STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

July 18, 2005

U.S. Army Corps of Engineers
Asheville Regulatory field Office
151 Patton Avenue / Room 208
Asheville, North Carolina 28801-5006

ATTN: Ms. Angie Pennock
NCDOT Coordinator

Dear Madam:

Subject: **Nationwide 23, 33, and 12 Permit Application** for the proposed replacement of Bridge No. 251 over Hall Creek and approaches on SR 1128 southwest of Morganton, Burke County, Federal Aid Project: BRZ-1128 (5), State Project No. 8.2852801, WBS Element 33406.1.1, TIP B-4040

Please find enclosed a copy of the Pre-Construction Notification form (PCN), permit drawings, Categorical Exclusion Action Classification Form, permit drawings, and half-size plan sheets for the above referenced project. The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 251 on SR 1128 over Hall Creek (DWQ Index # 11-34-2) in Burke County. The project involves replacement of the existing bridge structure with a 3 @ 8 feet x 8 feet reinforced concrete box culvert (RCBC) at approximately the same location and roadway elevation of the existing structure. The approach roadway will consist of two 11-foot travel lanes with shoulder widths of at least 5 feet. Shoulder widths will be increased by at least 3 feet where guardrail is warranted. Traffic will be detoured off-site, along surrounding roads, during construction. SR 1128 is classified as a Rural Local Route in the Statewide Functional Classification system. The total project length will be approximately 690 feet.

IMPACTS TO WATERS OF THE UNITED STATES

General Description: The project is located in the Catawba River Basin with a Hydrologic Unit Code of 03050102. Hall Creek originates near the Burke/Rutherford County line west of the South Mountains Game Lands. Hall Creek flows in a northerly direction through the project study area to its confluence with Silver Creek approximately 1.4 miles north of the project. A best usage classification of "C" has been assigned to Hall Creek.

No jurisdictional wetlands occur within the project area, however, the Natural Resource Technical Report (February 2002) indicated palustrine wetlands did occur as narrow bands along Hall Creek. An August 12, 2002 field meeting with the USACE determined they occurred below bankfull, and were therefore identified as features of the stream channel.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1548 MAIL SERVICE CENTER
RALEIGH NC 27699-1548

TELEPHONE: 919-733-3141
FAX: 919-733-9794

WEBSITE: WWW.NCDOT.ORG

LOCATION:
TRANSPORTATION BUILDING
1 SOUTH WILMINGTON STREET
RALEIGH NC

Permanent Impacts: Hall Creek will be impacted by the proposed project. Construction of the proposed project will result in a permanent impact of 0.02 acre of fill in surface water. A total of 123 feet of stream channel will be impacted. Permanent impacts to jurisdictional surface waters result from fill for construction of the box culvert.

Temporary Impacts: There will be 0.03 acre of temporary impacts to surface waters of Hall Creek from dewatering associated with construction of the box culvert.

Utility Impacts: Temporary impacts will occur to 4 linear feet (0.002 ac) of Hall Creek from the installation of an 8-inch diameter water line within the aforementioned disturbed area. Installation of the water line will involve excavation of the bottom of the stream. Excavation will be approximately 4 feet wide and 20 feet in length. The excavated material will be placed back in the streambed after the proposed water line is installed.

BRIDGE DEMOLITION

The existing bridge consists of a timber floor on steel girders with an asphalt-wearing surface. The end bents and crutch bent are composed entirely of timber, which can be removed without any falling debris. Therefore, the bridge will be removed without dropping components into Waters of the United States during construction. Best Management Practices for Bridge Demolition and Removal will be followed to avoid any temporary fill from entering Waters of the United States. There are no special restrictions beyond those outlined in the BMPs for Protection of Surface Waters and BMPs for Bridge Demolition and Removal.

RESTORATION PLAN

The material excavated for the installation of the water line will be placed back in the streambed after the proposed water line is installed and these areas will be restored to their original contours.

Schedule: The project schedule calls for a November 15, 2005 Let date with a review date of September 27, 2005.

AVOIDANCE, MINIMIZATION, AND MITIGATION

Avoidance and Minimization: Avoidance examines all appropriate and practicable possibilities of averting impacts to "Waters of the United States". Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible. The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Minimization measures were incorporated as part of the project design these included:

- Use of an off-site detour during construction.
- Best Management Practices will also be utilized during demolition of the existing bridge and construction of the new culvert.

Mitigation: The U.S. Army Corps of Engineers' interpretation of Nationwide Permits is that all impacts to perennial streams or intermittent streams that exhibit important aquatic function require mitigation. Therefore, the remaining unavoidable impacts to 123 linear feet of stream will be offset by compensatory mitigation.

Based upon the agreements stipulated in the "Memorandum of Agreement 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" (MOA), it is understood that the North Carolina Department of Environment and Natural Resources Ecosystem Enhancement Program (EEP), will assume responsibility for satisfying the federal Clean Water Act compensatory mitigation requirements for NCDOT projects that are listed in Exhibit 1 of the subject MOA during the EEP transition period which ends on June 30, 2005.

Since the subject project is listed in Exhibit 2, the necessary compensatory mitigation to offset unavoidable impacts to waters that are jurisdictional under the federal Clean Water Act will be provided by the EEP. The offsetting mitigation will derive from an inventory of assets already in existence within the same 8-digit cataloguing unit. The Department has avoided and minimized impacts to jurisdictional resources to the greatest extent possible as described above.

FEDERAL PROTECTED SPECIES

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of February 5, 2003 the US Fish and Wildlife Service (USFWS) lists seven federally protected species for Burke County (see Table 1). No species have been added to or deleted from the list since the completion of the CE (23 May 2005).

Table 1 Federally Protected Species in Burke County

Common Name	Scientific Name	Status	Biological Conclusion
Bald eagle	*Haliaeetus leucocephalus*	Threatened*	No Effect
Bog turtle	*Clemmys muhlenbergii*	T (S/A)	No Effect
Dwarf-flowered heartleaf	*Hexastylis naniflora*	Threatened	No Effect
Heller's blazing star	*Liatris helleri*	Threatened	No Effect
Mountain golden heather	*Hudsonia montana*	Threatened	No Effect
Small-whorled pogonia	*Isotria medeoloides*	Threatened	No Effect
Spreading avens	*Geum radiatum*	Endangered	No Effect

Endangered – A taxon "in danger of extinction throughout all or a significant portion of its range."

Threatened – A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of it's range."

Threatened (S/A) – Threatened due to similarity of appearance (e.g., American alligator)—a species that is threatened due to similarity of appearance with other rare species and is listed for its protection.

*Proposed for delisting.

Field surveys were initially conducted in 2001 and it was determined that the project area does not contain habitat for any of the above listed species. Therefore a biological conclusion of "No Effect" has been given for each species.

REGULATORY APPROVALS

Section 404 Permit: NCDOT requests that the installation of the 8-inch diameter ductile iron water line be authorized by a Nationwide Permit 12. It is anticipated that the temporary impacts will be authorized under Section 404 Nationwide Permit 33 (Temporary Construction Access and Dewatering). We are, therefore, requesting the issuance of a Nationwide Permit 33 authorizing the temporary dewatering. All other aspects of this project are being processed by the Federal Highway Administration as a "Categorical Exclusion" in accordance with 23 CFR 771.115(b). It is anticipated that the fill in Surface Waters will be authorized under Section 404 Nationwide Permit 23. The NCDOT requests that these activities be authorized by a Nationwide Permit 23.

Section 401 Permit: We anticipate 401 General Certification numbers 3403, 3366, and 3374 will apply to this project. All general conditions of the Water Quality Certifications will be met. Therefore, in accordance with 15A NCAC 2H, Section .0500(a) and 15A NCAC 2B.0200 we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their review. A copy of this permit will be posted on the NCDOT web site at http:/www.ncdot.org/planning/pe/naturalunit/permit.html.

Thank you for your time and assistance with this project. Please contact Tyler Stanton at (919) 715- 1439 if you have any questions or need any additional information.

Sincerely,

Gregory J. Thorpe, Ph.D.
Environmental Management Director, PDEA

Cc: W/attachment
Mr. John Hennessy, NCDWQ (7 Copies)
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.J. Swain, P.E., Division Engineer
Mr. Roger Bryan, DEO

W/o attachment
Mr. Jay Bennett, P.E., Roadway Design
Mr. Omar Sultan, Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. David Franklin, USACE, Wilmington
Ms. Beth Harmon, EEP
Mr. Todd Jones, NCDOT External Audit Branch
Mr. Hank Schwab, P.E., PDEA

Office Use Only: Form Version March 05

USACE Action ID No. _____ **DWQ No.** _____

(If any particular item is not applicable to this project, please enter "Not Applicable" or "N/A".)

I. Processing

1. Check all of the approval(s) requested for this project:
   - ☒ Section 404 Permit
   - ☐ Section 10 Permit
   - ☒ 401 Water Quality Certification
   - ☐ Riparian or Watershed Buffer Rules
   - ☐ Isolated Wetland Permit from DWQ
   - ☐ Express 401 Water Quality Certification

2. Nationwide, Regional or General Permit Number(s) Requested: NW 12, NW 23, NW 33

3. If this notification is solely a courtesy copy because written approval for the 401 Certification is not required, check here: ☒

4. If payment into the North Carolina Ecosystem Enhancement Program (NCEEP) is proposed for mitigation of impacts, attach the acceptance letter from NCEEP, complete section VIII, and check here: ☐

5. If your project is located in any of North Carolina's twenty coastal counties (listed on page 4), and the project is within a North Carolina Division of Coastal Management Area of Environmental Concern (see the top of page 2 for further details), check here: ☐

II. Applicant Information

1. Owner/Applicant Information
   Name: NC Department of Transportation
   Mailing Address: 1548 Mail Service Center
   Raleigh, NC 27699- 1 548
   Telephone Number: (919) 733-7844 Fax Number: (919)-715-1501
   E-mail Address:

2. Agent/Consultant Information (A signed and dated copy of the Agent Authorization letter must be attached if the Agent has signatory authority for the owner/applicant.)
   Name: N/A
   Company Affiliation:
   Mailing Address:
   Telephone Number: Fax Number:
   E-mail Address:

III. Project Information

Attach a **vicinity map** clearly showing the location of the property with respect to local landmarks such as towns, rivers, and roads. Also provide a detailed **site plan** showing property boundaries and development plans in relation to surrounding properties. Both the vicinity map and site plan must include a scale and north arrow. The specific footprints of all buildings, impervious surfaces, or other facilities must be included. If possible, the maps and plans should include the appropriate USGS Topographic Quad Map and NRCS Soil Survey with the property boundaries outlined. Plan drawings, or other maps may be included at the applicant's discretion, so long as the property is clearly defined. For administrative and distribution purposes, the USACE requires information to be submitted on sheets no larger than 11 by 17-inch format; however, DWQ may accept paperwork of any size. DWQ prefers full-size construction drawings rather than a sequential sheet version of the full-size plans. If full-size plans are reduced to a small scale such that the final version is illegible, the applicant will be informed that the project has been placed on hold until decipherable maps are provided.

1. Name of project: Replacement of Bridge No. 251 over Hall Creek

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-4040

3. Property Identification Number (Tax PIN): N/A

4. Location
   County: Burke Nearest Town: Morganton
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.): From Morganton take I-40 west to exit 94. Take Dysartsville Road (SR 1129) south approximately 3.5 miles to Morrison Road (SR1128) on left. Take Morrison Road to approximately 1.5 miles to the bridge site.

5. Site coordinates (For linear projects, such as a road or utility line, attach a sheet that separately lists the coordinates for each crossing of a distinct waterbody.)
   Decimal Degrees (6 digits minimum): UTM 17 426445E 3945145N (WGS84/NAD83)

6. Property size (acres): approximately 1.4 acres (length 768.7 x width 80 feet = 61496 SF)

7. Name of nearest receiving body of water: Hall Creek

8. River Basin: Catawba River Basin (USGS Catalog Unit Number-03050102)
   (Note – this must be one of North Carolina's seventeen designated major river basins. The River Basin map is available at http://h2o.enr.state.nc.us/admin/maps/.)

   Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: The project area lies in a rural area in the western part of Burke County. Surrounding land use is primarily agricultural land.

9. Describe the overall project in detail, including the type of equipment to be used: The project will consist of replacing the old bridge over Hall Creek with a 3@8 feet by 8 feet reinforced concrete box culvert (RCBC) at approximately the same location and roadway elevation of the existing structure. The approach roadway will consist of two 11-foot travel lanes and shoulder widths of at least 5 feet. Shoulder widths will be increased by at least 3 feet where guardrail is warranted. Traffic will be detoured off-site, along surrounding roads, during construction. Construction equipment will consist of heavy-duty trucks, earth moving, equipment, cranes, etc.

10. Explain the purpose of the proposed work: The bridge has a sufficiency ratio of 38.8 out of 100. The deck is only 19.2 feet wide and the structure is composed mainly of timber. Rehabilitation of the existing deteriorating bridge is neither practical nor economical.

IV. Prior Project History

If jurisdictional determinations and/or permits have been requested and/or obtained for this project (including all prior phases of the same subdivision) in the past, please explain. Include the USACE Action ID Number, DWQ Project Number, application date, and date permits and certifications were issued or withdrawn. Provide photocopies of previously issued permits, certifications or other useful information. Describe previously approved wetland, stream and buffer impacts, along with associated mitigation (where applicable). If this is a NCDOT project, list and describe permits issued for prior segments of the same T.I.P. project, along with construction schedules. N/A

V. Future Project Plans

Are any future permit requests anticipated for this project? If so, describe the anticipated work, and provide justification for the exclusion of this work from the current application.
N/A

VI. Proposed Impacts to Waters of the United States/Waters of the State

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to wetlands, open water, and stream channels associated with the project. Each impact must be listed separately in the tables below (e.g., culvert installation should be listed separately from riprap dissipater pads). Be sure to indicate if an impact is temporary. All proposed impacts, permanent and temporary, must be listed, and must be labeled and clearly identifiable on an accompanying site plan. All wetlands and waters, and all streams (intermittent and perennial) should be shown on a delineation map, whether or not impacts are proposed to these systems. Wetland and stream evaluation and delineation forms should be included as appropriate. Photographs may be included at the applicant's discretion. If this proposed impact is strictly for wetland or stream mitigation, list and describe the impact in Section VIII below. If additional space is needed for listing or description, please attach a separate sheet.

1. Provide a written description of the proposed impacts: There will be 123 linear feet of surface water impacts resulting in 0.02 acre of permanent fill and 0.03 acres of temporary fill from the construction of the culvert. There will be 0.002 acre of temporary excavation in surface waters, and impact to 4 linear feet of stream channel due to the installation of a water line.

2. Individually list wetland impacts. Types of impacts include, but are not limited to mechanized clearing, grading, fill, excavation, flooding, ditching/drainage, etc. For dams, separately list impacts due to both structure and flooding.

Wetland Impact Site Number (indicate on map)	Type of Impact	Type of Wetland (e.g., forested, marsh, herbaceous, bog, etc.)	Located within 100-year Floodplain (yes/no)	Distance to Nearest Stream (linear feet)	Area of Impact (acres)
N/A					
Total Wetland Impact (acres)					

3. List the total acreage (estimated) of all existing wetlands on the property: N/A

4. Individually list all intermittent and perennial stream impacts. Be sure to identify temporary impacts. Stream impacts include, but are not limited to placement of fill or culverts, dam construction, flooding, relocation, stabilization activities (e.g., cement walls, rip-rap, crib walls, gabions, etc.), excavation, ditching/straightening, etc. If stream relocation is proposed, plans and profiles showing the linear footprint for both the original and relocated streams must be included. To calculate acreage, multiply length X width, and then divide by 43,560.

Stream Impact Number (indicate on map)	Stream Name	Type of Impact	Perennial or Intermittent?	Average Stream Width Before Impact	Impact Length (linear feet)	Area of Impact (acres)
1	Hall Creek	Permanent Fill from culvert	Perennial	20	45	0.02
1	Hall Creek	Temporary disturbance from culvert construction	Perennial	20	78	0.03
1	Hall Creek	*Temporary Excavation	Perennial	20	* 4	0.002
Total Stream Impact (by length and acreage)					123	0.052

* The waterline will be placed in an area already disturbed by the construction of the culvert.

5. Individually list all open water impacts (including lakes, ponds, estuaries, sounds, Atlantic Ocean and any other water of the U.S.). Open water impacts include, but are not limited to fill, excavation, dredging, flooding, drainage, bulkheads, etc.

Open Water Impact Site Number (indicate on map)	Name of Waterbody (if applicable)	Type of Impact	Type of Waterbody (lake, pond, estuary, sound, bay, ocean, etc.)	Area of Impact (acres)
N/A				
Total Open Water Impact (acres)				

6. List the cumulative impact to all Waters of the U.S. resulting from the project:

Stream Impact (acres):	0.02
Wetland Impact (acres):	
Open Water Impact (acres):	
Total Impact to Waters of the U.S. (acres)	0.02
Total Stream Impact (linear feet):	123*

* The waterline will be placed in an area already disturbed by the construction of the culvert.

7. Isolated Waters
Do any isolated waters exist on the property? ☐ Yes ☒ No
Describe all impacts to isolated waters, and include the type of water (wetland or stream) and the size of the proposed impact (acres or linear feet). Please note that this section only applies to waters that have specifically been determined to be isolated by the USACE.
N/A

8. Pond Creation
If construction of a pond is proposed, associated wetland and stream impacts should be included above in the wetland and stream impact sections. Also, the proposed pond should be described here and illustrated on any maps included with this application.
Pond to be created in (check all that apply): ☐ uplands ☐ stream ☐ wetlands
Describe the method of construction (e.g., dam/embankment, excavation, installation of draw-down valve or spillway, etc.): N/A
Proposed use or purpose of pond (e.g., livestock watering, irrigation, aesthetic, trout pond, local stormwater requirement, etc.): N/A
Current land use in the vicinity of the pond: N/A
Size of watershed draining to pond:_____ Expected pond surface area:_____

VII. Impact Justification (Avoidance and Minimization)

Specifically describe measures taken to avoid the proposed impacts. It may be useful to provide information related to site constraints such as topography, building ordinances, accessibility, and

financial viability of the project. The applicant may attach drawings of alternative, lower-impact site layouts, and explain why these design options were not feasible. Also discuss how impacts were minimized once the desired site plan was developed. If applicable, discuss construction techniques to be followed during construction to reduce impacts. Due to the presence of surface waters and wetlands within the project study area, avoidance of all impacts is not possible.

VIII. Mitigation

DWQ - In accordance with 15A NCAC 2H .0500, mitigation may be required by the NC Division of Water Quality for projects involving greater than or equal to one acre of impacts to freshwater wetlands or greater than or equal to 150 linear feet of total impacts to perennial streams.

USACE – In accordance with the Final Notice of Issuance and Modification of Nationwide Permits, published in the Federal Register on January 15, 2002, mitigation will be required when necessary to ensure that adverse effects to the aquatic environment are minimal. Factors including size and type of proposed impact and function and relative value of the impacted aquatic resource will be considered in determining acceptability of appropriate and practicable mitigation as proposed. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland and/or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferable in the same watershed.

If mitigation is required for this project, a copy of the mitigation plan must be attached in order for USACE or DWQ to consider the application complete for processing. Any application lacking a required mitigation plan or NCEEP concurrence shall be placed on hold as incomplete. An applicant may also choose to review the current guidelines for stream restoration in DWQ's Draft Technical Guide for Stream Work in North Carolina, available at http://h2o.enr.state.nc.us/ncwetlands/strmgide.html.

1. Provide a brief description of the proposed mitigation plan. The description should provide as much information as possible, including, but not limited to: site location (attach directions and/or map, if offsite), affected stream and river basin, type and amount (acreage/linear feet) of mitigation proposed (restoration, enhancement, creation, or preservation), a plan view, preservation mechanism (e.g., deed restrictions, conservation easement, etc.), and a description of the current site conditions and proposed method of construction. Please attach a separate sheet if more space is needed.
   N/A

2. Mitigation may also be made by payment into the North Carolina Ecosystem Enhancement Program (NCEEP). Please note it is the applicant's responsibility to contact the NCEEP at (919) 715-0476 to determine availability, and written approval from the NCEEP indicating that they are willing to accept payment for the mitigation must be attached to this form. For additional information regarding the application process for the NCEEP, check the NCEEP

website at http://h2o.enr.state.nc.us/wrp/index.htm. If use of the NCEEP is proposed, please check the appropriate box on page five and provide the following information:

Amount of stream mitigation requested (linear feet): 123
Amount of buffer mitigation requested (square feet): N/A
Amount of Riparian wetland mitigation requested (acres): N/A
Amount of Non-riparian wetland mitigation requested (acres): N/A
Amount of Coastal wetland mitigation requested (acres): N/A

IX. Environmental Documentation (required by DWQ)

1. Does the project involve an expenditure of public (federal/state/local) funds or the use of public (federal/state) land? Yes ☒ No ☐

2. If yes, does the project require preparation of an environmental document pursuant to the requirements of the National or North Carolina Environmental Policy Act (NEPA/SEPA)? Note: If you are not sure whether a NEPA/SEPA document is required, call the SEPA coordinator at (919) 733-5083 to review current thresholds for environmental documentation. Yes ☒ No ☐

3. If yes, has the document review been finalized by the State Clearinghouse? If so, please attach a copy of the NEPA or SEPA final approval letter. Yes ☒ No ☐

X. Proposed Impacts on Riparian and Watershed Buffers (required by DWQ)

It is the applicant's (or agent's) responsibility to determine, delineate and map all impacts to required state and local buffers associated with the project. The applicant must also provide justification for these impacts in Section VII above. All proposed impacts must be listed herein, and must be clearly identifiable on the accompanying site plan. All buffers must be shown on a map, whether or not impacts are proposed to the buffers. Correspondence from the DWQ Regional Office may be included as appropriate. Photographs may also be included at the applicant's discretion.

1. Will the project impact protected riparian buffers identified within 15A NCAC 2B .0233 (Neuse), 15A NCAC 2B .0259 (Tar-Pamlico), 15A NCAC 02B .0243 (Catawba) 15A NCAC 2B .0250 (Randleman Rules and Water Supply Buffer Requirements), or other (please identify _____)? Yes ☐ No ☒

2. If "yes", identify the square feet and acreage of impact to each zone of the riparian buffers. If buffer mitigation is required calculate the required amount of mitigation by applying the buffer multipliers.

Zone*	Impact (square feet)	Multiplier	Required Mitigation
1		3 (2 for Catawba)	
2		1.5	
Total			

* Zone 1 extends out 30 feet perpendicular from the top of the near bank of channel; Zone 2 extends an additional 20 feet from the edge of Zone 1.

3. If buffer mitigation is required, please discuss what type of mitigation is proposed (i.e., Donation of Property, Riparian Buffer Restoration / Enhancement, or Payment into the Riparian Buffer Restoration Fund). Please attach all appropriate information as identified within 15A NCAC 2B .0242 or .0244, or .0260.

N/A

XI. Stormwater (required by DWQ)

Describe impervious acreage (existing and proposed) versus total acreage on the site. Discuss stormwater controls proposed in order to protect surface waters and wetlands downstream from the property. If percent impervious surface exceeds 20%, please provide calculations demonstrating total proposed impervious level.

NCDOT BMPs will be followed to control stormwater runoff during construction

XII. Sewage Disposal (required by DWQ)

Clearly detail the ultimate treatment methods and disposition (non-discharge or discharge) of wastewater generated from the proposed project, or available capacity of the subject facility.

N/A

XIII. Violations (required by DWQ)

Is this site in violation of DWQ Wetland Rules (15A NCAC 2H .0500) or any Buffer Rules?
Yes ☐ No ☒

Is this an after-the-fact permit application? Yes ☐ No ☒

XIV. Cumulative Impacts (required by DWQ)

Will this project (based on past and reasonably anticipated future impacts) result in additional development, which could impact nearby downstream water quality? Yes ☐ No ☒
If yes, please submit a qualitative or quantitative cumulative impact analysis in accordance with the most recent North Carolina Division of Water Quality policy posted on our website at http://h2o.enr.state.nc.us/ncwetlands. If no, please provide a short narrative description:

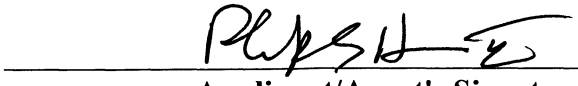
This project involves the replacement of a bridge with a culvert.

XV. Other Circumstances (Optional):

It is the applicant's responsibility to submit the application sufficiently in advance of desired construction dates to allow processing time for these permits. However, an applicant may choose to list constraints associated with construction or sequencing that may impose limits on work schedules (e.g., draw-down schedules for lakes, dates associated with Endangered and Threatened Species, accessibility problems, or other issues outside of the applicant's control).

_____

_____



7/12/05

Applicant/Agent's Signature **Date**

(Agent's signature is valid only if an authorization letter from the applicant is provided.)

CATEGORICAL EXCLUSION ACTION CLASSIFICATION FORM

TIP Project No.	**B-4040**
WBS No.	**33406.1.1**
State Project No.	**8.2852801**
Federal Project No.	**BRZ-1128 (5)**

A. Project Description:

Replacement of Bridge No. 251 on SR 1128 over Hall Creek in Burke County. Bridge No. 251 will be replaced with a 3 @ 8 feet x 8 feet reinforced concrete box culvert (RCBC) at approximately the same location and roadway elevation of the existing structure. The approach roadway will consist of two 11-foot travel lanes and shoulder widths of at least 5 feet. Shoulder widths will be increased by at least 3 feet where guardrail is warranted. Traffic will be detoured off-site, along surrounding roads, during construction. Total project length will be approximately 690 feet.

B. Purpose and Need:

Bridge No. 251 has a sufficiency rating of 38.8 out of 100. The deck is only 19.2 feet wide and the structure is composed mainly of timber. For these reasons, Bridge No. 251 needs to be replaced.

C. Proposed Improvements:

The following Type II improvements which apply to the project are circled:

1. Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (e.g., parking, weaving, turning, climbing).

    a. Restoring, Resurfacing, Rehabilitating, and Reconstructing pavement (3R and 4R improvements)
    b. Widening roadway and shoulders without adding through lanes
    c. Modernizing gore treatments
    d. Constructing lane improvements (merges, auxiliary, and turn lanes)
    e. Adding shoulder drains
    f. Replacing and rehabilitating culverts, inlets, and drainage pipes, including safety treatments
    g. Providing driveway pipes
    h. Performing minor bridge widening (less than one through lane)
    i. Slide Stabilization
    j. Structural BMP's for water quality improvement

2. Highway safety or traffic operations improvement projects including the installation of ramp metering control devices and lighting.

a. Installing ramp metering devices
b. Installing lights
c. Adding or upgrading guardrail
d. Installing safety barriers including Jersey type barriers and pier protection
e. Installing or replacing impact attenuators
f. Upgrading medians including adding or upgrading median barriers
g. Improving intersections including relocation and/or realignment
h. Making minor roadway realignment
i. Channelizing traffic
j. Performing clear zone safety improvements including removing hazards and flattening slopes
k. Implementing traffic aid systems, signals, and motorist aid
l. Installing bridge safety hardware including bridge rail retrofit

3. Bridge rehabilitation, reconstruction, or replacement or the construction of grade separation to replace existing at-grade railroad crossings.

a. Rehabilitating, reconstructing, or replacing bridge approach slabs
b. Rehabilitating or replacing bridge decks
c. Rehabilitating bridges including painting (no red lead paint) scour repair, fender systems, and minor structural improvements
d. Replacing a bridge (structure and/or fill)

4. Transportation corridor fringe parking facilities.

5. Construction of new truck weigh stations or rest areas.

6. Approvals for disposal of excess right-of-way or for joint or limited use of right-of-way, where the proposed use does not have significant adverse impacts.

