STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

August 16, 2006

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

ATTN: Mr. Steve Lund
Cc: Mr. David Baker
NCDOT Coordinator

Dear Sir:

Subject: **Nationwide 23 & 33 Permit Application** for the proposed replacement of Bridge No. 61 on NC 197 over The North Toe River, Yancey/Mitchell Counties. Federal Aid Project No. BRSTP-197(1), State Project No. 8.1900401, TIP Project No. B-1443.

Please find enclosed three copies of the project planning report along with the Pre-Construction Notification form (PCN), permit drawings, roadway plans, and stormwater management plan for the above referenced project. The North Carolina Department of Transportation (NCDOT) proposes to replace existing Bridge No. 61 on NC 197 over The North Toe River [DWQ Index # 7-2-(38.5), Class "C; TR"] on the Yancey and Mitchell County line. The project involves replacing Bridge No. 61 on a new alignment to the southeast of the existing structure. During construction, traffic will be maintained on the existing bridge.

BRIDGE DEMOLITION

Bridge No. 61 is currently a 270-foot, 5 span structure, that consists of a reinforced concrete slab and continuous closed spandrel arch supported by reinforced concrete post and web bents with reinforced concrete vertical abutments. Removal of the bridge will result in dropping components into Waters of the United States during demolition; subsequently, any temporary fill will be removed. The resulting temporary fill is calculated to be approximately 60 cubic yards.

The NCDOT will adhere to appropriate guidelines for bridge demolition and removal including those presented in "Pre-Construction Guidelines for Bridge Demolition and Removal", "Policy: Bridge Demolition and Removal in Waters of the United States", "Best Management Practices for Bridge Demotion and Removal", "Best Management Practices for the Protection of Surface Waters", and "Design Standards in Sensitive Watersheds".

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
PROJECT DEVELOPMENT AND ENVIRONMENTAL ANALYSIS
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

TELEPHONE: 919-715-1500
FAX: 919-715-1501
WEBSITE: WWW.NCDOT.ORG

LOCATION:
2728 CAPITAL BLVD.
PARKER LINCOLN BUILDING, SUITE 168
RALEIGH NC 27604

BRIDGE CONSTRUCTION

The proposed bridge will be on a curved alignment. The proposed structure will be approximately 340.4 feet in length with a width of 24.6 feet due to the curved alignment. Bridge No. 61 will include three spans, two at 107 feet and one at 142 feet, and a reinforced concrete deck superstructure. The substructure will consist of steel girders and the two bridge piers will be single drilled shaft columns.

IMPACTS TO WATERS OF THE UNITED STATES

Permanent Impacts: The North Toe River will be impacted by the proposed project. Construction of the proposed project will result in total equaling less than 0.01 acre (100 square feet) of permanent impacts to jurisdictional surface waters, from the construction of bridge piers.

Temporary Impacts: The North Toe River will be temporarily impacted by the proposed project. Construction of the proposed project will result in a total of 0.22 acre of temporary impacts to jurisdictional streams, in the form of temporary rock causeways and temporary support structures (see permit drawings). Temporary support structures will be constructed to assist in the demolition of the existing structure. Temporary rock causeways will be used to provide access for equipment during construction of the new structure and removal of the old bridge once the new bridge is in place. It is assumed that the contractor will begin construction of the proposed temporary rock causeways shortly after the date of availability for the project. The Let date is January 16, 2007 with a review date of November 28, 2006.

Restoration Plan: Upon completion of the new bridge, the temporary fill will be removed to natural grade and the area will be planted with native grasses and or tree species as appropriate.

AVOIDANCE AND MINIMIZATION

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages; minimization measures were incorporated as part of the project design.

Of the five reasonable and feasible alternatives considered, the chosen, best minimizes impacts to the sensitive natural ecosystems in the vicinity of the project site and provides the most economic design. In addition, "Design Standards in Sensitive Watersheds", NCDOT's guidelines for "Best Management Practices for the Protection of Surface Waters", and "Guidelines for Construction Adjacent to Trout Waters" will be enforced throughout the duration of the project construction.

Since this project will be affecting the federally-protected Appalachian elktoe, areas adjacent to the project site will be regarded as "Environmentally Sensitive Areas" on the Erosion Control Plans. Please refer to the project commitments for additional detail.

FEDERALLY-PROTECTED SPECIES

As of April 27, 2006 the U.S. Fish and Wildlife Service (USFWS) lists ten federally protected species (Table 1) for Yancey County, and ten for Mitchell County (Table 2). Federal Status and Biological conclusions are listed in the following tables. A Biological Opinion (BO) for Appalachian elktoe has been has been rendered by the USFWS (see attached).

Table 1. Federally protected species of Yancey County.

Scientific Name	Common Name	Federal Status	Biological Conclusion
Clemmys muhlenbergii	Bog turtle	T S/A	No Survey Required
Corynorhinus townsendii virginianus	Virginia big-eared bat	E	No Effect
Felis concolor couguar	Eastern cougar	E	No Effect
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No Effect
Alasmidonta raveneliana	Appalachian elktoe	E	May Affect, Likely to Adversely Affect
Microhexura montivaga	Spruce-fir moss spider	E	No Effect
Geum radiatum	Spreading avens	E	No Effect
Houstonia montana	Roan mountain bluet	E	No Effect
Spiraea virginiana	Virginia spiraea	T	No Effect
Gymnoderma lineare	Rock gnome lichen	E	No Effect

Table 2. Federally protected species of Mitchell County.

Scientific Name	Common Name	Federal Status	Biological Conclusion
Clemmys muhlenbergii	Bog turtle	T S/A	No Survey Required
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No Effect
Myotis sodalis	Indiana bat	E	No Effect
Alasmidonta raveneliana	Appalachian elktoe	E	May Affect, Likely to Adversely Affect
Microhexura montivaga	Spruce-fir moss spider	E	No Effect
Geum radiatum	Spreading avens	E	No Effect
Liatris helleri	Heller's blazing star	T	No Effect
Solidago spithamaea	Blue Ridge goldenrod	T	No Effect
Spiraea virginiana	Virginia spiraea	T	No Effect
Gymnoderma lineare	Rock gnome lichen	E	No Effect

Endangered (E) – is defined as a taxon that is threatened with extinction throughout all or a significant portion of its range.

Threatened (T) – A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of it's range."

T S/A – "Similarity of Appearance" (a species that is listed as threatened due to similarity of appearance with other rare species).

REGULATORY APPROVALS

Section 404 Permit: It is anticipated that the temporary work bridge across the North Toe River 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 temporary rock causeways in the North Toe River. 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). The NCDOT requests that these activities be authorized by a Nationwide Permit 23 (FR number 10, pages 2020-2095; January 15, 2002).

Section 401 Certification: We anticipate 401 General Certifications numbers 3403 and 3366 will apply to this project. In accordance with 15A NCAC 2H .0501(a) we are providing two copies of this application to the North Carolina Department of Environmental and Natural Resources, Division of Water Quality, for their records.

A copy of this permit application will be posted on the DOT website at: http://www.doh.dot.state.nc.us/preconstruct/pe/neu/permit.html. If you have any questions or need additional information, please contact Tyler Stanton at tstanton@dot.state.nc.us or (919) 715-1439.

Sincerely,

E. L. Lusk

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

W/attachment

Mr. John Hennessy, NCDWQ
Ms. Marella Buncick, USFWS
Ms. Marla Chambers, NCWRC
Mr. Harold Draper, TVA
Dr. David Chang, P.E., Hydraulics
Mr. Greg Perfetti, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. J.J. Swain, P.E., Division 13 Engineer
Mr. Roger Bryan, Divison 13 Environmental Officer

W/o attachment

Mr. Jay Bennett, P.E., Roadway Design
Mr. Majed Alghandour, P. E., Programming and TIP
Mr. Art McMillan, P.E., Highway Design
Mr. Scott McLendon, USACE, Wilmington
Mr. John Williams, 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 23 & 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: Gregory J. Thorpe, Ph.D., Environmental Management Director
   Mailing Address: 1598 Mail Service Center
   Raleigh, NC
   Telephone Number: (919) 733-3141 Fax Number: (919) 733-9794
   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. 61 on NC 197 over the North Toe River

2. T.I.P. Project Number or State Project Number (NCDOT Only): B-1443

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

4. Location
   County: Mitchell & Yancey Nearest Town: Burnsville
   Subdivision name (include phase/lot number): N/A
   Directions to site (include road numbers/names, landmarks, etc.):

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): -82.2290 °N 36.0130 °W

6. Property size (acres): N/A

7. Name of nearest receiving body of water: North Toe River

8. River Basin: French Broad
   (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/.)

9. Describe the existing conditions on the site and general land use in the vicinity of the project at the time of this application: Rural major collector. Area is mixture of rural, residential, and agriculture.

10. Describe the overall project in detail, including the type of equipment to be used: Bridge replacement using mechanical highway construction equipment.

11. Explain the purpose of the proposed work: The bridge is considered to be structurally deficient and functionally obsolete and the replacement will result in safer traffic operations.

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 no impacts to jurisdictional streams from the construction of the proposed project.

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)
No Impacts			N/A	N/A	N/A
				Total Wetland Impact (acres)	0

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, 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)
No Impacts	N/A	N/A	N/A	N/A	N/A	N/A
Total Stream Impact (by length and acreage)					0	0

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)
Sta. 13+00.00	North Toe River	Piers in streambed	Stream	0.01
12+40 – 13+48	North Toe River	Temporary Causeway	Stream	0.12
Old Bridge	North Toe River	Temporary Causeway	Stream	0.09
Old Bridge	North Toe River	Temporary Supports	Stream	0.01
Total Open Water Impact (acres)				0.23

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

Stream Impact (acres):	0
Wetland Impact (acres):	0
Open Water Impact (acres):	0.23
Total Impact to Waters of the U.S. (acres)	0.23
Total Stream Impact (linear feet):	0

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.):
   Current land use in the vicinity of the pond:
   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. Traffic maintained on existing bridge during construction, longer spans, fewer bents in streambed, Best Management Practices will be utilized during demolition of the existing bridge and construction of the new bridge.

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 will 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): N/A

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: N/A)? 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			0
2			0
Total			0

* 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. See attached Stormwater Management Plan

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:
N/A

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).

E. L. Lusk 8-25-06

Applicant/Agent's Signature **Date**

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

Yancey County
Bridge No. 61 on NC 197
over North Toe River
Federal Aid Project No. BRSTP-197(1)
State Project No. 8.1900401
T.I.P. No. B-1443

CATEGORICAL EXCLUSION & PROGRAMMATIC SECTION 4(f)

UNITED STATES DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

9-02-03
DATE

for Teresa Hart
Gregory J. Thorpe, PhD.,
Environmental Management Director, PDEA

9/2/03
DATE

John F. Sullivan III
Division Administrator, FHWA

Yancey County
Bridge No. 61 on NC 197
over North Toe River
Federal Aid Project No. BRSTP-197(1)
State Project No. 8.1900401
T.I.P. No. B-1443

CATEGORICAL EXCLUSION & PROGRAMMATIC SECTION 4(f)

Documentation Prepared in
Project Development and Environmental Analysis Branch By:

9-02-03
DATE

John L. Williams, PE,
Project Planning Engineer

9-02-03
DATE

William T. Goodwin Jr., PE, Unit Head
Bridge Replacement Planning Unit

PROJECT COMMITMENTS:

Yancey County
Bridge 61 on NC 97
Over North Toe River
Federal Project BRSTP-197()
State Project 8.1900401
TIP # B-1443

"**Design Standards in Sensitive Watersheds**" will be applied for this project

"**Guidelines for Construction Adjacent to Trout Waters**" will be applied for this project.

The Historic Bridge has been recorded in accordance with the attached Memorandum of Agreement.

The driveway access to the property immediately south of the bridge will be re-established as part of the design and construction of the project.

Appalachian elktoe

This project will be affecting the endangered Appalachian elktoe and as such the following commitments will be implemented in project construction.

Erosion Control Measures: The areas adjacent to the North Toe River will be identified as "Environmentally Sensitive Areas" on the Erosion Control plans for this project.

Within the Environmentally Sensitive Areas the following shall apply:

1. Provide 50-Foot buffer Zone (both sides of river) which allows clearing but not grubbing until immediately before grading operations.
2. Limit grubbing operations to within 10 days of grading.
3. Erosion and Sediment Control Measures to be installed immediately after clearing.
4. Require "Seeding and Mulching" to be performed immediately following grade establishment.
5. Require "Staged Seeding" – 20 foot fill sections or 2 acres, whichever is less.
6. Erosion and sediment Control Measures must be cleaned out when ½ full.
7. Increase sediment storage capacity by 50% above standard BMP guidelines.

Agency Coordination: NCDOT will invite representatives from the U.S. Fish and Wildlife Service and the North Carolina Wildlife resource Commission to the pre-construction meeting for these projects, along with all subsequent field inspections prior to construction, to insure compliance with all special project commitments.

Bridge Drainage: Deck drains will be placed at the ends of the replacement bridge so no drainage will occur over the North Toe River channel. Currently drainage from the decks of both of the existing structures flows directly into the river. The amount of discharge from the roadway entering the river will be reduced with the new structure. This commitment will be incorporated in the Structure Design Plans.

Preconstruction Survey: NCDOT conducts final surveys (just prior to construction) in the project footprint of projects impacting waters known to contain protected mussel species. NCDOT is anticipating that a few individuals will be found in surveys of the project footprint and is proposing to relocate these mussels to appropriate habitat to be defined in the forthcoming Biological Assessment.

Bridge Demolition: A plan for Bridge Demolition has been developed and tentatively agreed upon by U.S. Fish & Wildlife Service. The plan will be included with the forthcoming Biological Assessment (B.A.). Upon completion of a U.S. Fish & Wildlife Service approved B.A., then the full details of the plan will be included in the final Greensheet as part of the permit package.

Yancey County
Bridge No. 61 on NC 197
over North Toe River
Federal Aid Project No. BRSTP-197(1)
State Project No. 8.1900401
T.I.P. No. B-1443

INTRODUCTION: Bridge No. 61 is included in the latest North Carolina Department of Transportation (NCDOT) Transportation Improvement Program and is eligible for the Federal-Aid Bridge Replacement and Rehabilitation Program. The location is shown in Figure 1. No substantial environmental impacts are anticipated. The project is classified as a Federal "Categorical Exclusion".

I. PURPOSE AND NEED STATEMENT

Bridge Maintenance Unit records indicate the bridge has a sufficiency rating of 49.2 out of a possible 100 for a new structure. The bridge is fast approaching the end of its useful life. It is considered to be structurally deficient due to deteriorating structural integrity and functionally obsolete due to narrow roadway geometry on the bridge. The replacement of this inadequate structure will result in safer traffic operations.

II. EXISTING CONDITIONS

The project is located on NC 197 over the North Toe River on the Yancey-Mitchell County line. The project is in a rural area that includes a combination of residential, rural, and agricultural areas. The topography in the project vicinity is characterized by rolling hills with steep slopes in some places.

NC 197 is classified as a rural major collector in the Statewide Functional Classification System and is not on the National Highway System. This route is not a designated bicycle route and there is no indication that an unusual number of bicyclists use this roadway.

In the vicinity of the bridge, NC 197 has a 20-foot (6.0-meter) pavement width with approximately 2-foot (0.6-meter) grass shoulders. The roadway grade begins in a slight sag vertical curve and then reverses to a slight crest vertical curve at the end of the project. The existing bridge has straight alignment with sharp curves on both approaches. The northeast approach crosses a CSX railroad line. The roadway is situated approximately 31 feet (9.4 meters) above the river bed.

Bridge No. 61 is a five-span structure. The existing bridge (see Figure 3) was constructed in 1925 and has an overall length of 270 feet (82.3 meters). The structure consists of a reinforced concrete slab and continuous closed spandrel arch supported by reinforced concrete post and web

bents with reinforced concrete vertical abutments. The clear roadway width is 15.6 feet (4.8 meters). There are no weight limitations posted for the bridge.

There are no utilities attached to the existing structure. Overhead power lines are located parallel to the railroad tracks on the east end of the bridge. An overhead telephone line crosses the river above the bridge.

The current traffic volume of 1450 vehicles per day (VPD) is expected to increase to 2800 VPD by the year 2025. The projected volume includes two-percent truck-tractor semi-trailer (TTST) and six-percent dual-tired vehicles (DT). The speed limit is not posted in the area and is therefore statutory 55 miles (90 kilometers) per hour in the project area.

There were two accidents reported in the vicinity of Bridge No. 61 during a recent three-year period. The accidents resulted in personal injuries and property damage. The accidents ocurred in the sharp curves on the approaches to the bridge.

There are currently no school buses utilizing this bridge.

III. ALTERNATIVES

A. Project Description

Existing Bridge No. 61 will be replaced with a bridge of sufficient width to provide, at a minimum, two 11-foot (3.3-meter) lanes with 3.0-foot (1.0-meter) offsets. The roadway grade of the new structure will be approximately the same as the existing grade at this location. Traffic will be maintained on the existing bridge during construction. Upon completion of the project the existing bridge will be removed.

The existing roadway will be widened to a pavement width of 22-foot (6.6-meter); providing two 11-foot (3.3-meter) lanes and shoulder widths of 8-foot (2.4-meter). The project will be designed as a rural major collector.

B. Reasonable and Feasible Alternatives

Five alternates were studied for the replacement of Bridge No. 61. They are described as follows. The speed limit through the area is 55 mph. This as a design speed can not be met due to economic and environmental constraints. Therefore, a Design Exception will be required for a design speed of 30 mph (90 kph).

Alternate 1 involves replacing Bridge No. 61 on new alignment approximately 92 feet (28 meters) to the east of the existing structure (see Figure 2A). The proposed structure would be approximately 312 feet (95 meters) in length with a travelway of 22 feet (6.6 meters) and shoulders of 3.0 feet (1.0 meter). The proposed bridge would be on a straight alignment. Improvements to the approach roadways would be required for a distance of approximately 920 feet (280 meters) to the south and 480 feet (146 meters) to the north.

Alternate 2 involves replacing Bridge No. 61 on new alignment approximately 197 feet (60 meters) to the east of the existing structure (see Figure 2A). The proposed structure would be approximately 312 feet (95 meters) in length with a travelway of 22 feet (6.6 meters) and shoulders of 3.0 feet (1.0 meter). The proposed bridge would be mostly straight with short curved section on the south end. Improvements to the approach roadways would be required for a distance of approximately 902 feet (275 meters) to the south and 380 feet (116 meters) to the north.

Alternate 3 involves replacing Bridge No. 61 on new alignment approximately 121 feet (37 meters) to the west of the existing structure (see Figure 2A). The proposed structure would be approximately 345 feet (105 meters) in length with a travelway of 12 feet (6.6 meters) and shoulders of 3.0 feet (1.0 meter). The proposed bridge would be straight. Improvements to the approach roadways would be required for a distance of approximately 985 feet (300 meters) to the south and 540 feet (165 meters) to the north.

Alternate 4 involves replacing Bridge No. 61 on new alignment approximately 131 feet (40 meters) to the east of the existing structure (see Figure 2B). The proposed structure would be approximately 312 feet (95 meters) in length with a travelway of 12 feet (6.6 meters) and shoulders of 3.0 feet (1.0 meter).). The proposed bridge would be mostly straight with short curved section on the south end. Improvements to the approach roadways would be required for a distance of approximately 223 feet (68 meters) to the south and 197 feet (60 meters) to the north.

Alternate 4A (Preferred) involves replacing Bridge No. 61 on new alignment approximately 180 feet (55 meters) to the east of the existing structure. The proposed bridge will be on a curved alignment. The proposed structure will be approximately 360 feet (109 meters) in length with a travelway of 36 feet (10.9 meters) due to the curved alignment. The inside shoulder will be 8 feet (2.4 meters) to accommodate horizontal sight distance. The outside shoulder will be 3 feet (1 meter). Improvements to the approach roadways will be required for a distance of approximately 213 feet (65 meters) to the south and 59 feet (18 meters) to the north.

C. Alternatives Eliminated From Further Consideration

The "do-nothing" alternative will eventually necessitate closure of the bridge. This is not acceptable due to the traffic service provided by NC 197.

Rehabilitation of the old bridge is not practical due to its age and deteriorated condition. Rehabilitation of the existing bridge would require the following; repair to cracked and spalling concrete, rail retrofits to the bridge rail, and would need to be widened to accommodate two lanes of traffic. Scouring of the substructure would also have to be addressed. Given the expense of a temporary onsite detour and lack of an offsite detour, these alternatives are not feasible and prudent.

D. Preferred Alternative

After coordination with numerous resource agencies, it has been determined that Bridge No. 61 will be replaced on new alignment as shown by Alternate 4A (See Figure 2B). Alternate 4A is recommended because it minimizes impacts on the sensitive natural ecosystems in the vicinity of the site and provides a safe, economic design.

The NCDOT Division 13 Engineer concurs with the selection of Alternate 4A as the preferred alternative.

IV. ESTIMATED COSTS

The estimated costs for the five alternatives are summarized below.

	Alternate 1	Alternate 2	Alternate 3	Alternate 4	Alternate 4A
Existing Structure Removal	$ 31,800	$ 31,800	$ 31,800	$ 31,800	$ 31,800
New Structure	531,000	531,100	587,000	531,000	559,000
Roadway Approaches	1,016,000	822,300	976,700	131,900	134,000
Misc. & Mob.	477,100	415,800	478,500	208,300	217,200
Eng. & Contingencies	344,000	299,000	326,000	147,000	158,000
Total Construction Cost	$ 2,400,000	$ 2,100,000	$ 2,400,000	$ 1,050,000	$ 1,100,000
Right-of-way Costs	$ 436,500	$ 450,500	$ 262,500	$ 282,000	$ 299,000
Total Project Cost	$ 2,836,500	$ 2,550,500	$ 2,662,500	$ 1,332,000	$ 1,399,000

V. NATURAL RESOURCES

A. Physiography

The proposed project lies on the Yancey/Mitchell County Line approximately 7 miles (11 kilometers) northeast of Burnsville, North Carolina and approximately 13 miles (21 kilometers) east of the Tennessee state line. The project is in a rural area in the northwestern portion of North Carolina, which lies within the Blue Ridge Physiographic Province. Elevations in the project area are approximately 2200 feet (671 meters) National Geodetic Vertical Datum (NGVD). The topography of the project vicinity is characterized by rolling hills with steep slopes in some places. Within the project area, the stream banks are steep along North Toe River. The project vicinity includes a combination of residential, rural, and agricultural areas.

B. Soils

Published soil surveys were not available for Yancey or Mitchell Counties. According to the available NRCS mapping (Mitchell County 1989), the detailed map units within the project area include Biltmore sand, Dillsboro clay loam, Fannin sandy loam, and Chandler-Micaville complex.

Biltmore sand is mapped along the floodplain areas of the North Toe River. This soil occurs on 0 to 3 % slopes and it is a non-hydric soil that is described as frequently flooded. The Chandler-Micaville complex is mapped in the northwestern quadrant of the project. This soil occurs on 50 to 95 % slopes and is non-hydric. Dillsboro clay loam (2 to 8 % slopes) is a non-hydric soil, which is mapped along NC 197, to the north of the river. Fannin sandy loam is mapped adjacent to the areas of Dillsboro clay loam. This soil occurs on 15 to 30 % slopes, is non-hydric, and is described as well-drained micaceous soil on side slopes.

According to the available mapping for Yancey County (1998) the project area includes:

1). Porters-Unaka complex, mapped to the south of the river, is the main map unit within the study corridor. This non-hydric soil occurs on 50 to 95 % slopes and is described as rocky and well-drained.

2). Saunook-Thunder complex (15 to 30 %) slopes is mapped in a small area just south of the existing bridge. This stony soil is non-hydric and well drained.

C. Water Resources

1. Physical Characteristics of Surface Waters

The project is located in the French Broad River basin. Two surface water resources, North Toe River and an unnamed tributary to North Toe River, will be impacted by the proposed project. North Toe River originates in northern Avery County, approximately 50 miles (80 kilometers) upstream of the project area. From its origin, the river flows south to Mitchell County, then turns to the northwest. North Toe River is 64 miles (103 kilometers) long from its headwaters to its confluence with the Nolichucky River, which is approximately 14.3 miles (23 kilometers) downstream of the project area.

North Toe River is 140 to 150 feet (43 to 46 meters) wide within the project area. The bed and channel materials consist of bedrock and boulders, as well as micaceous sand. Within the project area, the river flows west and consists mainly of a straight run. The riparian vegetation consists mostly of deciduous trees, and the floodplain appears to be seasonally flooded along some areas of the bank. At the time of the field survey, the river ranged from a few inches deep over rapids and riffles to several feet deep in pools. The water was slightly turbid and streamflow was rapid.

An unnamed perennial tributary to North Toe River parallels the east side of NC 197, on the north side of the river. The stream is 4 to 5 feet (1.2 to 1.5 meters) wide with a cobble, silt, and sand substrate. On the day of the site visit the stream was 3 to 8 inches (7.6 to 20.3 centimeters) deep. The confluence with North Toe River is just east of the existing bridge (Figure 2).

2. Best Usage Classification

Surface waters in North Carolina are assigned a classification by the Division of Water Quality (DWQ) that is designed to maintain, protect, and enhance water quality within the state. North Toe River and the unnamed tributary [Index # 7-2-(38.5)] is classified as a Class C Tr waterbody. Class C water resources are used for aquatic life propagation and survival, fishing, wildlife, secondary recreation, and agriculture. The supplemental Tr classification indicates freshwaters protected for natural trout propagation and survival of stocked trout.

No waters classified as High Quality Waters (HQW), Water Supplies (WS-I of WS-II) or Outstanding Resource Waters (ORW) occur within 1 miles (1.6 kilometers) of the project study area.

3. Water Quality

The Benthic Macroinvertebrate Ambient Network (BMAN), managed by the Division of Water Quality (DWQ) and established in 1982, is part of an on-going ambient long-term water quality monitoring program. The program has established fixed water quality monitoring stations for selected benthic macroinvertebrates.

Several BMAN stations have been established along North Toe River upstream of the project area. One station is located at SR 1315 near Loafers Glen in Yancey County, which is approximately 4 kilometers (2.5 miles) upstream of Bridge No. 61. This station was sampled in July, 1992 and received a bioclassification of "good". A second station has been established at SR 1162, near Penland in Mitchell County, approximately 15 miles (24 kilometers) upstream of the project area. This station was sampled seven times between 1984 and 1992. Bioclassification at this station ranged from "fair" to "good". Other stations along the North Toe River, which are located further upstream than the stations described, also ranged from "fair" to "good".

Point source discharges in North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program administered by the DWQ. All discharges are required to obtain a permit to discharge. There are no known permitted point source dischargers to North Toe River within the project vicinity.

4. Summary of Anticipated Impacts

Any action that affects water quality can adversely affect aquatic organisms. Temporary impacts during the construction phases may result in long-term impacts to the aquatic community. Alternate 3 would result in the greatest impacts to the aquatic and terrestrial communities due to its longer length and skewed alignment. Alternate 4 will have approximately the same impacts on the North Toe River as Alternate 3 due to the skewed alignment. Alternate 4A offers the least amount of impacts because of its curved alignment. This alignment requires only two bents, which can be placed at the edge of the river. The other alternates would require a bent to be placed in the middle of the river. Physical impacts will be the most severe at the point of bridge replacement.

Project construction may result in the following impacts to surface water resources:

1). Increased sediment loading and siltation as a consequence of watershed vegetation removal, erosion/and or construction.
2). Decreased light penetration/water clarity from increased sedimentation.
3). Changes in water temperature with vegetation removal.
4). Changes in the amount of available organic matter with vegetation removal.
5). Increased concentration of toxic compounds from highway runoff, construction activities and construction equipment, and spills.
6). Alteration of water levels and flows due to interruptions and/or additions to surface and groundwater flow from construction.
7). Increased scouring of the existing channel due to increased water flows from the stormwater runoff associated with curb and gutter systems.

It is important to understand that construction impacts may not be restricted to the communities in which the construction activity occurs. Efforts should be made to ensure that no sediment leaves the construction site. NCDOT's Best Management Practices for the Protection of Surface Waters should be followed during the construction phase of the project. In addition, Design Standards in Sensitive Watersheds and "Guidelines for Construction Adjacent to Trout Waters" will be adhered to during the project construction.

D. Biotic Resources

Terrestrial and aquatic communities are included in the description of biotic resources. Living systems described in the following sections include communities of associated plants and animals. These descriptions refer to the dominant flora and fauna in each community and the relationship of these biotic components. Descriptions of the terrestrial systems are presented in the context of plant community classifications. These classifications follow Schafale and Weakley (1990) where possible. Representative animal species, which are likely to occur in these habitats (based on published range distributions) are also cited. Scientific nomenclature and common names (when applicable) are used for the plant and animal species described. Subsequent references to the same species are by the common name only.

1. Terrestrial Communities

Three distinct terrestrial communities were identified within the project area: a man-dominated/disturbed community, a floodplain community, and a forested upland (Figure 2). Dominant faunal components associated with these terrestrial areas will be discussed in each community description. Many species are adapted to the entire range of habitats found along the project alignment, but may not be mentioned separately in each community description.

Man-Dominated/Disturbed Community

The man-dominated or disturbed community includes road shoulders, residential areas, the field south of the river, and areas associated with the railroad on the north side of the river.

Many plant species are adapted to these disturbed areas. Regularly maintained areas along road shoulders, lawns, and fields are dominated by various grasses such as fescue (*Festuca* sp.) and ryegrass (*Lolium* sp.), as well as plantain (*Plantago virginica*), wild onion (*Allium cernuum*), white clover (*Trifolium repens*), and dandelion (*Taraxacum officinale*). The irregularly maintained areas, which include the transition areas between the regularly maintained and the forested communities, are dominated by weedy invasive species such as Japanese honeysuckle (*Lonicera japonica*), greenbrier (*Smilax* sp.), goldenrod (*Solidago* sp.), and blackberry (*Rubus* sp.). Along the railroad track, which parallels North Toe River to the north, thick mats of scouring rush (*Equisetum hyemale*) dominate the embankment.

The animal species present in these disturbed habitats are opportunistic and capable of surviving on a variety of resources, ranging from vegetation (flowers, leaves, fruits, and seeds) to both living and dead faunal components. A turkey vulture (*Cathartes aura*) was observed during the site visit. House sparrows (*Passer domesticus*), northern mockingbirds (*Mimus polyglottos*), northern juncos (*Junco hyemalis*), and mourning doves (*Zenaida macroura*) are other common birds that use these habitats. The field and residential lawn areas may be utilized by gray squirrel (*Sciurus carolinensis*), Virginia opossum (*Didelphis virginiana*), several species of mice (*Peromyscus* sp.), American toad (*Bufo americanus*), and Eastern garter snake (*Thamnophis sirtalis sirtalis*).

Floodplain Community

There is an alluvial floodplain present along the northern bank of North Toe River within the project area. This area had recently been flooded by high water. Vegetation along this floodplain is somewhat sparse and includes scattered sycamore (*Platanus occidentalis*), spicebush (*Lindera benzoin*), black willow (*Salix nigra*), and iris (*Iris* sp.). The alluvial soils along the floodplain consist of a dark brown (10YR 3/3) well-drained sand. This community corresponds most closely to the Montane Alluvial Forest community described in Schafale and Weakley (1990).

The banks of the North Toe River are steep and rocky. Dominant species along the banks include sycamore, tulip poplar (*Liriodendron tulipifera*), American beech (*Fagus grandifolia*), eastern hemlock (*Tsuga canadensis*), black walnut (*Juglans nigra*), and yellow buckeye (*Aesculus octandra*). The understory is dominated by great rhododendron (*Rhododendron maximum*) which is dense in some places. The shrub and herbaceous layer includes dog's hobble (*Leucothoe fontanesiana*), nannyberry (*Viburnum lentago*), Christmas fern (*Polystichum acrostichoides*), poison ivy (*Toxicodendron radicans*), and greenbrier (*Smilax* sp.).

Although only Carolina chickadee (*Parus carolinensus*) was observed during the field activities, other species which may utilize the trees and shrubs in this habitat include white-breasted nuthatch (*Sitta carolinensis*), tufted titmouse (*Parus bicolor*), hairy woodpecker (*Picoides villosus*), white-eyed vireo (*Vireo griseus*), and yellow warbler (*Dendroica petechia*). Species which may forage and reside along the river banks include raccoon (*Procyon lotor*), Virginia opossum, white-tailed deer (*Odocoileus virginianus*), red-spotted newt (*Notophthalmus viridescens viridescens*), and ground skink (*Scincella lateralis*).

Upland Forest

An upland forest community is present on the south side of the river and north of the floodplain forest on the north side. The forested areas are mostly open communities dominated by beech (*Fagus grandifolia*), black oak (*Quercus velutina*), hickories (*Carya* spp.), eastern hemlock, and black locust (*Robinia pseudo-acacia*), with Christmas fern in the herbaceous layer. This community corresponds most closely to the Montane Oak-Hickory Forest community of the NHP classification system.

