

US 158  
From the I-95 / NC 46 Interchange West of Garysburg  
To the Murfreesboro Bypass  
Northampton County

WBS No. 34472.1.1  
T.I.P. Project No. R-2582 & R-2584

ADMINISTRATIVE ACTION  
STATE DRAFT ENVIRONMENTAL IMPACT STATEMENT

In Compliance with the North Carolina  
State Environmental Policy Act

N. C. DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS



APPROVED:

2/29/08  
Date

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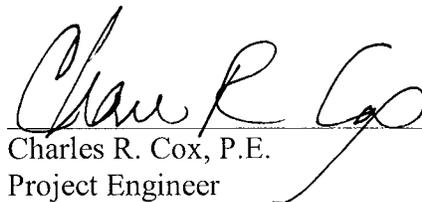
STATE DRAFT ENVIRONMENTAL IMPACT STATEMENT

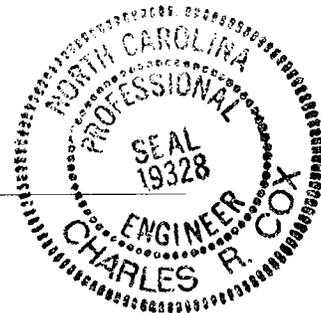
North Carolina Department of Transportation

February, 2008

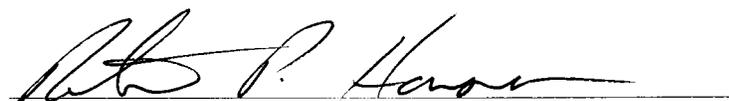
Documentation Prepared in Project Development and Environmental Analysis Branch by:

2/28/08  
Date

  
Charles R. Cox, P.E.  
Project Engineer



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Robert P. Hanson, P.E.  
Eastern Project Development Engineer

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## **PROJECT COMMITMENTS**

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### Roadway Design:

- Roadway Design Unit will coordinate with the NCDOT Rail Division in order to preserve space for a future connector track west of Garysburg.

### Project Development & Environmental Analysis Branch:

- An archeological survey will be completed once the recommended alternatives are selected.
- If alternatives are selected that have notably higher primes soils and farmland impacts than other alternatives, then NCDOT will document why lower farmland-impacting alternatives could not be selected, and will present practical minimization measures.
- Given the high rate of minority and low income populations in several of the communities along the project alternatives, enhanced outreach measures at the time of the public hearing(s) will be utilized.

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**SUMMARY**

**A. Type of Action**

This State Draft Environmental Impact Statement (DEIS) has been prepared to evaluate the potential impacts of this proposed transportation improvement project. From this evaluation, the North Carolina Department of Transportation (NCDOT) anticipates significant impacts to the environment will not occur due to this proposed project. A final determination will be made in supplemental documentation, likely a final EIS.

**B. General Description**

The NCDOT proposes to widen US 158 in Northampton County from the I-95/NC 46 Interchange to the Murfreesboro Bypass (see Figure 1). Alternatives under consideration utilize the existing facility with some segments located along new location. The widening will convert the highway from its current configuration as a two-lane facility to a four-lane, median-divided facility. The proposed facility will have 12-foot lanes, paved shoulders, and a 46-foot grass median. The total length of the project is approximately 32 miles.

These projects are included in the approved 2007-2013 State Transportation Improvement Program (STIP) and the Draft 2008-2015 STIP. R-2582 and R-2584 are being addressed in one environmental planning document to more appropriately address logical termini. The total cost in the STIP is \$170,562,000, which includes \$18,925,000 for right of way and \$150,200,000 for construction. The current estimated cost varies depending on the segments selected. Right of way acquisition is scheduled to begin in State Fiscal Year (FY) 2012 and construction is currently in an “unfunded” status.

**C. Purpose and Need for Project**

The purpose of the proposed action is to:

- Improve traffic flow and level of service (LOS) on this section of US 158
- Improve safety along this section of US 158
- Improve access to existing and future industry

**D. Alternatives Considered**

Mass transit alternatives and the “no-build” alternative were considered as alternatives to the proposed improvements (see Section IV). There are 17 alternatives created from 29 design segments. These alternatives include bypasses around each of the four communities located along the project: Garysburg, Jackson, Faison’s Old Tavern, and Conway, in addition to some widening segments. Figures 1 and 2 show the location and relationship of these segments (A1 through H1).

**E. Recommended Alternative**

No alternative is recommended at this time. Comments received at the design public hearing will be reviewed, and the additional coordination with other federal, state, and local agencies will occur before the final decision is made.

**F. Summary of Environmental Effects**

Tables S-1 through S-4 give details of the effects that this project will have on the Natural and Human Environments.

**Table S-1: Comparison of Garysburg Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Garysburg Northern Bypass</b>	<b>Garysburg Southern Bypass 1</b>	<b>Garysburg Southern Bypass 2</b>
Segments Included	A1 B1	A1 B2 B3	A1 B2 B4
Length	5.0	5.4	5.5
Interchanges	1	2	1
Railroad Crossings	2	2	2
Schools	1	0	0
Recreational Areas and Parks	0	0	0
Churches	1	1	1
Cemeteries	0	0	0
Major Utility Crossings	1	1	1
Historic Properties (Eligible or listed on the National Register)	5	5	4
Archaeological Sites	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0
NRCS-Potential Farmland Conversion	Below Threshold	Below Threshold	Below Threshold
Residential Relocations	32	11	11
Business Relocations	5	2	2
Noise Receptors Impacted	28	8	7
Wetland Impacts (acres)	5	11	10
Stream Impacts (feet)	1520	2040	3410
Water Supply Watershed Protected Areas	0	0	0
Wildlife Refuges and Game Lands	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	Yes	No	No
Hazardous Material / Landfill Sites	0	0	0
Underground Storage Tank Sites	4	3	3
Construction Cost	\$48,500,000	\$53,100,000	\$57,500,000
Right of Way Cost	\$10,648,250	\$13,548,750	\$13,713,250
Utility Relocation Cost	\$1,188,686	\$1,015,868	\$953,060
<b>Total Cost</b>	<b>\$60,336,936</b>	<b>\$67,664,618</b>	<b>\$72,166,310</b>

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table S-2: Comparison of Jackson Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Old Jackson Bypass</b>	<b>Extended Northern Jackson Bypass</b>	<b>Northern Jackson Bypass</b>	<b>Southern Jackson Bypass</b>
Segments Included	D1	C1 E1	C1 E2 E3	C1 E2 E4
Length	8.8	11.9	13.1	10.5
Interchanges	0	0	1	1
Railroad Crossings	0	0	0	0
Schools	0	1	0	1
Recreational Areas and Parks	0	0	1	1
Churches	1	1	0	0
Cemeteries	0	1	0	0
Major Utility Crossings	1	1	1	1
Historic Properties (Eligible or listed on the National Register)	4	4	10	10
Archaeological Sites	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0
NRCS-Potential Farmland Conversion	Moderate Concern	Below Threshold	Below Threshold	Below Threshold
Residential Relocations	6	5	11	25
Business Relocations	0	0	0	0
Noise Receptors Impacted	11	0	52	4
Wetland Impacts (acres)	40	43	16	34
Stream Impacts (feet)	1620	850	1770	2110
Water Supply Watershed Protected Areas	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	No	No	No	No
Hazardous Material / Landfill Sites	0	0	0	0
Underground Storage Tank Sites	0	2	2	2
Construction Cost	\$40,200,000	\$53,900,000	\$71,300,000	\$68,000,000
Right of Way Cost	\$3,900,500	\$4,213,500	\$6,383,500	\$9,444,000
Utilities Cost	\$1,144,221	\$919,947	\$1,054,723	\$1,452,850
Total Cost	\$45,244,721	\$59,033,447	\$78,738,223	\$78,896,850

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table S-3: Comparison of Faison's Old Tavern Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Faison's Widen on Existing 1</b>	<b>Faison's Widen on Existing 2</b>	<b>Faison's Northern Bypass 1</b>	<b>Faison's Northern Bypass 2</b>	<b>Faison's Southern Bypass 1</b>	<b>Faison's Southern Bypass 2</b>
Segments Included	F2 F5 F7	F4 F7	F2 F6 F9	F2 F6 F10	F1 F8	F3 F8
Length	8.0	7.5	8.6	8.3	8.0	7.7
Interchanges	0	0	1	1	1	1
Railroad Crossings	0	0	0	0	0	0
Schools	0	0	0	0	1	1
Recreational Areas and Parks	0	0	0	0	0	0
Churches	0	0	0	0	0	0
Cemeteries	5	5	0	0	0	0
Major Utility Crossings	0	0	0	0	0	0
Historic Properties (Eligible or listed on the National Register)	1	1	1	0	0	1
Archaeological Sites	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0	0	0
NRCS-Potential Farmland Conversion	Below Threshold	Below Threshold	Below Threshold	Moderate Concern	Higher Concern	Higher Concern
Residential Relocations	36	39	2	2	5	5
Business Relocations	2	2	2	1	1	0
Noise Receptors Impacted	2	2	11	11	0	0
Wetland Impacts (acres)	4	1	23	21	10	9
Stream Impacts (feet)	400	0	2810	2780	490	540
Water Supply Watershed Protected Areas	0	0	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	Potential	Potential	No	No	No	No
Hazardous Material / Landfill sites	0	0	0	0	0	0
Underground Storage Tank Sites	12	11	1	1	2	1
Construction Cost	\$33,400,000	\$31,200,000	\$51,200,000	\$49,100,000	\$43,300,000	\$44,400,000
Right of Way Cost	\$12,684,000	\$13,688,000	\$6,343,500	\$5,985,500	\$6,069,500	\$5,790,000
Utilities Cost	\$1,290,430	\$1,155,899	\$423,593	\$395,593	\$318,493	\$267,539
Total Cost	\$47,374,430	\$46,043,899	\$57,967,093	\$55,481,093	\$50,687,993	\$50,457,539

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table S-4: Comparison of Conway Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Conway Northern Bypass 1</b>	<b>Conway Northern Bypass 2</b>	<b>Conway Southern Bypass 1</b>	<b>Conway Southern Bypass 2</b>
Segments Included	G2 G6 G7 H1	G1 G6 G7 H1	G3 G5 G7 H1	G3 G4 H1
Length	7.8	7.8	8.8	8.0
Interchanges	1	1	1	1
Railroad Crossings	1	1	1	1
Schools	1	1	0	0
Recreational Areas and Parks	0	0	0	0
Churches	1	0	0	0
Cemeteries	0	1	0	0
Major Utility Crossings	0	0	0	0
Historic Properties (Eligible or listed on the National Register)	5	6	5	5
Archaeological Sites	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0
NRCS-Potential Farmland Conversion	Higher Concern	Higher Concern	Higher Concern	Higher Concern
Residential Relocations	19	15	22	15
Business Relocations	1	1	0	1
Noise Receptors Impacted	2	2	0	0
Wetland Impacts (acres)	15	15	36	42
Stream Impacts (feet)	2280	2030	2080	1930
Water Supply Watershed Protected Areas	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	No	No	No	No
Hazardous Material / Landfill sites	0	0	0	0
Underground Storage Tank Sites	1	0	0	0
Construction Cost	\$72,600,000	\$64,000,000	\$60,600,000	\$66,200,000
Right of Way Cost	\$8,832,500	\$8,570,500	\$8,916,500	\$7,177,500
Utilities Cost	\$1,477,696	\$1,383,772	\$1,296,080	\$638,257
Total Cost	\$82,910,196	\$73,954,272	\$70,812,580	\$74,015,757

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

### **G. Special Permits Required**

An Individual Permit will be required based on the cumulative loss of stream channel and wetlands being greater than the current thresholds for Nationwide Permits. Once a design alternative is selected, a final permitting strategy can be developed. A water quality certification

from NC Division of Water Quality (NCDWQ) will be requested. An Individual 401 Water Quality Certification will be necessary for impacts before an Individual 404 Permit can be obtained. The USACE does not have jurisdiction over isolated wetlands. Therefore, an Isolated Wetland Permit will be required from NCDWQ if an alternative impacts any of the isolated wetlands. NCDOT will coordinate with the USACE and NCDWQ after the completion of final design to obtain the necessary permits required by Sections 404 and 401 of the CWA.

## **H. Coordination**

The following federal, state, and local agencies were consulted during the preparation of this environmental assessment. Written comments were received from agencies noted with an asterisk (\*).

- \*United States Army Corps of Engineers (USACE)
- \*United States Environmental Protection Agency (USEPA)
- \*United States Fish and Wildlife Service (USFWS)
- \*National Marine Fisheries Service (NMFS)
- \*North Carolina Department of Cultural Resources (SHPO)
- \*North Carolina Wildlife Resources Commission (WRC)
- \*North Carolina Division of Soil and Water Conservation (DSWC)
- \*North Carolina Division of Forest Resources
- \*North Carolina Division of Water Quality (DWQ)
- \*North Carolina Division of Environmental Health
- North Carolina Division of Coastal Management (DCM)
- North Carolina Division of Marine Fisheries (DMF)
- Upper Coastal Plains Council of Governments
- \*Town of Garysburg
- Town of Conway
- Halifax County Commissioner
- Northampton County Commissioner
- \*Town of Jackson
- \*Town of Weldon
- \*Northampton County Schools

## **I. Additional Information**

Additional information concerning the proposal and assessment can be obtained by contacting the following:

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**US 158**  
**From the I-95 / NC 46 Interchange West of Garysburg**  
**To the Murfreesboro Bypass**  
**Northampton County**  
**WBS No. 34472.1.1**  
**T.I.P. Project Nos. R-2582 & R-2584**

**I. DESCRIPTION OF PROPOSED ACTION**

The NCDOT proposes to widen US 158 in Northampton County from the I-95/NC 46 Interchange to the Murfreesboro Bypass (see Figure 1). Alternatives under consideration utilize the existing facility with some segments located along new location. The widening will convert the highway from its current configuration as a two-lane facility to a four-lane, median-divided facility.

The proposed facility will have 12-foot lanes, paved shoulders, and a 46-foot grass median. The total length of the project is approximately 32 miles.

These projects are included in the approved 2007-2013 State Transportation Improvement Program (STIP) and the Draft 2008-2015 STIP. R-2582 and R-2584 are being addressed in one environmental planning document to more appropriately address logical termini. The total cost in the STIP is \$169,125,000, which includes \$18,925,000 for right of way and \$150,200,000 for construction. The current estimated cost varies depending on the segments selected. Right of way acquisition is scheduled to begin in State Fiscal Year (FFY) 2011 and construction is currently in an “unfunded” status.

**Table 1-1 TIP Project Cost**

<b>TIP Number</b>	<b>Project Section</b>	<b>Right of Way Cost</b>	<b>Construction Cost</b>
R-2582	A	\$5,625,000	\$23,300,000
	B	\$3,000,000	\$24,900,000
R-2584	A	\$5,770,000	\$51,000,000
	B	\$2,160,000	\$30,600,000
	C	\$2,370,000	\$20,400,000
		\$18,925,000	\$150,200,000
Total Cost - \$169,125,000			

## **II. PURPOSE AND NEED FOR THE PROPOSED PROJECT**

### **A. Project Need**

The need for the proposed transportation project results from the following areas: traffic flow and level of service (LOS); safety; and access.

#### **Traffic flow**

Efficient East-West routes are lacking in northeastern North Carolina. US 158 is a major intrastate highway traversing from west of Winston-Salem to the Outer Banks of North Carolina. US 158 is the principal east-west route from I-85 and I-95 to the coast in the northern part of North Carolina. It is currently a two-lane road for much of the route, and passes through numerous small towns.

US 158 has been designated as Strategic Highway Corridor (SHC) No. 37. Strategic Highway Corridors are a set of primarily existing highway corridors that exemplify the long-term potential to serve passenger and freight movement in a high-speed manner. These facilities, upon some level of improvement, will substantially increase the mobility and connectivity of travel to destinations within and just outside North Carolina, while helping foster economic prosperity and promoting environmental stewardship. The Board of Transportation adopted the SHC concept as part of the Statewide Transportation Plan in September 2004.

Similar to the SHC, US 158 is also part of the State's Intrastate System. The Intrastate System was established to provide high-speed, safe travel service throughout the state. It connects major population centers both inside and outside the State and provides safe, convenient, through-travel for motorists. The Intrastate System supports statewide growth and development objectives and connects to major highways of adjoining states.

US 158 is on the Federal Highway Administration's (FHWA) National Highway System (NHS). In 1998, the FHWA published a National Strategic Plan, which sought to preserve and enhance the infrastructure of Federal-aid highways with emphasis on the NHS. Objectives of the plan include reducing delay by 20 percent in 10 years, reducing the number of highway related fatalities and serious injuries by 20 percent in 10 years, enhancing community and social benefits of highway transportation, increasing public satisfaction with highway systems and highway projects as a beneficial part of their community, and reducing on-road mobile source emissions by 20 percent in 10 years.

For most of the project length, the highway has a speed limit of 55 mph. The speed limit is lower as US 158 passes through the towns of Garysburg, Jackson, and Conway. Various developed areas lining the highway also limit the permissible areas that vehicles can safely pass. Because of numerous slow moving vehicles, farm machinery, the sections of US 158 passing through towns, and the limited opportunities to pass, average operating speeds are generally lower than 55 mph.

In 2005, traffic on US 158 ranged from 2300 vph to 10,000 vph. By 2030, it is estimated to range from 4000 vph to 17,500 vph (see Figure 6). If traffic levels increase as projected and no improvements are made to US 158, the level of service on the west end of US 158 is expected to deteriorate to LOS E by the year 2010. Other sections of US 158 in Northampton County are expected to deteriorate to LOS D or E by the design year (2030).

### **Safety**

When the planning for this project began, US 158 had experienced a fatal accident rate twice the average for roads in North Carolina of similar type. The rate has since gone down and the overall collision rate for US 158 in Northampton County was 98.27 collisions/per million vehicle miles (coll/100mvm) from April 1, 2004 to March 31, 2007. This is lower than the statewide average of 193.9 coll/100mvm for rural U.S. routes. During this time period, there were no fatal crashes along this corridor. From July 1996 to July 1999, the fatal accident rate was 5.22 fatal coll/100mvm, which was twice the statewide average for similar US routes.

### **Access**

Traffic passing through the towns along US 158 results in inefficient through-travel and deterioration of local vehicle and pedestrian operations. Existing US 158 in Northampton County travels through the towns of Jackson and Conway, requiring vehicles to slow down to meet a speed limit of 20 mph through the business districts and 35 mph within the town limits, and to operate among local business traffic and pedestrians. Both US 158 and NC 46 travel through the town of Garysburg. Vehicles traveling east on NC 46 must stop at the NC 301 intersection before proceeding south to US 158 to continue east. Two fatal accidents along US 158, one in 1998 and one in 1999, involved pedestrians near the town of Garysburg.

Local officials view this project as important to Northampton County's economy. The improved transportation corridor will improve transportation service to existing and potential future industry. This directly affects both existing industries utilizing this highway, as well as potential future industries looking to relocate in Northampton County.

US 158 is a major east-west thoroughfare in the northeastern section of North Carolina. The projected traffic and land use conditions in and around the small towns along the route diminish this segment's ability to function as an intrastate corridor.

### **B. Purpose of the Project**

The purpose of the proposed action is to:

**Improve traffic flow and level of service (LOS) on this section of US 158.** In a "no-build" scenario, the projected traffic along several segments of US 158 would exceed capacity, thus creating deficient levels of service along those segments. This increases the potential for accidents and contributes to the inefficient operation of motor vehicles. With the proposed improvements, traffic flow would be improved to a Level of Service A (LOS A). Travel conditions would remain at LOS A through the design year.

**Fulfill US 158's role as a SHC, Intrastate Route and meet FHWA's Strategic Plan objectives.** Widening this facility to four lanes will meet the objectives of these designations, designed to improve safety, decrease travel time, and foster economic prosperity through the quick and efficient movement of people and goods.

**Improve safety along this section of US 158.** The most prevalent types of vehicle crashes along the project corridor were the rear end type collisions, or collisions involving animals. The additional travel lanes with median openings to allow left turn movements will reduce the potential for rear end collisions.

With bypasses of Jackson and Conway, through traffic and local traffic would be separated. Because the through traffic would not be as mixed with local traffic, the variance of speeds among vehicles would decrease. Bypasses of the towns would provide for better through traffic from one side of the county to the other. With less through traffic within the town limits, the safety and operations of local vehicles and pedestrians would improve.

**Improve access to existing and future industry.** The NuCor facility in Hertford County is one example of new industries that could locate to the area. This plant employs approximately 450 people and generates approximately 3500 truck trips per day. As this area of the state continues to attract industry such as the NuCor facility, the need for adequate transportation facilities will increase.

### **III. EXISTING ROADWAY INVENTORY**

#### **A. Length of Project**

The total length of the proposed project is approximately 32 miles.

#### **B. Project Terminals**

The project currently begins at the interchange of Interstate 95 and NC 46 west of Garysburg. The project ends at the existing four-lane divided section of the Murfreesboro Bypass.

#### **C. Existing Typical Section**

US 158 is currently a two-lane highway, having between 24 feet and 28 feet of pavement along most of the route in Northampton County. US 158 is a three-lane section through the Town of Conway. US 158 travels through small towns and communities and passes by agricultural fields and wooded areas.

#### **D. Route Classification**

US 158 is designated as a principal arterial on the North Carolina Statewide Functional Classification System.

#### **E. Right of Way**

Current right of way along this section of US 158 ranges from 50 feet to 110 feet. The right of way is narrower within town limits and is usually 100 feet in rural areas.

#### **F. Bridge/Drainage Structures**

The existing inventory of bridges and culverts is listed in Table 3-1.

**Table 3-1. Bridge/ Drainage Structures**

<b>Structure</b>	<b>Segment</b>	<b>Location</b>	<b>Size</b>
Culvert #31	A1	NC 46, just over a mile east of I-95	Triple 9-ft x 9-ft RCBC
Culvert #5	B3	US 158, a mile east of US 301	Triple 8-ft x 6-ft RCBC
Bridge #51	D1	SR 1311 (Old Jackson Bypass Road), half a mile east of SR 1313	45-ft
Culvert #8	C1	US 158, 0.2 miles east of US 301	Triple 8-ft x 6-ft RCBC
Structure #114	D1	SR 1311 (Old Jackson Bypass Road), 0.1 miles west of NC 305	Double 120-in x 84-in CSPA
Non-Inventory Structure	E2	US 158, 0.6 miles west of SR 1137	Double 50-in x 31-in CSPA
Bridge #112	E2	US 158, 0.1 miles east of SR 1137	150-ft
Culvert #16	E4	US 158, 0.25 miles east of NC 305	Triple 8-ft x 8-ft RCBC
Non-Inventory Structure	E1	US 158, 0.65 miles west of SR 1332	Triple 78-in x 54-in CSPA
Non-Inventory Structure	G7	US 158, 0.1 miles east of SR 1358	10-ft x 6-ft RCBC

\* RCBC – Reinforced Concrete Box Culvert

\* CSPA – Corrugated Steel Pipe Arch

### **G. Speed Limit**

For most of the project length, US 158 has a 55-mph posted speed limit. Within Garysburg, Jackson, and Conway, the speed limit reduces to as low as 20-mph.

### **H. Access Control**

Existing US 158 and NC 46 have no control of access through the project corridor, with the exception of the I-95/NC 46 interchange, which has full control of access.

### **I. Intersection and Type of Control**

All intersections are managed by traffic signals or signs. The following intersections on this section of US 158 and NC 46 are signalized:

US 158 and NC 305 in Jackson

US 158 and NC 35 in Conway

### **J. Utilities**

Underground cable, sewer, electricity, water, gas, and telephone are located within the project corridor.

**K. School Buses**

Currently, approximately 23 buses use portions of US 158, each making two trips per day.

**L. Railroad Crossings**

There are three railroad crossings within this project area (see Figures 2a-2ii). The CSX A-line runs from Weldon, NC to Emporia, VA and is a route being considered as part of the Southeast High Speed Rail Corridor (SEHSR) from Washington DC through Raleigh to Charlotte, NC. The second crossing is the CSX SA-line that runs from Weldon, NC to Portsmouth, VA. The third railroad in the project area is in Conway. The North Carolina & Virginia Railroad (NCVA) is a shortline railroad which was once a part of the CSX SAB-line that ran from Boykins, VA through Conway to Lewiston, NC.

**M. Traffic Volumes**

In 2005, traffic on US 158 ranged from 2,300 vph (near Conway) to 10,000 vph (in Weldon). By 2030 it is estimated to range from 4,000 vph to 17,500 vph.

**N. Sidewalks**

There are sidewalks along US 158 in Jackson and Conway. There are no sidewalks along NC 46.

**O. Parking**

There is designated on-street parking along US 158 in Jackson and Conway. There is no parking along NC 46.

**P. Bicycles**

This section of US 158 and NC 46 is not designated as a bicycle route.

**Q. Greenways**

No greenways exist along this section of US 158 and NC 46.

**R. Other TIP Projects**

Table 3-2 shows the series of transportation projects along the US 158 corridor in Northeastern North Carolina east of Interstate 95 (also refer to Appendix A, Figure 3):

**Table 3-2. Other US 158 Projects in the 2008-2015 STIP (At and East of Interstate 95)**

<b>TIP Project</b>	<b>County</b>	<b>Right of Way/Let Schedule</b>
R-2581	Halifax	Post Year/Post Year
R-2507A	Hertford/Gates	2011/2013
R-2578	Gates	Post Year/Post Year
R-2579	Gates/Pasquotank	2015/Post Year
R-2414	Camden	In Progress/2009
R-2574	Camden/Currituck	Post Year/Post Year
R-2583	Hertford	2010/2012

\* Post Year denotes the project is not currently funded

Other major TIP projects in Northampton County include:

U-2419, Widening of NC 48 from Roanoke Avenue in Halifax County to NC 46 in Gaston in Northampton County, scheduled for a post year let date.

I-4913, Pavement Rehabilitation on I-95 from milepost 175 to the Virginia State line, scheduled for let in 2007.

#### **IV. ALTERNATIVES CONSIDERED**

Alternatives considered for this project included the “no-build” transportation system, mass transit, and construction alternatives. The 17 “construction alternatives” are a combination of improving existing US 158 and new location sections.

##### **A. “No Build” Alternative**

The “no build” alternative would forego any improvements to existing roads with the exception of routine maintenance. No new segment would be constructed, and no roadway or intersection improvements would be performed.

The “no-build” alternative would avoid all adverse impacts, in that no wetlands, streams, historic properties, or other cultural and natural resources would be directly impacted. However, this alternative would not meet the Purpose and Need of this project.

Therefore, the “no-build” alternative has been dropped from further consideration. The “no-build” alternative does, however, provide a basis for comparison of other alternatives.

##### **B. Transportation Systems Management Alternatives**

Transportation Systems Management (TSM) improvements involve increasing the available capacity of the facility within the existing right-of-way with minimum capital expenditures and without reconstructing the facility. Items such as the addition of turn lanes, striping, signing, signalization, and minor realignments are examples of TSM physical improvements. Traffic law enforcement, speed restrictions, control, and signal timing changes are examples of TSM operational improvements. These types of improvements were considered, and some elements, such as access control measures, will be incorporated into the recommendations. However, TSM improvements alone would not meet the stated purpose of the project. Therefore, the TSM alternatives were not considered a reasonable and feasible alternative and were eliminated from further consideration.

##### **C. Mass Transit Alternatives**

There is no existing mass transit in Northampton County due to lack of demand, low-density development, and low population density. The study area is primarily rural, with the exception of downtown areas in the communities of Garysburg, Jackson, and Conway. In addition, US 158 carries a large portion of through traffic with relatively high truck percentages, which is not conducive to local mass transit. Based on these factors, the Mass Transit Alternative was eliminated from consideration because it would not effectively address the purpose and need of the project.

## **D. Construction Alternatives**

The project originally began in Weldon east of the existing US 158 one-way pair. The section that ties to I-95/NC 46, the current western terminus, was added later. In developing alternatives, the project was divided to correspond with the four main populated segments of the project: Garysburg, Jackson, Faison's Old Tavern, and Conway. Both widening and new location alternatives have been developed. Currently, there are 17 alternatives created from 29 segments (A1-H1). Figures 2a through 2ii (Appendix A) show these alternatives and segments.

NCDOT is proposing a four-lane facility with a 46-foot wide grassy median for the length of the project. The median-divided typical section is consistent with the existing Murfreesboro Bypass at the eastern end of the project. NCDOT proposes full control of access for any new location segments, with interchanges planned at most major intersecting NC and US routes. Partial access control is proposed for all of the widening alternatives.

