Compensatory Mitigation Plan for Greene Street Bridge
Pitt County
Bridge Number 411 on SR 1531 and Pitt Street (extension)
TIP Project NumberB-2225
North Carolina State Project Number 8.2220601

Prepared by
Natural Systems Unit II
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
February 1999

1.0 Introduction and Description of Proposed Project

The North Carolina Department of Transportation (NCDOT) proposes to replace the existing Greene Street bridge over the Tar River in Greenville and construct an additional bridge 330 feet upstream, extending Pitt Street across the Tar River. Both bridges will provide one-way traffic flow, circulating northbound and southbound traffic through the central business district of Greenville. Greene Street will provide a two-lane bridge for northbound traffic, while Pitt Street will accommodate two lanes of southbound traffic. Both bridges will provide a 28-foot travelway with two feet allocated for bicycles on the right side of the bridges. In addition, each bridge will have five-foot sidewalks. Environmental impacts associated with this project are considered in several documents. Most recently, the document "Environmental Assessment and Programmatic Section 4(f) Evaluation (1996)" was completed.

2.0 Wetland Resources

2.1 Methodology

Wetlands were delineated by Tim W. Savidge of NCDOT on June 27, 1996 using the "Corps of Engineers Wetlands Delineation Manual" (1987). A total of four wetland sites were identified in the delineation; these were verified by the US Army Corps of Engineers (USACE) on August 27, 1996. Impacts to jurisdictional wetlands were determined to be 0.66 acres. Mechanized clearing in wetlands will account for 0.11 acres of impacts and the remaining 0.55 acres of impacts will be from fill.

2.2 Affected Wetlands

Of the total 0.66 acres of wetland impacts, 0.36 acres are cypress swamp, 0.2 acres are bottomland hardwoods and 0.1 acre consists of graminoid marsh (disturbed, utility right-of-way). Using the "Classification of the Natural Communities of North Carolina - Third Approximation" (Schafale and Weakley 1990), these wetlands are classified as cypress-gum swamp (brownwater subtype), coastal plain levee forest (brownwater subtype) and a regularly disturbed transmission line easement containing shrubby and herbaceous vegetation.

3.0 Mitigation

3.1 Purpose and Goals

Compensatory mitigation to offset the impacts of this project will occur onsite. The NCDOT has purchased 3.1 acres of land between the proposed bridges specifically to be used for mitigation for Project B-2225. A deed containing a boundary description of the property purchased for mitigation is attached.

This mitigation site will provide approximately 1.75 acres of creation/restoration, 0.40 acres of enhancement and 0.95 acres of preservation of upland levee forest and adjacent bottomlands. The premise of mitigation would be to provide a contiguous bottomland hardwood and cypress swamp system in areas where fill had previously been placed and to enhance areas that had been continually altered for utility-line right of way. Because of the proximity of adjacent urban areas, it is important to maintain or increase (by creating,

restoring or enhancing) wetlands in sites such as this, as wetlands provide flood storage and the opportunity for pollutant removal and sediment filtration and retention.

4.0 Site Description

Pockets of bottomland hardwood wetlands occur on the project property among the alluvial levee forest, adjacent to the Tar River. Further from the river, cypress swamp occurs in deeper depressions. Disturbed freshwater marsh and continually maintained higher ground are found throughout the property along utility and bridge right of ways. In general, this area contains only slight changes in elevation with the lower depressions being occupied by cypress swamp and the higher areas adjacent to the river, an alluvial levee system. The property is traversed by a gravel access road and utility lines and structures, all of which will be removed.

4.1 Hydrology

Overbank flooding occurs from the Tar River, although a high berm likely reduces the amount and frequency of overbank flooding from the river into the levee forest. The United States Geological Survey has intermittently collected gage height data from the Tar River at Greenville (station #02084000) at this location. River stage data were collected from 1985 through the middle of September 1990 and again from April 1997 through the present. Gaps often exist in data collection so the precise extent of river flooding is unknown. Overbank flooding was noted on the north side of the river during a site visit on January 29, 1999. The river stage was 10.3 feet when overbank flooding occurred. A review of hydrological data has shown that overbank flooding is a frequent phenomena that occurs frequently during the growing season. On the average, overbank flooding occurred 21 days during the growing season when considering the last six years that data were collected.