Although only a northern mockingbird was observed, a variety of species likely utilizes these well-developed upland communities. Birds may include blue-gray gnatcatcher (*Polioptila caerulea*), Acadian flycatcher (*Empidonax virescens*), black-and-white warbler (*Mniotilta varia*), scarlet tanager (*Piranga olivacea*), and purple finch (*Carpodacus purpureus*). Other species may include eastern chipmunk (*Tamias triatus*), white-footed mouse (*Peromyscus leucopus*), striped skunk (*Mephitis mephitis*), Fowler's toad (*Bufo woodhousei fowleri*), timber rattler (*Crotalus horridus*), copperhead (*Agkistrodon contortrix*), eastern box turtle (*Terrapene carolina*), and five-lined skink (*Eumeces fasciatus*).

2. Aquatic Communities

Within the project area North Toe River is a mid-gradient, high order river. The bed material consists of bedrock and boulders, as well as sand substrates. An unnamed perennial tributary to North Toe River parallels the east side of NC 197, on the north side of the river. The confluence with North Toe River is just east of the existing bridge. The stream is 4 to 5 feet (1.2 to 1.5 meters) wide with a cobble, silt, and sand substrate. On the day of the site visit the stream was 3 to 8 inches (7.6 to 20.3 centimeters) deep. Water clarity was fair to good in the North Toe and the unnamed tributary on the day of the site visit. The riparian community contains mostly trees.

North Toe River provides habitat for a variety of species of fish. According to Christopher Goudreau, the District 8 Biologist for the North Carolina Wildlife Resources Commission (WRC), the North Toe River was sampled at Bridge No. 61 in 1992. Fish species collected include central stoneroller (*Campostoma anomalum*), warpaint shiner (*Luxilus coccogenis*), rosyface shiner (*Notropis rubellus*), telescope shiner (*N. telescopis*), mirror shiner (*N. spectrunculus*), Tennessee shiner (*N. leuciodus*), mimic shiner (*N. volucellus*), silver shiner (*N. photogenis*), whitetail shiner (*Cyprinella galactura*), river chub (*Nocomis micropogon*), longnose dace (*Rhinichthys cataractae*), northern hog sucker (*Hypentelium nigricans*), blotched chub (*Erimystax insignis*), bigeye chub (*Hybopsis amblops*), fatlips minnow (*Phenacobius crassilabrum*), channel catfish (*Ictalurus punctatus*), rock bass (*Ambloplites rupestris*), smallmouth bass (*Micropterus dolomieu*), greenside darter (*Etheostoma blennioides*), greenfin darter (*E. chlorobranchium*), banded darter (*E. zonale*), Swannanoa darter (*E. swannanoa*), tangerine darter (*Percina aurantiaca*), gilt darter (*P. evides*), and mottled sculpin (*Cottus bairdi*).

The sharphead darter (*Etheostoma acuticeps*), which is a state listed threatened species, was also collected at this location. These species may also utilize the unnamed tributary in the vicinity of the bridge. Yancey and Mitchell counties are designated as "trout" counties by the WRC.

Reptiles and amphibians which may inhabit this community include hellbender (*Cryptobranchus alleganiensis*), shovelnose salamander (*Leurognathus marmoratus*) and northern water snake (*Nerodia sipedon sipedon*).

3. Summary of Anticipated Impacts

Project construction will have various impacts to the previously described terrestrial and aquatic communities. Any construction activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies potential impacts to the natural communities within the project area in terms of the area impacted and the plants and animals affected. Temporary and permanent impacts are considered here along with recommendations to minimize or eliminate impacts.

Terrestrial Communities

Terrestrial communities in the project area will be impacted by project construction from clearing and paving and loss of the terrestrial community area along NC 197. Estimated impacts are derived based on the study corridor lengths of 515 (1690 feet) for Alternate 1; 1590 feet (485 meters) for Alternate 2; and 1804 feet (550 meters) for Alternate 3; and the entire proposed study corridor width of 80 feet (24.4 meters). Table 1 details the potential impacts to terrestrial communities by habitat type. It should be noted that impacts are based on the entire study corridor width and actual loss of habitat will likely be less.

Table 1
Estimated Area Impacts to Terrestrial Communities

Community	Impacted Area in ac (ha)		
	Alternate 1	**Alternate 2**	**Alternate 3**
Upland Forest	0.59 (0.24)	0.43 (0.17)	0.92 (0.37)
Floodplain Forest	0.18 (0.07)	1.33 (0.54)	0.81 (0.33)
Man-dominated/Disturbed	1.64 (0.66)	0.18 (0.07)	0.11 (0.04)
Total Impacts	2.41 (0.97)	1.94 (0.78)	1.84 (0.74)

Note: Alternates 4 and 4A will have impacts to the Terrestrial Communities very similar to Alternate 2.

Destruction of natural communities along the project alignment will result in the loss of foraging and breeding habitats for the various animal species which utilize the area. Animal species will be displaced into surrounding communities. Adult birds, mammals, and some reptiles are mobile

enough to avoid mortality during construction. Young animals and less mobile species, such as many amphibians, may suffer direct loss during construction. Plants and animals found in these upland communities are generally common throughout western North Carolina.

Impacts to terrestrial communities, particularly in locations having steep to moderate slopes, can result in the aquatic community receiving heavy sediment loads as a consequence of erosion. It is important to understand that construction impacts may not be restricted to the communities in which the construction activity occurs, but may affect downstream communities. Efforts should be made to ensure that no sediment leaves the construction site.

Aquatic Communities

Impacts to aquatic communities include fluctuations in water temperatures due to the loss of riparian vegetation. Shelter and food resources, both in the aquatic and terrestrial portions of these organisms' life cycles, will be affected by losses in the terrestrial communities. The loss of aquatic plants and animals will affect terrestrial fauna which rely on them as a food source.

Temporary and permanent impacts may result to aquatic organisms from increased sedimentation. Aquatic invertebrates may drift downstream during construction and recolonize the disturbed area once it has been stabilized. Sediments have the potential to affect fish and other aquatic life in several ways, including the clogging and abrading of gills and other respiratory surfaces; affecting the habitat by scouring and filling of pools and riffles; altering water chemistry; and smothering different life stages. Increased sedimentation may caused decreased light penetration through an increase in turbidity. Each alternate will cause temporary increases in sedimentation from construction. However, Alternate 3, which proposes the longest replacement structure, will have greater impact as well as destruction of additional riparian habitat.

Wet concrete should not come into contact with surface water during bridge construction in order to minimize effects of runoff on the stream water quality. Potential adverse effects can be minimized through the implementation of NCDOT Best Management Practices for Protection of Surface Waters. In addition, Design Standards in Sensitive Watersheds and "Guidelines for Construction Adjacent to Trout Waters" will be adhered to during the project construction.

E. JURISDICTIONAL TOPICS

This section provides inventories and impact analyses for two federal and state regulatory issues: Waters of the U.S. and rare and protected species.

1. Waters of the United States

Wetlands and surface waters fall under the broad category of "Waters of the United States" as defined in 33 CFR 328.3 and in accordance with provisions of Section 404 of the Clean Water Act (33 U.S.C. 1344), and are regulated by the U.S. Army Corps of Engineers (USACE). Any action that proposes to dredge or place fill material into surface waters or wetlands falls under these provisions.

2. Characteristics of Wetlands and Surface Waters

Jurisdictional wetlands do not occur within the project area. North Toe River meets the definition of surface waters. North Toe River is therefore classified as Waters of the United States. The channel is approximately 140 to 150 feet (43 to 46 meters) wide within the project area.

3. Summary of Anticipated Impacts

No wetlands will be impacted by the project. Project construction cannot be accomplished without infringing on surface waters. Anticipated surface water impacts fall under the jurisdiction of the U.S. Army Corps of Engineers (USACE) and DWQ.

Within the project area, North Toe River is 140 to 150 feet (43 to 46 meters) wide. Assuming a 24.4 meters (80 feet) wide study corridor for the replacement structure, the construction of either alternate will impact a total of 80 linear feet (24.4 linear meters). Alternate 2 will impact approximately 0.28 ac (0.11 hectares) of surface waters; Alternates 1 and 3 will each impact approximately 0.37 ac (0.15 ha) of surface waters. Alternates 4 and 4A will have comparable surface water impacts to Alternate 2. Additionally, the linear stream impacts are approximately the same as Alternate 2. Please note that these estimates are based on the study corridor for each alternate. The actual length and area of the stream impacts will likely be less, depending on final design plans.

4. Permits

Impacts to jurisdictional surface waters are anticipated from the proposed project. Permits and certifications from various state and federal agencies may be required prior to construction activities.

Construction is likely to be authorized by provisions of CFR 330.5 (a) Nationwide Permit (NWP) No. 23, which authorizes activities undertaken, assisted, authorized, regulated, funded, or financed in whole or in part, by another Federal agency or department where that agency or department has determined, pursuant to the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act:

that the activity, work, or discharge is categorically excluded from environmental documentation because it is included within a category of actions which neither individually nor cumulatively have a significant effect on the human environment, and

that the Office of the Chief Engineer has been furnished notice of the agency's or department's application for the categorical exclusion and concurs with that determination.

This project will also require a 401 Water Quality Certification or waiver thereof, from DEHNR prior to issuance of the NWP 23. Section 401 of the Clean Water Act requires that the state issue or deny water certification for any federally permitted or licensed activity that results in a discharge into Waters of the U.S. In addition, the project is located in a designated "trout" county where NCDOT is required to obtain a letter of approval from the NC Wildlife Resources Commission. Final permit decision rests with the USACE.

5. Avoidance, Minimization, Mitigation

Since this project will likely be authorized under a Nationwide permit, mitigation for impacts to surface waters may or may not be required by the USACE. In accordance with the Division of Water Quality Wetland Rules [15A NCAC 211 .0506 (h)] "Fill or alteration of more than one acre of wetlands will require compensatory mitigation; and fill or alteration of more than 150 linear feet (45.7 linear meters) of streams may require compensatory mitigation. Since there are no wetlands within the study corridor, and the length of stream impacts will be less than the 150 linear foot (45.7 linear meter) threshold, wetland or stream mitigation should not be required for this project.

6. Rare and Protected Species

Some populations of plants and animals are declining either due to natural forces or due to their inability to coexist with man. Rare and protected species listed for Yancey and Mitchell counties, and any likely impacts to these species as a result of the proposed project construction, are discussed in the following sections.

Federally Protected Species

Plants and animals with federal classification of Endangered (E), Threatened (T), Proposed Endangered (PE) and Proposed Threatened (PT) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended.

The Fish and Wildlife Service (FWS) lists 11 federally protected species for Yancey County and nine for Mitchell County as of January 2003. These species are listed in Tables 2 and 3.

Table 2
Federally Protected Species for Yancey County

Scientific Name	Common Name	Federal Status
Clemmys muhlenbergii	Bog turtle	T S/A
Corynorhinus townsendii virginianus	Virginia big-eared bat	E
Falco peregrinus	Peregrine falcon	E
Felis concolor couguar	Eastern cougar	E
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E
Alasmidonta raveneliana	Appalachian elktoe	E
Microhexura montivaga	Spruce-fir moss spider	E
Geum radiatum	Spreading avens	E
Houstonia montana	Roan mountain bluet	E
Spiraea virginiana	Virginia spiraea	T
Gymnoderma lineare	Rock gnome lichen	E

Notes:
"E" Denotes Endangered (a species that is threatened with extinction throughout all or a significant portion of its range).
"T" Denotes Threatened (a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range).
"T S/A" Denotes Similarity of Appearance (a species that is listed as threatened due to similarity of appearance with other rare species).

Table 3 Federally Protected Species for Mitchell County		
Scientific Name	Common Name	Federal Status
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E
Myotis sodalis	Indiana bat	E
Alasmidonta raveneliana	Appalachian elktoe	E
Geum radiatum	Spreading avens	E
Liatris helleri	Heller's blazing star	T
Solidago spithamaea	Blue Ridge goldenrod	T
Spiraea virginiana	Virginia spiraea	T
Gymnoderma lineare	Rock gnome lichen	E

Notes: "E" Denotes Endangered (a species that is threatened with extinction throughout all or a significant portion of its range).
"T" Denotes Threatened (a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range).

A brief description of the characteristics and habitat requirements of each species, along with a conclusion regarding potential project impact, follows.

Clemmys muhlenbergii (Bog turtle)
Vertebrate Family: Emydidae
Federally Listed: 1997

Threatened due to Similarity of Appearance

The bog turtle is a small freshwater turtle reaching a maximum carapace length of 4.5 inches (11.4 centimeters). These turtles have a domed carapace which is weakly keeled and is light brown to ebony in color. The scutes have a lighter-colored starburst pattern. The plastron is brownish-black with contrasting yellow or cream areas along the midline. This species is distinguished by a large conspicuous orange, yellow, or red blotch on each side of the head.

The bog turtle is semi-aquatic and is typically found in freshwater wetlands characterized by open fields, meadows, or marshes with slow moving streams, ditches, and boggy areas. The bog turtle is also found in wetlands in agricultural areas subject to light to moderate livestock grazing which helps to maintain an intermediate stage of succession. During the winter, this species hibernates just below the upper surface of mud. Mating occurs in May and June, and the female deposits two to six eggs in sphagnum moss or sedge tussocks in May, June or July. The diet of the bog turtle is varied consisting of beetles, lepidopteran and caddisfly larvae, snails, millipedes, pondweed and sedge seeds, and carrion.

The southern population of the bog turtle is listed as Threatened due to Similarity of Appearance to the northern population, therefore, the southern population is not afforded protection under Section 7 of the Endangered Species Act. No habitat exists in the project area for the bog turtle. There are no freshwater wetlands characterized by open fields, meadows, or marshes with slow moving streams, ditches, or boggy areas near the bridge. A search of the NHP database found no occurrence of the bog turtle in the project vicinity.

Corynorhinus townsendii virginianus (Virginia big-eared bat) **Endangered**
Vertebrate Family: Vespertilionidae
Federally Listed: 1979

The big-eared bat (*Corynorhinus townsendii*) includes two subspecies which are federally protected: the Virginia big-eared bat (*C. t. virginianus*), and the Ozark big-eared bat (*C. t. ingen*). The Virginia big-eared bat is known from West Virginia, Virginia, Kentucky, and North Carolina, with a current population estimated at 13,566. The Ozark big-eared bat is currently known from Oklahoma and Arkansas, with an estimated population of 1,800.

Big-eared bats have light to dark brown fur and are medium in size, weighing 0.25 to .42 ounces (7 to 12 grams). The total body length is about 3.9 inches (9.8 centimeters). Distinguishing characteristics include facial glands on either side of the snout and long ears (over 1.0 inch /2.5 centimeters).

Virginia big-eared bats roost in caves year-round. From December through February, the bats hibernate in caves which range in temperature from 36.5 to 49.1 F (2.5 to 9.5 C). In the summer, the females gather in warmer caves which range in temperature from 59 to 64 F (15 to 18 C). While females are raising young in these "maternity caves", males disperse into smaller groups separate from the females. The diet of the big-eared bat consists primarily of moths captured in the air along forest edges after dark.

Biological Conclusion: No Effect

No habitat exists in the project area for the Virginia big-eared bat. There are no caves located near the bridge. A search of the NHP database found no occurrence of the Virginia big-eared bat in the project vicinity. It can be concluded that the project will not impact this endangered species.

Felis concolor couguar (Eastern cougar) **Endangered**
Vertebrate Family: Felidae
Federally Listed: 1973

Cougars are tawny colored with the exception of the muzzle, the backs of the ears, and the tip of the tail, which are black. Young cougars are paler with a spotted coat until about six months of age. Adult males from the eastern United States weigh 188 to 240 pounds (70 to 90 kilograms) females are 30 to 40 % smaller.

The eastern cougar is found in large remote wilderness areas where there is an abundance of their primary food source, white-tailed deer. A cougar will usually occupy a range of 25 miles (40 kilometers), and they are most active at night. In North Carolina, the cougar is thought to occur in only a few scattered areas, possibly including coastal swamps and the southern Appalachian mountains. There have not been any official cougar sightings in North Carolina since the 1960s.

Biological Conclusion: **No Effect**

No habitat exists in the project area for the eastern cougar. The project area is characterized by residential, agricultural, and other disturbed areas. A search of the NHP database found no occurrence of the eastern cougar in the project vicinity. It can be concluded that the project will not impact this endangered species.

Glaucomys sabrinus coloratus (Carolina northern flying squirrel) **Endangered**
Vertebrate Family: Sciurdiae
Federally Listed: 1985

The Carolina northern flying squirrel is a small mammal weighing about 3 to 5 oz (95 to 140 g). The adult squirrel is gray with a reddish or brownish wash on the back, and a grayish white to white underside. It has a large flap of skin along either side of its body which is connected at the wrist in the front and at the ankle in the rear. The skin flaps and its broad flattened tail allow the northern flying squirrel to glide from tree to tree. It is a solely nocturnal animal with large dark eyes.

There are several isolated populations of the northern flying squirrel in the western part of North Carolina along the Tennessee border. This squirrel is found above 5000 feet (1517 meters) in the vegetation transition zone between hardwood and coniferous forests. Both forest types are used to search for food and the hardwood forest is used for nesting sites. The squirrel can subsist on lichens and fungi throughout much of its range, however, the diet can also include seeds, buds, fruits, cones, and insects.

Biological Conclusion: **No Effect**

No habitat exists in the project area for the Carolina northern flying squirrel. The project area is characterized by agricultural and residential areas at an elevation of 2200 feet (671 meters). A search of the NHP database found no occurrence of the Carolina northern flying squirrel in the project vicinity. It can be concluded that the project will not impact this endangered species.

Myotis sodalis (Indiana bat) **Endangered**
Vertebrate Family: Vespertilionidae
Federally Listed: 1967

The Indiana bat is medium in size 0.24 to 0.32 ounces (7 to 9 grams) with dull grayish chestnut colored fur with pinkish to cinnamon underparts. This species is very similar to the little brown

myotis (*Myotis lucifugus*) except that the heel of the foot (calcar) of the Indian bat is strongly keeled.

The Indiana bat breeds on the ceilings of large rooms near cave entrances. Mating takes place at night during the first ten days of October. During the winter, the bats hibernate in limestone caves which have a temperature of 37 to 43 F (2.7 to 6.1 C) and 87 % humiditiy. The bats hang from the ceiling in tight clusters. The hibernating colonies disperse in late March and migrate to a more northern habitat for the summer. Females give birth to a single new offspring in June. Development to the flying stage and independent feeding usually takes about one month.

Indiana bats feed on insects, preferring the orders Hymenoptera (bees and wasps), Homoptera (cicadas), and Coleoptera (beetles). The bats forage in the air near the foliage of riparian and floodplain trees. The ideal foraging habitat is along a riparian corridor with a width of at least 98 feet (30 meters) of woody vegetation on each bank.

Biological Conclusion: No Effect

No breeding or hibernating habitat exists in the project area for the Indiana bat. The project area is characterized by agricultural and residential areas with no caves or cave entrances present near the bridge. Foraging habitat may exist along the riparian corridor, however, a search of the NHP database found no occurrence of the Indiana bat in the project vicinity. If the Indiana bat utilizes this area for foraging, construction of the bridge should have little effect, as the bats can forage upstream or downstream of the project. It can be concluded that the project will not impact this endangered species.

Falco peregrinus (Peregrine falcon) **Endangered**
Vertebrate Family: Falconidae
Federally Listed: 1970; 1984

The peregrine falcon is a medium sized raptor (15 to 20 inches/ 38 to 50 cm) with a long narrow tail and long pointed wings. The coloring of the adult bird is slate gray with black bars on the wings, tail and flanks. The lower body is white and reddish buffy and it is extensively spotted and barred with black. The throat is white with black moustache marks on the sides of the face.

The typical nesting habitat of the peregrine falcon is along a cliff or series of cliffs, however, nests have also been constructed in river cutbanks, trees, and ledges of large buildings. The diet of the falcon consists primarily of small birds which are hunted in the air. Hunting grounds include open waterways, fields, and marshes where the falcon has known to dive at speeds up to 200 miles (322 kilometers) per hour. The peregrine falcon may travel as far as 10 to 12 miles (16 to 19 kilometers) from its nest in search of prey.

Biological Conclusion: No Effect

The project area is characterized by agricultural and residential areas with no cliffs or ledges of large buildings present near the bridge. A search of the NHP database found no occurrence of the peregrine falcon in the project vicinity. No nests were observed along the river banks or in nearby trees. It can be concluded that the project will not impact this endangered species.

Alasmidonta raveneliana (Appalachian elktoe) **Endangered**
Invertebrate Family: Unionidae
Federally Listed: 1993

The Appalachian elktoe is a small mussel with a maximum length reaching up to 3 inches (8 centimeters). Its shell is thin although the shell is not fragile nor subovate (kidney-shaped). The periostracum (outer shell) of the adult Appalachian elktoe is dark brown in color, while juvenile have a yellowish-brown color.

Known populations of Appalachian elktoe in North Carolina have been reported in the main stem of the Nolichucky River and a short reach of the Toe River, with a single specimen reported in the Cane River. Specimens have also been reported in the Little Tennessee River and its tributaries. The Appalachian elktoe has been observed in gravelly substrates often mixed with cobble and boulders, in cracks of bedrock and in relatively silt-free, coarse sandy substrates.

Biological Conclusion: Unresolved

The U.S. Fish & Wildlife Service and FHWA are currently engaged in a Section 7 Consultation regarding this project. The species is present at the project site and will likely be impacted by the construction of the new bridge and by the demolition of the old bridge but it is not anticipated that the impact will result in a jeopardy opinion. A Biological Assessment (B.A.) and consequently Biological Opinion (B.O.) cannot be rendered until mitigation occurs. Mitigation cannot occur until the document is signed and Right of Way can be purchased. Multiple alternatives have been evaluated and alternate 4A has been determined to be the preferred alternative by the U.S. Fish & Wildlife Service as it minimizes impacts to the river and surrounding landscape. The placement of the piers has been designed so as to minimize impacts to the river. A plan for demolition of the old bridge has been submitted to U.S. Fish & Wildlife Service who have reviewed and tentatively agreed with the plan which will be included as part of the biological assessment. The Greensheet for this Categorical Exclusion will only make reference to the plan. When the B.O. is ultimately rendered, the final Greensheet, to be included as part of the permit package, will include a full description of the plan for demoltion.

Microhexura montivaga (Spruce-fir moss spider) **Endangered**
Invertebrate family: Dipluridae
Federally Listed: 1995

The spruce-fir moss spider is a small spider, approximately 0.1 to .15 inches (0.25 to 0.38 centimeters) in length, which ranges from light brown to yellow-brown to a darker reddish brown with no markings on its abdomen. This species is distinguished by chelicerae which project forward beyond the anterior edge of the carapace. Other characteristics include long posterior

spinnerets, and a second pair of book lungs which appear as light patches behind the genital furrow.

The spruce-fir moss spider constructs tube-shaped webs in the interface between damp, well-drained moss mats and rock surfaces. It prefers well-shaded areas of mature Fraser fir and red spruce forest communities in the highest elevations of the Southern Appalachian Mountains. The spider has not been observed feeding and prey has not been found in the webs. It is likely that the abundant springtails (collembolans) which occur in the moss mats are the food source for the spider.

Biological Conclusion: No Effect

No habitat exists in the project area for the spruce-fir moss spider. There are no well-shaded areas of mature Fraser fir and red spruce forest near the bridge. A search of the NHP database found no occurrence of this species in the project vicinity. It can be concluded that the project will not impact this endangered species.

Geum radiatum (Spreading avens) **Endangered**
Plant Family: Rosaceae
Federally Listed: 1990

Spreading avens is a perennial herb having stems with an indefinite cyme of bright yellow radially symmetrical flowers. Flowers of spreading avens are present from June to early July. Spreading avens has basal leaves which are odd-pinnately compound; terminal leaflets are kidney shaped and much larger than the lateral leaflets, which are reduced or absent.

Spreading avens is found only in the North Carolina and Tennessee section of the Southern Appalachian Mountains. Spreading avens occurs on scarps, bluffs, cliffs and escarpments on mountains, hills and ridges. Known populations of this plant has been found to occur at elevations from 5060 to 5800 feet (1535 to 1759 meters). Other habitat requirements for this species include full sunlight and shallow acidic soils. These soils contain a composition of sand, pebbles, humus, sandy loam and clay loam. Most populations are pioneers on rocky outcrops.

Biological Conclusion: No Effect

No habitat exists in the project area for spreading avens. The elevation of the project area is approximately 2200 feet (671 meters) and known populations occur above 5000 feet (1524 meters). A search of the NHP database found no occurrence of spreading avens in the project vicinity. It can be concluded that the project will not impact this endangered species.

Houstonia montana (Roan Mountain bluet) **Endangered**
Plant Family: Rubiaceae
Federally Listed: 1990

Roan Mountain bluet is a cespitose perennial herb with erect or ascending, unbranched or weakly terminally branched stems to 8 inches (21 centimeters) tall from a basal winter rosette. Cauline leaves are opposite, sessile and ovate, 0.3 to 1.2 inches (0.8 to 3.0 centimeters) long and 0.2 to 0.5 inches (0.6 to 1.3 centimeters) wide. Flowers are reddish purple and funnel-shaped. The inflorescence is few flowered, with flowers occurring from late May through August, with peak flowering in June and July. There is considerable disagreement among the experts concerning whether the Roan Mountain bluet belongs to the *Hedyotis* or *Houstonia* genus, and whether it is a variety or deserves a full species ranking.

Roan Mountain bluet grows on rocky exposures at high elevations ranging from 4600 to 6270 feet (1400 to 1911 meters). Bedrock geology is critical for the growth of this species. All sites are on mafic (i.e. basic) rock, which contrasts with most other high elevation rocky-summit sites, which are typically on felsic or acidic rock. The plants typically grow in gravel-filled pockets found on north or northwest facing cliff ledges, or on talus slopes associated with outcrop exposures on the south or southwest slopes of mountain balds. Most sites are kept moist by frequent fog, mid-elevation clouds, or summer thunderstorms.

Biological Conclusion: No Effect

No habitat exists in the project area for Roan Mountain bluet. The elevation of the project area is approximately 2200 feet (671 meters) and this species occurs above 4600 feet (1400 meters). A search of the NHP database found no occurrence of Roan Mountain bluet in the project vicinity. It can be concluded that the project will not impact this endangered species.

Liatris helleri (Heller's blazing star) **Threatened**
Plant Family: Asteraceae
Federally Listed: 1987

Heller's blazing star is a perennial herb with an erect stem growing from a cormlike rootstock. The stiff stems are purple near the base turning to green, and are strongly ribbed and angulate. Both basal and cauline leaves are numerous, decreasing in size upward. The leaves are long and narrow, with those at the base 8 to 12 inches (20 to 30 centimeters) in length. The stems reach up to 16 inches (40 centimeters) in height and are topped by a showy spike of lavender flowers 7 to 0.3 to 8 inches (20 centimeters) long. Flowering occurs from July through September.

Heller's blazing star typically occurs on sandy soil on rocky summits, cliffs, ledges and rocky woods at high elevation [3500 to 6000 feet (1067 to 1829 meters)]. The plants grow in humus or clay loams on igneous and metasedimentary rock. Soils are generally acidic (pH 4) and shallow. Sites occupied by the Heller's blazing star are generally exposed to full sun.

Biological Conclusion: No Effect

No habitat exists in the project area for Heller's blazing star. The elevation of the project area is approximately 2200 feet (671 meters) and this species occurs above 3500 feet (1067 meters). A search of the NHP database found no occurrence of Heller's blazing star in the project vicinity. It can be concluded that the project will not impact this threatened species.

Solidago spithamaea (Blue Ridge goldenrod) **Threatened**
Plant Family: Asteraceae
Federally Listed: 1995

The Blue Ridge goldenrod is a perennial herb with an erect, angled stem 4 to 16 inches (10.2 to 40.6 centimeters) tall This sparsely to densely pubescent herb arises from a stout, short rhizome. The elliptic leaves are serrate 3.9 to 9.8 inches (10 to 25 centimeters) long. The flowers are yellow and are borne in heads of 20 to 30 flowers in a compact corymb. Flowering occurs during July and August.

The Blue ridge goldenrod occurs at elevations above 4600 feet (1402 meters). It is an early successional species which occurs in the crevices of granite outcrops in full sun.

Biological Conclusion: No Effect

No habitat exists in the project area for Blue Ridge goldenrod. The elevation of the project area is approximately 2200 feet (671 meters) and this species occurs above 4600 feet (1402 meters). A search of the NHP database found no occurrence of Blue Ridge goldenrod in the project vicinity. It can be concluded that the project will not impact this threatened species.

Spiraea virginiana (Virginia spiraea) **Threatened**
Plant Family: Rosaceae
Federally Listed: 1990

Virginia spiraea is a colonial, perennial shrub that has a modular growth form. Its growth form is described as "plastic" and varies depending upon age and environmental conditions. The roots are a complex system of horizontal rootstock with mats of small fibrous roots. If exposed, the horizontal rootstock gives rise to upright stems. Virginia spiraea typically has a diffuse branching pattern and grows to 3 to 10 feet (1 to 3 meters) in height. Leaves are simple, ovate to lanceolate, with an acute base. The leave margins range from entire to completely serrate. Virginia spiraea flowers from late May to late July, with bright to creamy white flowers forming a corymb.

Virginia spiraea is a clonal species, with a root system and vegetative characteristics that allow it to grow in appropriate disturbed habitats. It is typically found in disturbed sites along rivers and streams. It requires disturbance sufficient to inhibit arboreal competition, yet without scour that will remove most organic material or root stock. Typical habitat includes scoured banks of high

gradient streams, or on meander scrolls, point bars, natural levees and braided features of lower stream reaches.

Biological Conclusion: **No Effect**

A search of the NHP database found no occurrence of Virginia spiraea in the project vicinity. Habitat exists along the banks of North Toe River within the project area for this species. The project area was surveyed in June 1998 where a plant by plant survey was conducted and the plant was not found at the project site. The site was revisited in 2002 and the species was again determined not to be present.

Gymnoderma lineare (Rock gnome lichen) **Endangered**
Family: Cladoniaceae
Federally Listed: 1994

The rock gnome lichen is a squamose lichen in the reindeer moss family. The lichen can be identified by its fruiting bodies which are born singly or in clusters, black in color, and are found at the tips of the squamules. The fruiting season of the rock gnome lichen occurs from July through September.

The rock gnome lichen is a narrow endemic, restricted to areas of high humidity. These high humidity environments occur on high elevation (4000 feet/ 1220 meters) mountaintops and cliff faces which are frequently bathed in fog or lower elevation (2500 feet /762 meters) deep gorges in the Southern Appalachians. The rock gnome lichen primarily occurs on vertical rock faces where seepage water from forest soils above flows only at very wet times. The rock gnome lichen is almost always found growing with the moss *Adreaea* in these vertical intermittent seeps. The major threat of extinction to the rock gnome lichen relates directly to habitat alternation/loss of high elevation coniferous forests. These coniferous forest usually lie adjacent to the habitat occupied by the rock gnome lichen. The high elevation habitat occurs in the counties of Ashe, Avery, Buncombe, Graham, Haywood, Mitchell, Swain, and Yancey. The lower elevation habitat of the rock gnome lichen can be found in the counties of Jackson, Rutherford and Transylvania.

Biological Conclusion: **No Effect**

No habitat exists in the project area for the rock gnome lichen. The elevation of the project area is approximately (2200 feet 671 meters). In Yancey and Mitchell counties, this species occurs on high elevation (4000 feet/1220 meters) mountaintops and cliff faces. A search of the NHP database found no occurrence of rock gnome lichen in the project vicinity. It can be concluded that the project will not impact this threatened species.

Federal Species of Concern and State Listed Species

Federal Species of Concern (FSC) are not legally protected under the Endangered Species Act and are not subject to any of its provisions, including Section 7, until they are formally proposed

or listed as Threatened or Endangered. Tables 4 and 5 includes FSC species listed for Yancey and Mitchell counties and their state classifications. Organisms which are listed as Endangered (E), Threatened (T), or Special Concern (SC) by the North Carolina Natural Heritage Program list of Rare Plant and Animal Species are afforded state protection under the State Endangered Species Act and the North Carolina Plant Protection and Conservation Act of 1979; however, the level of protection given to state listed species does not apply to NCDOT activities.

Table 4
Federal Species of Concern and NC Protected Species for Yancey County

Scientific Name	Common Name	NC Status	Habitat present
Contopus borealis	Olive-sided flycatcher	SC	No
Cryptobranchus alleganiensis	Hellbender	SC	Yes
Microtus chrotorrhinus carolinensis	Southern rock vole	SC	No
Myotis leibii	Eastern small-footed myotis	SC	No
Percina squamata	Olive darter	SC	Yes
Sylvilagus obscurus	Appalachian cottontail	SR	No
Glyphyalinia clingmani	Fragile glyph	E	No
Paravitrea varidens *	Roan supercoil	T	Yes
Stygobromus carolinensis *	Yancey sideswimmer	SR	No
Abies fraseri	Fraser fir	C	No
Calamagrostis cainii	Cain's reedgrass	E	No
Cardamine clematitis	Mountain bittercress	C	Yes
Euphorbia purpurea	Glade spurge	C	No
Juglans cinerea	Butternut	W5	Yes
Lilium grayi	Gray's lily	T-SC	No
Saxifraga caroliniana	Carolina saxifrage	C	No
Silene ovata	Mountain catchfly	C	Yes
Plagiochila sharpii	A liverwort	C	No
Plagiochila sullivantii var. sullivantii	A liverwort	C	No
Sphenolobopsis pearsonii	A liverwort	C	No

Notes: Source, Amoroso & Weakley, 1995, LeGrand, 1995
T-Threatened, E-Endangered, SC-Special Concern, SR-State Rare, C-Candidate,
W5 - rare because of severe decline
* - Denotes historic record - species was last observed in the county more than 50 years ago.

