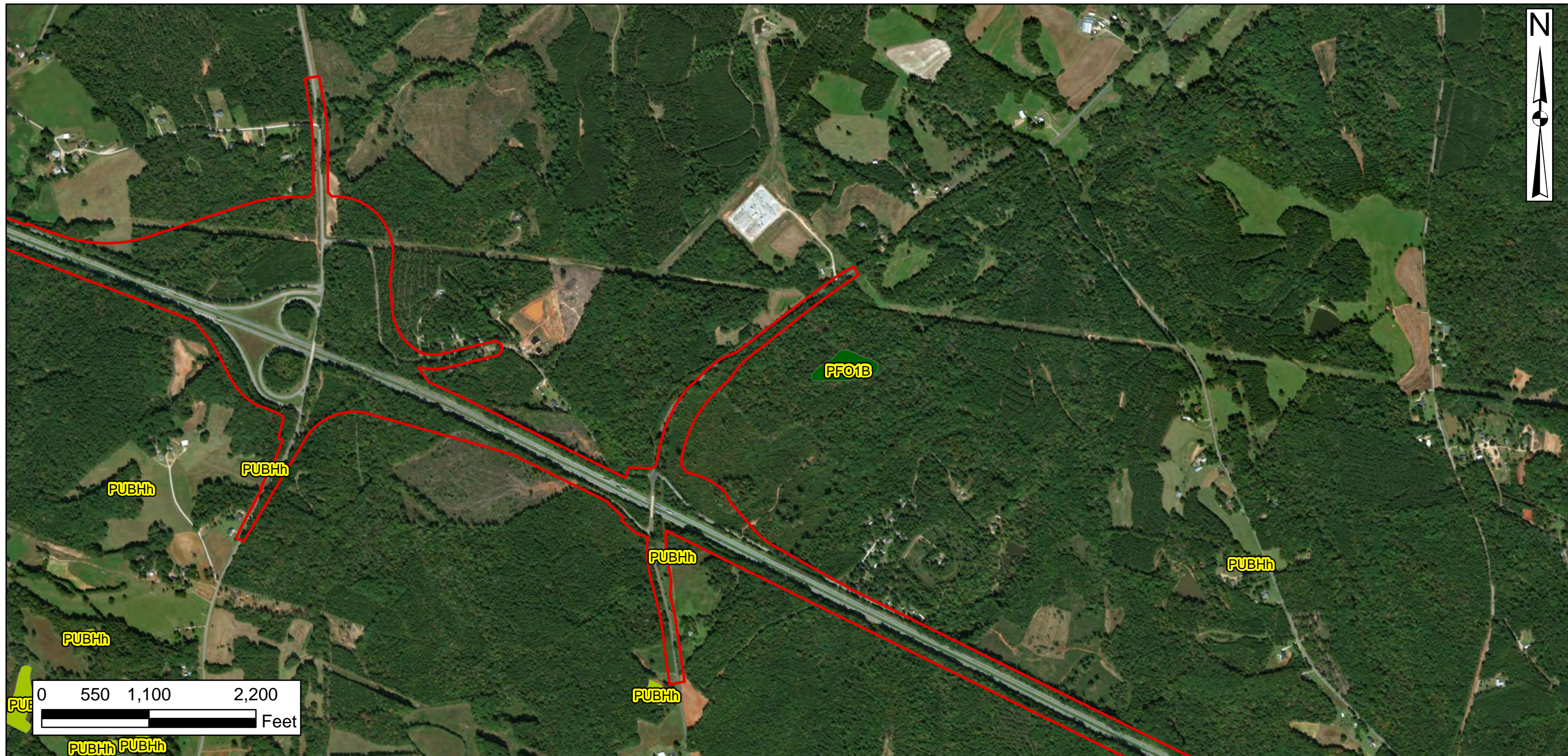
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 Photography

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 QA/QC: KLM

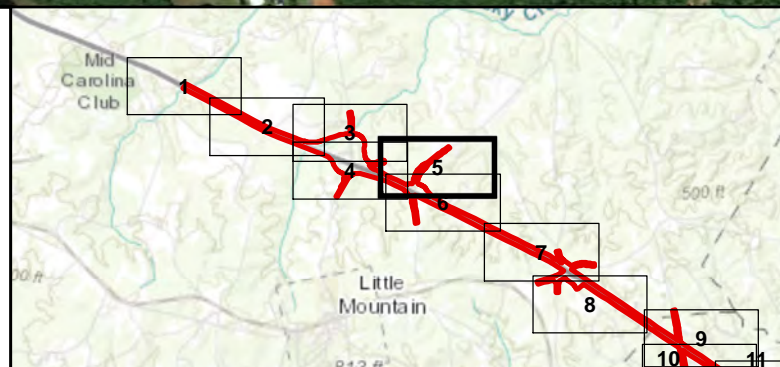
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
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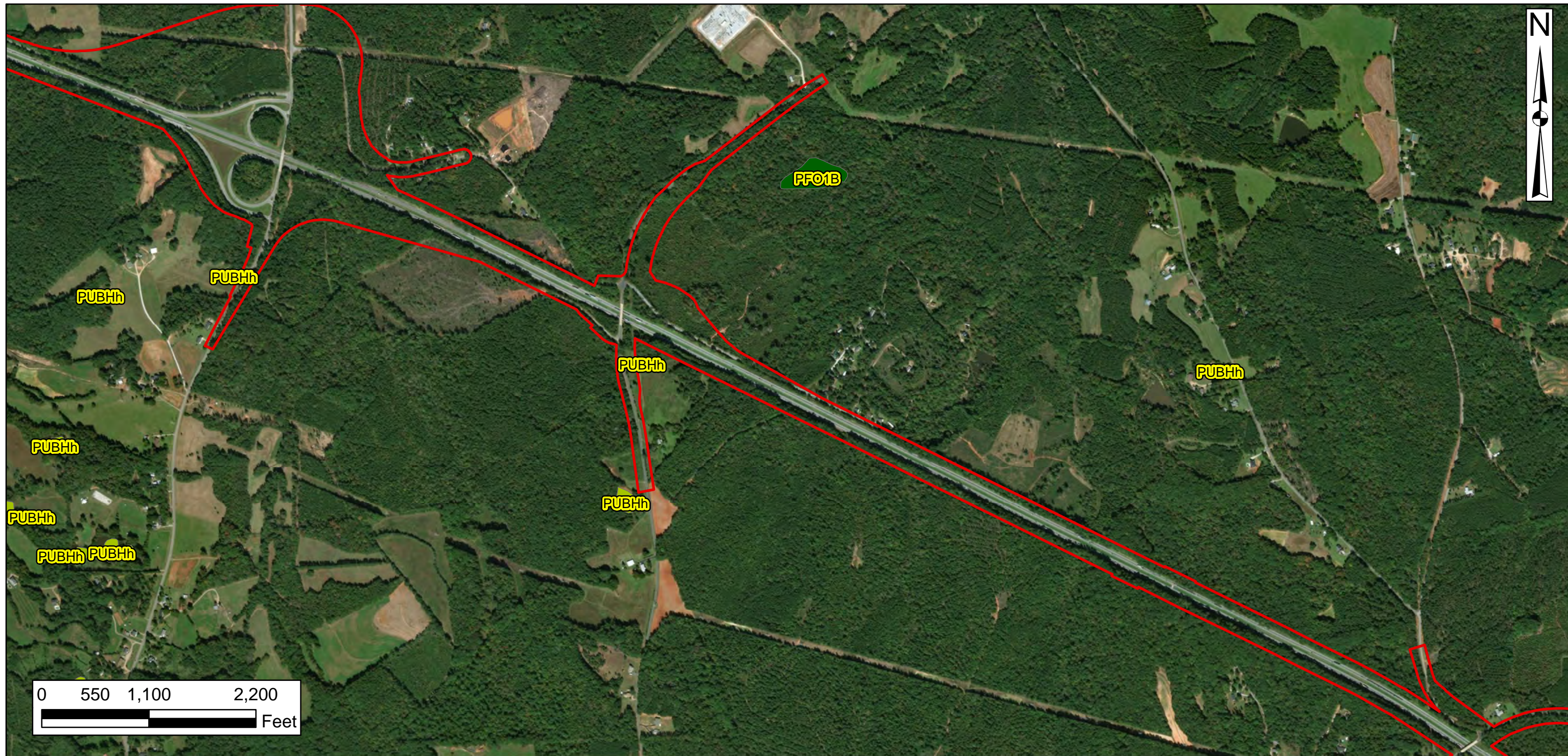
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 QA/QC: KLM

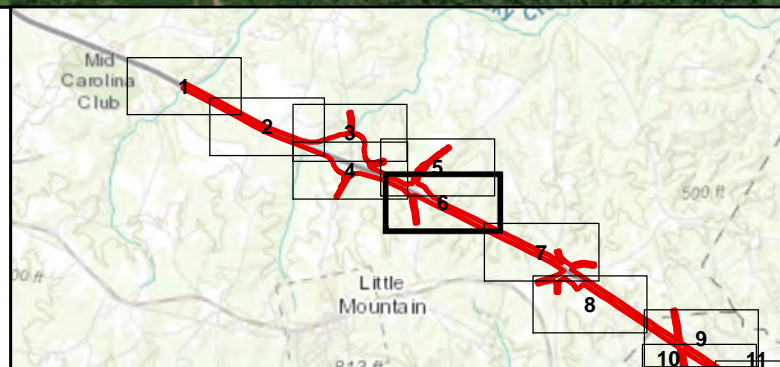
January 2018





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**SCDOT P029208**

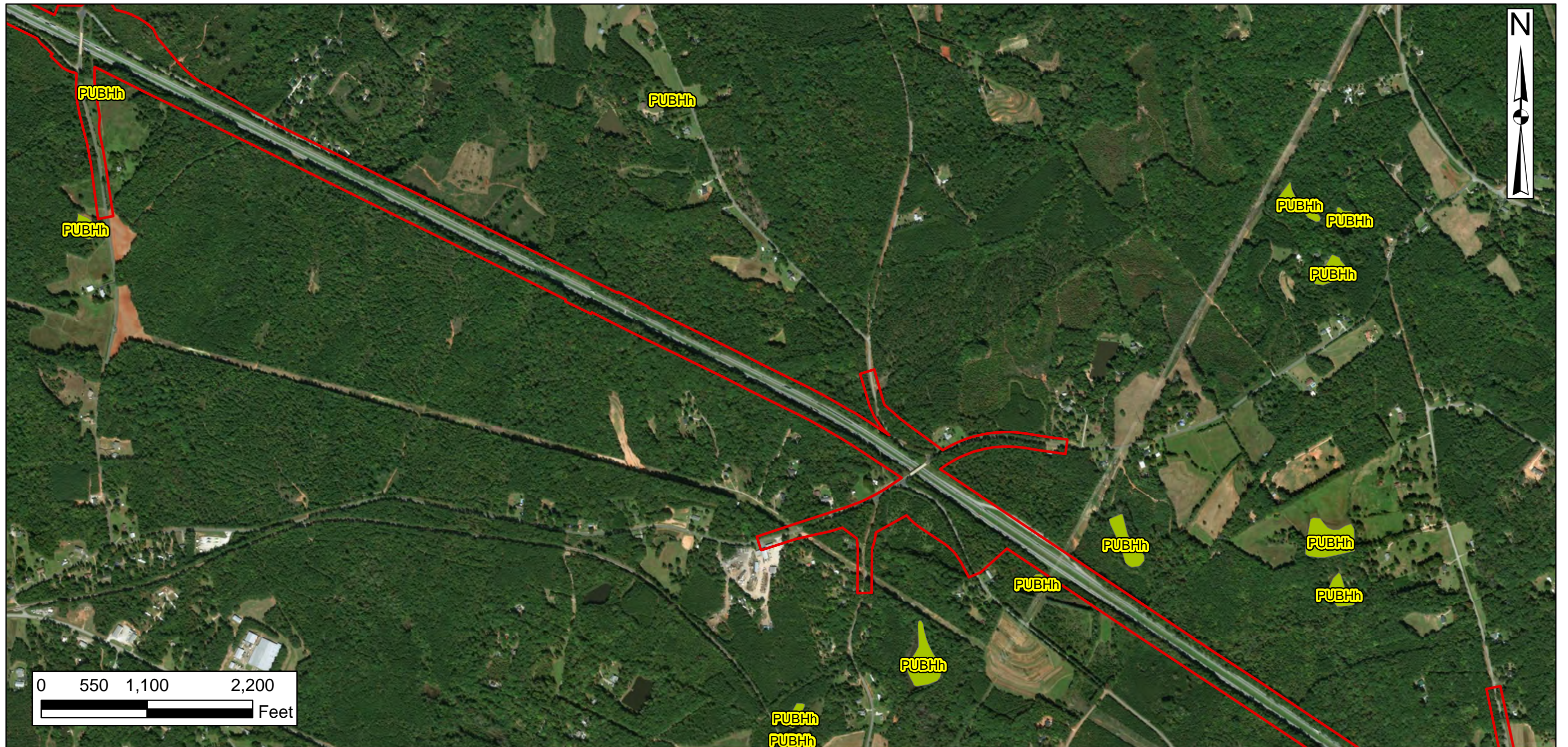
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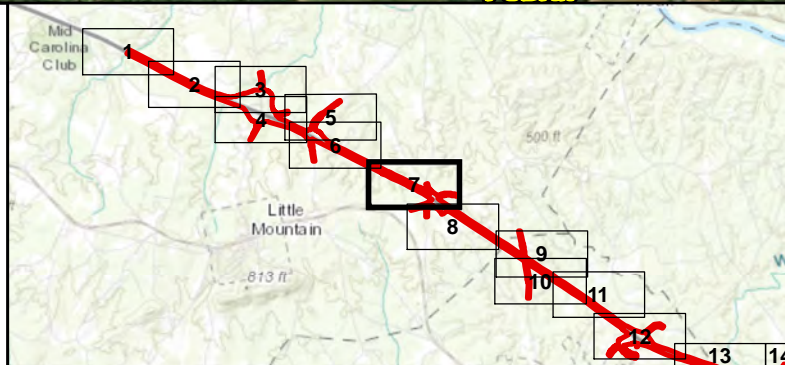
January 2018





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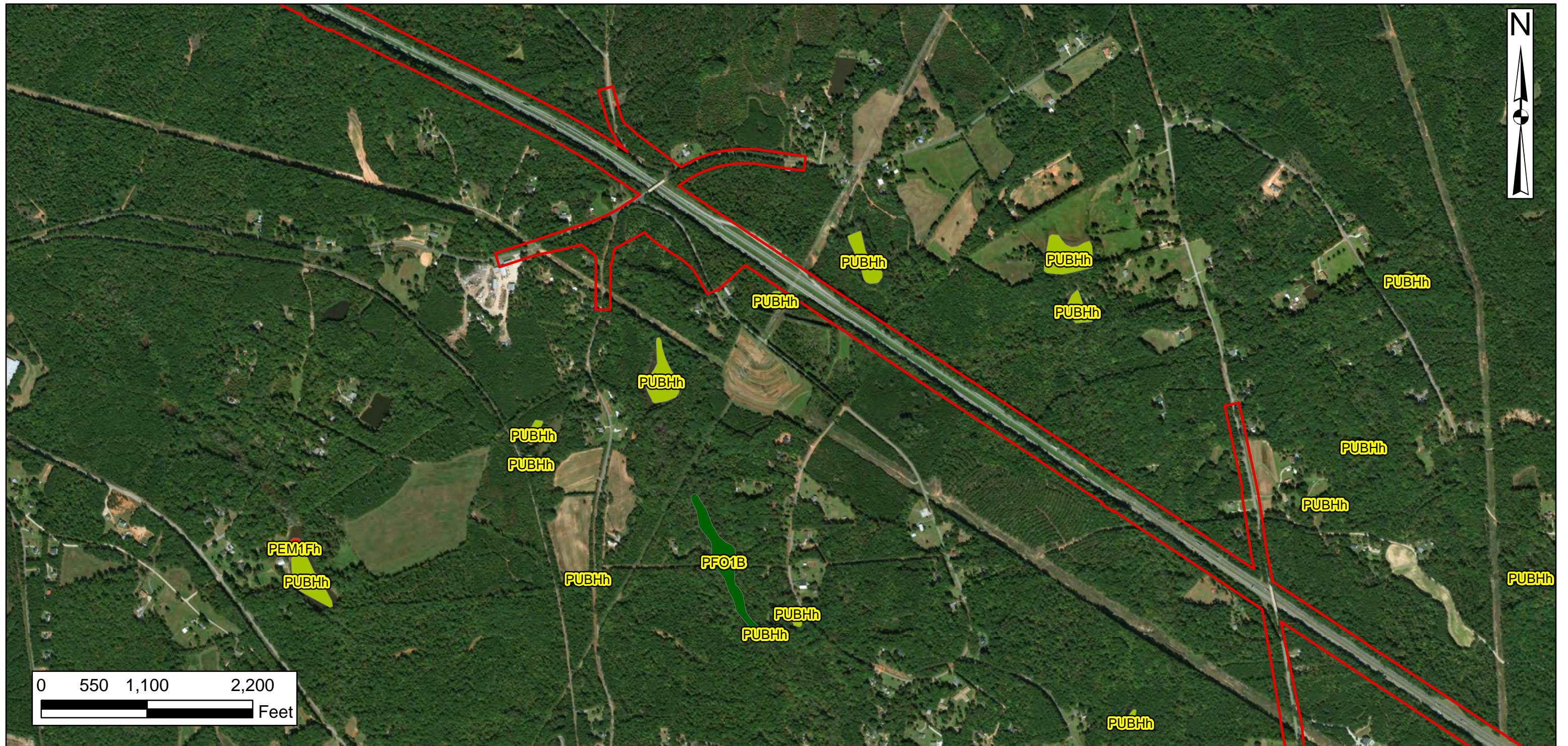
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 QA/QC: KLM

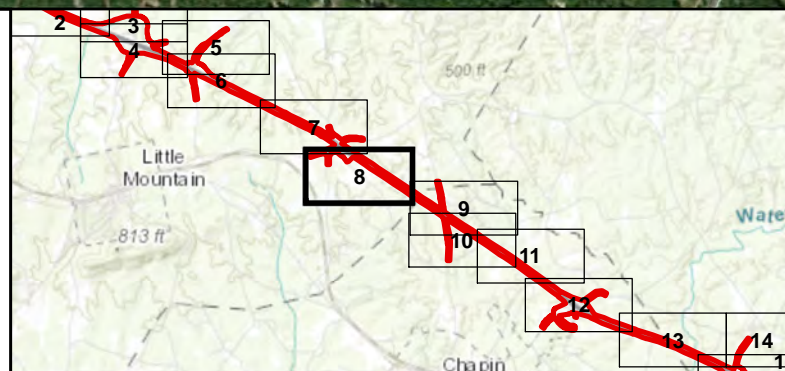
January 2018





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**SCDOT P029208**

Source:  
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 ESRI Base Map Aerial  
 Photography

**NWI MAP**

Drawn By: RHH  
 QA/QC: KLM

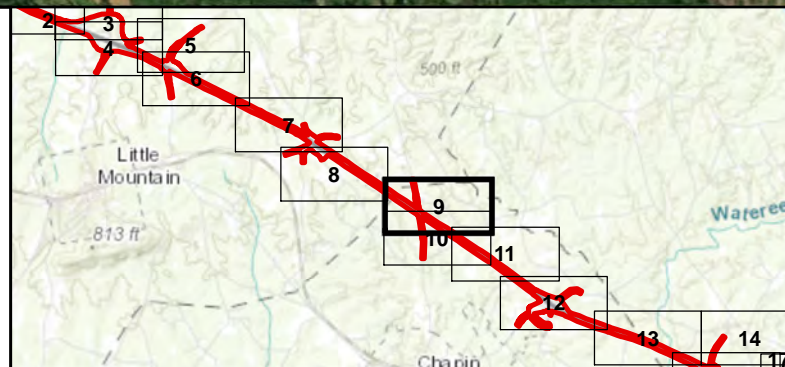
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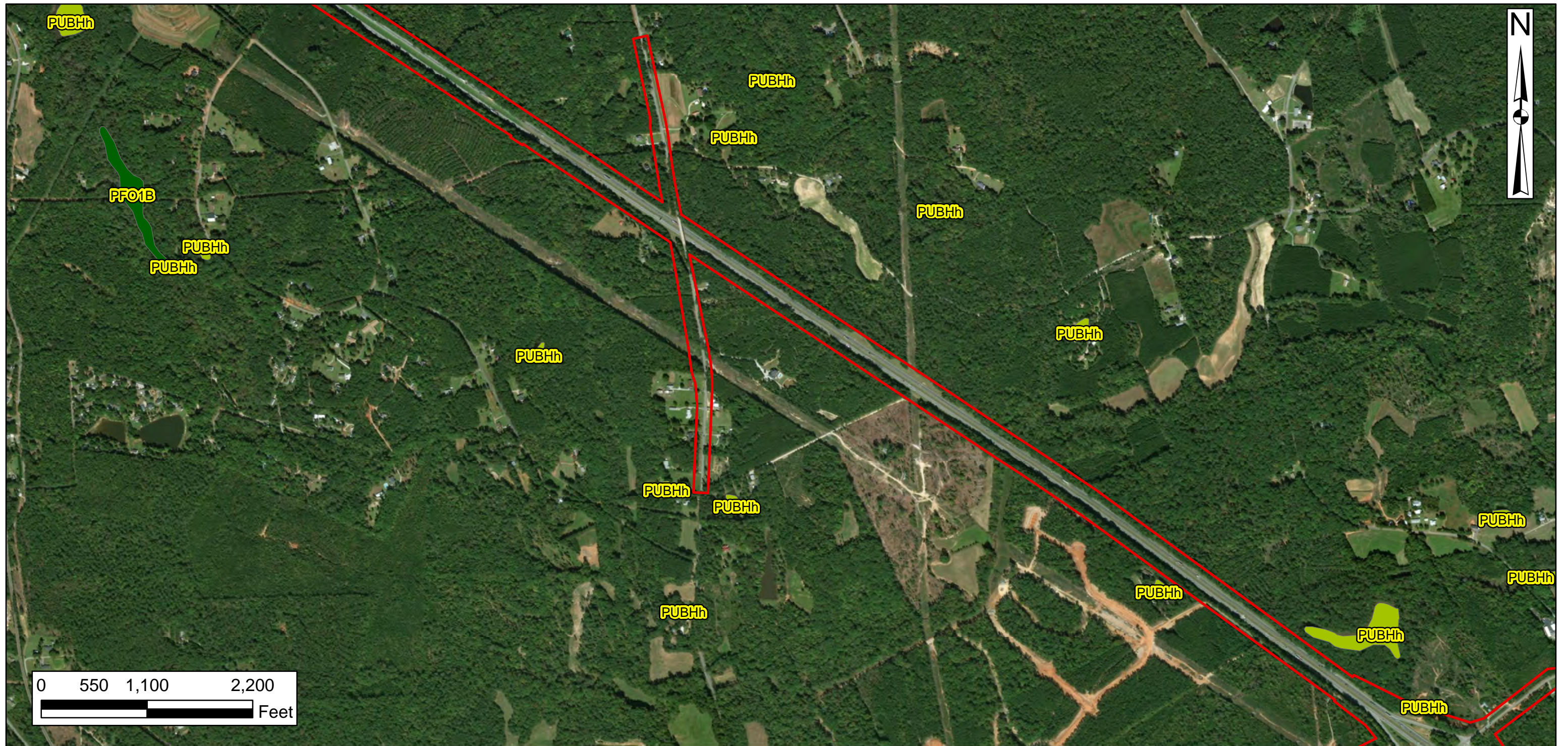
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**NWI MAP**






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 QA/QC: KLM

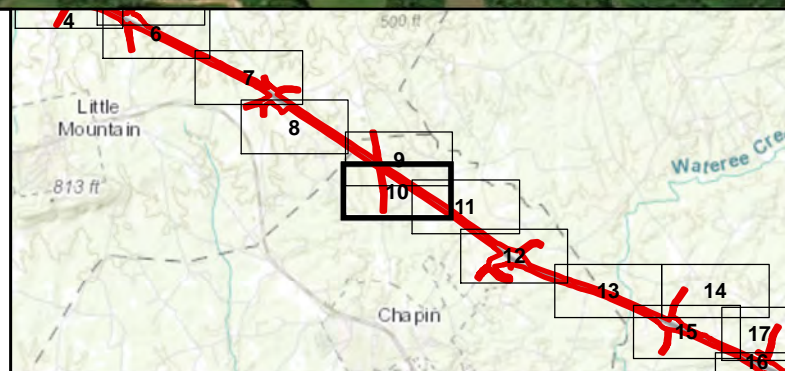
January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USFWS NWI  
ESRI Base Map Aerial  
Photography

**NWI MAP**

Drawn By: RHH  
QA/QC: KLM

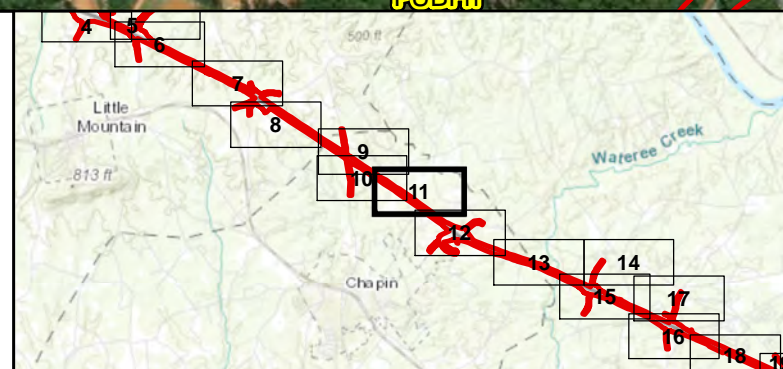
January 2018





# Legend

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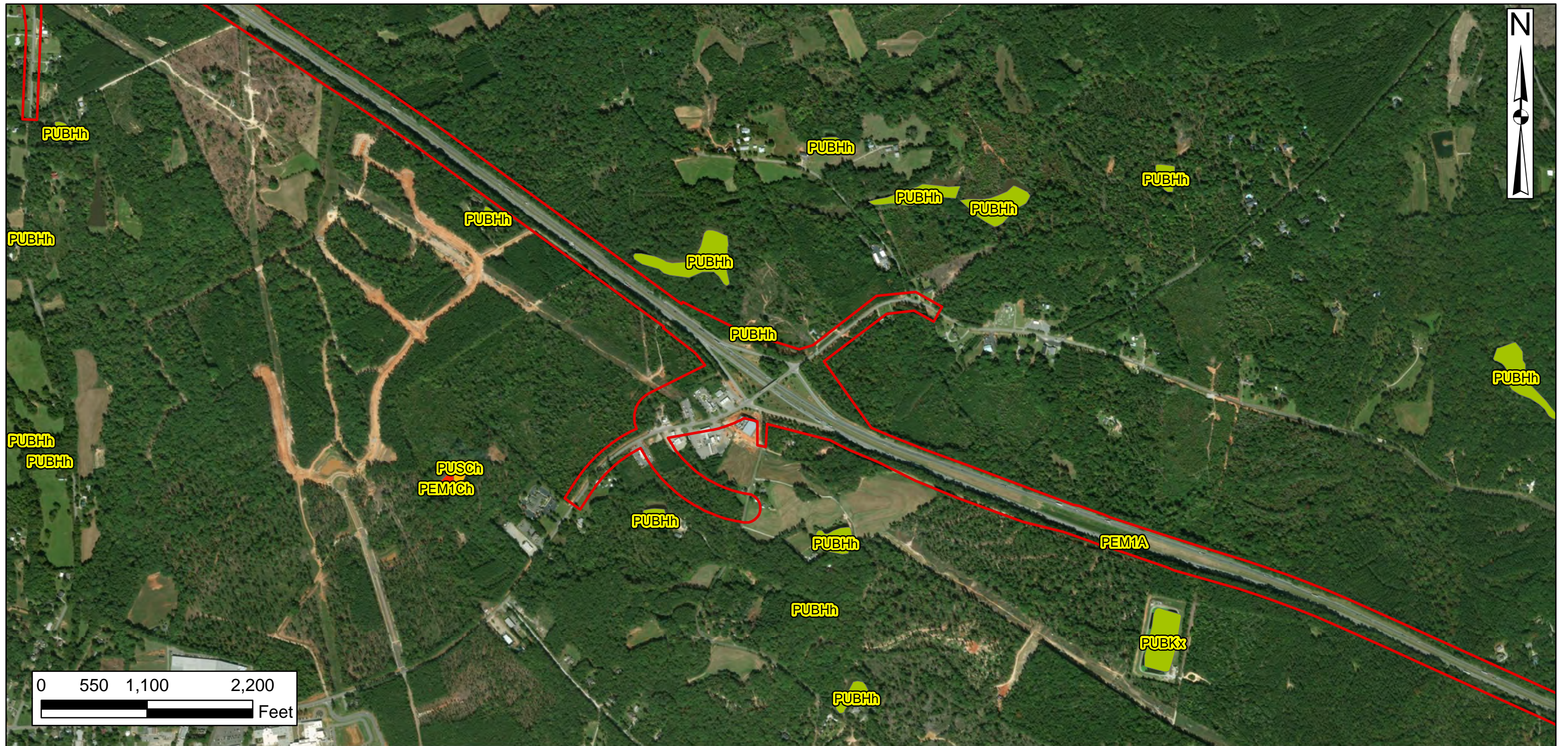
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## NWl MAP

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QA/QC: KLM

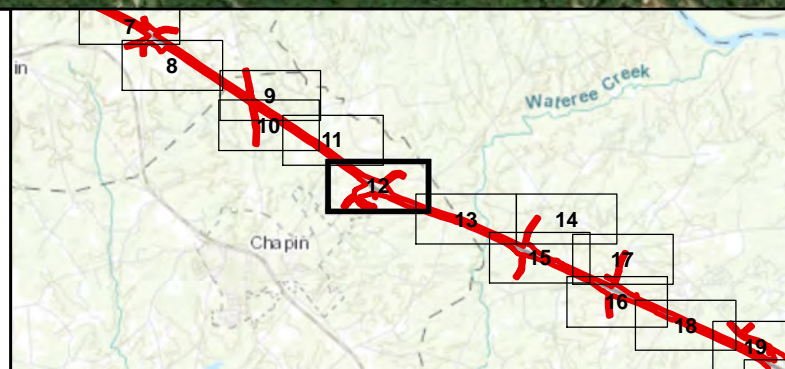
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

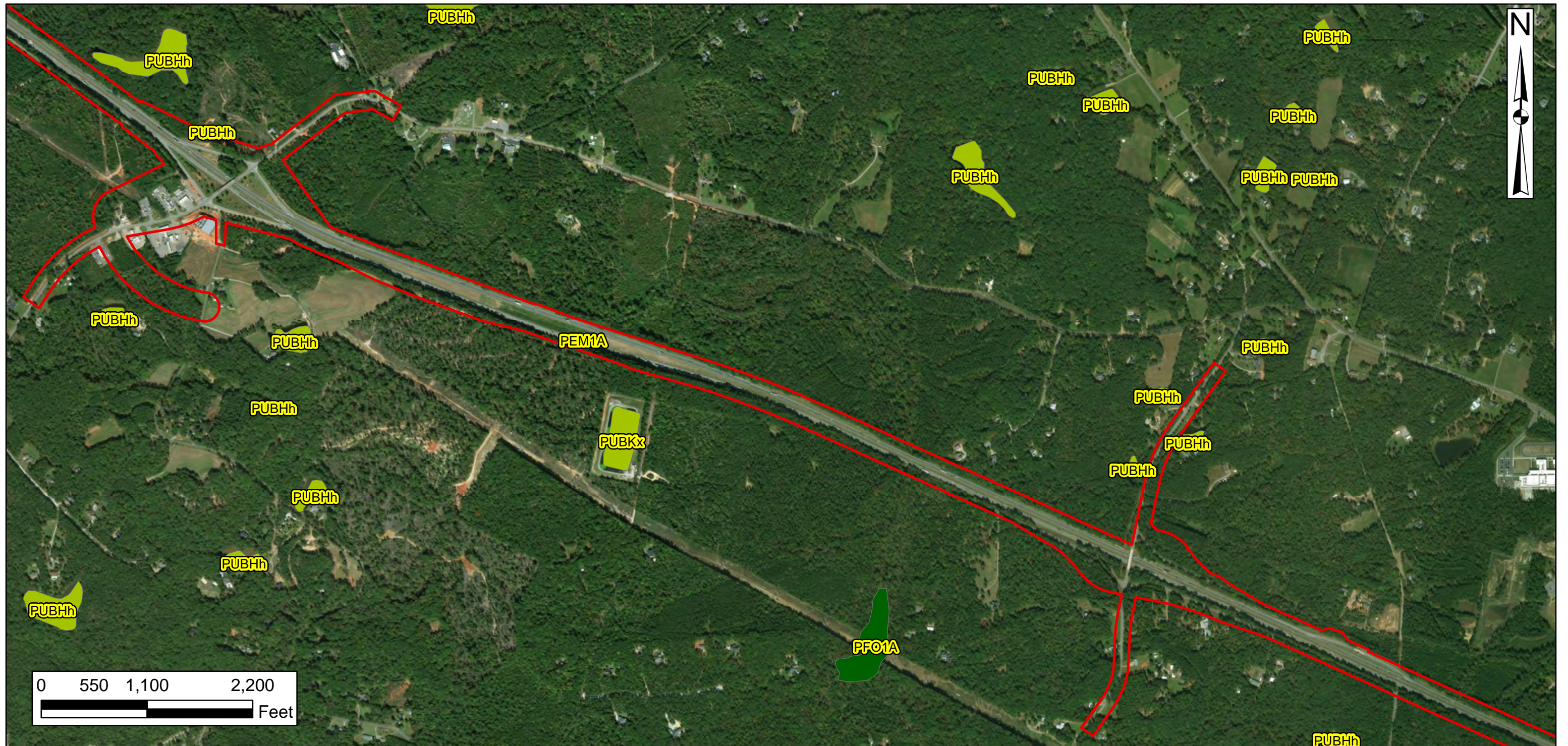
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**NWI MAP**

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 QA/QC: KLM

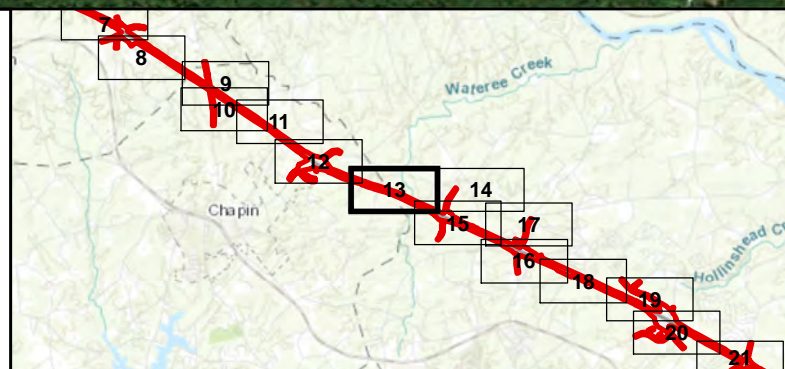
January 2018





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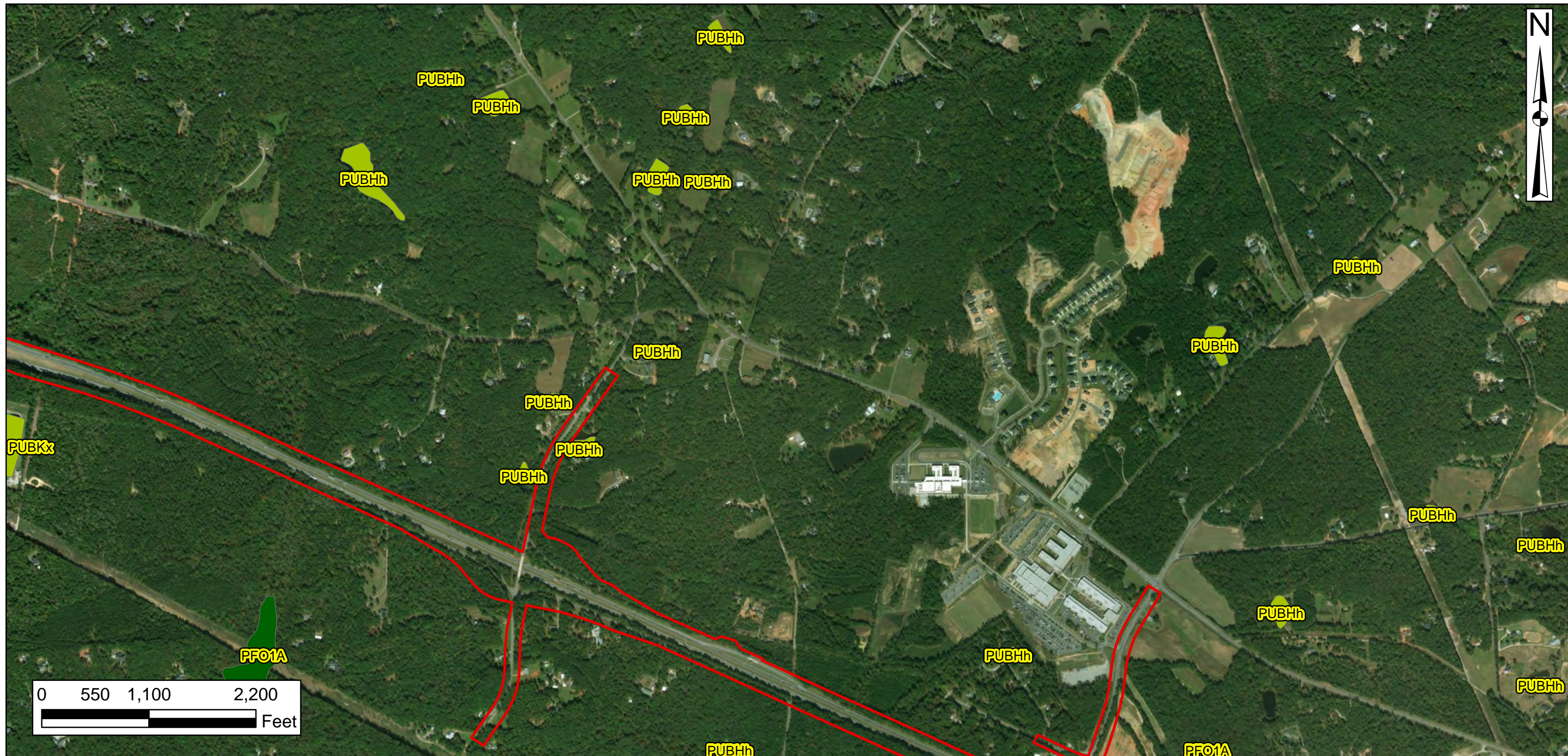
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**NWI MAP**

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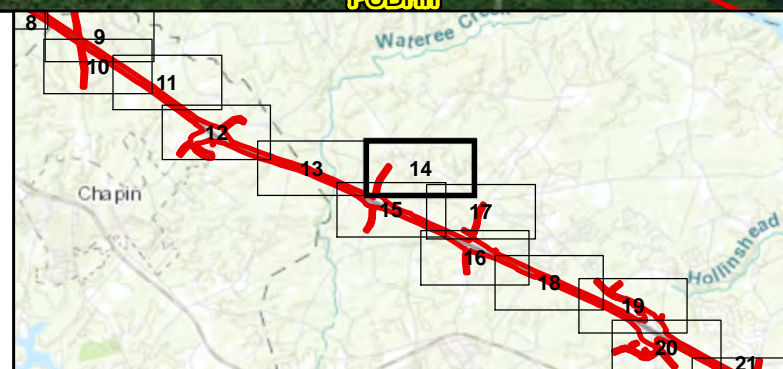
January 2018





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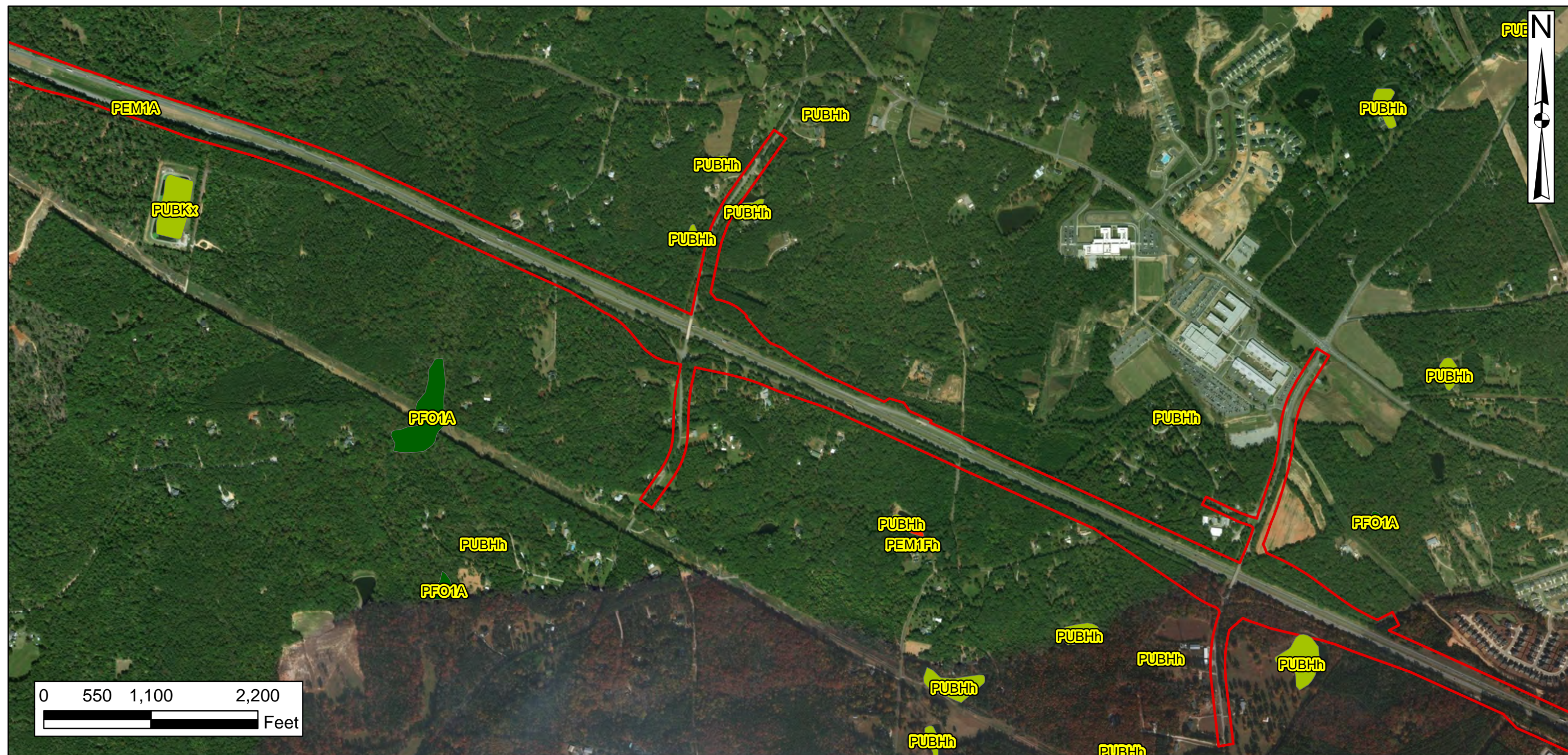
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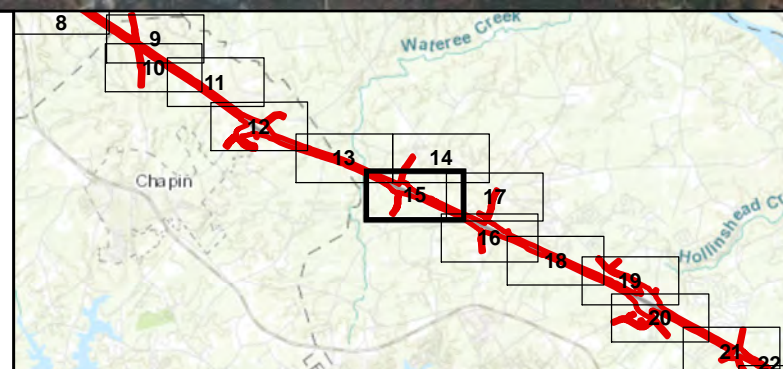
January 2018





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**SCDOT P029208**

Source:  
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 Photography

### NWI MAP

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 QA/QC: KLM

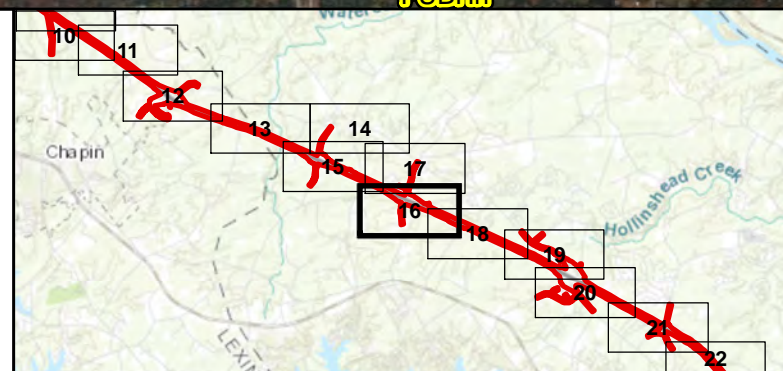
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#### Legend

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**SCDOT P029208**

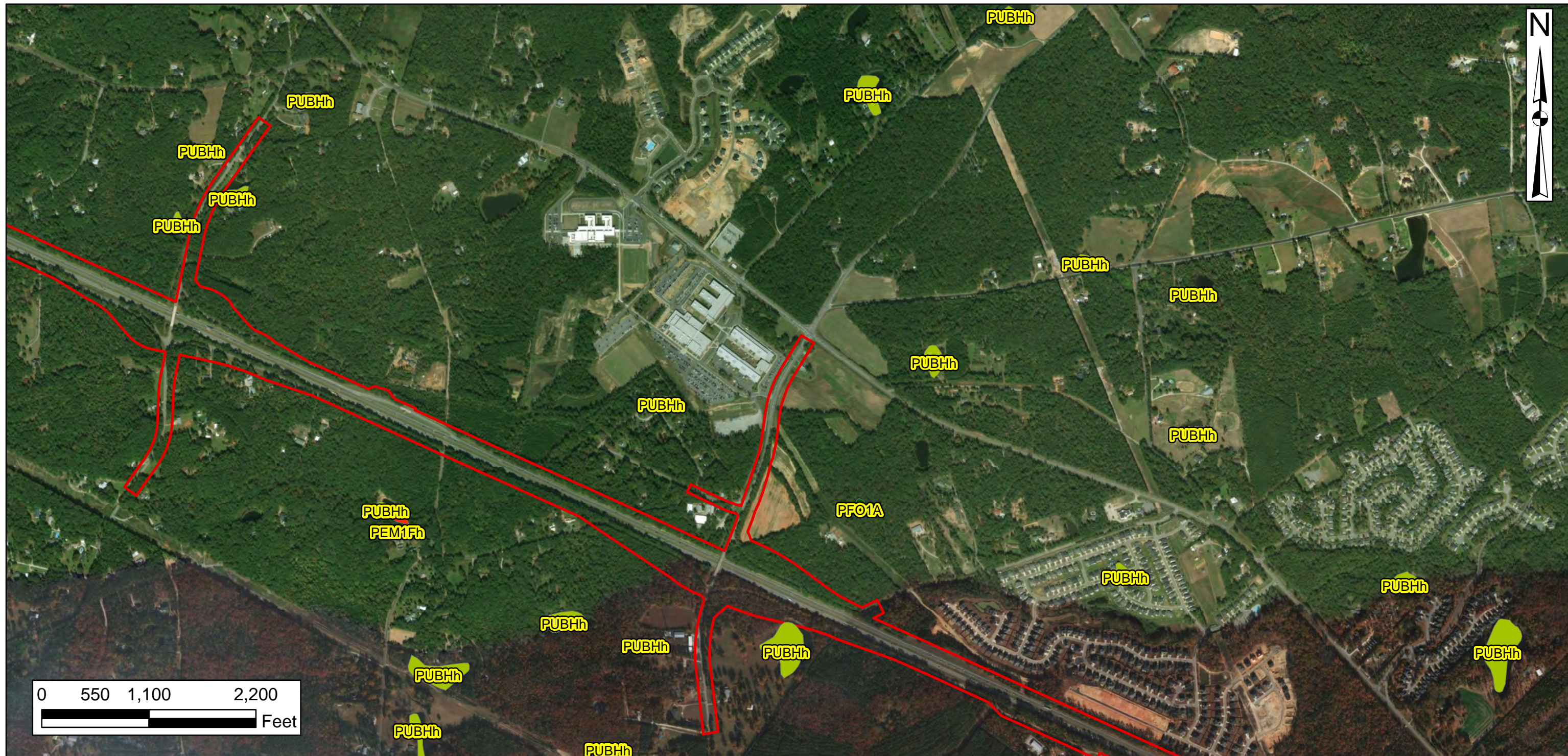
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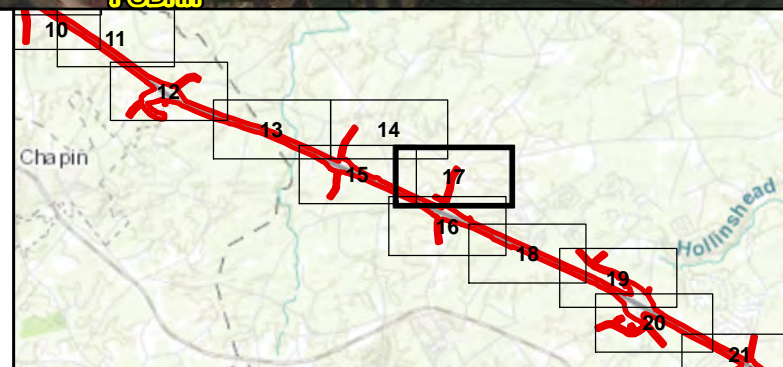
January 2018





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**SCDOT P029208**

Source:  
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 Photography

**NWI MAP**

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 QA/QC: KLM

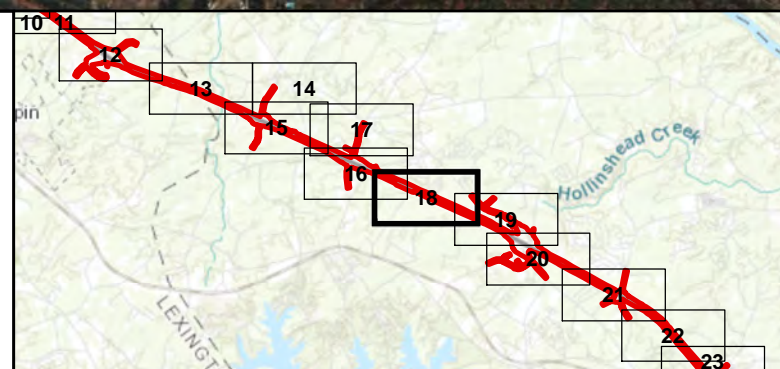
January 2018





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**SCDOT P029208**

Source:  
USFWS NWI  
ESRI Base Map Aerial  
Photography

## NW I MAP

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QA/QC: KLM

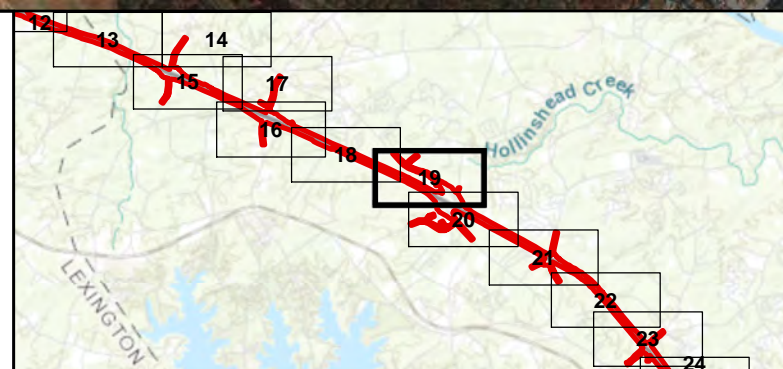
January 2018





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### NWI MAP

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 QA/QC: KLM

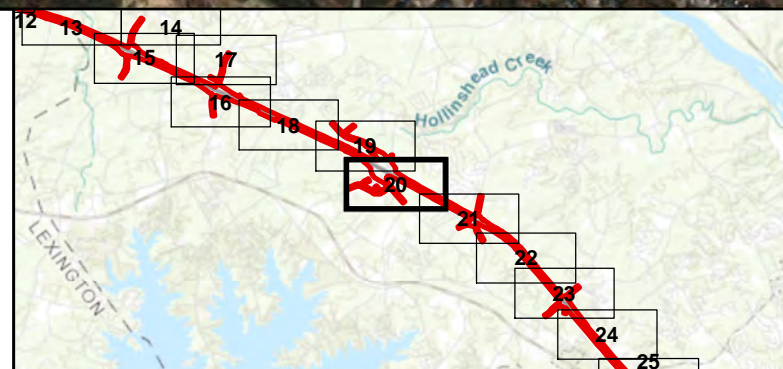
January 2018





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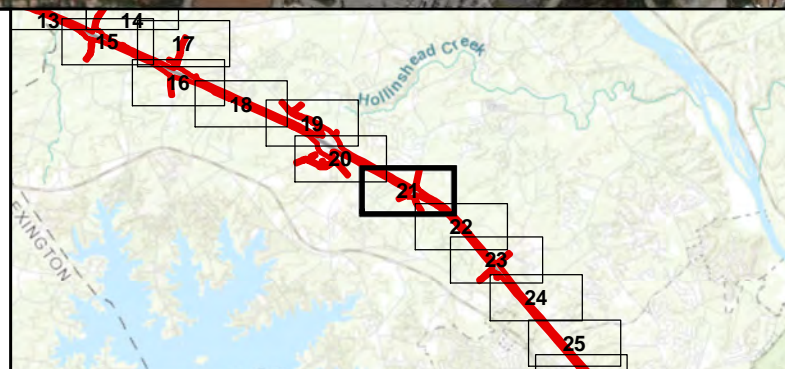
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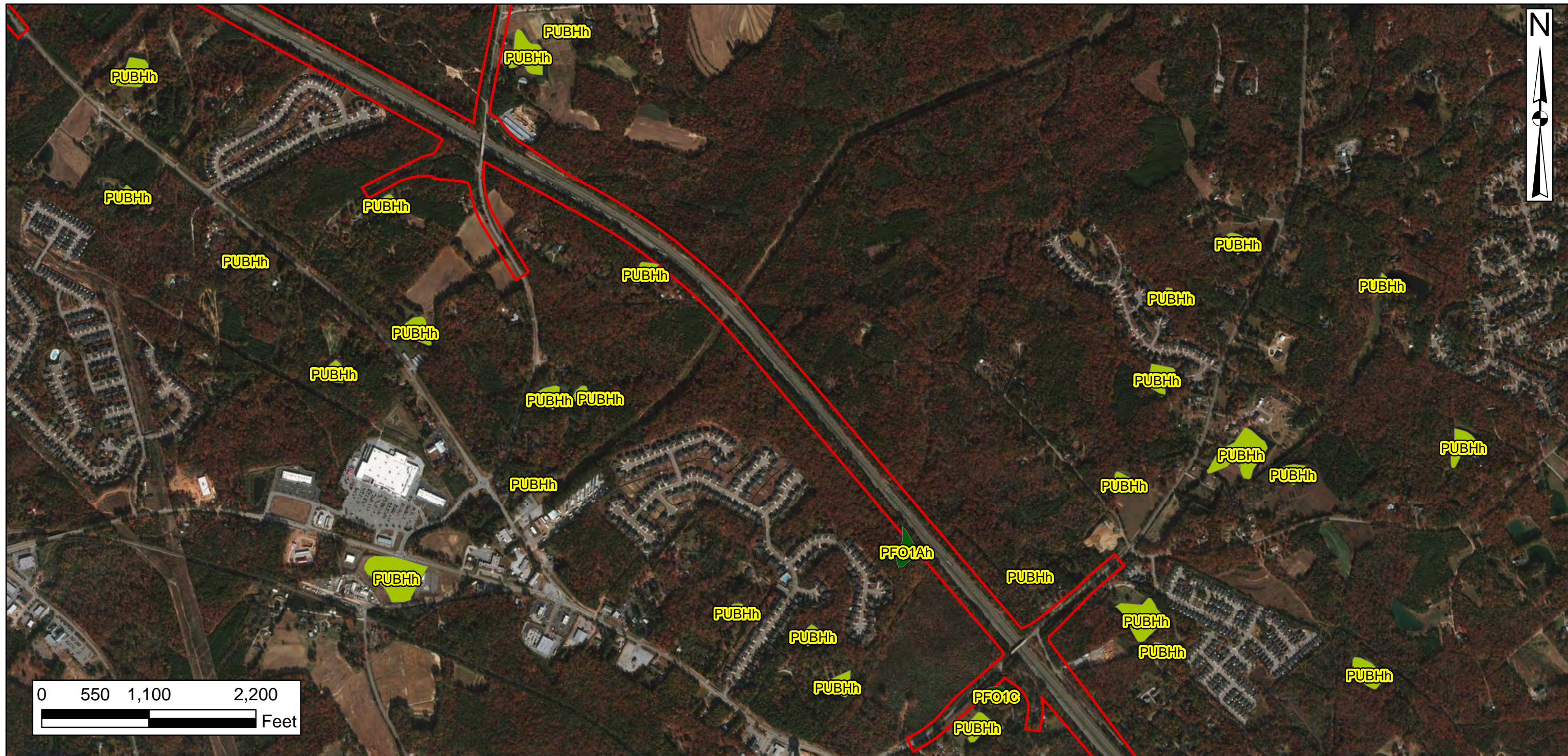
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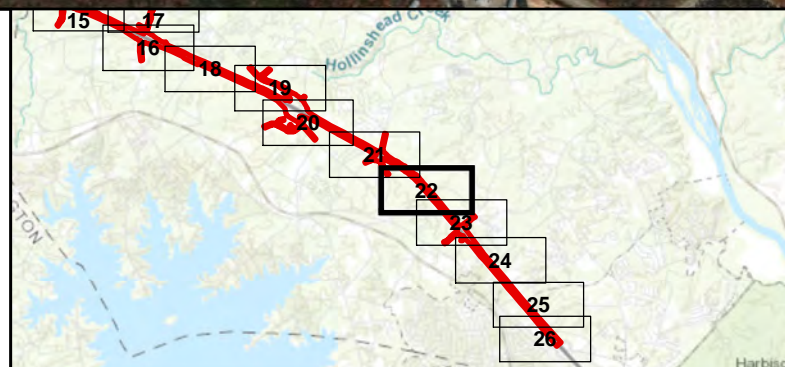
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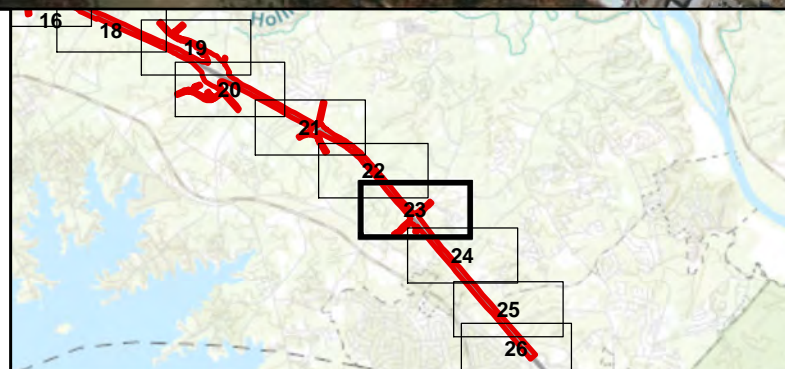
January 2018





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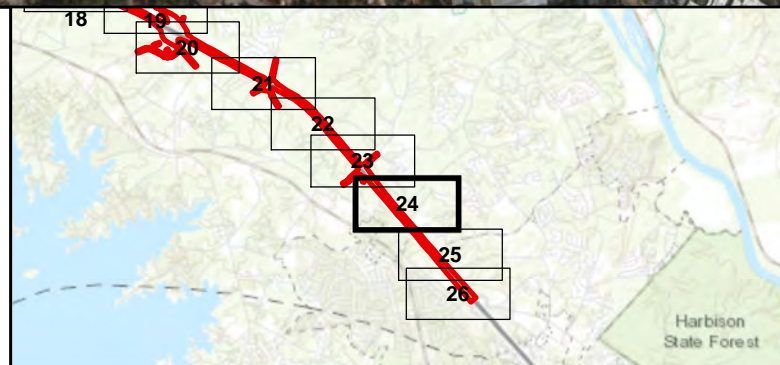
January 2018





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 QA/QC: KLM

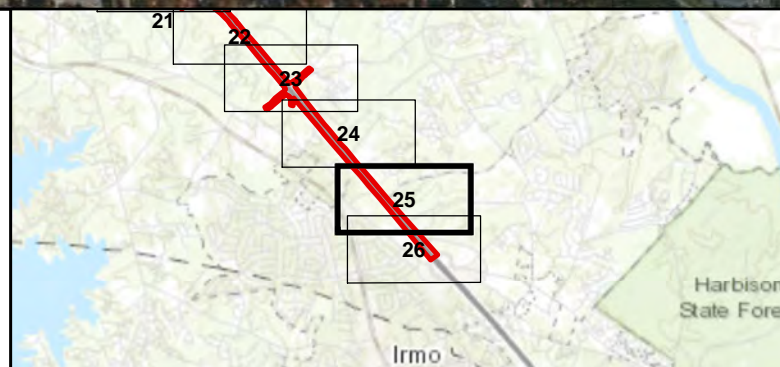
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 Photography