Hydrology of the cypress swamp is influenced by a man-made canal located adjacent to the project that flushes water back and forth from the Tar River. Cypress swamps generally have a long hydroperiod, being flooded throughout the winter and episodically in the summer. Adjacent to the project site, beavers have impounded a canal, creating deeper backwaters.

4.2 Vegetation

Wetland communities on the project site include cypress-gum swamp (brownwater subtype), coastal plain levee forest (brownwater subtype) and a regularly disturbed transmission line easement containing shrubby and herbaceous vegetation. Dominant vegetation in and adjacent to the cypress swamp includes trees such as baldcypress (*Taxodium distichum*), American elm (*Ulmus americana*), water ash (*Fraxinus caroliniana*), water hickory (*Carya aquatica*) and swamp cottonwood (*Populus heterophylla).* Ironwood (*Carpinus caroliniana)* is a common understory tree on slightly higher elevations. Several species of shrubs including hawthorn (*Crataegus* sp.) and buttonbush (*Cephalanthus occidentalis)* are present. Dominant vegetation in the levee forest and bottomlands include sycamore (*Platanus occidentalis*), Green ash (*Fraxinus pennsylvanica*), river birch (*Betula nigra*), willow oak (*Quercus phellos*) and water hickory (*Carya aquatica*). The disturbed marsh consists of a variety of grasses, sedges

and herbs with some shrubby growth. The invasive aquatic plant, alligator weed (*Alternanthera philoxeroides*) is also prevalent near a drainage ditch. Regular mowing under utility lines has prevented succession into mature cypress swamp.

4.3 Soils

Two soil types occur within the mitigation site and both are considered to be hydric (USDA 1989). Soils adjacent to the Tar River and within 500 feet are classified as Bibb complex. This mapping series consists of flood plain soils or alluvial deposits consisting of a variety of fine sandy loams. Areas of Bibb soils experience very frequent flooding for brief periods. Beyond 500 feet from the river, the site contains soils classified as Cape Fear loam. These soils are also poorly drained with the soils being frequently flooded for brief periods. Both soil types are rated as 'good' for supporting suitable wildlife habitat (cover and food) including hardwood trees and shrubs (Karnowski et. al 1974).

5.0 Proposed Wetland Mitigation

Mitigated wetlands would support a levee system adjacent to the river that trancends into deeper bottomland hardwoods and cypress swamp with more contiguous flow than is currently present. The mitigation site is comprised of a total of 3.1 acres located between the proposed Pitt Street bridge and Greene Street as depicted in Figure 1. Of this acreage, 2.15 acres are for enhancement and restoration/creation in addition to 0.95 acres of preservation. Figure 2a illustrates existing wetlands and Figure 2b outlines mitigation areas for comparison. The mitigation site encompasses regularly mowed, disturbed right-of-way (from former utility lines) that functions as a fresh water marsh. Once planted, this area would revert to cypress swamp such as that found near the northern end of the project site. Higher areas adjacent to the maintained bridge right-of way would be graded to the elevation of the current bottomlands. Topsoil from higher (non-wet) areas will be stockpiled onsite and later reused for topsoil in the mitigated areas once grading is completed. The stockpiled topsoil will be clearly labeled so that their intended use is known.

The existing gravel road and land adjacent to the bridges would be graded to the elevation of the bottomlands and planted in hardwoods similar to those existing in the bottomlands. There is also a triangular shaped area of non-wetland vegetation that contains predominately invasive Chinese privet (*Ligustrum sinense*) that would be cleared and graded to allow a continuation of bottomland forest. The portion of gravel road adjacent to cypress swamp would be graded and planted as cypress swamp.