Table 5 Federal Species of Concern and NC Protected Species for Mitchell County			
Scientific Name	Common Name	NC Status	Habitat present
Contopus borealis	Olive-sided flycatcher	SC	N
Neotoma magister *	Alleghany woodrat	SC	Y
Percina squamata	Olive darter	SC	Y
Sylvilagus obscurus	Appalachian cottontail	SR	N
Paravitrea varidens	Roan supercoil	T	Y
Speyeria diana*	Diana fritillary butterfly	SR	Y
Abies fraseri	Fraser fir	C	N
Astilbe crenatiloba *	Roan false goat's beard	C	Y
Buckleya distichophylla	Piratebush	E	N
Carex roanensis	Roan sedge	C	Y
Delphinium exaltatum *	Tall larkspur	E-SC	N
Euphorbia purpurea	Glade spurge	C	Y
Geum geniculatum	Bent avens	T	Y
Juglans cinerea	Butternut	W5	Y
Lilium grayi	Gray's lily	T-SC	N
Paxistima canbyi *	Canby's mountain lover	W4	N
Plagiochila sullivantii var. sullivantii	A liverwort	C	N
Sphenolobopsis pearsonii	A liverwort	C	N

Notes: Source: Amoroso and LeGrand; 1995 Weakley, 1995
T - Threatened, E - Endangered, SC - Special Concern, SR - State Rare, C - Candidate,
W4 - rare, but believed not native, W5 - rare because of severe decline
* - Denotes a historic record - the species was last observed in the county more than 50 years ago.

A review of the NHP data base of rare species and unique habitats revealed no occurrence of any FSC species within the project area. There was an occurrence of sharphead darter, which is a state listed threatened species, during a fish sampling effort at Bridge No. 61.

This section of the North Toe River is part of the NHP Priority Area known as North Toe River/Nolichucky River Aquatic Habitat. This priority area is described as a medium-sized mountain stream in the Tennessee River drainage, which provides habitat for several rare fish including the sharphead darter, olive darter, and logperch. Water quality in this area is

threatened from sedimentation. Surveys for FSC and state listed species were not conducted during the site visit.

VI. CULTURAL RESOURCES

A. Compliance Guidelines

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

B. Historic Architecture

The Federal Highway Administration (FHWA), in consultation with the State Historic Preservation Officer (SHPO), has determined that Bridge No. 61, on NC 197 over the North Toe River, is eligible for the National Register of Historic Places. The replacement of this bridge will have an impact on the structure. Subsequently, a Memorandum of Agreement (MOA) has been drafted and executed by the SHPO, FHWA, and the North Carolina Department of Transportation (NCDOT) to mitigate the effects of the proposed undertakings on the bridge. The MOA states that prior to the demolition of Bridge No. 61 the NCDOT will record the bridge in accordance with the Historic Structures Recordation Plan (Appendix A to the MOA).

C. Archaeology

No archaeological sites or historic structures were identified within the project area by background research or field survey. Therefore, none of the proposed replacement alternatives are deemed likely to have any effect on archaeological sites that are on or eligible for nomination to the National Register of Historic Places.

VII. GENERAL ENVIRONMENTAL EFFECTS

The project is expected to have an overall positive impact. Replacement of an inadequate bridge will result in safer traffic operations.

The project will involve taking one home and several outbuildings immediately south of the bridge. Access to the remainder of the owner's property will be maintained during and after construction.

The project is considered to be a Federal "Categorical Exclusion" due to its limited scope and lack of substantial environmental consequences.

The bridge replacement will not have an adverse effect on the quality of the human or natural environment with the use of the current North Carolina Department of Transportation standards and specifications.

The project is not in conflict with any plan, existing land use, or zoning regulation. No change in land use is expected to result from the construction of the project.

No adverse effect on public facilities or services is expected. The project is not expected to adversely affect social, economic, or religious opportunities in the area.

The proposed project will not require right-of-way acquisition or easement from any land protected under Section 4(f) of the Department of Transportation Act of 1966. Bridge No. 61 is considered to be eligible for the National Register of Historic Places and will be removed as part of this project. The Section 4(f) documentation is included as Section VIII of this document.

The Farmland Protection Policy Act requires all federal agencies or their representatives to consider the potential impact to prime farmland of all land acquisition and construction projects. There are no soils classified as prime, unique, or having state or local importance in the vicinity of the project. Therefore, the project will not involve the direct conversion of farmland acreage within these classifications.

This project is an air quality "neutral" project, so it is not required to be included in the regional emissions analysis and a project level CO analysis is not required. If vegetation is disposed of by burning, all burning shall be done in accordance with applicable local laws and regulations of the North Carolina State Implementation Plan (SIP) for air quality in compliance with 15 NCAC 2D.0520.

Noise levels could increase during construction but will be temporary. This evaluation completes the assessment requirements for highway traffic noise of Title 23, Code of Federal Regulation (CFR), Part 772 and for air quality (1990 Clean Air Act Amendments and the National Environmental Policy Act) and no additional reports are required.

An examination of records at the North Carolina Department of Environment and Natural Resources, Division of Environmental Management, Groundwater Section and the North Carolina Department of Human Resources, Solid Waste Management Section revealed no underground storage tanks or hazardous waste sites in the project area.

Yancey and Mitchell Counties are participants in the National Flood Insurance Program. The approximate 100-year floodplain in the project area is shown in Figure 6. There are no practical alternatives to crossing the floodplain area. Any shift in alignment will result in an impact area of about the same magnitude. The proposed project is not anticipated to increase the level or extent of upstream flood potential.

On the basis of the above discussion, it is concluded that no substantial adverse environmental impacts will result from implementation of the project.

VIII. PROGRAMMATIC SECTION 4(f)

NORTH CAROLINA DIVISION
FINAL NATIONWIDE SECTION 4(f) EVALUATION AND APPROVAL
FOR FEDERALLY-AIDED HIGHWAY PROJECTS
THAT NECESSITATE THE USE OF HISTORIC BRIDGES

F. A. Project: BRSTP-197(1)
State Project: 8.1900401
T. I. P. No. B-1443

Description:
Bridge No. 61 is scheduled to be replaced with a new structure on new alignment shifted to the southeast of the existing structure. The existing bridge is functionally obsolete due to the existing horizontal alignment and narrow bridge width and is in a deteriorated condition.

Bridge No. 61 was built by the engineering firm of Steel & Lebby of Knoxville, Tennessee. Completed in 1925, it is an intact example of a reinforced-concrete closed spandrel arch bridge (type 111). The bridge is also distinguished from other structures of the time by its open two-bar concrete bridge safety rail and distinctively profile endposts. The bridge possesses integrity of location, materials, design, and setting. Therefore, Bridge No. 61 in Yancey and Mitchell Counties is eligible for the National Register under Criterion C for design and construction.

		Yes	No
1.	Is the bridge to be replaced or rehabilitated with Federal funds?	X	☐
2.	Does the project require the use of a historic bridge structure which is on or eligible for listing on the National Register of Historic Places?	X	☐
3.	Is the bridge a National Historic Landmark?	☐	X
4.	Has agreement been reached among the FHWA, the State Historic Preservation Officer (SHPO), and the Advisory Council on Historic Preservation (ACHP) through procedures pursuant to Section 106 of the National Historic Preservation Act (NHPA)?	X	☐

ALTERNATIVES CONSIDERED AND FOUND NOT TO BE FEASIBLE AND PRUDENT

The following alternatives were evaluated and found not to be feasible and prudent:

		Yes	No
1.	Do nothing	X	☐
	Does the "do nothing" alternative:		
	(a) correct the problem situation that caused the bridge to be considered deficient?	☐	X
	(b) pose serious and unacceptable safety hazards?	X	☐

		Yes	No
2.	Build a new structure at a different location without affecting the historic integrity of the structure.	X	☐

(a) The following reasons were reviewed: (circle, as appropriate)

(i) The present bridge has already been located at the only feasible and prudent site

and/or (ii) Adverse social, environmental, or economic impacts were noted

and/or (iii) Cost and engineering difficulties reach extraordinary magnitude

and/or (iv) The existing bridge cannot be preserved due to the extent of rehabilitation, because no responsible party will maintain and preserve the historic bridge, or the permitting authority requires removal or demolition.

3.	Rehabilitate the historic bridge without affecting the historic integrity of the structure.	X	☐

(a) The following reasons were reviewed: (circle, as appropriate)

(i) The bridge is so structurally deficient that it cannot be rehabilitated to meet the acceptable load requirements and meet National Register criteria

and/or (ii) The bridge is seriously deficient geometrically and cannot be widened to meet the required capacity and meet National Register criteria

MINIMIZATION OF HARM

		Yes	No
1.	The project includes all possible planning to minimize harm.	X	☐

2. Measures to minimize harm include the following: (circle, as appropriate)

a. For bridges that are to be rehabilitated, the historic integrity of the bridge is preserved to the greatest extent possible, consistent with unavoidable transportation needs, safety, and load requirements.

b. For bridges that are to be rehabilitated to the point that the historic integrity is affected or that are to be removed or demolished, the FHWA ensures that, in accordance with the Historic American Engineering Record (HAER) standards, or other suitable means developed through consultation, fully adequate records are made of the bridge.

c. For bridges that are to be replaced, the existing bridge is made available for an alternative use, provided a responsible party agrees to maintain and preserve the bridge.

(d.) For bridges that are adversely affected, agreement among the SHPO, ACHP, and FHWA is reached through the Section 106 process of the NHPA on measures to minimize harm and those measures are incorporated into the project.

3. Specific measures to minimize harm are discussed below:

Prior to the demolition of Yancey County Bridge 61, NCDOT shall record the bridge in accordance with the attached Historic Structures Recordation Plan. (Note: This has been accomplished and the documentation delivered to the State Historic Preservation Office.)

Note: Any response in a box requires additional information prior to approval. Consult Nationwide 4(f) evaluation.

COORDINATION

The proposed project has been coordinated with the following (attach correspondence):

a. State Historic Preservation Officer	x
b. Advisory Council on Historic Preservation	x
c. Local/State/Federal Agencies	x
d. US Coast Guard (for bridges requiring bridge permits)	n/a

SUMMARY AND APPROVAL

The project meets all criteria included in the programmatic 4(f) evaluation approved on July 5, 1983.

All required alternatives have been evaluated and the findings made are clearly applicable to this project.

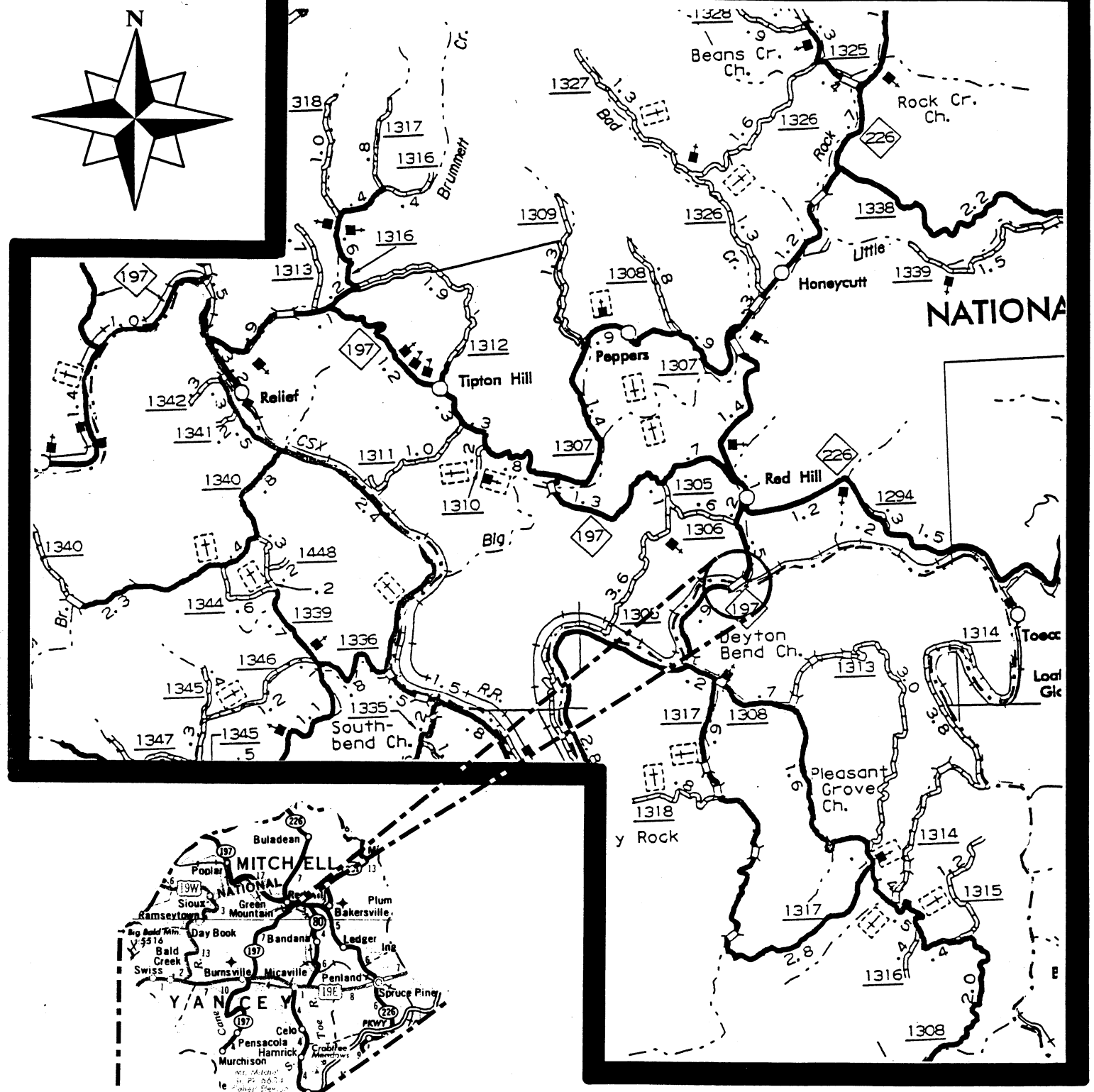
There are no feasible and prudent alternatives to the use of the historic bridge. The project includes all possible planning to minimize harm, and there are assurances that the measures to minimize harm will be incorporated in the project.

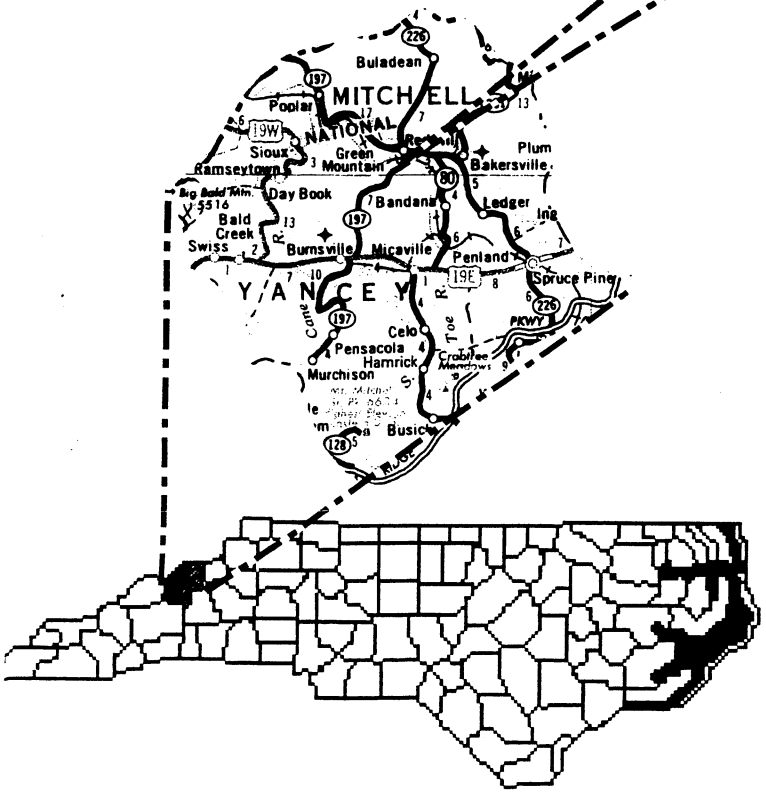
All appropriate coordination has been successfully completed.

Approved:

9-02-03 Teresa Hart
Date Manager, Project Development and Environmental Analysis Branch

9/2/03
Date Division Administrator, FHWA



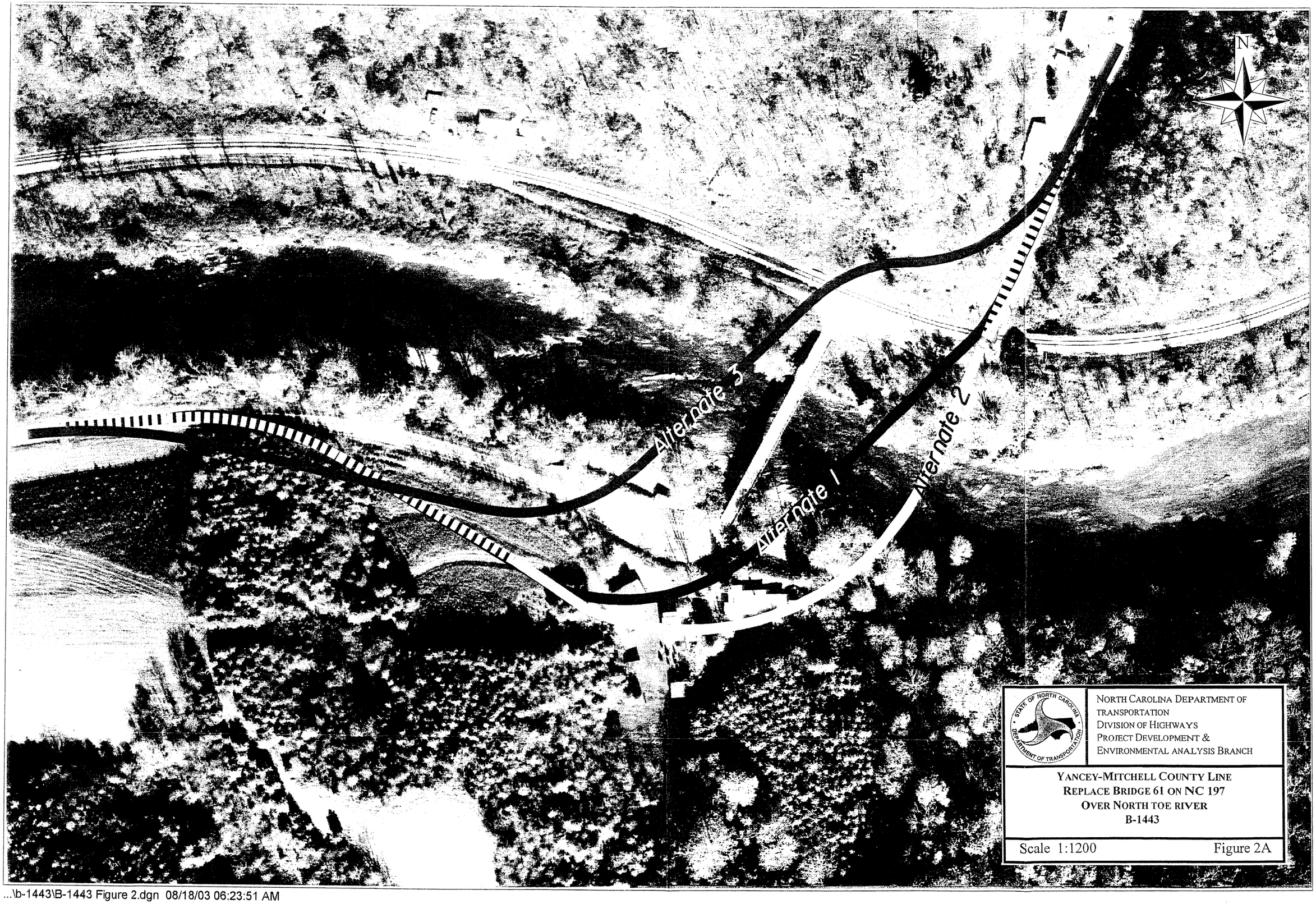


North Carolina
Department Of Transportation
Planning & Environmental Branch

YANCEY/MITCHELL COUNTY
REPLACE BRIDGE NO. 61 ON NC 197
OVER NORTH TOE RIVER
B-1443

0 kilometers 1.6 kilometers 3.2
0 miles 1.0 miles 2.0

Figure 1



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

YANCEY-MITCHELL COUNTY LINE
REPLACE BRIDGE 61 ON NC 197
OVER NORTH TOE RIVER
B-1443

Scale 1:1200 Figure 2A

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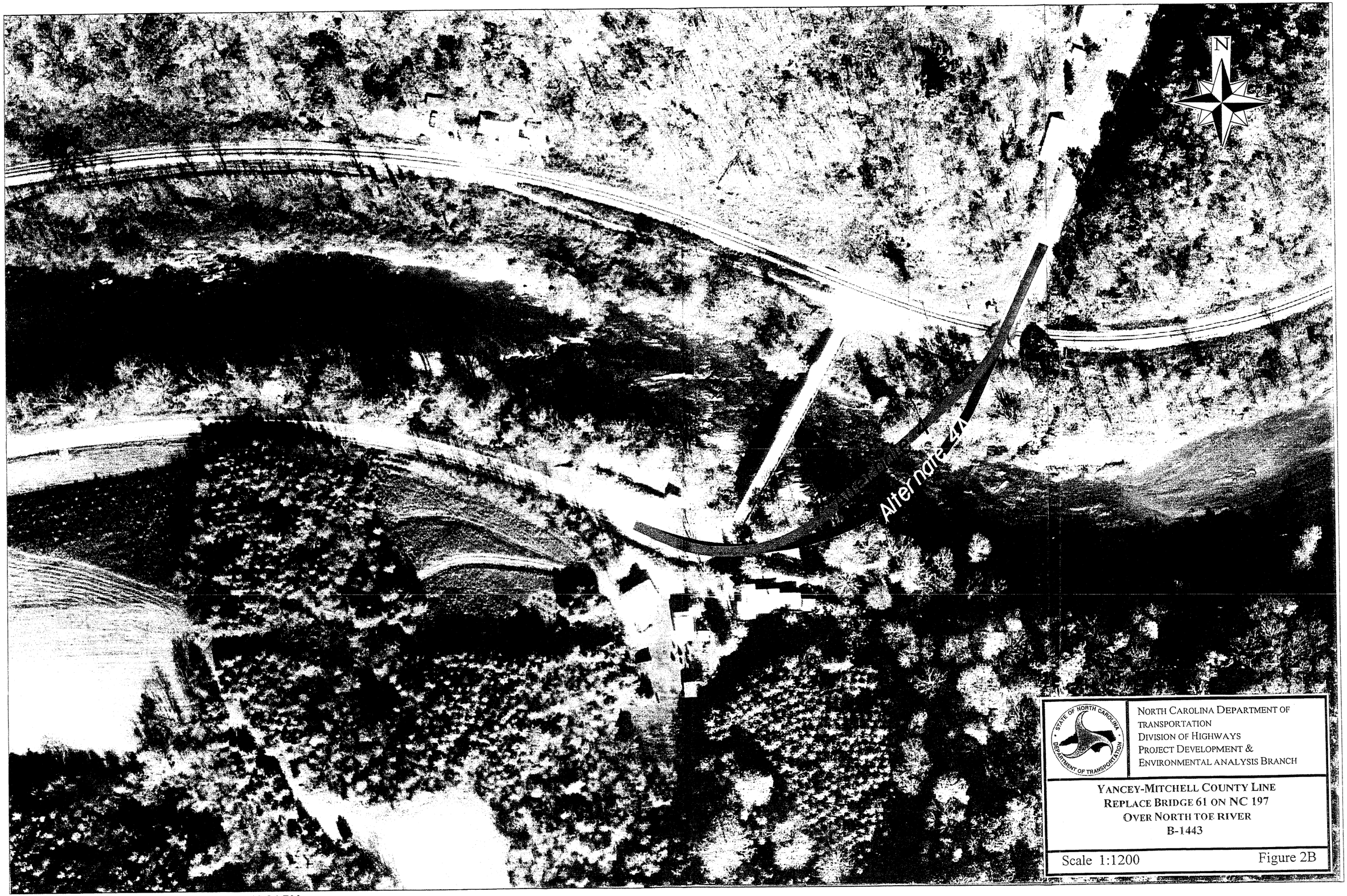


NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PROJECT DEVELOPMENT &
ENVIRONMENTAL ANALYSIS BRANCH

YANCEY-MITCHELL COUNTY LINE
REPLACE BRIDGE 61 ON NC 197
OVER NORTH TOE RIVER
B-1443

Scale 1:1200 Figure 2B

...\b-1443\B-1443 Figure 2B.dgn 08/19/03 03:19:34 PM

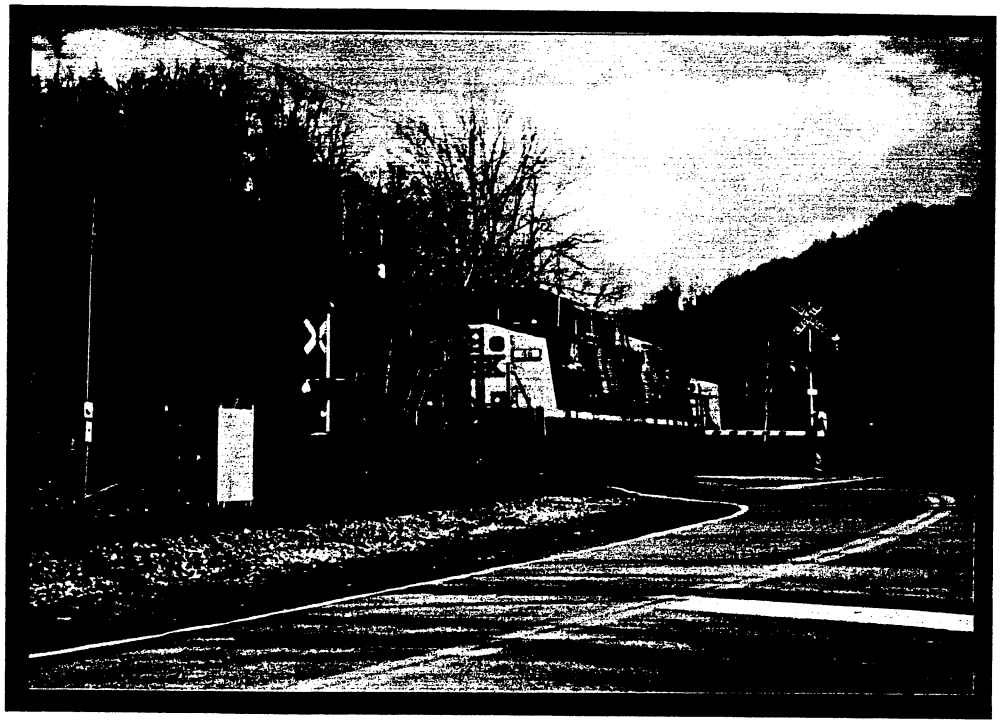
Bridge No. 61

Name Plate on Bridge

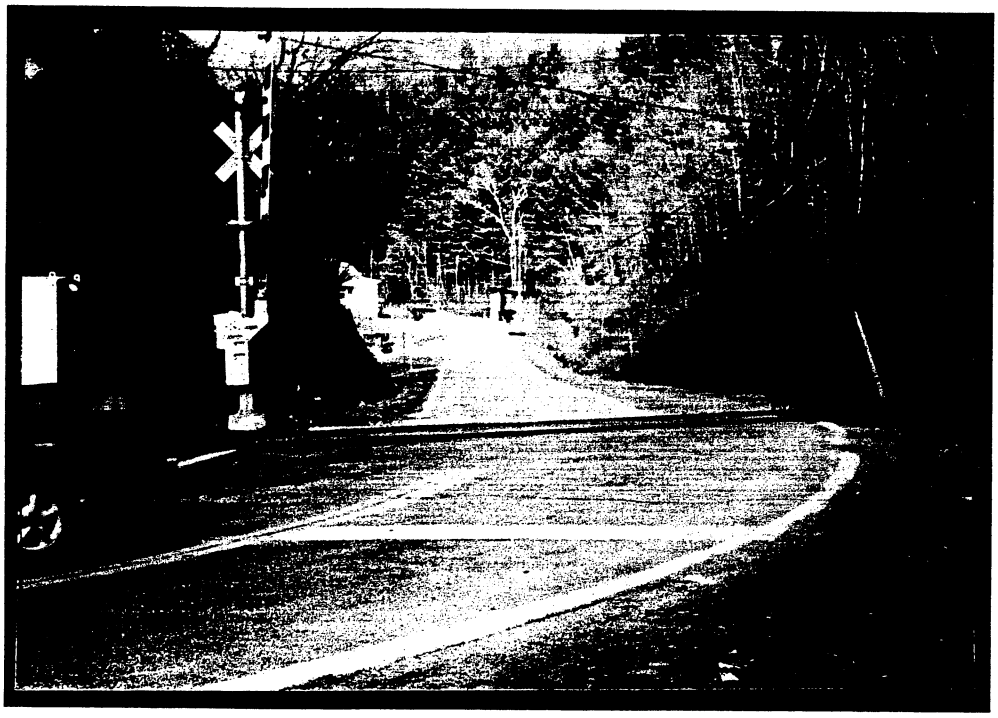
North Carolina Department of Transportation
Division of Highways
Project Development & Environmental Analysis Branch

Yancey-Mitchell County Line
Replace Bridge No. 61 on NC 197
Over North Toe River
B-1443

Figure Three



View of Railroad Crossing



View of Railroad Crossing

North Carolina Department of Transportation

Division of Highways
Project Development &
Environmental Analysis Branch

Yancey-Mitchell County Line
Replace Bridge No. 61 on NC 197
Over North Toe River
B-1443

Figure Four

View Approaches to Bridge from South End of Bridge

Home to be impacted by new alignment

North Carolina Department of Transportation

Division of Highways
Project Development &
Environmental Analysis Branch

Yancey-Mitchell County Line
Replace Bridge No. 61 on NC 197
Over North Toe River
B-1443

Figure Five

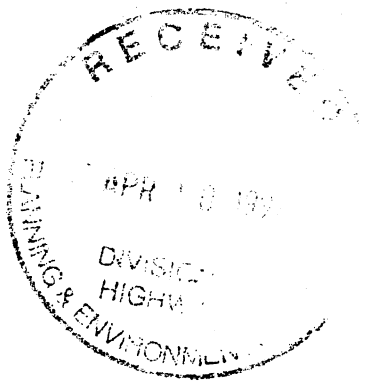
Elliott/Ingham

North Carolina Department of Cultural Resources

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

April 4, 1997



Nicholas L. Graf
Division Administrator
Federal Highway Administration
Department of Transportation
310 New Bern Avenue
Raleigh, N.C. 27601-1442

Re: Bridge 61 on NC 197 on North Toe River, Mitchell and Yancey Counties, B-1443, Federal Aid Project BRSTP-197(1), State Project 8.1900401, ER 97-8345

Dear Mr. Graf:

On March 11, 1997, Debbie Bevin of our staff met with North Carolina Department of Transportation (NCDOT) staff for a meeting of the minds concerning the above project. We reported our available information on historic architectural and archaeological surveys and resources along with our recommendations. NCDOT provided project area photographs and aerial photographs at the meeting.

Based upon our review of the photographs and the information discussed at the meeting, we offer our preliminary comments regarding this project.

In terms of historic architectural resources, Bridge 61 is the only structure over fifty years of age within the general project area. We recommend that an architectural historian from NCDOT evaluate the bridge for National Register eligibility and report the findings to us.

We recommend that an archaeological survey be conducted for bridge replacement on a new alignment.

Having provided this information, we look forward to receipt of either a Categorical Exclusion or Environmental Assessment which indicates how NCDOT addressed our comments.

The above comments are made pursuant to Section 106 of the National Historic Preservation Act of 1966 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.

Sincerely,

David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: H. F. Vick
B. Church
T. Padgett

Federal Aid # BRSTP-197(1) *TIP* # B-1443 *County*: Yancey/Mitchell

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

Project Description: Replace Bridge No. 61 on NC 197 over North Toe River

On February 19, 1998, representatives of the

☒ North Carolina Department of Transportation (NCDOT)
☐ Federal Highway Administration (FHWA)
☒ North Carolina State Historic Preservation Office (SHPO)
☐ 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, but based on the historical information available and the photographs of each property, the property identified as **House #1** is considered not eligible for the National Register and no further evaluation of it is necessary.

