STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

J. ERIC BOYETTE
SECRETARY

August 6, 2020

MEMORANDUM TO: Mr. Michael Pettyjohn, P.E.
Division 11 Engineer

FROM: MAT for Philip S. Harris, III, P.E., Manager
Environmental Analysis Unit

SUBJECT: 404 Permit and 401 Water Quality Certification for the Widening of US 321 in Catawba, Burke, and Caldwell Counties, Divisions 11, 12 and 13; WBS No 35993.1.2, **TIP: U-4700**.

Enclosed are the US Army Corps of Engineers Permit, NC Division of Water Resources Water Quality Certifications, and Project Commitments ("greensheet") for the above-referenced project. All environmental permits have been received for the construction of this project.

The permit package has been posted on the NCDOT website at:
https://xfer.services.ncdot.gov/pdea/PermIssued/

ec:

Mr. Ron Davenport, P.E. Contracts Management
Mr. Kevin Hining, Division Environmental Officer
Dr. Majed Al-Ghandour, P.E., Programming and TIP
Mr. Stephen Morgan, P.E., Hydraulics
Mr. Brian Hanks, P.E., Structure Design
Mr. Mark Staley, Roadside Environmental
Mr. Lamar Sylvester, P.E., State Roadway Construction Engineer

Mailing Address:
NC DEPARTMENT OF TRANSPORTATION
ENVIRONMENTAL ANALYSIS UNIT
1598 MAIL SERVICE CENTER
RALEIGH NC 27699-1598

Telephone: (919) 707-6000
Customer Service: 1-877-368-4968
Website: www.ncdot.gov

Location:
1000 BIRCH RIDGE DRIVE
RALEIGH NC 27610

PROJECT COMMITMENTS

T.I.P Project No. U-4700
Proposed US 321 Widening
From US 70 in Hickory to Southwest Boulevard in Lenoir
Catawba, Burke, and Caldwell Counties
NCDOT Divisions 11, 12, & 13

WBS Element 35993.1.2
Federal Aid Project NHF-0321(25)

COMMITMENTS FROM PROJECT DEVELOPMENT AND DESIGN

Hydraulics Unit – FEMA Coordination

The Hydraulics Unit will coordinate with the NC Floodplain Mapping Program (FMP) to determine status of project with regard to applicability of NCDOT'S Memorandum of Agreement, or approval of a Conditional Letter of Map Revision (CLOMR) and subsequent final Letter of Map Revision (LOMR).

Division Construction – FEMA Coordination

This project involves construction activities on or adjacent to FEMA-regulated streams. Therefore, the Division shall submit sealed as-built construction plans to the Hydraulics Unit upon completion of project construction, certifying that the drainage structures and roadway embankment that are located within the 100-year floodplain were built as shown in the construction plans, both horizontally and vertically.

Division Construction

On US 321, intermediate contact times will be included in the construction contract and traffic management plan to minimize the disruption to the travelling public. Specific access to the L.P. Frans Stadium will be considered in more detail during final design. NCDOT will coordinate with the stadium staff prior to construction.

Roadway Design and Hydraulic Design Units

As part of the Concurrence Point 2A agreement to narrow the 46' median option, NCDOT committed to treat storm water in designated places throughout the project. These locations will be identified during final design.

Division Construction and Environmental Analysis Unit

In order to partially offset anticipated adverse effects from project construction activities, all or portions of dwarf-flowered heartleaf Sites 32, 34, 36, and 43 that remain intact from project construction will be purchased through the attainment of additional NCDOT right of way (ROW) via fee simple ROW settlement or condemnation. NCDOT estimates 2,737 dwarf-flowered

heartleaf plants and 2.3543 acres of occupied dwarf- flowered heartleaf habitat will incur beneficial effects as a result of this on-site preservation.

The parcels to be obtained for dwarf-flowered heartleaf Site 32 can be purchased as of January 18, 2019. Once funding is available to obtain the parcels for dwarf-flowered heartleaf Sites 34, 36, and 43, NCDOT will resurvey the sites before purchasing the parcels to be protected.

For dwarf-flowered heartleaf Sites 32, 34, 36, and 43, a form of right-of-way or controlled/access fencing, with access gates, will be placed around the perimeter of the portion of parcels to be protected as an added barrier to outside encroachment.

Before construction activities begin at dwarf-flowered heartleaf Sites 32, 34, 36, and 43, the portion of occupied dwarf-flowered heartleaf habitat remaining intact from construction activities will be protected by placing orange safety fencing or otherwise hardened barriers with appropriate signage along the construction limits.

The portions of dwarf-flowered heartleaf Sites 32, 34, 36, and 43 that are protected will remain on the project's design plans throughout the duration of construction activities and will be labeled on the plans as 'SENSITIVE AREAS'.

Environmental Analysis Unit

NCDOT has committed to monitoring the portions of preserved areas at dwarf-flowered heartleaf Sites 32, 34, 36, and 43, and will include a plant count, completion of NCNHP rare plant form, and mapping of protected areas. The pre-construction survey of each protected site is provided in the Biological Assessment, and was conducted in 2018. Additionally, NCDOT committed to three post-construction surveys of the protected sites every two years over six years.

NCDOT, with the cooperation of the US Fish & Wildlife Service and NC Natural Heritage Program, committed to a three-year research project to develop tools to circumscribe and identify dwarf-flowered heartleaf outside its flowering stage. This research developed morphological and micromorphological characteristics, and microsatellite markers to identify dwarf-flowered heartleaf and to differentiate members of the target species from congeners and hybrids. NCDOT provided approximately $230,000 in funding to Appalachian State University (ASU) to conduct the research project.

Products of this study include:

- Updated floral and vegetative morphological markers of the *Heterophylla* subgroup;
- New molecular markers to identify species and hybrids in the *Heterophylla* subgroup;
- Much better understanding of the genetic structure of dwarf-flowered heartleaf and congeners;
- Improved comprehension of dwarf-flowered heartleaf habitat requirements;
- Voucher collections of plant material that can be used in future studies. The collections are housed in appropriate facilities at the ASU Herbarium, and are available to NCDOT biologists for future use or further analysis; and

- A final publication of the research results is found in "Sixteen Polymorphic Microsatellite Markers for a Federally Threatened Species, *Hexastylis naniflora* (Aristolochiaceae), and Co-Occurring Congeners" (Hampstead et al. 2015).

Community Studies Team

Pedestrian accommodations and access for pedestrians across U.S. 321 at the proposed 2nd Avenue SW interchange will be maintained to address the concerns and needs of area residents.

Division Project Development – FERC Coordination

The proposed project crosses Lake Hickory, which is a Federal Energy Regulatory Commission (FERC) site operated by Duke Energy. This crossing of Lake Hickory will require FERC coordination through Duke Energy. NCDOT Division 12, in conjunction with the NCDOT Environmental Analysis Unit, will coordinate with Duke Energy during final design to provide designs and ensure compliance with Duke Energy's FERC commitments.

GeoEnvironmental Group

The NCDOT GeoEnvironmental Group will conduct a field visit and submit a report of their findings. A Phase II study will be completed for the 1167 1st Avenue SW site if the design is not revised to avoid impacts to the property.

COMMITMENTS FROM PERMITTING

See 404 Permit and 401 Certification for all conditions developed during permitting.

Division Construction

404 Special Condition #1: Phased Merger Project - This permit only authorizes work on Sections CA, CB and CC of TIP U-4700. Construction on Sections A, B and C of TIP U-4700 shall not commence until: (a) final design has been completed for those sections and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification to the plans have been approved by the Corps in writing; and (d) a final compensatory mitigation plan has been submitted by the Permittee and approved by the Corps.

404 Special Condition #16: Endangered Species Act - This Department of the Army permit does not authorize you to take an endangered species, in particular the Dwarf-flowered heartleaf (*Hexastylis naniflora)*. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a BO under ESA Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service Biological Opinion (BO) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take

of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your permit. The U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

404 Special Condition #23: Cultural Resources - NCDOT shall comply with its commitments regarding the following historic properties: James Edgar Broyhill Estate (CW0251 – DE). Specifically, NCDOT shall incorporate conditions agreed to on the Concurrence Form For Assessment Of Effects as updated on March 20, 2018. The conditions include utilization of curb and gutter sections (with 10-foot buffer within existing ROW) to replace previously recommended shoulder section with retaining wall. Median will transition to 22 feet before reaching property, and existing slope adjacent to property will be retained, grassed, and maintained by NCDOT. Existing main entrance to property on US321, including flanking stone posts, will be retained. Existing access to Lenoir Golf Club and Hillhaven Place south of property on US321 will be retained and improved to allow left-over turn.

DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

July 29, 2020

Regulatory Division

Action ID. SAW-2006-20748

Philip S. Harris III, P.E., C.P.M.,
North Carolina Department of Transportation
Project Development and Environmental Analysis Branch
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris,

In accordance with the written request of December 20, 2018, and the ensuing administrative record, enclosed is a permit to impact waters of the U.S. in order to widen US 321 to a six lane median divided facility from just north of the US 70 interchange in Hickory (Catawba County) to the Southwest Boulevard (SR 1933) interchange in Lenoir (Caldwell County), North Carolina [State Transportation Improvement Program (STIP) Number U-4700]. Construction of this project will permanently impact 5,950 linear feet of stream, 0.7 acre of wetland and temporarily impact <0.01acre of stream in the project corridor.

Any deviation in the authorized work will likely require modification of this permit. If any change in the authorized work is necessary, you should promptly submit revised plans to the Corps showing the proposed changes. You may not undertake the proposed changes until the Corps notifies you that your permit has been modified.

Carefully read your permit. The general and special conditions are important. Your failure to comply with these conditions could result in a violation of Federal law. Certain significant general conditions require that:

a. You must complete construction before December 31, 2025.

b. You must notify this office in advance as to when you intend to commence and complete work.

c. You must allow representatives from this office to make periodic visits to your worksite as deemed necessary to assure compliance with permit plans and conditions.

d. In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined in the U.S. Army Corps of Engineers, Wilmington District, and Compensatory Mitigation Responsibility

Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit authorization.

You should address all questions regarding this authorization to Steve Kichefski at the Asheville regulatory Field Office, telephone 828-271-7980, extension 4234.

FOR THE DISTRICT ENGINEER

Monte Matthews Date: 2020.07.29 15:18:49 -04'00'

Monte Matthews
Lead Project Manager
Regulatory Division

Enclosures:

Electronic Copies Furnished (without enclosures):

Chief, Source Data Unit
NOAA/National Ocean Service
1315 East-west Highway, Room 7316
Silver Spring, Maryland 20910-3282

U. S. Fish and Wildlife Service
160 Zillicoa Street
Asheville, North Carolina 28801

Mr. Fritz Rhode
National Marine Fisheries Service
101 Pivers Island Road
Beaufort, North Carolina 28516

Mr. Todd Bowers
Wetlands and Marine Regulatory Section
Water Protection Division – Region IV
U. S. Environmental Protection Agency
61 Forsyth St. SW
Atlanta, Georgia 30303-8931

Ms. Amy Chapman
401 & Buffer Permitting Branch Supervisor
Division of Water Resources
Department of Environmental Quality
1617 Mail Service Center
Raleigh, North Carolina

DEPARTMENT OF THE ARMY PERMIT

Permittee **NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**
ATTN: MR. PHILIP S. HARRIS III, P.E., C.P.M.

Permit No. **SAW-2006-20748, STIP U-4700**

Issuing Office **CESAW-RG-A**

NOTE: The term "you" and its derivatives, as used in this permit, means the permittee or any future transferee. The term "this office" refers to the appropriate district or division office of the Corps of Engineers having jurisdiction over the permitted activity or the appropriate official of that office acting under the authority of the commanding officer.

You are authorized to perform work in accordance with the terms and conditions specified below.

Project Description: **To construct STIP U-4700, the project involves the permanent discharge of fill material into 5,950 linear feet of stream, 0.7 acre of wetland and temporarily impact <0.01acre of stream along the 14-mile project corridor in order to widen US321 in Catawba, Burke and Lenoir Counties, North Carolina.**

Project Location: **STIP Project U-4700 is located along US 321 from just north of the US 70 interchange in Hickory (Catawba County) to the Southwest Boulevard (SR 1933) intersection in Lenoir (Caldwell County). The proposed improvements involve approximately 14 miles of existing US 321 with a majority of the roadway located in Catawba and Caldwell Counties and 0.3 mile in Burke County. There are five municipalities that are located along the project corridor: City of Hickory, Town of Granite Falls, Town of Sawmills, Town of Hudson, and City of Lenoir.**

THIS IS A PHASED PERMIT AUTHORIZATION: This permit only authorizes work on Sections CA, CB & CC of the STIP U-4700 project. The permittee is authorized to impact regulated waters along U-4700 CA, CB & CC as follows: permanent discharge of fill material into 100 lf of streams and temporary discharge into 15 lf of stream channel. Construction on the remaining sections of STIP U-4700 shall not commence until final designs have been completed for these sections; the permittee has minimized impacts to waters and wetlands to the maximum extent practicable, and; any modifications to the plans, and the compensatory mitigation plans, have been approved by the US Army Corps of Engineers (the Corps).

Permit Conditions:

General Conditions:

1. The time limit for completing the work authorized ends on **December 31, 2025.** If you find that you need more time to complete the authorized activity, submit your request for a time extension to this office for consideration at least one month before the above date is reached.

2. You must maintain the activity authorized by this permit in good condition and in conformance with the terms and conditions of this permit. You are not relieved of this requirement if you abandon the permitted activity, although you may make a good faith transfer to a third party in compliance with General Condition 4 below. Should you wish to cease to maintain the authorized activity or should you desire to abandon it without a good faith transfer, you must obtain a modification of this permit from this office, which may require restoration of the area.

3. If you discover any previously unknown historic or archeological remains while accomplishing the activity authorized by this permit, you must immediately notify this office of what you have found. We will initiate the Federal and state coordination

required to determine if the remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

4. If you sell the property associated with this permit, you must obtain the signature of the new owner in the space provided and forward a copy of the permit to this office to validate the transfer of this authorization.

5. If a conditioned water quality certification has been issued for your project, you must comply with the conditions specified in the certification as special conditions to this permit. For your convenience, a copy of the certification is attached if it contains such conditions.

6. You must allow representatives from this office to inspect the authorized activity at any time deemed necessary to ensure that it is being or has been accomplished in accordance with the terms and conditions of your permit,

Special Conditions:

SEE ATTACHED SPECIAL CONDITIONS

Further Information:

1. Congressional Authorities: You have been authorized to undertake the activity described above pursuant to:

( ) Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403).

(X) Section 404 of the Clean Water Act (33 U.S.C. 1344).

( ) Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 (33 U.S.C. 1413).

2. Limits of this authorization.

a. This permit does not obviate the need to obtain other Federal, state, or local authorizations required by law.

b. This permit does not grant any property rights or exclusive privileges.

c. This permit does not authorize any injury to the property or rights of others.

d. This permit does not authorize interference with any existing or proposed Federal project.

3. Limits of Federal Liability. In issuing this permit, the Federal Government does not assume any liability for the following:

a. Damages to the permitted project or uses thereof as a result of other permitted or unpermitted activities or from natural causes.

b. Damages to the permitted project or uses thereof as a result of current or future activities undertaken by or on behalf of the United States in the public interest.

c. Damages to persons, property, or to other permitted or unpermitted activities or structures caused by the activity authorized by this permit.

d. Design or construction deficiencies associated with the permitted work.

e. Damage claims associated with any future modification, suspension, or revocation of this permit.

4. Reliance on Applicant's Data: The determination of this office that issuance of this permit is not contrary to the public interest was made in reliance on the information you provided.

5. Reevaluation of Permit Decision. This office may reevaluate its decision on this permit at any time the circumstances warrant. Circumstances that could require a reevaluation include, but are not limited to, the following:

a. You fail to comply with the terms and conditions of this permit.

b. The information provided by you in support of your permit application proves to have been false, incomplete, or inaccurate (See 4 above).

c. Significant new information surfaces which this office did not consider in reaching the original public interest decision.

Such a reevaluation may result in a determination that it is appropriate to use the suspension, modification, and revocation procedures contained in 33 CFR 325.7 or enforcement procedures such as those contained in 33 CFR 326.4 and 326.5. The referenced enforcement procedures provide for the issuance of an administrative order requiring you to comply with the terms and conditions of your permit and for the initiation of legal action where appropriate. You will be required to pay for any corrective measures ordered by this office, and if you fail to comply with such directive, this office may in certain situations (such as those specified in 33 CFR 209.170) accomplish the corrective measures by contract or otherwise and bill you for the cost.

6. Extensions. General condition 1 establishes a time limit for the completion of the activity authorized by this permit, Unless there are circumstances requiring either a prompt completion of the authorized activity or a reevaluation of the public interest decision, the Corps will normally give favorable consideration to a request for an extension of this time limit.

Your signature below, as permittee, indicates that you accept and agree to comply with the terms and conditions of this permit.

Carla Dagnino — July 29, 2020

(PERMITTEE) **NC DEPARTMENT OF TRANSPORTATION** *(DATE)*
for **ATTN: MR. PHILIP S. HARRIS III**

This permit becomes effective when the Federal official, designated to act for the Secretary of the Army, has signed below.

FOR THE DISTRICT ENGINEER

Monte Matthews — Date: 2020.07.29 15:30:45 -04'00'

(DISTRICT COMMANDER) **BENJAMIN A. BENNETT, COLONEL** *(DATE)*

When the structures or work authorized by this permit are still in existence at the time the property is transferred, the terms and conditions of this permit will continue to be binding on the new owner(s) of the property. To validate the transfer of this permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below.

(TRANSFEREE) *(DATE)*

*U.S. GOVERNMENT PRINTING OFFICE: 1986 - 717-425

Special Conditions
TIP U-4700
Action ID SAW-2006-20748

WORK LIMITS / NOTIFICATION

1. **Phased Merger Project:** This permit only authorizes work on Sections CA, CB and CC of TIP U-4700. Construction on Sections A, B and C of TIP U-4700 shall not commence until: (a) final design has been completed for those sections and submitted to the U.S. Army Corps of Engineers (Corps); (b) the Permittee has minimized impacts to waters and wetlands to the maximum extent practicable and the Corps concurs with this assessment through standard Merger 4B and 4C meetings; (c) any modification to the plans have been approved by the Corps in writing; and (d) a final compensatory mitigation plan has been submitted by the Permittee and approved by the Corps.

2. **Work Limits:** All work authorized by this permit shall be performed in strict compliance with the attached permit plans for Section CA, CB and CC submitted on December 20, 2018, which are a part of this permit. The Permittee shall ensure that the construction design plans for this project do not deviate from the permit plans attached to this authorization. Any modification to the attached permit plans must be approved by the US Army Corps of Engineers prior to any active construction in waters or wetlands.

3. **Unauthorized Dredge or Fill:** Except as authorized by this permit or any U.S. Army Corps of Engineers approved modification to this permit, no excavation, fill, or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, within waters or wetlands, or shall any activities take place that cause the degradation of waters or wetlands. There shall be no excavation from, waste disposal into, or degradation of, jurisdictional wetlands or waters associated with this permit without appropriate modification of this permit, including appropriate compensatory mitigation. This prohibition applies to all borrow and waste activities connected with this project. In addition, except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within, into, or out of waters or wetlands or to reduce the reach of waters or wetlands.

4. **Permit Distribution:** The Permittee shall require its contractors and/or agents to comply with the terms and conditions of this permit in the construction and maintenance of this project, and shall provide each of its contractors and/or agents associated with the construction or maintenance of this project with a copy of this permit. A copy of this permit, including all

conditions, drawings and attachments shall be available at the project site during the construction and maintenance of this project.

5. **Pre-Construction Meeting:** The Permittee shall schedule and attend a preconstruction meeting between its representatives, the contractors representatives, and the U.S. Army Corps of Engineers, Asheville Field Office, NCDOT Regulatory Project Manager, prior to any work within jurisdictional waters and wetlands to ensure that there is a mutual understanding of all the terms and conditions contained with this Department of Army Permit. The Permittee shall provide the Corps, Asheville Field Office, NCDOT Project Manager, with a copy of the final permit plans at least two weeks prior to the preconstruction meeting along with a description of any changes that have been made to the project's design, construction methodology or construction timeframe. The Permittee shall schedule the preconstruction meeting for a time frame when the Corps, NCDCM, and NCDWR Project Managers can attend. The Permittee shall invite the Corps, NCDCM, and NCDWR Project Managers a minimum of thirty (30) days in advance of the scheduled meeting in order to provide those individuals with ample opportunity to schedule and participate in the required meeting. The thirty (30) day requirement can be waived with the concurrence of the Corps.

6. **Notification of Construction Commencement and Completion:** The Permittee shall notify the U.S. Army Corps of Engineers in writing prior to beginning the work authorized by this permit and again upon completion of the work authorized by this permit.

7. **Reporting Address:** All reports, documentation, and correspondence required by the conditions of this permit shall be submitted to the following: U.S. Army Corps of Engineers, Wilmington District Asheville Regulatory Field Office, Attn: Steve Kichefski, 151 Patton Avenue, Room 208, Asheville, North Carolina 28801, or steven.l.kichefski@usace.army.mil. The Permittee shall reference the following permit number, SAW-2006-20748, on all submittals.

8. **Permit Revocation:** The Permittee, upon receipt of a notice of revocation of this permit or upon its expiration before completion of the work will, without expense to the United States and in such time and manner as the Secretary of the Army or his authorized representative may direct, restore the water or wetland to its pre-project condition.

9. **Reporting Violations:** Violation of these permit conditions or violation of Section 404 of the Clean Water Act or Section 10 of the Rivers and

Special Conditions
TIP U-4700
Action ID SAW-2006-20748

Harbors Act shall be reported to the Corps in writing and by telephone at: 828-271-7980 within 24 hours of the Permittee's discovery of the violation.

Related Laws

10. **Maintain Flows and Circulation Patterns of Waters:** Except as specified in the plans attached to this permit, no excavation, fill or mechanized land-clearing activities shall take place at any time in the construction or maintenance of this project, in such a manner as to impair normal flows and circulation patterns within waters or wetlands or to reduce the reach of waters and/or wetlands.

11. **Water Contamination:** All mechanized equipment shall be regularly inspected and maintained to prevent contamination of waters and wetlands from fuels, lubricants, hydraulic fluids, or other toxic materials. In the event of a spill of petroleum products or any other hazardous waste, the Permittee shall immediately report it to the N.C. Division of Water Resources at (919) 733-3300 or (800) 858-0368 and provisions of the North Carolina Oil Pollution and Hazardous Substances Control Act shall be followed.

12. **Aquatic Life Movement:** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area. All discharges of dredged or fill material within waters of the United States shall be designed and constructed to maintain low flows to sustain the movement of aquatic species.

13. **Prohibitions on Concrete:** The Permittee shall take measures necessary to prevent live or fresh concrete, including bags of uncured concrete, from coming into contact with any water in or entering into waters of the United States. Water inside coffer dams or casings that has been in contact with concrete shall only be returned to waters of the United States when it no longer poses a threat to aquatic organisms (concrete is set and cured).

14. **Clean Fill:** The Permittee shall use only clean fill material for this project. The fill material shall be free from items such as trash, construction debris, metal and plastic products, and concrete block with exposed reinforcement bars. Soils used for fill shall not be contaminated with any toxic substance in concentrations governed by Section 307 of the Clean Water Act. Unless otherwise authorized by this permit, all fill material placed in waters or wetlands shall be generated from an upland source.

Special Conditions
TIP U-4700
Action ID SAW-2006-20748

15. **Endangered Species Act:** The Permittees shall implement all necessary measures to ensure the authorized activity does not kill, injure, capture, harass, or otherwise harm any federally-listed threatened or endangered species. While accomplishing the authorized work, if the Permittees discover or observe an injured or dead threatened or endangered species, the U.S. Army Corps of Engineers, Wilmington District Asheville Field Office, Attn: Steve Kichefski at 828-271-7980 Ext.4234 / Steven.L.Kichefski@usace.army.mil will be immediately notified to initiate the required Federal coordination.

16. **Endangered Species Act:** This Department of the Army permit does not authorize you to take an endangered species, in particular the Dwarf-flowered heartleaf (*Hexastylis naniflora)*. In order to legally take a listed species, you must have separate authorization under the Endangered Species Act (ESA) (e.g., an ESA Section 10 permit, or a BO under ESA Section 7, with "incidental take" provisions with which you must comply). The enclosed U.S. Fish and Wildlife Service Biological Opinion (BO) contains mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" that is also specified in the BO. Your authorization under this permit is conditional upon your compliance with all of the mandatory terms and conditions associated with incidental take of the attached BO, which terms and conditions are incorporated by reference in this permit. Failure to comply with the terms and conditions associated with incidental take of the BO, where a take of the listed species occurs, would constitute an unauthorized take, and it would also constitute non-compliance with your permit. The U.S. Fish and Wildlife Service is the appropriate authority to determine compliance with the terms and conditions of its BO, and with the ESA.

17. **Culverts:**

1) Unless otherwise requested in the application and depicted on the approved permit plans, culverts greater than 48 inches in diameter shall be buried at least one foot below the bed of the stream. Culverts 48 inches in diameter and less shall be buried or placed on the stream bed as practicable and appropriate to maintain aquatic passage, and every effort shall be made to maintain existing channel slope. The bottom of the culvert shall be placed at a depth below the natural stream bottom to provide for passage during drought or low flow conditions. Culverts shall be designed and constructed in a manner that minimizes destabilization and head cutting.

2) Measures shall be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed opening shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. Spring flow should be determined from gauge data, if available. In the absence of such data, bankfull flow can be used as a comparable level.

3) The Permittee shall implement all reasonable and practicable measures to ensure that equipment, structures, fill pads, work, and operations associated with this project do not adversely affect upstream and/or downstream reaches. Adverse effects include, but are not limited to, channel instability, flooding, and/or stream bank erosion. The Permittee shall routinely monitor for these effects, cease all work when detected, take initial corrective measures to correct actively eroding areas, and notify this office immediately. Permanent corrective measures may require additional authorization by the U.S. Army Corps of Engineers.

4) Culverts placed within wetlands must be installed in a manner that does not restrict the flows and circulation patterns of waters of the United States. Culverts placed across wetland fills purely for the purposes of equalizing surface water shall not be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

18. **Sediment and Erosion Control:**

1) During the clearing phase of the project, heavy equipment shall not be operated in surface waters or stream channels. Temporary stream crossings will be used to access the opposite sides of stream channels. All temporary diversion channels and stream crossings will be constructed of non-erodible materials. Grubbing of riparian vegetation will not occur until immediately before construction begins on a given segment of stream channel.

2) No fill or excavation impacts for the purposes of sedimentation and erosion control shall occur within jurisdictional waters, including

wetlands, unless the impacts are included on the plan drawings and specifically authorized by this permit. This includes, but is not limited to, sediment control fences and other barriers intended to catch sediment losses.

3) The Permittee shall remove all sediment and erosion control measures placed in waters and/or wetlands, and shall restore natural grades on those areas, prior to project completion.

4) The Permittee shall use appropriate sediment and erosion control practices which equal or exceed those outlined in the most recent version of the “North Carolina Sediment and Erosion Control Planning and Design Manual” to ensure compliance with the appropriate turbidity water quality standard. Erosion and sediment control practices shall be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices in order to ensure compliance with the appropriate turbidity water quality standards. This shall include, but is not limited to, the immediate installation of silt fencing or similar appropriate devices around all areas subject to soil disturbance or the movement of earthen fill, and the immediate stabilization of all disturbed areas. Additionally, the project shall remain in full compliance with all aspects of the Sedimentation Pollution Control Act of 1973 (North Carolina General Statutes Chapter 113A, Article 4). Adequate sedimentation and erosion control measures shall be implemented prior to any ground disturbing activities to minimize impacts to downstream aquatic resources. These measures shall be inspected and maintained regularly, especially following rainfall events. All fill material shall be adequately stabilized at the earliest practicable date to prevent sediment from entering into adjacent waters or wetlands.

19. **Temporary Fills:** Within thirty (30) days of the date of completing the authorized work, the Permittee shall remove all temporary fills in waters of the United States and restore the affected areas to pre-construction contours and elevations. The affected areas shall be re-vegetated with native, non-invasive vegetation as necessary to minimize erosion and ensure site stability.

20. **Borrow and Waste:** To ensure that all borrow and waste activities occur on high ground and do not result in the degradation of adjacent waters and wetlands, except as authorized by this permit, the Permittee shall

require its contractors and/or agents to identify all areas to be used as borrow and/or waste sites associated with this project. The Permittee shall provide the U.S. Army Corps of Engineers with appropriate maps indicating the locations of proposed borrow and/or waste sites as soon as such information is available. The Permittee shall submit to the Corps site-specific information needed to ensure that borrow and/or waste sites comply with all applicable Federal requirements, to include compliance with the Endangered Species Act and the National Historic Preservation Act, such as surveys or correspondence with agencies (e.g., the USFWS, the NC-HPO, etc.). The required information shall also include the location of all aquatic features, if any, out to a distance of 400 feet beyond the nearest boundary of the site. The Permittee shall not approve any borrow and/or waste sites before receiving written confirmation from the Corps that the proposed site meets all Federal requirements, whether or not waters of the U.S., including wetlands, are located in the proposed borrow and/or waste site. All delineations of aquatic sites on borrow and/or waste sites shall be verified by the U.S. Army Corps of Engineers and shown on the approved reclamation plans. The Permittee shall ensure that all borrow and/or waste sites comply with Special Condition 3 of this permit. Additionally, the Permittee shall produce and maintain documentation of all borrow and waste sites associated with this project. This documentation will include data regarding soils, vegetation, hydrology, any delineation(s) of aquatic sites, and any jurisdictional determinations made by the Corps to clearly demonstrate compliance with Special Condition 3. All information will be available to the U.S. Army Corps of Engineers upon request. The Permittee shall require its contractors to complete and execute reclamation plans for each borrow and/or waste site and provide written documentation that the reclamation plans have been implemented and all work is completed. This documentation will be provided to the U.S. Army Corps of Engineers within 30 days of the completion of the reclamation work.

21. **Compensatory Mitigation:** In order to compensate for impacts associated with this permit, mitigation shall be provided in accordance with the provisions outlined on the most recent version of the attached Compensatory Mitigation Responsibility Transfer Form. The requirements of this form, including any special conditions listed on this form, are hereby incorporated as special conditions of this permit.

22. **National Historic Preservation Act:** While accomplishing the authorized work, if the Permittees discover any previously unknown cultural

resources, the District Engineer will be immediately notified so that required coordination can be initiated with the North Carolina Division of Natural and Cultural Resources.

23. **Cultural Resources:** NCDOT shall comply with its commitments regarding the following historic properties: James Edgar Broyhill Estate (CW0251 – DE). Specifically, NCDOT shall incorporate conditions agreed to on the Concurrence Form For Assessment Of Effects as updated on March 20, 2018. The conditions include utilization of curb and gutter sections (with 10-foot buffer within existing ROW) to replace previously recommended shoulder section with retaining wall. Median will transition to 22 feet before reaching property, and existing slope adjacent to property will be retained, grassed, and maintained by NCDOT. Existing main entrance to property on US321, including flanking stone posts, will be retained. Existing access to Lenoir Golf Club and Hillhaven Place south of property on US321 will be retained and improved to allow left-over turn.

U.S. ARMY CORPS OF ENGINEERS
Wilmington District
Compensatory Mitigation Responsibility Transfer Form

Permittee: Mr. Philip Harris III/NCDOT **Action ID:** SAW-2006-20748
Project Name: NCDOT-TIP U-4700 **County:** Caldwell

Instructions to Permittee: The Permittee must provide a copy of this form to the Mitigation Sponsor, either an approved Mitigation Bank or the North Carolina Division of Mitigation Services (NCDMS), who will then sign the form to verify the transfer of the mitigation responsibility. Once the Sponsor has signed this form, it is the Permittee's responsibility to ensure that Wilmington District Project Manager identified on page two is in receipt of a signed copy of this form before conducting authorized impacts, unless otherwise specified below. If more than one Mitigation Sponsor will be used to provide the mitigation associated with the permit, or if the impacts and/or the mitigation will occur in more than one 8-digit Hydrologic Unit Code (HUC), multiple forms will be attached to the permit, and the separate forms for each Sponsor and/or HUC must be provided to the appropriate Mitigation Sponsors.

Instructions to Sponsor: The Sponsor verifies that the mitigation requirements (credits) shown below have been released and are available at the identified site. By signing below, the Sponsor is accepting full responsibility for the identified mitigation, regardless of whether they have received payment from the Permittee. Once the form is signed, the Sponsor must update the bank ledger and provide a copy of the signed form and the updated ledger to the Permittee, the Project Manager who issued the permit, the Bank Project Manager, and the District Mitigation Office (see contact information on page 2). The Sponsor must also comply with all reporting requirements established in their authorizing instrument.

Permitted Impacts and Compensatory Mitigation Requirements

Permitted Impacts Requiring Mitigation*: **8-digit HUC and Basin:** 03050101, Catawba River Basin

Stream Impacts (linear feet)			Wetland Impacts (acres)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
100						

*If more than one mitigation sponsor will be used for the permit, only include impacts to be mitigated by this sponsor.

Compensatory Mitigation Requirements: **8-digit HUC and Basin:** 03050101, Catawba River Basin

Stream Mitigation (credits)			Wetland Mitigation (credits)			
Warm	Cool	Cold	Riparian Riverine	Riparian Non-Riverine	Non-Riparian	Coastal
200						

Mitigation Site Debited: DMS
(List the name of the bank to be debited. For umbrella banks, also list the specific site. For NCDMS, list NCDMS. If the NCDMS acceptance letter identifies a specific site, also list the specific site to be debited).

Section to be completed by the Mitigation Sponsor

Statement of Mitigation Liability Acceptance: I, the undersigned, verify that I am authorized to approve mitigation transactions for the Mitigation Sponsor shown below, and I certify that the Sponsor agrees to accept full responsibility for providing the mitigation identified in this document (see the table above), associated with the USACE Permittee and Action ID number shown. I also verify that released credits (and/or advance credits for NCDMS), as approved by the Wilmington District, are currently available at the mitigation site identified above. Further, I understand that if the Sponsor fails to provide the required compensatory mitigation, the USACE Wilmington District Engineer may pursue measures against the Sponsor to ensure compliance associated with the mitigation requirements.

Mitigation Sponsor Name: _____

Name of Sponsor's Authorized Representative: _____

_____ _____
Signature of Sponsor's Authorized Representative **Date of Signature**

USACE Wilmington District
Compensatory Mitigation Responsibility Transfer Form, Page 2

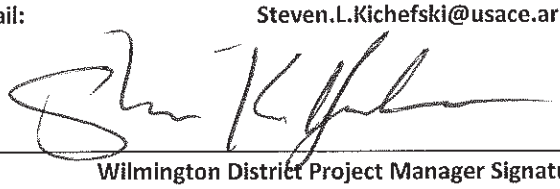
Conditions for Transfer of Compensatory Mitigation Credit:

- Once this document has been signed by the Mitigation Sponsor and the District is in receipt of the signed form, the Permittee is no longer responsible for providing the mitigation identified in this form, though the Permittee remains responsible for any other mitigation requirements stated in the permit conditions.
- Construction within jurisdictional areas authorized by the permit identified on page one of this form can begin only after the District is in receipt of a copy of this document signed by the Sponsor, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein. When NCDMS provides mitigation for authorized impacts conducted by the North Carolina Department of Transportation (NCDOT), construction within jurisdictional areas may proceed upon permit issuance; however, a copy of this form signed by NCDMS must be provided to the District within 30 days of permit issuance. NCDOT remains fully responsible for the mitigation until the District has received this form, confirming that the Sponsor has accepted responsibility for providing the mitigation requirements listed herein.
- Signed copies of this document must be retained by the Permittee, Mitigation Sponsor, and in the USACE administrative records for both the permit and the Bank/ILF Instrument. It is the Permittee's responsibility to ensure that the District Project Manager (address below) is provided with a signed copy of this form.
- If changes are proposed to the type, amount, or location of mitigation after this form has been signed and returned to the District, the Sponsor must obtain case-by-case approval from the District Project Manager and/or North Carolina Interagency Review Team (NCIRT). If approved, higher mitigation ratios may be applied, as per current District guidance and a new version of this form must be completed and included in the District administrative records for both the permit and the Bank/ILF Instrument.