5.1 Hydrologic restoration

Mitigation will involve extending existing wetlands by grading non-wet areas to the elevation of the wetland areas. Stockpiled topsoil will be incorporated on top of the graded area. Areas of microtopographic relief will be created throughout the area to be graded. In addition, removal of the gravel access road will provide for a more contiguous overland flow of water. As previously mentioned, overbank flooding from the Tar River is sufficient to create hydrological conditions favorable for successful mitigation.

Figure 1. Greene Street Mitigation Site, Pitt County, B-2225

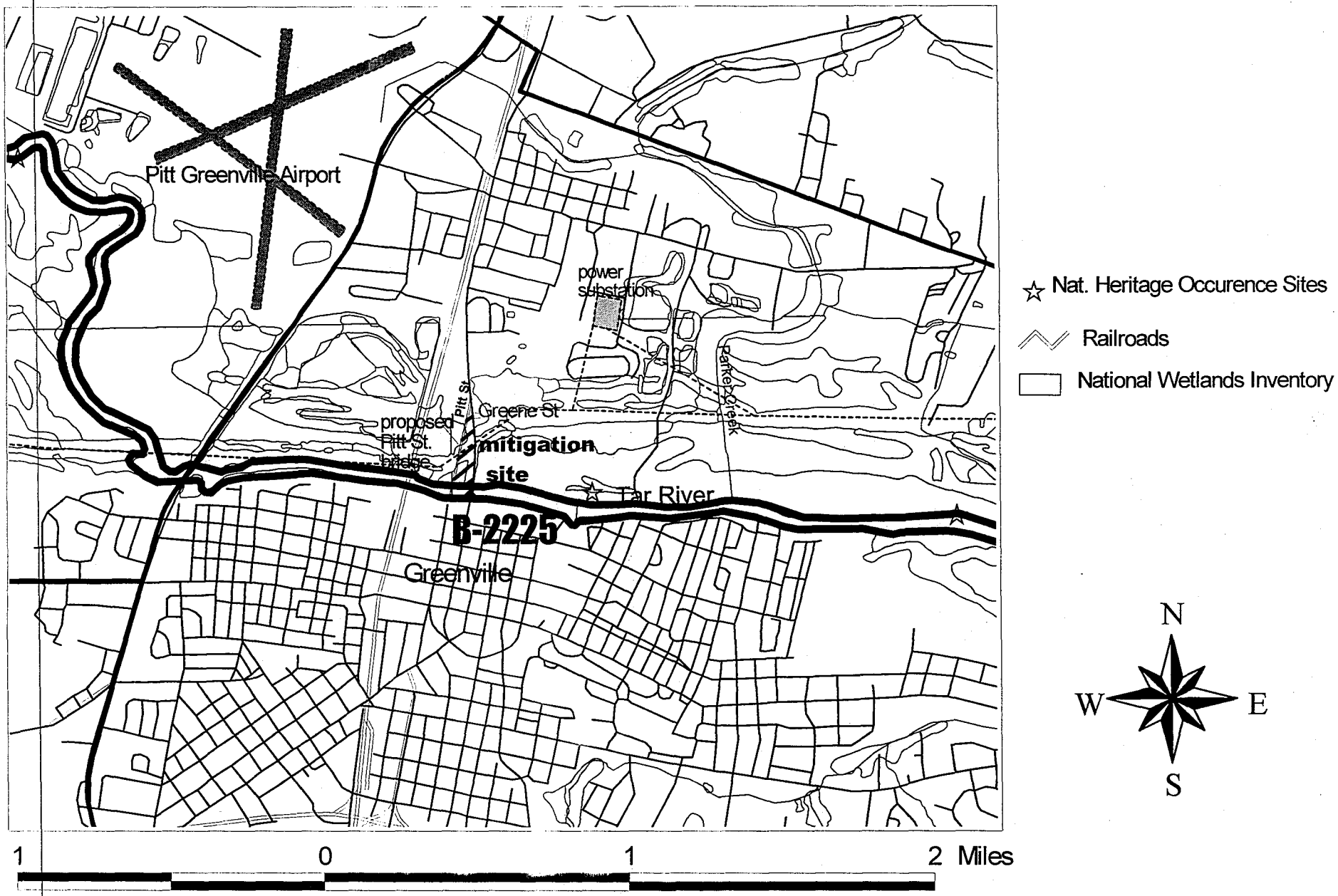


Figure 2a. Existing Wetlands-Greene Street Mitigation Site, Pitt County B-2225

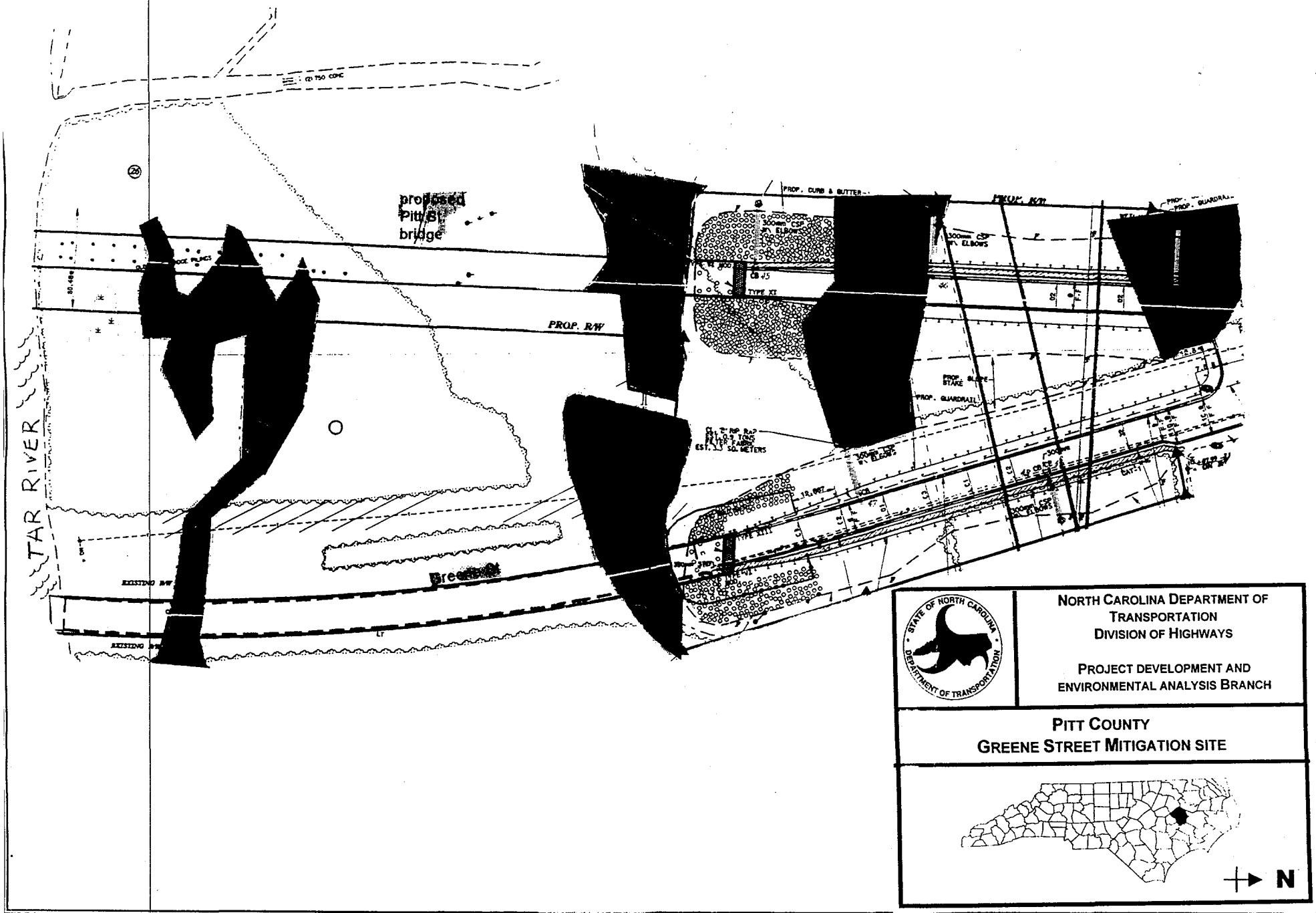
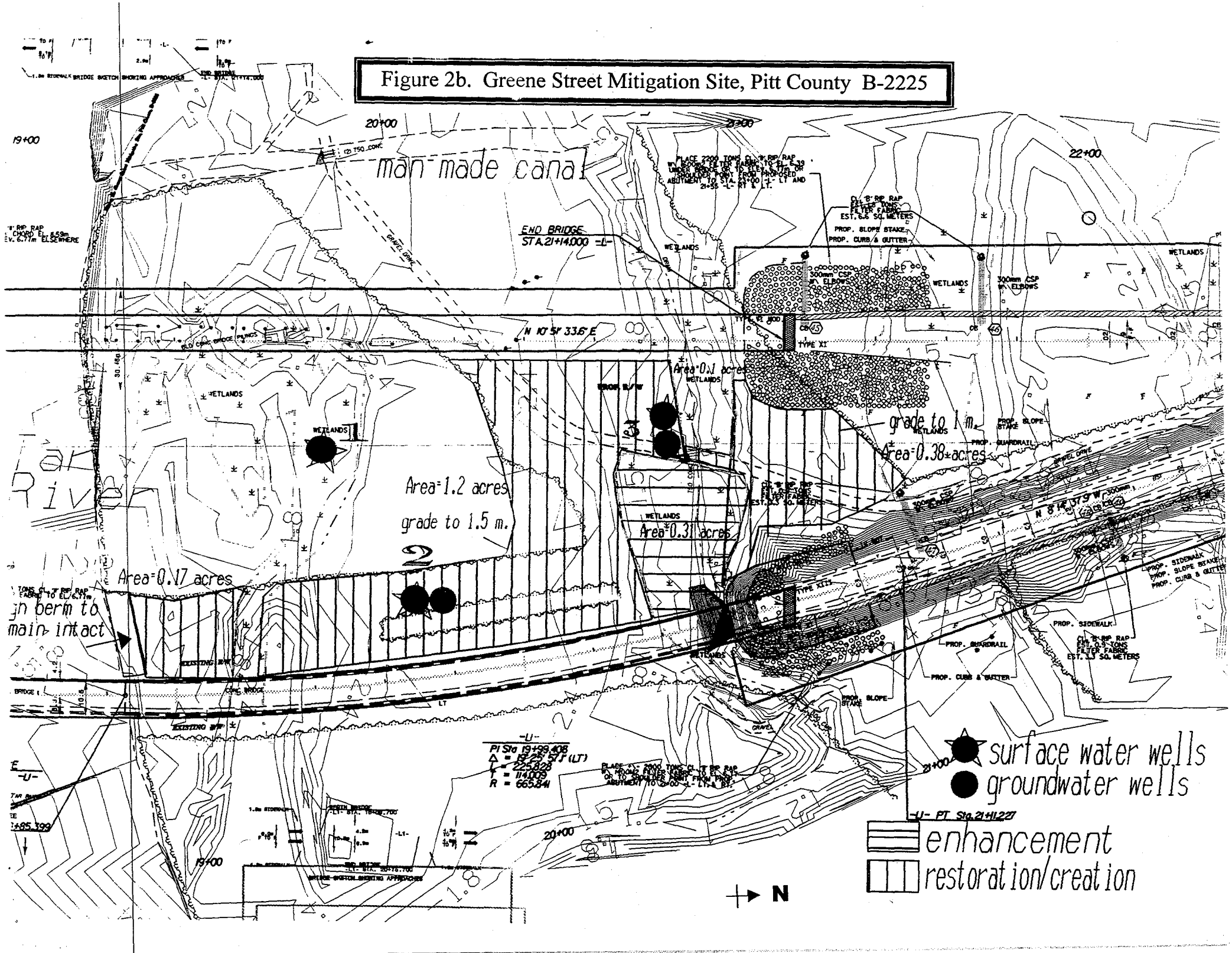