7. Approvals for changes in access control.

8. Construction of new bus storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and located on or near a street with adequate capacity to handle anticipated bus and support vehicle traffic.

9. Rehabilitation or reconstruction of existing rail and bus buildings and ancillary facilities where only minor amounts of additional land are required and there is not a substantial increase in the number of users.

10. Construction of bus transfer facilities (an open area consisting of passenger shelters, boarding areas, kiosks, and related street improvements) when located in a commercial area or other high activity center in which there is adequate street capacity for projected bus traffic.

11. Construction of rail storage and maintenance facilities in areas used predominantly for industrial or transportation purposes where such construction is not inconsistent with existing zoning and where there is no significant noise impact on the surrounding community.

12. Acquisition of land for hardship or protective purposes, advance land acquisition loans under section 3(b) of the UMT Act. Hardship and protective buying will be

permitted only for a particular parcel or a limited number of parcels. These types of land acquisition qualify for a CE only where the acquisition will not limit the evaluation of alternatives, including shifts in alignment for planned construction projects, which may be required in the NEPA process. No project development on such land may proceed until the NEPA process has been completed.

13. Acquisition and construction of wetland, stream and endangered species mitigation sites.

14. Remedial activities involving the removal, treatment or monitoring of soil or groundwater contamination pursuant to state or federal remediation guidelines.

D. Special Project Information:

Estimated Costs:

Total Construction	$ 350,000
Right of Way	$ 3,000
Total	**$ 353,000**

Estimated Traffic:

Current	-	400 vpd
Year 2025	-	700 vpd
TTST	-	1%
Dual	-	2%

Proposed Typical Cross Section:

The approach roadway will consist of two 11-foot travel lanes and shoulder widths of at least 5 feet. Shoulder widths will be increased by at least 3 feet where guardrail is warranted.

Design Speed:

55 mph

Design Exceptions:

A design exception is needed for the horizontal curve, vertical sag K factor, maximum grade, and stopping sight distance.

Functional Classification:

SR 1128 is classified as a Rural Local Route in the Statewide Functional Classification system.

Division Office Comments:

The Division 13 Construction Engineer supports the chosen alternate and proposed method for detouring traffic during construction.

Bridge Demolition:

The superstructure of Bridge No. 251 consists of a timber floor on steel girders with an asphalt-wearing surface. The end bents and crutch bent are composed entirely of timber, which can be removed without any falling debris. Therefore, Bridge No. 251 will be removed without dropping components into Waters of the United States during construction.

Alternatives Discussion: (including Studied Offsite Detour Evaluation)

According to the Transportation Director for Burke County Schools, there are six school bus crossings per day over Bridge No. 251.

Emergency Management Services states they can handle a temporary offsite detour.

The studied detour route utilizes SR 1129, SR 1133, and SR 1124. These routes total 4.6 additional miles.

Two "build" Alternatives were studied: replace in place with offsite detour and new alignment. Replace in place is the most cost effective alternate with the least amount of impacts. "Do-nothing" is not practical; requiring the eventual closing of the road as the existing bridge completely deteriorates. Rehabilitation of the existing deteriorating bridge is neither practical nor economical.

E. Threshold Criteria

The following evaluation of threshold criteria must be completed for Type II actions

ECOLOGICAL		YES	NO
(1)	Will the project have a substantial impact on any unique or important natural resource?		X
(2)	Does the project involve habitat where federally listed endangered or threatened species may occur?		X
(3)	Will the project affect anadromous fish?		X
(4)	If the project involves wetlands, is the amount of permanent and/or temporary wetland taking less than one-third (1/3) of an acre and have all practicable measures to avoid and minimize wetland takings been evaluated?	X	
(5)	Will the project require the use of U. S. Forest Service lands?		X
(6)	Will the quality of adjacent water resources be adversely impacted by proposed construction activities?		X
(7)	Does the project involve waters classified as Outstanding Water Resources (OWR) and/or High Quality Waters (HQW)?		X
(8)	Will the project require fill in waters of the United States in any of the designated mountain trout counties?	X	
(9)	Does the project involve any known underground storage tanks (UST's) or hazardous material sites?		X

PERMITS AND COORDINATION		YES	NO
(10)	If the project is located within a CAMA county, will the project significantly affect the coastal zone and/or any "Area of Environmental Concern" (AEC)?		X
(11)	Does the project involve Coastal Barrier Resources Act resources?		X
(12)	Will a U. S. Coast Guard permit be required?		X

		YES	NO
(13)	Will the project result in the modification of any existing regulatory floodway?		X
(14)	Will the project require any stream relocations or channel changes?		X

SOCIAL, ECONOMIC, AND CULTURAL RESOURCES		YES	NO
(15)	Will the project induce substantial impacts to planned growth or land use for the area?		X
(16)	Will the project require the relocation of any family or business?		X
(17)	Will the project have a disproportionately high and adverse human health and environmental effect on any minority or low-income population?		X
(18)	If the project involves the acquisition of right of way, is the amount of right of way acquisition considered minor?	X	
(19)	Will the project involve any changes in access control?		X
(20)	Will the project substantially alter the usefulness and/or land use of adjacent property?		X
(21)	Will the project have an adverse effect on permanent local traffic patterns or community cohesiveness?		X
(22)	Is the project included in an approved thoroughfare plan and/or Transportation Improvement Program (and is, therefore, in conformance with the Clean Air Act of 1990)?	X	
(23)	Is the project anticipated to cause an increase in traffic volumes?		X
(24)	Will traffic be maintained during construction using existing roads, staged construction, or on-site detours?	X	
(25)	If the project is a bridge replacement project, will the bridge be replaced at its existing location (along the existing facility) and will all construction proposed in association with the bridge replacement project be contained on the existing facility?	X	
(26)	Is there substantial controversy on social, economic, or environmental grounds concerning the project?		X

(27)	Is the project consistent with all Federal, State, and local laws relating to the environmental aspects of the project?	X	
(28)	Will the project have an "effect" on structures/properties eligible for or listed on the National Register of Historic Places?		X
(29)	Will the project affect any archaeological remains, which are important to history or pre-history?		X
(30)	Will the project require the use of Section 4(f) resources (public parks, recreation lands, wildlife and waterfowl refuges, historic sites, or historic bridges, as defined in Section 4(f) of the U. S. Department of Transportation Act of 1966)?		X
(31)	Will the project result in any conversion of assisted public recreation sites or facilities to non-recreation uses, as defined by Section 6(f) of the Land and Water Conservation Act of 1965, as amended?		X
(32)	Will the project involve construction in, across, or adjacent to a river designated as a component of or proposed for inclusion in the Natural System of Wild and Scenic Rivers?		X

F. **<u>Additional Documentation Required for Unfavorable Responses in Part E</u>**
(Discussion regarding all unfavorable responses in Part E should be provided below. Additional supporting documentation may be attached, as necessary.)

Item (8) Mountain Trout County
Burke County is listed as a mountain trout county. Hall Creek does not have a water resource classification involving trout and the NC Wildlife Resources Commission states no concerns indicated, standard requirements apply.

G. CE Approval

TIP Project No.	**B-4040**
WBS No.	**33406.1.1**
State Project No.	**8.2852801**
Federal Project No.	**BRZ-1128 (5)**

Project Description:

Replacement of Bridge No. 251 on SR 1128 over Hall Creek in Burke County. Bridge No. 251 will be replaced with a 3 @ 8 feet x 8 feet reinforced concrete box culvert (RCBC) at approximately the same location and roadway elevation of the existing structure. The approach roadway will consist of two 11-foot travel lanes and shoulder widths of at least 5 feet. Shoulder widths will be increased by at least 3 feet where guardrail is warranted. Traffic will be detoured off-site, along surrounding roads, during construction. Total project length will be approximately 690 feet.

Categorical Exclusion Action Classification:

____ TYPE II(A)
_X_ TYPE II(B)

Approved:

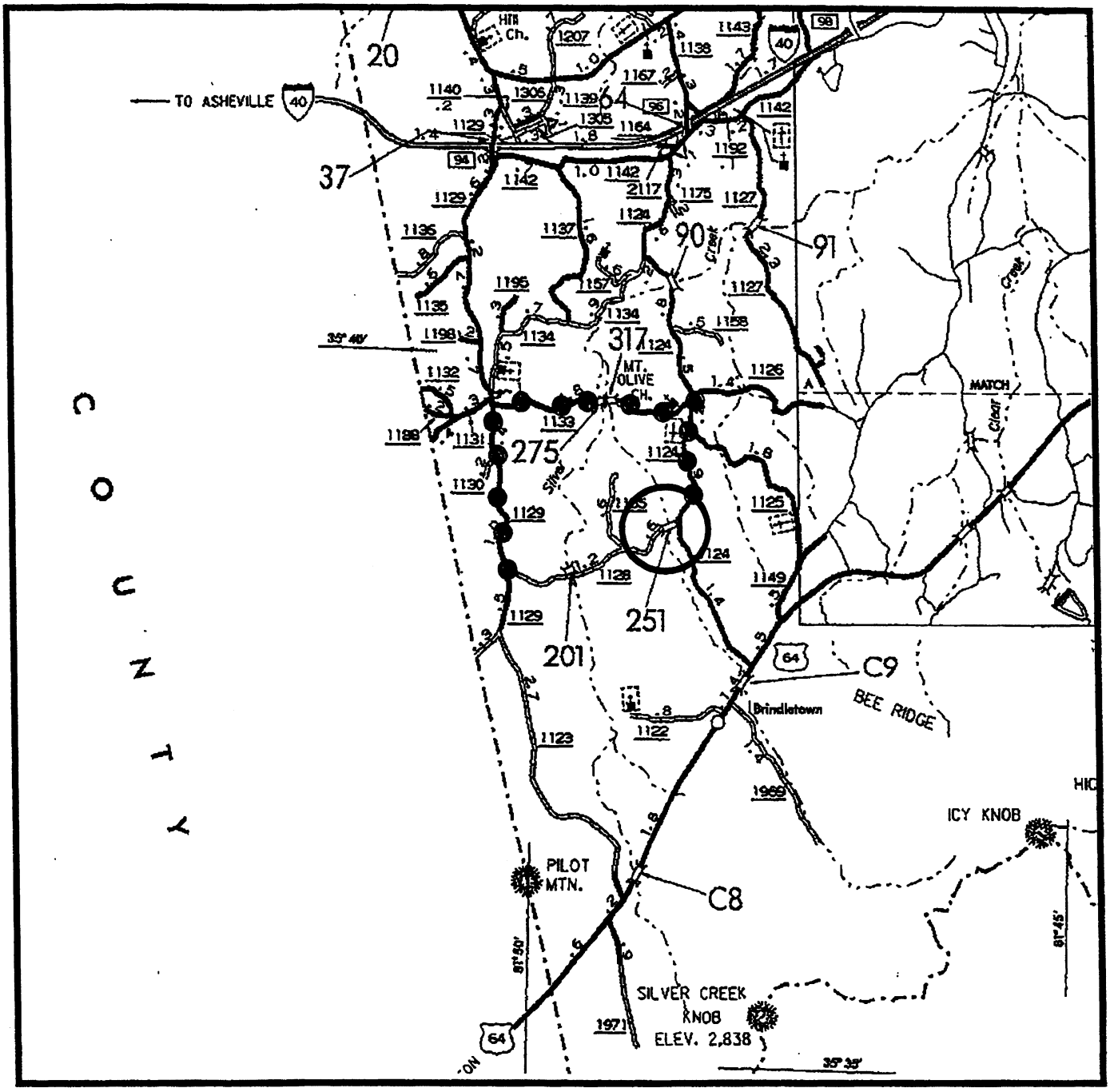
3-2-04 — Date
Assistant Manager, Teresa Hart, PE, CPM
Project Development & Environmental Analysis Branch

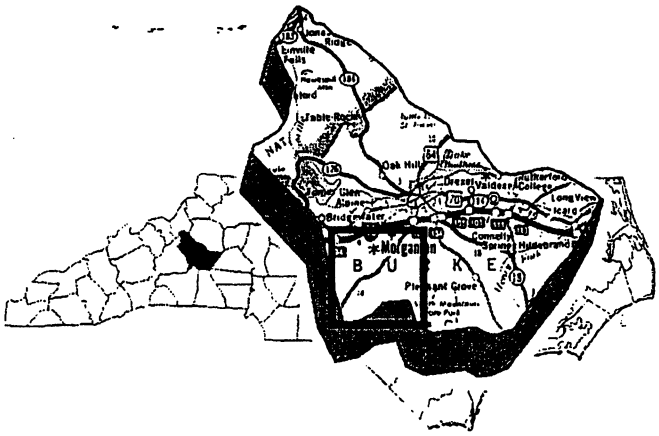
3-2-04 — Date
Project Planning Unit Head, William T. Goodwin, Jr., PE
Project Development & Environmental Analysis Branch

3-2-04 — Date
Project Development Engineer, Robin Y. Hancock
Project Development & Environmental Analysis Branch

For Type II(B) projects only:

3/3/04 — Date
for John F. Sullivan, III, Division Administrator
Federal Highway Administration





NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT & ENVIRONMENTAL ANALYSIS BRANCH

BURKE COUNTY
REPLACE BRIDGE NO. 251 ON SR 1128
OVER HALL CREEK
B-4040

Figure 1

R. Young

North Carolina Department of Cultural Resources
State Historic Preservation Office
David L. S. Brook, Administrator

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary
Office of Archives and History

Division of Historical Resources
David J. Olson, Director

January 29, 2002

MEMORANDUM

TO: William D. Gilmore, Manager
NCDOT, Division of Highways

FROM: David Brook

SUBJECT: Replace Bridge 251 on SR 1128, TIP B-4040, Burke County, ER 02-8501

Thank you for your letter of September 25, 2001, regarding the above project.

We recommend that a comprehensive survey be conducted by an archaeologist to identify and evaluate the significance of archaeological remains that may be damaged or destroyed by the project. Potential effects on unknown resources must be assessed prior to the initiation of construction activities.

Two copies of the resulting archaeological survey report, as well as one copy of the appropriate site forms, should be forwarded to us for review and comment as soon as they are available and well in advance of any construction activities.

A list of archaeological consultants who have conducted or expressed an interest in contract work in North Carolina is available at www.arch.dcr.state.nc.us/consults. The archaeologists listed, or any other archaeologist, may be contacted to conduct the recommended survey.

We have conducted a search of our maps and files and have located the following structures of historical or architectural importance within the general area of the project:

Thomas Morrison House, north side of SR 1128, west of SR 1124

An architectural historian for the Department of Transportation should inventory and evaluate this property and any others, that are fifty years old or older and located within the area of potential effect.

The above comments are made pursuant to Section 106 of National Historic Preservation Act and Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Mary Pope Furr, NCDOT
Matt Wilkerson, NCDOT

	Location	Mailing Address	Telephone/Fax
Administration	507 N. Blount St. Raleigh, NC	4617 Mail Service Center. Raleigh 27699-4617	(919) 733-4763 •733-8653
Restoration	515 N. Blount St. Raleigh , NC	4613 Mail Service Center. Raleigh 27699-4613	(919) 733-6547 •715-4801
Survey & Planning	515 N. Blount St. Raleigh, NC	4618 Mail Service Center. Raleigh 27699-4618	(919) 733-4763 •715-4801

Federal Aid # **BRZ-1128(5)** *TIP#* **B-4040** *County:* **Burke**

CONCURRENCE FORM FOR PROPERTIES NOT ELIGIBLE FOR THE NATIONAL REGISTER OF HISTORIC PLACES

Project Description: **Replace Bridge No. 251 on SR 128, Burke County**

On **July 22, 2003** representatives of the

- ☒ North Carolina Department of Transportation (NCDOT)
- ☒ Federal Highway Administration (FHWA)
- ☒ North Carolina State Historic Preservation Office (HPO)
- ☐ Other

Reviewed the subject project at

- ☐ Scoping meeting
- ☒ Historic architectural resources photograph review session/consultation
- ☐ Other

All parties present agreed

- ☐ There are no properties over fifty years old within the project's area of potential effects.
- ☒ There are no properties less than fifty years old which are considered to meet Criteria Consideration G within the project's area of potential effects.
- ☒ There are properties over fifty years old within the project's Area of Potential Effects (APE), but based on the historical information available and the photographs of each property, the property/ies identified as **# 1 – Thomas Morrison House; #2 - Barn** is/are considered not eligible for the National Register and no further evaluation of it/them is/are necessary.
- ☒ There are no National Register-listed or Study Listed properties within the project's area of potential effects.
- ☒ All properties greater than 50 years of age located in the APE have been considered at this consultation. and based upon the above concurrence, all compliance for historic architecture with Section 106 of the National Historic Preservation Act and GS 121-12(a) has been completed for this project.
- ☒ There are no historic properties affected by this project. (*Attach any notes or documents as needed*)
  [THE BRIDGE WAS CONSTRUCTED IN 1962 – NOT 50 YEARS OLD]

Signed:

Representative, NCDOT	22 July 2003 Date
FHWA, for the Division Administrator, or other Federal Agency	7/22/03 Date
Representative, HPO	7/22/03 Date
State Historic Preservation Officer	7/22/03 Date

If a survey report is prepared, a final copy of this form and the attached list will be included.

North Carolina Department of Cultural Resources
State Historic Preservation Office

Michael F. Easley, Governor
Lisbeth C. Evans, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

March 2, 2004

MEMORANDUM

To: Matt Wilkerson, Archaeological Supervisor
Division of Highways
Department of Transportation

FROM: David Brook David Brook BJS

SUBJECT: Bridge 251 on SR 1128, B-4040, Burke County, ER02-8501

Thank you for your letter of October 22, 2003 transmitting the archaeological survey report by Gerold Glover for the above project.

During the course of the survey, no sites were located within the project area. Dr. Glover has recommended that no further archaeological investigation be conducted in connection with this project. We concur with this recommendation since the project will not involve significant archaeological resources.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763. In all future communication concerning this project, please cite the above-referenced tracking number.

cc: Robin Hancock

North Carolina Wildlife Resources Commission

512 N. Salisbury Street, Raleigh, North Carolina 27604-1188, 919-733-3391
Charles R. Fullwood, Executive Director

TO: William T. Goodwin, Jr., PE, Unit Head
Bridge Replacement & Environmental Analysis Branch

FROM: Ron Linville, Habitat Conservation Coordinator
Habitat Conservation Program

DATE: May 10, 2002

SUBJECT: NCDOT Bridge Replacements in Burke County:
Bridge No. 26, NC183, Linville River, B-4038
Bridge No. 51, SR1424, Parks Creek, B-4043
Bridge No. 251, SR1128, Hall Creek, B-4040
Bridge No. 4, SR1515, Smoky Creek, B-4044
Bridge No. 57, SR1244, Canoe Creek, B-4041
Bridge No. 94, SR1972, East Prong Hunting Creek, B-4047
Bridge No. 19, SR1736, Camp Creek, B-4045
Bridge No. 91, SR1127, Silver Creek, B-4039

Biologists with the N. C. Wildlife Resources Commission (NCWRC) have reviewed the information provided and have the following preliminary comments on the subject project. Our comments are provided in accordance with provisions of the National Environmental Policy Act (42 U.S.C. 4332(2)(c)) and the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667d).

Our standard recommendations for bridge replacement projects of this scope are as follows:

1. We generally prefer spanning structures. Spanning structures usually do not require work within the stream and do not require stream channel realignment. The horizontal and vertical clearances provided by bridges allows for human and wildlife passage beneath the structure, does not block fish passage, and does not block navigation by canoeists and boaters.

2. Bridge deck drains should not discharge directly into the stream.

3. Live concrete should not be allowed to contact the water in or entering into the stream.

4. If possible, bridge supports (bents) should not be placed in the stream.

5. If temporary access roads or detours are constructed, they should be removed back to original ground elevations immediately upon the completion of the project. Disturbed areas should be seeded or mulched to stabilize the soil and native tree species should be planted with a spacing of not more than 10'x10'. If possible, when using temporary structures the area should be cleared but not grubbed. Clearing the area with chain saws, mowers, bush-hogs, or other mechanized equipment and leaving the stumps and root mat intact, allows the area to revegetate naturally and minimizes disturbed soil.

6. A clear bank (riprap free) area of at least 10 feet should remain on each side of the steam underneath the bridge.

7. In trout waters, the N.C. Wildlife Resources Commission reviews all U.S. Army Corps of Engineers nationwide and general '404' permits. We have the option of requesting additional measures to protect trout and trout habitat and we can recommend that the project require an individual '404' permit.

8. In streams that contain threatened or endangered species, NCDOT biologist Mr. Tim Savidge should be notified. Special measures to protect these sensitive species may be required. NCDOT should also contact the U.S. Fish and Wildlife Service for information on requirements of the Endangered Species Act as it relates to the project.

9. In streams that are used by anadromous fish, the NCDOT official policy entitled "Stream Crossing Guidelines for Anadromous Fish Passage (May 12, 1997)" should be followed.

10. In areas with significant fisheries for sunfish, seasonal exclusions may also be recommended.

11. Sedimentation and erosion control measures sufficient to protect aquatic resources must be implemented prior to any ground disturbing activities. Structures should be maintained regularly, especially following rainfall events.

12. Temporary or permanent herbaceous vegetation should be planted on all bare soil within 15 days of ground disturbing activities to provide long-term erosion control.

13. All work in or adjacent to stream waters should be conducted in a dry work area. Sandbags, rock berms, cofferdams, or other diversion structures should be used where possible to prevent excavation in flowing water.

14. Heavy equipment should be operated from the bank rather than in stream channels in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into streams.

15. Only clean, sediment-free rock should be used as temporary fill (causeways), and should be removed without excessive disturbance of the natural stream bottom when construction is completed.

16. During subsurface investigations, equipment should be inspected daily and maintained to prevent contamination of surface waters from leaking fuels, lubricants, hydraulic fluids, or other toxic materials.

If corrugated metal pipe arches, reinforced concrete pipes, or concrete box culverts are used:

1. The culvert must be designed to allow for aquatic life and fish passage. Generally, the culvert or pipe invert should be buried at least 1 foot below the natural streambed (measured from the natural thalweg depth). If multiple barrels are required, barrels other than the base flow barrel(s) should be placed on or near stream bankfull or floodplain bench elevation (similar to Lyonsfield design). These should be reconnected to floodplain benches as appropriate. This may be accomplished by utilizing sills on the upstream and downstream ends to restrict or divert flow to the base flow barrel(s). Silled barrels should be filled with sediment so as not to cause noxious or mosquito breeding conditions. Sufficient water depth should be provided in the base flow barrel(s) during low flows to accommodate fish movement. If culverts are longer than 40-50 linear feet, alternating or notched baffles should be installed in a manner that mimics existing stream pattern. This should enhance aquatic life passage: 1) by depositing sediments in the barrel, 2) by maintaining channel depth and flow regimes, and 3) by providing resting places for fish and other aquatic organisms. In essence, base flow barrel(s) should provide a continuum of water depth and channel width without substantial modifications of velocity.

2. If multiple pipes or cells are used, at least one pipe or box should be designed to remain dry during normal flows to allow for wildlife passage.

3. Culverts or pipes should be situated along the existing channel alignment whenever possible to avoid channel realignment. Widening the stream channel must be avoided. Stream channel widening at the inlet or outlet end of structures typically decreases water velocity causing sediment deposition that requires increased maintenance and disrupts aquatic life passage.

4. Riprap should not be placed in the active thalweg channel or placed in the streambed in a manner that precludes aquatic life passage. Bioengineering boulders or structures should be professionally designed, sized, and installed.

In most cases, we prefer the replacement of the existing structure at the same location with road closure. If road closure is not feasible, a temporary detour should be designed and located to avoid wetland impacts, minimize the need for clearing and to avoid destabilizing stream banks. If the structure will be on a new alignment, the old structure should be removed and the approach fills removed from the 100-year floodplain. Approach fills should be removed down to the natural ground elevation. The area should be stabilized with grass and planted with native tree species. If the area reclaimed was previously wetlands, NCDOT should restore the area to wetlands. If successful, the site may be utilized as mitigation for the subject project or other projects in the watershed.

Project specific comments:

1. Bridge No. 26, NC183, Linville River, B-4038, RED LIGHT, Significant & historic resource, Proposed Critical Habitats, Game Lands, Trout clubs, National Park Service, Blue Ridge Parkway, Moratoriums proposed (15 Feb. – 30 May, Walleye and White Bass; 15 Oct – 31 March, Brown Trout), Brook floater (*Alasmidonta varicosa*) populations. NEW Spanning Bridge.

2. Bridge No. 51, SR1424, Parks Creek, B-4043 – YELLOW LIGHT, Santee Chub in John's River, No sport fish concerns indicated.

3. Bridge No. 251, SR1128, Hall Creek, B-4040 - GREEN LIGHT, No concerns indicated. Standard requirements.

4. Bridge No. 4, SR1515, Smoky Creek, B-4044 - YELLOW LIGHT, Moratorium for warm water fish species.

5. Bridge No. 57, SR1244, Canoe Creek, B-4041 - GREEN LIGHT, No concerns indicated. Standard requirements.

6. Bridge No. 94, SR1972, East Prong Hunting Creek, B-4047 - GREEN LIGHT, No concerns indicated. Standard requirements.

7. Bridge No. 19, SR1736, Camp Creek, B-4045 - GREEN LIGHT, No concerns indicated. Standard requirements.

8. Bridge No. 91, SR1127, Silver Creek, B-4039 - GREEN LIGHT, No concerns indicated. Standard requirements.

NCDOT should routinely minimize adverse impacts to fish and wildlife resources in the vicinity of bridge replacements. Restoring previously disturbed floodplain benches should narrow and deepen streams previously widened and shallowed during initial bridge installation. NCDOT should install and maintain sedimentation control measures throughout the life of the project and prevent wet concrete from contacting water in or entering into these streams. Replacement of bridges with spanning structures of some type, as opposed to pipe or box culverts, is recommended in most cases. Spanning structures allow wildlife passage along streambanks and reduce habitat fragmentation.

If you need further assistance or information on NCWRC concerns regarding bridge replacements, please contact me at (336) 769-9453. Thank you for the opportunity to review and comment on these projects.