### NWI MAP

Drawn By: RHH  
 QA/QC: KLM

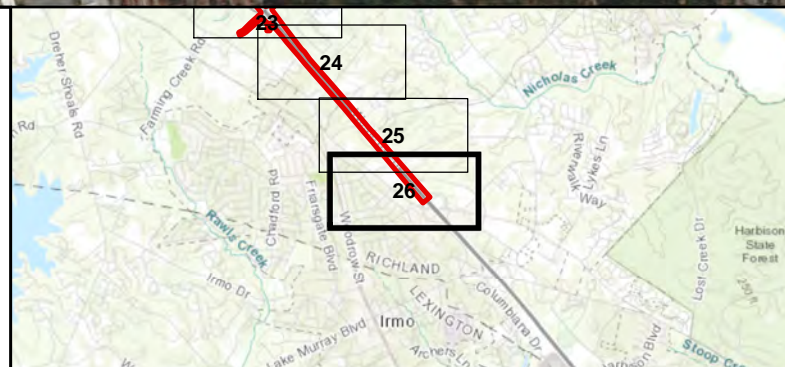
January 2018





### Legend

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Other
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USFWS NWI  
ESRI Base Map Aerial  
Photography

### NWI MAP

Drawn By: RHH  
QA/QC: KLM

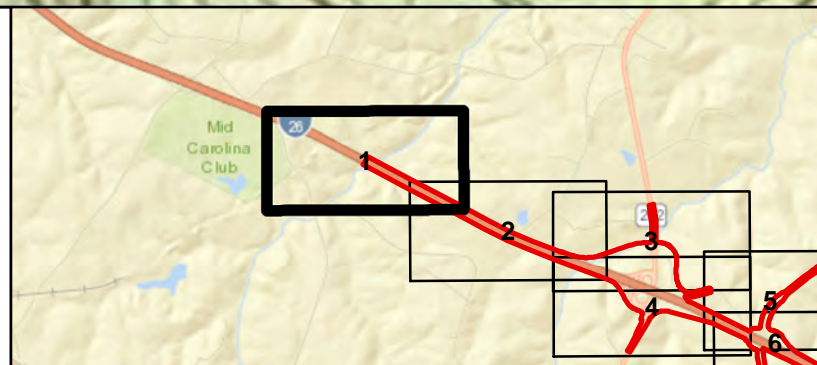
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

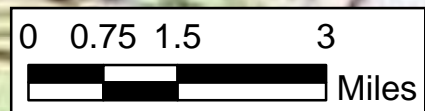
Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP



Drawn By: RHH  
 QA/QC: KLM

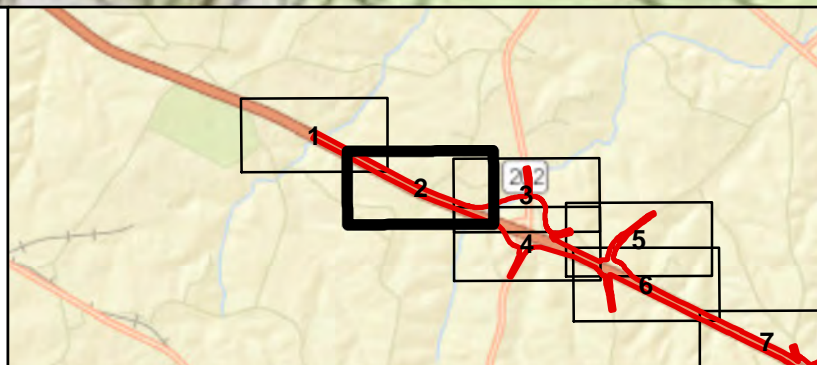
January 2018





### Legend

-  Quad Boundary
-  Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

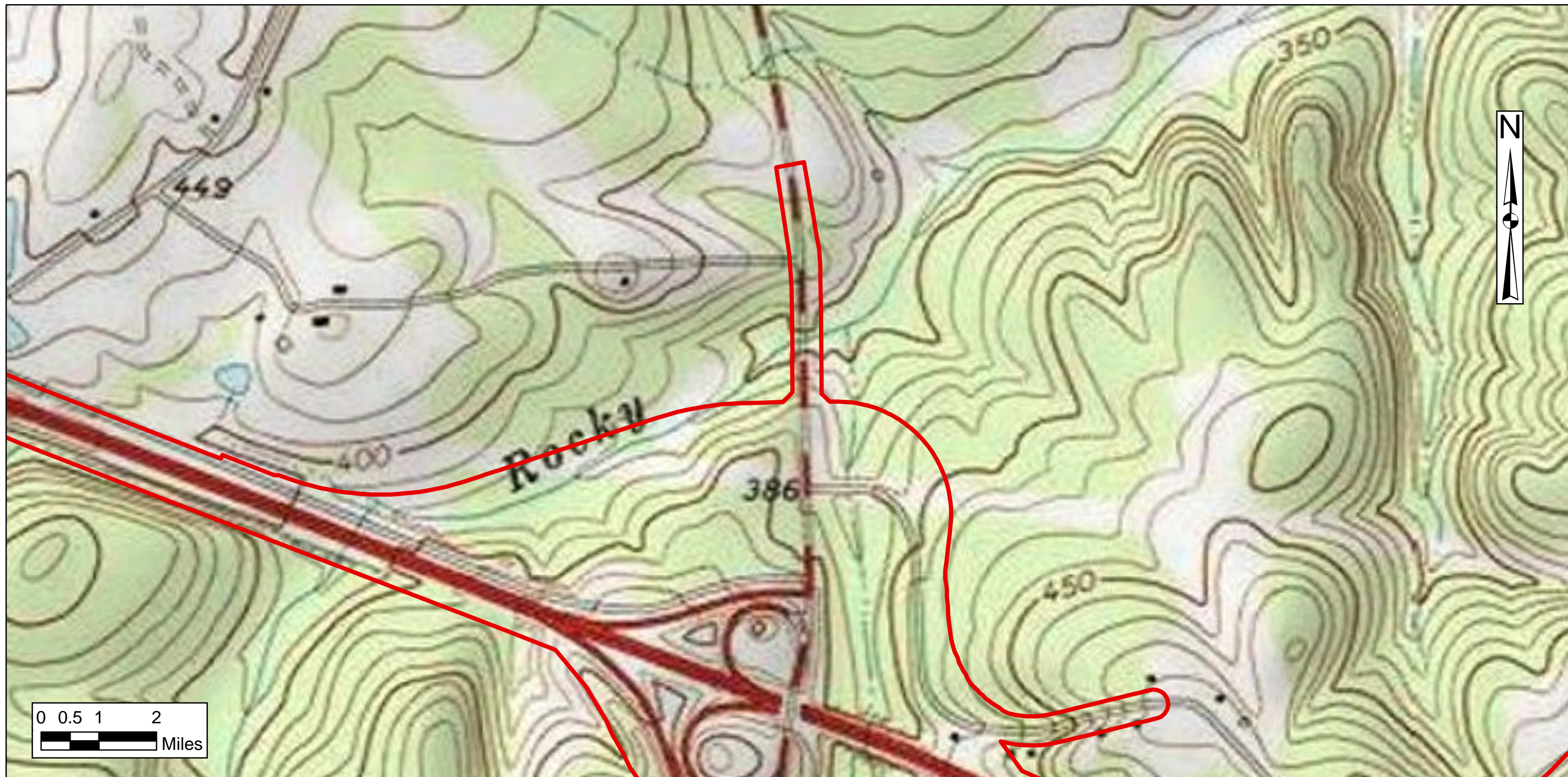
Source:  
 USGS 7.5 Minute Quad  
 South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

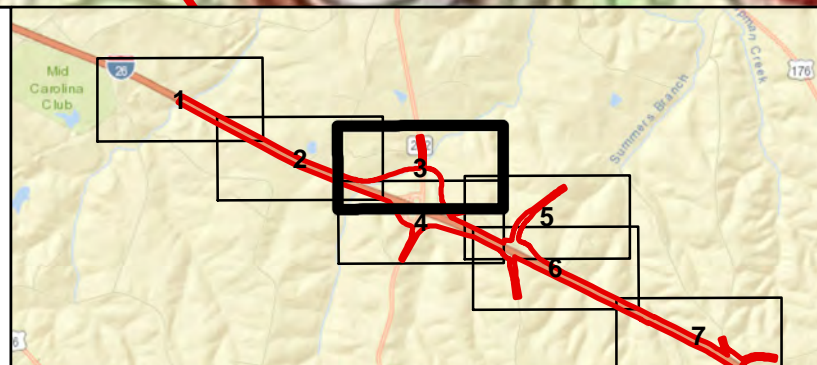
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

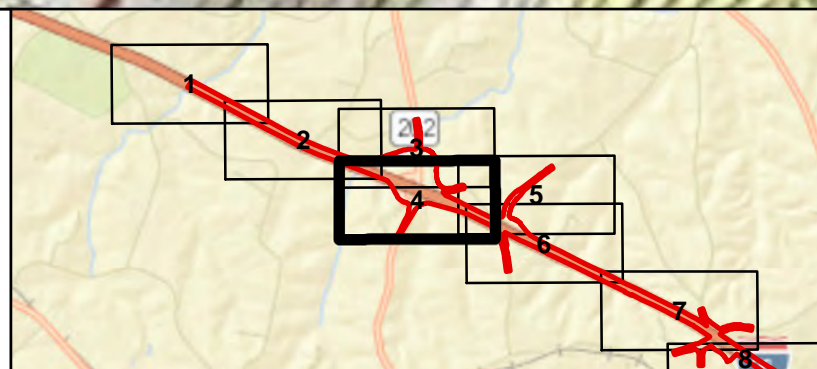
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

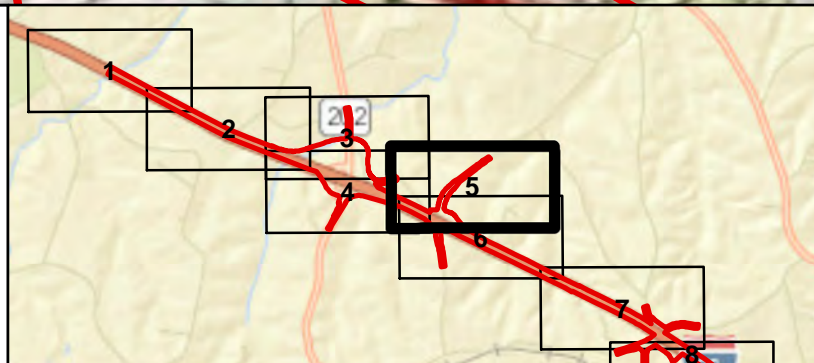
January 2018





# Legend

- Quad Boundary
- ▭ Project Study Area



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
USGS 7.5 Minute Quad  
South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

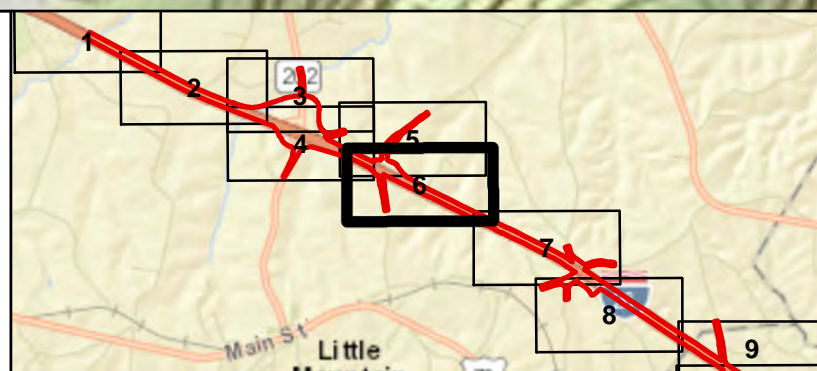
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

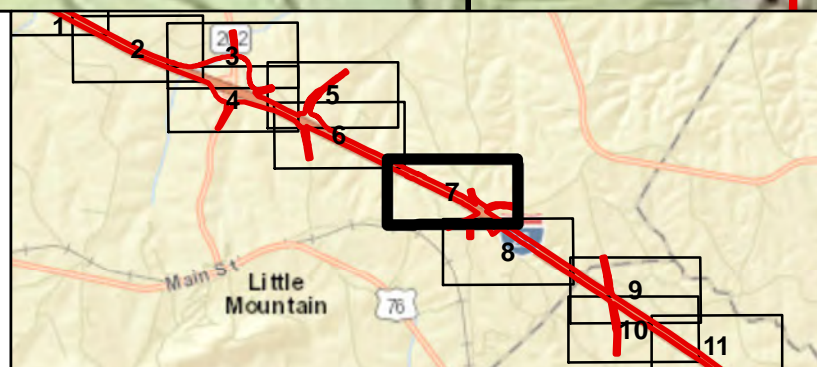
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

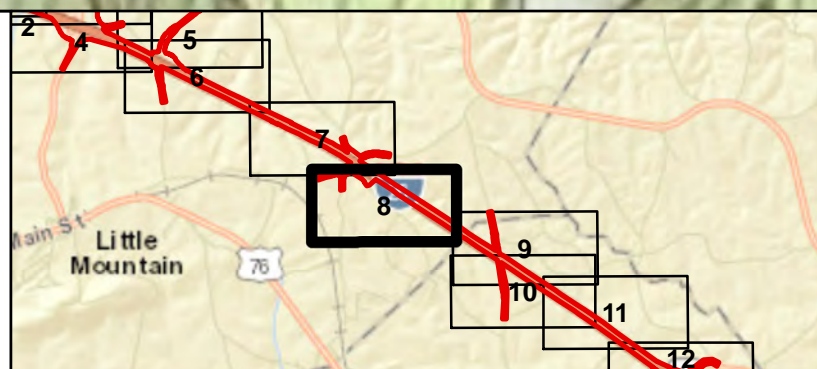
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

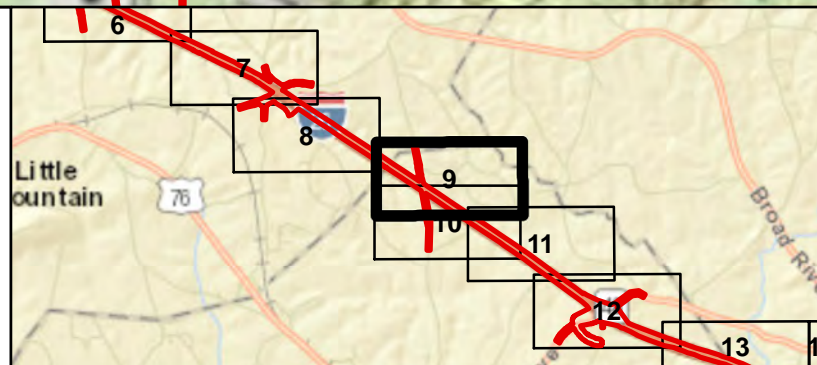
January 2018





### Legend

- Quad Boundary
- Project Study Area



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

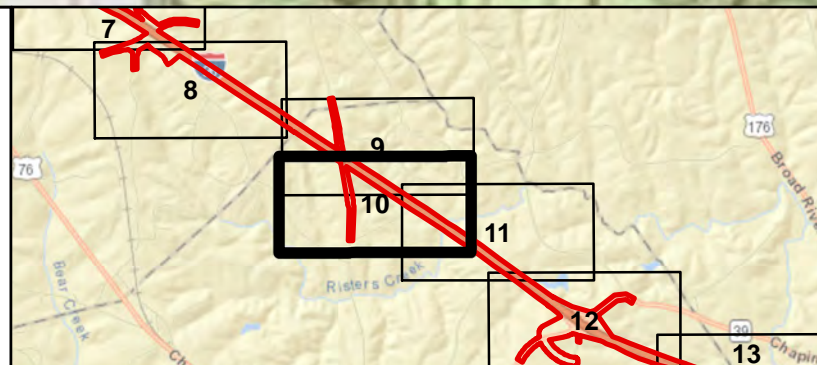
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

### USGS TOPOGRAPHY MAP

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 QA/QC: KLM

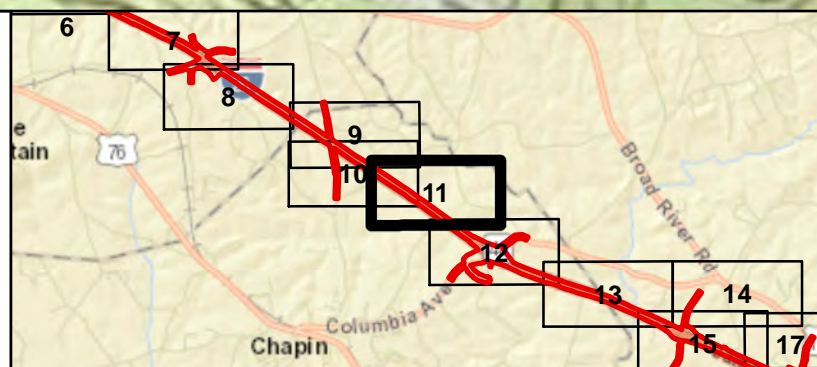
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

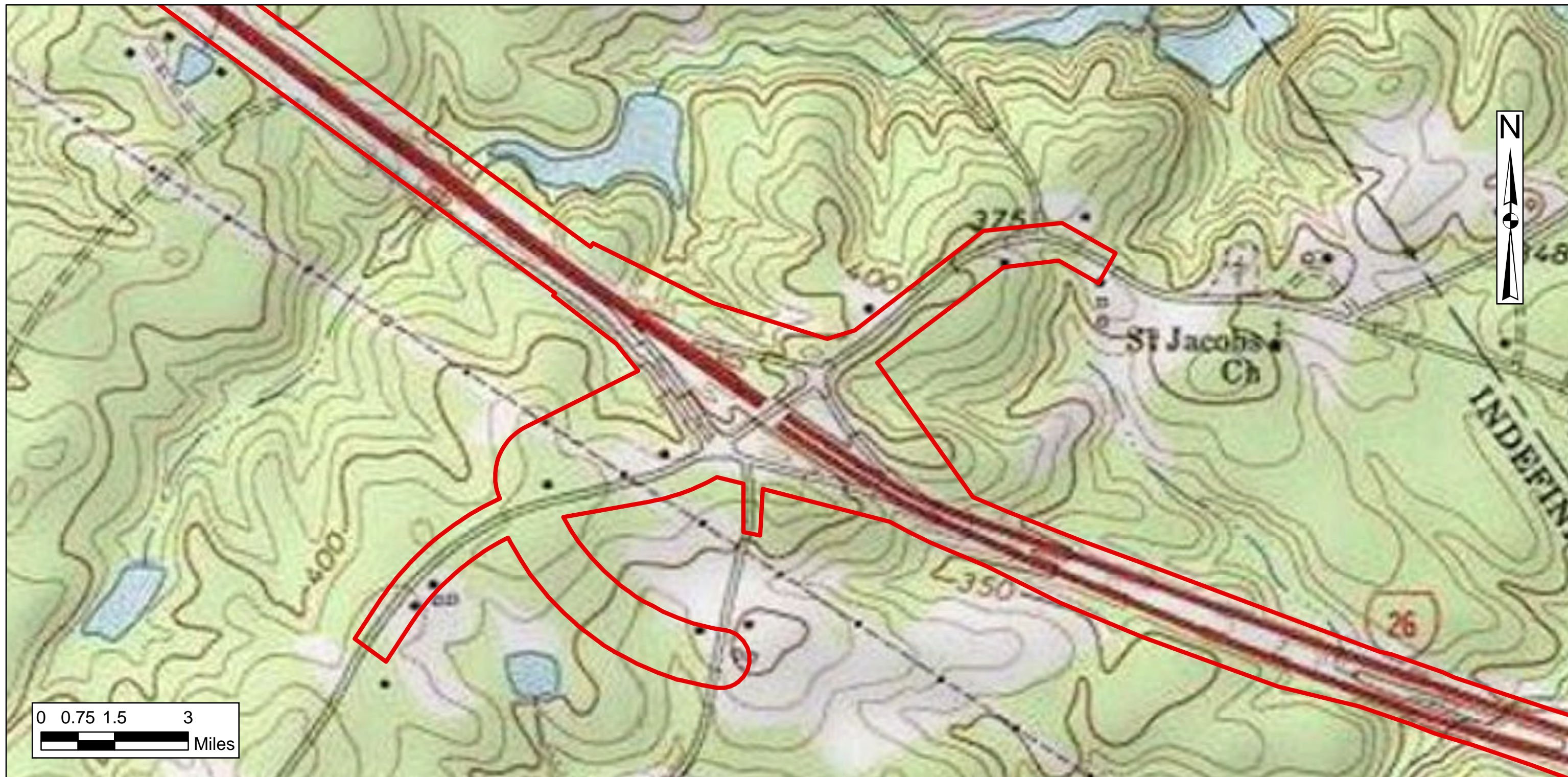
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 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

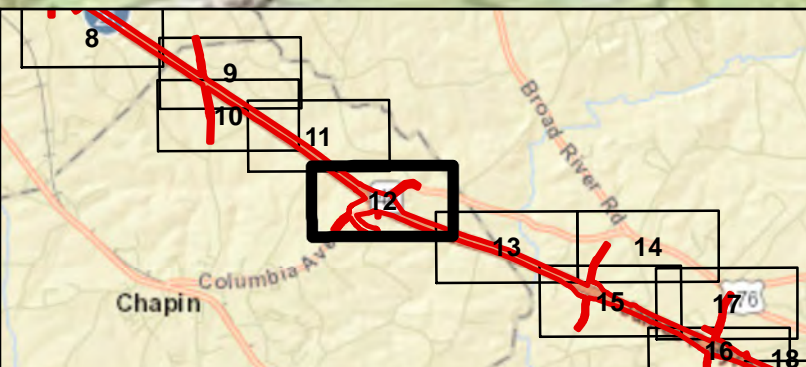
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

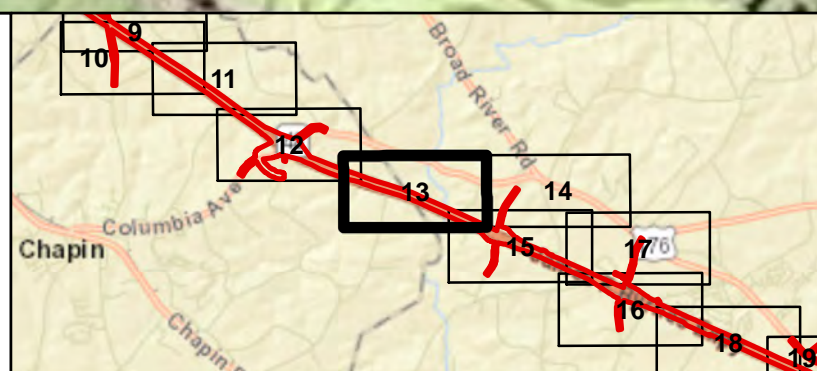
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

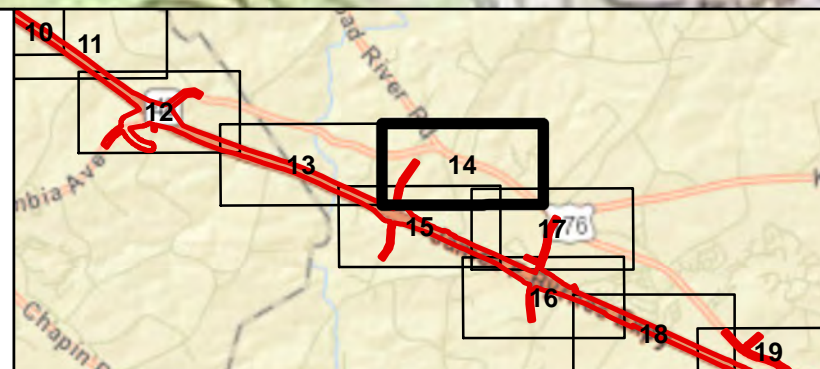
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

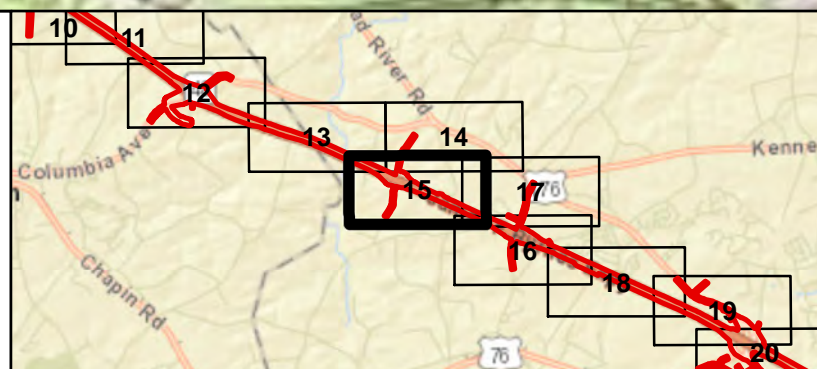
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

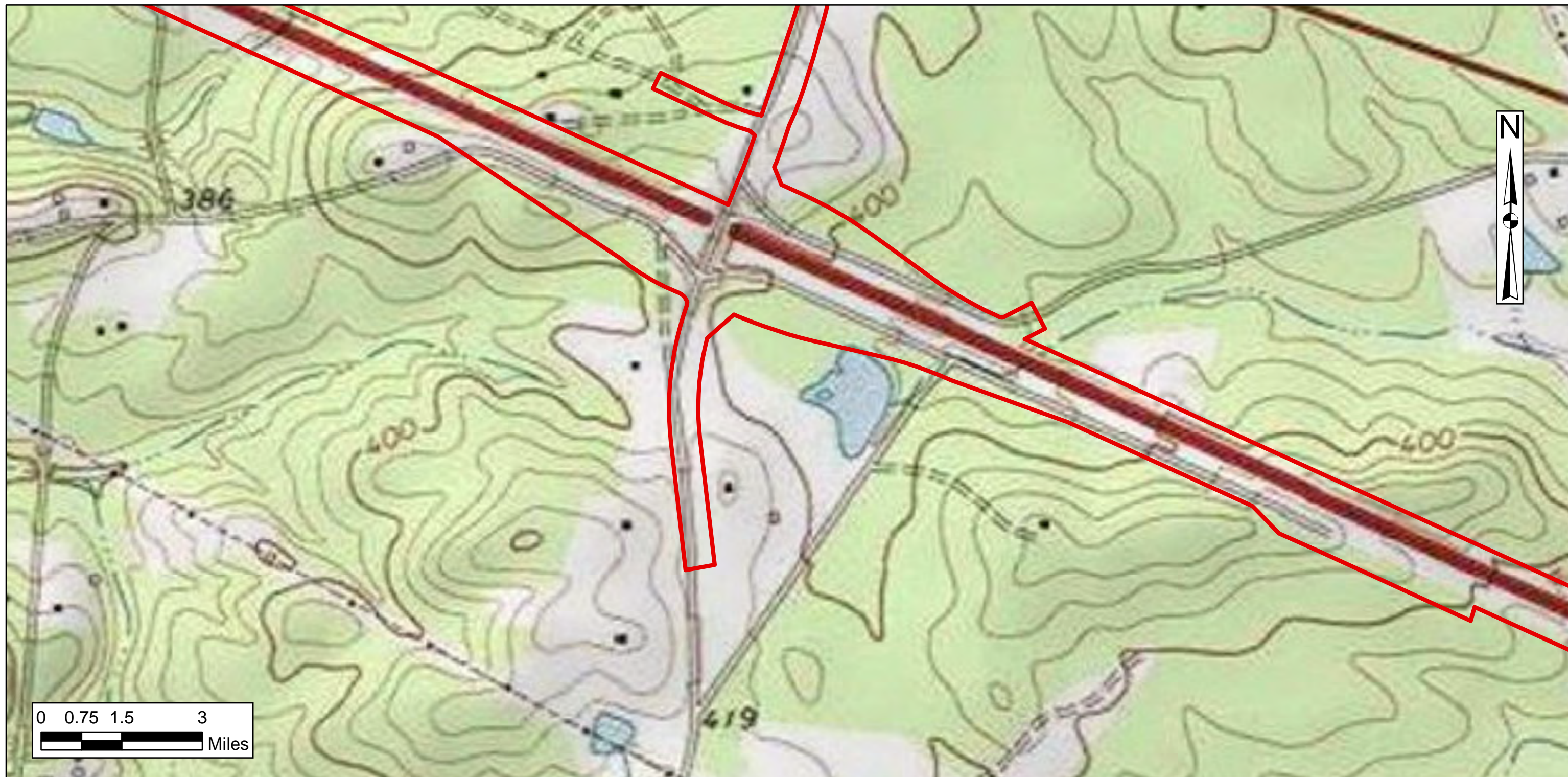
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USGS 7.5 Minute Quad  
South Carolina

## USGS TOPOGRAPHY MAP



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QA/QC: KLM

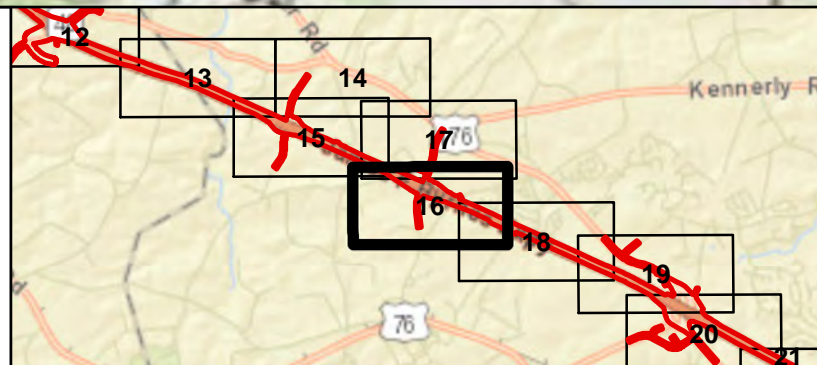
January 2018





### Legend

-  Quad Boundary
-  Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

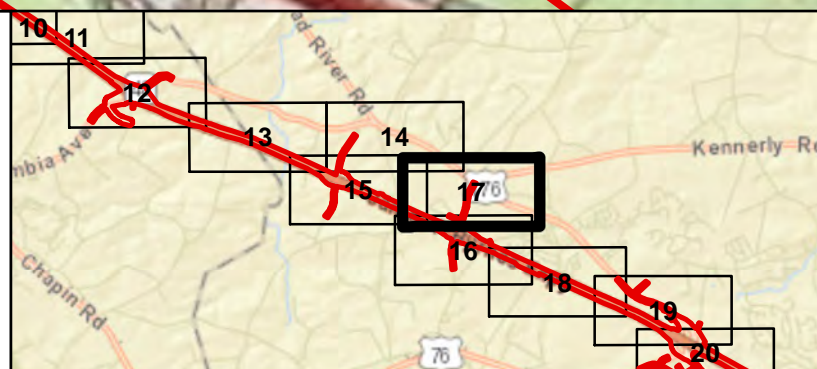
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

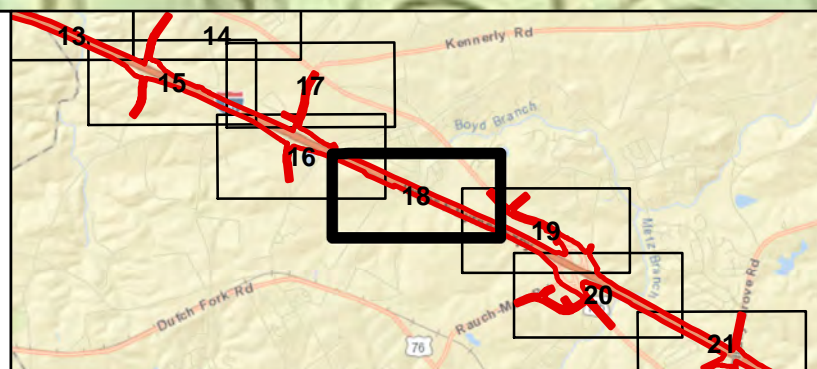
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

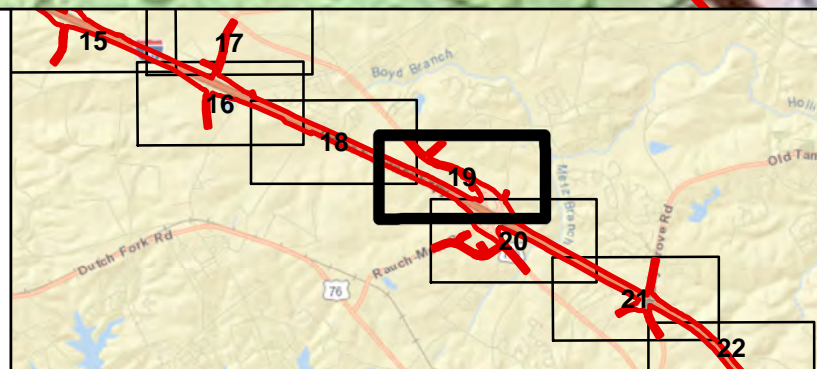
January 2018





### Legend

- Quad Boundary
- ▭ Project Study Area



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

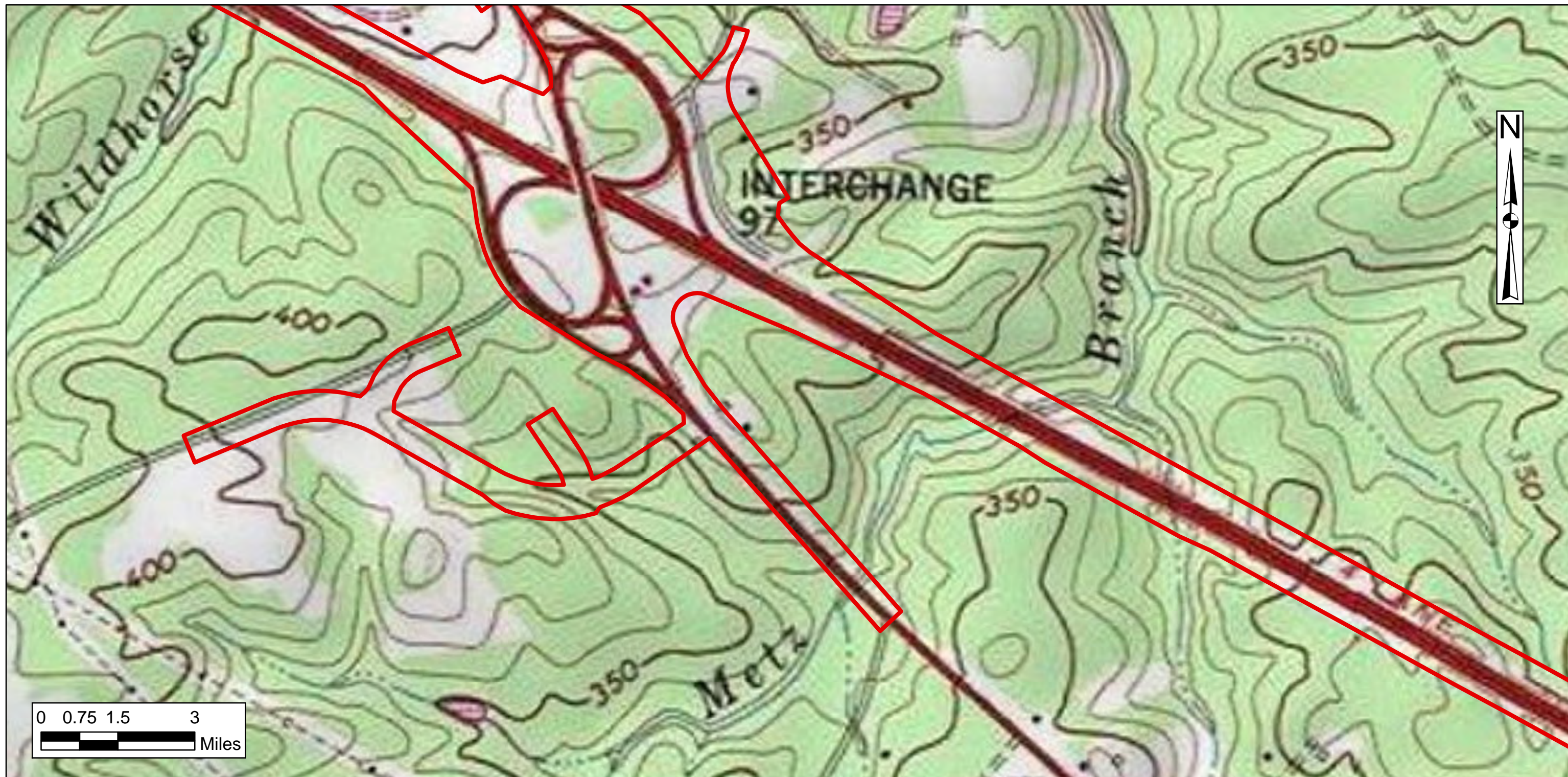
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USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

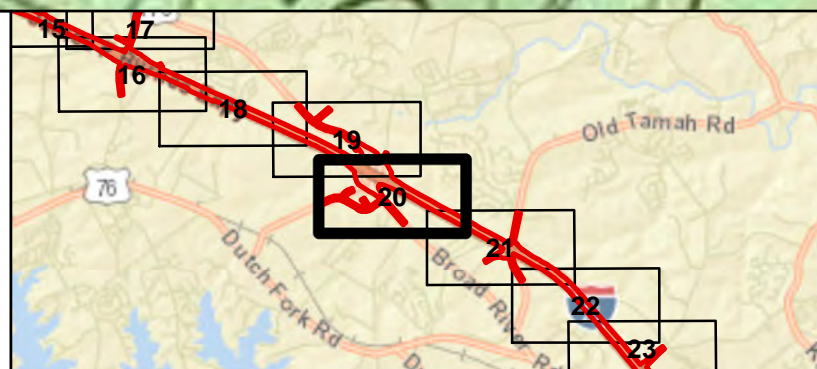
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

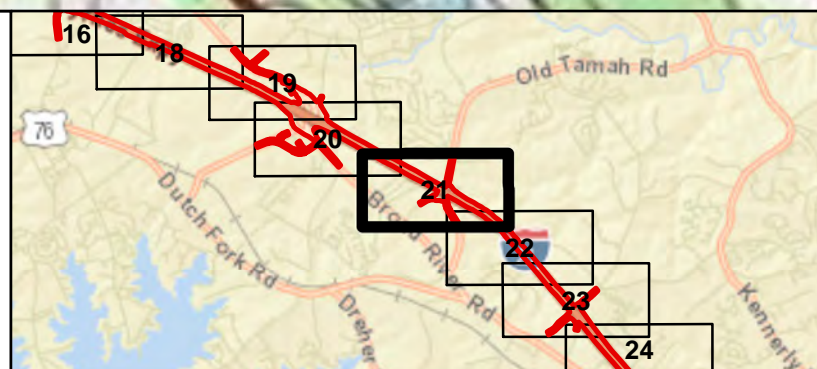
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

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 QA/QC: KLM

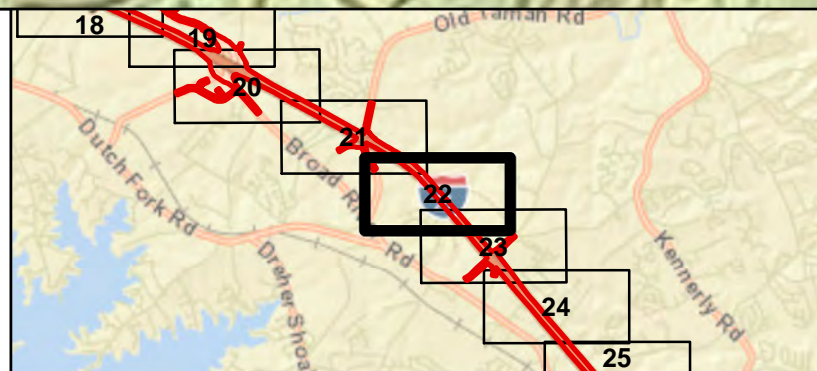
January 2018





### Legend

- Quad Boundary
- ▭ Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

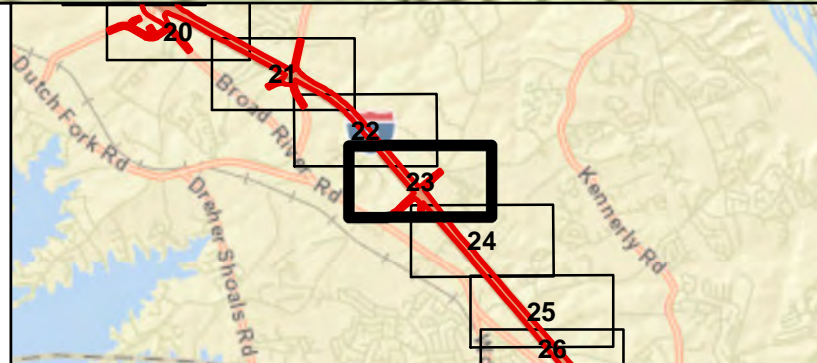
January 2018





### Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP



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QA/QC: KLM

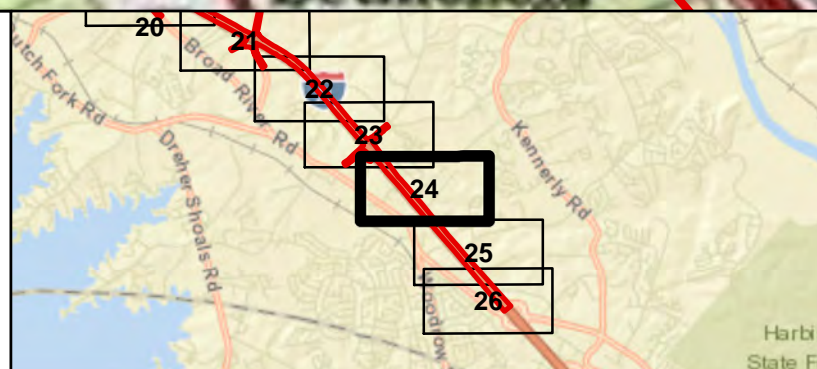
January 2018





### Legend

-  Quad Boundary
-  Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

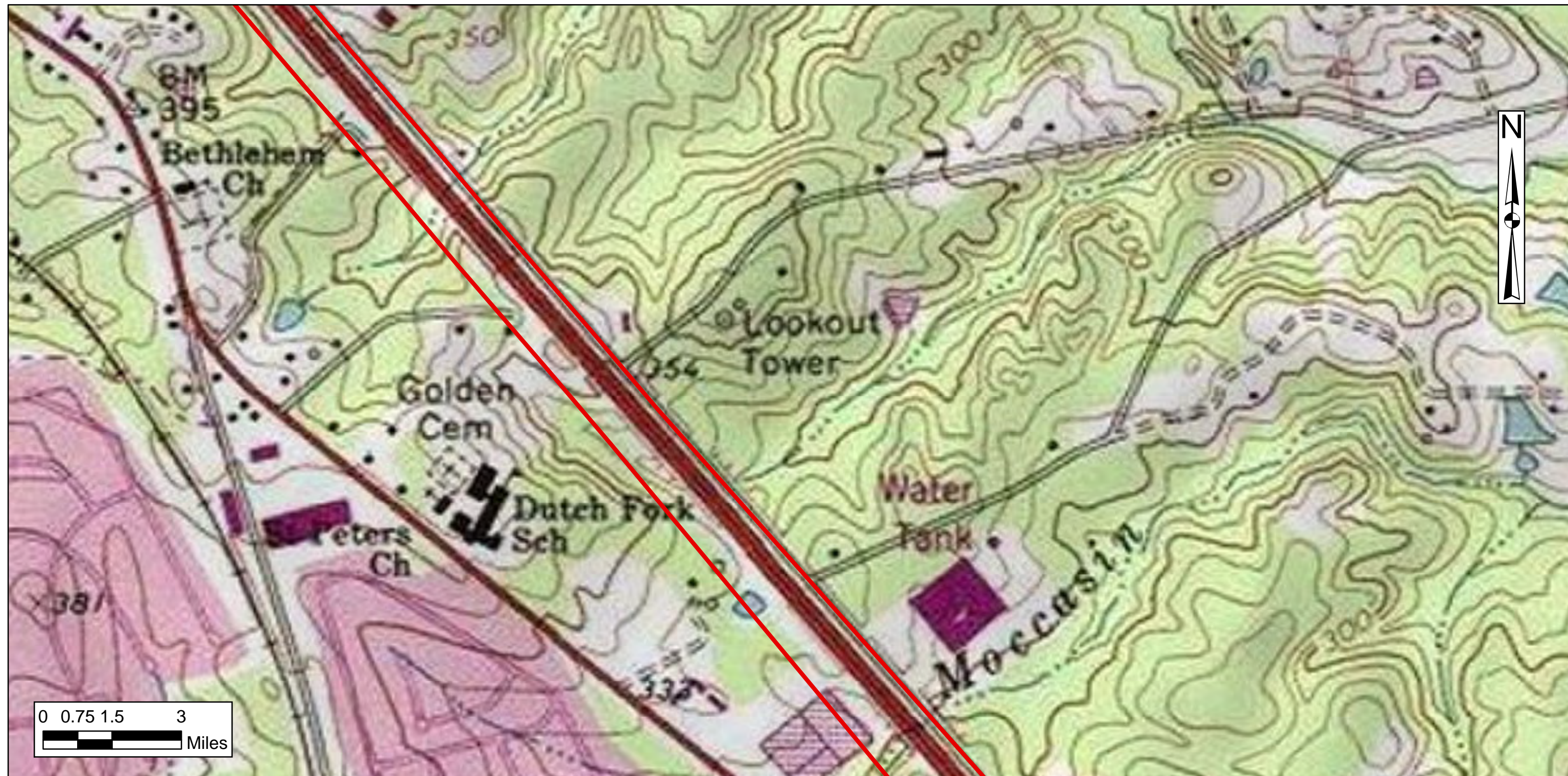
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USGS 7.5 Minute Quad  
South Carolina

### USGS TOPOGRAPHY MAP

Drawn By: RHH  
QA/QC: KLM

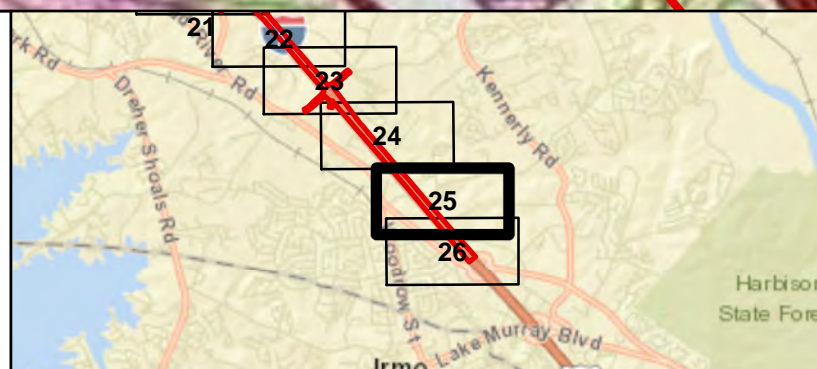
January 2018





## Legend

- Quad Boundary
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

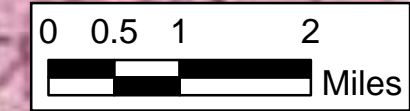
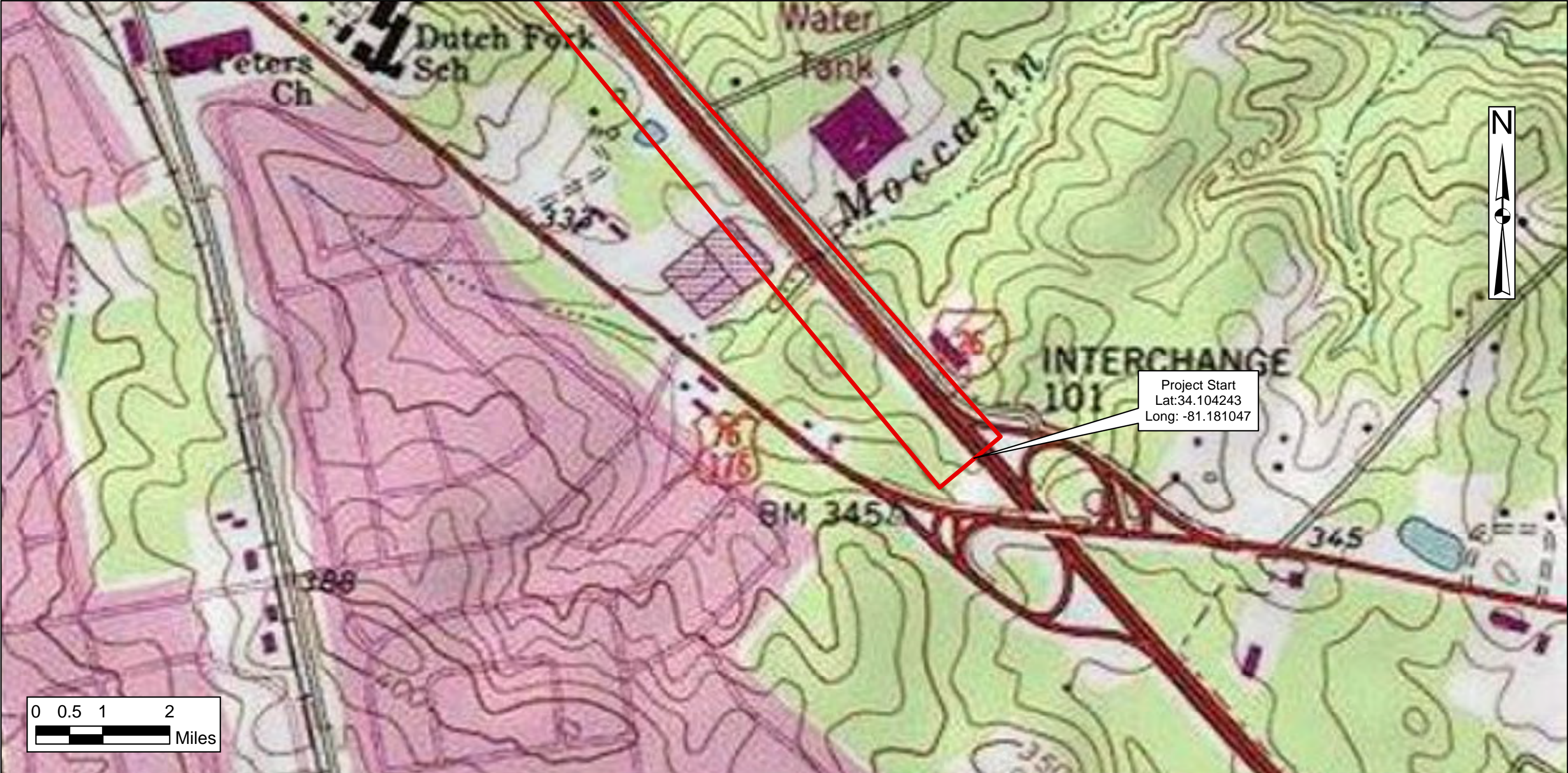
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 USGS 7.5 Minute Quad  
 South Carolina

## USGS TOPOGRAPHY MAP

Drawn By: RHH  
 QA/QC: KLM

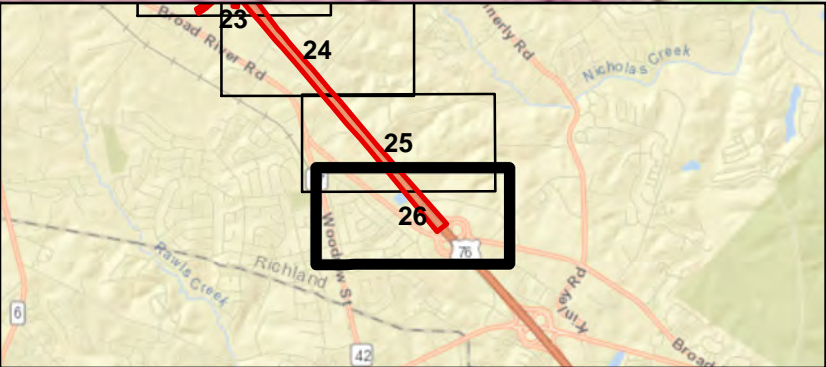
January 2018





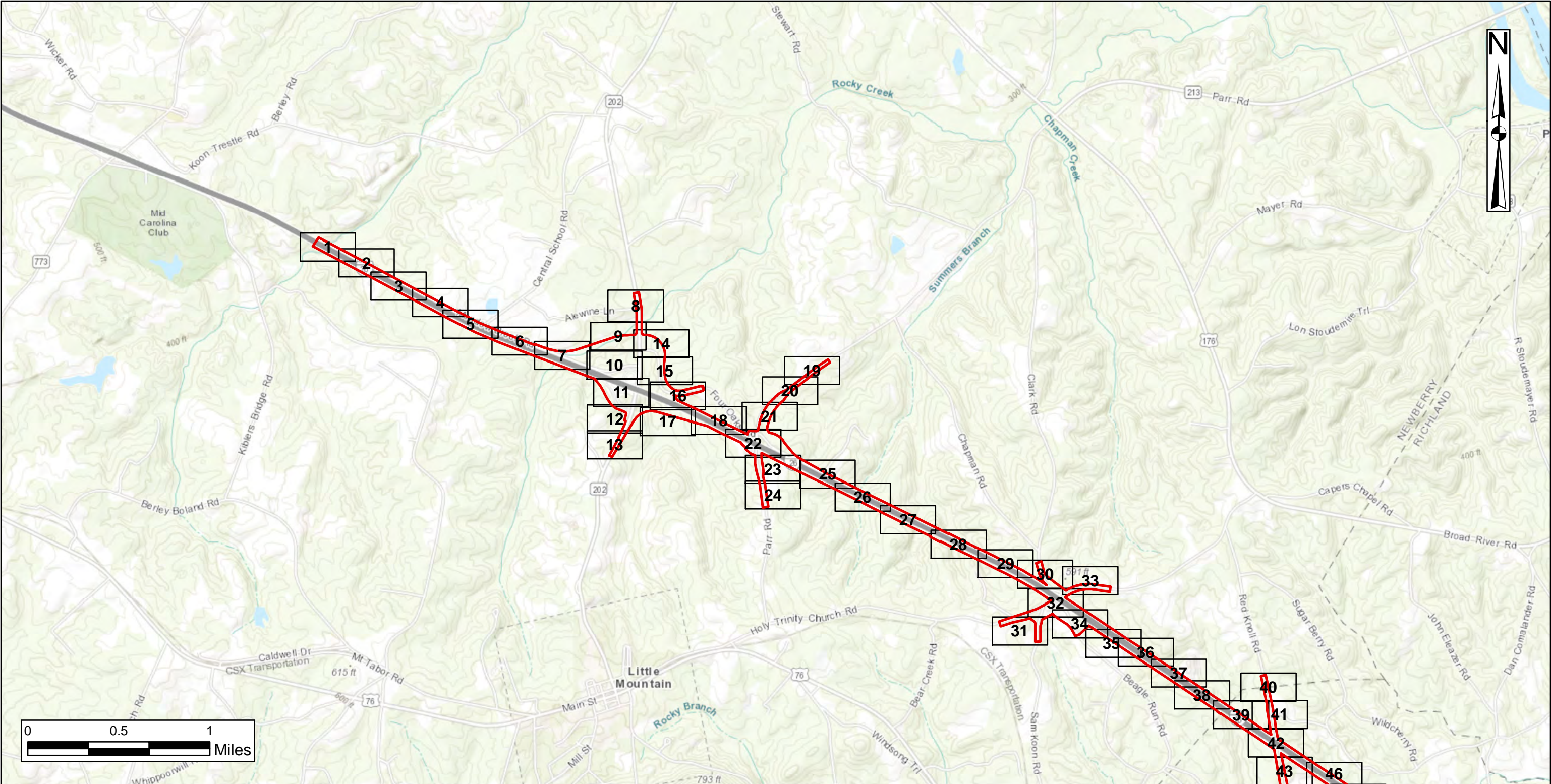
**Legend**

- Quad Boundary
- ▭ Project Study Area



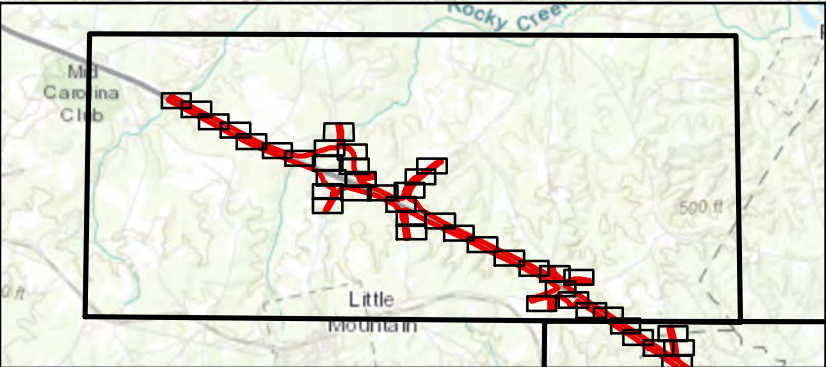
<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: USGS 7.5 Minute Quad South Carolina	<b>USGS TOPOGRAPHY MAP</b>  Drawn By: RHH QA/QC: KLM  January 2018	Page 26 of 26





**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



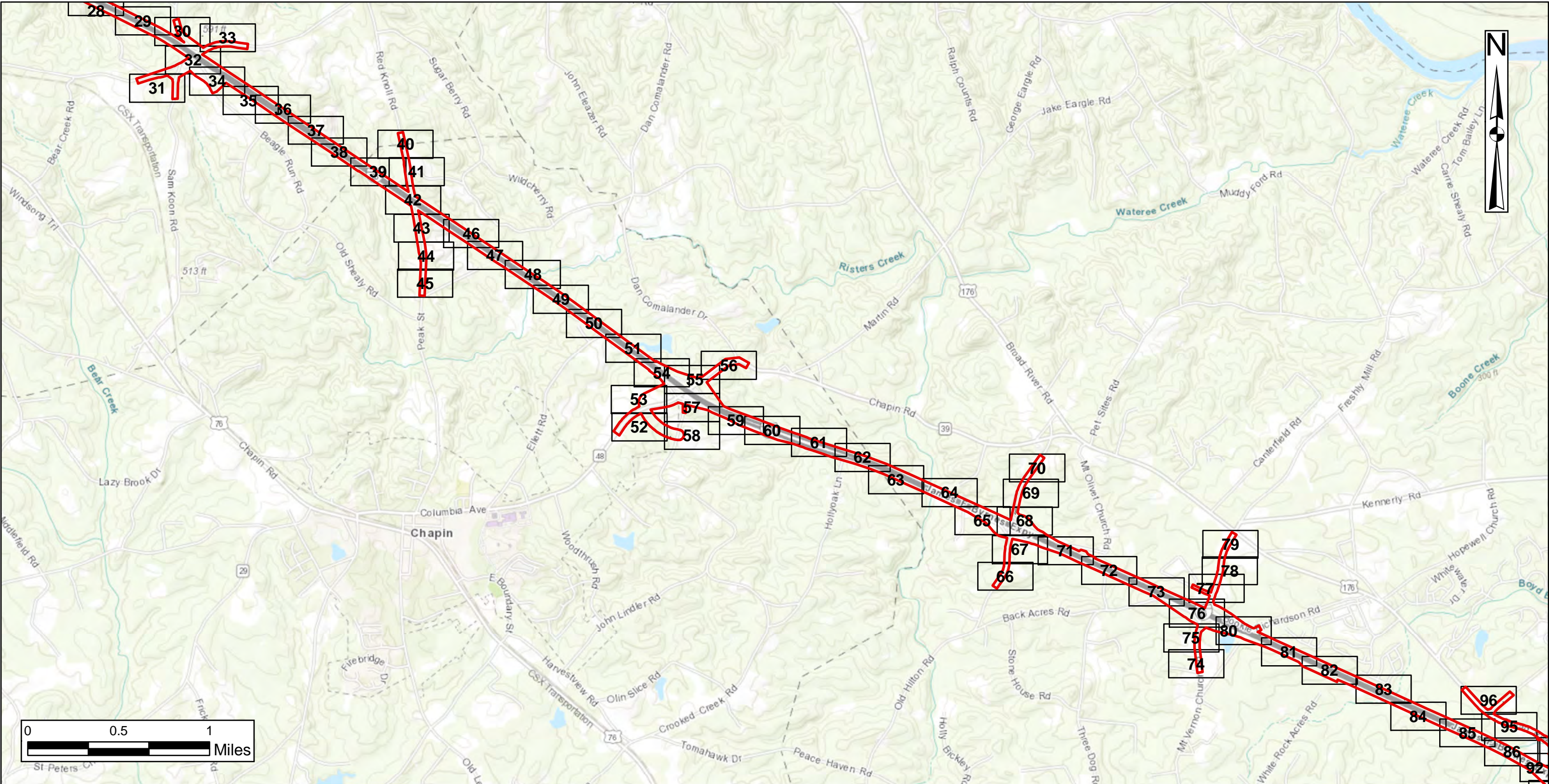
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

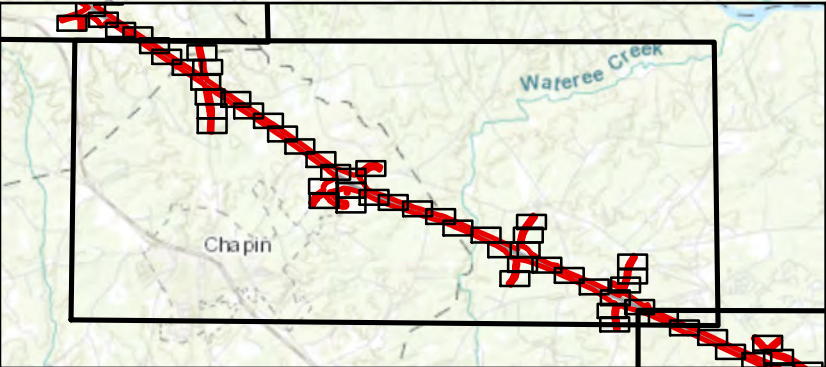
**AQUATIC RESOURCES**  
**Index Maps**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