☒ there are no National Register-listed properties within the project's area of potential effects.

Signed:

Representative, NCDOT — 19 Feb. 1998 Date

FHWA, for the Division Administrator, or other Federal Agency — 3/2/98 Date

Representative, SHPO — 2/19/98 Date

State Historic Preservation Officer — 3/12/98 Date

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

Federal Aid #STP-197(1) *TIP* #B-1443 *County*: Yancey/Mitchell

CONCURRENCE FORM FOR ASSESSMENT OF EFFECTS

Project Description: Replace Bridge No. 61 on NC 197 over North Toe River

On May 28, 1998, representatives of the

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

reviewed the subject project and agreed

☐ there are no effects on the National Register-listed property/properties located within the project's area of potential effect and listed on the reverse.

☐ there are no effects on the National Register-eligible property/properties located within the project's area of potential effect and listed on the reverse.

☐ there is an effect on the National Register-listed property/properties located within the project's area of potential effect. The property/properties and the effect(s) are listed on the reverse.

☒ there is an effect on the National Register-eligible property/properties located within the project's area of potential effect. The property/properties and effect(s) are listed on the reverse.

Signed:

Representative, NCDOT — 5-28-98 Date

FHWA, for the Division Administrator, or other Federal Agency — 6/2/98 Date

Representative, SHPO — 5/28/98 Date

State Historic Preservation Officer — 6/18/98 Date

North Carolina Department of Cultural Resources

mes B. Hunt Jr., Governor
:tty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

April 6, 1998

Nicholas L. Graf
Division Administrator
Federal Highway Administration
Department of Transportation
310 New Bern Avenue
Raleigh, N.C. 27601-1442

Re: Bridge 61 on NC 197 over North Toe River, Mitchell and Yancey Counties, B-1443, Federal Aid Project STP-197(1), State Project 8.1900401, ER 98-8760

Dear Mr. Graf:

Thank you for your letter of March 18, 1998, transmitting the historic structures survey report by Clay Griffith concerning the above project.

For purposes of compliance with Section 106 of the National Historic Preservation Act, we concur that the following property is eligible for the National Register of Historic Places under the criterion cited:

> Bridge 61. This bridge is an intact example of the rare reinforced-concrete closed-spandrel arch bridge, and is distinguished by its open, two-bar concrete bridge safety rail and distinctive imposts. It is eligible under Criterion C for construction/design.

The report meets our office's guidelines and those of the Secretary of the Interior.

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.

Sincerely,

David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: H. F. Vick
B. Church

Federal Aid # STP-197(1) *TIP* # B-1443 *County*: Yancey/Mitchell

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

Project Description: Replace Bridge No. 61 on NC 197 over North Toe River

On July 16, 1998, representatives of the

☒ North Carolina Department of Transportation (NCDOT)
☒ Federal Highway Administration (FHWA)
☒ North Carolina State Historic Preservation Office (SHPO)
☐ 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, but based on the historical information available and the photographs of each property, the property identified as **House #2** is considered not eligible for the National Register and no further evaluation of it is necessary.

☒ there are no National Register-listed properties within the project's area of potential effects.

Signed:

Representative, NCDOT — Date 7.16.98

FHWA, for the Division Administrator, or other Federal Agency — Date 7/16/98

Representative, SHPO — Date 7/16/98

State Historic Preservation Officer — Date 7/21/98

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

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

July 21, 1998

Nicholas L. Graf
Division Administrator
Federal Highway Administration
Department of Transportation
310 New Bern Avenue
Raleigh, N.C. 27601-1442

Re: Archaeological study, Replace Bridge 61 on NC 197, Mitchell and Yancey Counties, TIP B-1443, Federal Aid No. BRSTP-197(1), ER 98-9337

Dear Mr. Graf:

Thank you for your letter of June 15, 1998, transmitting the archaeological survey report by Nick Harper concerning the above project. We concur with your determination of no eligible archaeological properties within the area of potential effect.

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.

Sincerely,

David Brook

David Brook
Deputy State Historic Preservation Officer

DB:slw

cc: W. D. Gilmore
T. Padgett

North Carolina Department of Cultural Resources

James B. Hunt Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
Jeffrey J. Crow, Director

September 10, 1998

Nicholas L. Graf
Division Administrator
Federal Highway Administration
Department of Transportation
310 New Bern Avenue
Raleigh, N.C. 27601-1442

Re: Bridge 61 on NC 197 over North Toe River, Yancey and Mitchell Counties, TIP B-1443, State Project 8.1900401, Federal Aid BRSTP-197(1), ER 99-7286

Dear Mr. Graf:

Thank you for your letter of August 17, 1998, forwarding the Memorandum of Agreement for Bridge 61. I have signed the Memorandum of Agreement and am returning it to you for submission to the Advisory Council on Historic Preservation.

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.

Sincerely,

Jeffrey J. Crow
State Historic Preservation Officer

JJC:slw

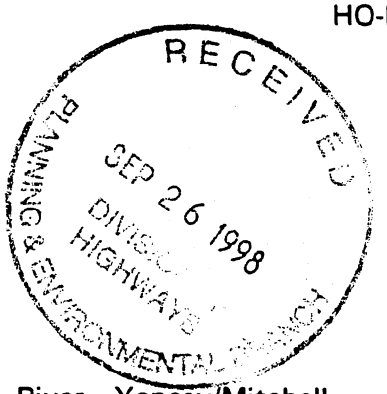
Enclosure

cc: W. D. Gilmore
B. Church

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
Region Four
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601

September 23, 1998

IN REPLY REFER TO
HO-NC



Mr. Don Klima, Director
Eastern Office of Project Review
Advisory Council on Historic Preservation
The Old Post Office Building
1100 Pennsylvania Ave., N.W. No. 809
Washington, D.C. 20004

Subject: Bridge No. 61 on NC 197 over North Toe River, Yancey/Mitchell Counties, Tip No. B-1443, State Project No. 8.1900401, Federal Aid No. STP-197(1)

Dear Mr. Klima:

Enclosed for your review are copies of the following information:

1) A description of the undertaking;
2) A description of the efforts to identify historic properties;
3) A description of the affected historic property;
4) A description of the undertaking's effects on the historic property;
5) A description of any proposed mitigation measures or alternatives considered dealing with the undertaking's effects on the historic property;
6) A summary of the views of the State Historic Preservation Officer (SHPO) and any interested parties.

The Federal Highway Administration (FHWA), in consultation with the State Historic Preservation Officer (SHPO), has determined that Bridge # 61, on NC 197 over the North Toe River, is eligible for the National Register of Historic Places. The replacement of this bridge will have an impact on the structure. Subsequently, a Memorandum of Agreement (MOA) has been drafted and executed by the SHPO, FHWA, and the North Carolina Department of Transportation (NCDOT) to mitigate the effects of the proposed undertakings on the bridge. The MOA states that prior to the demolition of bridge #61 the NCDOT will record the bridge in accordance with the Historic Structures Recordation Plan (Appendix A to the MOA).

This information is provided to your office pursuant to 36 CFR 800.8(b) and (c). Please review the attached MOA. If the MOA is acceptable to your office please execute and return to the

FHWA. Should you have any questions please contact Mr. David Snyder of my staff at (919)856-4350, Extension 104.

Sincerely yours,

Boyce Shelton

For Nicholas L. Graf, P.E.
Division Administrator

Enclosures

cc: Mr. William D. Gilmore, PE, NCDOT
Mr. David Brook, SHPO, NC Department of Cultural Resources

BRSTP 1-17(1)

Advisory Council On Historic Preservation

The Old Post Office Building
1100 Pennsylvania Avenue, NW, #809
Washington, DC 20004

OCT 14 1998

Mr. Nicholas L. Graf, P.E.
Division Administrator
Region Four
Federal Highway Administration
U.S. Department of Transportation
310 New Bern Avenue, Suite 410
Raleigh NC 27601

REF: Replacement of Bridge 61 on NC 197 over North Toe River
Yancey/Mitchell Counties, North Carolina

Dear Mr. Graf:

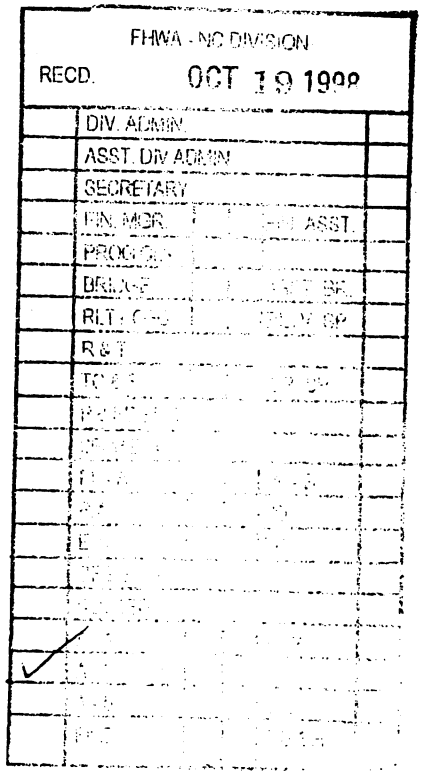
The enclosed Memorandum of Agreement for the referenced project has been accepted by the Council. This acceptance completes the requirements of Section 106 of the National Historic Preservation Act and the Council's regulations. We recommend that you provide a copy of the fully-executed Agreement to the North Carolina State Historic Preservation Officer.

Should you have any questions, please contact me at (202) 606-8528.

Sincerely,

Ralston Cox
Historic Preservation Analyst
Office of Planning and Review

Enclosure



Execution of this Memorandum of Agreement by FHWA and the North Carolina SHPO and implementation of its terms evidence that FHWA has afforded the Advisory Council on Historic Preservation an opportunity to comment on the replacement of Bridge No. 61 on NC 197 over North Toe River and its effect on the historic property, and that FHWA has taken into account the effects of the undertaking on the historic property.

Roy C Shelton for 8/17/98

FEDERAL HIGHWAY ADMINISTRATION DATE

Jeffrey J. Crow 9/11/98

NORTH CAROLINA STATE HISTORIC PRESERVATION OFFICER DATE

William J. Gilmore 8-6-98

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DATE

Concurring Party

John M. Fowler 10/13/98

ACCEPTED for DATE

ADVISORY COUNCIL ON HISTORIC PRESERVATION

APPENDIX A

Historic Structures Recordation Plan
for the Replacement of Bridge No. 61
Yancey and Mitchell Counties, North Carolina

Description

A brief physical description and narrative statement of significance

Photographic Requirements

Photographic views of Bridge No. 61 including:

Overall views (elevations and oblique views)

Overall views of the bridge in its setting

Details of construction or design

Format:

Representative color transparencies

35 mm or larger black and white negatives (all views)

8 x 10 inch black and white contact print (all negatives)

All processing to be done to archival standards

All photographs and negatives to be labeled according to Division of Archives and History standards

Copies and Curation

One (1) set of all photographic documentation will be deposited with the North Carolina Division of Archives and History/State Historic Preservation Office to be made a permanent part of the statewide survey and iconographic collection.

North Carolina Wildlife Resources Commission

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

MEMORANDUM

TO: Jeff Ingham
North Carolina Department of Transportation

FROM: Stephanie E. Goudreau, Eastern Mt. Region Coordinator
Habitat Conservation Program

Stephanie E. Goudreau

DATE: April 23, 1997

SUBJECT: Preliminary comments for the replacement of Bridge #61 on NC 197 over North Toe River, Yancey and Mitchell Counties, TIP #B-1443

This correspondence responds to a request by you for our preliminary comments regarding the subject project.

The North Toe River does not likely support trout this far downstream; however, it does support several species of gamefish (black bass, sunfish, muskellunge) and nongame fish. In addition, the river supports a population of the Appalachian elktoe, a federally threatened freshwater mussel species. We have the following recommendations regarding this project:

1) The U.S. Fish and Wildlife Service should be contacted to determine if the project has the potential to impact the Appalachian elktoe. Contact is Mr. John Fridell at 704/258-3939, extension 225. The Service may make additional recommendations if this species could be impacted by the project.

2) If concrete will be used, work must be accomplished so that wet concrete does not contact river water. This will lessen the chance of altering the river's water chemistry and causing a fish kill.

3) If possible, heavy equipment should be operated from the bank rather than in the river channel in order to minimize sedimentation and reduce the likelihood of introducing other pollutants into the river.

4) 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.

5) If the bridge is replaced on new location, native species of trees and shrubs should be planted along the river at the site of the existing bridge over the North Toe River upon removal of this structure to add bank stability, shade, and a travel corridor for wildlife.

Thank you for the opportunity to review and comment during the early stages of this project. If you have any questions regarding these comments, please contact me at 704/652-4257.

cc: Mr. John Fridell, USFWS

STORMWATER MANAGEMENT PLAN

State Project 8.1900401 (B-1443)
Mitchell/Yancey County

The project involves the removal and replacement of Bridge Number 61 carrying NC 197 over the North Toe River in Mitchell and Yancey Counties. The existing two lane 82.7 m (270 ft.) long bridge will be replaced with a two lane 109 m (360 ft.) long bridge. The North Toe River has a Class 'C' Trout water classification and supports a population of the Appalachian Elktoe, a federally listed endangered freshwater mussel species. The overall length of the project is 0.191 km (0.07 mi.). Traffic will be maintained on site during construction.

The existing 7.2 m (24 ft.) roadway is a two-lane road with 3.0 m (10 ft.) lanes and 0.6 m (2 ft.) grassed shoulders. The proposed 11.4 m (38 ft.) paved road is a two-lane road with two 3.3 m (11 ft.) lanes and 2.4 m (8 ft.) shoulders. Where there is guardrail at the beginning of the bridge the entire shoulder will be paved to help prevent erosion of the fill slopes. The proposed structure will have a travelway of 10.9 m (36 ft.). This will include an inside shoulder of 2.4 m (8 ft.) to accommodate sight distance and an outside shoulder of 1.0 m (3 ft.). The existing bridge is 5.2 m (17 ft.) wide. Approximately 561 sq m (6.032 sq ft) of additional pavement will be added as a result of the project.

The following best management practices and measures were taken during the design of the project to reduce the stormwater impacts:

1. Drainage from the proposed bridge will not be allowed to discharge directly into the North Toe River. Drainage on the existing bridge presently runs off directly into the river. Deck drains will be utilized at both ends of the bridge.

2. Storm drainage that is collected at the south end of the bridge where guardrail is used will be discharged into a stormwater retention basin whereas currently the stormwater drains directly to the river.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

July 6, 2006

Mr. John F. Sullivan, III
Division Administrator
Attention: Mr. Rob Ayers, Area Engineer
Federal Highway Administration
310 New Bern Avenue, Suite 410
Raleigh, North Carolina 27601-1441

Dear Mr. Sullivan:

Subject: Bridge Replacements over the Toe River (Projects B-1443 and B-2848) in Yancey and Mitchell Counties, North Carolina, and Their Effects on the Federally Endangered Appalachian Elktoe and Its Designated Critical Habitat

This document transmits the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) based on our review of the Biological Assessment (BA) on the effects of the subject bridge replacements on the Appalachian elktoe and its designated critical habitat in accordance with section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.) (Act).

This Opinion is based on information provided in the May 12, 2005, BA; supplemental information to the BA (requested June 23, 2005, and received February 21, 2006); other available literature; personal communications with experts on the federally endangered Appalachian elktoe (*Alasmidonta raveneliana*); and other sources of information. A complete administrative record of this consultation is on file at this office.

In the BA, you determined that the following federally listed species would not be affected by the proposed bridge replacements: Carolina northern flying squirrel (*Glaucomys sabrinus coloratus*), Virginia big-eared bat (*Corynorhinus townsendii virginianus*), Indiana bat (*Myotis sodalist*), Eastern cougar (*Puma concolor couguar*), spruce-fir moss spider (*Microhexura montivaga*), Virginia spiraea (*Spiraea virginiana*), spreading avens (*Geum radiatum*), Heller's blazing star (*Liatris helleri*), Roan Mountain bluet (*Hedyotis purpurea* var. *montana*), Blue Ridge goldenrod (*Solidago spithamaea*), and rock gnome lichen (*Gymnoderma lineare*). In view of the information in the BA, we concur with your determination that the bridge replacement projects will have no effect on these species. Therefore, we believe the requirements under

section 7 of the Act are fulfilled for these species. However, obligations under section 7 of the Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Migratory Birds – Swallows were observed nesting at bridge B-2848. The Migratory Bird Treaty Act (16 U.S.C. 703-712) prohibits the taking, killing, possession, transportation, and importation of migratory birds (including the bald eagle), their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Both bridges should be inspected for nesting migratory birds. The North Carolina Department of Transportation (NCDOT) should avoid impacting the nests during the migratory bird nesting season of March through September. Therefore, if birds are discovered nesting on the bridges, demolition of the bridges should take place outside this nesting season. If it is not possible to demolish the bridges outside the nesting season, the NCDOT should work, in consultation with us, to develop measures to discourage birds from establishing nests on the bridges by means that will not result in the take of birds or eggs.

CONSULTATION HISTORY

A consultation history of this project is provided in Appendix A.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

As defined in the Service's section 7 regulations (50 CFR 402.02), "action" means "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by federal agencies in the United States or upon the high seas." The action area is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." The direct and indirect effects of the actions and activities must be considered in conjunction with the effects of other past and present federal, state, or private activities, as well as the cumulative effects of reasonably certain future state or private activities within the action area. This Opinion addresses only those actions from which the Service believes adverse effects may result. In their BA, the NCDOT outlined those activities involved in the construction and demolition of two bridges (Projects B-1443 and B-2848) that would affect the Appalachian elktoe and its designated critical habitat. The NCDOT also considered the effect of their proposal to protect at least 3,000 linear ft of 100-ft riparian buffers along the Toe, North Toe, and Cane Rivers. This Opinion addresses whether replacing these existing bridges is likely to jeopardize the continued existence of the Appalachian elktoe or adversely modified its designated critical habitat.

The NCDOT has determined that the subject two bridges are deficient because of deteriorating structural integrity and are functionally obsolete due to narrow roadway

geometry and substandard design. The proposed action calls for the NCDOT to replace and demolish Bridge Nos. 61 and 143 over the Toe River as follows:

Project B-1443 - The existing Bridge No. 61 over the Toe River on SR 197 was constructed in 1925 and is a continuous reinforced concrete closed-spandrel arch structure. It is comprised of five spans, is 270 feet (ft) in length, has a roadway width of 15.6 ft, and has two piers within the river channel totaling an area of 151.2 ft^2. Six alternatives to replacing the bridge were considered, including five build alternatives. The chosen alternate will require the least amount of roadway approach construction and was designed to minimize impacts to the river. The new bridge will be on a new alignment, approximately 180 ft upstream of the existing bridge. It will be approximately 360 ft in length and 36 ft wide and will require two piers to be placed in the river, which will result in 57 ft^2 of fill within the channel. Improvements to the approach roadways will be required for a distance of approximately 213 ft to the south and 59 ft to the north. Traffic will be maintained on the existing bridge during construction.

The use of temporary bridges for construction and demolition activities is not feasible for this project due to the amount of bedrock present at the construction site. A drilled shaft structure will need to be used for any type of bridge at this site since the presence of bedrock makes pile driving impossible. Given the deteriorated condition and small size of the existing bridge, it is not possible to work from the existing bridge to construct the new bridge. Therefore, rock causeways will be required to construct the new bridge and demolish B-1443. The temporary construction/demolition causeways used for the project were designed to result in the least amount of fill in the river while providing sufficient area to accomplish the construction and demolition. The rock causeways will consist of a base of clean class II riprap, with about 1 ft of clean class I riprap on top of the causeways. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 50 percent of the river will be open. Constructing the piers for the new bridge and demolishing the existing bridge causeways will result in 4,972 ft^2 and 3,993.4 ft^2 of temporary rock fill in the river, respectively. NEW DEMO OF OLD

Concrete arch bridges are difficult to demolish because, when trying to dismantle the bridge, the entire structure acts as one piece. Historically, the preferred method of demolition for concrete arch bridges was removal with explosives. This method of demolition caused the entire structure to drop into the waterway. To minimize impacts from the bridge demolition and reduce the potential for the entire bridge to fall into the river, the NCDOT has proposed that the contractor construct a support frame at the existing bridge (as discussed later in this document, the contractor will be required to submit for approval a demolition plan that provides construction and demolition techniques that provide equal to or fewer impacts than described in the BA). Temporary support frames will be placed in the river under each arch. The support frame foundation will most likely be precast concrete (such as a concrete barrier), but the contractor may choose to use a timber or steel foundation. Due to the irregular rock streambed, small amounts of riprap or sandbags may be required to level up the support frame foundation.

Project B-2848 - The existing Bridge No. 143 over the Toe River on SR 1304 was constructed in 1922 and is a reinforced concrete spandrel arch structure. The bridge consists of earth-filled spandrel piers. It is comprised of five spans, is 367 ft in length, has a roadway width of 12 ft, and has three piers within the river channel totaling an area of 349 ft^2. Five alternatives to replacing the bridge were considered, including three build alternatives. The chosen alternative will have less impact on the natural environment than the other two build alternatives and will avoid impacting a tributary to the Toe River. The new bridge will be on a new alignment, approximately 50 ft downstream of the existing bridge. It will be approximately 366 ft in length and 24 ft wide. It will require one bent, consisting of two drilled piers totaling 32.0 ft^2, and another bent with similar dimensions will be constructed at the water's edge on the east bank of the river.

As with B-1443, the use of temporary bridges for construction and demolition activities is not feasible for this project due to the amount of bedrock present at the construction site. The rock causeways that will be required to construct the new bridge and demolish B-2848 were also designed to result in the least amount of fill in the river while providing sufficient area to accomplish the construction and demolition. The rock causeways will consist of a base of clean class II riprap, with about 1 ft of clean class I riprap on top of the causeways. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 52 percent of the river will be open. Constructing the piers for the new bridge and demolishing the existing bridge causeways will result in 15,551 ft^2 and 1,786 ft^2 of temporary rock fill in the river, respectively.

The NCDOT will also use support frames, as described for the demolition of B-1443, to minimize impacts from the bridge demolition and reduce the potential for the entire bridge to fall into the river. In addition to the difficult nature of demolishing concrete arch bridges, the piers at B-2848 are also filled with earthen material. The NCDOT has proposed the removal of this fill in the initial steps of the demolition process to ensure that the fill material does not enter the river.

A. Action Area

The action area for this Opinion includes the areas directly impacted by construction activities; the areas potentially impacted by indirect impacts; a 100-ft (500-meter [m]) boundary around each bridge site, which includes 1,312 ft (400 m) downstream and 328 ft (100 m) upstream of both the existing and newly constructed bridges; and the areas the NCDOT is considering for riparian buffer preservation and/or restoration along the Toe, North Toe, and Cane Rivers to help offset impacts from the project. Therefore, the project area includes the main stem of the North Toe River, Toe River, and Cane River in Mitchell and Yancey Counties, North Carolina (see attached Figures 1 and 2).

Physical Characteristics within the Action Area - The South Toe River and North Toe River combine near the Town of Spruce Pine to form the Toe River; the Toe River then combines with the Cane River to form the Nolichucky River, a tributary to the French Broad River. The North Toe River originates in central Avery County, approximately 5 miles northeast of Newland. From Newland the river flows east for approximately 4 miles to Minneapolis. The river generally flows in a southwest direction from Minneapolis, through the city of Spruce Pine in Mitchell County, until its confluence with the South Toe River near Kona, forming the Toe River. The Toe River continues to flow northwest along the Mitchell/Yancey County border through Toecane and Relief until its confluence with the Cane River near Huntdale. The headwaters of the Cane River arise in Mount Mitchell State Park in Yancey County. The Cane River flows generally south for approximately 40 miles before joining the Toe River near Huntdale to form the Nolichucky River.

The Nolichucky River watershed occupies parts of two physiographic provinces. Upstream parts of the watershed (upstream from about Dry Creek, at river mile 87.5) and the higher slopes along the eastern side of the river are in the Blue Ridge Province. The remainder of the watershed and most of the length of the Nolichucky River are located in the Valley and Ridge Province. The approximately one-third of the watershed that is located in the Blue Ridge Province consists of high, steep ridges with narrow valleys. The mountains in this part of the watershed rise 1,000 to 2,500 ft above the adjacent lowlands. The western part of the Blue Ridge Province is characterized by long, narrow individual ridges, aligned parallel to the trend of the range and similar to the more subdued ridges of the Valley and Ridge Province. The main mountain mass along the Tennessee/North Carolina state line is a tumbled confusion of peaks and valleys that appear to have no regular pattern.

Land Use - Most of the land in the action area is forested, with a large portion of it occurring within the Pisgah National Forest. A significant portion of land, mostly along the alluvial areas of the middle North Toe River, South Toe River, and Toe River, is residential/golf course (<1 percent) or cultivated cropland and pasture (14 percent) (North Carolina Department of Environment and Natural Resources [NCDENR] 2005). Historically, the economy of the entire Nolichucky River subbasin depended on natural resources. The mining of mica, feldspar, kaolin, or olivine in the Spruce Pine mining district within the North Toe and South Toe watersheds was the main source of income for the area.

Ecological Significance – The Nolichucky River subbasin is known to support a number of rare fish and freshwater mussel species (Table 1). The stonecat (*Noturus flavus*) is found only in North Carolina in the Nolichucky and Little Tennessee River watersheds. The Cane River contains several rare animals, the most notable of which is almost the entire North Carolina population of sharphead darter (*Etheostoma acuticeps*). The lower stretches of the North Toe and Nolichucky Rivers provide habitat for the olive darter (*Percina squamata*), logperch (*Percina caprodes*), and tangerine darter (*Percina aurantiaca*), as well as the federally endangered Appalachian elktoe mussel. The wavy-rayed lampmussel (*Lampsilis fasciola*) and the hellbender

Table 1. Rare Aquatic Species in the North Toe, Toe, and Cane Rivers.

Scientific Name	Common Name	North Carolina Status	Federal Status
Mussels:			
Alasmidonta raveneliana	Appalachian elktoe	Endangered	Endangered
Lampsilis fasciola	Wavy-rayed lampmussel	Special Concern	None
Amphibians:			
Cryptobranchus alleganiensis	Hellbender	Special Concern	Federal Species of Concern
Fishes:			
Etheostoma acuticeps	Sharphead darter	Threatened	Federal Species of Concern
Etheostoma vulneratum	Wounded darter	Special Concern	Federal Species of Concern
Percina squamata	Olive darter	Special Concern	Federal Species of Concern
Noturus flavus	Stonecat	Endangered	None

(*Cryptobranchus alleganiensis*) have been found in the same reaches of the upper Nolichucky River subbasin where the Appalachian elktoe occurs.

The North Carolina Natural Heritage Program (NCNHP) maintains a database of rare plant and animal species, as well as significant natural areas, for the State of North Carolina. Natural areas (sites) are inventoried and evaluated on the basis of rare plant and animal species, rare or high-quality natural communities, and geological features occurring in the particular site. These sites are rated with regard to national, state, and regional significance. The aquatic habitat of the South Toe, a portion of the North Toe, the Toe, and the Nolichucky River is considered to be of "National Significance," and the aquatic habitat of the Cane River is considered to be of "Statewide Significance."

Water Quality Assessment and Best Usage Classification - Historically, sedimentation and pollution from several mining operations throughout the Nolichucky River subbasin (primarily in the North Toe watershed) significantly degraded cool-warm water habitats (North Carolina Wildlife Resources Commission [NCWRC] 2005). Feldspar, mica, and kaolin have been extensively mined in this watershed in North Carolina since the early 1900s (Muncy 1981). Nearly half of the nation's mica is produced in this region. Sedimentation from mining and agricultural practices in the subbasin is well documented (Tennessee Valley Authority [TVA] 1981, Ahlstedt and Rashleigh 1996). However, the North Carolina Mining Control Act of 1971 and the Sedimentation and Pollution Control Act of 1973 have helped improve the water

quality of this basin (NCDENR 2003, Ahlstedt and Rashleigh 1996). Recent bioassessments, including benthic macroinvertebrate and fish sampling, in the Nolichucky River subbasin by the North Carolina Division of Water Quality (DWQ) indicate improving conditions in the subbasin (Tables 2 and 3).

While the sampling conducted by DWQ indicates that water quality is generally good in the subbasin (based on the parameters that are sampled and evaluated by the DWQ), there are still areas of concern. Mining impacts are still widespread, while croplands for corn, tomatoes, and burley tobacco, along with development, contribute to nonpoint-source pollution, including pesticides, fertilizers, oil, heavy metals, animal waste, and eroded sediment, that are washed from land or paved surfaces when it rains. Overall, sedimentation has been considered a significant problem in the Nolichucky River system for many years. Habitat in the North Toe River between Spruce Pine and its confluence with the South Toe River continues to be degraded, seemingly from discharges and runoff from mining operations and the town of Spruce Pine. Floodplain gravel mining in the upper Cane River watershed, both permitted and unpermitted actions, presents a potential threat to long-term channel stability and habitat quality. Development is increasing throughout much of the subbasin, and erosion and sedimentation may also be on the rise. Portions of the subbasin may also be impacted by the direct, indirect, and secondary impacts associated with road construction activities as a result of the expansion of NC 19 from Burnsville to Spruce Pine (NCWRC 2005).

The NCDENR assigns a best usage classification[1] to all the waters of North Carolina. These classifications provide for a level of water quality protection to ensure that the designated usage of that water body is maintained. The portions of the Toe River, Cane River, and North Toe River that are occupied by the Appalachian elktoe have a "Class C, Trout," usage classification, and the Nolichucky River from its source to the North Carolina/Tennessee state line has a usage classification of "Class B."

Point-source Pollution - Point-source discharge is defined as discharges that enter surface waters through a pipe, ditch, or other well-defined point of discharge. These

[1] **15A NCAC 02B.0101 GENERAL PROCEDURES:** (c) Freshwater shall be assigned to one of several classifications, including: (1) Class C: freshwaters protected for secondary recreation, fishing, aquatic life including propagation and survival, and wildlife (All freshwaters shall be classified to protect these uses at a minimum); or (2) Class B: freshwaters protected for primary recreation which includes swimming on a frequent or organized basis and all Class C uses. Section (e) describes supplemental classification, as: (1) Trout waters: freshwaters protected for natural trout propagation and survival of stocked trout. (4) Outstanding Resource Waters (ORW): unique and special waters of exceptional state or national recreational or ecological significance which require special protection to maintain existing uses. (5) High Quality Waters (HQW): including waters which are rated as excellent based on biological and physical/chemical characteristics through Division monitoring or special studies, native and special native trout waters (and their tributaries) designated by the [North Carolina] Wildlife Resources Commission. (7) Unique wetland (UWL): wetlands of exceptional state or national ecological significance which require special protection to maintain existing uses. These wetlands may include wetlands that have been documented to the satisfaction of the Commission as habitat essential for the conservation of state or federally listed threatened or endangered species.

Table 2. DWQ Benthic Macroinvertebrate Sampling Results in the Nolichucky River Subbasin (DWQ 2003).[2]

Water Body	County	Location	1997/2002 Survey Results
Toe River	Mitchell	SR 1321	Good/Good
Toe River	Yancey	SR 1314	Good/Good
North Toe River	Avery	US 19E	Good/Good
North Toe River	Mitchell	SR 1162	Fair/Good
Big Crabtree Creek	Mitchell	US 19E	Excellent/Excellent
South Toe River	Yancey	SR 1167	Excellent/Excellent
Big Rock Creek	Mitchell	NC 197	Good/Excellent
Jacks Creek	Yancey	SR 1337	Fair/Fair
Pigeonroost Creek	Mitchell	SR 1349/NC 197	Excellent/Excellent
Cane River	Yancey	US 19E	Excellent/Excellent
Bald Mountain Creek	Yancey	SR 1408	Good/Excellent
Price Creek	Yancey	SR 1126	Good/Fair/Good

include municipal (city and county) and industrial wastewater treatment facilities, small domestic discharging treatment systems (i.e., schools, commercial offices, subdivisions, and individual residences), and storm-water systems from large urban areas and industrial sites. The primary substances and compounds associated with point-source discharge include nutrients, oxygen-demanding wastes, and toxic substances (such as chlorine, ammonia, and metals).

Under Section 301 of the Clean Water Act of 1977 (CWA), the discharge of pollutants into surface waters is regulated by the Environmental Protection Agency. Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permitting program, which delegates permitting authority to qualifying states. In North

[2]Water quality monitoring programs have been implemented by the DWQ to assess water quality trends in North Carolina Waters. One method used is the monitoring of benthic macroinvertebrates to assess water quality by sampling for selected benthos organisms. The species and overall biomass, as well as the presence of various groups intolerant of water quality degradation, are reflections of water quality. A biodiversity rating is given to a water body sampled, based on the taxa richness of the stream, and a qualitative sampling for intolerant forms such as mayflies (Ephemeroptera), stoneflies (Plecoptera), and caddisflies (Trichoptera), collectively referred to as EPT. Biodiversity ratings include: Excellent, Good, Good-Fair, Fair, and Poor. Excellent and Good ratings indicate that the best usage classification for that stream is being supported (S). A rating of Good-Fair indicates that the usage is supported but is threatened (ST). A Fair rating relates to a partial support (PS) of the best usage, and a Poor rating indicates that the best usage classification for that stream is not being supported (NS).