Cc: David Cox, WRC

PROJECT COMMITMENTS

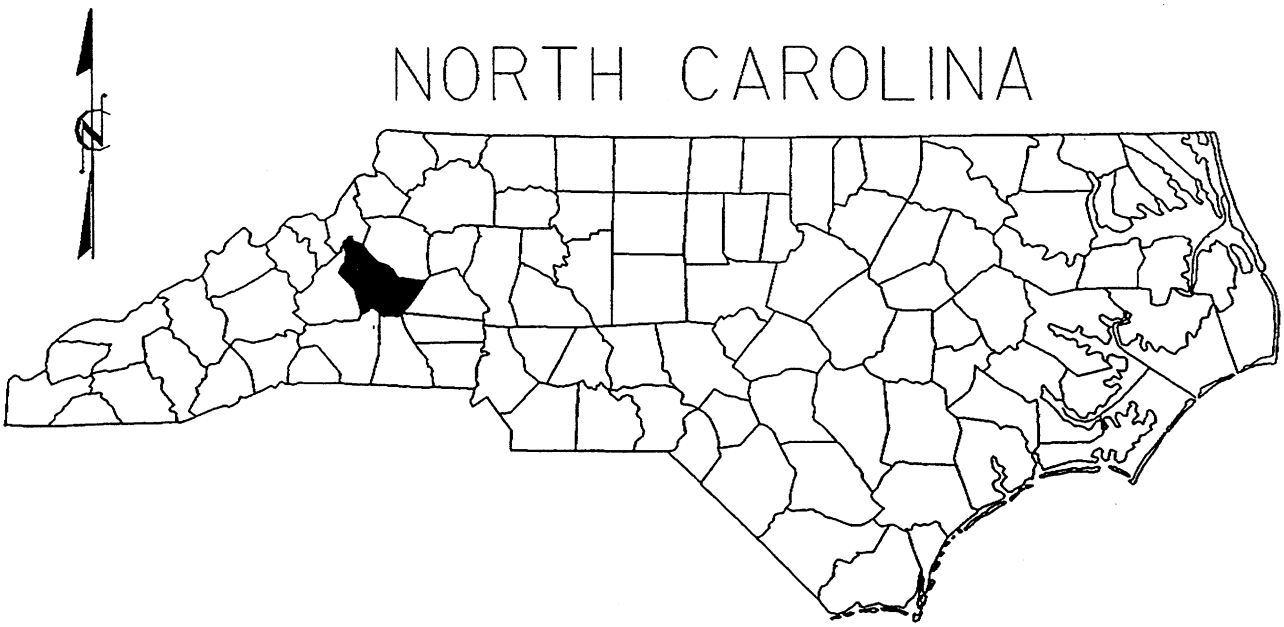
Burke County
Bridge No. 251 on SR 1128
Over Hall Creek
Federal Project BRZ-1128 (5)
WBS 33406.1.1
State Project 8.2852801
TIP No. B-4040

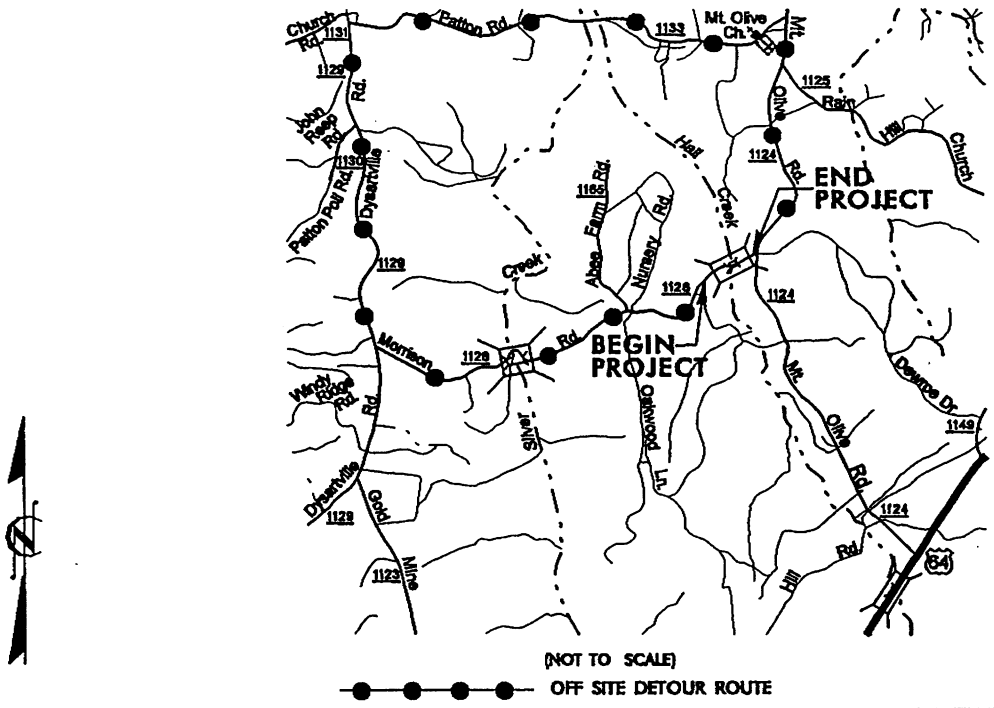
Commitments Developed Through Project Development and Design

Roadside Environmental Unit, Division 13 Construction, Structure Design Unit
Bridge Demolition: Best Management Practices for Bridge Demolition & Removal will be implemented. The superstructure consists of a timber floor on steel girders with an asphalt-wearing surface. The end bents and crutch bent are composed entirely of timber, which can be removed without any falling debris. Therefore, Bridge No. 251 will be removed without dropping components into Waters of the United States during construction.

Division 13 Construction
In order to allow Emergency Management Services (EMS) time to prepare for road closure, the NCDOT Resident Engineer will notify Clint Patton with Burke County EMS at (828) 433-6609 of the bridge removal 30 days prior to road closure.

In order to allow Burke County Schools time to prepare for road closure, the NCDOT Resident Engineer will notify the Transportation Director at (828) 438-8803 of the bridge removal 30 days prior to road closure.

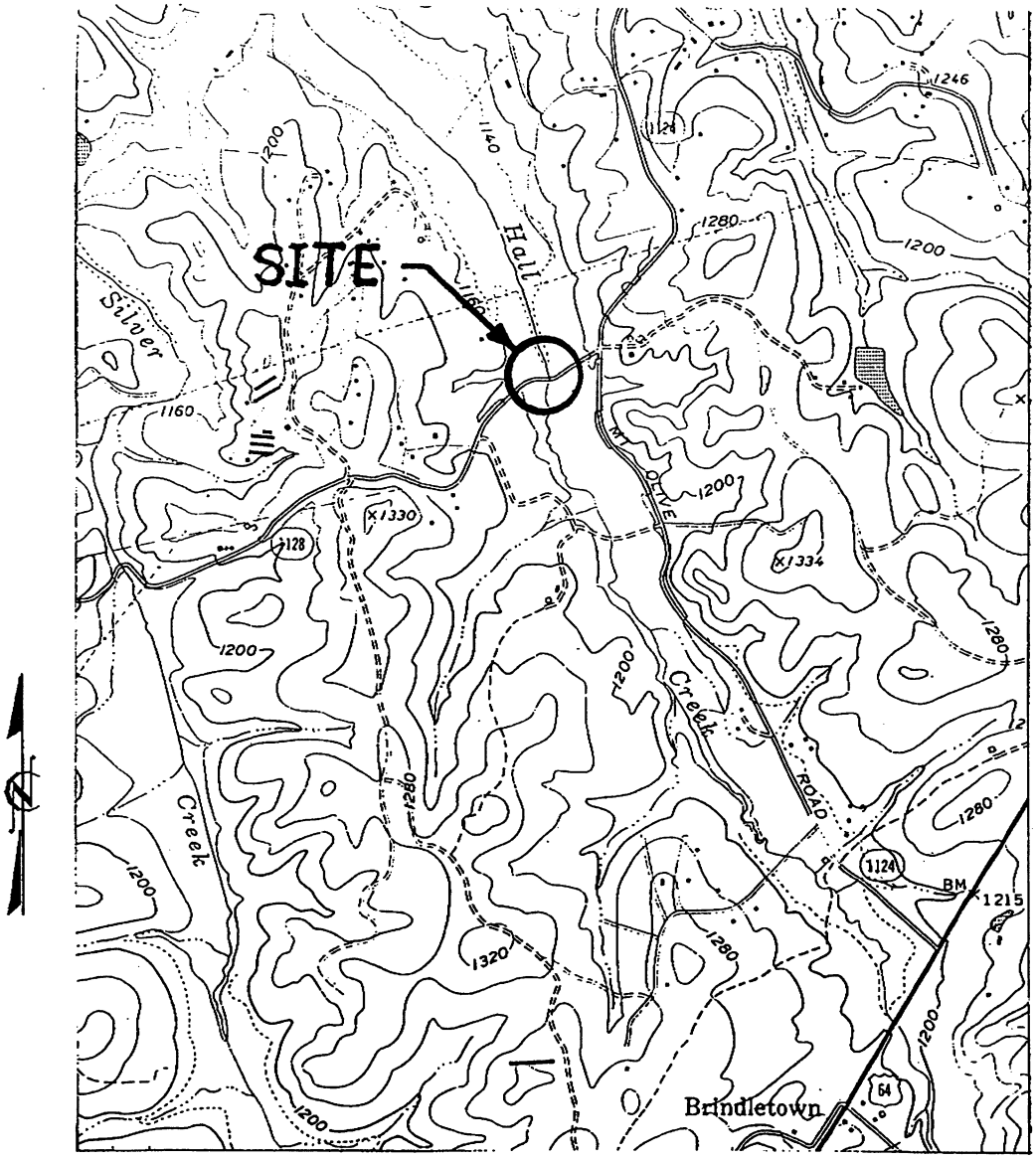




VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS
BURKE COUNTY
PROJECT: 33406.1.1 (B-4040)
BRIDGE NO. 251 OVER HALL CREEK AND APPROACHES ON SR 1128



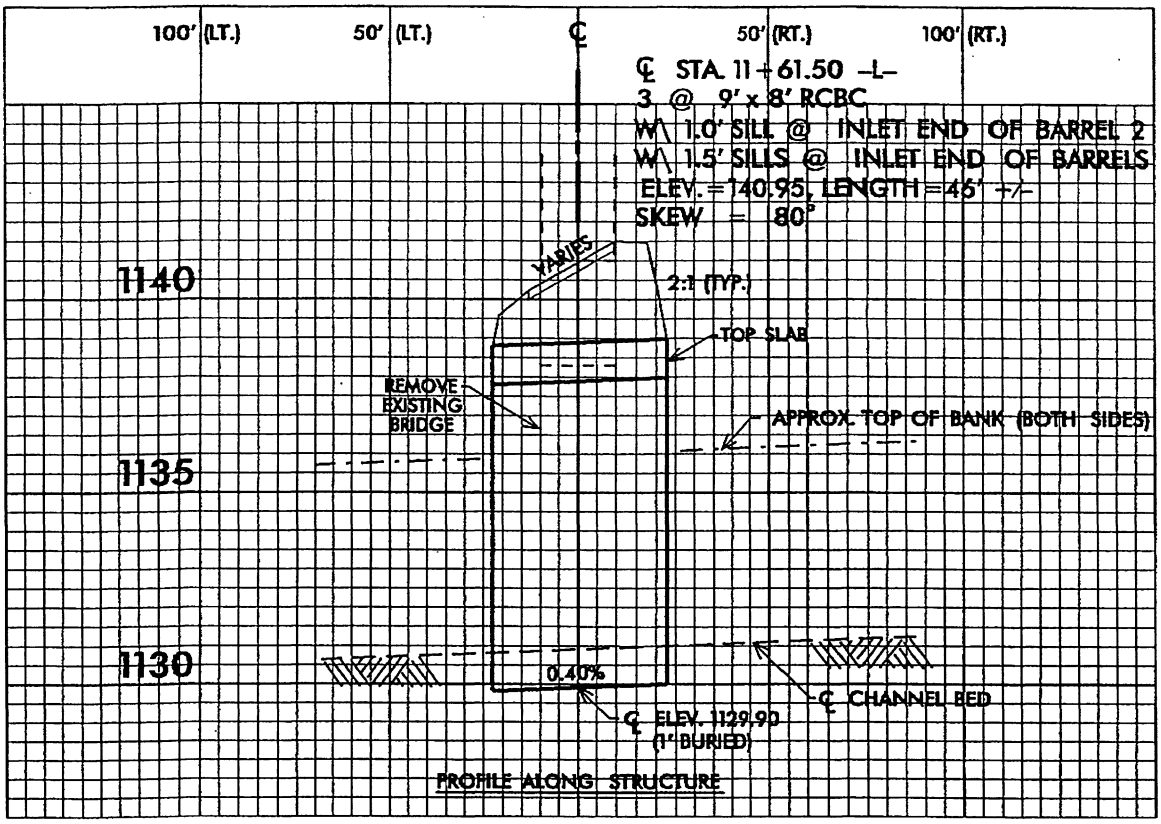
TOPO MAP

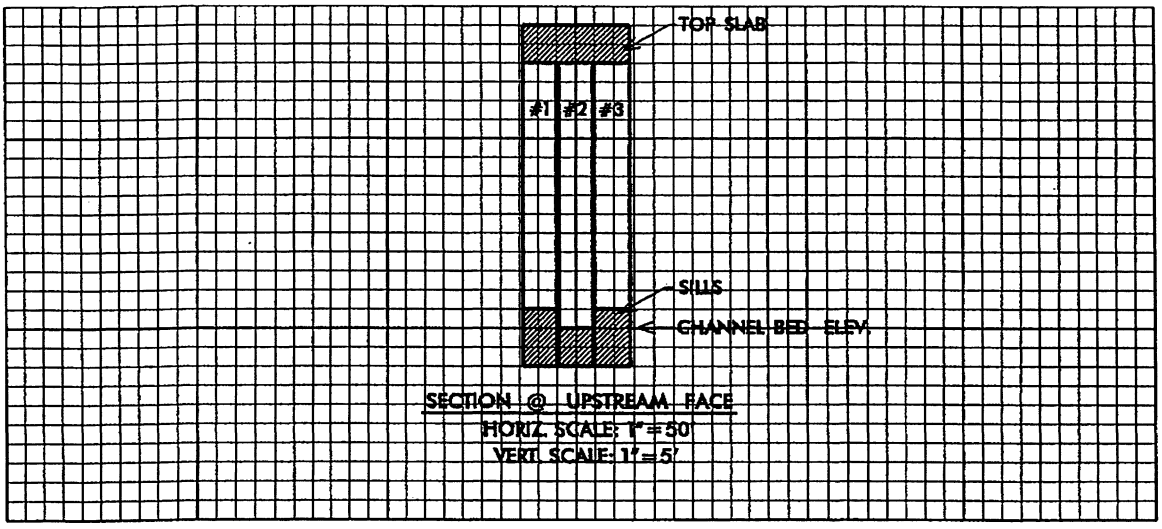
SCALE: 1" : 2000'

NCDOT

DIVISION OF HIGHWAYS
BURKE COUNTY
PROJECT: 33406.1.1 (B-4040)
BRIDGE NO. 251 OVER
HALL CREEK AND
APPROACHES ON SR 1128

SHEET 2 OF 11 11/5/04





NCDOT

DIVISION OF HIGHWAYS
BURKE COUNTY
PROJECT: 33406.1.1 (B-4040)
BRIDGE NO. 251 OVER
HALL CREEK AND
APPROACHES ON SR 1128

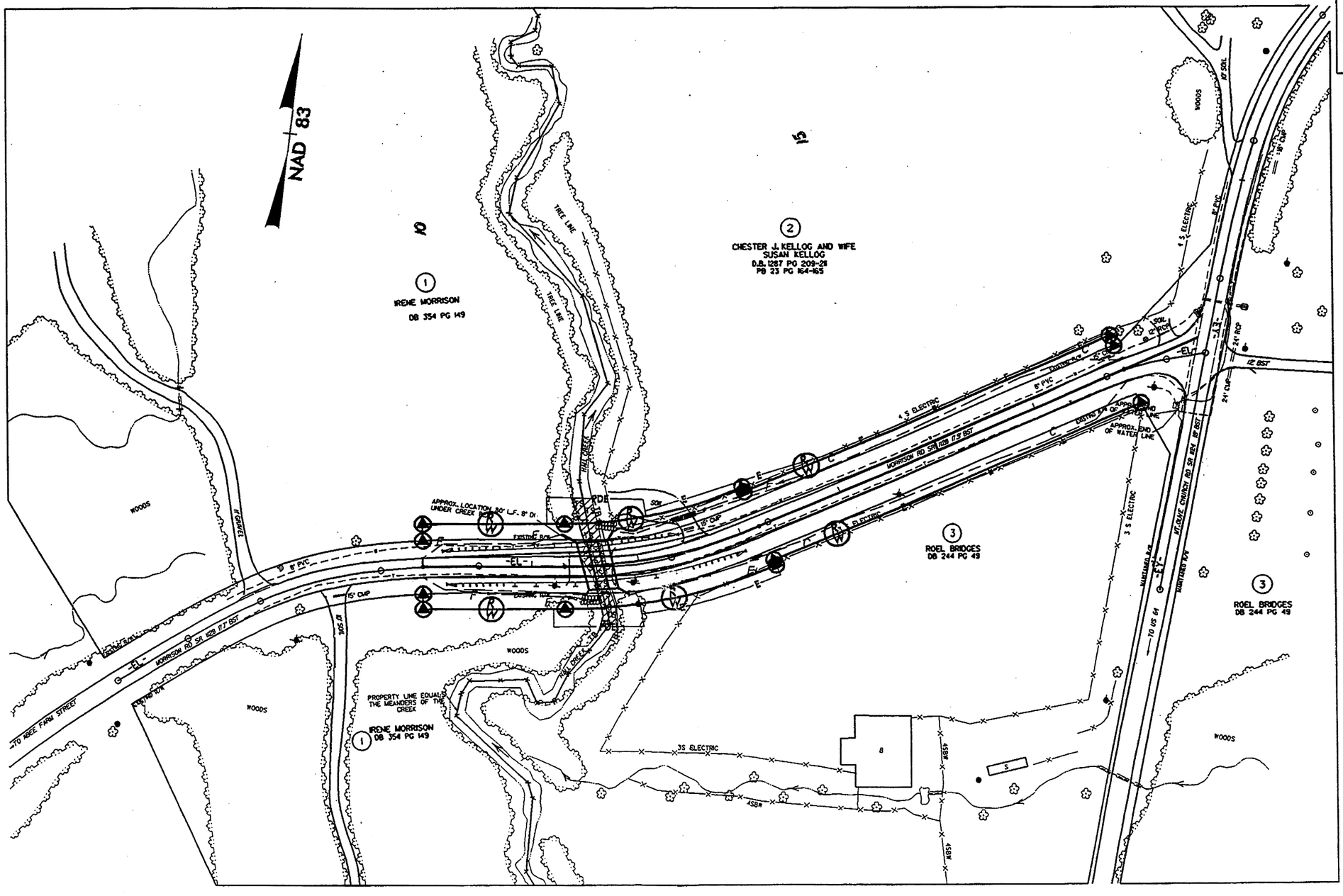
SHEET 3 OF 11 11/5/04

8/17/99

*Design Exception Required for Design Speed and Stopping Sight Distance.

PROJECT REFERENCE NO.	SHEET NO.
B-4040	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
Not for Construction or Recordation



NOTE: SEE SHEET 5 FOR -L- PROFILE

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8/17/99

*Design Exception Required for Design Speed and Stopping Sight Distance.

PROJECT REFERENCE NO.	SHEET NO.
B-4040	4A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

NAD 83

(1) IRENE MORRISON
DB 354 PG 149

(2) CHESTER J. KELLOG AND WIFE
SUSAN KELLOG
D.B. 1287 PG 209-211
PB 23 PG 164-165

(3) ROEL BRIDGES
DB 244 PG 43

PROPERTY LINE EQUALS THE MEANDERS OF THE CREEK

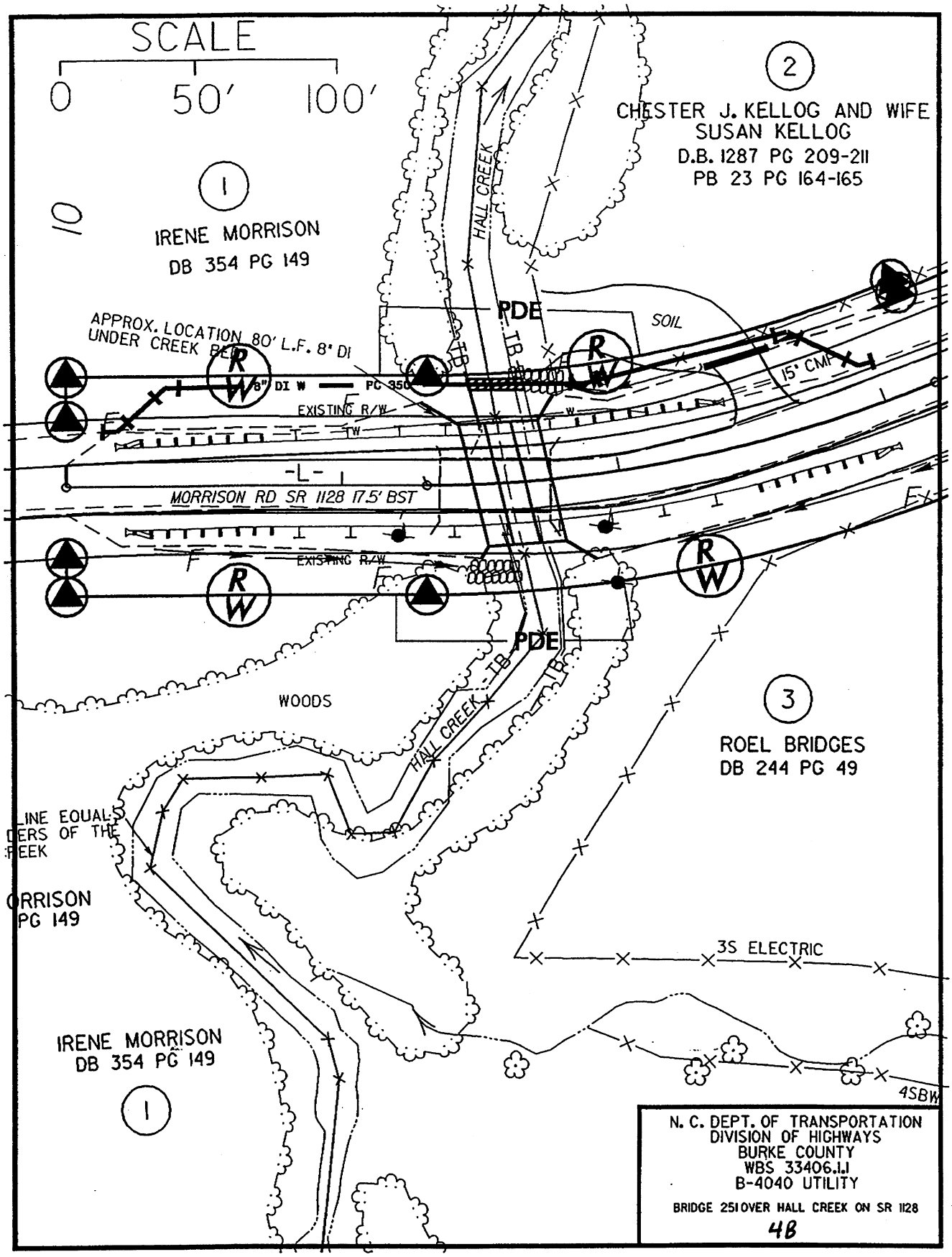
DENOTES FILL IN SURFACE WATER

DENOTES TEMPORARY FILL IN SURFACE WATER

0 50' 100'
HORIZONTAL SCALE

NOTE: SEE SHEET 5 FOR -L- PROFILE

30-SEP-2004 15:34
R:\hydraulics\permit\B4040-hyd.prn
adingard
A1


SCALE
0 50' 100'
2
CHESTER J. KELLOG AND WIFE
SUSAN KELLOG
D.B. 1287 PG 209-211
PB 23 PG 164-165
1
IRENE MORRISON
DB 354 PG 149
10
HALL CREEK
PDE
SOIL
APPROX. LOCATION 80' L.F. 8" DI
UNDER CREEK BED
8" DI W
PC 350
15" CMP
EXISTING R/W
MORRISON RD SR 1128 17.5' BST
EXISTING R/W
PDE
WOODS
HALL CREEK
3
ROEL BRIDGES
DB 244 PG 49
LINE EQUAL-
DERS OF THE
REEK
ORRISON
PG 149
3S ELECTRIC
IRENE MORRISON
DB 354 PG 149
1
4SBW
N. C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
BURKE COUNTY
WBS 33406.1.1
B-4040 UTILITY
BRIDGE 251 OVER HALL CREEK ON SR 1128
4B

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4040	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

BEGIN GRADE
-L- STA 10+00.00
EL = 1140.14

PI = 10+50.00
EL = 1139.95'
VC = 100'
K = 19

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1140.60 FT
BASE DISCHARGE	= 2300 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1141.79 FT
OVERTOPPING DISCHARGE	= 1440 CFS
OVERTOPPING FREQUENCY	= <25 YRS
OVERTOPPING ELEVATION	= 1140.60 FT

-L- 24" RCP
-Y1- 24" RCP
-Y2- 24" RCP

-L- S=0.8925%
-Y1- S=0.8925%
-Y2- S=0.8925%

BEGIN RIGHT DITCH
-L- STA 12+00.00
ELEV 1136.53

BEGIN RIGHT DITCH
-Y1- STA 12+00.00
ELEV 1136.53

BEGIN LEFT DITCH
-L- STA 11+75.00
ELEV 1135.85

END RIGHT DITCH
-L- STA 11+50.00
ELEV 1134.43

LEFT DITCH
-L- STA 13+00.00
ELEV 1137.50

END LEFT DITCH
-L- STA 14+00.00
ELEV 1140.17

END RESURFACING
-L- STA 17+68.70
EL = 1170.38

END GRADE
BEGIN RESURFACING
-L- STA 16+92.57
EL = 1161.17

XPI = 15+47.05
EL = 1144.39'
VC = 290'
K = 27

RIGHT DITCH - - - - - - -
LEFT DITCH — · — · —

BM#1 8" NAIL IN BASE OF 20" WHITE OAK
STA. -BL- 14+17.28 32.2' LT
N 702118.0000 E 1163988.0000
ELEV.= 1159.03'

BM#2 8" NAIL IN BASE OF 13" BLACK WALNUT
STA. -L- POC 12+26.11 111.3' LT
N 702318.0000 E 1164546.0000
ELEV.= 1138.49'

BM#3 8" NAIL IN BASE OF 14" TWIN POPLAR
STA. -BY- 13+91.98 49.15' LT
N 702195.0000 E 1165102.0000
ELEV.= 1154.43'

1,170
1,160
1,150
1,140
1,130

10 11 12 13 14 15 16

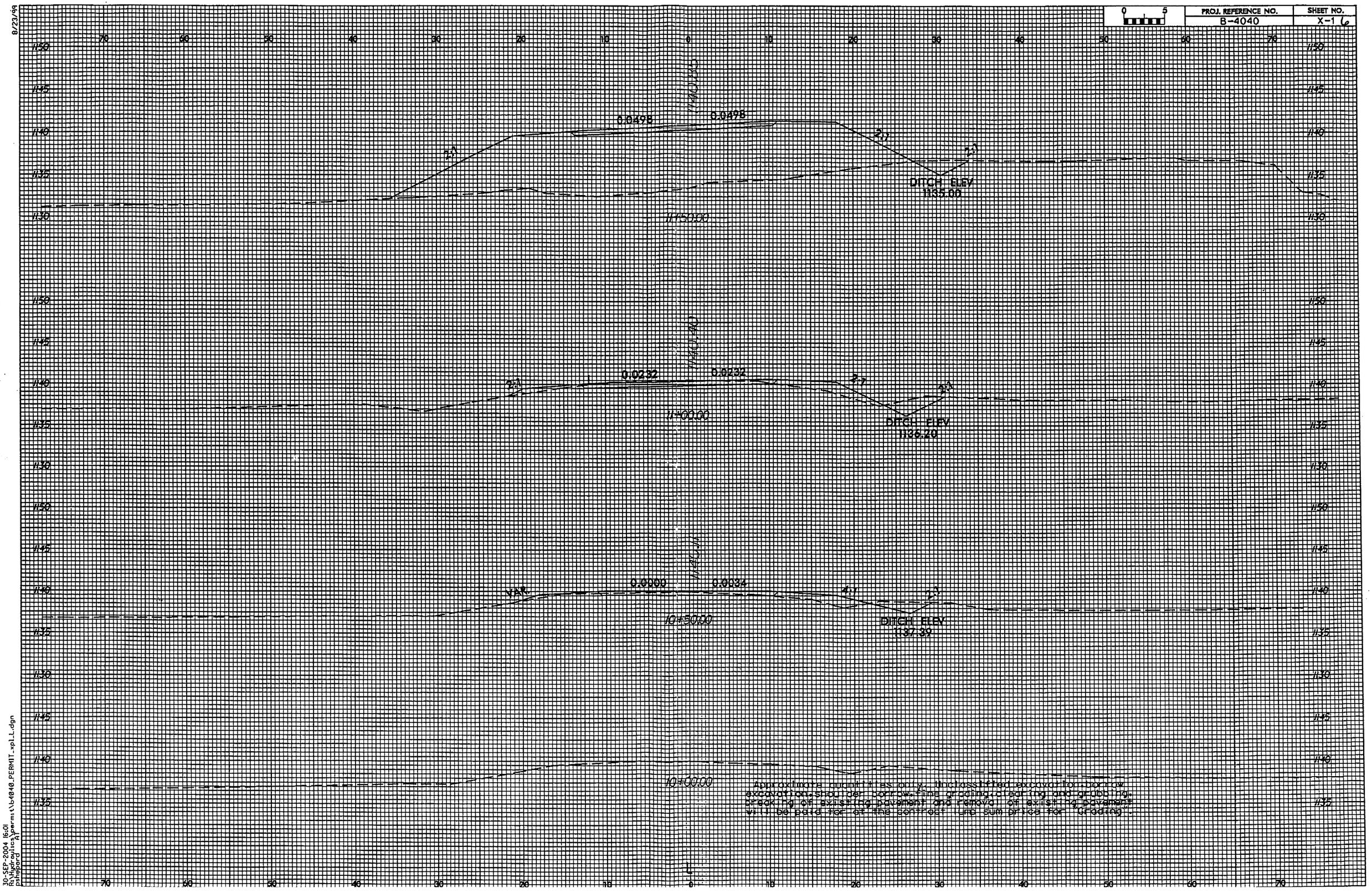
* DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K FACTOR AND, STOPPING SIGHT DISTANCE.