Figure 2b. Greene Street Mitigation Site, Pitt County B-2225



5.2 Plant community restoration

When grading is complete, vegetative communities will match the adjacent wetland with the created/restored levee community grading into a bottomland hardwoods/cypress swamp, toward the north end of the project. Trees such as baldcypress, green ash, water hickory and swamp blackgum (*Nyssa aquatica*) are proposed for planting in the newly created cypress swamp. Several species of shrubs including hawthorn, buttonbush and Virginia willow are present currently, however, it is expected that these shrubs will naturalize in the restored area, therefore we do not propose planting these species. Closer to the river, recommended plantings of tree species include sycamore, green ash, river birch, willow oak and water hickory. These proposed tree species are found onsite and are consistent with the community assemblages described by Schafale and Weakley (1990).

Hardwood trees to be planted will be at least 12 to 18" tall and at least a year old at the time of planting. Trees will be planted on 8-foot centers with a variety of trees in each row to create a mosaic of different types of trees.

5.3 Site considerations

Due to the occurrence of active beavers in the mitigation area, either tree protection or beaver removal may be necessary to insure the survival of trees. In addition, the marsh area has been invaded by Alligator weed (*Alternanthera philoxeroides*), a noxious aquatic plant that may invade higher ground. Two initial sprayings (early summer and late fall) with an appropriate herbicide such as Rodeo may be necessary to reduce the competitiveness of this weed. As canopy cover increases, this aggressive weed will likely become diminished.

Since construction equipment will be active on the mitigation site, problems with soil compaction are likely. After grading and installation of stockpiled topsoil, soil compaction will be corrected (ripped) with the use of subsoiling equipment. Appropriate erosion control measures will be implemented to minimize impacts to water quality. If necessary, the soil will be stabilized with annuals (such as winter rye) to reduce erosion. Topsoil from existing high ground will be stockpiled for inclusion into replanted areas. Since soil fertility varies considerably, fertilizer supplements may be necessary.

6.0 Monitoring plan

6.1 Hydrology

Placement of (40-inch) groundwater monitoring wells will occur 1) in the levee forest depression (bottomlands), 2) in the newly created/restored site adjacent to the bridge and 3) in the created/restored area adjacent to the gravel roadbed (Figure 2b). Surface water monitoring wells will also be placed in the two newly created/restored areas described above. Data from these wells will be collected throughout the year with particular attention paid to the hydrology present during the growing season from March 15 through November 16. Data from created/restored wetlands will be compared to data from the existing wetlands to determine successful hydrologic restoration for bottomland hardwood wetlands. Hydrological success will have occurred if data from the reference well (#1) are comparable to data from the mitigated bottomland hardwoods (well #2) or if

data from the mitigated area demonstrate saturated or inundated conditions within 12 inches of the surface for at least 12.5 percent of the growing season.

Hydrologic data collected from the north end of the mitigation site (well #3) will show successful hydrological restoration for cypress swamp if the site exhibits surface water ponding or saturated/inundated conditions within 12 inches of the surface for at least 12.5 percent of the growing season.

Because of the presence and use of construction equipment onsite, it will be difficult to install and keep in place monitoring wells during the construction phase. Therefore well installation will take place after site grading is complete.

6.2 Vegetation

After planting, two vegetation monitoring plots will be established in mitigated areas that are located adjacent to monitoring wells. One monitoring plot will be located in an area that is (currently) non-wet near the bridge right-of-way and the other monitoring plot will be in the disturbed utility right of way, adjacent to the existing cypress swamp. Monitoring plots will be 50'x50' in size. Plots will be monitored annually by stem counts (# and species per plot) and assessment of plant vigor (healthy, unhealthy) and species composition. Adjustments (additions of plantings) may occur if deemed necessary.

Since vegetation in the mitigated area is to grade from levee forest to bottomland hardwood to deeper cypress swamp, the vegetation of planted trees should match adjacent existing wetlands with success determined at the end of the fifth growing season. Successful plantings will be determined by obtaining at least 260 of the target trees per acre after five years. The target number of 260 trees per acre after five years is determined by a ratio assuming that 680 trees per acre are planted initially. No tree species should dominate more than 20% of the total density. Target species are defined as trees from the list of species to be planted.