Comments/Additional Conditions: For Phase CB of U-4700 project. Additional mitigation for future phases will be required at the time of final design approval and permit modification of each subsequent phase.

This form is not valid unless signed below by the District Project Manager and by the Mitigation Sponsor on Page 1. ***Once signed, the Sponsor should provide copies of this form along with an updated bank ledger to: 1) the Permittee, 2) the District Project Manager at the address below, 3) the Bank Manager listed in RIBITS, and 4) the Wilmington District Mitigation Office, 3331 Heritage Trade Drive, Suite 105, Wake Forest, NC 27587 (or by email to SAWMIT@usace.army.mil).*** Questions regarding this form or any of the permit conditions may be directed to the District Mitigation Office.

USACE Project Manager: Steve Kichefski
USACE Field Office: Asheville Regulatory Field Office
US Army Corps of Engineers
151 Patton Avenue, Room 208
Asheville, NC 28801-5006
Email: **Steven.L.Kichefski@usace.army.mil**



Wilmington District Project Manager Signature

July 17, 2020
Date of Signature

Current Wilmington District mitigation guidance, including information on mitigation ratios, functional assessments, and mitigation bank location and availability, and credit classifications (including stream temperature and wetland groupings) is available at http://ribits.usace.army.mil.

Biological Opinion

Improvements to US 321 from Hickory to Lenoir
Catawba, Burke, and Caldwell Counties, North Carolina
TIP U-4700

FWS Log # 06-277

Prepared by:

U.S. Fish and Wildlife Service
Asheville Ecological Services Office
160 Zillicoa Street
Asheville, NC 28801

Janet Mizzi, Field Supervisor

7/9/19
Date

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CONSULTATION HISTORY

This section lists key events and correspondence during the course of this consultation. A complete administrative record of this consultation is on file in the U.S. Fish and Wildlife Service's (Service) Asheville Field Office.

In May 2009, Kimley-Horn contacted the Service to discuss species identifications / concurrence due to the potential hybridization of *Hexastylis naniflora* and *H. heterophylla* and *H. minor*.

On June 11, 2009, Tim Bassette, North Carolina Department of Transportation (NCDOT) biologist, sent James Padgett, North Carolina Natural Heritage Program (NCNHP) biologist, an email with the *Hexastylis spp.* floral measurements of the floral samples taken during the field surveys earlier that year, requesting species identification input. Mr. Padgett responded he was unsure if *H. naniflora* and *H. heterophylla* could co-exist in the same population. Mr. Padgett noted that his survey work in Caldwell County uncovered overlapping floral features in the two species, which could suggest hybridization, as did another taxonomist.

On August 25, 2009, Tim Bassette initiated consultation with the Service via email with Service biologist Marella Buncick. The NCDOT requested concurrence with their species identifications for each site, noting concerns with the identification process.

On October 6, 2009, NCDOT biologists Tim Bassette, Jared Gray, and Kris Dramby met with Carolyn Wells and Marella Buncick of the Service's Asheville Field Office to discuss *H. naniflora* identification concerns in the U-4700 project. Confirmation and correction of the *Hexastylis spp.* ratios were returned to the NCDOT shortly thereafter. NCDOT biologist Kris Dramby confirmed a site-by-site *Hexastylis spp.* ratio with Tim Bassette in an email sent on October 15, 2009.

Consultation with the Service continued in March of 2014. On March 4, 2014 Marella Buncick noted that it would be necessary to resurvey the updated project corridor prior to any construction. On March 13, 2014, Tim Bassette and Marella Buncick discussed the need for future surveys and impact assessments.

In July of 2015, Kimley-Horn was contracted to write the Natural Resources Technical Report (NRTR) Addendum. In December of 2015, Kimley-Horn completed the Natural Resources Technical Report (NRTR) Addendum for the U-4700 road-widening project, concluding that the project may affect and was likely to adversely affect dwarf-flowered heartleaf (*H. naniflora*).

In December of 2016, Tim Bassette and Marella Buncick discussed whether updated *H. naniflora* surveys were needed given the age of the initial surveys. The Service felt a resurvey of the project before submittal of a Biological Assessment was needed. Both agreed to ensure that any interchange areas had adequate survey coverage to account for indirect or cumulative effects that might be uncovered during the assessment of adverse effects on the project.

On July 12, 2018, Tim Bassette and Marella Bucick discussed avoidance and minimization efforts and potential measures to address impacts to the *H. naniflora* for the project. A genetic research project to aid in the identification of *H. naniflora*, funded by NCDOT and completed by Appalachian State University, was considered.

On September 20, 2018, during a project planning meeting, Marella Buncick emphasized that the Biological Assessment must analyze for utility impacts. The Service recommended that NCDOT reevaluate places where utility impacts may coincide with known *H. naniflora* sites on the project, noting that NCDOT's 25-foot wide construction impact zone may not be sufficient.

On December 13, 2018, Tim Bassette and Service biologists Claire Ellwanger and Rebekah Reid discussed comments that the resource agency generated from its review of the draft BA. Items discussed include how the Appalachian State University research project would be depicted in the BA, differences between the project study corridor and the environmental baseline, the project's protections associated with Site 44, the exclusion of cumulative effects from compensatory measures, and the inclusion of orange safety fencing or other protective barriers around *H. naniflora* sites during project construction.

On January 28, 2019, The Service received the BA from the Federal Highways Administration (FHWA) immediately following a partial government shut-down.

On April 16, 2019, The Service submitted the draft BO to NCDOT and FHWA.

On April 22, 2019, The Service received comments from The FHWA.

On May 24, 2019, Tim Bassette and Claire Ellwanger discussed NCDOT comments on the draft BO, including whether all of the conservation parcels needed to be purchased before construction started on Section A. Tim Bassette committed to discussing options for right of way acquisition with NCDOT.

On June 6, 2019, NCDOT and Claire Ellwanger discussed the necessary timing of parcel acquisition for segmented projects.

On June 18, 2019, Claire Ellwanger requested that NCDOT provide additional tables clearly specifying for each project section the number of plants impacted and the timing of funding to acquire right of way, as well as identifying for each conservation parcel the corresponding section and date of purchase.

On July 1, 2019, The Service received the revised tables.

On July 9, 2019, The Service submitted the final BO to NCDOT and FHWA, including the tables as an appendix (Appendix II, Table A: Adverse Effects by Section and Timing of Construction, Table B: Acquisition Timing of Beneficial Effects from On-site Preservation of *H. naniflora*).

BIOLOGICAL OPINION

INTRODUCTION

A biological opinion (BO) states the opinion of the U.S. Fish and Wildlife Service (Service) under the Endangered Species Act of 1973, as amended (ESA), as to whether a Federal action is likely to:

- jeopardize the continued existence of species listed as endangered or threatened; or
- result in the destruction or adverse modification of designated critical habitat.

The Federal action addressed in this BO is the Federal Highway Administration's (FHWA) proposed improvements to US 321 from Hickory to Lenoir, (the Action). This BO considers the effects of the Action on *Hexastylis naniflora* (dwarf-flowered heartleaf). The Action does not affect designated critical habitat; therefore, this BO does not further address critical habitat.

A BO evaluates the effects of a Federal action along with those resulting from interrelated and interdependent actions, and from non-Federal actions unrelated to the proposed Action (cumulative effects), relative to the status of listed species and the status of designated critical habitat. A Service opinion that concludes a proposed Federal action is *not* likely to jeopardize species and is *not* likely to destroy or adversely modify critical habitat fulfills the Federal agency's responsibilities under §7(a)(2) of the ESA. In this BO, only the jeopardy definition is relevant, because the Action does not affect designated critical habitat. "*Jeopardize the continued existence*" means to engage in an action that reasonably would be expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02). The basis of our opinion for *H. naniflora* is developed by considering the status of the species, its environmental baseline, the effects of the Action, and cumulative effects.

I. PROPOSED ACTION

The purpose of this action is to reduce congestion on US 321 to achieve an acceptable level of service. The existing four-lane highway experiences congestion and operates at a level of service typically considered unacceptable, as do the majority of the intersections. Traffic projections for the road section predict almost the entire roadway and the majority of intersections will operate at the lowest level of service by 2035.

The proposed action, as defined in the BA, is to widen US 321 to a six-lane median divided facility from just north of US 70 in Hickory, NC to the Southwest Blvd (SR1933) interchange in Lenoir, NC. The length of the widening will extend for approximately 13.5 miles.

The proposed highway will have three NCDOT Typical Section designs. Typical Section 1 design consists of a six-lane highway divided by a 22-foot raised median with a concrete barrier, and curb and gutter in outside lanes. Typical Section 2 design consists of a six-lane highway divided by a 30-foot raised grassed median with curb and gutter in the median and shoulder.

Typical Section 3 design consists of a six-lane divided highway with 30-foot raised grassed median with curb and gutter in median and grassed shoulder.

The merger team initially considered four alternatives for the proposed action during the National Environmental Policy Act (NEPA)/Clean Water Act (CWA) Sections 404-401 merger process (merger). The merger team chose the proposed action as the least environmentally damaging and the most practicable alternative, which is the alternative analyzed in this Opinion. Within the project action area of the preferred alternative, the team took numerous steps to avoid or minimize impacts to *H. naniflora*.

Direct effects will be incurred through the physical disturbance from widening US 321 and a 25 foot buffer around the cut/fill slope to account for temporary access for construction. The preferred alternative for the proposed project will directly impact 13 sites currently occupied by *H. naniflora*. Total adverse effects incurred by this project equate to the permanent loss of approximately 3.394 acres of occupied *H. naniflora* habitat containing an estimated 2,008 *H. naniflora* plants found on all or portions of the 13 sites situated in the action area.

A. Action Area

For purposes of consultation under ESA §7, 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" (50 CFR §402.02).

For the purposes of analysis in this BO, the action area includes the total area encompassed by the limits of disturbance for project construction as well as the areas of project construction, including drainage and construction easements, areas expected to be lost to biological pollution, and interrelated and interdependent actions such as utility relocations (Figure 1). The action area also includes areas outside the project construction limits but that have been proposed as project conservation measures.

B. Interrelated and Interdependent Actions

A BO evaluates the effects of a proposed Federal action. For purposes of consultation under ESA §7, the effects of a Federal action on listed species or critical habitat include the direct and indirect effects of the action, plus the effects of interrelated or interdependent actions. "Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration" (50 CFR §402.02).

We anticipate some adverse effects from the interrelated action of utility relocation. Several Duke energy utilities cross the 13.5 mile long road section, some of which will be moved or redesigned. We discuss these interrelated action effects in detail in Section IV. NCDOT will not undertake any interdependent actions as the US 321 corridor and current road already exist, and no other projects are dependent on this project for their justification.

C. Conservation Measures

Avoidance and Minimization

During the project planning process, the project team selected design alternatives at three intersections that avoided and minimized impacts to *H. naniflora* sites. Initial design alternatives affected an estimated total of 1,042 plants and 3 acres of habitat at the three intersections. The selected alternatives eliminate impacts at two intersections and reduce impacts to 92 affected plants and 0.3 acres at the third intersection. These impacts are included in the total impacts of the proposed action (2,008 plants, 3.394 acres).

The following additional avoidance and minimization measures for *H. naniflora* have been incorporated into the proposed action:

- Selection of 22 and 30-foot medians rather than the 46-foot median typical section
- The inclusion of a retaining wall on the northbound side of US 321 to minimize adverse effects to Population 48.
- Steepened slope stake limits to a 2:1 ratio at Sites 24, 26, 32, 36, 48, and 51 in order to avoid a total of 0.762 acres of habitat and an estimated 787 plants.

Measures to Offset Adverse Effects

NCDOT anticipates an estimated total loss of 3.394 acres of occupied *H. naniflora* habitat and an estimated 2,008 individuals. In order to offset the loss of *H. naniflora*, NCDOT will implement on-site preservation of plants and occupied habitat. NCDOT has also furthered recovery of the species by funding a genetic research project to aid in species delineation.

On-Site Preservation

In order to partially offset the anticipated direct, indirect, and adverse effects from interrelated/interdependent actions, all or portions of Sites 32, 34, 36, and 43 that remain intact after incurring adverse effects from project construction will be purchased through the attainment of additional NCDOT Right of Way (ROW) via fee simple ROW settlement or condemnation. These sites contain only specimens identified as *H. naniflora* to maximize preservation of the species. A form of ROW or Controlled/Access fencing, with access gates, will be placed around the perimeter of the parcels to be protected as an added barrier to outside encroachment (See Appendix I for site maps and Appendix II for NCDOT timeline of acquisition commitments).

NCDOT has committed to monitoring the preserved sites, which will include a plant count, completion of NCNHP rare plant form, and mapping protected areas. The pre-construction survey of each site is provided in the BA, and was conducted in 2018. Additionally, NCDOT committed to three post-construction surveys every two years over six years.

NCDOT estimates 2,737 *H. naniflora* plants and 2.3543 acres of occupied habitat will incur beneficial effects as a result of on-site preservation.

Before construction activities begin at Sites 32, 34, 36, and 43, the portion of occupied *H. naniflora* habitat remaining intact from construction activities will be protected by placing orange safety fencing or otherwise hardened barriers with appropriate signage along the construction limits. The portions of *H. naniflora* sites that are protected will remain on the project's design plans throughout the duration of construction activities and will be labeled on the plans as 'SENSITIVE AREAS'.

Development of molecular and morphological tools to circumscribe and identify Hexastylis naniflora

NCDOT, with the cooperation of the Service and NCNHP, committed to a three-year research project to develop tools to circumscribe and identify *H. naniflora* outside its flowering stage. This research developed morphological and micromorphological characteristics, and microsatellite markers to identify *H. naniflora* and to differentiate members of the target species from congeners and hybrids. With these results, NCDOT anticipates increased efficiency in long-term planning by identifying conservation areas made up of higher densities of *H. naniflora* rather than hybrid species. The development of molecular markers can also be used to potentially identify *H. naniflora* populations throughout the year instead of only during the flowering season, which will enable NCDOT and Service to make decisions earlier in the planning process. NCDOT provided approximately $230,000 in funding to Appalachian State University (ASU) to conduct the research project.

Products of this study include:

- Updated floral and vegetative morphological markers of the Heterophylla subgroup.
- New molecular markers to identify species and hybrids in the Heterophylla subgroup.
- Much better understanding of the genetic structure of *H. naniflora* and congeners.
- Improved comprehension of *H. naniflora* habitat requirements.
- Voucher collections of plant material that can be used in future studies. The collections are housed in appropriate facilities at the ASU Herbarium, and are available to NCDOT biologists for future use or further analysis.
- A final publication of the research results is found in "Sixteen Polymorphic Microsatellite Markers for a Federally Threatened Species, *Hexastylis naniflora* (Aristolochiaceae), and Co-Occurring Congeners" (Hampstead *et al.* 2015).

These results will contribute to recovery efforts and status assessments of this species.

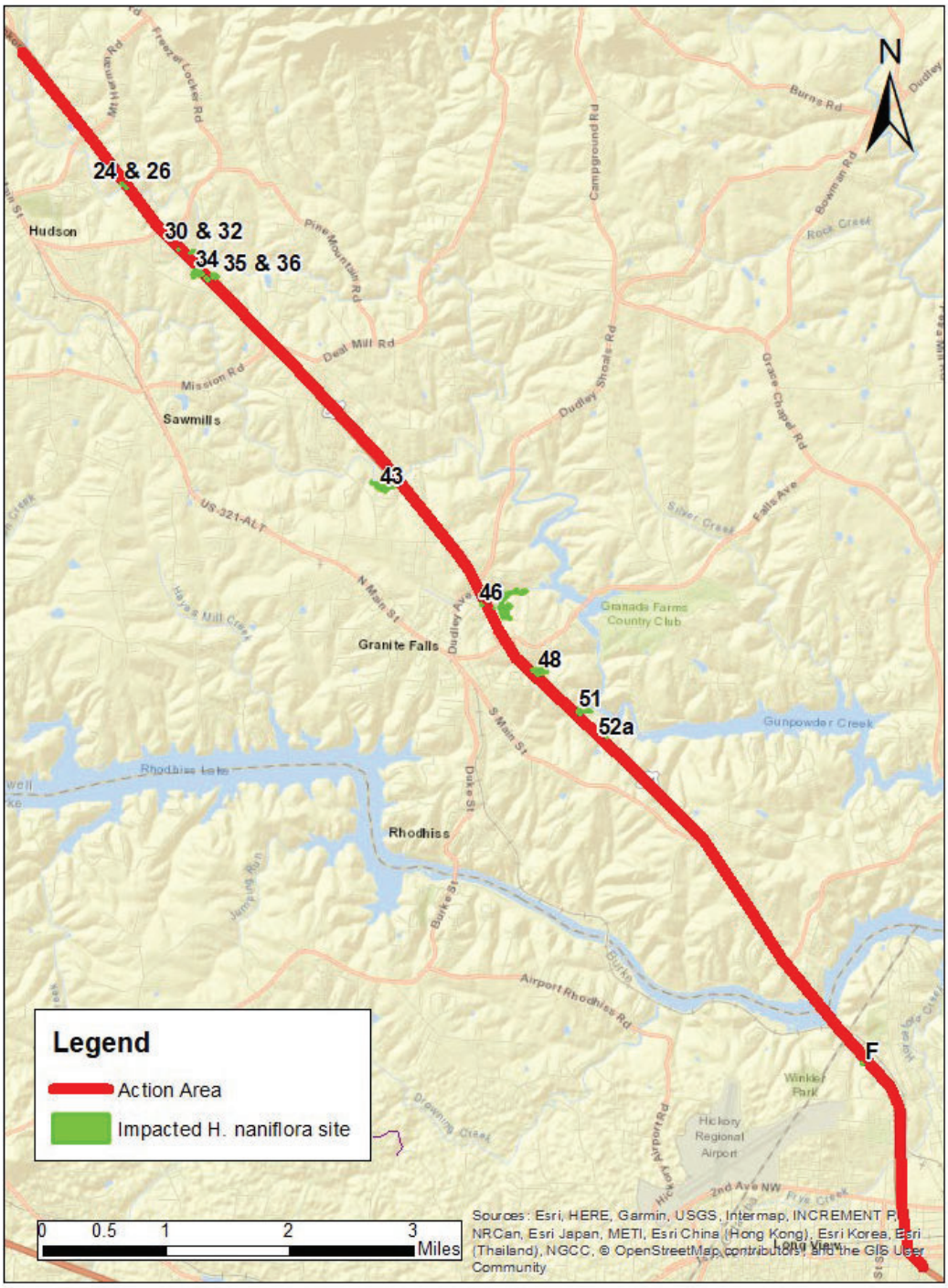

Figure 1. Action Area map of project U-4700, including impacted *H. naniflora* sites and site #.

II. STATUS OF SPECIES

A. Dwarf-flowered heartleaf (*Hexastylis naniflora*)

This section summarizes best available data about the biology and current condition of *Hexastylis naniflora* (dwarf-flowered heartleaf) throughout its range that are relevant to formulating an opinion about the Action. The Service published its decision to list *H. naniflora* as threatened on April, 14, 1989 (Service 1989, 54 FR 14964-14967).

1. Species Description

Hexastylis naniflora was described as a new species in 1957 and was placed in the Virginica subgroup of the *Hexastylis* genus (Blomquist 1957). Leaves are cordate to orbicular-cordate (heart-shaped), supported by long thin petioles that grow from a subsurface rhizome. The leaves are variegated, dark green in color, evergreen, and leathery. The inconspicuous flowers are found near the base of the petioles (Blomquist 1957, Gaddy 1981, Gaddy 1987).

One concern regarding this complex is the inability to distinguish between species without access to fresh flowers. Even with fresh flowers, Blomquist (1957) and Gaddy (1987) still recognized considerable overlap in flower morphology making species delineation difficult.

The Service is not aware of any proposed changes in taxonomy that would affect the continued legal status of *H. naniflora* under the Act. However, within the range of *H. naniflora* there are populations which fall outside of the range of published values for key floral characteristics, overlapping with values described for *H. heterophylla* or *H. minor* (Murrell *et al.* 2007; Gaddy 1987). These geographic areas of overlap in key characters have been the focus of recent genetic analyses (Murrell *et al.* 2007; Renninger 2010; Murrell 2015).

The most outstanding characteristic of this species is the small flowers, which are one of the smallest of any *Hexastylis* species in North America (Blomquist 1957). The plant's heart shaped leaves are dark green in color, evergreen, and leathery, and are supported by long thin petioles from a subsurface rhizome. The shape of the leaf blades, their pattern of variegation, and the ridged reticulation inside the calyx-tube, place this species inside the Virginica group. It differs from all the other members of this group, aside from the small flowers, in having no flare in the calyx-tube. Maximum height rarely exceeds 15 centimeters (cm). The jug-shaped flowers are usually beige to dark brown in color and appear from mid-March to early June. They are small and inconspicuous and are found near the base of the petioles. The fruit matures from mid-May to early July (Blomquist 1957, Gaddy 1980, 1981). Characteristics that distinguish it from other *Hexastylis* species are found in floral structures and pollen characters (Gaddy 1987, Padgett 2004, Niedenberger 2010). *H. naniflora* has a smaller calyx tube orifice, which is typically 5mm or less (sometimes up to 7mm) and the ovary is half-inferior, rather than superior (Blomquist 1957, Gaddy 1987, Padgett 2004). Pollen surface features have also been shown to be an effective character to identify *H. naniflora*, as it has a microporate surface and, unlike any other *Hexastylis* species, lacks gemmae entirely (Padgett 2004, Niedenberger 2010).

2. Life History

Thrips (sucking insects) and flies are the major pollinators of most plant species in the genus *Hexastylis*. The specific pollination method for *H. naniflora* is unknown, but biologists speculate that it may use the same method as related species (Jones *et al.* 2014). With most *Hexastylis* species, the vectors--flies and thrips--spend most of their lives in the plant's flower tissues and feed on pollen grains or on portions of the plant's outer skin. Once the flowers have been fertilized, ants distribute the seeds (Jones *et al.* 2014). These ants eat the coating of the seeds and leave the seeds near the plant site or by the ant nest. Seed germination takes place in the spring after the seeds have been exposed to cool temperatures. Germination in *H. naniflora* generally occurs in clusters. Some flowering *Hexastylis* plants do not reach flowering age for 7 to 10 years. The plant's flowering period is mid-March to early June; fruit production begins in mid- to late May; buds develop in late July and develop by October. In the buds are next spring's flowers, and next year's leaf will not grow until the plant flowers again.

3. Distribution and habitat requirements

Hexastylis naniflora is endemic to the western Piedmont and foothills of North and South Carolina. This herbaceous evergreen is found in moist to rather dry forests along bluffs; boggy areas next to streams and creek heads; and adjacent hillsides, slopes, and ravines. Requiring acidic, sandy loam soils, the species is found in soil series such as Pacolet, Madison, and Musella, among others. Occurrences are generally found on a north facing slope. Undisturbed natural communities such as Piedmont/Coastal Plain Heath Bluff, Dry-Mesic Oak Hickory Forest, and Mesic Mixed Hardwood Forest hold the most viable occurrences. However, less viable remnant occurrences are found in disturbed habitats, including logged, grazed, mown, and residential/commercial developed lands; areas converted to pasture, orchards, and tree plantations; roadside rights-of-way; and on upland slopes surrounding man made ponds or lakes (Service 1989, Schafale and Weakley 1990, NCNHP 2001, Padgett 2004, Service 2011b).

Many of those working with *H. naniflora* have used the terms “sub site”, “site”, “location”, “occurrence” (often, but not always, in reference to Natural Heritage Program Element Occurrence (EO) records), “subpopulation” and “population” interchangeably. Others have aggregated smaller sites into populations according to subjective criteria which have never been explicitly defined. This generates discrepancies among sources with respect to the abundance and distribution of the species, resulting in data usually not comparable from one source to the next.

For the purpose of this BO we used data from the NCNHP database, accessed in 2018. To estimate the total number of populations range-wide we used principle and stand-alone EOs as proxies for populations, in accordance with NCNHP guidelines.

Across its range, *H. naniflora* is known from 119 populations in North and South Carolina (NCNHP 2018). Additionally, NCDOT recorded 35 new sites not yet incorporated into the NCNHP database. Thirty of these sites are within the project area. The NCNHP would likely consider these 30 sites as two or three populations or EOs, with multiple sub-EOs, based on the distances between sites.

When *H. naniflora* was federally listed in 1989, the listing rule described 24 extant and one extirpated "population" (USFWS 1989, 54 FR 14964-14967). According to the 2011 5-year review, as of 2010, the combined databases of the NCNHP and the South Carolina Heritage Trust Program (SCHTP), SC Department of Natural Resources (SCDNR), contained 275 Element Occurrence (EO) Records, roughly depicting 108 locations, which are sufficiently geographically distinct. Therefore, the total number of *H. naniflora* populations increased greater than four times from the time the species was listed in 1989 to 2010 (Service 2011b).

Although dwarf-flowered heartleaf is restricted in range, it is not as rare as once thought (Service 2011a, NCNHP 2018). When dwarf-flowered heartleaf was federally listed in 1989, the listing rule described 24 extant "populations" (and one extirpated population) distributed across eight counties in the upper Piedmont of North and South Carolina. Since 1989, the range has expanded to include five additional counties in North Carolina. In North Carolina, it is found in Alexander, Burke, Caldwell, Catawba, Cleveland, Gaston, Iredell, Lincoln, Polk, and Rutherford Counties. In South Carolina, it is in Cherokee, Greenville, and Spartanburg Counties. As of 2018, the distribution of this species consisted of 119 populations distributed across 13 counties in these two states. We estimate there are over 300,000 *H. naniflora* individuals range-wide (NCNHP 2018).

4. Conservation Needs and Threats

Hexastylis naniflora is threatened by habitat loss due to the conversion of land to residential, commercial, industrial, and agricultural use, timber harvest, hydrological alterations from damming of ponds, cattle grazing, ORV damage, trampling, invasive species, highway and road improvements, and erosion or siltation. The species needs multiple resilient populations across its range to maintain its persistence into the future and to avoid extinction. The Service has not completed a recovery plan for this species.

III. ENVIRONMENTAL BASELINE

This section is an analysis of the effects of past and ongoing human and natural factors leading to the current status of *H. naniflora*, its habitat, and ecosystem within the Action Area. The environmental baseline is a "snapshot" of the species' health in the Action Area at the time of the consultation, and does not include the effects of the Action under review.

A. Status of Species within the Action Area

Survey Information for H. naniflora

2009

Biologists from NCDOT, Kimley-Horn and Mulkey Engineers & Consultants conducted surveys in 2009. Kimley-Horn completed initial habitat assessments, noting potential for *H. naniflora* within *Hexastylis spp*. populations and known *H. naniflora* population locations.

NCDOT biologists assessed habitat within the project corridor and gathered floral samples from *Hexastylis spp.* species for species identification. The NCDOT biologists cataloged the flowers and discerned the species using floral measurements typically used for species ID. Additionally, the biologists flagged site boundaries and conducted plant counts for 18 sites.

On October 6, 2009, NCDOT and Service biologists met to discuss difficulties discerning *Hexastylis* species at several delineated sites within the project corridor. Based on the floral measurements taken from plant specimens sampled at these problem sites, there appeared to either be a mix of *H. naniflora* and *H. heterophylla* (variable-leaf heartleaf) or a hybridization of the two species found concurrently in the same site. The NCDOT and Service agreed that those sites exhibiting a general mix of floral characteristics spread between the two species at a particular site be identified as a mix of 50 percent *H. naniflora* and 50 percent *H. heterophylla* specimens occurring across the entire site. This 50/50 split acts as a reasonable estimate of the number of *H. naniflora* at sites with species identification issues, and those sites can be found in the summary Table 1.

NCDOT initiated a research study with Appalachian State University in response to the species identification issues. The document "Development of molecular and morphological tools to circumscribe and identify the Dwarf-Flowered Heartleaf (*Hexastylis naniflora*)" (Hampstead *et al.* 2015) was a product of this study.

2011

NCDOT biologists surveyed site 44 as part of *H. naniflora* monitoring efforts associated with two conservation easements that protect a portion of the site (NCDOT 2015).

2012

Mulkey Engineers & Consultants' (now CALYX Engineers and Consultants) completed additional surveys in 2012. This work included site boundary delineation and plant counts.

2016

Carolina Ecosystems Inc. biologists conducted the monitoring survey for EO 44. Additionally, NCDOT biologists conducted a habitat assessment and floral sampling in expanded corridor areas of the project.

2017

NCDOT biologists and a Dewberry Consultants biologist delineated the boundaries of additional sites in expanded corridor areas.

2018

McCormick Taylor biologists surveyed the 30 sites found in the project area and delineated their boundaries. Locations of the *H. naniflora* sites are included in the BA (NCDOT 2018, Figures 2-18, Appendix B).

Summary

Within the action area, NCDOT identified 30 *Hexastylis spp.* sites with an estimated 21,953 *H. naniflora* plants, over a total of 25.667 acres. For the 11 of the 30 *Hexastylis* sites that were a mix of *H. naniflora* and *H. spp.,* 50% of the plant count was estimated as *H. naniflora*. Not all of the sites will be directly impacted by the proposed action, which we discuss further in the effects section.

Table 1. 2018 *Hexastylis spp.* site survey summary

Site	***Hexastylis* spp. individuals counted / DFHL individuals estimated**	**Site area (acres)**
22	14/7	0.008
22a (Portion of EO No. 291)	333/167	0.130
24 (Portion of EO No. 291)	17/9	0.055
26 (Portion of EO No. 291)	24/24	0.027
30	11/6	0.024
32	301/301	0.238
34	2205/2205	1.988
35	44/44	0.179
36	817/817	0.511
37	286/143	0.389
38	1615/1615	1.929
39	575/575	1.209
43 (Portion of EO No. 44)	2633/2633	2.632
44 (Portion of EO No. 44)	304/304	0.182
46a	6/6	0.015
46c	4384/2192	3.053
46d	4795/2398	2.393
48	1244/622	2.037
51	2874/1437	1.463
52a	200/100	0.021
52b	4430/2215	1.917
F	27/27	0.033
G (EO No. 313)	2771/2771	2.440
H	83/83	0.625
I (EO No. 314)	620/620	1.557
Ia	13/13	0.076
Ib	6/6	0.030
Ja	72/72	0.175
Jb	531/531	0.309
Total	**31,245/21,953**	**25.667**

IV. EFFECTS OF THE ACTION

This section analyzes the direct and indirect effects of the Action on *H. naniflora*, which includes the direct and indirect effects of interrelated and interdependent actions. Direct effects are caused by the Action and occur at the same time and place. Indirect effects are caused by the Action, but are later in time and reasonably certain to occur.

A. Analysis of the Species Likely to be Affected

For the purposes of this opinion, adverse effects include direct, indirect, and cumulative effects as well as interrelated and interdependent actions. The roadway improvements of NC 321 will incur adverse effects to *H. naniflora* most likely through direct effects from construction activities. Thirty sites that contain *H. naniflora,* an estimated 21,953 individuals, exist within the project area. NCDOT predicts that 13 of these sites will be impacted. Of the estimated 8,231 plants at these sites, NCDOT estimates 2,008 plants and 3.4 acres of habitat will be lost.

B. Factors to be considered

Proximity of the Action - Surveys within the action area conducted by NCDOT and consultants show *H. naniflora* is within the project impact areas and could be directly and indirectly affected.

Nature of the Effect - Habitat of *H. naniflora* will be permanently affected permanently by the road construction activities.

Disturbance duration, frequency, and intensity - Direct and indirect disturbances to the vegetation surrounding the road will occur during construction. Construction activities will likely result in localized compaction and soil disturbance.

C. Analysis of the effects of the action

Our analysis assumed an even distribution of *H. naniflora* plants across each of the sites. Actual spatial distribution of *H. naniflora* plants within each site, as well as the portions of sites within the environmental baseline, may not exactly equate to the conditions defined in this assumption. Given the size and scope of the project, this assumption allowed for an approximation of adverse and beneficial effects, and reduced the amount of time involved in determining effects in the field.

We computed all adverse effects sequentially. Direct effects were determined first, then interrelated/interdependent effects, followed by indirect effects.

If utilities were located parallel to US 321, NCDOT added a 20 foot buffer to account for interrelated effects. If no existing utilities were present, these effects were not assessed. Biological pollution/invasive intrusion indirect effects were then considered. These effects were only considered if the invasive species threat within or around the site was deemed high during the latest population surveys. Invasive species effects were taken out to the NCDOT ROW based on the Service approving this accounting method in previous ESA Section 7 Formal

Consultations for *H. naniflora*. Indirect effects of the extended permanent drainage easement were then included. However, all indirect effects from this impact were within either the interrelated effects from utility relocation or indirect effects from invasive species. Cumulative effects were then accounted for in the effects analysis. This hierarchy allowed us to categorize appropriately how each plant would be affected.

1. Direct effects

Direct construction impacts to *H. naniflora* are primarily associated with where the road will be widened and temporary access is needed for construction. The cut and fill aspects of the construction will result in surface modification, modifying both the current population's range and the possible spread of populations as the aspect is changed. Direct effects will also be incurred in areas where construction machinery access is required, especially in some areas immediately beyond fill slopes, and where temporary work spaces are set up. Direct construction impacts for this project go out to the slope stakes limits plus an additional 25 feet to account for additional unanticipated direct effects including, but not limited to, future adverse effects from mechanized hand clearing activities.

The project will incur direct effects on an estimated 1,151 plants and 1.3 acres of occupied *H. naniflora* habitat. All or portions of 13 of the 30 sites within the project area will incur adverse effects. The direct effects are depicted in a summary table of effects (Table 2).

2. Indirect effects

Examples of indirect effects from this project include, but are not limited to, drainage impacts occurring over time from construction activities as well as encroachment of non-native, invasive plant species that may be found adjoining or within the sites. Newly installed drainage structures will alter hydrology, which will affect habitat viability. However, only site 46 has a permanent drainage easement that extends farther than the interrelated effects of utility relocation, and is therefore the only site with indirect effects due to altered hydrology. We anticipate invasive plant intrusion from this project, however, only one site with a high threat level is close enough to the project to be affected. However, we already accounted for the loss of this site through utility relocations. Therefore, no sites will incur indirect effects due to invasive plant intrusion.

Qualitative analyses of the probable development patterns in the Future Land Use Study Area (FLUSA) suggested that the project would not have a notable indirect effect on land use in the FLUSA. Although we expect growth and development within the project corridor, there is little divergence between the Build and No-Build scenarios (NCDOT 2018).

The project will incur indirect effects on an estimated two *H. naniflora* plants and 0.004 acres of occupied habitat at site 46 due to altered hydrology (effects depicted in Table 2).

3. Interrelated and Interdependent Actions

An interrelated activity is defined as an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is defined as an activity

that has no independent utility apart from the action under consultation (Service and National Marine Fisheries Service (NMFS) 1998).

Due to the extensive nature of the project, some adverse effects are anticipated as a result of interrelated actions. No interdependent actions will be undertaken as the US 321 corridor and current road already exist, and no other projects are completely dependent on this project for their justification.

