

NC 16
From North of Tower Road (SR 1895)
to Caleb Setzer Road (SR 1800) Southeast of Newton
Catawba County
Federal Aid No. STP-16(4)
State Project No. 8.1792501
T.I.P. No. R-3100

ADMINISTRATIVE ACTION

ENVIRONMENTAL ASSESSMENT

U. S. DEPARTMENT OF TRANSPORTATION

FEDERAL HIGHWAY ADMINISTRATION

AND

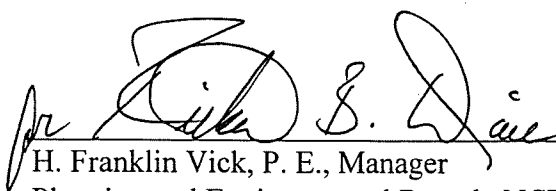
N. C. DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

Submitted Pursuant to 42 U. S. C. 4332(2)(c)

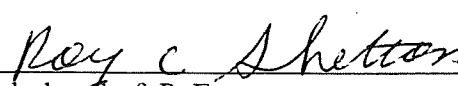
APPROVED:

1/26/98
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FOR 

Nicholas Graf, P. E.
Division Administrator, FHWA

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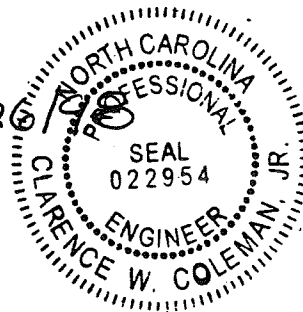
ENVIRONMENTAL ASSESSMENT

January, 1998

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SUMMARY OF ENVIRONMENTAL AND SPECIAL PROJECT COMMITMENTS

- A. NCDOT's Best Management Practices for the Protection of Water Supply Watersheds will be strictly enforced throughout the duration of the project. Provisions to preclude unnecessary contamination by toxic substances during the construction interval will also be strictly enforced to protect the High Quality Waters of Maiden Creek.
- B. The Geotechnical Unit will conduct a thorough survey for contaminated soil and groundwater prior to right of way acquisition if property is to be acquired on any of the ten sites identified as possibly hazardous.
- C. Special attention will be given to proper installation and maintenance of all erosion and sedimentation control devices.
- D. Any "major" stream relocations will be designed according to the North Carolina Wildlife Resources Commission (NCWRC) guidelines "N.C. Stream Protection and Improvement Guidelines". Proposed channel designs will be similar to original channels in width, depth, gradient, and substrate. Site specific requirements for re-establishment of bank vegetation with planting regime, meanders, and habitat structures will be determined through coordination with the NCWRC field staff during the hydraulic phase of the project.

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SUMMARY

1. Type of Action

This is a Federal Highway Administration Administrative Action, Environmental Assessment.

2. Description of Action

The North Carolina Department of Transportation (NCDOT), Division of Highways, proposes to widen NC 16 from a two-lane roadway to a multi-lane facility in Catawba County. The project originates just north of Tower Road (SR 1895) and terminates approximately 750 meters (2500 feet) north of Caleb Setzer Road (SR 1800), southeast of Newton. The proposed project is divided into three sections: (1) Section A, from north of Tower Road (SR 1895) to Ball's Creek Road (SR 1810)/Providence Mill Road (SR 1810), (2) Section B, from Ball's Creek Road/Providence Mill Road to Claremont Road (SR 1801), and (3) Section C, beginning at Claremont Road and ending approximately 750 meters (2500 feet) north of Caleb Setzer Road (SR 1800) (See Appendix A, Figures 1A and 2). The total project length is approximately 14.5 kilometers (9.0 miles). The length of Section A is approximately 8.5 kilometers (5.3 miles), Section B is approximately 4.4 kilometers (2.7 miles), and Section C is approximately 1.6 kilometers (1.0 mile).