Table 3. Tennessee Valley Authority Fish Community Assessment in the Nolichucky River Subbasin (DWQ 2003).[3]

Water Body	County	Location	Date	Score/Rating
North Toe River	Mitchell	US 19	1999	50/Good
North Toe River	Yancey	NC 80	1997 1999	40/Good 50/Good
Toe River	Avery	SR 1314	1997 1999	40/Fair 56/Good-Excellent
Toe River	Mitchell	SR 1336	1997	48/Good
South Toe River	Mitchell	NC 80	1997	48/Good
Little Crabtree Creek	Yancey	US 19E	1997 1999	44/Fair 40/Fair
Cane Creek	Mitchell	NC 80	1997 1999	32/Poor 34/Poor
Big Rock Creek	Mitchell	NC 197	1997 2000	50/Good 50/Good
Jacks Creek	Yancey	SR 1336	2000	40/Fair
Cane River	Yancey	US 19E	1997 2000	44/Fair 50/Good
Cane River	Yancey	US 19W	1997 2000	40/Fair 48/Good
Cane River	Yancey	US 19W	1997	46/Fair-Good
Nolichucky River	Mitchell	SR 1321	1997 2002	50/Good 52/Good

Carolina, the NCDENR's DWQ is responsible for permitting and enforcement of the NPDES program. There were 23 NPDES permitted discharges in the subbasin in 2003 (NCDENR 2005), although additional discharges have been permitted recently (a new wastewater treatment plant [WWTP] discharge into the South Toe below Highway 19E). Most of these discharges are small WWTPs that serve schools or subdivisions, including the Spruce Pine WWTP, Newland WWTP, Bakersville WWTP, and multiple mining process discharges, including Unimin's four discharges.

Nonpoint-source Pollution – Nonpoint-source pollution refers to runoff that enters surface waters through storm water or snowmelt. There are many types of land-use

[3]The Fish Community Assessment assigns an Index of Biotic Integrity (IBI), which is another method of assessing water quality. The IBI evaluates species richness and composition, trophic composition, and fish abundance and condition.

activities that are sources of nonpoint-source pollution, including land development, construction activity, animal waste disposal, mining, and agriculture and forestry operations, as well as impervious surfaces, such as roadways and parking lots. Various nonpoint-source management programs have been developed by a number of agencies to control specific types of nonpoint-source pollution (e.g., forestry, pesticide, urban, and construction-related pollution). Each of these management programs develops Best Management Practices (BMP) to control the specific type of nonpoint-source pollution.

The Sedimentation and Erosion Control Program (SECP) applies to construction activities, such as roadway construction, and is established and authorized under the Sedimentation Pollution Control Act of 1973. This act delegates the responsibility for its administration and enforcement to the NCDENR's Division of Land Resources (DLR) (Land Quality Section). The SECP requires, prior to construction, the submission and approval of erosion-control plans on all projects disturbing one or more acres. On-site inspections by DLR are conducted to determine compliance with the plan and to evaluate the effectiveness of the BMP that are being used. The NCDOT, in cooperation with the DWQ, has developed a sedimentation-control program for highway projects, which adopts formal BMP for the protection of surface waters. Additional erosion-control measures, as outlined in Design Standards in Sensitive Watersheds (NCAC T15A:04B.0124), are implemented by the NCDOT for projects within WS-I or WS-II water supply watersheds, critical areas, waters designated for shellfishing, or any waters designated by the DWQ as High Quality Waters. When crossing an aquatic resource containing a federally listed species, the NCDOT has committed to implement erosion-control guidelines that go beyond both the standard BMP, as well as the Design Standards in Sensitive Watersheds, regardless of the DWQ classification. These areas are designated as "Environmentally Sensitive Areas" on the erosion-control plans.

B. Conservation Measures

Conservation measures represent actions, pledged in the project description, that the action agency will implement to minimize the effects of the proposed action and further the recovery of the species under review. Such measures should be closely related to the action and should be achievable within the authority of the action agency. The beneficial effects of conservation measures are taken into consideration in the Service's conclusion of a jeopardy versus a nonjeopardy opinion and in the analysis of incidental take. However, such measures must minimize impacts to listed species within the action area in order to be factored into the Service's analyses.

The following conservation measures are proposed by the NCDOT to avoid and/or minimize potential impacts from construction and demolition activities to the Appalachian elktoe. These measures have been incorporated into the design and implementation plans for the bridge replacement projects.

Conservation Measures for Bridge Design

1. Deck drains will be placed at the ends of the replacement bridges. Storm water will be directed into catch basins and will then flow through a vegetated buffer so that no drainage will occur over the Toe River. Currently, drainage from the decks of both the existing structures flows directly into the river. Storm water coming off the approaching roadways at the bridge locations will be managed in a similar manner. These commitments have been incorporated in the Structure Design Plans for each project.

2. The replacement of B-1443 will result in two piers placed within the river, the same number of piers as the existing bridge; however, the piers of the new bridge will impact 57 ft^2 of the riverbed, while the existing bridge piers are over two and a half times that size--151.2 ft^2. The replacement of B-2848 will reduce the number of piers within the water as well as the area of impact to the riverbed. The existing bridge has three piers within the river channel, totaling an area of 349 ft^2, whereas the new bridge will require one bent, consisting of two drilled piers totaling 32.0 ft^2 and another bent with similar dimensions at the water's edge on the east bank of the river. The reduction in the area and the number of piers in the Toe River is expected to reduce the bridges' effects on stream-flow patterns at these sites.

Conservation Measures for Bridge Construction

1. The NCDOT will remove Appalachian elktoes from the impact site and relocate them to suitable locations upstream of the impacted areas in the North Toe River, at river mile 25.5, according to the procedures in the approved relocation plan in the BA.

2. In addition to relocating all mussels found in the footprint of the impact area, the NCDOT will conduct final mussel surveys in the project footprint just prior to construction and will move any additional mussels found to the above-described upstream habitat.

3. North Carolina sedimentation regulations, entitled "Design Standards in Sensitive Watersheds,"[4] will be implemented during the design and construction of the

[4]**DESIGN STANDARDS IN SENSITIVE WATERSHEDS, 15A NCAC 04B.0124:** (a) Uncovered areas in HQW zones shall be limited at any time to a maximum total area within the boundaries of the tract of 20 acres. Only the portion of the land-disturbing activity within a HQW zone shall be governed by this Rule. Larger areas may be uncovered within the boundaries of the tract with the written approval of the Director. (b) Erosion and sedimentation control measures, structures, and devices within HQW zones shall be so planned, designed and constructed to provide protection from the runoff of the 25 year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agricultural Soil Conservation Service's "National Engineering Field Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association. (c) Sediment basins within HQW zones shall be designed and constructed such that the basin will have a settling efficiency of at least 70 percent for the 40 micron (0.04 mm) size soil particle transported into the basin by the runoff of that two-year storm which produces the maximum peak rate of runoff as calculated according to procedures in the United States Department of Agriculture Soil Conservation Services "National Engineering Field

projects, as applicable. In addition to these standards, erosion-control measures for environmentally sensitive areas will be implemented and will:

a. Identify areas adjacent to the Toe River as "Environmentally Sensitive Areas" on the erosion-control plans for this project;

b. Provide a 50-ft buffer zone (each side of the stream), allowing clearing but not grubbing until immediately before grading operations;

c. Limit grubbing operations to within 10 days of grading;

d. Require "seeding and mulching" to be performed immediately following grade establishment;

e. Require "staged seeding"--20-ft fill sections or 2 acres, whichever is less;

f. Clean erosion and sediment control measures when half full;

g. Increase sediment storage capacity above standard BMP guidelines; the amount of increase will be determined during the preconstruction meetings.

Conservation Measures for Bridge Demolition

The contractor will be required to submit for approval a demolition plan to the Resident Engineer and the Bridge Construction Engineer prior to beginning bridge removal. This plan must be sealed by a registered North Carolina Professional Engineer. The plan must use demolition techniques that minimize the amount of debris that will enter the river and may include procedures similar to those listed below. If the contractor provides procedures that do not follow those described below, they will be reviewed for approval by the NCDOT Resident Engineer and Bridge Construction Engineer and the Service and must be techniques that provide equal to or fewer impacts than described below.

1. Prior to bridge demolition, all the asphalt-wearing surface will be removed from the deck in a manner that prohibits material from entering the river. Approved removal techniques include milling or scrapping with a backhoe bucket. Depending on the technique used, containment headers may be required. Typically, this consists of

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Manual for Conservation Practices" or according to procedures adopted by any other agency of this state or the United States or any generally recognized organization or association. (d) Newly constructed open channels in HQW zones shall be designed and constructed with side slopes no steeper than two horizontal to one vertical if a vegetative cover is used for stabilization unless soil conditions permit a steeper slope or where the slopes are stabilized by using mechanical devices, structural devices or other acceptable ditch liners. In any event, the angle for side slopes shall be sufficient to restrain accelerated erosion. (e) Pursuant to G.S. 113A-57(3) provisions for a ground cover sufficient to restrain erosion must be provided for any portion of a land-disturbing activity in a HQW zone within 15 working days or 60 calendar days following completion of construction or development, whichever period is shorter.

vertical boards attached to the bottom of concrete barrier rail to prevent material from spilling into the river during removal.

2. For B-2848 the fill material within the piers will then be removed. The NCDOT has proposed that the contractor conduct the removal of the fill material by the following process: a backhoe will load the material into dump trucks, working from one end of bridge to the other. After as much fill material as possible is removed with the machinery, the rest of the material will be removed manually (by shovel). The manual removal of the deepest areas of the piers may have to occur after the upper portions of the pier have been removed.

3. For B-1443 the next step of the demolition process will be to remove all the concrete rail and deck by saw-cutting or nonshattering methods. This material will be removed from the bridge without dropping material into the stream. For B-2848 the existing steel beam guardrail will be removed by unbolting and cutting as needed.

4. At this time in the demolition process the bridge superstructure of B-1443 will consist of the concrete arches connected by small concrete beams (concrete diaphragms). The B-2848 superstructure will consist of concrete arches connected by a solid concrete floor. Portions of the concrete deck will be removed by saw-cutting and lifting out large pieces. Removing portions of the floor will reduce the weight of the structure for the next step of demolition. However, like the concrete diaphragms, some portion of the floor must remain to keep the arches from separating.

5. At this point in the demolition process the remaining portion of the bridge will be dismantled; every attempt will be made to prevent components of the bridge from dropping into the river. Temporary support frames will be placed in the river under each arch. The support frame foundation will most likely be precast concrete (such as a concrete barrier), but the contractor may choose to use a timber or steel foundation. Due to the irregular rock streambed, small amounts of riprap or sandbags may be required to level up the support frame foundation. Support frames will need to be placed in at least three locations under each arch (midspan and quarter points). The arches will then be sawed into sections and an attempt will be made to lift these sections out with a crane. The arches could potentially separate, and all or a portion of them could fall into the river. The contractor's demolition plan will detail the maximum amount of the bridge that can be safely removed. Any portion that falls into the stream will be lifted out with a crane.

6. The proposed causeways will be used as access for bent removal. Equipment will need to be staged adjacent to the bent in order to facilitate sawing it into manageable sections above water elevation. Cranes on the causeways will lift the sections out. Once the bents have been removed to water elevation, the remaining mass of concrete will be removed to streambed elevation by underwater sawing or the use of a hoe ram to break the bent at streambed interface to allow for lifting it

out as a unit. During this process, turbidity curtains will be used (if water depth is sufficient), and the disturbance of the steam bottom will be limited to an area 3 ft around the perimeter of the bent. The existing footing below streambed will be left in place to avoid additional streambed disturbance.

7. The temporary causeways used for the project were designed to result in the least amount of rock fill entering the river while providing sufficient area to accomplish the construction and demolition. The causeways will be constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan so that not all causeways needed for construction and demolition are in the river at the same time, minimizing impacts to the flow of the river. The use of Jersey-type or similar barrier devices will be installed around the perimeter of the causeways to help contain the stone used to construct the causeways.

8. The use of explosives will not be allowed.

9. Saw slurry must be contained by approved vacuum methods.

Additional Conservation Measures

1. In order to avoid and minimize environmental impacts associated with these projects, all standard procedures and measures, including the NCDOT's BMP for Construction and Maintenance Activities and the TVA's Water Management Standard Conditions will be strictly enforced during the project. Provisions to preclude contamination by toxic substances during the project will also be strictly enforced.

2. The NCDOT proposes to relocate all native mussels, including the Appalachian elktoe, from the footprints and extending downstream 262 ft (80 m) and upstream 66 ft (20 m) of the two bridge replacement projects. The procedure for the relocation is detailed in the BA. The relocation procedure within the BA provides a plan that relocates freshwater mussels in such a way as to reduce stress and minimize the risk of injury while the species are in transit. If at any time during the relocation it is determined that these procedures are not meeting the stated objectives, more stringent methods may be developed, in cooperation with the NCWRC and the Service, to ensure that the mussels are relocated successfully. During August 2005 the NCDOT, NCWRC, Catena Group, and Service worked together to choose a suitable relocation site. It was decided that the mussels from both bridge sites would be moved to suitable habitat within the upstream limits of the Appalachian elktoe's distribution. Concentrating mussels in a location within the upper limits of its distribution, where numbers are currently very low, may help facilitate the continued up-river recruitment trend of the species. The most suitable site was determined to be on the North Toe River, between Penland and Boonford, at approximately river mile 25.5. The relocation site will be monitored for the survival of relocated mussels and the movement of mussels a month after they have

been removed from the defined salvage areas. The relocation site will then be monitored for recovery, survival (of recovered mussels), movement, and growth of mussels once a year for 5 years after the project is constructed.

3. The NCDOT has initiated a watershed search for potential riparian properties within the Toe River. The NCDOT has investigated approximately five sites consisting of opportunities for 100-ft riparian buffer protection and/or restoration. The NCDOT has committed to purchase (for protection and/or restoration) at least 3,000 linear ft of these riparian buffers sites. Riparian buffers will be purchased to offset unavoidable impacts on the Appalachian elktoe population associated with the bridge construction and demolition.

4. The NCDOT proposes to monitor the river channel and banks at sites upstream, at the construction sites, and downstream to determine changes in habitat resulting from activities at these sites. If any problems with regard to stream stability are detected during the monitoring, the NCDOT has proposed to attempt to correct the problems. This monitoring will also help evaluate the impacts of construction on habitat in the Toe River.

5. The NCDOT has developed erosion-control measures for these two projects specifically to protect the Appalachian elktoe and its habitat. These measures are listed in the "Conservation Measures for Bridge Design" section of this Opinion. In addition to these erosion-control measures, an inspection of the erosion-control devices will be conducted on a daily basis by the Construction Project Inspector positioned in the District Office in which the project occurs. The Roadside Environmental Branch of the NCDOT also has Area Field Operations Engineers who will perform compliance inspections of the erosion-control devices a minimum of twice a month during the life of a project. In addition to these levels of inspection, an environmental specialist with the NCDOT Office of Natural Environment's Biological Surveys Unit will perform periodic site inspections of the erosion-control measures at the respective construction sites. This person will also be making qualitative assessments of the Toe River habitat at the construction sites. These visits will be unannounced and directly in relationship to rain events whenever possible.

6. The NCDOT Project Development and Environmental Analysis Branch and the Service will be invited to the preconstruction conference to discuss with the contractor the provisions of this Opinion. Prior to construction the contractor will be required to give notification of the construction initiation date to the Service, NCWRC, and TVA.

II. STATUS OF THE SPECIES AND ITS CRITICAL HABITAT

A. Species Description, Life History, and Critical Habitat Description

The Appalachian elktoe has a thin, but not fragile, kidney-shaped shell, reaching up to about 3.2 inches (in.) in length, 1.4 in. in height, and 1 in. in width. Juveniles generally have a yellowish-brown periostracum (outer shell surface), while the periostracum of the adults is usually dark brown to greenish-black in color. Although rays are prominent on some shells, particularly in the posterior portion of the shell, many individuals have only obscure greenish rays. The shell nacre (inside shell surface) is shiny, often white to bluish-white, changing to a salmon, pinkish, or brownish color in the central and beak cavity portions of the shell; some specimens may be marked with irregular brownish blotches.

The Appalachian elktoe has been reported from relatively shallow, medium-sized creeks and rivers with cool, clean, well-oxygenated, moderate- to fast-flowing water. The species is most often found in riffles, runs, and shallow flowing pools with stable, relatively silt-free, coarse sand and gravel substrate associated with cobble, boulders, and/or bedrock (Gordon 1991; Service 1994, 1996, 2002). Stability of the substrate appears to be critical to the Appalachian elktoe, and the species is seldom found in stream reaches with accumulations of silt or shifting sand, gravel, or cobble (Service 2002). Individual specimens that have been encountered in these areas are believed to have been scoured out of upstream areas during periods of heavy rain and have not been found on subsequent surveys (Service 2002).

Like other freshwater mussels, the Appalachian elktoe feeds by filtering food particles from the water column. The specific food habits of the species are unknown, but other freshwater mussels have been documented to feed on detritus (decaying organic matter), diatoms (various minute algae) and other algae and phytoplankton (microscopic floating aquatic plants), and zooplankton (microscopic floating aquatic animals). The reproductive cycle of the Appalachian elktoe is similar to that of other native freshwater mussels. Males release sperm into the water column, and the sperm are then taken in by the females through their siphons during feeding and respiration. The females retain the fertilized eggs in their gills until the larvae (glochidia) fully develop. The mussel glochidia are released into the water and, within a few days, must attach to the appropriate species of fish, which they then parasitize for a short time while they develop into juvenile mussels. They then detach from their fish host and sink to the stream bottom where they continue to develop, provided they land in a suitable substrate with the correct water conditions. The banded sculpin (*Cottus carolinae*) was identified as a host species for glochidia of the Appalachian elktoe at the time the elktoe was listed, and the mottled sculpin (*C. bairdi*) was identified as a host species soon after the listing (Service 2002). Dr. Jim Layzer (Tennessee Technological University, unpublished data) has recently identified eight additional species of fish that successfully transformed glochidia of the Appalachian elktoe into juveniles under laboratory condition. These eight species include the wounded darter (*Etheostoma vulneratum*), greenfin darter (*Etheostoma chlorobranchium*), greenside

darter (*Etheostoma blenniodes*), river chub (*Nocomis micropogon*), northern hogsucker (*Hypentilum nigracans*), central stoneroller (*Campostoma anomalum*), longnose dace (*Rhinichthys cataractae*), and rosyside dace (*Clinostomus funduloides*). The life span and many other aspects of the Appalachian elktoe's life history are currently unknown.

Critical habitat was designated for the Appalachian elktoe in 2002 (Service 2002). The areas designated as critical habitat for the Appalachian elktoe total approximately 144.3 miles of various segments of rivers in North Carolina and one river in Tennessee. Critical habitat identifies specific areas that are essential to the conservation of a listed species and that may require special management considerations or protection. Section 7(a)(2) of the Act requires that each federal agency shall, in consultation with the Service, ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of critical habitat.

The following constituent elements are part of the critical habitat designation and are essential to the conservation of the Appalachian elktoe:

1. Permanent, flowing, cool, clean water;

2. Geomorphically stable stream channels and banks;

3. Pool, riffle, and run sequences within the channel;

4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment;

5. Moderate to high stream gradient;

6. Periodic natural flooding; and

7. Fish hosts, with adequate living, foraging, and spawning areas for them.

In the Nolichucky River subbasin, critical habitat is designated for the Appalachian elktoe in the main stem of the Nolichucky River, Cane River, Toe River, South Toe River, and North Toe River.

B. Status and Distribution

The Appalachian elktoe is known only from the mountain streams of western North Carolina and eastern Tennessee. Although the complete historical range of the Appalachian elktoe is unknown, available information suggests that the species once lived in the majority of the rivers and larger creeks of the upper Tennessee River system in North Carolina, with the possible exception of the Hiawassee and Watauga River systems (the species has not been recorded from either of these river systems). In

Tennessee, the species is known only from its present range in the main stem of the Nolichucky River.

Currently, the Appalachian elktoe has a very fragmented, relict distribution. The species still survives in scattered pockets of suitable habitat in portions of the Little Tennessee River system, Pigeon River system, Mills River, and Little River in North Carolina and the Nolichucky River system in North Carolina and Tennessee.

Little Tennessee River Subbasin - In the Little Tennessee River system in North Carolina, populations survive in the reach of the main stem of the Little Tennessee River, between the city of Franklin and Fontana Reservoir, in Swain and Macon Counties (McGrath 1999; Service 1994, 1996, 2002), and in scattered reaches of the main stem of the Tuckasegee River in Jackson and Swain Counties (McGrath 1998; Tim Savidge, NCDOT, personal communication, 2001; Service 2002), from below the town of Cullowhee downstream to Bryson City. Monitoring by the NCWRC of the Appalachian elktoe population in the Little Tennessee River over the last couple of years has revealed that the population is apparently declining. A single live individual and one shell were recorded in 2000 from the Cheoah River, below Santeetlah Lake, in Graham County (Service 2002). Biologists with the NCDOT, U.S. Forest Service, and the Service have recorded up to 11 live Appalachian elktoes from the Cheoah River, below Santeetlah Dam, during surveys of portions of the river in 2002, 2003, 2004, and 2005.

French Broad River Subbasin - In the Pigeon River system in North Carolina, a small population of the Appalachian elktoe occurs in small scattered sites in the West Fork Pigeon River and in the main stem of the Pigeon River, above Canton, in Haywood County (McGrath 1999, Service 2002). The Little River (upper French Broad River system) population of the species, in Transylvania County, North Carolina (Service 2002), is restricted to small scattered pockets of suitable habitat downstream of Cascade Lake. In the Mills River, Henderson County, North Carolina, the Appalachian elktoe occurs in a short reach of the river, from just above the Highway 280 bridge (Savidge, Catena Group, personal communication, 2003) to about 1 mile below the bridge (Jeff Simmons, NCWRC, personal communication, 2004). In addition, NCWRC biologists have recently discovered a few individuals of the species at a site in the main stem of the French Broad River, below the mouth of the Little River (Steve Fraley, NCWRC, personal communication, 2005).

Nolichucky River Subbasin - In the Nolichucky River system, the Appalachian elktoe survives in scattered areas of suitable habitat in the Toe River, Yancey and Mitchell Counties, North Carolina (McGrath 1996, 1999; Service 1994, 1996); the Cane River, Yancey County, North Carolina (McGrath 1997; Service 1994, 1996); and the main stem of the Nolichucky River, Yancey and Mitchell Counties, North Carolina, extending downstream to the vicinity of Erwin, Unicoi County, Tennessee (Service 1994, 1996, 2002). A cooperative and comprehensive mussel survey effort was undertaken between 2000 and 2003 by the NCWRC, NCDOT, NCNHP, and Service throughout the upper Nolichucky River system in Yancey, Mitchell, and Avery

Counties, North Carolina. Given that many areas in the Nolichucky River system had not been surveyed since the 1990s, the primary goal for these surveys was reassessment of the Appalachian elktoe's population status. The survey efforts indicate that suitable habitat within at least 73 miles of stream in the Nolichucky River system is presently occupied by the Appalachian elktoe, an apparent 15-mile increase from reported occupied habitat prior to 2000 (Fraley and Simmons 2004). These surveys also indicate that this population appears to be growing in numbers as well. Sites where mussels were found during 2000 and 2003 produced higher catch per unit effort (CPUE) than the nearest sites sampled prior to 2000 (Fraley and Simmons 2004). However, the available habitat in the subbasin is a limiting factor; therefore, the Appalachian elktoe is not evenly dispersed throughout the 15-mile increase in the subbasin.

During August and September of 2004, significant flooding from Hurricanes Frances and Ivan occurred in the Nolichucky River drainage. The NCWRC surveyed sites in the Nolichucky River drainage for federally listed and state-listed mussels after the hurricanes and compared the results to survey results prior to the hurricanes. As stated previously, based on the results in 2000 and 2003, prior to the 2004 floods, Appalachian elktoe populations in the Nolichucky subbasin were found to be increasing in abundance and expanding their range. The survey results after the floods of 2004 indicate that recovery was set back to some degree based on reduced CPUE results; however, Appalachian elktoes were found throughout most of the occupied range known in 2003, which illustrates the resilience of the species to periodic hydraulic disturbance, especially in a system, such as the Nolichucky River subbasin, that is more prone to habitat disturbance from floods. Currently, the Nolichucky population appears to be a relatively large (at least in terms of spatial distribution) metapopulation that is more or less contiguous, with at least the opportunity for some level of gene flow throughout the subbasin (Fraley and Simmons 2006).

Extirpated Sites - Historically, the species has been recorded from Tulula Creek (Tennessee River drainage), the main stem of the French Broad River at Asheville, and the Swannanoa River (French Broad River system) (Clarke 1981), but it has apparently been eliminated (except from a small section of the main stem of the French Broad River at the confluence of the Little River) from these streams (Service 1994, 1996). There is also a historical record of the Appalachian elktoe from the North Fork Holston River in Tennessee (S. S. Haldeman collection); however, this record is believed to represent a mislabeled locality (Gordon 1991). If the historical record for the species in the North Fork Holston River was accurate, the species has apparently been eliminated from this river as well.

Available information indicates that several factors have contributed to the decline and loss of populations of the Appalachian elktoe and threaten the remaining populations. These factors include pollutants in wastewater discharges (sewage treatment plants and industrial discharges); habitat loss and alteration associated with impoundments, channelization, and dredging operations; and the runoff of silt, fertilizers, pesticides, and other pollutants from land-disturbing activities that were implemented without adequate measures to control erosion and/or storm water (Service 1994, 1996).

Mussels are known to be sensitive to numerous pollutants, including, but not limited to, a wide variety of heavy metals, high concentrations of nutrients, ammonia, and chlorine—pollutants commonly found in many domestic and industrial effluents (Havlik and Marking 1987). In the early 1900s, Ortmann (1909) noted that the disappearance of unionids (mussels) is the first and most reliable indicator of stream pollution. Keller and Zam (1991) concluded that mussels are more sensitive to metals than commonly tested fish and aquatic insects. The life cycle of native mussels makes the reproductive stages especially vulnerable to pesticides and other pollutants (Fuller 1974, Gardner et al. 1976, Ingram 1957, Stein 1971). Effluent from sewage treatment facilities can be a significant source of pollution that can severely affect the diversity and abundance of aquatic mollusks. The toxicity of chlorinated sewage effluents to aquatic life is well-documented (Bellanca and Bailey 1977, Brungs 1976, Goudreau et al. 1988, Tsai 1975), and mussel glochidia (larvae) rank among the most sensitive invertebrates in their tolerance of the toxicants present in sewage effluents (Goudreau et al. 1988). Goudreau et al. (1988) found that the recovery of mussel populations may not occur for up to 2 miles below the discharge points of chlorinated sewage effluent.

Land-clearing and disturbance activities carried out without proper sedimentation and storm-water control pose a significant threat to the Appalachian elktoe and other freshwater mussels. Mussels are sedentary and are not able to move long distances to more suitable areas in response to heavy silt loads. Natural sedimentation resulting from seasonal storm events probably does not significantly affect mussels, but human activities often create excessively heavy silt loads that can have severe effects on mussels and other aquatic organisms. Siltation has been documented to adversely affect native freshwater mussels, both directly and indirectly (Aldridge et al. 1987, Ellis 1936, Kat 1982, Marking and Bills 1979). Siltation degrades water and substrate quality, limiting the available habitat for freshwater mussels (and their fish hosts), thereby limiting their distribution and potential for the expansion and maintenance of their populations; irritates and clogs the gills of filter-feeding mussels, resulting in reduced feeding and respiration; smothers mussels if sufficient accumulation occurs; and increases the potential exposure of the mussels to other pollutants. Ellis (1936) found that less than 1 in. of sediment deposition caused high mortality in most mussel species. Sediment accumulations that are less than lethal to adults may adversely affect or prevent the recruitment of juvenile mussels into the population. Also, sediment loading in rivers and streams during periods of high discharge is abrasive to mussel shells. Erosion of the outer shell allows acids to reach and corrode underlying layers that are composed primarily of calcium, which dissolves under acid conditions (Harman 1974).

The effects of impoundments on mussels are also well-documented. For the most part, lakes do not occur naturally in western North Carolina and eastern Tennessee (most of them are man-made), and the Appalachian elktoe, like the majority of our other native mussels, fish, and other aquatic species in these areas, is adapted to stream conditions (flowing, highly oxygenated water and coarse sand and gravel bottoms). Dams change the habitat from flowing to still water. Water depth increases, flow decreases, and silt accumulates on the bottom (Williams et al. 1992), altering the quality and stability of

the remaining stream reaches by affecting water flow regimes, velocities, temperature, and chemistry. Dams that operate by releasing cold water from near the bottom of the reservoirs lower the water temperature downstream, changing downstream reaches from warm- or cool-water streams to cold-water streams and affecting their suitability for many of the native species historically inhabiting these stream reaches (Miller et al. 1984, Layzer et al. 1993). The effects of impoundments result in changes in fish communities (fish host species may be eliminated) (Brimm 1991) and in mussel communities (species requiring clean gravel and sand substrates are eliminated) (Bates 1962). In addition, dams result in the fragmentation and isolation of populations of species and act as effective barriers to the natural upstream and downstream expansion or recruitment of mussel and fish species.

The information available demonstrates that habitat deterioration resulting from sedimentation and pollution from numerous point and nonpoint sources, when combined with the effects of other factors (including habitat destruction, alteration, and fragmentation resulting from impoundments, channelization projects, etc.), has played a significant role in the decline of the Appalachian elktoe. We believe this is particularly true of the extirpation of the Appalachian elktoe from the Swannanoa River, most of the French Broad River, and long reaches of the Pigeon, upper Little River, and upper Little Tennessee River systems. We believe these factors also have contributed to the extirpation of the species from parts of the upper Tuckasegee River, Cheoah River, and Tulula Creek, though the effects of impoundments are believed to have played an even more significant role in the loss of the species in the upper reaches of these streams.

The most immediate threats to the remaining populations of the Appalachian elktoe are associated with sedimentation and other pollutants (i.e., fertilizers, pesticides, heavy metals, oil, salts, organic wastes, etc.) from nonpoint sources. Much of the Nolichucky River in North Carolina contains heavy loads of sediment, primarily from past land-disturbing activities within its watershed, and suitable habitat for the Appalachian elktoe appears to be very limited in this river system. The species has not been found in the Nolichucky River system in substrates with accumulations of silt and shifting sand; it is restricted to small scattered pockets of stable, relatively clean, and gravelly substrates. The same is true of the other surviving populations of the species.

C. Analysis of the Species and Critical Habitat Likely to be Affected

Species - NCDOT biologists conducted mussel surveys at the two bridge sites on July 24, 1996. The surveys were conducted from a point approximately 1,312 ft (400 m) downstream to 328 ft (100 m) upstream of the existing bridges. A total of five Appalachian elktoes and two wavy-rayed lampmussels were discovered in 2.5 person-hours of survey time at the B-1443 bridge site, totaling a Catch Per Unit Effort (CPUE) of 2 per hour for the Appalachian elktoe. At the B-2848 bridge site, seven Appalachian elktoes and two wavy-rayed lampmussels were found in 3 person-hours of survey time, totaling a CPUE of 2.33 per hour for the Appalachian elktoe.

During the cooperative and comprehensive mussel survey efforts mentioned previously, another mussel survey was conducted at the two bridge sites on September 9, 2002. A total of 11 Appalachian elktoes and 2 wavy-rayed lampmussels were discovered at the B-1443 site in 4 person-hours of survey time, totaling a CPUE of 2.75 per hour for the Appalachian elktoe. At the B-2848 site, 15 Appalachian elktoes and 2 wavy-rayed lampmussels were found in 3.5 person-hours of survey time, totaling a CPUE of 4.28 per hour for the Appalachian elktoe. The survey limits during these surveys were confined to the areas immediately under the existing bridges because previous surveys had documented the species at these sites. The highest CPUE for the Appalachian elktoe during the comprehensive surveys in the basin was 16 per hour (total of 96 individuals); this occurred at a site in the South Toe River (Fraley and Simmons 2004).

Mussel surveys were also conducted in 2002 by Service, NCWRC, and NCDOT personnel in habitats in close proximity to the existing bridges. The purpose of these surveys was to identify potential relocation sites. Neither the exact locations nor the results of those surveys were recorded.

Densities of Appalachian elktoes vary, depending on many factors that cause their distribution pattern to be scattered and difficult to generalize. Based on surveys for Appalachian elktoes from other drainages, the number below the surface is highly variable and dependent on the substrate. In general, mussels can be very difficult to locate in the substrate, and most mussel surveys detect only those specimens located at or on the surface of the substrate. It is likely that additional mussels were present in the survey areas which were overlooked or were not visible on the surface of the stream bottom. It is also potentially likely that fewer mussels are currently present at the site because of impacts from the 2004 hurricanes. Therefore, accurate estimates of the total number of Appalachian elktoes that will be impacted (both above and below the surface of the stream bottom) are not possible, but the numbers are likely different from those recorded during the surveys.