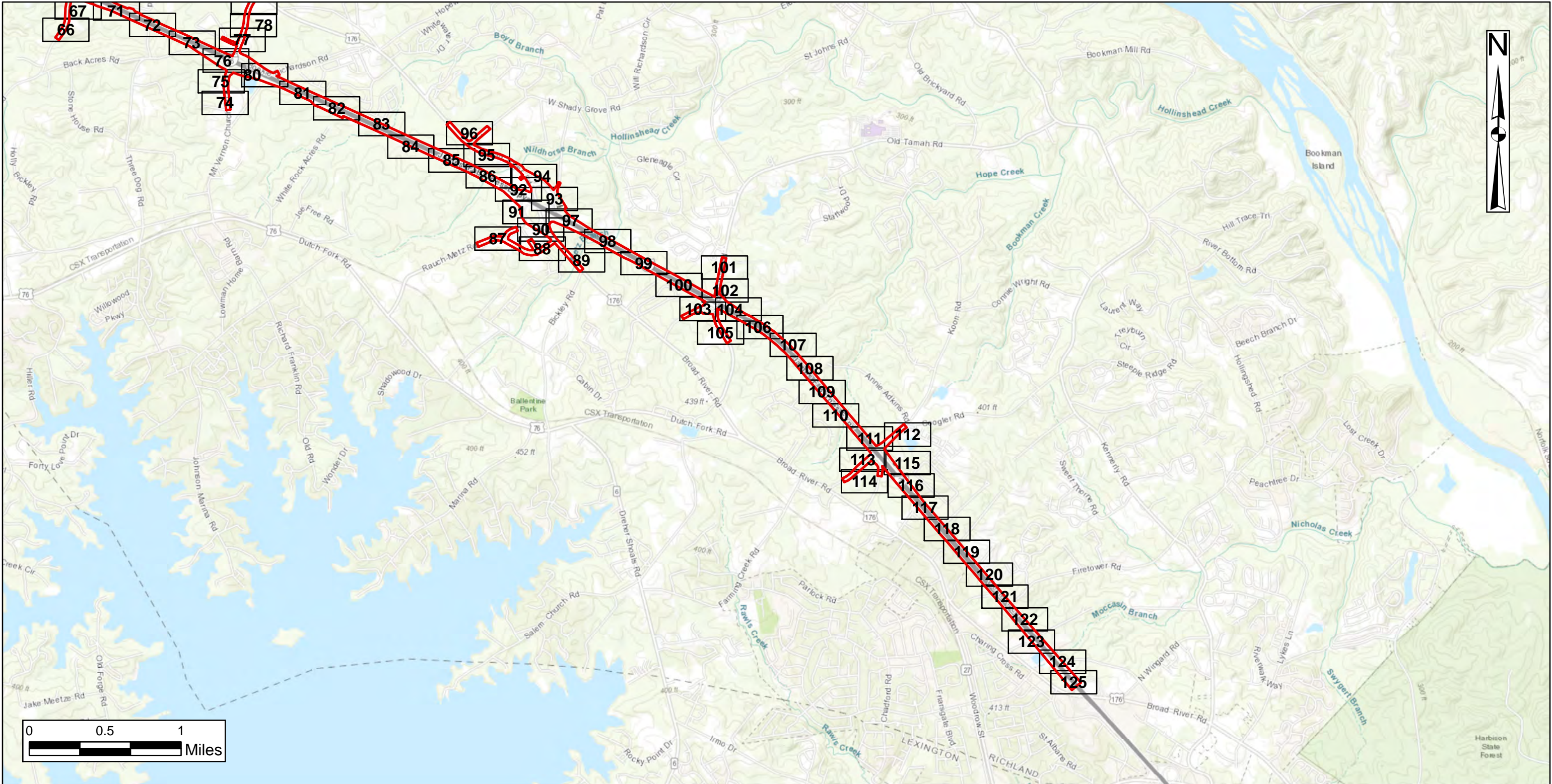
I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES  
Index Maps**

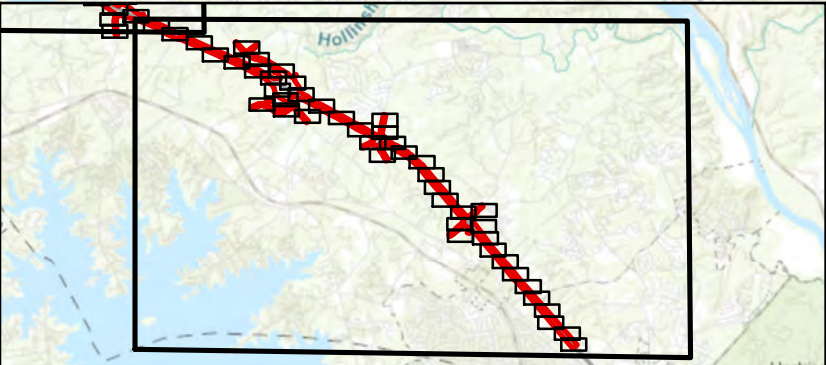
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



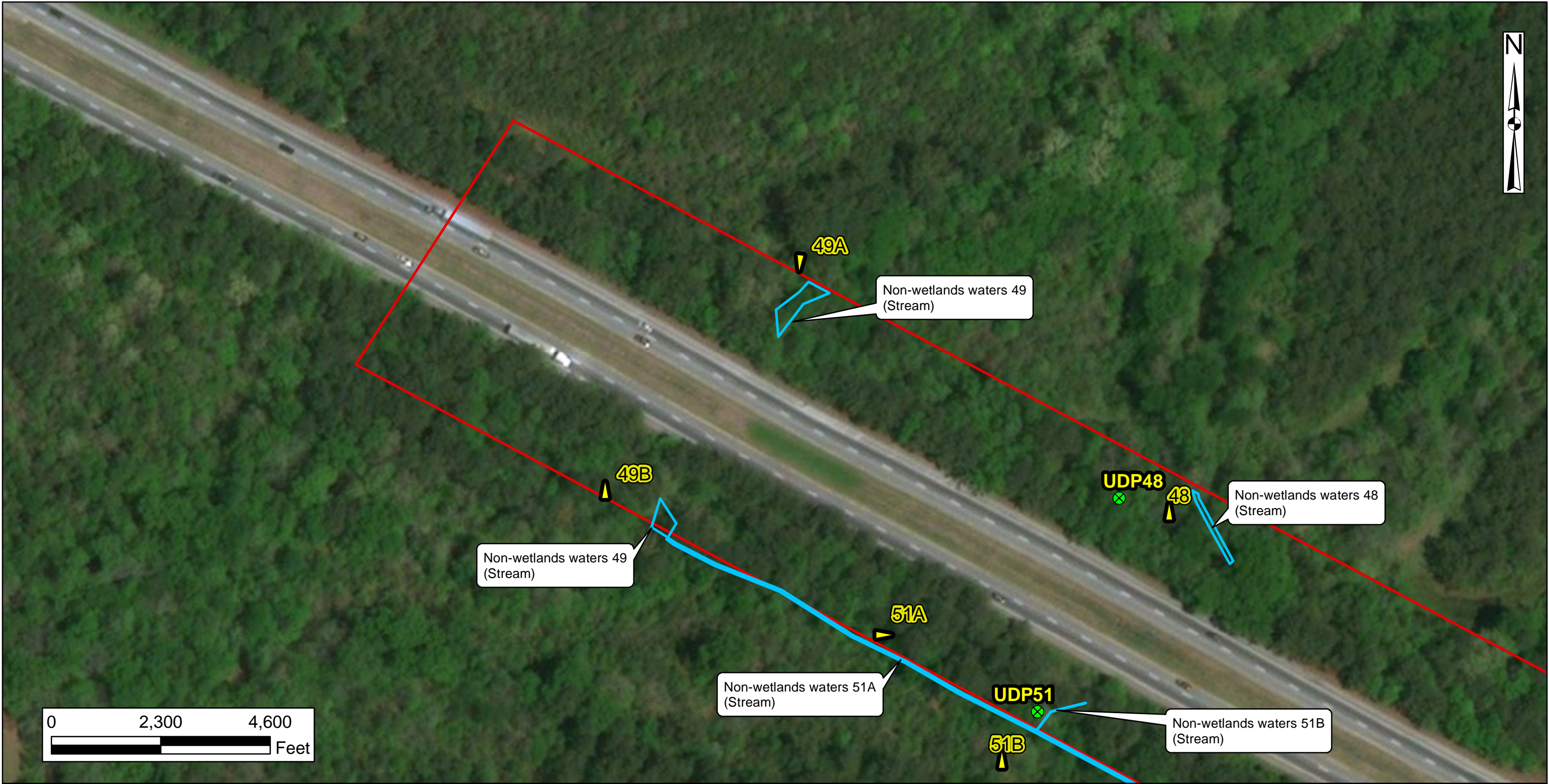
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
2015

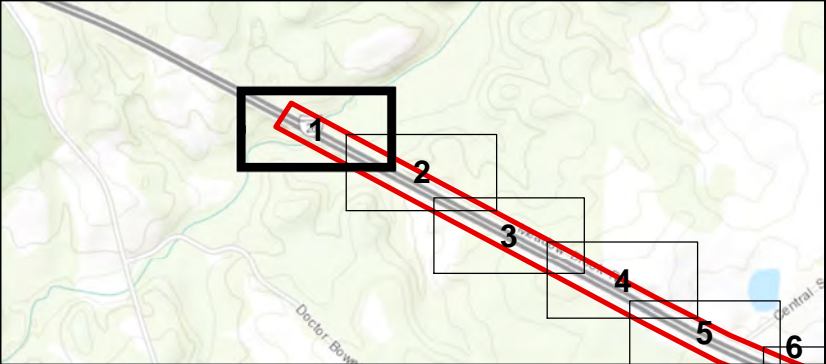
**AQUATIC RESOURCES**  
**Index Maps**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

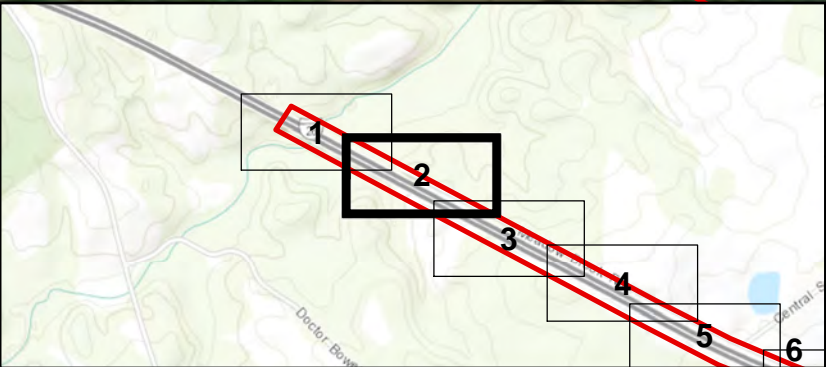
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland

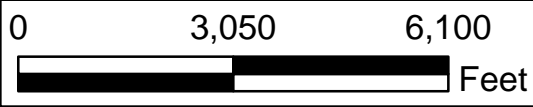


<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P29208</b>		
Source: ESRI Base Map Aerial Photography 2015	<b>AQUATIC RESOURCES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 2 of 125

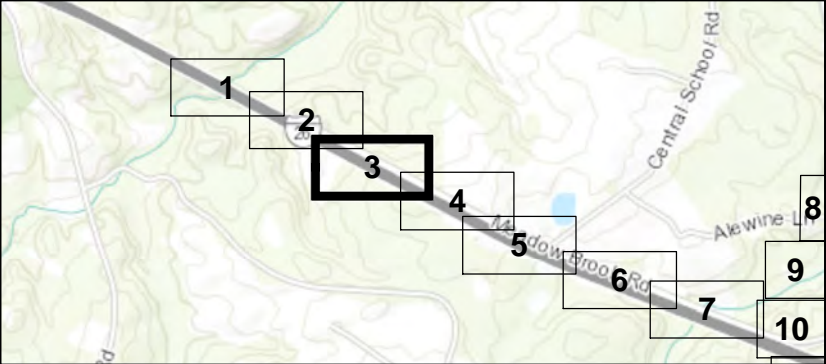




No Aquatic Resources Identified within Project Study Boundary



- Legend**
- Data Point
  - Palustrine Forested Wetland
  - Photo Point
  - Palustrine Emergent Wetland
  - Stream
  - Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

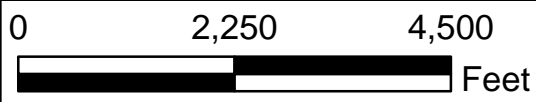
Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

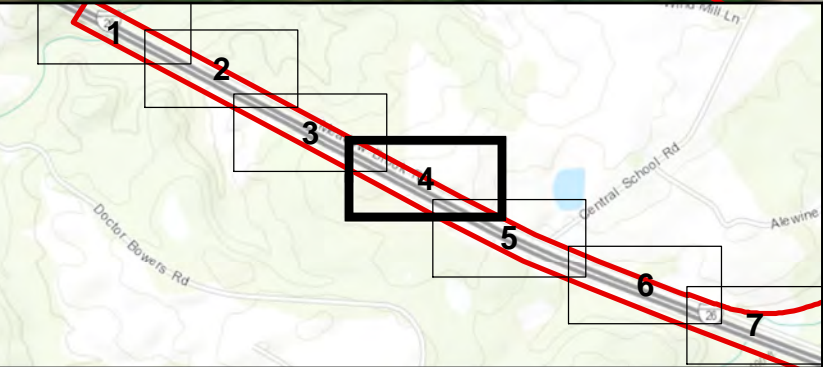


No Aquatic Resources Identified within Project Study Boundary



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P29208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

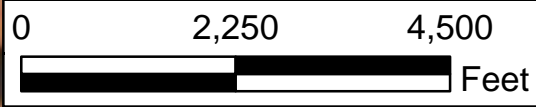
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

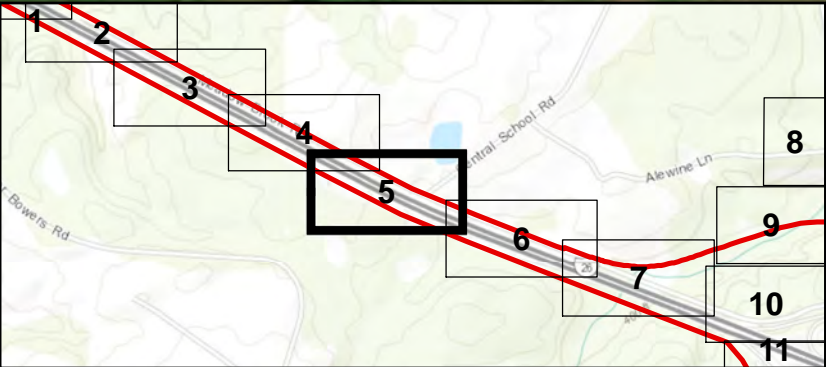




No Aquatic Resources Identified within Project Study Boundary



- Legend**
- Data Point
  - Palustrine Forested Wetland
  - Photo Point
  - Palustrine Emergent Wetland
  - Stream
  - Project Study Area



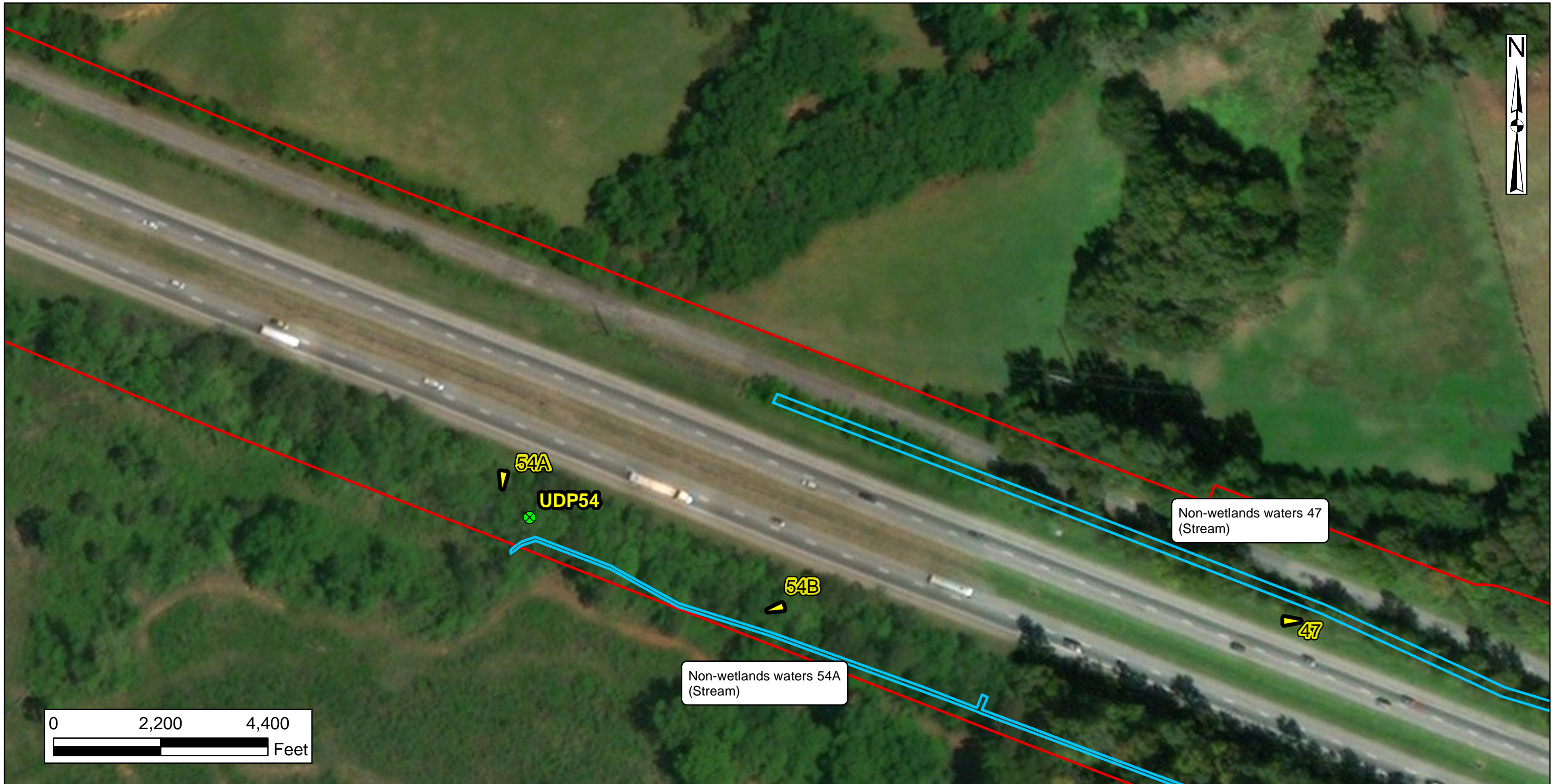
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

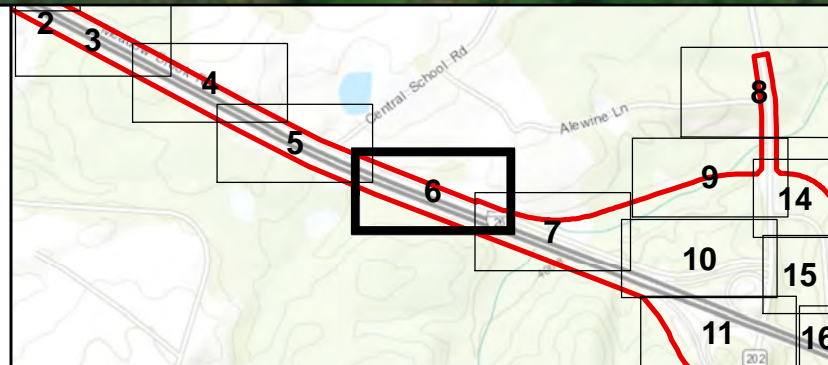
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



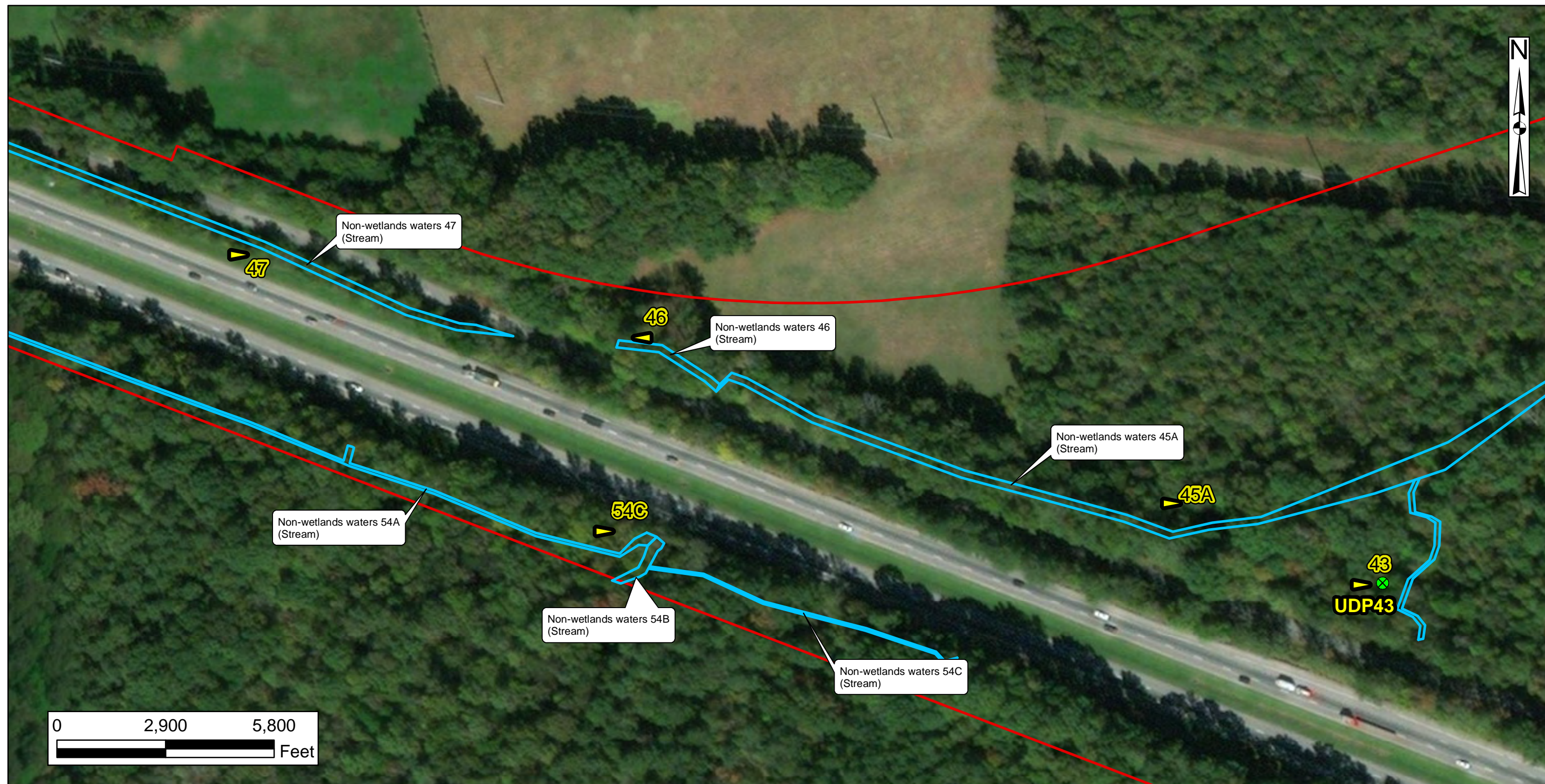
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

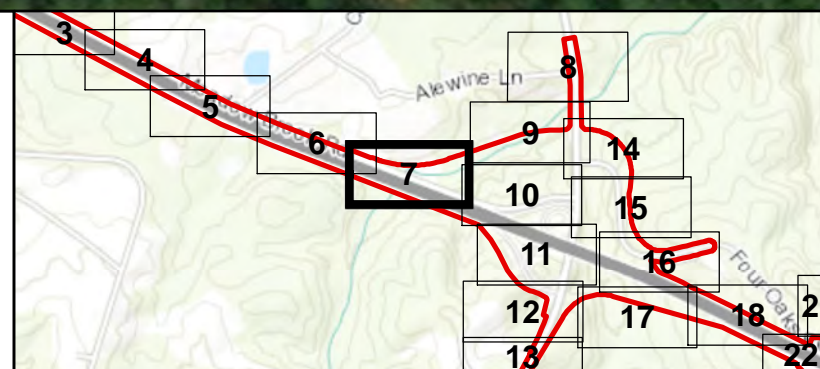
Drawn By: RHH  
QA/QC: KLM  
January 2018





# Legend

- ✕ Data Point
- ▬ Photo Point
- ▬ Stream
- ▬ Project Study Area
- ▬ Palustrine Forested Wetland
- ▬ Palustrine Emergent Wetland



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

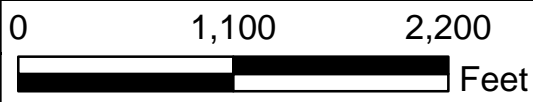
## AQUATIC RESOURCES

Drawn By: RHH  
QA/QC: KLM  
January 2018









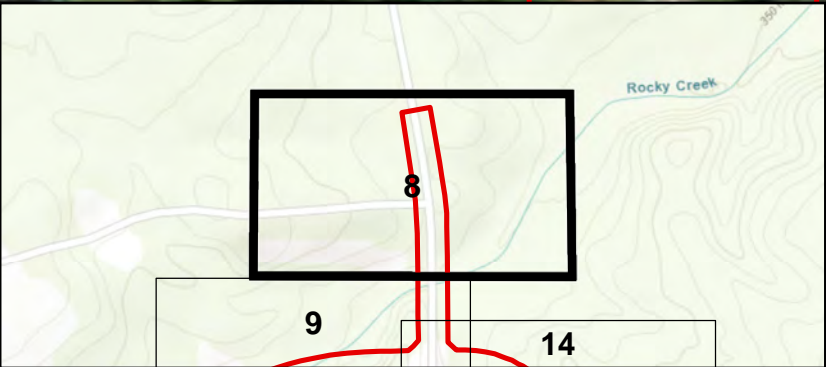


No Aquatic Resources Identified within Project Study Boundary



**Legend**

-  Data Point
-  Palustrine Forested Wetland
-  Photo Point
-  Palustrine Emergent Wetland
-  Stream
-  Project Study Area



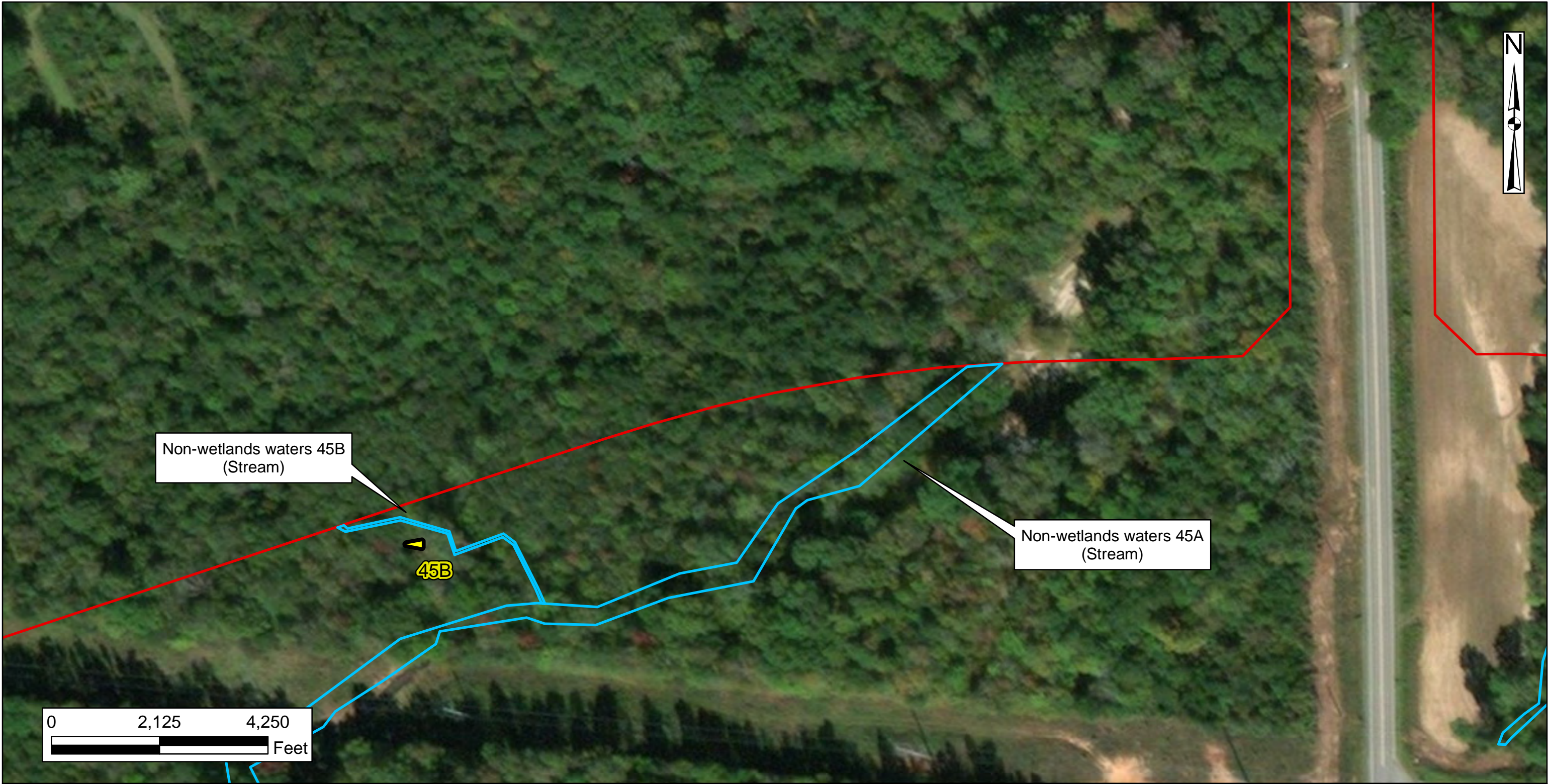
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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ESRI Base Map Aerial  
Photography  
2015

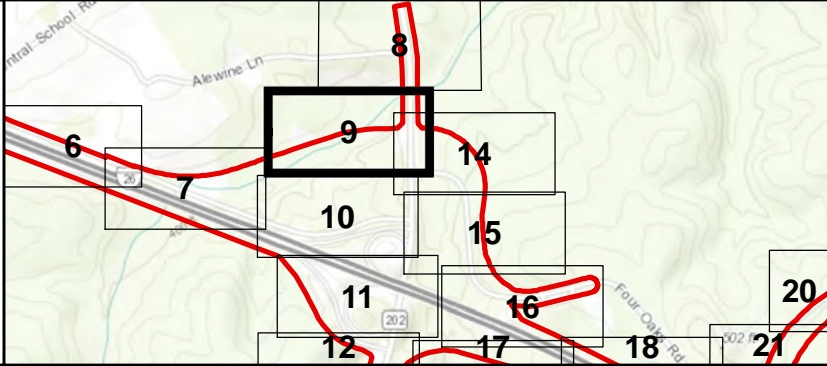
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

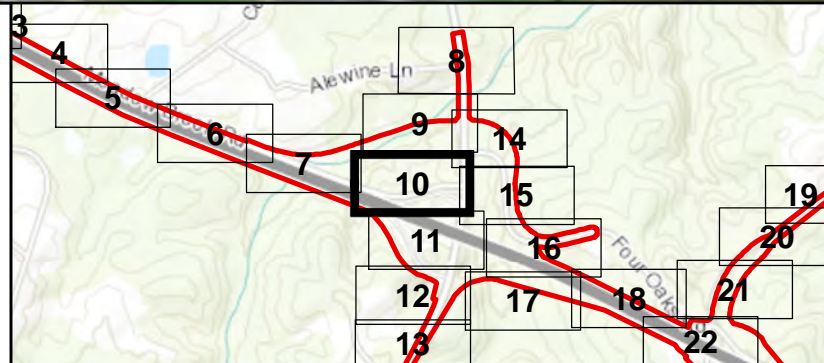
Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 ESRI Base Map Aerial  
 Photography  
 2015

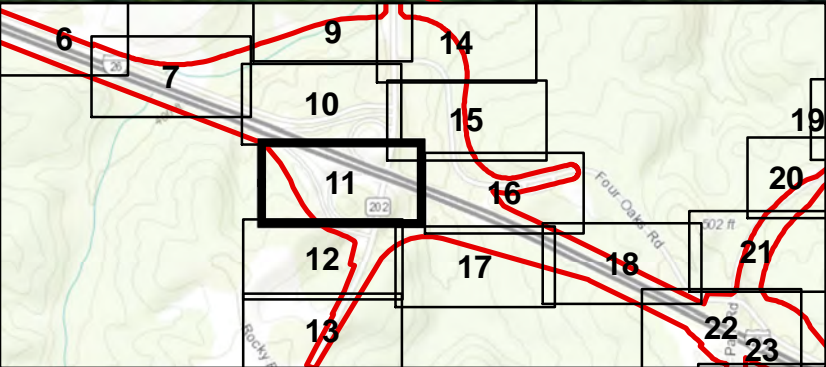
**AQUATIC RESOURCES**

Drawn By: RHH  
 QA/QC: KLM  
 January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

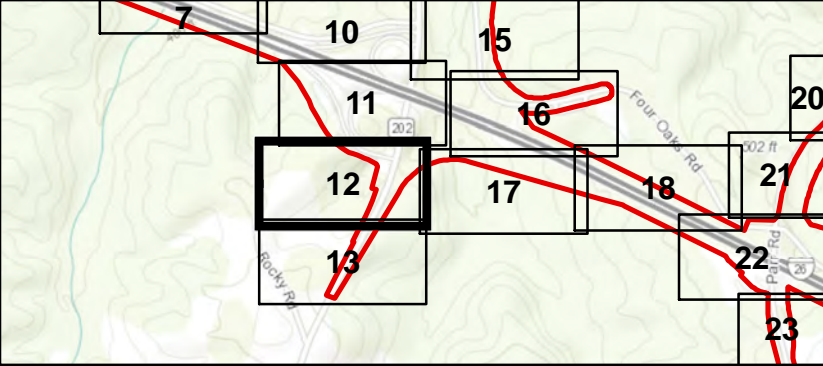
**AQUATIC RESOURCES**

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QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

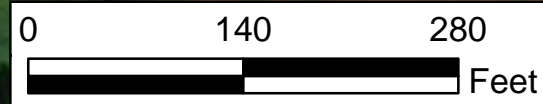
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QA/QC: KLM  
January 2018



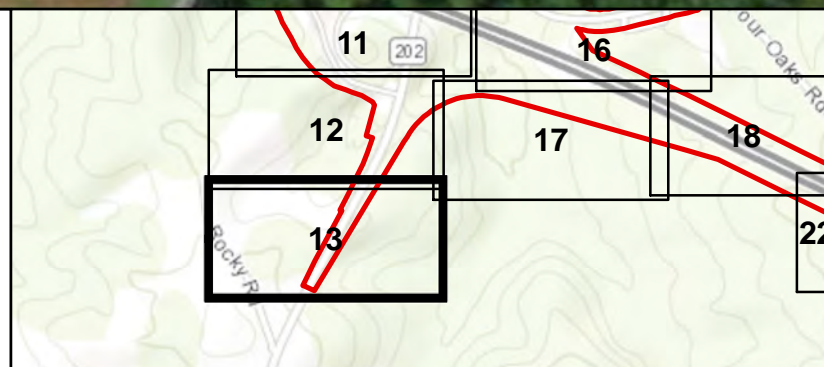


No Aquatic Resources Identified within Project Study Area



**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015







**AQUATIC RESOURCES**

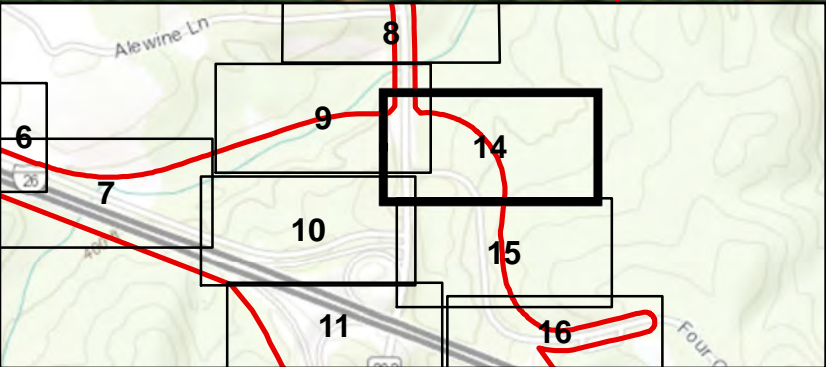
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QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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ESRI Base Map Aerial  
Photography  
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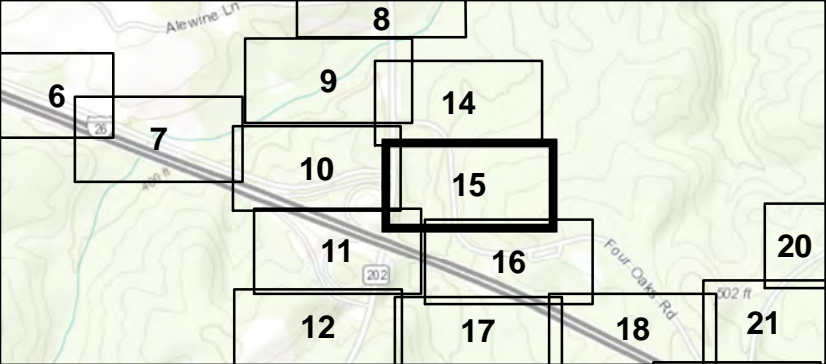
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Drawn By: RHH  
QA/QC: KLM  
January 2018



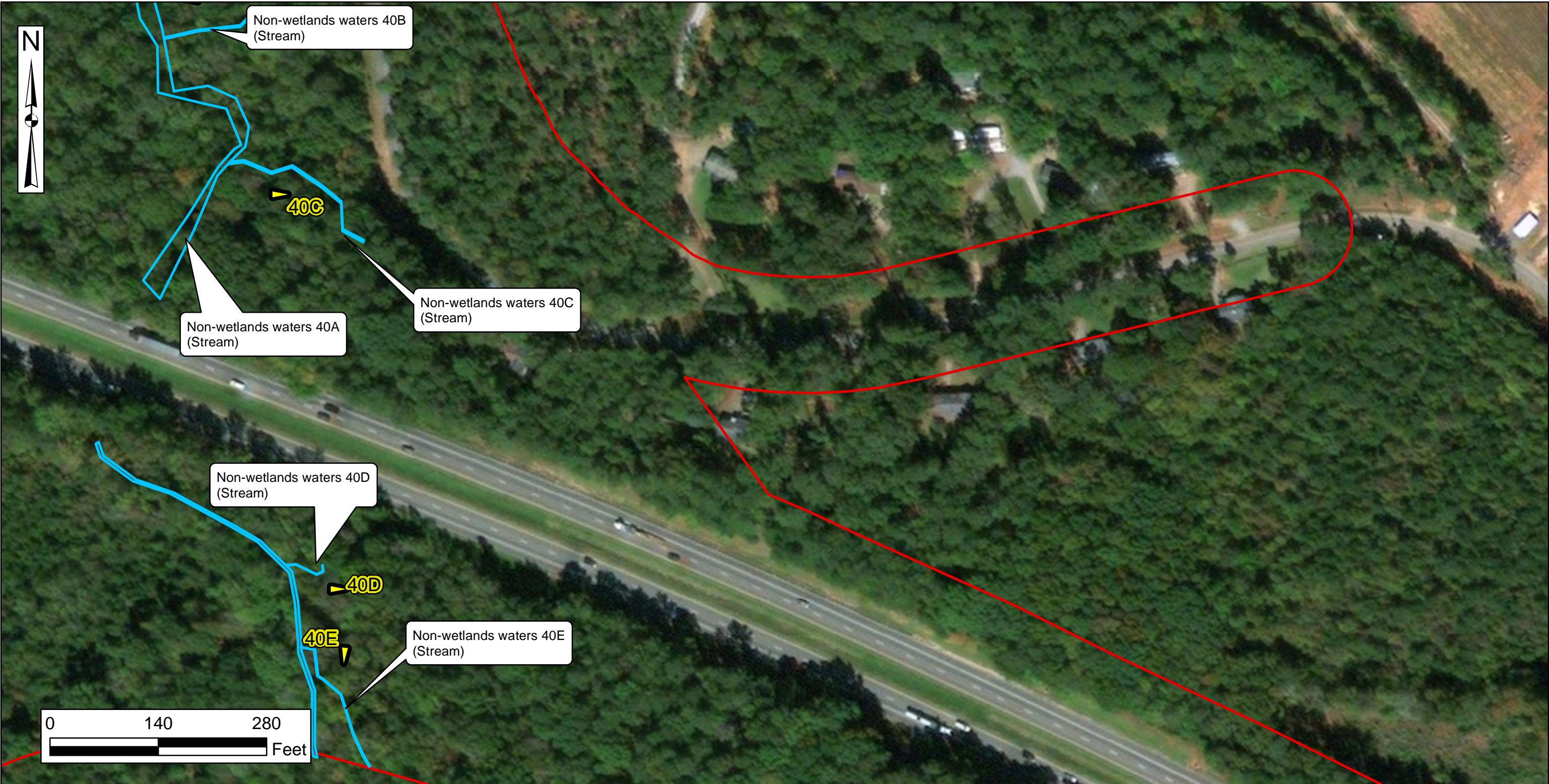


- Legend**
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  - Palustrine Forested Wetland
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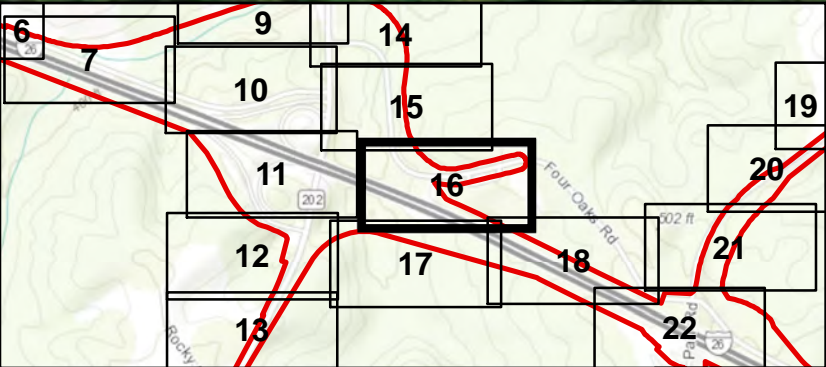


<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: ESRI Base Map Aerial Photography 2015	<b>AQUATIC RESOURCES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 15 of 125





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

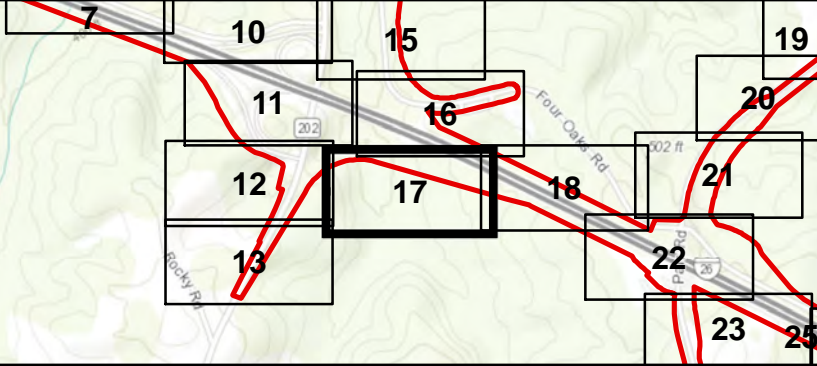
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

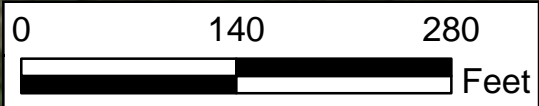
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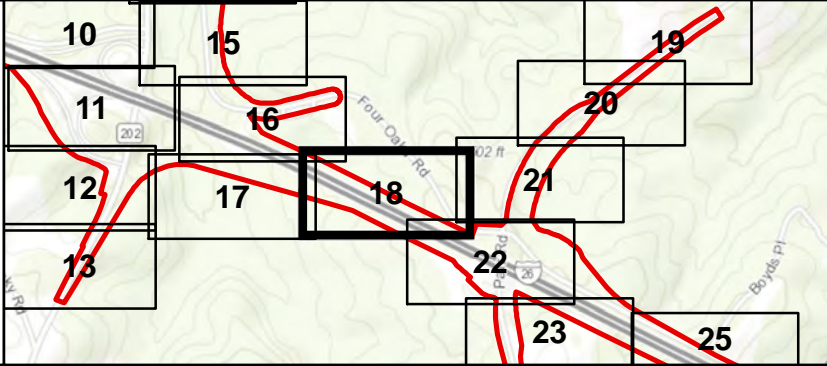
Drawn By: RHH  
QA/QC: KLM  
November 2017



No Aquatic Resources Identified within Project Study Area



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- Data Point
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  - Photo Point
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I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

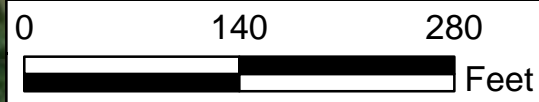
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Drawn By: RHH  
QA/QC: KLM  
January 2018



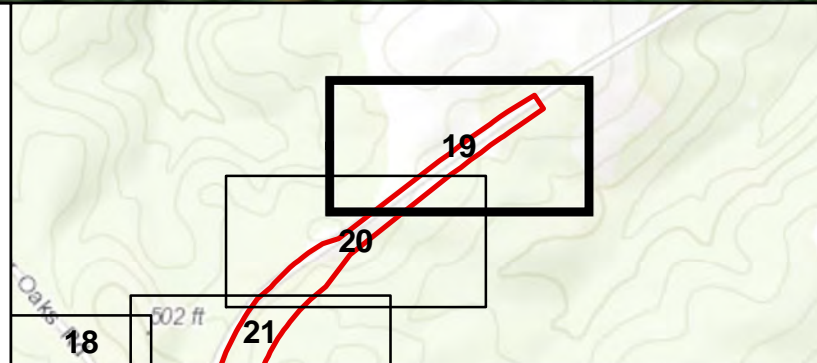


No Aquatic Resources Identified within Project Study Area



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I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

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Photography  
2015

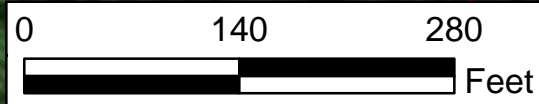
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Drawn By: RHH  
QA/QC: KLM  
January 2018



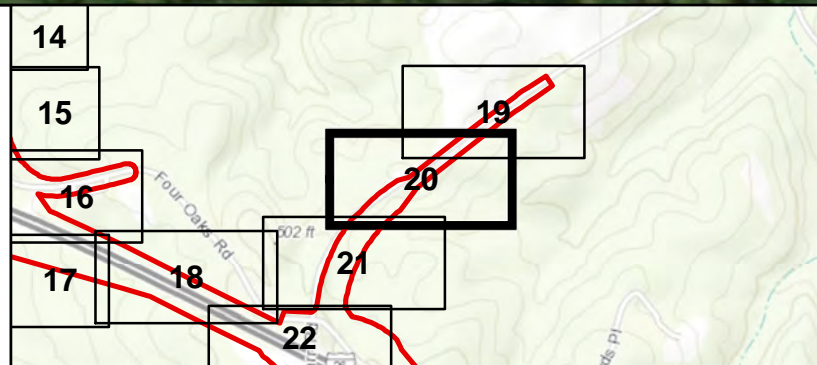


No Aquatic Resources Identified within Project Study Area



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- Data Point
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

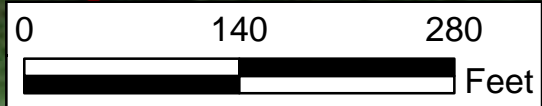
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**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

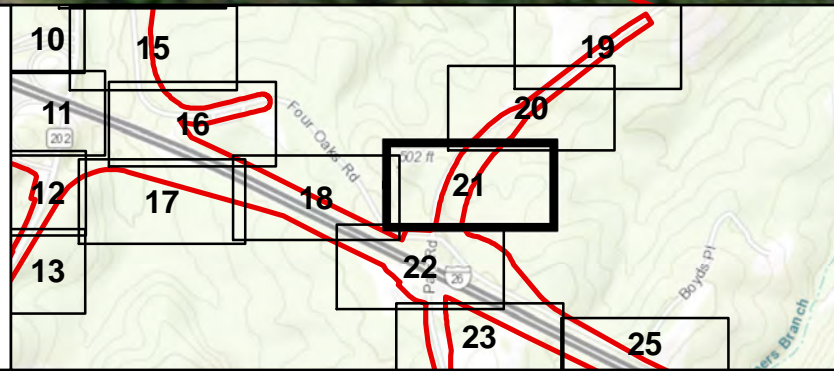


No Aquatic Resources Identified within Project Study Area



**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

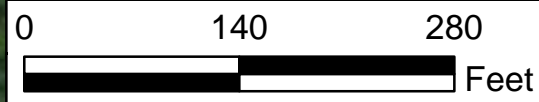
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**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

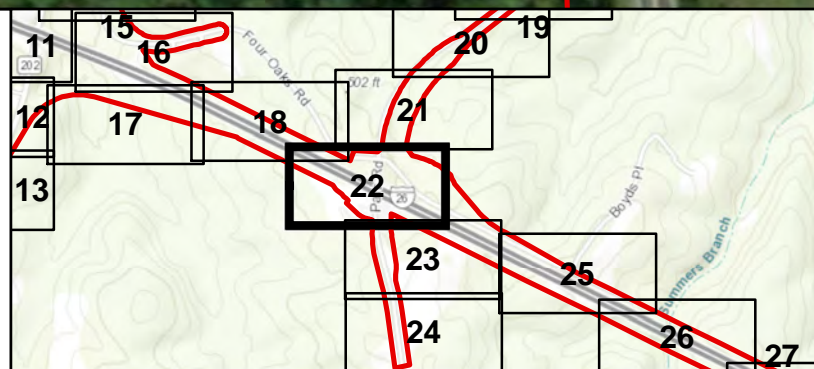


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
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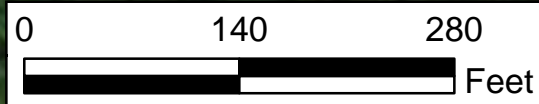
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QA/QC: KLM  
January 2018



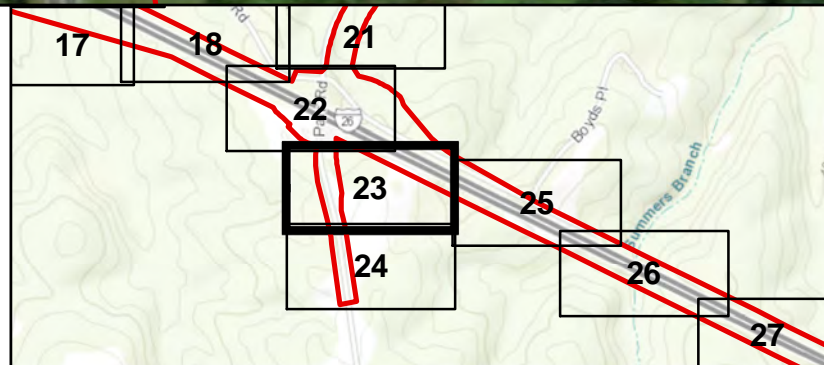


No Aquatic Resources Identified within Project Study Area



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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
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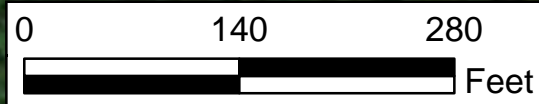
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January 2018



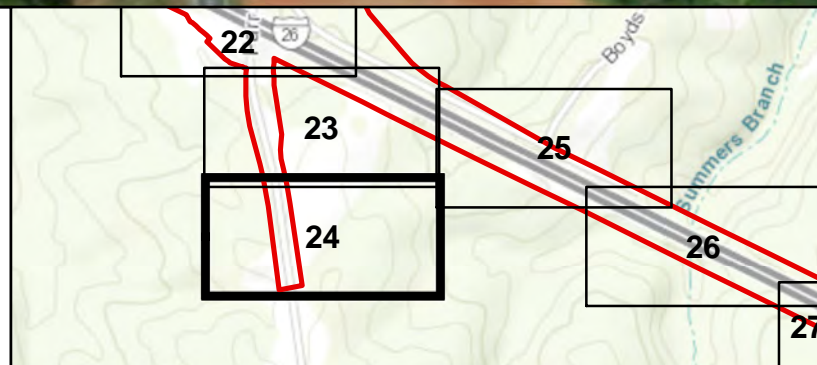


No Aquatic Resources Identified within Project Study Area



**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

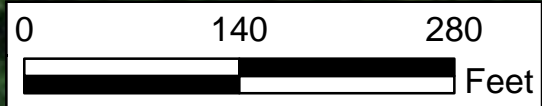
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**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



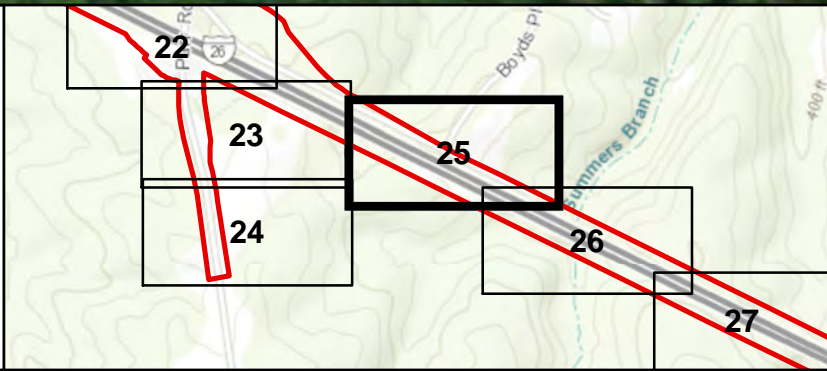
No Aquatic Resources Identified within Project Study Area



UDP39



- Legend**
- Data Point
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  - Photo Point
  - Palustrine Emergent Wetland
  - Stream
  - Project Study Area



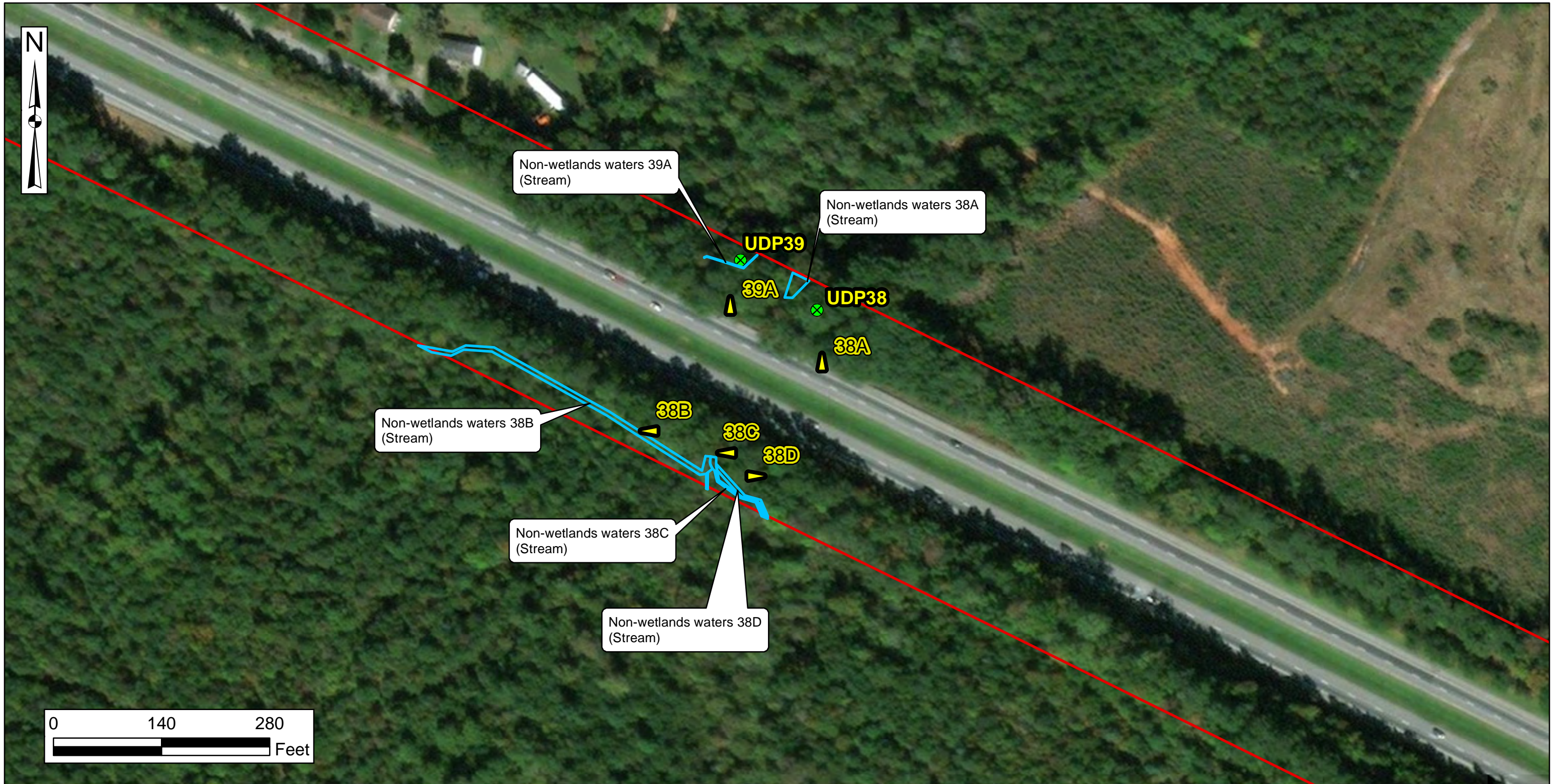
I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

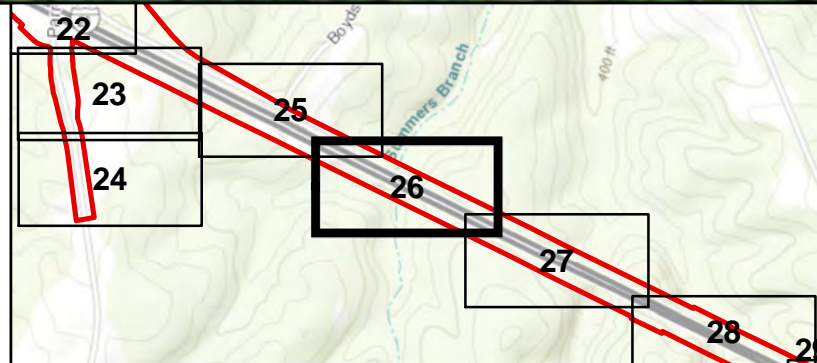
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

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- ▲ Photo Point
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- Project Study Area
- Palustrine Forested Wetland
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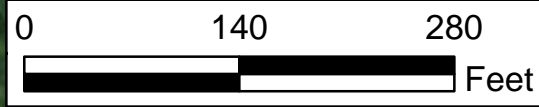
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 ESRI Base Map Aerial  
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 2015

**AQUATIC RESOURCES**

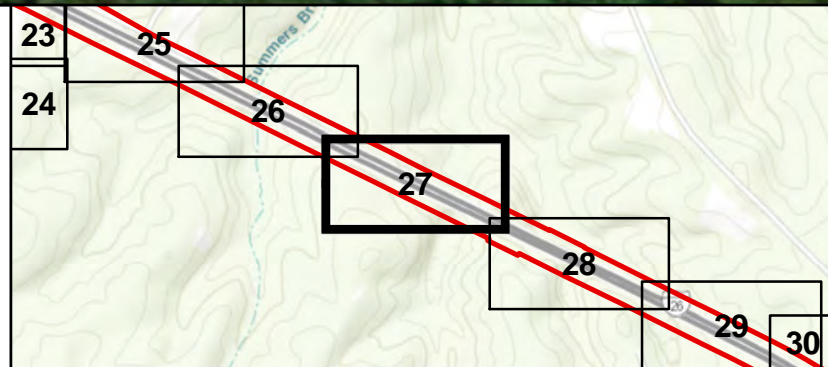
Drawn By: RHH  
 QA/QC: KLM  
 January 2018