The recommended typical cross-section for Section A is a four-lane divided shoulder section with a 14-meter (46-foot) median. For Sections B and C, the recommended typical cross-section is a five-lane, 19.2-meter (64-foot) face to face of curbs, curb and gutter facility.

The subject project is included in the 1998-2004 Transportation Improvement Program (T.I.P.) with an estimated cost of \$24,100,000. The current estimated cost is \$30,000,500. Section C is scheduled for right of way acquisition in Federal Fiscal Year (FFY) 1998 and construction in FFY 1999. Sections A and B are scheduled for right of way acquisition and construction beyond FFY 2004.

3. Summary of Environmental Impacts

The proposed project will provide an overall positive benefit for Catawba County. The project will improve traffic flow and increase safety. Also, the proposed widening of NC 16 to a multi-lane facility will help reduce travel times and provide more efficient vehicle operation.

No adverse effect on the air quality of the surrounding area is anticipated as a result of the project. The proposed project will not impact any structures eligible for the National Register of Historic Places. The recommended alternative will not encroach upon any archaeological sites eligible for listing in the National Register. The project will have some negative impacts on the human and natural environment. It is anticipated 34 residences, four businesses, and one non-profit organization will be relocated as a result of the proposed road widening. Also, noise levels are expected to increase from +5 dBA to +10 dBA.

This project will impact 12 perennial streams and one intermittent stream. Segments of several streams may be relocated as part of project construction. The project impacts approximately 0.02 hectare (0.06 acre) of wetlands.

It is anticipated right of way may be required from ten sites with the potential for involvement with underground storage tanks or hazardous materials. If further design studies indicate right of way from these properties needs to be acquired, preliminary site assessments for soil and groundwater contamination will be performed prior to right of way purchase. If contaminants are located on the proposed right of way, the current landowner or NCDOT will take appropriate action to decontaminate the area.

4. Special Permits Required

It is anticipated the proposed improvements can be performed under Department of the Army Nationwide Permits for discharges Above Headwaters or for Road Crossing Fills in accordance with 33 CFR 330.5(a)(26) respectively.

A 401 Water Quality Certification, administered through the Department of Environment, Health, and Natural Resources (DEHNR), is required for the proposed project since a federal permit is involved.

5. Alternatives Considered

The following alternatives were studied for the proposed project.

A. Recommended Alternative (Alternative 4)

Widen NC 16 to a four-lane divided facility with a 14-meter (46-foot) median from Tower Road (SR 1895) to Ball's Creek Road (SR 1810) and a five-

lane curb and gutter typical cross-section from Ball's Creek Road (SR 1810) to Caleb Setzer Road (SR 1800).

B. Other Design Alternatives

1. Alternative 1

Widen NC 16 to a four-lane divided facility from Tower Road (SR 1895) to Mount Ruhama Church Road (SR 1876), a five-lane shoulder section from Mount Ruhama Church Road (SR 1876) to Claremont Road (SR 1801), and a five-lane curb and gutter facility from Mount Ruhama Church Road (SR 1801) to Caleb Setzer Road (SR 1800).

2. Alternative 2

Widen NC 16 to a four-lane divided facility with a 14-meter (46-foot) median from Tower Road (SR 1895) to Providence Mill Road (SR 1810), a five-lane shoulder section from Providence Mill Road (SR 1810) to Claremont Road (SR 1801), and a five-lane curb and gutter facility from Claremont Road (SR 1801) to Caleb Setzer Road (SR 1800).

3. Alternative 3

Widen NC 16 to a four-lane divided facility with a 14-meter (46-foot) median from Tower Road (SR 1895) to Bethany Church Road (SR 1804) and a five-lane curb and gutter facility from Bethany Church Road (SR 1804) to Caleb Setzer Road (SR 1800).