The proposed project corridor spans for 13.5 miles, along which several Duke Energy utilities pass both under and overhead. Some of these lines may need to be moved or redesigned. Rachel Nance of McCormick Taylor contacted Duke Energy on June 26, 2018 and spoke with Dennis Popp, Distribution Engineer, who stated they cannot assess what may need to be altered or moved until they have a final set of plans from the NCDOT. Many of the utility corridors running parallel to the roadway overlap with *H. naniflora* sites in the project's environmental baseline, including Sites 24, 26, 32, 34, 35, 51, and 52a.

The project will incur adverse effects from interrelated actions on an estimated 294 *H. naniflora* plants and 0.2436 acres of occupied habitat. All or portions of seven sites will incur effects from such actions (Table 2).

4. Cumulative effects

Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action areas considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require a separate consultation pursuant to section 7 of the Act.

Projects in the planning or permitting stages along the corridor were also investigated. The Town Planner from the Town of Granite Falls, Greg Wilson, stated a private individual has a site plan approved by NCDOT for a 66-unit apartment complex on a 16-acre lot (Caldwell County Parcel ID 08 16 1 6) directly adjacent to US 321. Mr. Wilson stated the parcel slated for construction contains almost the entirety of Site 48. This project also includes multifamily sidewalks and a possible connector to Woodland Street Extension, showing a high likelihood of construction encompassing the totality of the parcel (personal communication via Greg Wilson on June 28, 2018).

Other new residential development is expected to occur in areas where land is available and zoned for residential development through the planning period to 2035. Non-residential development has occurred primarily along the US 321 corridor with concentrations of commercial/retail development at major intersections within the city limits in areas zoned for commercial, industrial and office development. Commercial nodes are expected at the following interchanges: 13th Street SW, Southwest Boulevard, Clement Boulevard, Connelly Springs Road, and US 64. These areas are zoned for commercial business or highway commercial uses.

From this analysis, it was determined the project is reasonably certain to incur cumulative effects

on an estimated 561 *H. naniflora* plants and 1.8375 acres of occupied *H. naniflora* habitat. The portion of Site 48 found on Caldwell County Parcel ID 08 16 1 6, that is not already proposed to be lost to adverse direct effects, effects from interrelated/interdependent actions, and/or indirect effects, is the only site anticipated to incur this type of effect (Table 2).

Table 2. Summary of Adverse Effects

Site	Site area (ac.)	Estimated Number of *H. naniflora* Plants	Direct Effects		Interrelated Effects		Indirect Effects		Cumulative Effects		Total Adverse Effects to *H. naniflora*	
			Area (ac.)	Estimated Plants	Area (ac.)	Estimated Plants	Area (ac.)	Estimated Plants	Area (ac.)	Estimated Plants	Area (ac.)	Estimated Plants
24 (EO No. 291)	0.0202	3	0.0004	1	0.0198	3	0	0	0	0	0.0202	4
26 (EO No. 291)	0.0267	24	0.0252	23	0.0016	1	0	0	0	0	0.0267	24
30	0.0241	6	0.0241	6	0	0	0	0	0	0	0.0241	6
32	0.2363	299	0.0011	1	0.0055	7	0	0	0	0	0.0066	8
34	1.3564	1504	0.5036	559	0.2005	222	0	0	0	0	0.7041	781
35	0.1791	44	0.1782	43	0.0009	1	0	0	0	0	0.1791	44
36	0.5112	817	0.0926	148	0	0	0	0	0	0	0.0926	148
43 (EO No. 44)	1.0663	1066	0.0126	13	0	0	0	0	0	0	0.0126	13
46	0.0138	6	0.0098	4	0	0	0.0040	2	0	0	0.0138	6
48	2.0370	622	0.1995	61	0	0	0	0	1.837	561	2.0370	622
51	0.2562	252	0.2529	249	0.0033	3	0	0	0	0	0.2562	252
52a	0.0208	99	0.0088	42	0.0120	57	0	0	0	0	0.0208	99
F	0.0001	1	0.0001	1	0	0	0	0	0	0	0.0001	1
Total	**5.7482**	**4743**	**1.3089**	**1151**	**0.2436**	**294**	**0.0040**	**2**	**1.837**	**561**	**3.394**	**2008**

5. Conclusion

Hexastylis naniflora is known from 119 populations in North and South Carolina. This project will only impact two known element occurrences at three of the 13 distinct sites. The project will not significantly impact the viability of any previously known populations. The impacted project sites include an estimated 4,743 *H. naniflora* individuals and 5.7482 acres of occupied *H. naniflora* habitat. Adverse effects from this project will incur a loss of 3.394 acres of occupied *H. naniflora* habitat containing an estimated 2,008 *H. naniflora* individuals from the impacted sites. We estimate there are over 300,000 *H. naniflora* individuals worldwide. This loss is approximately 0.6% percent of the known individuals and is, therefore, not likely to appreciably reduce the likelihood of the survival or recovery of the species. The project will benefit the species through the on-site preservation of an estimated 2,737 individuals of *H. naniflora* on 2.3543 acres of occupied *H. naniflora* habitat.

After reviewing the current status of the species, the environmental baseline for the Action Area, the effects of the Action and the cumulative effects, it is the Service's biological opinion that the Action is not likely to jeopardize the continued existence of *Hexastylis naniflora*. No critical habitat has been designated for this species; therefore, none will be affected.

V. 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 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 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, which 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. ·

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, section 9(a)(2)(B) provides limited protection to listed plants from take to the extent that the Act prohibits the removal and reduction to possession of federally listed endangered plants or the malicious damage to such plants on areas under Federal jurisdiction or the destruction of endangered plants on non-Federal areas in violation of state law or regulation or in the course of any violation of a state criminal trespass law. Therefore, for this Opinion, incidental take does not apply; and an incidental take statement is not necessary.

VI. CONSERVATION RECOMMENDATIONS

Section 7(a)(l) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid the adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. We request that the following conservation recommendations be implemented by the FHWA and NCDOT as part of the project plan:

A. Install brightly colored fencing (construction fence) where *H. naniflora* plants occur and the remainder of the site will be preserved (Sites 32, 34, 36 and 43) as well as sites we estimate to contain 50% *H. naniflora* where not all *Hexastylis* will be impacted. Fencing is recommended as it can easily be seen by equipment operators

and ground crews during clearing activities. The fencing makes an easily-visible marker so any construction and clearing crews know the boundaries in order to keep from causing additional/undocumented impacts to *H. naniflora* populations.

B. Conduct a preconstruction meeting with project contractors to ensure site crews understand the reason for the construction fencing and the importance of working within the bounds of the fencing.

The FHWA and NCDOT, will purchase the parcels that make up the remainder of Sites 32, 34, 36, and 43 (See Appendix II for NCDOT timeline of acquisition commitments). The NCDOT has committed to the preservation of these four *H. naniflora* sites in perpetuity and will monitor these sites, which indicate the NCDOT and FHWA's continued support of *H. naniflora* conservation and their commitment to recovery of the species.

In order to ensure the protection and status of *H. naniflora* at these four sites, the NCDOT has agreed to quantitatively and qualitatively monitor the specimens and the occupied habitat of the entire occurrence. Monitoring efforts will follow the methods outlined in the conservation measures section. The Service formally acknowledges the NCDOT and FHWA's preservation and monitoring of the sites and the protection of an estimated 2,737 individual *H. naniflora* plants. Further, the Service commends the NCDOT and FHWA for pursuing this opportunity and recommends these types of actions when feasible. In order for us to be kept informed about actions that minimize or avoid adverse effects or that benefit listed species or their habitats, we request notification of the implementation of any conservation recommendations.

We encourage NCDOT to purchase the parcel adjacent to site 34, which will only increase the benefit to the species.

The Wallace and Church Conservation Easements encompass site 44 and protect it by prohibiting all future development. This easement was intended to offset the loss of an estimated 324 *H. naniflora* plants from construction of bridge No. 84 over Little Gunpowder Creek on SR 1108. We recommend that NCDOT work with Duke Energy to ensure site 44 is protected in perpetuity, as intended by the purchase of conservation easements in 2010.

VII. REINITIATION NOTICE

This concludes formal consultation on the action outlined in your January 28, 2019 request for formal consultation. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over an 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 that was not considered in this Opinion, or (4) a new species is listed or critical habitat is designated that may be affected by the action.

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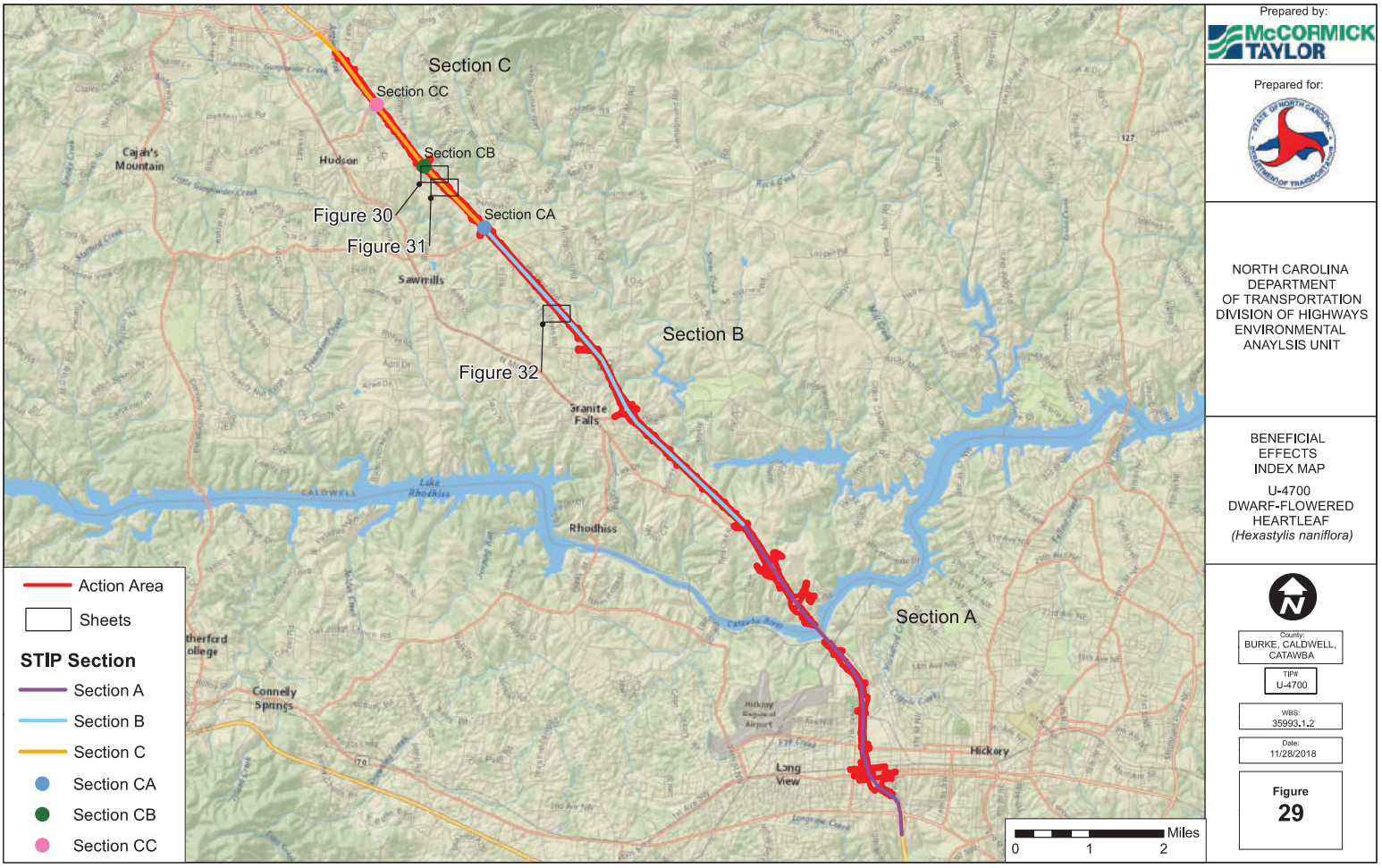
Appendix I – Beneficial effects site maps
(NCDOT 2018)



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Prepared for:

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENVIRONMENTAL
ANAYLSIS UNIT

BENEFICIAL
EFFECTS
INDEX MAP

U-4700
DWARF-FLOWERED
HEARTLEAF
(Hexastylis naniflora)

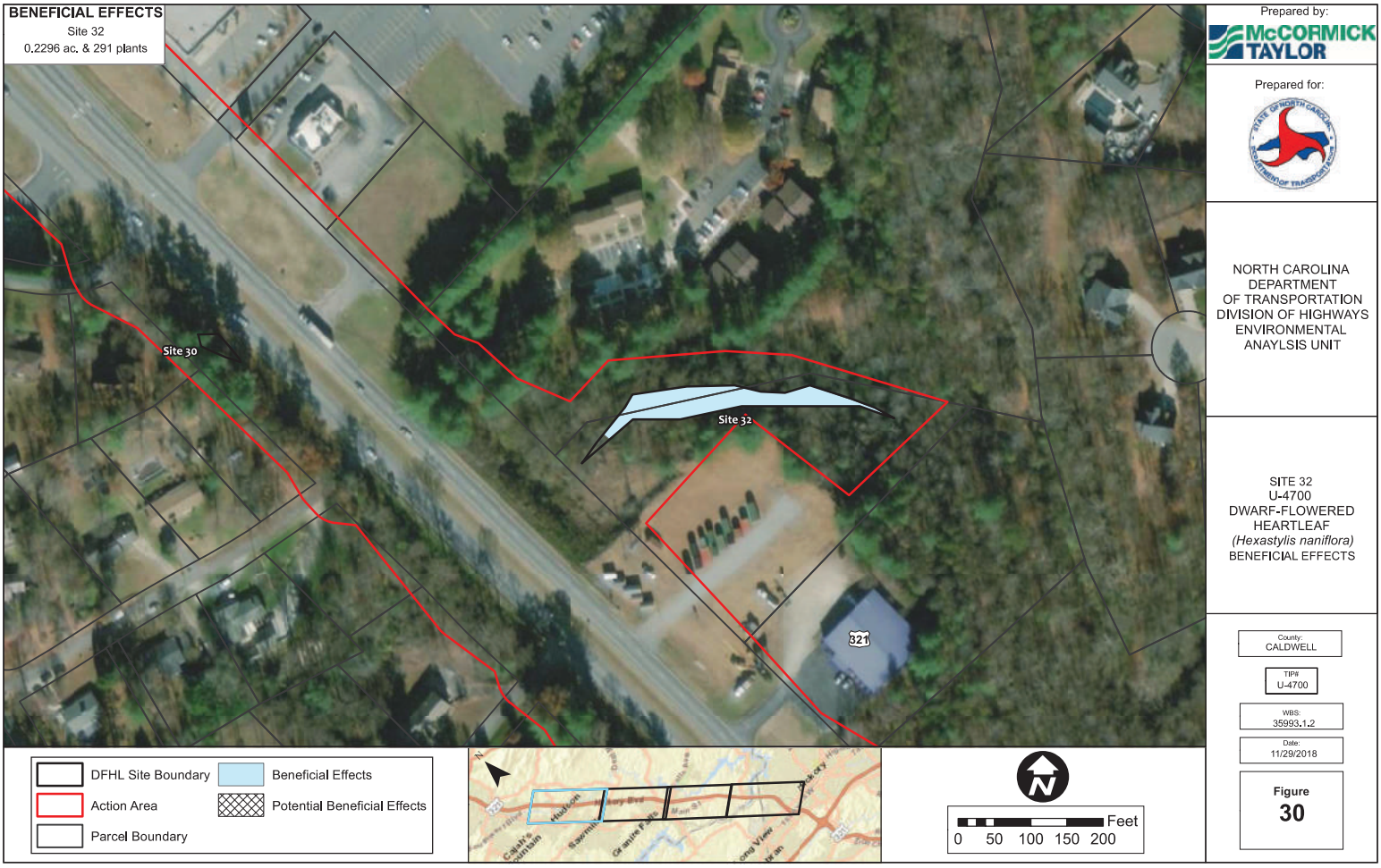
County:
BURKE, CALDWELL, CATAWBA

TIP#
U-4700

WBS:
35993.1.2

Date:
11/28/2018

Figure
29


BENEFICIAL EFFECTS
Site 32
0.2296 ac. & 291 plants
Site 30
Site 32
321
DFHL Site Boundary
Action Area
Parcel Boundary
Beneficial Effects
Potential Beneficial Effects
Feet
0 50 100 150 200
Prepared by:
McCORMICK TAYLOR
Prepared for:
NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENVIRONMENTAL
ANAYLSIS UNIT
SITE 32
U-4700
DWARF-FLOWERED
HEARTLEAF
(Hexastylis naniflora)
BENEFICIAL EFFECTS
County:
CALDWELL
TIP#
U-4700
WBS:
35993.1.2
Date:
11/29/2018
Figure
30

Prepared by:
McCORMICK TAYLOR

Prepared for:

NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENVIRONMENTAL
ANAYLSIS UNIT

SITE 34 & 36
U-4700
DWARF-FLOWERED
HEARTLEAF
(Hexastylis naniflora)
BENEFICIAL EFFECTS

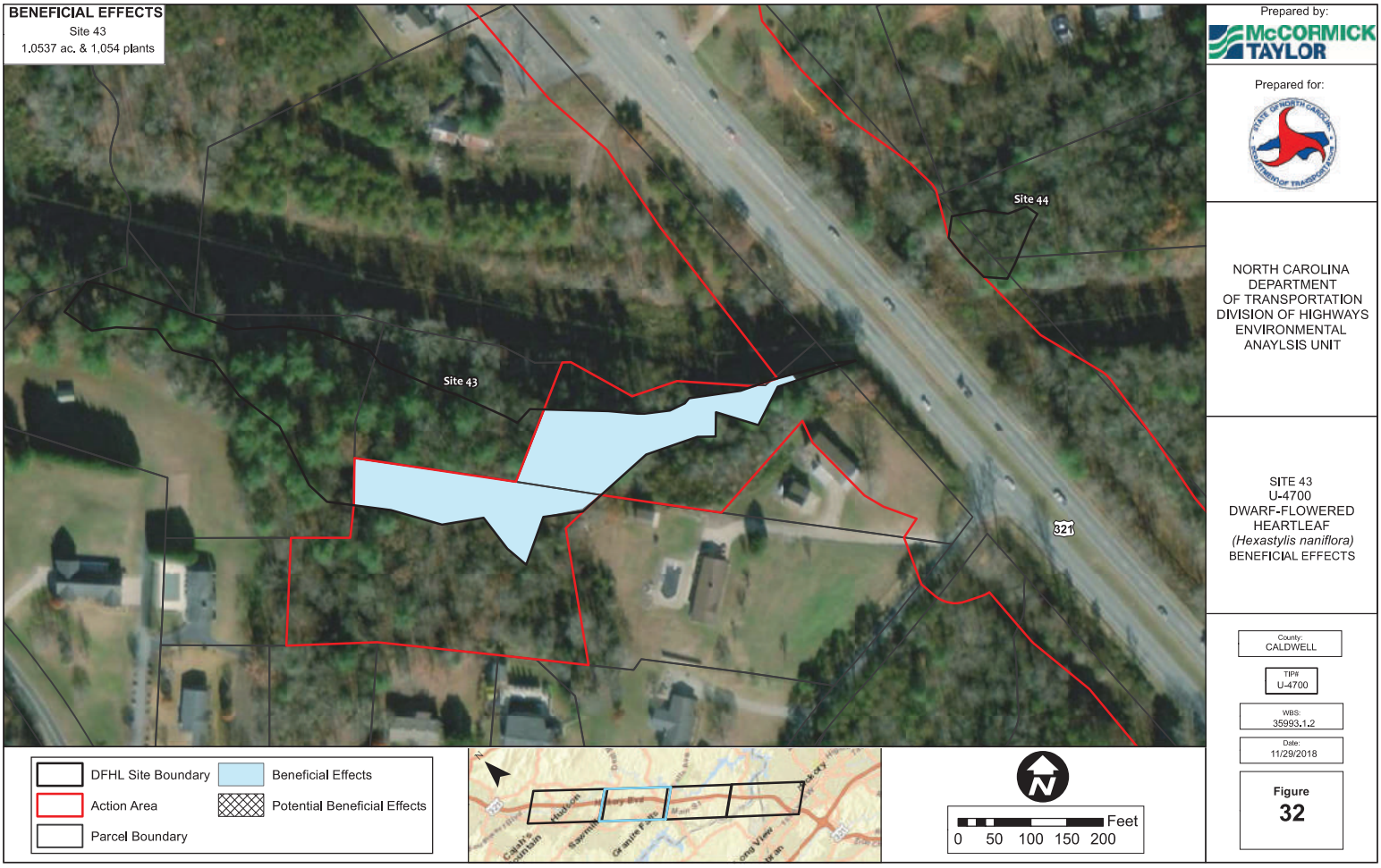
County:
CALDWELL

TIP#
U-4700

WBS:
35993.1.2

Date:
11/29/2018

Figure
31


BENEFICIAL EFFECTS
Site 43
1.0537 ac. & 1,054 plants
Site 44
Site 43
321
DFHL Site Boundary
Action Area
Parcel Boundary
Beneficial Effects
Potential Beneficial Effects
Feet
0 50 100 150 200
Prepared by:
McCORMICK TAYLOR
Prepared for:
NORTH CAROLINA
DEPARTMENT
OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENVIRONMENTAL
ANAYLSIS UNIT
SITE 43
U-4700
DWARF-FLOWERED
HEARTLEAF
(Hexastylis naniflora)
BENEFICIAL EFFECTS
County:
CALDWELL
TIP#
U-4700
WBS:
35993.1.2
Date:
11/29/2018
Figure
32

Appendix II - NCDOT timeline of parcel acquisition commitments

Table A. Adverse Effects by Section and Timing of Construction

Section	Location Description	Length (miles)	Section Date	Potential Number of Plants Incurring Adverse Effects
Section A	US 70 to US 321A	4.6	Right of way – 9/30/2019 Let – 8/17/2021	0 - *Revised from original BA.*
Section B	US 321A to Mission Road	5.4	Currently unfunded, earliest it could be funded is the 2022-2031 STIP	992
Section C	Mission Road to Southwest Blvd	3.5	Currently unfunded, earliest it could be funded is the 2022-2031 STIP	1,001
Section CA	US 321/Mount Herman Road intersection	N/A	Right of way – 1/18/2019 Let – 6/18/2019	0
Section CB	US 321/Pine Mountain Road intersection	N/A	Right of way – 1/18/2019 Let – 6/18/2019	14
Section CC	US 321/Mission Road intersection	N/A	Right of way – 1/18/2019 Let – 6/18/2019	0

Table B. Acquisition Timing of Beneficial Effects from On-site Preservation of *H. naniflora*

Site	Parcel ID	Occupied *H. naniflora* Habitat Preserved (Ac)	Estimated H. naniflora Plants Preserved	Section & Date of purchase
32	03 91 1 12, 03 91 1 1	0.2296	291	CB – Can purchase as of 1/18/2019
34	03113 1 11, 03113 1 12, 03113 1 13, 03 46 1 15, N/A (NCDOT)	0.6523	723	C - Currently unfunded, NCDOT will re-survey before purchasing parcel when funds are available.
36	03 91 1 5, N/A (NCDOT)	0.4186	669	C - Currently unfunded, NCDOT will re-survey before purchasing parcel when funds are available.
43	08 51 1 34, 08 51 1 3A, 08 51 1 17, 08 51 1 18, 08 51 1 19, N/A (NCDOT)	1.0537	1054	B - Currently unfunded, NCDOT will re-survey before purchasing parcel when funds are available.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

April 3, 2019

Mr. Philip S. Harris, III, P.E., CPM
Natural Environment Section Head
Project Development and Environmental Analysis
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina, 27699-1598

Subject: 401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS for proposed widening of US 321 from north of US 70 interchange to Southwest Blvd. (SR 1933) interchange in Catawba, Burke, and Caldwell Counties. Federal Aid Project No. NHG-032(25); Division 11, 12, and 13; TIP No. U-4700; WBS 35993.1.2.
NCDWR Project No. 20190061

Dear Mr. Harris:

Attached hereto is a copy of Certification No. WQC004182 issued to The North Carolina Department of Transportation (NCDOT) dated April 2, 2019.

If we can be of further assistance, do not hesitate to contact us.

Sincerely,

Linda Culpepper, Director
Division of Water Resources

Attachments

Electronic copy only distribution:
Steve Kichefski, US Army Corps of Engineers, Asheville Field Office
Heath Slaughter, Division 11 Environmental Officer
Carla Dagnino, NC Department of Transportation
Chris Militscher, US Environmental Protection Agency
Claire Ellwanger, US Fish and Wildlife Service
Marla Chambers, NC Wildlife Resources Commission
Beth Harmon, Division of Mitigation Services
File Copy

401 Water Quality Certification Pursuant to Section 401 of the Federal Clean Water Act with ADDITIONAL CONDITIONS

THIS CERTIFICATION is issued in conformity with the requirements of Section 401 Public Laws 92-500 and 95-217 of the United States and subject to the North Carolina Division of Water Resources (NCDWR) Regulations in 15 NCAC 2H .0500. This certification authorizes the NCDOT to permanently impact 0.7 acre of jurisdictional wetlands and 5,950 linear feet of jurisdictional streams, and temporarily impact 15 linear feet of streams. The project occurs in Catawba, Burke, and Caldwell Counties. The project shall be constructed pursuant to the application dated received December 20, 2018. The authorized impacts (Final and Preliminary) are as described below in Tables 1 and 2.

Table 1. Stream Impacts in the Catawba River Basin for entire U-4700 project.

Section	Design Stage	Impact (Fill) Type and Length (linear feet)		Stream Impacts Requiring Mitigation (linear ft)
		Permanent	Temporary	
U-4700A	Preliminary	1,795	-	1,795*
U-4700B	Preliminary	3,055	-	3,055*
U-4700C	Preliminary	1,000	-	1,000*
U-4700CA	Final	-	-	-
U-4700CB	Final	100	15	100*
U-4700CC	Final	-	-	-
Total	-	**5,950**	**15**	**5,950**

* Mitigation required by US Army Corps of Engineers. Portions of preliminary impacts may require mitigation by NCDWR once permanent impacts are determined later.

Table 2. Wetland Impacts in the Catawba River Basin for entire U-4700 project.

Section	Design Stage	Wetland Impact Type	Impacts (ac)	Impacts Requiring Mitigation (ac)
U-4700A	Preliminary	Permanent Fill	0.1	0.1*
U-4700B	Preliminary	Permanent Fill	0.2	0.2*
U-4700C	Preliminary	Permanent Fill	0.4	0.4*
U-4700CA	Final	Permanent Fill	0	0
U-4700CB	Final	Permanent Fill	0	0
U-4700CC	Final	Permanent Fill	0	0
Totals			**0.7**	**0.7***

* Mitigation required by US Army Corps of Engineers.

Table 3. Stream Impacts in the Catawba River Basin for the U-4700CB Section.

Site	Permanent Fill in Perennial Stream (linear ft)	Temporary Fill in Perennial Stream (linear ft)	Total Stream Impact (linear ft)	Stream Impacts Requiring Mitigation (linear ft)
1	32	5	37	-
2	68	10	78	-
Totals	**100**	**15**	**115**	**0**

Total Stream Impacts for this Section 115 linear feet.

The application provides adequate assurance that the discharge of fill material into the waters of the Catawba River Basin in conjunction with the proposed development will not result in a violation of applicable Water Quality Standards and discharge guidelines. Therefore, the State of North Carolina certifies that this activity will not violate the applicable portions of Sections 301, 302, 303, 306, 307 of PL 92-500 and PL 95-217 if conducted in accordance with the application and conditions hereinafter set forth.

This approval is only valid for the purpose and design that you submitted in your application dated received December 20, 2018. Should your project change, you are required to notify the NCDWR and submit a new application. If the property is sold, the new owner must be given a copy of this Certification and approval letter and is thereby responsible for complying with all the conditions. If any additional wetland impacts, or stream impacts, for this project (now or in the future) exceed one acre or 300 linear feet, respectively, additional compensatory mitigation may be required as described in 15A NCAC 2H .0506 (h) (6) and (7). For this approval to remain valid, you are required to comply with all the conditions listed below. In addition, you should obtain all other federal, state or local permits before proceeding with your project including (but not limited to) Sediment and Erosion control, Coastal Stormwater, Non-discharge and Water Supply watershed regulations. This Certification shall expire on the same day as the expiration date of the corresponding Corps of Engineers Permit.

Specific Condition of Certification:

1. When final design plans are completed for U-4700A, B and C, a modification to the 401 Water Quality Certification shall be submitted with five copies and fees to the NC Division of Water Resources. Final designs shall reflect all appropriate avoidance, minimization, and mitigation for impacts to wetlands, streams, other surface waters and buffers if applicable. No construction activities that impact any wetlands, streams, surface waters located in U-4700A, B and C shall begin until after the permittee applies for and receives a written modification of the 401 Water Quality Certification and from the NC Division of Water Resources. [15A NCAC 02H. 0506(b)]

General Conditions of Certification:

1. Design and placement of culverts, other structures (including culvert extensions) and temporary erosion control measures shall not be conducted in a manner that may result in dis-equilibrium of wetlands or streambeds or banks, adjacent to or upstream and downstream of the above structures. The applicant is required to provide evidence that the equilibrium is being maintained if requested in writing by NCDWR. If this condition is unable to be met due to bedrock or other limiting features encountered during construction, please contact NCDWR for guidance on how to proceed and to determine whether a permit modification will be required. [15A NCAC 02H.0506(b)(2)]

2. If concrete is used during construction, a dry work area shall be maintained to prevent direct contact between curing concrete and stream water. Water that inadvertently contacts uncured concrete shall not be discharged to surface waters due to the potential for elevated pH and possible aquatic life and fish kills. [15A NCAC 02B.0200]

3. During the construction of the project, no staging of equipment of any kind is permitted in waters of the U.S., or protected riparian buffers. [15A NCAC 02H.0506(b)(2)]

4. The dimension, pattern and profile of the stream above and below the crossing shall not be modified. Disturbed floodplains and streams shall be restored to natural geomorphic conditions. [15A NCAC 02H.0506(b)(2)]

5. The use of rip-rap above the Normal High Water Mark shall be minimized. Any rip-rap placed for stream stabilization shall be placed in stream channels in such a manner that it does not impede aquatic life passage. [15A NCAC 02H.0506(b)(2)]

6. The Permittee shall ensure that the final design drawings adhere to the permit and to the permit drawings submitted for approval. [15A NCAC 02H .0507 (c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

7. All work in or adjacent to stream waters shall be conducted in a dry work area. Approved BMP measures from the most current version of NCDOT Construction and Maintenance Activities manual such as sandbags, rock berms, cofferdams and other diversion structures shall be used to prevent excavation in flowing water. [15A NCAC 02H.0506(b)(3) and (c)(3)]

8. Heavy equipment shall be operated from the banks rather than in the stream channel in order to minimize sedimentation and reduce the introduction of other pollutants into the stream. [15A NCAC 02H.0506(b)(3)]

9. All mechanized equipment operated near surface waters must be regularly inspected and maintained to prevent contamination of stream waters from fuels, lubricants, hydraulic fluids, or other toxic materials. [15A NCAC 02H.0506(b)(3)]

10. No rock, sand or other materials shall be dredged from the stream channel except where authorized by this certification. [15A NCAC 02H.0506(b)(3)]

11. Discharging hydroseed mixtures and washing out hydroseeders and other equipment in or adjacent to surface waters is prohibited. [15A NCAC 02H.0506(b)(3)]

12. When applicable, all construction activities shall be performed and maintained in full compliance with G.S. Chapter 113A Article 4 (Sediment and Pollution Control Act of 1973). Regardless of applicability of the Sediment and Pollution Control Act, all projects shall incorporate appropriate Best Management Practices for the control of sediment and erosion so that no violations of state water quality standards, statutes, or rules occur. [15A NCAC 02H .0506{b)(3) and (c)(3) and 15A NCAC 02B .0200]

13. Design, installation, operation, and maintenance of all sediment and erosion control measures shall be equal to or exceed the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual,* or for linear transportation projects, the *NCDOT Sediment and Erosion Control Manual.*

14. All devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) sites, including contractor-owned or leased borrow pits associated with the project. Sufficient materials required for stabilization and/or repair of erosion control measures and stormwater routing and treatment shall be on site at all times.

15. For borrow pit sites, the erosion and sediment control measures shall be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual.* Reclamation measures and implementation shall comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act and the Mining Act of 1971.

16. If the project occurs in waters or watersheds classified as Primary Nursery Areas (PNAs), SA, WS-1, WS-11, High Quality Waters (HQW), or Outstanding Resource Waters (ORW), then the sedimentation and erosion control designs shall comply with the requirements set forth in 15A NCAC 04B .0124, *Design Standards in Sensitive Watershed.* [15A NCAC 02H.0506(b)(3) and (c)(3); GC 4135]

17. The permittee and its authorized agents shall conduct its activities in a manner consistent with State water quality standards (including any requirements resulting from compliance with §303(d) of the Clean Water Act) and any other appropriate requirements of State and Federal law. If the NCDWR determines that such standards or laws are not being met (including the failure to sustain a designated or achieved use) or that State or federal law is being violated, or that further conditions are necessary to assure compliance, the NCDWR may reevaluate and modify this certification. [15A NCAC 02B.0200]

18. All fill slopes located in jurisdictional wetlands shall be placed at slopes no flatter than 3:1, unless otherwise authorized by this certification. [15A NCAC 02H.0506(b)(2)]

19. A copy of this Water Quality Certification shall be maintained on the construction site at all times. In addition, the Water Quality Certification and all subsequent modifications, if any, shall be maintained with the Division Engineer and the on-site project manager. [15A NCAC 02H .0507(c) and 15A NCAC 02H .0506 (b)(2) and (c)(2)]

20. The outside buffer, wetland or water boundary located within the construction corridor approved by this authorization, including all non-commercial borrow and waste sites associated with the project, shall be clearly marked by highly visible fencing prior to any land disturbing activities. Impacts to areas within the fencing are prohibited unless otherwise authorized by this certification. [15A NCAC 02H.0501 and .0502]

21. The issuance of this certification does not exempt the Permittee from complying with any and all statutes, rules, regulations, or ordinances that may be imposed by other government agencies (i.e. local, state, and federal) having jurisdiction, including but not limited to applicable buffer rules, stormwater management rules, soil erosion and sedimentation control requirements, etc.

22. The Permittee shall report any violations of this certification to the Division of Water Resources within 24 hours of discovery. [15A NCAC 02B.0506(b)(2)]

23. Upon completion of the project (including any impacts at associated borrow or waste sites), the NCDOT Division Engineer (or appointee) shall complete and return the enclosed "Certification of Completion Form" to notify the NCDWR when all work included in the 401 Certification has been completed. [15A NCAC 02H.0502(f)]

24. Native riparian vegetation must be reestablished in the riparian areas within the construction limits of the project by the end of the growing season following completion of construction. [15A NCAC 02B.0506(b)(2)]

25. There shall be no excavation from, or waste disposal into, jurisdictional wetlands or waters associated with this permit without appropriate modification. Should waste or borrow sites, or access roads to waste or borrow sites, be located in wetlands or streams, compensatory mitigation will be required since that is a direct impact from road construction activities. [15A NCAC 02H.0506(b)(3) and (c)(3)

26. Sediment and erosion control measures shall not be placed in wetlands or surface waters without prior approval from DWR. [15A NCAC 02H.0506(b)(3) and (c)(3)]

27. Erosion and sediment control practices must be in full compliance with all specifications governing the proper design, installation and operation and maintenance of such Best Management Practices to protect surface waters standards [15A NCAC 02H.0506(b)(3) and (c)(3):

    a. The erosion and sediment control measures for the project must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Sediment and Erosion Control Planning and Design Manual*.
    b. The design, installation, operation, and maintenance of the sediment and erosion control measures must be such that they equal, or exceed, the requirements specified in the most recent version of the *North Carolina Sediment and Erosion Control Manual*. The devices shall be maintained on all construction sites, borrow sites, and waste pile (spoil) projects, including contractor-owned or leased borrow pits associated with the project.

c. For borrow pit sites, the erosion and sediment control measures must be designed, installed, operated, and maintained in accordance with the most recent version of the *North Carolina Surface Mining Manual*.
d. The reclamation measures and implementation must comply with the reclamation in accordance with the requirements of the Sedimentation Pollution Control Act.