SEE SHEET 4 FOR -L- DESIGN

20-SEP-2004 15:55
R:\hydraulics\permits\b4040_permit_pfl.dgn
mmoore

8/23/99

0 1 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4040	X-1 6



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8/23/99

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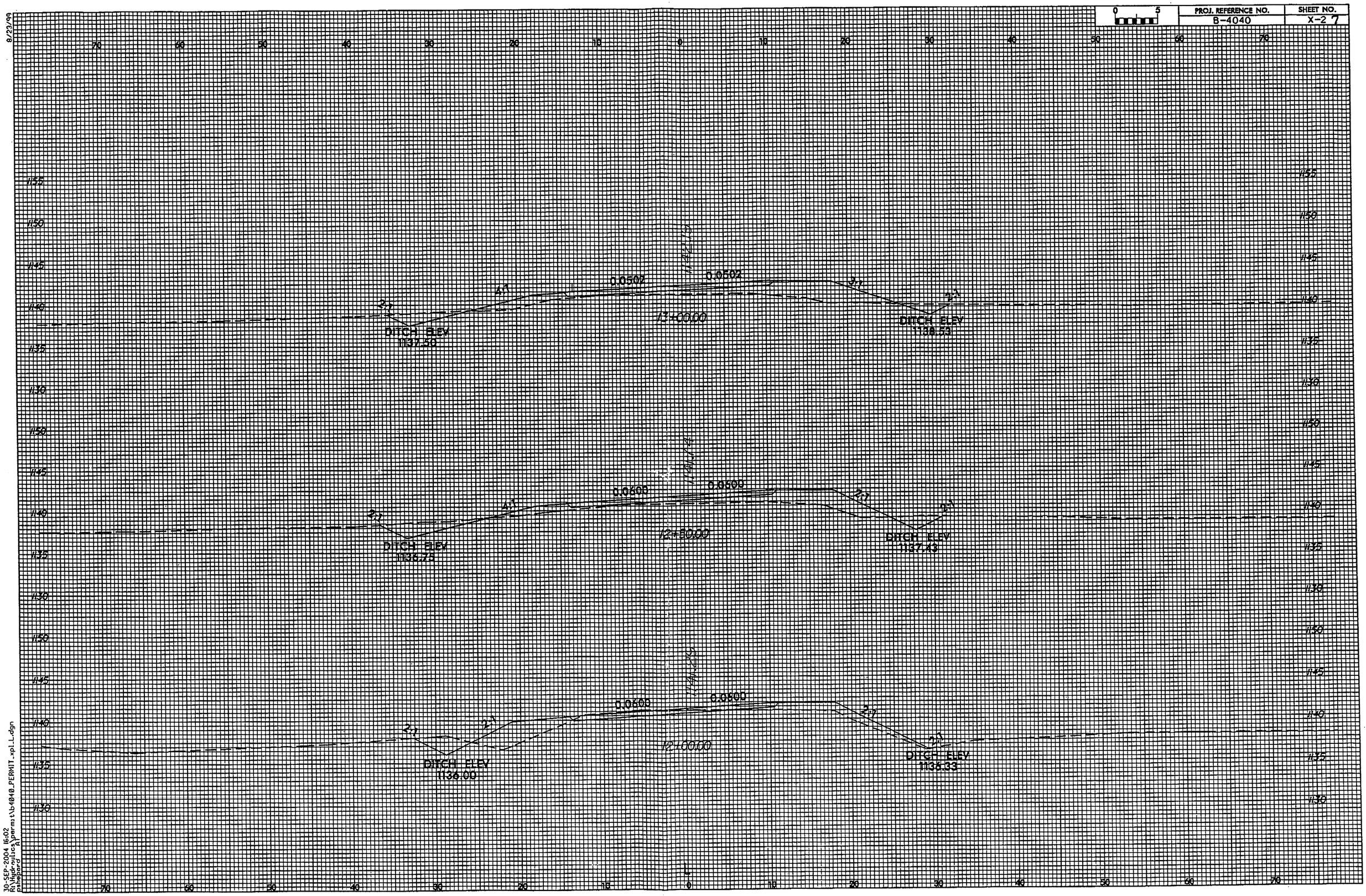

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pshepard
All

B-4040 X-3 B

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

1155 1150 1145 1140 1135

5.0200 5.0200

3:1 4:1 2:1

1141.345 1141.345

141+50.00

1155 1150 1145 1140 1135

0.0290 0.0290

4:1 2:1

1140.47 1140.733

141+00.00

1155 1150 1145 1140 1135

0.0236 0.0236

4:1 2:1

DITCH ELEV 1138.99 DITCH ELEV 1139.63

137+50.00

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

8/23

30-SEP-2004 16:02
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pshepard
A1

PROJ. REFERENCE NO.
B-4040

SHEET NO.
X-4 9

1170 1165 1160 1155 1150 1145

76 66 56 46 36 26 16 0 16 26 36 46 56 66 76

0.0200 0.0200

2:1 4:1 4:1 2:1

1153.989 1153.985

16+50.00

0.0200 0.0200

2:1 4:1 4:1 2:1

1149.449 1149.449

16+00.00

0.0200 0.0200

2:1 4:1 4:1 2:1

1145.830 1145.830

15+50.00

0.0200 0.0200

2:1 4:1 4:1 2:1

1143.128 1143.128

15+00.00

20-SEP-2004 16:03
R:\Highpoint\permits\b4040.PERMIT.xplL.dgn
psheppard
22.000000 x 34.000000

PROPERTY OWNERS

NAMES AND ADDRESSES

REFERENCE NO.	NAMES	ADDRESSES
1	ROY & IRENE MORRISON	4664 Morrison Rd. Morganton, NC 28655
2	CHESTER KELLOGG	72 Prentice Road Worthington, MA 01098
3	ROEL P. BRIDGES	4465 Dewroe Drive Morganton, NC 28655

NCDOT

DIVISION OF HIGHWAYS

BURKE COUNTY

PROJECT: 33406.1.1 (B-4040)

BRIDGE NO. 251 OVER

HALL CREEK AND

APPROACHES ON SR 1128

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS				SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation In Wetlands (ac)	Mechanized Clearing (Method III) (ac)	Fill In SW (Natural) (ac)	Fill In SW (Pond) (ac)	Temp. Fill In SW (ac)	Existing Channel Impacted (ft)	Natural Stream Design (ft)
1	11+61.50 -L-	3 @ 9' x 8'	0	0	0	0	0.02	0	0.03	123	0
	C. L. STA.	RCBC									
TOTALS:			0	0	0	0	0.02	0	0.03	123	0

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BURKE COUNTY
8.2852801 (B-4040)

BRIDGE # 251 OVER HALL CREEK ON SR 1128

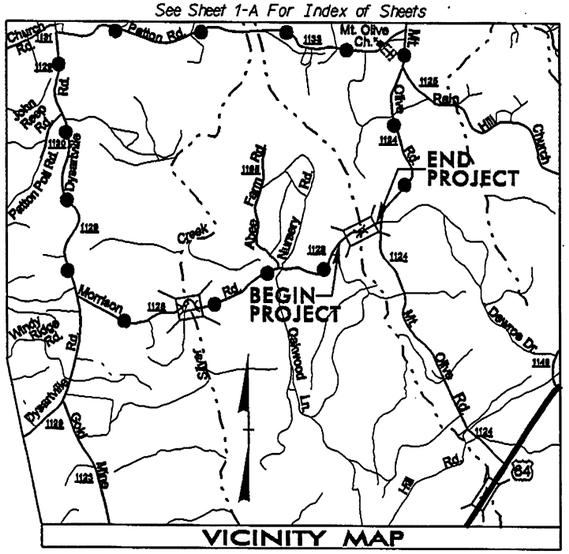
SHEET 11 OF 11 11/5/04

Form Revised 3/22/01

TIP PROJECT: B-4040

CONTRACT: C201291

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFF SITE DETOUR ROUTE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

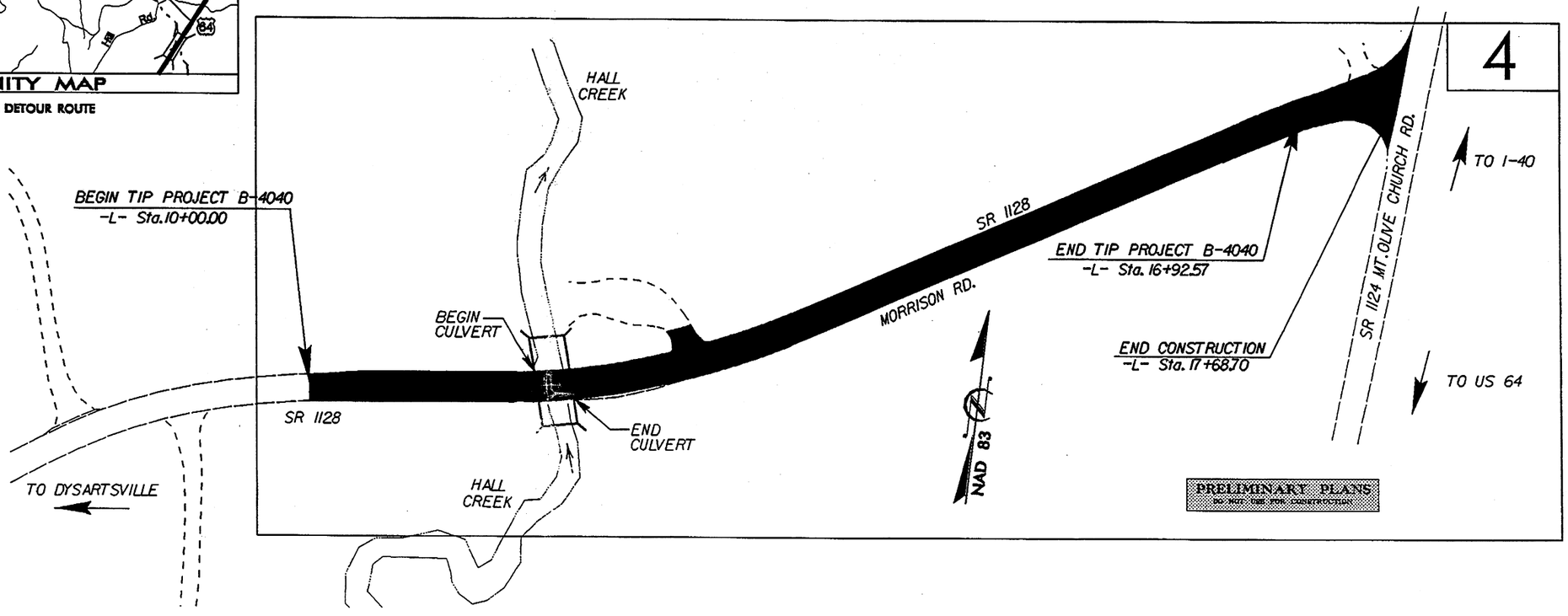
BURKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33406.1.1	1	

STATE PROJ.NO.	F.A.PROJ.NO.	DESCRIPTION
33406.1.1	BRZ-1128 (5)	P.E.
33406.2.1	BRZ-1128 (5)	R/W & UTILITIES

LOCATION: BRIDGE NO. 251 OVER HALL CREEK ON SR 1128

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND CULVERT



THIS PROJECT IS NOT IN THE CITY LIMITS OF ANY MUNICIPALITY.

** DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED, STOPPING SIGHT DISTANCES, & VERTICAL CURVE K FACTOR.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

GRAPHIC SCALES

PLANS 50 25 0 50 100

PROFILE (HORIZONTAL) 50 25 0 50 100

PROFILE (VERTICAL) 5 2. 0 5 10

DESIGN DATA

ADT 2004 = 430 VPD
ADT 2025 = 700 VPD
DHV = 12 %
D = 55 %
T = 3 % *
** V= 35 MPH

* TTST 1% DUAL 2%

PROJECT LENGTH

TOTAL LENGTH TIP PROJECT B-4040 = 0.131 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 30, 2004

LETTING DATE: SEPTEMBER 20, 2005

JAMES A. SPEER, PE
PROJECT ENGINEER

JOHN C. LANSFORD, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE DESIGN ENGINEER P.E.

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR DATE

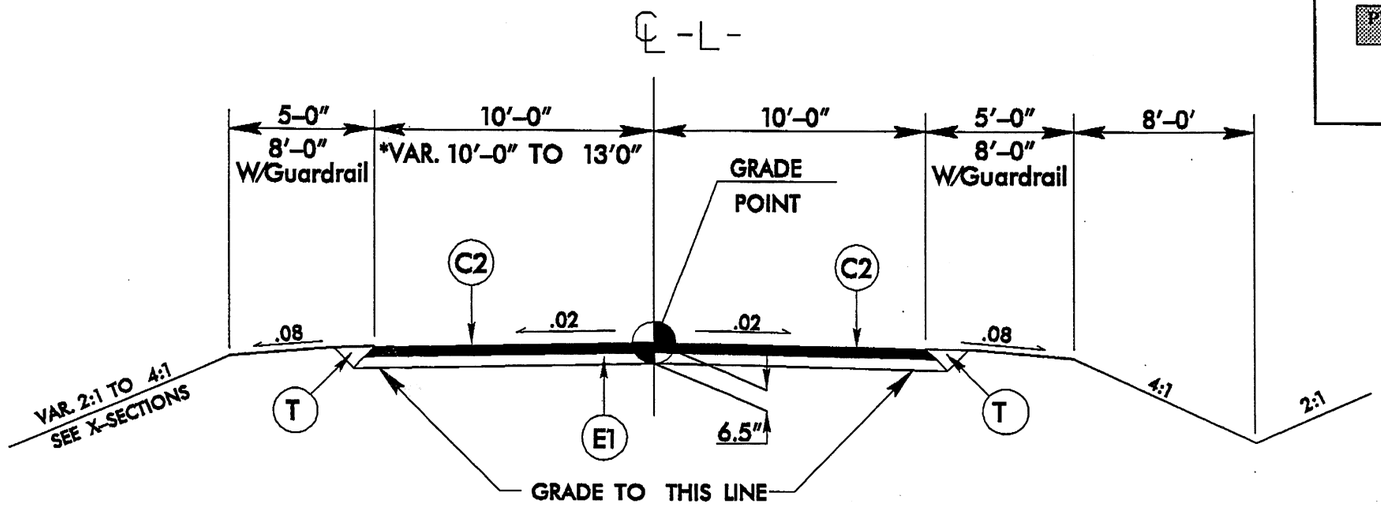
PROJECT REFERENCE NO.	SHEET NO.
B-4040	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 1¼" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A. AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
C2	PROP. APPROX. 2½" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A. AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
E1	PROP. APPROX. 4 " ASPHALT CONCRETE BASE COURSE, TYPE B25.0B. AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
T	EARTH MATERIAL.
U	EXISTING PAVEMENT.

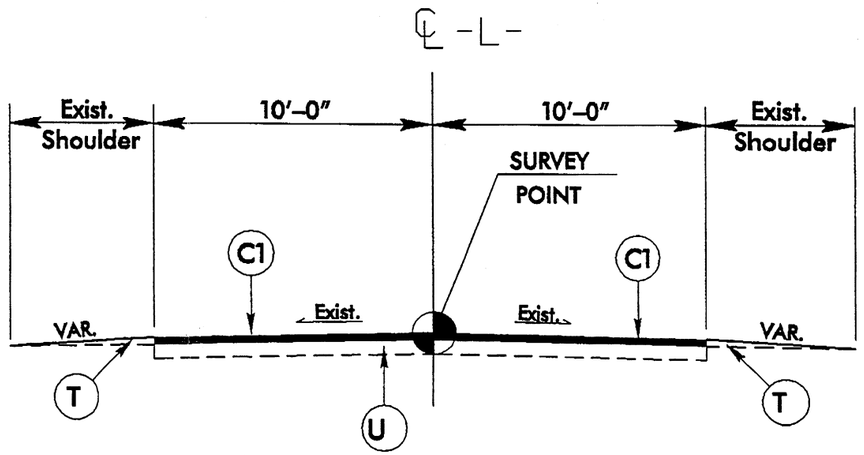
NOTE: ALL SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



TYPICAL SECTION NO. 1

USE TYPICAL SECTION NO. 1 AT THE FOLLOWING LOCATIONS:
-L- STA. 10+00.00 -L- STA. 16+92.57

* SEE PLAN FOR CURVE WIDENING



TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 2 AT THE FOLLOWING LOCATIONS:
-L- STA. 16+92.57 -L- STA. 17+68.70
(RESURFACE EXISTING PAVEMENT)

10/26/98
22-MAR-2005 11:07
f:\roadway\dgn\b4040_rdy_typ.dgn
Instrd AT 1024x1357

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-4040	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
NOT FOR CONSTRUCTION

*Design Exception Required for Design Speed and Stopping Sight Distance.

NAD 83

BEGIN STATE PROJECT B-4040
-L- POT Sta. 10+00.00

-BL-3 16+14.44 PINE

WOODS

TO ABEE FARM STREET

EXISTING R/W

SR 1556 (MORRISON RD) 17' BST

EXISTING R/W

RETAIN

TE TO EXISTING DITCH

N 73° 8' 45.3" E

8" PVC

GRAU-350

N 81° 54' 30.9" E

EXISTING R/W

SR 1556 (MORRISON RD) 17' BST

+00.00 -L-
EX R/W & 40.00' LT

SPECIAL LATERAL 'V' DITCH
GRASS LINED
SEE DETAIL I

1 IRENE MORRISON
DB 354 PG 149

+30.91 -L-
40.00' LT

+14.00 -L-
65.00', EX R/W

-L- PC Sta. 11+30.91

55' TAPER APPROX. LOCATION UNDER CREEK

CURVE WIDENING 13'

80' L.F. 8" DI

TIE TO EXISTING DITCH

PROPERTY LINE EQUALS THE MEANDERS OF THE CREEK

IRENE MORRISON
DB 354 PG 149

WOODS

+20.00 -L-
57.00' R/W

+30.91 -L-
40.00' RT

SEE SHEET 1-D

BM#2

+58.67

+58.67

+56.67

RIP RAP @ EMBANKMENT CLASS 'II' RIP RAP SEE DETAIL

+15.00 -L-
56.00', 45.00', EX R/W

REMOVE AND RESET FENCE

CURVE WIDENING 13'

-BL-4 21+25.98 PINC
-L- POC 12+26.11
11.13' LT

+19.27 -L-
35.00' & 40.00' LT

2 CHESTER J. KELLOG AND WIFE
SUSAN KELLOG
D.B. 1287 PG 209-211
PB 23 PG 164-165

TREE LINE

-L- PT Sta. 13+19.27

+92.57 -L-
37.00', 35.00', & EX R/W

SPECIAL LATERAL 'V' DITCH
GRASS LINED
SEE DETAIL I

+00.00 -L-
37.00' LT

DO NOT DISTURB EXISTING FENCE

4.5 ELECTRIC

N 59° 34' 59.9" E
N 58° 41' 59.9" E

15" CMP

RETAIN

8" PVC

24" RCP

12" BST

TIE TO EXISTING DITCH

APPROX. END OF WATER LINE

REMOVE AND RESET FENCE

+10.00 -L-
35.00' RT

+94.47 -L-
35.00', EX R/W

+94.77 -L-
EX R/W

DO NOT DISTURB EXISTING FENCE

3 ROEL BRIDGES
DB 244 PG 49

SPECIAL LATERAL 'V' DITCH
GRASS LINED
SEE DETAIL I

+00.00 -L-
35.00', 48.00', 50.00' RT

RIP RAP @ EMBANKMENT CLASS 'II' RIP RAP SEE DETAIL

+00.00 -L-
50.00', 62.00', R/W

3S ELECTRIC

45BW

S 1° 42' 56.1" W

MARYLAND R.R.

MT. OLIVE CHURCH RD SR 1184 18' BST

TO US 64

-BL-3 26+46.16 PINC
-BY-7 9+09.33 POT

8" PVC

4.5 ELECTRIC

8" CMP

18" RCP

24" CMP

10' SOIL

-BY-7 13+90.26 POT
-L- POT 14+87.35
BM#3 390.56' RT
SEE SHEET 1-D

DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not To Scale)

Natural Ground | 2V | D | 2V | Fill Slope | Min. D = 1.5 Ft.

FROM STA. 10+00 TO 11+57 -L- RT
STA. 11+75 TO 14+00 -L- LT
3 STA. 12+00 TO 14+00 -L- RT

ROEL BRIDGES
DB 244 PG 49

DETAIL
RIP RAP AT EMBANKMENT
(Not To Scale)

Ditch Grade | 1.5 | 3 | 1 | 1

Type of Liner = CLASS 'II' RIP RAP

@ STA. 11+58 -L- RT Est. 12 Tons
@ STA. 11+74 -L- LT Est. 12 Tons

-L-
PI Sta 12+26.40
Δ= 23°12'30.4" (LT)
D = 12°19'18.0"
L = 188.35'
T = 95.49'
R = 465.00'
SE = 0.06 FT/FT
RUNOFF = 113'
CURVE WIDENING = 3'

NOTE: SEE SHEET 5 FOR -L- PROFILE

22-MAR-2005 11:06
K:\roadway\proj\b4040_rdy_psh4.dgn
jl_crawford AT RDO14557

5/14/99

PROJECT REFERENCE NO.	SHEET NO.
B-4040	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

-L-

BEGIN GRADE
-L- STA 10+00.00
EL = 1140.14

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1500 CFS
DESIGN FREQUENCY	= 25 YRS
DESIGN HW ELEVATION	= 1140.60 FT
BASE DISCHARGE	= 2300 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 1141.79 FT
OVERTOPPING DISCHARGE	= 1440 CFS
OVERTOPPING FREQUENCY	= <25 YRS
OVERTOPPING ELEVATION	= 1140.60 FT

PI = 10+50.00
EL = 1139.96'
VC = 100'
K = 79

L=15.95665 (-)0.89256

L=13.39466 (-)0.89256

BELOW RIGHT DITCH
-L- STA 9+90.00
ELEV 1138.58

END RIGHT DITCH
-L- STA 9+80.00
ELEV 1138.43

BELOW RIGHT DITCH
-L- STA 10+40.00
ELEV 1138.83

BELOW LEFT DITCH
-L- STA 11+10.00
ELEV 1139.68

LEFT DITCH
-L- STA 11+60.00
ELEV 1139.50

END LEFT DITCH
-L- STA 11+80.00
ELEV 1140.11

END RIGHT DITCH
-L- STA 9+60.00
ELEV 1138.43

(-)0.89256

(-)0.89256

END RESURFACING
-L- STA 17+68.70
EL = 1170.38

END GRADE
BEGIN RESURFACING
-L- STA 16+92.57
EL = 1161.11

XPI = 15+47.05
EL = 1144.39'
VC = 290'
K = 27

BM#1 8" NAIL IN BASE OF 20" WHITE OAK
STA. -BL- 14+17.28 32.2' LT
N 702118.0000 E 1163988.0000
ELEV.= 1159.03'

BM#2 8" NAIL IN BASE OF 13" BLACK WALNUT
STA. -L- POC 12+26.11 11.3' LT
N 702318.0000 E 1164546.0000
ELEV.= 1138.49'

RIGHT DITCH

LEFT DITCH

BM#3 8" NAIL IN BASE OF 14" TWIN POPLAR
STA. -BY- 13+91.98 49.15' LT
N 702195.0000 E 1165102.0000
ELEV.= 1154.43'

* DESIGN EXCEPTION REQUIRED FOR SAG VERTICAL CURVE K FACTOR AND, STOPPING SIGHT DISTANCE.