Critical Habitat - Given that the Appalachian elktoe occurs within the area of the two bridges and Nolichucky River subbasin, it appears that the constituent elements necessary for critical habitat are present within the project area as well as portions of the Cane River, Toe River, and North Toe River. Following is a brief description of the status of the constituent elements within the project area:

1. Permanent, flowing, cool, clean water - There is variation in stream flow within critical habitat; however, there is always permanent flowing water. Based on the DWQ's bioassessments of benthic macroinvertebrate and fish sampling, the water appears to be cool and clean enough to sustain a population of the Appalachian elktoe.

2. Geomorphically stable stream channels and banks - Overall, the stream channel and stream banks appear to be stable at the two bridge sites, as evidenced by the

presence of vegetation on the river banks (trees, shrubs, and herbaceous plants) and an abundance of benthic organisms in the substrate.

3. Pool, riffle, and run sequences within the channel - The Cane River, Toe River, and North Toe River have natural pool, riffle, and run sequences, varied by the local stream gradient and bedrock influence. There is a natural pool, riffle, and run sequence at both bridge sites.

4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment - The habitat within the project area at the bridge sites consists primarily of bedrock, with small patches of gravel and course sand providing microhabitat for the Appalachian elktoe. At B-2848 there is more favorable habitat downstream of the bridge, consisting of an island of gravel and course sand and numerous Appalachian elktoes.

5. Moderate to high stream gradient - The Cane River, Toe River, and North Toe River are characterized as high stream gradient. Some portions of these reaches in the alluvial floodplain have some moderate stream gradient, but nowhere can the stream be characterized as low gradient.

6. Periodic natural flooding - Natural peak events occur throughout the Nolichucky River subbasin.

7. Fish hosts, with adequate living, foraging, and spawning areas for them - Recent sampling by the NCWRC and TVA identified fairly diverse fish communities, including many of the potential host fishes for the Appalachian elktoe in the Cane River, Toe River, and North Toe River.

III. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the "effects of the action" on federally listed species, we are required to take into consideration the environmental baseline. The environmental baseline includes past and ongoing natural factors and the past and present impacts of all federal, state, or private actions and other activities in the action area (50 CFR 402.02), including federal actions in the area that have already undergone section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process. The environmental baseline for this Opinion considers all projects approved prior to the initiation of formal consultation.

A. Status of the Species Within the Action Area

Survey efforts between 2000 and 2003 indicate that suitable habitat within at least 73 miles of stream in the Nolichucky River system are presently occupied by the Appalachian elktoe; an apparent 15-mile increase from reported occupied habitat prior to 2000 (Fraley and Simmons 2004). These surveys also indicate that this population

appears to be growing in numbers as well. Sites where mussels were found during 2000 and 2003 produced higher CPUEs than the nearest sites sampled prior to 2000 (Fraley and Simmons 2004). However, the available habitat in the subbasin is a limiting factor; therefore, Appalachian elktoes are not evenly dispersed throughout the 73-mile range within the subbasin. The NCWRC's sampling efforts after the floods of 2004 indicate that, since the last survey efforts in 2000 and 2003, recovery was set back to some degree based on reduced CPUE results; however, Appalachian elktoes were found throughout most of the occupied range known in 2003.

As stated previously, the 2002 mussel surveys at the bridge sites indicate that at least 26 individual Appalachian elktoes occur within project area. The CPUE for the bridge sites was 2.75 per hour for the B-1443 site and 4.28 per hour for the B-2848 site. As part of the NCWRC's continued monitoring efforts of state-listed and federally listed mussels, in 2002 and 2003 the NCWRC surveyed six sites in the Toe River for the Appalachian elktoe. Three of the six sites had higher CPUEs than the highest CPUE at the bridge sites, and four of the sites had higher CPUEs than the lowest CPUE at the bridge sites (Fraley, NCWRC, personal communication and unpublished data, 2006). This indicates that the mussel population at the bridge sites is average to below average for the Toe River. Further, while 26 individual Appalachian elktoes at the site will be relocated (and potentially lost), there are several other sites within the Toe River that support equal or greater numbers of the elktoe. Therefore, that population should be able to recover from this loss, and the conservation measures developed by the NCDOT should minimize the loss of Appalachian elktoes.

The BA determined the direct and indirect impacts occurring within 1,312 ft (400 m) downstream and 328 ft (100 m) upstream of the existing and proposed bridge sites. Considering the placement of the bridges, the total potential amount of impact at the B-1443 site is 1,820 ft (555 m) and 1,689 ft (515 m) at the B-2848 site. Therefore approximately 0.66 mile of the Toe River could potentially be directly or indirectly impacted by construction and demolition activities from the project. Therefore, within the 73-mile range of the Appalachian elktoe in the Nolichucky River system, the bridge replacement projects could have an impact on 0.9 percent of this potential habitat.

The constituent elements necessary for critical habitat are present within the project area and could be affected by the construction and demolition of the projects. The following is a list of the constituent elements that may be impacted by the project:

1. Permanent, flowing, cool, clean water - There could be impacts to the amount of sediment that enters the river from the demolition process.

2. Geomorphically stable stream channels and banks – The stream channel could be temporarily impacted during the construction of the causeways and bridge piers.

3. Pool, riffle, and run sequences within the channel – The flow of the river could change while the temporary causeways are in place.

4. Stable sand, gravel, cobble, and boulder or bedrock substrates with no more than low amounts of fine sediment – As stated previously, the amount of sediment could increase during the bridge demolition process.

While there could be impacts to critical habitat, most of these impacts should be temporary, and the conservation measures developed by the NCDOT should minimize all effects.

B. Factors Affecting the Species' Environment Within the Action Area

Some residential development and agricultural practices have impacted the aquatic habitat in the action area, particularly the riparian habitat. Because riparian areas have been cleared of trees and other woody vegetation and rock has been placed on the river banks, high-water events have resulted in bank erosion and failure at several areas in the Nolichucky subbasin. The poor condition of the riparian habitat also likely leads to excessive runoff from adjacent agriculture fields that contain not only silt but also the fertilizers and pesticides used in those fields.

Two bridges along the Toe River--B-2081 and B-3089--have been replaced within the last 10 years. No mussels were discovered within the project area of these bridges nor was critical habitat listed at that time; therefore, the projects were constructed in a manner that avoided adverse effects to the Appalachian elktoe. During August and September of 2004, significant flooding occurred in the Nolichucky River drainage. The Natural Resources Conservation Service (NRCS) proposed the implementation of the Emergency Watershed Protection (EWP) program to restore areas impacted by the flooding. In December 2005 we issued a biological opinion to the NRCS for implementation of the EWP program. That biological opinion assessed the direct and indirect impacts to 3,325 linear ft of stream within the Nolichucky River subbasin and any additional indirect impacts to 1,312 ft (400 m) downstream of each of the 18 individual restoration project "footprints." Other federal actions proposed for the upper Nolichucky River basin include widening and improving Highway 19E for about 29 miles. This will include the widening/extension and construction of several stream crossing structures within the Nolichucky River subbasin (94 crossings total) and will require a 404 permit (from the U.S. Army Corps of Engineers) for the filling of wetlands and alteration of stream channels associated with development of the proposed "Communities of Penland" along the North Toe River. We do not have any information concerning any additional federal actions ongoing or proposed for the action area at the present time.

IV EFFECTS OF THE ACTION

Under section 7(a)(2) of the Act, "effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. The federal agency is responsible for analyzing these effects. The effects of the proposed action are added to the

environmental baseline to determine the future baseline, which serves as the basis for the determination in this Opinion. Should the effects of the federal action result in a situation that would jeopardize the continued existence of the species, we may propose reasonable and prudent alternatives that the federal agency can take to avoid a violation of section 7(a)(2). The discussion that follows is our evaluation of the anticipated direct and indirect effects of replacing the subject two bridges. Indirect effects are those caused by the proposed action that occur later in time but are still reasonably certain to occur (50 CFR 402.02).

A. Factors to be Considered

Proximity of the Action – Based on the 2002 mussel survey conducted by the NCDOT, at least 26 individuals of the Appalachian elktoe occur in the vicinity of the existing bridges. Although measures to avoid and minimize impacts to the Toe River and the Appalachian elktoe are included in the project plans, implementation of these projects will result in unavoidable impacts to the river habitat and to individual mussels. However, several other sites within the 73 miles of occupied river reaches support equal or greater numbers of individuals (Fraley, NCWRC, personal communication and unpublished data, 2006).

Nature of the Effect – In-stream habitat will be impacted permanently by the construction of the piers within the river channel, 57 ft^2 for B-1443 and 32 ft^2 for B-2848. Suitable in-stream habitat at both construction sites will also be affected for the duration of the construction and demolition and likely for some period after completion of the projects. Portions of the habitat may be impacted permanently by the construction and use of the causeways. A small portion of the riparian area at both sites may be cleared for equipment access and could result in temporary increases in water temperature at each location until reforestation can occur.

Disturbance Duration, Frequency, and Intensity – Disturbance to the riverbed will occur over a relatively short period of time from the construction of the bridge piers. It will take approximately 3 weeks to install each bent. However, the disturbance to the river's flow pattern at the piers will exist throughout the life of the bridges. The causeways for construction and demolition will be in place for the length of time needed to construct and demolish the bridges; therefore, the disturbance to the riverbed associated with the causeways will be over an extended period of time. Although there will be direct impacts to the riverbed associated with the causeways, the construction of the causeways will be phased to limit the amount of causeway in the river at any one time, and only the causeways needed for an activity will be in place during that activity and will be removed when the action is completed. The causeways will be constructed with clean stone and pipes so that the river can flow through, not just over, the causeways. However, there will still be impacts to the hydrology of the river both upstream and downstream of the causeways.

B. Analyses of Effects of the Action

Potential Beneficial Effects

The construction and demolition of the existing bridges have some negative impacts but also have some long-term beneficial effects. Specifically, the NCDOT has described the following beneficial effects that could result from these projects:

1. *Reduction of direct storm-water runoff.* Storm water from the existing bridges enters the river directly from the bridge decks. The new bridges will collect and direct storm water into catch basins, and the storm water will then flow through a vegetated buffer before entering the river. Storm water coming off the approaching roadways at the bridge locations will be managed in a similar manner. The elimination/reduction of runoff into the Toe River may result in localized improvement of water quality and potentially have a beneficial effect on the Appalachian elktoe.

2. *Reduction in number of bents in the main river channel.* The existing B-1443 bridge has two piers within the river channel totaling an area of 151.2 ft^2. The new bridge construction will require the placement of two piers in the river, which will result in 57 ft^2 of fill. The existing B-2848 bridge has three piers within the river channel totaling an area of 349 ft^2. The new bridge construction will require one bent for construction, consisting of two drilled piers totaling 32.0 ft^2 of fill. Given that bents in the river trap debris during high flows and can change the hydraulics in the immediate vicinity of the structure (causing scour and deposition), the reduction in the number of piers in the Toe River is expected to reduce the bridges' effects on stream-flow patterns at the respective bridge sites.

Direct Effects - Actions that may result in direct impacts include the construction of causeways for the construction of new structures and the demolition of existing structures, land clearing for access, potential toxic spills, the removal of causeways after construction, and the demolition and removal of existing bridge structures. All of these activities have the potential to kill or injure mussels, either by crushing them; poisoning them with the release of some toxic substance; or causing siltation, which may suffocate them. These actions may result in direct harm to individuals or negative changes in currently suitable habitat.

Substrate Disturbance and/or Habitat Loss

Project B-1443: The construction of this new bridge will require the placement of two piers in the river, which will result in 57 ft^2 of permanent fill. This will be a 94.2-ft^2 reduction from the existing structure, which has two bents totaling 151.2 ft^2 of fill in the river. Rock causeways will be required to construct the new bridge and demolish the existing bridge. The temporary construction/demolition causeways used for the project are designed to result in the least amount of rock fill in the river while providing sufficient area to accomplish the construction and demolition. The causeways will be

constructed with pipes to maintain linear flow of the river by passing water through the causeways. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 50 percent of the river will be open. To construct the piers for the new bridge and demolish the existing bridge, the causeways will result in 4,972 ft^2 and 3,993.4 ft^2 of temporary rock fill in the river, respectively. There also will be a minimal amount of temporary rock fill associated with the temporary support frames that will be placed in the river under each arch to support the bridge during demolition.

Project B-2848: The construction of this new bridge will require the placement of one bent in the river, consisting of two drilled piers, which will result in 32.0 ft^2 of permanent fill. This will be a 317-ft^2 reduction from the existing structure, which has three piers totaling 349 ft^2 of fill in the river. Rock causeways will also be required for construction and demolition of this project. The causeways for this project follow the design standards listed for B-1443. The construction of the causeways will follow a phasing plan to minimize impacts to the flow of the river; at the narrowest point, 52 percent of the river will be open. To construct the piers for the new bridge and demolish the existing bridge, the causeways will result in 15,551 ft^2 and 1,786 ft^2 of temporary rock fill in the river, respectively. There also will be a minimal amount of temporary rock fill associated with the temporary support frames that will be placed in the river under each arch to support the bridge during demolition.

There will be a combined permanent loss of 89.0 ft^2 of stream habitat at the two project sites. There will also be a combined temporary loss of stream habitat from the construction/demolition causeways of 26,302 ft^2. Based on the surveys conducted in 2002 by the NCDOT, it is likely that at least 26 individual Appalachian elktoe mussels will be impacted by the project. The NCDOT is proposing to remove individuals from the impact sites and relocate them (see the "Additional Conservation Measures" in the "Conservation Measures" section of this Opinion). While the causeways will be placed in the river only temporarily, it is difficult to predict if the impacts to the streambed will permanently or temporarily impact habitat and mussel recruitment to the sites. Given that the habitat at the impact sites consists primarily of bedrock, a reduction in suitable habitat by substrate compaction from the causeways is less likely.

Impacts from Sedimentation

Because of the topography and the erodible nature of the soils in the project area (fine loamy soils with moderate erodibility), project construction has the potential to result in sedimentation in the Toe River. To minimize the potential for sedimentation, the NCDOT has developed specific erosion-control measures for this project that are designed to protect environmentally sensitive areas (see the "Conservation Measures" section of this Opinion). The primary concerns for sedimentation entering the river are during the removal of the earth-filled material in bridge B-2848 and the demolition of both bridges. The NCDOT has provided a plan for the removal of the earth-filled material as well as plans for stabilizing the bridges during demolition, reducing the likelihood that sediment will enter the river as a result of these actions.

Impacts from Changes in Hydrology

The temporary causeways proposed at both project sites will narrow the channel and will alter the hydrology, resulting in localized changes in flow patterns at the respective sites. This change in hydrology and any associated scour could result in the loss or displacement of mussels. However, the change in hydrology will be temporary, during the life of the respective causeways, and the design of the causeways (allowing for flow through the causeways) should minimize the impacts to hydrology and associated impacts. The NCDOT has proposed to monitor the riverbed and stream-bank stability before, during, and after construction at both bridge sites. If any problems with regard to stream stability are detected during the monitoring, the NCDOT has proposed to attempt to correct the problems.

Impacts to Fish Hosts

In addition to the potential changes in hydrology as a result of the causeways, there is the potential for the causeways to act as a barrier to fish migration. The disruption of fish migrations could indirectly impact the Appalachian elktoe if the fish that are disturbed serve as fish hosts for the elktoe. While temporary disruptions to fish migration may occur during construction of the causeways, the following design factors should reduce the long-term effects of the causeways on fish migration: the causeways will be temporary structures in the river, at least 50 percent of the channel will be unrestricted by the causeways at any given time, and the causeways are designed to allow for linear flow. Given these design features, the causeways are not expected to have a significant impact, if any, on the natural migration of fish species and therefore should not impact the life cycle or distribution of the Appalachian elktoe in the Toe River.

Indirect Effects - Indirect effects are defined as those that are caused by the proposed action and are later in time but are still reasonably certain to occur (50 CFR 402.02). Indirect effects to the Appalachian elktoe may include permanent changes in channel substrate or stability that adversely affect the availability of suitable habitat in the vicinity of the bridges.

The infrastructure improvements associated with these bridge replacements could indirectly affect and improve levels of service, better accommodate merging and exiting traffic, or reduce travel times, all of which could have land-development impacts outside the project area. Given that both projects involve the replacement of existing structures in essentially the same locations, it is not likely that the new structures would increase accessibility to the adjacent land or result in changes in the type or volume of traffic using the structures. Although the existing bridges will be replaced with wider two-lane structures, potentially allowing access to the surrounding land by larger trucks (including construction equipment), there are other existing bridges and road access surrounding the existing bridges that allow for the passage of large vehicles and provide access to the same land area as the subject bridges.

Interrelated and Interdependent Actions - An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation. A determination of whether other activities are interrelated to, or interdependent with, the proposed action under consultation is made by applying the "but for" test. That is, it must be determined that the other activity under question would not occur "but for" the proposed action under consultation. There are no other projects planned that would satisfy the "but for" test; therefore, there are no interrelated or interdependent actions that should be considered in this Opinion.

V. CUMULATIVE EFFECTS

Action Area

Cumulative effects include the combined effects of any future state, local, or private actions that are reasonably certain to occur within the action area covered in this Opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

We are aware of several potential private actions that may occur and produce significant cumulative impacts. A proposed 40-unit affordable housing development is proposed on the north side of US 19E in Burnsville, near Mountain Heritage High School and near the headwaters of the Toe River. In Mitchell County, just north of Spruce Pine, approximately 2,000 to 5,000 acres within the North Toe River drainage area (owned by Penland Bailey Corporation) is being divided into 0.5- to 2-acre lots, with some of the lots bordering the North Toe River. A golf course development (planned to be patterned after the Mountain Air Country Club in Yancey County) is proposed near Altapass in Mitchell County, within the North Toe River watershed. A 100-acre development is being planned near Huntdale, in Yancey and Mitchell Counties, with over 13,000 linear ft of the Cane River and over 2,000 linear ft of the Toe River occurring within the property boundary. Although these actions are being proposed, it is uncertain if they will be developed or if they will need a federal permit or money to construct the projects. Therefore, we will not address these developments further in this Opinion. We are not aware of any other future state, local, or private actions that are reasonably certain to occur within the action area that would not be subject to section 7 reviews. Therefore, cumulative effects, as defined by the Act, will not occur and will not be addressed further in this Opinion.

Cumulative Impacts of Incidental Take Anticipated by the Service in Previously Issued Biological Opinions

In reaching a decision of whether the implementation of activities outlined in the BA are likely or are not likely to jeopardize the continued existence of the Appalachian elktoe, we must factor into our analysis previous biological opinions issued involving the species, especially those opinions where the Service allowed for incidental take as the area of

habitat disturbed, instead of individual mussels. There have been four biological opinions for the Appalachian elktoe, one within the Nolichucky River drainage and the others outside the drainage. In May of 2005 we issued a biological opinion to the U.S. Army Corps of Engineers on the effect of their permit on the Appalachian elktoe for a sewer line crossing along the Mills River. The amount of incidental take was limited to the disturbance of habitat 20 ft in width at the construction corridor and 100 ft downstream and upstream of the construction corridor. The three other biological opinions were rendered to the NRCS in 2005 for the implementation of the EWP program in the Nolichucky, Pigeon, and Mills River subbasins. These biological opinions limited the amount of incidental take to all Appalachian elktoes within at lest 3,325 linear ft of stream within the Nolichucky, Pigeon, and Mills River subbasins and any additional indirect impacts to Appalachian elktoes 1,312 ft (400 m) downstream of each of the 40 individual restoration project "footprints."

VI. CONCLUSION

After reviewing the current status of the Appalachian elktoe; the environmental baseline for the action area; the effects of bridge construction and demolition; measures identified in the NCDOT's BA to help minimize the potential impacts of the proposed projects and assist in the protection, management, and recovery of the species; previously issued Service nonjeopardy biological opinions that allow various levels of incidental take; any potential interrelated and interdependent actions associated with the proposed action; and any potential cumulative effects, it is the Service's biological opinion that implementing these projects is not likely to jeopardize the continued existence of the Appalachian elktoe. Critical habitat will not be adversely modified or destroyed by implementing these projects as proposed.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulations pursuant to section 4(d) of the Act prohibit the taking of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, such as breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns that include, but are not limited to, breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not for the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Amount of Take Anticipated

The Service anticipates that incidental take of the Appalachian elktoe may occur as a result of construction of the subject bridges. During construction, individual mussels may be crushed, harmed by siltation or other water quality degradation, or dislocated because of physical changes in their habitat.

There will be a combined permanent loss of 89.0 ft^2 of stream habitat at the two project sites. There will also be a combined temporary loss of stream habitat from the construction/demolition causeways of 26,302 ft^2. Downstream impacts (sedimentation), if any, are expected to occur within 1,312 ft (400 m) of the construction sites. Because there are no reliable data on the number of Appalachian elktoes buried in the substrate compared to those on the surface (and even those on the surface are difficult to detect), it is not possible to base the amount of incidental take on numbers of individual mussels. Rather, the amount of incidental take will be exceeded if the project "footprint" exceeds 26,391 ft^2 or downstream impacts are occurring more than 1,312 ft (400 m) downstream from the "footprint" of each project. If incidental take is exceeded, all work should stop, and the Service should be contacted immediately.

EFFECT OF THE TAKE

In this Opinion the Service has determined that this level of take is not likely to result in jeopardy to the Appalachian elktoe or destruction or adverse modification of critical habitat.

In addition to the subsequent measures listed in the "Reasonable and Prudent Measures" and "Terms and Conditions" sections of this Opinion, the measures listed in the "Conservation Measures" section[5] of this opinion must be implemented. The Conservation Measures are project minimization measures, for the construction and demolition of the projects, that were described by the NCDOT in the BA. The Conservation Measures include, but are not limited to, the following:

1. The NCDOT will provide, or contract with biologists who have experience in mussel relocation techniques, for the removal of Appalachian elktoes from the impact site and relocate them to the approved relocation site on the North Toe River (between Penland and Boonford) at about river mile 25.5, according to the procedures in the approved relocation plan in the BA (see plan within the BA). The plan details appropriate collection methods, tagging and recapture, handling and transportation of individuals, and monitoring protocols, which includes the monitoring of the relocation sites for recovery, survival (of recovered mussels), movement, and growth of mussels for a period of 5 years.

[5]The "Conservation Measures" section includes all of the measures listed within the following subsections: "Conservation Measures for Bridge Design," "Conservation Measures for Bridge Demolition," "Conservation Measures for Bridge Construction," and "Additional Conservation Measures."

2. The NCDOT will monitor the river channel and banks at sites upstream, at the construction sites, and downstream to determine changes in habitat resulting from activities at these sites (see plan within the BA). If any problems with regard to stream stability are detected during the monitoring, the NCDOT will attempt to correct them.

3. As committed to by the NCDOT within the project description of the BA, the NCDOT will protect and/or restore 100-ft riparian buffers for at least 3,000 linear ft of stream within the action area. Given that the conservation area has not been determined or obtained by the NCDOT at the time of the issuance of this Opinion, the Service will continue to review sites that the NCDOT is considering and approve the site that is ultimately acquired.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize take of the Appalachian elktoe. These nondiscretionary measures include, but are not limited to, the terms and conditions outlined in this Opinion.

1. The NCDOT will ensure that the contractor understands and follows the measures listed in the "Conservation Measures," "Reasonable and Prudent Measures," and "Terms and Conditions" sections of this Opinion.

2. Containment systems will be developed for particular stages of the demolition and construction of the bridges to minimize impacts to the Appalachian elktoe and its habitat.

3. Demolition activities and the relocation of mussels will be conducted during time periods that will result in fewer impacts to the Appalachian elktoe.

4. The NCDOT will send copies of the monitoring reports for the relocated mussels to the Service's Asheville Field Office every year for the 5-year monitoring time period.

5. During the relocation of mussels, the Service may alter, if needed, methods and plans for moving the mussels.

6. The NCDOT will notify the Service if their monitoring of the river channel and river banks reveals changes in habitat resulting from project activities.

7. All appropriate NCDOT BMP for bridge maintenance, construction, and demolition will be followed or exceeded for these projects, and any additional BMP listed in the "Terms and Conditions" section of this Opinion will be followed.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the NCDOT must comply with the following terms and conditions, which implement the reasonable and prudent measures described previously and outline required reporting and/or monitoring requirements. These terms and conditions are nondiscretionary and apply to the Toe River.

1. A Service biologist will be present at the preconstruction meeting to cover permit conditions and discuss any questions the contractor has regarding implementation of these projects. After the contractor submits plans for various stages of the projects, a Service biologist will review and provide comments on the plans and will attend any meetings to discuss implementation of the plans.

2. The NCDOT will ensure that a qualified aquatic biologist is present at critical times to monitor certain phases of construction, including, but not limited to, initial clearing for construction, when the causeways are installed, when demolition begins, and when the causeways are removed. The individual will be present to ensure that the procedures listed in the "Conservation Measures," "Reasonable and Prudent Measures," and "Terms and Conditions" sections of this Opinion are being implemented and that all project plans are being implemented in a manner to ensure that the conditions of the Opinion are met.

3. If during demolition the bridge decks start to crumble and enter the river, a containment system shall be developed and installed to catch debris that inadvertently falls from the concrete deck of bridge B-2848 and the concrete rail and deck of bridge B-1443.

4. A containment system shall be developed and installed prior to the removal of the piers. The conservation measures proposed by the NCDOT recommend placing turbidity curtains, if the water depth is sufficient, around each of the bents. We are concerned that turbidity curtains will not be of sufficient strength to capture material that may enter the river; therefore, we recommend that the design include a containment system such as the Jersey barriers (with fabric) around each bent.

5. When constructing the drilled shafts a containment system will be developed so that material does not enter the river. Any material by-product will be pumped out of the shaft and onto uplands and to an off-site disposal area or will be treated through a proper stilling basin or silt bag.

6. The conservation measures proposed by the NCDOT state that the saw slurry used during the demolition process will be contained by approved vacuum methods. Given that a wet saw will be used, the vacuum methods should include a provision for pumping and treating the saw slurry outside the project area.

7. The NCDOT will not relocate mussels between May 1 and June 30, the time at which Appalachian elktoes release glochidia. The NCDOT will relocate the mussels during

low flow, low turbidity, and relatively cool weather; the most appropriate time to accomplish this would be in the fall.

8. Demolition of the bridge substructure will occur during low flow in order to reduce the likelihood that sediment will leave the project area and potentially impact downstream resources.

9. In the BA, the NCDOT proposed to relocate all native mussels, including the Appalachian elktoe, from the project "footprints," extending downstream 262 ft (80 m) and upstream 66 ft (20 m) of the two bridge replacements. Representatives of the Service's Asheville Field Office may determine during relocation of the mussels that the area the mussels are moved from should be reduced.

10. A Service biologist will review and provide comments on plans proposed to correct problems that may be revealed in the monitoring of the river channel and banks within the project area.

11. The erosion-control plan will be in place prior to any ground disturbance. When needed, combinations of erosion-control measures (such as silt bags in combination with a stilling basin) will be used to ensure that the most protective measures are being implemented.

12. Activities in the floodplain will be limited to those needed to construct the proposed bridges and remove the existing bridges.

13. Work pads will be used when equipment must be staged in the floodplain to complete the project construction. The work pads will be constructed by placing fabric matting down prior to placing the stone work pad. All of the stone and matting will be removed and disposed of off-site or the stone can be used in areas that require permanent stone protection after project completion.

14. Access roads and construction staging areas will be minimized to the maximum extent practicable. The access roads and construction staging areas should be established from the start of the project and designed with erosion-control measures. The placement of the access roads and staging areas will be discussed with the Service and determined at the preconstruction meetings.

15. Riparian vegetation, especially large trees, will be maintained wherever possible. If riparian areas are disturbed, they will be revegetated with native species as soon as possible after construction.

16. Upon completion of the project the existing approach fills will be removed to natural grade, and the area will be planted with native grasses and tree species.

17. Construction will be accomplished in a manner that prevents wet concrete from coming into contact with water entering or flowing in the river.

18. Unconsolidated material (such as sand and dirt) will not be placed directly on the causeways since the material could be washed off of the causeways or settle into the causeways and enter the river. If unconsolidated material must be placed on the causeways, a solid barrier will be placed on the causeways prior to the placement of the material. The barrier and unconsolidated material will be removed anytime throughout a work day when the water level rises to a point, or is expected to rise over night to a point, where material could wash off the causeway or during periods of inactivity (two or more consecutive days). Any equipment that is placed on the causeways will also be removed anytime throughout a work day when the water level rises to a point, or is expected to rise over night to a point, where the equipment could be flooded or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig may be left in place for periods of inactivity; however, it must also be removed if the water rises or is expected to rise to a point where the drill rig could be flooded.

19. All construction equipment should be refueled outside the 100-year floodplain or at least 200 ft from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 ft from all water bodies (whichever distance is greater), preferably at an upland site. Areas used for borrow or construction by-products will not be located in wetlands or the 100-year floodplain.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. The following conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. Where opportunities exist, work with landowners, the general public, and other agencies to promote education and information about the Appalachian elktoe and its conservation.

2. Pursue additional buffers and conservation opportunities along the main stem of the Cane River, North Toe River, and Toe Rivers and their tributaries, either individually or in concert with other conservation programs.

3. Explore opportunities to work with local and state water quality officials in order to minimize or eliminate wastewater and storm-water discharges into the Cane River, North Toe River, and Toe River.

4. Consult with the Service on projects affecting aquatic habitat in the Toe River drainage, regardless of funding source, to ensure compliance with all provisions of the Act.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION/CLOSING STATEMENT

This concludes formal consultation on the actions outlined in your BAs dated May 12, 2005, and February 21, 2006. As provided in 50 CFR 402.16, the reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded, (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operation causing such take must cease, pending reinitiation. Consultation should also be reinitiated if new biological information comes to light that invalidates the assumptions made regarding the biology or distribution of the Appalachian elktoe within the project area of the Nolichucky River subbasin in North Carolina.

If there are any questions, please contact Ms. Denise Moldenhauer of our staff at 828/258-3939, Ext. 226, or me, Ext. 223. We have assigned our log number 4-2-02-460 to this consultation; please refer to this number in any future correspondence concerning this matter.

Sincerely,

Brian P. Cole
Field Supervisor

cc:
Mr. Tom Walker, Asheville Regulatory Field Office, U.S. Army Corps of Engineers, 151 Patton Avenue, Room 208, Asheville, NC 28801-5006
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Ms. Marla J. Chambers, Western NCDOT Permit Coordinator, North Carolina Wildlife Resources Commission, 4614 Wilgrove-Mint Hill Road, Suite M, Charlotte, NC 28227
Regional Director, FWS, Southeast Regional Office, Atlanta, GA (ES, Attention: Mr. Joe Johnston)
Field Supervisor, FWS, Raleigh Field Office, Raleigh, NC (Attention: Mr. Gary Jordan)

Literature Cited

Ahlstedt, S. A., and B. L. Rashleigh. 1996. The Upper Tennessee River Basin: A Biological Treasure Imperiled. U.S. Geological Survey. Knoxville, TN.

Aldridge, D. W., B. S. Payne, and A. C. Miller. 1987. The effects on intermittent exposure to suspended solids and turbulence on three species of freshwater mussels. Environmental Pollution 1987:17-28.

Bates, J. M. 1962. The impacts of impoundment on the mussel fauna of Kentucky Reservoir, Tennessee River. Am. Midl. Nat. 68:232-236.

Bellanca, M. A., and D. S. Bailey. 1977. Effects of chlorinated effluents on aquatic ecosystems in the lower James River. Jour. of Water Pollution Control Federation 49(4):639-645.

Brimm, J. 1991. Coastal plain fishes: Floodplain utilization and the effects of impoundments. M.S. thesis, University of South Carolina, Columbia, SC. 98 pp.

Brungs, W. A. 1976. Effects of wastewater and cooling water chlorination on aquatic life. EPA-600/3-76-098. Nat. Tech. Info. Serv., Springfield, VA. 45 pp.

Clarke, A. H. 1981. The Tribe Alasmidontini (Unionidae: Anodontinae), Part 1: *Pegias*, *Alasmidonta*, and *Arcidens*. Smithsonian Contributions to Zoology, 326:1-101.

Ellis, M. M. 1936. Erosion silt as a factor in aquatic environments. Ecology. 17:29-42.

Fraley, S. J. and J. W. Simmons. 2004. A Preliminary Report on Cooperative Mussel Surveys in the Upper Nolichucky River Basin in Western North Carolina, 2002 and 2003, Draft Report. North Carolina Wildlife Resources Commission. Raleigh, NC. 3 pp.

------. 2006. An Assessment of Selected Rare Mussel Populations in Western North Carolina Following Extraordinary Floods of September 2004. North Carolina Wildlife Resources Commission. 40 pp.

Fuller, S. L. H. 1974. Clams and mussels (Mollusca: Bivalvia). Pp. 215-273 *in* C. W. Hart, Jr., and S. L. H. Fuller (eds.), Pollution Ecology of freshwater invertebrates. Academic Press, NY.