C. Alternative Modes of Transportation

No alternative mode of transportation is considered to be a practical alternative to this highway project. Highway transportation is the dominant mode of transportation in the project area, and the project involves widening an existing highway. Currently, public transportation is provided in Newton, Conover, and Hickory by Piedmont Wagon. Increased use of these services along with staggering work hours, car-pooling, and van-pooling could relieve some congestion on NC 16 within municipal areas; however, these congestion management measures are not within the control of NCDOT and will not meet the transportation improvements necessary for the growing residential and industrial areas surrounding Newton and Conover.

D. Postponement of Project

Postponement of the project would result in continuing deterioration of traffic and safety conditions in the future as traffic demands increase. Therefore, this alternative is not recommended.

E. “No Build “ Alternative

The “no build” alternative was considered but rejected since the project will provide a safer, more efficient route in Catawba County.

6. The following federal, state, and local agencies were consulted during the preparation of this environmental assessment.

- *U. S. Army Corps of Engineers
- *U. S. Fish and Wildlife Service
- U. S. Department of Interior
- Federal Emergency Management Administration
- U. S. Advisory Council on Historic Preservation
- U. S. Department of Agriculture
- U. S. Environmental Protection Agency
- U. S. Soil Conservation Service
- U. S. Geological Survey
- *N. C. State Clearinghouse, Department of Administration
- *N. C. Department of Environment, Health, and Natural Resources
- *N. C. Department of Cultural Resources, Division of Archives and History
- *N. C. Wildlife Resources Commission
- N. C. Department of Human Resources
- N. C. Department of Public Instruction
- *Catawba County Public Schools
- *Catawba County Planning
- *City of Newton

* Denotes agencies from which input was received

7. Additional Information

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

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I. DESCRIPTION OF PROPOSED ACTION

The North Carolina Department of Transportation (NCDOT), Division of Highways, proposes to widen NC 16 in Catawba County from a two-lane roadway to a multi-lane facility. The project originates north of Tower Road (SR 1895) [at the termination of the proposed new location of NC 16 (T.I.P. No. R-2206)] and terminates north of Caleb Setzer Road (SR 1800). The proposed Newton-Conover Eastern Loop (T.I.P. No. U-2404) will tie into NC 16 in the vicinity of Caleb Setzer Road. The project is divided into three sections: (1) Section A, from north of Tower Road (SR 1895) to Ball's Creek Road (SR 1810)/Providence Mill Road (SR 1810), (2) Section B, from Ball's Creek Road/Providence Mill Road to Claremont Road (SR 1801), and (3) Section C, from Claremont Road to north of Caleb Setzer Road (SR 1800). The total project length is approximately 14.5 kilometers (9.0 miles). The length of Section A is approximately 8.5 kilometers (5.3 miles), Section B is approximately 4.4 kilometers (2.7 miles), and Section C is approximately 1.6 kilometers (1.0 mile).

The recommended typical cross section for Section A is a four-lane divided shoulder section with a 14-meter (46-foot) median. For Sections B and C, the recommended typical cross section is a five-lane, 19.2-meter (64-foot) face to face of curbs, curb and gutter facility.

The subject project is included in the 1998-2004 Transportation Improvement Program (T.I.P.) with an estimated total cost of \$24,100,000. This includes \$5,000,000 for right of way acquisition, \$1,000,000 for construction, \$500,000 in prior years costs, and \$17,600,000 in post year (beyond the year 2004) for right of way and construction costs. The current total estimated cost is \$30,000,500, which includes \$14,000,500 for right of way acquisition, and \$16,000,000 for construction. Section C is scheduled for right of way acquisition in Federal Fiscal Year (FFY) 1998 and construction in FFY 1999. Sections A and B are scheduled for right of way acquisition and construction beyond FFY 2004.

II. NEED FOR THE PROPOSED PROJECT

A. Purpose of Project

The purpose of widening NC 16 is to improve traffic service for motorists in the project area. NC 16 is a major north-south route in the western piedmont of North Carolina. The portion of NC 16 studied in this report serves as a radial route between Charlotte and Newton. NC 16 is also heavily used to access Interstate 40.