7.0 Mitigation Credit Ratios

NCDOT proposes to mitigate for 0.66 acres of impact through a combination of restoration, creation, enhancement and preservation. Three and one tenth acres of land were purchased solely for mitigation of project B-2225 and will be used to compensate for unavoidable impacts to wetlands. Of this land, 2.15 acres will be used for active mitigation: 0.34 acres are to be restored/created as cypress swamp and 0.40 acres are to be enhanced as cypress swamp. Approximately 1.41 acres will be created/restored as bottomland hardwood. Much of the remaining parcel of land (0.95 acres) is forested upland levee with pockets of wetlands and would be more beneficial intact, from an ecological perspective, as branches and root systems of vegetation provide filtration, nutrient adsorption and sediment retention

For this project, NCDOT has exceeded the required ratio for compensatory mitigation. ~~Three and one tenth acres will be used for mitigation of 0.66 acres of impact which yields~~ a mitigation to impacts ratio of greater than 4:1.

8.0 Implementation and Reporting Schedule

Because the mitigation site is contiguous with the project site, restoration and enhancement of the B-2225 bridge site will occur towards completion of the construction phase of the bridges, since soil compaction from heavy equipment and injury to small trees may present problems. Construction and grading of the mitigation site will be initiated immediately after the bridge project is completed. Planting of tree species will take place the following fall/winter. Monitoring of the hydrology and vegetation will be conducted for five years with annual monitoring reports submitted to the appropriate agencies in January of each following year.

9.0 As-built reports

Within 90 days after the mitigation project is completed, a description, photos and as-built plans describing the Greene Street mitigation site will be provided to the appropriate resource agencies. Pertinent information such as the degree of established vegetation, vegetation monitoring plots, data from surface and ground water wells and ground elevations will be included in the as built reports.

10.0 Dispensation of property

NCDOT will retain ownership of the mitigation site and protect it in perpetuity. It is possible that classes from nearby East Carolina University would like to use the area for the study of wetlands.

References

Carter and Burgess, Inc. 1996. Environmental assessment and programmatic section 4(f) evaluation. U.S. Department of Transportation, Federal Highway Administration and NC Department of Transportation, Division of Highways.

Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg MS.

Karnowski, E.H. , J.B. Newman, J. Dunn and J.A. Meadows. 1974. Soil Survey of Pitt County, North Carolina. USDA Soil Conservation Service and NC Agricultural Experiment Station. U.S. Government Printing Office, Washington D. C. 73pp.

Schafale, M.P. and A.S. Weakley. 1990. Classification of the natural communities of North Carolina, Third Approximation. NC Natural Heritage Program, Division of Parks and Recreation, NCDEHNR, Raleigh. 325pp.

United States Department of Agriculture (USDA). 1989. Hydric soils of North Carolina. Soil Conservation Service, Raleigh, NC. 20 pp.

08/06/98
$9.00
Real Estate Excise Tax

Mit. Deed

STATE PROJECT : 8.2220601

I. D. NO. : B-2225

PARCEL NO. : 27

Excise Tax | Recording Time, Book and Page

Tax Lot No. _____ Parcel Identifier No. _____

Verified by _____ County on the _____ day of _____, 19____

by _____

Mail after recording to Albert E. Joyner, Division Right of Way Agent, NC Department of Transportation, 105 Eastbrook Drive, Greenville, NC 27858

This instrument was prepared by Robert H. Arnold, III, Right of Way Agent NC Department of Transportation

Brief description for the Index: Property described in Deed Book 641, Page 485, Pitt County Registry.

NORTH CAROLINA GENERAL WARRANTY DEED

THIS DEED made this 19th day of June, 19 98, by and between

GRANTOR	GRANTEE
BOBBY RAY O'NEAL AND WIFE,	DEPARTMENT OF TRANSPORTATION,
BARBARA L. O'NEAL	AN AGENCY OF THE STATE OF NORTH CAROLINA
6168 US #13	105 EASTBROOK DRIVE
FARMVILLE, NC 27828	GREENVILLE, NC 27858

Enter in appropriate block for each party: name, address, and, if appropriate, character of entity e.q. corporation or partnership.