Gardner, J. A., W. R. Woodall, Jr., A. A. Staats, Jr., and J. F. Napoli. 1976. The invasion of the Asiatic clam in the Altamaha River, Georgia. Nautilus 90(3):117-125.

Gordon, M. E. 1991. Species account for the Appalachian elktoe (*Alasmidonta raveneliana*). Unpublished report to The Nature Conservancy. 5 pp.

Ingram, W. M. 1957. Use and value of biological indicators of pollution: Freshwater clams and snails. Pp. 94-135 *in* C. M. Trazwell (ed.). Biological problems in water pollution. USDHEW, PHS, R. A. Taft Sanitary Engineering Center. Cincinnati, OH.

Harman, W. N. 1974. The effects of reservoir construction and channelization on mollusks of the upper Delaware basin. Bull. Am. Malac. Union 1973:12-14.

Havlik, M. E., and L. L. Marking. 1987. Effects of contaminants on Naiad Mollusks (Unionidae): A Review. U.S. Dept. of the Int., Fish and Wildl. Serv., Resource Publ. 164. Washington, DC. 20 pp.

Kat, P. W. 1982. Effects of population density and substratum type on growth and migration of *Elliptio complanata* (Bivalvia: Unionidae). Malacological Review 15(1-2):199-127.

Keller, A. E., and S. G. Zam. 1991. The acute toxicity of selected metals to the freshwater mussel, *Anodonta imbelecilis*. Environ. Toxicol. Chem. 10:539-546.

Layzer, J. B., M. E. Gordon, and R. M. Anderson. 1993. Mussels: the forgotten fauna of regulated rivers. A case study of the Caney Fork River. Regulated Rivers: Research and Management 8:63-71.

Marking, L. L., and T. D. Bills. 1979. Acute effects of silt and sand sedimentation on freshwater mussels. Pp. 204-211 *in* J. L. Rasmussen, ed. Proc. of the UMRCC symposium on the Upper Mississippi River bivalve mollusks. UMRCC. Rock Island, IL. 270 pp.

McGrath, C. 1996. Mountain Aquatic Survey. Pp. 22-26 *in* Annual Performance Report Vol. V, July 1995 - June 1996, Nongame and Endangered Wildlife Program, North Carolina Wildlife Resources Commission. 185 pp.

------. 1997. Mountain Aquatic Survey. Pp. 14-24 *in* Annual Performance Report Vol. VI, July 1996 - June 1997, Nongame and Endangered Wildlife Program, North Carolina Wildlife Resources Commission. 200 pp.

------. 1998. Mountain Aquatic Survey. Pp. 12-16 *in* Annual Performance Report Vol. VII, July 1997 - June 1998, Nongame and Endangered Wildlife Program, North Carolina Wildlife Resources Commission. 184 pp.

------. 1999. Mountain Aquatic Survey. Pp. 28-36 *in* Annual Performance Report Vol. VIII, July 1998 - June 1999, Nongame and Endangered Wildlife Program, North Carolina Wildlife Resources Commission. 225 pp.

Miller, A. C., L. Rhodes, and R. Tippit. 1984. Changes in the naiad fauna of the Cumberland River below Lake Cumberland in central Kentucky. The Nautilus 98:107-110.

Muncy, J. A. 1981. The Tennessee Valley Authority's Cooperative Noncoal Minerals Abandoned Mine Land Reclamation Demonstration Project: Avery, Mitchell, and Yancey Counties, North Carolina. TVA, Division of Land and Forest Resources, Norris, TN. 71 pp.

North Carolina Department of Environment and Natural Resources. 2003. Basinwide Information Management System Reports, website.

North Carolina Department of Environment and Natural Resources, Division of Water Quality. 2005. French Broad River Basinwide Water Quality Plan. Water Quality Section, Raleigh, NC. 158 pp. + Appendices.

North Carolina Wildlife Resources Commission. 2005. North Carolina Wildlife Action Plan. Raleigh, NC.

Ortmann, A. E. 1909. The destruction of the freshwater fauna in western Pennsylvania. Proc. of the Amer. Phil. Soc. 48(1):90-110.

Stein, C. B. 1971. Naiad life cycles: their significance in the conservation of the fauna. Pp. 19-25 *in* Jorgensen and Sharp (eds.). Proceedings of a Symposium on Rare and Endangered Mollusks (Naiads) of the United States. U.S. Dept. of the Int., Fish and Wildl. Serv. Bur. of Sport Fish. and Wildl.

Tennessee Valley Authority . 1981. Surface mines and sedimentation. Impact 4(4):15.

Tsai, C. F. 1975. Effects of sewage treatment plant effluents on fish: a review of literature. Chesapeake Res. Consort. Inc., Publ. No. 36. Center for Env. and Estuarine Studies. Univ. of Maryland, Solomons, MD.

U.S. Fish and Wildlife Service. 1994. Endangered and Threatened Wildlife and Plants; Appalachian elktoe determined to be an endangered species. *Federal Register* 59(225):60324-60334.

------. 1996. Recovery plan for the Appalachian elktoe (*Alasmidonta raveneliana*) Lea. Atlanta, GA. 31 pp.

------. 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Appalachian Elktoe. *Federal Register* 67(188):61016-61040.

Williams, J. D., S. L. H. Fuller, and R. Grace. 1992. Effects of impoundments on freshwater mussels (Mollusca: Bivalvia: Unionidae) in the main channel of the Black Warrior and Tombigbee Rivers in western Alabama. Bulletin of the Alabama Museum of Natural History 13:1-10.

STORMWATER MANAGEMENT PLAN

State Project 8.1900401 (B-1443)
Mitchell/Yancey County

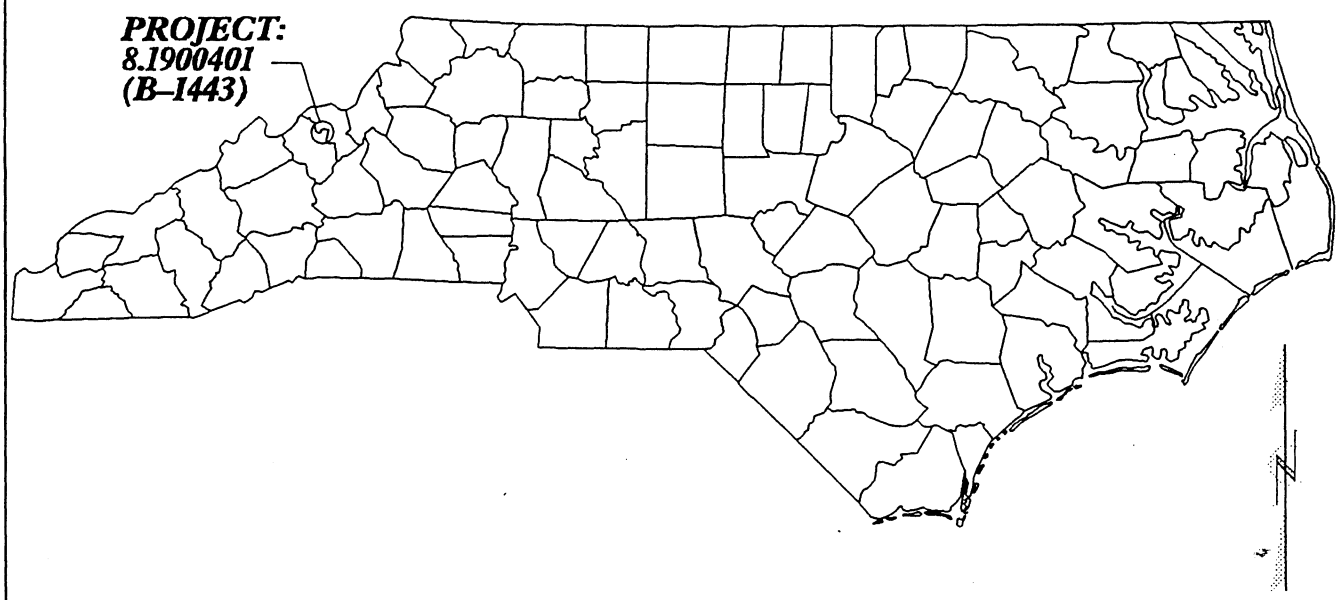
The project involves the removal and replacement of Bridge Number 61 carrying NC 197 over the North Toe River in Mitchell and Yancey Counties. The existing two lane 82.7 m (270 ft.) long bridge will be replaced with a two lane 109 m (360 ft.) long bridge. The North Toe River has a Class 'C' Trout water classification and supports a population of the Appalachian Elktoe, a federally listed endangered freshwater mussel species. The overall length of the project is 0.191 km (0.07 mi.). Traffic will be maintained on site during construction.

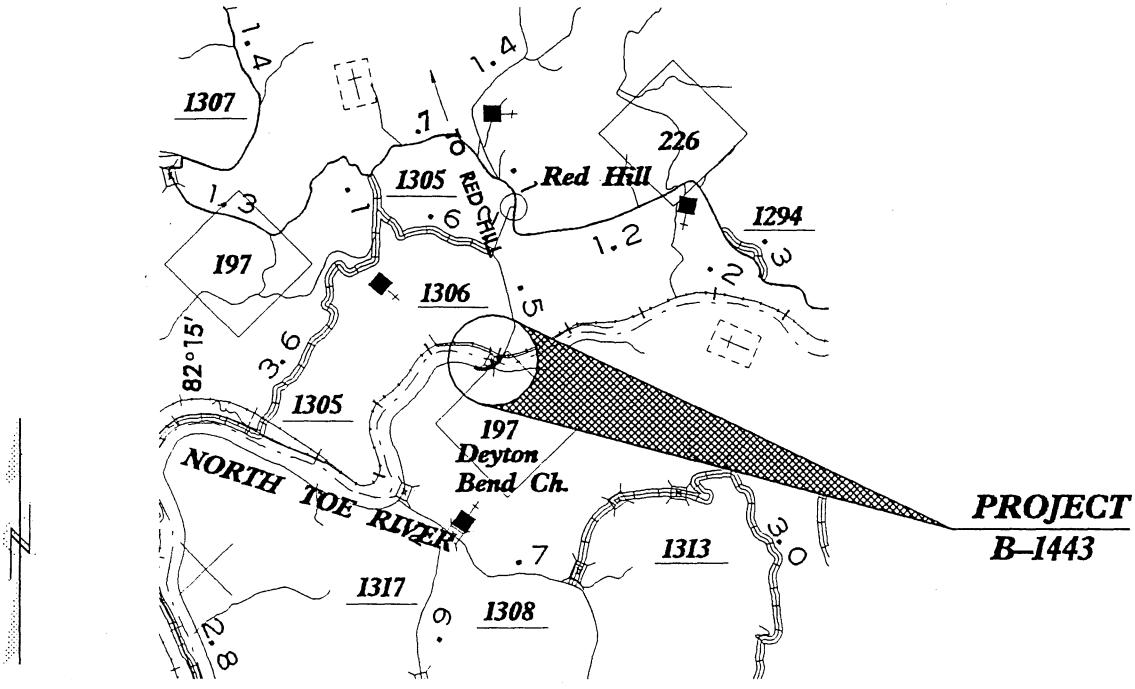
The existing 7.2 m (24 ft.) roadway is a two-lane road with 3.0 m (10 ft.) lanes and 0.6 m (2 ft.) grassed shoulders. The proposed 11.4 m (38 ft.) paved road is a two-lane road with two 3.3 m (11 ft.) lanes and 2.4 m (8 ft.) shoulders. Where there is guardrail at the beginning of the bridge the entire shoulder will be paved to help prevent erosion of the fill slopes. The proposed structure will have a travelway of 10.9 m (36 ft.). This will include an inside shoulder of 2.4 m (8 ft.) to accommodate sight distance and an outside shoulder of 1.0 m (3 ft.). The existing bridge is 5.2 m (17 ft.) wide. Approximately 561 sq m (6.032 sq ft) of additional pavement will be added as a result of the project.

The following best management practices and measures were taken during the design of the project to reduce the stormwater impacts:

1. Drainage from the proposed bridge will not be allowed to discharge directly into the North Toe River. Drainage on the existing bridge presently runs off directly into the river. Deck drains will be utilized at both ends of the bridge.

2. Storm drainage that is collected at the south end of the bridge where guardrail is used will be discharged into a stormwater retention basin whereas currently the stormwater drains directly to the river.





VICINITY MAPS

NCDOT

DIVISION OF HIGHWAYS

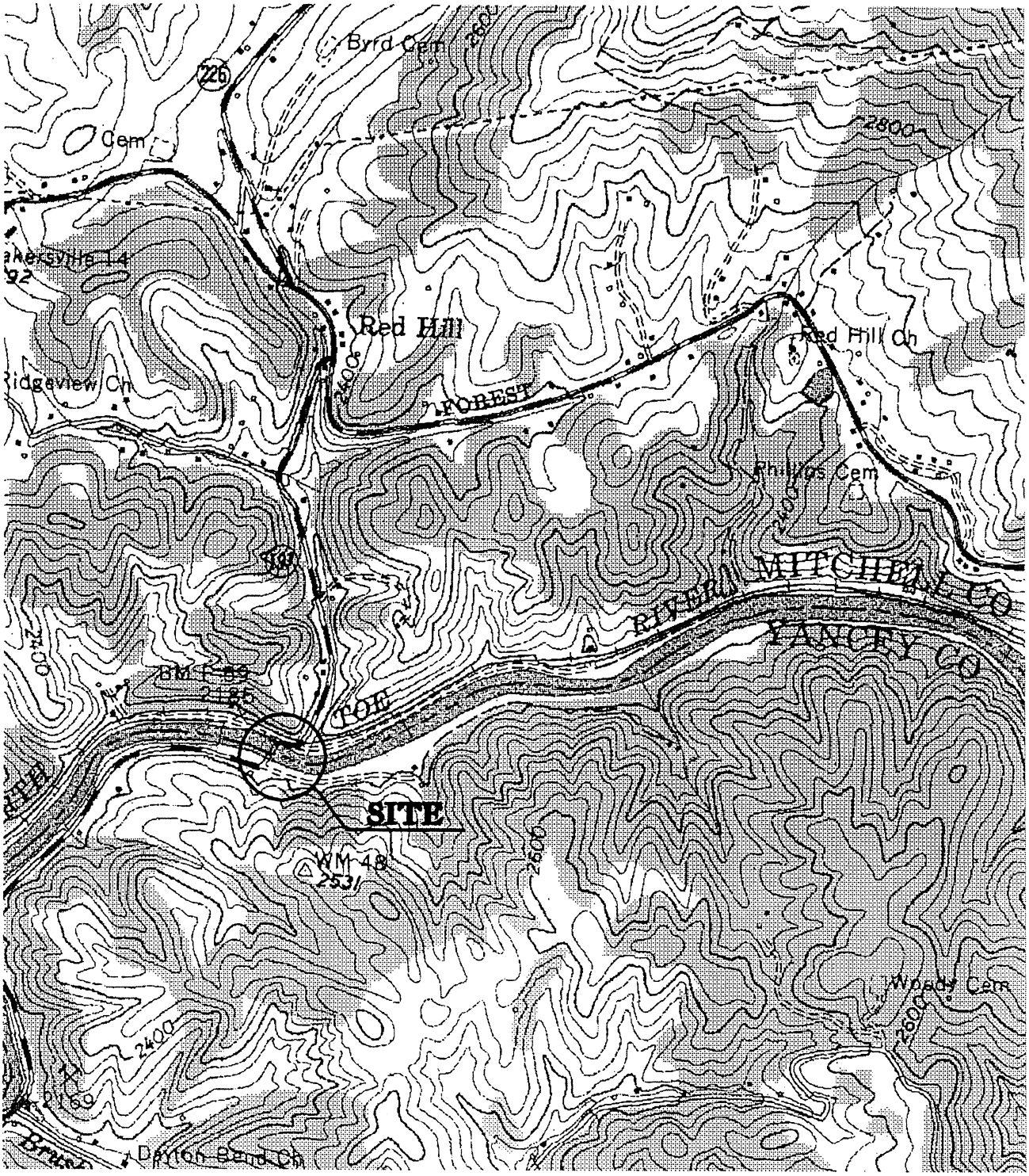
MITCHELL / YANCEY COUNTY

PROJECT: 8.1900401 (B-1443)

BRIDGE NO. 61 ON NC 197

OVER THE NORTH TOE RIVER

SHEET 1 OF 9 3/10/04



SITE MAP

NCDOT

DIVISION OF HIGHWAYS

MITCHELL / YANCEY COUNTY

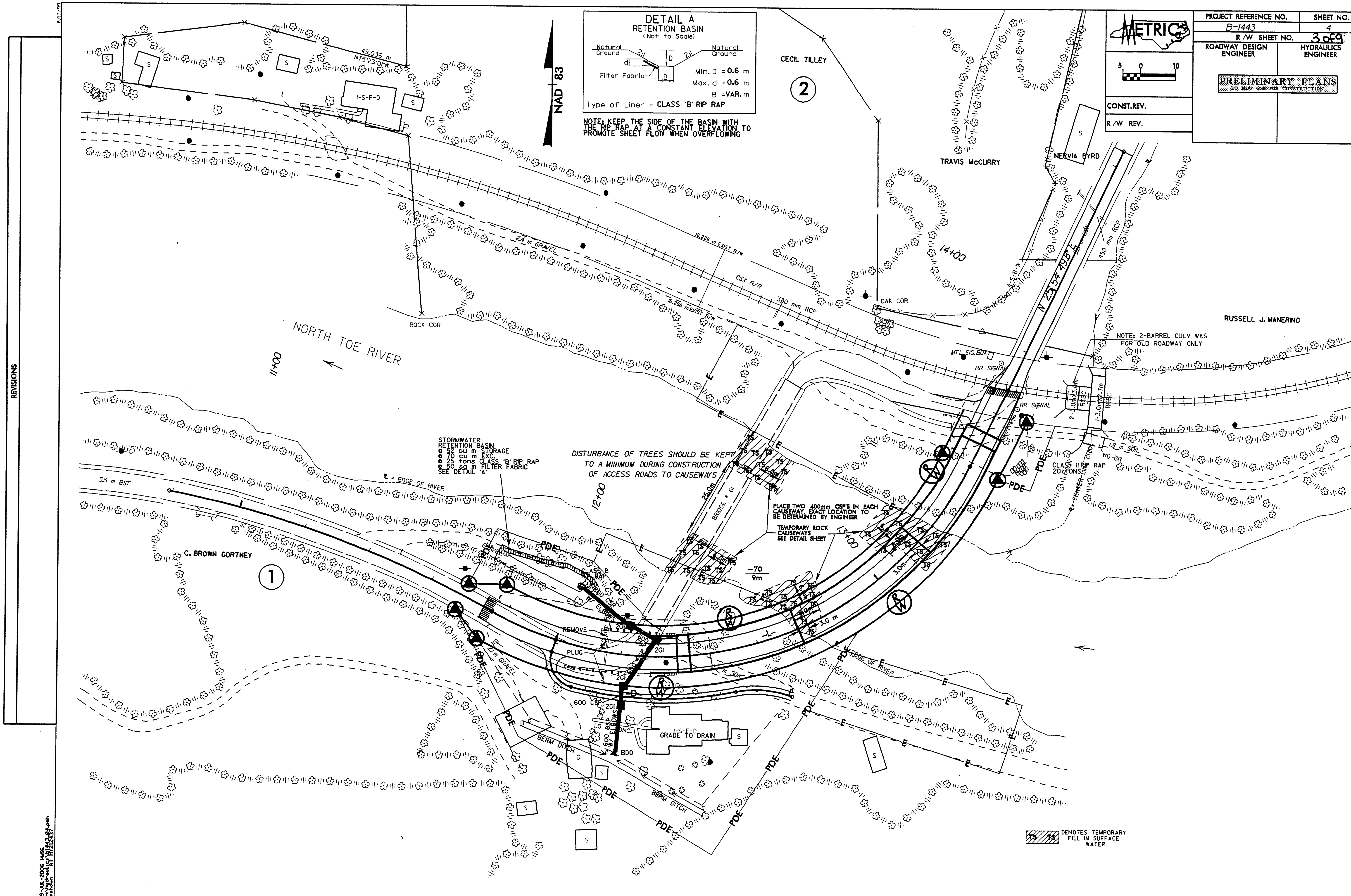
PROJECT: 8.1900401 (B-1443)

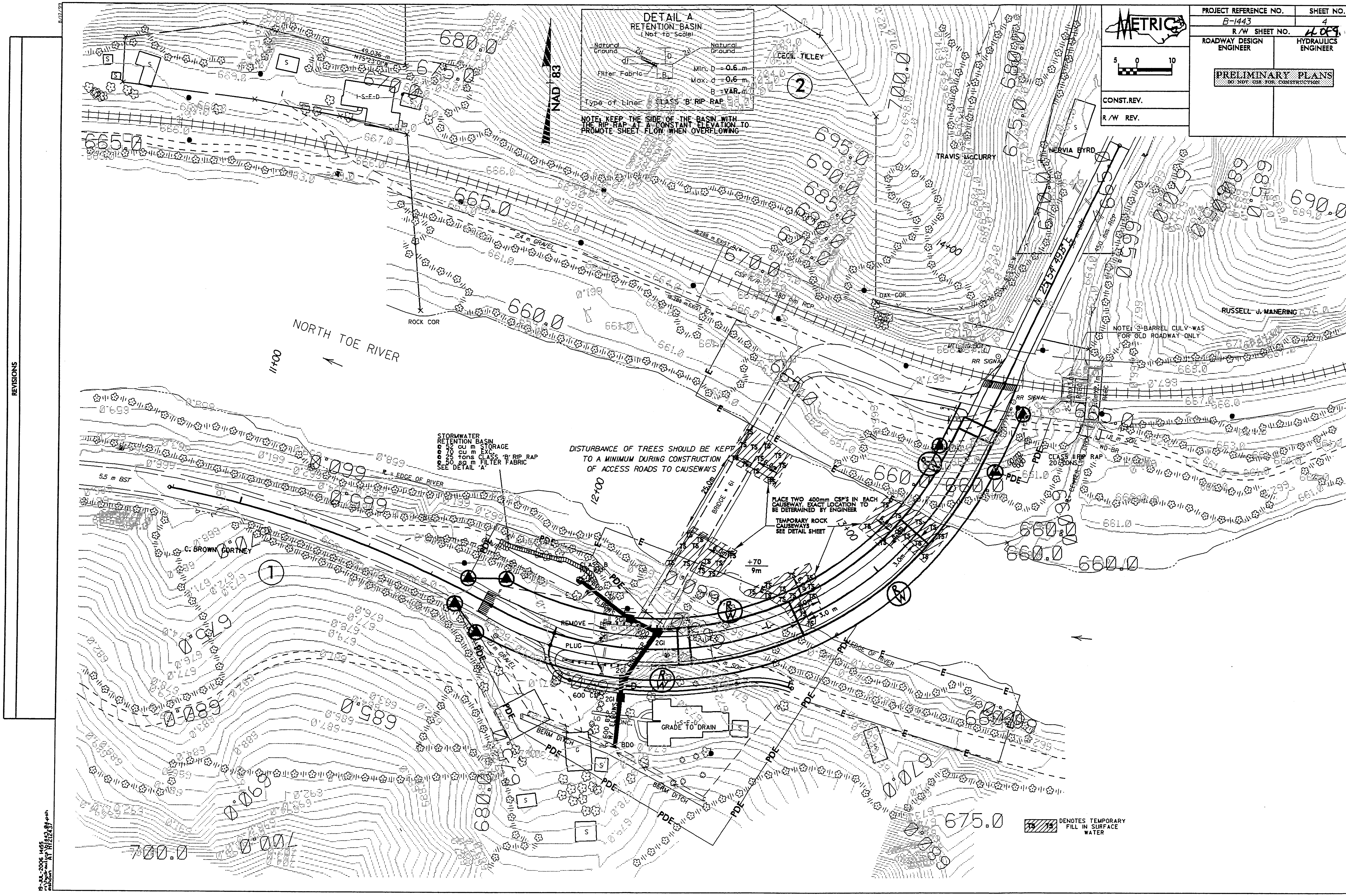
BRIDGE NO. 61 ON NC 197

OVER THE NORTH TOE RIVER

SHEET 2 OF 9

3/10/04


PROJECT REFERENCE NO.
SHEET NO.
B-1443
4
R/W SHEET NO.
3 of 9
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
METRIC
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST. REV.
R/W REV.
REVISIONS
DETAIL A
RETENTION BASIN
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 0.6 m
Max. d = 0.6 m
B = VAR. m
Type of Liner = CLASS 'B' RIP RAP
NOTE: KEEP THE SIDE OF THE BASIN WITH THE RIP RAP AT A CONSTANT ELEVATION TO PROMOTE SHEET FLOW WHEN OVERFLOWING
NAD 83
CECIL TILLEY
TRAVIS McCURRY
NERVIA BYRD
RUSSELL J. MANERING
C. BROWN GORTNEY
NORTH TOE RIVER
ROCK COR
OAK COR
CSX R/R
18.288 m EXIST R/W
2.4 m GRAVEL
380 mm RCP
450 mm RCP
N 23°54'49" E
49.036 m
N75°23'01"W
NOTE: 2-BARREL CULV WAS FOR OLD ROADWAY ONLY
MTL SIG. BOX
RR SIGNAL
CLASS II RIP RAP
DISTURBANCE OF TREES SHOULD BE KEPT TO A MINIMUM DURING CONSTRUCTION OF ACCESS ROADS TO CAUSEWAYS
STORMWATER RETENTION BASIN
52 cu m STORAGE
70 cu m EXC.
25 tons CLASS 'B' RIP RAP
50 sq m FILTER FABRIC
SEE DETAIL 'A'
EDGE OF RIVER
5.5 m BST
PLACE TWO 400mm CSP'S IN EACH CAUSEWAY. EXACT LOCATION TO BE DETERMINED BY ENGINEER
TEMPORARY ROCK CAUSEWAYS SEE DETAIL SHEET
BRIDGE
REMOVE
PLUG
600 CSP
GRADE TO DRAIN
BERM DITCH
I-S-F-D
11+00
12+00
13+00
14+00
DENOTES TEMPORARY FILL IN SURFACE WATER


METRIC
PROJECT REFERENCE NO.
B-1443
SHEET NO.
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
CONST.REV.
R/W REV.
REVISIONS
DETAIL A
RETENTION BASIN
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 0.6 m
Max. d = 0.6 m
B = VAR. m
Type of Liner = CLASS 'B' RIP RAP
NOTE: KEEP THE SIDE OF THE BASIN WITH THE RIP RAP AT A CONSTANT ELEVATION TO PROMOTE SHEET FLOW WHEN OVERFLOWING
NAD 83
CECIL TILLEY
TRAVIS McCURRY
NERVIA BYRD
RUSSELL J. MANERING
C. BROWN CORTNEY
NORTH TOE RIVER
ROCK COR
OAK COR
RR SIGNAL
NOTE: 2-BARREL CULV WAS FOR OLD ROADWAY ONLY
STORMWATER RETENTION BASIN
52 cu m STORAGE
70 cu m EXC.
25 tons CLASS 'B' RIP RAP
50 sq m FILTER FABRIC
SEE DETAIL 'A'
DISTURBANCE OF TREES SHOULD BE KEPT TO A MINIMUM DURING CONSTRUCTION OF ACCESS ROADS TO CAUSEWAYS
PLACE TWO 400mm CSP'S IN EACH CAUSEWAY. EXACT LOCATION TO BE DETERMINED BY ENGINEER
TEMPORARY ROCK CAUSEWAYS SEE DETAIL SHEET
EDGE OF RIVER
5.5 m BST
REMOVE
PLUG
GRADE TO DRAIN
BERM DITCH
CLASS II RIP RAP
DENOTES TEMPORARY FILL IN SURFACE WATER
11+00
12+00
13+00
14+00
665.0
660.0
670.0
675.0
680.0
685.0
690.0
695.0
700.0

5/03/99

PROJECT REFERENCE NO.	SHEET NO.
B-1443	5 of 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

METRIC

5 0 10

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

CONST.REV.

R/W REV.

BEGIN GRADE -L- STA 11+77.000
ELEV. = 667.887

PI = 12+29.840
EL = 665.805 m
VC = 85 m
K = 13

PI = 13+15.740
EL = 668.193 m
VC = 37 m
K = 10

-3.40%

-2.80%

+2.80%

+100%

100 YR WSEL 663.37 m

50 YR WSEL 662.69 m

NATURAL GROUND

DESIGN EXCEPTION REQUIRED
FOR DESIGN SPEED, 50 km/h

END GRADE -L- STA 13+67.649
ELEV. = 667.670

TEMPORARY ROCK CAUSEWAYS TO ELEV. 659.5 m

669 668 667 666 665 664 663 662 661 660 659 658 657 656 655

+80 11 +20 +40 +60 +80 12 +20 +40 +60 +80 13 +20 +40 +60 +80 14 +20 +40

-D-

BM: BL-5 PINC 11+62.767
ELEV. 666.0855

END GRADE -D- STA 11+01.087
ELEV. = 666.374

BEGIN GRADE -D- STA 10+22.692
ELEV. = 667.171

PI = 10+88.600
EL = 666.676 m
VC = 20 m
K = 5

667.171

666.374

-3.35%

-3.35%

+1.40%

+2.40%

PI = 10+52.040
EL = 666.162 m
VC = 25 m
K = 5

673 672 671 670 669 668 667 666 665 664 663 662 661 660

+20 +40 +60 +80 11

30-JUN-2004 10:23
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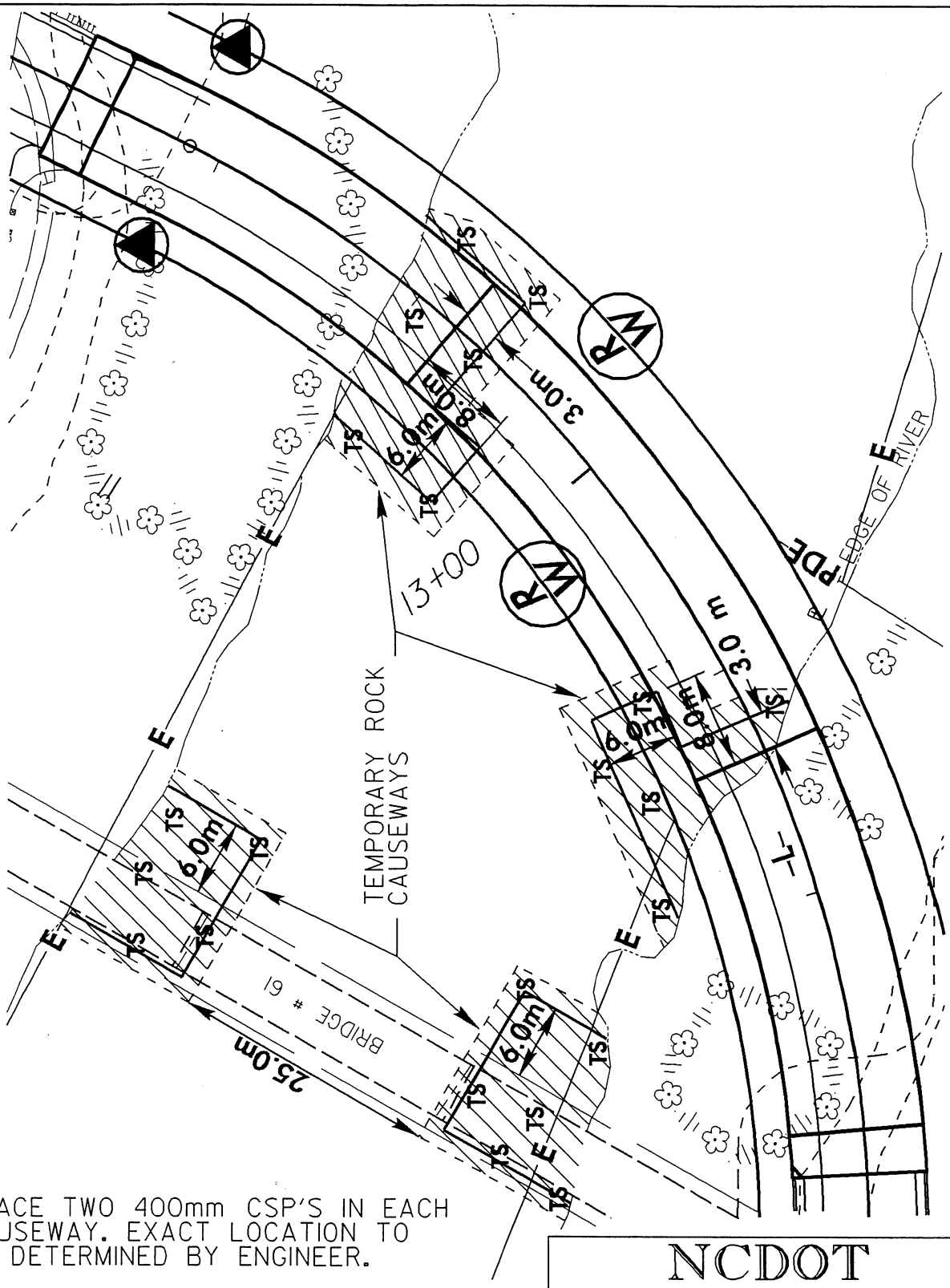
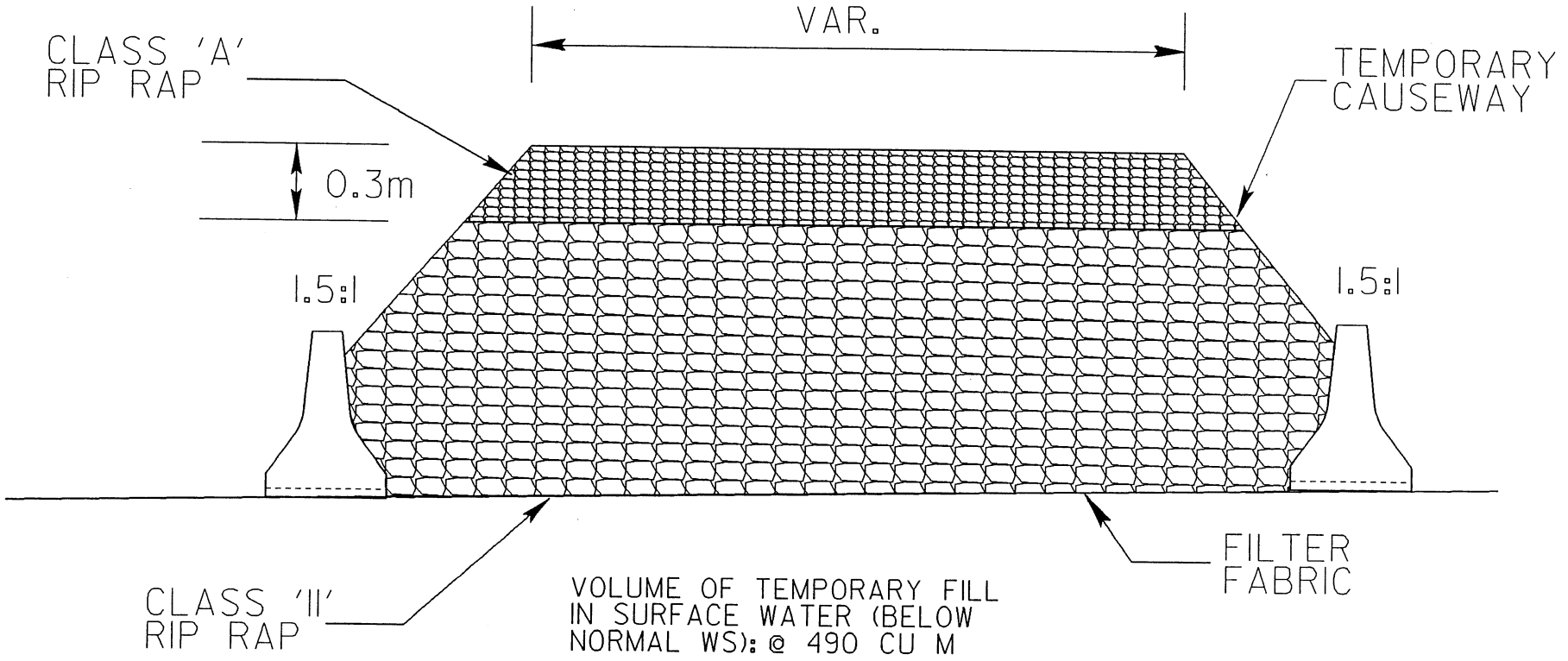


PLACE TWO 400mm CSP'S IN EACH CAUSEWAY. EXACT LOCATION TO BE DETERMINED BY ENGINEER.