B. Traffic/Truck Volumes

NC 16 is currently a two-lane roadway with unpaved shoulders and open ditches. It is designated as a major north-south thoroughfare on the 1991 Catawba County Urban Area Thoroughfare Plan (see Appendix A, Figure 1B).

The 1995 Average Daily Traffic (ADT) volumes along this project vary from a low of 6060 vehicles per day (vpd) to a high of 11,530 vpd. In the year 2020, these volumes are expected to vary from 13,930 vpd to 23,650 vpd over the length of the project (See Appendix A, Figures 5A and 5B).

The Level of Service (LOS) of a roadway is a measure of its traffic carrying ability. Levels of Service range from LOS A and F. Level of Service A represents unrestricted maneuverability and operating speeds. Level of Service B represents reduced maneuverability and normal operating speeds. Level of Service C represents restricted maneuvering and operating speeds close to the speed limit. This condition is considered acceptable in sparsely populated rural areas. Level of Service D represents severely restricted maneuvering and unstable, low operating speeds. Level of Service E represents operating conditions at or near the capacity level. Breakdown conditions which are characterized by stop and go travel occur with Level of Service F.

With the present traffic volumes, NC 16 is operating at Level of Service D from north of Tower Road (SR 1895) to Caleb Setzer Road (SR 1800), and Level of Service C for the remaining portion of the project. If no improvements were made to NC 16, the roadway is expected to operate at Level of Service E from north of Tower Road to Ball's Creek Road, Level of Service F from Ball's Creek Road to Caleb Setzer Road (SR 1800), and Level of Service E from Caleb Setzer Road to the project end terminus in the design year 2020. The proposed improvements to NC 16 will improve the level of traffic service to Level of Service B from north of Tower Road to Bethany Church Road, and Level of Service C or better for the remainder of the project in the design year 2020.

The following three intersections with NC 16 will remain signalized: Buffalo Shoals Road (SR 1003), Ball's Creek Road (SR 1810), and Bethany Church Road (SR 1804). Also, the intersection of NC 16 and the proposed Newton-Conover Loop (T.I.P. No. U-2404) is recommended to be signalized. The signalization of the intersection of NC 16 and the proposed Newton-Conover Loop will be done as part of Project U-2404.

The recommended lane treatment for each signalized intersection is illustrated in Appendix A, Figures 4A - 4D. With the proposed improvements, each intersection is expected to operate at Level of Service D or better through the year 2020.

Table 1
MAINLINE CAPACITY LEVELS OF SERVICE

SEGMENT	LEVEL OF SERVICE	LEVEL OF SERVICE	LEVEL OF SERVICE
	1995	2020 No improvements	2020 With improvements
Tower Road to Ball's Creek Road	D	E	B
Ball's Creek Road to Bethany Church Road	D	F	B
Bethany Church Road to Caleb Setzer Road	D	F	C
Caleb Setzer Road to Project End Terminal	C	E	B

C. Accident Studies

During the period from April 1, 1992 to March 31, 1995, a total of 233 accidents were reported on the studied portion of NC 16. This resulted in an accident rate of 155.76 accidents per 100 million vehicle miles (ACC/100MVM), which is below the statewide average of 211.50 ACC/100MVM for all rural, two-lane NC routes. There were six fatalities during the period, and 110 accidents resulted in injuries. The primary accident type was rear-end collisions with slowing or stopping vehicles. The proposed multi-lane cross section should reduce the potential for this type of accident.