Violations of any condition herein set forth may result in revocation of this Certification and may result in criminal and/or civil penalties. This Certification shall become null and void unless the above conditions are made conditions of the Federal 404 and/or Coastal Area Management Act Permit. This Certification shall expire upon the expiration of the 404 or CAMA permit.

If you wish to contest any statement in the attached Certification you must file a petition for an administrative hearing. You may obtain the petition form from the office of Administrative hearings. You must file the petition with the office of Administrative Hearings within sixty (60) days of receipt of this notice. A petition is considered filed when it is received in the office of Administrative Hearings during normal office hours. The Office of Administrative Hearings accepts filings Monday through Friday between the hours of 8:00am and 5:00pm, except for official state holidays. The original and one (1) copy of the petition must be filed with the Office of Administrative Hearings.

The petition may be faxed, provided that the original and one copy of the document is received by the Office of Administrative Hearings within five (5) business days following the faxed transmission.
The mailing address for the Office of Administrative Hearings is:

Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714
Telephone: (919) 431-3000, Facsimile: (919) 431-3100

A copy of the petition must also be served on DEQ as follows:

Mr. Bill F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center

This the 3rd day of April 2019

DIVISION OF WATER RESOURCES

for:

Linda Culpepper, Director

WQC No. WQC004182

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 35993.1.1 **TIP No.:** U-4700-CB **County(ies):** Caldwell **Page** 1 **of** 1

General Project Information

WBS Element:	35993.1.1	**TIP Number:**	U-4700-CB	**Project Type:**	Roadway Widening
NCDOT Contact:	Carla Dagnino	**Contractor / Designer:**	Vaughn & Melton Consulting Engineers		
Address:	Environmental Analysis Unit, NC Department of Transportation 1598 Mail Service Center Raleigh, NC 27699-1598	**Address:**	1318-F Patton Ave Asheville, NC 28806		
Phone:	(919) 707-6110	**Phone:**	(828) 253-2796		
Email:	cdagnino@ncdot.gov	**Email:**	bsridnour@vaughnmelton.com		
City/Town:	Hudson, NC	**County(ies):**	Caldwell		
River Basin(s):	Catawba	**CAMA County?**	No		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	0.55	**Surrounding Land Use:**	Mixed Retail and Residential.

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	9.3 ac.	7.5 ac.
Typical Cross Section Description:	US 321: 2 @ 12' lanes each direction with 12' (10' paved, 2' grass) outer shoulders, 6' (4' paved, 2' grass) inner shoulders, and variable width median. SR 1809 West: 2 @ 12' eastbound lanes with curb and gutter, 4' utility strip, and 5' concrete sidewalk; 1 @ 12' westbound lane with 4' paved shoulder. SR 1809 East: 2 @ 12' lanes each direction, each with curb and gutter, 4' utility strip, and 5' concrete sidewalk	US 321: 2 @ 12' lanes each driection with paved shoudlers, and variable width median. SR 1809: 2 @ 12' lanes each direction
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 32000 Year: 2035	Existing: 20400 Year: 2015
General Project Narrative: (Description of Minimization of Water Quality Impacts)	NCDOT proposes to reconstruct the intersection of US 321 (Hickory Blvd.) and SR 1809 (Pine Mountain Road) from a traditional signalized intersection to a superstreet style intersection. This will improve traffice flow and accommodate the expected increases in ADT. Impacts to water quality will be minimized by utilizing existing outfalls and by utilizing open channels where possible. Additonally, offsite drainage passing through the NCDOT system in this area will be pretreated by the property owners per state and local stormwater management ordinaces.	

Waterbody Information

Surface Water Body (1):	Gunpowder Creek	**NCDWR Stream Index No.:**	11-55-(1.5)		
NCDWR Surface Water Classification for Water Body	**Primary Classification:**	Water Supply IV (WS-IV)			
	Supplemental Classification:	None			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	N/A		**Buffer Rules in Effect:**	Catawba	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

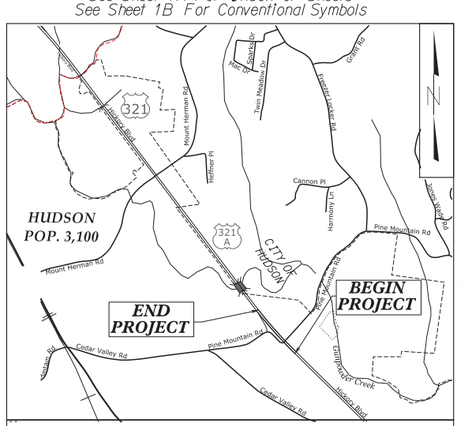
09/08/99

TIP PROJECT: U-4700CB

CONTRACT:

$$$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Symbols



VICINITY MAP

25% REVIEW PLANS

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CALDWELL COUNTY

V&M Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8400
Knoxville, TN 865-546-1600
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5600
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3509

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4700CB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
35993.1.1	NHF-321(18)	PE

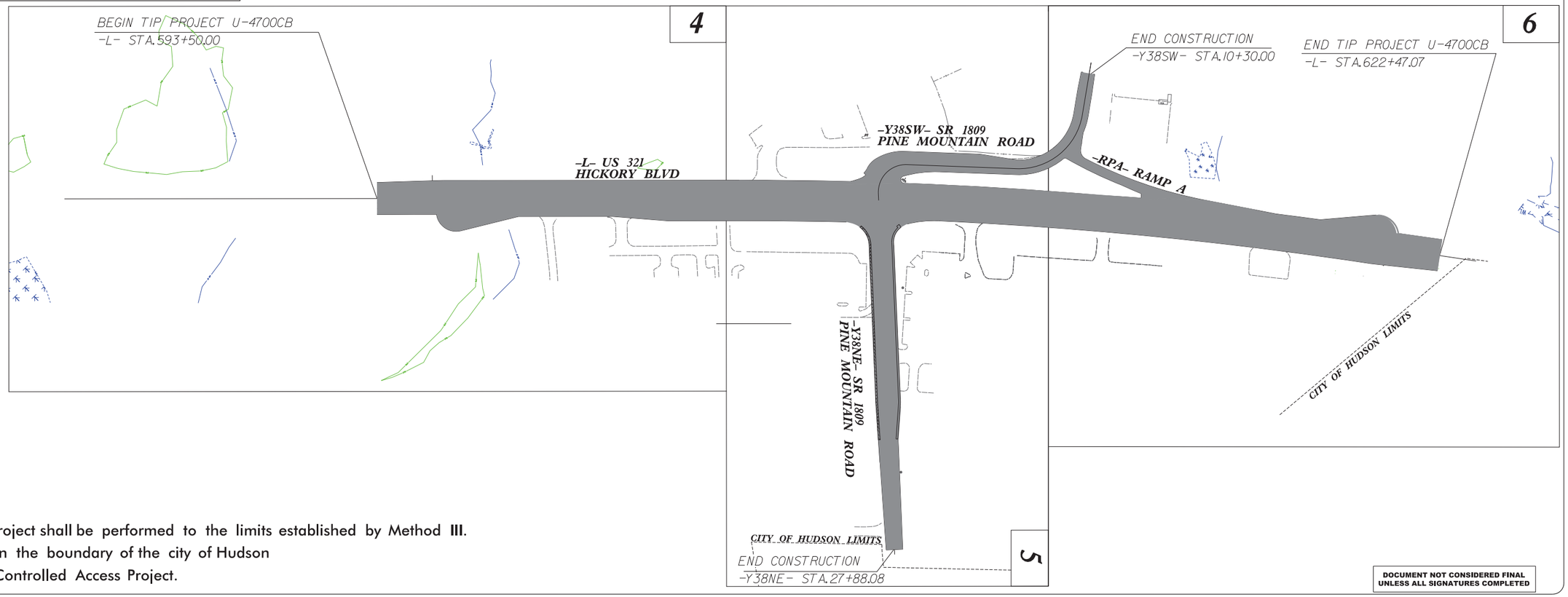
NAD 83 NC GRID NA 2011

PERMIT DRAWING
SHEET 1 OF 10

LOCATION: US 321 (HICKORY BLVD) AT SR 1809 (PINE MOUNTAIN ROAD)

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

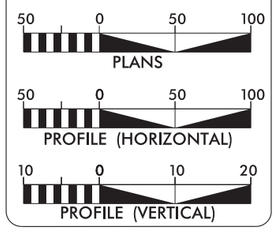
WETLAND AND SURFACE WATER IMPACTS PERMIT



Clearing on this project shall be performed to the limits established by Method **III**.
This project is within the boundary of the city of Hudson
This is a partially Controlled Access Project.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2015 = 32000
ADT 2035 = 20400
K = %
D = %
T = % *
V = 60 MPH
* TTST = 6% DUAL
FUNC CLASS = PRINCIPAL ARTERIAL TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT U-4700CB = 0.548 MI.

LENGTH STRUCTURE PROJECT U-4700CB = 0.000 MI.

TOTAL LENGTH OF PROJECT U-4700CB = 0.548 MI.

Prepared in the Office of:
VAUGHN & MELTON
1318-F PATTON AVE.
ASHEVILLE NC, 28806
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:

LETTING DATE:

REECE SCHULER, PE, PLS
PROJECT ENGINEER

JOSHUA PHILLIPS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	2
R/W SHEET NO.	

PERMIT DRAWING
SHEET 2 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

NAD 83 NA 2011

BEGIN TIP PROJECT U-4700CB
-L- STA. 593+50.00=
-L_LI- STA. 10+00
-L_RI- STA. 10+00

BM-1 ELEV. 1176.62'
-BL-STA. 7+47.00 161' LT
NAIL SET IN BASE OF 24" OAK

END -L_LI- STA. 11+50.00=
-L- STA. 595+00.00, 27.00' LT

END -L_RI- STA. 11+50.00=
-L- STA. 595+00.00, 27.00' RT

SITE 1

SITE 2

-L- +50.00
BEGIN PROPOSED SHOULDER

-L- +50.00
TIE INTO EXISTING SHOULDER 2

-L- N 45° 25' 26.0" W

N 45° 36' 39.5" W

N 45° 38' 20.8" W

MATCH LINE -L- STA. 603+00 SEE SHEET 4

WALTER SPICER
DB 784 PG 757
PB 9 PG 16

NORMA BOWMAN
DB 1487 PG 618
DB 1250 PG 1397

DANIEL CODY
DB 1060 PG 407

ROSEMARY BASSIN
DB 1762 PG 635
PB 9 PG 16

STEPHEN R. MINTON
DB 973 PG 615

RUSSELL J. KERFOOT
DB 1099 PG 639

SHIRLEY DOVER
DB 1199 PG 353

CLARENCE W. SUMMERLIN
DB 1806 PG 6

WILLIAM HOWELL,ET AL
DB 1809 PG 75

BEN GRIFFIN REALTY & AUCTION, INC.
DB 1922 PG 1973

HUDSON HOUSING PARTNERSHIP
(LP POWDER CREEK APPARTMENTS)
DB 825 PG 667

STRIKER PROPERTIES, LLC
DB 1757 PG 45

HUDSON-HWY 321, LLC
DB 1465 PG 1250
PB 18 PG 221

US 321 (HICKORY BLVD.)

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	3
R/W SHEET NO.	

PERMIT DRAWING SHEET 3 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

NAD 83 NA 2011

BEGIN TYP PROJECT U-4700CB
-L- STA. 593+50.00=
-L_LI- STA. 10+00
-L_RI- STA. 10+00

END -L_LI- STA. 11+50.00=
-L- STA. 595+00.00, 27.00' LT

SITE 1

SEE INSET A

SITE 2

-L- +50.00
BEGIN PROPOSED SHOULDER

-L- +50.00
TIE INTO EXISTING SHOULDER

180' TAPER

150' TAPER

300' TAPER

COLLAR AND EXTEND

RETAIN

REMOVE

PLUG AND ABANDON

N 45° 25' 26.0" W

N 45° 36' 39.5" W

N 45° 38' 20.8" W

BM-1 ELEV. 1176.62'
-BL-STA. 1+47.00 161' LT
NAIL SET IN BASE OF 24" OAK

NORMA BOWMAN
DB 1487 PG 618
DB 1250 PG 1397

DANIEL CODY
DB 1060 PG 407

ROSEMARY BASSIN
DB 1762 PG 635
PB 9 PG 16

WALTER SRICER
DB 1786 PG 1751
PB 9 PG 16

STEPHEN R. MINTON
DB 373 PG 615

RUSSELL J. KERFOOT
DB 1099 PG 639

CLARENCE W. SUMMERLIN
DB 1806 PG 5

SHIRLEY DOVER
DB 1199 PG 353

BEN GRIFFIN REALTY & AUCTION, INC.
DB 1922 PG 1973

HUDSON HOUSING PARTNERSHIP
(LP POWDER CREEK APPARTMENTS)
DB 825 PG 667

STRIKER PROPERTIES, LLC
DB 1757 PG 45

HUDSON-HWY 321, LLC
DB 1465 PG 1250
PB 18 PG 221

WILLIAM HOWELL,ET AL
DB 1809 PG 75

INSET A
NOT TO SCALE

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

MATCH LINE -L- STA. 603+00 SEE SHEET 5

$$$$SYSTIME$$$$
$$$$USERNAME$$$$

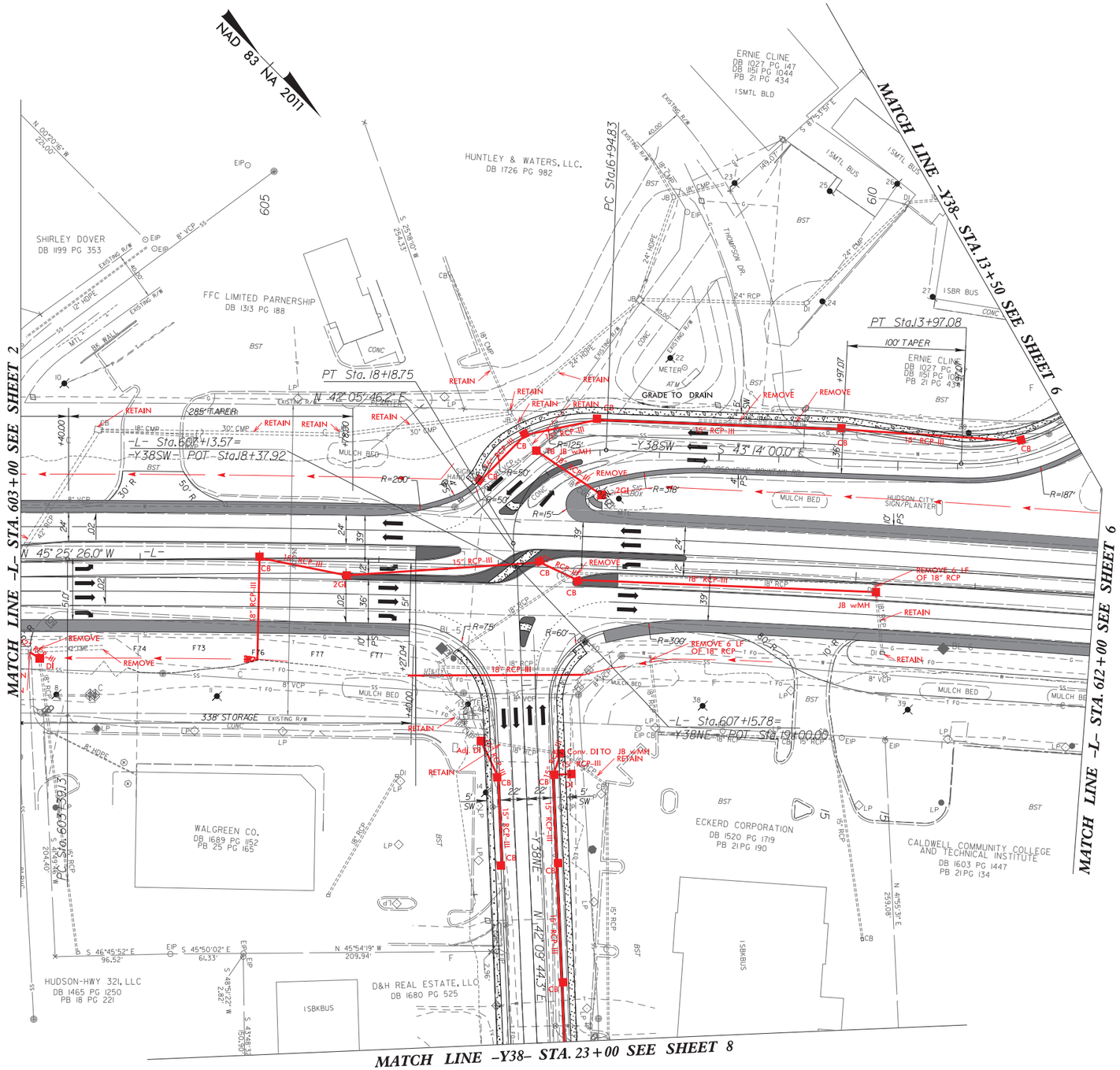
8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	4
R/W SHEET NO.	

PERMIT DRAWING SHEET 4 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

-L- CURVE DATA

PI Sta 611+89.94
△ = 8° 32' 11.4" (RT)
D = 0° 30' 09.3"
L = 1,698.49'
T = 850.82'
R = 11,400.00'

-Y38SW- CURVE DATA

PI Sta 12+98.54
△ = 82° 35' 00.0" (RT)
D = 32° 44' 25.6"
L = 252.24'
T = 153.70'
R = 175.00'

PI Sta 17+76.20
△ = 94° 40' 13.8" (LT)
D = 76° 23' 39.7"
L = 123.92'
T = 81.38'
R = 75.00'

$$$$SYSTIME$$$$
$$$$DATE$$$$
$$$$USERNAME$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	5
R/W SHEET NO.	

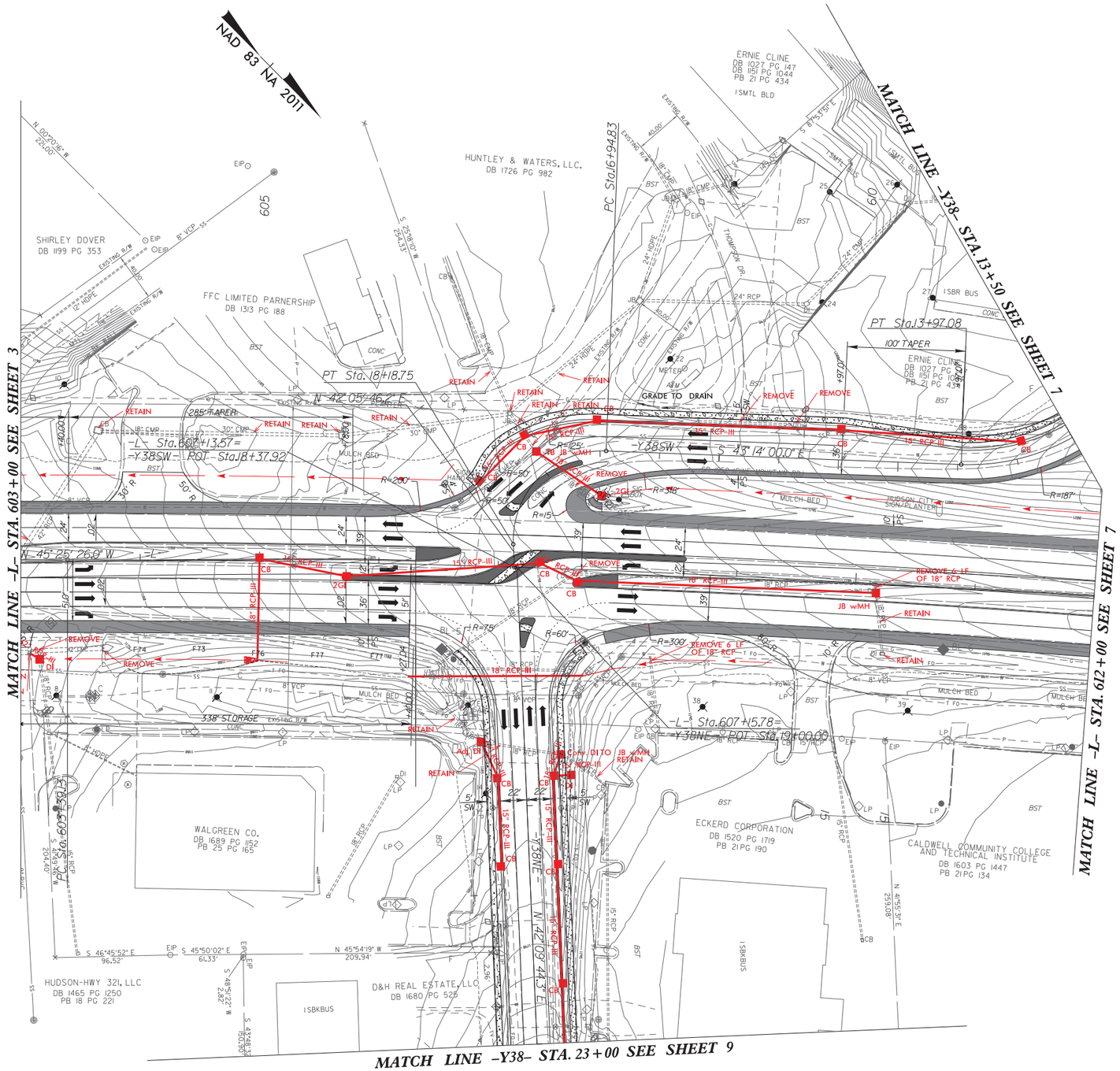
PERMIT DRAWING SHEET 5 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011

LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER



-L- CURVE DATA
PI Sta 611+89.94
△ = 8° 32' 11.4" (RT)
D = 0° 30' 09.3"
L = 1,698.49'
T = 850.82'
R = 11,400.00'

-Y38SW- CURVE DATA
PI Sta 12+98.54
△ = 82° 35' 00.0" (RT)
D = 32° 44' 25.6"
L = 252.24'
T = 153.70'
R = 175.00'

PI Sta 17+76.20
△ = 94° 40' 13.8" (LT)
D = 76° 23' 39.7"
L = 123.92'
T = 81.38'
R = 75.00'

$$$$SYSTIME$$$$
$$$$PLOTDATE$$$$
$$$$USERNAME$$$$

8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	6
R/W SHEET NO.	

PERMIT DRAWING SHEET 6 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

NAD 83 NA 2011

BEGIN CONSTRUCTION STA.10+30.00

POT Sta.10+00.00

POT Sta.11+44.85

-L- POC Sta. 6161+61.08 39.0' LT.=
-RPA- POT Sta. 5+00.00
Δ = 4° 02' 47.3"

-Y38SW- POC Sta. 12+62.76=
-RPA- PT Sta. 9+82.56

-RPA- PC Sta. 5+54.65

BEGIN -L_L2- STA.10+00.00
-L- STA.621+41.39, 27.00' LT

END TIP PROJECT U-4700CA
-L- STA.622+47.07
-Y12_ STA.11+05.76
-L_R2- STA.11+05.76

POT Sta. 623+47.07

PT Sta. 620+37.61

MATCH LINE -L- STA. 612+00 SEE SHEET 4

MATCH LINE -L- STA. 612+00 SEE SHEET 4

JAMES SECREAST DB 310 PG 385

ERNIE MCLINE DB 1027 PG 147 DB 1151 PG 1044 PB 21 PG 434

STATE OF NORTH CAROLINA DB 421 PG 13

CALDWELL COUNTY DB 1567 PG 1123

CALDWELL COMMUNITY COLLEGE AND TECHNICAL INSTITUTE DB 1603 PG 1447 PB 21 PG 134

SAMUEL SWANSON DB 1186 PG 492 DB 1135 PG 1457

SKILL CREATIONS INC. DB 1435 PG 698

REAVESTON ENTERPRISES, LLC. DB 1761 PG 1539

WILLIAM SMITH DB 1272 PG 934

JENNIFER CHURCH DB 1884 PG 842

ISBK SCHOOL

ISBR BUS

ISBK BUS

ISBKBUS

ISBRBUS

CALDWELL COUNTY DB 1567 PG 1123

ELEV. 1196.57' C BM-3 -L- STA. 34+03.00 48' RT TOP OF MTL SIGN BASE

PINE MOUNTAIN RD. EXIT

US 321 HICKORY BLVD

HUDSON CITY LIMITS

-L- CURVE DATA
PI Sta 611+89.94
Δ = 8° 32' 11.4" (RT)
D = 0° 30' 09.3"
L = 1,698.49'
T = 850.82'
R = 11,400.00'

-Y38SW- CURVE DATA
PI Sta 12+98.54
Δ = 82° 35' 00.0" (RT)
D = 32° 44' 25.6"
L = 252.24'
T = 153.70'
R = 175.00'

-RPA- CURVE DATA
PI Sta 7+70.90
Δ = 20° 25' 52.3" (RT)
D = 4° 46' 28.7"
L = 427.91'
T = 216.25'
R = 1,200.00'

$$$$USERNAME$$$$ $$$$SYSTIME$$$$ $$$$DGN$$$$

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	7
R/W SHEET NO.	

PERMIT DRAWING
SHEET 7 OF 10

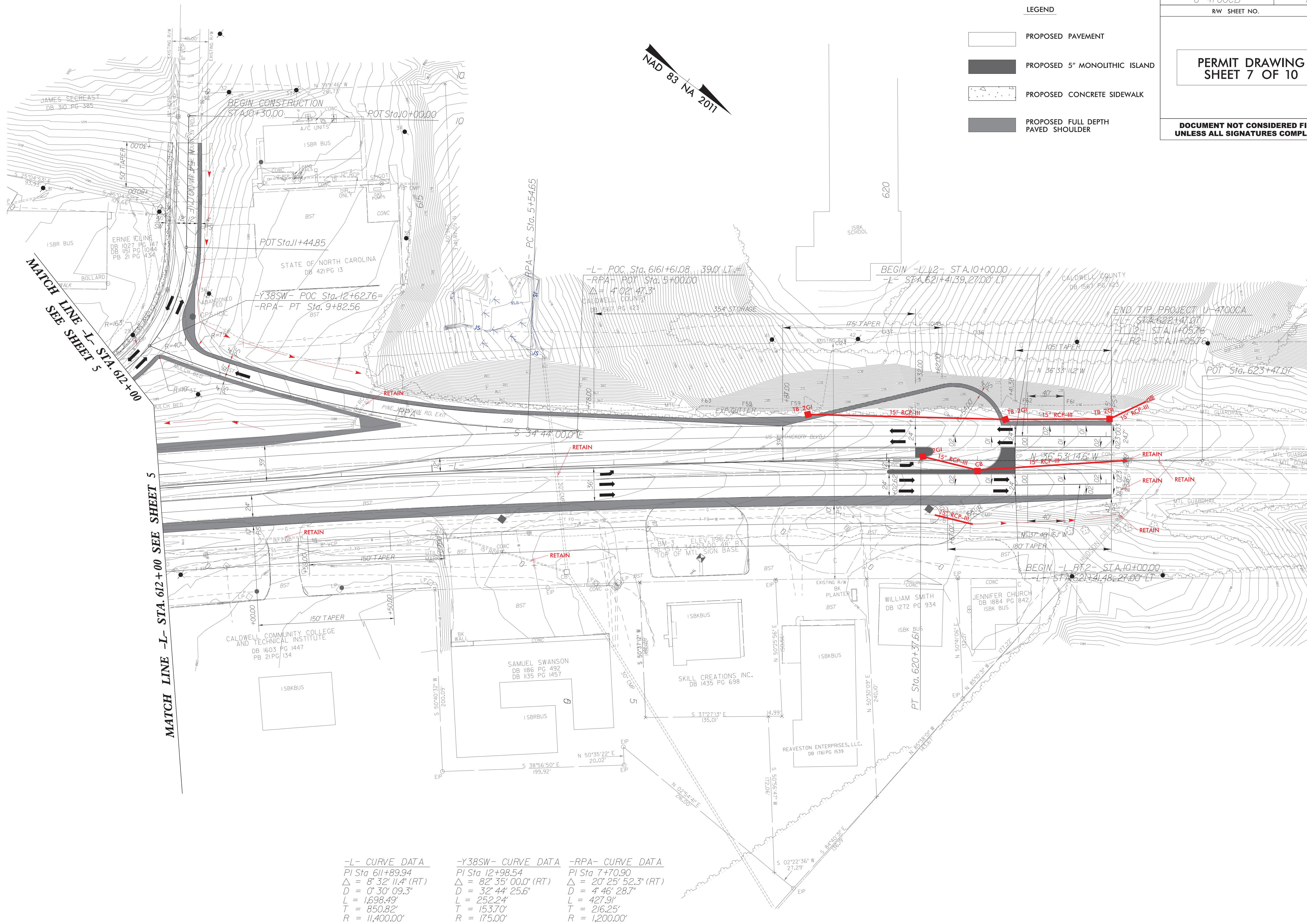
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

REVISIONS

8/17/99



NAD 83 NA 2011
MATCH LINE -L- STA. 612+00 SEE SHEET 5
MATCH LINE -L- STA. 612+00 SEE SHEET 5
BEGIN CONSTRUCTION STA.10+30.00
POT Sta.10+00.00
POT Sta.11+44.85
STATE OF NORTH CAROLINA DB 421 PG 13
-Y38SW- POC Sta.12+62.76= -RPA- PT Sta. 9+82.56
-RPA- PC Sta. 5+54.65
-L- POC Sta. 616I+61.08 39.0' LT.= -RPA- POT Sta. 5+00.00
CALDWELL COUNTY DB 1567 PG 825
BEGIN -L/L2- STA.10+00.00 -L- STA.621+41.39,27.00' LT
END TIP PROJECT U-4700CA -L- STA.622+47.07 -L/L2- STA.11+05.76 -L/R2- STA.11+05.76
POT Sta. 623+47.07
BEGIN -L/RT2- STA.10+00.00 -L- STA.621+41.48,27.00' LT
PT Sta. 620+37.61
JAMES SECREAST DB 310 PG 385
ERNIE CLINE
CALDWELL COMMUNITY COLLEGE AND TECHNICAL INSTITUTE DB 1603 PG 1447 PB 21 PG 134
SAMUEL SWANSON DB 1186 PG 492 DB 1135 PG 1457
SKILL CREATIONS INC. DB 1435 PG 698
REAVESTON ENTERPRISES, LLC. DB 1761 PG 1539
WILLIAM SMITH DB 1272 PG 934
JENNIFER CHURCH DB 1884 PG 1842
S 34°44'00.0"E
N 36°53'14.6" W
RETAIN
15" RCP-III
TB 2GI
CB

-L- CURVE DATA	-Y38SW- CURVE DATA	-RPA- CURVE DATA
PI Sta 611+89.94	PI Sta 12+98.54	PI Sta 7+70.90
Δ = 8° 32' 11.4" (RT)	Δ = 82° 35' 00.0" (RT)	Δ = 20° 25' 52.3" (RT)
D = 0° 30' 09.3"	D = 32° 44' 25.6"	D = 4° 46' 28.7"
L = 1,698.49'	L = 252.24'	L = 427.91'
T = 850.82'	T = 153.70'	T = 216.25'
R = 11,400.00'	R = 175.00'	R = 1,200.00'

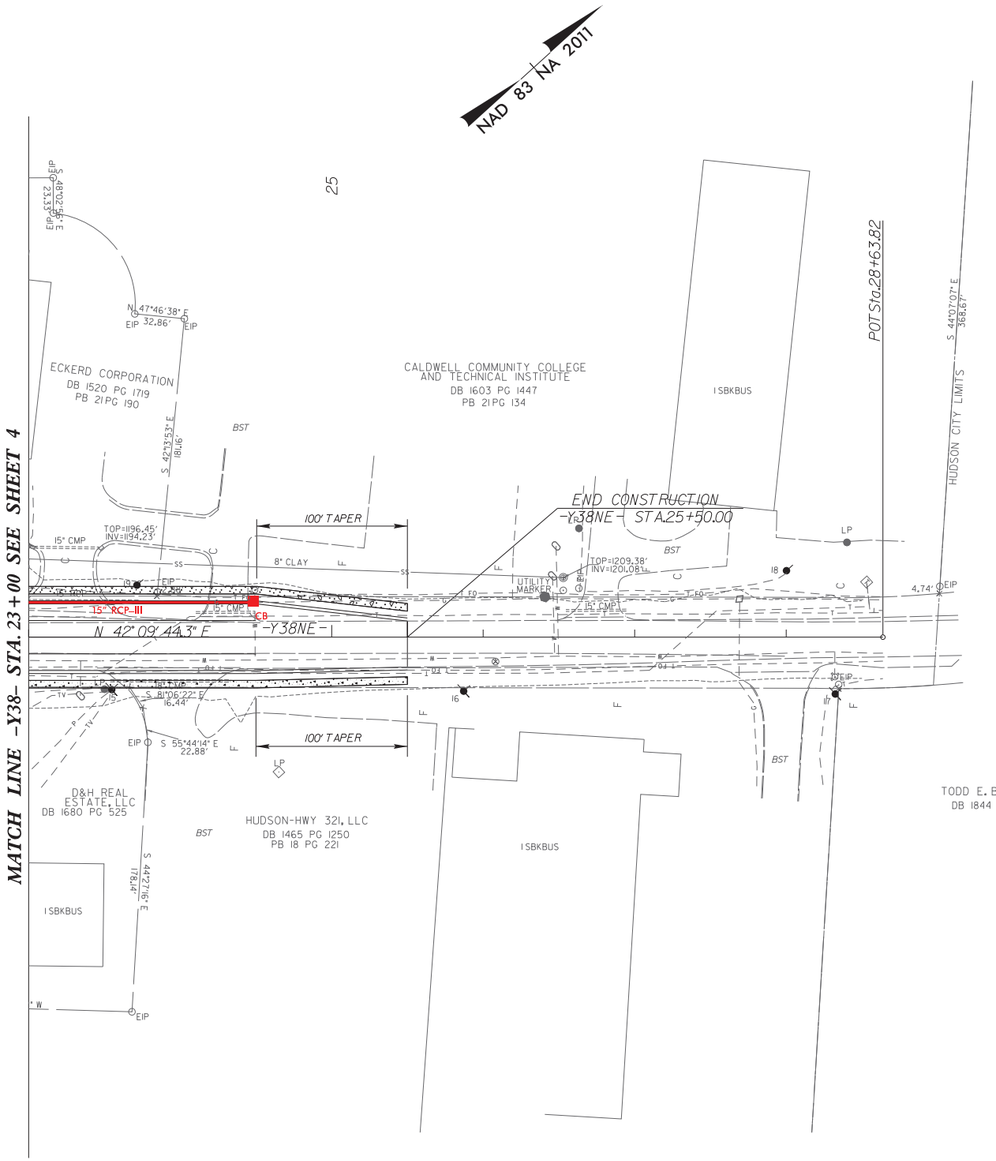
8/17/99

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	8
R/W SHEET NO.	