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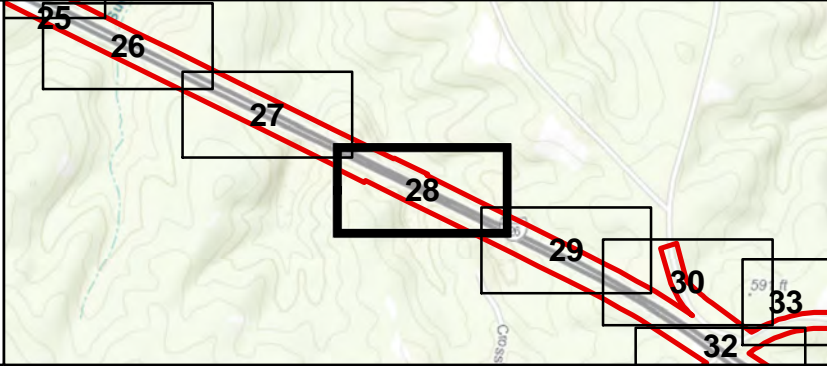
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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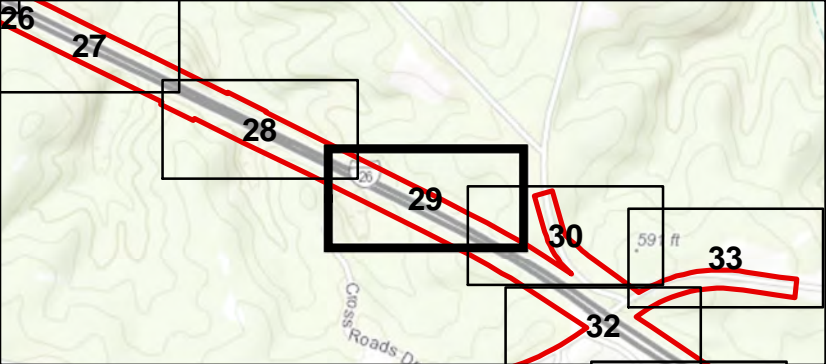
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
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Source:  
ESRI Base Map Aerial  
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**AQUATIC RESOURCES**

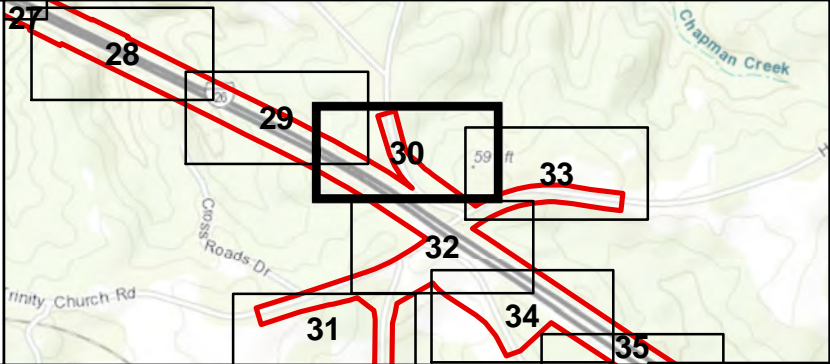
Drawn By: RHH  
QA/QC: KLM  
November 2017





**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

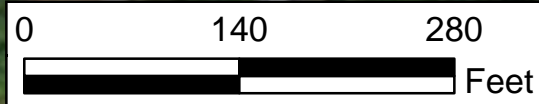
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**AQUATIC RESOURCES**

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QA/QC: KLM  
January 2017

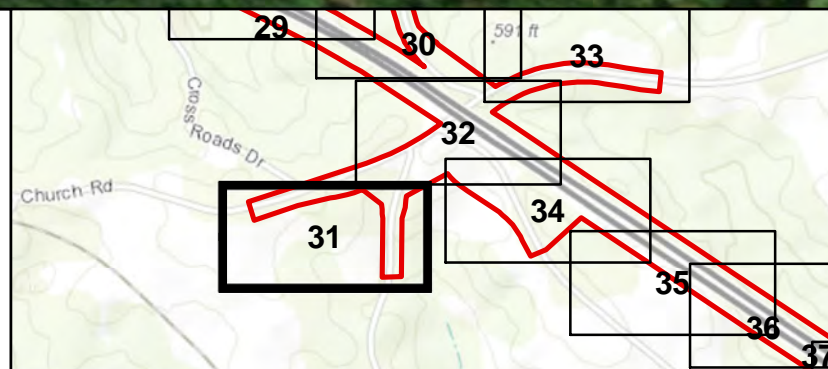


No Aquatic Resources Identified within Project Study Area



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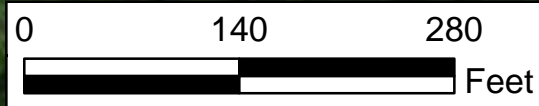
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Drawn By: RHH  
QA/QC: KLM  
January 2018



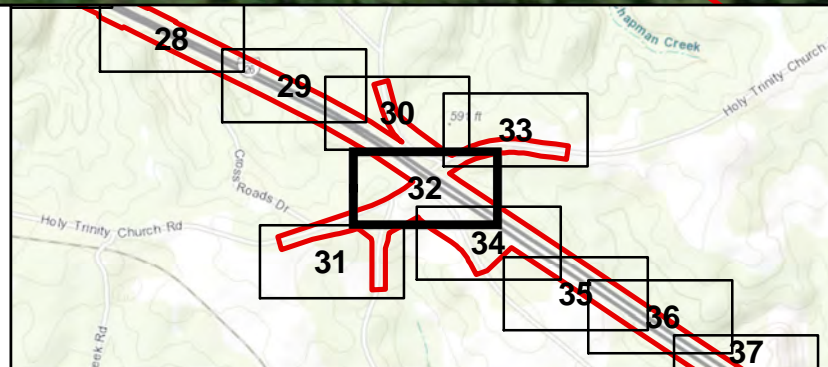


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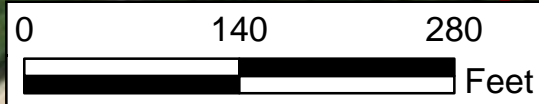
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**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

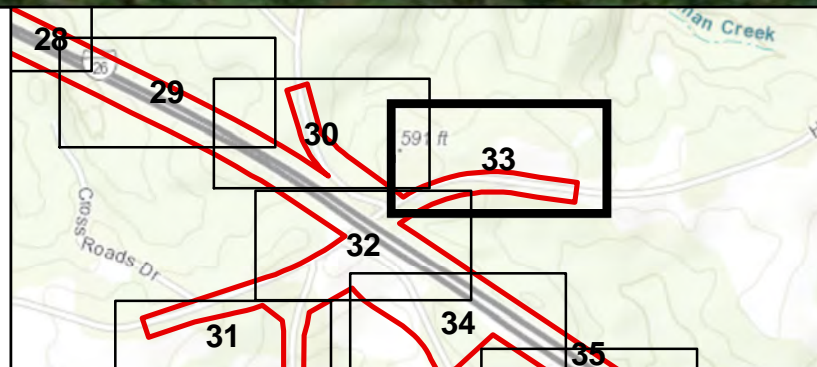


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



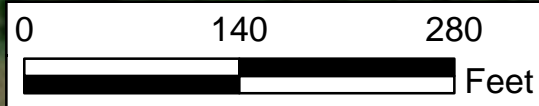
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

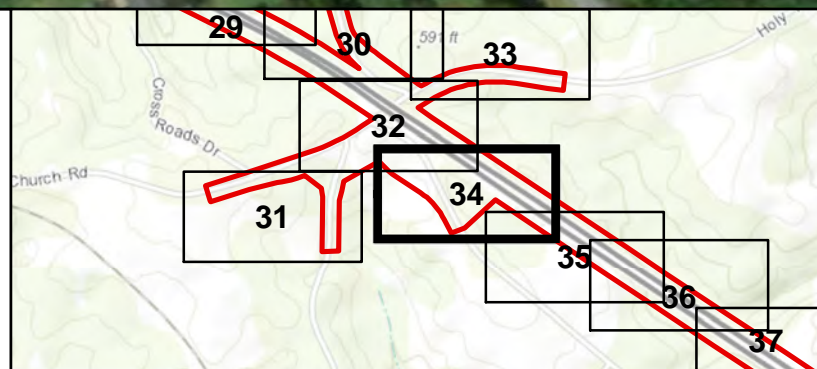
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

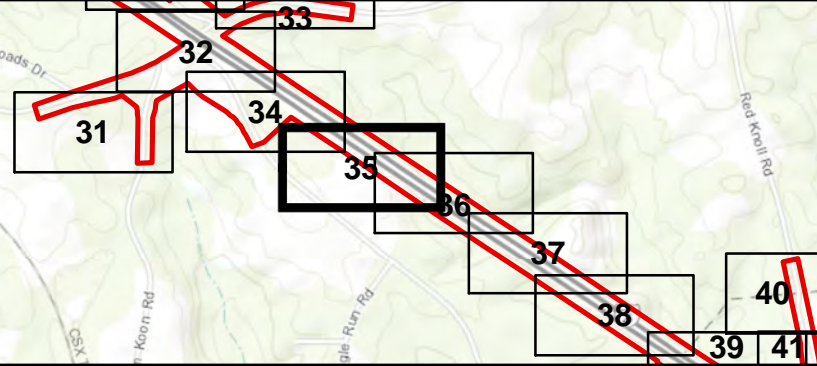
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
November 2017





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland

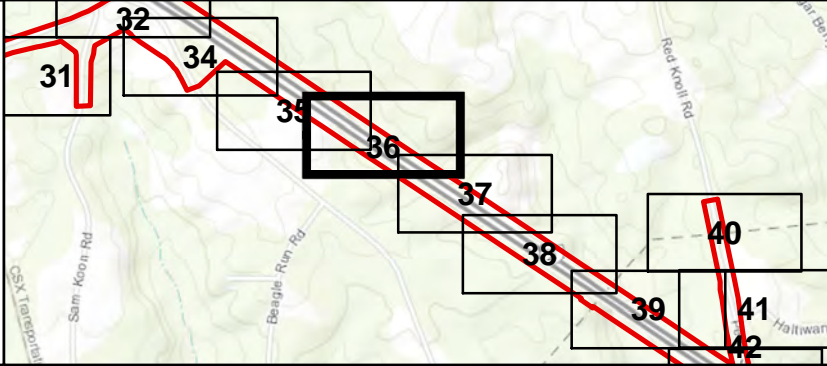


<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: ESRI Base Map Aerial Photography 2015	<b>AQUATIC RESOURCES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 35 of 125





- Legend**
- Data Point
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  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

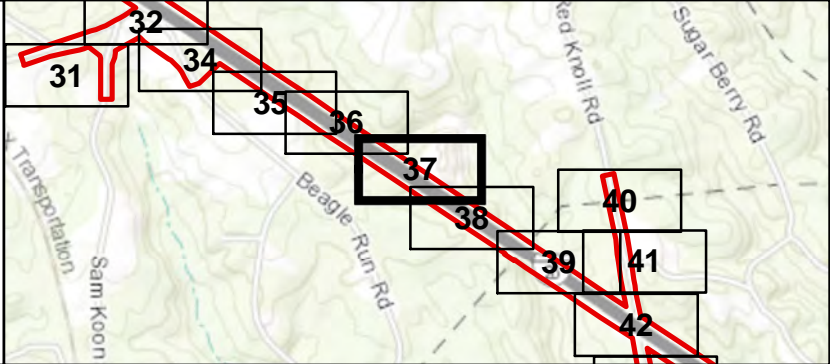
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

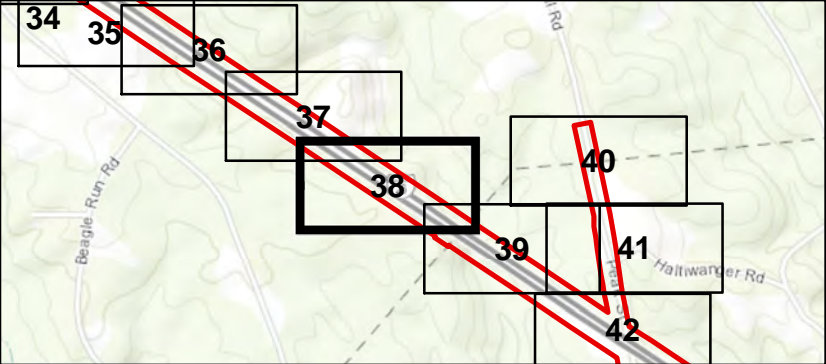
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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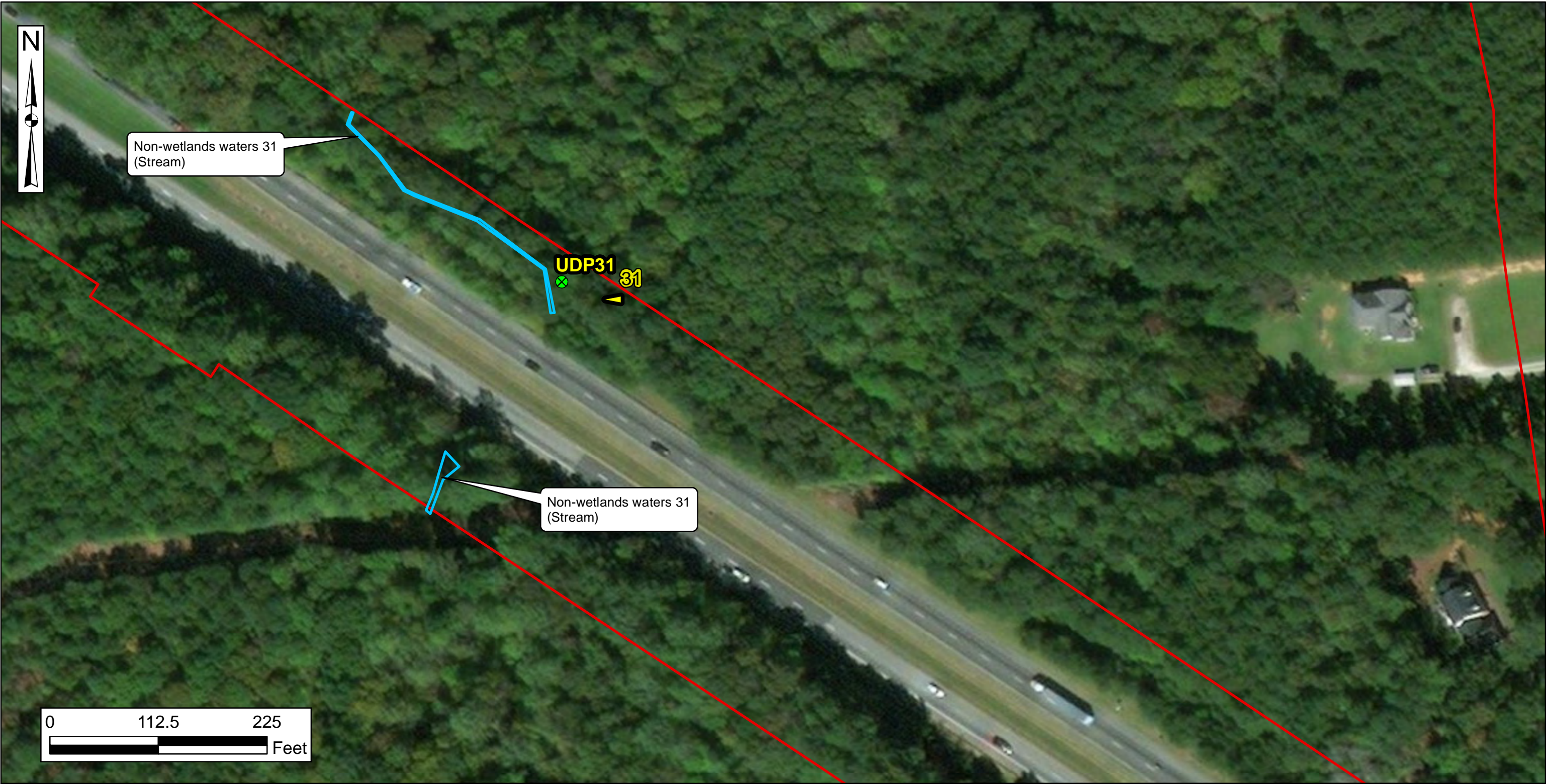
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

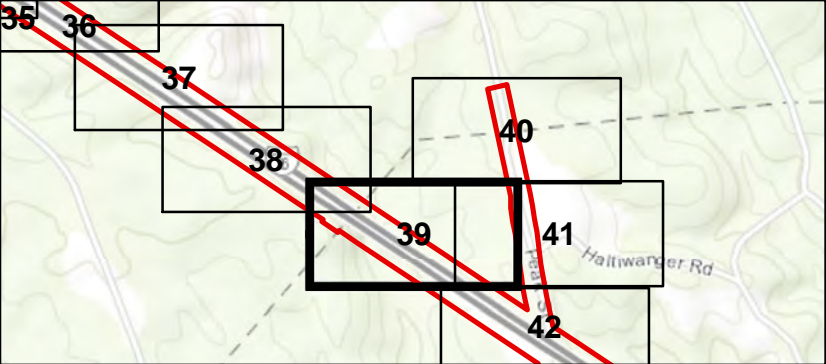
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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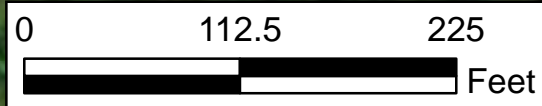
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Drawn By: RHH  
QA/QC: KLM  
January 2018



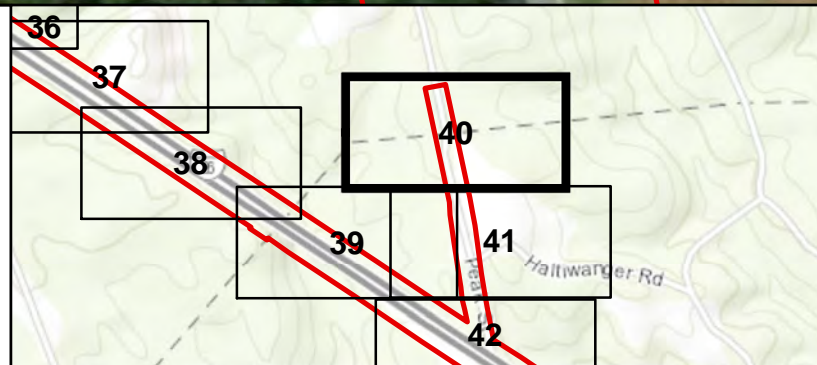


No Aquatic Resources Identified within Project Study Area



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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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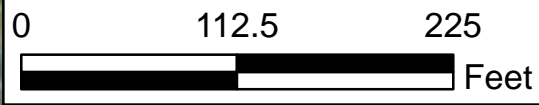
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



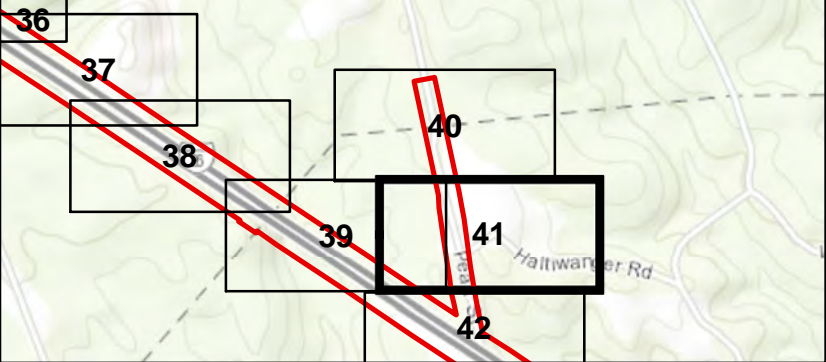


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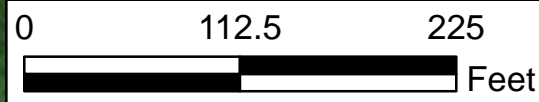
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Drawn By: RHH  
QA/QC: KLM  
January 2018



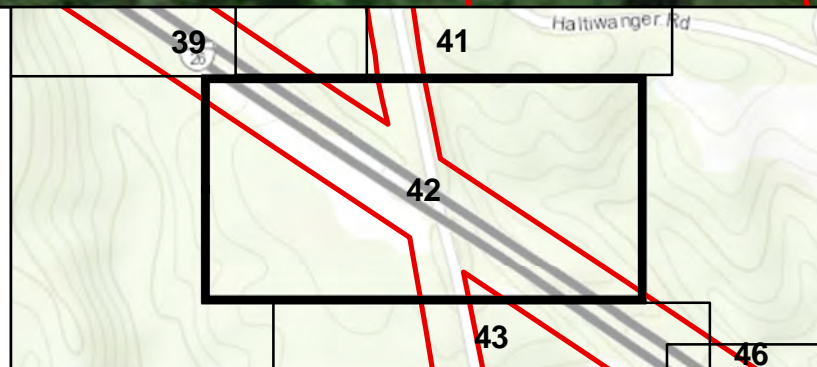


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**SCDOT P029208**

Source:  
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Photography  
2015

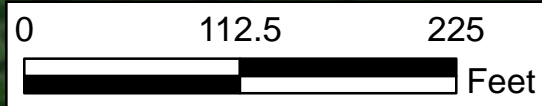
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Drawn By: RHH  
QA/QC: KLM  
January 2018



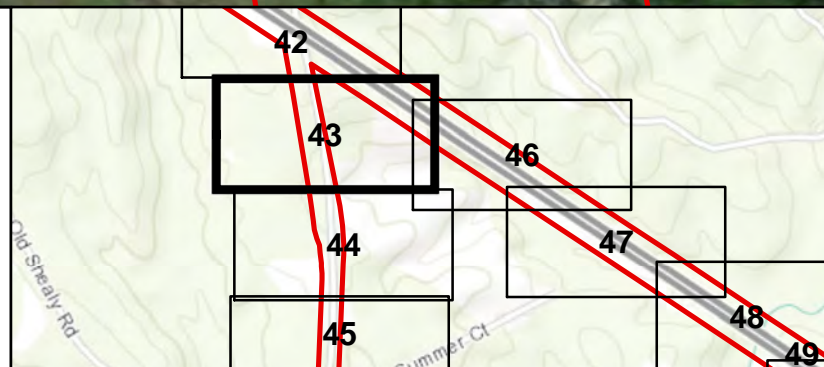


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**SCDOT P029208**

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Photography  
2015

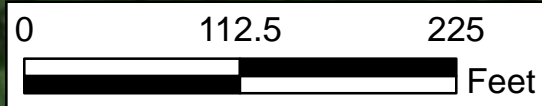
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



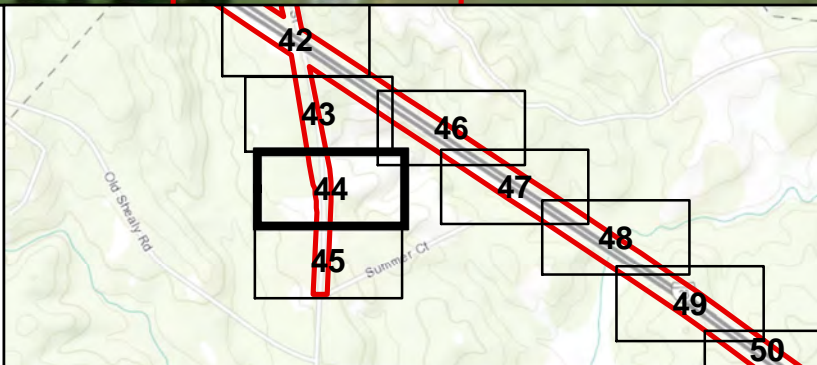


No Aquatic Resources Identified within Project Study Area



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I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

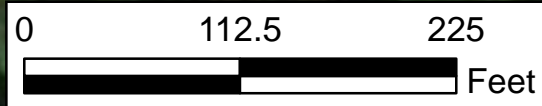
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Drawn By: RHH  
QA/QC: KLM  
January 2018



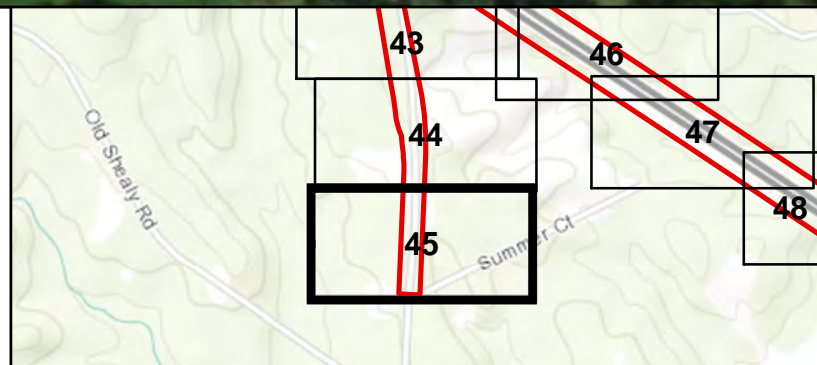


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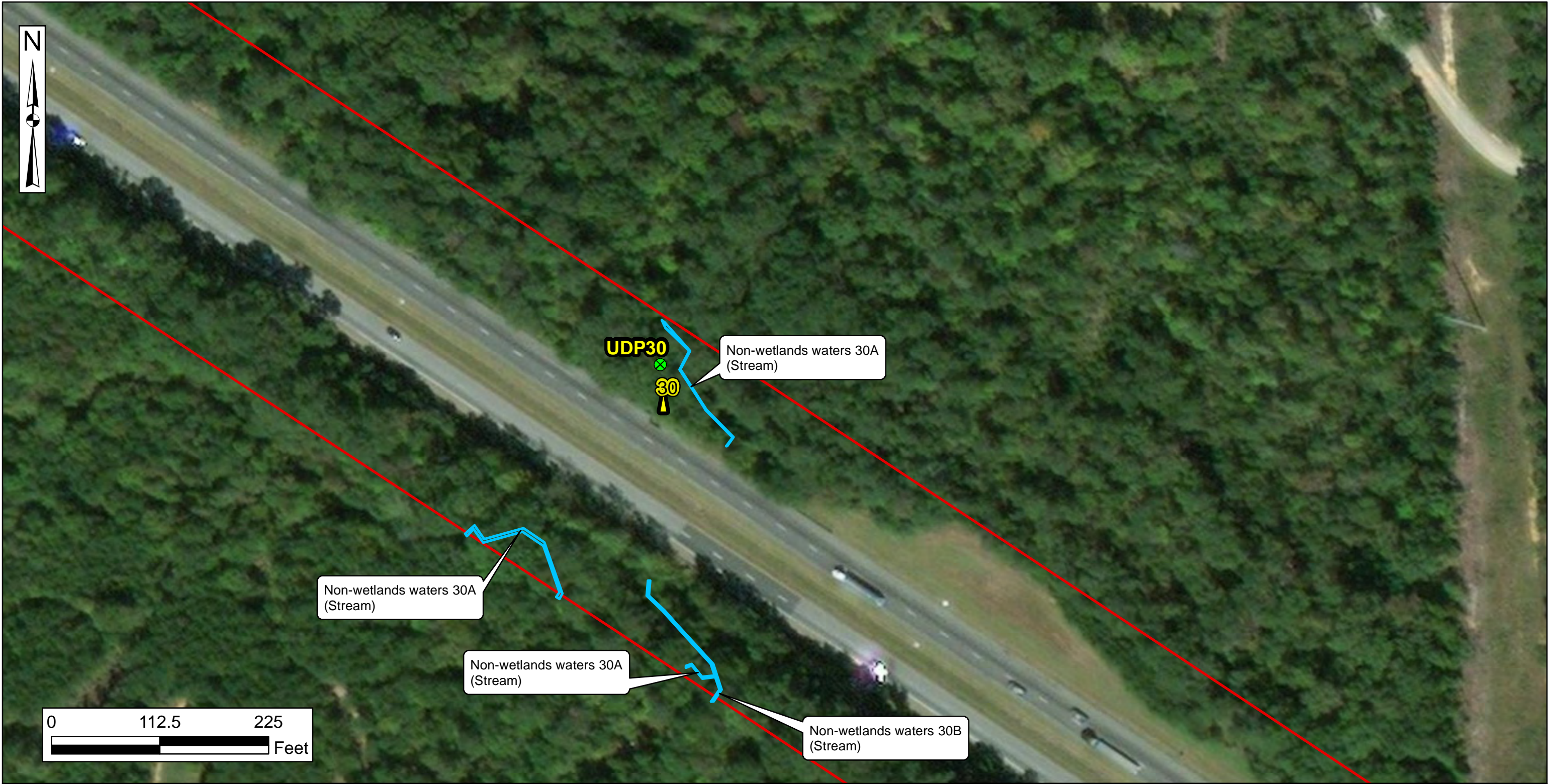
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

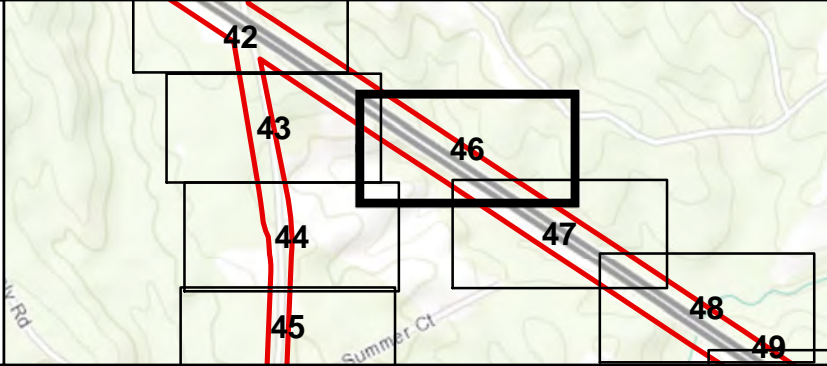
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
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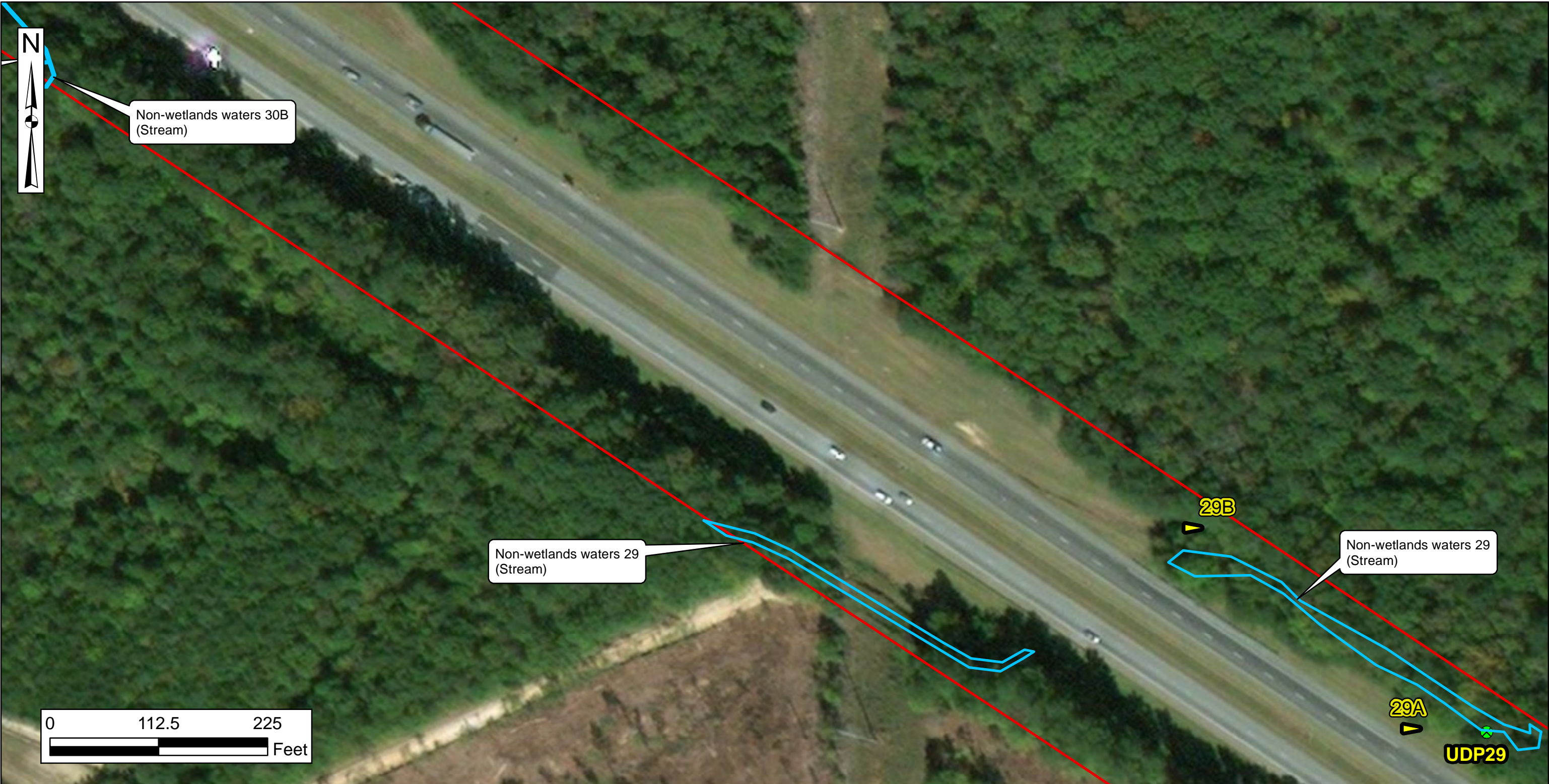
**I-26 Design Build Widening MM 85 to MM 101**  
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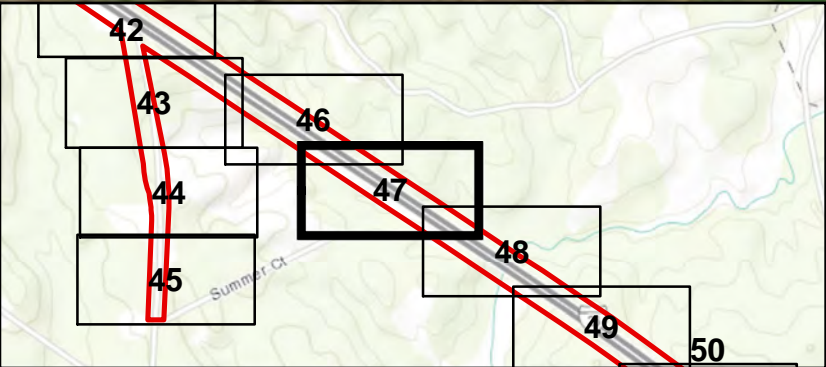
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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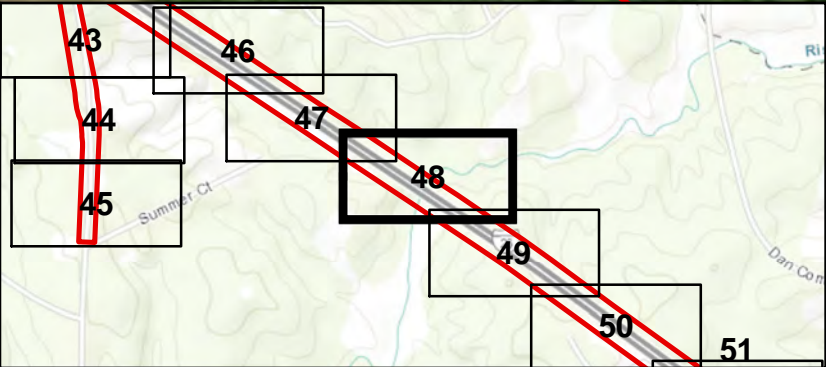
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

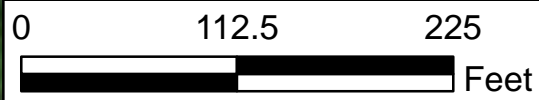
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January 2018





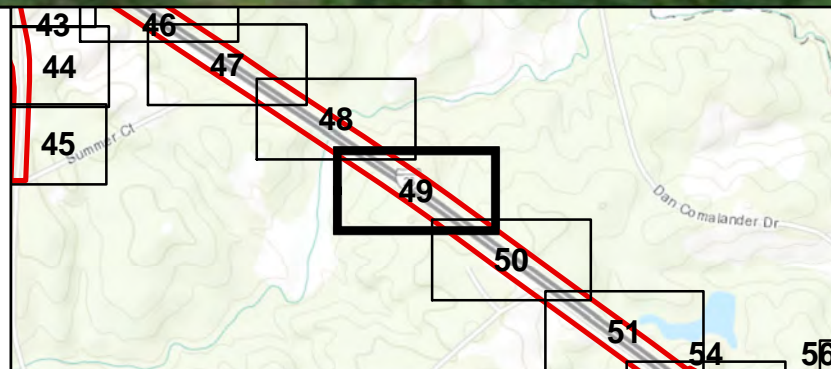
No Aquatic Resources Identified within Project Study Area

UDP106 106



**Legend**

- Data Point
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- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

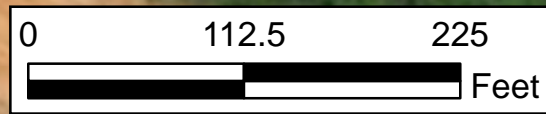
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



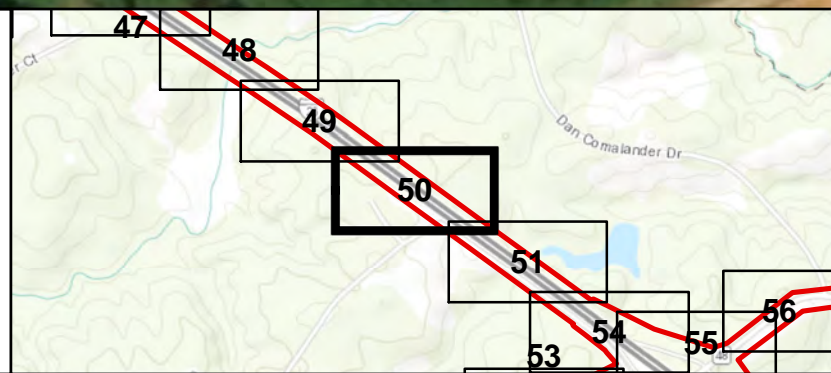


No Aquatic Resources Identified within Project Study Area



**Legend**

-  Data Point
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-  Photo Point
-  Palustrine Emergent Wetland
-  Stream
-  Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

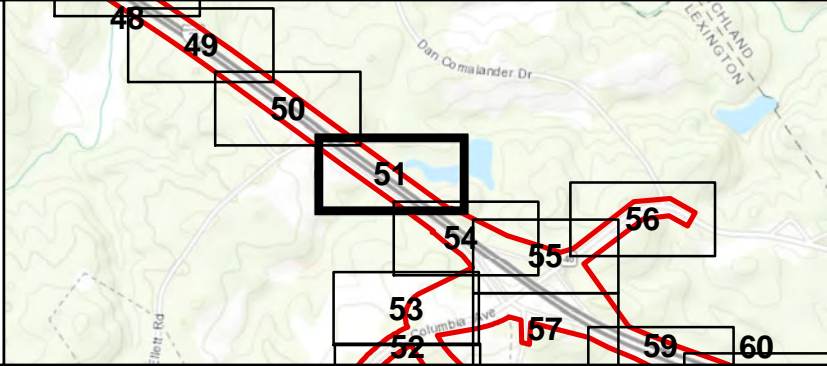
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
2015

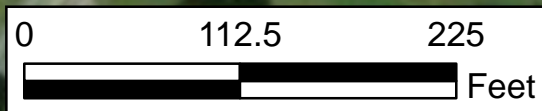
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

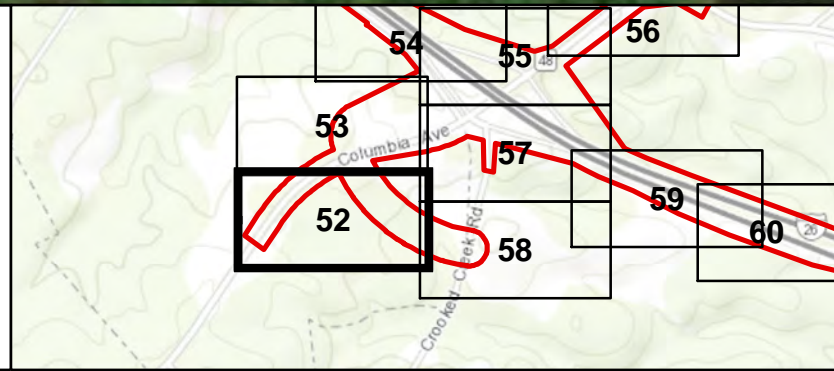




No Aquatic Resources Identified within Project Study Area



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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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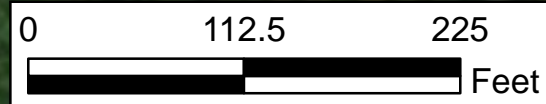
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



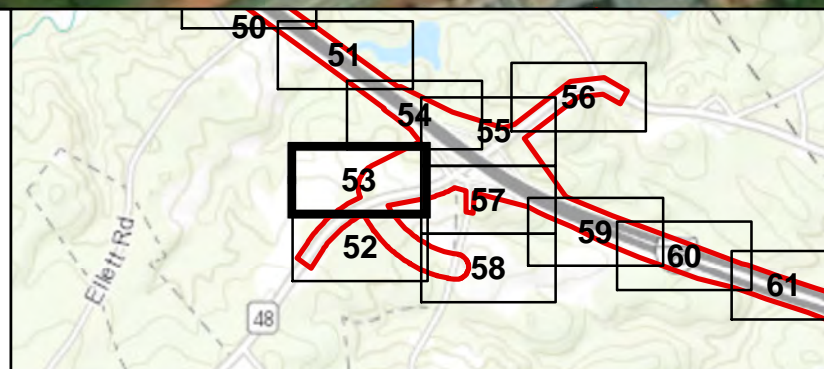


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
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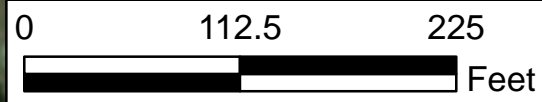
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





Non-wetlands waters K  
(Stream)

Palustrine Emergent Wetland  
Wetland K (0.0232 Acres).

SK3

Palustrine Emergent Wetland  
Wetland K (0.0420 Acres).

UK2

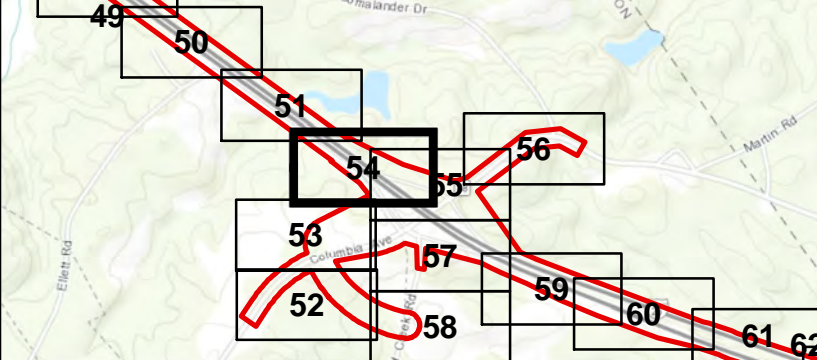
UDPK

WDPK

WK1



- Legend**
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  - Photo Point
  - Palustrine Emergent Wetland
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
2015

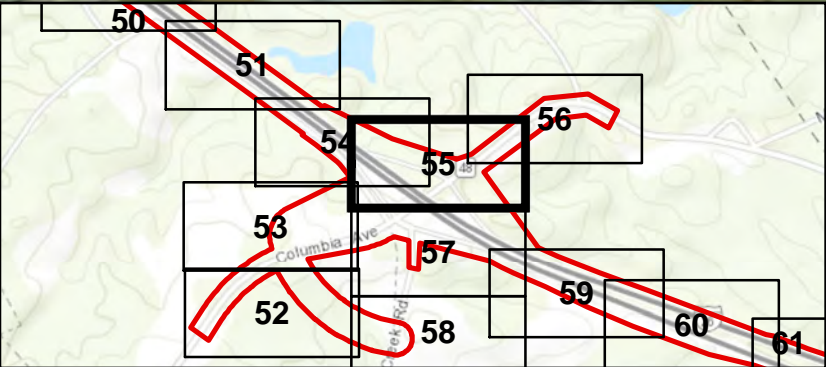
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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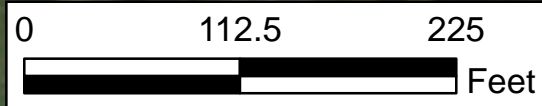
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Drawn By: RHH  
QA/QC: KLM  
January 2018

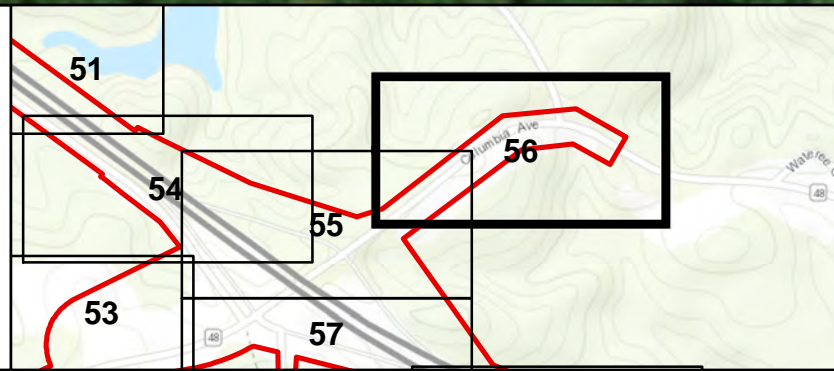




No Aquatic Resources Identified within Project Study Area



- Legend**
- Data Point
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I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

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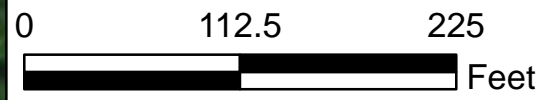
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QA/QC: KLM  
January 2018



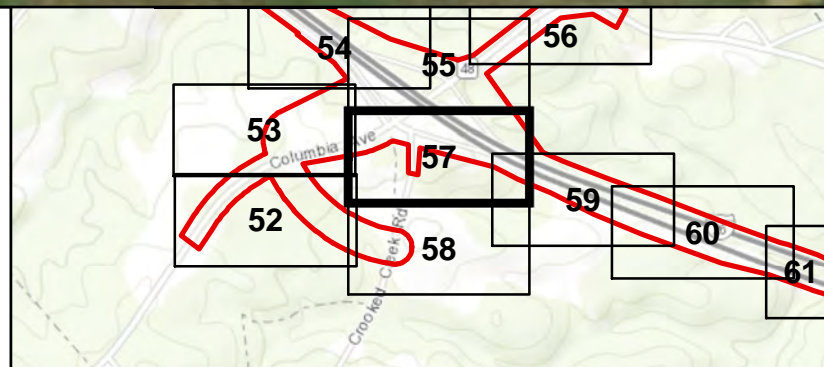


No Aquatic Resources Identified within Project Study Area



**Legend**

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- Stream
- Project Study Area



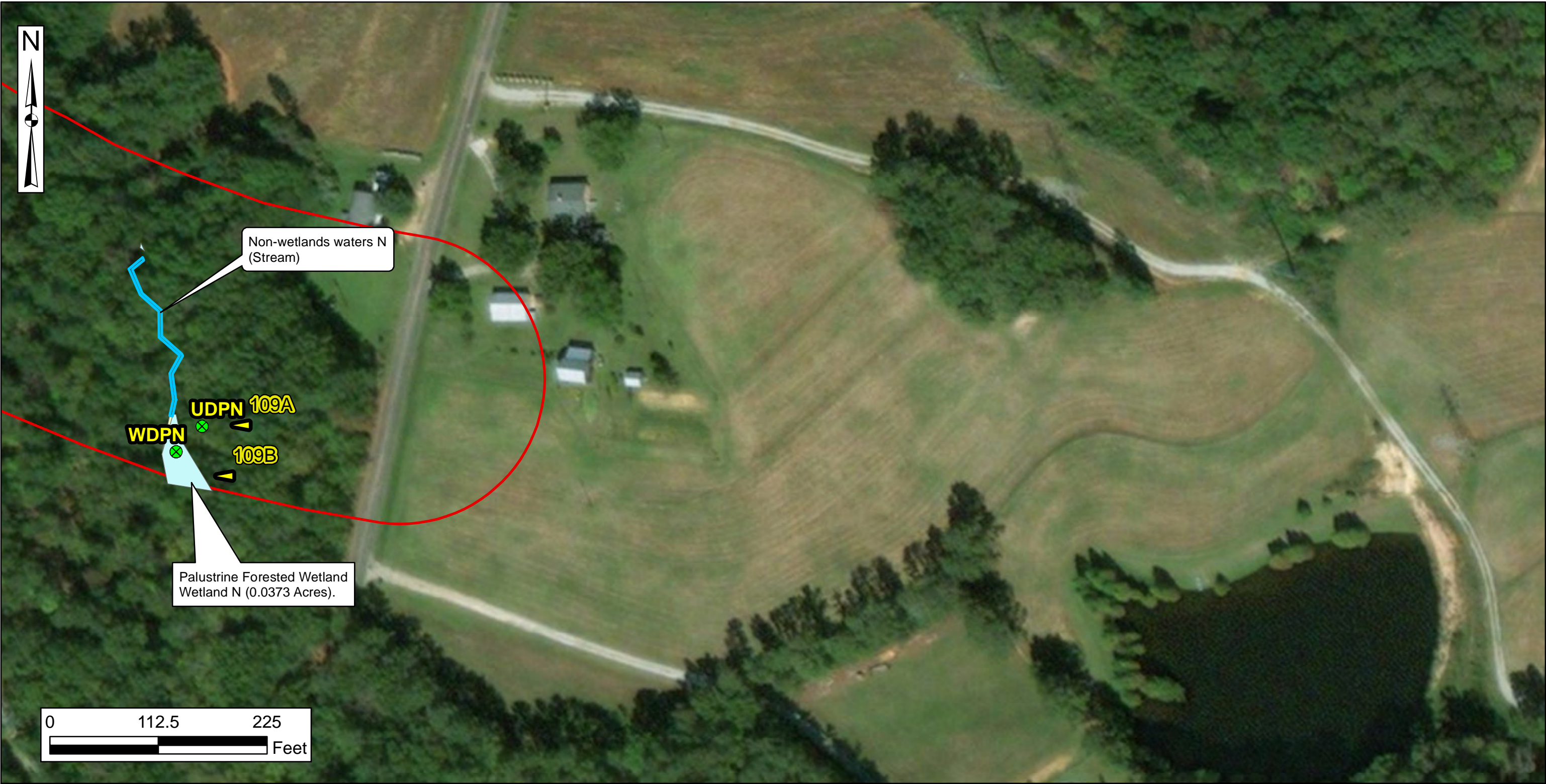
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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**AQUATIC RESOURCES**

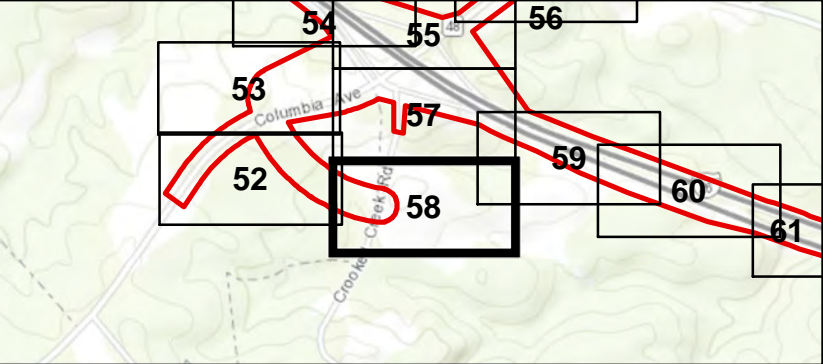
Drawn By: RHH  
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January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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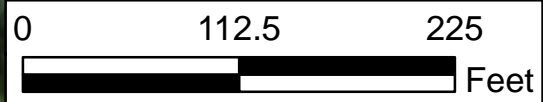
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QA/QC: KLM  
January 2018



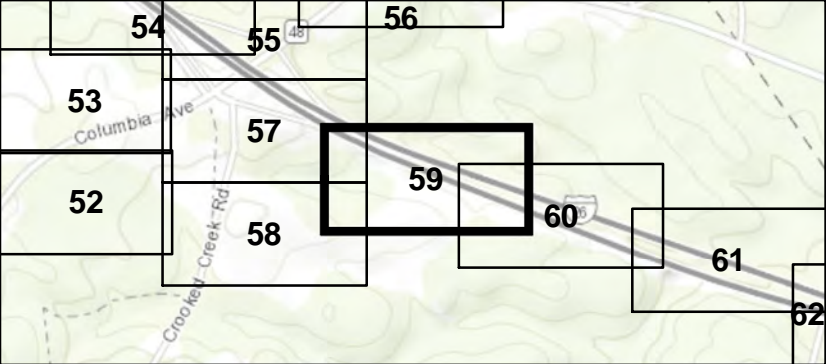


Non-wetlands waters 107  
(Stream)



**Legend**

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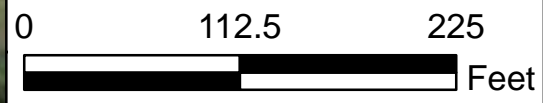
**I-26 Design Build Widening MM 85 to MM 101**  
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**AQUATIC RESOURCES**

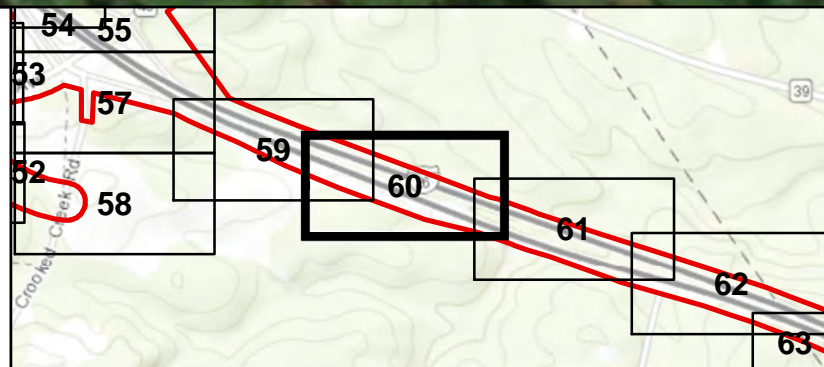
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- Palustrine Forested Wetland
- Palustrine Emergent Wetland



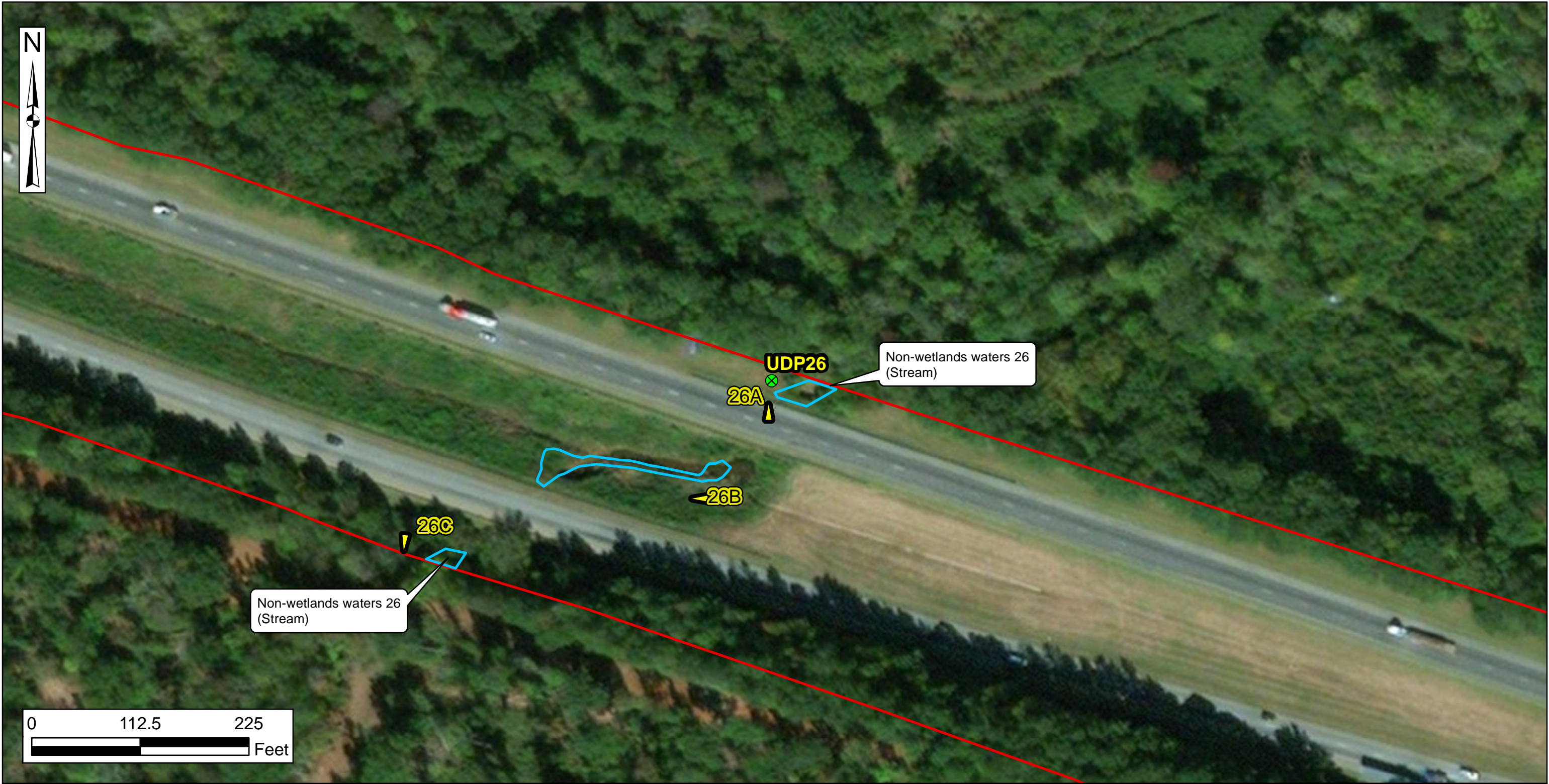
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

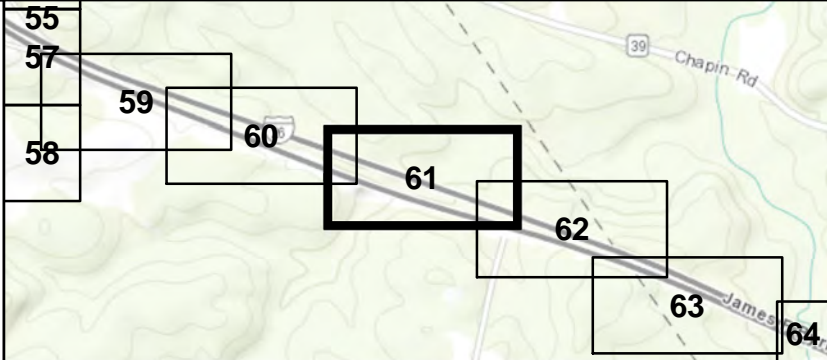
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

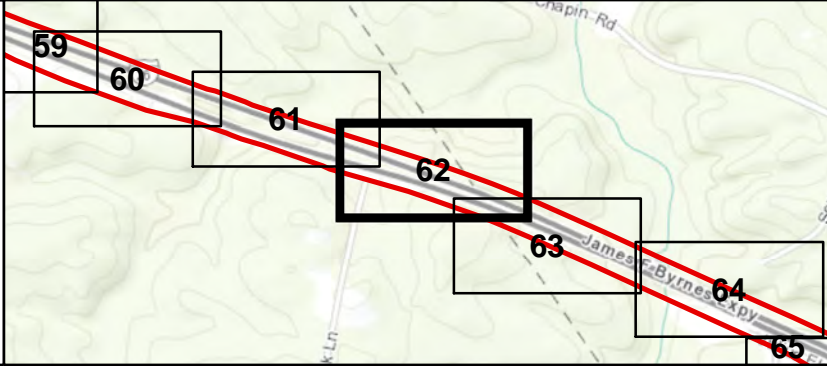
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



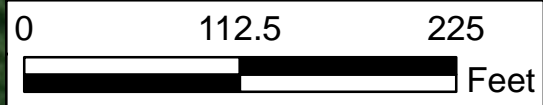
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

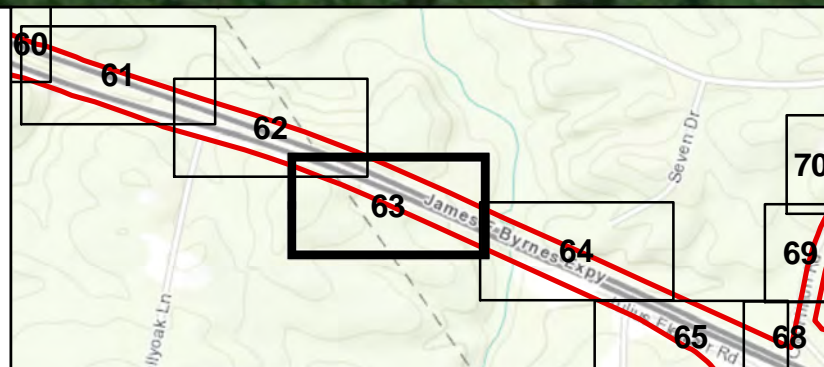
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