### **Garysburg**

The current Garysburg alternatives all begin at the junction of NC 46 and I-95. This is the project's western terminus, and involves re-designating US 158 onto existing NC 46 at its intersection with I-95, one exit north of the existing US 158 exit. Figure 1 shows the study corridors for each of the Garysburg alternatives.

Garysburg Northern Bypass (Segments A1, B1): This bypass begins at the NC 46/ I-95 intersection and extends along existing NC 46 until its intersection with US 301 north of town. The bypass proceeds on new location around Garysburg until it rejoins US 158 east of town. A grade separation is proposed over US 301, and an interchange is proposed at the reconnection of the bypass with existing US 158 east of town. This alternative involves two railroad crossings.

Garysburg Southern Bypass 1 (Segments A1, B2, B3): This bypass begins at the NC 46/ I-95 intersection and extends along existing NC 46 until just west of Garysburg. The bypass then proceeds on new location south of Garysburg, until it rejoins US 158 east of town (at the same location as the proposed Northern Bypass). An interchange is proposed at US 301. An intersection is proposed at the reconnection of the bypass with existing US 158 east of town. This alternative also involves two railroad crossings.

Garysburg Southern Bypass 2 (Segments A1, B2, B4): This bypass follows the same path as Southern Bypass 1 alternative, but extends farther south after it crosses existing US 158/US 301 south of town. This alternative reconnects with US 158 east of town at the intersection of US 158 and Old Jackson Bypass Road (SR 1311). An interchange is proposed at US 301. An intersection is proposed at the reconnection with existing US 158 east of town. This alternative also involves two railroad crossings.

## **Jackson**

The Jackson section of the project extends from east of Garysburg (at the intersection of US 158 and Old Jackson Bypass Road) to east of Jackson; the eastern end of this section corresponds to the split between projects R-2582 and R-2584. Figure 1 shows the study corridors for the Jackson alternatives.

Old Jackson Bypass (Segment D1): This alternative widens the existing Old Jackson Bypass Road (SR 1311) for use as a bypass. Two sections of the existing road would be straightened, thus creating some new location sections. No interchanges are included in this alternative.

Extended Northern Jackson Bypass (Segments C1, E1): This alternative follows US 158 on existing location, then proceeds on new location north of Jackson and reconnects with US 158 east of Mt. Carmel Road (SR 1333). The bypass would intersect NC 305 just south of Pleasant Grove Road (SR 1314). An interchange is proposed at NC 305 while the connections with existing US 158 will be at-grade intersections.

Northern Jackson Bypass (Segments C1, E2, E3): This alternative follows existing US 158 until just west of Jackson and extends north of town on new location. The bypass reconnects with US 158 east of Mt. Carmel Road (SR 1333). An interchange is proposed at NC 305 while the connections with existing US 158 will be at-grade intersections.

Southern Jackson Bypass (Segments C1, E2, E4): This alternative follows existing US 158 until just west of Jackson and extends south of town on new location. The bypass reconnects with US 158 east of NC 305 Mt. Carmel Road (SR 1333). An interchange is proposed at NC 305 while the connections with existing US 158 will be at-grade intersections.

## **Faison's Old Tavern**

The Faison's Old Tavern alternatives extend from east of Jackson through just west of the town of Conway. Figure 1 shows the study corridors for the Faison's Old Tavern alternatives.

Widen on Existing 1 (Segments F2, F5, F7) and 2 (Segments F4, F7): These alternatives widen US 158 on its existing location from east of Jackson to just west of Conway. No interchanges are proposed with this alternative. The connections with existing US 158 will be at-grade intersections. The alternatives differ where they tie to Jackson alternative.

Faison's Old Tavern Northern Bypasses 1 (Segments F2, F6, F9) and 2 (Segments F2, F6, F10): These alternatives proceed on new location from just east of Old Jackson Bypass Road to west of Conway. An interchange is proposed at Galatia Road (SR 1344) while the connections with existing US 158 will be at-grade intersections.

Faison's Old Tavern Southern Bypasses 1 (Segments F1, F8) and 2 (Segments F3, F8): These alternatives extend on new location from west of the Old Jackson Bypass Road intersection to west of Conway. An interchange is proposed at NCHS East Road (SR 1505) while the connections with existing US 158 will be at-grade intersections.

### **Conway**

The Conway alternatives extend from west of town (just east of Zion Church) through to the east end of the project. Included in each of these alternatives is a segment of US 158 at the end of the project that will be widened on its existing location. Figure 1 shows the study corridors for the Conway alternatives.

Northern Conway Bypasses 1 (Segments G2, G6, G7, H1) and 2 (Segments G1, G6, G7, H1): This alternative begins on new location east of Zion Church Road (SR 1500) and reconnects with existing US 158 east of Gilmer Ricks Road (SR 1543). An interchange is proposed at NC 35 north of town while the connections with existing US 158 will be at-grade intersections. This alternative involves one railroad crossing.

Southern Conway Bypass 1 (Segments G3, G5, G7, H1): This alternative begins on new location east of Zion Church Road (SR 1500) and, after passing south of town, curves north to cross over the existing facility before reconnecting with US 158 east of Gilmer Ricks Road (SR 1543). An interchange is proposed at NC 35 and a grade separation is proposed over one section of existing US 158. The end connections with existing US 158 will be at-grade intersections. There is one railroad crossing associated with this alternative.

Southern Conway Bypass 2 (Segments G3, G4, H1): This bypass follows most of the same alignment as the other southern bypass alternative; however, it proceeds east to reconnect with existing US 158 at Ashley's Grove Road (SR 1536). An interchange is proposed at NC 35 while the connections with existing US 158 will be at-grade intersections. There is also one railroad crossing associated with this alternative.

### **E. Alternatives Eliminated**

Weldon-Widen on Existing US 158: This alternative begins east of Weldon and west of the Roanoke River on US 158. It was dropped from consideration by the merger team on 8/18/2005 due to the impacts to the Weldon Historic District and the new crossing required over the Roanoke River.

Jackson-Widen on Existing: This alternative involves only widening the existing roadway. It was dropped from consideration by the merger team on 3/10/2005 due to the impacts to the Jackson Historic District.

Conway-Widen on Existing: This alternative would was dropped from further consideration by the merger team on 3/10/2005 due to impacts to the Conway Historic District.

**F. Comparison of Remaining Alternatives****Table 4-1: Comparison of Garysburg Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Garysburg Northern Bypass</b>	<b>Garysburg Southern Bypass 1</b>	<b>Garysburg Southern Bypass 2</b>
Segments Included	A1 B1	A1 B2 B3	A1 B2 B4
Length	5.0	5.4	5.5
Interchanges	1	2	2
Railroad Crossings	2	2	2
Schools	1	0	0
Recreational Areas and Parks	0	0	0
Churches	1	1	1
Cemeteries	0	0	0
Major Utility Crossings	1	1	1
Historic Properties (Eligible or listed on the National Register)	5	5	4
Archaeological Sites	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0
NRCS-Potential Farmland Conversion	Below Threshold	Below Threshold	Below Threshold
Residential Relocations	32	11	11
Business Relocations	5	2	2
Noise Receptors Impacted	28	8	7
Wetland Impacts (acres)	5	11	10
Stream Impacts (feet)	1520	2040	3410
Water Supply Watershed Protected Areas	0	0	0
Wildlife Refuges and Game Lands	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	Yes	No	No
Hazardous Material / Landfill Sites	0	0	0
Underground Storage Tank Sites	4	3	3
Construction Cost	\$48,500,000	\$53,100,000	\$57,500,000
Right of Way Cost	\$10,648,250	\$13,548,750	\$13,713,250
Utilities Cost	\$1,188,686	\$1,015,868	\$953,060
Total Cost	\$60,336,936	\$67,664,618	\$72,166,310

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table 4-2: Comparison of Jackson Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Old Jackson Bypass</b>	<b>Extended Northern Jackson Bypass</b>	<b>Northern Jackson Bypass</b>	<b>Southern Jackson Bypass</b>
Segments Included	D1	C1 E1	C1 E2 E3	C1 E2 E4
Length	8.8	11.9	13.1	10.5
Interchanges	0	0	1	0
Railroad Crossings	0	0	0	0
Schools	0	1	0	1
Recreational Areas and Parks	0	0	1	1
Churches	1	1	0	0
Cemeteries	0	1	0	0
Major Utility Crossings	1	1	1	1
Historic Properties (Eligible or listed on the National Register)	4	4	10	10
Archaeological Sites	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0
NRCS-Potential Farmland Conversion	Moderate Concern	Below Threshold	Below Threshold	Below Threshold
Residential Relocations	6	5	11	25
Business Relocations	0	0	0	0
Noise Receptors Impacted	11	0	52	4
Wetland Impacts (acres)	40	42	15	33
Stream Impacts (feet)	1620	860	1770	2110
Water Supply Watershed Protected Areas	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	No	No	No	No
Hazardous Material / Landfill Sites	0	0	0	0
Underground Storage Tank Sites	0	2	2	2
Construction Cost	\$40,200,000	\$53,900,000	\$71,300,000	\$68,000,000
Right of Way Cost	\$3,900,500	\$4,213,500	\$6,383,500	\$9,444,000
Utilities Cost	\$1,144,221	\$919,947	\$1,054,723	\$1,452,850
<b>Total Cost</b>	<b>\$45,244,721</b>	<b>\$59,033,447</b>	<b>\$78,738,223</b>	<b>\$78,896,850</b>

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table 4-3: Comparison of Faison's Old Tavern Alternatives Resources and Impacts**

<b>Impacted Resources</b>	<b>Faison's Widen on Existing 1</b>	<b>Faison's Widen on Existing 2</b>	<b>Faison's Northern Bypass 1</b>	<b>Faison's Northern Bypass 2</b>	<b>Faison's Southern Bypass 1</b>	<b>Faison's Southern Bypass 2</b>
Segments Included	F2 F5 F7	F4 F7	F2 F6 F9	F2 F6 F10	F1 F8	F3 F8
Length	8.0	7.5	8.6	8.3	8.0	7.7
Interchanges	0	0	1	1	1	1
Railroad Crossings	0	0	0	0	0	0
Schools	0	0	0	0	1	1
Recreational Areas and Parks	0	0	0	0	0	0
Churches	0	0	0	0	0	0
Cemeteries	5	5	0	0	0	0
Major Utility Crossings	0	0	0	0	0	0
Historic Properties (Eligible or listed on the National Register)	1	1	1	0	0	1
Archaeological Sites	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0	0	0
NRCS-Potential Farmland Conversion	Below Threshold	Below Threshold	Below Threshold	Moderate Concern	Higher Concern	Higher Concern
Residential Relocations	36	39	2	2	5	5
Business Relocations	2	2	2	1	1	0
Noise Receptors Impacted	2	2	11	11	0	0
Wetland Impacts (acres)	4	1	23	21	10	9
Stream Impacts (feet)	400	0	3000	2770	490	550
Water Supply Watershed Protected Areas	0	0	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	Potential	Potential	No	No	No	No
Hazardous Material / Landfill Sites	0	0	0	0	0	0
Underground Storage Tank Sites	12	11	1	1	2	1
Construction Cost	\$33,400,000	\$31,200,000	\$51,200,000	\$49,100,000	\$43,300,000	\$44,400,000
Right of Way Cost	\$12,684,000	\$13,688,000	\$6,343,500	\$5,985,500	\$6,069,500	\$5,790,000
Utilities Cost	\$1,290,430	\$1,155,899	\$423,593	\$395,593	\$318,493	\$267,539
Total Cost	\$47,374,430	\$46,043,899	\$57,967,093	\$55,481,093	\$50,687,993	\$50,457,539

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**Table 4-4: Comparison of Conway Alternatives Resources and Impacts**

<b>Impacted Resource</b>	<b>Conway Northern Bypass 1</b>	<b>Conway Northern Bypass 2</b>	<b>Conway Southern Bypass 1</b>	<b>Conway Southern Bypass 2</b>
Segments Included	G2 G6 G7 H1	G1 G6 G7 H1	G3 G5 G7 H1	G3 G4 H1
Length	7.8	7.8	8.8	8.0
Interchanges	1	1	1	1
Railroad Crossings	1	1	1	1
Schools	1	1	0	0
Recreational Areas and Parks	0	0	0	0
Churches	1	0	0	0
Cemeteries	0	1	0	0
Major Utility Crossings	0	0	0	0
Historic Properties (Eligible or listed on the National Register)	5	6	5	5
Archaeological Sites	Unknown	Unknown	Unknown	Unknown
Federally Listed Species within Corridors	0	0	0	0
NRCS-Potential Farmland Conversion	Higher Concern	Higher Concern	Higher Concern	Higher Concern
Residential Relocations	19	15	22	15
Business Relocations	1	1	0	1
Noise Receptors Impacted	2	2	0	0
Wetland Impacts (acres)	13	13	35	42
Stream Impacts (feet)	2280	2020	2070	2840
Water Supply Watershed Protected Areas	0	0	0	0
Wildlife Refuges and Game Lands	0	0	0	0
Minority/ Low Income Populations (Adverse & Disproportionate Impacts)	No	No	No	No
Hazardous Material / Landfill Sites	0	0	0	0
Underground Storage Tank Sites	1	0	0	0
Construction Cost	\$72,600,000	\$64,000,000	\$60,600,000	\$66,200,000
Right of Way Cost	\$8,832,500	\$8,570,500	\$8,916,500	\$7,177,500
Utilities Cost	\$1,477,696	\$1,383,772	\$1,296,080	\$638,257
Total Cost	\$82,910,196	\$73,954,272	\$70,812,580	\$74,015,757

Note 1: Archeological sites will be evaluated once a recommended alternative is selected.

**G. Capacity Analysis**

**1. Intersection Capacity Analysis**

Capacity analysis was performed for no-build, northern bypass, and southern bypass alternatives in the Garysburg area. The following major intersections have Level of Service (LOS) F in the design year, and the method used to improve the failing LOS is also indicated in Table 4-5.

**Table 4-5: Intersection Capacity Deficiencies (LOS E or F) Garysburg (2030)**

<b>Intersection</b>	<b>No-build</b>	<b>Northern Bypass</b>	<b>Southern Bypass</b>	<b>Proposed Improvement</b>
I-95/ NC 46 E (2E)	F	F	F	Signalize intersection, widen bridge over I-95 from 2 to 5 lanes, add separate left turn lanes on NC 46
I-95/NC 46 W (2W)	F	F	F	Signalize intersection, widen bridge over I-95 from 2 to 5 lanes, add separate left turn lanes on NC 46
NC 46/US 301 (4)	F	F	F	Grade separate, no access
US 158 Byp/US 158 (104)	-	F	-	Trumpet interchange
US 158 Byp/NC 46 (105)	-	-	F	At grade intersection, superstreet design
US 158 Byp/US 301 (106)	-	-	F	Half clover interchange
US 158 Byp/US 158 (107)	-	-	F	At grade intersection, superstreet design

Note 1: Intersection numbers in parentheses refers to the numbering system in the Capacity Analysis.

Note 2: "US 158 Bypass" denotes the proposed new location sections versus "US 158" which denotes widening along existing US 158.

In Jackson, the no-build, Old Jackson Bypass, Northern Bypass, Extended Northern Bypass and Southern Bypass alternatives were analyzed for capacity. As a result, an interchange is proposed in several locations. The first location is north of Jackson at the intersection of US 158 Bypass and NC 305. This interchange (Intersection # 108) is proposed for both of the Northern Bypass alternatives. The intersection of US 158 Bypass and NC 305 on the southeast of Jackson is also recommended for an interchange due to the Southern Bypass alternative. The remaining intersections with failing LOSs will be treated with a Superstreet design.

Directional Crossover Intersection (Superstreet) is the name of an intersection design on a divided highway in which a right turn, followed by a U-turn, replaces a traditional left-turn or through movement. Motorists using the major highway have the ability to turn right and (usually) left onto the minor street. Motorists on the side street can only turn right onto the major highway, then must proceed to a median crossover at least 800 feet downstream to make a U-turn on the major highway if they desire to travel in the opposite direction (see Figure 4).

**Table 4-6: Intersection Capacity Deficiencies (LOS E or F) Jackson (2030)**

<b>Intersection</b>	<b>No-build</b>	<b>Old Jackson Bypass (SR 1311)</b>	<b>Northern Bypass</b>	<b>Extended Northern Bypass</b>	<b>Southern Bypass</b>	<b>Proposed Improvement</b>
US 158 Byp/NC 305 (108) (121)	-	-	F	F	F	Diamond interchange
US 158 Byp/US 158 (109) (111)	-	-	F	E	F	Superstreet design
US 158 Byp/SR 1131/NC 305 (26)	C	F	-	-	-	Superstreet design
US 158/SR 1311 (38)	C	F	-	-	-	Superstreet design
US 158/NC 305 (70) (Existing Alignment)	E	C	C	C	B	

Note 1: Intersection numbers in parentheses refers to the numbering system in the Capacity Analysis.

Note 2: "US 158 Bypass" denotes the proposed new location sections verses "US 158" which denotes widening along existing US 158.

Through the Faison’s Old Tavern community, widen existing, northern bypass, and southern bypass alternatives were studied for capacity deficiencies. There were no intersections, either existing or proposed, that generated failing LOSs. In order to provide access to the community, an interchange with SR 1344 (Galatia Road) is proposed with the Northern Bypass and an interchange with SR 1505 (NCHS East Road) is proposed with the Southern Bypass.

Through Conway, both northern and southern bypasses, along with the no-build alternative were studied. Failing LOSs were discovered to occur on new location intersections, but not on the no-build alternative.

**Table 4-7: Intersection Capacity Deficiencies (LOS E or F) Conway (2030)**

<b>Intersection</b>	<b>No-build</b>	<b>Northern Bypass</b>	<b>Southern Bypass</b>	<b>Proposed Improvement</b>
US 158 Byp/NC 35 (138) (143)	-	E	F	Half clover interchange to avoid railroad bridges
US 158 Byp/US 158 Bus (140) (East end)	-	-	E	Superstreet design

\* - Intersection Number refers to the Capacity Analysis Intersection Numbering

**2. Arterial Analysis**

The arterial analysis studies were completed and determined the LOS of the segment as a whole. When compared to the no-build alternative, the 2030 construction alternatives all improve the level of service along the segment as shown in Table 4-8.

**Table 4-8: Arterial Analysis for Build Alternatives (2030)**

<b>Alternative</b>	<b>2030 No-Build Worst Segment LOS Along Existing US 158</b>	<b>2030 Build Segment LOS Along New US 158</b>
Garysburg Northern Bypass	Not Available	A
Garysburg Southern Bypasses	Not Available	A
Old Jackson Bypass	F	A
Jackson Extended Northern Bypass	F	A
Jackson Northern Bypass	F	A
Jackson Southern Bypass	F	A
Faison’s Old Tavern Widen Existing	E	A
Faison’s Old Tavern Northern Bypasses	E	A
Faison’s Old Tavern Southern Bypasses	E	A
Conway Northern Bypass	E	A
Conway Southern Bypass	E	A

**3. Interchange Analysis**

An interchange analysis was completed for the proposed interchange locations. The results are shown in Table 4-9.

**Table 4-9: Interchange Analysis (2030)**

<b>Intersection (**)</b>	<b>Alternative</b>	<b>Intersection LOS</b>	<b>Ramp LOS (where available)</b>
I-95/NC 46 (2)	Existing	*	*
US 158 Bypass/US 158 Bus (104) East of Town	Garysburg Northern Bypass	A	-
US 158 Bypass/US 301 (106) West of Town	Garysburg Southern Bypass	A	-
US 158 Bypass/US 301 (107) East of Town	Garysburg Southern Bypass	A	-
US 158 Bypass/NC 305 (108) West of Jackson	Jackson Northern Bypass/Jackson Extended Northern Bypass	A	-
US 158 Bypass/US 158 Bus (112) West of Jackson	Jackson Southern Bypass	A	-
US 158 Bypass/NC 305 (121) South of Jackson	Jackson Southern Bypass	C	A
US 158 Bypass/NC 35 (138) North of Conway	Conway Northern Bypass	B	A
US 158 Bypass/NC 35 (143) South of Conway	Conway Southern Bypass	B	A

\* - The NC 46 bridge over I-95/NC will be widened to four lanes but an interchange analysis was not performed for this intersection.

\*\* - Intersection Number refers to the Capacity Analysis Intersection Numbering

**H. Recommended Alternative**

No alternative is recommended at this time. Comments received at the design public hearing will be reviewed, and the additional coordination with other federal, state, and local agencies will occur before a final decision is made. When a decision is made, the final recommendation for R2582/ R-2584 will be a combination of a recommended alternative from each of the four communities; i.e., an alternative from Garysburg, Jackson, Faisons Old Tavern, and Conway.

## V. PROPOSED IMPROVEMENTS

### A. Design Speed

The proposed design speed is 70 mph throughout the project. Posted speed will be 60 mph or less.

### B. Typical Section

The proposed cross section includes four 12-foot lanes, two in each direction, separated by a 46-foot grass median. Figure 5 shows detail of the typical section.

### C. Right of Way

Proposed right of way width is 250 feet.

### D. Access Control

Full control of access is proposed for all new location sections. Partial control of access is proposed for all widening sections to allow for existing driveway connection. Definitions are listed below:

Full Control Access – Connections to a facility provided only via ramps at interchanges. All cross-streets are grade-separated. No private driveway connections allowed. A control to access fence is placed along the entire length of the facility and at a minimum of 1000 feet beyond the ramp intersections on the Y lines (minor facility) at interchanges (if possible).

Partial Control of Access – Connections to a facility provided via ramps at interchanges, at-grade intersections, and private driveways. Private driveway connections are normally defined as a maximum of one connection per parcel. One connection is defined as one ingress and one egress point. The use of shared or consolidated connections is highly encouraged. Connections may be restricted or prohibited if alternate access is available through other adjacent public facilities. A control of access fence is placed along the entire length of the facility, except at intersections and driveways, and at a minimum of 1000 feet beyond the ramp terminals on the minor facility at interchanges (if possible).

### E. Bridges/Drainage Structures

Table 5-1 illustrates the proposed structures for this project. These include all locations that are deemed major hydraulic crossings and have been agreed upon by the Merger Team at the Concurrence Point 2A meeting, (see section VIII. B. for explanation of the Merger Process/Terms).

**Table 5-1: Proposed Bridges/Drainage Structures**

<b>Segment</b>	<b>Wetland/ Steam system</b>	<b>Existing Structure</b>	<b>Proposed Structure</b>
A1	WA 03/ WA 06/ SA 02	Triple 9-ft x 9-ft RCBC	Retain and extend as needed
D1	WA 16/ WA 17/ WA 35/ SA 07	Double 84-in CMP	340-ft bridge
D1	WA 23/ WA 19/ SA 08	Single 24-in RCP	Double 8-ft x 5-ft RCBC
D1	WA 25/ WA 26/ SA 10	45-ft bridge	95-ft bridge
D1	WA 34/ WA 33/ SA 16	Double 120-in CSPA	Triple 7-ft x 6-ft RCBC
D1	WA 40/ WA 38/ WA 39/ SA 22	Single 60-in CMP	Double 6-ft x 6-ft RCBC
F2	WA 46/ WA 47/ SA 25	Single 54-in CMP	Double 6-ft x 5-ft RCBC
G1	WA 63/ SA 48	Not applicable	Single 6-ft x 6-ft RCBC
G1	WA 70/ WA 72/ WA 73/ SA 51/ SA 52	Not applicable	Double 6-ft x 6-ft RCBC or 975-ft bridge
F1/F3/F4	WA 93/ WA 92/ SA 90	Triple 77-in x 52-in CSPA	Triple 7-ft x 6-ft RCBC
B3	WB 06/ SB 03	Not applicable	Single 6-ft x 5-ft RCBC
B1/B3	WB 09/ SB 05	Triple 8-ft x 6-ft RCBC	Retain and extend as needed
B4	WB 10/ SB 08	Not applicable	Double 9-ft x 6-ft RCBC
B4	SB 09	Not applicable	Single 7-ft x 6-ft RCBC
C1	WB 17/ WB 18/ SB 11	Triple 8-ft x 9-ft RCBC	Retain and extend as needed
E2	WB 20/ WB 21/ SB 15	120-ft bridge	Add parallel 120-ft bridge to the south
E3	WB 25/ WB 27	Not applicable	1295-ft bridge
E1	WB 29/ WB 30/ WB 31	Not applicable	1225-ft bridge
E1	WB 32/ WB 36/ SB 20	Not applicable	Double 10-ft x 7-ft RCBC
E1	WB 41/ SB 22/ SB 23	Not applicable	Triple 10-ft x 8-ft RCBC
E4	SB 24	Not applicable	Single 8-ft x 7-ft RCBC
E2	UT to Gumberry Swamp	2 @ 46-in x 31-in CSPA	Single 8-ft x 5-ft RCBC
G3	WB 74/ SB 41	Not applicable	Single 7-ft x 6-ft RCBC
E4	WB 47/ WB 48/ SB 26A	Not applicable	Single 7-ft x 6-ft RCBC
E4	WB 54/ WB 55	Triple 8-ft x 6-ft RCBC	140-ft bridge and replace culvert with new bridge of similar length

**Table 5-1: Bridges/Drainage Structures (Cont.)**

<b>Segment</b>	<b>Wetland/ Steam system</b>	<b>Existing Structure</b>	<b>Proposed Structure</b>
F8	WB 60/ WB 61/ SB 30	Not applicable	Triple 8-ft x 6-ft RCBC
G3	WB 71/ SB 32	Not applicable	Double 9-ft x 7-ft RCBC at eastern Single 9-ft x 7-ft RCBC at western
G3	WB 73/ SB 34	Not applicable	Single 7-ft x 9-ft RCBC
G4	WB 75/ SB 36	Not applicable	Single 8-ft x 6-ft RCBC
G7	WB 76/ SB 35	Single 10-ft x 6-ft RCBC	Retain and extend as needed
G4	WB 77/ WA 78/ WA 79/ SB 63	Not applicable	Single 7-ft x 6-ft RCBC

- \* CMP – Corrugated Metal Pipe
- \* CSPA – Corrugated Steel Pipe Arch
- \* RCBC – Reinforced Concrete Box Culvert
- \* RCP – Reinforced Concrete Pipe

**F. Parking**

On-street parking will not be provided along this project corridor.

**G. Sidewalks/Bicycles**

Sidewalks or bicycle facilities are not currently proposed as part of this project.

**H. Directional Crossovers with Median U-Turn**

The new facility will employ a directional crossover with median u-turn design to handle several at-grade intersections on the project. Directional crossover with median u-turn is the name of an intersection design on a divided highway in which a right turn, followed by a U-turn, replaces a traditional left-turn or through movement. Motorists using the major highway have the ability to turn right and (usually) left onto the minor street. Motorists on the side street can only turn right onto the major highway, then must proceed to a median crossover at least 800 feet downstream to make a U-turn on the major highway if they desire to travel in the opposite direction (see Figure 4).

**I. Railroad Crossings**

NCDOT proposes grade-separated crossings of the three railroads regardless of which alternatives are chosen.

**J. Route Designation**

US 158 will likely be re-designated since all remaining alternatives on the west end of the project use the NC 46 corridor between Interstate 95 and Garysburg. It is anticipated that US 158 will be rerouted along I-95 between exits 173 and 176. The existing US 158 route through Weldon will likely become “US 158 Business”

## VI. HUMAN ENVIRONMENTAL EFFECTS

### A. Community Effects

#### 1. Community Characteristics

##### a. Population Characteristics

The 1990 US Census and 2000 US Census data (when available) were used to gather information on the population and demographics of the project study area unless otherwise stated. Census Tracts 9801 and 9803 encompass the length of the study corridor for this project. Data for the census tract that includes Weldon and data for Halifax County were not included because these areas encompass only a very small portion of the project. The statistics for the town of Weldon were included, however, as this data is more representative of the study area.

**Table 6-1: Population Growth, 1990-2000**

Area	Population		Growth	
	1990	2000	#	%
North Carolina	6,628,637	8,049,313	1,420,676	21.4
Northampton County	20,798	22,086	1,268	6.1
Town of Weldon	1,392	1,374	(-18)	(-1.3)
Town of Garysburg	1,057	1,254	197	18.6
Town of Jackson	592	695	103	17.4
Town of Conway	759	734	(-25)	(-3.3)
Tract 9801	5,298	5,431	133	2.5
Tract 9803	6,461	6,296	(-165)	(-2.6)

Source: US Census Bureau 1990 & 2000

##### b. Ethnicity

According to US census data, Northampton County is predominantly “Black or African American,” as this ethnic group includes 59.4 percent of the total population. In contrast, the State of North Carolina is predominantly “white” with 72.1 percent of the population in this ethnic group. Ethnicity in the three towns along the study corridor varies. In Conway, whites make up 65.5 percent of the population, while the Garysburg population is almost entirely made up of African-Americans with other ethnic groups accounting for less than 4 percent of the population. The town of Jackson includes a balance of whites and African-Americans. Other ethnic groups account for less than 1 percent of the total population.