III. EXISTING ROADWAY INVENTORY

A. Existing Streets

The recommended project alignment will involve the following existing streets:

1. Tower Road (SR 1895)
2. R. L. Caldwell Drive
3. Airport Road (SR 1891)
4. Anderson Mountain Road (SR 1857)
5. Emma Road
6. Rant Drum Road (SR 1816)

7. Pine Leaf Drive
8. Hemlock Street
9. Winfield Drive
10. Buffalo Shoals Road (SR 1003)
11. Beda Drive
12. Timberbrook Drive
13. Mount Ruhama Church Road (SR 1876)
14. Caldwell Road (SR 1814)
15. Providence Mill Road/Ball's Creek Road (SR 1810)
16. Springlake Drive
17. Stove Drive
18. Woodstone Drive
19. Smyre Farm Road (SR 1884)/Bethany Church Road (SR 1804)
20. Crestview Drive (SR 1909)
21. Coley Pond Road (SR 1803)
22. Claremont Road (SR 1801)
23. E. P. Street Extension (SR 2105)/Caleb Setzer Road (SR 1800)
24. Debra Drive (SR 1913)

No major improvements for any of these streets are recommended for this project. However, the intersection of E. P. Street Extension (SR 2105)/Caleb Setzer Road (SR 1800) and NC 16 will be improved by the proposed Newton-Conover Eastern Loop (T.I.P. No. U-2404) (See Appendix A, Figure 2). Also, sight distance will be improved as needed at all intersecting streets.

B. Existing Cross Section

The existing typical cross section of NC 16 is a two-lane, 7.2-meter (24-foot), shoulder section with 1.8-meter (6-foot) unpaved shoulders. The typical cross sections for all intersecting secondary roads along the project alignment are two lane shoulder sections.

C. Right of way

The existing right of way width along NC 16 varies between 18 to 30 meters (60 to 100 feet).

D. Bridges

There are no existing bridges along the proposed project corridor.

E. Speed Limits

The existing speed limit along the studied section of NC 16 is predominantly 80 kilometers per hour (km/h) (55 miles per hour (mph)) from Tower Road (SR 1895) to just

south of Coley Pond Road (SR 1803), where the speed limit reduces to 72 km/h (45 mph). Also, the speed limit reduces to 56 km/hr (35 mph) through the following signalized intersections: Buffalo Shoals Road (SR 1003), Ball's Creek Road (SR 1810), and Bethany Church Road (SR 1804).

F. Access Control

The existing roadway has no control of access.

G. Intersections and Type of Control

All roads currently intersecting the project alignment are at-grade. The following intersections are signalized: Buffalo Shoals Road (SR 1003), Ball's Creek Road (SR 1810), and Bethany Church Road (SR 1804). The remaining intersections are stop sign controlled.

H. Utilities

The following utilities are located within the project corridor: electricity, phone, and water. The water line extends from Coley Pond Road (SR 1803) northward to the end of the project. Utility impacts are expected to be low.

I. School Buses

Currently, twelve school buses travel NC 16 twice a day.

J. Railroad Crossing

There are no railroad crossings along the studied section of NC 16.

K. Drainage Structures

There are eight culverts along the project corridor. The following table summarizes the major stream crossings associated with the project and recommendations for culvert extensions. These recommendations are based on field review and a preliminary hydraulics analysis (Refer to Figures 7A-7C for location of sites).