SEE SHEET 4 FOR -L- DESIGN

1,170
1,160
1,150
1,140
1,130

10
11
12
13
14
15
16

22-MAR-2005 11:09
i:\roadway\prj\b4040_rdy_pfl.dgn
jl.pratford
All 702115.57

8/23/9

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4040	X-1

11+40.00

0.0498

0.0498

2:1

2:1

DITCH ELEV
1135.00

11+50.00

11+40.00

0.0232

0.0232

2:1

2:1

1:1

DITCH ELEV
1136.20

11+00.00

11+00.00

0.0200

0.0034

VAR.

4:1

2:1

DITCH ELEV
1137.39

10+50.00

10+00.00

Approximate quantities only. Unclassified excavation, borrow excavation, shoulder borrow, fine grading, clearing and grubbing, breaking of exist ng pavement and removal of exist ng pavement will be paid for at the contract lump sum price for "Grading".

22-MAR-2005 11:09
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jlansford
User Name = JLANSFORD

8/23/05

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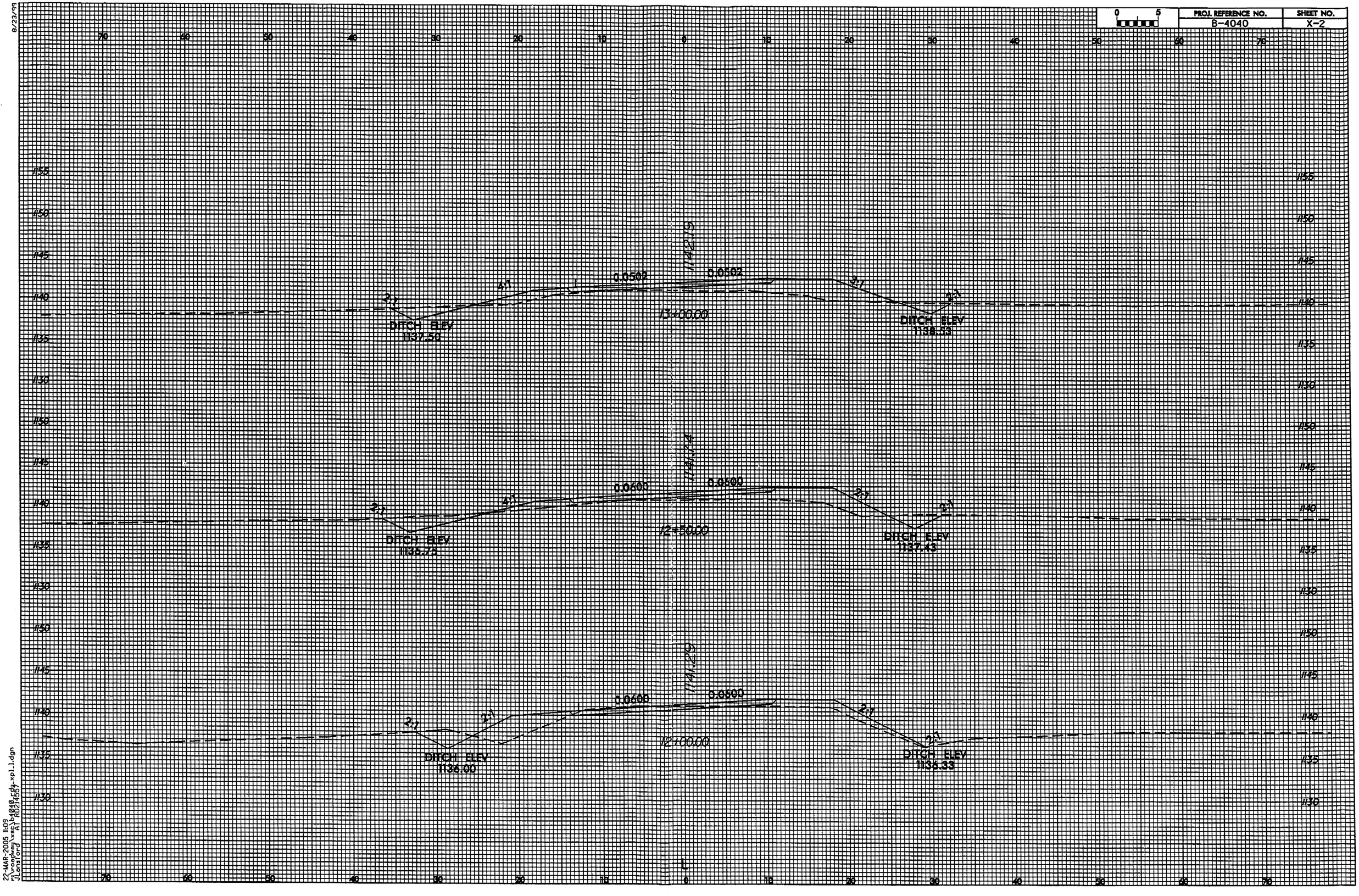
	B-4040	X-2



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rcrowley
Design Files\B4040_rdy_xpl1.dgn
Longford
RD21459

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4040	X-3

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

1155 1150 1145 1140 1135

0.0200 0.0200

2:1 4:1 1141.345 11+50.00 4:1 2:1 1141.345

1142.00

0.0200 0.0039

2:1 4:1 1140.47 11+00.00 4:1 2:1 1140.733

1142.00

0.0236 0.0236

4:1 2:1 DITCH ELEV 1138.99 12+50.00 4:1 2:1 DITCH ELEV 1139.63

22-MAR-2005 11:10
J:\roadway\xss\b4040_fdy_xpl_1.dgn
Lonsford AT 4102145S7

8/23/99

0 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4040	X-4

B-4040 Utility Impact Summary

Site	Station Number	Plan View Permit Drawing	Fill in Surface Water (Natural) Acre	Existing Stream Channel Impacted (Feet) Mitigation	Existing Stream Channel Impacted (Feet) No Mitigation	Temporary Channel Impact (Feet)	Relocated Stream Channel (Feet)	Proposed On-Site Stream Mitigation (Feet)	Stream Channel Loss After On-Site Mitigation	Proposed 2:1 Off-Site Compensatory Stream Mitigation (Feet)
	-L- 11+62		0.002	-	-20		-	-	-	-

The stream impact due to water line installation involves excavation of the bottom of the stream to allow installation of a proposed 8" diameter ductile iron water line. Excavation will be approximately four feet wide and twenty feet in length. The excavated material will be placed back in the stream bed after the proposed water line is installed.

Ecosystem Enhancement PROGRAM

May 31, 2005

Mr. Gregory J. Thorpe, Ph.D.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4040, Bridge 251 over Hall Creek on SR 1128, Burke County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide stream mitigation for the subject project. Based on the information supplied by you in a letter dated April 14, 2005, the impacts are located in CU 03050101 of the Catawba River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

Stream Impacts: 123 feet

As stated in your letter, the subject project is listed in Exhibit 2 of the Memorandum of Agreement 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 dated July 22, 2003. The mitigation for the subject project will be provided in accordance with this agreement.

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-715-1929.

Sincerely,

James B. Stanfill Jr

William D. Gilmore, P.E.
EEP Director

cc: Ms. Angie Pennock, USACE-Asheville
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4040

Ecosystem Enhancement PROGRAM

May 31, 2005

Ms. Angie Pennock
U. S. Army Corps of Engineers
Asheville Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, North Carolina 28801-5006

Dear Ms. Pennock:

Subject: EEP Mitigation Acceptance Letter

B-4040, Replace Bridge 251 over Hall Creek on SR 1128 (Morrison Road), Burke County; Catawba River Basin (Cataloging Unit 03050101); Northern Mountains (NMP) Eco-Region

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) proposes to provide high quality preservation to compensate for the unavoidable 123 feet of warm stream impacts associated with the subject project in the following manner:

Stream Preservation (10:1) in Same Eco-Region

Mingo Tract (Caldwell County) 1,230 feet

The subject TIP project is listed in Exhibit 2 of the Memorandum of Agreement 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 dated July 22, 2003. The compensatory mitigation for the project will be provided in accordance with Section IX, EEP Transition Period, of the Agreement.

If you have any questions or need additional information, please contact Ms. Beth Harmon at (919) 715-1929.

Sincerely,

James B. Stanfill Jr

William D. Gilmore, P.E.
EEP Director

cc: Mr. Phil Harris, Office of Natural Environment, NCDOT
Mr. John Hennessey, Division of Water Quality, Wetlands/401 Unit
File: B-4040

Ecosystem Enhancement PROGRAM

May 31, 2005

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Asheville Regulatory Field Office
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cc: Mr. Phil Harris, Office of Natural Environment, NCDOT
Mr. John Hennessey, Division of Water Quality, Wetlands/401 Unit
File: B-4040

Ecosystem Enhancement PROGRAM

May 31, 2005

Mr. Gregory J. Thorpe, PhD.
Environmental Management Director
Project Development and Environmental Analysis Branch
North Carolina Department of Transportation
1548 Mail Service Center
Raleigh, NC 27699-1548

Dear Dr. Thorpe:

Subject: EEP Mitigation Acceptance Letter:

B-4040, Bridge 251 over Hall Creek on SR 1128, Burke County

The purpose of this letter is to notify you that the Ecosystem Enhancement Program (EEP) will provide stream mitigation for the subject project. Based on the information supplied by you in a letter dated April 14, 2005, the impacts are located in CU 03050101 of the Catawba River Basin in the Northern Mountains (NM) Eco-Region, and are as follows:

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Sincerely,

James B. Stanfill for

William D. Gilmore, P.E.
EEP Director

cc: Ms. Angie Pennock, USACE-Asheville
Mr. John Hennessy, Division of Water Quality, Wetlands/401 Unit
File: B-4040

REPLACE BRIDGE NUMBER 251 ON SR 1128
OVER HALL CREEK
BURKE COUNTY, NORTH CAROLINA

TIP NUMBER B-4040
STATE CONTRACT NUMBER A303718
STATE WORK ORDER NUMBER 8.2852801

NATURAL RESOURCES TECHNICAL REPORT
B-4040

PREPARED FOR:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS BRANCH

FEBRUARY 2002

REPLACE BRIDGE NUMBER 251 ON SR 1128
OVER HALL CREEK
BURKE COUNTY, NORTH CAROLINA

TIP NUMBER B-4040
STATE CONTRACT NUMBER A303718
STATE WORK ORDER NUMBER 8.2852801

NATURAL RESOURCES TECHNICAL REPORT
B-4040

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1.0 INTRODUCTION

The following Natural Resources Technical Report is submitted to assist in the preparation of a Categorical Exclusion (CE) for the proposed project. The purpose of this report is to inventory and describe the natural resources which occur within the proposed right-of-way boundaries and which have a probability of being impacted by the proposed action. Assessments of the nature and severity of probable impacts to these natural resources are provided, along with recommendations for measures that will minimize resource impacts.

This report identifies areas of particular environmental concerns that may affect the selection of a preferred alignment or may necessitate changes in design criteria. Such environmental concerns should be addressed during the preliminary planning stages of the proposed project in order to maintain environmental quality in the most efficient and effective manner. The analyses contained in this document are relevant only in the context of the existing preliminary boundaries and design. If design parameters and criteria change, additional field investigations may be necessary.

1.1 Project Description

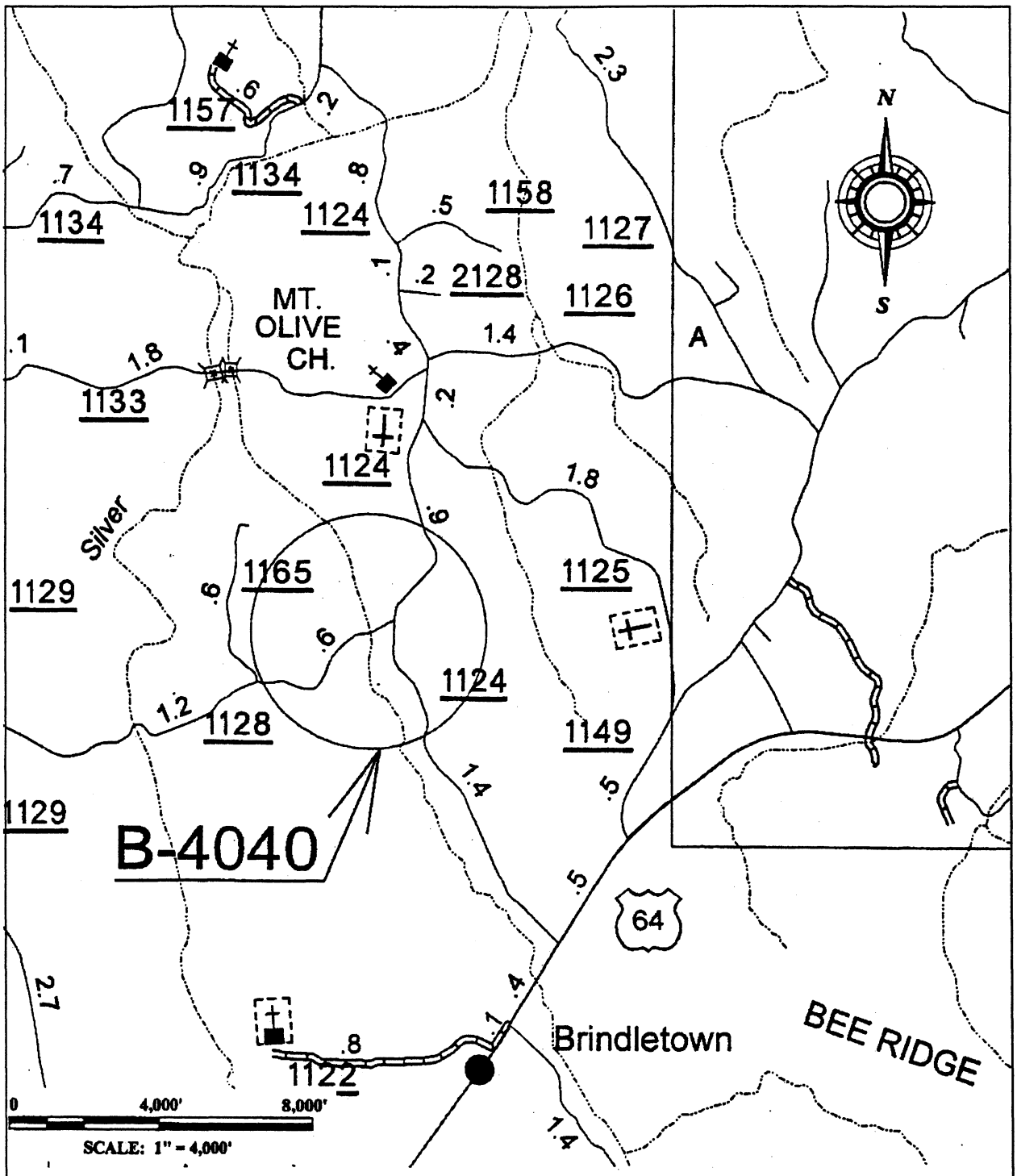
The project calls for the replacement of Bridge Number 251 on SR 1128 in Burke County, North Carolina. The proposed project crosses Hall Creek approximately 1.8 miles (2.9 kilometers) north of the community of Brindletown (Figure 1).

1.2 Methodology

Research was conducted prior to the field investigations. Published resource information pertaining to the project area was collected and reviewed. Resources utilized in this preliminary investigation of the project area include:

- U.S. Geological Survey (USGS) Glen Alpine 7.5–minute topographic quadrangle map.
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) map for Glen Alpine 7.5–minute quadrangle (1995).
- North Carolina Department of Transportation (NCDOT) aerial photographs of the project area (1:1,200 scale).
- U.S. Department of Agriculture, Natural Resources Conservation Service provisional soil survey of Burke County, North Carolina (unpublished).
- U.S. Environmental Protection Agency Water Discharges and RCRA Map accessed via EPA's EnviroMapper Program (September 2001).

Water research information was obtained from publications of the North Carolina Department of Environment and Natural Resources (NCDENR, 1999; 2000, 2001). Information concerning the occurrence of federal and state protected species in the project area was obtained from the U.S. Fish and Wildlife Service list of protected and candidate species (3 March 2001) and from the North Carolina Natural Heritage Program (NCNHP) database of rare species and unique habitats (NCNHP, 2001).



SITE VICINITY MAP
SR 1128 BRIDGE REPLACEMENT
OVER HALL CREEK (TIP B-4040)
BURKE COUNTY, NORTH CAROLINA
(Excerpted from NCDOT County Highway Map, 2000)

FIGURE 1

NCNHP files were reviewed for documented occurrences of state-listed or federal-listed species. USFWS Recovery Plans for federal-listed species were reviewed, where applicable.

Environmental scientists on the staff of HSMM, Inc. conducted a field investigation of natural resources within the project area on 18 July 2001. Qualifications of environmental scientists who conducted the field investigations are provided in Appendix B. Water resources were identified and categorized, and their physical characteristics were documented while in the field. Plant communities and their associated wildlife were also identified and documented. The *Classification of Natural Communities of North Carolina, Third Approximation* (Schafale and Weakley, 1990) was used to classify plant communities, where possible. Plant taxonomy was based primarily upon the *Manual of the Vascular Flora of the Carolinas* (Radford, et al., 1968). Animal taxonomy was based primarily upon *Amphibians and Reptiles of the Carolinas and Virginia* (Martof, et al., 1980), *Freshwater Fishes of the Carolinas, Virginia, Maryland, and Delaware* (Rohde, et al., 1994), *Birds of the Carolinas* (Potter, et al., 1980), and *Mammals of the Carolinas, Virginia, and Maryland* (Webster, et al., 1985).

Approximate boundaries of major vegetation communities were mapped while in the field utilizing aerial photography of the project area. Wildlife identification involved active searching of known or suspected species, incidental visual observations, incidental auditory indicators (such as birdsong and other sounds), and secondary indicators of species presence or site utilization (such as scat, tracks, and burrows). Predictions regarding wildlife community composition were supplemented utilizing a general qualitative habitat assessment based on existing vegetation communities and aquatic habitat.

Wetlands subject to regulation by the Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 were identified and delineated according to methods prescribed in the 1987 *Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1)* and the Corps' 6 March 1992 guidance document titled *Clarification and Interpretation of the 1987 Manual.* Values of wetlands delineated were assessed utilizing the *Guidance for Rating the Values of Wetlands in North Carolina* (NCDEHNR, 1995). Wetland types were classified based on the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al., 1979). Wetland boundaries were surveyed and recorded in the field using Global Positioning Satellite (GPS) survey methods.

1.3 Terminology and Definitions

For the purpose of this document, the following terms are used concerning the limits of natural resources investigations:

- Project area – denotes the area bound by the proposed right-of-way limits along the full length of the project alignment.
- Project vicinity – denotes an area extending 0.6 mile (1.0 kilometer) on all sides of the project area.
- Project region – denotes an area equivalent in size to the area represented by a 7.5-minute USGS quadrangle map (i.e., 60.8 square miles or 157.5 square kilometers).

2.0 PHYSICAL RESOURCES

Soil and water resources that occur in the project area are discussed below with respect to possible environmental concerns. Soil properties and site topography can significantly influence the potential for soil erosion and compaction, along with other possible construction limitations or management concerns. Water resources within the project area present important management limitations due to the need to regulate water movement and the increased potential for water quality degradation. Excessive soil disturbance resulting from construction activities can potentially alter both the flow and the quality of the water resources, potentially limiting downstream uses. In addition, soil characteristics and the availability of water directly influence the composition and distribution of flora and fauna in biotic communities, thus affecting the characteristics of these resources.

2.1 Regional Characteristics

Burke County lies in the Blue Ridge (Southern Appalachian Mountains) Physiographic Province of western North Carolina. The county encompasses 511 square miles (1,324 square kilometers) and is primarily rural. The county ranges in elevation from approximately 935 feet (285 meters) mean sea level (msl) where the Catawba River flows into Catawba County to 4,350 feet (1,326 meters) msl. Elevations within the project area range from approximately 1,140 to 1,180 feet (347 to 360 meters) msl, with the stream bed near the bridge lying at approximately 1,140 feet (347 meters) msl.

Hall Creek is located within the upper portion of the Catawba River drainage basin. The headwaters of the Catawba River and its tributaries are located within the mountain physiographic region. This river basin originates on the eastern side of the Blue Ridge Mountains and flows towards the North Carolina – South Carolina border near Charlotte, North Carolina. The Catawba River basin, along with the adjoining Broad River basin, forms the headwaters of the Santee-Cooper River system, which flows through South Carolina to the Atlantic Ocean. The Catawba River basin encompasses all of Burke and Catawba Counties, as well as portions of Alexander, Avery, Caldwell, Gaston, Iredell, Lincoln, McDowell, Mecklenburg, Union, and Watauga Counties. There are 58 municipalities located in the Catawba River basin, with several areas of the basin being classified for water supply use. Over 45 percent of the land in the Catawba River basin is covered in forest (NCDENR, 1999, 2001).

2.2 Soils

The portion of Burke County within the project area (NRCS map panel B-9) has been mapped by NRCS under the currently provisional (unpublished) soil survey. Official soil series descriptions were also obtained by the NRCS (USDA: http://www.statlab.iastate.edu/soils/osd). A brief description of unofficial soil types mapped by NRCS and/or observed during field investigation is as follows:

- Fluvaquents-Udifluvents complex along the stream bed (unmapped by NRCS but observed during field investigation).

- Unison fine sandy loam (2 to 8 and 8 to 15 percent slopes) (UnB, UnC). This unit is a very deep and

well-drained soil. It occurs on mountain footslopes, alluvial fans, or stream terraces. The permeability of Unison soils is moderate and the rate of runoff is moderate to rapid. The A horizon of Unison soils consists of up to 9.0 inches (23 centimeters) of brown (7.5YR4/4) friable loam with moderate acidity. Unison fine sandy loam underlies steeper slopes within the easternmost and westernmost portions of the project area. This soil unit is classified as non-hydric (USDA, 1996, 1999).

- Arkaqua loam (0 to 2 percent slopes) (AaA). This unit is somewhat poorly drained and exhibits moderate permeability. Runoff is slow. Arkaqua soils occur on nearly level floodplains along creeks and rivers in the Appalachian, Blue Ridge, and Great Smokey Mountains. They formed in alluvial sediments washed largely from soils formed in residuum from granite, gneiss, schist, phyllite, and other metamorphic and crystalline rocks. The A horizon of Arkaqua soils consists of up to 9.0 inches (23 centimeters) of dark brown (10YR4/3) friable loam with medium acidity. Arkaqua loam underlies the floodplain along Hall Creek and adjoining gently sloping land surfaces. This soil unit is not listed as a hydric soil of Burke County; however, it is listed as a soil unit that typically contains inclusions of Hatboro hydric soils (USDA, 1996, 1999).

2.3 Water Resources

This section contains information concerning surface water resources likely to be impacted by the proposed project. Water resource assessments include the physical characteristics, best usage standards, and water quality aspects of water resources, along with their relationship to major regional drainage systems. Probable impacts to surface water resources are also discussed, as are means to minimize impacts.

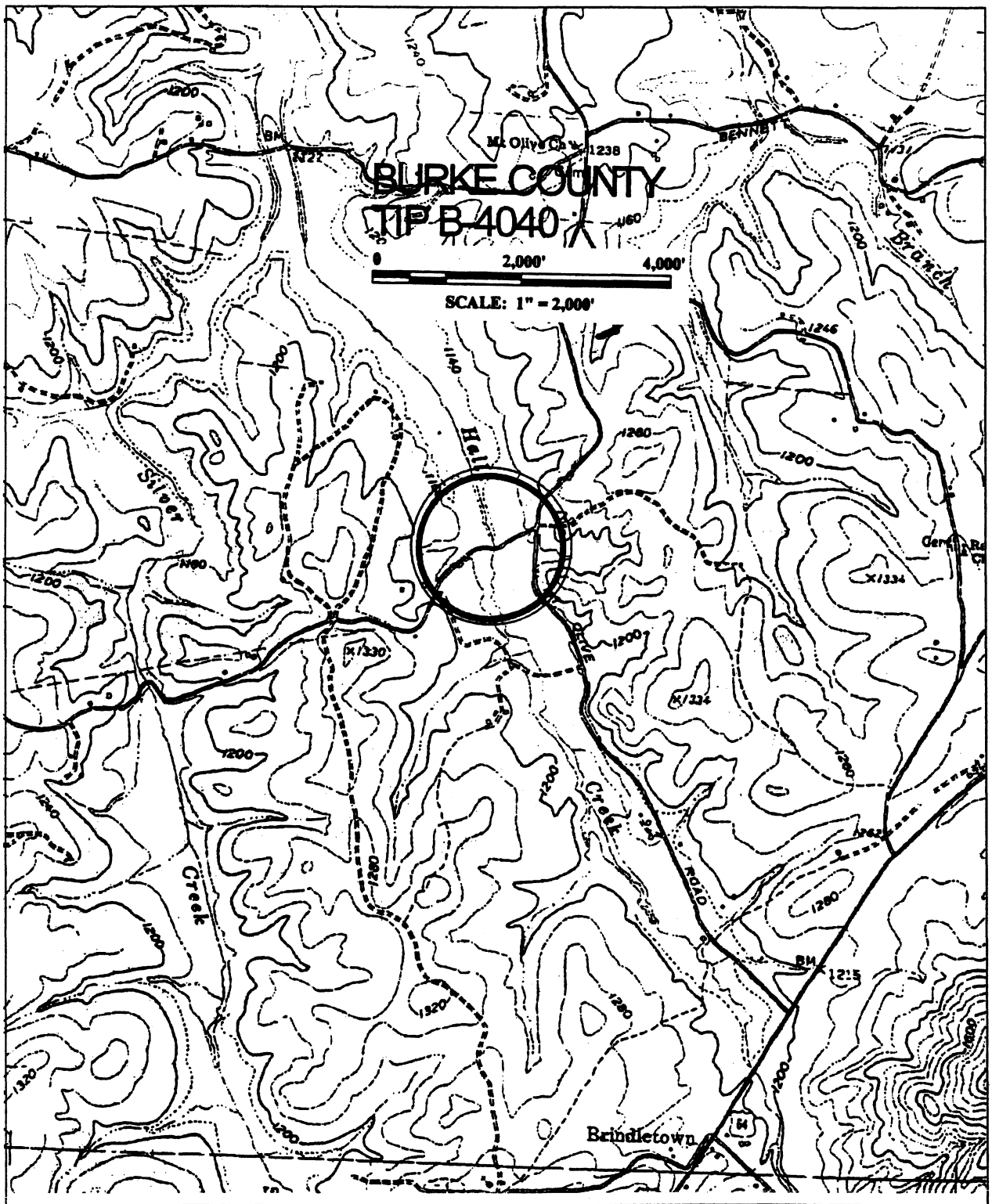
A perennial stream, Hall Creek, comprises the single water resource within the project area (Figure 2). Hall Creek is located within the Catawba River drainage basin. The Catawba River basin is the eighth largest river basin in North Carolina, encompassing 3,279 square miles (8,493 square kilometers).