The ethnic mix of Northampton County varied only slightly from 1990 to 2000 (less than 1 percent). The only significant change occurred in Jackson. Census data indicate that the African-American population increased from 41.6 percent to 47.6 percent, and the white population decreased from 58.4 percent to 51.9 percent.

**Table 6-2: Ethnicity and Race 2000**

Category	State	County	Weldon	Garysburg	Jackson	Conway	Tract 9801	Tract 9803
Total Pop.	8,049,313	22,086	1,374	1,254	695	734	5,431	6,296
White	5,804,656 (72.1%)	8,633 (39.1%)	497 (36.2%)	30 (2.4%)	361 (51.9%)	481 (65.5%)	3,077 (56.7%)	1,485 (23.6%)
Black or African American	1,737,545 (21.6%)	13,125 (59.4%)	862 (62.7%)	1,205 (96.1%)	331 (47.6%)	244 (33.2%)	2,270 (41.8%)	4,742 (75.3%)
American Indian / Alaska Native	99,551 (1.2%)	71 (0.3%)	2 (0.15%)	8 (0.6%)	0 (0%)	4 (0.5%)	22 (0.4%)	20 (0.3%)
Asia	113,689 (1.4%)	20 (0.1%)	1 (0.1%)	3 (0.2%)	1 (0.1%)	0 (0%)	10 (0.2%)	6 (0.1%)
Native Hawaiian / Pacific Islander	3,983 (0.05%)	12 (0.1%)	1 (0.1%)	0 (0%)	0 (0%)	0 (0%)	11 (0.2%)	1 (0.02%)
Hispanic or Latino (of any race)	378,963 (4.7%)	161 (0.7%)	11 (0.8%)	5 (0.4%)	2 (0.3%)	2 (0.3%)	33 (0.6%)	29 (0.5%)

Source: 2000 US Census Bureau

**c. Age**

Census data indicate an aging population in the entire study area. According to 2000 census data, 12 percent of the population of North Carolina is 65 or older. In Northampton County, 17.4 percent of the population is in this age group. In Jackson 27.6 percent of the population is 65 or older. The median age for the study area ranges from 37.8 in the town of Garysburg to 45 years in the town of Jackson, compared to the state's median age of 35.3. Many of the people in Northampton County, including study area tracts, are long-term residents, which is indicative of the higher elderly population.

**d. Income**

The Federal Highway Administration's (FHWA) "Actions to Address Environmental Justice in Minority and Low-Income Populations," in compliance with Executive Order 12898, dated February 11, 1994, defines "low-income" as a household income at or below the Department of Health and Human Services (DHHS) poverty guidelines. For the purpose of this analysis, census poverty thresholds were used instead of poverty guidelines of the DHHS because there is very little difference between the United States Bureau of the Census poverty thresholds (by household size) and the DHHS poverty guidelines (by household size), and because the poverty thresholds are updated each year by the Census Bureau. Associated demographic data were collected and classified into degrees of poverty according to the United States Bureau of the Census poverty thresholds. The weighted average poverty threshold for 2000, according to the census, is an annual income level of \$17,603 for a family of four.

According to the US Census Income and Poverty Status in 1989, 179,906 families were below the poverty level in North Carolina (\$12,674 for a family of four). This equates to 7.1 percent of the total number of households. The percentage of families below the poverty level is significantly higher in the study area at the county, town, and tract level. The percentage of families below the poverty level in all three of the study area towns is greater than the state as a whole, with the greatest percentage in Garysburg at 21.7 percent. Census Tracts 9801 and 9803 area also higher than the state trend with 12.6 percent and 20 percent of households below the poverty level, respectively.

The median household income for North Carolina was \$26,647 in 2000. The median household income for the study area is lower than the state at the county, town, and tract levels. The median household income for Northampton County is \$18,029. A significantly lower median household income in Garysburg (\$12,865) may be associated with the aging population and lower educational attainment than the county and state as a whole.

**Table 6-3: Income Levels and Poverty Status for 1989**

Category	State	County	Weldon	Garysburg	Jackson	Conway	Tract 9801	Tract 9803
Number of House-holds	2,517,098	7,518	551	383	2201	310	1,971	2,098
Families Below the Poverty Line	179,906 (7.1%)	1,149 (15.3%)	55 (10%)	83 (21.7%)	23 (10.5%)	48 (15.5%)	248 (12.6%)	420 (20%)

Source: 1990 US Census Bureau

#### e. Employment Status

According to the North Carolina Employment Security Commission, the unemployment rate in April 2002 for the state was 6.5 percent, while the rate for Northampton County was higher at 10.4 percent.

In North Carolina, 67.6 percent of the population 16 years and older is in the labor force. The county, town, and tract level yield somewhat lower statistics ranging from 47.2 percent in Census Tract 9803 to 64.6 percent in the town of Jackson. The lower rate may be associated with an aging population and is reflected in the poverty statistics for the area.

#### f. Economic Base

Northampton County has its roots in agriculture. By the time Northampton County was formed in 1741 it supported a plantation society, which thrived through the antebellum years. Agriculture plantation continues to be a principal industry, but employs only 6.4% of the work force according to the North Carolina Department of Commerce. Nearly one-third of the workforce (31.2%) is employed in the government sector, followed by manufacturing (17.7%), service (14.2%), retail trade (11%), and wholesale trade (7.3%). Other principal industries include textiles, lumber, chemical, and manufacturing businesses. The county's largest employers include International Paper in Seaboard,

Resinall Corporation in Severn, Fineline Industries East Incorporated in Woodland, Hampton Farms in Severn, John B. Sanfilippo & Son Incorporated in Garysburg, FX Gear in Rich Square, Perdue near Conway, and Meherinne Agricultural and Chemical in Severn. Sanfilippo & Son, referred to locally as “the peanut factory,” and Perdue are the only ones of these businesses located directly on an alternative. Until recently, Georgia-Pacific was the county’s largest employer. The company closed its Conway hardboard manufacturing plant at the end of 2001. The company continues to operate its chemical facility, Georgia-Pacific Resins, which employs 100 people at the same site.

**g. Housing Costs**

The 2000 census data on housing values was not available, but the 1990 census data shows that housing values for the study area at all levels are significantly lower than the state median value, which is \$65,800. The median value in Northampton County is \$38,100. In Northampton County 71 percent of owner-occupied housing units are valued below \$50,000, as compared with 31.4 percent at the state level. These housing values correspond with the lower income levels for the area.

**h. Business Activities and Employment Centers**

Commercial uses are somewhat randomly distributed along most of the US 158 corridor. Jackson and Conway have concentrations of typical downtown businesses and services including a hardware store, florist, restaurant, bank, and professional and government offices. Gas stations/convenience stores are located in Garysburg, Jackson, and Conway. Major employers along the study corridors include John B. Sanfilippo & Son Incorporated on NC 46 just west of Garysburg and the Perdue facility on US 158 east of Conway. The Lowe’s Home Improvement regional distribution center on NC 46 is also a major employment center.

**2. Community Facilities and Services**

**a. Schools**

Northampton County has six elementary schools with kindergarten through fifth grades. There are two middle schools located in Conway and Gaston, which include sixth through eighth grades. The county’s two high schools serve ninth through twelfth grade students. Two of these schools are located directly on an alternative, and several schools are located in the study area. This school is located within the Garysburg Northern corridor.

Garysburg Elementary School is located on NC 46. This school is set back from the road on a large site. Five buses carry students to and from school each day. Worn paths across the street indicate a high volume of pedestrian activity in the area. Children from nearby neighborhoods are able to walk to the school.

Just east of Jackson, the East Side Elementary School is located on NC 305 in proximity to the Jackson southern bypass corridor. A portion of the school building and site falls within the Jackson southern bypass corridor. This school is eligible for the National Register. The school is now closed and students attend Central Elementary School.

Central Elementary School is located on NC 305 north of Jackson. This school property sits just north of the proposed Jackson Extended Northern Bypass. Central opened in the fall of 2006 and was formed by combining Jackson Eastside Elementary and Seaboard-Coates Elementary Schools. The school has a total enrollment of 215 students.

One of the county’s two high schools is located in the study area. Northampton County High School East is located on SR 1305 in proximity to the Faison’s Old tavern southern bypass corridor. The northernmost corner of the school’s property falls within the corridor. All students arrive by car or bus. According to school officials, approximately 75 of the school’s 500 students drive and 11 buses serve the school.

In addition, school administration is housed in a former school off NC 305 and Bagley Drive in Jackson.

**Table 6-4: Schools in Project Corridor**

School	Location	Alternative Segment
Garysburg Elementary	Located on NC 46; set back from the road on a large site	B1
Central Elementary	Located on NC 305; north of Jackson	E1
Northampton High School	Located on SR 1305; in proximity to Faison’s Old Tavern southern bypass corridor	F8

**b. Parks**

A roadside picnic area is located on the north side of US 158 between Garysburg and Jackson. The picnic area, which overlooks a former millpond (that served Boone’s Mill), is accessed by a dead-end section of roadway that parallels US 158. The picnic area is within the US 158 right-of-way. Tax records indicate that adjacent properties are under private ownership. The Northampton County Recreation Director confirmed that the county does not own any recreational facilities and uses school sites for recreational programs.

**c. Churches**

There are several churches within the study corridor and numerous churches in the study area. The following churches are located within or very close to the study corridor:

**Table 6-5: Churches in Project Corridor**

<b>Church</b>	<b>Location</b>	<b>Alternative Segment</b>
Oak Grove Baptist Church	South side of NC 46 near I-95; Garysburg vicinity	A1
The Apostolic Faith Church of Giving Grace	North side of US 158; Garysburg	B1
Mt. Carmel Baptist Church	SR 1333; north of Jackson	D1
Hill Chapel Baptist Church	North side of US 158 between Garysburg and Jackson	E1,E2
Piney Grove Baptist Church	SR 1500; east of Jackson	E4
Faison’s Assembly of God	South side of US 158; Faison community	F7
St. John AME Church	North side of US 158; Conway vicinity	G2
Garysburg United Methodist Church		B1, B2, B3
Zion Methodist Church	South of US 158; Faison Community	F7, F8, F9

All of the churches within the study corridor are situated fairly close to the roadway. Hill Chapel Baptist Church and St. John AME Church, in particular, are extremely close to the roadway and are likely to be impacted, unless the new alignment is asymmetrical or a bypass alternative is selected in those location.

Piney Grove Baptist Church is located east of Jackson on SR 1500, just off US 158. The church is partially located in the project corridor. A recently constructed church parking lot across the street is adjacent to existing US 158, entirely within the project corridor, and will likely be impacted.

**d. Transit**

The Chowan Public Transportation Authority (CPTA) provides subscription and demand-responsive transportation in Northampton, Halifax, Bertie, and Hertford counties. Hours of operation are 6 a.m. to 6:30 p.m., Monday through Friday. Riders can schedule transportation a day in advance to any location within this four-county area. Some fees are either subsidized or paid through county social service departments. CPTA also provides 14 drivers to transport children to Head Start programs. In Northampton County, these programs are located in Woodland and Seaboard. The operations center is located in Rich Square in southern Northampton County.

**e. Emergency Services**

In Jackson, the rescue squad is located less than a block north of US 158. The county coordinates its emergency services with other political jurisdictions to ensure the most effective operation of emergency management plans.

There are volunteer fire departments operating in Garysburg, Jackson, and Conway. None of these emergency service facilities are located on an alternative. However, in Jackson, the fire department is located less than a block off US 158. The Town of Garysburg has just broken ground on a new fire department building, located next to the Town Hall. Both the new fire department and Town Hall will be impacted by the Garysburg – Northern Bypass alternative.

**f. Public Housing**

The Roanoke Chowan Regional Housing Authority provides housing for low-income families in Northampton, Halifax, and Hertford counties. The agency has several sites in Weldon and Northampton County, however, only one is located in the study area. Located on the southeast side of US 158 west of the Garysburg town limits, the “Garysburg Complex” includes 58 rental apartments. Rent is determined based on family income. Although the complex is visible from US 158, the property is not adjacent to the roadway. Several single-family residential lots buffer the complex from the roadway.

**3. Land Use and Development**

**a. Existing Land Use**

**NC 46 and Garysburg Bypasses**

Land use along the NC 46 corridor is primarily agricultural. Some structures, including mostly single-family homes, a few commercial uses, and a church dot the roadway. A Lowe’s Distribution facility sits on the north side of NC 46 in proximity to I-95. The Sanfilippo & Son Peanut factory is located on the south side of NC 46 just west of the railroad and the Garysburg town limits. The Garysburg Elementary School is located on the north side of the road just inside the town’s western limits. Small ranch-style homes line NC 46 inside the town limits, with a convenience store at the road’s eastern terminus at US 301. The remainder of the northern bypass corridor (on new location) is primarily agricultural.

The southern bypass alternatives split from existing NC 46 just east of the peanut factory. Land use is primarily agricultural. However, the alternatives cross a mobile-home community and cemetery adjacent to the railroad tracks at the town’s western limits. This new cemetery is associated with nearby Chapel Grove Baptist Church. Land use on US 158 west of town includes residential and commercial uses.

## Existing US 158

Along US 158 west of Garysburg, land use is primarily residential with scattered commercial uses including a convenience-type store with a laundromat, and a funeral home. A renter-occupied housing development, operated by the Roanoke-Chowan Housing Authority, is located on the southeast side of the highway, although situated well back from the road. An adjacent residential subdivision is under construction. Deerfield includes approximately 50 lots for single-family homes including modular homes and double-wide modular homes. In Garysburg, land use along the corridor is also mixed with several stores, an auto sales operation, and a church among the uses. Much of Garysburg is eligible as a district for the National Register of Historic Places (NR). Several abandoned brick structures of early to mid-twentieth century vintage are located around the US 158/301 split.

Between Garysburg and Jackson, land use along the corridor is primarily agricultural or vacant with several noteworthy historic structures and sites. Mowfield, Verona, and Longview are plantation-era properties with significant houses and landscapes. The latter is eligible for and the former two are listed in the National Register. Boone's Mill (said to be the site of a Civil War battle) is marked today by a picnic area with a view of the scenic millpond.

In Jackson, land use along US 158 is mixed but primarily includes commercial and institutional uses. The downtown commercial core contains typical early twentieth century brick stores, most of which are occupied. Businesses include a florist, dime store, restaurant, auto parts store, hardware store, grocery store, and an antiques shop. The 1858 Northampton County Courthouse dominates the downtown streetscape. Listed in the National Register, the structure is one of the state's finest antebellum Greek Revival courthouses. It is contained within the larger National Register – listed Jackson Historic District. Other institutional and office uses include a doctor's office, a lawyer's office, the town hall, the Northampton County Museum, the Northampton County Memorial Library, and the sheriff's office. This downtown commercial area and the adjacent residential areas to the north are eligible for listing in the National Register of Historic Places. Outside the central core, uses include several convenience stores/gas stations, banks, a funeral home, auto repair, and a farm supply store with some scattered residential uses.

From Jackson to Conway, land use is primarily agricultural with scattered residential uses. A review of USGS maps indicates that at least 16 cemeteries dot the corridor, with many of them located close to the roadway. Most of these cemeteries are probably associated with the Faison's Old Tavern community, which stretches along the corridor. This linear community includes a high density of houses relative to other unincorporated segments of the corridor. Several commercial uses and churches are also located along this segment of the roadway.

Land use in Conway is residential towards the western and eastern town limits with commercial uses spreading from the town center at the intersection of US 158 and NC 35. Non-residential uses include a florist/gift shop, a hardware store, a barbershop, a restaurant, a grocery store, an appliance store, and the town hall. The downtown includes a small row of attached brick commercial buildings with the remainder being detached structures. Auto dependant uses include a convenience store/gas

station and an auto repair shop. A great part of the town of Conway is eligible as a district for the National Register.

As in other segments of this corridor, agriculture dominates the remainder of the project corridor with scattered residential uses. The USGS maps note several cemeteries bordering this section of the roadway as well. Of note are several historic structures and the Perdue Hatchery. Just east of Conway is the National Register – eligible J. R. Martin Farm. The Francis Parker House is a National Register site located on the north side of US 158 near the Northampton County line. The late eighteenth century house, situated close to the roadway, was moved to its present site from Hertford County and restored. The Perdue facility occupies a large site on the south side of US 158.

### **Jackson Bypasses**

The northern bypass alternatives cross NC 305 north of town and are agricultural with associated residential uses. Of note are several residential structures on NC 305.

The southern bypass alternative crosses agricultural and vacant land until it reaches SR 1108 south of Jackson. Land use along this section of SR 1108 is primarily residential with a low-income minority neighborhood stretching along the roadway. This proposed bypass impacts a second neighborhood and a school as it crosses NC 305 and merges with existing US 158 just east of Jackson.

One alternative north of Jackson predominantly follows the Old Jackson Bypass (SR 1311).

### **Faison's Old Tavern Bypasses**

The northern Faison Old Tavern bypass alternative includes mostly agricultural land. There appear to be only a few homes in this corridor. The eastern end of the bypass will either tie to the northern Conway bypass or to US 158 in proximity to SR 1500. Several residents or commercial uses dot US 158 near the proposed intersection.

The southern Faison bypass alternative crosses primarily agricultural and vacant land. The corridor crosses SR 1505 just north of Northampton County High School East. Land use on SR 1505 is agricultural with some residential uses. This is also the case where the bypass is proposed to tie to existing US 158.

### **Conway Bypasses**

The northern alternatives have several residences in the corridor, but elsewhere land use is primarily agricultural. The roadway would cross several existing roads on its way to its eastern terminus. These intersections with SR 1342, SR 1341, NC 35, and US 158 include some residential uses.

The southern alternatives include mostly agricultural and vacant land with some residential uses as it crosses existing roadways. These alternatives are in proximity to the Georgia-Pacific site.

**b. Existing Zoning, Land Use Plans, and Transportation Plans**

Land Use Plans do not exist for most of the study area; however, all jurisdictions have adopted or are preparing zoning ordinances. In addition, thoroughfare plans have been adopted for the entire study area. Plans are summarized by jurisdiction in the following sections.

**Garysburg**

Garysburg's zoning ordinance essentially serves as the land use plan for the town. In order to provide for orderly and consistent development as well as restrict some types of undesirable development, the town's zoning regulations are also applied in an area extending one mile outside the corporate limits. The zoning ordinance allows primarily residential and agricultural uses along the existing US 158 and NC 46 corridors with a commercial concentration at the NC 46/US 301 intersection. An Economic Development Plan was developed for the town of Garysburg in 1996. The plan recognizes the substandard housing conditions and limited economic activity in the town and is intended to serve as an information resource and guide for future development efforts. In developing the plan, a community needs survey identified housing repairs, storm drainage problems, and streets and sidewalks as major needs. The survey also revealed a need for additional retail and commercial businesses in Garysburg. To address this issue, the Economic Development Plan recommends a retail/commercial development strategy with a priority on strengthening existing businesses. The strategy also identifies businesses to be recruited, incentives for recruiting new businesses, and funding resources for community and economic development. The plan notes that sufficient undeveloped properties are available to accommodate the growth and development of the town. A preliminary analysis of undeveloped properties indicates that there are 251 sites of less than one acre for residential development, ten sites of 1 to 10 acres for commercial development, two sites of 10 to 50 acres for commercial or industrial use, and one site of more than 50 acres suitable for residential or industrial use. There are also a number of large tracts of land in the town's planning jurisdiction outside the corporate limits that are suitable for industrial or residential subdivision development. Industrial areas are designated along the NC 46 corridor and southwest of the US 158/US 301 intersection.

The Garysburg Town Council and the NCDOT adopted the Garysburg Thoroughfare Plan in 1994 as an update to a 1984 plan. Primary concerns addressed by the plan include the traffic on US 158, US 301, NC 46, and NC 186. Economic development issues were also a concern.

The plan recommends widening US 158 to a four-lane divided section and relocating the roadway to run south of Garysburg from Jackson By pass Road (SR 1311) to the Roanoke River. In explaining the proposed improvements to US 158 the plan states, "Two options were considered for improvements of US 158: widening the existing US 158 or locating a four-lane section on new location. Due to the development along the existing US 158, the widening of the existing section would be very disruptive and expensive, so this option was eliminated. It is recommended that the four-lane controlled access facility be moved south of Garysburg on new location. It should connect at US 301 just south of Washington Avenue (SR 1651) in Halifax County, cross the Roanoke River at a new location east of the existing US 158 bridge, and run south of Garysburg. The proposed US 158 should connect to the existing US 158 just south of Jackson Bypass Road (SR 1311)/US 158 intersection with an interchange. The general effect of the proposed US 158 corridor would be to free

existing US 158 for local traffic. The proposed US 158 would increase speed and safety for through traffic.”

The plan also recommends extending NC 46, which connects Garysburg to I-95, east to a proposed realignment of US 301. Because the existing NC 46 ends at US 301, trucks and other traffic must turn south on US 301 to reach US 158. The thoroughfare plan recommends that NC 46 be extended to alleviate congestion and accidents at this intersection. It was also suggested that NC 46 be widened to a standard 24-foot pavement section to improve safety and capacity, in accordance with the Roanoke Rapids-Weldon-Gaston plan.

### **Jackson**

Jackson’s zoning map indicates that properties fronting on US 158 are zoned for either residential or commercial uses. The Jackson zoning officer indicated that there is no land use plan for the town of Jackson. The town is included in the Northampton County Thoroughfare Plan.

### **Conway**

The town of Conway is currently considering the adoption of a zoning ordinance. The proposed ordinance indicates primarily residential and commercial zoning districts along US 158. There is no land use plan for the town. The Northampton County Thoroughfare Plan includes Conway.

### **Northampton County**

Northampton County enforces a zoning ordinance outside municipal planning jurisdictions. According to the county’s planning director, the zoning ordinance serves as the county’s land use plan. Most of the US 158 corridor, as well as proposed corridors, is zoned Agricultural Residential. According to the town’s zoning ordinance, “this district is established to promote a compatible mixture of agricultural, forestry, conservation, and very low-density residential uses where few public services will be available. Protection of the environment, preservation of prime farm land, and the continuation of rural lifestyles are goals this district seeks to attain.” Residential uses in this district are intended to be those incidental to farming operations. The zoning map also designates a highway industrial district on the north side of US 158 just west of Garysburg with a small highway business area on the south side. The crossroads at Faison’s Old Tavern is zoned highway business as well.

The Northampton County Thoroughfare Plan was developed concurrently with the Garysburg Thoroughfare Plan and adopted by the Northampton County Board of Commissioners and the NCDOT in 1995. The primary concern of the Board of Commissioners was the US 158 corridor, as it is the primary east-west route through the county. It was also noted that several other facilities needed study, including a connector between US 158 and I-95 and bypasses of Faison’s Old Tavern, Jackson, and Conway, in order to relieve congestion and truck traffic.

The plan recommends improving US 158 to a four-lane divided highway on mostly new location throughout the county. Due to development along existing US 158, widening the road would be very disruptive and expensive, according to the plan. The plan endorses the realignment of US 158 south of Garysburg as proposed in the Garysburg Thoroughfare Plan. The improved roadway east of

Garysburg is described in the plan as follows: “It should then run near or on SR 1311 (on new or existing locations) and rejoin existing US 158 where SR 1311 terminates. The corridor will then bypass Faison’s Old Tavern and Conway to the south. An interchange is recommended for the proposed US 158/NC 35 intersection. Proposed US 158 will connect to the Murfreesboro Bypass near Hertford County.” According to the county’s Economic Development Director, the Northampton County Board of Commissioners supports a full grade-separated interchange at all intersections of NC and/or US highways.

An important issue in developing the plan was the relocation of US 158 to the SR 1311 (Old Jackson Bypass Road) corridor instead of improving the existing road. Based on a study of cost estimates, it was assumed that both alternatives were essentially equal in cost. The NCDOT Transportation Planning Branch and the Northampton County Economic Development Commission agreed that US 158 should be aligned near SR 1311 to provide for more direct east-west access. It was also estimated that 11 homes might receive proximity damages. The plan states, “the proposed design minimizes impacts to farmland, traverses cut-over timber land and borders wetland areas wherever possible. Some wetland impacts will occur, and one small gravesite will need to be relocated. The general effect of the proposed US 158 corridor will be to free existing US 158 for local traffic.”

**c. Wild and Scenic Rivers**

Under provisions of the Wild and Scenic Rivers Act, if a federal action compromises the designation of a Wild and Scenic River or forecloses the possibility of future designation, the implementation of the federal action must be coordinated with the U.S. Department of the Interior (DOI).

There are no Wild and Scenic Rivers within the project, therefore, the Wild and Scenic Rivers Act does not apply.

**d. Farmland Impacts**

The Farmland Policy Protection Act (FPPA) of 1981 (7 CFR 658) requires all federal agencies to consider the impact of land acquisition and construction projects to farming operations and on prime and important farmland soils, as designated by the United States Soil Conservation Service. Farmland soils in an urbanized area or in an area committed to urban development by the local governing body are exempt from the requirements of the FPPA. Much of the study area is rural in nature, and therefore, impacts of land acquisition and construction of the proposed project on farming operations and prime and important farmland soils is a concern. As is required by the Farmland Protection Policy Act, the Form NRCS-CPA-106 (for corridor projects) has been completed (see Appendix F) according to FHWA guidelines.

The Farmland Conversion Impacts Matrix is shown in Table 6-6. The matrix indicates the number of total acres of new right of way, but does not represent actual acres of prime soils.

**Table 6-6: Farmland Conversion Impacts Matrix**

<b>R-2582/84 Farmland Conversion Matrix</b>	<b>Sheet / Column NRCS Form</b>	<b>Acres Outside Existing ROW</b>	<b>NRCS Potential Farmland Screening</b>	<b>NRCS Evaluation Status</b>	<b>Potential Farm Operation Impacts / Local Concerns</b>
<b>Garysburg</b>					
Garysburg Northern Bypass	1/A	130	Below Threshold	N/A	Moderate Concern
Garysburg Southern Bypass1	1/B	149	Below Threshold	N/A	Moderate Concern
Garysburg Southern Bypass 2	1/C	155	Below Threshold	N/A	Moderate Concern
<b>Jackson</b>					
Old Jackson Bypass	2/A	211	Moderate Concern	submitted	None Noted
Extended Northern Jackson Bypass	2/B	232	Below Threshold	N/A	None Noted
Northern Jackson Bypass	2/C	262	Below Threshold	N/A	None Noted
Southern Jackson Bypass	2/D	261	Below Threshold	N/A	None Noted
<b>Faison's Old Tavern</b>					
Faison's Old Tavern - Widen on Existing 1	3/A	148	Below Threshold	N/A	None Noted
Faison's Old Tavern - Widen on Existing 2	3/B	144	Below Threshold	N/A	None Noted
Faison's Old Tavern Northern Bypass 1	3/C	264	Below Threshold	N/A	Higher Concern
Faison's Old Tavern Northern Bypass 2	3/D	250	Moderate Concern	submitted	Higher Concern
Faison's Old Tavern Southern Bypass 1	4/A	231	Higher Concern	submitted	Moderate Concern
Faison's Old Tavern Southern Bypass 2	4/B	234	Higher Concern	submitted	Moderate Concern
<b>Conway</b>					
Northern Conway Bypass 1	5/A	202	Higher Concern	submitted	Higher Concern
Northern Conway Bypass 2	5/B	202	Higher Concern	submitted	Higher Concern
Southern Conway Bypass 1	5/C	241	Higher Concern	submitted	Higher Concern
Southern Conway Bypass 2	5/D	232	Higher Concern	submitted	Higher Concern

All three Garysburg alternatives, three of the four Jackson bypass alternatives, and three of the six Faison's Old Tavern alternatives received a total point value of less than 160 points. These alternatives will receive no further consideration for farmland conversion evaluation.

The Jackson Old Jackson Bypass alternative (210 acres), the Faison's Old Tavern Northern Bypass 2 (249 acres), and both Southern Bypasses (230 and 233 acres respectively), and all four Conway bypass alternatives (201 to 240 acres) will be further evaluated by NRCS. Most are modestly above the NRCS screening threshold and none may trigger NRCS concerns.

No Voluntary (VAD) or Enhanced (EVAD) Voluntary Agriculture Districts were identified in the study area. A landowner at a Citizens Information Workshop identified his farm, south of Garysburg and US-158, as a Century Farm.