**Table 2
EXISTING DRAINAGE STRUCTURES AND
RECOMMENDED IMPROVEMENTS**

SITE	STREAM	EXISTING STRUCTURE	RECOMMENDATION
1	Tributary to South Fork Mountain Creek	1@ 2.1 m x 2.1 m RCBC (1@ 7 ft. x 7 ft. RCBC)	Retain and extend to west to improve alignment. Will require 30 m (100 ft.) channel realignment (upstream) west to accommodate culvert extension.
2	South Fork Mountain Creek	2@ 2.7 m x 2.4 m RCBC (2@ 9 ft. x 8 ft. RCBC)	Retain and extend to east to avoid lake and resort property.
2A	Tributary to South Fork Mountain Creek	2@ 2.7 m x 2.4 m RCBC (2@ 9 ft. x 8 ft. RCBC)	Retain and extend to east (consistent with site 2)
3	Bee Branch	1@ 2.1 m x 2.1 m RCBC (1@ 7 ft. x 7 ft. RCBC)	Retain and extend to west to improve alignment.
4	Tributary to Maiden Creek	1@ 2.1 m x 1.8 m RCBC (1@ 7 ft. x 6 ft. RCBC)	Retain and extend to west to minimize impacts to adjacent development.
5	Tributary to Smyre Creek	1@ 2.7 m x 2.7 m RCBC (1@ 9 ft. x 9 ft. RCBC)	Retain and extend to west. Will require 60 m (200 ft.) channel change (vs. 120 m (400 ft.) channel change if widened to east side)
6	Tributary to Smyre Creek	1@ 3.0 m x 2.4 m RCBC (1@ 10 ft. x 8 ft. RCBC)	Retain and extend to east to improve alignment
6A	Tributary to Smyre Creek	1@ 1.8 m x 1.8 m RCBC (1@ 6 ft. x 6 ft. RCBC)	Retain and extend to east to improve alignment and avoid 60 m (200 ft.) channel change on Smyre Creek

All culverts are recommended to be retained and are considered to be in good condition with sufficient cover to accommodate the proposed culvert extensions. Most of the proposed culvert extensions will be accommodated with only minor channel modifications at the extended end of the culverts unless otherwise noted in Table 2.

Catawba County is a participant in the National Flood Insurance Regular Program. None of the project's stream crossings are in a designated flood hazard zone, nor in a detailed flood study. Refer to Figures 7A - 7C for the 100-year floodplain for each of the stream crossings. The existing floodplain areas in the vicinity of the stream

crossings are rural, consisting of mostly wooded areas and some open fields. No buildings were observed with the floor elevation below the 100-year flood level in the vicinity of stream crossings. It is anticipated the proposed roadway widening and associated drainage work will not have a substantial adverse effect on the existing floodplains nor on the associated flood hazards.

This project lies within a water supply watershed that is designated high quality waters. Therefore, erosion and sedimentation will be controlled through specification, installation, and maintenance of more stringent erosion and sedimentation control measures appropriate for high quality waters. Existing drainage patterns will be maintained to the extent practicable. If necessary, groundwater resources will be evaluated in final hydraulics design to ensure measures are taken to prevent contamination.

L. Project terminals

The southern project terminal is located just north of Tower Road (SR 1895) at the end of the proposed relocation of NC 16 (T.I.P. No. R-2206). Project R-2206 proposes to improve NC 16 by constructing a four-lane divided limited access expressway on new location from Lucia to north of Tower Road (SR 1895). This improvement is scheduled for construction in Federal Fiscal Year (FFY) 1999. The northern project terminal is located north of Caleb Setzer Road (SR 1800), southeast of Newton. At this terminal, the proposed Newton-Conover Eastern Loop will tie into NC 16. The proposed improvements to NC 16 will end where a three-lane curb and gutter facility exists on NC 16.

IV. PROPOSED IMPROVEMENTS

A. Length of Project

The length of this proposed project is approximately 14.5 kilometers (9.0 miles). The length of Section A is approximately 8.5 kilometers (5.3 miles). Section B is approximately 4.4 kilometers (2.7 miles) and the length of Section C is approximately 1.6 kilometers (1.0 mile).

B. Design Speed Proposed

The proposed design speed for Section A is a minimum 100 km/h kilometers per hour (km/h) [60 miles per hour (mph)]. For Sections B and C, the design speed is a minimum 80 km/h (50 mph). Design speed is a correlation of physical features of a highway which influence vehicle operation and reflects the degree of safety and mobility desired along a highway. Design speed is not to be interpreted as the recommended or posted speed.

C. Cross Section

The recommended typical cross section for Section A is a four-lane divided facility with a 14-meter (46-foot) grass median (see Appendix A, Figure 5A). For Sections B and C, the recommended typical cross section is a five-lane, 19.2-meter (64-foot) face to face of curbs, curb and gutter facility.