Under the federal system for cataloging drainage basins, the drainage basin containing the project area is designated as USGS Hydrologic Unit 03050101 (the Upper Catawba drainage basin). Under the North Carolina DWQ system for cataloging drainage basins, the drainage basin containing the project area is designated as Subbasin 03-08-31 (the Warrior Fork, Johns River, and Rhodhiss Lake Subbasin).

2.3.1 Best Usage Classification

Streams and rivers have been assigned a best usage classification by the North Carolina Division of Water Quality (DWQ). The assigned best usage classification reflects water quality conditions and potential resource usage. Unnamed tributaries receive the same classification as the named streams to which they flow.

The single water resource located in the project area, Hall Creek, is designated as DWQ Stream Index Number 11-34-2. Hall Creek in the project vicinity has been assigned a primary water resource classification of "C". Class "C" refers to waters that are protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture, and other uses found suitable for Class "C" waters.



WATER RESOURCES AND PHYSIOGRAPHY OF THE REGION
SR 1128 BRIDGE REPLACEMENT
OVER HALL CREEK (TIP B-4040)
BURKE COUNTY, NORTH CAROLINA
(Excerpted from USGS Glen Alpine 7.5-minute Quadrangle, 1995)

FIGURE 2

Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development or types of discharges in Class "C" waters.

No surface waters classified as High Quality Water (HQW), Water Supplies (WS-I or WS-II), or Outstanding Resource Waters (ORW) occur within 0.6 mile (1.0 kilometer) of the project area. These findings are based on review of the most recently updated state-maintained databases as made available through the date of preparation of this report.

2.3.2 Physical Characteristics of the Stream and Surface Waters

As previously discussed, Hall Creek comprises the single water resource within the project area. The proposed project crosses Hall Creek on SR 1128 approximately 1.8 miles (2.9 kilometers) north of the community of Brindletown. Hall Creek ranges in width from approximately 10 feet (3.0 meters) to 15 feet (4.6 meters) within the project area. Observed depths at the time of field investigation ranged from several inches (several centimeters) in weakly defined riffles to approximately 2.0 feet (0.6 meters) in pools. The average water depth of the creek was estimated at 0.8 foot (0.2 meter). Water levels appeared to be at or near the ordinarily high water level at the time of investigation.

The substrate of Hall Creek in the project area is comprised of sediments ranging in size from fine sand to cobbles. The portion of Hall Creek downstream of the existing bridge is relatively straight and featureless. Looking upstream, the portion of Hall Creek approximately 50 feet (15 meters) upstream of the bridge makes a relatively gentle meander to the right. This portion of the stream exhibits a shallow scour-pool that appears to be the result of stream pumping for irrigation of nearby fields. A plastic 2.0 inch (5.1 centimeters) pipe was observed extending into the scour pool at the time of field investigation. The stream channel exhibits steep banks and is comprised largely of runs. Where present, the weakly defined riffles are not as wide as the stream and their length is less than twice the width of the stream. No sand bars or major channel meanders are present.

The stream banks, although relatively steep, are well-vegetated with a diverse assemblage of trees, shrubs, and herbs and, as a result, they exhibit indicators of low erosion. The riparian vegetation zone ranges from 20 to 40 feet (6.1 to 12 meters) in width throughout most of the project area; however, breaks are present along the left bank just downstream of the bridge and where the stream flows through the right-of-way. Vertical bridge abutments laterally confine the stream below the existing bridge. Localized bank erosion was observed in the vicinity of the bridge abutments at the time of field investigation. The stream banks are comprised of unconsolidated poorly sorted sediments of primarily alluvial origin and, to a lesser degree, colluvial origin.

2.3.3 Water Quality

This section describes the quality of water resources within the project area. Potential sediment loads and toxin concentrations of these waters from both point and nonpoint sources are evaluated. Water quality assessments are made based on published resource information and existing general watershed characteristics. This data provides insight into the value of the water resources within the project area with

respect to their ability to meet human needs and to provide suitable habitat for aquatic organisms

2.3.3.1 Biological Monitoring

The Basinwide Monitoring Program, managed by the DWQ, is part of an ongoing ambient water quality monitoring program that addresses long term trends in water quality. The program monitors ambient water quality by sampling at fixed sites for selected benthic macroinvertebrate organisms that are sensitive to water quality conditions. Samples are evaluated on the number of taxa of intolerant groups (Ephemeroptera, Plecoptera, Tricoptera or "EPT") present and a taxa richness value (EPT S) is calculated. A biotic index value that summarizes tolerance data for all species in each collection is also calculated for the sample. The two rankings are given equal weight in final site classification. The biotic index and EPT taxa richness values primarily reflect the effects of chemical pollution and are a poor measure of the effects of such physical pollutants as sediment.

No previously monitored or presently monitored benthic monitoring stations exist on Hall Creek within the project area or upstream of the project within the project vicinity.

2.3.3.2 Point and Nonpoint Source Discharges

Point source discharge is defined as "any discharge that enters surface waters through a pipe, ditch, or any other well-defined point" (NCDEHNR, 1993). The term commonly refers to discharges associated with wastewater treatment plants. Discharges from stormwater collection systems at industrial sites and in large urban areas are also considered point source discharges. Point source discharges within North Carolina are regulated through the National Pollutant Discharge Elimination System (NPDES) program. Any point source discharger is required to apply for a permit.

No registered point discharges are located within 1.0 mile (1.6 kilometers) of the project area (EPA, 2001). The City of Morganton WTP (NPDES Permit Number NC0060194) and Case Farms – B&L (NPDES Permit Number NCG060115) are registered point discharge sources located on the Catawba River approximately 7.2 miles (12 kilometers) upstream and northeast of the project area. The City of Morganton WTP facility is identified as a minor and non-municipal process water treatment plant. The industry class applied to the discharge is identified as "X" (an industry that has not been categorized under EPA's Effluent Limitation Guidelines). Case Farms – B&L is identified as a private prepared animal feed facility. The industry class applied to the discharge is identified as "R" (an industry that has been categorized under EPA's Effluent Limitation Guidelines, but is not considered a primary industry). No violations appear on record for either facility (EPA, 2001).

Nonpoint source discharge refers to runoff that enters surface waters through stormwater or snowmelt (NCDEHNR, 1993). Agricultural activities may serve as a source for various forms of nonpoint source pollutants. Land clearing and plowing disturbs soils to a degree where they are susceptible to erosion, which can lead to sedimentation in streams. Sediment is the most widespread cause of nonpoint sources pollution in North Carolina (NCDEHNR, 1993). Pesticides, chemical fertilizers, and land application of animal waste can be transported to receiving streams and waterways via runoff - potentially elevating concentrations of toxic compounds and nutrients. Animal wastes can also be the source of

bacterial contamination and can elevate the biochemical oxygen demand (BOD). Drainage ditches on poorly drained soils can contribute to the influence of stormwater pollutants into surface waters (NCDEHNR, 1993).

Under the NC Unified Watershed Assessment (UWA) program, the Upper Catawba River Hydrologic Unit (03050101), within which the project area is located, is classified by DWQ as a UWA Category "II" watershed for nonpoint source pollution. Under this classification, the watershed is identified as a watershed "meeting goals, including those needing action to sustain water quality" (NCDENR, 2000). Currently, Lower Creek is the only 303(d) waters (high priority restoration waters) listed within Subbasin 03-08-31 (NCDENR, 1999, 2000). Lower Creek is located approximately 10 miles (16 kilometers) downstream of the project area.

2.4 Summary of Anticipated Water Quality Impacts

Impacts to water resources in the project area are likely to result from activities associated with project construction. Activities likely to result in impacts consist of clearing and grubbing along stream banks, removal of riparian canopy, instream construction, use of fertilizers and pesticides as part of revegetation operations, and installation of pavement. The following impacts to surface water resources are likely to result from the aforementioned construction activities:

- Short-term increases in sedimentation and siltation downstream of the crossing associated with increased erosion potential in the project area during and immediately following construction.
- Short-term changes in incident light levels and turbidity due to increased sedimentation rates and vegetation removal.
- Short-term alteration of water levels and flows due to interruptions and/or additions of surface water and groundwater during construction.
- Short-term increases in nutrient loading during construction via runoff from temporarily exposed land surfaces.
- A short-term increase in the potential for the release of toxic compounds (such as petroleum products) from construction equipment and other vehicles.
- Changes in and possible destabilization of water temperature regimes due to removal of vegetation within or overhanging the watercourse.
- Increased concentrations of pollutants typically associated within roadway runoff.

To minimize potential impacts to water resources in and downstream of the project area, NCDOT's 1997 *Best Management Practices for the Protection of Surface Waters* (NCDOT, 1997) will be strictly enforced during the construction phase of the project. Means to minimize impacts will include (1) utilizing construction methods that will limit instream activities as much as practicable, (2) restoring the stream bed as needed, and (3) revegetating stream banks immediately following the completion of grading. Because the project is located in a North Carolina Wildlife Resources Commission (NCWRC) trout county, the NCWRC may require a moratorium for instream construction from November to March.

3.0 BIOTIC RESOURCES

This section describes the biotic communities observed within the project area, as well as the basic relationships between flora and fauna within these communities. Biotic resources assessed as part of this investigation include discernable terrestrial and aquatic communities. The composition and distribution of biotic communities within the project area are a function of topography, soils, hydrology, and past and present land uses.

Terrestrial systems are discussed primarily from the perspective of dominant plant communities and are classified in accordance with the *Classification of Natural Communities of North Carolina: Third Approximation* (Schafale and Weakley, 1990) where applicable. Representative animal species likely to inhabit or utilize biotic communities of the project area (based on published range distributions) are also discussed. Species observed during field investigation are listed.

3.1 Biotic Communities

Boundaries between contiguous biotic communities are gradational in certain portions of the project area, making boundaries sometimes difficult to delineate. Five discernable terrestrial communities are located within the project area (Figure 3). Four of these communities have been altered to the extent that they cannot be classified as a natural vegetation community under the *Classification of Natural Communities of North Carolina*. These altered communities consist of: (1) altered right-of-way communities, (2) cropland, (3) pastureland, and (4) successional sapling and scrub/shrub communities interspersed with open fields. One community within the project area retains enough of its natural characteristics to be classified under the *Classification of Natural Communities of North Carolina.* This natural community consists of a Piedmont/Mountain Bottomland Forest along Hall Creek. In addition to the aforementioned terrestrial components, the aquatic community associated with Hall Creek was assessed within the project area.

3.1.1 Altered Right-of-Way Communities

These communities are located along the right-of-way bordering on SR 1128 and SR 1124 (Communities No. 1 of Figure 3). Vegetation within these areas has been maintained in an early succession through mechanical and possibly chemical vegetation management practices. It is estimated that 0.5 acre (0.2 hectare) of this community exists within the project area.

No woody plant species were observed at the time of site investigation within altered rights-of-way communities of the project area. Dominant herbaceous species observed at the time of site investigation include common ragweed (*Ambrosia artemisiifolia*), man-root (*Ipomoea pandurata*), bitter nightshade (*Solanum dulcamara*), common plantain (*Plantago major*), common chickweed (*Stellaria media*), dandelion (*Taraxacum officinale*), red clover (*Trifolium pratense*), white clover (*Trifolium repens*), crab grass (*Digitaria sanguinalis*), Queen Anne's lace (*Daucus carota*), goldenrod (*Solidago* sp.), aster (*Aster* sp.), common milkweed (*Asclepias syriaca*), and unidentified grasses (Poaceae). Dominant vine species observed at the time of site investigation include tick-trefoil (*Desmodium nudiflorum*) and trumpet creeper (*Campsis radicans*).

B-4040

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LEGEND

1 ALTERED RIGHT-OF-WAY
2 CROPLAND
3 PASTURELAND
4 SUCCESSIONAL SAPLING AND SCRUB/SHRUB COMMUNITIES INTERSPERSED WITH OPEN FIELD
5 PIEDMONT/MOUNTAIN BOTTOMLAND FOREST (WITH DISCONTINUOUS WETLAND FRINGE ALONG RIVER)
6 AQUATIC HABITAT

SCALE: 1" = 100' (1" = 30.5 m)

BIOTIC COMMUNITIES
OF THE B-4040 PROJECT AREA

FIGURE 3

3.1.2 Cropland

These communities consist of a recently harvested hay field in the northwest quadrant, a fallow hay field in the northeast quadrant, and a small recently tilled field in the southeast quadrant of the project area (Communities No. 2 of Figure 3). These communities occur on gently to moderately sloping land surfaces and are largely underlain by Arkaqua loams adjacent to a relatively narrow floodplain terrace, which separates the croplands from Hall Creek. It is estimated that 1.8 acres (0.7 hectare) of this community type exist within the project area.

The hay field appears to have been planted with tall fescue (*Festuca* sp.) and possibly some red clover (*Trifolium pratense*). Other pioneer or opportunistic species observed in and around the edges of the cropland at the time of field investigation include blackberry (*Rubus* sp.), Queen Anne's lace (*Daucus carota*), frost aster (*Aster pilosus*), goldenrod (*Solidago* sp.), bitter nightshade (*Solanum dulcamara*), thistle (*Carduus altissimus*), common milkweed (*Asclepias syriaca*), redtop (*Agrostis stolonifera*), wild onion (*Allium canadense*), daisy fleabane (*Erigeron annuus*), man-root (*Ipomoea pandurata*), pokeweed (*Phytolacca americana*), unidentified grasses (Poaceae), and poison ivy (*Toxicodendron radicans*).

3.1.3 Pastureland

This community occurs as an active pasture in the southeast quadrant of the project area (Community No. 3 of Figure 3). It is estimated that 2.3 acres (0.9 hectare) of this community exist within the project area.

At the time of field investigation, horses were grazing in the pasture. Species observed in the active pasture at the time of field investigation include blackberry (*Rubus* sp.), knotweed (*Polygonum persicaria*), Queen Anne's lace (*Daucus carota*), buttercups (*Ranunculus abortivus*), frost aster (*Aster pilosus*), goldenrod (*Solidago* sp.), bitter nightshade (*Solanum dulcamara*), thistle (*Carduus altissimus*), common milkweed (*Asclepias syriaca*), redtop (*Agrostis stolonifera*), wild onion (*Allium canadense*), daisy fleabane (*Erigeron annuus*), man-root (*Ipomoea pandurata*), pokeweed (*Phytolacca americana*), unidentified grasses (Poaceae), and poison ivy (*Toxicodendron radicans*).

3.1.4 Scrub/Shrub Communities Interspersed With Open Fields

These communities occur in the northwest and southwest quadrants of the project area, outside the state right-of-way and the floodplain of Hall Creek (Communities No. 4 of Figure 3). The community in the southwest quadrant appears to be highly altered remnants of a once-larger natural forested community. Well-drained Unison fine sandy loams exhibiting relatively high chromas and less well-drained Arkaqua loams exhibiting relatively high chromas underlie of these communities. It is estimated that 0.9 acre (0.4 hectare) of this community exists within the project area.

The scrub/shrub communities, as mapped, support only several mature trees. Dominant tree and sapling species observed at the time of site investigation include red maple (*Acer rubrum*), sycamore (*Platanus occidentalis*), black walnut (*Juglans nigra*), tulip tree (*Liriodendron tulipifera*), river birch (*Betula*

nigra), scrub pine (*Pinus virginiana*), sweetgum saplings (*Liquidambar styraciflua*), ash saplings (*Fraxinus* sp.), yellow buckeye saplings (*Aesculus flava*), black willow (*Salix nigra*), and black cherry (*Prunus serotina*). Dominant shrub species observed at the time of site investigation include smooth sumac (*Rhus glabra*), blackberry (*Rubus allegheniensis*), elderberry (*Sambucus canadensis*), and multiflora rose (*Rosa multiflora*). Dominant herbaceous species observed at the time of site investigation include giant cane (*Arundinaria gigantea*), red clover (*Trifolium pratense*), violets (*Viola* sp.), Queen Anne's lace (*Daucus carota*), Curtis' goldenrod (*Solidago curtisii*), goldenrod (*Solidago* sp.), aster (*Aster* sp.), common milkweed (*Asclepias syriaca*), Japanese knotweed (*Polygonum cuspidatum*), Joe-pye-weed (*Eupatorium fistulosum*), and unidentified grasses (Poaceae). Dominant vine species observed at the time of site investigation include tick-trefoil (*Desmodium nudiflorum*), poison ivy (*Toxicodendron radicans*), Japanese honeysuckle (*Lonicera japonica*), common greenbrier (*Smilax rotundifolia*), and riverside grape (*Vitis riparia*).

3.1.5 Piedmont/Mountain Bottomland Forest

These communities (Communities No. 5 of Figure 3) occur along the banks and floodplain of Hall Creek in all quadrants. It is estimated that 0.5 acre (0.2 hectare) of this community exists within the project area. The Piedmont/Mountain Bottomland Forest occurs upon a gently sloping floodplain terrace perched approximately 2.5 to 4.5 feet (0.8 to 1.4 meters) above the stream bed. The terrace is largely underlain by somewhat poorly drained Arkaqua loams exhibiting relatively high chromas. However, where poorly drained conditions or semi-permanent flooding prevail, hydric soil inclusions (possible Hatboro inclusions) are observed. Portions of the Piedmont/Mountain Bottomland Forest underlain by these hydric soils have been mapped as wetlands and are discussed below and in section 4.1 of this report.

Dominant tree species observed within the Piedmont/Mountain Bottomland Forest at the time of site investigation include sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), black walnut (*Juglans nigra*), hickory saplings (*Carya* sp.), and Indian cigar tree (*Catalpa* sp.). Dominant sapling and shrub species observed at the time of site investigation include fire cherry (*Prunus pensylvanica*), tag alder (*Alnus serrulata*), spicebush (*Lindera benzoin*), multiflora rose (*Rosa multiflora*), flowering dogwood (*Cornus florida*), and blackberry (*Rubus* sp.). Dominant herbaceous species observed at the time of site investigation include giant cane (*Arundinaria gigantea*), agrimony (*Agrimonia parviflora*), violets (*Viola* sp.), Curtis' goldenrod (*Solidago curtisii*), joint head (*Arthraxon hispidus*), bracken (*Pteridium aquilinum*), and Joe-pye-weed (*Eupatorium fistulosum*). Dominant vine species observed at the time of site investigation include Japanese honeysuckle (*Lonicera japonica*), riverside grape (*Vitis riparia*), poison ivy (*Toxicodendron radicans*), tick-trefoil (*Desmodium nudiflorum*), Virginia creeper (*Parthenocissus quinquefolia*), and common greenbrier (*Smilax rotundifolia*).

Wetlands Component: The Piedmont/Mountain Bottomland Forest contains several narrow bands of wetlands that are generally less than 3.0 feet (0.9 meter) wide within the project area. These bands of wetlands occur along the lower and middle stream banks of Hall Creek. These wetland bands are dominated by hydrophytic vegetation including black willow saplings (*Salix nigra*), sandbar willow (*Salix exigua*), river birch saplings (*Betula nigra*), tag alder (*Alnus serrulata*), multiflora rose (*Rosa multiflora*), elderberry (*Sambucus canadensis*), orange jewelweed (*Impatiens capensis*), creeping grass

(*Microstegium vimineum*), joint head (*Arthraxon hispidus*), rice cutgrass (*Leersia oryzoides*), boneset (*Eupatorium perfoliatum*), dotted smartweed (*Polygonum punctatum*), bur-reed (*Sparganium americanum*), clearweed (*Pilea pumila*), riverside grape (*Vitis riparia*), honeysuckle (*Lonicera japonica*), and poison ivy (*Toxicodendron radicans*). The soils within the wetland areas are comprised of low-chroma fine sandy loams that were saturated within the upper 12 inches (30 centimeters) at the time of field investigation. The wetlands also exhibited sediment deposits, water-stained leaf litter, and drift lines.

3.1.6 Terrestrial Fauna of the Project Area

Most of the communities within the project vicinity have been altered or affected by man's activities to varying degrees. Due to forest tract fragmentation common to the project region, species that require large contiguous tracts of forests are not likely to utilize the site on a normal basis. Certain opportunistic wildlife species, such as woodchuck (*Marmota monax*) can be expected to utilize edge habitat present within the project area. Due to the relatively small size of the project area and the fact that many wildlife species are capable of moving between and/or utilizing adjoining communities, no distinct terrestrial wildlife habitat can be assigned to any one terrestrial plant community within the project area.

The eastern cottontail rabbit (*Sylvilagus floridanus*) and the eastern harvest mouse (*Reithrodontomys humulis*) were the only mammals observed in the project vicinity at the time of field investigation. However, sign for the following mammals were observed: tracks of white-tailed deer (*Odocoileus virginianus*), and tracks and scat of raccoon (*Procyon lotor*). Although not observed, other mammals common to the project region which can be expected to periodically utilize habitat of the project area include: Virginia opossum (*Didelphis virginiana*), shrews and moles (Insectivora), gray squirrel (*Sciurus carolinensis*), beaver (*Castor canadensis*), white-footed mouse (*Peromyscus leucopus*), golden mouse (*Ochrotomys nuttalli*), hispid cotton rat (*Sigmodon hispidus*), eastern woodrat (*Neotoma floridana*), meadow vole (*Microtus pennsylvanicus*), woodland vole (*Microtus pinetorum*), muskrat (*Ondatra zibethicus*), black rat (*Rattus rattus*), Norway rat (*Rattus norvegicus*), house mouse (*Mus musculus*), meadow jumping mouse (*Zapus hudsonius*), woodland jumping mouse (*Napaeozapus insignis*), red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), long-tailed weasel (*Mustela frenata*), eastern spotted skunk (*Spilogale putorius*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*).

The communities within the project area provide limited but suitable habitat and forage areas for a variety of birds. Birds observed at the time of field investigation include turkey vulture (*Cathartes aura*), American robin (*Turdus migratorius*), mockingbird (*Mimus polyglottos*), cardinal (*Cardinalis cardinalis*), and mourning dove (*Zenaida macroura*). Songs and/or calls of the following birds were also noted within the project vicinity at the time of field investigation: eastern meadowlark (*Sturnella magna*), Carolina chickadee (*Parus carolinensis*), tufted titmouse (*Parus bicolor*), and bobwhite (*Colinus virginianus*). A wide variety of resident and migratory songbirds can be expected to periodically utilize forested tracts immediately to the south of the project area. The open landscaped areas and the croplands within the project vicinity provide probable hunting grounds for birds of prey, such as hawks and owls.

No reptiles or amphibians were observed within the project area at the time of field investigation. A variety of reptile and amphibian species may, however, use the communities located in the project area.

These animals include the rat snake (*Elaphe obsoleta*), eastern box turtle (*Terrapene carolina*), five-lined skink (*Eumeces fasciatus*), two-lined salamander (*Eurycea bislineata*), pickerel frog (*Rana palustris*), and American toad (*Bufo americanus*). Fish species are discussed in following sections. Terrestrial insects observed in the project area include organpipe mud daubers (*Tryploxylon* sp.), wolf spiders (Lycosidae), June beetles (*Phyllophaga fervida*), bumblebees (Bombini), honeybees (Apini), and West Virginia white butterflies (*Lycaena phlaeas*).

3.1.7 Aquatic Community

The aquatic community of the project area consists of Hall Creek below the ordinary high water line. As previously discussed, Hall Creek ranges in width from approximately 10 to 15 feet (3.0 to 4.6 meters) within the project area. Dominant aquatic habitats within this section of Hall Creek include cobble/boulder substrate and snags. The stream within the project area is characterized by a weakly defined riffle and run sequence. The riffles are not as wide as the stream and their length is less than twice the width of the stream. Gravel and cobble substrate was 20 to 40 percent embedded on the day of investigation. Pools are infrequent (comprising less than 30 percent of the project area stream bed) and are present in a variety of sizes. A forested riparian zone 20 to 40 feet (6.0 to 12 meters) wide is present within all portions of the project area, except in the northeast quadrant, where croplands extend within several feet of the stream bank. Breaks in the riparian vegetation zone exist at the bridge and localized eroded areas are present.

3.1.7.1 Flora

With the exception of several bur-reed plants immediately upstream of the existing bridge, no aquatic vegetation was observed below the ordinary high water line of Hall Creek at the time of field investigation. A narrow band (generally less than 3.0 feet (0.9 meter) wide) of hydrophytic vegetation occurs along the lower to middle portions of the stream banks. This hydrophytic vegetation is discussed as a component of the Piedmont/Mountain Bottomland Forest of section 3.1.5.

3.1.7.2 Fauna

Aquatic vertebrates observed within the project area at the time of field investigation consist of a small number of unidentified juvenile finfish and several unidentified minnows (Cyprinidae). Aquatic invertebrates observed within the project area at the time of field investigation include the following: crayfish (Cambaridae), snail (Pleuroceridae), snail (Physidae), caddisfly larvae (Trichoptera), abundant mayfly larvae (Heptageniidae), stonefly larvae (Perlidae), water strider (Gerridae), and blue dasher damselfly (*Pachydiplax longipennis)*. Brown algal mats, iron-reducing bacteria, and snails (Physidae) are present throughout most of the project area and are particularly abundant upstream of the bridge where the stream nears the active pasture.

3.2 Summary of Anticipated Impacts to Biotic Communities

3.2.1 Terrestrial Impacts

Terrestrial impacts can result in changes in both species numbers and composition. Plant communities found along the proposed project area often serve as nesting and sheltering habitat for wildlife. The proposed project construction may reduce the existing habitat for these species, thereby diminishing fauna numbers. Additionally, the reduction of habitat within the project area concentrates wildlife into smaller areas of refuge, therefore causing some species to become more susceptible to disease, predation, and starvation.

Ecological impacts can also occur outside of the project area because of habitat reduction. Typically, those areas modified by construction (but not paved) will become road shoulders and early successional habitat. The increased traffic noise and reduction/change of habitat, while attracting other wildlife, may displace existing wildlife further from the roadway. The animals displaced by construction activities may repopulate other areas suitable for the species. However, the increased animal density can result in an increase in competition for the remaining resources.

Construction of the project will result in certain unavoidable impacts to biotic resources within the project area. Following development of project alternatives, temporary and permanent impacts will be assessed from the perspective of impact areas (the acreage or square footage of affected biotic communities) and from the perspective of resource functions and values, where possible. Impacts to the previously identified communities will not exceed those acreages stated in their respective sections. Practicable means to avoid or minimize impacts were evaluated and recommended, where applicable.