No other alternatives other than those already discussed in this document will be considered without a re-evaluation of the project's potential impacts upon farmland. This project is not expected to have a significant impact to farmland.

If alternatives are selected that have notably higher primes soils and farmland impacts than other alternatives, then NCDOT will document the justification why those lower farmland-impacting alternatives could not be selected, as well as present practical minimization measures.

#### **4. Community Impact Analysis**

##### **a. Social and Psychological Aspects**

Social and psychological impacts can result from changes in population, community cohesion, social values, or the quality of life of the residents in the project study area as a result of the proposed project. Overall, the project is expected to have a positive impact on quality of life in Northampton County by providing a safer roadway and a more efficient means to reach and be reached by services. The project will not directly cause or encourage an influx or loss of population; however, widening the existing roadway through more intensely developed areas will have a substantial impact on community cohesion and interaction, as well as social values. These areas include the towns of Garysburg and the Faison's Old Tavern community where relocations and displacements are likely. Garysburg has a downtown area along NC 46 that will require 26 residential relocations and five business relocations if the northern bypass alternative is selected. Among the relocations include the Garysburg Town Hall, Fire Department under construction, and the Dollar General, the only retail store in Garysburg. The Faison's Old Tavern community is developed linearly along US 158. Widening the roadway through this community will likely result in the taking of houses and businesses along one side of the road, thereby greatly impacting the social nature of the community. Unlike the downtown areas, this community does not appear to be a walkable area. However, several residents of this community indicated that they walk the roadway, primarily for social reasons. Widening of the roadway should accommodate this aspect of community life. Displacements are discussed in more detail later in this section.

For the most part, the bypass alternatives will not directly cause or encourage an influx or loss of population, affect the cohesion of the area, or isolate people from one another. The Garysburg northern bypass alternative will likely displace single-family homes on both sides of NC 46 in the corporate limits. An asymmetrical alignment is assumed, given the location of Garysburg Elementary School. In addition to the displacements, the widened roadway would hinder pedestrian activity in the

area. Worn paths were observed from the residential area on the south side of NC 46 to the school and adjacent residential areas. Therefore, this alternative will have a significant impact on the cohesion and overall social patterns of the area.

Some displacements are likely to occur if the Garysburg southern bypass alternative is selected. Several businesses and residences are in the corridor as it crosses existing US 158. It does not appear that these displacements will have any community-wide social or psychological effects.

The Jackson southern bypass alternative may also result in some displacements. The corridor crosses SR 1108 in the proximity of a low-income neighborhood. If part of the neighborhood is taken, community cohesion would be affected.

### **b. Visual Environment**

Visual impacts can affect a community from both the view of the road and the view from the road. The view of the road by residents contributes to the feeling of community pride and value. The view from the road is the user's perspective and leaves an impression of the community on the driver as well as the residents. The overall character of the study area will be affected as the existing two-lane section changes to a four-lane, median-divided facility. The most significant visual changes will result where displacements occur.

Boone's Mill is an important local historical site. The scenic area offers picnic opportunities for travelers and residents. There are several former plantations and later farms along the roadway that are either listed in the National Register or are eligible. The Francis Parker House in eastern Northampton County sits close to the roadway.

The view of the road will be altered as residences and businesses become closer to the roadway. Specifically, proximity to the widened roadway will visually impact the Garysburg public housing complex.

### **c. Land Use**

There are no land use plans for much of the study area; however, most of the area is zoned. Outside of the corporate limits, widening the existing roadway is not expected to cause changes in existing land use patterns. Construction of any of the bypass alternatives will open new land for development, most of which is currently zoned for agricultural uses. However, access controls paired with zoning regulations will direct development. Displacements, especially in towns, will not only result in alterations to existing land use but may also alter future land use patterns in the towns.

Much of the study area is rural in nature, and therefore, impacts of land acquisition and construction of the proposed project on prime and important farmland soils is a concern. Coordination with the Natural Resources Conservation Service is underway to determine the extent of impacts to prime and important farmland soils in the project area. Forms have been submitted.

All of the bypass alternatives will impact farms including cultivated fields and farm buildings. Some of these alternatives also bisect farm roads, potentially impacting farming operations.

**d. Economic Conditions**

Overall, the improved roadway may have an impact on economic development in the county. A good transportation network is often criterion for new industries to locate in an area. The southern bypass alternative in Conway is in proximity to the Georgia-Pacific site and may encourage continued use of the closed portion of that facility. An improved roadway will also facilitate commutes to and from work locations. The widening of existing US 158 may have an effect on viability of existing and future businesses by controlling access to the roadway. Displacements, especially in the downtown areas will likely have a substantial impact on the tax bases in Jackson and Conway. Because municipal residents pay county property taxes, these displacements will alter Northampton County's tax base as well. New alignments will remove more land from property tax roles. It is assumed that land values for agricultural land are lower than commercial property in downtown areas. Changes in individual property values are dependent on proximity to the new roadway. Most of the bypass alternatives may affect existing businesses on US 158 to some degree by removing through traffic. Travel-related businesses such as gas stations and convenience stores will be most affected. A portion of the peanut factory site is located in the southern bypass corridor. If this alternative is selected, the specific alignment should be shifted as far to the east as possible to minimize impacts to this site.

**e. Mobility and Access**

The upgraded median-divided facility will limit turning movements to existing businesses along the highway; however, significant immediate impacts are not expected. Exceptions may include convenience-related destinations such as gas stations and convenience stores. Some of the businesses along US 158 have parking lots between the building and roadway that will probably be impacted, depending on the alignment selected. Bypass alternatives will be full access controlled, which may limit development and conversion of farmland. During the construction phase, detours may temporarily impede the flow of traffic on the existing road. Special attention to short-term access is warranted at the schools on the corridor.

The potential for bicycle and pedestrian traffic in most of the unincorporated study area is low. Due to vehicle speeds and the lack of shoulder along existing US 158, these portions of the roadway are not conducive to either bicyclists or pedestrians. However, in the towns there is opportunity for significant pedestrian activity. Widening the existing roadway through the towns will have a major impact on pedestrians. Conversely, several of the bypass alternatives will take through traffic off local roads, making them more conducive to pedestrian activity. The NC 46/ Garysburg Northern bypass alternative will severely restrict access to the elementary school from the residential areas to the south and may make it prohibitive for children to walk to the school from this area. Conway Middle School, the other school directly on the corridor, would not be similarly affected because most homes within walking distance are on the same side of US 158 as the school.

There are no fixed bus routes in the area. Buses and emergency vehicles may experience short-term impacts during construction as described above.

**f. Safety**

Accident rates along the study corridor should improve as a result of the proposed widening. Overall, the project is expected to improve safety by providing a facility that better accommodates the existing traffic and projected future traffic. The median will separate directional traffic, further enhancing safety. The improved roadway will also enhance delivery of emergency medical services, which are provided on a regional basis. In developed areas there are safety issues for pedestrians as it will likely be more difficult to cross the road. However, the median will allow pedestrians to cross two lanes at a time. Although set back from the roadway, safety at Garysburg Elementary School and Conway Middle School will also be an issue depending on the alignment selected. Significant impacts to safety at these facilities can be avoided by taking right-of-way from the south side of the roadway. By choosing a bypass alternative in Jackson, Faison's Old Tavern, and Conway, US 158 will become safer for local motorists and pedestrians.

**g. Displacements/Relocation Impacts**

Both residential and commercial displacements will result from project implementation (see the Relocation Report in Appendix D). The number of these replacements is indicated in the Comparison of Alternatives section (see Tables 4-1 to 4-4).

NCDOT's policy regarding displacements involves providing assistance to those affected by transportation improvements per the Federal Uniform Relocation Assistance and Real Properties Acquisition Policies Act. All alternatives under evaluation will result in the displacement of homes and/or businesses. Some residents in the Project Study Area are low-income. If so, and if they are displaced, the Last Resort Housing Program established by the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act (PL 91-646) may be used.

The Division of Highways offers a Relocation Assistance Program to help minimize the effects of displacement on families and businesses. The occupants of the affected residences or businesses may qualify for aid under one or more of the NCDOT relocation programs.

It is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of state and federally assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

- Relocation Assistance
- Relocation Moving Payments
- Relocation Replacement Housing Payments or Rent Supplement

The Relocation Assistance Program provides experienced NCDOT staff to assist displacees with information such as availability and prices of homes, apartments, or businesses for sale or rent and financing or other housing programs. The Relocation Moving Payments Program provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program

will compensate up to \$22,500 to owners who are eligible and qualify and up to \$5,250 to tenants who are eligible and qualify.

The relocation program for the proposed action will be conducted in accordance with the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), and the North Carolina Relocation Assistance Act (GS-133-5 through 133-18). The program is designed to provide assistance to displaced persons in relocating to a replacement site in which to live or do business. At least one relocation officer is assigned to each highway project for this purpose.

The relocation officer will determine the needs of displaced families, individuals, businesses, non-profit organizations, and farm operations for relocation advisory services without regard to race, color, religion, sex, or national origin. The NCDOT will schedule its work to allow ample time prior to displacement for negotiations and possession of replacement housing that meets decent, safe, and sanitary standards. The displacees are given at least a 90-day written notice after NCDOT purchases the property. Relocation of displaced persons will be offered in areas not generally less desirable in regard to public utilities and commercial facilities. Rent and sale prices of replacement property will be within financial means of the families and individuals displaced, and will be reasonably accessible to their places of employment. The relocation officer will also assist owners of displaced businesses, non-profit organizations, and farm operations in searching for and moving to replacement property.

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing, (2) rental of replacement housing, either private or public, or (3) moving existing owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

The Moving Expense Payments Program is designed to compensate the displacee for the costs of moving personal property from homes, businesses, non-profit organizations, and farm operations acquired for a highway project. Under the Replacement Program for Owners, NCDOT will participate in reasonable incidental purchase payments for replacement dwellings such as attorney's fees, surveys, appraisals, and other closing costs and, if applicable, make a payment for any increased interest expenses for replacement dwellings. Reimbursement to owner-occupants for replacement housing payments, increased interest payments, and incidental purchase expenses may not exceed \$22,500 (combined total), except under the Last Resort Housing provision.

A displaced tenant may be eligible to receive a payment, not to exceed \$5,250, to rent a replacement dwelling or to make a down payment, including incidental expenses, on the purchase of a replacement dwelling. The down payment is based upon what the state determines is required when the rent supplement exceeds \$5,250.

It is the policy of the state that no person will be displaced by the NCDOT's state or federally assisted construction projects unless and until comparable replacement housing has been offered or provided for each displacee within a reasonable period of time before displacement. No relocation payment received will be considered as income for the purposes of the Internal Revenue Code of 1954

or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort Housing is a program used when comparable replacement housing is not available, or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal/state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. Last Resort Housing may be used if necessary.

#### **h. Environmental Justice**

According to Transportation and Environmental Justice, one of the three fundamental environmental justice principles is, “to avoid, minimize, or mitigate disproportionately high and adverse human health and environmental effects, including social and economic effects, on minority populations and low-income populations.” Overall, the study area includes a high percentage of low-income and minority populations. Widening on existing location in the town of Garysburg may adversely and disproportionately impact this minority community. Garysburg is overwhelmingly a minority and low income community, second only to the town of Princeville, NC for the greatest percent of minority residents in the state. It has a high percentage of low income households.

A four-lane, median-divided facility through town would likely result in both cohesion and economic impacts. Numerous residents would be displaced and the road could create a barrier effect between neighborhoods. In addition, several businesses would be relocated, including the only national chain in the town (Family Dollar). Removing existing at grade access at US 301 and replacing it with an overpass would impact mobility for local residents. In addition, the new town hall, and the newly planned fire station would be relocated. The elementary school is adjacent to the corridor. Bike and pedestrian accessibility would likely be affected. Enhanced outreach measures at the time of the public hearing will be utilized for this area.

GIS mapping indicates a higher than average minority population on the Old Jackson Bypass immediately the north of the existing roadway. However, given the extremely low density development in that area, it will not likely rise to the level of being an adverse impact. Enhanced outreach measures at the time of the public hearing will be considered for this area. The Jackson southern bypass corridor includes a portion of a low-income neighborhood. However, depending on the alignment chosen, impacts to the neighborhood can be avoided.

There is also a higher than average minority population in the area of Faison's Old Tavern, immediately to the north of the existing roadway, and east of NCHS East Road. This is consistent with comments from the local county planner. This community may extend, to some extent, to south of existing US-158 as well, but this cannot be confirmed with census information. Large numbers of relocations, especially north of US-158 and east of NCHS Road could rise to the level of an adverse and disproportionate impact.

Enhanced outreach measures at the time of the public hearing will be utilized for this area. Outreach measures and any additional community comments and concerns will be documented in the subsequent environmental documents.

This assessment has found no evidence or indication of discrimination on the basis of race, color, natural origin, age, sex, or disability. The proposed project is being implemented in accordance with Executive Order 12898.

**i. Indirect and Cumulative Impacts**

The Council on Environmental Quality defines indirect impacts as those, “which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR 1508.8).” Cumulative impacts are defined as, “impacts on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions (40 CFR 1508.7).”

Overall, the improved roadway will result in mild stimulus for change in land use. The project will result in cross-county travel time savings, but will not serve specific development and will not likely influence intra-regional land development decisions. It may however stimulate some complementary development in the vicinity of new interchanges.

Near the town of Jackson, the project could increase the marketability of the Verona site. This former plantation is being marketed for industrial development, however the market for development in this area is modest. This may also result in increased property values. Although the bypass alternatives will open new land for development, controlled access is proposed. Coupled with zoning regulations, these controls will prevent significant changes in land use. However, given roadway access, the potential for development pressures exists. Land use changes are not expected unless local policy is revised. Increased development may impact water quality. Reduced access to existing businesses may eventually result in lower tax values.

Access to businesses along the existing corridor will be limited, as the divided median facility will restrict turning movements. The resulting cumulative impact may be a loss of business as customers find a more convenient alternative. Immediate changes are not expected, except during the construction phase. The absence of through traffic in the towns is also expected to impact businesses over time. However, businesses that are supported mostly by local customers should not be affected.

The overall character of the study area will be affected as the existing two-lane section changes to a four-lane median-divided facility.

**Existing Conditions**

- Similar to other rural eastern North Carolina counties, Northampton County has experienced minimal population growth during recent years. Approximately 1,300 people were added to the County between 1990 and 2000 (a 6.2% population growth rate).
- Between 1990 and 2004, employment in Northampton County grew by over 26%, which is a net gain of over 1,000 jobs. Based on available employment sector data, more than 800 jobs were added to the retail trade industry during that time frame, while there was a loss of nearly 500 manufacturing jobs.

- Land throughout the Demographic Area and Northampton County is predominantly undeveloped or utilized for agricultural uses. Most of the residential development is located along Roanoke Rapids Lake, in the extreme northwestern portion of the Growth Impact Study Area (GISA). A number of paper mills, including two International Paper and two Georgia Pacific facilities, generate much of the activity in the area, and contribute to a substantial amount of truck traffic along US 158.
- There are no water supply watersheds within the GISA for this project. The GISA is located in portions of both the Chowan River and Roanoke River basins. These river basins have no buffer regulations.
- A search of DWQ's 2006 Draft 303(d) List reveals that Painter Swamp is an impaired water body within the GISA with an unknown source of impairment. There are also numerous wetlands scattered throughout the GISA and the Roanoke River is considered an anadromous fish spawning area.

### **Potential Indirect and Cumulative Effects**

- This project and other TIP projects along the US 158 Corridor should improve regional access from I-95 in Northampton County eastward to the Town of Winton. Cumulatively, these improvements could make this region more attractive for industries that rely upon the transportation of goods and services on a regional or national level.
- There may be increased potential for commercial development at various locations, particularly in the vicinity of new interchanges. Residential development may take place along feeder roads because of access to a four-lane highway. Due to the lack of development pressures, this development would likely be limited in scale.
- With the length of the project over 30 miles and a potential 10 mph increase in the speed limit along most sections of the new roadway, the travel time savings from one terminus to the other for most of the alternatives should approach the 10 minute level. For the alternative that includes using existing Old Jackson Bypass as part of the new facility, travel time savings could be greater due to the more direct east-west alignment.

### **Findings**

- Based on an evaluation of GISA development conditions and the identification of human and/or environmental features that could be impacted, the potential for indirect effects associated with TIP R-2582/R-2584 is low.
- Existing land planning, the large amount of rural land, limited availability of utilities outside built-up areas (especially sewer), low population growth, and limited development pressures should minimize the potential for impacts to water quality.

#### **j. Transportation Plans**

Garysburg/ Northampton County: the Garysburg and Northampton County plans endorsed improving existing US 158 from Weldon to Garysburg. This alternative was developed by NCDOT but was then eliminated from consideration due to impacts to the Roanoke River; instead, NC 46 will

be improved. The plans endorsed by bypassing Garysburg to the south; “Garysburg Southern Bypass 1 and 2” are alternatives that address this issue.

Jackson: the Northampton County plan endorsed utilizing SR 1311 (Old Jackson Bypass Rd) as the new route for US 158. The “Old Jackson Bypass” alternative was developed to address this issue.

Faison’s Old Tavern and Conway: the Northampton County plan endorsed bypasses of Faison’s Old Tavern and Conway. There are several bypass alternatives of each community that address this need.

## **B. Cultural Resources**

### **1. Compliance Guidelines**

This project is subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, and implemented by the Advisory Council on Historic Preservation’s Regulations for Compliance with Section 106, codified as 36 CFR Part 800. Section 106 requires Federal agencies to take into account the effect of their undertakings (federally-funded, licensed, or permitted) on properties included in or eligible for inclusion on the National Register of Historic Places (NR) and to afford the Advisory Council a reasonable opportunity to comment on such undertakings.

### **2. Historic Architecture**

During the review of historic properties within the study corridors, thirty-five properties were identified as possible impacts. The extent and details of the impacts are noted in Table 6-7. These properties are either listed on the National Register, are eligible for listing on the Register or are listed on the State Study list. NCDOT, in consultation with the North Carolina State Historic Preservation Office (HPO) on November, 2007 determined that out of thirty-five properties listed in the table, only seven have been identified as having potential adverse effects and three no adverse effects, based on current designs.

Evolution of the project design has placed fifteen properties outside the Area of Potential Effects (APE). Each of the remaining twenty properties are located and delineated on Figures 2a through 2ii. The Northampton County Home property was a late addition to the list and will be evaluated for effects in late November 2007. NCDOT is still working on the final concurrence form with the USACE for effects. The information will be included in the Final EIS.

**Table 6-7: Historic Architectural Resources**

Map	Survey No.	Name	Status	Alt. Segment Location	Effects
Fig. 2ii	3	Francis Parker House	NR	H1	Adverse effect
Fig. 2ff	20	J. R. Martin Farm	DOE	G4, G5, G6	No effect G4, adverse effect for G5 and G6
Fig. 2bb	31	St. John AME Church	DOE	G2, G3	Adverse effect for G2, no effect for G3
Fig. 2q	74	Jackson Elementary School	DOE	E4	No adverse effect
Fig. 2e	101	Henry Stephenson House	DOE	C1, D1	Adverse effect for C1, no effect for D1
Fig. 2i	124	Bellevue	SL and DOE	D1	Adverse effect
Fig. 2j	128	Mt. Carmel Baptist Church	DOE	D1, F3	No effect
-	142	Norris Boone House	DOE	G1	Outside APE
-	163	Deberry Mill	DOE	G1	Outside APE
Fig. 2i, 2m	213	Mowfield	NR	E1, E2, E3	No adverse effect for E2, no effect for E1, not in APE for E3
Fig. 2i	214	Verona	NR	E1, E2	No effect
Fig. 2k	307	Longview	DOE	C1	No adverse effect
-	311	(former) Nebo Baptist Church and Cemetery	DOE	H1	Outside APE
-	313	Ira W. Futrell House	DOE	Eliminated	Outside APE
-	315	Milwaukee Historic District	DOE	Eliminated	Outside APE
Fig. 2cc, 2ee, 2ff, 2gg	316	Conway Historic District	DOE	G1, G2, G3, G5, G6,	No effect for all
Fig. 2r	319	Peebles House (Holly Lodge)	DOE	E3	No effect
-	340	Northampton County Courthouse Square Historic District (in Jackson HD)	NR	E3, E4	Outside APE
Fig. 2q, 2r	341	Jackson Historic District	NR	E3, E4	Adverse effect for E3, no effect for E4
Fig. 2c	344	Stephenson Farm	DOE	B1, B3, D1	No effect
Fig. 2b, 2d	361	Garysburg United Methodist Church Cemetery	NR	B1, B2, B3	No effect
Fig. 2b, 2c, 2d	365	Triangle Service Station	DOE	B1, B3, B4	No effect
-	389	ACL Railroad Bridge	SL and DOE	Eliminated	Outside APE

**Table 6-7: Historic Architectural Resources**

-	390	SAL Railroad Bridge	SL and DOE	Eliminated	Outside APE
-	392	Roanoke Canal Historic District	NR	Eliminated	Outside APE
-	393	Weldon Historic District	NR	Eliminated	Outside APE
-	394	Grace Episcopal Church (in Weldon HD)	NR	Eliminated	Outside APE
Fig. 2bb	450	Zion Methodist Church	DOE	F7, F8, F9	No effect
Fig. 2b, 2c, 2d	473	Garysburg Historic District	DOE	B1, B2, B3, B4	No effect
-	474	Gov. Thomas Bragg (Amis-Bragg) House (in Jackson HD)	NR	E3, E4	Outside APE
-	475	Church of the Savior and Cemetery (in Jackson HD)	NR	E3, E4	Outside APE
-	476	SAL-ACL Railroad Station	SL and DOE	Eliminated	for E1, outside APE Outside APE
-	477	Peebles Hill Historic District	DOE	E3, E4	Outside APE
Fig. 2a	490	Oak Grove Baptist Church	DOE	A1	Adverse effect
Fig. 2p	7 (supplemental survey, 2007)	Northampton County Home	DOE	E1, E3	No effect for E3

NR = Listed on National Register of Historic Places

SL = Study list for National Register

DOE = Determination of Eligibility

APE = Area of Potential Effects

### 3. Archaeology

One potential site a roadside picnic area located on the north side of US 158 between Garysburg and Jackson. The picnic area, which overlooks a former millpond, is accessed by a dead-end section of roadway that parallels US 158 to the north. A state historical marker reads, “Boon’s Mill. Here on July 28, 1863, a Confederate force repulsed a Union march on the vital Wilmington and Weldon Railroad. Breastworks 50 yds. S.W.”

The picnic area is within the US 158 right of way. Tax records indicate that adjacent properties are under private ownership. The Boone’s Mill site may be eligible for listing in the National Register. (Note: Boone’s Mill was historically spelled “Boon’s Mill,” as noted on the historical marker, while the contemporary spelling is “Boone’s Mill.”) This will be studied further if the alternative selected impacts the site.

A detailed archeological study will be done after the recommended alternative is selected.

### **C. Air Quality Analysis**

The project is located in Northampton County, which has been determined to comply with the National Ambient Air Quality Standards. The proposed project is located in an attainment area; therefore, 40 CFR Parts 51 and 93 are not applicable. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

#### **Mobile Source Air Toxics (MSATs)**

Recently, concerns for air toxics impacts are more frequent on transportation projects during the NEPA process. Transportation agencies are increasingly expected by the public and other agencies to address MSAT impacts in their environmental documents as the science emerges. Mobile Source Air Toxics (MSATs) analysis is a continuing area of research where, while much work has been done to assess the overall health risk of air toxics, many questions remain unanswered. In particular, the tools and techniques for assessing project-specific health impacts from MSATs are limited. These limitations impede FHWA's ability to evaluate how mobile source health risks should factor into project-level decision-making under the National Environmental Policy Act (NEPA). Also, EPA has not established regulatory concentration targets for the six relevant MSAT pollutants appropriate for use in the project development process. FHWA has several research projects underway to more clearly define potential risks from MSAT emissions associated with transportation projects. While this research is ongoing, FHWA requires each NEPA document to qualitatively address MSATs and their relationship to the specific highway project through a tiered approach (US DOT, Federal Highway Administration memorandum, "Interim Guidance on Air Toxic Analysis in NEPA Documents", February 3, 2006). The FHWA will continue to monitor the developing research in this emerging field. A qualitative analysis of MSATs for this project is available for review in the project *Air Quality Analysis*, located in Room 445, the Transportation Building, 1 South Wilmington Street, Raleigh.

### **D. Highway Traffic Noise/Construction Noise Analysis**

#### **Highway Traffic Noise**

In accordance with Title 23 Code of Federal Regulations Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise* (Title 23 CFR 772), each Type I highway project must be analyzed for predicted traffic noise impacts. Type I projects are proposed Federal or Federal-aid highway projects for construction of a highway on new location or improvements of an existing highway which significantly changes the horizontal or vertical alignment or increases the vehicle capacity. Traffic noise impacts are determined from the current procedures for the abatement of highway traffic noise and construction noise found in Title 23 CFR 772, which also includes provisions for traffic noise abatement measures. When traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures must be considered for reducing or eliminating these impacts. A copy of the unabridged version of the full technical report entitled *Highway Traffic Noise / Construction Noise Analysis* can be viewed in Room 445, the Transportation Building, 1 South Wilmington Street, Raleigh.

### Traffic Noise Impacts and Noise Contours

The maximum number of receptors in each project alternative predicted to become impacted by future traffic noise is shown in Table 6-8. The table includes those receptors expected to experience traffic noise impacts by either approaching or exceeding the FHWA Noise Abatement Criteria or by a substantial increase in exterior noise levels.

**Table 6-8: Predicted Traffic Noise Impacts by Alternative**

Alternative	Traffic Noise Impacts			
	Residential	Churches/ Schools	Businesses	Total
Garysburg Northern Bypass	26	0	2	28
Garysburg Southern Bypass 1	8	0	0	8
Garysburg Southern Bypass 2	7	0	0	7
Old Jackson Bypass	11	0	0	11
Northern Jackson Bypass	5	0	0	5
Extended Northern Jackson Bypass	0	0	0	0
Southern Jackson Bypass	4	0	0	4
Faison’s Old Tavern Widening	44	-	1	45
Faison’s Old Tavern Northern Bypass 1, 2	11	0	0	11
Faison’s Old Tavern Southern Bypass 1, 2	0	0	0	0
Conway Northern Bypass	2	0	0	2
Conway Southern Bypass	0	0	0	0

\*Per TNM<sup>®</sup>2.5 and in accordance with 23 CFR Part 772

The maximum extent of the 72- and 67-dBA noise level contours, measured from the center of the proposed roadway, is 37 feet and 47 feet, respectively.

#### “Do Nothing” Alternative

The Traffic Noise Analysis did not consider traffic noise impacts for the “no-build” alternative because this project is largely proposed to occur along new alignments. If the traffic currently using the network of roads in the project area should double within the next twenty years, research indicates that future noise levels would increase by approximately 3 dBA. Additional research has found that humans barely detect noise level changes of 2-3 dBA, whereas a 5-dBA change is more readily noticeable. Therefore, most people working and living near the roadway will not notice this predicted increase.

## **Traffic Noise Abatement Measures**

Measures for reducing or eliminating the traffic noise impacts were considered for all impacted receptors in each alternative. The primary noise abatement measures evaluated for highway projects include highway alignment changes, traffic system management measures, buffer acquisition and noise barriers. For each of these measures, benefits versus costs, engineering feasibility, effectiveness and practicability, land use issues, and other factors were included in the noise abatement considerations.

Substantially changing the highway alignment to minimize noise impacts is not considered a viable option for this project due to engineering and/or environmental factors. Traffic system management measures are not considered viable for noise abatement due to the negative impact they would have on the capacity and level of service of the proposed roadway. Costs to acquire buffer zones for impacted receptors will exceed the NCDOT abatement threshold of \$35,000 per benefited receptor, causing this abatement measure to be unreasonable.

## **Noise Barriers**

Noise barriers include three basic types: vegetative barriers, earthen berms and noise walls. These structures act to diffract, absorb and reflect highway traffic noise. For this project, the cost of acquiring additional right of way and planting sufficient vegetation is estimated to exceed the NCDOT abatement threshold of \$35,000 per benefited receptor. Also, for this project, earthen berms are not found a viable abatement measure because the additional right of way, materials and construction costs are estimated to exceed the NCDOT abatement threshold of \$35,000 per benefited receptor.

This project will have both partial control of access (on widening segments) and full control of access (on new location segments). For partial control, most commercial establishments and residences will have direct access connections to the proposed project. All intersections will either be at-grade or incorporate interchanges. Businesses, churches and other related establishments require accessibility and high visibility. Noise barriers do not allow uncontrolled access, easy accessibility or high visibility, and would therefore not be acceptable abatement measures for this project.