PERMIT DRAWING SHEET 8 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

$$$$USERNAME$$$$ $$$$SYSTIME$$$$

8/17/99

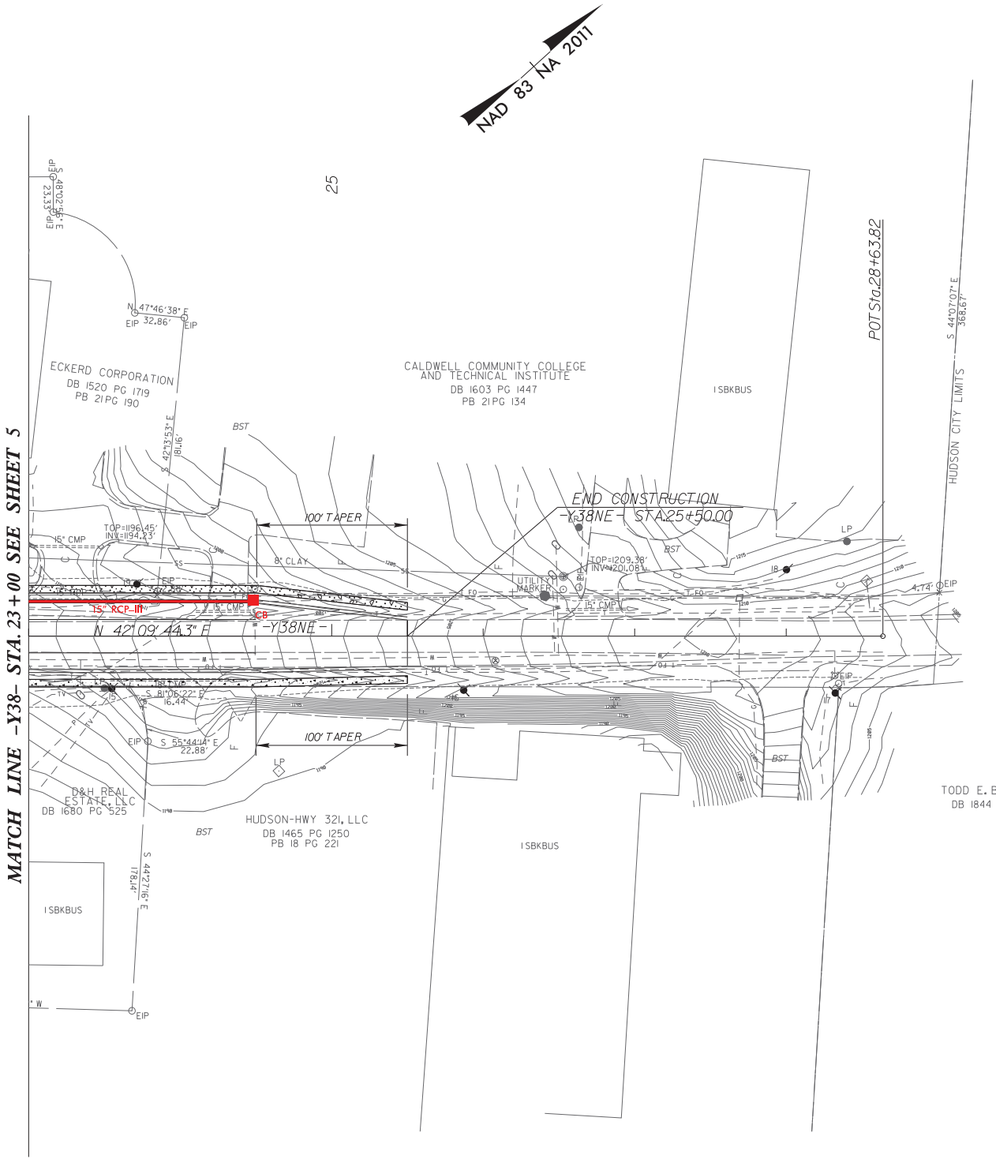
REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
U-4700CB	9
R/W SHEET NO.	

PERMIT DRAWING
SHEET 9 OF 10

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011



LEGEND

- PROPOSED PAVEMENT
- PROPOSED 5" MONOLITHIC ISLAND
- PROPOSED CONCRETE SIDEWALK
- PROPOSED FULL DEPTH PAVED SHOULDER

$$$$USERNAME$$$$ $$$$SYSTIME$$$$

WETLAND AND SURACE WATER IMPACTS SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	596+36 90' LT	1 @ 36" RCP						< 0.01		16		
	596+35 107' LT	Channel Relocation						< 0.01		16		
	596+33 123' LT	Const. Area							< 0.01		5	
2	597+08 84' RT	Fill						< 0.01		68		
	597+19 120' RT	Const. Area							< 0.01		10	
TOTALS*:								0.01	< 0.01	100	15	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
10/18/18
CALDWELL
U-4700CB
35993.1.1

STIP No. U-4700 A, B, and C

Preliminary Plans

Proposed U.S. 321 Widening

From U.S. 70 in Hickory to Southwest Boulevard in

Lenoir *Catawba, Burke, and Caldwell Counties*

The following tables summarize the anticipated impacts to jurisdictional resources on the U.S. 321 project corridor. This assumes a 6-lane superstreet from north of U.S. 70 to Southwest Boulevard. All impacts were calculated using a 25' buffer of the slope stakes of the preliminary designs, and are based on delineated jurisdictional resources.

- Table 1 summarizes the impacts to delineated streams. The site numbers refer to locations with proposed or existing hydraulic structures that have the potential to impact existing streams.
- Table 2 summarizes the impacts to delineated wetlands.

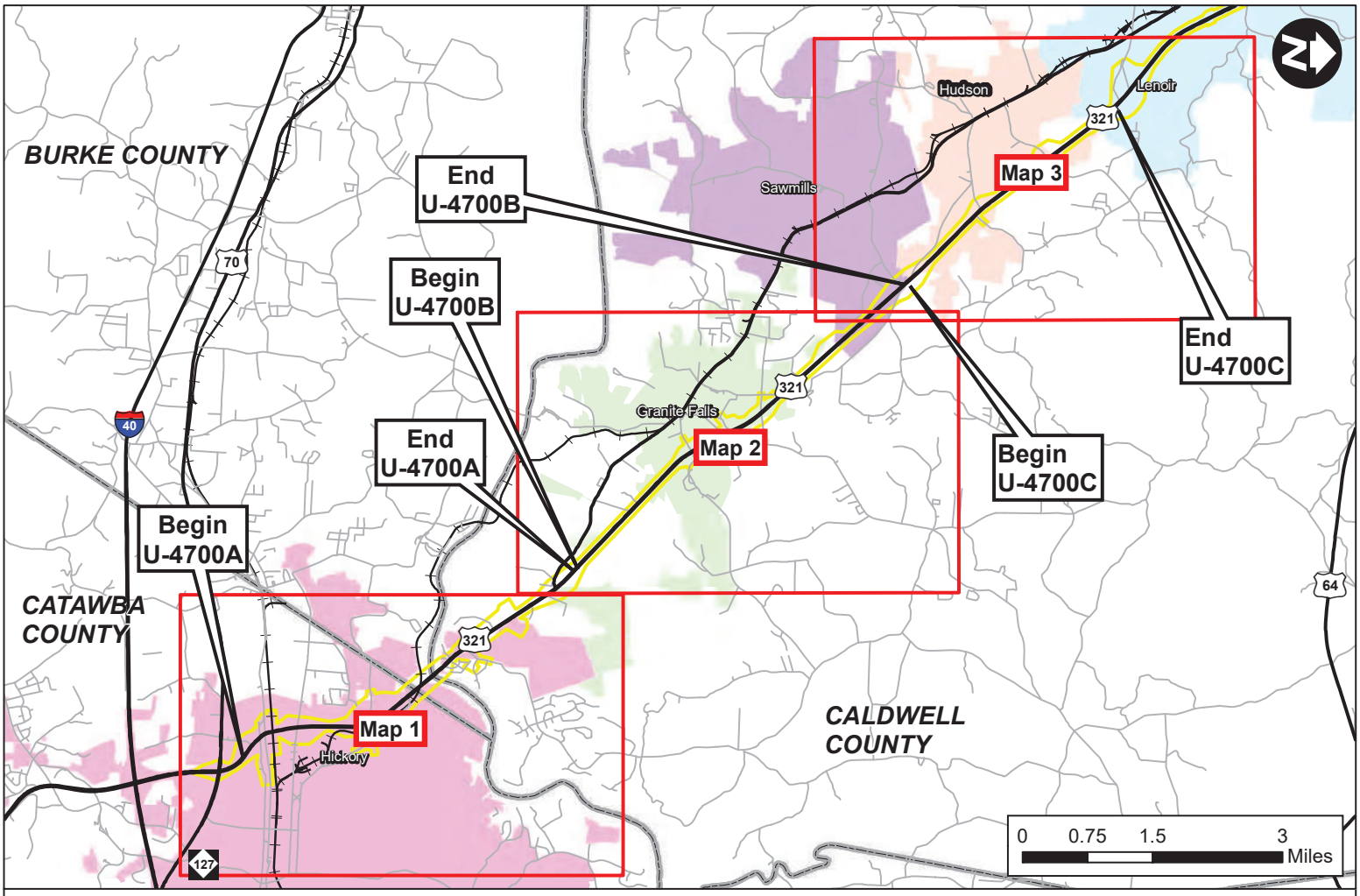
The figure numbers in the tables refer to the figures following the tables.

Table 1: Itemized Stream Impacts

Section	Figure	Map ID	Stream Name	Impact (feet)
A	1	Frye Creek	Frye Creek	125
	2	SB	UT to Catawba River	45
	3A	SB	UT to Catawba River	690
	3B	Catawba River	Catawba River	0
	4	SC	UT to Catawba River	0
	4	SC	UT to Catawba River	300
	5	SRR	UT to Catawba River	370
	6	SQQ	UT to Catawba River	40
	6	SRR	UT to Catawba River	225
Section A Stream Impact Sub-total				**1,795**
B	7	SF	UT to Gunpowder Creek	230
	8	SJ	UT to Gunpowder Creek	40
	9	SK	UT to Gunpowder Creek	120
	10	SM	UT to Gunpowder Creek	100
	11	SN	UT to Gunpowder Creek	280
	13	SO	UT to Gunpowder Creek	365
	14	Billy Branch	Billy Branch	305
	14	SP	UT to Billy Branch	180
	15	SQ	UT to Little Gunpowder Creek	130
	16	Little Gunpowder Creek	Little Gunpowder Creek	145
	16	SR	UT to Little Gunpowder Creek	170
	16	SS	UT to Little Gunpowder Creek	65
	17	ST	UT to Little Gunpowder Creek	30
	17	STA	UT to Little Gunpowder Creek	85
	18	SU	UT to Little Gunpowder Creek	65
	19	SV	UT to Little Gunpowder Creek	110
	20	SW	UT to Little Gunpowder Creek	540
	20	SX	UT to Little Gunpowder Creek	50
	20	SY	UT to Little Gunpowder Creek	45
Section B Stream Impact Sub-total				**3,055**
C	22	SZ	UT to Gunpowder Creek	85
	23	SAA	UT to Gunpowder Creek	115
	24	SBB	UT to Gunpowder Creek	70
	25	Gunpowder Creek	Gunpowder Creek	55
	25	Gunpowder Creek	Gunpowder Creek	0
	26	SDD	UT to Gunpowder Creek	20
	27	SEE	UT to Gunpowder Creek	150
	27	SLL	UT to Gunpowder Creek	185
	28	Brushy Fork	Brushy Fork	120
	29	Angley Creek	Angley Creek	200
Section C Stream Impact Sub-total				**1,000**
U-4700 Project Stream Impact Total				**5,850**

Table 2: Itemized Wetlands Impacts

Section	Figure	Map ID	Impact (acres)
A	3A	WA	0.1
Section A Wetland Impact Sub-total			**0.1**
B	13	WF	<0.1
	16	WFA	0.1
	20	WG	<0.1
Section B Wetland Impact Sub-total			**0.2**
C	21	WP	0.1
	24	WI	0.1
	27	WKA	<0.1
	27	WK	0.1
Section C Wetland Impact Sub-total			**0.4**
U-4700 Project Wetland Impact Total			**0.7**

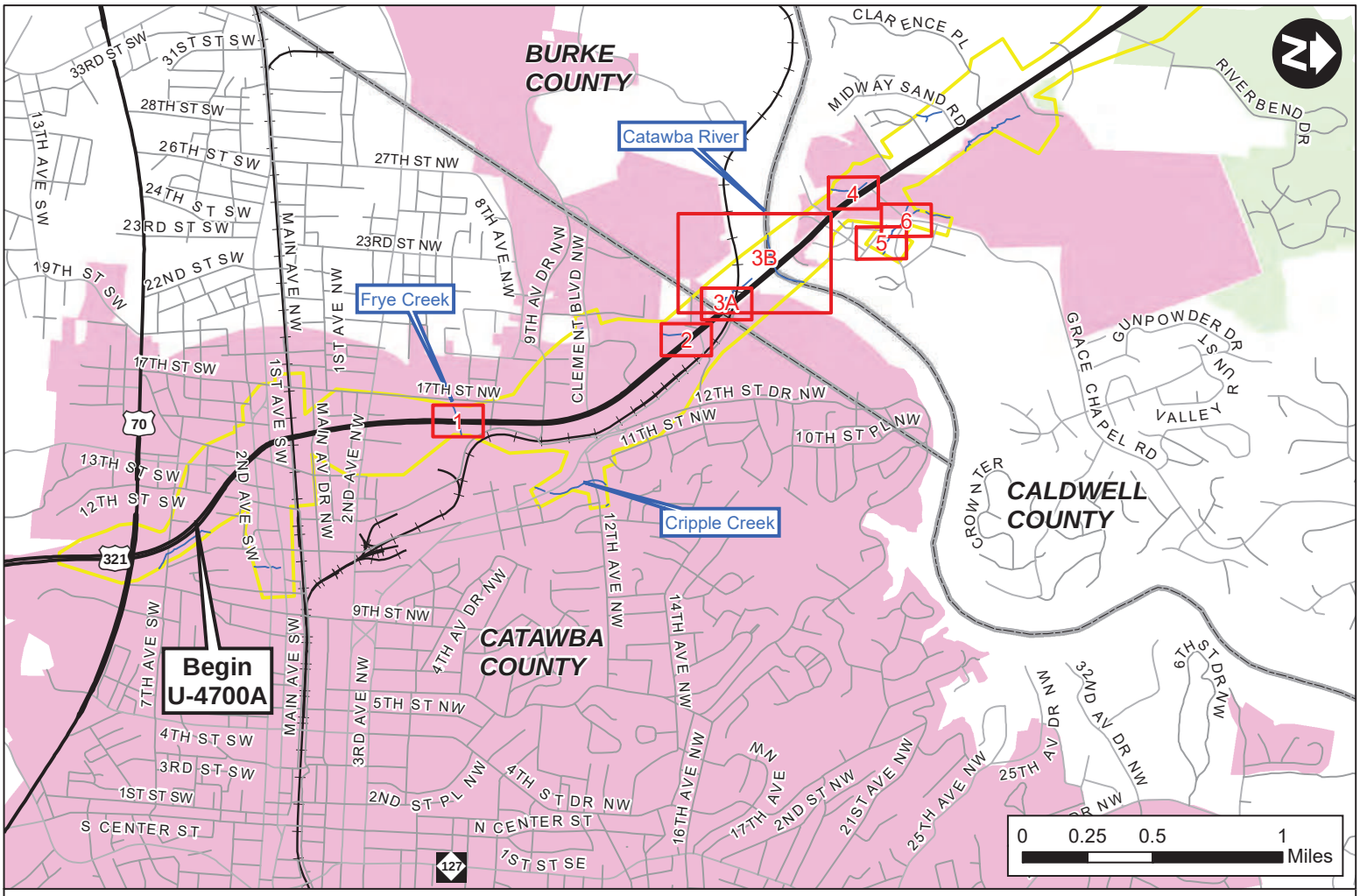


Town of Granite Falls
City of Hickory
Town of Hudson
City of Lenoir
Town of Sawmills
U-4700 Project Area

U-4700 - U.S. 321 Widening

Project Overview
Impacts to Jurisdictional Resources

Burke, Caldwell, and Catawba Counties

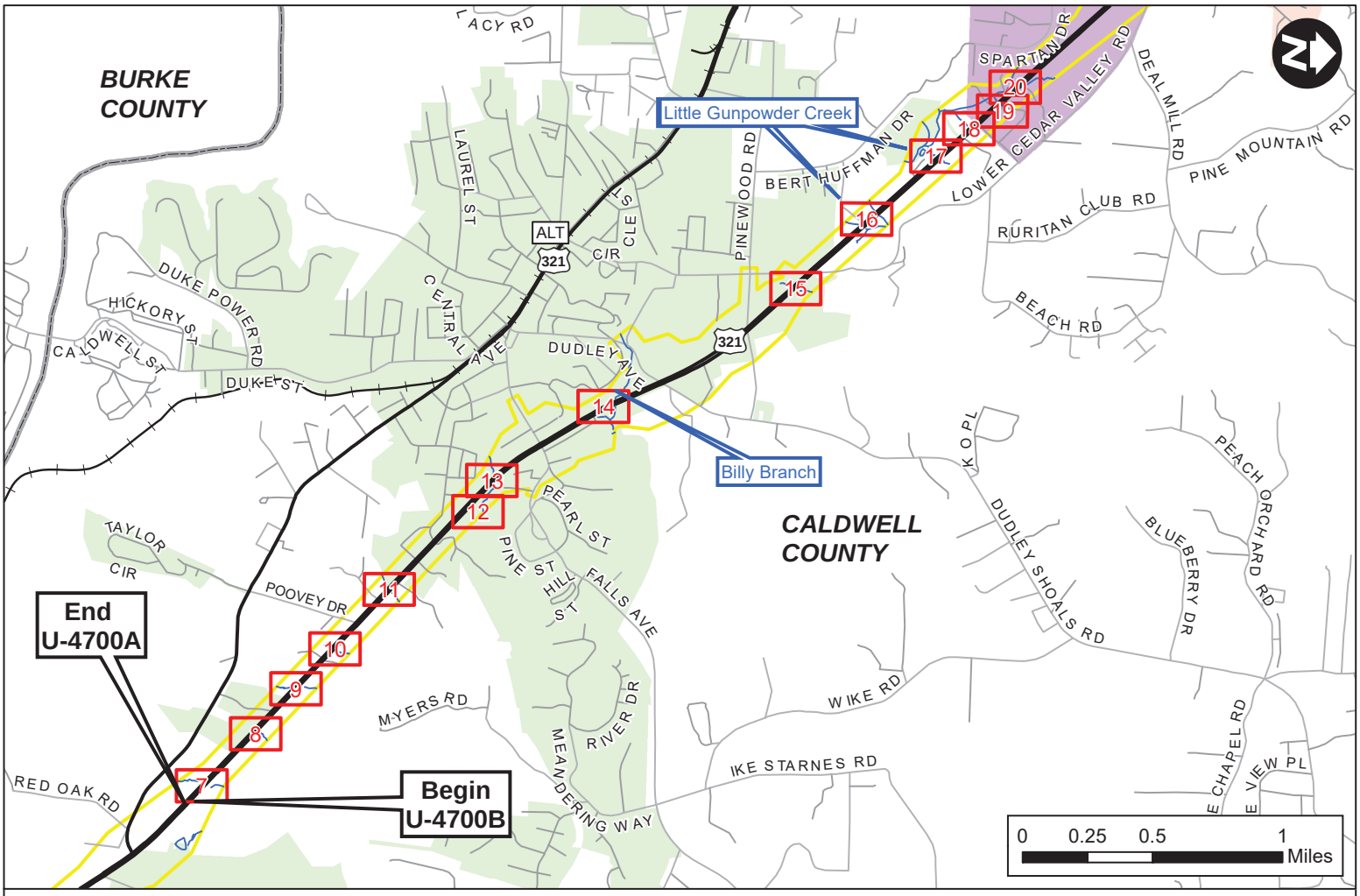


Delineated Stream
Town of Granite Falls
City of Hickory
U-4700 Project Area
Permit Figure Extents 1-29

U-4700 - U.S. 321 Widening

Map 1
Impacts to Jurisdictional Resources

Catawba, Burke, and Caldwell Counties

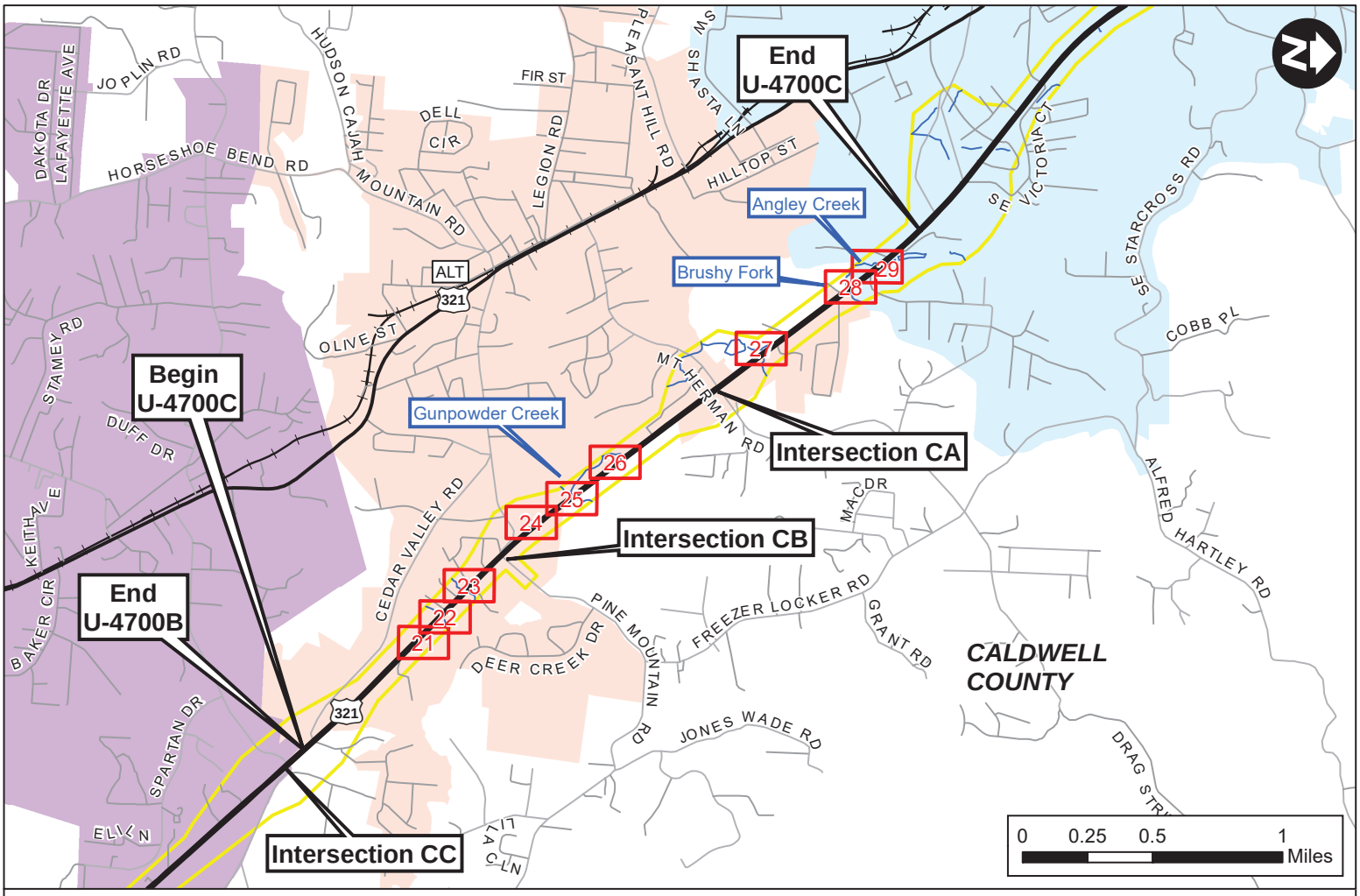


Delineated Stream
Town of Granite Falls
Town of Hudson
Town of Sawmills
U-4700 Project Area
Permit Figure Extents 1-29