DETAIL

NCDOT

DIVISION OF HIGHWAYS
MITCHELL / YANCEY COUNTY
PROJECT: 8.1900401 (B-1443)
BRIDGE NO. 61 ON NC 197
OVER THE NORTH TOE RIVER



TYPICAL SECTION
(NOT TO SCALE)

NCDOT
DIVISION OF HIGHWAYS
MITCHELL / YANCEY COUNTY
PROJECT: 8.1900401 (B-1443)
BRIDGE NO. 61 ON NC 197
OVER THE NORTH TOE RIVER

PROPERTY OWNERS

NAMES AND ADDRESSES

PARCEL NO.	NAMES	ADDRESSES
1	C. BROWN GORTNEY	RT. 2, BOX 450 BAKERSVILLE, NC 28705
2	CECIL TILLEY	11013 MIDDLE ACRES ROAD CHARLOTTE, NC 28813

NCDOT

DIVISION OF HIGHWAYS

MITCHELL / YANCEY COUNTY

PROJECT: 8.1900401 (B-1443)

BRIDGE NO. 61 ON NC 197

OVER THE NORTH TOE RIVER

3/10/04

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)
	NEW BRIDGE	1@107 ft, 1@142 ft					<0.01*				
		1@107 Ft CURVED									
		STEEL GIRDERS									
	NEW BRIDGE	Temporary rock causeway							0.12		
	OLD BRIDGE	Temporary rock causeway							0.09		
	REMOVAL										
	OLD BRIDGE	Temporary supports							0.01		
	REMOVAL										
TOTALS:			0	0	0	0	0	0	0.22	0	0

*NOTE: 100 sq ft OF PERMANENT FILL IN SURFACE WATER DUE TO BRIDGE PIERS

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
MITCHELL/YANCEY COUNTY
PROJECT 8.1900401 (B-1443)
BRIDGE No. 61 ON NC 197
OVER THE NORTH TOE RIVER

7/25/2006

Form Revised 3/22/01

9/09/99

B-1443

CONTRACT: C201180

See Sheet 1-A For Index of Sheets

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

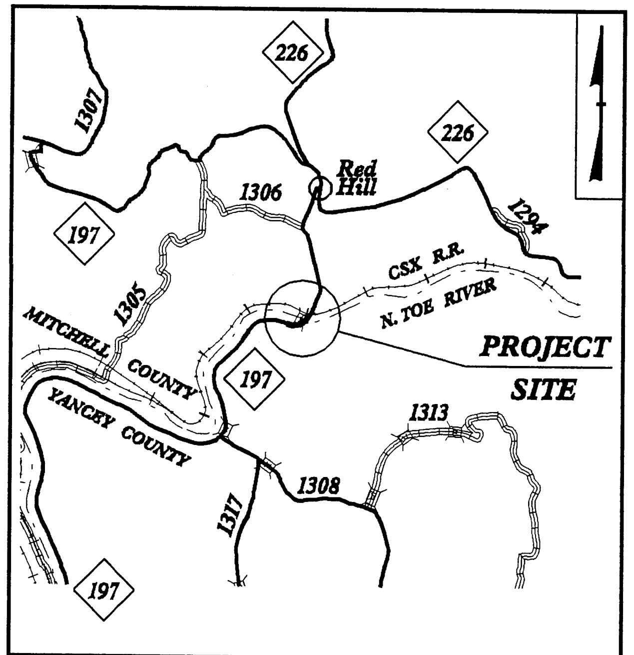
MITCHELL /YANCEY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-1443	1	

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
32597.1.1	BRSTP-197(1)	PE
32597.2.1	BRSTP-197(1)	ROW

METRIC

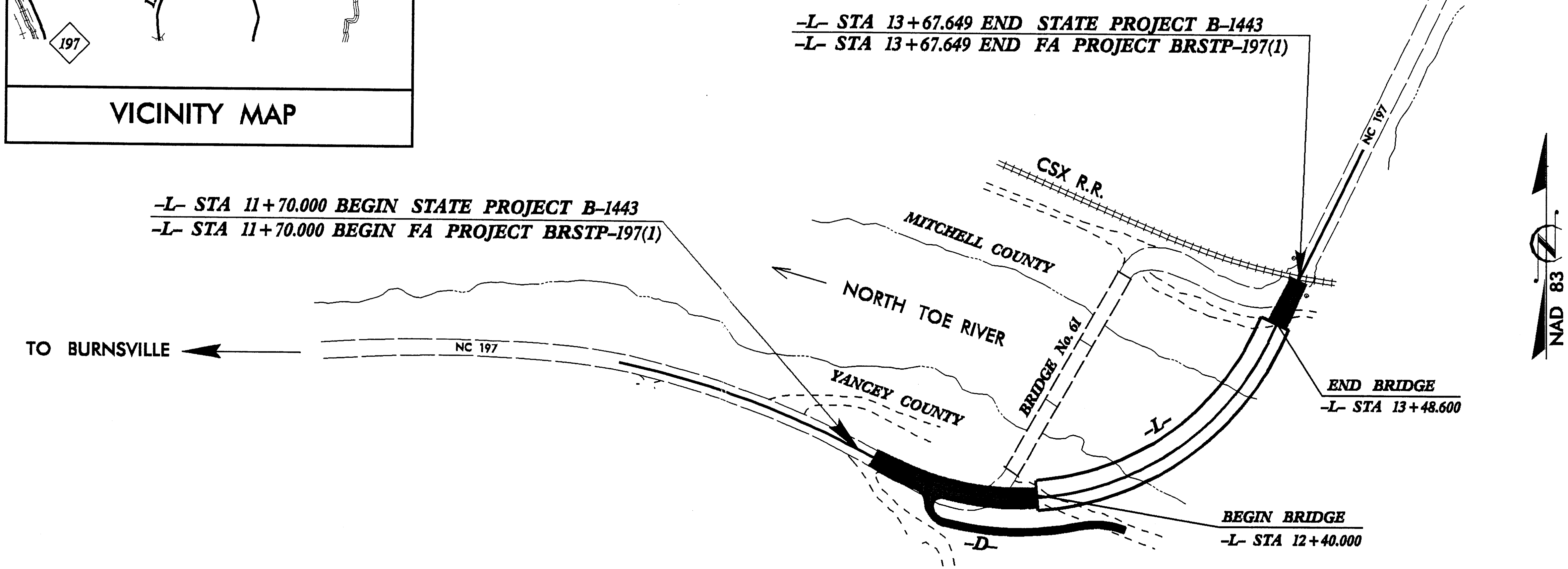
ALL DIMENSIONS IN THESE PLANS ARE IN METERS AND/OR MILLIMETERS UNLESS OTHERWISE SHOWN



VICINITY MAP

LOCATION: BRIDGE No. 61 ON NC 197 OVER THE NORTH TOE RIVER

TYPE OF WORK: PAVING, GRADING, DRAINAGE, AND STRUCTURES



NOTE: THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II
** DESIGN EXCEPTION FOR 'DESIGN SPEED' REQUIRED

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

5 0 10 — PLANS

5 0 10 — PROFILE (HORIZONTAL)

2 0 10 — PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 1600
ADT 2025 = 2800
DHV = 9 %
D = 55 %
T = 8 % *
V = 50 km/h
(** REQUIRES DESIGN EXCEPTION)
* TTST 2 % DUAL 6 %

PROJECT LENGTH

LENGTH ROADWAY STATE PROJECT 8.1900401 = 0.082 KM
LENGTH STRUCTURE STATE PROJECT 8.1900401 = 0.109 KM
TOTAL LENGTH STATE PROJECT 8.1900401 = 0.191 KM

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

1995 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: February 26, 2004

JIMMY GOODNIGHT, PE — PROJECT ENGINEER

LETTING DATE: March 15, 2005

JASON MOORE, 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

25-JUN-2004 15:35
R:\proj\b1443...

METRIC

PROJECT REFERENCE NO.	SHEET NO.
B-1443	2
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

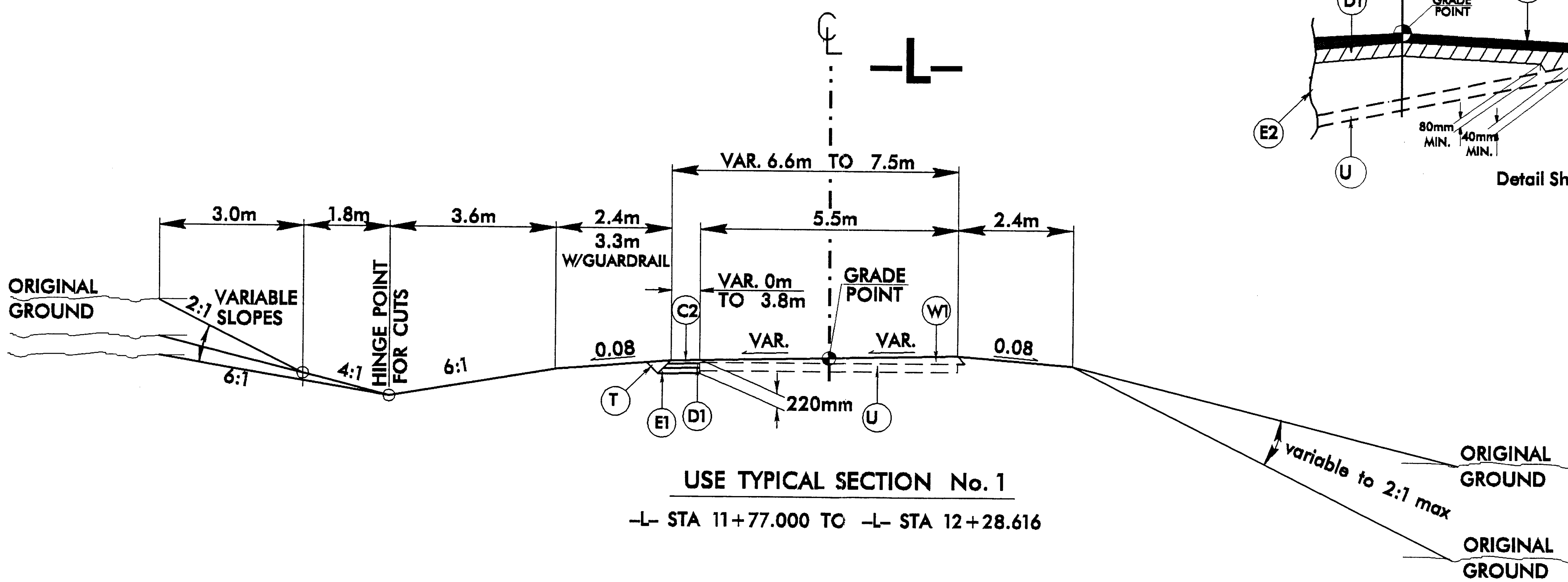
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PAVEMENT SCHEDULE

C1	PROP. APPROX. 25 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 60 kg PER SQ. METER.	E1	PROP. APPROX. 110 mm ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 269.5 kg PER SQ. METER.
C2	PROP. APPROX. 50 mm ASPHALT CONC. SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 60 kg PER SQ. METER IN EACH OF TWO LAYERS.	E2	PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 75 mm IN DEPTH OR GREATER THAN 140 mm IN DEPTH.
C3	PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 2.4 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT TO EXCEED 40 mm IN DEPTH.	T	EARTH MATERIAL.
D1	PROP. APPROX. 60 mm ASPHALT CONC. BINDER COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 147 kg PER SQ. METER.	U	EXISTING PAVEMENT.
D2	PROP. VAR. DEPTH ASPHALT CONC. BINDER COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 2.45 kg PER SQ. METER PER 1 mm DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 55 mm IN DEPTH OR GREATER THAN 110 mm IN DEPTH.	W1	VARIABLE DEPTH ASPHALT PAVEMENT. (SEE STANDARD WEDGING DETAIL SHEET No. 2)

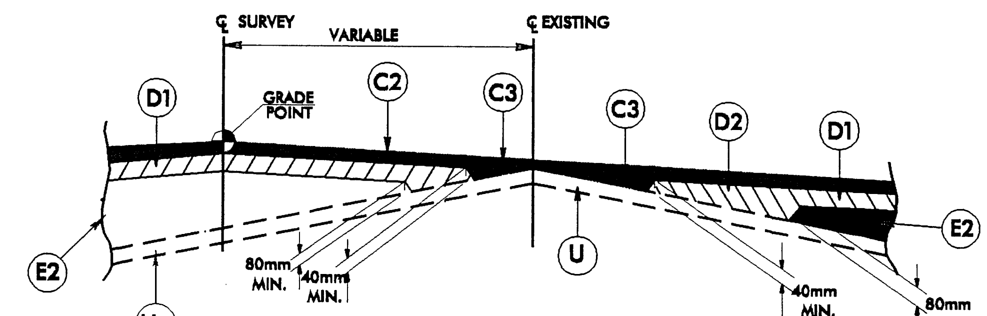
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

TYPICAL SECTION No. 1



USE TYPICAL SECTION No. 1

-L- STA 11+77.000 TO -L- STA 12+28.616



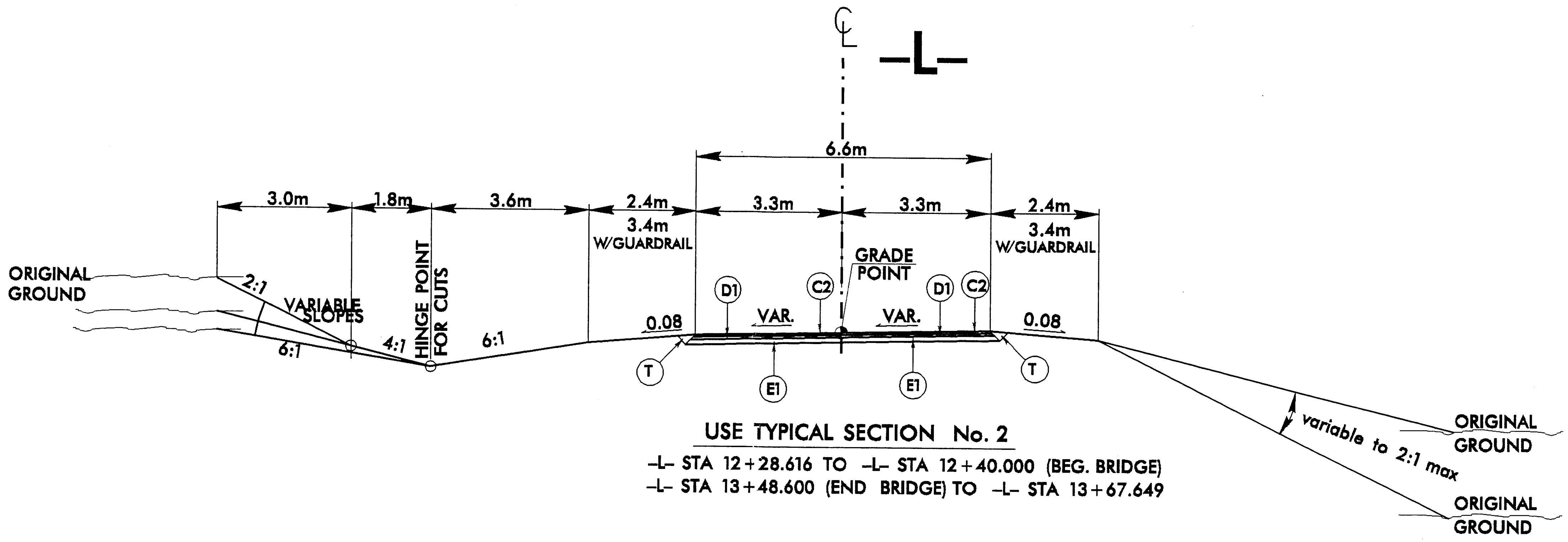
Detail Showing Method of Wedging

PROJECT REFERENCE NO.	SHEET NO.
B-1443	2-A
ROADWAY DESIGN ENGINEER	PAVEMENT DESIGN ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

C1	25mm I-1
C2	50mm I-1
C3	VAR. DEPTH I-1
D1	60mm H
D2	VAR. DEPTH H
E1	25mm I-1
E2	VAR. DEPTH HB
T	EARTH MAT'L
U	EXIST. PAV'T
W1	WEDGING

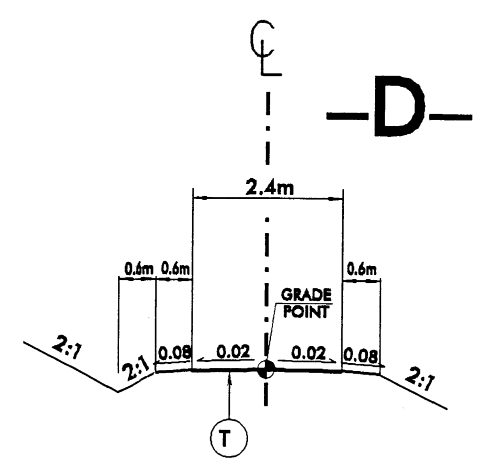
TYPICAL SECTION No. 2



USE TYPICAL SECTION No. 2

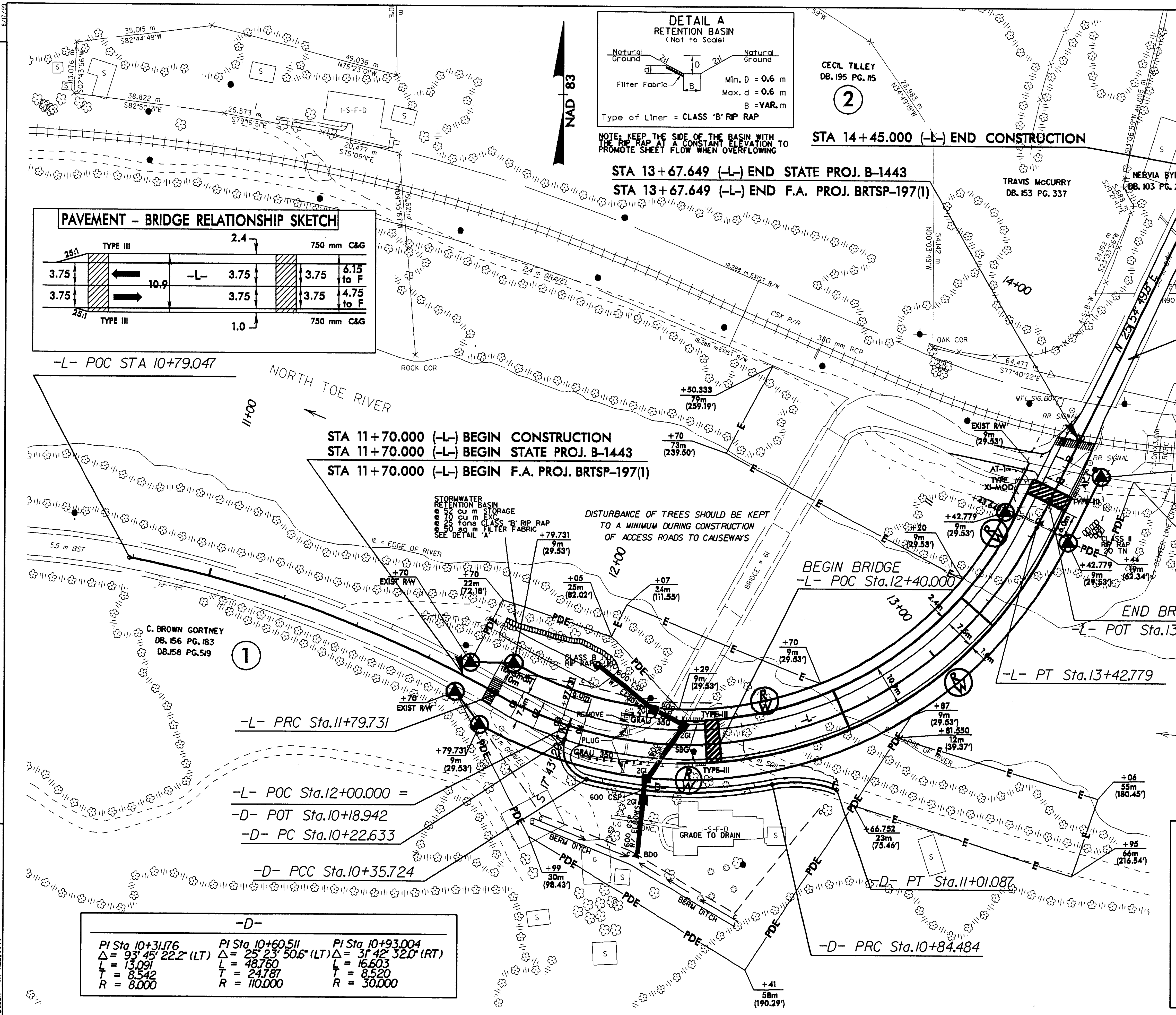
-L- STA 12+28.616 TO -L- STA 12+40.000 (BEG. BRIDGE)
-L- STA 13+48.600 (END BRIDGE) TO -L- STA 13+67.649

TYPICAL SECTION No. 3



TYPICAL SECTION No. 3

STA 10+00.000 (-D-) TO STA 11+01.087 (-D-)



NAD 83
DETAIL A
RETENTION BASIN
(Not to Scale)
Natural Ground
Filter Fabric
Min. D = 0.6 m
Max. d = 0.6 m
B = VAR. m
Type of Liner = CLASS 'B' RIP RAP
NOTE: KEEP THE SIDE OF THE BASIN WITH THE RIP RAP AT A CONSTANT ELEVATION TO PROMOTE SHEET FLOW WHEN OVERFLOWING
CECIL TILLEY
DB. 195 PG. 115
STA 14+45.000 (-L-) END CONSTRUCTION
STA 13+67.649 (-L-) END STATE PROJ. B-1443
STA 13+67.649 (-L-) END F.A. PROJ. BRTSP-197(1)
TRAVIS McCURRY
DB. 153 PG. 337
NERVIA BYRD
DB. 103 PG. 222
PAVEMENT - BRIDGE RELATIONSHIP SKETCH
TYPE III
750 mm C&G
-L-
6.15 to F
4.75 to F
-L- POC STA 10+79.047
NORTH TOE RIVER
ROCK COR
CSX R/W
380 mm RCP
OAK COR
RESURFACE AS DIRECTED BY THE ENGINEER
RUSSELL J. MANERING
DB. 139 PG. 534
NOTE: 2-BARREL CULV WAS FOR OLD ROADWAY ONLY
STA 11+70.000 (-L-) BEGIN CONSTRUCTION
STA 11+70.000 (-L-) BEGIN STATE PROJ. B-1443
STA 11+70.000 (-L-) BEGIN F.A. PROJ. BRTSP-197(1)
STORMWATER RETENTION BASIN
SEE DETAIL 'A'
DISTURBANCE OF TREES SHOULD BE KEPT TO A MINIMUM DURING CONSTRUCTION OF ACCESS ROADS TO CAUSEWAYS
C. BROWN GORTNEY
DB. 156 PG. 183
DB.158 PG.519
BEGIN BRIDGE
-L- POC Sta.12+40.000
END BRIDGE
-L- POT Sta.13+48.600
-L- PT Sta.13+42.779
DESIGN EXCEPTION REQUIRED FOR DESIGN SPEED, 50km/h
-L- PRC Sta.11+79.731
-L- POC Sta.12+00.000 =
-D- POT Sta.10+18.942
-D- PC Sta.10+22.633
-D- PCC Sta.10+35.724
-D- PT Sta.11+01.087
-D- PRC Sta.10+84.484
GRADE TO DRAIN
BERM DITCH

METRIC	PROJECT REFERENCE NO.	SHEET NO.
	B-1443	4
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
CONST.REV.		
R/W REV.		

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

-L-

PI Sta 11+29.822	PI Sta 12+85.885
Δ = 18° 18' 48.9" (RT)	Δ = 93° 25' 10.7" (LT)
L = 100.684	L = 163.048
T = 50.775	T = 106.154
R = 315.000	R = 100.000

-D-

PI Sta 10+31.176	PI Sta 10+60.511	PI Sta 10+93.004
Δ = 93° 45' 22.2" (LT)	Δ = 25° 23' 50.6" (LT)	Δ = 31° 42' 32.0" (RT)
L = 13.091	L = 48.760	L = 16.603
T = 8.542	T = 24.787	T = 8.520
R = 8.000	R = 110.000	R = 30.000

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B1443-01"
WITH NAD 83 STATE PLANE GRID COORDINATES OF
NORTHING: 255785.5918 (m) EASTING: 318,182.5459 (m)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9999652815
THE N.C. LAMBERT GRID BEARING
LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B1443-01" TO -L- STATION 11+77.000 IS
S 87°12'50.50" E 297.470 (m)
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NGVD 29

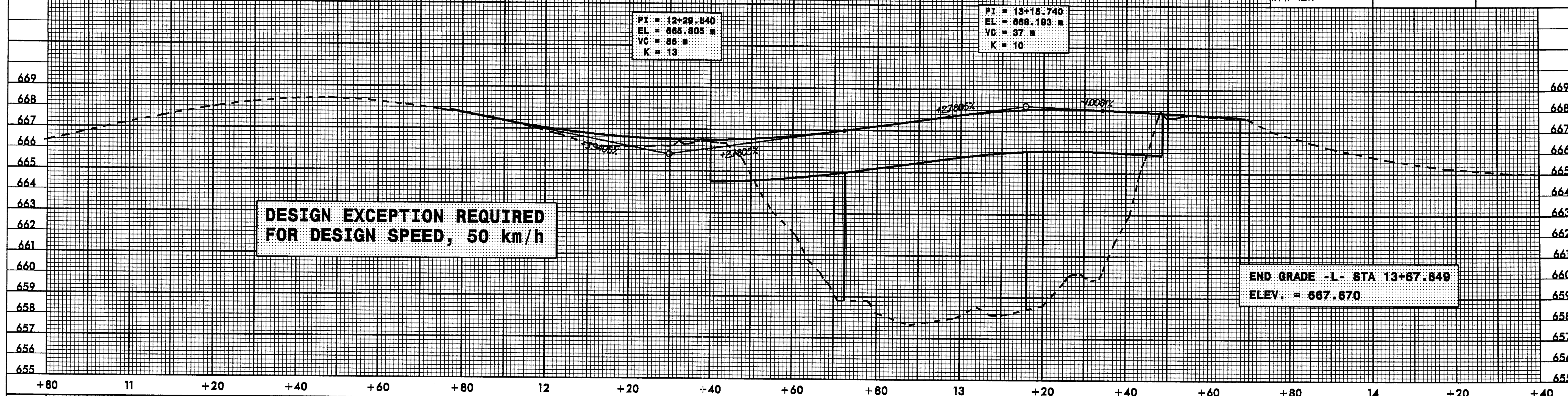
PROJECT REFERENCE NO.	SHEET NO.
B-1443	5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

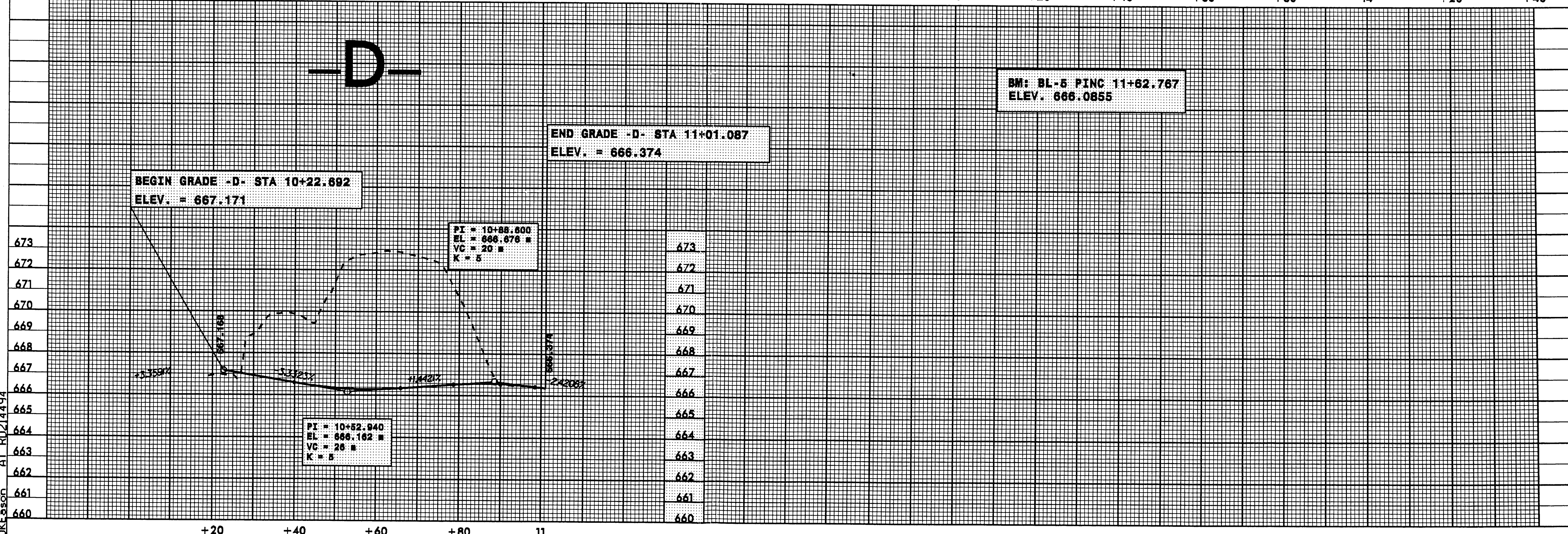
METRIC

CONST.REV.

R /W REV.

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





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