Based on this preliminary study, remaining receptors (those not taken by right of way) at all interchanges will have a maximum predicted increase of approximately 5 dBA and are predicted to remain well below the impact threshold. Based on the preliminary studies, traffic noise abatement is not recommended and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772. No additional noise analysis will be performed for this project unless warranted by a significant change in the project scope, vehicle capacity or alignment.

In accordance with NCDOT Traffic Noise Abatement Policy, the Federal/State governments are not responsible for providing noise abatement measures for new development for which building permits are issued after the Date of Public Knowledge. The Date of Public Knowledge of the proposed highway project will be the approval date of the Record of Decision. For development occurring after this date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

**E. Geodetic Markers**

This project will not impact any geodetic survey markers.

**F. Hazardous Materials**

No hazardous waste sites or landfills were identified within the project limits. Nineteen possible sites presently or formerly containing petroleum underground storage tanks (USTs) were identified within the project limits (see Table 6-9).

**Table 6-9: Known and Potential GeoEnvironmental Impact Sites**

Property Location	Property Owner	UST Owner	Facility ID #
New Dixie Oil 517 I-95 Exit 176 & NC 46 Gaston, NC 27832	New Dixie Oil Corp.	New Dixie Oil Corp.	0-022615
This former Texaco gas station and convenience store (fdba Sunnyside Market) is located on the southeast quadrant of the I-95 Exit 176. Bottoms Interstate Shell also operated at this location prior to the Texaco operation, and a ground water incident was reported in that time period. Three USTs are located 80 feet South of the store and are listed on the UST Section registry. No monitoring wells were noted at the site, and there is no evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			
Property Location	Property Owner	UST Owner	Facility ID #
Former Truck Stop of America I-95 Exit 176 & NC 46 Gaston, NC 27832	Rena Development LLC	Rena Development LLC	N/A
This former truck stop and fueling station site is located on the northeast quadrant of the I-95 Exit 176. The store, scales, and fueling area were torn down but the foundation footprints are still visible. The pump island area is 200 feet from the NC 46 median. A ground water incident was listed for this operation, but no longer appears on the DENR Groundwater Incident database. This site does not appear on the UST Section registry. No monitoring wells were noted at the site, and there is no other evidence of USTs or UST removal. <b>This site will have a negligible impact to this project.</b>			
Property Location	Property Owner	UST Owner	Facility ID #
M.C. Dunlow Farm Supply 8026 NC 46 Gaston, NC 27832	Viola Dunlow	Viola Dunlow	N/A
This former farm supply and Sinclair gas station is located on the south side of NC 46. A pump island is 75 feet from the highway centerline. Two ASTs are located on the East side of the building. There is no UST Section Facility ID for this parcel, and no evidence of USTs or UST removal on site. <b>This site will have a low impact to this project.</b>			

**Table 6-9 Known and Potential GeoEnvironmental Impact Sites (Cont'd)**

Property Location	Property Owner	UST Owner	Facility ID #
Vassor's Garysburg Mini Mart 103 US 301 Garysburg, NC 27831	William T. Vassor	William T. Vassor	0-022407
This active America Gas gas station and convenience store is located on the south side of NC 46. Three USTs are situated at the northwest corner of the store, and two USTs at the northeast corner. All are set back 85 feet from the NC 46 median. No monitoring wells were noted at the site, and there is no other evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			
Property Location	Property Owner	UST Owner	Facility ID #
Cuz' Mini Mart 100 US 301 Garysburg, NC 27831	Thorton & Doris Majette	New Dixie Oil Corp.	0-022398
This active America Gas gas station and convenience store (aka: Majettes Grocery) is located on the northwest corner of the US 301 and NC 46 intersection. Four (4) USTs are located 100 feet from the NC 46 centerline. No monitoring wells were noted at the site, and there is no other evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			
Property Location	Property Owner	UST Owner	Facility ID #
Former store & gas station 999 US 158 Garysburg, NC 27831	Jessica Karnbach	Jessica Karnbach	N/A
This former gas station & store (aka: R.O. Harris Station) is located on the North corner of the SR 1301 (Cornwallis Road) and US 158 intersection. There is no UST Section Facility ID for this parcel, and no evidence of USTs or UST removal on site. A cursory Schonstedt survey did not pick up any large magnetic anomalies. <b>This site will have a low impact to this project.</b>			
Property Location	Property Owner	UST Owner	Facility ID #
Davis Store 1859 US 158 Garysburg, NC 27831	Janet Davis c/o Teddie Boone	Janet Davis c/o Teddie Boone	N/A
This former store and possible gas station is located on the South side of US 158. The store front is 65 feet from the US 158 median. There is no UST Section Facility ID for this parcel, and no evidence of USTs or UST removal on site. A cursory Schonstedt survey did not pick up any large magnetic anomalies. <b>This site will have a low impact to this project.</b>			

**Table 6-9 Known and Potential GeoEnvironmental Impact Sites (Cont'd)**

<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Ray's Place 6530 US 158 Jackson, NC 27845	Joseph & Annie Epps	Joseph & Annie Epps	N/A
This active store may also be a former gas station. The present management could not recount the parcel history. The store front is 75 feet from the US 158 median. There is no apparent record of this business on the UST Section registry. No monitoring wells were noted at the site, and there is no evidence of USTs or UST removal. This site will have a low impact to this project.			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Former store & gas station US 158 Seaboard, NC 27876	Oscar & Judy Barnes	Oscar & Judy Barnes	N/A
This former gas station & store is located on the south side of US 158 in the 7900 block. The wood structure is 50 feet from the highway median. There is no apparent UST Section Facility ID for this business. However, at least two (2) monitoring wells are located in front of the building and 28 feet from the US 158 median. The wells were installed in 1997. A cursory Schonstedt survey did not indicate any large magnetic anomalies. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Popes garage 8335 US 158 Conway, NC 27820	Alton & Margaret Pope	Alton & Margaret Pope	N/A
This former garage is located on the north side of US 158. The wood structure is set back 50 feet from the US 158 centerline. Tires, automotive parts, oil filters in water filler drums, and vehicles, are located on the east and north sides of this parcel. There is no UST Section Facility ID for this parcel, and no evidence of USTs or UST removal on site. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Taylor's Gas & Grocery 8715 US 158 Seaboard, NC 27876	Joyce Taylor	Joyce Taylor	0-029087
This former gas station and convenience store is located on the north side of US 158. The UST registry shows that four (4) USTs were removed from the property in 1999. A cursory Schonstedt survey did not locate any large magnetic anomalies. The pump island is located 60 feet from the US 158 median. No monitoring wells were noted at this site, and there is no other evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			

**Table 6-9 Known and Potential GeoEnvironmental Impact Sites (Cont'd)**

<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Craven Davis Store 8761 US 158 Seaboard, NC 27876	Marion Davis	Eastern Fuels, Inc.	0-033724
This former gas station and convenience store is located on the North side of US 158, and West of the SR 1505 (NCHS East Road) intersection. One (1) UST was removed in 1994. A vent line is still located at the southeastern corner of the building. The storefront and pump island, are set back 52 feet and 50 feet respectively, from the highway median. Although a groundwater incident associated with this site, no monitoring wells were observed. There is no other evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Pope's Auto Sales 8775-9 US 158 Seaboard, NC 27876	W.N. Taylor est.	W.N. Taylor est.	N/A
This active used car lot is located on the North side of US 158, and West of the SR 1505 (NCHS East Road) intersection. There is no UST Section Facility ID for this parcel, and no evidence of UST's or UST removal on site. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Faison Old Tavern 8785 US 158 Seaboard, NC 27876	Elmo Fletcher Cordle	Elmo Fletcher Cordle	N/A
This former tavern is located at the intersection of the US 158 and SR 1505 (NCHS East Road). There is no apparent record of this business on the UST Section registry. No monitoring wells were noted at the site, there is no evidence of the UST's or UST removal. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Old Tavern Flea Market 8799 US 158 Seaboard, NC 27876	Lafayette Majette	Lafayette Majette	0-026625
This former gas station and convenience store is located on the northwest corner of US 158 and SR 1344 (Galatia Church Road) intersection. The business has apparently operated under several names, including Ram 4, Red Apple Market #4, and Red Apple Market #46. Two groundwater incident numbers are associated with this property. The UST section registry indicates that six (6) USTs were removed in March 1993. Two (2) vent lines are still located near the front entrance. The storefront and pump island, are set back 80 feet and 60 feet respectively, from the highway median. Although groundwater incidents are associated with this site, no monitoring wells were observed. There is no other evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			

**Table 6-9 Known and Potential GeoEnvironmental Impact Sites (Cont'd)**

<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Tractor Trailer Repair Yard 8979 US 158 Conway, NC 27820	Felicia Ramsey-Green	ET Eight, Inc.	N/A
This active truck repair and junkyard is located on the north side of NC 158 and intersection with Cumbo Road (private). Several tractor rigs and trailers are scattered over the property. The shop building is located near the rear of the property and oil staining was noted in the soil. There is no UST Section Facility ID for this parcel, and no evidence of USTs or UST removal on site. <b>This will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Northeastern Home Care 9181 US 158 Conway, NC 27820	James Titus Deloath	James Titus Deloath	N/A
This active health care clinic is located on the north side of US 158. A pump island was noted at the front entrance and 78 feet from the highway median. The clinic manager indicated that a gas station operated this location in the 1970's. An earlier survey showed two (2) UST fill ports and vent lines on the west side of the building in 2002. There is no UST Section Facility ID for this parcel, and no present evidence of USTs or UST removal on site. <b>This site will have a low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Former W.F. Davis Store 9454 US 158 Conway, NC 27820	Jean Davis Watson	Eastern Fuels, Inc.	0-034221
This former gas station and convenience store is located on the south side of US 158. The UST registry shows that three (3) USTs were removed from the property in December 1993. The property owner confirmed the removal, and former location of the USTs. The wood structure, with asbestos siding, is set back 75 feet from the US 158 median. At least three (3) monitoring wells are located adjacent to the west side of the building, and surrounding the old tank bed. There is no other evidence of USTs or UST removal. <b>This site will have low impact to this project.</b>			
<b>Property Location</b>	<b>Property Owner</b>	<b>UST Owner</b>	<b>Facility ID #</b>
Davis Farm Supply 10505 US 158 Conway, NC 27820	Susan D. Pope	Susan D. Pope	N/A
This active farm supply and pesticide business is located across from the US 158 and SR 1500 (Zion Church Road) intersection. The storeowner indicated that no gas station operated on this location. No monitoring wells were noted at the site, and there is no evidence of USTs or UST removal. <b>This site will have a low impact to this project.</b>			

**Table 6-9 Known and Potential GeoEnvironmental Impact Sites (Cont'd)**

Property Location	Property Owner	UST Owner	Facility ID #
Residence (fmr store & gas station?) 10793 US 158 Conway, NC 27820	George Thurman Majette	George Thurman Majette	N/A
<p>This residence is located on the north side of US 158. The Building has the appearance of a former store and is 45 feet from the highway median. There is no UST Section Facility ID for this parcel, and no magnetic anomalies. <b>This site will have a low impact to this project.</b></p>			

## **VII. NATURAL ENVIRONMENT EFFECTS**

### **A. Physical Resources**

Northampton County is on the North Carolina and Virginia border along the divide of the Piedmont and Coastal Plain physiographic provinces in North Carolina. This divide, commonly referred to as the Fall Zone, separates two physiographic regions that contain moderately different physical characteristics. The project study area is located in the Middle Coastal Plain physiographic province (Daniels et al. 1999). The topography of this region is described as smooth, gently sloping, plateau-like uplands with gentle to steep valley slopes near the rivers (Daniels et al. 1999). Elevations in the project study area range from approximately 50 feet above mean sea level (MSL) to 140 feet above MSL. Current land uses within the project vicinity include rural residential, agricultural, timber production, and undeveloped.

#### **1. Soils**

Six soil associations are present within the project study area (Shaffer 1994). The Turbeville-Caroline association is a well-drained soil located on uplands and has a loamy surface layer with a clayey subsoil. The Turbeville-Caroline association exists in areas that are nearly level to strongly sloping. The Gritney-Caroline association is a moderately well-drained to well-drained soil located on ridgetops and side slopes and has a loamy surface layer with a clayey subsoil. The Norfolk-Bonneu-Goldsboro association occurs on ridgetops and side slopes. These soils are well-drained to moderately well-drained and are described as having a sandy or loamy surface layer and loamy subsoil. The Craven-Bethera-Lenior association consists of moderately well-drained to poorly-drained soils that have a loamy surface layer and clayey subsoil and occurs on uplands. The Wickham-Altavista association is characteristic of narrow flood plains along the Roanoke River. These soils are well-drained to moderately well drained and have a loamy surface layer and loamy subsoil. The Wehadkee-Chastain association consists of poorly-drained to well-drained soils that have a loamy surface layer and loamy subsoil and occurs on flood plains.

Forty soil types are found within the project study area (Shaffer 1994). Table 7-1 lists each soil map unit and its soil series with slope, drainage capabilities, site index, and general characteristics. The project study area is dominated by the upland soils Gritney sandy loam, Goldsboro sandy loam, Norfolk sandy loam, and Bonneu loamy sandy.

**Table 7-1: Soil Series within the Project Study Area**

Map Unit	Soil Series	Slope	Site Index **	Drainage	Hydric Status	General Characteristics
AtA*	Altavista fine sandy loam	0-3%	91	Moderately	Hydric B	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 1.5 to 2.5 feet during wet periods. Soils are located on terraces along larger streams.
AuA	Autryville loamy sand	0-3%	77	Well Drained	Non-hydric	Soils have moderately rapid permeability in the upper part of the soil and moderate in the lower part. Available water capacity is low. The seasonal high water table is at a depth of 4 to 6 feet.
Be*	Bethera silt loam	0-2%	95	Poorly Drained	Hydric A	Soils have slow permeability and high available water capacity. The seasonal high water table is at or near the surface for 3 to 5 months in most years. Soils are on broad flats or in shallow depressions on the uplands.
BoB	Bonneau loamy sand	0-6%	95	Well Drained	Non-hydric	Soils have moderate permeability and low available water capacity. The seasonal high water table is at a depth of 3.5 to 5.0 feet. Soils are generally uplands.
BoC	Bonneau loamy sand	6-12%	95	Well Drained	Non-hydric	Soils have moderate permeability and low available water capacity. The seasonal high water table is at a depth of 3.5 to 5.0 feet. Soils are generally uplands.
CaA	Caroline sandy loam	0-2%	76	Well Drained	Non-hydric	Soils have moderately slow or slow permeability and high available water capacity. A perched seasonal high water table is at a depth of 3.5 to 5.0 feet.
CaB	Caroline sandy loam	2-6%	76	Well Drained	Non-hydric	Soils have moderately slow or slow permeability and high available water capacity. A perched seasonal high water table is at a depth of 3.5 to 5.0 feet.
CrA*	Craven fine sandy loam	0-1%	88	Moderately Well Drained	Hydric B	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 2 to 3 feet during the spring and winter. Soils are on broad, smooth ridges in the uplands.
CrB	Craven fine sandy loam	1-4%	88	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 2 to 3 feet during the spring and winter. Soils are located on uplands.
CrC	Craven fine sandy loam	4-10%	88	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 2 to 3 feet during the spring and winter. Soils are located on side slopes along drainageways.

**Table 7-1: Soil Series within the Project Study Area (Cont.)**

Map Unit	Soil Series	Slope	Site Index **	Drainage	Hydric Status	General Characteristics
CsB2	Craven sandy clay loam	1-4%	80	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 2 to 3 feet during the spring and winter. Soils are located on narrow ridges in the uplands.
CuB	Craven-Urban land complex	0-4%	***	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 2 to 3 feet. Intricate mix of 50% Craven soil and 35% Urban land.
ExA	Exum loam	0-2%	82	Moderately Well Drained	Non-hydric	Soils have slow permeability and high available water capacity. The seasonal high water table is at a depth of 2 to 3 feet. Soils are located on uplands.
GoA	Goldsboro sandy loam	0-2%	90	Moderately Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 2 to 3 feet. Soils are located on uplands.
GuA	Goldsboro Urban-land complex	0-2%	***	Moderately Well Drained	Non-hydric	Goldsboro soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 2 to 3 feet. Intricate mix of 50% Goldsboro soil and 30% Urban land.
GxB	Gritney sandy loam	2-6%	85	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate water capacity. The seasonal high water table is at a depth of 1.5 to 3 feet. Soils are located on uplands.
GxC	Gritney sandy loam	6-10%	85	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate water capacity. The seasonal high water table is at a depth of 1.5 to 3 feet. Soils are located on side slopes and rolling areas on uplands.
GyB2	Gritney sandy clay loam	2-6%	80	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate water capacity. The seasonal high water table is at a depth of 1.5 to 3 feet. Soils are eroded and located on uplands.
GyC2	Gritney sandy clay loam	6-10%	80	Moderately Well Drained	Non-hydric	Soils have slow permeability and moderate water capacity. The seasonal high water table is at a depth of 1.5 to 3 feet. Soils are eroded and located on side slopes and rolling areas on uplands.
Le*	Lenoir silt loam	0-2%	87	Somewhat Poorly Drained	Hydric B	Soils have slow permeability and moderate available water capacity. The seasonal high water table is at a depth of 1.0 to 2.5 feet during wet periods. Soils are in broad interstream areas on uplands.

**Table 7-1: Soil Series within the Project Study Area (Cont.)**

Map Unit	Soil Series	Slope	Site Index **	Drainage	Hydric Status	General Characteristics
Ly*	Lynchburg fine sandy loam	0-2%	86	Somewhat Poorly Drained	Hydric B	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 0.5 foot to 1.5 feet. Soils are located on uplands.
NoA	Norfolk sandy loam	0-2%	84	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 4 to 6 feet. Soils are located on uplands.
NoB	Norfolk sandy loam	2-6%	84	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 4 to 6 feet. Soils are located on uplands.
NoC	Norfolk sandy loam	6-10%	84	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 4 to 6 feet. Soils are located on side slopes that drain into creeks.
NuB	Norfolk-Urban land complex	0-6%	***	***	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 4 to 6 feet. Soils are located around the towns of Jackson, Seaboard, Garysburg, and Conway.
OcA	Ocilla loamy fine sand	0-3%	85	Somewhat Poorly Drained	Non-hydric	Soils have moderate permeability and low available water capacity. The seasonal high water table is at a depth of 1.5 to 2.5 feet during wet periods. Soils are located on uplands.
PtA	Pactolus loamy fine sand	0-2%	86	Moderately Well Drained	Non-hydric	Soils have rapid permeability and low available water capacity. The seasonal high water table is at a depth of 1.5 to 3.0 feet. Soils are located on uplands.
Ra*	Rains fine sandy loam	0-2%	94	Poorly Drained	Hydric A	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of 1 foot during wet periods. Soils are located on uplands.
Se	Seabrook loamy sand	0-2%	81	Moderately Well Drained	Non-hydric	Soils have rapid permeability and low available water capacity. The seasonal high water table is at a depth of 2 to 4 feet. Soils are located on stream terraces.
TrA	Turberville loamy sand	0-2%	80	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are located on uplands.
TrB	Turberville loamy sand	2-6%	80	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are located on uplands.
TsA	Turberville sandy loam	0-2%	80	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are located on broad, smooth landscape positions in uplands.

**Table 7-1: Soil Series within the Project Study Area (Cont.)**

Map Unit	Soil Series	Slope	Site Index **	Drainage	Hydric Status	General Characteristics
TsB	Turberville sandy loam	2-6%	80	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are located on uplands.
TtB2	Turberville sandy clay loam	2-6%	80	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are eroded and located on uplands.
TxB	Turberville-Urban land complex	0-8%	***	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are an intricate mix of 50% Turberville soil and 30% Urban land.
Ud	Udorthents, loamy	***	***	***	Non-hydric	Natural soil layering sequence is disturbed. Map unit includes borrow pits, cut and fill areas, and landfills.
WeD2	Wedowee sandy clay loam	8-15%	70	Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. The seasonal high water table is at a depth of more than 6 feet. Soils are eroded and located on uplands.
Wh*	Wehadkee loam	0-2%	93	Poorly Drained	Hydric A	Soils have moderate permeability and high available water capacity. The seasonal high water table is at or near the surface during wet periods. Soils are located on flood plains along major rivers and creeks.
WtE	Winton fine sandy loam	10-25%	93	Moderately Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. A perched seasonal high water table is at a depth of 2 to 4 feet. Soils are located on slopes along rivers and their tributaries.
WtF	Winton fine sandy loam	25-50%	93	Moderately Well Drained	Non-hydric	Soils have moderate permeability and available water capacity. A perched seasonal high water table is at a depth of 2 to 4 feet. Soils are located on slopes along rivers and their major tributaries.

Source: Shaffer 1994.

\* Occurs on Hydric Soils list, Gregory 2001.

\*\* Site Index values are based on potential productivity of *Pinus taeda* and/or *Uiquidambar styraciflua*

\*\*\* - No designation has been assigned for the mapping unit.

Hydric soils are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation (Cowardin et al. 1979). Natural Resource Conservation Service (NRCS) has divided hydric soil mapping units into two categories, Hydric A and Hydric B. Hydric A soil mapping units are defined as areas that contain all hydric soils or have hydric soils as a major component. Hydric B soil mapping units are defined as areas that are known to contain inclusions of hydric soils. In the project study area, there are three soils that are categorized as Hydric A and four soils that are Hydric B, comprising 18 percent and 8 percent, respectively. The Hydric A soils include Bethera silt loam, Rains fine sandy loam, and Wehadkee loam. The

Hydric B soils within the project study area include Altavista fine sandy loam, Craven fine sandy loam, Lenior silt loam, and Lynchburg fine sandy loam.

## **2. Water Resources**

### **a. Watershed Characteristics**

The project study area is within the Roanoke and Chowan River basins. Approximately 33 percent of the project study area is located in the Roanoke River basin and 67 percent in the Chowan River basin. The information presented in the following section is derived from the Roanoke River Basinwide Assessment Report (NCDWQ 2005b) and the Chowan River Basinwide Assessment Report (NCDWQ 2006a) unless otherwise stated.

The Roanoke River flows from the Blue Ridge Mountains in Virginia, east-southeastward across mountainous, piedmont, and coastal topography, into the Albemarle Sound in North Carolina. The Roanoke River Basin encompasses approximately 3,503 square miles and includes approximately 2,389 miles of streams and rivers in North Carolina. A portion of the project study area is located in USGS HUC 03010107 and DWQ Subbasin 03-02-08. Four major stream systems, Arthurs Creek, Trouble Field Creek, Occonechee Creek, and Gumberry Swamp, drain the project study area within the Roanoke River Basin. These streams flow south to their confluence with the Roanoke River.

The Chowan River is formed at the Virginia-North Carolina State line by the confluence of the Nottoway and Blackwater Rivers, and flows southeastward into the Albemarle Sound in North Carolina. The Chowan River Basin encompasses approximately 1,315 square miles in North Carolina; however, approximately 76 percent of the drainage basin lies in Virginia. The remaining portion of the project study area is located in USGS Hydrologic Cataloging Unit (HUC) 03010203 and DWQ Subbasin 03-01-02. Eight major stream systems drain the project study area in the Chowan River Basin: Wiccacanee Swamp, Ramsey Creek, Corduroy Swamp, Wildcat Swamp, Paddys Delight, Reedy Branch, Kirbys Creek, and Maple Fork Branch. These streams flow predominantly east and southeast and their waters eventually drain into the Meherrin River.

Eighty-four stream segments comprising 11.7 miles were identified within the project study area. The Natural Resources Technical Report (NRTR) lists these streams along with their associated NCDWQ Index Number, physical characteristics, and Best Usage Classification.

### **b. Floodplain Management**

Halifax and Northampton Counties are participants in the National Flood Insurance Regular Program. Currently, there are no detailed flood studies on any of the identified stream crossings. At this time, the new Halifax County flood study is effective; however, the Northampton County preliminary flood study is currently still in preliminary status. These studies indicate that some current approximated 100-year flood zones (currently designated as Zone A on effective maps) will be upgraded to zone AE status, indicating that base flood elevations for the 100-year flood will have been established. At such stream crossings, a

designated non-encroachment area will also be established which will carry the same regulatory status as a designated 100-year floodway. Therefore, it is anticipated that this project will involve several locations requiring approval of a Conditional Letter of Map Revision for a floodway revision. After completion of the project, a final Letter of Map Revision will also need to be approved. The NCDOT Hydraulics Unit will coordinate with local authorities and the Federal Emergency Management Agency (FEMA) in the final design phase of the project and following construction, upon acceptance by NCDOT, to ensure compliance with applicable floodplain management ordinances.

**c. Physical Characteristics**

There are ten named stream systems (on USGS maps) within the project study area and they are summarized in the following text.

**Arthur's Creek** (NCDWQ 23-28) and four of its unnamed tributaries are located within the project study area. Arthur's Creek is a perennial stream with a bankfull width of 30 feet and a bank height of 6 feet. It has a USACE quality assessment of 57. The stream segment within the project study area is immediately downstream of extensive gravel pits. Arthur's Creek has moderate sinuosity and a variety of fish, amphibians, and benthic macroinvertebrates were observed. However, this stream has evidence of impacts from agriculture and timber production in addition to some bank failures and channel widening.

Two segments of **Trouble Field Creek** (NCDWQ 23-29.2) and six of its unnamed tributaries are found within the project study area. Trouble Field Creek is a perennial stream with a bankfull width of 6 to 12 feet and a bank height of 6 feet. It has an average USACE quality assessment of 74. The upstream portion of Trouble Field Creek within the project study area exhibits moderate stream geomorphology with the characteristics becoming strong in the downstream portion. This stream is very sinuous with a moderate slope. There are small wetland areas along both portions of the stream with only minor impacts from agriculture or timber production.

Both segments of **Occoneechee Creek** (NCDWQ 23-31) within the project study area are in proposed widening areas. In addition to the main channel, there are three unnamed tributaries within the project study area. The upstream segment is located along the Old Jackson Bypass (SR 1311) and has a braided channel flowing through a coastal plain small stream swamp. The downstream segment intersects US 158 west of Jackson and is a single channel flowing through a bottomland hardwood community. The bankfull width ranges from 4 to 8 feet upstream to 15 to 20 feet in the downstream segment and a bank height of 1 to 3 feet upstream and 3 to 4 feet downstream. Both reaches are stable with little evidence of erosion or impacts from agriculture or timber production. Both segments have similar USACE quality assessments of 88 and 89, respectively.

The project study area intersects **Gumberry Swamp** (NCDWQ 23-23-1) at three different locations. In addition, there are six unnamed tributaries to Gumberry Swamp in the project study area. The upstream location of Gumberry Swamp intersects the Jackson Bypass and has a USACE quality assessment of 72. This stream is located within a bottomland hardwood wetland

and was over its banks at the time of the investigation. There was little evidence of disturbance and good wildlife habitat was present. The middle crossing of Gumberry Swamp is located northeast of Jackson where the stream is a braided channel within a beaver impounded area. Therefore, bankfull width ranged from 20 to 50 feet and bank heights were from 2 to 5 feet. To the east of this stream segment, land that was historically used for crop production has been converted to the production of pine (estimated age 5 years). This segment of Gumberry Swamp has a USACE quality assessment of 74. The downstream segment of Gumberry Swamp is along the proposed widening of US 158 to the southwest of Jackson at the discharge to Boones Millpond. This stream segment has a bankfull width of 30 to 35 feet and a bank height of 5 to 6 feet. There is riprap on the stream banks and slight erosion downstream of US 158. A bottomland hardwood wetland community is located to the east of the stream and a young mesic hardwood community is located to the west of the stream. This downstream segment of Gumberry Swamp has a USACE quality assessment of 71.

The main channel of **Ramsey Creek** (NCDWQ 25-4-8-1) is crossed by the project study area at four different locations: SR 1311 (Jackson Bypass Road) and all three alternatives around the town of Jackson. The SR 1311 location is the only area where there is a defined stream channel. The defined channel is approximately 100 feet in length. The stream discharges from a beaver dam and flows through a set of culverts under SR 1311 (Jackson Bypass Road). This stream segment has a bankfull width of 12 to 20 feet and a bank height of 1 to 3 feet. It has a USACE quality assessment of 60. The remaining portions of Ramsey Creek are encompassed in bottomland hardwood wetland communities delineated as WB29, WB25, and WB54, respectively. There are four unnamed tributaries draining into Ramsey Creek within the project study area.