3.2.2 Aquatic Impacts

The replacement of the bridge over Hall Creek at SR 1128 (TIP Number B-4040) will result in certain unavoidable impacts to the aquatic community of the creek. Probable impacts will be associated with the physical disturbance of the benthic habitat and water column disturbances resulting from changes in water quantity and quality. Significant disturbance of stream segments can have an adverse effect on aquatic community composition by reducing species diversity and the overall quality of aquatic habitats. Physical alterations to aquatic habitats can result in the following impacts to aquatic communities:

- Inhibition of plant growth.
- Resuspension of organic detritus and removal of aquatic vegetation that can lead to increased nutrient loading. Nutrient loading can, in turn, lead to algal blooms and ensuing depletion of dissolved oxygen levels.
- Increases in suspended and settleable solids that can, in turn, lead to clogging of feeding structures of filter-feeding organisms and the gills of fish.
- Loss of benthic macroinvertebrates through increased scouring and sediment loading.
- Loss of fish shelter through removal of overhanging stream banks and snags.
- Increases in seasonal water temperatures resulting from removal of riparian canopy.
- Burial of benthic organisms and associated habitat.

Unavoidable impacts to aquatic communities within and immediately downstream of the project

area will be minimized to the fullest degree practicable through strict adherence to NCDOT's *Best Management Practices for the Protection of Surface Waters* (NCDOT, 1997) and other applicable guidelines pertaining to best management practices. Means to minimize impacts will include (1) utilizing construction methods that will limit instream activities as much as practicable, (2) restoring the stream bed as needed, and (3) revegetating stream banks immediately following the completion of grading.

4.0 JURISDICTIONAL TOPICS

The following sections provide an inventory of resource areas and species and an assessment of possible impacts for (1) waters of the United States and (2) rare and protected species. Waters of the United States and rare and protected species are of particular significance when assessing impacts because of federal and state mandates that regulate their protection. The following sections address those measures that will be required in order to comply with regulatory permit conditions prior to project construction.

4.1 Waters of the United States

Certain surface waters considered significant to interstate commerce and wetlands adjacent to these waters fall under the broad category of "waters of the United States" (as defined in codified federal regulation 33 CFR 328.3). The discharge of dredged or fill material to waters of the United States is regulated by the Corps of Engineers under the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. Regulated surface waters typically consist of standing or flowing waters that have commercial and/or recreational value to the general public. As a category of waters of the United States, wetlands are defined as "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions".

To determine whether wetlands exist within the project area, vegetation, soils, and hydrology are assessed using criteria set forth in the 1987 Corps of Engineers Wetlands Delineation Manual (Technical Report Y-87-1). As specified in the Manual, wetlands are identified based on the presence of hydrophytic vegetation, hydric soils, and wetlands hydrology – all three of which must be present for an area to meet the federal definition of a wetland.

4.1.1 Waters of the United States, Including Wetlands, Affected

The National Wetlands Inventory (NWI) map for the Glen Alpine 7.5-minute quadrangle indicates that temporarily flooded, broad-leaved deciduous, scrub-shrub, palustrine wetlands (PSS1A of USFWS classification) occur northward along Hall Creek from a point approximately 100 feet (31 meters) north of the existing bridge. Under the NWI program, no wetlands have been mapped south of the existing bridge within the project area.

Although wetlands south of the existing bridge have not been mapped under the NWI program (because of their limited extent), field studies conducted as part of this investigation indicate that temporarily flooded, broad-leaved deciduous, scrub-shrub, palustrine wetlands (PSS1A of USFWS

classification) occur as narrow bands (averaging 3.0 feet (0.9 meter) wide) along Hall Creek both north and south of the existing bridge. These wetlands are located upon small terraces that are elevated approximately 12 to 20 inches (31 to 51 centimeters) above the stream bed. The PSS1As are transitional communities encountered between "waters of the United States" (i.e., the aquatic habitat of Hall Creek) and adjoining upland plant communities (i.e., the bottomland forest). The soils within the wetland areas are comprised of fine sandy loams that were saturated within the upper 12 inches (31 centimeters) at the time of field investigation. As encountered in soil probes conducted as part of this investigation, the soils are comprised of up to 6.0 inches (15 centimeters) of light brown (10YR4/3 to 7.5YR3/3) sandy loam overlying 6.0 to 12 inches (15 to 31 centimeters) of dark gray (10YR4/1 to 2.5Y3/0) sandy loam. These wetlands are discussed as a component of the bottomland forest community of section 3.1.5. It is estimated that 0.04 acre (0.02 hectare) of wetlands exists within the project area.

Despite the fact that the stream bank wetlands are located adjacent to a perennial waterway, their relatively steep slopes, limited extent, and proximity to cleared and landscaped areas limit certain of their values. Utilizing NCDENR's *Guidance for Rating the Values of Wetlands in North Carolina*, the stream bank wetlands within the project area have been estimated to have the following ratings for values assessed: 4 of 20 for water storage, 8 of 20 for bank/shoreline stabilization, 5 of 25 for pollutant removal, 4 of 10 for wildlife habitat, 16 of 20 for aquatic life value, and 1 of 5 for recreation/education – for a total rating of 38.

The National Wetland Inventory (NWI) map for the Glen Alpine 7.5-minute quadrangle also indicates that permanently flooded, lower perennial, riverine habitat with unconsolidated bottom (R2UBH of USFWS classification) occurs southward along Hall Creek from a point approximately 100.0 feet (30.5 meters) downstream (north) of the existing bridge. The R2UBH within the project area is comprised of shallow water riverine habitat that, other than areas along the immediate stream bank edge, was devoid of persistent emergent vegetation at the time of field investigation. It is estimated that 400 feet (122 meters) of waters of the United States exist within the project area.

4.1.2 Permits

Based on wetland field indicators observed at the time of field investigation, waters of the United States, including wetlands, subject to regulation under section 404 of the Clean Water Act and the North Carolina 401 Water Quality Certification program have been delineated and mapped within the proposed project area. Impacts to jurisdictional surface waters are anticipated to occur as a result of project construction. As a result, proposed construction activities will require permits and certifications from the various state and federal regulatory agencies in charge of protecting the water quality of public water resources.

Based on past experience with similar actions, if non-tidal wetland impacts at each bridge crossing are less than 0.5 acre (0.2 hectare) and none of the activities jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, the action would be considered a Class II Action as defined under FHWA regulation 23 CFR 771.115(b). As a Class II Action, bridge rehabilitation, reconstruction, or replacement would qualify as a Categorical Exclusion as defined under FHWA regulation 23 CFR 771.117.

As a categorically excluded Class II Action and a public linear transportation project in non-tidal waters, bridge rehabilitation, reconstruction, or replacement impacting less than 0.5 acre (0.2 hectare) of waters of the United States at a stream crossing could be authorized under the provisions of a U.S. Army Corps of Engineers Nationwide 23 Permit for Categorical Exclusions or a Nationwide 14 Permit for Linear Transportation Projects, respectively. The proposed project is located in a designated "Trout" county; therefore, authorization of the project by the Corps of Engineers under the provisions of a nationwide permit is conditional on concurrence of the NCWRC.

If the proposed work cumulatively impacts more than 0.5 acre (0.2 hectare) of non-tidal waters of the United States, an Individual Permit may be required at the discretion of the U.S. Army Corps of Engineers unless authorization is granted under the provisions of Department of the Army General Permit Number 198200031 (for NCDOT bridge crossings). If the proposed work involves greater than 1.0 acre (0.4 hectare) of wetland impacts, the Corps could not make a discretionary determination regarding Nationwide Permit applicability nor could the General Permit option be exercised and, therefore, an Individual Permit would be mandatory.

In addition to the aforementioned permit requirements, a 401 Water Quality Certification from the North Carolina Department of Environmental and Natural Resources, Division of Water Quality (DWQ) will be required for the project prior to issuance of a Corps of Engineers permit. Section 404 of the Clean Water Act requires that the state issue or deny water quality certification for any federally permitted or licensed activity that may result in a discharge to waters of the United States. Section 401 Certification allows surface waters to be temporarily impacted for the duration of the construction or other land disturbance. The issuance of a 401 Certification from DWQ is a prerequisite to issuance of a Section 404 permit.

4.1.2.1 Bridge Demolition

The bridge addressed under TIP Number B-4040 is located on SR 1128 over Hall Creek in Burke County. The possibility exists that demolition materials (such as asphalt, concrete rubble, portions of deck timbers, etc.) could be inadvertently dropped into waters of the United States during bridge demolition. Should this occur, such materials would be removed from waters of the United States as soon as possible, where conditions allow. The resulting temporary fill associated with bridge demolition will be determined later.

4.1.3 Avoidance, Minimization, Mitigation

The 14 December 1989 Memorandum of Agreement (MOA) between EPA and the Department of the Army on Clean Water Act Section 404(b)(1) Guidelines sets forth the policy and procedures to be used in the determination of the type and level of mitigation necessary to demonstrate compliance with the Clean Water Act. The purpose of the MOA is to implement the objective of the Clean Water Act to restore and maintain the chemical, physical, and biological integrity of the Nation's waters, including wetlands. As part of the MOA, a project assessment procedure is set forth requiring a sequential assessment of (1) impact avoidance, (2) impact minimization, and (3) compensatory mitigation for unavoidable impacts. Adherence to sequencing during project planning and design stages is intended to assist in attaining a goal of no net overall loss of wetland functions and values.

The impact avoidance stage of the sequencing procedure entails an assessment of all appropriate and practicable alternatives for avoiding impacts to waters of the United States. Cost, existing technology, significant adverse environmental consequences to other resources, and logistics in light of overall project purposes are considered in identifying "appropriate and practicable" avoidance alternatives.

The impact minimization stage of the sequencing procedure entails an assessment of all measures that would minimize unavoidable impacts to waters of the United States to the fullest degree practicable. The final determination regarding the availability of practicable minimization measures lies with the reviewing regulatory agencies and, if it is determined that additional minimization measures are available, such measures will be required through project modifications and/or 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 shoulder widths.

Compensatory mitigation measures are not considered until such time that it has been demonstrated that no practicable avoidance alternatives exist, and that all practicable measures for minimizing unavoidable impacts have been incorporated into project design. Compensatory mitigation includes such measures as restoration, creation, enhancement, and preservation. Where possible, mitigation should be in-kind and within the same watershed as near to the impacted area as conditions allow. Compensatory mitigation is conventionally required for projects authorized under Individual Permits or certain Nationwide Permits that result in the fill or alteration of more than 0.10 acre (0.04 hectare) of all wetlands and/or 150 feet (46 meters) of streams within or adjacent to tidal waters. Under the nationwide permit program, the District Engineer must be notified if proposed discharge to wetlands will exceed 0.10 acre (0.04 hectare). Discharges to wetlands exceeding 0.10 acre (0.04 hectare), for which authorization under a Nationwide Permit 14 is being sought, require submittal of a compensatory mitigation plan as part of the Notification.

4.2 Rare and Protected Species

The Endangered Species Act of 1973, as amended, requires that any action likely to adversely affect a species listed as a federally protected threatened or endangered species be subject to review by the U.S. Fish and Wildlife Service (USFWS). Other species (such as state-listed threatened or endangered species) may receive additional protection under separate state laws.

4.2.1 Federally-Protected Species

Plants and animals with federal classifications of endangered (E), threatened (T), proposed endangered (PE), and proposed threatened (PT) are protected under the provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of 22 March 2001, the USFWS lists six federally protected species for Burke County (Table 1). Brief descriptions of the characteristics and habitat requirements for these species are provided in Appendix A. A review of the North Carolina Natural Heritage Program (NHP) database of rare species and unique habitats indicates no occurrences of federally protected species in the project area. No individual organisms, populations, or suitable habitat for any of the species listed in Table 1 were observed within the project area at the time of site investigation.

Table 1. Federally Protected Species for Burke County

Scientific Name	Common Name	Status
Haliaeetus leucocephalus	Bald Eagle	Threatened
Hexastylis naniflora	Dwarf-flowered Heartleaf	Threatened
Liatris helleri	Heller's Blazing Star	Threatened
Hudsonia montana	Mountain Golden Heather	Threatened
Isotria medeoloides	Small-whorled Pogonia	Threatened
Geum radiatum	Spreading Avens	Endangered

Note:
- "Endangered" denotes a species in danger of extinction throughout all or a significant portion of its range.
- "Threatened" denotes a species likely to become endangered in the foreseeable future throughout all or a significant portion of its range.

4.2.2 Federal Species of Concern and State Listed Species

A federal species of concern (FSC) is defined as a species that is under consideration for listing for which there is insufficient information to support listing. The U.S. Fish and Wildlife Service (USFWS) lists 12 federal species of concern in Burke County (Table 2). Federal species of concern are not afforded federal protection under the Endangered Species Act and are not subject to any of the provisions included in Section 7 until they are formally proposed or listed as threatened or endangered. The status of these species is subject to change so their status should be periodically monitored prior to project construction if individuals or suitable habitat is present within the project area. In addition to the federal program, organisms that are listed as endangered (E), threatened (T), or special concern (SC) by the North Carolina Natural Heritage Program on its List of Rare Plants and Animal Species are afforded state protection under the NC State Endangered Species Act and the NC Plant Protection and Conservation Act of 1979.

Table 2 lists federal species of concern, the state status of these species (if afforded state protection), and the potential for suitable habitat in the project area. This species list is provided for information purposes, as the protection status of these species may change in the future.

The NCNHP database of rare and unique habitat (as updated through January 2001) was reviewed. The database shows no occurrences of federal species of concern (FSC) within 0.6 mile (1.0 kilometer) of the project area. Determinations regarding the presence of suitable FSC habitat, as indicated in Table 2, were based on site conditions observed at the time of field investigation and search of published literature.

Table 2. Federal Species of Concern for Burke County

Scientific Name	Common Name	NC Status	Habitat Present
Neotoma floridana haematoreia	Southern Appalachian Woodrat	---	No
Neotoma magister	Allegheny Woodrat	---	No
Alasmidonta varicosa	Brook Floater	T	Yes
Ophiogomphus edmundo	Edmund's Snaketail Dragonfly	SR	Yes
Ophiogomphus howei	Pygmy Snaketail Dragonfly	SR	Yes
Speyeria diana	Diana Fritillary Butterfly	SR	Yes
Juglans cinerea	Butternut	---	No
Monotropsis odorata	Sweet Pinesap	C	No
Saxifraga caroliniana	Carolina saxifrage	C	No
Cephaloziella obtusilobula	A Liverwort	C	No
Plagiochila sullivantii var. *spinigera*	A Liverwort	C	No
Plagiochila sullivantii var. *sullivantii*	A Liverwort	C	No

Notes:

T A "Threatened" species is any native or once native species that is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range, or one that is designated as a threatened species pursuant to the Endangered Species Act.

C A "Candidate" is any species that is very rare in North Carolina, generally with 1-20 populations in the state, generally substantially reduced in numbers by habitat destruction.

SR A "Significantly Rare" species is not listed as "E", "T", or "SC", but which exists in the state in small numbers and has been determined to need monitoring.

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APPENDIX A

Biological Conclusions for Federally Protected Species Found in Burke County, North Carolina

Bald Eagle (*Haliaeetus leucocephalus*) **Threatened**
Animal Family: Accipitridae
Date Listed: Endangered, 1967; Threatened, 1995

Characteristics:
The bald eagle is a large raptor. The characteristic adult plumage consists of a white head and tail with a dark brown body. Juvenile eagles are completely dark brown and do not fully develop the white head and tail until the fifth or sixth year. Fish are the primary food source, but bald eagles will also take a variety of birds, mammals, and turtles (both live and as carrion) when fish are not readily available. Adults average about 3.0 feet (0.9 meter) from head to tail, weigh approximately 10.0 to 12.0 pounds (4.5 to 5.4 kilograms) and have a wingspan that can reach 7.0 feet (2.1 meters). Generally, female bald eagles are somewhat larger than the males.

Distribution:
Bald eagles breed primarily in the eastern third of Texas (mostly east of I-35) and winter wherever open water occurs.

Habitat:
Habitat includes quiet coastal areas, rivers or lakeshores with large, tall trees. Man-made reservoirs have also provided habitat.

Bald Eagles in North Carolina:
In 1982, there were no bald eagle nests in North Carolina. In 1998, there were 17 nests, and in 2000 there were 34 nests. Several new nests have been located so far during the 2001 nesting season. The bald eagle's recovery has led to a proposal for de-listing the bald eagle from the Endangered/Threatened Species List.

Threats to Species:
The decline of the Bald Eagle coincided with the introduction of the pesticide DDT in 1947. Birds of prey at the top of the food chain, such as eagles, ingested relatively high levels of the pesticide, which was concentrated in the fatty tissues of their prey. Eagles contaminated with DDT failed to lay eggs or produced thin eggshells that broke during incubation. In 1972, DDT was banned in the United States, and a slow recovery for the Bald Eagle began. Loss of nesting habitat due to development along the coast and near inland rivers and waterways also has resulted in decreasing numbers of bald eagles.

Distinguishing Characteristics:
Bald eagle (*Haliaeetus leucocephalus*) adults have white heads and tails, a dark brownish black body, with yellow bill, eyes, and feet. Immature species are variable in plumage but generally have a dark brown, blotchy head, tail and bodies; brownish bill, yellow feet, and pale yellow-gray eyes. They are normally found near water, but during migration may occur in any part of the state. Their size is approximately 3.0 feet (0.9 meter) long with a 7.0 feet (2.1 meters) wingspan.

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was investigated on 18 July 2001. No individual organisms, populations, or suitable habitat were observed within the project area.

Biological Conclusion: **No Effect**

Spreading Avens (*Geum radiatum*) **Endangered**
Plant Family: Rosaceae
Date Listed: April 5, 1990

Characteristics:
Spreading avens is a perennial herb. Spreading avens is topped with an indefinite cyme of large, bright yellow flowers. Its leaves are mostly basal with large terminal lobes and small laterals, and they arise from horizontal rhizomes. Plant stems grow 7.9 to 20 inches (20 to 50 centimeters) tall. Flowering occurs from June through September, and the fruits (achenes) are produced from August through October.

Distribution:
The species is restricted to a few, scattered mountaintops in western North Carolina and eastern Tennessee. Spreading avens was originally known from 16 sites, and 11 of these sites still support populations. Three of the remaining spreading avens populations are in Ashe County, North Carolina. Two others are situated on the Mitchell County, North Carolina/Carter County, Tennessee line; and on the Avery/Watauga County line in North Carolina. One population each remains in Avery, Transylvania, Watauga, Buncombe, and Yancey Counties, North Carolina. Seven of these 11 avens sites have less than 50 plants each. In fact, three of the seven sites support less than 10 individuals.

Habitat:
The species inhabits high elevation cliffs, outcrops, and steep slopes that are exposed to full sun. The adjacent spruce/fir forests are dominated by red spruce (*Picea rubens*) and a federal candidate species, Fraser fir (*Abies fraseri*). Heller's blazing star (*Liatris helleri*) and/or Blue Ridge goldenrod (*Solidago spithamaea*), both federally-listed as threatened species, are also present at some sites. The substrate at all the population sites is composed of various igneous, metamorphic, and metasedimentary rocks (Massey et al, 1980; Morgan, 1980; Kral, 1983; Department of the Interior, 1990).

Threats to Species:
The species is being seriously impacted by recreational and residential development. Their population sites occur on open mountain summits, which are prime areas for recreational facilities. The construction of trails, parking lots, roads, buildings, observation platforms, and other facilities, combined with the increased foot traffic from sightseers, has already severely decreased populations. Eight of the remaining 11 spreading avens populations face increasing impacts from soil compaction, soil erosion, and trampling. In addition, the spruce/fir forests surrounding these species' populations are suffering from airborne pollution and an exotic insect pest, the balsam woody aphid. It is not known as yet how the decline of these forests will affect the species. Scientists speculate that the moist habitat required by both species may become drier. It's already known that spreading avens individuals located on dry sites usually fail to produce seeds. Also, because of the plants' low numbers and the scarcity of their habitat, there may be little genetic adaptability within populations. The species also faces threats from collection, natural succession (becoming over-shaded and crowded by other woody species), and natural events such as rockslides.

References:
Department of the Interior. U.S. Fish and Wildlife Service. April 5, 1990. Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for *Geum radiatum* and *Hedyotis purpurea var. montana*. Federal Register, 55:66:12793-12797.

Kral, R. 1983. A Report on Some Rare, Threatened, or Endangered Forest- Related Vascular Plants of the South. USDA Forest Service Tech. Publication. R8-TP2. 600-603 and 1074-1077.

Massey, J.P. Whitson, and T. Atkinson. 1980. Endangered and Threatened Plant Survey of 12 Species In the Eastern Part of Region IV. USFWS Contract 14-160004-78-108. Report.

Morgan, S. 1980. Species Status Summary for *Geum radiatum* Michaux: Species General Information System: Species, Population, Habitat, and Threat Inventory.

Terrell, E. 1978. Taxonomic Notes on *Houstonia purpurea* var. *montana* (Rubiaceae). Castanea. 43:25-29.

Distinguishing Characteristics:
Spreading avens (*Geum radiatum*), of the rose family, is characterized by stems 8.0 to 20.0 inches (20.3 to 50.8 centimeters) tall and an indefinite cyme of large bright yellow flowers. Leaves are mostly basal, with large terminal lobes and small laterals arising from horizontal rhizomes. The flowers occur from June to September. They are found in the Southern Blue Ride Mountains on (1) high elevations cliffs, rock crevices, and steep slopes in full sunlight with soil composed of thin gravelly soils or (2) grassy balds near summit outcrops on high elevations from 4,200 to 6,300 feet (1280 to 1920 meters) and in the vicinity adjacent to spruce/fir forest (red spruce (*Picea rubens*) and Fraser fir (*Abies fraseri*).

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was investigated on 18 July 2001. No individual organisms, populations, or suitable habitat were observed within the project area. Elevations within the project area range from approximately 1,140 to 1,180 feet (347 to 360 meters) msl, with the stream bed in the vicinity of the bridge lying at approximately 1,140 feet (347 meters) msl. The elevation required by spreading avens is approximately 5,000 to 5,800 feet (1,524 to 1,768 meters) msl (based on known populations).

Biological Conclusion: **No Effect**

Dwarf Flower Heartleaf (*Hexastylis naniflora*) **Threatened**
Plant Family: Aristolochiaceae
Date Listed: April 14, 1989

Characteristics:
This species has the smallest flowers of any North American plant in the genus *Hexastylis*. The flowers of most individuals are less than 0.4 inch (1.0 centimeter) long, and their sepal tubes are narrow, never more than 0.2 to 0.3 inch (0.6 to 0.7 centimeter) wide even in flower. Flower color usually ranges from beige to dark brown; sometimes it is greenish or purplish. The flowers are jug-shaped, and the plant's dark green leaves are heart-shaped, evergreen, and leathery. Plant stalks are long and thin, originating from an underground root. Another name for this species is dwarf-flowered wild ginger.

Distribution:
This species is found in the Upper Piedmont regions of South Carolina and North Carolina.

Habitat:
Dwarf-flowered heartleaf grows in acidic, sandy loam soils along bluffs and nearby slopes; in boggy areas adjacent to creekheads and streams; and along the slopes of hillsides and ravines. Soil type is the most important habitat requirement. The species needs Pacolet, Madison gravelly sandy loam, or Musella fine sandy loam soils to grow and survive. Provided the soil type requirement exists, the plant can survive in either dry or moderately moist habitat. For maximum flowering, the plant needs sunlight in early spring. Creekheads where shrubs are rare and bluffs with light gaps are the habitat types most conducive to flowering and high seed production. Seed output is lowest in bluff populations with a lot of shade.

Threats to Species:
Timber harvesting, urbanization, conversion from woodlands to pasture, reservoir construction, pond construction, trash, and insecticide use are threatening the remaining populations. The eight populations in Greenville, South Carolina are all endangered by residential, industrial, and commercial expansion. The largest population in South Carolina (1,400 plants) once contained over 4,000 plants, but this population was reduced by reservoir construction in Spartanburg. Any use of insecticides in or around plant populations could reduce flies, thrips, and ants, thus decreasing the likelihood of plant pollination.

References:
Blomquist, H.L. 1957. A Revision of *Hexastylis* of North America. Brittonia 8255-281.
Department of the Interior. U.S. Fish and Wildlife Service. *Federal Register*, Vol. 54, No. 71. April 14, 1989. Pp. 14964-14967.
Gaddy, L.L. 198O. Status Report on *Hexastylis naniflora* Blomquist. Unpublished Report Prepared Under Contract to the U.S. Fish and Wildlife Service, Southeast Region, Atlanta, Georgia. 32 pp.
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Gaddy, L.L. 1987. "A Review of the Taxonomy and Biogeography of *Hexastylis* (Aristolochiaceae)". Castanea 52(3)186-196. September 1987.
Otte, D.K.S. 1977. The Pollination Ecology *Hexastylis arifolia* and *Hexastylis minor* in the Area of Chapel Hill, North Carolina. M.A. Thesis 79 pp.
Rayner, D.A. et al.. 1979. Native Vascular Plants Endangered, Threatened, or Otherwise in Jeopardy in South Carolina. S.C. Museum Commission Bulletin No. 4. Columbia, S.C.

Distinguishing Characteristics:
Dwarf flower heartleaf (*Hexastylis naniflora*) is a member of the birthwort family (Aristolochiaceae). They have leathery evergreen leaves, which are dark green and heart shaped; and long, thin stalks that originate from an underground stem. Flowers are jug-shaped, beige to dark brown, and 0.4 inch (1.0 centimeter) long, with narrow sepal tubes around 0.3 inch (0.7 centimeter) wide (flower is sometimes greenish or purplish). It flowers from mid March to early June. They are found in acidic sandy loam soils; along bluffs and nearby slopes, hillsides, and ravines; and in boggy areas adjacent to creek heads and streams. The soil types are Pacolet, Madison, or Musella. They need sunlight for maximum seed production.

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was

investigated on 18 July 2001. No *Hexastylis* spp. or suitable habitat were observed within the project area. Consequently, the biological conclusion for *Hexastylis naniflora* is "No Effect".

Biological Conclusion: **No Effect**

Mountain Golden Heather (*Hudsonia montana*) **Threatened**

Plant Family: Cistaceae
Date Listed: October 20, 1980

Characteristics:
Mountain golden heather is a low, needle-leaved shrub with yellow flowers and long-stalked fruit capsules. It usually grows in clumps of 4 to 8 inches (10 to 20 centimeters) across and about 6 inches (15 centimeters) high, and sometimes is seen in larger patches of 1.0 to 2.0 feet (0.3 to 0.6 meter) across. The plants have the general aspect of a big moss or a low juniper, but their branching is more open; their leaves are about 0.25 inch (0.60 centimeter) long; and the plant is often somewhat yellow-green in color, especially in shade. The leaves from previous years appear scale-like and persist on the older branches. The flowers appear in early or mid-June, and are yellow, nearly 1.0 inch (2.5 centimeters) across, with five blunt-tipped petals and 20 to 30 stamens. The fruit capsules are on 0.5 inch (1.3 centimeters) stalks, and are roundish with three projecting points at the tips. These fruits often persist after opening, and may be seen at any time of the year.