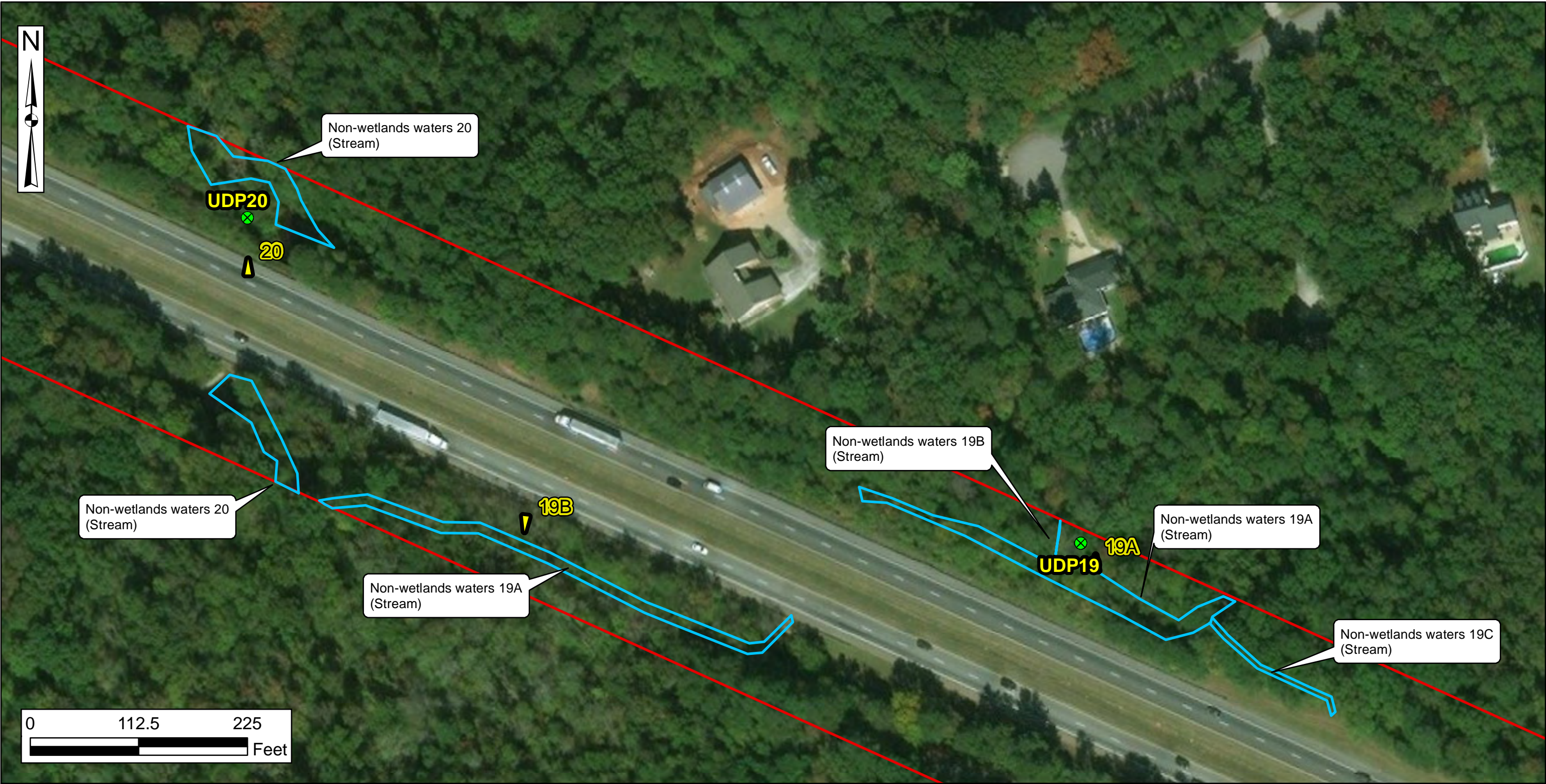
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

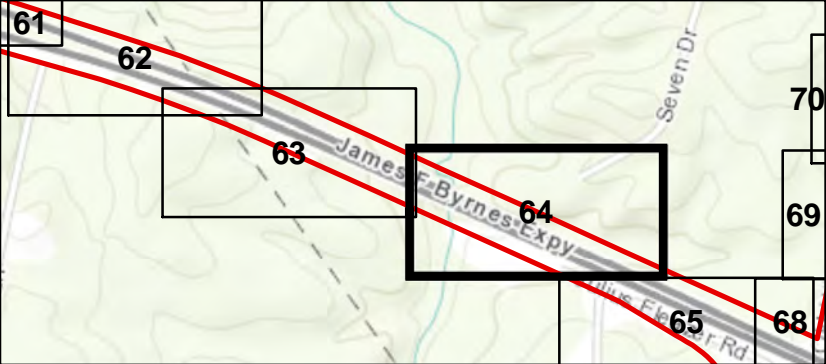
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
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  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

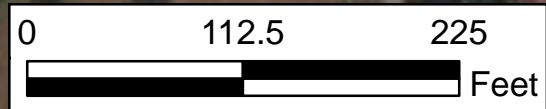
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Drawn By: RHH  
QA/QC: KLM  
January 2018



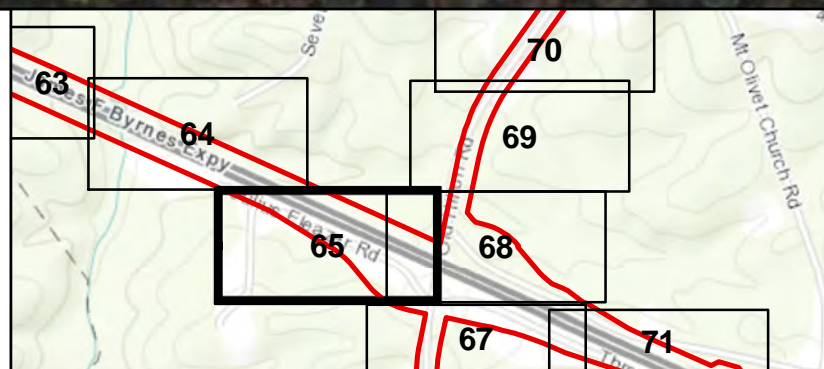


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

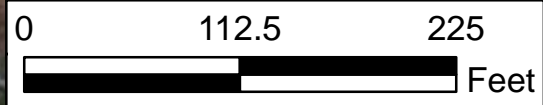
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Drawn By: RHH  
QA/QC: KLM  
January 2018



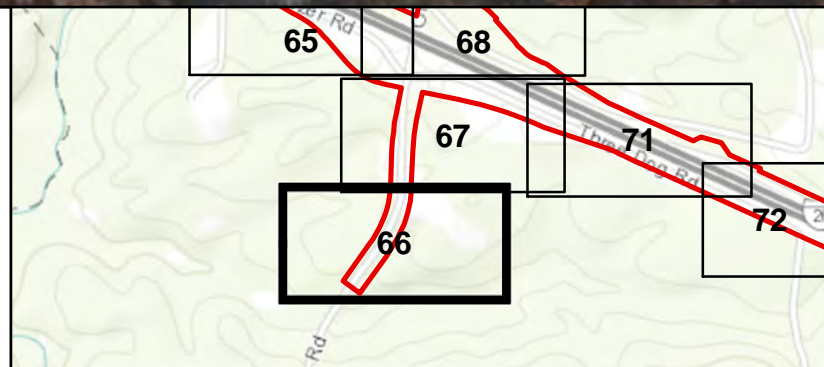


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

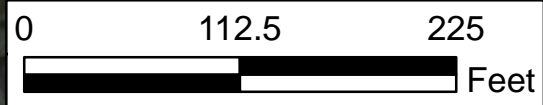
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Drawn By: RHH  
QA/QC: KLM  
January 2018



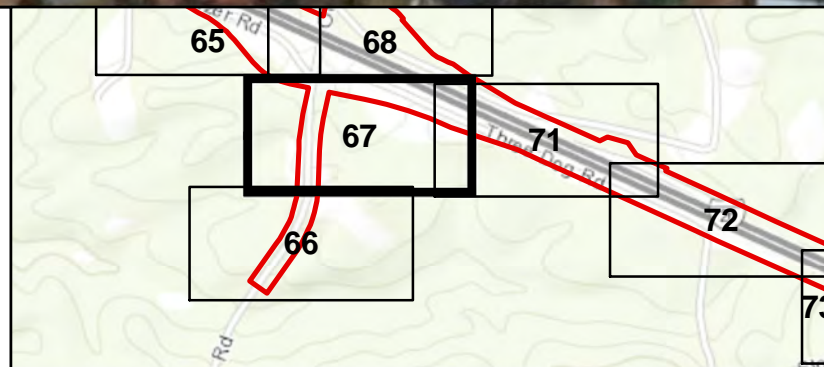


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



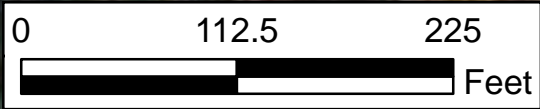
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015







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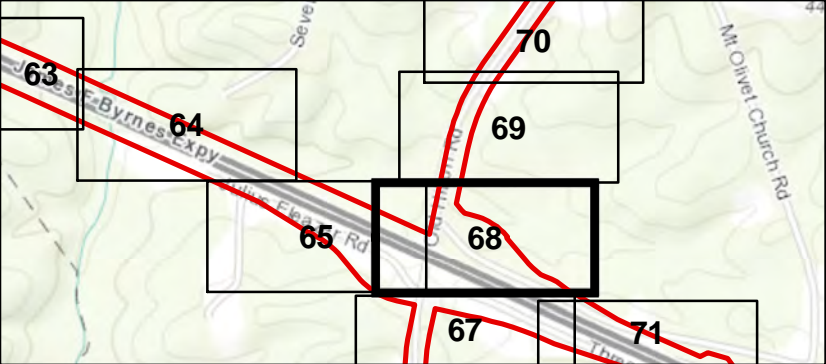
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

-  Data Point
-  Photo Point
-  Stream
-  Project Study Area
-  Palustrine Forested Wetland
-  Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



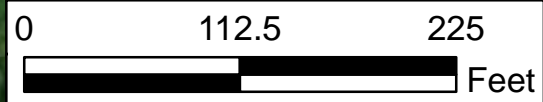


Non-wetlands waters 104  
(Stream)

UDP104

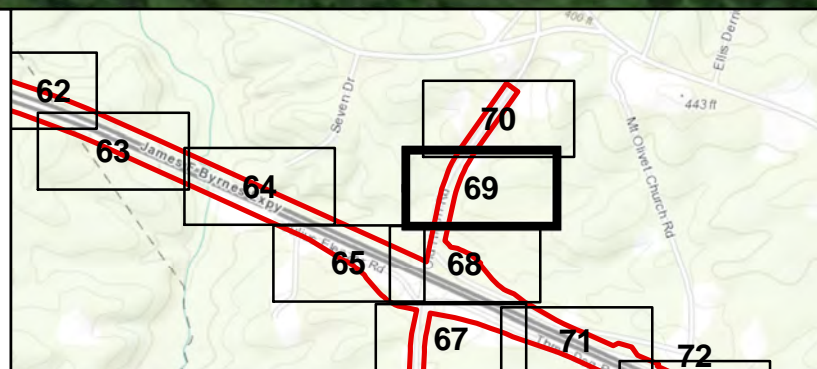
104

Non-wetlands waters 104  
(Stream)



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland
- Pond



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

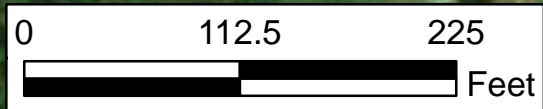
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Drawn By: RHH  
QA/QC: KLM  
January 2018

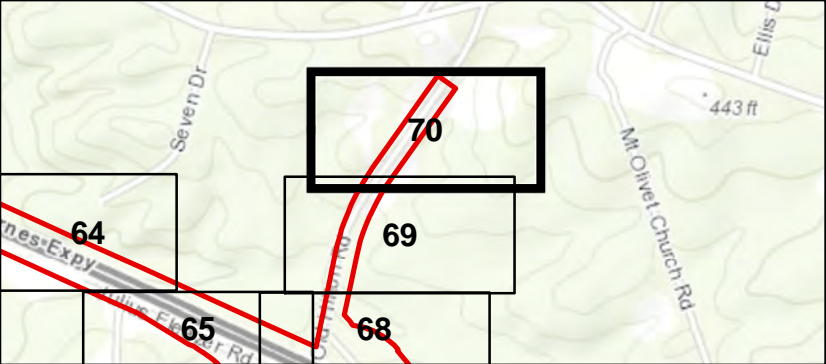




Non-wetlands waters (Pond) not accessed



- Legend**
- Data Point
  - Palustrine Forested Wetland
  - Photo Point
  - Palustrine Emergent Wetland
  - Stream
  - Project Study Area



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

Source:  
ESRI Base Map Aerial  
Photography  
2015

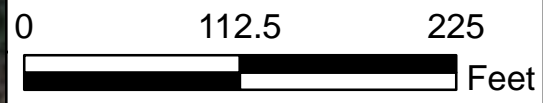
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Drawn By: RHH  
QA/QC: KLM  
January 2018



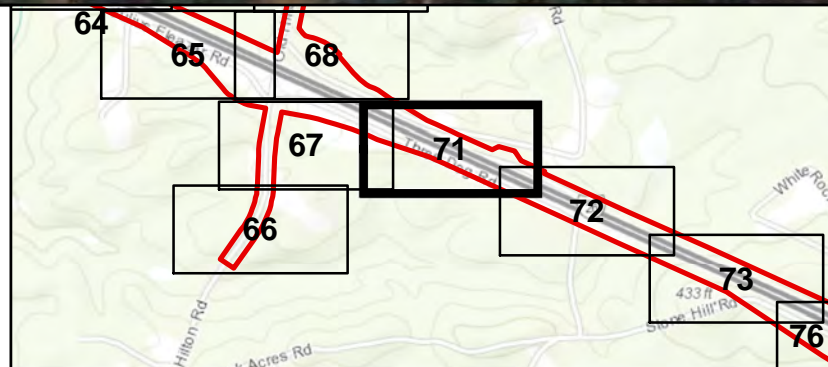


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



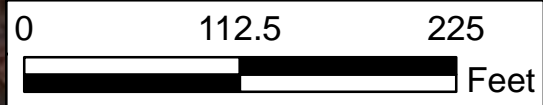
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

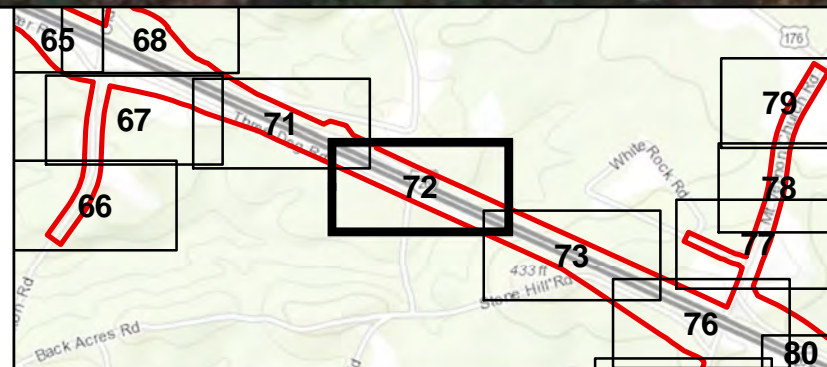
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

Non-wetlands waters 18  
(Stream)

18

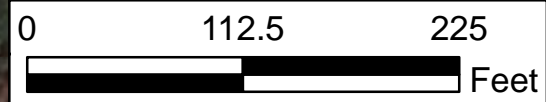
UDP18

Non-wetlands waters 18  
(Stream)



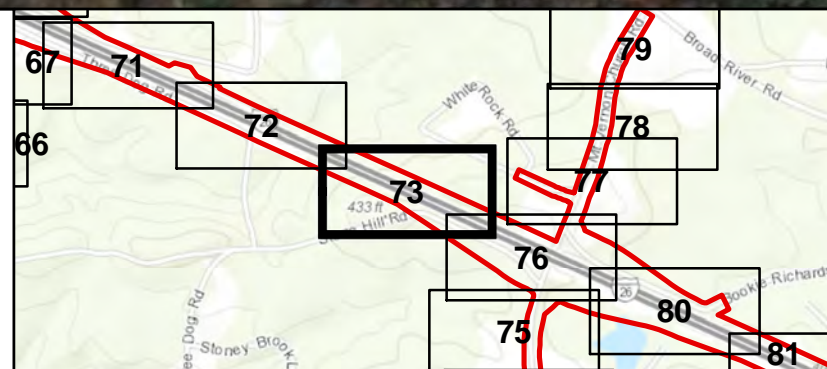


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

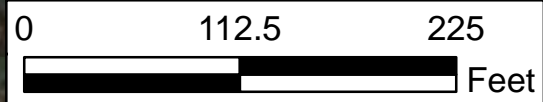
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Drawn By: RHH  
QA/QC: KLM  
January 2018



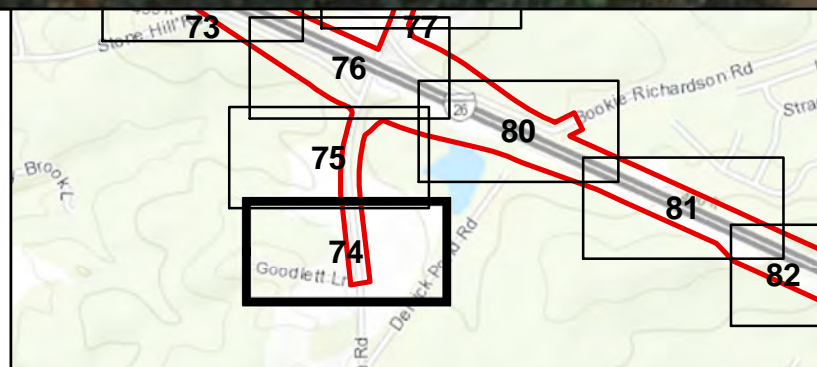


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
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- Palustrine Emergent Wetland
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- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

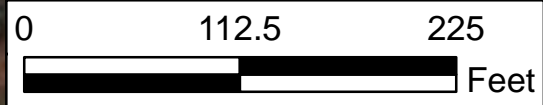
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QA/QC: KLM  
January 2018



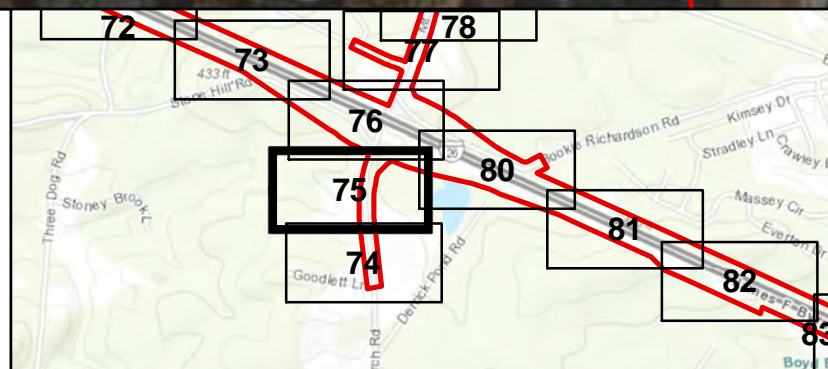


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
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- Palustrine Emergent Wetland
- Stream
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

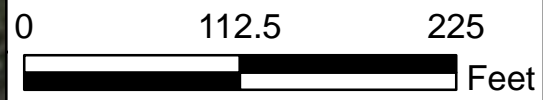
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Drawn By: RHH  
QA/QC: KLM  
January 2018



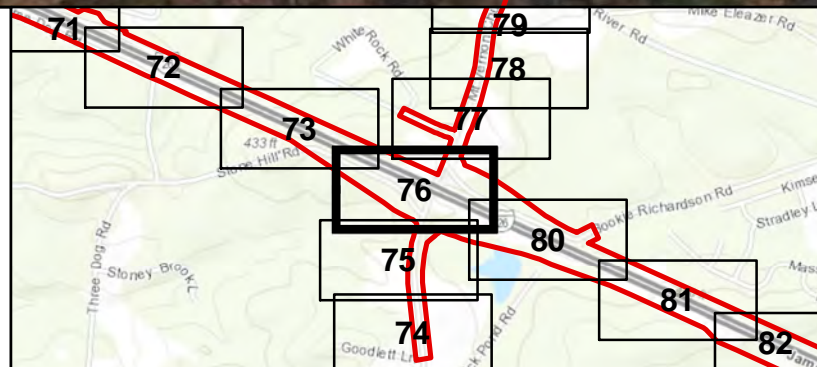


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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
2015

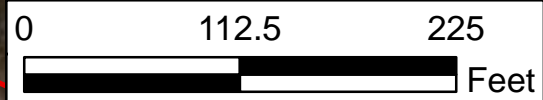
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Drawn By: RHH  
QA/QC: KLM  
January 2018



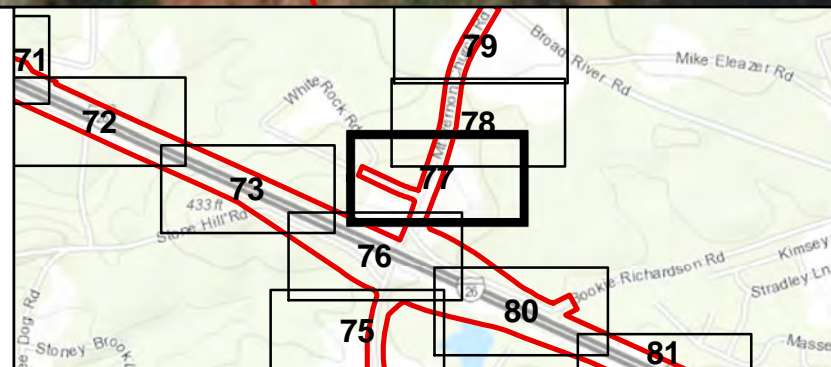


No Aquatic Resources Identified within Project Study Area



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- Palustrine Forested Wetland
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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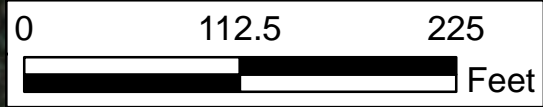
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



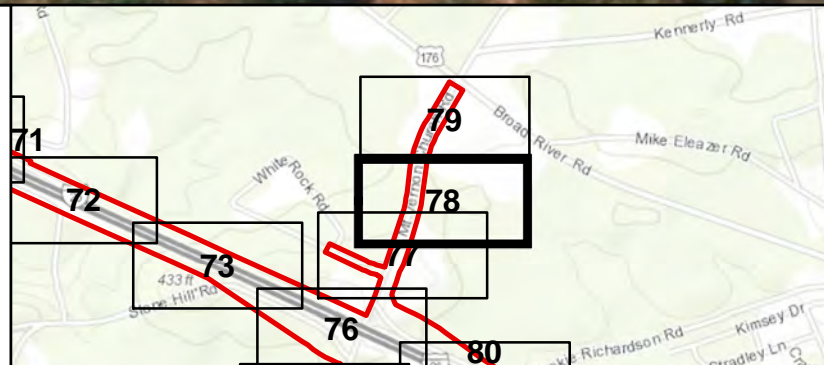


No Aquatic Resources Identified within Project Study Area



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- Data Point
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- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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ESRI Base Map Aerial  
Photography  
2015

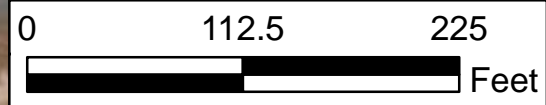
**AQUATIC RESOURCES**

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QA/QC: KLM  
January 2018



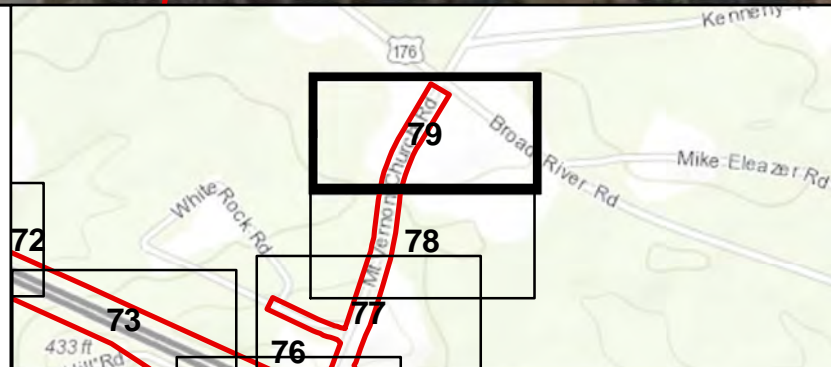


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



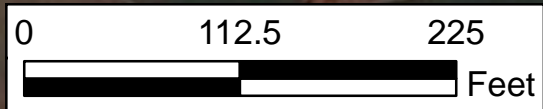
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

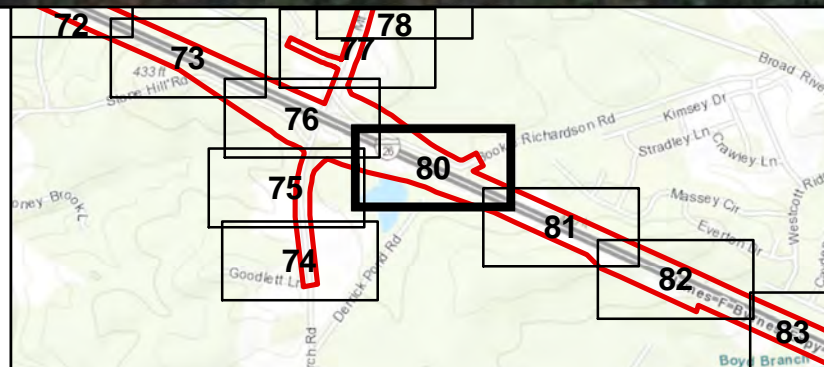
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Palustrine Forested Wetland
  - Photo Point
  - Palustrine Emergent Wetland
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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

### AQUATIC RESOURCES

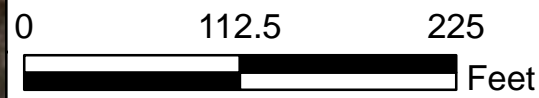
Drawn By: RHH  
QA/QC: KLM  
January 2018

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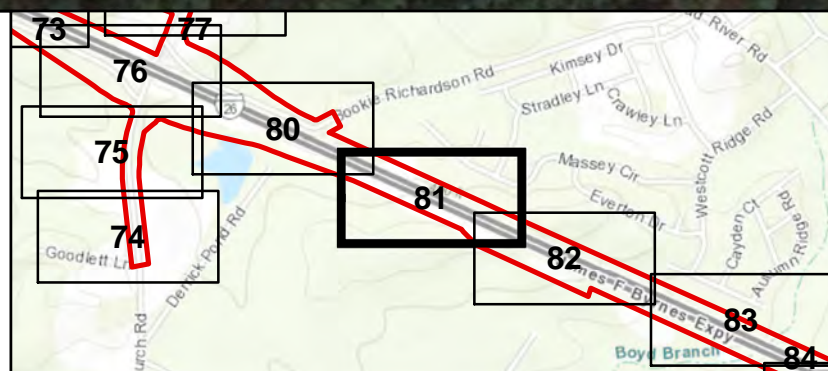


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
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- Palustrine Emergent Wetland
- Stream
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**SCDOT P029208**

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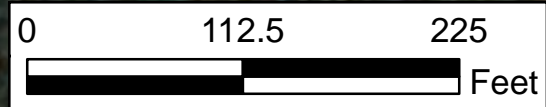
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



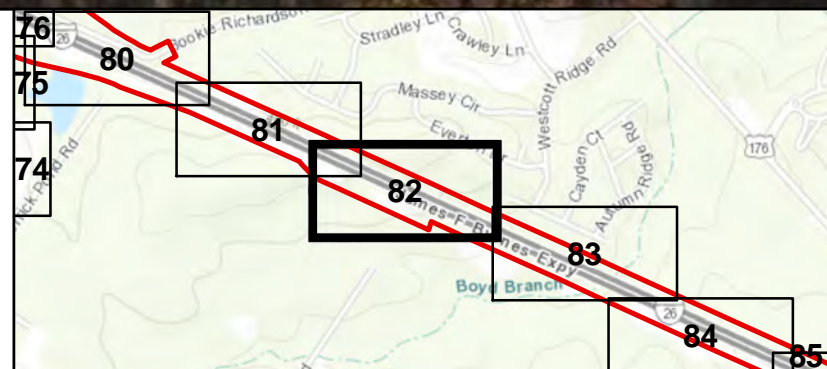


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

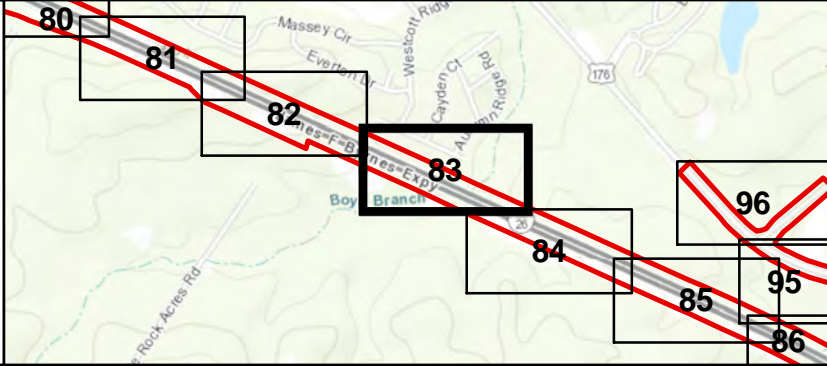
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

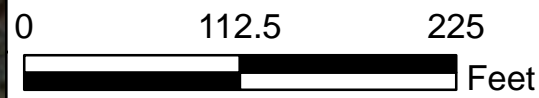
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



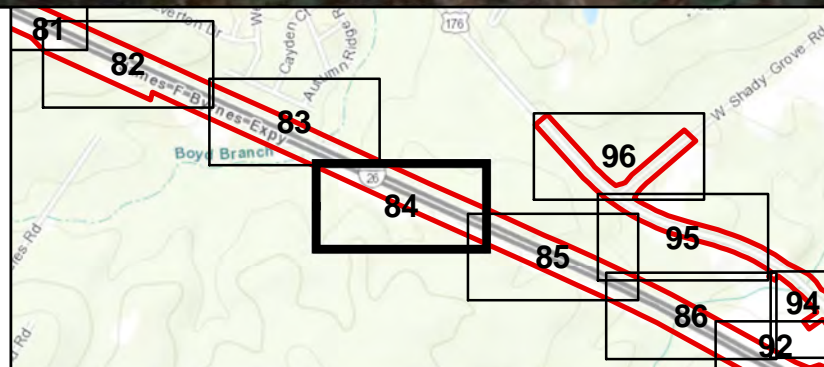


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**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
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Photography  
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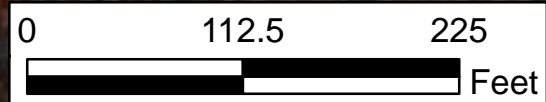
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Drawn By: RHH  
QA/QC: KLM  
January 2018



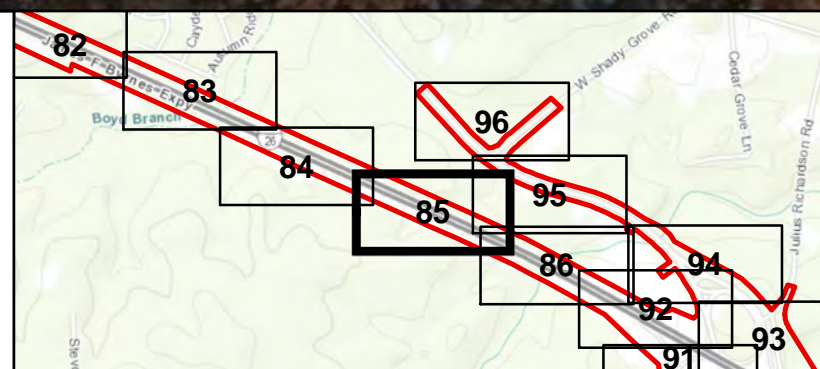


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



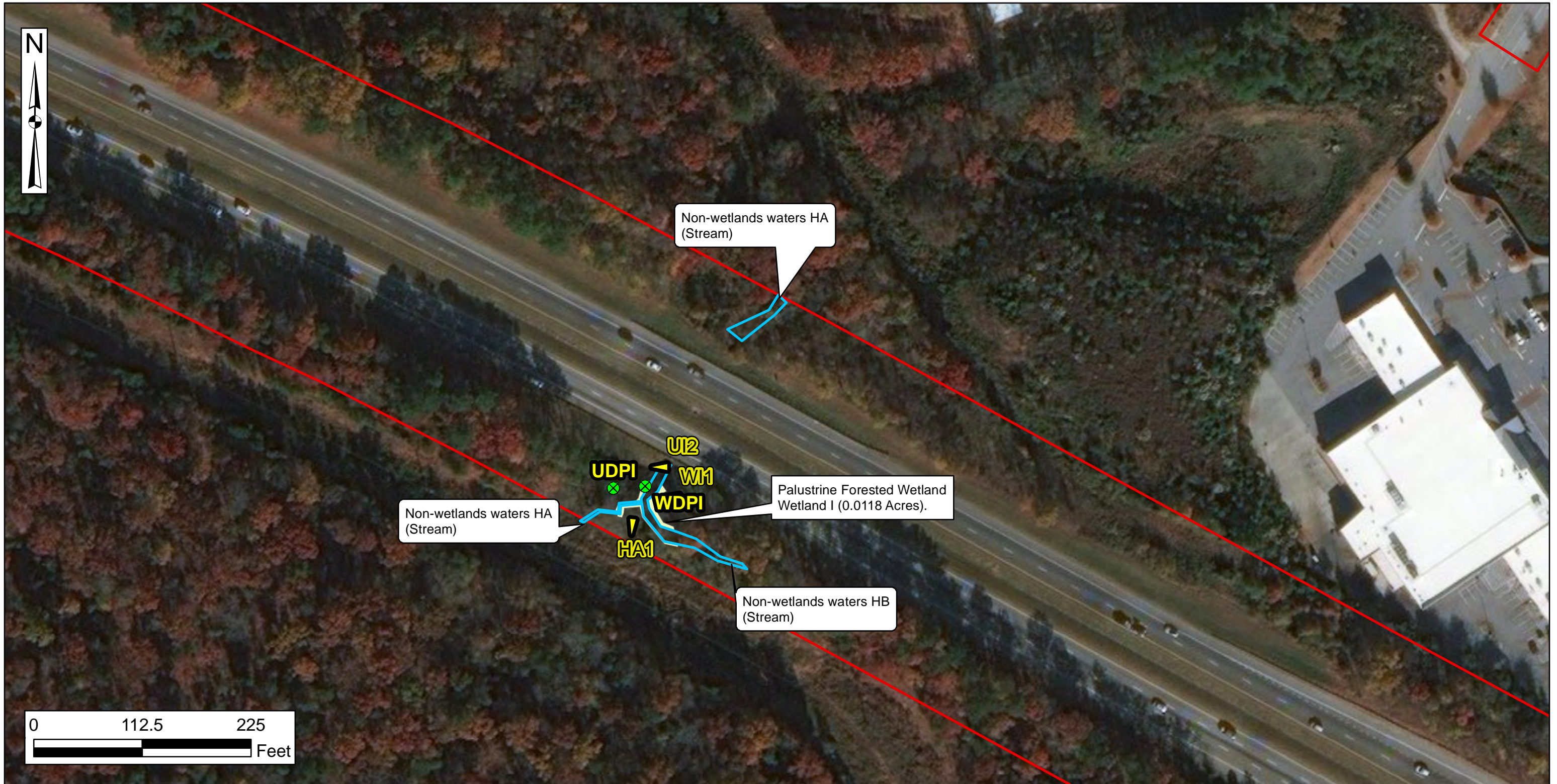
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

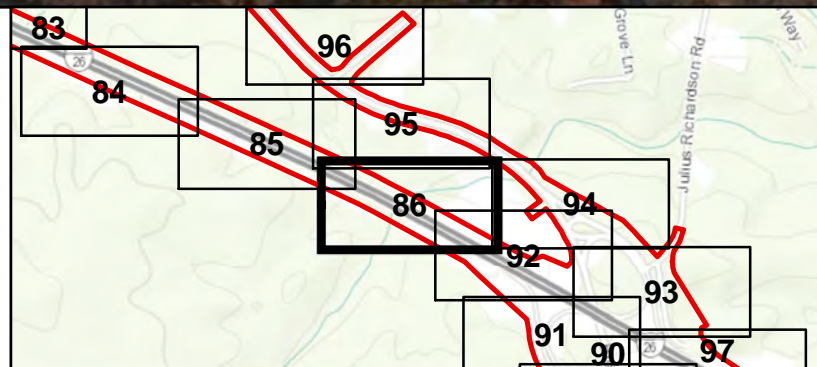
Drawn By: RHH  
QA/QC: KLM  
January 2018





#### Legend

- ✕ Data Point
- ▶ Photo Point
- ▬ Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 ESRI Base Map Aerial  
 Photography  
 2015

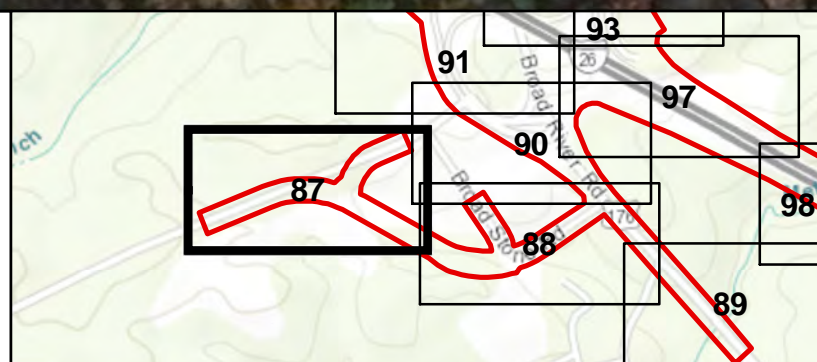
#### AQUATIC RESOURCES

Drawn By: RHH  
 QA/QC: KLM  
 January 2018





-  Data Point
  Palustrine Forested Wetland
-  Photo Point
  Palustrine Emergent Wetland
-  Stream
-  Project Study Area



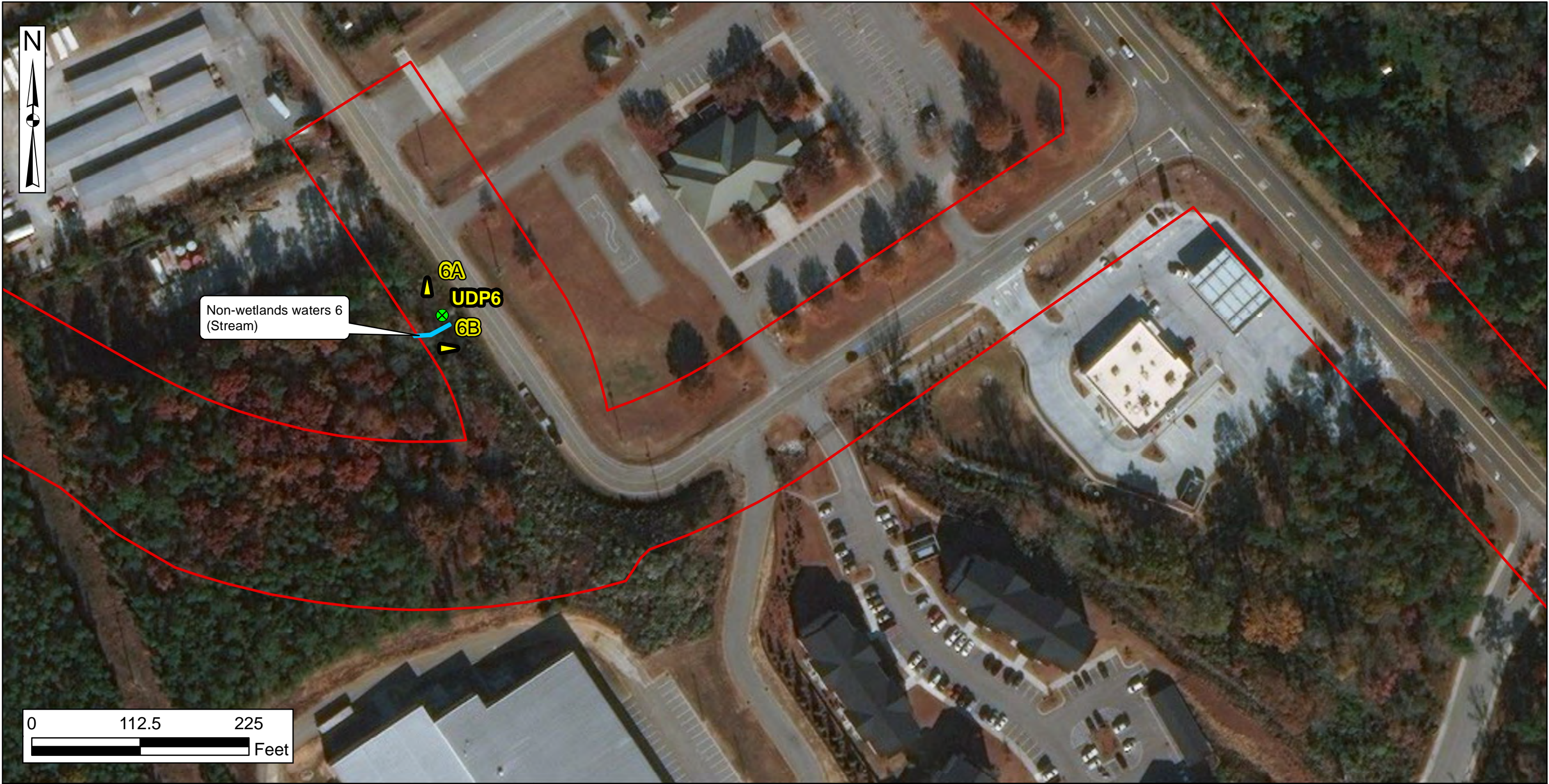
**I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

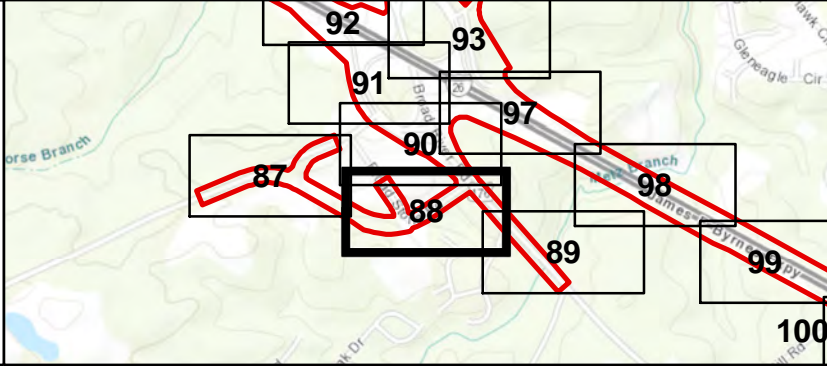
## AQUATIC RESOURCES

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



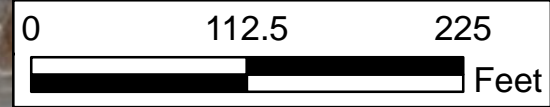
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



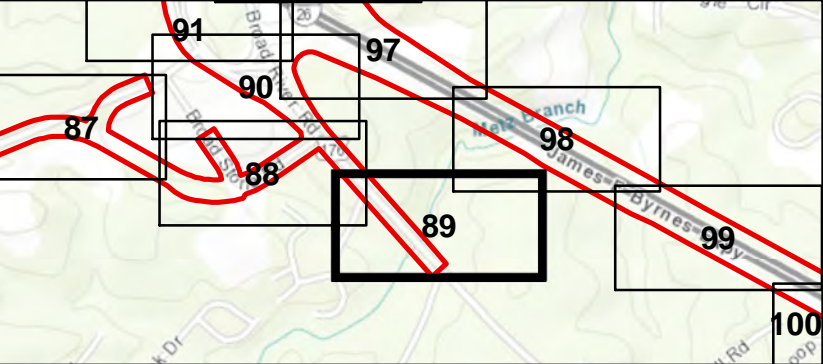


Palustrine Forested Wetland  
Wetland I (0.0633 Acres).

UE2 UDPE  
WDPE WE1



- Legend**
- Data Point
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  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208

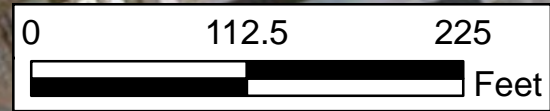
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Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

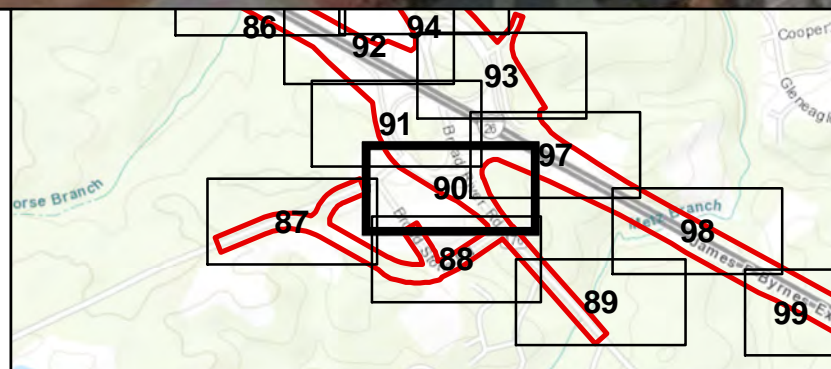


No Aquatic Resources Identified within Project Study Area



**Legend**

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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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Photography  
2015

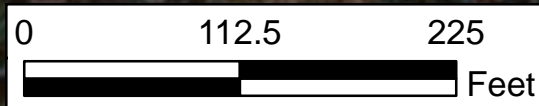
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Drawn By: RHH  
QA/QC: KLM  
January 2018

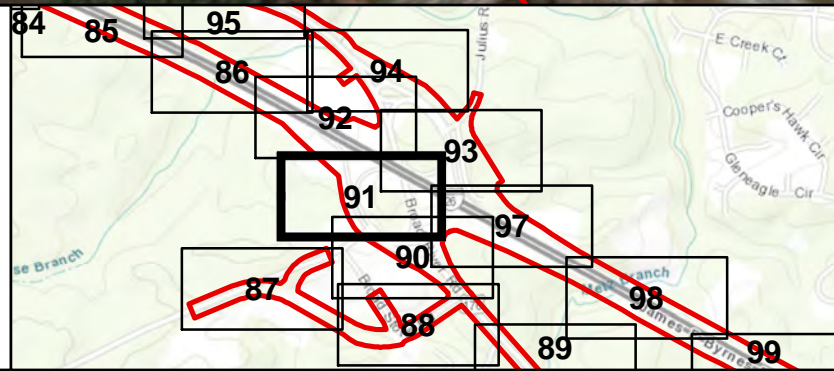




No Aquatic Resources Identified within Project Study Area



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  - Photo Point
  - Palustrine Emergent Wetland
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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

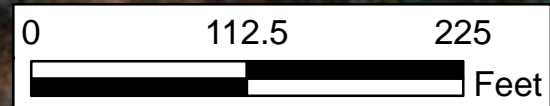
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Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

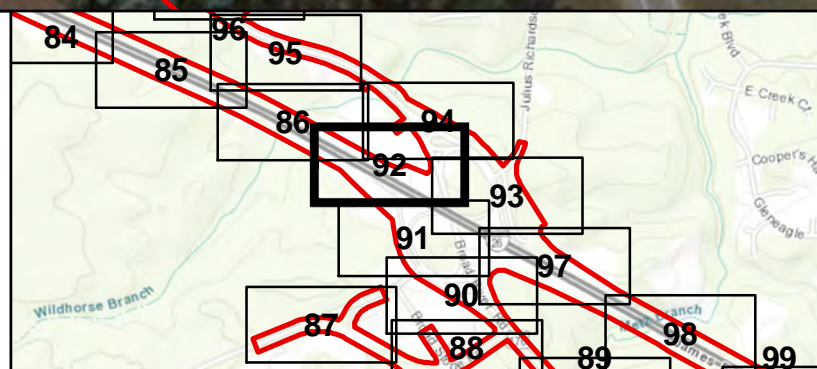


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**Newberry, Lexington, Richland Counties**  
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ESRI Base Map Aerial  
Photography  
2015

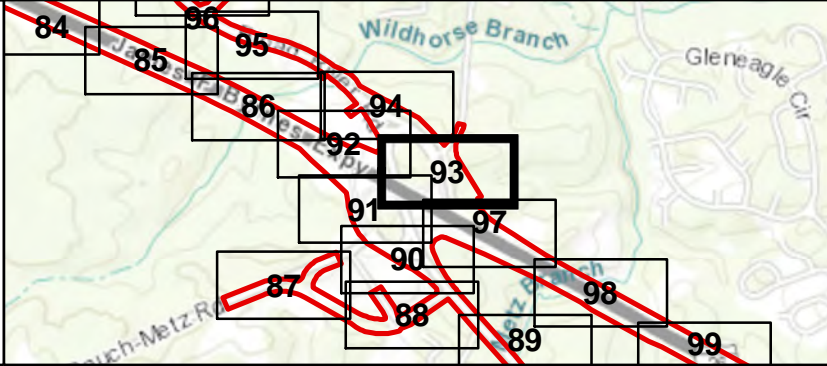
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
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Source:  
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**AQUATIC RESOURCES**

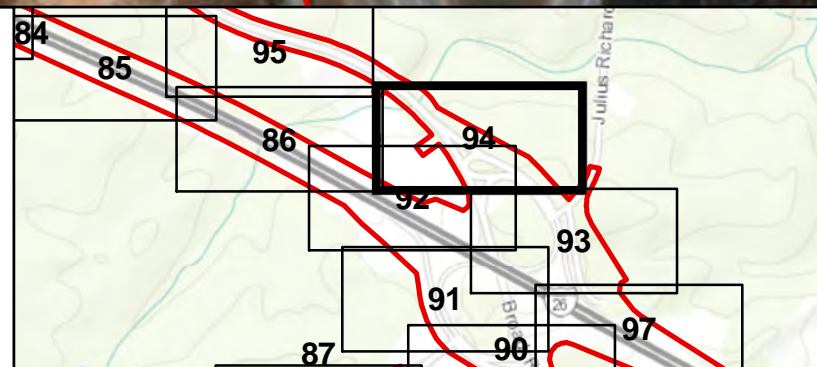
Drawn By: RHH  
QA/QC: KLM  
January 2018





#### Legend

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- Palustrine Forested Wetland
- Palustrine Emergent Wetland



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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
 ESRI Base Map Aerial  
 Photography  
 2015

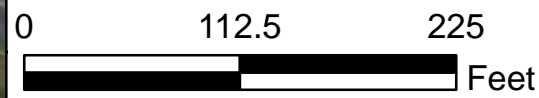
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Drawn By: RHH  
 QA/QC: KLM  
 January 2018



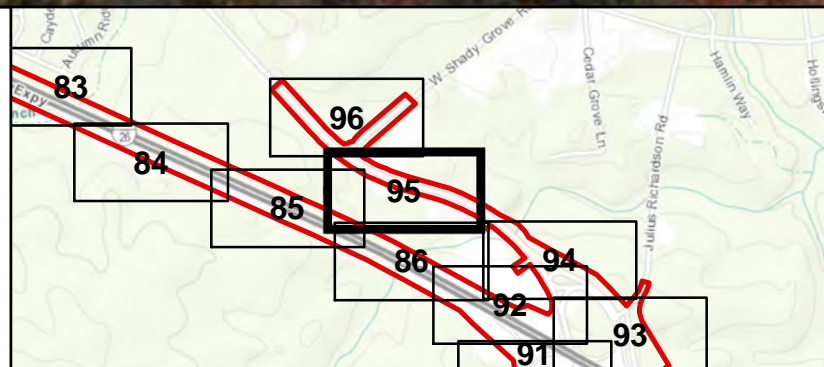


No Aquatic Resources Identified within Project Study Area



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- Palustrine Forested Wetland
- Palustrine Emergent Wetland



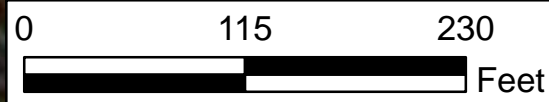
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

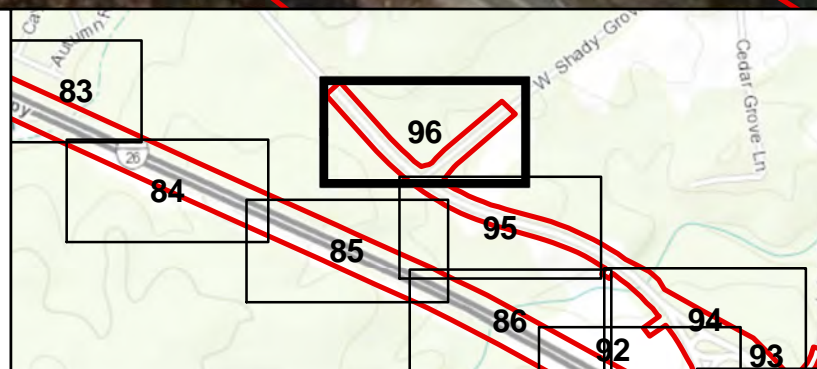
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

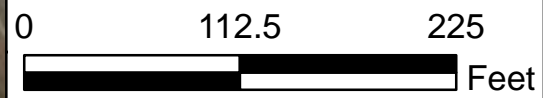
Palustrine Emergent Wetland  
Wetland C (0.0146 Acres).