The designation Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine or neuter as required by context.

WITNESSETH, that the Grantor, for a valuable consideration of $4,125.00 paid by the Grantee, the receipt of which is hereby acknowledged, has and by these presents does grant, bargain, sell and convey unto the Grantee in fee simple, all that certain lot or parcel of land situated GREENVILLE Township, PITT County, North Carolina and more particularly described as follows:

Being a portion of that property described in Deed Book 641, Page 485, Pitt County Registry, said tract is lying between the proposed eastern right of way boundary of Survey Line-L-, Pitt Street Extension, and the existing western right of way boundary of Survey Line-L-, Greene Street, and extends from the northern bank of the Tar River northwardly to a straight line extending from a point located 9.607 m, (31.5') westerly from and normal to Survey Station 20+60, Survey Line-L1-to a point located 15 m, (49.21') easterly from and normal to Survey Station 21+00, Survey Line-L1-. Said tract contains 3.170 Acres more or less.

Sue W. Smith, beneficiary, and William H. Lewis, Jr., trustee, have entered into the execution of the foregoing instrument for the purpose of releasing any and all interest in the property hereinabove described as set forth in that deed of trust dated April 2, 1996, to Sue W. Smith, beneficiary, and William H. Lewis, Jr., trustee From Bobby Ray O'Neal, and wife Barbara O'Neal recorded in Deed Book 641, Page 487, Pitt County Registry, and in no way warrant the title to the Grantee.

N.C. Bar Assoc. Form No. 3 1976

[redacted]erty hereinabove described was acquired by Grantor by instrument recorded in Deed [redacted]K 641, pg. 485.

A map showing the above described property is recorded in Plat Book ____, Page _____.

TO HAVE AND TO HOLD the aforesaid lot or parcel of land and all ~~privileges and appurtenances thereto belonging~~ to the Grantee in fee simple.

And the Grantor covenants with the Grantee, that Grantor is seized of the premises in fee simple, has the right to convey the same in fee simple, that title is marketable and free and clear of all encumbrances, and that Grantor will warrant and defend the title against the lawful claims of all persons whomsoever except for the exceptions hereinafter stated. Title to the property hereinabove described is subject to the following exceptions. None

IN WITNESS WHEREOF, the Grantor has hereunto set their hands and seals, or if corporate, has caused this instrument to be signed in its corporate name by its duly authorized officers and its seal to be hereunto affixed by authority of its Board of Directors, the day and year first above written.

Bobby R. O'Neal (SEAL)
Bobby R. O'Neal

Barbara L. O'Neal (SEAL)
Barbara L. O'Neal

Sue W. Smith (SEAL)
Sue W. Smith, beneficiary

William H. Lewis (SEAL)
William H. Lewis, Jr., trustee

SEAL-STAMP

NORTH CAROLINA COUNTY OF PITT

I, Robert H. Arnold III, a Notary Public of said county do hereby certify that Bobby R. O'Neal and wf., Barbara L. O'Neal; Sue W. Smith, Beneficiary; and William H. Lewis, Jr., Trustee GRANTOR, personally appeared before me this day and acknowledged the execution of the foregoing instrument. Witness my hand and official stamp or seal, this 19th day of June, 1998.

My Commission expires: 3-2-2002

Robert H. Arnold III
NOTARY PUBLIC

ROBERT H. ARNOLD III - NOTARY PUBLIC
County of Pitt
State of N.C.

The foregoing Certificate(s) of Robert H. Arnold III a notary public is/are certified to be correct. This instrument and this certificate are duly registered at the date and time and in the Book and Page shown on the first page hereof.

Annie G. Holder REGISTER OF DEEDS FOR Pitt COUNTY

By _____ Deputy/Assistant Register of Deeds

FILED
ANNIE G. HOLDER
REGISTER OF DEEDS
Annie G. Holder
'98 AUG 6 AM 10 40
PITT COUNTY, NC

N.C. Bar Assoc. Form No. 3 1976