U-4700 - U.S. 321 Widening

Map 2
Impacts to Jurisdictional Resources

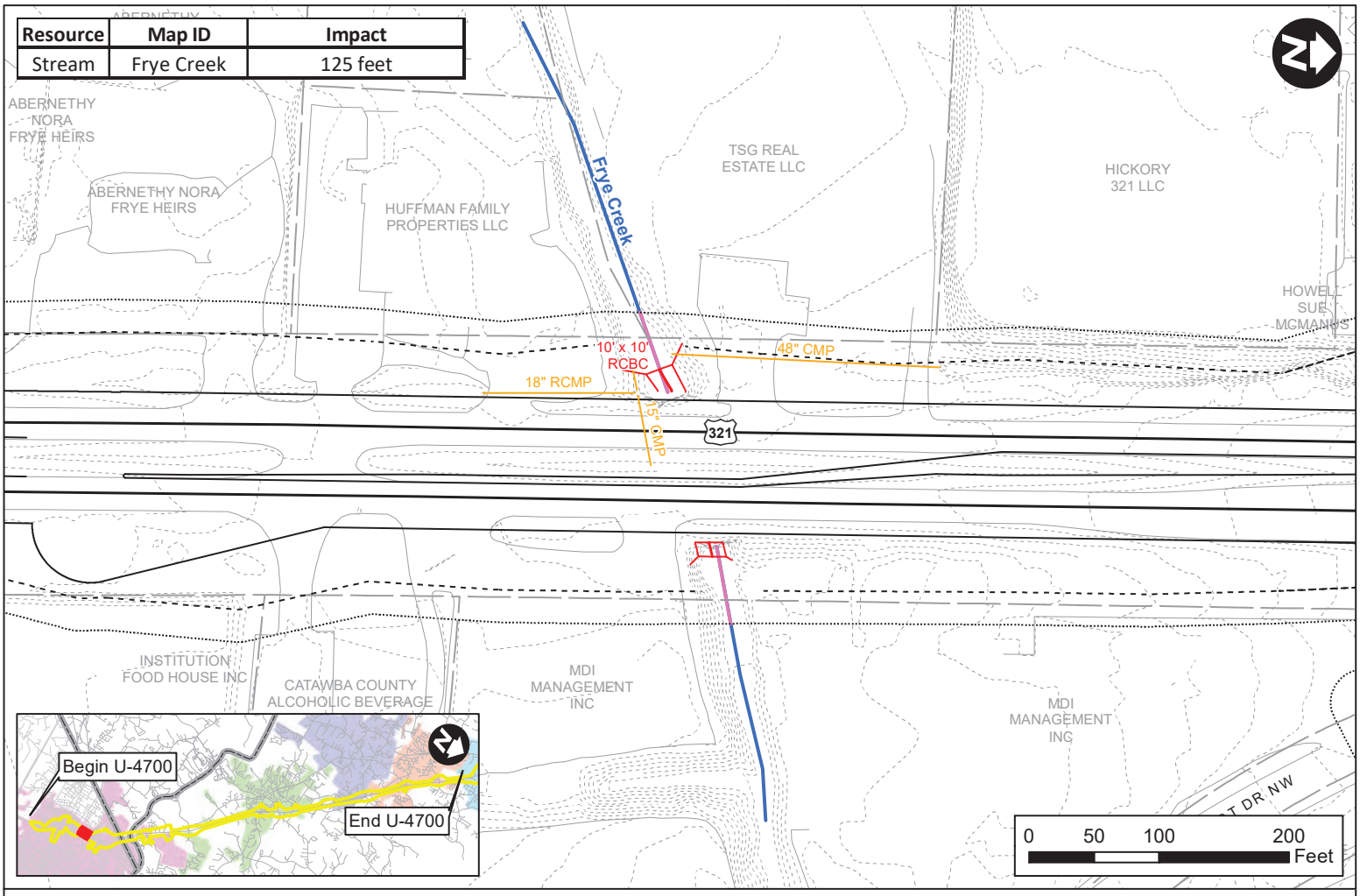
Burke and Caldwell Counties



U-4700 - U.S. 321 Widening

Map 3
Impacts to Jurisdictional Resources

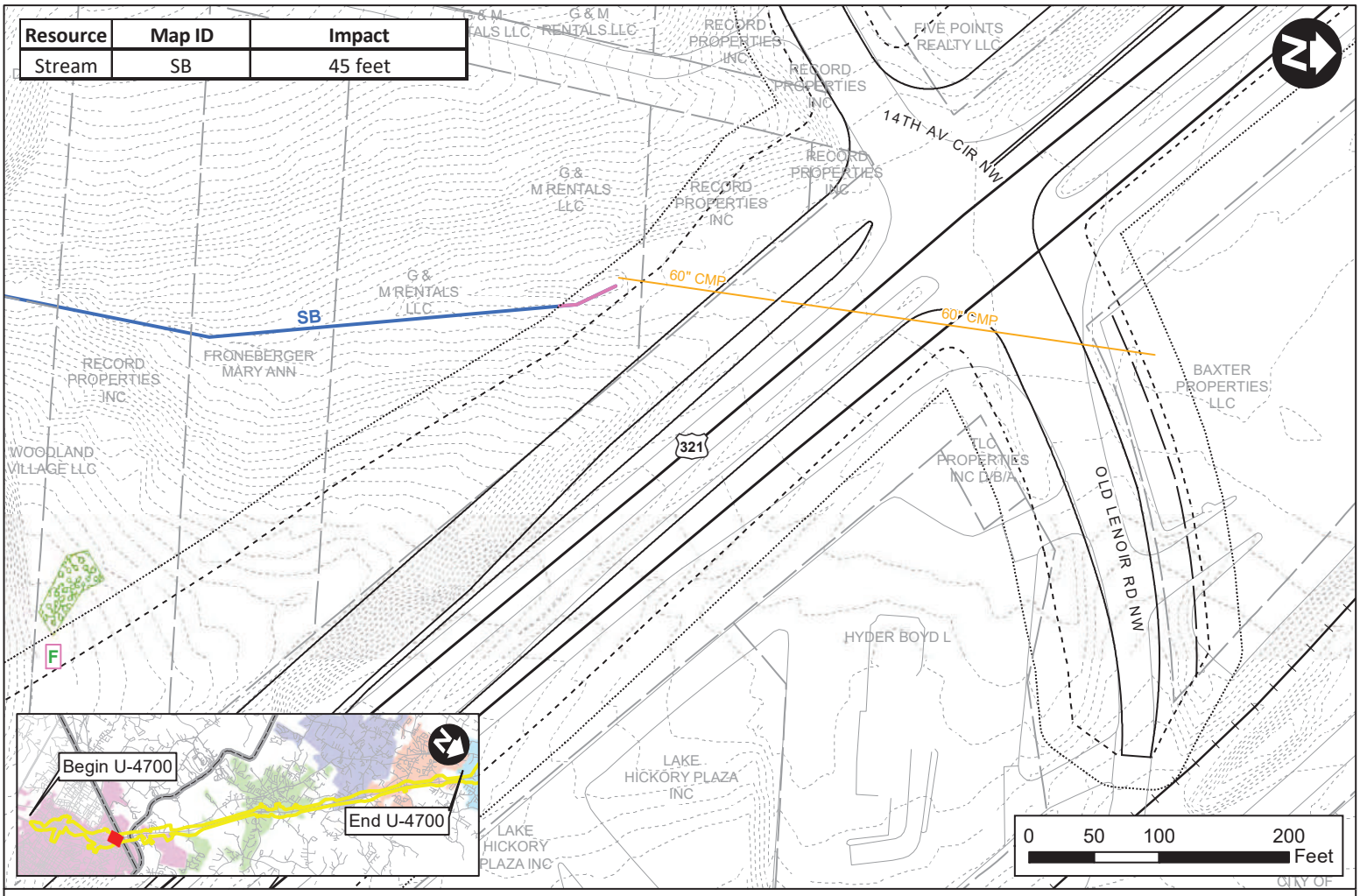
Caldwell County



U-4700 - U.S. 321 Widening

Figure 1
Impacts to Jurisdictional Resources

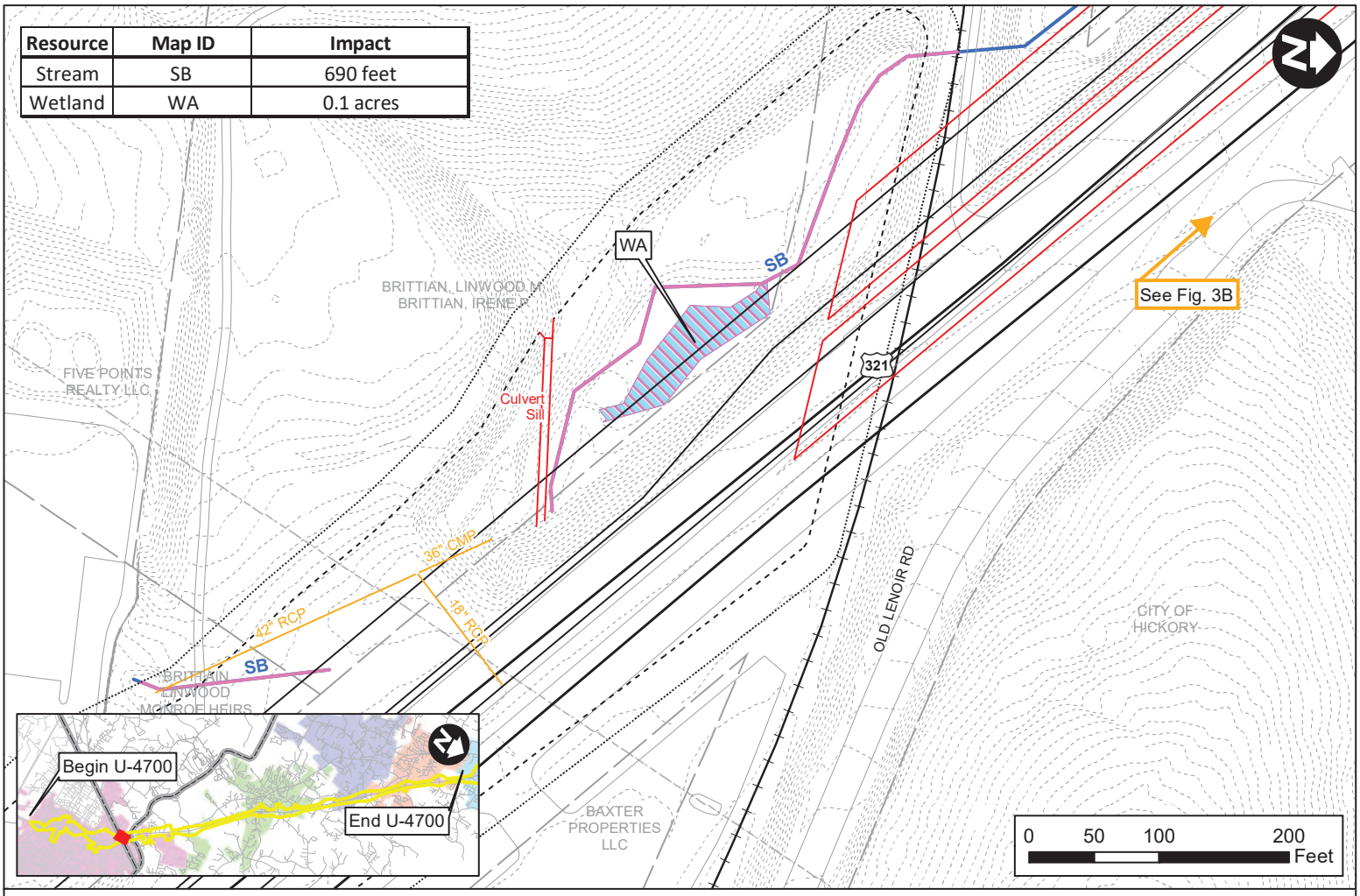
Catawba County



U-4700 - U.S. 321 Widening

Figure 2
Impacts to Jurisdictional Resources

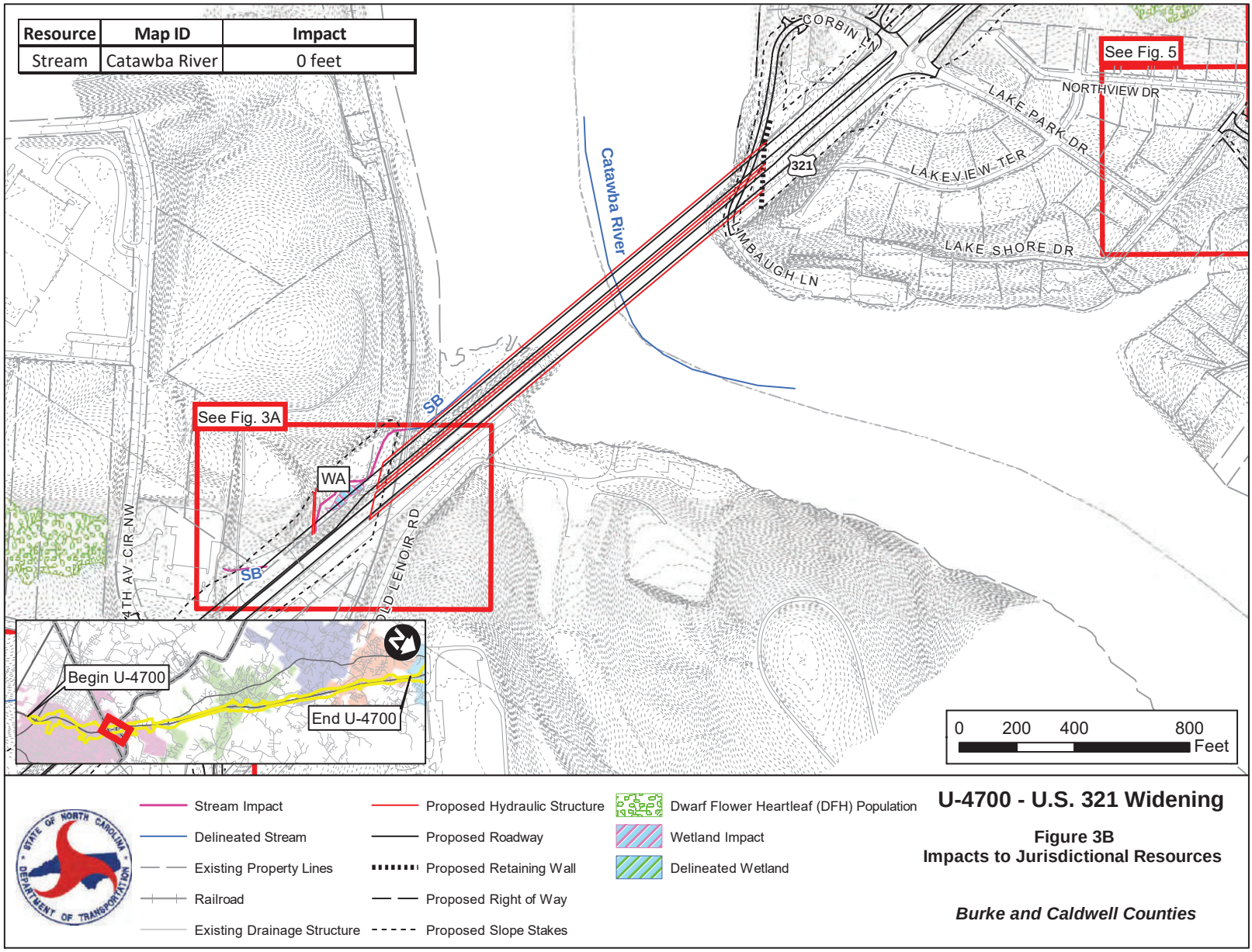
Catawba County



U-4700 - U.S. 321 Widening

Figure 3A
Impacts to Jurisdictional Resources

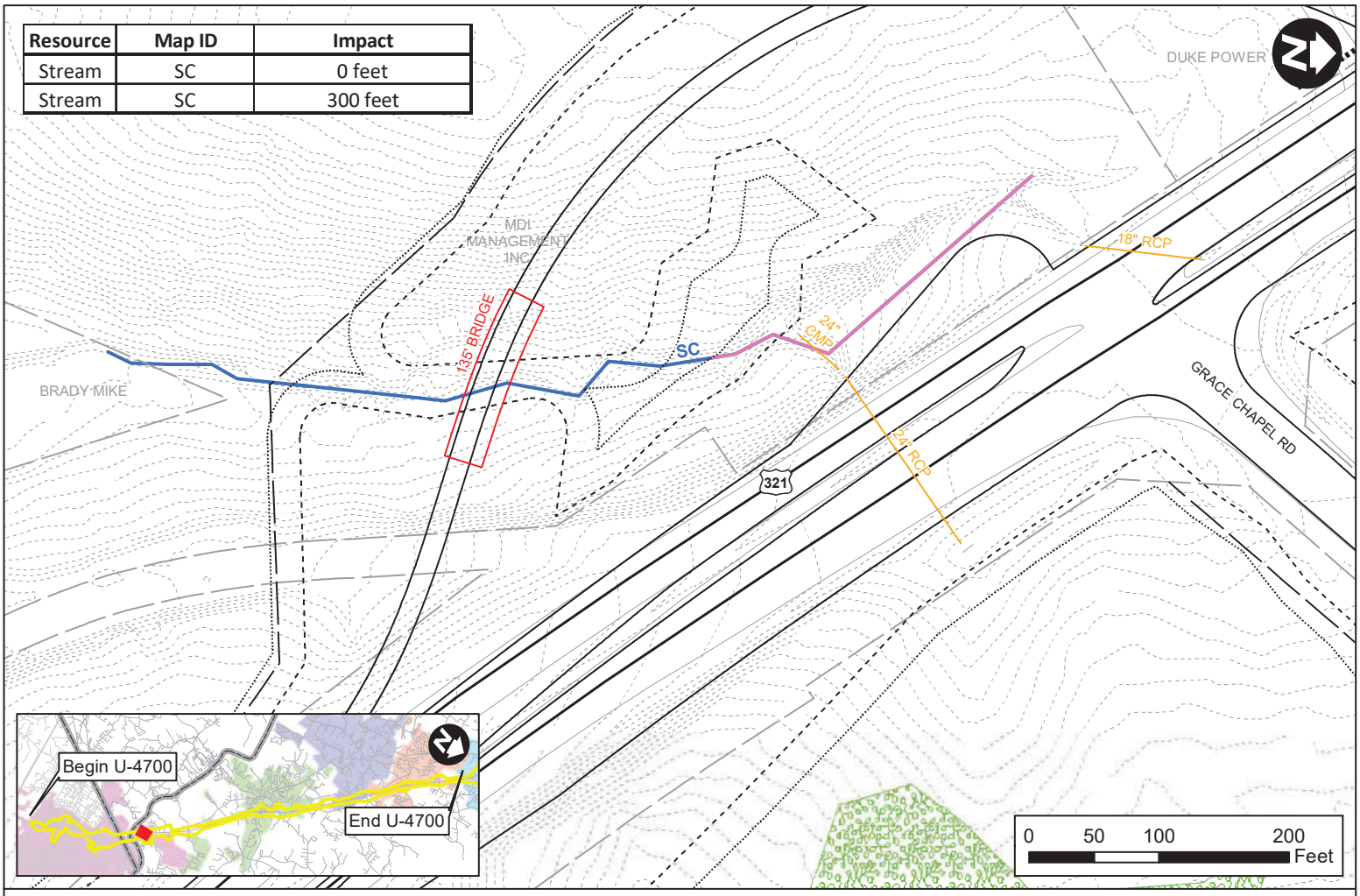
Burke and Catawba County



U-4700 - U.S. 321 Widening

Figure 3B
Impacts to Jurisdictional Resources

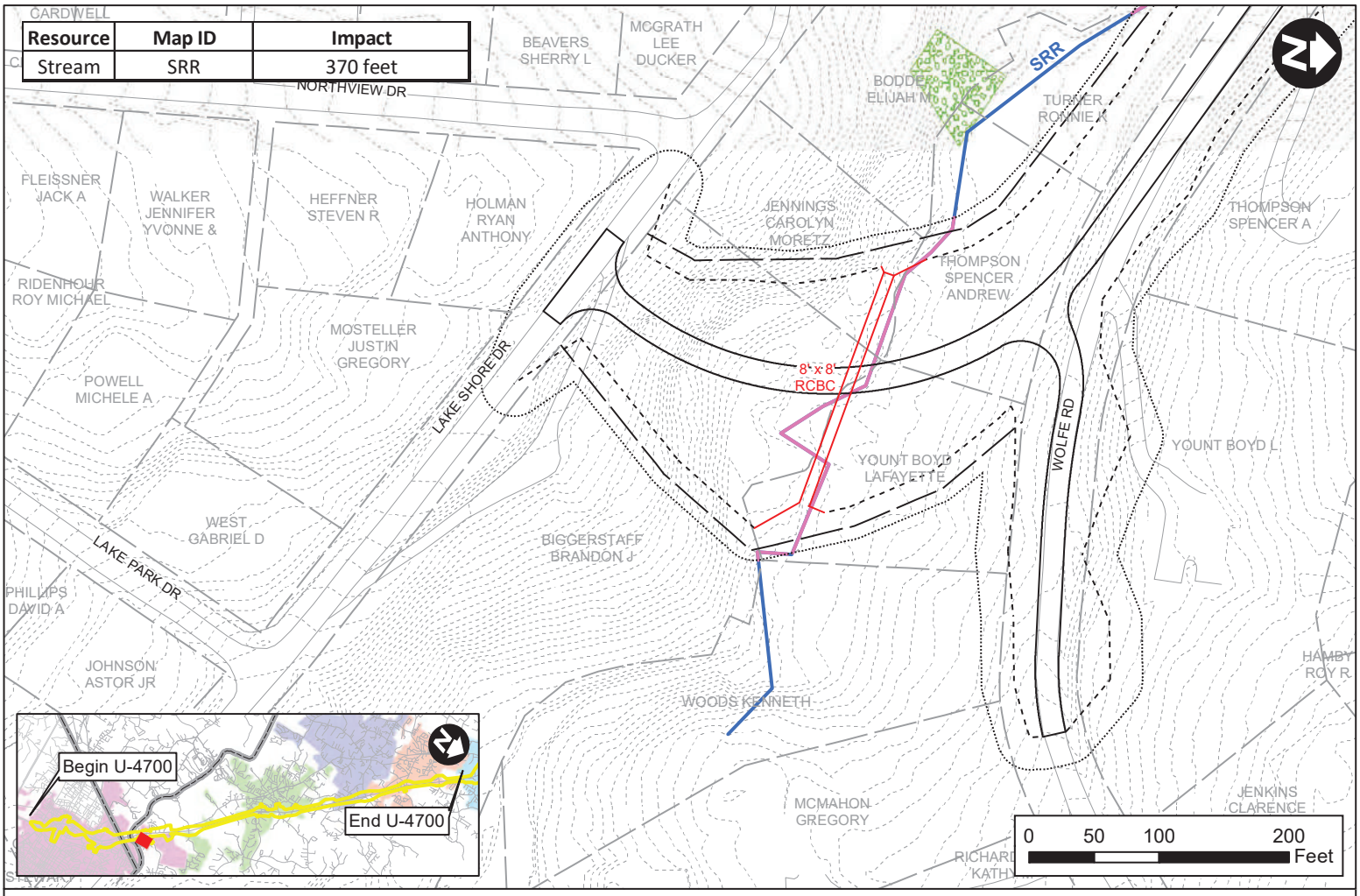
Burke and Caldwell Counties



U-4700 - U.S. 321 Widening

Figure 4
Impacts to Jurisdictional Resources

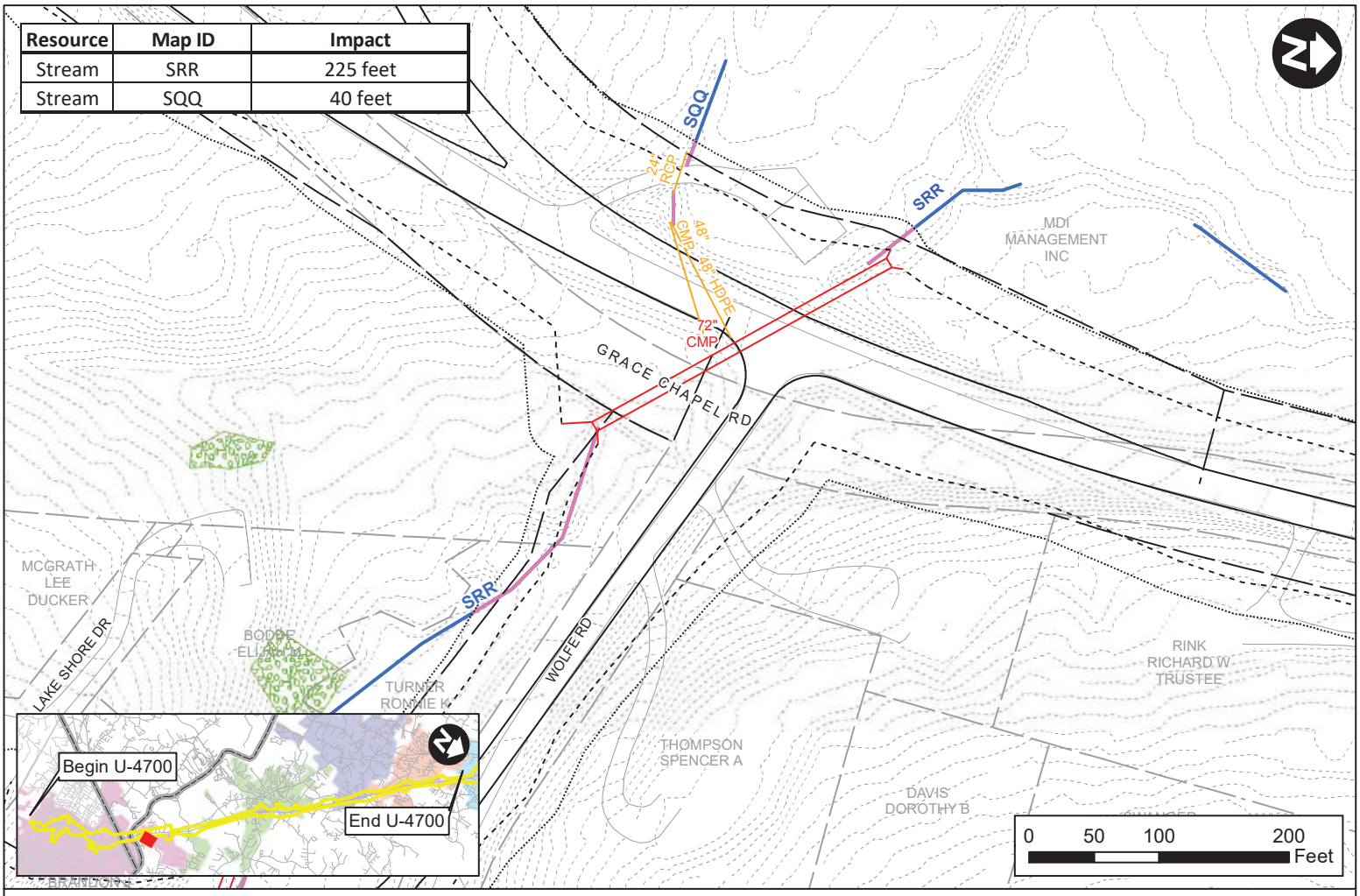
Caldwell County



U-4700 - U.S. 321 Widening

Figure 5
Impacts to Jurisdictional Resources

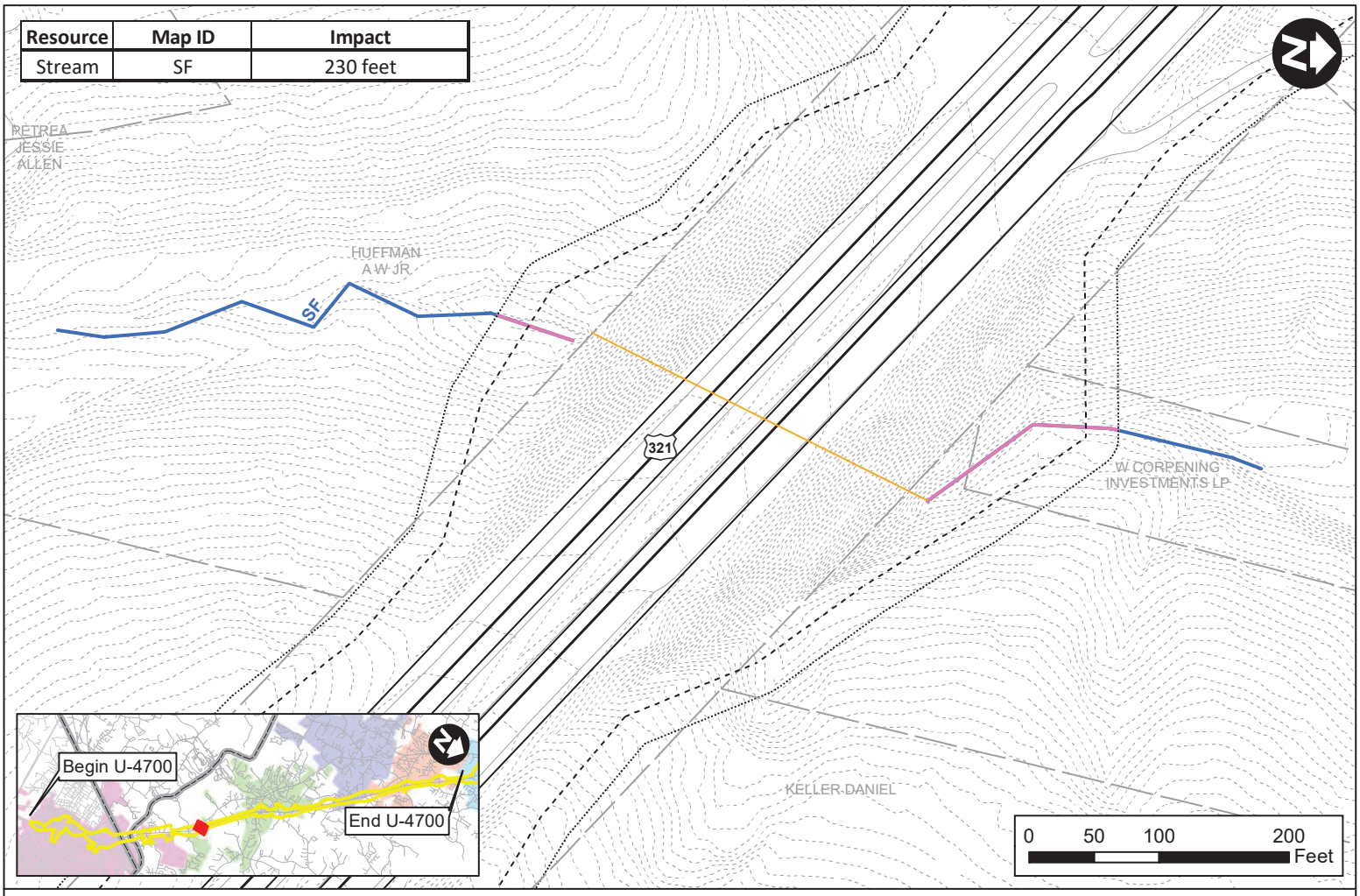
Caldwell County



U-4700 - U.S. 321 Widening

Figure 6
Impacts to Jurisdictional Resources

Caldwell County

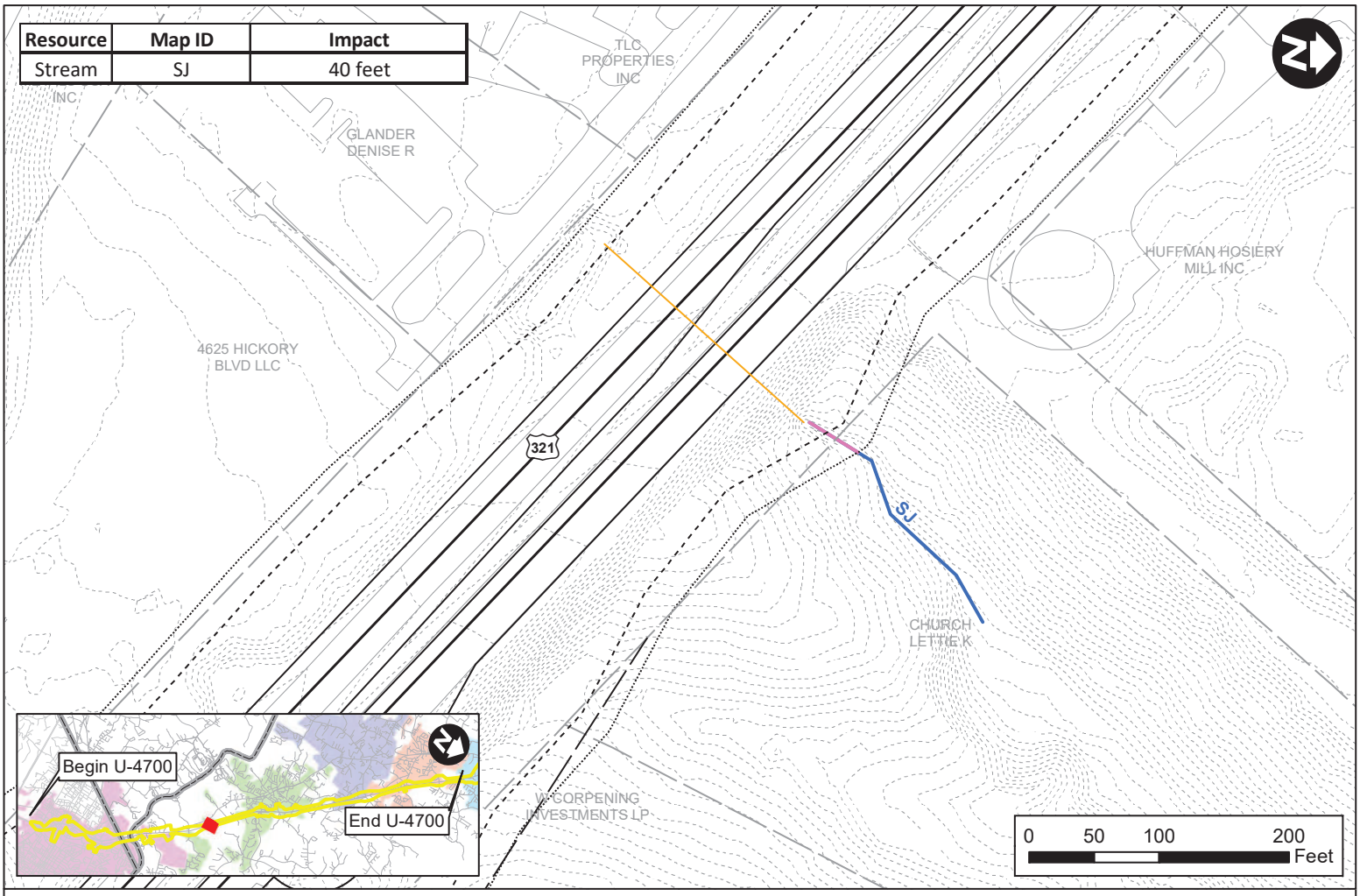


Existing Roadway
Existing Property Lines
Existing Drainage Structure
Proposed Roadway
Proposed Slope Stakes
Contour Lines (2')
Delineated Stream
Stream Impact
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 7
Impacts to Jurisdictional Resources

Caldwell County

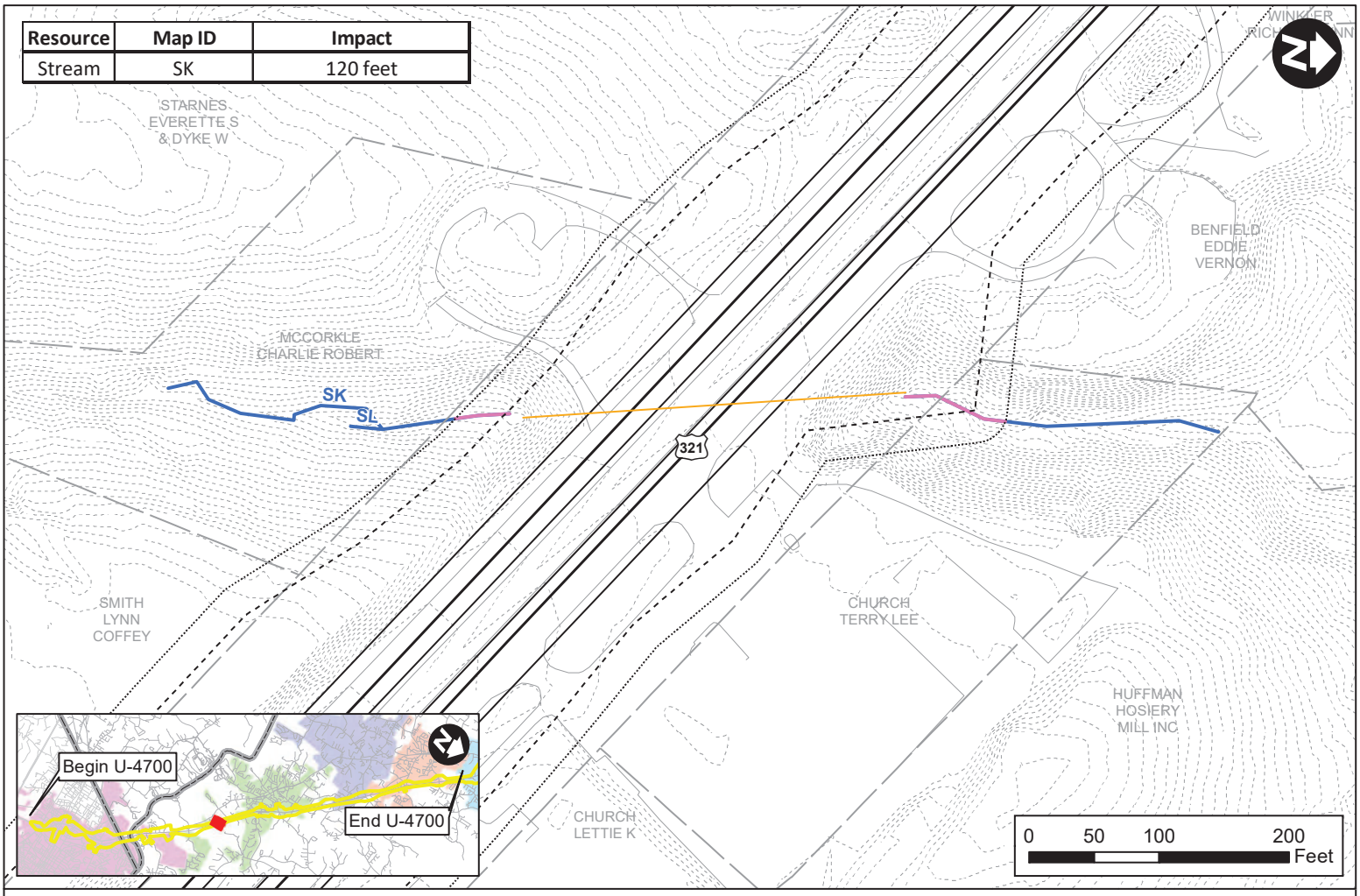


Existing Roadway
Existing Property Lines
Existing Drainage Structure
Proposed Roadway
Proposed Slope Stakes
Proposed Right of Way
Contour Lines (2')
Delineated Stream
Stream Impact
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 8
Impacts to Jurisdictional Resources