UC2  
WC1  
WDPC  
UDPC



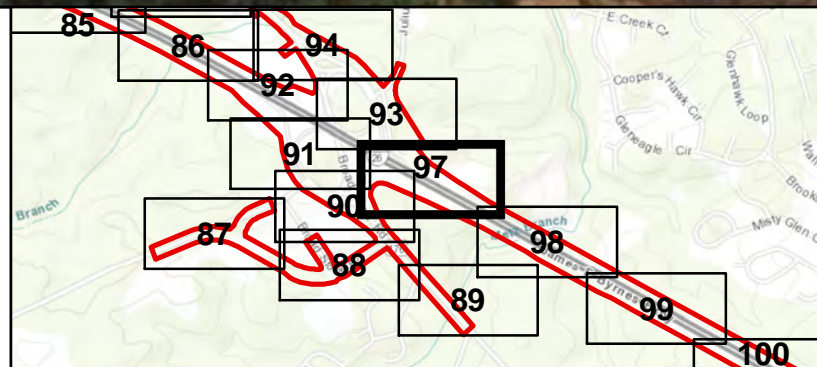


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
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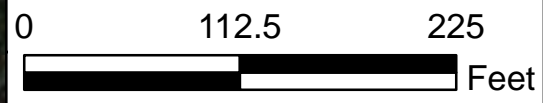
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

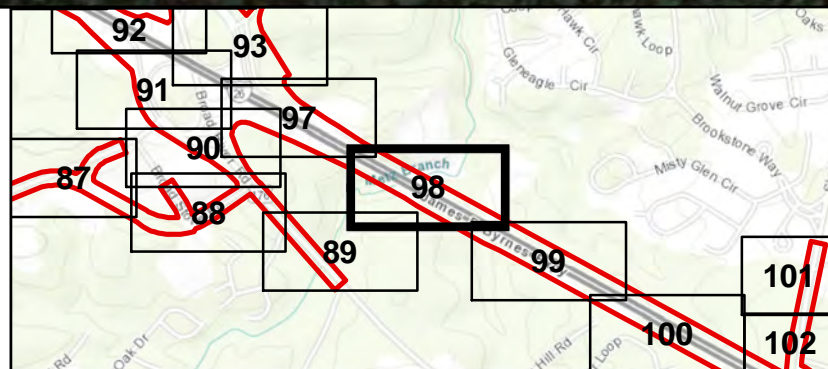
Drawn By: RHH  
QA/QC: KLM  
January 2018





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**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018

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**UDP13**

Non-wetlands waters 13  
(Stream)

**13**

Non-wetlands waters 13  
(Stream)

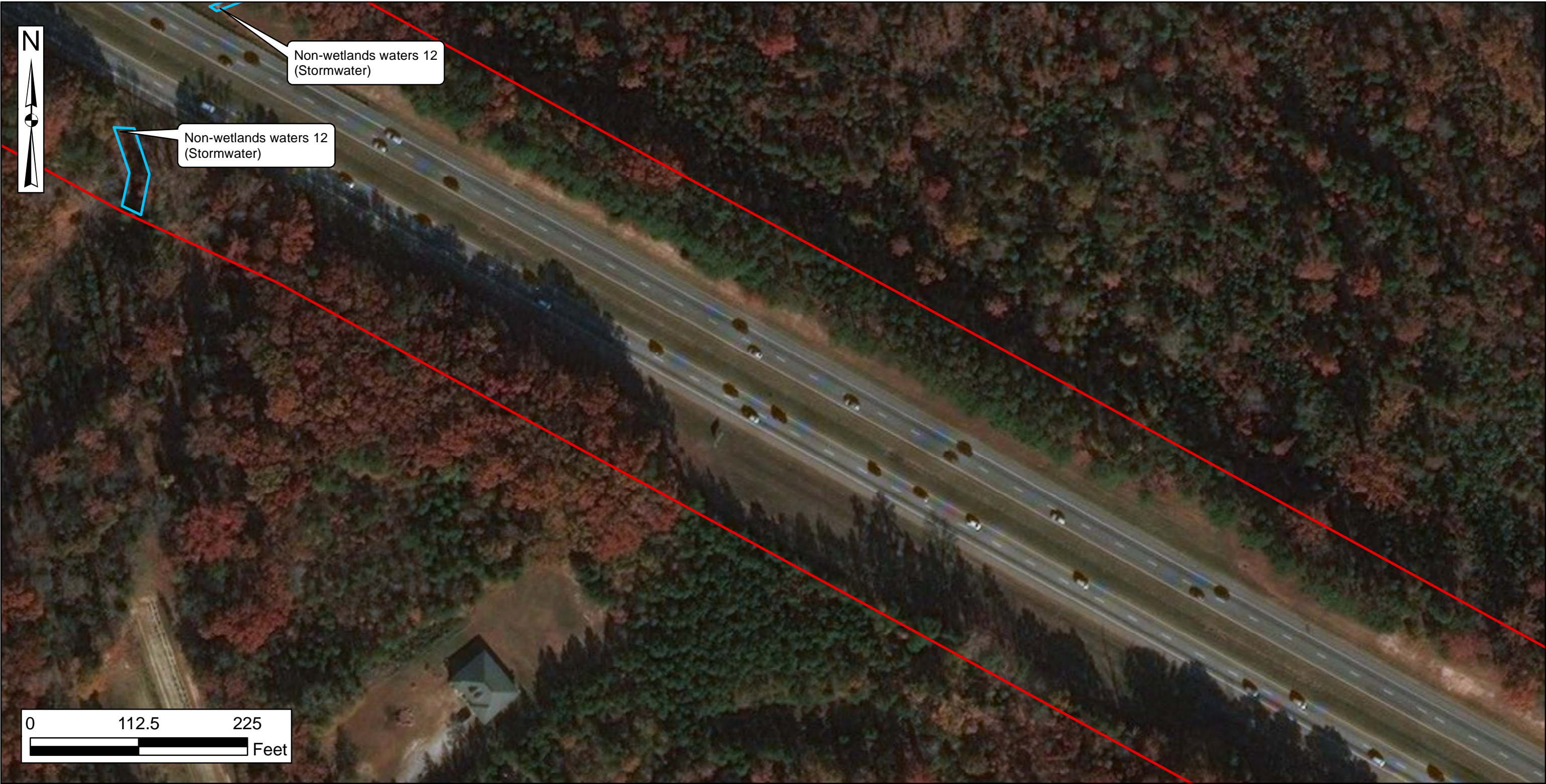
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**UDP12**

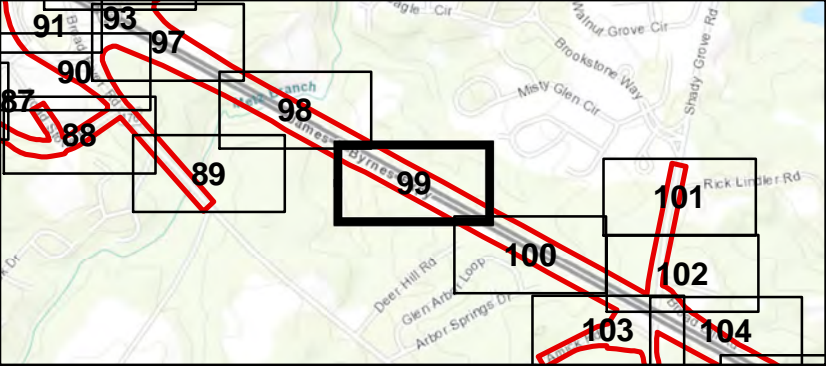
Non-wetlands waters 12  
(Stream)

Non-wetlands waters 12  
(Stormwater)





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



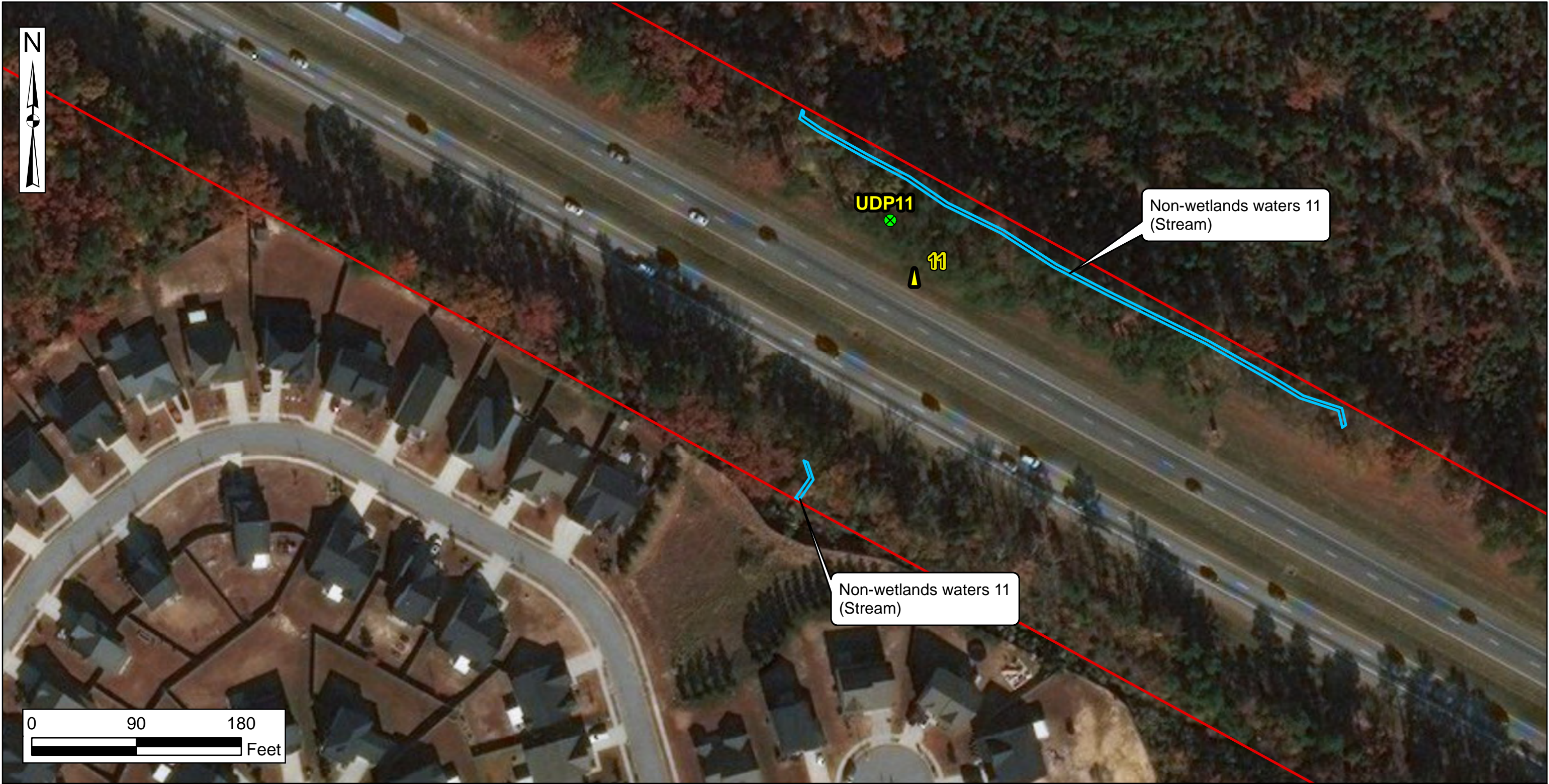
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

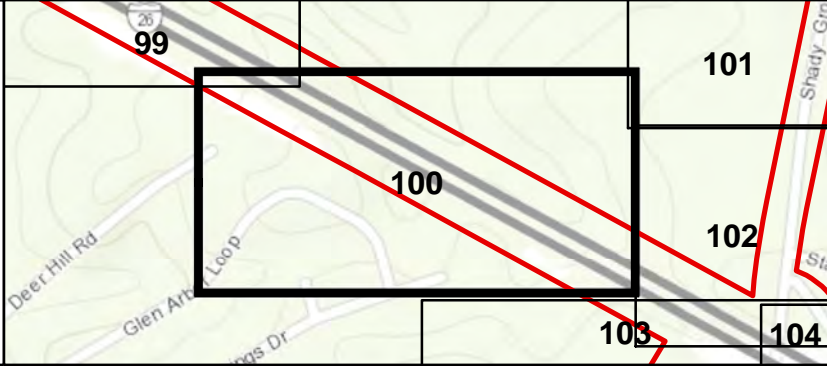
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
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  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland

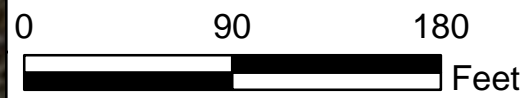


<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: ESRI Base Map Aerial Photography 2015	<b>AQUATIC RESOURCES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 100 of 125



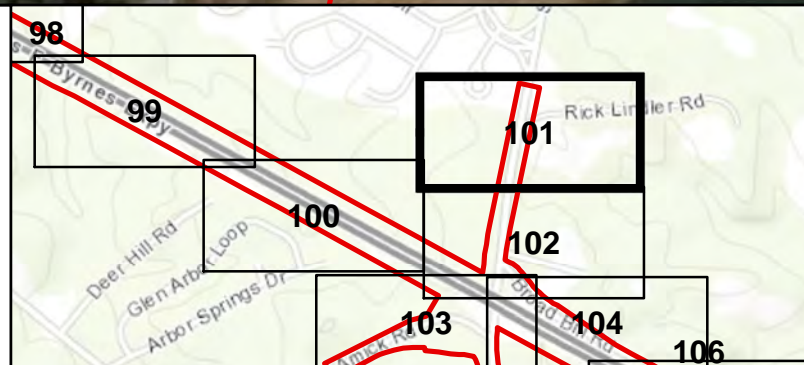


No Aquatic Resources Identified within Project Study Area



**Legend**

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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

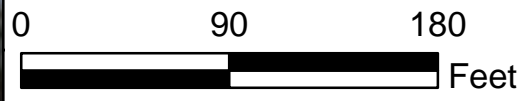
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Drawn By: RHH  
QA/QC: KLM  
January 2018



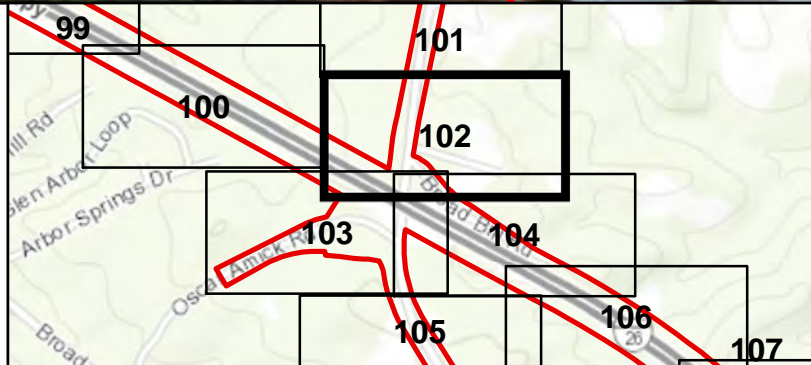


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**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

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ESRI Base Map Aerial  
Photography  
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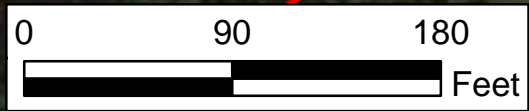
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Drawn By: RHH  
QA/QC: KLM  
January 2018









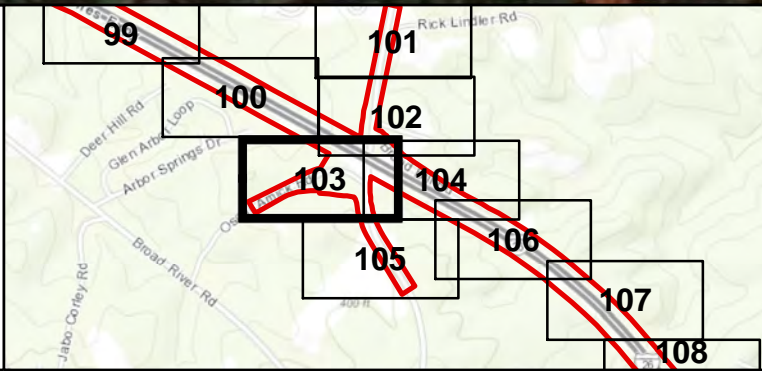


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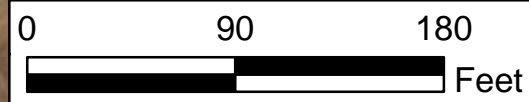
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Drawn By: RHH  
QA/QC: KLM  
January 2018



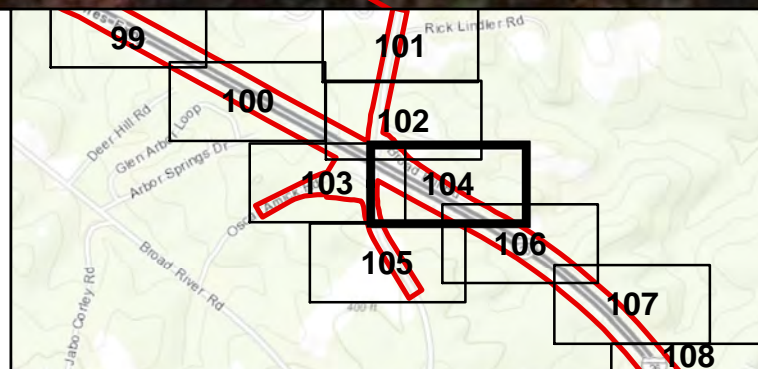


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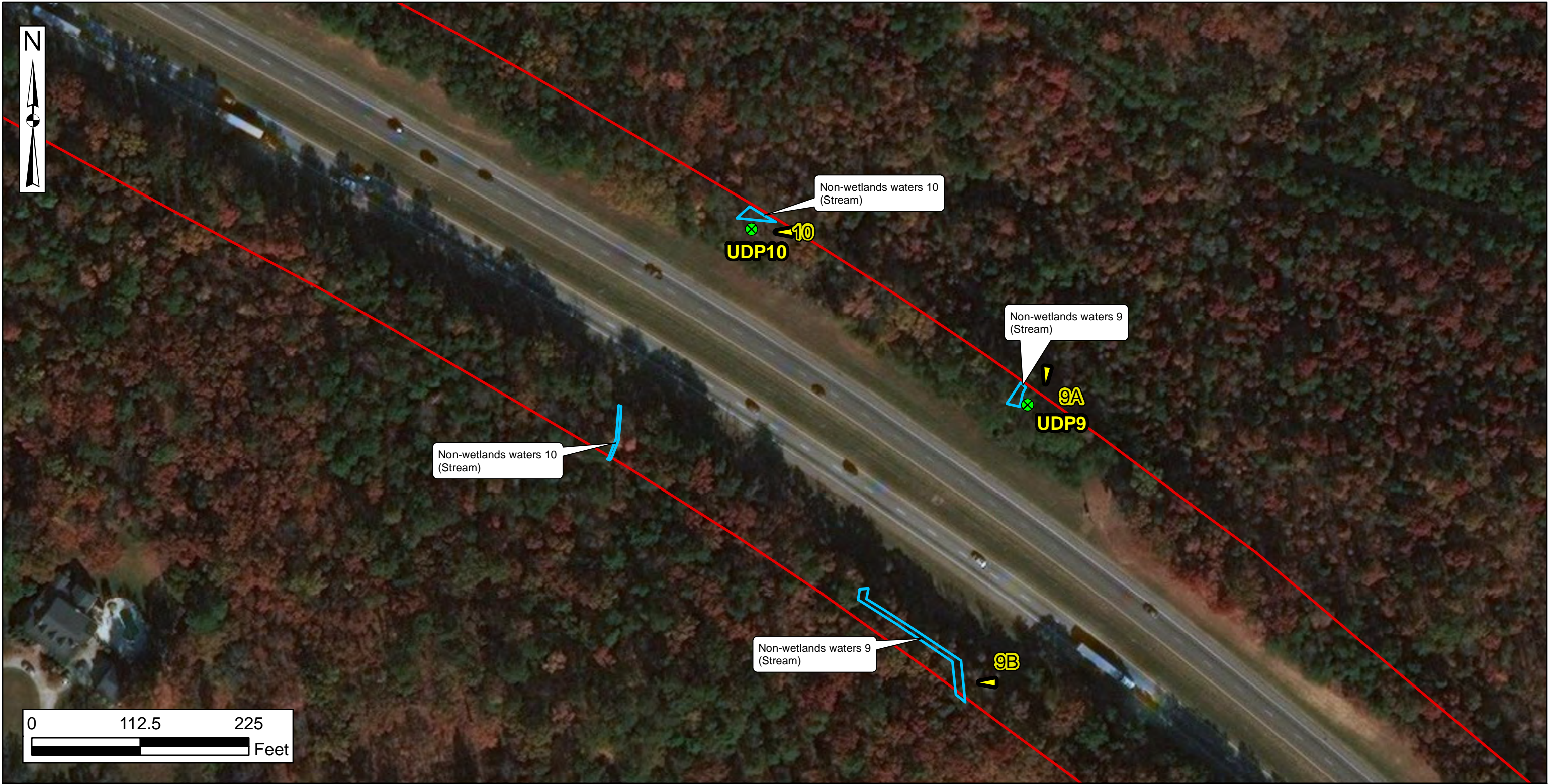
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
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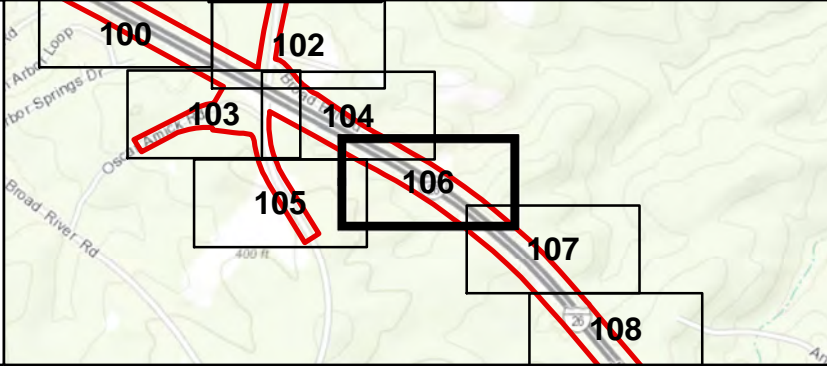
**AQUATIC RESOURCES**

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QA/QC: KLM  
January 2018





- Legend**
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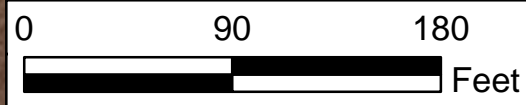
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January 2018



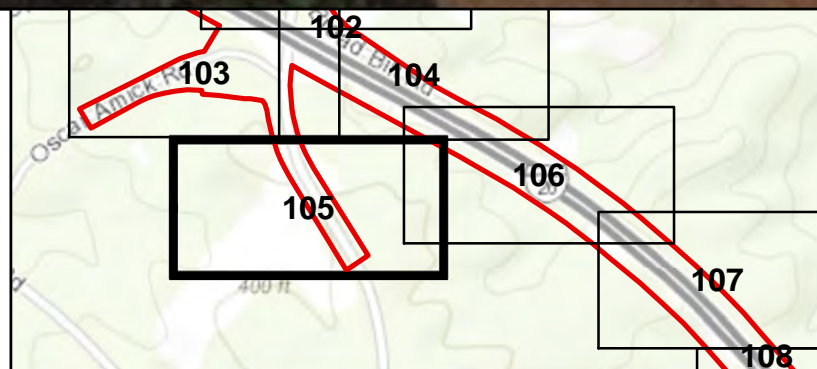


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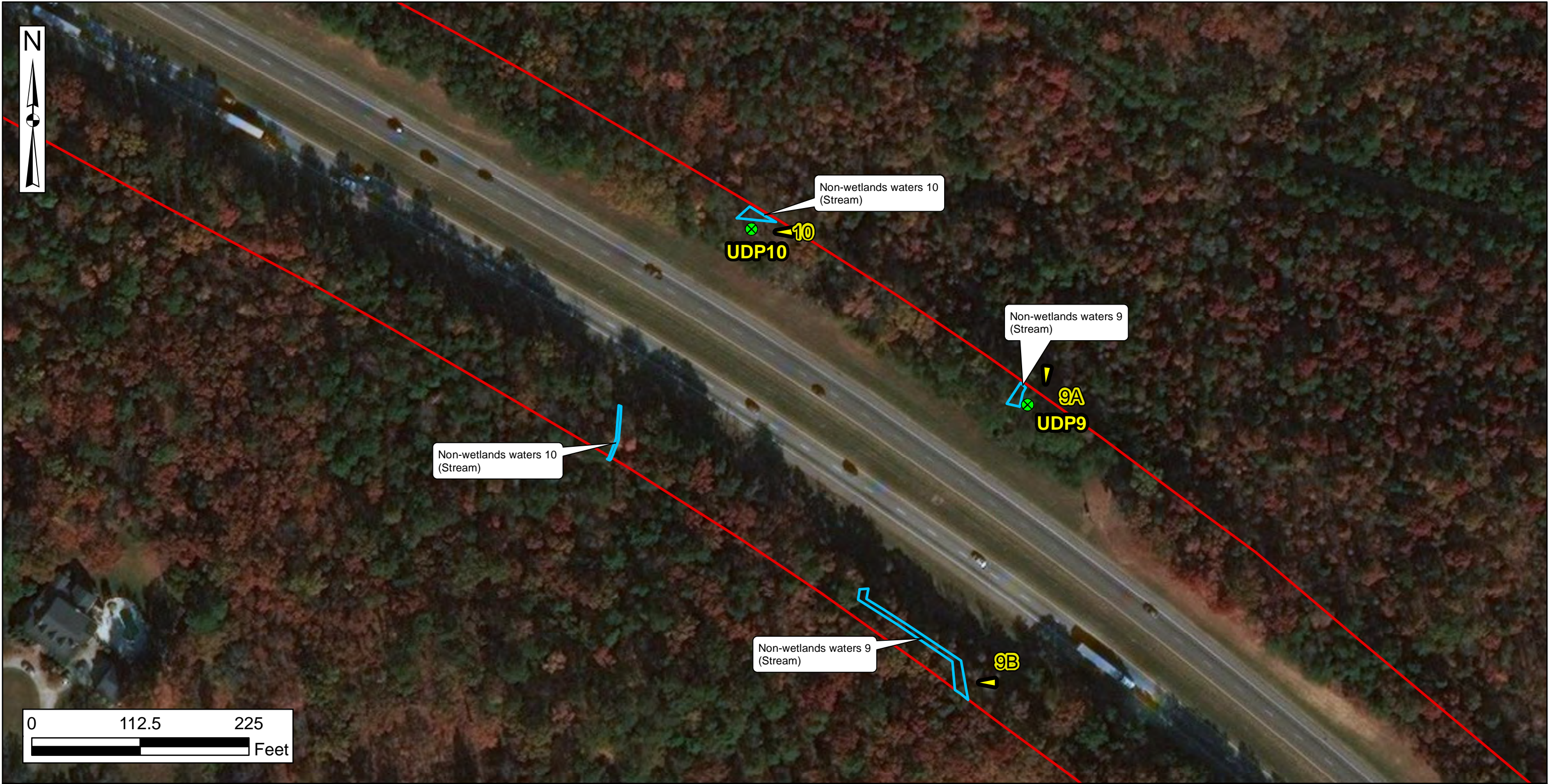
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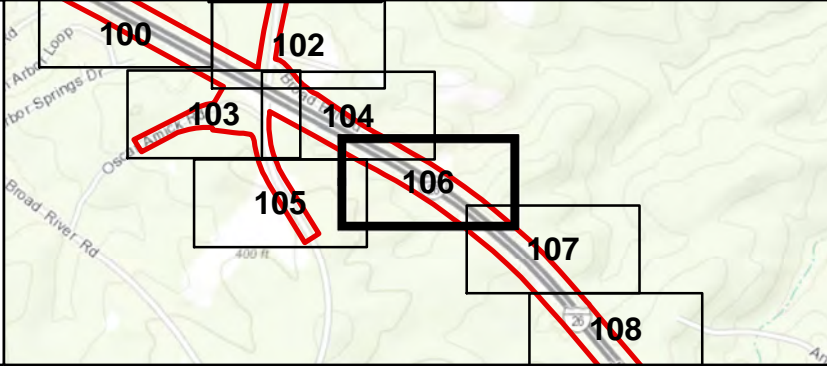
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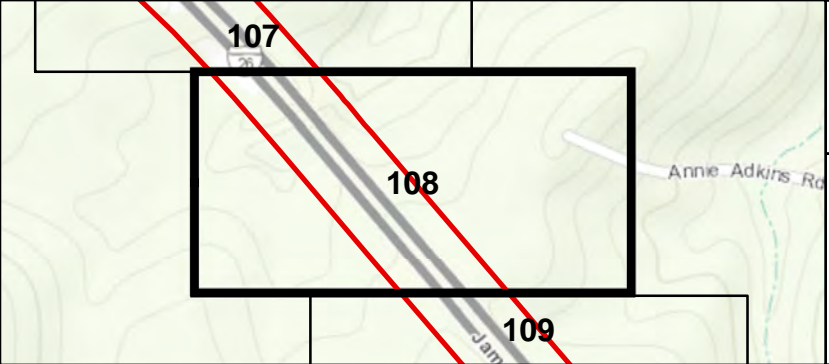
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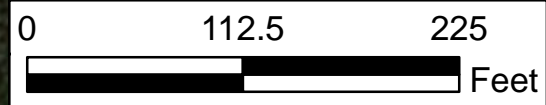
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QA/QC: KLM  
January 2018



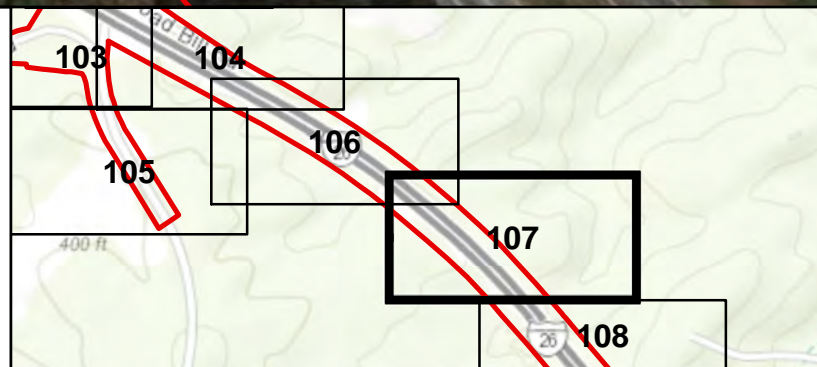


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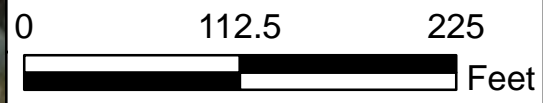
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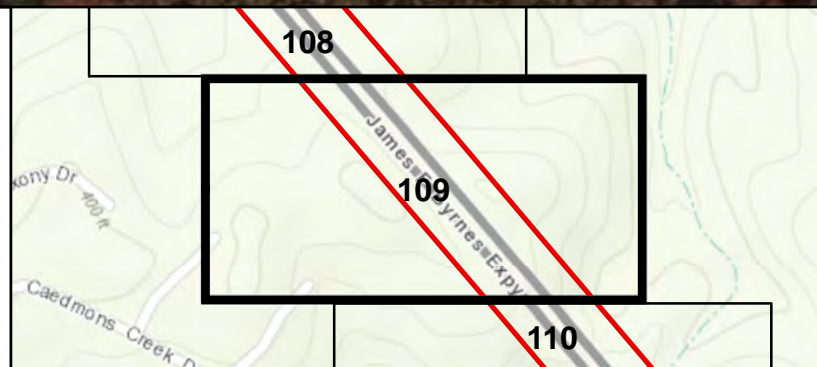


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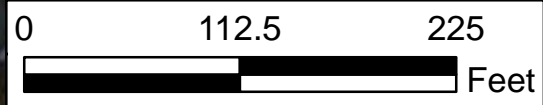
**I-26 Design Build Widening MM 85 to MM 101**  
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**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

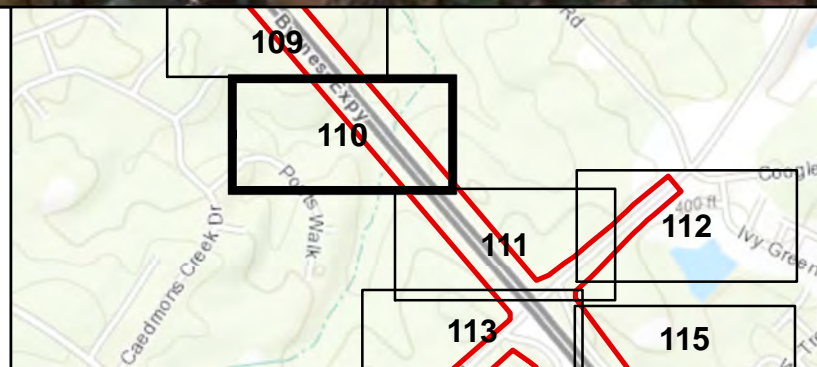
Drawn By: RHH  
QA/QC: KLM  
January 2018





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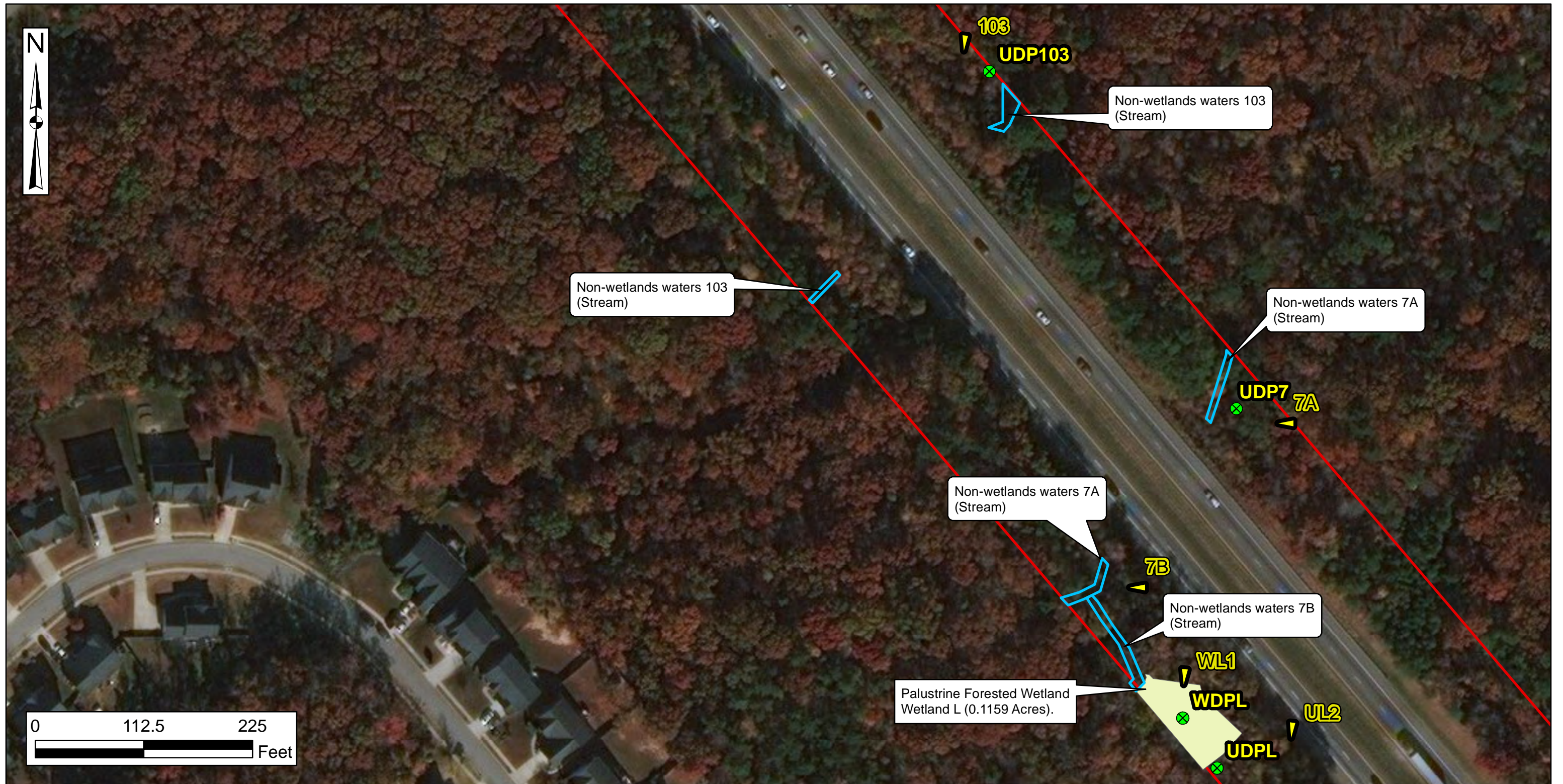


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**AQUATIC RESOURCES**

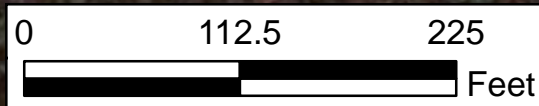
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QA/QC: KLM  
January 2018



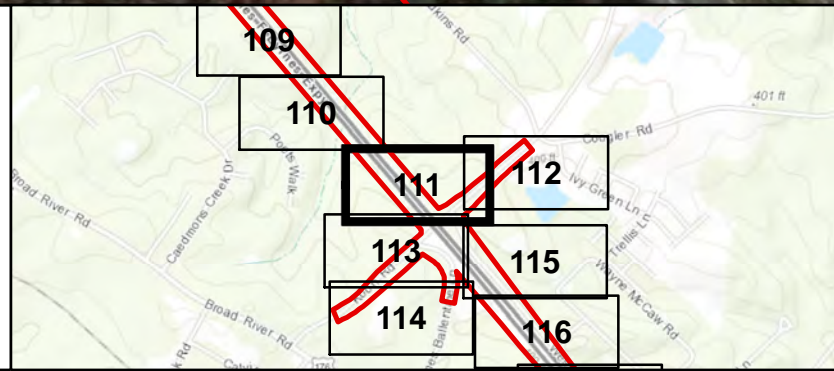




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2015

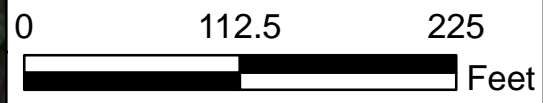
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



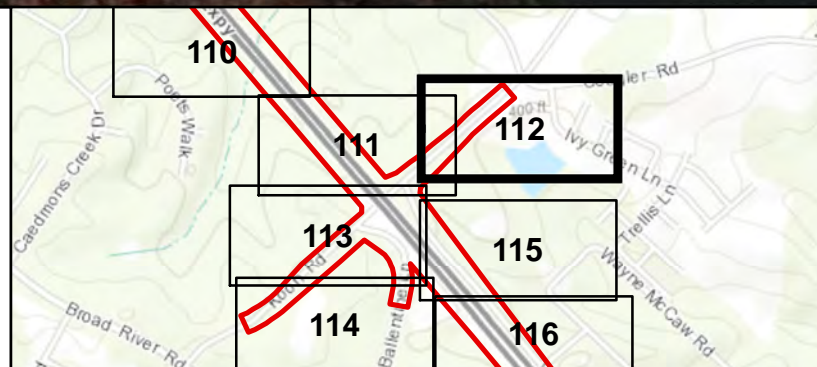


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

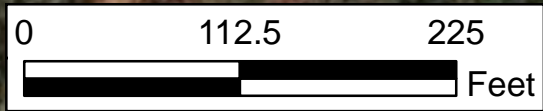
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



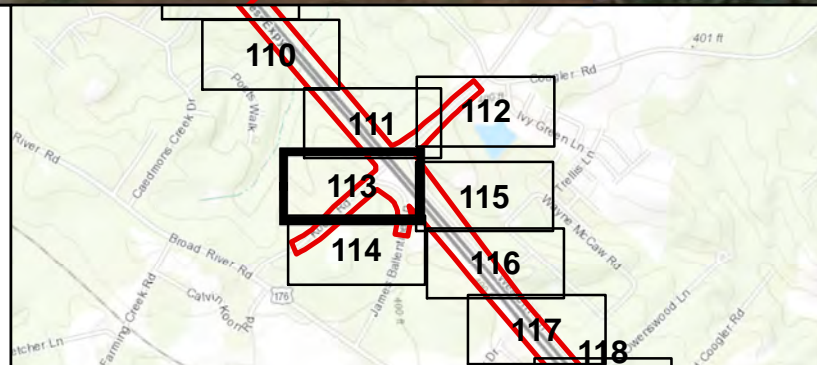


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

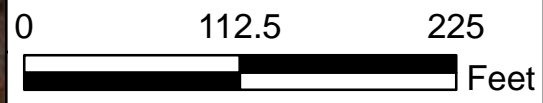
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Drawn By: RHH  
QA/QC: KLM  
January 2018



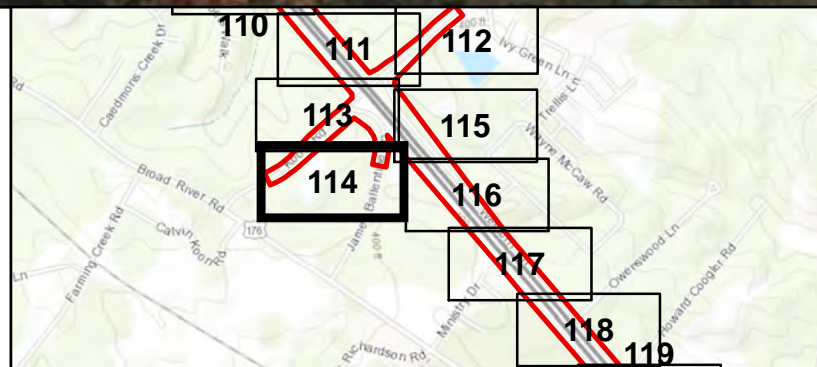


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

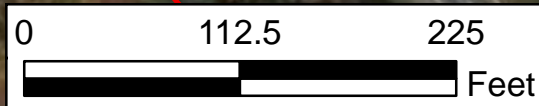
Drawn By: RHH  
QA/QC: KLM  
January 2018



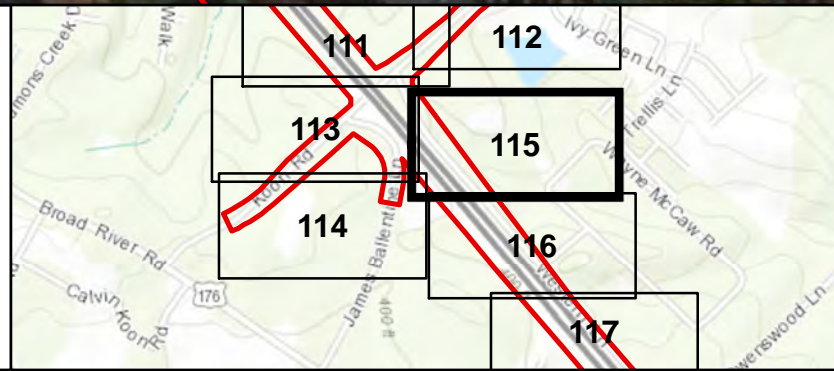


UPDB  
UB2  
WDPB  
WB1

Palustrine Forested Wetland  
Wetland B (0.1082 Acres).



- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

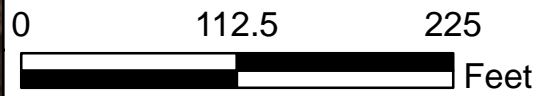
Drawn By: RHH  
QA/QC: KLM  
January 2018





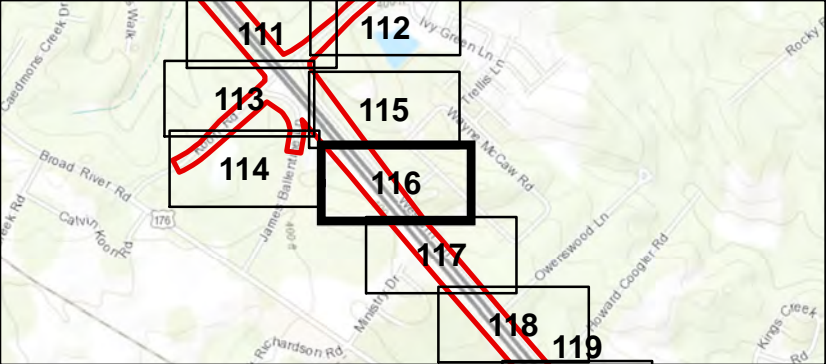
UDPA UA2  
WDPA WA1

Palustrine Emergent Wetland  
Wetland A (0.0186 Acres).



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



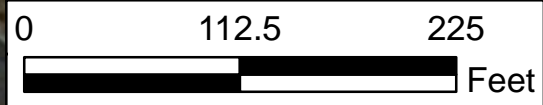
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





Non-wetlands waters 2  
(Stream)

Non-wetlands waters 2  
(Stream)

2A

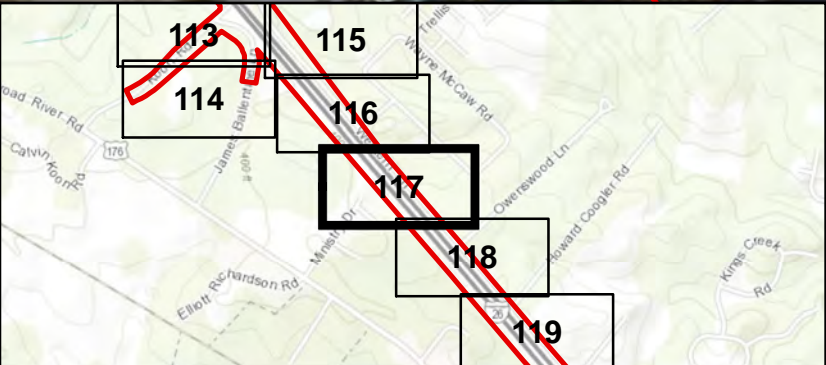
UDP2

2B



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

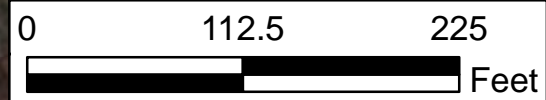
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



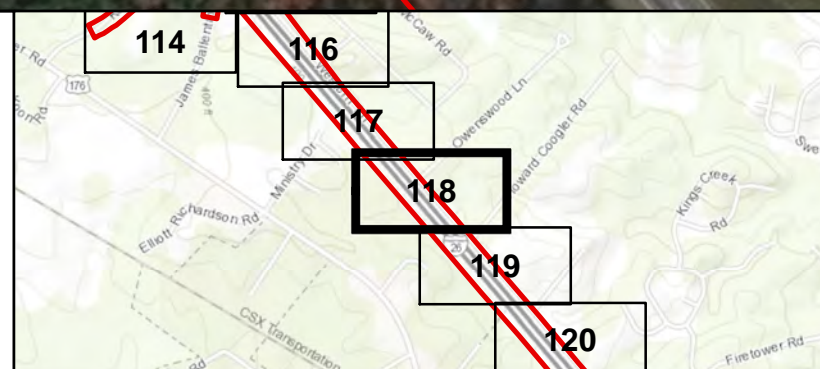


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

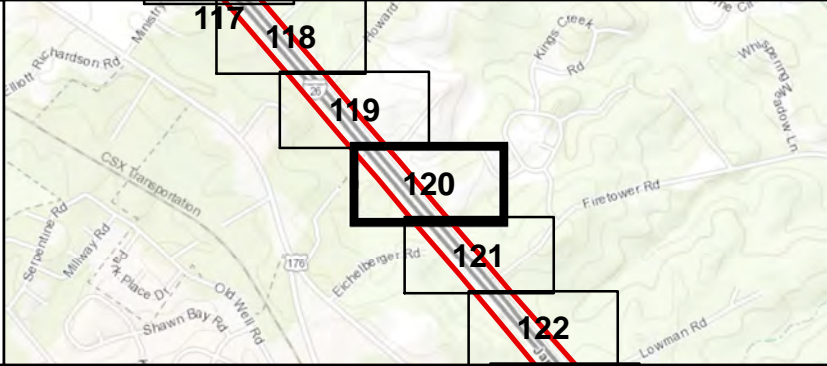
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

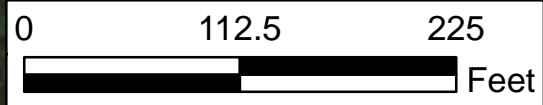
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



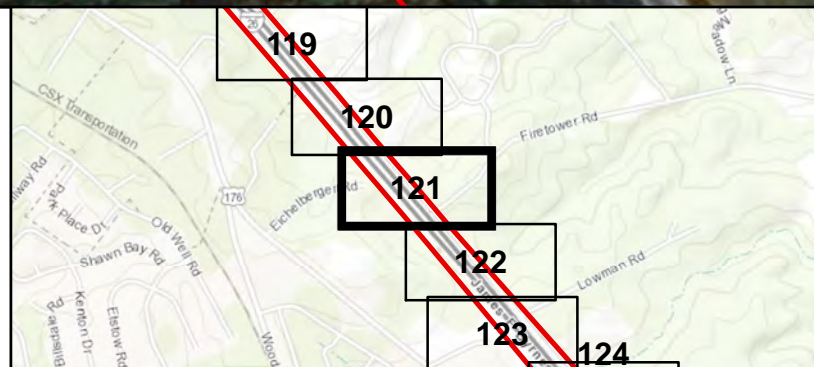


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

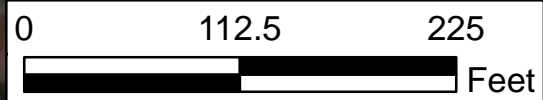
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QA/QC: KLM  
January 2018





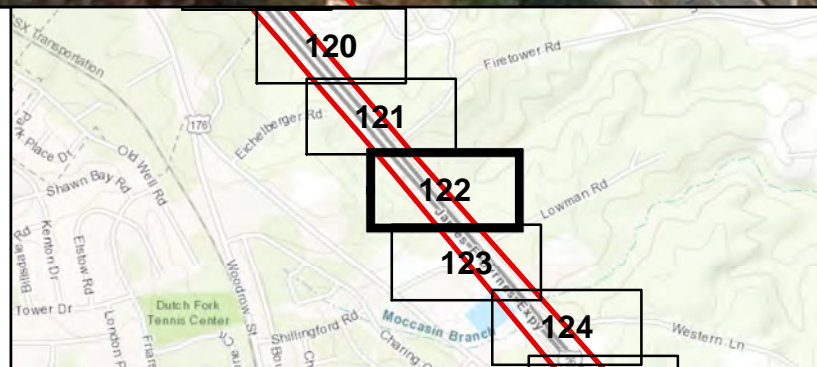
1D

Non-wetlands waters 1D  
(Stream)



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



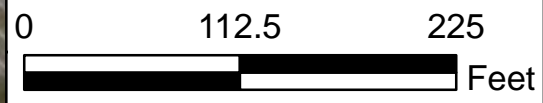
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



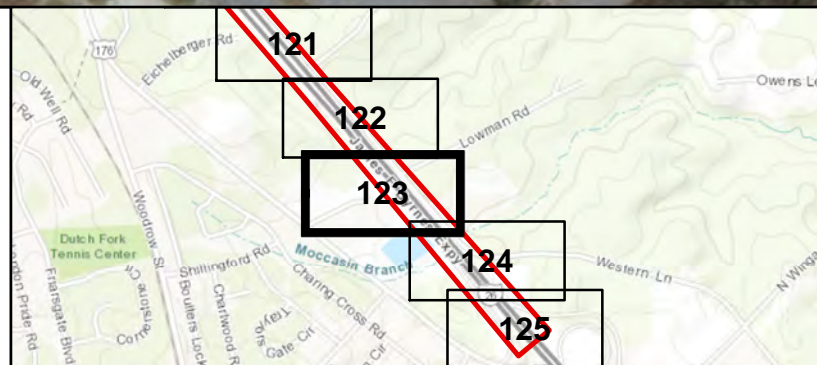


Non-wetlands waters  
Pond A



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

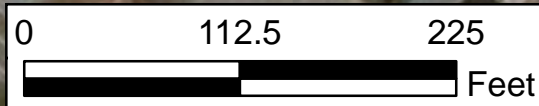
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



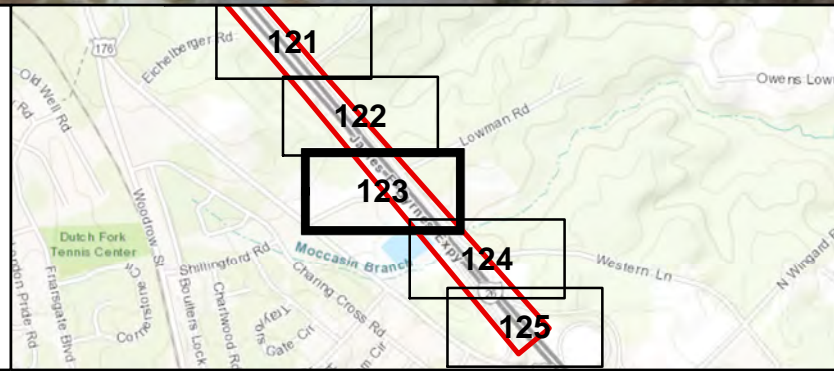


Non-wetlands Waters 108  
(Pond)



**Legend**

- Data Point
- Palustrine Forested Wetland
- Photo Point
- Palustrine Emergent Wetland
- Stream
- Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

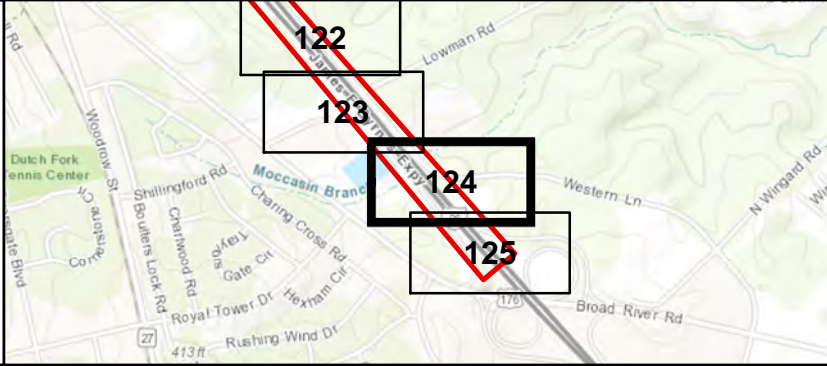
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018





- Legend**
- Data Point
  - Photo Point
  - Stream
  - Project Study Area
  - Palustrine Forested Wetland
  - Palustrine Emergent Wetland



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

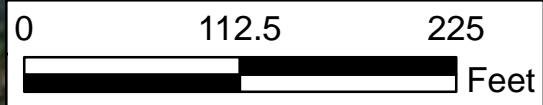
**AQUATIC RESOURCES**

Drawn By: RHH  
QA/QC: KLM  
January 2018



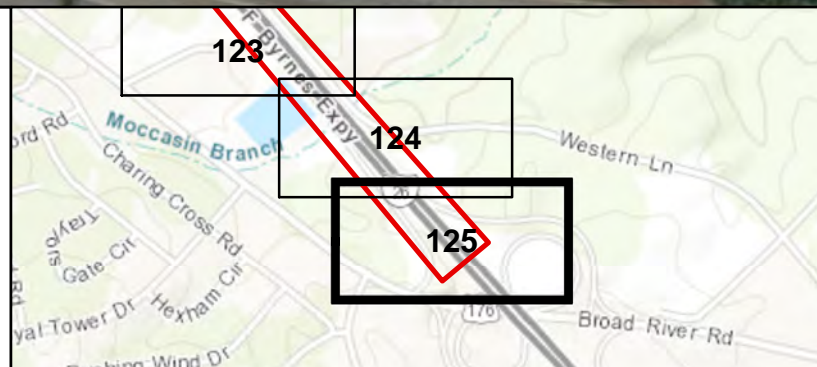


No Aquatic Resources Identified within Project Study Area



**Legend**

- Data Point
- Photo Point
- Stream
- Project Study Area
- Palustrine Forested Wetland
- Palustrine Emergent Wetland



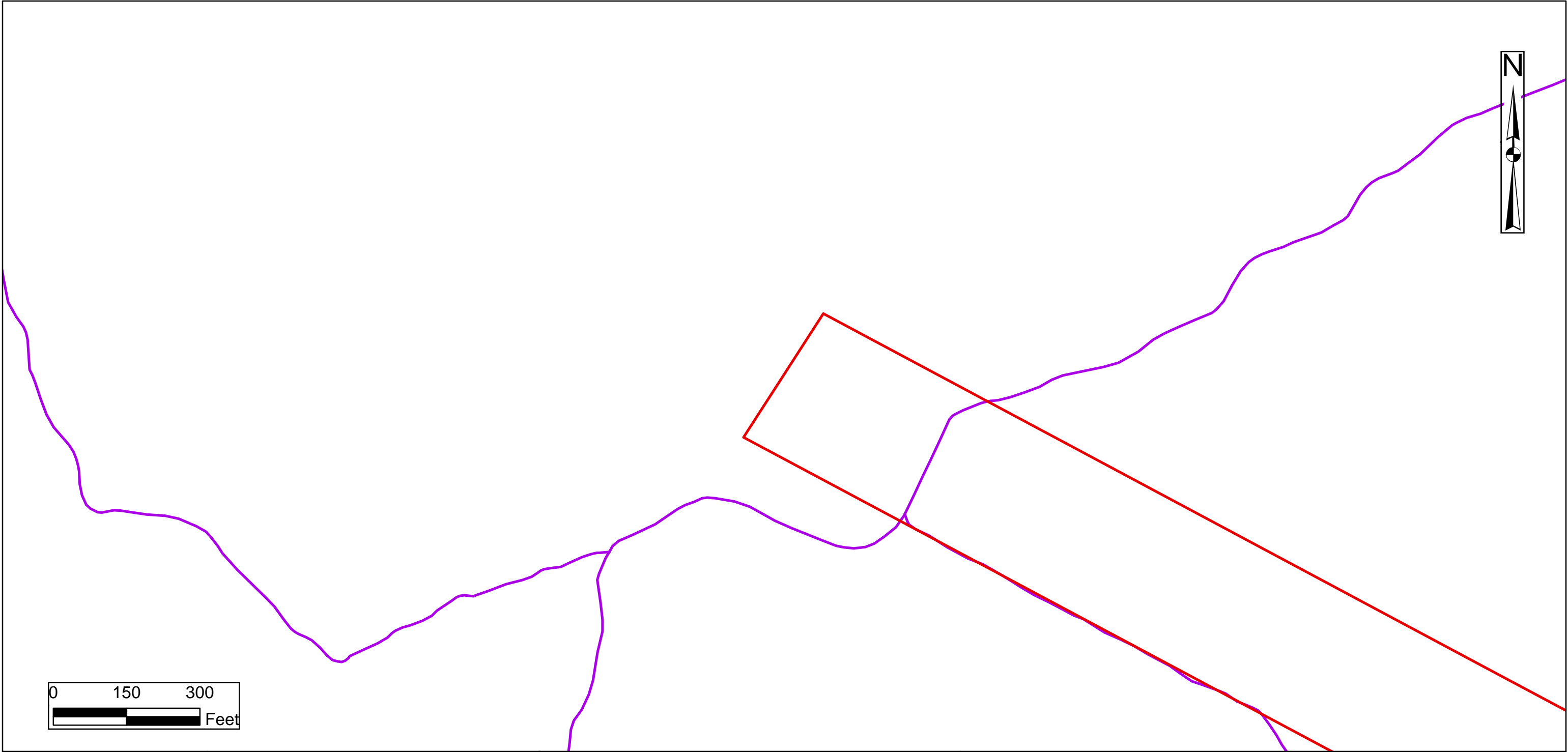
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
ESRI Base Map Aerial  
Photography  
2015

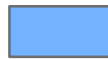


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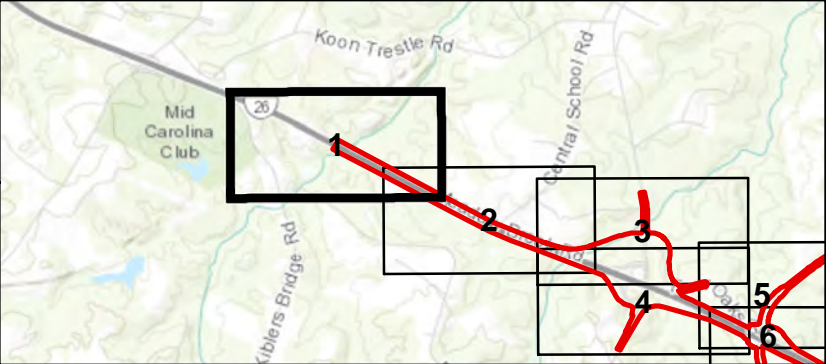
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections



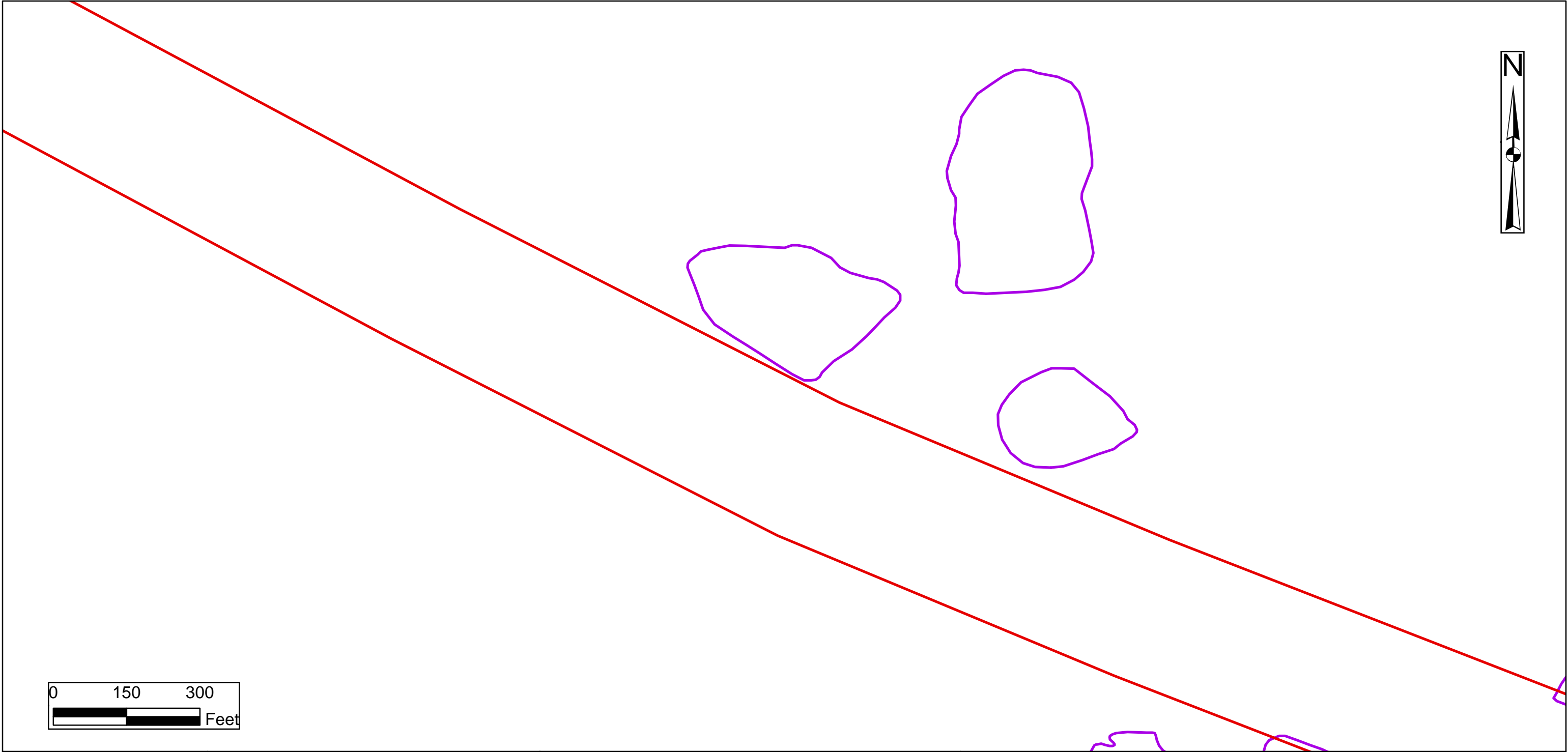
**I-26 Design Build Widening MM 85 to MM 101  
Newberry, Lexington, Richland Counties  
SCDOT P029208**

Source:  
USGS NHD  
2015

**HYDROLINES**

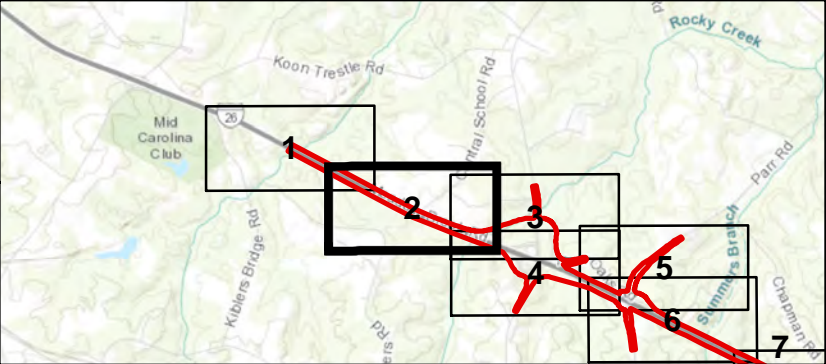
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Waterbody
- Project Study Area
- Hydrological Connections



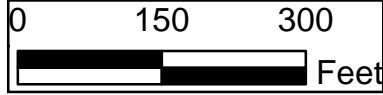
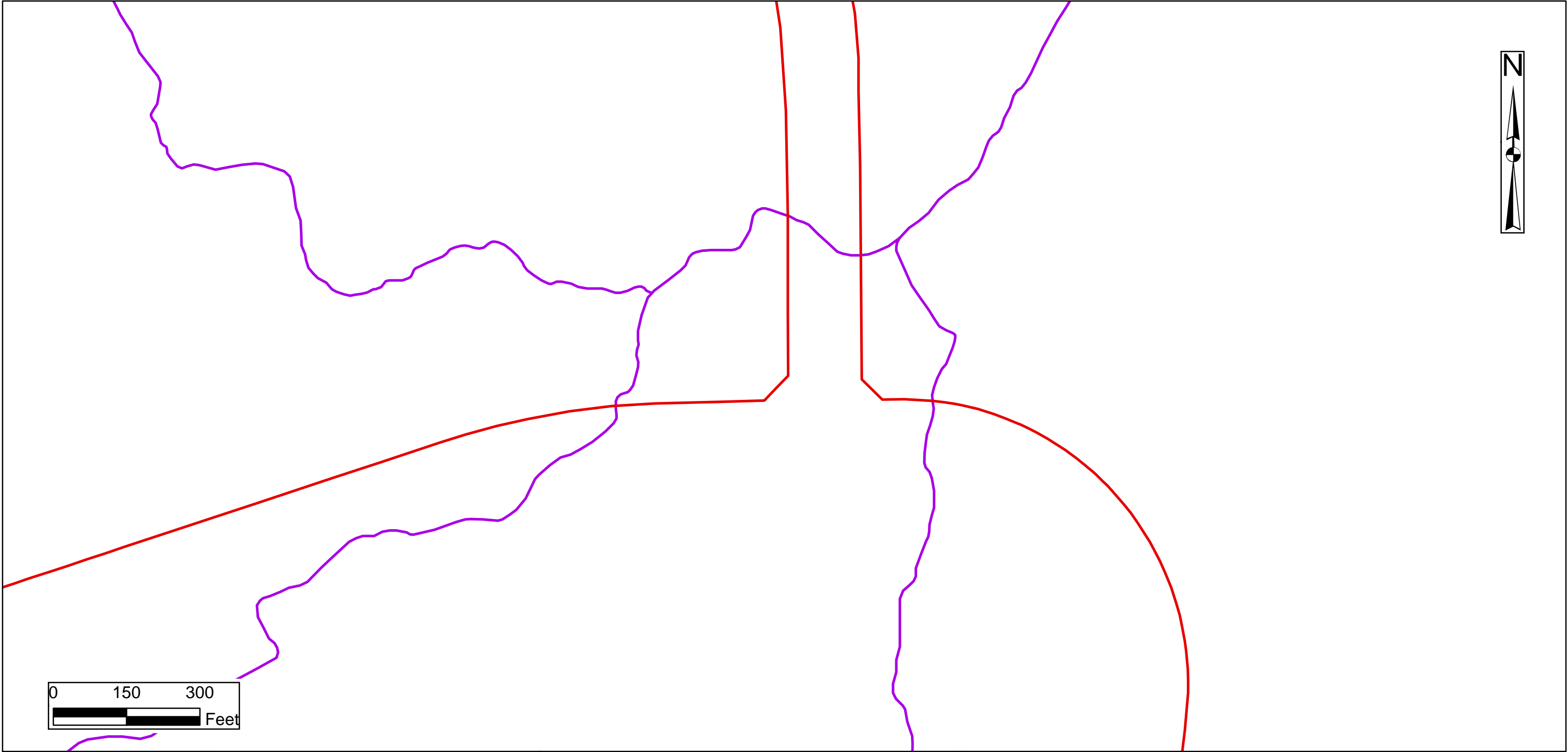
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

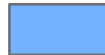


**HYDROLINES**

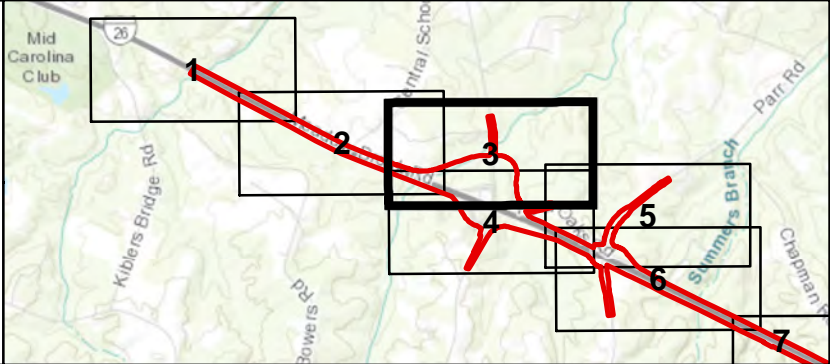
Drawn By: RHH  
QA/QC: KLM  
January 2018