The upstream portion of **Wiccacanee Swamp** (DWQ 25-4-8-1.5) is crossed by the project study area along the proposed widening of SR 1311 and the downstream portion is crossed east of Jackson along US 158. The upstream segment is located within a bottomland hardwood wetland community and has a bankfull width 12 to 15 feet and bank height of 3 to 5 feet. Downstream of SR 1311, the Wiccacanee Swamp has erosion due to cows accessing the stream from adjacent pasture land. This segment has a USACE quality assessment of 52. The downstream segment of Wiccacanee Swamp is also within a bottomland hardwood wetland community and has braided channels, a bankfull width of 2 to 5 feet, and bank height of 1 to 3 feet. This downstream segment of Wiccacanee Swamp has a USACE quality assessment of 92 and is characterized by a wide riparian zone providing canopy coverage and stable stream conditions. There are no tributaries to Wiccacanee Swamp in the project study area.

**Wildcat Swamp** (NCDWQ 25-4-8-2) begins near the center of the project study area where SR 1331 (Jackson Bypass Road) intersects US 158. It flows in an eastwardly direction between the proposed widening of US 158 and the proposed new southern alignment until it turns south and intersects the project study area west of SR 1505. Upstream of US 158, two tributaries join to form braided Wildcat Swamp within a bottomland hardwood wetland community with a bankfull width up to 25 feet. A single channel is formed as Wildcat Swamp crosses US 158 and has a bankfull width of 6 to 8 feet and bank height of 2 feet. The USACE quality assessment is 53 for Wildcat Swamp due to unnatural levees and runoff from adjacent agricultural fields. There is no defined stream channel where the project study corridor crosses

Wildcat Swamp at the downstream location. This area is delineated as bottomland hardwood wetland community WB60 and has standing surface water throughout. There are five unnamed tributaries to Wildcat Swamp in the project study area.

**Corduroy Swamp** (NCDWQ 25-4-4-1) is located along the north side of the project study area that is proposed as new alignment between Jackson and Conway north of US 158. The main channel of Corduroy Swamp is not within the project study area. However, there are 18 unnamed tributaries to Corduroy Swamp as well as bottomland hardwood wetlands defined as Corduroy Swamp within the project study area.

The main channel of **Kirbys Creek** (NCDWQ 25-4-4) is located northeast of Conway in the proposed new alignment portion of the project study area. Approximately 0.4 miles upstream of the study area, Kirby's Creek discharges from a 40-acre pond at NC 35 and flows through a bottomland hardwood wetland community lacking a defined channel. Approximately 1,000 feet of channel was delineated within the wetland. The channel has frequent meanders and stable banks with tannic waters characteristic of swamps. The stream channel has a bankfull width of 10 feet and bank height of 3 feet. Macroinvertebrates from the Diptera family were observed in leaf pack habitat. Kirbys Creek has USACE quality assessment of 73. There are 10 unnamed tributaries to Kirbys Creek within the project study area. The southern boundary of this stream and wetland system is bounded by relatively steep slopes uncharacteristic of the project study area.

**Reedy Branch** (NCDWQ 25-4-4-3) is located in the eastern portion of the project study area where the northern and southern alternatives around Conway meet the existing US 158. Reedy Branch flows north into Kirbys Creek approximately 1 mile north of the study area. Reedy Branch has a bankfull width of 8 feet and bank height of 3 feet with frequent meanders and stable banks. Several *Elliptio* sp. were observed in the upstream portion of Reedy Branch. The USACE quality assessment of the stream is 79. However, recent timber harvesting on adjacent land upstream of US 158 has the potential to degrade the stream. There are three unnamed tributaries to Reedy Branch in the project study area.

#### **d. Water Quality**

Best usage classification for surface waters is determined by NCDWQ. All of the waters in the Roanoke River Basin portion of the project study area are classified as Class C waters. All of the waters in the Chowan River Basin portion of the project study area are classified as Class C, nutrient sensitive waters (NSW) except for Paddys Delight Creek. It is classified as Class B, NSW from its source to the dam at Doolittle Millpond. Class C denotes waters that are suitable for aquatic life propagation, wildlife, secondary recreation, and agriculture. Class B denotes waters that are for primary recreation including frequent use for organized swimming. Nutrient sensitive waters are waters subject to growths of vegetation requiring limitations on nutrient inputs. Unnamed tributaries (UTs) receive the same best usage classification as the named streams into which they flow. No Outstanding Resource Waters (ORW), High Quality Waters (HQW), or Water Supply Waters (WS) occur within the project study area. Neither the Roanoke River nor the Chowan River Basins are subject to vegetated riparian buffer requirements by the state.

The Ambient Monitoring System (AMS) is a network of water quality monitoring stations strategically located for the collection of physical and chemical water quality data to help determine a waterbody's classification and corresponding water quality standards. The AMS determines how well a waterbody supports its designated uses. Since none of the streams within the project study area are monitored by NCDWQ, they are not rated. There are ambient monitoring stations on the Roanoke River at NC 46 (approximately 2.5 miles upstream of the project study area) and at US 258 (approximately 4 miles downstream of the project study area). This section is currently rated as Supporting aquatic life based on the ambient monitoring at these sites.

Section 303(d) of the Clean Water Act (CWA) requires states to develop a comprehensive public accounting of all impaired waters. The list includes waters impaired by pollutants, such as nitrogen, phosphorus and fecal coliform bacteria, and by pollution, such as hydromodification and habitat degradation. The source of impairment might be from point sources, nonpoint sources, or atmospheric deposition. The Roanoke River, from the Roanoke Rapids dam to the Albemarle Sound, is listed on the draft North Carolina 303(d) List as impaired because of fish consumption advisories (NCDWQ 2006b). The impairment is due to high mercury levels, likely resulting from atmospheric deposition (NCDWQ 2005b).

**e. Biological Data**

Benthic macroinvertebrate sampling within the NCDWQ Subbasin 03-02-08 consists of seven sites. One monitoring station is located on the Roanoke River at Halifax, approximately 8 miles downstream of the project study area. This site was not sampled in 2005 due to high flow conditions, but received a rating of Good in 1999. Another sampling point is located on Occoneechee Creek approximately 3 miles downstream of the project study area. Occoneechee Creek is a swampy stream and was rated as Natural with a total taxa richness of 22 and Ephemeroptera, Plecoptera, Trichoptera (EPT) taxa richness of 4. Swampy streams are characterized by low velocities, lower dissolved oxygen, lower pH, and sometimes complex braided channels.

Benthic macroinvertebrate sampling within the NCDWQ Subbasin 03-01-02 consists of five sites, with two of these sites downstream of the project study area. One sampling point is located on Kirbys Creek at SR 1362 and is approximately 3 miles downstream of the project study area. Another monitoring station is located on Potecasi Creek at SR 1504 near Creeksville and is approximately 2.5 miles downstream of the project study area. Kirbys Creek is a swamp stream benthic reference site. This stream rated Moderate in 2005 after rating Natural in 1997 and 2000. The decline is due to a lower habitat score and a decrease in the number of EPT taxa; however, it continues to support a healthy and pollution intolerant aquatic community. The Potecasi Creek monitoring station is approximately 2.5 miles downstream from the confluence of Wiccacanee Swamp and Ramsey Creek. This stream site rated Moderate in 2005. This site had the second highest habitat score in the Chowan basin, but only one EPT species was collected.

Fish tissue surveys consisting of two sites on the Roanoke River, in NCDWQ subbasin 03-02-08, were conducted through 1999. One of these sites was located approximately 2 miles south of the project study area, near the town of Weldon. These surveys were conducted as part of special mercury contamination assessments in the eastern part of the state and during routine basinwide assessments. Six bowfin samples from the site near Weldon had mercury concentrations greater than the EPA screening value; however, metal concentrations in 21 samples of other fish species were less than federal and state thresholds for fish consumption.

There are no fish community sampling sites in NCDWQ subbasin 03-02-08. The North Carolina Wildlife Resource Commission (NCWRC) has designated the Roanoke River from the Roanoke River Dam to US 258 as a Primary Nursery Area (PNA) (15 NCAC IOC .0503). This 35-mile reach of the river has been designated as the spawning reach for the striped bass (*Marone saxatilis*).

**f. Essential Fish Habitat (EFH)**

Essential fish habitat is defined by the National Oceanic Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS) as those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (NMFS 1999). A draft list of counties in North Carolina containing EFH as well as a draft list of water bodies within the listed counties has been produced by the Beaufort, North Carolina, office of the NMFS. Northampton County is not included on the draft list; therefore this project is not anticipated to impact EFH.

**g. NPDES Discharges**

Point source dischargers located throughout North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Dischargers are required by law to register for a permit. There are 10 permitted NPDES dischargers in DWQ Subbasin 03-02-08 (NCDENR 2006). None of the permitted NPDES dischargers are within a half-mile of the project study area. Information concerning the dischargers in this subbasin is included in Table 7-2. There are no NPDES facilities in the 03-01-02 subbasin (NCDENR 2006).

**Table 7-2: NPDES Dischargers within Subbasin 03-02-08 Northampton County**

<b>NPDES Permit #</b>	<b>Facility</b>	<b>Permit Type</b>	<b>Water Body</b>
NC0025721	Town of Weldon WWTP	Major, Municipal	Roanoke River
NC0024201	Roanoke Rapids, WWTP	Major, Municipal	Chockoytte Creek
NC0025437	Town of Rich Square, WWTP	Minor, Municipal	Bridgers Creek
NC0028835	Perdue Farms, Inc. (Lewiston)	Minor, Industrial & Commercial	Roanoke River
NC0079014	Virginia Electric and Power Company (Rosemary Power Station)	Minor, Industrial & Commercial	Chockoytte Creek
NC0066192	Town of Halifax WWTP	Minor, Municipal	Quankey Creek
NC0038636	Halifax County (Bakers Elementary School WWTP)	Minor, 100% Domestic	UT Kehukee Swamp
NC0027642	NCDOC-Odom Correctional Facility WWTP	Minor, 100% Domestic	Roanoke River
NC0027626	NCDOC-Caledonia Correctional WWTP	Minor, Industrial & Commercial	Roanoke River
NC0000752	International Paper Company (Roanoke Rapids Mill)	Major, Industrial & Commercial	Roanoke River

WWTP – Waste Water Treatment Plant

#### **h. Non-point Source Discharges**

Nonpoint source (NPS) pollution is described as pollution contained in stormwater and snowmelt runoff from agricultural, urban, mined, and other lands. NPS pollution comes from diffuse sources in contrast to point source pollution, which is discharged through a pipe or outlet. Surface water as well as leachate to groundwater can be impacted by NPS pollution. Evidence of NPS dischargers observed within the project study area includes agricultural runoff, runoff from residential lawns, and stormwater runoff from paved parking lots and roads.

#### **i. Anticipated Water Resource Impacts**

Construction of the proposed project may impact water resources by one or more of the following processes:

Increased sedimentation and siltation from construction and/or erosion.

Alteration of water levels and flows due to interruptions and additions to surface and ground water flow from construction.

Changes in light incidence and water clarity due to increased sedimentation and vegetation removal.

Changes in water temperature due to vegetation removal.

Increased nutrient loading during construction via runoff from exposed areas.

Increased concentration of toxic compounds from highway runoff, construction, and toxic spills, and increased vehicular use.

Temporary construction impacts due to erosion and sedimentation will be minimized through implementation of a stringent erosion control schedule and use of best management practices. The contractor will be required to follow contract specifications pertaining to erosion control measures (as outlined in 23 CFR 650, Subpart B and Article 107-13) entitled Control of Erosion, Siltation, and Pollution (NCDOT, Specifications for Roads and Structures). These measures are outlined in the following list.

Use of dikes, berms, silt basins, and other containment measures to control runoff during construction. Regular maintenance and inspection of these structures to insure effectiveness.

Elimination of construction staging areas in floodplains or adjacent to streams and tributaries to help reduce the potential for petroleum contamination or discharges of other hazardous materials into receiving waters.

Rapid re-seeding of disturbed sites to help alleviate sediment loadings and reduce runoff. Partial mitigation of increased runoff from new highway surfaces by providing grassed road shoulders and limited use of ditching.

Careful management and use of herbicides, pesticides, de-icing compounds, or other chemical constituents to minimize potential negative impacts on water quality. Roadside maintenance crews are well-versed in the use of these chemicals.

Avoidance of direct discharges into streams whenever feasible. Filtering runoff effluent through roadside vegetation in order to remove contaminants and to minimize runoff velocities.

## **B. Biotic Resources**

This section describes the existing terrestrial and aquatic ecosystems that occur within the project study area. Distribution and composition of terrestrial and aquatic communities reflect variations in topography, soils, hydrology, and past and present land uses. Within the project study area, some of the natural community patterns have been modified by previous disturbances. The following community profile description reflects the Schafale and Weakley (1990) classification scheme and contains the description of the range of communities that were observed. Nine vegetative communities are located in the project study area: Dry Mesic Oak-Hickory Forest, Mesic Mixed Hardwood Forest (Coastal Plain subtype), Mesic Pine Flatwoods, Maintained/Disturbed (including agricultural land and existing roadways), Coastal Plain Bottomland Hardwoods (Brownwater Subtype), Coastal Plain Semi-permanent Impoundment, Coastal Plain Small Stream Swamp (Brownwater Subtype), Nonriverine Wet Hardwood Flat, and Wet Pine Flatwoods.

## 1. Terrestrial

### a. Vegetative Communities

#### **Dry-Mesic Oak-Hickory Forest**

Dry-Mesic Oak-Hickory Forests are found on mid-slopes, low ridges, upland flats, and other dry-mesic upland areas. The community is generally underlain by acidic upland soils. Typically, the canopy and subcanopy strata are composed of a variety of oaks and hickories with white oak (*Quercus alba*) dominating the canopy. Other common canopy species include northern red oak (*Quercus rubra*), black oak (*Quercus velutina*), mockernut hickory (*Carya tomentosa*), and pignut hickory (*Carya glabra*). In areas of disturbance, tulip tree (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), and a variety of pines (*Pinus spp.*) may contribute to the canopy. The understory typically contains red maple (*Acer rubrum*), flowering dogwood (*Comus florida*), sourwood (*Oxydendron arboreum*), American holly (*Ilex opaca*), and black gum (*Nyssa sylvatica*). The vines commonly found in this community are muscadine grape (*Vitis rotundifolia*), and poison ivy (*Toxicodendron radicans*). The herbaceous layer tends to be sparse.

In the project study area, Dry-Mesic Oak-Hickory Forests tended to occur on midslopes and ridges. This community was often found between maintained/disturbed areas such as agricultural lands, which occur on the upper slopes and ridges, and Mesic Mixed Hardwoods (Coastal Plain Subtype), which occur on the lower slopes and in the valleys. Typical species found to dominate the canopy layer of Dry-Mesic Oak-Hickory Forests included white oak, post oak (*Quercus stellata*), southern red oak (*Quercus falcata*), black oak, mockernut hickory, pignut hickory, and loblolly pine (*Pinus taeda*). These forests maintained a moderately dense to open understory dominated by species such as red maple, sweetgum, sourwood, American holly, blackgum (*Nyssa sylvatica*), black cherry (*Prunus serotina*), and a mixture of younger canopy species. The shrub layer often consisted of American holly, deerberry (*Vaccinium stamineum*), red maple, Chinese privet (*Ligustrum sinense*), and saplings of canopy species. Within the herb and vine layers, dominant species included common greenbrier (*Smilax rotundifolia*), glaucous-leaved greenbrier (*Smilax glauca*), Japanese honeysuckle (*Lonicera japonica*), muscadine grape, poison ivy, and crane fly orchid (*Tipularia discolor*).

#### **Mesic Mixed Hardwood Forest (Coastal Plain Subtype)**

Mesic Mixed Hardwood Forest (Coastal Plain Subtype) occurs on mesic (non-wetland) upland areas throughout the Coastal Plains. Primarily found on north-facing river bluffs and ravine slopes in areas protected from fire by topography and moisture, these communities are supported by various moist upland soils. The canopy within this community is dominated by American beech (*Fagus grandifolia*), tulip tree, white oak, northern red oak, and sweetgum. Understory species include dogwood, American holly, hop hornbeam (*Ostrya virginiana*), sourwood, and red maple. The shrub and herb layers are described as ranging from sparse to dense and fairly diverse. Common shrubs include horse sugar (*Symplocos tinctoria*), witch-hazel (*Hamamelis virginiana*), and giant cane (*Arundinaria gigantea*). Herbaceous species may include partridgeberry (*Mitchella repens*), Christmas fern (*Polystichum acrostichoides*) and

various sedges (*Carex* spp.). Other oak species observed include southern red oak and willow oak (*Quercus phellos*). Chinese privet was common in the understory. Common greenbrier and muscadine grape were also typical in this community.

The Mesic Mixed Hardwood Forest (Coastal Plain Subtype) was a dominant community within the project study area. Most often this community occurred on the low and mid slopes transitioning from wet areas dominated by bottomland hardwood species to upland communities such as Mesic Pine Flatwoods, Dry-Mesic Oak-Hickory Forests, and agricultural fields. The canopy within this community was dominated by tulip tree, sweetgum, white oak, red maple, willow oak, water oak, and American beech. Loblolly pine was also observed in the canopy layer. The understory within this community was often moderately dense and dominated by younger canopy species as well as American holly and sourwood. The shrub layer consisted of coastal pepperbush (*Clethra alnifolia*), American holly, various blueberries (*Vaccinium* spp.), Chinese privet, and saplings of canopy species. The herb and vine layers included species such as poison ivy, Japanese honeysuckle, Christmas fern, ebony spleenwort (*Asplenium platyneuron*), muscadine grape, common greenbrier, and giant cane. Areas that had recently been timbered but were beginning to reestablish vegetation consistent with this community type were also mapped as Mesic Mixed Hardwood Forest (Coastal Plain Subtype). These cutover communities typically ranged from 5 to 15 years in age.

### **Mesic Pine Flatwoods**

Mesic Pine Flatwoods are mesic sites, located either on flat or rolling Coastal Plain sediments, that are neither excessively drained nor with a significant seasonal high water table. This community is underlain by loamy or fine-textured soils, sometimes on sands, and is characterized as having a closed to open canopy mainly consisting of longleaf pine (*Pinus palustris*) or loblolly pine. The understory is commonly sparse and contains species such as Southern red oak, water oak, post oak, mockernut hickory and sweet gum. The shrub layer will have varying densities and is similar to Wet Pine Flatwoods. The herbaceous layer is generally dominated by pineland three-awn grass (*Aristida stricta*), bracken fern (*Pteridium aquilinum*), old switch panic grass (*Panicum virgatum*), little bluestem (*Andropogon scoparium*), and roundhead bushclover (*Lespedeza capitata*).

The Mesic Pine Flatwoods was another dominant community within the project study area, typically occurring on broad flats along interstream divides. This community often consisted of large contiguous tracts of land that were being leased for hunting. Many of these tracts of land are owned by timber companies and routinely logged and replanted. Planted pine forests of all ages were mapped within this community type. The canopy layer was almost exclusively dominated by loblolly pine with only longleaf pine present at one location. In addition, sweetgum and various oaks were found in the canopy as well. The understory and shrub layers were moderately dense to sparse and consisted of sweet gum, red maple, water oak, willow oak, southern red oak, post oak, sweetbay magnolia (*Magnolia virginiana*), American holly, blackgum, winged elm (*Ulmus allata*), and black cherry. The herb and vine layers included species such as poison ivy, common greenbrier, blackberry (*Rubus* sp.), ebony spleenwort, muscadine grape, partridge berry, and Japanese honeysuckle. This community often occurred adjacent to Wet Pine Flatwoods. The main differentiating factor between this community and the

Wet Pine Flatwoods community is the lack of hydrophytic herbaceous vegetation such as giant cane and netted chain fern (*Woodwardia areolata*).

### **Maintained/Disturbed Lands**

The maintained/disturbed lands community is characterized by human influences and anthropogenic surfaces related to agricultural, commercial and residential development, roadways, railways, and other areas that have been manipulated. Vegetation associated with this community is kept in an early state of succession by regular mowing, plowing, or other maintenance. Within the project study area, this community includes the following areas: agricultural, rural residential, paved and unpaved roads, railways, industrial sites, parking lots, commercial development, and recent cutovers (generally less than 2 years old).

Agricultural fields and recent cutover areas are present throughout much of the project study area. Agricultural fields within the project study area consisted of crop land, active horse and cattle pasture, plant nurseries, poultry and swine farms, and food plots for wildlife. Cutover areas too young to be classified as other vegetative communities were classified as maintained/disturbed lands. Ground cover was often dense in these areas due to debris left over from timber harvesting and the abundance of early successional species. Species common within recent cutover areas included sweetgum, loblolly pine, red maple, blackberry, various rushes (*Juncus* spp.), wool grass (*Scirpus cyperinus*), trumpet vine (*Campsis radicans*), and poison ivy.

Within fallow fields, vegetation was dominated by sweetgum and loblolly pine. Vines and shrubs within these areas included muscadine grape, honeysuckle, and blackberry. The herbaceous layer had high diversity commonly including ebony spleenwort, longstalked aster (*Aster dumosus*), feather grass (*Microstegium vimineum*), and Chinese bushclover (*Lespedeza cuneata*). Maintained/disturbed land also includes roadsides and railroad buffers within which sweetgum, ragweed (*Ambrosia* spp.), common greenbrier, blackberry, fescue (*Festuca* spp.), and trumpet vine were found.

Mature hardwood trees were noted adjacent to maintained residential areas within the project study area. Canopy trees surrounding the residential areas include red maple, water oak, pecan (*Carya illinoensis*), loblolly pine, and willow oak. Fescue, Japanese honeysuckle, blackberry, poison ivy, and dandelion (*Taraxacum* spp.) were observed as the primary groundcover. Other species identified in these residential areas include mimosa (*Albizia julibrissin*), flowering dogwood, red mulberry (*Morus rubra*), eastern red cedar (*Juniperus virginiana*), and sweetbay magnolia.

#### **b. Terrestrial Wildlife**

The various forest communities present within the project study area, together with disturbed lands, offer plant diversity and water availability for wildlife. These forests provide a variety of habitats for amphibians, reptiles, birds, and mammals. Species observed during the site visit, either directly or indirectly by sign, scat, or tracks, are indicated by an asterisk (\*).

The project study area likely contains a diverse amphibian population. A variety of salamanders including the marbled (*Ambystoma opacum*), two-lined (*Eurycea bislineata*), three-lined (*E. guttolineata*), southern dusky (*Desmognathus auriculatus*), northern dusky (*Desmognathus fuscus*), mud (*Pseudo triton montanus*), many-lined (*Stereochilus marginatus*), slimy (*Plethodon glutinosus*), and redback (*Plethodon cinereus*) may exist within the project study area. Salamanders forage on insects (both aquatic and terrestrial), crustaceans, worms, and other organisms along the forest floor and in the streams. Salamanders can be found in a variety of habitats, though most are associated with small streams and seepages. Species such as the marbled, slimy, and redback salamanders are found primarily in terrestrial habitats under rocks, leaves, and woody debris. A variety of toads and frogs may be present throughout the project study area as well. Toads that may exist within the project study area include the eastern spadefoot toad (*Scaphiopus holbrooki*), American toad (*Bufo americanus*), \* southern toad (*Bufo terrestris*), and Fowler's toad (*Bufo woodhousei*). The American toad inhabits a variety of habitats from home gardens to forests. Bullfrogs\* (*Rana catesbeiana*) inhabit large ponds, lakes, and streams and consume insects, crayfish, and occasionally small vertebrates. Other amphibians that are likely present include spring peepers\* (*Hyla crucifer*), green tree frogs (*Hyla cinerea*), and pickerel frogs\* (*Rana. palustris*). Spring peepers mainly inhabit woodlands while pickerel frogs and tree frogs are found along shaded streams and wet areas.

Reptile species including snakes, lizards, and turtles are found throughout a variety of ecotones. During field investigations, the majority of reptiles were observed in forested areas near water. Depending upon the species, snakes forage on slugs, earthworms, insects, small mammals and their eggs, fish, and amphibians. Several snake species that are likely to be observed within the project study area include the brown snake (*Storeria dekayi*), northern water snake (*Nerodia sipedon*), \* brown water snake (*Nerodia taxispilota*), \* black racer (*Coluber constrictor*), eastern kingsnake (*Lampropeltis getulus*),\* rough green snake (*Opheodrys aestivus*),\* eastern garter snake (*Thamnophis sirtalis*), \* worm snake (*Carphophis amoenus*), \* copperhead (*Agkistrodon contortrix*), cottonmouth (*Agkistrodon piscivorus*), \* and rat snake (*Elaphe obsoleta*).\*

Lizards feed primarily on insects and inhabit a wide variety of habitats. Lizard species that are likely to be observed within the project study area include the eastern fence lizard (*Sceloporus undulatus*), five-lined skink (*Eumeces fasciatus*), and broadhead skink (*E. laticeps*). The eastern fence lizard avoids dense woods and inhabits open areas such as open pine woods, fences, and building sites. Broadhead skinks are arboreal, generally found in living and dead trees to considerable heights.

Turtles are generally omnivorous and found in or near water. Turtle species that are likely to be found within the project study area include the snapping turtle (*Chelydra serpentina*),\* yellowbelly slider (*Chrysemys scripta*),\* and eastern box turtle (*Terrapene carolina*). \* Snapping turtles are very aggressive animals, feeding on aquatic invertebrates and numerous small vertebrates in addition to vegetation. Eastern box turtles are largely terrestrial and often found away from water, but they will enter water during dry, hot weather.

The project study area offers various types of habitat for birds including open fields, residential areas, forests of various ages and types, open water, stream banks, cutovers, and

wetlands. This habitat diversity provided an opportunity for a wide variety of bird species to be observed within the project study area. Predatory birds observed within the project study area included the red-tailed hawk (*Buteo jamaicensis*), \* barred owl (*Strix varia*), \* Cooper's hawk (*Accipiter cooperii*), \* and red-shouldered hawk (*Buteo lineatus*). \* These predatory birds mainly consume rodents and other small animals, and nest above the ground. A bald eagle (*Haliaeetus leucocephalus*) \* was sighted perched in a tree within the project study area; however, no nesting sites were identified during field investigations. The bald eagle primarily feeds on fish; therefore, it is often found near open water. Great blue herons (*Ardea herodias*) \* were commonly observed along stream banks and pond edges within the project study area. Great blue herons feed primarily on fish and other animals that live in or near the water, and nest in the tops of tall trees near water.

During the months of March, April, and May an assemblage of migratory song birds was observed within the project study area. During the spring, as the weather warms and defoliating insects emerge, these migratory birds inhabit forests throughout North Carolina as they move northward. Migratory species observed within the project study area include the summer tanager (*Piranga rubra*), \* blue grosbeak (*Guiraca caerulea*), \* indigo bunting (*Passerina cyanea*), \* white-eyed vireo (*Vireo griseus*), \* common yellowthroat (*Geothlypis trichas*), \* black and white warbler (*Mniotilta varia*), \* prairie warbler (*Dendroica discolor*), \* and hooded warbler (*Wilsonia citrine*). \* The diets of these birds may include a combination of seeds, berries, vegetation, worms, and insects. Their nests are generally above ground, usually in trees or shrubs.

Game species such as American woodcock (*Scolopax minor*), \* Northern bobwhite quail (*Colinus virginianus*), \* Canada goose (*Branta canadensis*), \* mourning dove (*Zenaida macroura*), \* and wood duck (*Aix sponsa*) \* were also present within the project study area. Aside from the mourning dove and wood duck, these birds nest on the ground. Scavengers such as the turkey vulture (*Cathartes aura*) \* and black vulture (*Coragyps atratus*) \* were also found in the project study area. These birds feed primarily on fresh or rotting carrion and roost singly or communally at night. A list of all bird species observed within the project study area is included in the NRTR.

A diverse mammal population is expected to be associated with the communities present within the project study area. Recent cutover areas throughout the project study area offer habitat for the eastern cottontail (*Sylvilagus floridanus*), \* and whitetailed deer (*Odocoileus virginianus*). \* These cutover areas are also inhabited by the gray fox (*Urocyon cinereoargenteus*) \* which rely on rabbits and other small mammals as their primary food source. Mammals observed near streams and wetlands throughout the project study area included muskrat (*Ondatra zibethicus*), \* beaver (*Castor canadensis*), \* and mink (*Mustela vison*). \* Other mammals observed within the project study area included Virginia opossum (*Didelphis virginiana*), \* raccoon (*Procyon lotor*), \* eastern mole (*Sealopus aquaticus*), \* and bobcat (*Felis rufus*). \* The agricultural fields within the project study area likely support small rodents such as the eastern harvest mouse (*Reithrodontomys humulis*) and meadow vole (*Microtus pennsylvanicus*). The eastern harvest mouse feeds on seeds, fruits, and grasses common to this old-field habitat, and the meadow vole feeds on the leaves and stems of a variety of grasses and forbs as well as fungi and insects. The mature hardwood forests throughout the project study area

offer habitat for species such as the gray squirrel (*Sciurus carolinensis*). \* The gray squirrel feeds on acorns and other nuts from mast-producing trees. Bat species likely to exist within the project study area include Eastern pipistrelle (*Pipistrellus subjlavus*), big brown bat (*Eptesicus fuscus*), red bat (*Lasivirus borealis*), and evening bat (*Nycticeius humeralis*). Bats are the only mammals capable of sustained flight and are rarely seen due to their nocturnal nature. They feed on insects and typically roost in old buildings, caves, and trees. The farm buildings and extensive forested areas within the project study area offer excellent habitat for these bats.