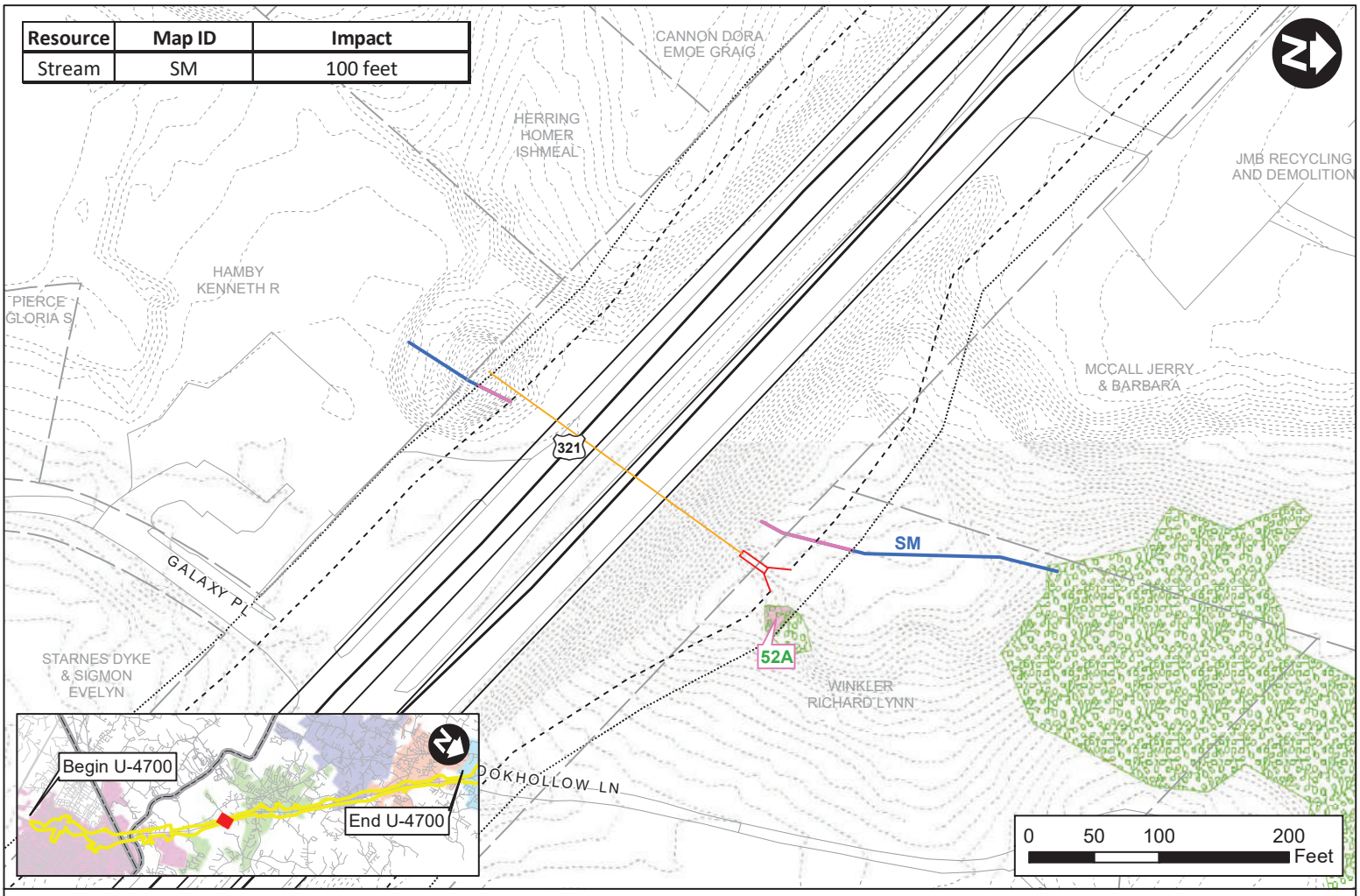
Caldwell County



U-4700 - U.S. 321 Widening

Figure 9
Impacts to Jurisdictional Resources

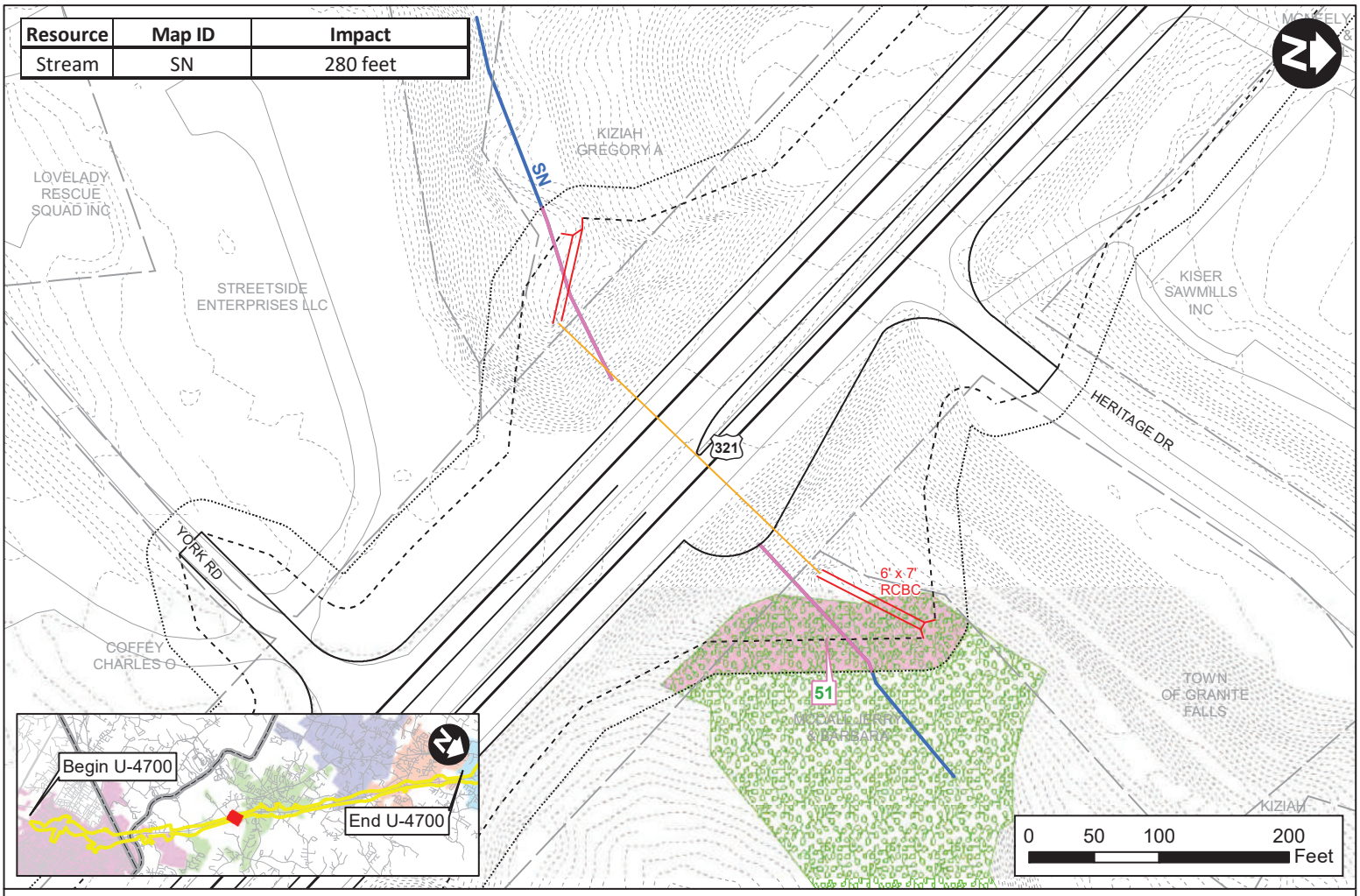
Caldwell County



U-4700 - U.S. 321 Widening

Figure 10
Impacts to Jurisdictional Resources

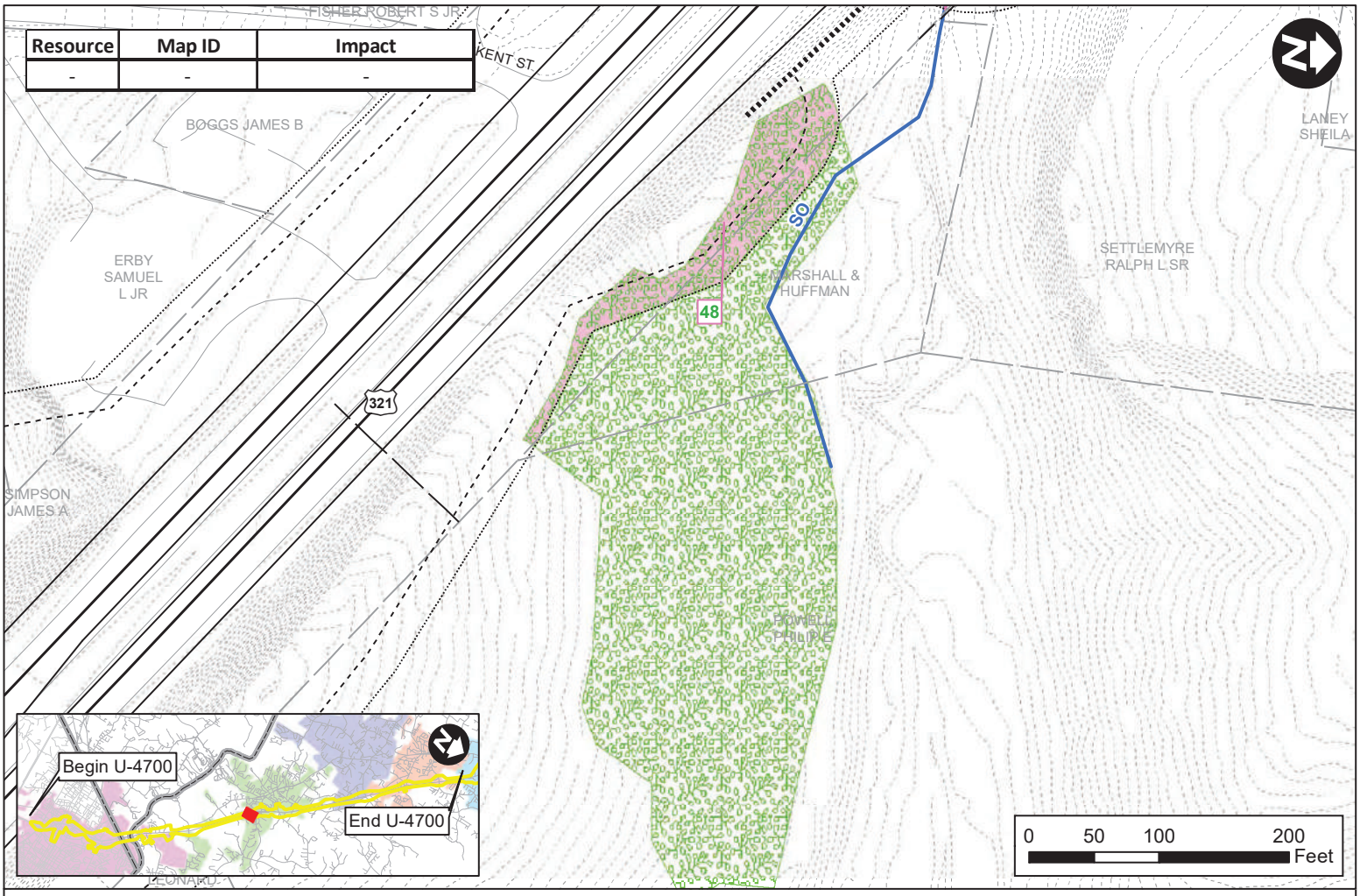
Caldwell County



U-4700 - U.S. 321 Widening

Figure 11
Impacts to Jurisdictional Resources

Caldwell County

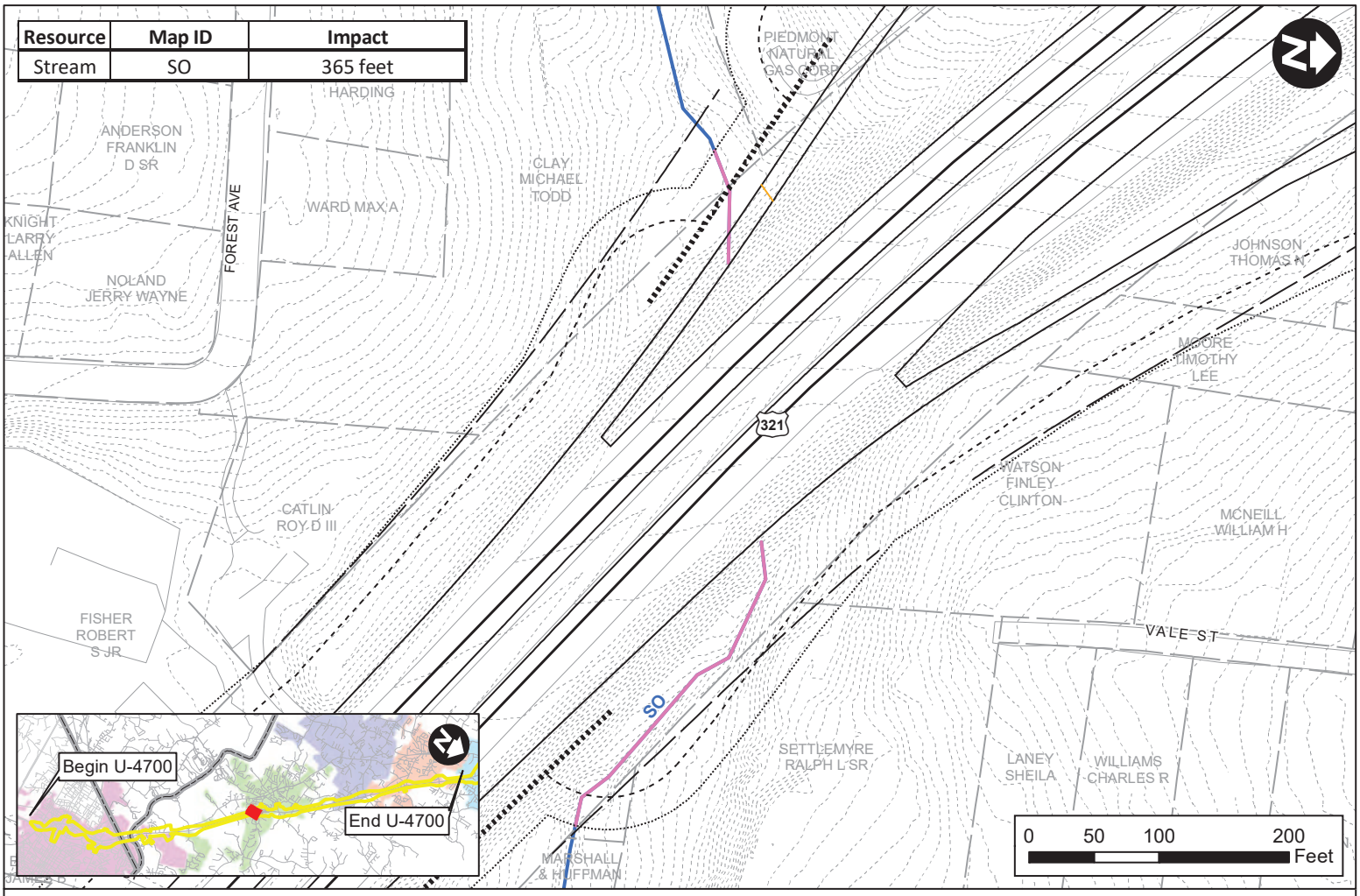


Existing Roadway
Existing Property Lines
Proposed Roadway
Proposed Retaining Wall
Proposed Slope Stakes
Proposed Right of Way
Contour Lines (2')
Delineated Stream
Stream Impact
Dwarf-flowered Heartleaf Population
Dwarf-flowered Heartleat Impact
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 12
Impacts to Jurisdictional Resources

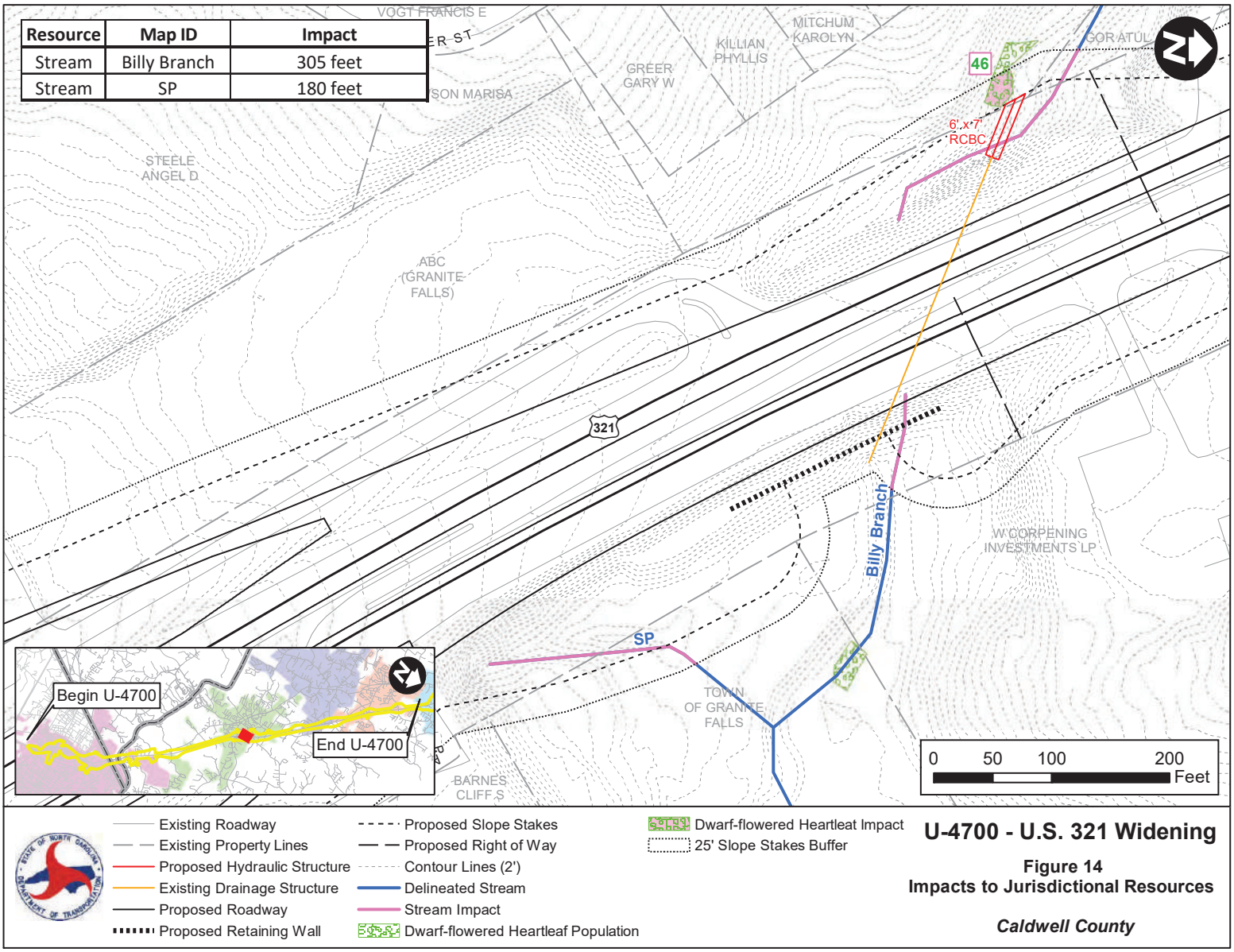
Caldwell County



U-4700 - U.S. 321 Widening

Figure 13
Impacts to Jurisdictional Resources

Caldwell County



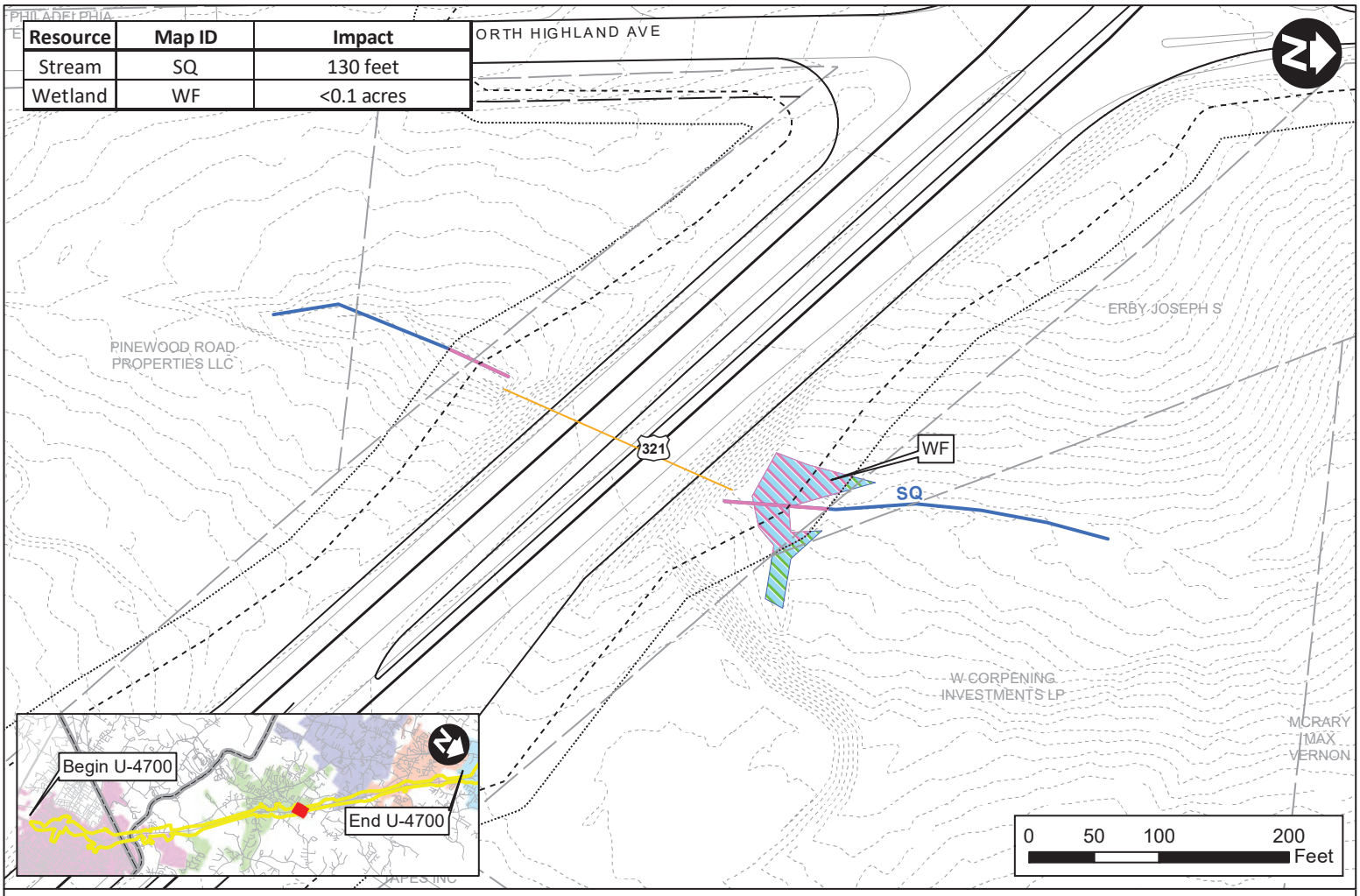
Resource	Map ID	Impact
Stream	Billy Branch	305 feet
Stream	SP	180 feet

Existing Roadway
Existing Property Lines
Proposed Hydraulic Structure
Existing Drainage Structure
Proposed Roadway
Proposed Retaining Wall
Proposed Slope Stakes
Proposed Right of Way
Contour Lines (2')
Delineated Stream
Stream Impact
Dwarf-flowered Heartleaf Population
Dwarf-flowered Heartleat Impact
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 14
Impacts to Jurisdictional Resources

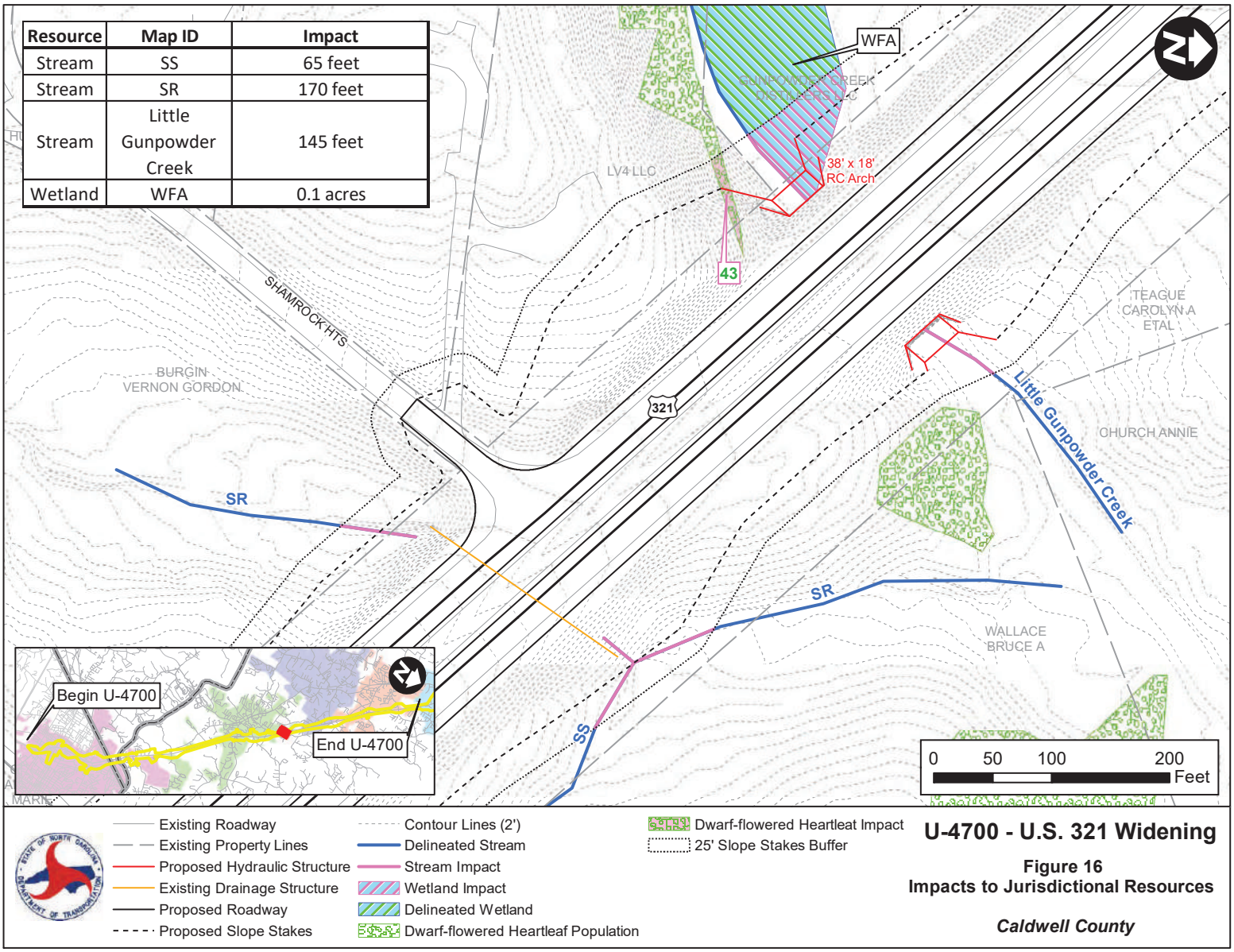
Caldwell County



U-4700 - U.S. 321 Widening

Figure 15
Impacts to Jurisdictional Resources

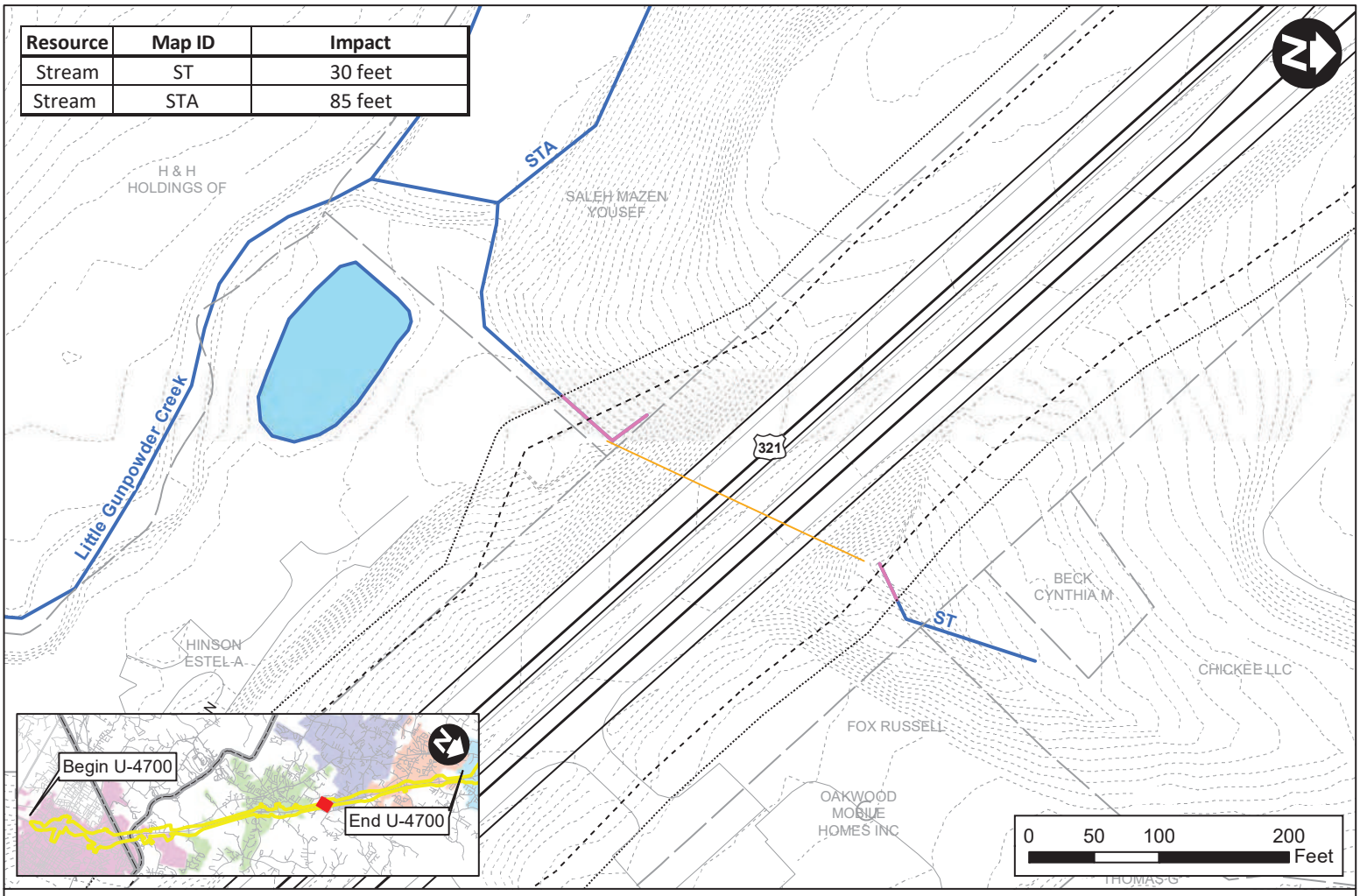
Caldwell County



U-4700 - U.S. 321 Widening

Figure 16
Impacts to Jurisdictional Resources

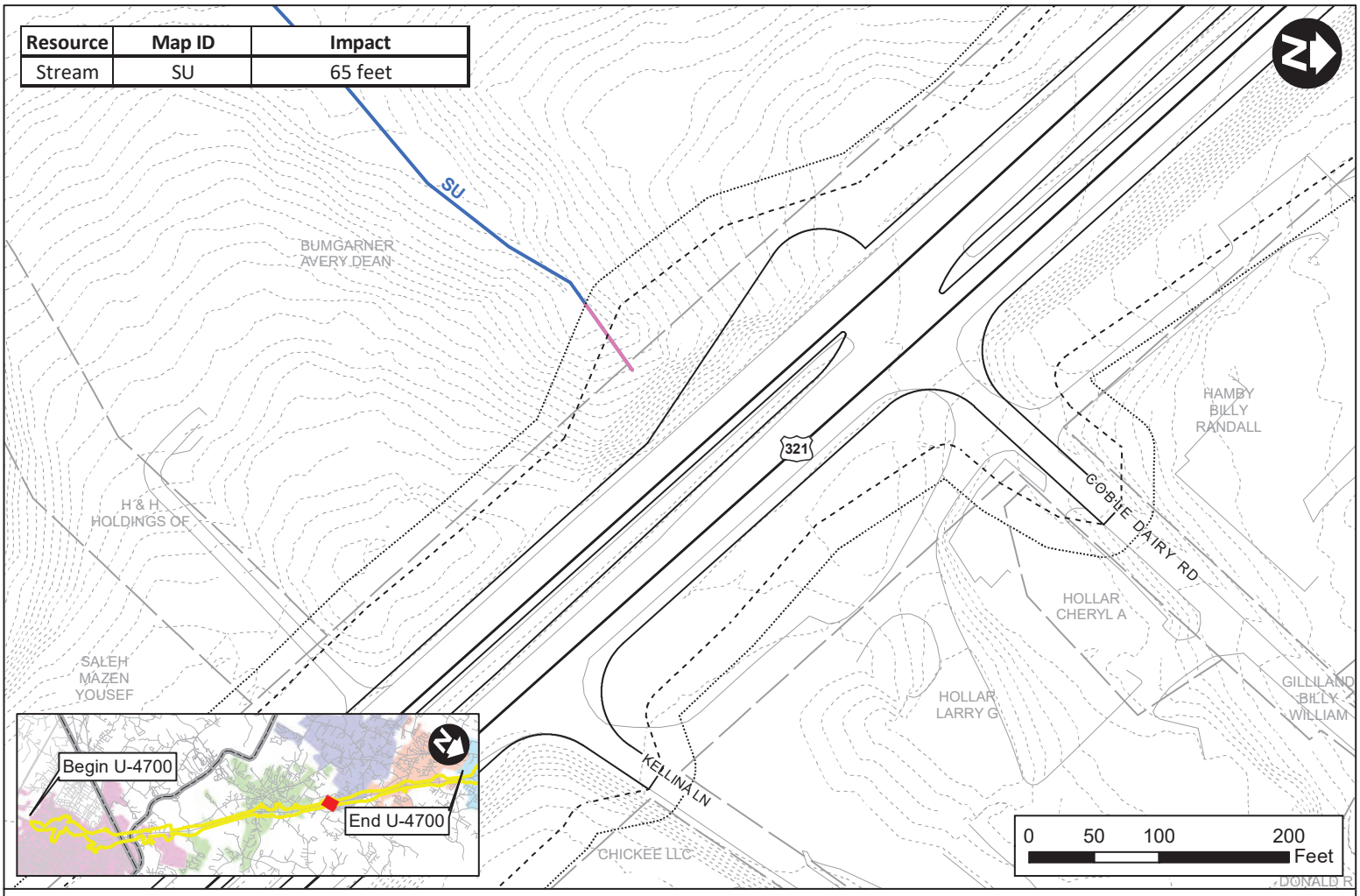
Caldwell County



U-4700 - U.S. 321 Widening

Figure 17
Impacts to Jurisdictional Resources

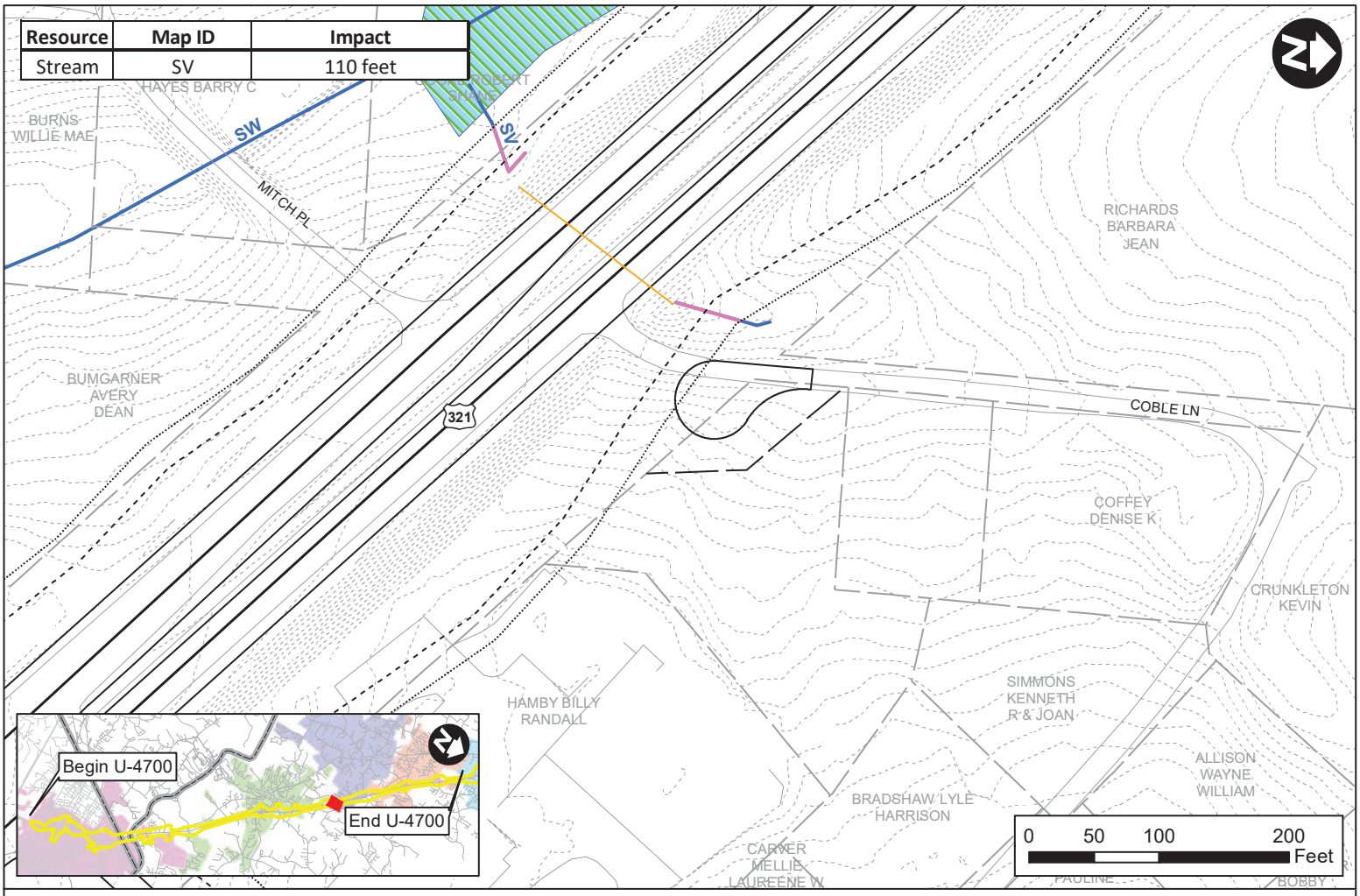
Caldwell County



U-4700 - U.S. 321 Widening

Figure 18
Impacts to Jurisdictional Resources

Caldwell County

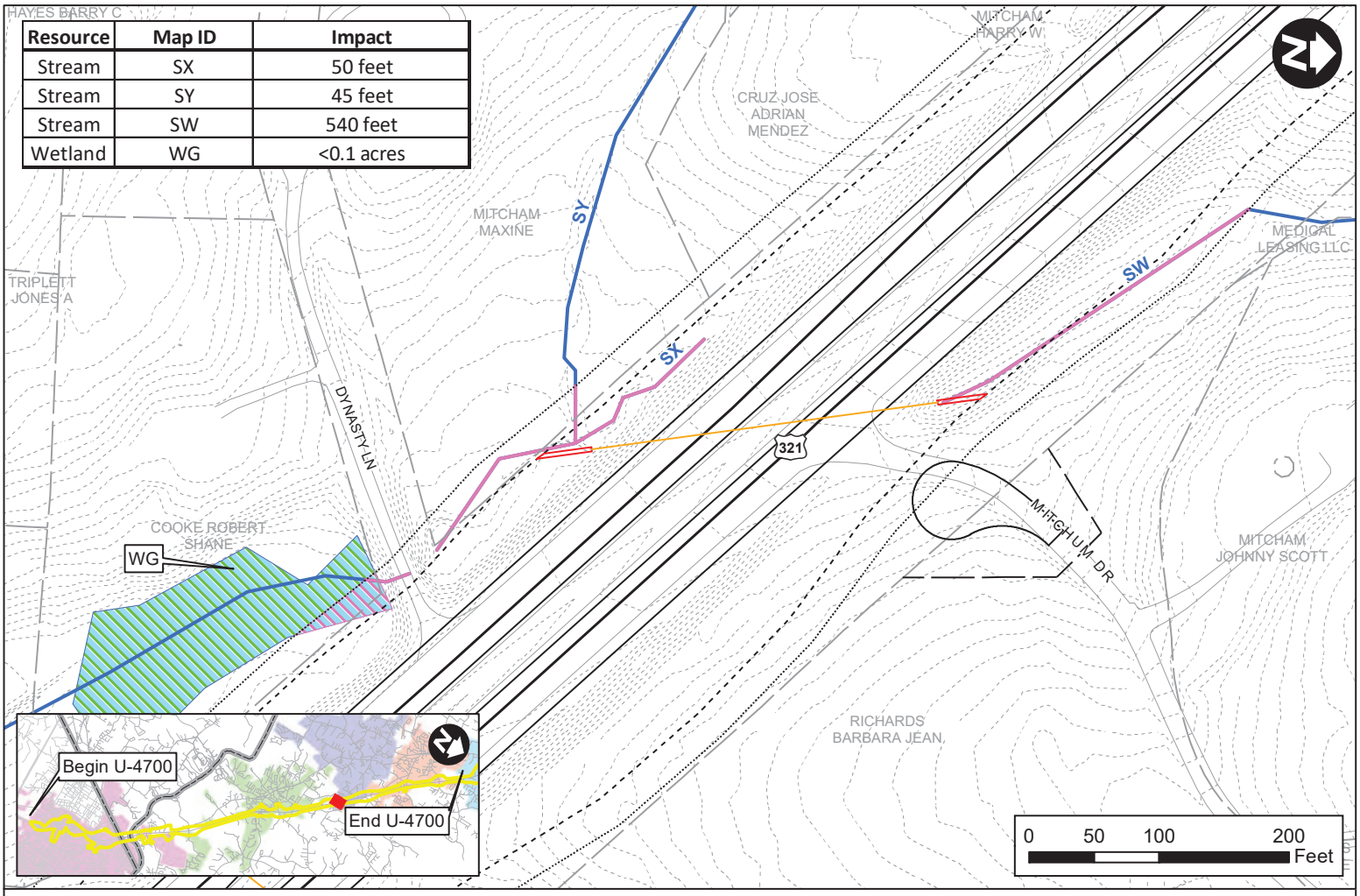


Existing Roadway
Existing Property Lines
Existing Drainage Structure
Proposed Roadway
Proposed Slope Stakes
Proposed Right of Way
Contour Lines (2')
Delineated Stream
Stream Impact
Delineated Wetland
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 19
Impacts to Jurisdictional Resources