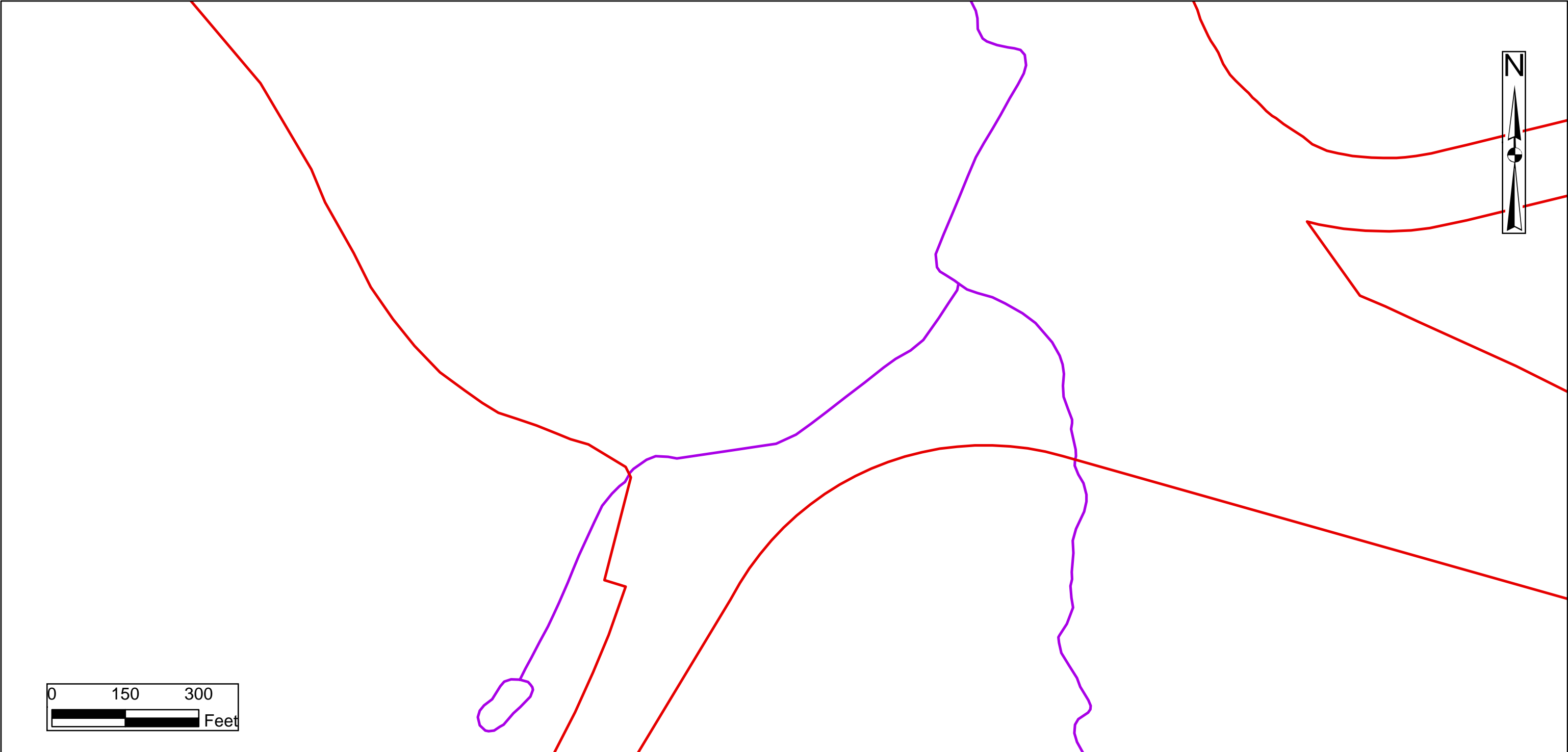
**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections

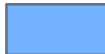




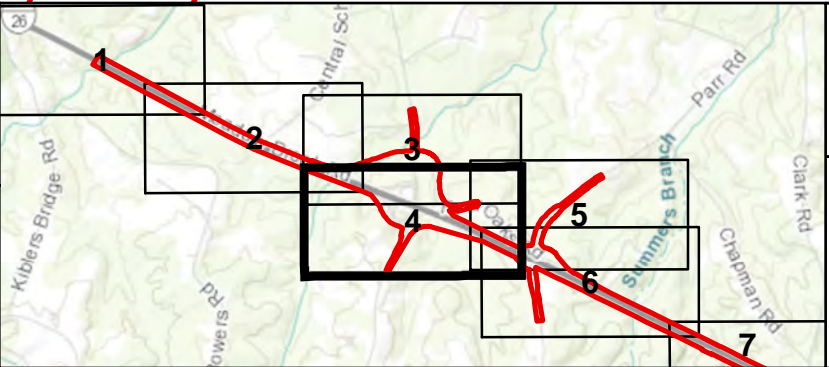
<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: USGS NHD 2015	<b>HYDROLINES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 3 of 26





**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections



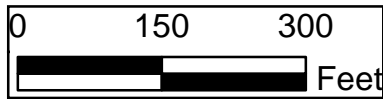
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

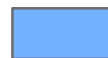


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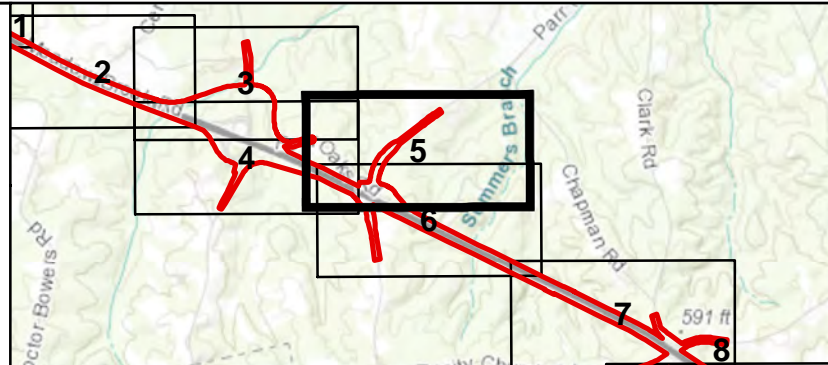
Drawn By: RHH  
QA/QC: KLM  
January 2018





### Legend

-  Waterbody
-  Project Study Area
-  Hydrological Connections



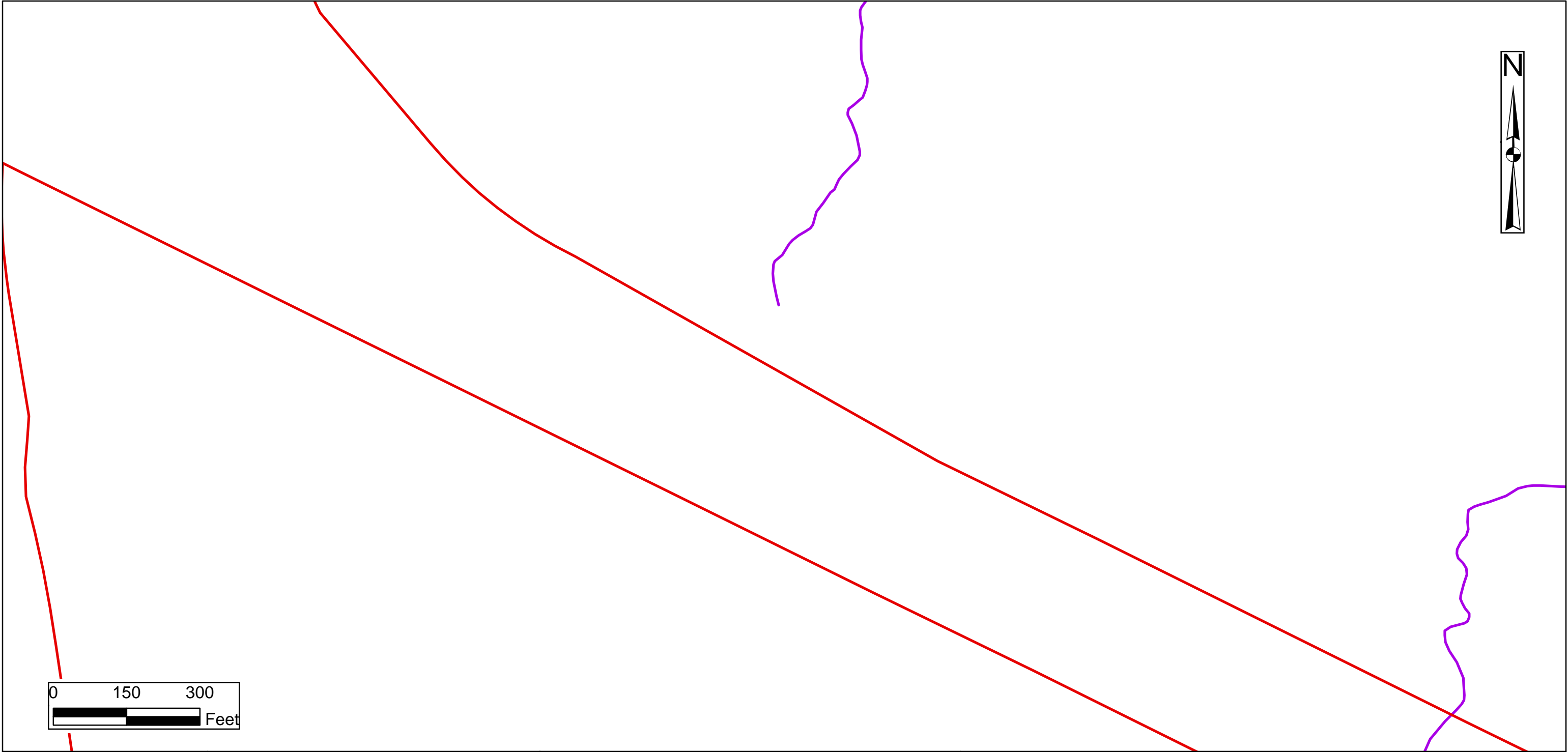
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

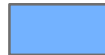


### HYDROLINES

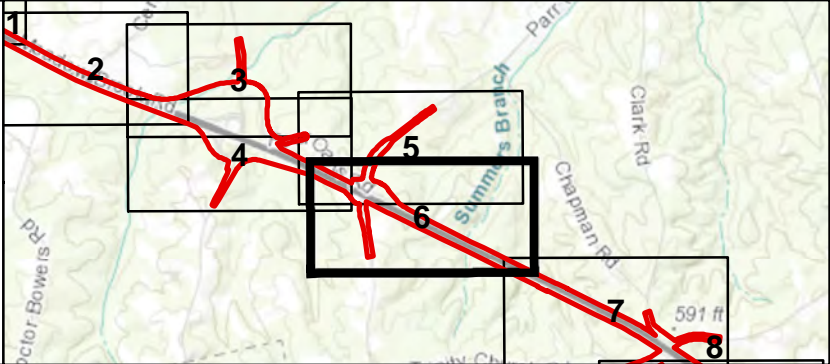
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections



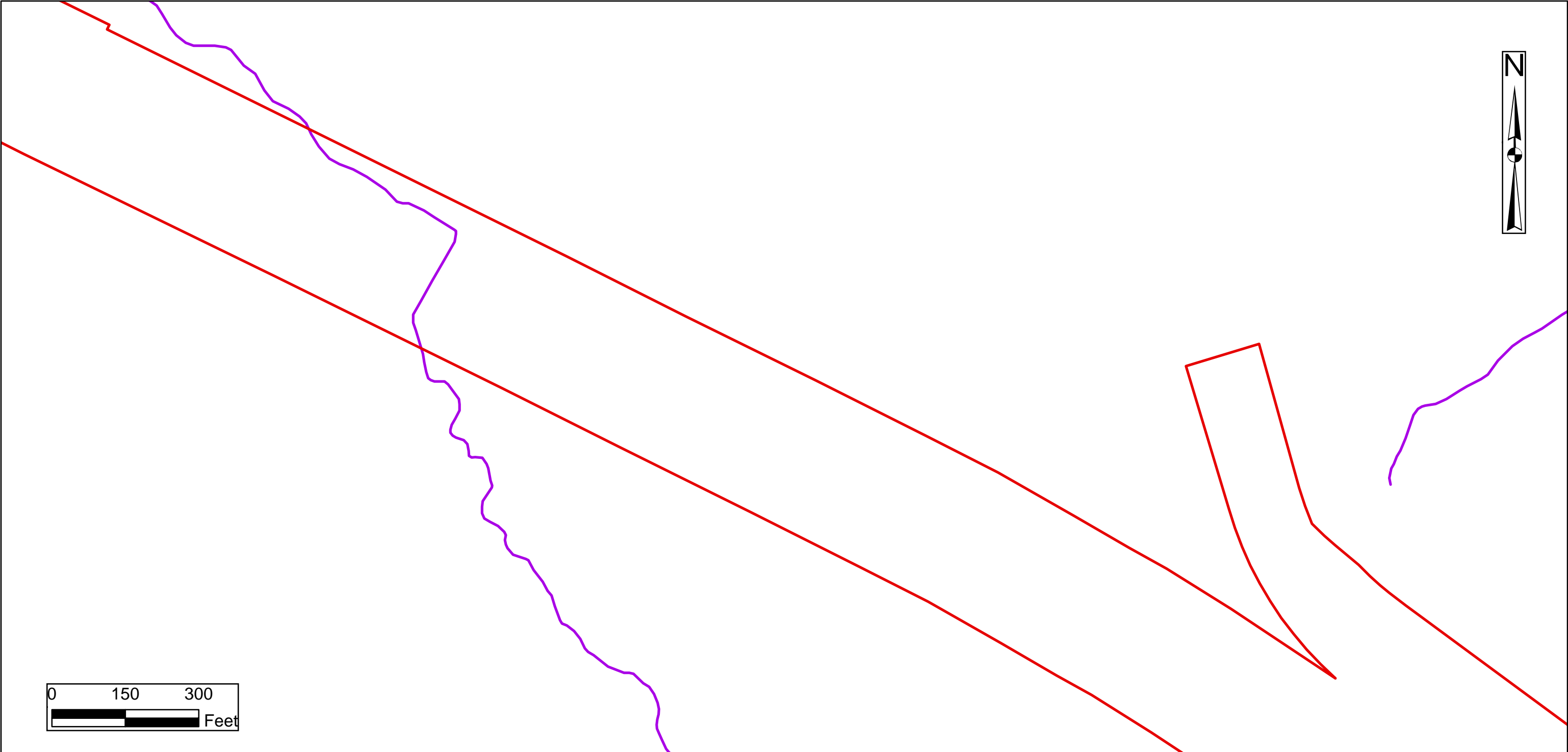
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

**HYDROLINES**

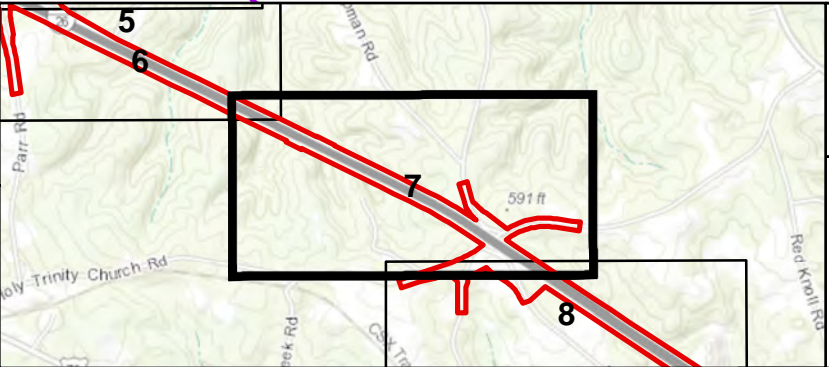
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

- Waterbody
- Project Study Area
- Hydrological Connections



**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

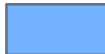


**HYDROLINES**

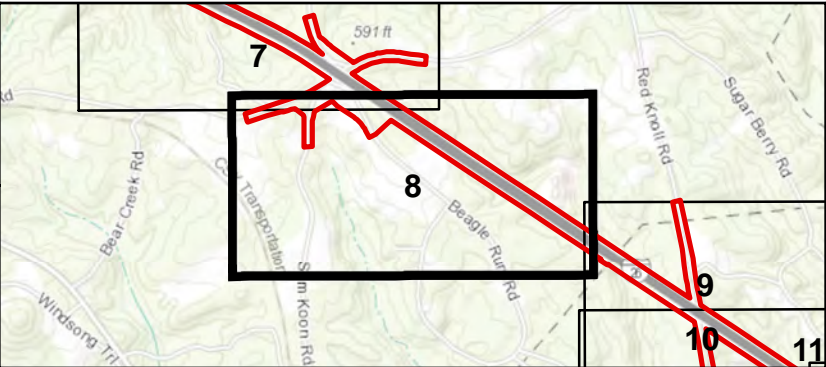
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections



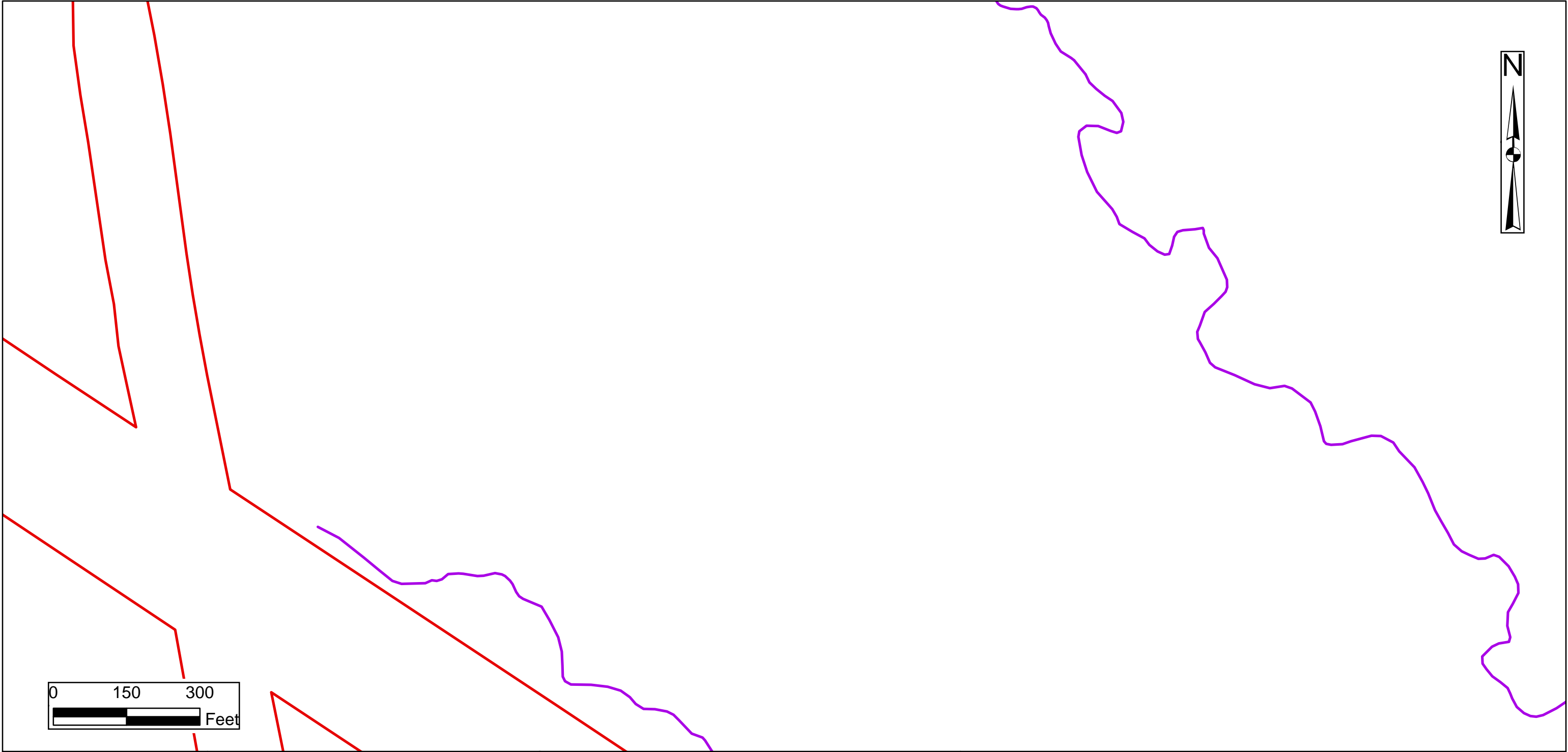
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

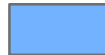


**HYDROLINES**

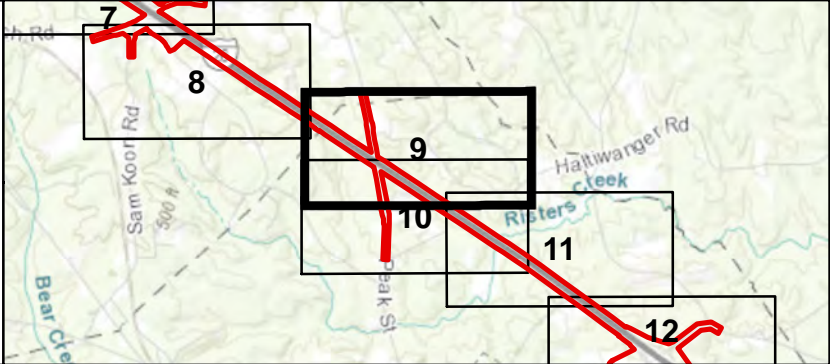
Drawn By: RHH  
QA/QC: KLM  
January 2018





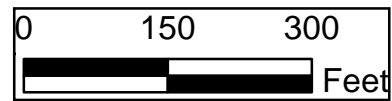
**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections






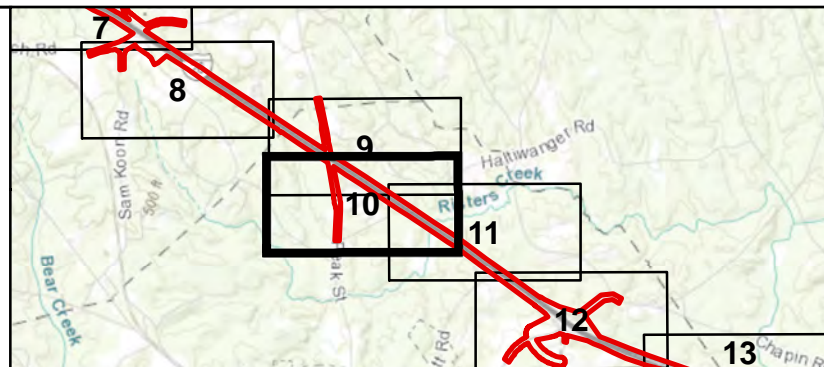
<b>I-26 Design Build Widening MM 85 to MM 101</b> <b>Newberry, Lexington, Richland Counties</b> <b>SCDOT P029208</b>		
Source: USGS NHD 2015	<b>HYDROLINES</b>  Drawn By: RHH QA/QC: KLM January 2018	Page 9 of 26





### Legend

-  Waterbody
-  Project Study Area
-  Hydrological Connections



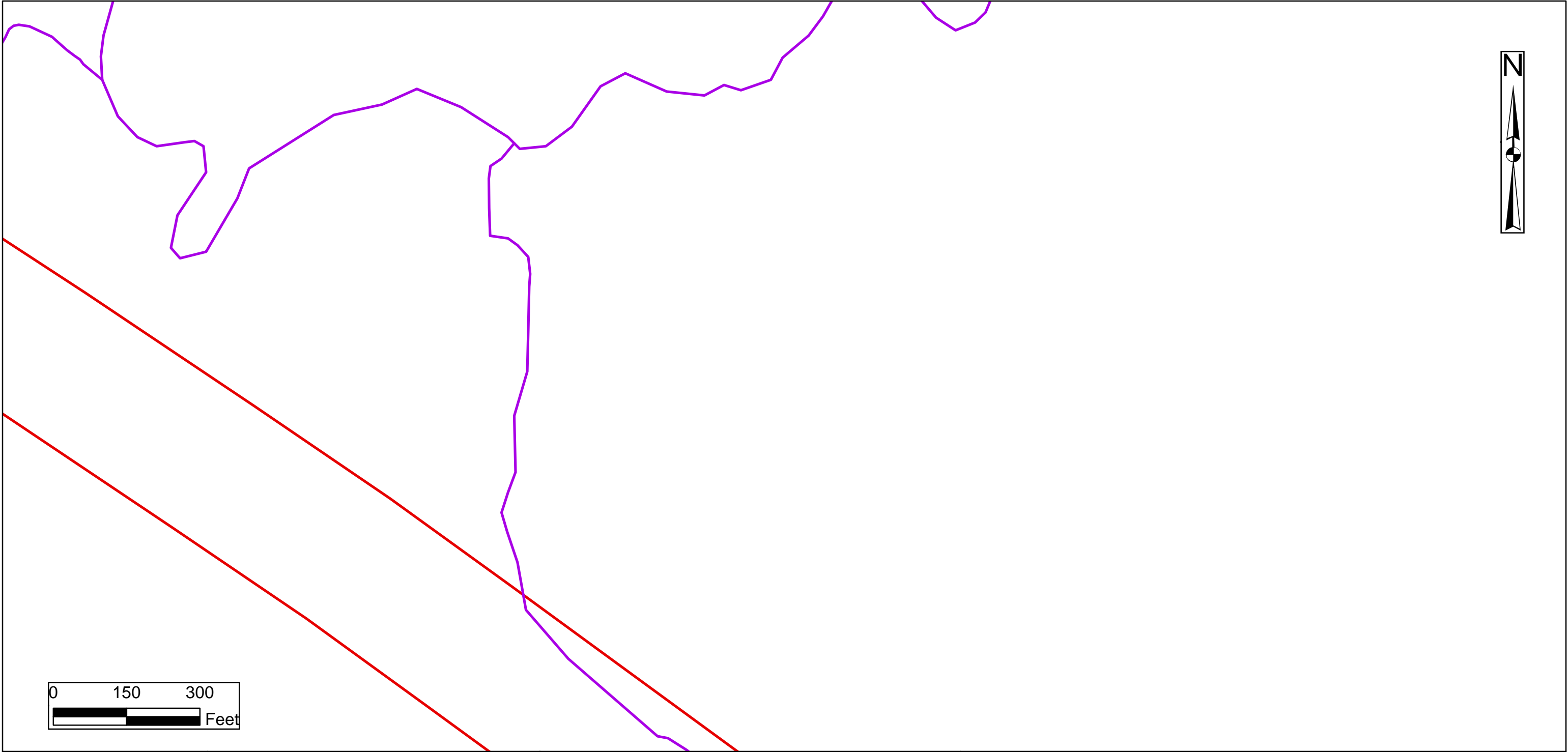
**I-26 Design Build Widening MM 85 to MM 101**  
**Newberry, Lexington, Richland Counties**  
**SCDOT P029208**

Source:  
USGS NHD  
2015

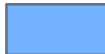


### HYDROLINES

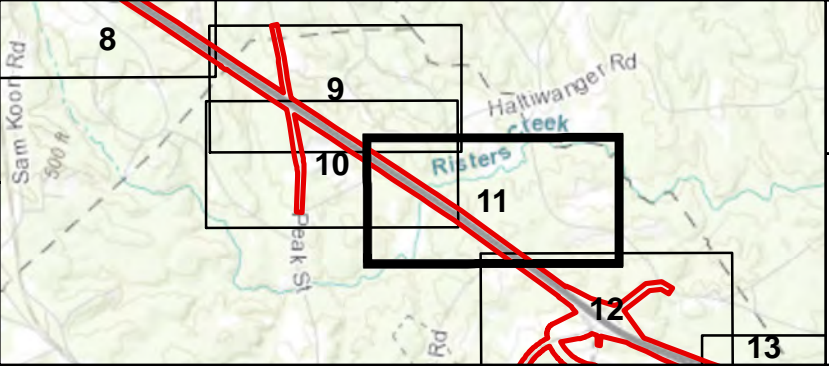
Drawn By: RHH  
QA/QC: KLM  
January 2018





**Legend**

-  Waterbody
-  Project Study Area
-  Hydrological Connections



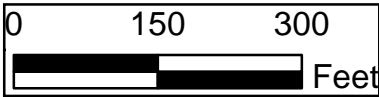
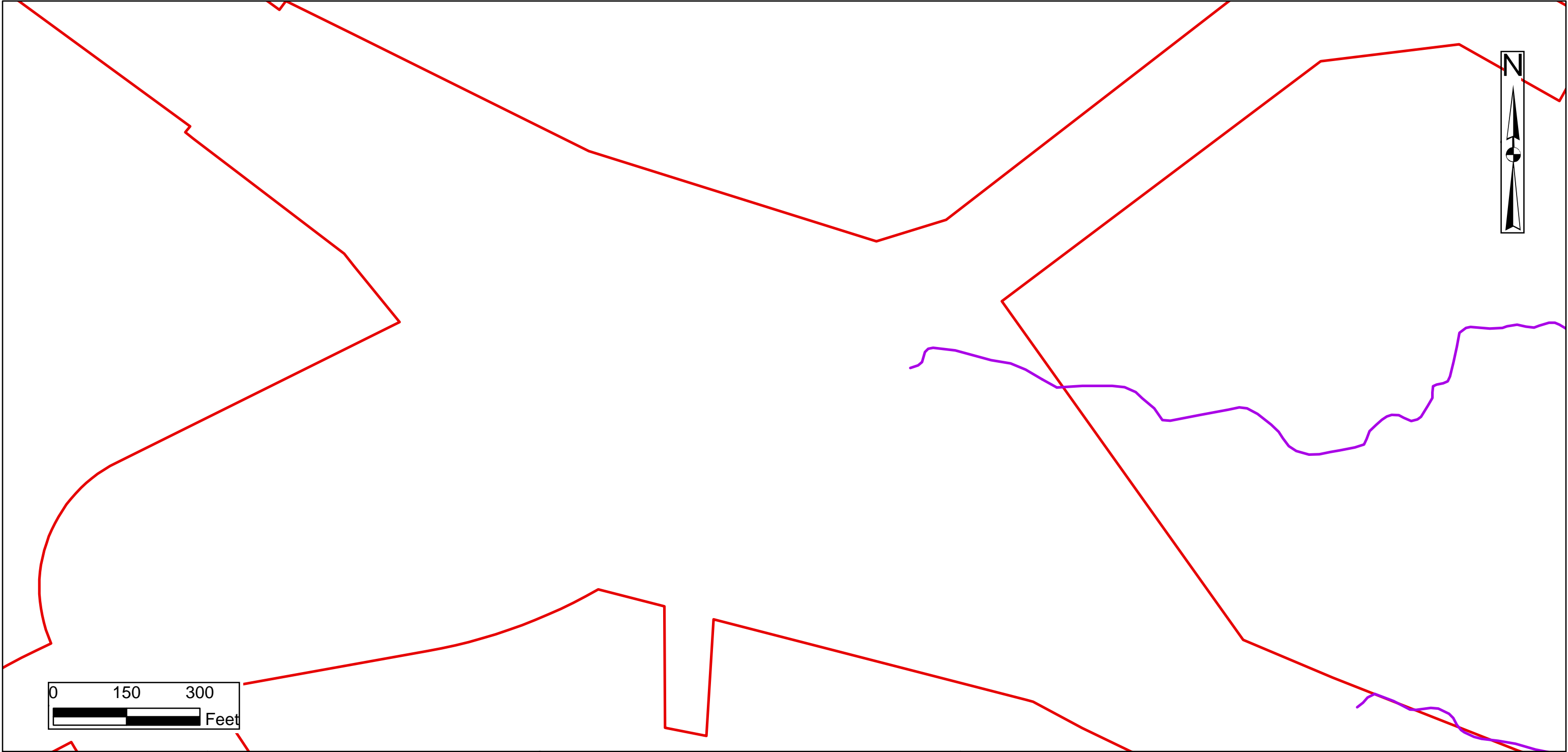
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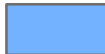


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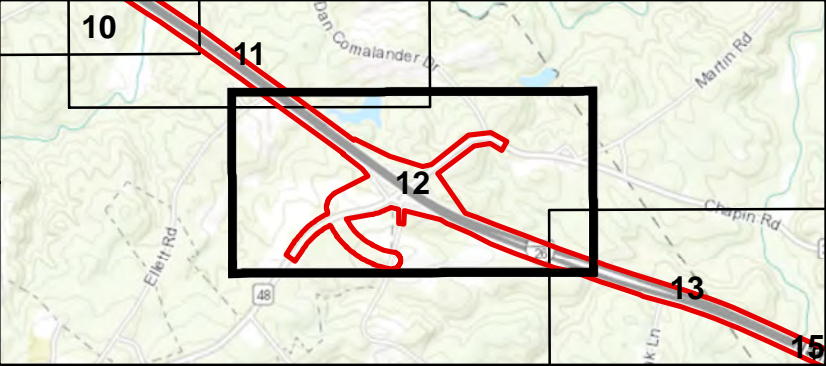
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January 2018





**Legend**

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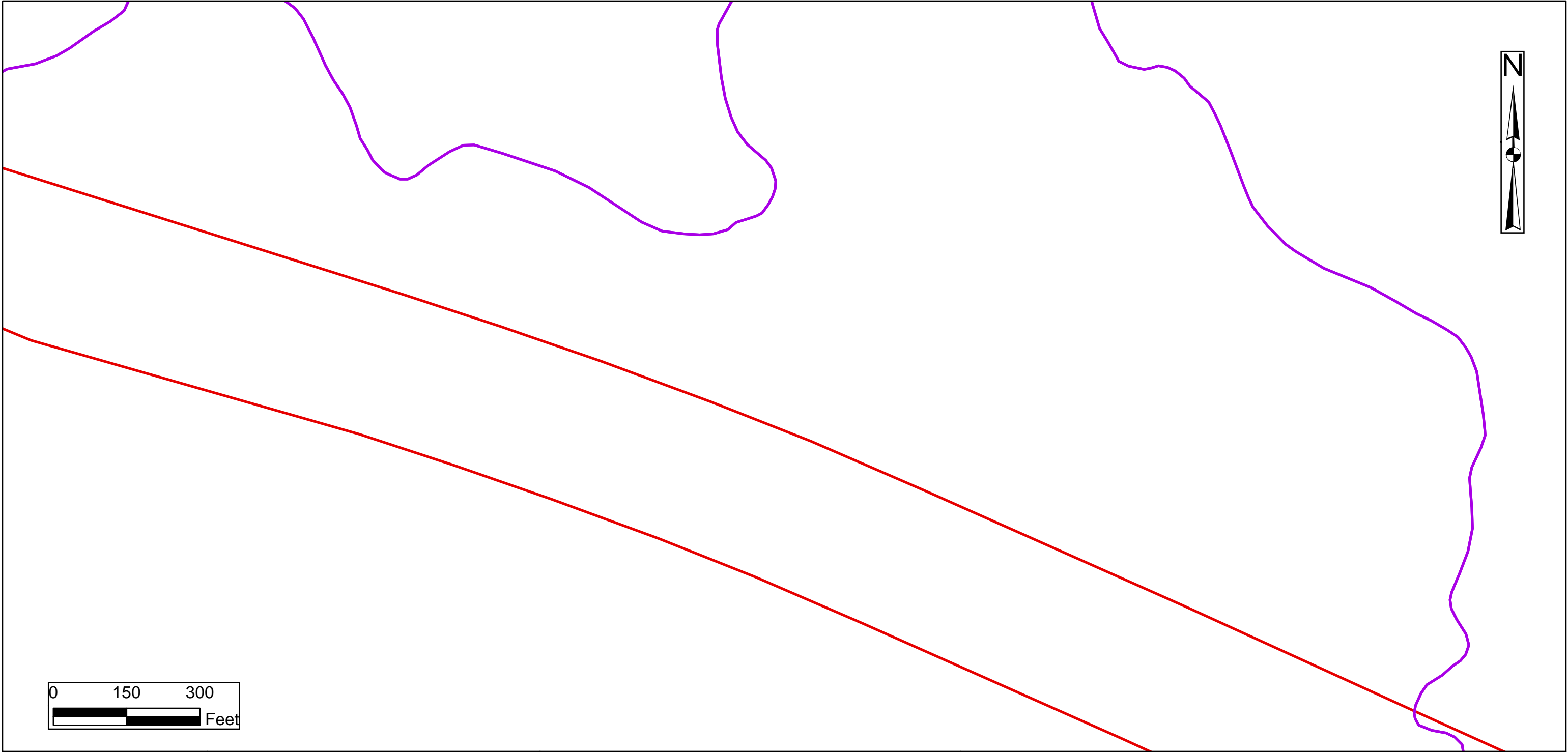
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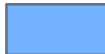


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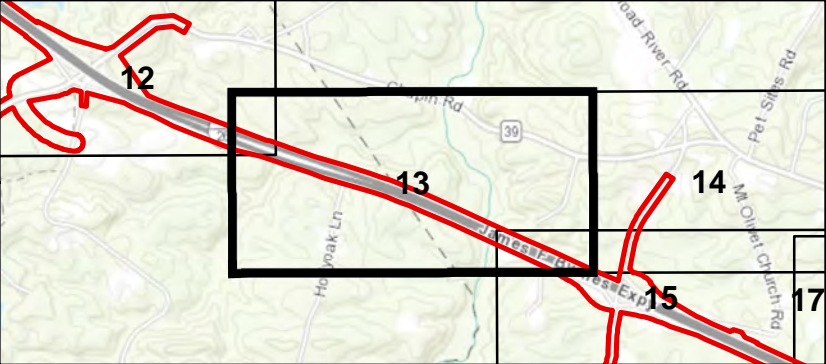
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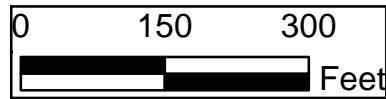
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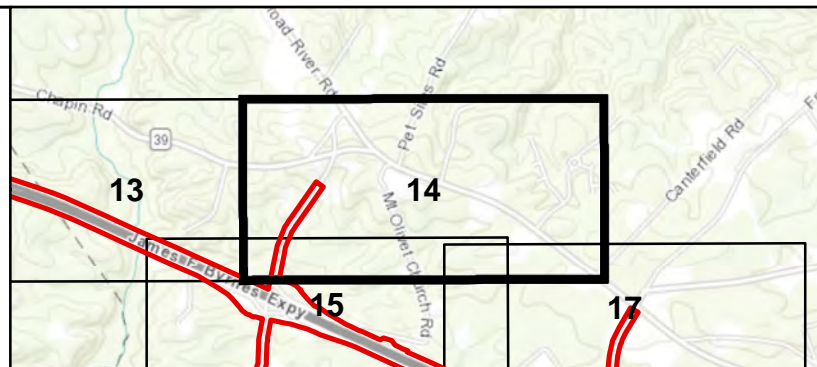
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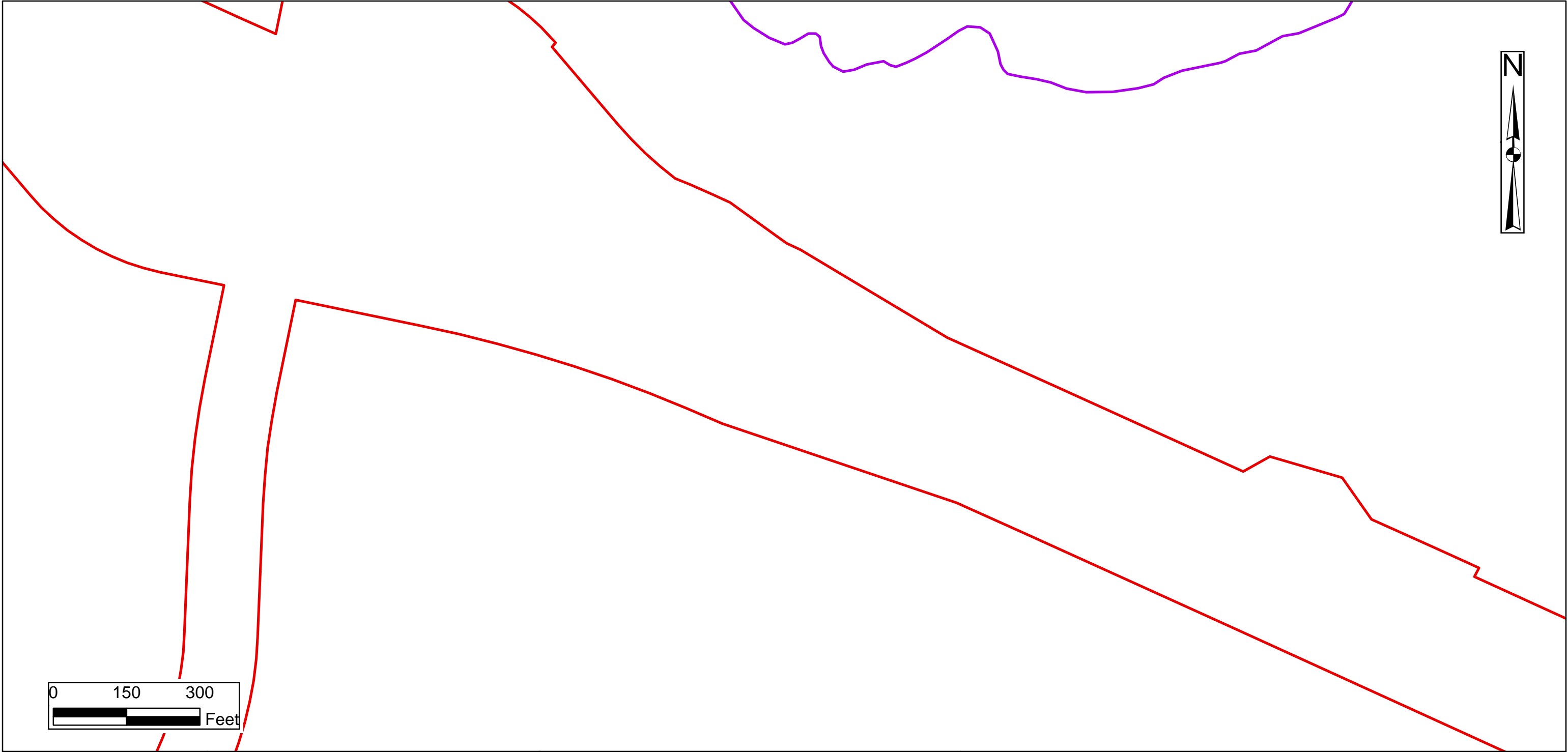
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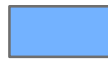


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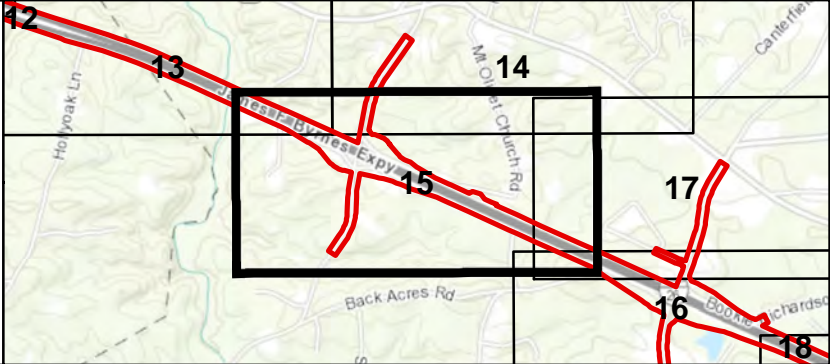
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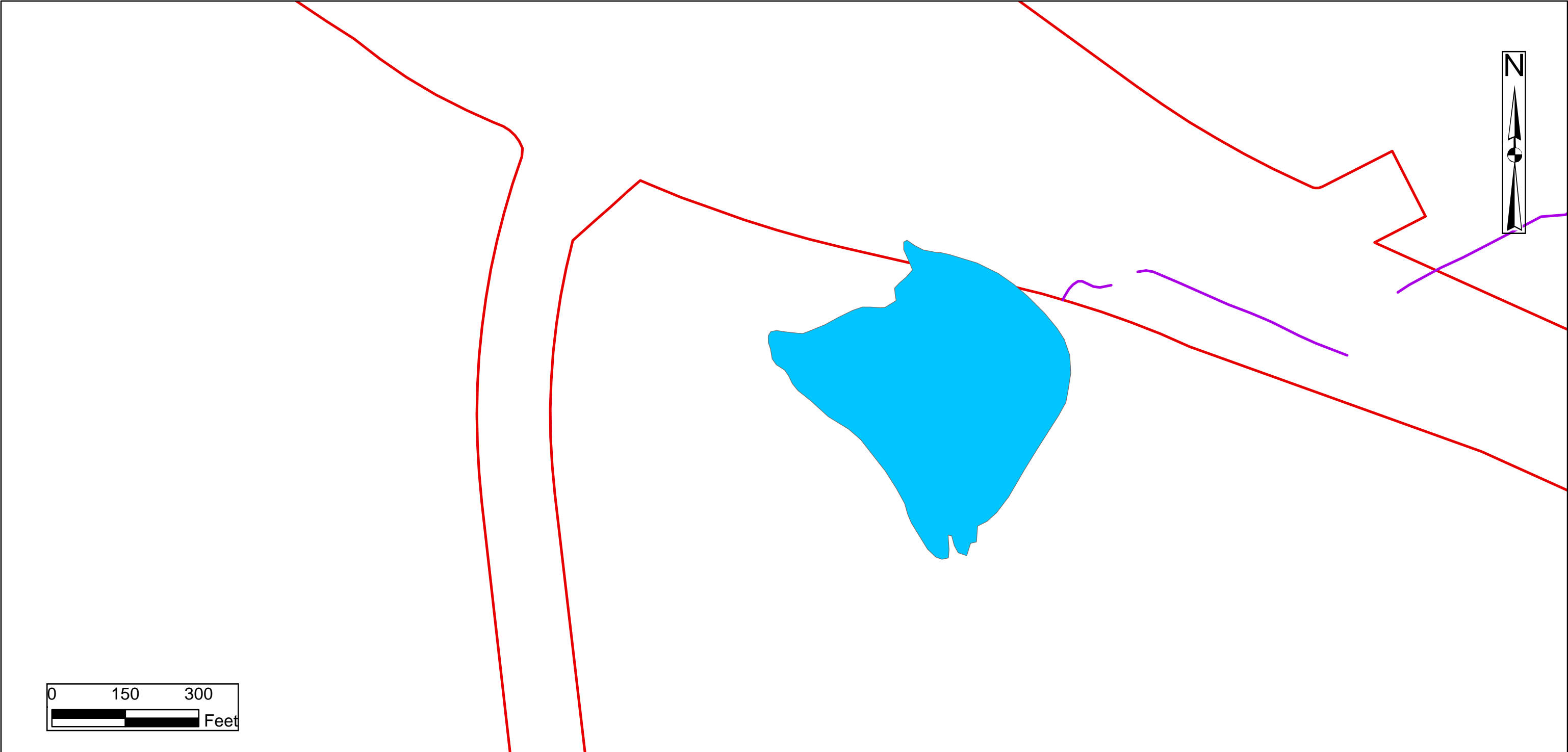
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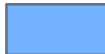


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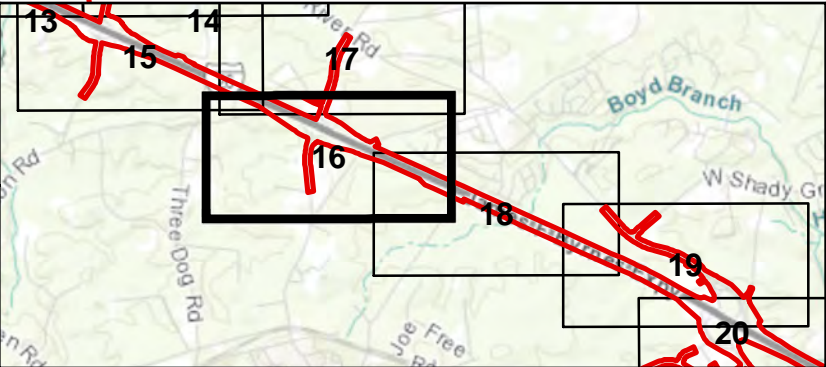
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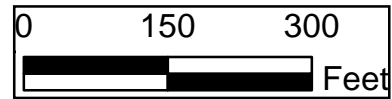
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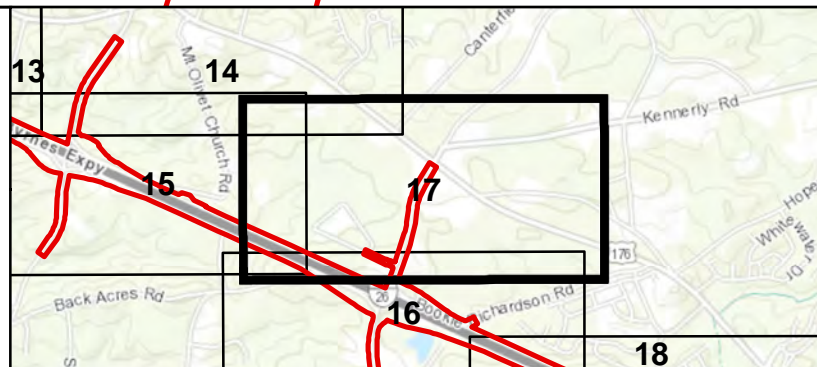
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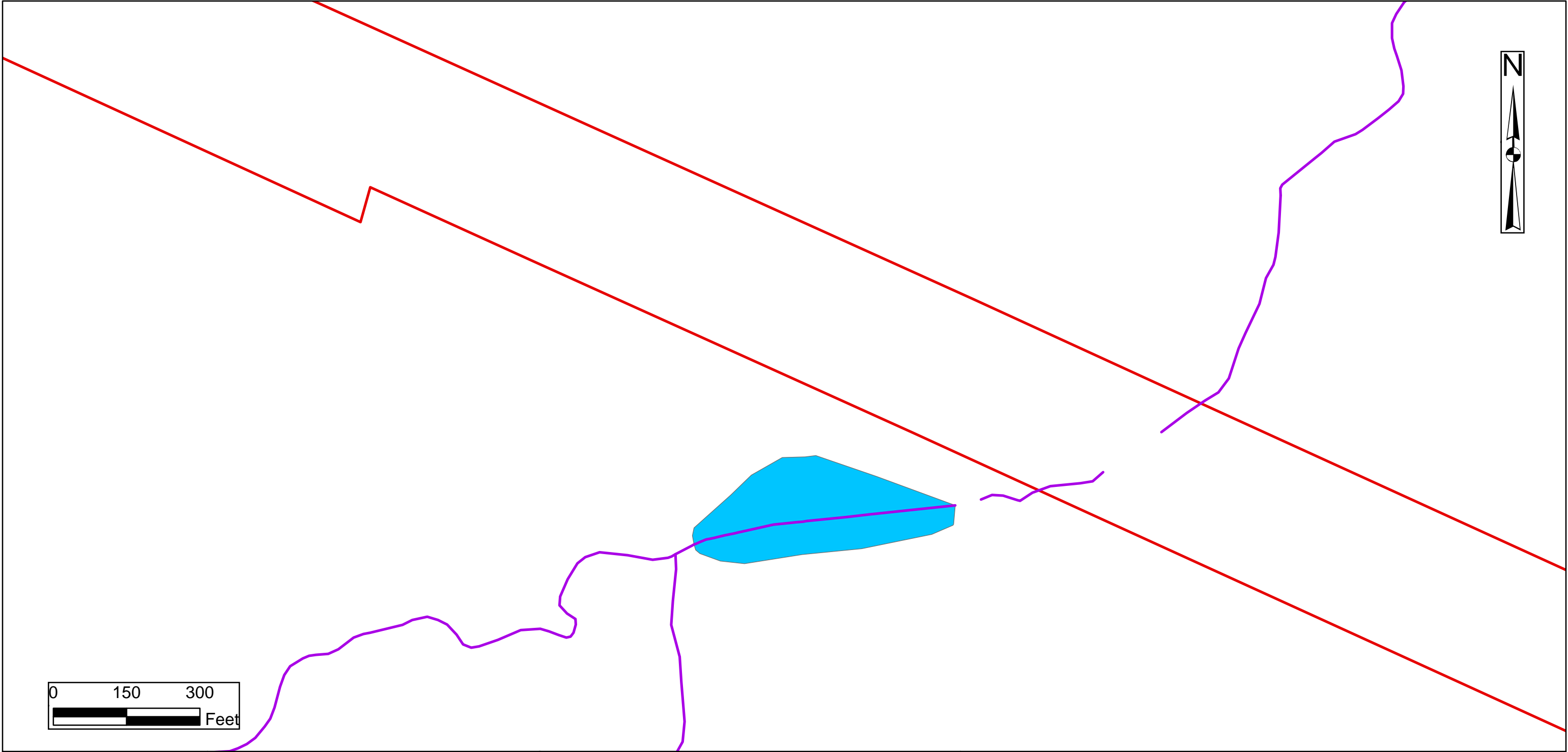
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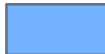


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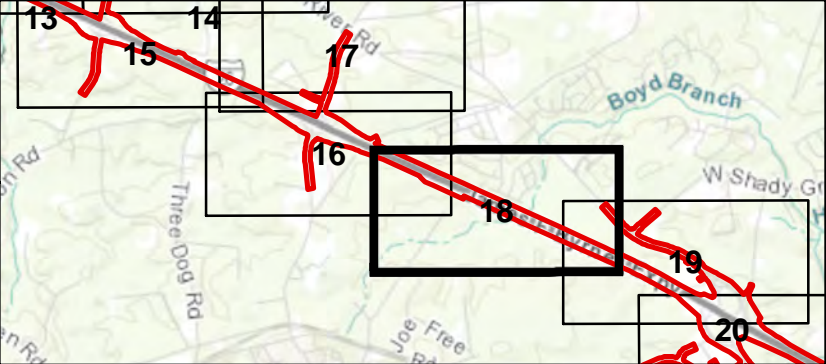
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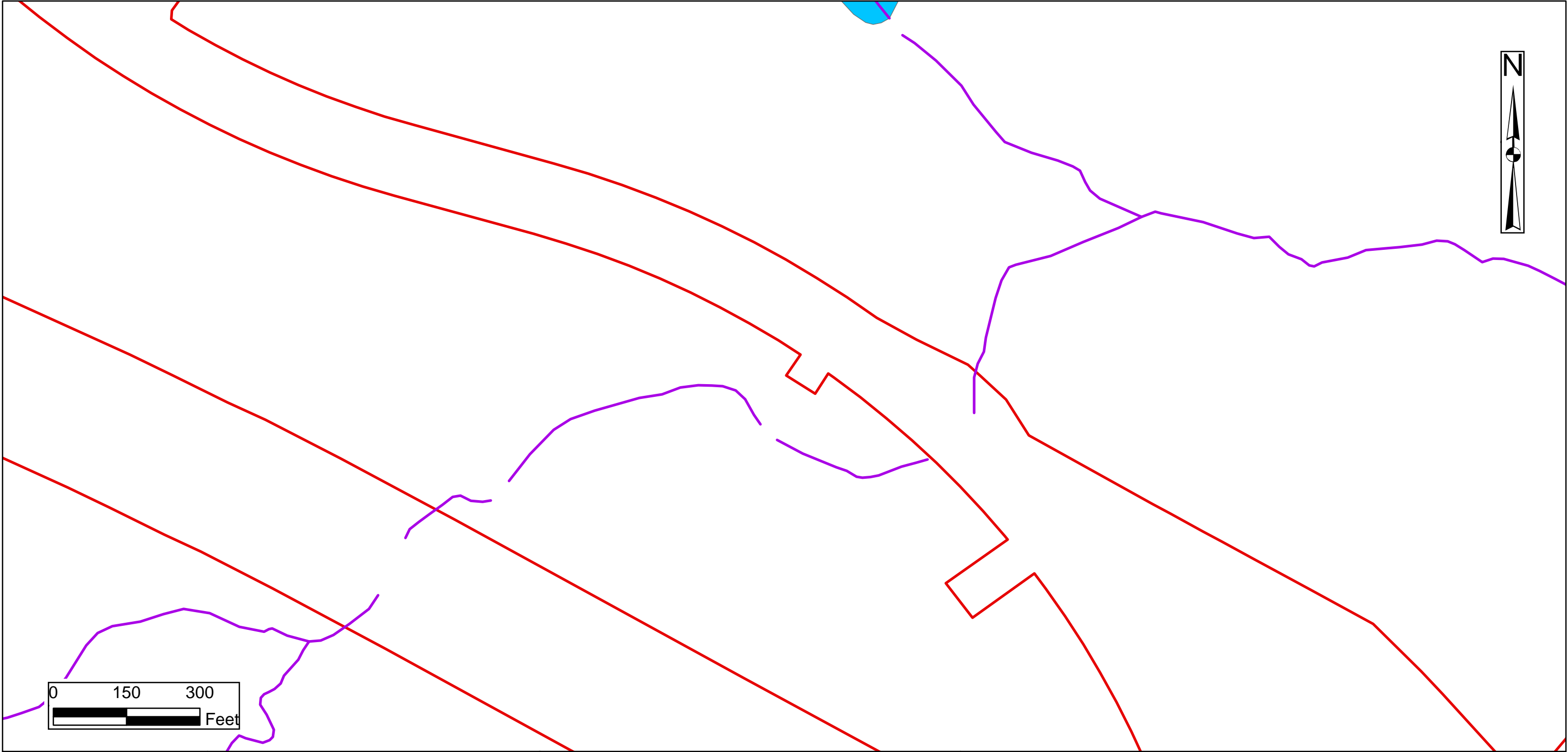
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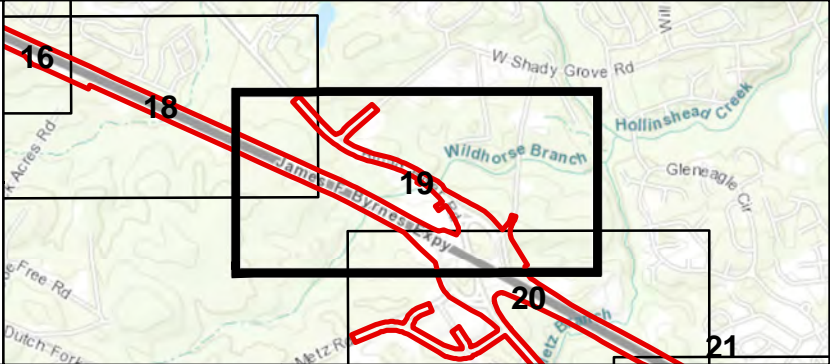
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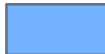




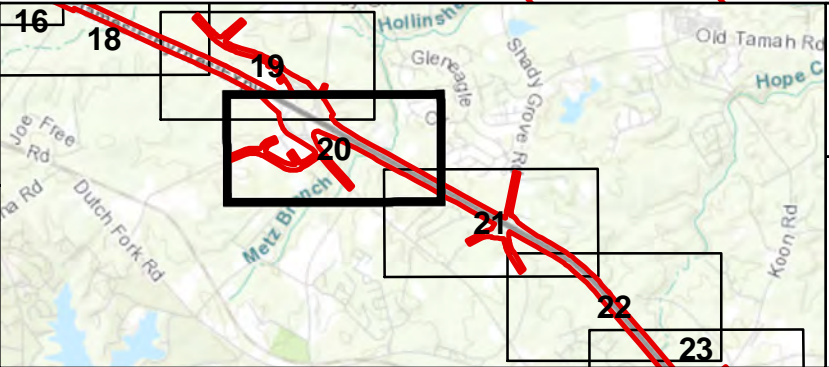
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**Legend**