### **c. Anticipated Impacts to Terrestrial Communities**

Temporary fluctuations in the populations of animal species that utilize the communities within the project study area are anticipated during the course of construction. Slow-moving, burrowing, and/or subterranean organisms will be directly impacted by construction activities, while more mobile organisms will be displaced to adjacent communities. Most species that may be temporarily displaced would be expected to re-colonize the area quickly once construction is complete.

Impacts to terrestrial plants and wildlife due to road construction may involve changes in microclimate, modified hydrologic regimes, soil compaction, habitat fragmentation, and increased road mortality. Changes in microclimate (moisture regimes, wind access, and available light) and microhabitat (wetlands and seeps) can negatively affect animals, such as salamanders, that rely on small pockets of these resources. Changes in microclimate can also affect the assemblage of plant life. For example, species that are shade intolerant will likely out-compete shade tolerant species in areas adjacent to the road. Cut and fill activities associated with construction can modify hydrologic regimes. Crossings of streams and wetlands can also change hydrologic patterns of these habitats, affecting the animals and plants that live there.

Several of the alternatives investigated involve road construction on new alignment. Construction of a new road corridor would involve impacts to areas that road construction on existing alignment would not. Soil within the new road corridor would likely become compacted, reducing its ability to transport water. This change in the physical properties of the soil would alter the habitat for slow-moving, burrowing, and/or subterranean species such as woodchucks and moles.

The majority of the land within the project study area has already been fragmented by roads, residential and commercial development, and agricultural practices. However, several large tracks of land within the project study area may be further fragmented as a result of construction of a new road corridor. Habitat fragmentation divides ecological units and increases wildlife competition, mortality, and avoidance behavior, which could potentially lower wildlife diversity.

Road mortality for animals could also increase as a result of construction of a new road corridor. Many animals such as Virginia opossum, raccoon, and gray fox are generalists and are attracted to the artificially created edge habitats associated with roads and other types of development. Several bird species are also attracted to this edge habitat. While these animals

might benefit from the additional habitat created by the new road corridor they would also be subject to mortality due to passing vehicles.

## 2. Aquatic

### a. Aquatic Natural Communities

#### **Coastal Plain Bottomland Hardwoods (Brownwater Subtype)**

The Coastal Plain Bottomland Hardwoods (Brownwater Subtype) are found throughout the Coastal Plain along large and medium size rivers. This Palustrine community has a variety of coarse to fine-grained alluvial soils and is seasonally to intermittently flooded. The canopy is comprised of a various mixture of bottomland oaks including swamp chestnut oak (*Quercus michauxii*), cherrybark oak (*Quercus pagoda*), laurel oak (*Quercus laurifolia*), water oak, willow oak, and Shumard oak (*Quercus shumardii*). Other hardwoods within the canopy include sweetgum, green ash (*Fraxinus pennsylvanicum*), shagbark hickory (*Carya ovata*), bitternut hickory (*Carya cordiformis*), black walnut (*Juglans nigra*), hackberry (*Celtis laevigata*), and American elm (*Ulmus americana*). The understory is commonly made up of ironwood (*Carpinus caroliniana*), deciduous holly (*Ilex decidua*), paw paw (*Asimina triloba*), and American holly. Typical vine species in this community include poison ivy, muscadine grape, and common greenbrier. The herb layer is generally sparse with sedges, Indian sea oats (*Chasmanthium latifolium*), slender spike grass (*Chasmanthium laxum*), violet (*Viola* spp.), and false nettle (*Boehmeria cylindrica*).

In the project study area this vegetative community occurred most often in the floodplains of second or higher order streams. This community was also associated with a majority of the larger wetland systems within the project study area, such as Corduroy Swamp, Ramsey Creek, and Wildcat Swamp. Coastal Plain Bottomland Hardwood Communities grade to Mesic Mixed Hardwood Forest (Coastal Plain Subtype) on the upland side. They grade to Coastal Plain Small Stream Swamp (Brownwater subtype) which is found along first order streams and headwater wetlands. The canopy was dominated by water oak, willow oak, laurel oak, sweetgum, tulip tree, red maple, and hackberry. The understory was fairly open and commonly contained sycamore (*Platanus occidentalis*), sweetbay magnolia, Chinese privet, coastal pepperbush, river birch (*Betula nigra*), ironwood, black willow (*Salix nigra*), American holly and younger canopy species. The herbaceous layer was quite diverse in the wetter portions of this community. Common herbaceous species observed include giant cane, netted chain fern, sensitive fern (*Onoclea sensibilis*), tearthumb (*Polygonum sagittatum*), slender spikegrass, wool grass, soft rush (*Juncus effusus*), various sedges, feather grass, and Christmas fern. Vines occurring in this community included Japanese honeysuckle, cross vine (*Bignonia capreolata*), and poison ivy.

#### **Coastal Plain Semi-permanent Impoundment**

The Coastal Plain Semi-permanent Impoundment is a Palustrine community and generally consists of beaver ponds, blocked embayments, and similar manmade impoundments. These communities are permanently flooded in the center and the existing soils are gradually covered by clayey or mucky sediments. Canopy coverage in this community ranges from absent to nearly

closed, and usually consists of cypress (*Taxodium* spp.) or swamp blackgum (*Nyssa biflora*). Floating or submergent aquatics often occur in the interior of this community, with emergent vegetation sometimes present at the margins. Common herbaceous species within this community include tearthumb, green arrow-aram (*Peltandra virginica*), and arrowhead (*Sagittaria* spp.).

Within the project study area this community consisted of manmade ponds, such as Boone's Millpond, borrow pits, gravel/sand pits, and agricultural ponds. No canopy was present in this community; however, it did support various floating, submergent, and/or emergent vegetation near the pond edges. This community was bordered by a variety of other communities including Maintained/Disturbed Lands, Coastal Plain Bottomland Hardwoods (Brownwater Subtype), Wet Pine Flatwoods, Mesic Pine Flatwoods, and Mesic Mixed Hardwood Forest (Coastal Plain Subtype).

### **Coastal Plain Small Stream Swamp (Brownwater Subtype)**

The Coastal Plain Small Stream Swamp (Brownwater Subtype) is a Palustrine community located along floodplains of small streams. These communities are made up of various alluvial soils and are intermittently, temporarily, or seasonally flooded. The canopy varies but is comprised of bald cypress, swamp blackgum, and various bottomland hardwoods such as chestnut oak, Shumard oak, southern red oak, laurel oak, water oak, willow oak, sweet gum, hackberry, sycamore, river birch, green ash, black walnut, and swamp cottonwood (*Populus heterophylla*). The understory is made up of ironwood, Carolina ash (*Fraxinus caroliniana*), American holly, and red maple.

This community occurred along first order streams and headwater wetlands throughout the project study area. The canopy species typically consisted of swamp blackgum, green ash, and red maple. Bald cypress (*Taxodium distichum*) was occasionally found dominating the canopy of this community as well. The understory and shrub layer was fairly open and consisted of ironwood, Chinese privet, possum-haw viburnum (*Viburnum nudum*), and young canopy species. Poison ivy, common greenbrier, giant cane, feather grass, arrow-aram (*Peltandra* sp.), and false nettle occupied the herb and vine layers. This community typically graded into Mesic Mixed Hardwood Forest (Coastal Plain Subtype) on the adjacent slopes and transitioned to Coastal Plain Bottomland Hardwoods (Brownwater Subtype) further downstream. This community is distinguished from Bottomland Hardwoods by their occurrence on small stream floodplains and headwater wetlands without well developed alluvial landforms.

### **Wet Pine Flatwoods**

This community is found in areas that are seasonally wet to usually wet that are generally flat. Soils are most commonly wet and sandy. The canopy can be open or closed and consist of various pines including longleaf pine, loblolly pine or pond pine (*Pinus serotina*). The understory layer is commonly sparse to absent. However, a low shrub layer consisting of species such as deciduous holly, dangleberry (*Gaylussacia frondosa*), stagger-bush (*Lyonia mariana*), coastal sweet bay, red bay (*Persea borbonia*), giant cane, and blueberry (*Vaccinium* spp.). The

herbaceous layer has little diversity and will likely include the pineland three-awn grass and bracken fern.

In the project study area, Wet Pine Flatwoods typically occurred along broad interstream divides. These areas were often planted pine forests that were owned by timber companies and leased to individuals for hunting purposes. Tire ruts were commonly found throughout this community as a result of past logging operations, which have also resulted in significant soil compaction in some areas. Loblolly pine dominated the canopy in this community and giant cane was often thick in the understory. Other species found within this community include willow oak, water oak, sweetgum, red maple, netted chain fern, sweetbay magnolia, and common greenbrier. The dominance of hydrophytic vegetation such as giant cane and netted chain fern distinguished this community from Mesic Pine Flatwoods, which often occurred adjacent to it on the landscape.

### **Non-riverine Wet Hardwood Flat**

Non-riverine Wet Hardwood Flats are described as poorly drained interstream flats with fine-textured soils, not associated with rivers or estuaries. These communities are underlain by poorly drained loamy or clayey mineral soils. These areas are seasonally saturated or flooded by high water tables with poor drainage. The canopy is dominated by various hardwood trees commonly found in bottomlands. These species include swamp chestnut oak, laurel oak, cherrybark oak, tulip tree, sweet gum, American elm, and red maple. The understory stratum is composed of ironwood, red maple, American holly, and paw paw. The shrub layer is often sparse to moderate, and species include spice bush (*Lindera benzoin*), red bay, Coastal pepper bush, highbush blueberry (*Vaccinium corymbosum*), wax myrtle (*Myrica cerifera*), and giant cane. Vines within this community include poison ivy, trumpet vine, and muscadine grape. The herbaceous layer is made up of sedges, lizard's tail (*Saururus cernuus*), false nettle, netted chainfern and partridge-berry.

This community occurred along interstream divides as medium to large flats, but also as small areas surrounded by agricultural fields and other upland communities. This community was fairly uncommon within the project study area. In the larger flats, the canopy was composed of various oak species such as willow oak, water oak, white oak, swamp chestnut oak, and tulip tree. Red maple, ironwood, and American holly dominated the understory, which was moderately open. The smaller areas were generally dominated by species such as sweetgum, red maple, black willow, common greenbrier, and coastal pepperbush. The herbaceous layer was usually sparse in this community. This community is distinguished from Mesic Mixed Hardwood Forest (Coastal Plain Subtype) by the presence of hydrophytic species such as black willow and coastal pepper bush. The presence of willow oak, swamp chestnut oak, and water oak distinguish this community from Dry-Mesic Oak-Hickory Forest, and its position on the landscape separates it from Coastal Plain Bottomland Hardwood Forest (Brownwater Subtype).

## **b. Aquatic Fauna**

Aquatic habitat within the project study area ranged from small headwater streams and wetlands to large third and fourth order streams and floodplain communities. The diversity of aquatic habitat available produces a variety of aquatic fauna within the project study area. Species observed during the field investigations, either directly or indirectly by are indicated by an asterisk (\*).

The most important physical factors that affect freshwater organisms are temperature, light, water current, and substrate (Voshell 2002). As stream order increases, these factors change and have a part in determining the type of organisms present within each aquatic community. Benthic species typically found dominating the smaller headwater and second order streams include various shredders such as mayflies (Ephemeroptera), stoneflies (Plecoptera), crane flies (Nematocera), and case maker caddisflies (Trichoptera). Shredders are most abundant in first and second order streams because these streams usually have an abundance of coarse particulate organic material (CPOM) entering the stream, which provides a food source for these organisms. Filter-feeders and collector-gatherers are most abundant in higher order streams due to the abundance of fine particular organic matter (FPOM), and may include species such as common net spinner caddisflies (Trichoptera), true flies (Diptera), and water boatmen (Heteroptera). Predator species that may be found in streams of all orders within the project study area include damselflies (Zygoptera), dragonflies (Anisoptera), hellgrammites (Megaloptera), and water striders (Heteroptera). Bivalves are most abundant in medium to large rivers and prefer a stable substrate consisting of gravel or a combination of gravel and sand. The only bivalves (*Elliptio* sp.)\* observed within the project study area were found in Reedy Branch, just south of US 158. Crayfish (Decapoda)\* were observed in streams and wetlands throughout the project study area.

Redbreast sunfish (*Lepomis auctus*), bluegill (*L. macrochirus*), largemouth bass (*Micropterus salmoides*), Eastern silvery minnow (*Hybognathus regius*), golden shiner (*Notemigonus crysoleucas*), common carp (*Cyprinus carpio*), tessellated darter (*Etheostoma olmstedi*), yellow bullhead (*Ameiurus natalis*), black crappie (*Promoxis nigromaculatus*), channel catfish (*Ictalurus punctatus*), hickory shad (*Alosa mediocris*), yellow perch (*Perea falvescens*), and striped bass are species that may be present in streams and creeks throughout the project study area. These fish feed on a variety of living and organic matter including algae, insects, worms, crustaceans, snails, fish, and detritus.

Other aquatic species likely include several of the amphibian, reptilian, and mammalian species discussed in Section 3.1.2. Salamanders, frogs, turtles, beavers and muskrats are a few of the species that inhabit both terrestrial and aquatic communities.

## **c. Anticipated Impacts to Aquatic Communities**

Cut and fill activities associated with road construction will impact soils due to removal, relocation, and compaction. The primary sources of water quality degradation in rural areas are agricultural operations and construction. Aquatic organisms are very sensitive to discharges and inputs resulting from construction. Precautions should be taken to minimize impacts to water

resources in the project study area during construction. Appropriate measures must be taken to avoid spilling construction materials and chemicals and to control runoff.

Potential impacts to aquatic resources associated with construction of the proposed project include increased sedimentation, scouring of the streambed, soil compaction, and loss of shading due to vegetation removal. Increased sedimentation from lateral flows is also expected. Measures to minimize these potential impacts include the formulation of an erosion and sedimentation control plan, provisions for waste materials and storage, stormwater management measures, and appropriate road maintenance measures. NCDOT's Best Management Practices (BMPs) for Protection of Surface Waters and Sedimentation Control guidelines should be strictly enforced during the construction stages of the project.

Aquatic organisms are acutely sensitive to changes in their environment, and environmental impacts from construction activities may result in long-term or irreversible effects. Impacts usually associated with in-stream construction include increased channelization and scouring of the streambed. In-stream construction alters the substrate and impacts adjacent streamside vegetation. Such disturbances within the substrate lead to increased siltation, which can clog the gills and/or feeding mechanisms of benthic organisms, fish, and amphibian species. Siltation may also cover benthic macroinvertebrates with excessive amounts of sediment that inhibit their ability to obtain oxygen.

The removal of streamside vegetation and placement of fill material during construction enhances erosion and possible sedimentation. Early re-vegetation of these areas helps to reduce the impacts by stabilizing the underlying soils and holding them in place. Erosion may carry soils, toxic compounds, trash, and other materials into the aquatic communities at the construction site. As a result, bars may form at and downstream of the site. Increased light penetration from the removal of streamside vegetation may increase water temperatures. Warmer water contains less oxygen, thus reducing aquatic life that depends on high oxygen concentrations.

An in-stream construction moratorium, to limit the effects on fishery resources, such as the striped bass, will be implemented February 15 through June 30 (as per NMFS, FWS, and WRC). The Roanoke River is listed as a primary nursery area by the NMFS. Although the Roanoke River no longer intersects the project study area, there are unnamed tributaries to the Roanoke River within the project study area.

### **3. Summary of Anticipated Impacts**

Impacts to terrestrial and aquatic organisms will occur as a result of construction of this project. The acreage covered by each vegetative community within the project study area is depicted in Table 7-3. The acreage to be impacted by the proposed project will not be determined until a final design is selected.

**Table 7-3: Vegetative Communities Within the Project Study Area**

<b>Community Type</b>	<b>Area Occupied by Community (Acres)</b>	<b>Percentage of the Total Study Area Coverage</b>
<b><u>Terrestrial</u></b>		
Dry Mesic Oak-Hickory Forest	221	3%
Mesic Mixed Hardwood Forest	749	11%
Mesic Pine Flats	927	13%
Maintained/Disturbed	4,097	58%
<b><u>Aquatic</u></b>		
Bottomland Hardwood	238	3%
Coastal Plain Semi-permanent Impoundment	10	<1%
Coastal Plain Small Stream Swamp	416	6%
Nonriverine Wet Hardwood Flat	95	1%
Wet Pine Flatwoods	363	5%
<b>Total</b>	<b>7,116</b>	<b>100%</b>

### **C. Jurisdictional Topics**

#### **1. Waters of the United States**

"Waters of the United States," or jurisdictional waters, are defined in the Clean Water Act (CWA) (32 USC 1251 et seq) as water bodies including lakes, rivers, streams and wetlands. All jurisdictional waters were identified and delineated within the project study area. ARCADIS and NCDOT met with representatives from the United States Army Corps of Engineers (USACE) and the North Carolina Division of Water Quality (NCDWQ) in May 2006 to determine the jurisdictional status of the streams and wetlands within the project corridors. At the time, a jurisdictional determination could not be issued, as all USACE representatives were instructed to await court case decisions. This has since been resolved.

##### **a. Jurisdictional Wetlands**

Wetlands, for the purposes of the CWA, are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically any adapted for life in saturated soil conditions (33 CFR 328.3). Any action that proposes to place fill into these areas falls under the jurisdiction of the USACE under Section 404 of the CWA (33 USC 1344). One-hundred forty-six (146) jurisdictional wetlands comprising 858.3 acres were delineated during field investigations. A complete list of each wetland, NCDWQ quality rating, acreage, and USFWS classification is available in the NRTR document. Table 7-4 lists the eleven USFWS wetlands types that were identified within the project study area.

**Table 7-4: USFWS Wetland Types Found within the Project Study Area**

<b>USFWS</b>	<b>Description</b>
PEM1F	Palustrine, emergent, nonpersistent, semi-permanently flooded
PFO1/2C	Palustrine, forested, broad-leaved/needle-leaved deciduous, seasonally flooded
PFO1/2F	Palustrine, forested, broad-leaved/needle-leaved deciduous, semi-permanently flooded
PFO1/4A	Palustrine, forested, broad-leaved/needle-leaved evergreen, temporarily flooded
PFO1/4C	Palustrine, forested, broad-leaved/needle-leaved evergreen, seasonally flooded
PFO1A	Palustrine, forested, broad-leaved deciduous, temporarily flooded
PFO1C	Palustrine, forested, broad-leaved deciduous, seasonally flooded
PFO1F	Palustrine, forested, broad-leaved deciduous, semi-permanently flooded
PFO4A	Palustrine, forested, needle-leaved evergreen, temporarily flooded
PSS1A	Palustrine, scrub shrub, broad-leaved deciduous, temporarily flooded
PUBHh	Palustrine, unconsolidated bottom, permanently flooded, impounded

NCDWQ rates the value of wetlands based on water storage, bank/shoreline stabilization, pollutant removal, wildlife habitat, aquatic life value, and recreation/education opportunities. Each wetland was given a numerical rating on a 0-100 scale with an associated rating of high (100-66), medium (65-33), or low (32-0). Table 7-5 summarizes the amount of high, medium, and low quality wetlands within the project study area.

**Table 7-5: Summary of Wetland Quality within the Project Study Area**

<b>Rating</b>	<b>Count</b>	<b>Acres</b>
High	39	463
Medium	58	171
Low	49	226
Total	146	860

#### **b. Jurisdictional Streams**

The NCDWQ is the principal administrative agency of Section 401 of the Clean Water Act in North Carolina. NCDWQ has created definitions for the identification of jurisdictional streams (NCDWQ 2005a). A perennial stream has a clearly defined channel that contains water year-round during a year of normal rainfall with the aquatic bed located below the water table for most of the year (15A NCAC 02B .0233[2][i]). An intermittent stream has a well-defined channel that contains water for only part of the year, typically during the winter and spring when the aquatic bed is below the water table (15 A NCAC 02B .0233[2][g]).

Of the 84 stream segments identified within the project study area, 37 of these streams comprising 7.2 miles were classified as intermittent and 47 streams comprising 4.5 miles were identified as perennial streams. All impacts to perennial streams typically require compensatory mitigation. Final determination of mitigation requirements for impacts to intermittent streams is left to the discretion of the USACE and will be determined during the permitting stage of the project.

### c. Isolated Wetlands

Isolated wetlands are "Waters of the United States" that have been determined by the USACE to meet the functions of a wetland but are not used for interstate commerce or are not connected to a navigable water body. Isolated wetlands are regulated by NCDWQ and Section 401 regulations, but are not regulated by the USACE and Section 404 regulations. Five isolated wetlands are located within the project study area.

**Table 7-6: Isolated Wetlands within the Project Study Area**

ID Number	DWQ Rating	DWQ Quality	USFWS	Acres
WB43	6	Low	PFO1/2F	0.1
WA08	25	Low	PEM2H	0.7
WA09	11	Low	PEM2H	0.3
WB71-Isolated	33	Low	PFO1C	1.1
WB96	14	Low	PFO1/2F	0.2

WB43 is a depressional wetland within a planted pine forest and is surrounded by upland. Precipitation is the hydrologic input to the wetland and groundwater is the output. This community is dominated by a sparse canopy of red maple, sweet gum, and black gum trees with a dense herbaceous layer of soft rush and wool grass. This wetland was delineated in January 2006 and soil was saturated within 1 inch of the surface.

WA08 and WA09 are old gravel pits located north and south of NC 46 in the western portion of the project study area. These wetlands have a permanent pool of water and support hydrophytic vegetation. The delineation of these wetlands occurred in September 2005 and was verified by the USACE and NCDWQ in May 2006. Aerial photography and USGS show both areas as having surface water. Hydrologic input is precipitation and overland flow from the road and output is through groundwater. These wetlands are located upslope from Arthur's Creek, but no hydrologic connection was found.

WB71 is a depressional wetland located 300 feet west of a riverine wetland system. It was delineated in May 2006 and verified by the USACE and NCDWQ several weeks later. A scrub-shrub vegetative community exists due to disturbance in the last 5 years. The dominant trees include sweet gum, black gum, red maple, and water oak. There was a low diversity of herbaceous vegetation consisting mainly of wool grass and giant cane. The past disturbance has left tire ruts 1 to 2 feet deep. The source of water to the wetland is precipitation and overland flow with groundwater as the outlet.

WB96 is a depressional wetland located within a planted sweet gum plantation. Therefore, the canopy is made of sweet gum trees planted in bedded rows 10 feet apart. Intermixed with the sweet gum are red maple, loblolly pine, soft rush, wool grass, and poison-ivy vines. This wetland was delineated in May 2006 and had surface water of 1 to 3 inches throughout the wetland, oxidized root channels, and water stained leaves.

#### **d. Ponds**

There are 18 surface water bodies or ponds within the project study area comprising 7.3 acres. Fourteen of the ponds are less than 1 acre in size and are generally located within agricultural or residential land either at the beginning of streams or as depressions within uplands. The size of each pond is listed in Table 7-7. Three larger ponds located within the project study area are described as follows.

Pond P2 is part of a series of ponds that were created when sand was removed from these areas. This pond is located northeast of the intersection of Jackson Bypass Road (SR 1311) and SR 1301. Pond P5 was formed as the result of a borrow pit and is located along US 158 at SR1312 west of Occoneechee Creek. Pond P7 is Boone's Millpond located along US 158 southwest of Jackson.

**Table 7-7: List of Ponds within the Project Study Area**

<b>ID</b>	<b>Surface Area (Acres)</b>	<b>Type/Land Use</b>
P1	0.4	Forested
P2	0.8	Sand Pit
P3	0.3	Residential
P4	0.3	Forested
P5	0.8	Borrow Pit
P6	0.1	Forested
P7	1.3	Millpond
P8	0.6	Residential
P9	0.4	Hog Lagoon
P10	0.1	Residential
P11	0.3	Residential
P12	0.2	Forested
P13	0.1	Forested
P14	0.4	Agricultural
P15	0.1	Forested
P16	0.8	Forested
P17	0.1	Forested
P18	0.1	Agricultural
P19	0.1	Residential

**e. Manmade Linear Wetlands**

Manmade linear wetlands meet the same criteria as jurisdictional wetlands. Section 404 and 401 permits are required for impacts to these wetlands, but often mitigation is not required. Four linear manmade wetlands were identified within the project study area. These wetlands are connected to jurisdictional wetlands but extend into adjacent uplands as ditches within agriculture fields. These wetlands are identified as WB97, WB65, WB63 and W A28 (see Table 7-8). The USACE Wetland Data Forms and NCDWQ Wetland Rating Forms for these wetlands are located in NRTR.

**f. Calculated Impacts**

Wetland and stream impacts were calculated based on the current alternatives. Wetland impacts are calculated from slope stake to slope stake plus an additional 25' outside of each limit as determined from the current functional design plans for each alternative studied. The totals are rounded to the nearest acre for wetlands and to the nearest 10 feet for streams.