D. Right of way

The proposed right of way width for Section A is variable with 60 meters (200 feet) minimum. For Sections B and C, the proposed right of width is 30 meters (100 feet) with slopes contained within construction easements.

E. Access Control

No access control is proposed along the project.

F. Drainage Structures

The recommendations for extending the eight existing culverts along the project corridor are listed in Table 2 in Section III.K.

G. Parking

Parking will neither be provided for nor permitted along the project.

H. Sidewalks

Sidewalks are not proposed as part of this project. However, for Sections B and C, berm widths will allow for the future construction of sidewalks on both sides of the project.

I. Bicycles

No special bicycle provisions are recommended for the proposed project.

J. Landscape Planting

In accordance with the NCDOT Highway Planting Policy, funding for landscaping is included in the construction cost estimate for this project. However, no unique landscaping is proposed or this project.

K. Speed Zones

The recommended speed limit for the proposed project is expected remain 80 km/hr (55 mph) along Section A of the project, and 72 km/hr (45 mph) for Sections B and C.

L. Intersection Treatment and Type of Control

The following three intersections with NC 16 will remain signalized: Buffalo Shoals Road (SR 1003), Ball’s Creek Road (SR 1810), and Bethany Church Road (SR 1804). Also, the intersection of the Newton-Conover Loop (T.I.P. No. U-2404) is proposed to be signalized. The recommended lane treatment for each signalized intersection is illustrated in Appendix A, Figures 4A - 4D. All other intersections are proposed to remain stop sign controlled.

M. Estimate of Costs

*Construction	\$ 16,000,000
**Right of way	<u>\$ 14,000,500</u>
 Total Cost	 \$ 30,000,500

- * Includes engineering and contingencies
- ** Includes relocation, acquisition and utility costs

V. ALTERNATIVES FOR PROPOSED ACTION

Widening along the existing roadway was carefully studied due to the negative environmental impacts associated with constructing on new location. Therefore, the option of alternative corridors were discarded. However, four design alternatives were evaluated and described in this section.

A. Recommended Alternative (Alternative 4)

The recommendation for the proposed improvements is to widen NC 16 to a four-lane divided facility from north of Tower Road (SR 1895) to Ball’s Creek Road (SR 1810), and widen NC 16 to a five-lane curb and gutter facility from north of Ball’s Creek Road to north of Caleb Setzer Road (SR 1800), southeast of Newton. The four-lane divided facility consists of two 3.6-meter (12-foot) lanes in each direction with a 14-meter (46-foot) median. The proposed right of way width for the four-lane divided facility is 200 feet (60 meters) minimum (See Figure 3A). The five-lane curb and gutter section consists of two 3.6-meter (12-foot) travel lanes in each direction, and a 3.6-meter (12-foot) center turn lane. The proposed right of way width for the five-lane curb and gutter section is 30 meters (100 feet) (See Figure 3B).

The project proposes to widen NC 16 asymmetrically to the east from north of Tower Road (SR 1895) to approximately 450 meters (1500 feet) north of Rant Drum Road (SR 1816). The project widens NC 16 asymmetrically to the east from 450 meters (1500 feet) north of Rant Drum Road (SR 1816) to approximately 150 meters (500 feet) north of Bethany Church Road (SR 1804). Symmetrical widening is proposed for the remainder of the project.

Alternative 4 is recommended because there are fewer relocatees and it is less expensive than the other design alternatives. This alternative relocates 34 residences, 4 businesses, and one non-profit organization. The estimated cost of this alternative is \$30,000,500.

B. Other Design Alternatives

In addition to the recommended Alternative 4, three other design alternatives were studied. They are listed and described below along with Tables 3 and 4.