Distribution:
This plant is found only in Burke and McDowell Counties, North Carolina, at elevations of 2,800 to 4,000 feet (853 to 1,219 meters). Originally discovered on Table Rock Mountain in 1816, mountain golden heather has since been found at several other sites in Linville Gorge and on Woods Mountain. All sites are on public land within the Pisgah National Forest. Mountain golden heather is known from several localities within its range with the total number of plants possibly numbering 2,000 to 2,500. Monitoring is needed to determine if the plant's abundance may be cyclic.

Habitat:
Mountain golden heather grows on exposed quartzite ledges in an ecotone between bare rock and *Leiophyllum* dominated heath balds that merge into pine/oak forest. The plant persists for some time in the partial shade of pines, but it appears less healthy than in open areas.

Critical Habitat:
Critical habitat includes the area in Burke County bounded by the following: on the west by the 2,200-foot (671-meter) contour; on the east by the Linville Gorge Wilderness Boundary north from the intersection of the 2,200-foot (671-meter) contour and the Short Off Mountain Trail to where it intersects the 3,400-foot (1,036-meter) contour at the "Chimneys"; then follow the 3,400-foot (1,036-meter) contour north until it re-intersects with the Wilderness Boundary; then follow the Wilderness Boundary again northward until it intersects the 3,200-foot (975-meter) contour extending west from its intersection with the Wilderness Boundary until it begins to turn south. At this point the boundary extends due east until it intersects the 2,200 foot (671-meter) contour. (The Woods Mountain sites were unknown at the time Critical Habitat was designated.)

Threats to Species:
Threats to the species include fire suppression and recreational activities such as hiking that result in a loss of plants due to trampling and soil compaction. Competition with other shrubs has also reduced size and vigor of populations. The small size and number of populations increases the plant's vulnerability to extinction through both natural and man-made factors.

References:
Morse, L. E. 1979. Report on the Conservation Status of *Hudsonia montana*, A Candidate Endangered Species. Prepared by the Cooperative Parks Study Unit of the New York Botanical Garden. 37 pp.

U.S. Fish and Wildlife Service. 1983. Mountain Golden Heather Recovery Plan. U.S. Fish and Wildlife Service. Atlanta, Georgia. 26 pp.

Distinguishing Characteristics:
Mountain golden heather (*Hudsonia montana*) is a member of the rockrose family (Cistaceae) that is characterized as a small needle-leaved shrub with yellow flowers nearly 1.0 inch (2.5 centimeters) across and long-staked fruit capsules. It is usually growing in clumps 4 to 8 inches (10 to 20 centimeters) across and 6 inches (15 centimeters) high. The flowers are made up of five blunt tipped petals, and flowering occurs from mid-June to July. Non-flowering plants resemble large moss or small juniper with leaves about 0.25 inch (0.60 centimeter) long and somewhat yellow-green in color. Fruit capsules are on 0.5 inch (1.3 centimeters) stalks that are roundish with three projecting points at the tips. They are found in exposed quartzite ledges at elevations from 2,200 to 3,400 feet (671 to 1,036 meters), between bare rock and sand myrtle-dominated heath balds that merge into pine/oak forest. The plant can persist for some time in the partial shade of pines to open areas.

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was investigated on 18 July 2001. No individual organisms, populations, or suitable habitat were observed within the project area. Elevations within the project area range from approximately 1,140 to 1,180 feet (347 to 360 meters) msl. The elevation range for known populations is 2,800 to 4,000 feet (853 to 1,219 meters) msl. Consequently, the biological conclusion for *Hudsonia montana* is "No Effect".

Biological Conclusion: **No Effect**

Small Whorled Pogonia (*Isotria medeoloides*) **Threatened**
Plant Family: Orchidaceae
Date Listed: October 6, 1994

Characteristics:
Small whorled pogonia is a perennial with long, pubescent roots and a smooth, hollow stem 3.7 to 9.8 inches (9.5 to 25 centimeters) tall terminating in a whorl of five or six light green, elliptical leaves that are somewhat pointed and measure up to 3.1 by 1.6 inches (8.0 by 4.0 centimeters). A flower, or occasionally two flowers, is produced at the top of the stem. Small whorled pogonia's nearest relative is *I. verticillata*, which looks similar but can be distinguished by its purplish stem and by differences in the flower structure. *I. verticillata* is much more common and widespread than the small whorled pogonia. When not in flower, young plants of Indian cucumber-root (*Medeola virginiana*) also resemble small whorled pogonia. However, the hollow stout stem of *Isotria* will separate it from the genus *Medeola*, which has a solid, more slender stem.

Flowering occurs from about mid-May to mid-June, with the flowers apparently lasting only a few days to a week or so. In addition, this plant doesn't necessarily flower annually. Usually only one flower is produced per plant. If pollination occurs, a capsule may be formed which can contain several thousand minute seeds. No evidence of insect pollination has been observed. This plant is believed to be self-pollinating by mechanical processes. The flower lacks both nectar guides and fragrance. There is no evidence for asexual reproduction. Individual plants may not flower every year; and extended dormancy, although not scientifically documented, is purported to occur under certain conditions.

Distribution:
This plant formerly occurred in 48 counties in 16 eastern states and Canada, but when listed as endangered in 1982 it was known to exist in only 16 counties in 10 states, and one county in Ontario, Canada. By 1991, 86 sites in 15 states were known, and by 1993, there were a known total of 104 sites in 15 states. Most populations are centered in the foothills of the Appalachian Mountains in New England and northern coastal Massachusetts. The 23 populations in the Southeast Region occur in North Carolina (5 populations); South Carolina (4 populations); Georgia (13 populations); and Tennessee (1 population). Most southeastern populations number less than 25 plants. South Carolina has one population of over 25 plants, and Georgia has 2 populations numbering about 100 plants. Small whorled pogonia is also known from Virginia, Delaware, New Jersey, Pennsylvania, Ohio, Michigan, Illinois, and Ontario, Canada.

This plant was reclassified from endangered to threatened because the number of known populations increased from 34 in 1985 to 104 in 1993. In addition, the species' 1992 revised recovery plan stipulates that at least 25 percent of the plant's self-sustaining populations were protected through public ownership or private landowner management agreement. According to the October 6, 1994 *Federal Register* notice, which officially down-listed the species, a total of 46 small whorled pogonia sites are currently protected rangewide, 24 of which have self-sustaining populations. In the southeast, North Carolina has two protected sites, both of which are viable; South Carolina has four protected sites, two of which are viable; and Georgia has seven protected sites, four of which are viable.

Habitat:
This species is generally known from open, dry, deciduous woods with acid soil. It occurs in habitat where there is not relatively high shrub or sapling coverage.

Threats to Species:
The current status of small whorled pogonia is attributed to loss of habitat and over-utilization for scientific and private collections. However, some populations observed for a number of years have also declined for unknown reasons.

References:
Correll, D.S. 1950. Native Orchids of North America. Chronica Botanica Co., Massachusetts. 399 pp.
Department of the Interior, Fish and Wildlife Service. October 6, 1994. Endangered and Threatened Wildlife and Plants: Final Rule to Reclassify the Plant Isotria medeoloides (Small Whorled Pogonia) From Endangered to Threatened. *Federal Register* 59:193. p. 50852-50857.
Luer, C.A. 1975. The Native Orchids of the United States and Canada. New York Botanical Garden. W.S. Cowell Ltd., Ipswich, England. 361 pp.
Mehrhoff, L.A. 1980. Abstracts of Papers to be Presented at the University of British Columbia, Vancouver. 12-16 July 1980. Botanical Society of America. Miscellaneous Series Publ. 158 pp.
U.S. Fish and Wildlife Service. 1992. Small Whorled Pogonia (Isotria medeoloides) Recovery Plan First Revision.

Prepared by Susanna L. von Oettingen for U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. 75 pp.

U.S. Fish and Wildlife Service. 1985. Small Whorled Pogonia Recovery Plan. Prepared by Peter G. Poulos for U.S. Fish and Wildlife Service, Newton Corner, Massachusetts. 45 pp.

Distinguishing Characteristics:
Small whorled pogonia (*Isotria medeoloides*) of the Orchidaceae family is characterized by its hollow stem that is 3.7 to 9.8 inches (9.5 to 25 centimeters) tall and its whorl of 5 to 6 light green elliptical leaves that are somewhat pointed and measure 3.1 by 1.6 inches (8 by 4 centimeters). Flowering from May to June, the flower is yellowish green and is produced on top of the stem. When not in bloom, the plant resembles the Indian cucumber-root (stem not hollow). The plant is found in open, dry, deciduous woods with acid soils of third growth upland forest. The areas are generally flat to moderately sloped to the northern or eastern direction, in habitat of relatively high shrub cover or high sapling density with flecks of sunlight play on the forest floor throughout the day. Soils are acidic sandy loams with low to very low nutrient contents.

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was investigated on 18 July 2001. No individual organisms, populations, or suitable habitat were observed within the project area.

Biological Conclusion: **No Effect**

Heller's Blazing Star (*Liatris helleri*) **Threatened**

Plant Family: Asteraceae
Date Listed: November 19, 1987

Characteristics:
Heller's blazing star is a perennial herb that has one or more erect or arching stems arising from a tuft of narrow pale green basal leaves. Its stems reach up to 1.3 feet (0.4 meter) in height and are topped by a showy spike of lavender flowers, which are 2.8 to 7.9 inches (7.0 to 20 centimeters) long (Porter, 1891). Its flowering season lasts from July through September, and its fruits are present from September through October (Kral, 1983; Radford et al., 1964). This plant is differentiated from other similar high altitude *Liatris* species by a much shorter pappus, ciliate petioles, internally pilose corolla tubes, and a lower, stockier habit (Cronquist, 1980; Gaiser, 1946). Work is being conducted on populations in two locations, which may result in their being reclassified as a new taxon (Sutter, in preparation). If so, these plants will still remain protected under the Endangered Species Act.

Distribution:
Heller's blazing star is endemic to the northern Blue Ridge Mountains of North Carolina. Although nine populations were originally reported, only seven still exist. A former population in Watauga County was allegedly destroyed by residential development, and one in Mitchell County apparently succumbed to intensive recreational use. Four of the seven remaining populations are in Avery County with one population each remaining in Caldwell, Ashe, and Burke Counties.

Habitat:
The plant exists on high elevation ledges of rock outcrops in shallow, acid soils, which are exposed to full sunlight.

Threats to Species:
Commercial and recreational developments pose the greatest threats. Heller's blazing star is threatened not only by the construction of buildings, roads, and other facilities, but also by the associated habitat disturbances such as soil erosion and compaction. Unintentional trampling by hikers is another danger. Of the seven remaining populations, five occur on privately-owned land, one on Forest Service land, and one on National Park Service land. Four of the sites in private ownership are recreational facilities. The two sites in public ownership also undergo heavy recreational use. Potential threats to the latter two sites include the use of aerially-applied fire retardants, road construction, and the issue of permits for mineral exploration. Only the site owned by The Nature Conservancy receives full protection from human disturbance; three of the seven sites receive partial protection. In future years, woody vegetation may overcrowd and overshade the plant making it impossible for the species to survive unless this threat is mitigated by proper habitat management and planning. The species' small numbers, possible lack of genetic variability, natural rockslides, and severe storms or droughts are also threats.

References:
Cronquist, A. 1980. Vascular Flora of the Southeastern U.S., Vol. 1 (Asteraceae). UNC Press, Chapel Hill, North Carolina. P. 204.

Gaiser, L.O. 1946. The Genus *Liatris*. Rhodora 48:572-576.

Kral, R. 1983. A Report on some Rare, Threatened, or Endangered Forest-related Vascular Plants of the South.
Tech. Publ. R-8-TP-2. USDA Forest Service. Pp. 1191-1194.

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Porter, T.C. 1981. A New *Liatris* from North Carolina. Rhodora 18:147-148.

Radford, A.E., H.E. Ahles, and C.R. Bell. 1964. Manual of the Vascular Flora of the Carolinas. UNC Press, Chapel Hill, North Carolina. Pp. 1048-1051.

Sutter, R. In Preparation. Taxonomic Analysis of *Liatris helleri*, a North Carolina Endemic.

U.S. Fish and Wildlife Service. 1987. Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for *Liatris helleri*. *Federal Register*, 52(223):44397-44401.

U.S. Fish and Wildlife Service. 1989. Recovery Plan for Heller's Blazing Star (*Liatris helleri* Porter). U.S. Fish and Wildlife Service, Atlanta, Georgia. 24 pp.

Distinguishing Characteristics:
Heller's blazing star (*Liatris helleri*) is of the aster family (Asteraceae), and is characterized by lavender spiked flowers with one or more erect stems with a maximum height of 16 inches (41 centimeters). The flowers arise from a

tuft of narrow, pale green basal leaves. It differs from other *Liatris* by its much shorter pappus (half the length of corolla tube or less), ciliated petioles, internally pilose corolla tubes, and lower, stockier habit. They are found in high elevations along ledges of rock outcropping and cliffs in shallow acid soils in full sunlight. Flowering occurs from July to August.

Investigation:
The North Carolina Natural Heritage Program's database of rare species and unique habitats was reviewed in September of 2001. No populations of the species have been recorded in the project vicinity. The project area was investigated on 18 July 2001. No individual organisms or suitable habitat were observed within the project area. Elevations within the project area range from approximately 1,140 to 1,180 feet (347 to 360 meters) msl. Known populations of this plant occur at elevations of 3,500 to 6,000 feet (1,067 to 1,829 meters). Consequently, the biological conclusion for *Liatris helleri* is "No Effect".

Biological Conclusion: **No Effect**

APPENDIX B

Qualifications of Principal Investigators

Investigator:	Martin L. Mitchell
Education:	B.U.S. (double major in Geology and Biology), University of New Mexico M.A. in Marine Science, College of William and Mary
Certification:	Professional Geologist Virginia License Number 001351 (1997)
Experience:	Project Manager/Environmental Scientist, HSMM, Inc. 1988 to present. Project Manager/Environmental Scientist, The BSC Group, 1986 to 1988. Wetlands Ecologist / Coastal Geologist, Massachusetts Department of Environmental Quality Engineering, Wetlands and Waterways Division, 1984 to 1986. Geologist, Virginia Division of Mineral Resources, 1981 to 1983.
Expertise:	Wetland delineations, wetland function and value assessments, wetland mitigation and stream restoration, biotic community inventories and mapping, threatened and endangered species investigations, environmental regulatory permit processing.

Investigator:	Anne L. Timm
Education:	B.A. Biology, Luther College Master of Environmental Science, Indiana University
Certification:	Aquatic Insect Collection Protocols Certification through NCDWQ
Experience:	Environmental Scientist, HSMM, Inc., 2000 to present Intern, Fallwood Nature Center, 2000. Data Management Assistant, Wisconsin Department of Natural Resources, Bureau of Watershed Management, 1997 to 1998. Science and Biology Teacher, U.S. Peace Corps, 1994 to 1996. Aquatic Biology Research Assistant, PEW Research Fellowship, Luther College, 1993.
Expertise:	Aquatic and wetland habitat assessments, biotic community inventories and mapping, rapid bioassessment, benthic macroinvertebrate sampling and identification, wetland delineation, wetland function and value assessments, wetland habitat restoration, GPS surveys.

Investigator:	Gregory G. Wilda
Education:	B.S. Biology, Old Dominion University
Certification:	N/A
Experience:	Environmental Scientist, HSMM, Inc., January 2001 to present. Environmental Scientist, TAF Group, June 1993 to 2001. Environmental Scientist, James R. Reed and Associates, May 1988 to 1993. Environmental Scientist, U.S. Army Corps of Engineers, May 1987 to 1988.
Expertise:	Wetland delineations, permit processing, wetland mitigation, threatened and endangered species investigations, biotic community inventories and mapping, GPS surveys.

APPENDIX C

Wetland Data Forms

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: NE1U

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix nigra*	S/S	OBL	9.		
2. *Solidago caesia var. curtisii*	Herb	FACU	10.		
3. *Eupatorium fistulosum*	Herb	FAC+	11.		
4. *Juncus effusus*	Herb	FACW	12.		
5. *Clematis virginiana*	Herb	FAC+	13.		
6. *Impatiens capensis*	Herb	FACW	14.		
7. *Solidago sp.*	Herb	---	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 83%

Remarks: 83% is for those species identified.

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: _____ (in.)
- Depth to Standing Water in Pit: _____ (in.)
- Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain caused the surface saturation. Wetland hydrology not found in combination with hydric soils or with any secondary indicators. Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? Yes

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-6	A1	10YR 3/4			SANDY LOAM
6-12	A2	5YR 4/4			SANDY SILT

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Units mapped by NRCS are non-hydric.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	NO	Is this Sampling Point Within a Wetland?	NO
Hydric Soils Present?	NO		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: NE1W

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix exigua*	S/S	OBL	9.		
2. *Impatiens capensis*	Herb	FACW	10.		
3. *Eupatorium perfoliatum*	Herb	FACW+	11.		
4. *Polygonum punctatum*	Herb	FACW	12.		
5. *Microstegium vimineum*	Herb	FAC+	13.		
6. *Sambucus canadensis*	Herb	FACW-	14.		
7. *Leersia oryzoides*	Herb	OBL	15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 100%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: _____ (in.)
- Depth to Standing Water in Pit: _____ (in.)
- Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- XX Drift Lines
- XX Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain
Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat Poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-4	A1	10YR 3/4			SILTY SAND
4-12	A2	10YR 4/1			SANDY CLAY

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
XX Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Units mapped by NRCS are non-hydric.
Soils observed likely represent hydric soil inclusion, which USDA reports to occur within Arkaqua map units, or fluvaquents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	YES	Is this Sampling Point Within a Wetland?	YES
Hydric Soils Present?	YES		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: NW1U

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Betula nigra*	Tree	FACW	9. *Pilea pumila*	Herb	FACW
2. *Platanus occidentalis*	Tree	FACW-	10. *Lonicera japonica*	Vine	FAC-
3. *Prunus serotina*	Tree	FACU	11. *Toxicodendron radicans*	Vine	FAC
4. *Alnus serrulata*	S/S	FACW	12.		
5. *Cornus amomum*	S/S	FACW+	13.		
6. *Rosa multiflora*	S/S	UPL	14.		
7. *Lonicera japonica*	Herb	FAC-	15.		
8. *Arthraxon hispidus*	Herb	FACU+	16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 55%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Standing Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain caused the surface saturation. Wetland hydrology not found in combination with hydric soils or with any secondary indicators. Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? Yes

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-2	A1	10YR 3/3			ORGANIC SANDY LOAM
2-12	A2	7.5YR 3/4			SANDY LOAM

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
Units mapped by NRCS are non-hydric.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	NO	Is this Sampling Point Within a Wetland?	NO
Hydric Soils Present?	NO		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT NRTR Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: NW1W

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Microstegium vimineum*	Herb	FAC+	9.		
2. *Toxicodendron radicans*	Herb	FAC	10.		
3. *Pilea pumila*	Herb	FACW	11.		
4. *Lonicera japonica*	Herb	FAC-	12.		
5.			13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Standing Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- XX Drift Lines
- XX Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain
Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (Occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-1	A	7.5YR 3/4			ORGANIC SANDY LOAM
1-8	B	7.5YR 3/3			SANDY LOAM
8-12	C	2.5Y 3/1			SANDY LOAM

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
XX Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:

Units mapped by NRCS are non-hydric.
Soils observed likely represent hydric soil inclusion, which USDA reports to occur within Arkaqua map units, or fluvaquents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? YES

Wetland Hydrology Present? YES

Hydric Soils Present? YES

Is this Sampling Point Within a Wetland? YES

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: SE1U

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Betula nigra*	Tree	FACW	9. *Lonicera japonica*	Vine	FAC-
2. *Salix nigra*	Tree	OBL	10.		
3. *Platanus occidentalis*	Tree	FACW-	11.		
4. *Rosa multiflora*	S/S	UPL	12.		
5. *Salix nigra*	S/S	OBL	13.		
6. *Solidago caesia var. curtisii*	Herb	FACU	14.		
7. *Eupatorium fistulosum*	Herb	FAC+	15.		
8. *Pilea pumila*	Herb	FACW	16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 67%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Standing Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain caused the surface saturation. Wetland hydrology not found in combination with hydric soils or with any secondary indicators. Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? Yes

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-6	A1	10YR 4/3			SANDY LOAM
6-12	A2	10YR4/4			SANDY LOAM

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
Units mapped by NRCS are non-hydric.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	NO	Is this Sampling Point Within a Wetland?	NO
Hydric Soils Present?	NO		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: SE1W

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Salix nigra*	Tree	OBL	9.		
2. *Alnus serrulata*	S/S	FACW	10.		
3. *Rosa multiflora*	S/S	UPL	11.		
4. *Eupatorium fistulosum*	Herb	FAC+	12.		
5. *Sparganium americanum*	Herb	OBL	13.		
6. *Microstegium vimineum*	Herb	FAC+	14.		
7. *Betula nigra*	Herb	FACW	15.		
8. *Lonicera japonica*	Vine	FAC-	16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 75%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Standing Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- XX Drift Lines
- XX Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain
Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-8	A1	10YR 4/3			ORGANIC SANDY LOAM
8-12	A2	10YR 4/1			SANDY LOAM

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
XX Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

Remarks:

Units mapped by NRCS are non-hydric.

Soils observed likely represent hydric soil inclusion, which USDA reports to occur within Arkaqua map units or fluvaquents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	YES	Is this Sampling Point Within a Wetland?	YES
Hydric Soils Present?	YES		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: SW1U

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Alnus serrulata*	S/S	FACW	9.		
2. *Rosa multiflora*	S/S	UPL	10.		
3. *Clematis virginiana*	Vine	FAC+	11.		
4. *Arthraxon hispidus*	Herb	FACU+	12.		
5. *Eupatorium fistulosum*	Herb	FAC+	13.		
6.			14.		
7. *Grass sp.*	Herb	---	15.		
8. *Solidago sp.*	Herb	---	16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 63%

Remarks: 63% of those species identified.

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: _____ (in.)
- Depth to Standing Water in Pit: _____ (in.)
- Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain caused the surface saturation. Wetland hydrology not found in combination with hydric soils or with any secondary indicators. Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally floolded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? Yes

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc
0-12	A	7.5YR 3/4			SANDY LOAM

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

Remarks:
Units mapped by NRCS are non-hydric.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	NO	Is this Sampling Point Within a Wetland?	NO
Hydric Soils Present?	NO		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: B-4040 Bridge Replacement NRTR Applicant/Owner: NCDOT Investigator: Gregory G. Wilda (HSMM, Inc.)	Date: July 18, 2001 Co./City: Burke County State: North Carolina
Do Normal Circumstances exist on the site? Yes Is the site significantly disturbed (Atypical Situation)? No Is the area a potential Problem Area? No (If needed, explain on reverse)	Community ID: _____ Transect ID: _____ Plot ID: SW1W

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. *Microstegium vimineum*	Herb	FAC+	9.		
2. *Polygonum punctatum*	Herb	FACW	10.		
3. *Leersia oryzoides*	Herb	OBL	11.		
4. *Vitis riparia*	Herb	FACW	12.		
5. *Lonicera japonica*	Herb	FAC-	13.		
6.			14.		
7.			15.		
8.			16.		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-): 80%

Remarks:

HYDROLOGY

X Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- X Aerial Photographs
- ___ Other (Explain in Remarks)

___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)

Depth to Standing Water in Pit: _____ (in.)

Depth to Saturated Soil: surface (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- XX Saturated in Upper 12 Inches
- ___ Water Marks
- XX Drift Lines
- XX Sediment Deposits
- ___ Drainage Patterns in Wetlands

Secondary Indicators (2 or more required):
- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaf Litter
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test
- ___ Other (Explain in Remarks)

Remarks: Recent rain
Adjacent to waterway shown in NCDOT black and white aerial photo.

DATA FORM (continued)

ROUTINE WETLAND DETERMINATION

(1987 COE Wetlands Delineation Manual)

SOILS

Map Unit Name (Series and Phase): Arkaqua loam (occasionally flooded)

Drainage Class: Somewhat poorly drained

Taxonomy (Subgroup): mesic Fluvaquentic Dystrudepts

Field Observations Confirmed Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structures, etc.
0-2	A	10YR 3/3			ORGANIC SANDY LOAM
2-8	B	2.5Y 4/3			SANDY LOAM
8-12	C	10YR 3/1			SANDY LOAM

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- XX Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

Remarks:

Units mapped by NRCS are non-hydric.

Soils observed likely represent hydric soil inclusion, which USDA reports to occur within Arkaqua map units, or fluvaquents.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	YES		
Wetland Hydrology Present?	YES	Is this Sampling Point Within a Wetland?	YES
Hydric Soils Present?	YES		

Remarks:

APPENDIX D

DWQ Wetland Rating Worksheets

WETLAND RATING WORKSHEET Fourth Version

Project Name NCDOT B-4040 Bridge Replacement NRTR Nearest Road SR1128
County Burke Wetland Area <2 acres Wetland Width 3 feet
Name of evaluator Greg Wilda, Martin Mitchell (HSMM, Inc.) Date 7/18/01

Wetland Location

___ on pond or lake
_x_ on perennial stream
___ on intermittent stream
___ within interstream divide
___ other _____

Soil Series Arkaqua loam

___ predominantly organic – humus, muck, or peat
_x_ predominantly mineral – non-sandy
___ predominantly sandy

Hydraulic Factors

_x_ steep topography
___ ditched or channelized
___ total wetland width ≥ 100 feet

Adjacent land use
(within ½ mile upstream, upslope, or radius)

_x_ forested/natural vegetation 30 %
_x_ agriculture, urban/suburban 65 %
_x_ impervious surface 2 %

Dominant vegetation

(1) *Salix nigra*
(2) *Betula nigra*
(3) *Alnus serrulata*

Flooding and wetness

___ semipermanently to permanently flooded or inundated
___ seasonally flooded or inundated
_x_ intermittently flooded or temporary surface water
___ no evidence of flooding or surface water

Wetland type (select one)*

_x_ Bottomland hardwood forest
___ Headwater forest
___ Swamp forest
___ Wet flat
___ Pocosin
___ Bog forest
___ Pine savanna
___ Freshwater marsh
___ Bog/fen
___ Ephemeral wetland
___ Carolina Bay
___ Other _____

* the rating system cannot be applied to salt or brackish marshes or stream channels

			weight		Wetland Rating
R	Water storage	1	x 4.00 =	4	38
A	Bank/Shoreline stabilization	2	x 4.00 =	8	
T	Pollutant removal	1	x 5.00 =	5	
I	Wildlife habitat	2	x 2.00 =	4	
N	Aquatic life value	4	x 4.00 =	16	
G	Recreation/Education	1	x 1.00 =	1	

*Add 1 point if in sensitive watershed and > 10% nonpoint disturbance within ½ mile upstream, upslope, or radius.