**Table 7-8: Wetland and Stream Impacts for Alternatives**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
A1		SA 01		129
		SA 02		192
	Palustrine, Forested	WA 01	0.4	
	Palustrine, Forested	WA 03	0.1	
	Palustrine, Forested	WA 04	0.1	
	Palustrine, Forested	WA 05	0.0	
	Palustrine, Forested	WA 06	0.0	
	Palustrine, Forested	WA 09	0.2	
		<b>Total Impact*</b>	<b>1 acre</b>	<b>320 feet</b>
B1		SA 04		27
		SB 02		395
		SB 05		270
		SB 07		507
	Palustrine, Forested	WA 07	1.1	
	Palustrine, Forested	WA 11	0.7	
	Palustrine, Forested	WA 08	2.5	
		<b>Total Impact*</b>	<b>4 acres</b>	<b>1200 feet</b>
	B2		SA 04	
		SB 02		261
Palustrine, Forested		WA 07	2.1	
Palustrine, Forested		WB 02	0.1	
		<b>Total Impact*</b>	<b>2 acres</b>	<b>420 feet</b>
B3		SB 01		1075
		SB 05		228
	Palustrine, Emergent	WB 06	1.1	
	Palustrine, Forested	WB 02	2.3	
	Palustrine, Forested	WB 03	1.0	
	Palustrine, Forested	WB 04	3.3	
	Palustrine, Forested	WB 08	0.7	
		<b>Total Impacts*</b>	<b>8 acres</b>	<b>1300 feet</b>
B4		SA 05		244
		SA 91		319
		SB 01		1075
		SB 08		520
		SB 09		509
	Palustrine, Forested	WB 02	2.3	
	Palustrine, Forested	WB 03	1.0	
	Palustrine, Forested	WB 04	3.3	
	Palustrine, Forested	WB 10	0.1	
		<b>Total Impacts*</b>	<b>7 acres</b>	<b>2670 feet</b>

Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
C1		SB 11		222
	Palustrine, Forested	WB 11	1.1	
	Palustrine, Forested	WB 12	0.0	
	Palustrine, Forested	WB 13	0.1	
	Palustrine, Forested	WB 17	0.1	
	Palustrine, Forested	WB 18	2.2	
		<b>Total Impact*</b>	<b>4 acres</b>	<b>220 feet</b>
D1		SA 06		129
		SA 07		298
		SA 08		207
		SA 09		207
		SA 10		225
		SA 11		56
		SA 14		260
		SA 18		44
		SA 22		194
	Palustrine, Forested	WA 14	6.7	
	Palustrine, Forested	WA 15	0.1	
	Palustrine, Forested	WA 16	0.2	
	Palustrine, Forested	WA 16	1.2	
	Palustrine, Forested	WA 18	0.1	
	Palustrine, Forested	WA 19	12.4	
	Palustrine, Forested	WA 23	0.5	
	Palustrine, Forested	WA 24	1.1	
	Palustrine, Forested	WA 25	1.2	
	Palustrine, Forested	WA 26	0.8	
	Palustrine, Forested	WA 30	10.0	
	Palustrine, Forested	WA 32	0.5	
	Palustrine, Forested	WA 33	0.1	
	Palustrine, Forested	WA 34	2.9	
	Palustrine, Forested	WA 35	0.1	
	Palustrine, Forested	WA 36	0.1	
	Palustrine, Forested	WA 39	0.1	
	Palustrine, Forested	WA 40	0.3	
	Palustrine, Forested	WB 22	1.0	
	Palustrine, Forested	WB 35	0.1	
	Palustrine, Forested	WB 93	0.2	
		<b>Total Impact*</b>	<b>40 acres</b>	<b>1620 feet</b>

Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)	
E1		SB 20		93	
		SB 21		273	
		SB 23		268	
		Palustrine, Emergent	WA 22	0.1	
		Palustrine, Emergent	WB 32-36	6.1	
		Palustrine, Forested	WA 20	0.5	
		Palustrine, Forested	WA 21	0.8	
		Palustrine, Forested	WA 85	4.2	
		Palustrine, Forested	WA 94	1.0	
		Palustrine, Forested	WB 29-31	6.2	
		Palustrine, Forested	WB 37	3.5	
		Palustrine, Forested	WB 38	2.3	
		Palustrine, Forested	WB 39	0.1	
		Palustrine, Forested	WB 40	0.4	
		Palustrine, Forested	WB 41	3.8	
		Palustrine, Forested	WB 43	0.0	
		Palustrine, Forested	WB 44	3.8	
		Palustrine, Forested	WB 46	5.2	
		Palustrine, Forested	WB 94	0.3	
		Palustrine, Forested	WB 96	0.2	
		<b>Total Impact*</b>	<b>39 acres</b>	<b>630 feet</b>	
E2		SB 15		196	
		SB 16		1149	
		Palustrine, Forested	WA 20	0.2	
		Palustrine, Forested	WA 21	0.8	
		Palustrine, Forested	WB 19	0.1	
		Palustrine, Forested	WB 20	0.1	
		Palustrine, Forested	WB 21	0.1	
		Palustrine, Forested	WB 92	1.4	
		Palustrine, Forested	WB 95	0.9	
			<b>Total Impact*</b>	<b>4 acres</b>	<b>1350 feet</b>
E3		SB 19		201	
		Palustrine, Forested	WA 94	1.1	
		Palustrine, Forested	WB 25-27	6.2	
		Palustrine, Forested	WB 92	0.2	
		Palustrine, Forested	WB 94	0.3	
		<b>Total Impact*</b>	<b>8 acres</b>	<b>200 feet</b>	

**Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.**

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
E4		SB 24		238
		SB 26A		302
	Palustrine, Forested	WA 94	0.2	
	Palustrine, Forested	WB 47-48	2.2	
	Palustrine, Forested	WB 49-50	10.2	
	Palustrine, Forested	WB 52-53	9.7	
	Palustrine, Forested	WB 54-55	3.3	
	Palustrine, Forested	WB 86	0.3	
		<b>Total Impact*</b>	<b>26 acres</b>	<b>540 feet</b>
F1		SA 90		208
	Palustrine, Forested	WA 48-49	1.4	
	Palustrine, Forested	WA 52	0.8	
	Palustrine, Forested	WA 92	1.8	
	Palustrine, Forested	WA 93	0.1	
		<b>Total Impact*</b>	<b>4 acres</b>	<b>210 feet</b>
F2		SA 25		175
		SA 90		221
	Palustrine, Forested	WA 47	0.2	
	Palustrine, Forested	WA 92	1.8	
	Palustrine, Forested	WA 93	0.8	
	Palustrine, Scrub-shrub	WA 46	0.5	
		<b>Total Impact*</b>	<b>3 acres</b>	<b>400 feet</b>
F3		SA 31		263
	Palustrine, Forested	WA 48-49	1.7	
	Palustrine, Forested	WA 52	0.8	
	Palustrine, Scrub-shrub	WA 46	0.50	
		<b>Total Impact*</b>	<b>3 acres</b>	<b>260 feet</b>
F4		No Impact		
F5		No Impact		
F6		SA 29		238
		SA 30		236
		SA 35		222
		SA 36		345
		SA 37		238
	Palustrine, Forested	WA 42	1.4	
	Palustrine, Forested	WA 43	0.3	
	Palustrine, Forested	WA 53	1.4	
	Palustrine, Forested	WA 54	6.7	
	Palustrine, Forested	WA 55	0.6	
	Palustrine, Forested	WA 56	0.3	
		<b>Total Impact*</b>	<b>11 acres</b>	<b>1280 feet</b>

Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
F7	Palustrine, Forested	WA 71	0.1	
	Palustrine, Forested	WB 67	0.1	
	Palustrine, Forested	WA 90	0.2	
	Palustrine, Forested	WA 91	0.4	
		<b>Total Impact*</b>	<b>1 acre</b>	<b>0 feet</b>
F8		SB 40		283
	Palustrine, Forested	WB 56	0.2	
	Palustrine, Forested	WB 57	0.2	
	Palustrine, Forested	WB 60-61	4.7	
	Palustrine, Forested	WB 64-66	0.9	
	Palustrine, Forested	WB 67	0.1	
	Palustrine, Forested	WB 97	0.1	
		<b>Total Impact*</b>	<b>6 acres</b>	<b>280 feet</b>
F9		SA 39		217
		SA 41		239
		SA 42		20
		SA 43		242
		SA 44		505
		SA 45		106
	Palustrine, Forested	WA 57	2.0	
	Palustrine, Forested	WA 58	0.7	
	Palustrine, Forested	WA 59	6.4	
		<b>Total Impact*</b>	<b>9 acres</b>	<b>1330 feet</b>
F10		SA 39		217
		SA 41		272
		SA 42		32
		SA 46		283
		SA 59		290
	Palustrine, Forested	WA 57	2.0	
	Palustrine, Forested	WA 58	0.7	
	Palustrine, Forested	WA 59	4.6	
	Palustrine, Forested	WA 60	0.1	
		<b>Total Impact*</b>	<b>7 acres</b>	<b>1100 feet</b>
G1		SA 50		330
		SA 52		279
		SA 53		308
	Palustrine, Forested	WA 61-62	0.5	
	Palustrine, Forested	WA 63	0.9	
	Palustrine, Forested	WA 65	0.2	
	Palustrine, Forested	WA 67	0.1	
	Palustrine, Forested	WA 68	2.9	
	Palustrine, Forested	WA 70-72-73	5.4	
		<b>Total Impact*</b>	<b>10 acres</b>	<b>920 feet</b>

**Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.**

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
G2		SA 49		148
		SA 50		341
		SA 52		349
		SA 53		335
	Palustrine, Forested	WA 65	0.1	
	Palustrine, Forested	WA 67	0.1	
	Palustrine, Forested	WA 68	2.9	
	Palustrine, Forested	WA 70-72-73	5.8	
	Palustrine, Forested	WB 88	1.0	
		<b>Total Impact*</b>	<b>10 acres</b>	<b>1170 feet</b>
G3		SB 32		432
		SB 33		1014
		SB 34		371
	Palustrine, Forested	WB 68	0.0	
	Palustrine, Forested	WB 71	7.4	
	Palustrine, Forested	WB 73	13.7	
	Palustrine, Forested	WB 74	4.8	
	Palustrine, Forested	WB 78-79-81	5.4	
		WB 71 Isolated	0.1	
		<b>Total Impact*</b>	<b>31 acres</b>	<b>1820 feet</b>
G4		SB 36		308
		SB 63		691
		SB 64		24
	Palustrine, Forested	WB 75	1.4	
	Palustrine, Forested	WB 77, WA 78-79	2.7	
	Palustrine, Forested	WB 78-79-81	3.4	
	Palustrine, Forested	WB 80	2.8	
	Palustrine, Scrub-shrub	WB 82	0.1	
			<b>Total Impact*</b>	<b>10 acres</b>
G5	Palustrine, Forested	WB 78-79-81	3.0	
		<b>Total Impact*</b>	<b>3.0 acres</b>	<b>0 feet</b>
G6		SA 54		321
		SA 56		51
		SA 57		43
		SA 58		281
		SA 60		42
		SA 61		113
	Palustrine, Forested	WA 75-76	0.8	
	Palustrine, Forested	WA 77 (1-24)	1.3	
	Palustrine, Forested	WA 77 (25-56)	1.0	
		<b>Total Impact*</b>	<b>3 acres</b>	<b>850 feet</b>

**Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.**

**Table 7-8: Wetland and Stream Impacts for Alternatives (Cont.)**

Segment	Wetland Type	Wetland/ Stream Identification	Wetland Impact (Acres)	Stream Impact (Feet)
G7		SB 35		181
		SB 64		74
	Palustrine, Forested	WB 75	0.1	
	Palustrine, Forested	WB 76	0.1	
	Palustrine, Forested	WB 83	0.1	
	Palustrine, Scrub-shrub	WB 82	0.1	
		<b>Total Impact</b>	<b>1 acre</b>	<b>260 feet</b>
H1	Palustrine, Forested	WB 85	0.0	
	Palustrine, Unconsolidated Bottom	WB 84	0.1	
		<b>Total Impact</b>	<b>1 acre</b>	<b>0 feet</b>

Note: \* totals for streams are rounded to 10 feet; total for wetlands are rounded to the nearest acre.

## 2. Permit Issues

No preferred alternative (or LEDPA) has been recommended for the project at this time; therefore, a detailed permit strategy cannot be developed at this time. Whichever alternative is selected, there will be impacts to Waters of the United States. This section discusses the necessary permits or certifications that would be required for project construction as well as methods to avoid, minimize, or compensate for those impacts.

### a. Permit Requirements

Section 404 of the CWA requires regulation of discharges into Waters of the United States. The United States Environmental Protection Agency (USEPA) is the principal administrative agency of the CWA; however, the USACE has the responsibility for implementation, permitting, and enforcement of the provisions of the CWA covering discharges of fill materials (33 CFR 320-330). An Individual Permit would likely be required based on the potential that cumulative loss of stream channel and wetlands would be greater than the current thresholds for Nationwide Permits. Once a design alternative is selected, a final permitting strategy can be developed.

Any action that may result in a discharge into Waters of the United States within North Carolina requires a water quality certification from NCDWQ. An Individual 401 Water Quality Certification will be necessary for impacts before an Individual 404 Permit can be obtained. The USACE does not have jurisdiction over isolated wetlands. Therefore, an Isolated Wetland Permit will be required from NCDWQ if an alternative impacts any of the isolated wetlands. NCDOT will coordinate with the USACE and NCDWQ after the completion of final design to obtain the necessary permits required by Sections 404 and 401 of the CWA.

**b. Mitigation**

The USACE has adopted, through the Council on Environmental Quality (CEQ), a mitigation policy that embraces the concepts of "no net loss of wetlands" and sequencing. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time, and compensating for impacts (40 CFR 1508.20). Avoidance, minimization, and compensatory mitigation must be considered in sequential order.

**Avoidance** examines all appropriate and practicable possibilities of averting impacts to Waters of the United States. According to a 1990 Memorandum of Agreement (MOA) between the USEPA and the USACE, "appropriate and practicable" measures to offset unavoidable impacts should be appropriate to the scope and degree of those impacts and practicable in terms of cost, existing technology, and logistics in light of overall project purposes.

In the development of alternatives, several wetland areas were avoided by shifting alignments. Impacts to the Roanoke River were avoided by eliminating the "Garysburg – Widen Existing" option between Weldon and Garysburg.

**Minimization** includes the examination of appropriate and practicable steps to reduce the adverse impacts to waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right-of-way widths, fill slopes, and/or road shoulder widths. The following other methods will minimize adverse impacts to water resources.

- Strict enforcement of BMPs to control sedimentation during project construction
- Bridge high quality, linear wetland systems
- Minimize clearing and grubbing activity
- Decrease or eliminate discharges into streams
- Re-establish vegetation on exposed areas
- Minimize in-stream activity

Project specific minimization efforts that have been incorporated into this project include:

Shifting alternatives D1, F9, G1, E1, and E4 to reduce wetland impacts

Longer bridges are recommended at several locations (D1, G1, E2, E3, E1, E4) to further minimize wetland/stream impacts

Equalizer pipes are recommended at several locations

**Compensatory mitigation** is not normally considered until anticipated impacts to waters of the United States have been avoided or minimized to the maximum extent possible. It is recognized that "no net loss of wetlands" functions and values may not be achieved in each and every permit action. Appropriate and practicable compensatory mitigation is required for unavoidable adverse impacts that remain after all appropriate and practicable minimization has

been completed. Compensatory actions often include restoration, creation, and enhancement of Waters of the United States. Such action should be undertaken in areas adjacent to the discharge site when feasible.

Opportunities for on-site mitigation were investigated within the project vicinity. Soil survey data (Shaffer 1994) and aerial photography were used to determine specific sites for field investigation. Field investigations resulted in a surprisingly low potential for on-site mitigation. Many of the streams that are mapped within agricultural fields, pastures, and cutovers are intermittent or ephemeral channels. The majority of perennial streams within the project study area exist in mature bottomland hardwood systems or other areas that are already forested. Vegetation surrounding the perennial streams protects the banks and creates a fairly stable stream system in most cases. There are also very few areas mapped as hydric A soils that are not currently forested, and in most cases considered existing wetlands.

There are four potential on-site mitigation opportunities, consisting of riverine wetland mitigation along with small amounts of stream mitigation, adjacent to the project study area.

The first opportunity exists along the headwaters of Wildcat Swamp. This area is located east of US 158 south of its intersection with Wildcat Swamp (SA25). The land is currently in active cattle pasture. An unnamed tributary, which starts as the discharge from Pond P8, was dry during site visits in May 2006 and determined to be an ephemeral channel. Therefore, stream mitigation is not an option at this site. However, the soils surrounding the unnamed tributary are mapped as Hydric B soils. There are two existing ponds along the tributary, one near its headwaters (P8) and one just before its confluence with Wildcat Swamp (outside the project study area). Cattle have unrestricted access to both ponds as well as to the ephemeral channel that connects them. Low to moderate potential for approximately 2 to 3 acres of headwater wetland restoration/creation exists along this tributary. The cattle need to be restricted from this drainage feature. The ponds and the land surrounding them could be drained, graded, and planted with native vegetation to reestablish what appears to have once been a headwater wetland system draining into Wildcat Swamp. The ephemeral channel that connects the two ponds could also be planted and possibly graded into a wetland swale.

Another on-site mitigation opportunity exists along an unnamed tributary to Gumberry Swamp. This site is located just south of SR 1311 (Jackson Bypass Road) approximately 0.5 mile east of its intersection with Gumberry Swamp. This tributary begins in the project study area, in an agricultural field, as a linear manmade wetland (WA28). Approximately 500 feet south of the project study area, this manmade wetland transitions into a channelized stream. The stream flows into a large beaver swamp, which eventually drains into Gumberry Swamp. The stream was determined to be perennial at the time of the site visit in May 2006. There was water in the channel, persistent bed and banks, low to moderate flow, and a relic floodplain.

The stream has been straightened and ditched in the past and lost connection to its floodplain. The stream is incised, with high banks at its headwaters but its bank height decreases as it reaches its confluence with the beaver swamp. The soils surrounding this tributary are mapped as Hydric B soils and there appears to be existing wetlands in the relic floodplain on the north side of the stream. Moderate potential for approximately 2 acres of wetland enhancement,

restoration, and/or creation along with 300 to 400 linear feet of stream restoration exists at this site. The linear manmade wetland could be graded and planted with native vegetation to establish a natural headwater wetland. The stream could be restored by reconnecting it to its floodplain and establishing proper dimension, pattern, and profile. The land adjacent to the stream could be graded and planted with native vegetation to restore, create, and/or enhance riverine wetlands.

A third on-site mitigation opportunity exists along an unnamed tributary to Lily Pond Creek (SB24). This site is located just west of the town of Jackson. The tributary flows north to south through agricultural fields, under US 158, and continues through agricultural fields out of the project study area to the south. This tributary has been straightened and ditched and has lost connection to its floodplain. There is a very narrow strip of vegetation along each side of the stream, but the channel is incised and shows moderate amounts of erosion. The stream was determined to be ephemeral upstream of US 158 and intermittent downstream of US 158 at the time of the site visit in May 2006. Although there was standing water in most of the intermittent portion of the stream, there were areas of dry streambed. The soils surrounding the tributary are mapped as Hydric A and B soils. The relic floodplain on each side of the stream is in agricultural production and the stream is draining approximately 300 acres of agricultural land. Northampton County was suffering from a drought at the time of the site visit. This stream should be re-evaluated under normal rainfall conditions to determine its status as intermittent versus perennial downstream of US 158. If this stream were determined to be perennial under normal circumstances, there is potential for approximately 4,000 linear feet of stream and several acres of riverine wetland restoration at this site. Since the stream is classified as intermittent, this site is not eligible for stream mitigation.

Possibly the best opportunity for on-site mitigation exists at a site approximately 0.25 miles north of the intersection of Ramsey Creek and US 158 just east of the town of Jackson. The floodplain of Ramsey Creek at this location was flagged as an existing wetland (WB54-55). The land north of this wetland is currently in active cattle pasture west of US 158 and has a commercial plant nursery to the east of US 158. Hydric A soils are mapped within the existing wetland (WB54-55) and on the land to the north of this wetland. According to the Northampton County NRCS (05-09-06), the land that is currently in active cattle pasture is mapped as prior converted agricultural land. At the time of the site visit, in May 2006, the cattle pasture adjacent to the wetland had standing water in several places and contained hydric soil indicators. The dominant vegetation within this portion of the cattle pasture was soft rush and fescue. The plant nursery to the east of US 158 is also mapped as Hydric A soils; however, this area was not checked for hydrology or hydric soil indicators. This site provides an excellent opportunity for approximately 6 acres of wetland enhancement within the cattle pasture and possibly 10 acres of wetland restoration or enhancement within the plant nursery. The cattle pasture could be planted with native vegetation and the wetland (WB54-55) adjacent to the cattle pasture could be used as a reference wetland to restore the cattle pasture and possibly the plant nursery to bottomland hardwood forests.

If sufficient on-site mitigation is not found, impacts will be compensated through offsite mitigation. In accordance with the MOA among the North Carolina Department of Environment and Natural Resources, the North Carolina Department of Transportation, and the U.S. Army Corps of Engineers, Wilmington District," July 22, 2003, the North Carolina Department of

Environment and Natural Resources Ecosystem Enhancement Program (EEP), will be requested to provide off-site mitigation to satisfy the CWA compensatory mitigation requirements for this project.

**3. Protected Species**

**a. Federally Threatened and Endangered Species**

Some populations of fauna and flora have declined, or are in the process of declining due to either natural forces or their inability to coexist with humans. Federal law (under the provisions of Section 7 of the Endangered Species Act of 1973, as amended [ESA]) requires that any action likely to adversely affect a species classified as federally protected is subject to review by the USFWS. Other species may receive additional protection under state laws. As of April 2006, the USFWS had identified two species that could potentially occur in Northampton County. These include one endangered species, the red-cockaded woodpecker (*Picoides borealis*), and one species that was considered threatened but has since been delisted, the bald eagle (*Haliaeetus leucocephalus*). As of June 28, 2007, the bald eagle was removed from the Endangered Species Act list. However, this raptor will still be protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA).

**Table 7-9: Threatened and Endangered Species Known for Northampton County**

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>	<b>State Status</b>	<b>Habitat Requirements</b>	<b>Habitat Available</b>	<b>Biological Conclusion</b>
<i>Haliaeetus leucocephalus</i>	Bald Eagle	P	E	Mature trees near open water	Yes	Not Applicable
<i>Picoides borealis</i>	Red-cockaded Woodpecker	E	E	Open, old growth stands of pine	Yes	No Effect

P – Protected  
E – Endangered

**Bald eagle** (*Haliaeetus leucocephalus*)

Federal Status: DELISTED from ESA, Protected under MBTA and BGEPA

State Status: ENDANGERED

Biological Conclusion: **Not Applicable**

The Roanoke River is the largest body of water providing nesting habitat for bald eagles. There are several small millponds and large beaver swamps that may provide foraging habitat. The gravel pits northwest of Garysburg and the sand pits east of Garysburg are the largest bodies of open water that may provide additional nesting habitat.

Bald eagles were looked for during each field day with special attention given to preferred habitat areas. Field surveys were conducted between September 2005 and May 2006. The western portion of the project study area near Garysburg is within 1 mile of the Roanoke River,

which is suitable habitat for this raptor. A review of the NCNHP database of rare species and unique habitats in September 2005 and March 2006 depicted no observations of the bald eagle within or near the project study area.

A single bald eagle was observed in the riparian area of Trouble Field Creek. This area is 1.25 miles northeast of the Roanoke River and 0.5 mile west of the sand pit ponds along SR 1311. No nests were located within or adjacent the project study area. The USFWS (Jordan 2006) and NCWRC (Allen 2006) have no known nests within one mile of the project study area.

**Red-cockaded woodpecker (*Picoides borealis*)**

Federal Status: ENDANGERED

State Status: ENDANGERED

Biological Conclusion: **NO EFFECT**

Suitable habitat for the RCW is found within and adjacent to the project study corridor. Current habitat within the project study area is under pressure from abundant timber operations throughout the county.

A review of the NCNHP database of rare species and unique habitats in July of 2007 revealed no observations of the RCW within or near the project study area. The listing for this county is based on a historic record from 1973.

**b. Federal Species of Concern and State Status**

Table 7-10 lists nine USFWS federal species of concern (FSC) for Northampton County (March 2006). FSC species are defined as species that are under consideration for listing, but for which there is insufficient information to support listing as threatened or endangered (formerly C2 candidate species). These species are not protected under the provisions of the ESA. The status of these species may be upgraded at any time; therefore, they are included here for consideration. The NCNHP list for Northampton County of May 2006 identifies nine FSC species and an additional 13 species receiving protection under the North Carolina Endangered Species Act of 1987 and North Carolina Plant Protection and Conservation Act of 1979. Protections afforded to species under state law are not applicable to this project.

**Table 7-10: Federal Species of Concern Known for Northampton County**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>	<b>State Status</b>	<b>Habitat Requirements</b>	<b>Habitat Available</b>
<b>Vertebrates</b>					
American eel	<i>Anguilla rostrata</i>	FSC	None	Streams, lakes, ponds	Yes
Cerulean warbler	<i>Dendroica cerulea</i>	FSC	SR	Mature forest on natural levee within 330 m of Roanoke River	No
Rafinesque's big-eared bat	<i>Corynorhinus rafinesquii</i>	FSC	T	Hollow trees, old mines, caves, underside of bridges, abandoned buildings	Yes
<b>Invertebrates</b>					
Atlantic pigtoe	<i>Fusconaia masoni</i>	FSC	E	Historic-Fast waters with high quality; headwaters	Yes
Chowanoke crayfish	<i>Orconectes virginensis</i>	FSC	SC	Low gradient stream with sandy or gravelly substrate	Yes
Green floater	<i>Lasmigona subviridis</i>	FSC	E	Low gradient streams with sandy or gravelly substrate in pools	Yes
<b>Vascular Plant</b>					
Bog St. John's-wort	<i>Hypericum adpressum</i>	FSC	SR	Historic-streamside seepage areas; depression pools; isolated wetlands	Yes
Reclining bulrush	<i>Scirpus Flaccidifolius</i>	FSC	P	Swamp Forest	Yes
Sandhills bog lilly	<i>Lilium pyrophilum</i>	FSC	SR-P	Historic-streamhead pocosins ecotones and openings	No

Status: E – Endangered; FSC – Federal Species of Concern; P – Proposed; SC – Special Concern; SR – Significantly Rare; T - Threatened

A review of NCNHP maps found three populations of cerulean warbler within 1 mile of the project study area. These populations are along the levees of the Roanoke River between US 158 and Trouble Field Creek. The historic population of the Atlantic pigtoe is within 1 mile of the project study area in the Roanoke River downstream of US 158. A population of the sandhills bog lily is located 0.5 miles north of the northern alternative around the Town of Jackson. These are the only known populations of FSC within the project vicinity.

## VIII. COMMENTS AND COORDINATION

### A. Comments Solicited

The following federal, state, and local agencies were consulted during the preparation of this environmental assessment. Written comments were received from agencies noted with an asterisk (\*).

- \*United States Army Corps of Engineers (USACE)
- \*United States Environmental Protection Agency (USEPA)
- \*United States Fish and Wildlife Service (USFWS)
- \*National Marine Fisheries Service (NMFS)
- \*North Carolina Department of Cultural Resources (SHPO)
- \*North Carolina Wildlife Resources Commission (WRC)
- \*North Carolina Division of Soil and Water Conservation (DSWC)
- \*North Carolina Division of Forest Resources
- \*North Carolina Division of Water Quality (DWQ)
- \*North Carolina Division of Environmental Health
- North Carolina Division of Coastal Management (DCM)
- North Carolina Division of Marine Fisheries (DMF)
- Upper Coastal Plains Council of Governments
- \*Town of Garysburg
- Town of Conway
- Halifax County Commissioner
- Northampton County Commissioner
- \*Town of Jackson
- \*Town of Weldon
- \*Northampton County Schools

These comments and related issues, included in Appendix B, have been addressed in this document.

### B. NEPA/404 Merger Process Coordination

Merger 01 is a process to streamline the project development and permitting processes, agreed to by the USACE, NCDENR (DWQ, DCM), FHWA and NCDOT and supported by other stakeholder agencies and local units of government. To this effect, the Merger 01 process provides a forum for appropriate agency representatives to discuss and reach consensus on ways to facilitate meeting the regulatory requirements of Section 404 of the Clean Water Act during the NEPA/SEPA decision-making phase of transportation projects.

The Merger 01 process allows agency representatives to work more efficiently (quicker and comprehensive evaluation and resolution of the issues) by providing a common forum for them to discuss and find ways to comply with key elements of their agency's mission. The merger process helps to document how competing agency mandates are balanced during a shared

decision-making process, which results in agency representatives reaching a “compromise based decision” to the regulatory and individual mandates.

Concurrence Meeting Correspondence is included in Appendix E.

February 9, 2000

On February 9, 2000, the Merger Team met and concurred on the Purpose and Need of the project (Concurrence Point 1). The Purpose and Need of the project is to:

Improve traffic flow and level of service (LOS) on this section of US 158  
Improve safety along US 158  
Improve access to existing and future industry

March 10, 2005

On March 10, 2005, the Merger Team met and concurred with carrying the following alternatives forward for detailed studies (Concurrence Point 2).

Garysburg

- Widen on Existing
- Garysburg Northern Bypass
- Garysburg Southern Bypass 1
- Garysburg Southern Bypass 2

Jackson

- Old Jackson Bypass
- Extended Northern Jackson Bypass
- Northern Jackson Bypass
- Southern Jackson Bypass

Faison’s Old Tavern

- Widen on Existing
- Faison’s Old Tavern Northern Bypass
- Faison’s Old Tavern Southern Bypass
- Faison’s Old Tavern Northern Bypass & Conway Northern Bypass

Conway

- Northern Conway Bypass
- Southern Conway Bypass 1
- Southern Conway Bypass 2

The team agreed to eliminate the following alternatives:

- Widen existing US 158 in Jackson
- Widen existing US 158 in Conway

#### August 18, 2005

On August 18, 2005, the Merger Team met and concurred with dropping the Garysburg – Widen on Existing Alternative. The elimination of this alternative moved the western project limit from the east of Weldon to the intersection of I-95 and NC 46 west of Garysburg. The remaining alternatives from the March 10<sup>th</sup> meeting were carried forward (Concurrence Point 2 - Supplemental).

#### June 19, 2007

On June 19, 2007, the Merger Team met and concurred on bridging options for high quality wetlands and major hydraulic crossings for the project. The team did not decide to drop any alternatives until after the public hearing.

A copy of the signed concurrence point forms are provided in Appendix E.

### **C. Public Involvement**

A series of Citizens Informational Workshops was held on April 4, 9 and 11, 2002 in Garysburg, Jackson, and Conway, respectively. The presentation at the three workshops was the same for each location. The purpose of these workshops was to gather suggestions and comments on the project.

Numerous comments received indicated there was a great need for the project, specifically to aid in economic development of northeastern North Carolina. There were also several other comments from residents opposed to widening alternatives close to their residence.

A Citizens Informational Workshop was held on July 12, 2004 at the County Administration Building in Jackson. A single workshop was held because the majority of the project had not changed since it was first presented in a series of workshops in 2002; the only changes that were made were the addition of two new alternatives in the Jackson vicinity.

A public hearing will be held following the circulation of this document. This public hearing will provide more detailed information to the public about the proposed improvements. The public will be invited to make additional comments or voice concerns regarding the proposed project.

CRC/cc