Caldwell County



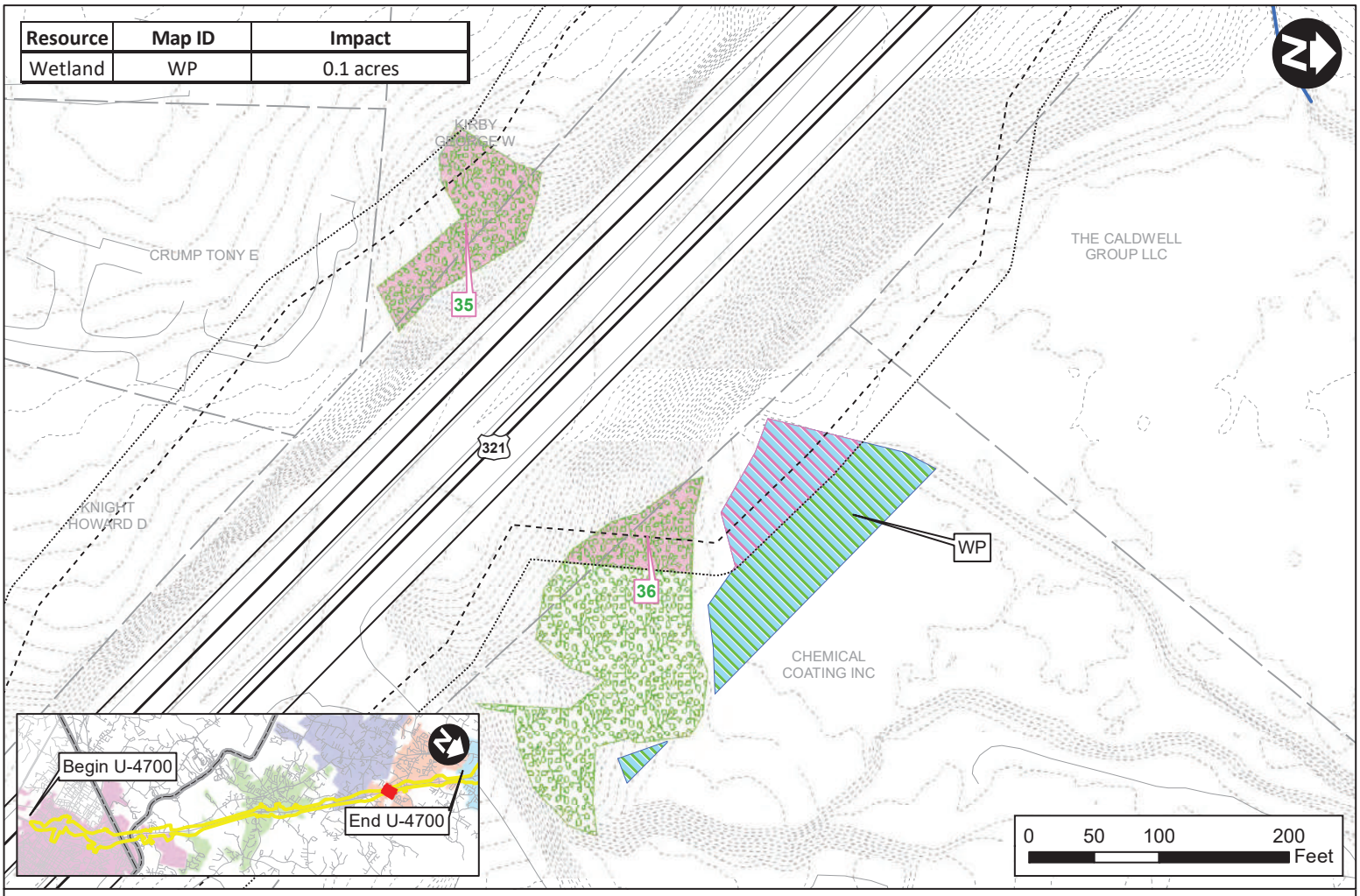
Resource	Map ID	Impact
Stream	SX	50 feet
Stream	SY	45 feet
Stream	SW	540 feet
Wetland	WG	<0.1 acres

Existing Roadway
Existing Property Lines
Proposed Hydraulic Structure
Existing Drainage Structure
Proposed Roadway
Proposed Slope Stakes
Proposed Right of Way
25' Slope Stakes Buffer
Contour Lines (2')
Delineated Stream
Stream Impact
Wetland Impact
Delineated Wetland

U-4700 - U.S. 321 Widening

Figure 20
Impacts to Jurisdictional Resources

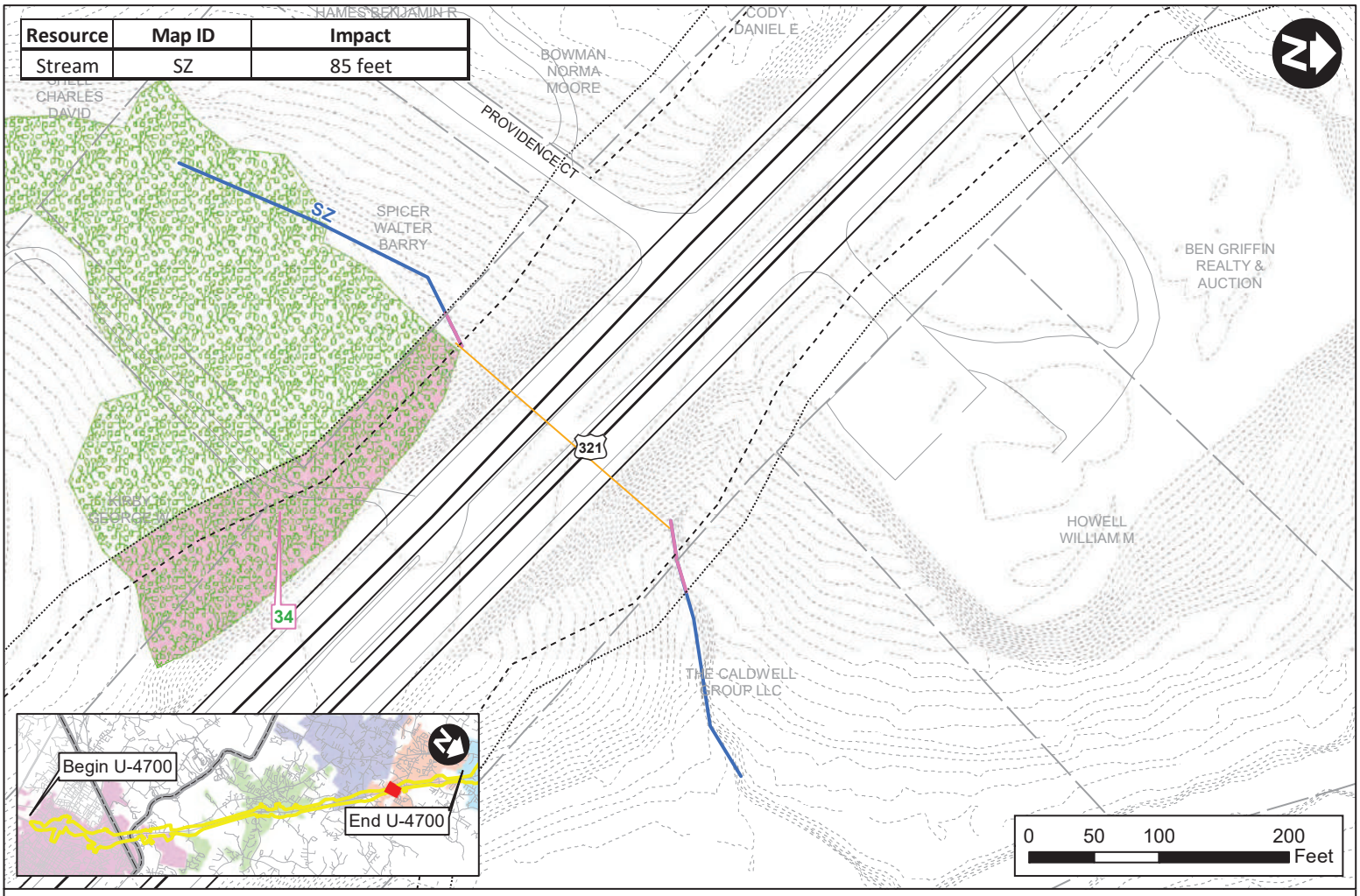
Caldwell County



U-4700 - U.S. 321 Widening

Figure 21
Impacts to Jurisdictional Resources

Caldwell County

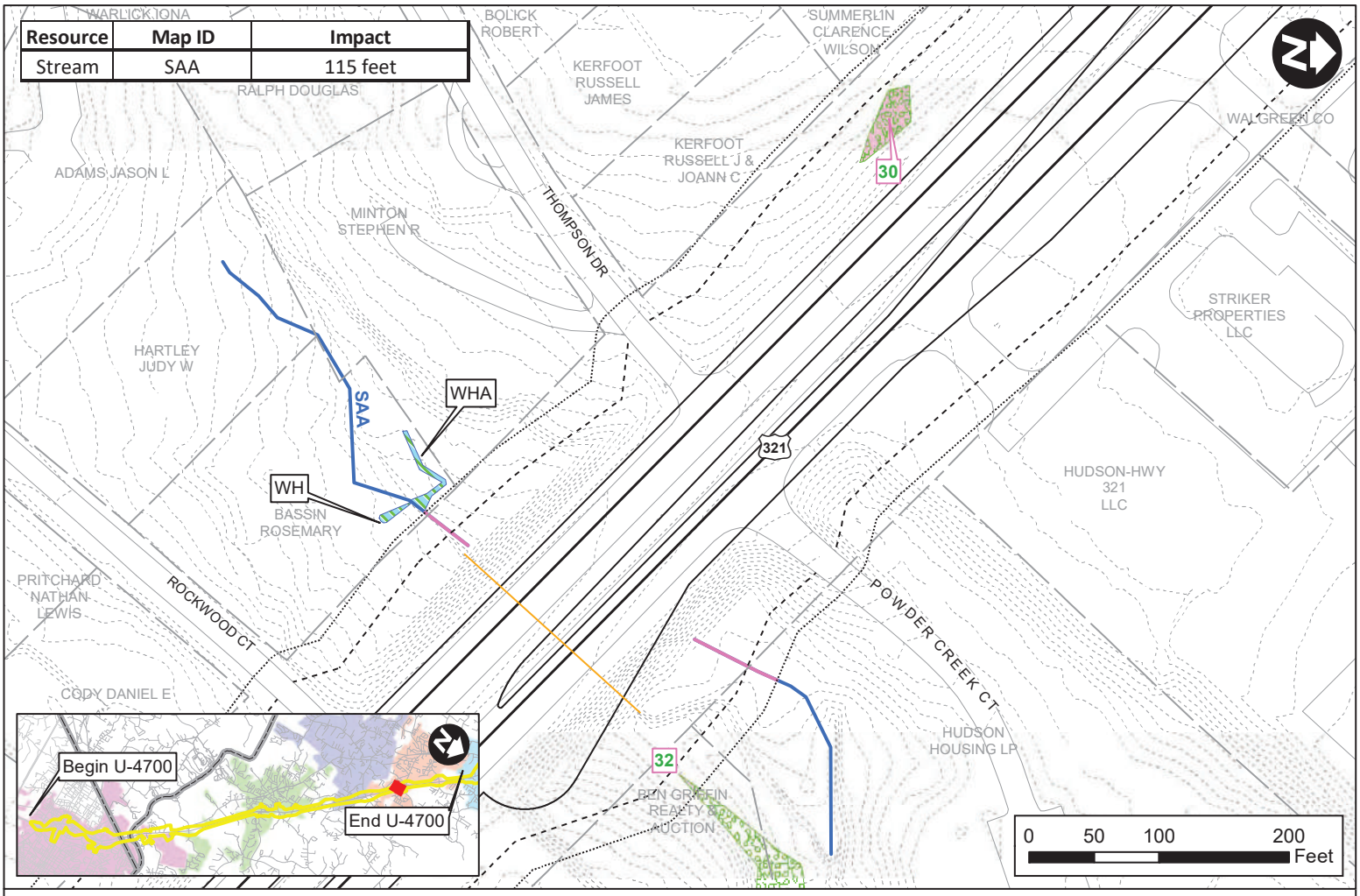


Existing Roadway
Existing Property Lines
Existing Drainage Structure
Proposed Roadway
Proposed Slope Stakes
Contour Lines (2')
Delineated Stream
Stream Impact
Dwarf-flowered Heartleaf Population
Dwarf-flowered Heartleat Impact
25' Slope Stakes Buffer

U-4700 - U.S. 321 Widening

Figure 22
Impacts to Jurisdictional Resources

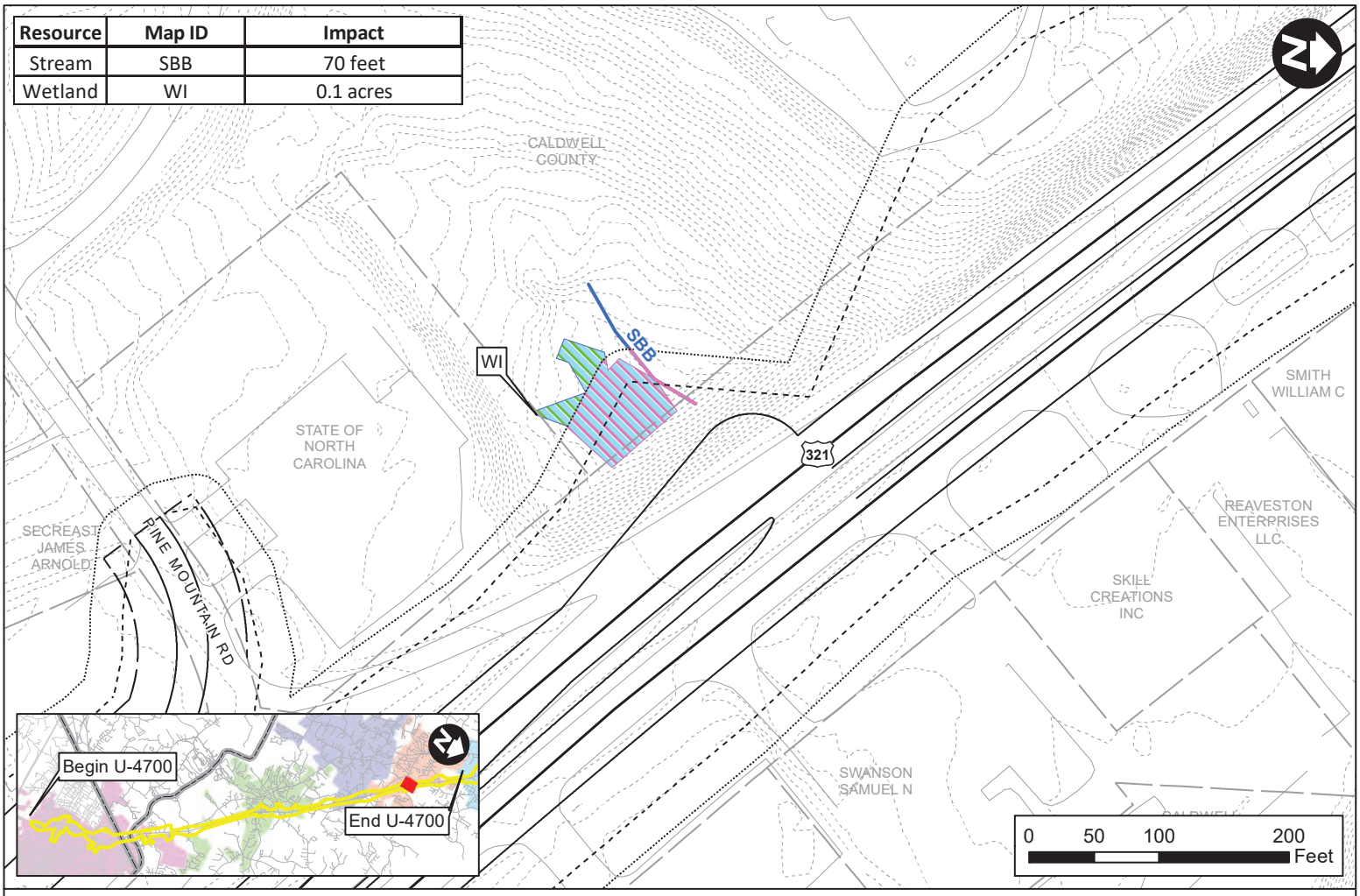
Caldwell County



U-4700 - U.S. 321 Widening

Figure 23
Impacts to Jurisdictional Resources

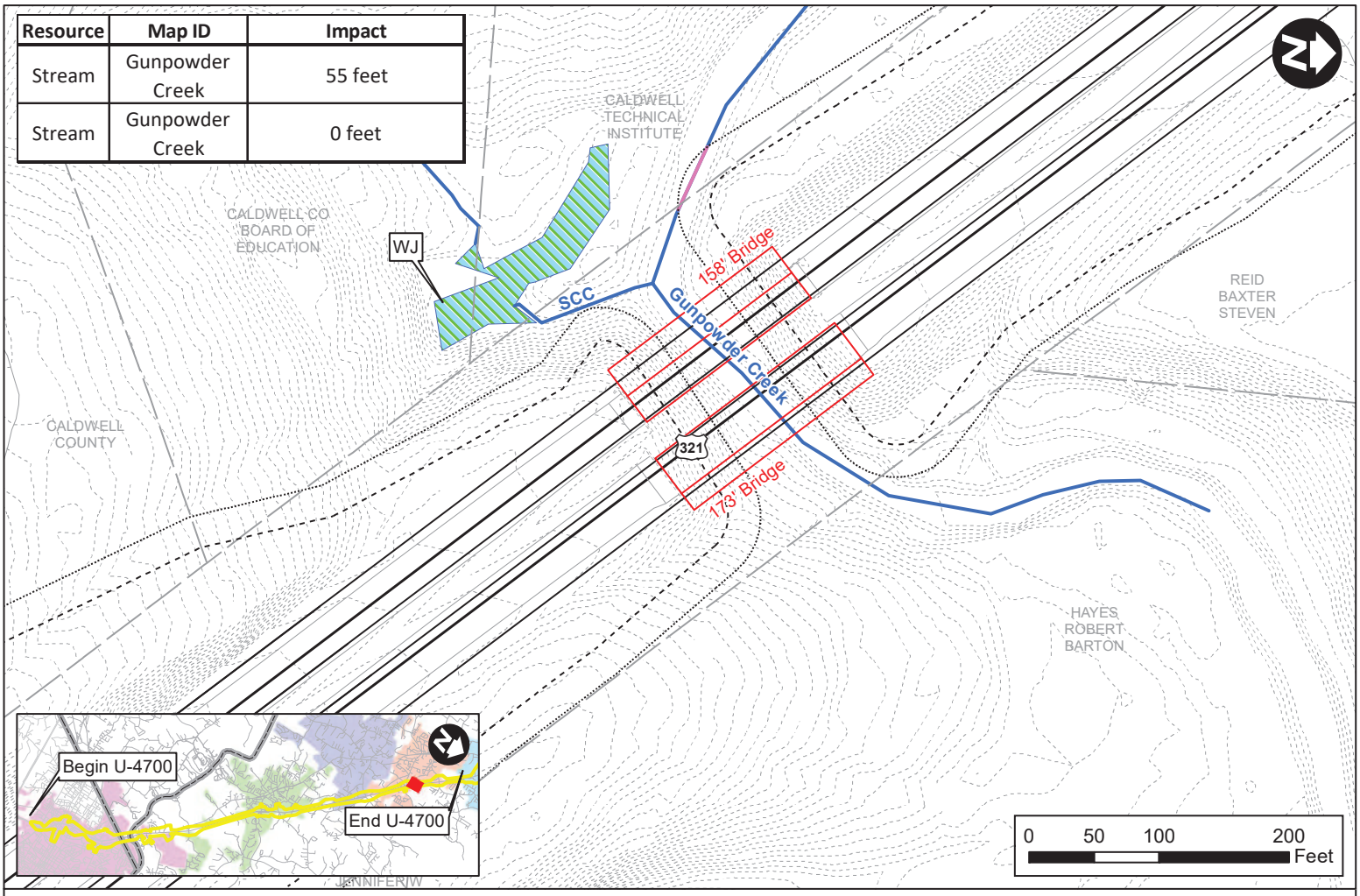
Caldwell County



U-4700 - U.S. 321 Widening

Figure 24
Impacts to Jurisdictional Resources

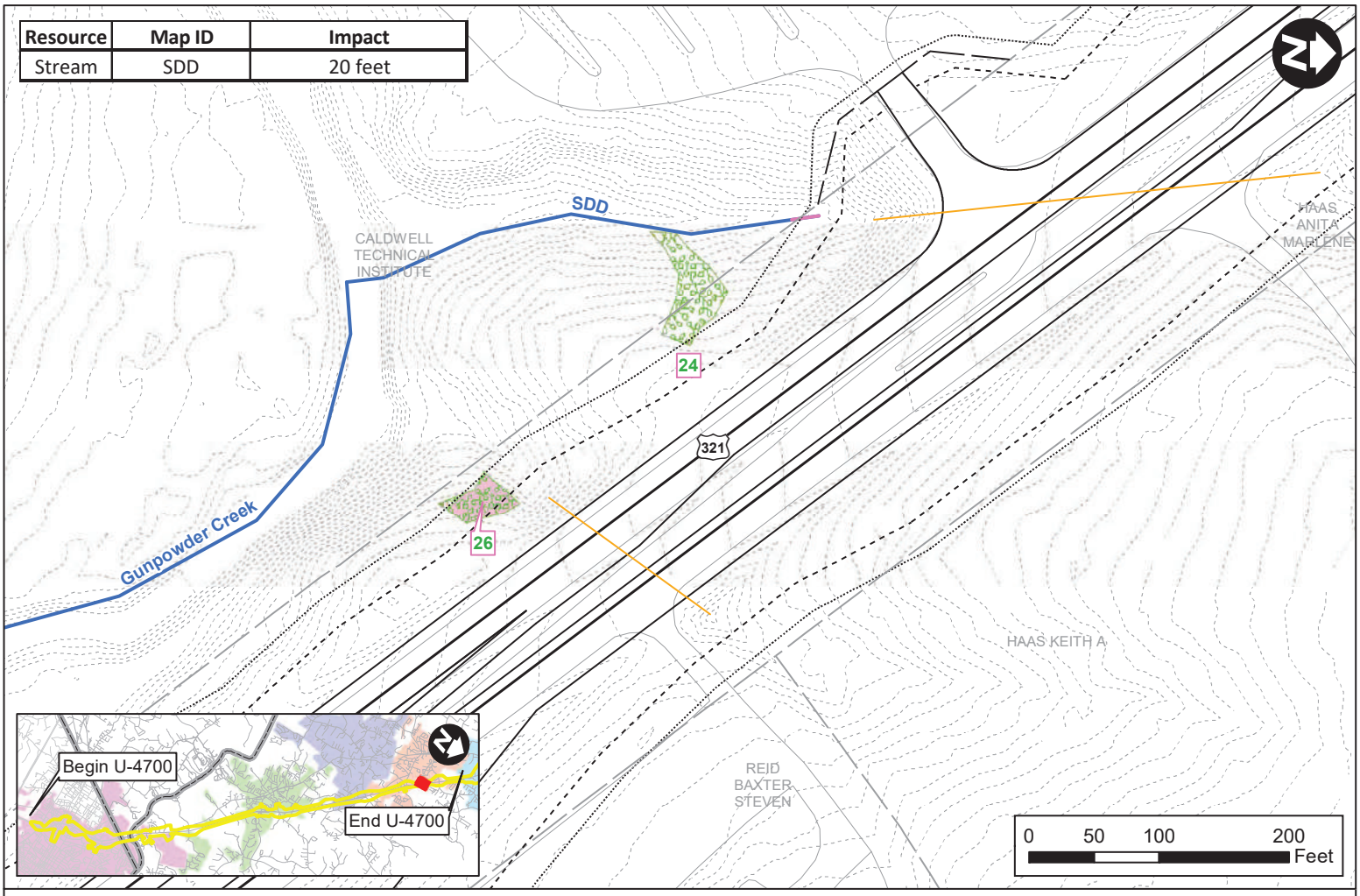
Caldwell County



U-4700 - U.S. 321 Widening

Figure 25
Impacts to Jurisdictional Resources

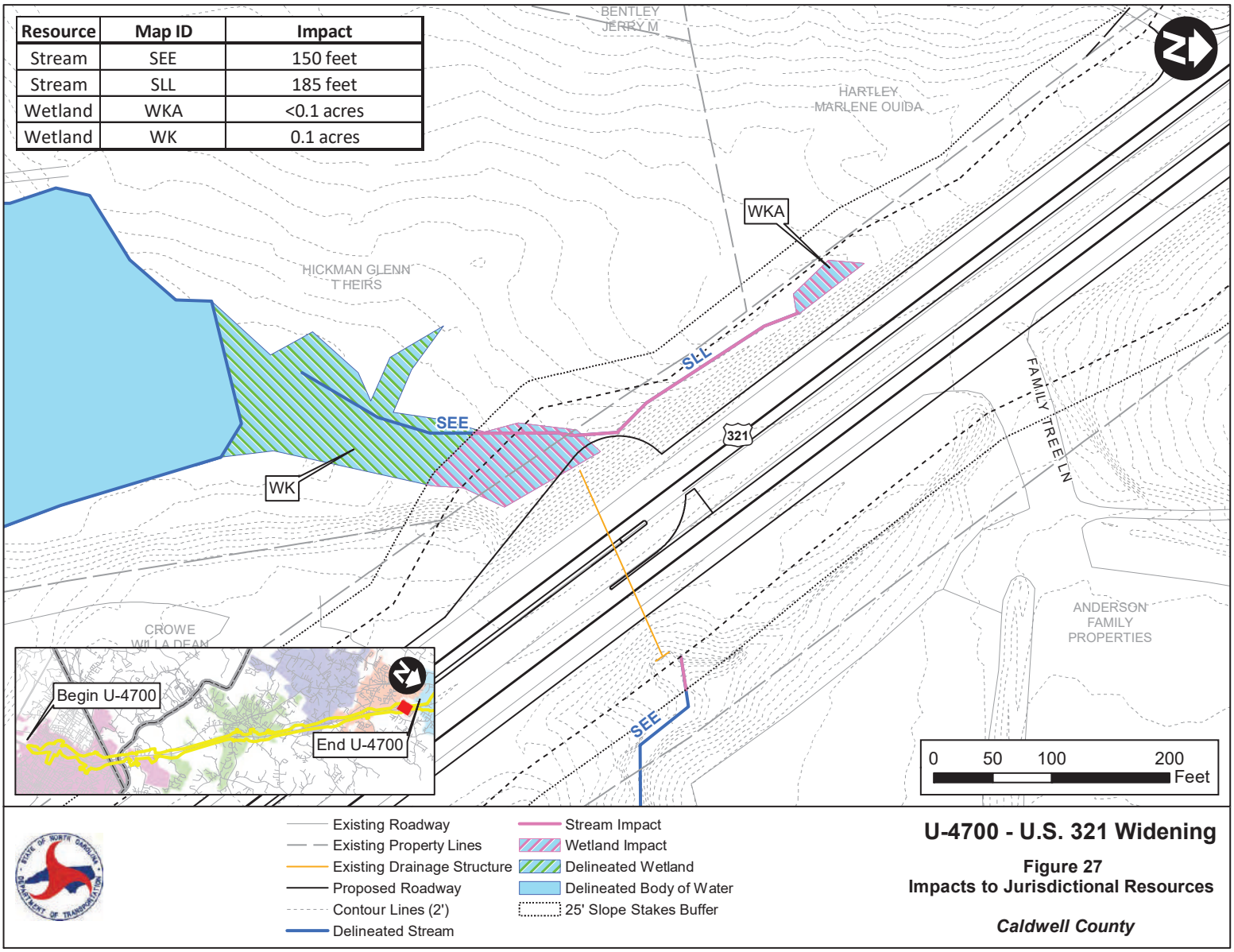
Caldwell County



U-4700 - U.S. 321 Widening

Figure 26
Impacts to Jurisdictional Resources

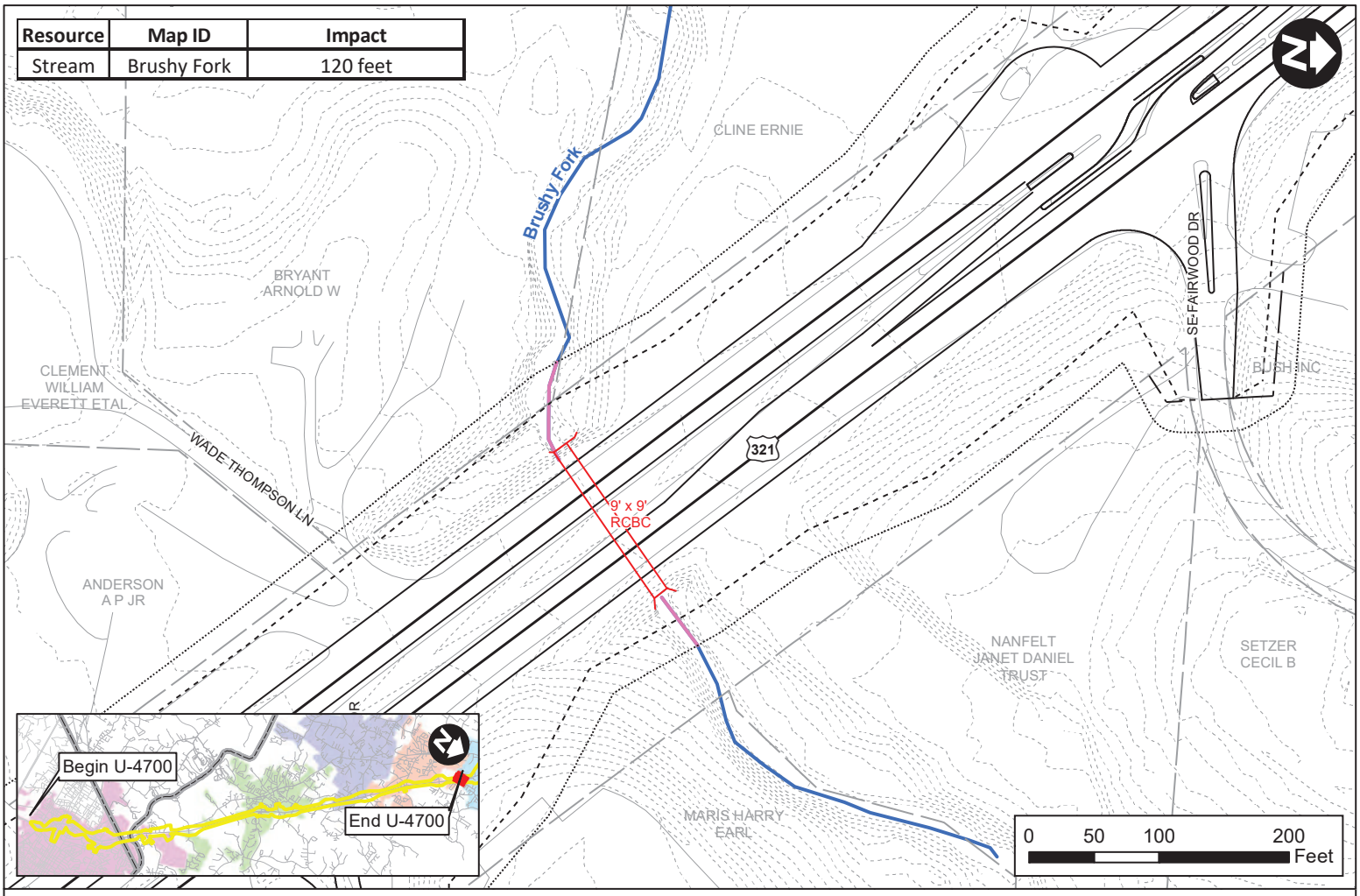
Caldwell County



U-4700 - U.S. 321 Widening

Figure 27
Impacts to Jurisdictional Resources

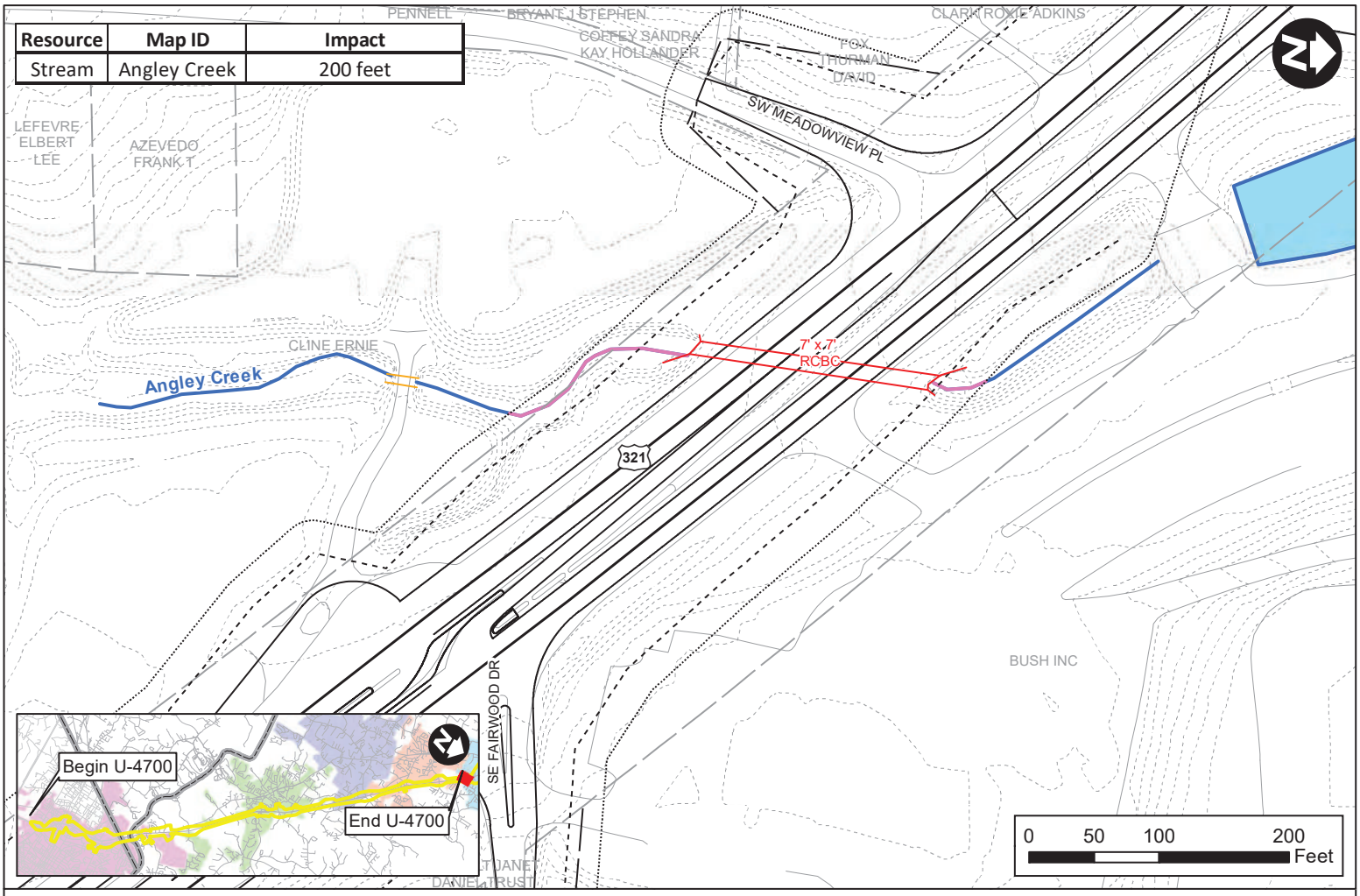
Caldwell County



U-4700 - U.S. 321 Widening

Figure 28
Impacts to Jurisdictional Resources

Caldwell County



U-4700 - U.S. 321 Widening

Figure 29
Impacts to Jurisdictional Resources

Caldwell County