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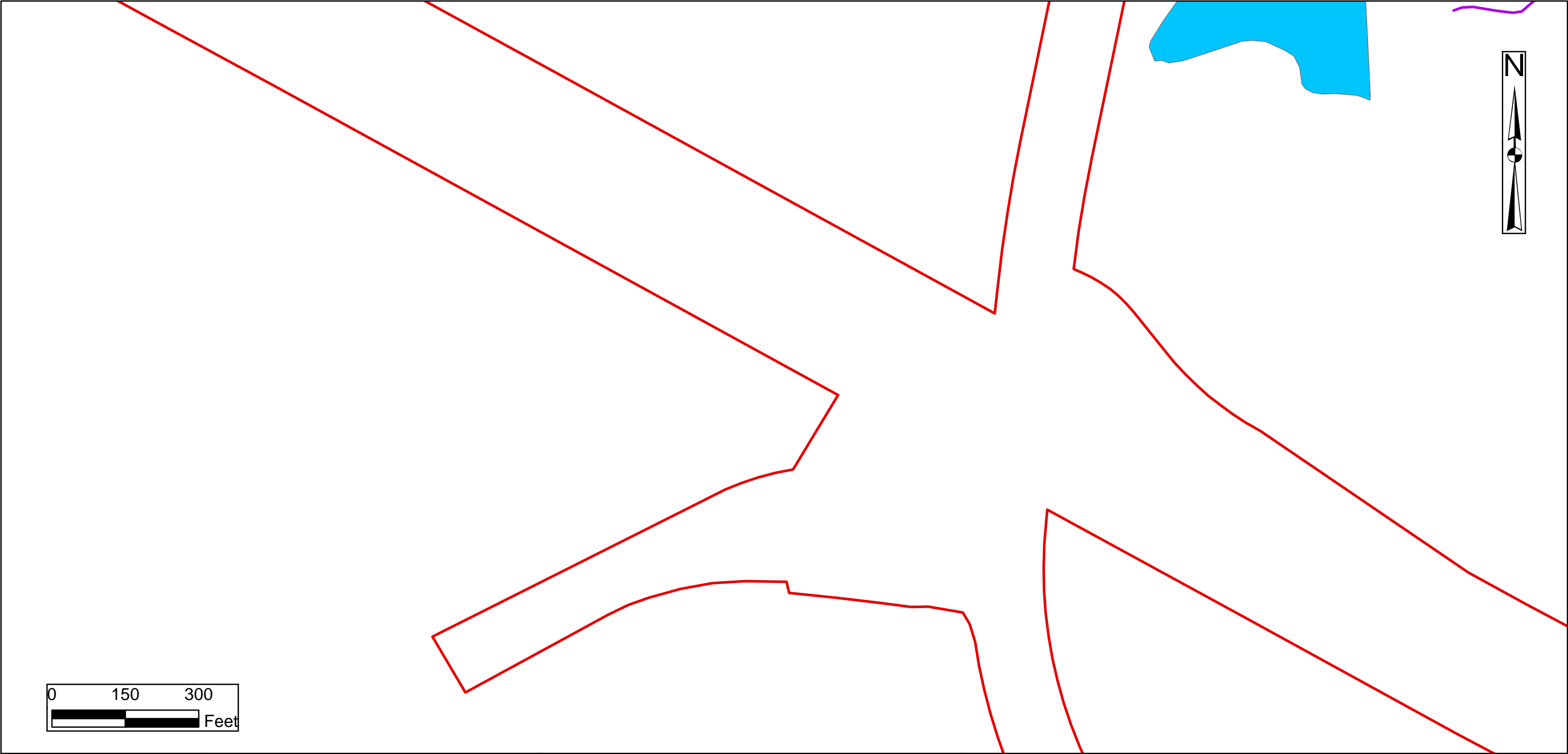
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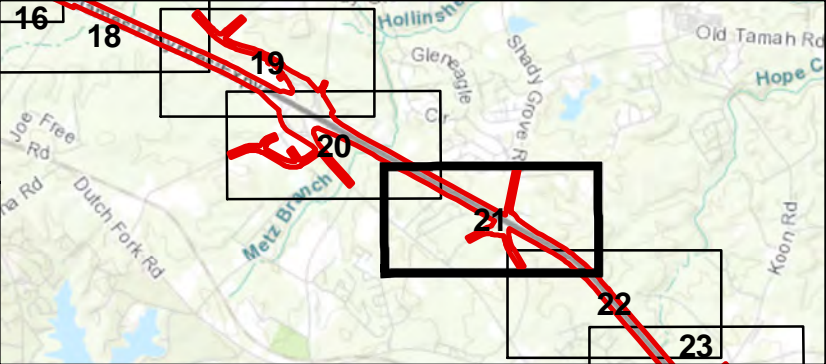
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**Legend**

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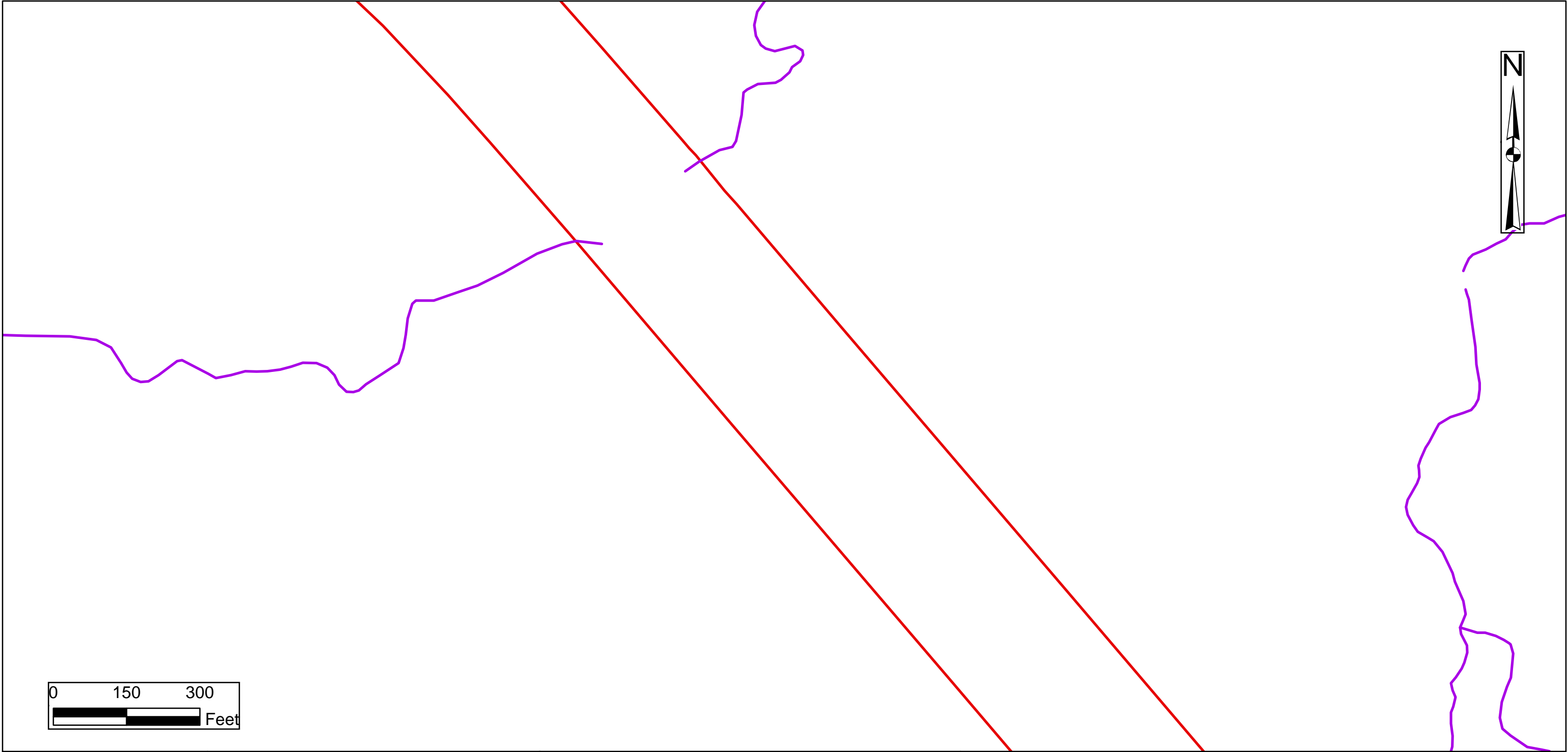
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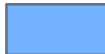


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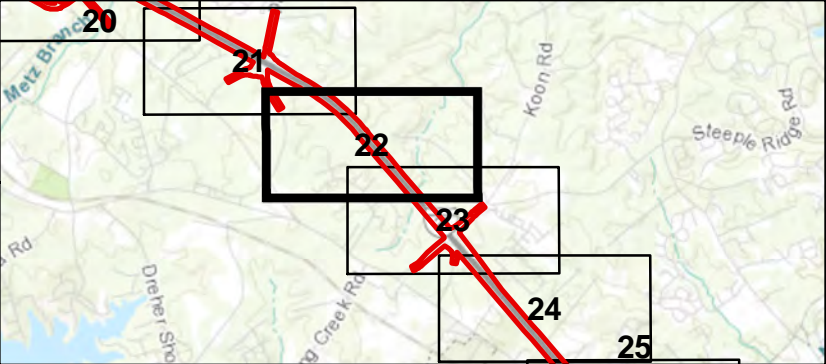
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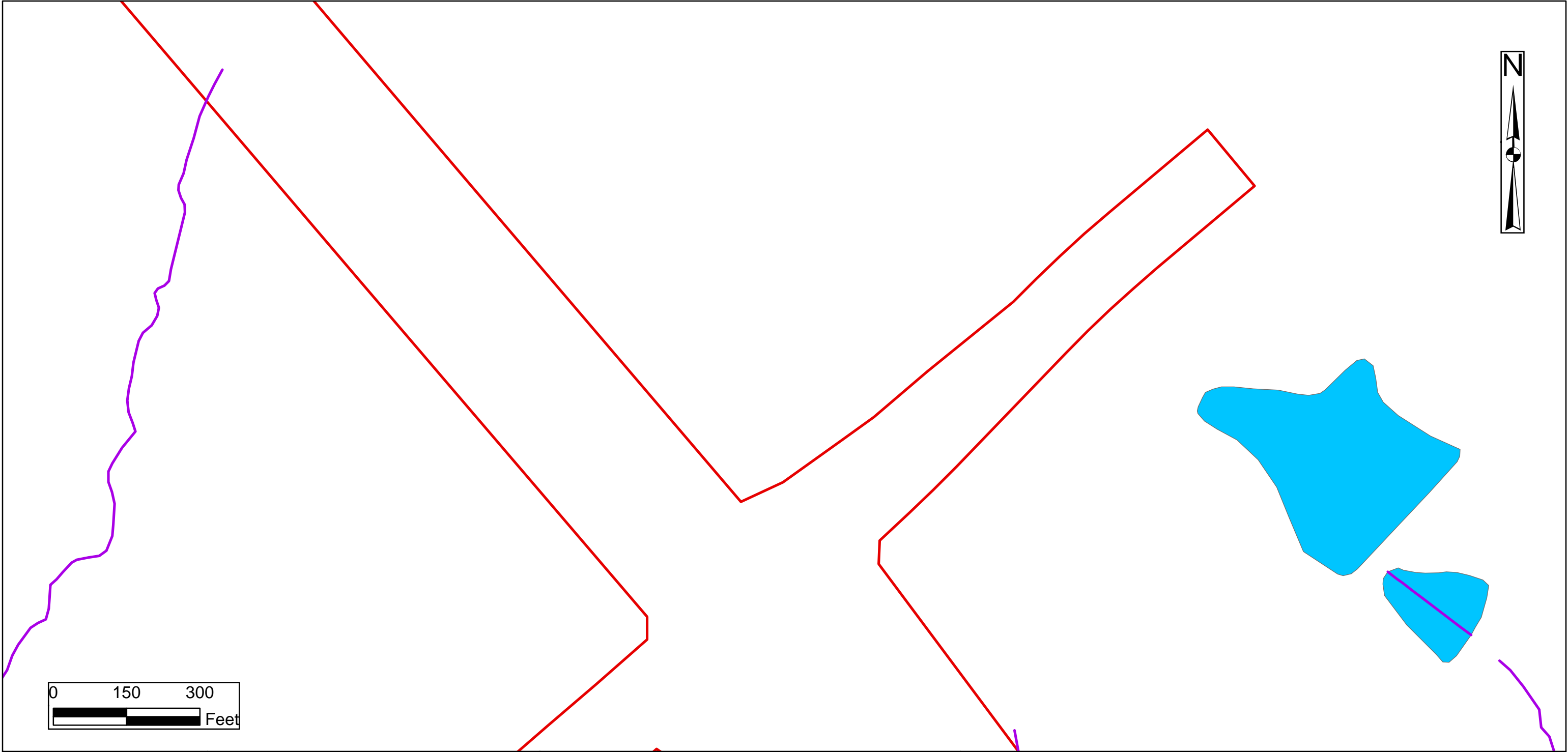
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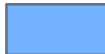


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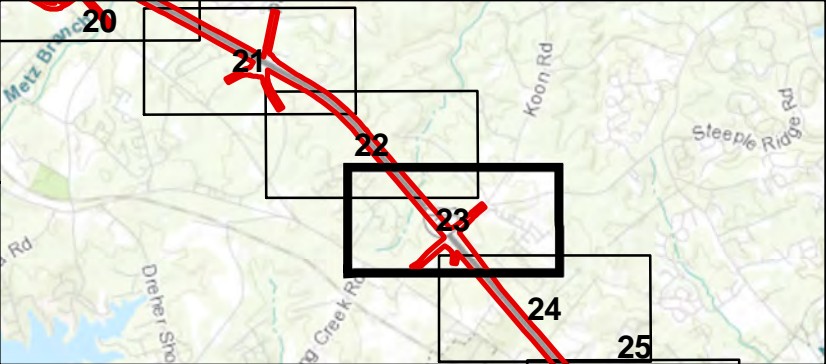
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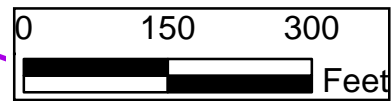
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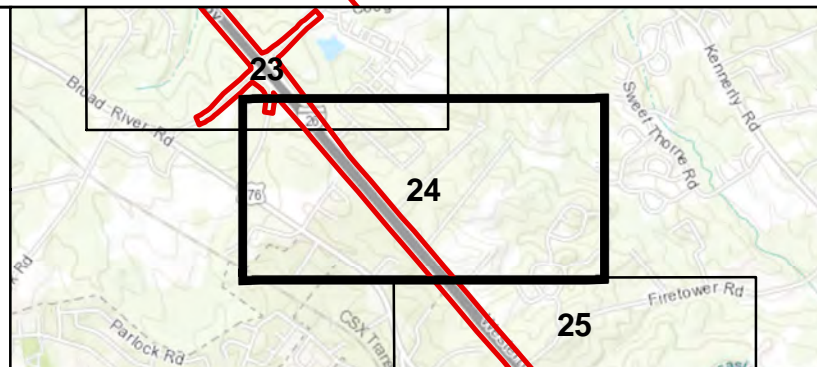
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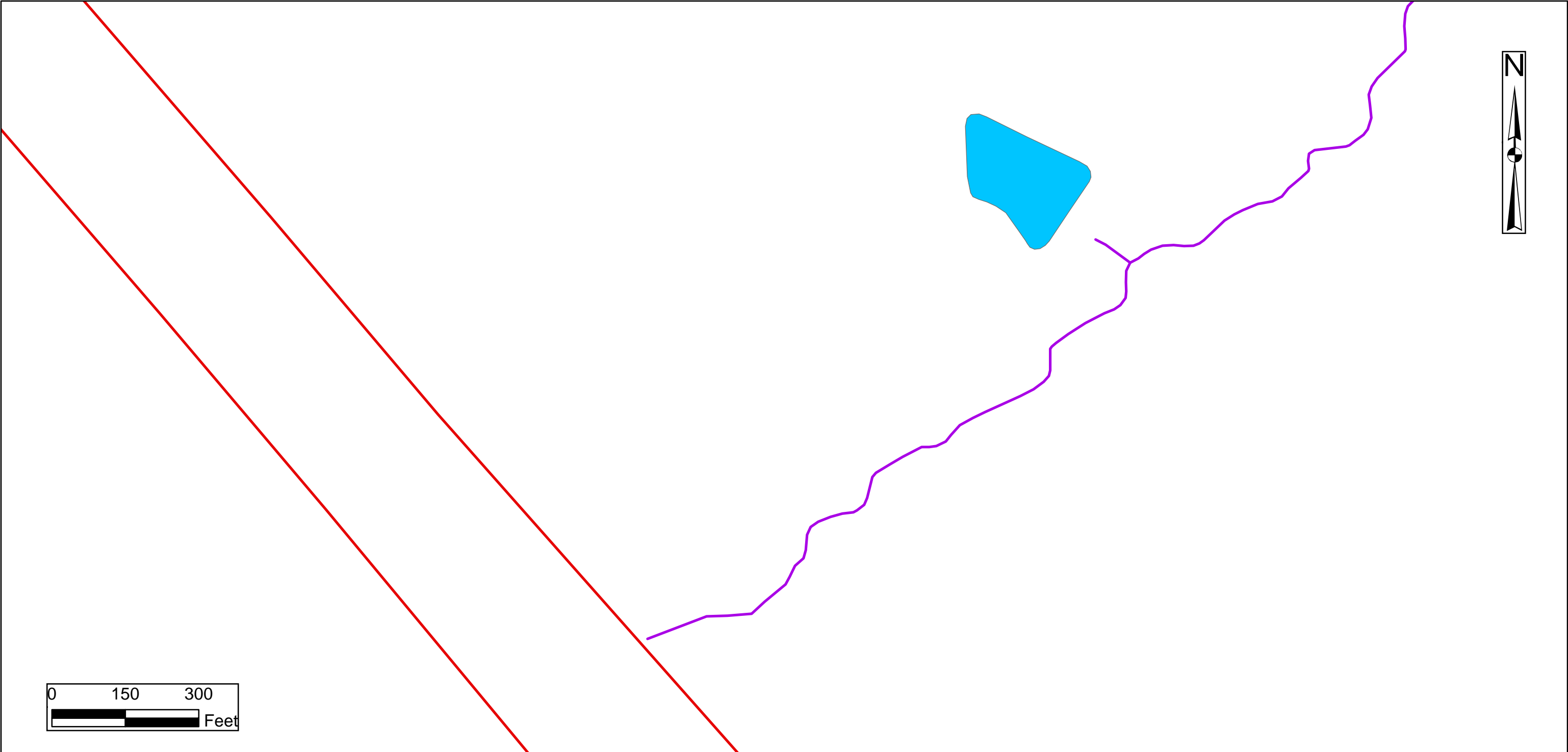
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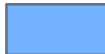


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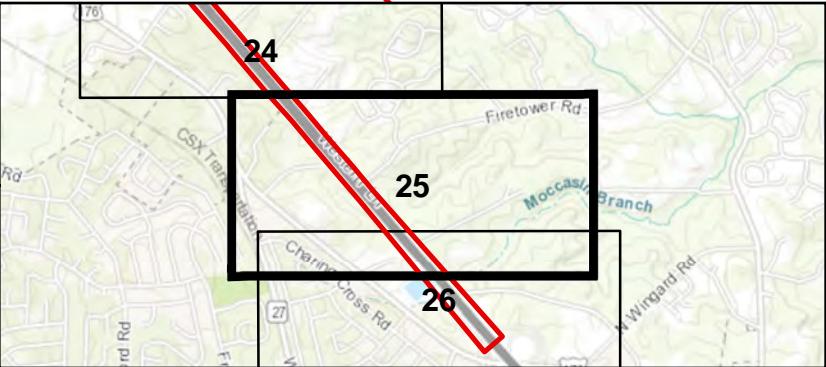
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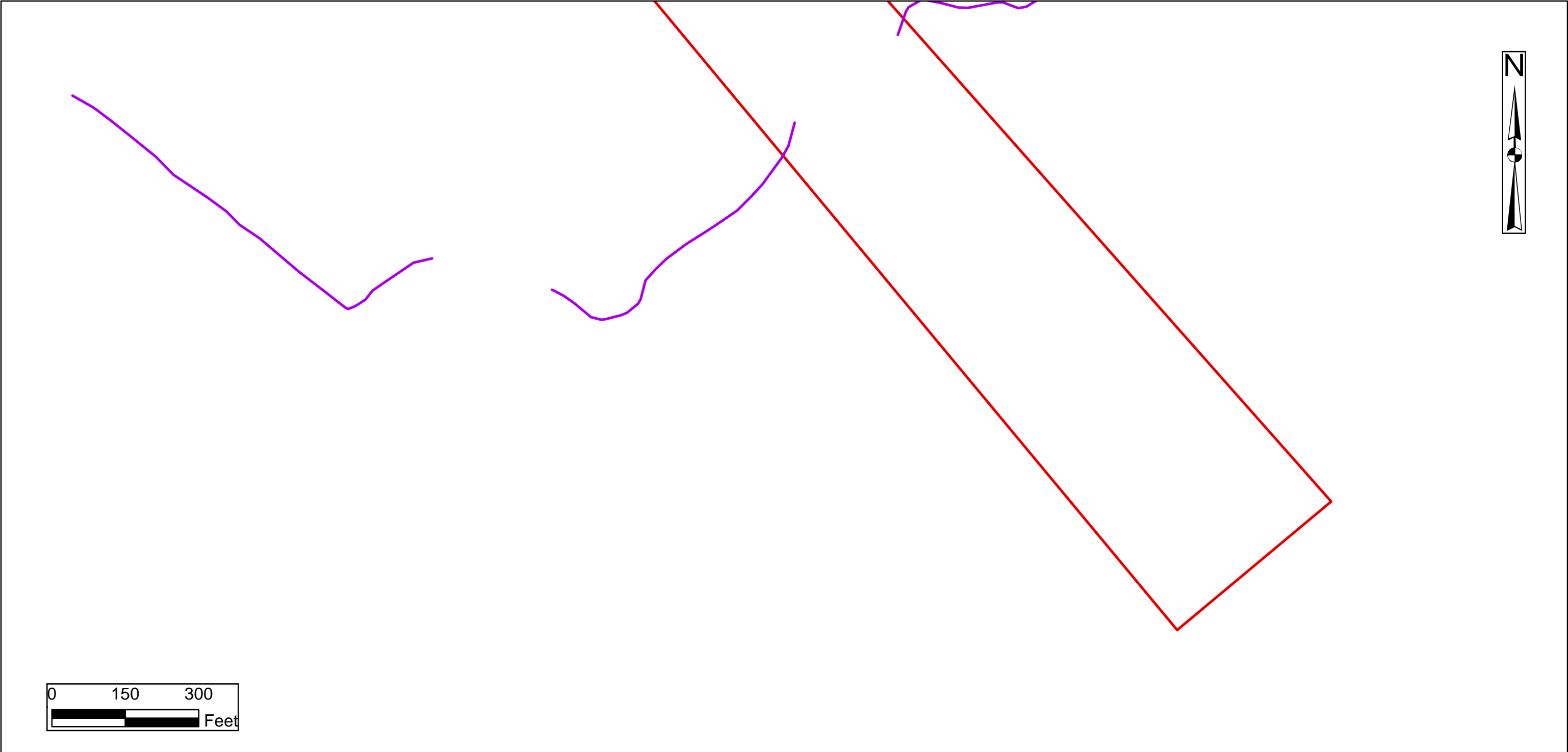
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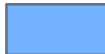


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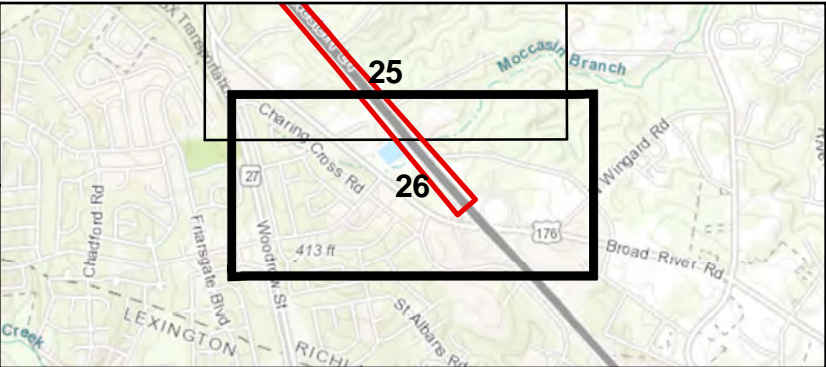
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# **APPENDIX B**

## **Representative Site Photolog**





**Photo 1A.** View looking downstream, southeast over Non-wetlands waters 1A.



**Photo 1B.** View looking downstream, north over Non-wetlands waters 1B near confluence with 1C and box culvert under Interstate 26.





**Photo 1C.** View looking upstream over Non-wetlands waters 1C near confluence with Non-wetlands waters 1B.



**Photo 1D.** View looking downstream over Non-wetlands waters 1D. Area upstream of culvert crossing exhibited reduced indicators of stream flow.





**Photo 2A.** View looking downstream, east over Non-wetlands waters 2.



**Photo 2B.** View looking north over Data Point 2, upland mixed hardwood forest.





**Photo WA1.** View looking north over Wetland Data Point A (WDPA), palustrine emergent wetland along slope of roadway.



**Photo UA2.** View looking west over Upland Data Point A, depicting upland herbaceous vegetation as outpoint to WDPA.





**Photo WB1.** View looking east over Wetland Data Point B (WDPB), depicting palustrine forested wetland.



**Photo UB2.** View looking north over Upland Data Point B (UDPB), depicting mixed hardwood forest as outpoint to WB1.





**Photo WC1.** View looking south over Wetland Data Point C (WDPC), palustrine emergent wetland located within maintained field.



**Photo UC2.** View looking east over Upland Data Point C (UDPC), maintained herbaceous field as outpoint to WDPC.





**Photo 4A.** View looking east, downstream over Non-wetlands waters 4.



**Photo 4B.** View looking north over Upland Data Point 4, mixed hardwood forest.





**Photo WD1.** View looking west over Wetland Data Point D (WDPD), palustrine forested wetland within low depressional area adjacent to Non-wetlands waters D.



**Photo UD2.** View looking north over Upland Data Point D (UDPD), mixed hardwood forest as outpoint to WDPD.





**Photo WE1.** View looking west over Wetland Data Point E (WDPE), palustrine emergent wetland within depressional floodplain.



**Photo UE2.** View looking east over Upland Data Point E (UDPE), maintained herbaceous vegetation within transmission right of way. Point serves as upland outpost to WDPE.





**Photo 6A.** View looking north over upland herbaceous vegetation adjacent to Non-wetlands waters 6.



**Photo 6B.** View looking east over Non-wetlands waters 6 and culvert inlet.





**Photo 7A.** View looking west over Non-wetlands waters 7A and box culvert under Interstate 26.



**Photo 7B.** View looking west over Non-wetlands waters 7B, ephemeral channel along Wetland J.





**Photo 103.** View looking upstream, south over Non-wetlands waters 103 and box culvert to Interstate 26.



**Photo 8.** View looking east over Upland Data Point 8 (UDP8) adjacent to Non-wetlands waters 8B.





**Photo 9A.** View looking south over Upland Data Point 9 (UDP9) depicting upland mixed hardwood forest adjacent to Non-wetlands waters 9.



**Photo 10.** View looking west over Upland Data Point 10 (UDP10), mixed hardwood forest along bench adjacent to Non-wetlands waters 10.





**Photo 11.** View looking north over Upland Data Point 11 (UDP11), mixed hardwood forest adjacent to Non-wetlands waters 11.



**Photo 12.** View looking north over Upland Data Point 12 (UDP12), mixed hardwood forest located adjacent to Non-wetlands waters 12.





**Photo 13.** View looking west over Upland Data Point 13 (UDP13) located adjacent to Non-wetlands waters 13.



**Photo WH1.** View looking west over Wetland Data Point H (WDPH) depicting palustrine emergent/forested wetland along Non-wetlands waters H.





**Photo HA1.** View looking south over Non-wetlands waters HA adjacent to Wetland H.



**Photo UH2.** View looking north over Upland Data Point H (UDPH) depicting scrub shrub vegetation as outpoint to WDPH.





**Photo WF1.** View looking east over Wetland Data Point F (WDPF) depicting palustrine emergent wetland located at culvert outlet along Interstate 26.



**Photo UF2.** View looking north over Upland Data Point F depicting maintained roadside vegetation as upland outpoint to UDPF.





**Photo 15.** View looking north over UDP15, mixed hardwood forest along low ridge adjacent to Non-wetlands waters 15.



**Photo WG1.** View looking north over Wetland Data Point G, depicting palustrine forest wetland along margin of Non-wetlands waters 17.





**Photo UG2.** View looking east over Upland Data Point G depicting mixed hardwood forest as outpoint to WDPG.



**Photo 17A.** View looking east over upland data point 17 (UDP17) depicting mixed hardwood forest to the south of Non-wetlands waters 17.





**Photo 17 B.** View looking south over Non-wetlands waters 17 near culvert inlet through Interstate 26.



**Photo 18.** View looking south over Upland Data Point 18 (UDP18) adjacent to Non-wetlands waters 18.





**Photo 19A.** View looking north over Upland Data Point 19 (UDP19) adjacent to Non-wetlands waters 19.



**Photo 19B.** View looking downstream, south over Non-wetlands waters 19.





**Photo 20.** View looking upstream, north over Non-wetlands waters 20.



**Photo 24.** View looking upstream, west over Non-wetlands waters and adjacent Upland Data Point 24 (UDP24) depicting mixed hardwood forest along slope of Interstate 26.





**Photo 25A.** View looking west over Upland Data Point 25 (UDP25) adjacent to Non-wetlands waters 25 depicting mixed hardwood forest along slope of Interstate 26.



**Photo 25B.** View looking west over Non-wetlands waters 25 and incised embankments with concrete flume to protect slope from excessive erosion during precipitation events.





**Photo 26A.** View looking upstream over Non-wetlands waters 26 and Upland Data Point 26 (UDP26) near box culvert through Interstate 26.



**Photo 26B.** View looking west over Non-wetlands waters 26 located within median of Interstate 26.





**Photo 26C.** View looking upstream, south over Non-wetlands waters 26 and box culvert inlet through Interstate 26.



**Photo 27.** View looking west over Non-wetlands waters 27 and Upland Data Point 27 (UDP27).





**Photo WJ1.** View looking north over Wetland Data Point J (WDPJ) depicting palustrine forested wetland along margin of Non-wetlands waters J.



**Photo UJ2.** View looking south over Upland Data Point J (UDPJ) depicting mixed hardwood forest as outpoint to WDPJ.





**Photo SJ.** View looking west over Non-wetlands waters I where stream is confined to concrete box culvert under Interstate 26 and frontage road to south.



**Photo 28.** View looking north over Upland Data Point 28 (UDP28) adjacent to Non-wetlands waters 28.





**Photo 29A.** View looking east over Upland Data Point 29 (UDP29) depicting mixed hardwood forest along slopes of Non-wetlands waters 29.



**Photo 29B.** View looking east over Non-wetlands waters 29. Stream bed highly incised and absent of active out of bank flooding.





**Photo 30.** View looking north over Upland Data Point 30 (UDP30) depicting mixed hardwood forest located adjacent to Non-wetlands waters 30A.



**Photo 31.** View looking upstream, west over Non-wetlands waters 31 and adjacent mixed hardwood forest along stream margin.





**Photo 32A.** View looking south over Upland Data Point 32 (UDP32) depicting mixed hardwood forest along slope to Interstate 26.



**Photo 32B.** View looking east over Non-wetlands waters 32 along south slope of Interstate 26.





**Photo 33A.** View looking east over Upland Data Point 33 (UDP33) and Non-wetlands waters 33B.



**Photo 33C.** View looking downstream, south over Non-wetlands waters 33C.





**Photo 35.** View looking north over Upland Data Point 35 (UDP35) along margin of Non-wetlands waters 35.



**Photo WG1.** View looking north over Wetland Data Point G (WDPG) depicting palustrine emergent wetland along Non-wetlands waters 36A.





**Photo UG2.** View looking north over Upland Data Point G (UDPG) depicting mixed hardwood forest along slope as outpoint to WDPG.



**Photo 36A.** View looking west of Upland Data Point 36 (UDP36) depicting mixed hardwood forest along slope to Interstate 26.





**Photo 36B.** View looking upstream, north over Non-wetlands waters 36B.



**Photo 37A.** View looking west over Upland Data Point 37 (UDP37) depicting mixed hardwood forest along slope to Interstate 26.





**Photo 37B.** View looking downstream, south over Non-wetlands waters 37.



**Photo 38A.** View looking north over Upland Data Point 38 (UDP38) and Non-wetlands waters 38A at box culvert outlet to Interstate 26.





**Photo 38B.** View looking west over Non-wetlands waters 38B.



**Photo 38C.** View looking west over Non-wetlands waters 38C at confluence with Non-wetlands waters 38A.





**Photo 38D.** View looking east, upstream over Non-wetlands waters 38D.



**Photo 39A.** View looking upstream north, over Non-wetlands waters 39 and Upland Data Point 39 (UDP39) along slope of embankment to Interstate 26.





**Photo 40A.** View looking upstream, north over Non-wetlands waters 40A.



**Photo 40B.** View looking west over Upland Data Point 40 (UDP40) depicting mixed hardwood forest along low land bench to Non-wetlands waters 40A.





**Photo 40C.** View looking east, upstream over Non-wetlands waters 40C.



**Photo 40D.** View looking upstream, east over Non-wetlands waters 40D at confluence with Non-wetlands waters 40A.





**Photo 40E.** View looking upstream, south over Non-wetlands waters 40E.



**Photo 43.** View looking east over Upland Data Point 43 (UDP43) along slope of hillside.





**Photo 44.** View looking upstream, east over Upland Data Point 44 and Non-wetlands waters 44 surrounded by mixed hardwood forest.



**Photo 45A.** View looking downstream, east over Non-wetlands waters 45A





**Photo 45B.** View looking downstream, west over Non-wetlands waters 45B.



**Photo 46.** View looking upstream, west over Non-wetlands waters 46.





**Photo 47.** View looking downstream, east over Non-wetlands waters 47.



**Photo 48.** View looking upstream, north over Upland Data Point 48 and Non-wetlands waters 48.





**Photo 49A.** View looking upstream, south over Non-wetlands waters 49 at outlet of box culvert to Interstate 26.



**Photo 49B.** View looking downstream over Non-wetlands waters 49 at inlet to box culvert through Interstate 26.





**Photo 51A.** View looking upstream, east over Non-wetlands waters 51A.



**Photo 51B.** View looking upstream, north over Non-wetlands waters 51B.





**Photo 51C.**View looking upstream, east over Non-wetlands waters 51C.



**Photo 54A.** View looking south over Upland Data Point 54 (UDP54) depicting mixed woodland habitat adjacent to Non-wetlands waters 54A.





**Photo 54B.** View looking upstream, south over Non-wetlands waters 54B at confluence with Non-wetlands waters 54A prior to box culvert at Interstate 26.



**Photo 54C.** View looking upstream, east over Non-wetlands waters 54C at confluence with Non-wetlands waters 54B and Non-wetlands waters 54A.





**Photo 59.** View looking upstream, south over Non-wetlands waters 59 along slope of Interstate 26.



**Photo 60.** View looking south over Upland Data Point 60 (UDP60) depicting mixed hardwood forest adjacent to Non-wetlands waters 60.





**Photo WK1.** View looking east over data point Wetland Data Point K (WDPK) depicting depressional PEM wetland located near Ellet Road, adjacent to Exit 91 interchange.



**Photo UK2.** View looking west over data point Upland Data Point K (UDPK) exhibiting upland herbaceous vegetation alongside margin of roadway slope.





**Photo SK3.** View looking north over Non-wetlands waters K depicting seasonal stream draining from Wetland K on south side of Interstate 26.



**Photo WM1.** View looking south over Wetland Data Point M (WDPM) depicting palustrine forested wetland along east side of Shady Grove Road.





**Photo UM2.** View looking north over Upland Data Point M (UDPM) as upland outpoint to Wetland M.



**Photo 109A.** View looking west over WDPN depicting palustrine forested wetland Wetland N and Non-wetlands waters N located within Exit 91 interchange area.





**Photo 109B.** View looking west over upland forest outpoint, UDPN, to Wetland N. Area is along slight terrace rise to north of wetland area.



**Photo WL1.** View looking west over Wetland Data L depicting palustrine forested wetland along south side of Interstate 26, adjacent to Non-wetlands waters 7B.





**Photo UL2.** View looking east over Upland Data Point L (UDPL) depicting upland mixed hardwood forest as upland outpoint to Wetland L along terrace rise.



## **APPENDIX C**

# **SCDOT Permit Determination Form and SCDHEC Water Quality Report**



Date: 9/27/17

## PERMIT DETERMINATION

FROM Kally McCormick COMPANY CECS

CONTACT INFO (phone and/or email) 843-696-7348, mccormickk@cecsinc.com

SCDOT PROJECT ENGINEER Michael Hood, PE

TO Siobhan Gordon - RPG 3 Permits Coordinator

Project Description I-26 Widening from MM 85 - 101 including reconstructed  
reconstructed interchanges at Exits 85, 91, and 97

Route or Road No. I-26 County Lexington, Newberry, Richland

CONST. PIN \_\_\_\_\_ OTHER PINS or STRUCTURE # P029208

RESPONSE:

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

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

USACE Permit ☐ GP ☒ IP ☒ 401 ☒ JD

OCRM Permit ☐ CAP ☐ CZC

Navigable ☐ SCDHEC NAVGP — if checked a USCG and/or USACE navigable permit may also be required, but will be determined during the NEPA and Permitting stages.

Other n/a

Water Classification: FW

*Print and attach the SCDHEC water quality report*

303(d) listed ☐ no ☒ yes, for \* ECOLI

TMDL developed ☐ no ☒ yes, for \* FC (recreational use)

\*List all that apply using the SCDHEC abbreviations

Comments: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

Kally McCormick 9/27/17  
Biologist, SCDOT/Consultant Date





9/14/2017

## Watershed and Water Quality Information

### General Information

Applicant Name:

Permit Type: MS4

Latitude:

Longitude:

MS4 Designation:

Monitoring Station: RS-11041

Within Coastal Critical Area:

Water Classification (Provisional): FW

Waterbody Name: CRIMS CREEK

Entered Waterbody Name:

### Parameter Descriptions

NH3N	Ammonia	FC	Fecal Coliform
CR	Chromium	FCB	Fecal Coliform (Shellfish)
CU	Copper	BIO	Macroinvertebrates (Bio)
HG	Mercury	TP	(Lakes) Phosphorus
NI	Nickel	TN	(Lakes) Nitrogen
PB	Lead	CHLA	(Lakes) Chlorophyll a
ZN	Zinc	ENTERO	(Beach) Enterococcus
DO	Dissolved Oxygen	HGF	Mercury (Fish)
PH	pH	PCB	PCB (Fish)

### Impaired Status (downstream sites)

Station	NH3N	CR	CU	HG	NI	PB	ZN	DO	PH	TURBIDITY	ECOLI	FCB	BIO	TP	TN	CHLA	ENTERO	HGF	PCB
RS-11041	X	X	X	X	X	X	X	F	F	F	T	A	X	X	X	X	X	X	X

F = Standards Fully Supported

A = Assessed at Upstream Station

T = Within TMDL Approved Watershed

N = Standards Not Supported

X = Parameter Not Assessed at Station

### Parameters to be addressed (those not supporting standards)

ECOLI

### Fish Consumption Advisory

### TMDL Information - TMDL Parameters to be addressed

In TMDL Watershed: Yes

TMDL Site: RS-03517

TMDL Report No: 028-05

TMDL Parameter: Fecal

TMDL Document Link: [http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl\\_lwrbrd\\_fc.pdf](http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_lwrbrd_fc.pdf)





9/14/2017

## Watershed and Water Quality Information

### General Information

Applicant Name:

Permit Type: MS4

Latitude:

Longitude:

MS4 Designation:

Monitoring Station: RS-11041

Within Coastal Critical Area:

Water Classification (Provisional): FW

Waterbody Name: HOLLINSHEAD CREEK

Entered Waterbody Name:

### Parameter Descriptions

NH3N	Ammonia	FC	Fecal Coliform
CR	Chromium	FCB	Fecal Coliform (Shellfish)
CU	Copper	BIO	Macroinvertebrates (Bio)
HG	Mercury	TP	(Lakes) Phosphorus
NI	Nickel	TN	(Lakes) Nitrogen
PB	Lead	CHLA	(Lakes) Chlorophyll a
ZN	Zinc	ENTERO	(Beach) Enterococcus
DO	Dissolved Oxygen	HGF	Mercury (Fish)
PH	pH	PCB	PCB (Fish)

### Impaired Status (downstream sites)

Station	NH3N	CR	CU	HG	NI	PB	ZN	DO	PH	TURBIDITY	ECOLI	FCB	BIO	TP	TN	CHLA	ENTERO	HGF	PCB
RS-11041	X	X	X	X	X	X	X	F	F	F	T	A	X	X	X	X	X	X	X

F = Standards Fully Supported

A = Assessed at Upstream Station

T = Within TMDL Approved Watershed

N = Standards Not Supported

X = Parameter Not Assessed at Station

### Parameters to be addressed (those not supporting standards)

ECOLI

### Fish Consumption Advisory

### TMDL Information - TMDL Parameters to be addressed

In TMDL Watershed: Yes

TMDL Site: RS-03517

TMDL Report No: 028-05

TMDL Parameter: Fecal

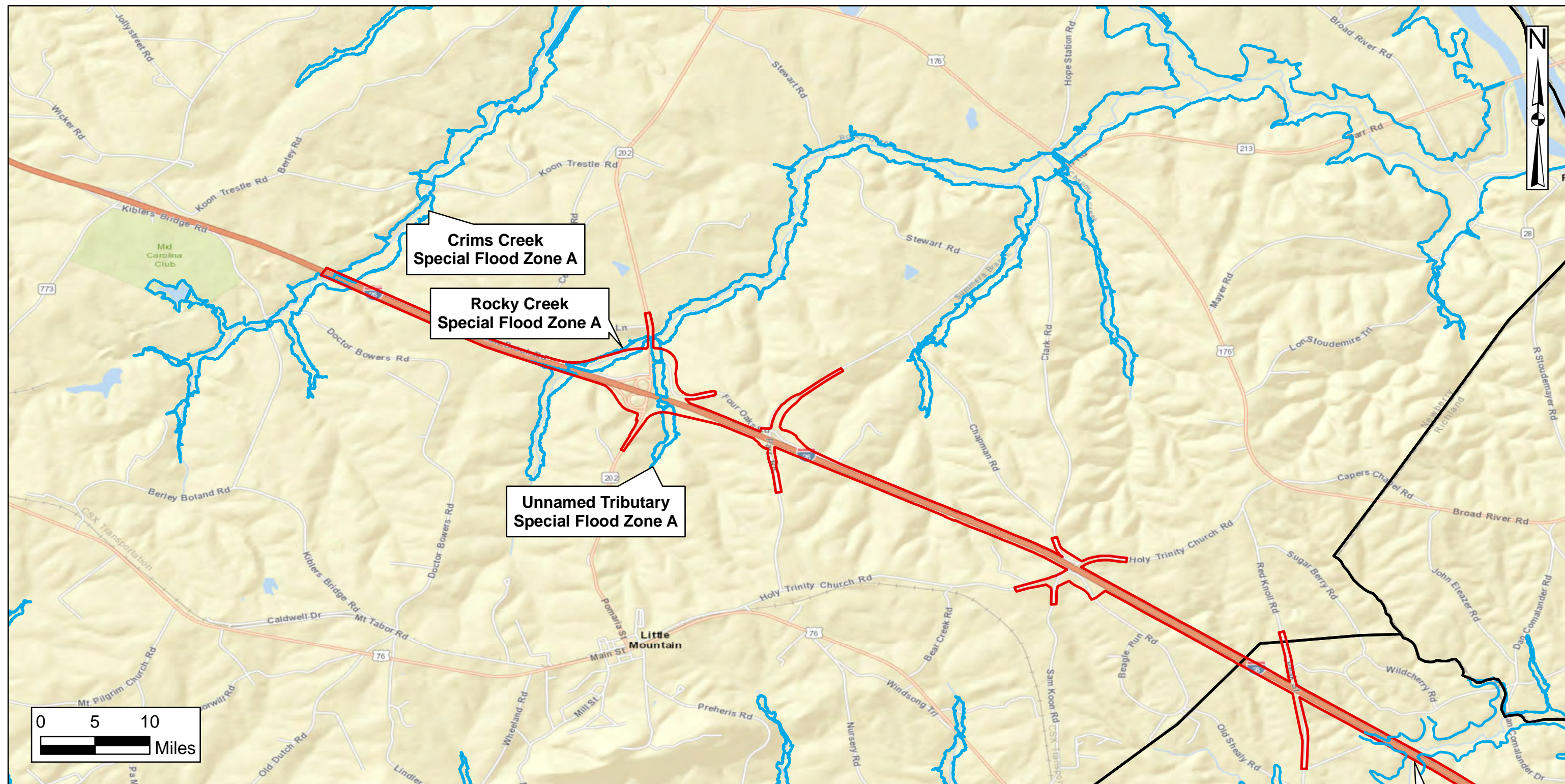
TMDL Document Link: [http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl\\_lwrbrd\\_fc.pdf](http://www.scdhec.gov/HomeAndEnvironment/Docs/tmdl_lwrbrd_fc.pdf)



# **APPENDIX D**

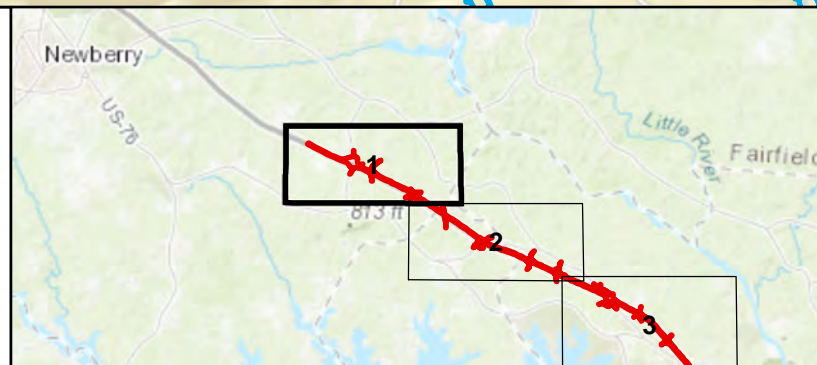
## **FEMA Floodplain Maps**





## Legend

- Flood Zone A
- County Line
- Project Study Area



## I-26 Design Build Widening MM 85 to MM 101 Lexington, Newberry, Richland Counties SCDOT P029208

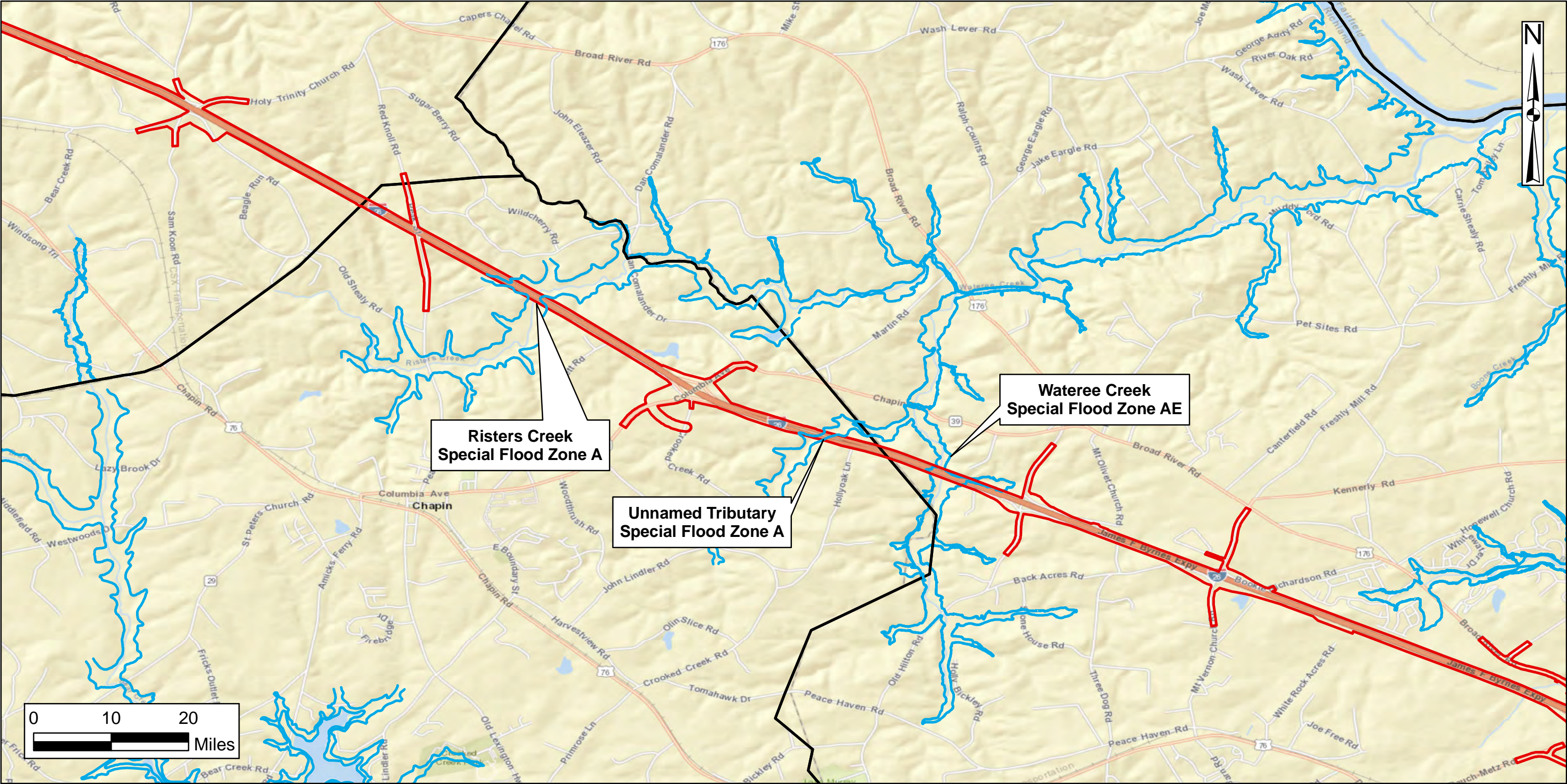
Source:  
FEMA FIRM Mapping  
South Carolina

Drawn By: RHH  
QA/QC: KLM




January 2018

Figure 1 of 3





**Legend**

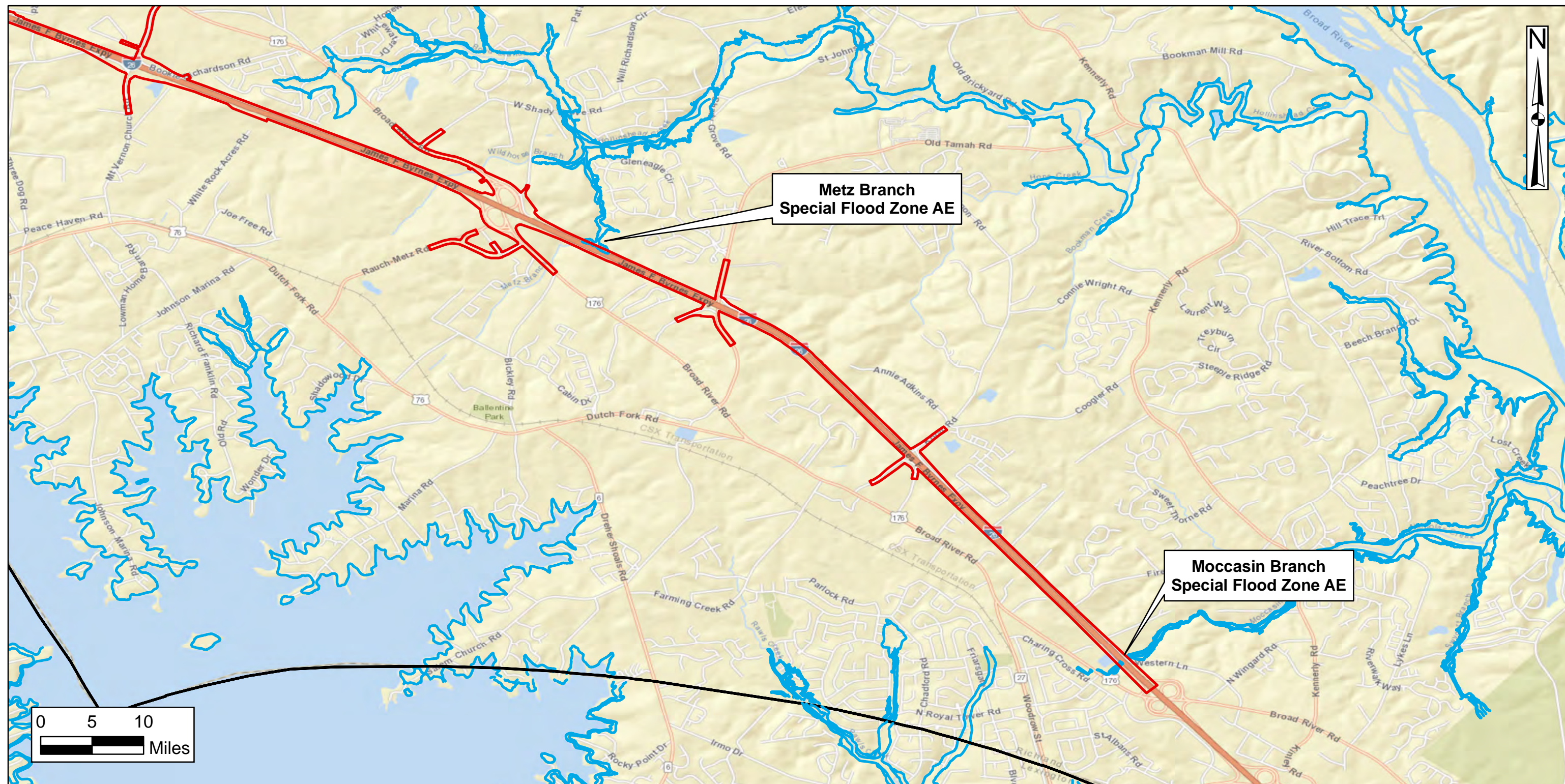
-  Flood Zone A
-  County Line
-  Project Study Area



**I-26 Design Build Widening MM 85 to MM 101**  
**Lexington, Newberry, Richland Counties**  
**SCDOT P029208**

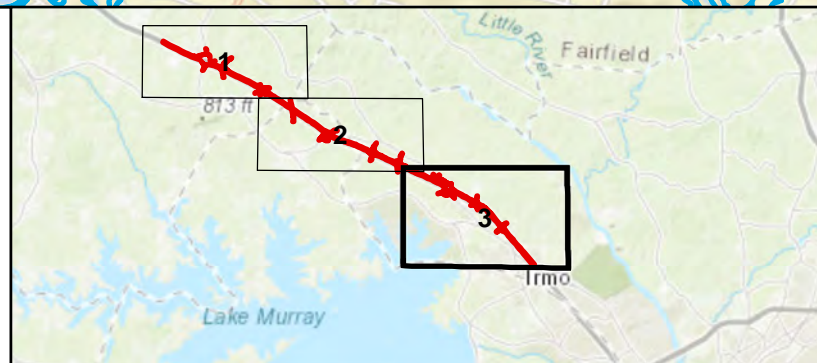
Source: FEMA FIRM Mapping South Carolina	Drawn By: RHH QA/QC: KLM  January 2018	Figure 2 of 3
------------------------------------------------	-------------------------------------------------	---------------





### Legend

- Flood Zone A
- County Line
- Project Study Area



### I-26 Design Build Widening MM 85 to MM 101 Lexington, Newberry, Richland Counties SCDOT P029208

Source:  
FEMA FIRM Mapping  
South Carolina

Drawn By: RHH  
QA/QC: KLM

January 2018

Figure 3 of 3



# **APPENDIX E**

## **USFWS Letter of Intent Response**





## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407



September 13, 2016

Mr. Edward W. Frierson  
NEPA Coordinator – Midlands Region  
South Carolina Department of Transportation  
P.O. Box 191  
Columbia, SC 29202-0191

Re: Letter of Intent, I-26 Widening, Richland County, SC  
FWS Log No. 2016-CPA-0114

Dear Mr. Frierson:

The U.S. Fish and Wildlife Service (Service) has received your September 6, 2016, Letter of Intent (LOI) for the proposed widening of a portion of I-26 in Richland County, South Carolina. The proposed corridor is 1.6 miles west of Exit 85 to 2,200 feet west of Exit 101, a distance of approximately 16 miles. The purpose of the project is to increase capacity, improve safety, and upgrade this portion of I-26 to current design standards. Pursuant to the National Environmental Policy Act of 1969, as amended (43 U.S.C. 4321 *et seq.*) South Carolina Department of Transportation (SCDOT) is preparing an Environmental Assessment (EA) to evaluate the benefits and impacts of the project. We offer the following information and preliminary comments and concerns for SCDOT's consideration.

- Water quality and quantity affects due to increased stormwater runoff from the additional impervious surface resulting from the widening;
- Recommend that all stream habitat be delineated and approved by the U.S. Army Corps of Engineers during the planning phases of the project;
- The presence of At-Risk Species (ARS), including but not limited to, Rafinesque's big-eared bat (*Corynorhinus rafinesquii*), and the Carolina birds-in-a-nest (*Macbridea caroliniana*), should be addressed in the environmental assessment.
- Ancillary widening of roads leading to adjacent development and resulting impacts; and
- Alternative analyses should be performed in order to determine the least environmentally damaging alternative.

The Service encourages SCDOT to use such measures in order to avoid or minimize impacts, particularly near aquatic resources. Widening I-26 to the inside of the existing median would result in the lowest amount of resource impacts.



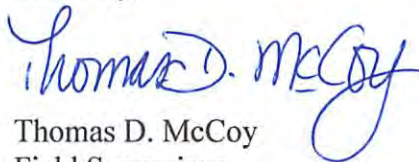
The Service is not aware of any federally protected threatened and endangered (T&E) species or suitable habitat in the project area. We recommend that SCDOT conduct a survey for the presence of T&E species and habitat during planning phases. Once the survey is complete, it should be submitted to our office for review.

For SCDOT's convenience, the Service has included with this letter a list of species that are currently protected under the Endangered Species Act of 1973 (ESA). This list also includes species that are considered as a candidate for listing under the ESA and those that have been petitioned for listing under the ESA. Appropriate survey time frames or windows for each species are included in the list. The species which have been petitioned for listing are considered "At-Risk Species" and may occur in Richland County, South Carolina. Although there are no Federal protections afforded to ARS, please consider including ARS in your survey 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>

The Service appreciates the opportunity to provide input at this early stage of the project's development. If you have any questions, please contact Mr. Mark Caldwell at (843) 727-4707 ext. 215, and reference FWS Log No. 2016-CPA-0114.

Sincerely,



Thomas D. McCoy  
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)	<i>Eurycea chamberlaini</i>	Spring/Fall surveys	Breeding survey: November to February
Bird	American wood stork (T)	<i>Mycteria americana</i>	February 15-September 1	Nesting season
	Bald eagle (BGEPA)	<i>Haliaeetus leucocephalus</i>	October 1-May 15	Nesting season
	Red-cockaded woodpecker (E)	<i>Picoides borealis</i>	April 1-July 31	Nesting season
Crustacean	Broad River spiny crayfish (ARS)	<i>Cambarus spicatus</i>	November-April	
Fish	American eel (ARS)	<i>Anguilla rostrata</i>	March 1-May 30; October 1-December 15	Temperature dependent: normally (17-20°C); can be found between 13-25°C
	Atlantic sturgeon* (E)	<i>Acipenser oxyrinchus*</i>	February 1-April 30	Spawning migration
	Blueback herring (ARS)	<i>Alosa aestivalis</i>	Mid-January-mid May	Peak: March-April
	Robust redhorse (ARS)	<i>Moxostoma robustum</i>	Late April-early May	Temperature dependent: 16-24°C
	Shortnose sturgeon* (E)	<i>Acipenser brevirostrum*</i>	February 1-April 30	Spawning migration
Insect	None Found			
Mammal	Rafinesque's big-eared bat (ARS)	<i>Corynorhinus rafinesquii</i>	Year round	Found in mines, caves, large hollow trees, buildings, and bat towers
	Tri-colored bat (ARS*)	<i>Perimyotis subflavus</i>	Year round	Found in mines and caves in the winter
Mollusk	Savannah lilliput (ARS)	<i>Toxolasma pullus</i>	March 1-September 30	
Plant	Bog spicebush (ARS)	<i>Lindera subcoriacea</i>	March-August	
	Canby's dropwort (E)	<i>Oxypolis canbyi</i>	Mid-July-September	
	Carolina-birds-in-a-nest (ARS)	<i>Macbridea caroliniana</i>	July-November	
	Ciliate-leaf tickseed (ARS)	<i>Coreopsis integrifolia</i>	August-November	
	Georgia aster (ARS*)	<i>Symphotrichum georgianum</i>	Early October-mid November	
	Michaux's sumac (E)	<i>Rhus michauxii</i>	May-October	
	Purple balduina (ARS)	<i>Balduina atropurpurea</i>	August-November	
	Rough-leaved loosestrife (E)	<i>Lysimachia asperulaefolia</i>	Mid May-September	
	Sandhills lily (ARS*)	<i>Lilium pyrophilum</i>	Late July-August	
	Smooth coneflower (E)	<i>Echinacea laevigata</i>	Late May-October	
	Spathulate seedbox (ARS)	<i>Ludwigia spathulata</i>	June-October	
	Wire-leaved dropseed (ARS)	<i>Sporobolus teretifolius</i>	August-September	Following fire
Reptile	Southern hognose snake (ARS)	<i>Heterodon simus</i>	Most of the year	



10/20/2015

- |       |                                                                                                                                                                                                                                       |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| *     | Contact National Marine Fisheries Service (NMFS) for more information on this species                                                                                                                                                 |
| **    | The U.S. Fish and Wildlife Service (FWS) and NMFS share jurisdiction of this species                                                                                                                                                  |
| ARS   | Species that the FWS has been petitioned to list and for which a positive 90-day finding has been issued (listing may be warranted); information is provided only for conservation actions as no Federal protections currently exist. |
| ARS*  | Species that are either former Candidate Species or are emerging conservation priority species                                                                                                                                        |
| BGEPA | Federally protected under the Bald and Golden Eagle Protection Act                                                                                                                                                                    |
| C     | FWS or NMFS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list these species                                                                                                   |

	Critical Habitat	Federally Endangered	Proposed for listing or critical habitat in the Federal Register	Federally protected due to similarity of appearance to a listed species	Federally Threatened
CH					
E					
P or P - CH					
S/A					
T					
These lists should be used only as a guideline, not as the final authority. The lists include known occurrences and areas where the species has a high possibility of occurring. Records are updated as deemed necessary and may differ from earlier lists.					
For a list of State endangered, threatened, and species of concern, please visit <a href="https://www.dnr.sc.gov/species/index.html">https://www.dnr.sc.gov/species/index.html</a> .					
Mollusk					
Insect					
Bird					
Amphibian					
Reptile					
Fish					
Plant					
Marine Invertebrate					
Terrestrial Invertebrate					