1. Alternative 1 - Widen NC 16 to a four-lane divided facility from Tower Road (SR 1895) to Mount Ruhama Church Road (SR 1876), a five-lane shoulder section from Mount Ruhama Church Road (SR 1876) to Claremont Road (SR 1801), and a five-lane curb and gutter facility from Mount Ruhama Church Road (SR 1801) to Caleb Setzer Road (SR 1800). Alternative 1 is not recommended since it requires the relocation of 10 more residences and costs more than recommended Alternative 4.
2. Alternative 2 - Widen NC 16 to a four-lane divided facility with a 14-meter (46-foot) median from Tower Road (SR 1895) to Providence Mill Road (SR 1810), a five-lane shoulder section from Providence Mill Road (SR 1810) to Claremont Road (SR 1801), and a five-lane curb and gutter facility from Claremont Road (SR 1801) to Caleb Setzer Road (SR 1800). Alternative 2 is not recommended because it requires the relocation of 81 residences, 10 businesses, and 1 non-profit organization. The number of relocatees is significantly higher than the number caused by recommended Alternative 4. Also, Alternative 2 is more expensive than recommended Alternative 4.
3. Alternative 3 - Widen NC 16 to a four-lane divided facility with a 14-meter (46-foot) median from Tower Road (SR 1895) to Bethany Church Road (SR 1804) and a five-lane curb and gutter facility from Bethany Church Road (SR 1804) to Caleb Setzer Road (SR 1800). Alternative 3 is not recommended because it requires the relocation of 83 residences, 13 businesses, and 1 non-profit organization. The number of relocatees is substantially higher than the number caused by recommended Alternative 4. Also, Alternative 3 is more expensive than recommended Alternative 4.

TABLE 3: COMPARISON OF COSTS OF ALTERNATIVES

ALTERNATIVE	RIGHT OF WAY	CONSTRUCTION	TOTAL
#1	\$18,424,000	\$16,400,000	\$34,824,000
#2	\$17,758,000	\$16,600,000	\$34,458,000
#3	\$17,238,000	\$16,400,000	\$33,638,000
#4	\$14,000,500	\$16,000,000	\$30,000,500

TABLE 4: COMPARISON OF ALTERNATIVES

ALTERNATIVE	ESTIMATED COST	RESIDENTIAL RELOCATEES	BUSINESS/ NONPROFIT RELOCATEES	TOTAL RELOCATEES
#1	\$34,824,000	44	4/1=5	49
#2	\$34,458,000	81	10/1=11	92
#3	\$33,638,000	83	13/1=14	97
#4	\$30,000,500	34	4/1=5	39

C. Alternative Modes of Transportation

No alternative mode of transportation is considered to be a practical alternative to this highway project. Highway transportation is the dominant mode of transportation in the project area, and the project involves widening an existing highway. Currently, public transportation is provided in Newton, Conover, and Hickory by Piedmont Wagon. Increased use of these services along with staggering work hours, car-pooling, and van-pooling could relieve some congestion on NC 16 within municipal areas; however, these congestion management measures are not within the control of NCDOT and will not meet the transportation improvements necessary for the growing residential and industrial areas surrounding Newton and Conover.

D. Postponement of Project

Postponement of the project would result in continuing deterioration of traffic and safety conditions in the future as traffic demands increase. Therefore, this alternative is not recommended.

E. "No Build" Alternative

The "no build" alternative was considered but rejected since the project will provide a safer, more efficient route in Catawba County.

VI. ENVIRONMENTAL IMPACTS

A. Land Use

1. Current Planning Status

The proposed project is located in the Catawba County planning and zoning jurisdiction. The county adopted the Catawba County Land Use Plan in October, 1996. The County and Town both enforce a zoning ordinance and subdivision regulations. The county enforces a zoning ordinance and subdivision regulations based on the land use plan.

2. Existing Land Use

The project area is rural in character and is composed of a mix of land uses. The area's mixed land uses includes a cemetery, churches, single family residences, commercial, and retail businesses. A water line extends from Coley Pond Road (SR 1803) to the end of the project. Therefore, development in the project area is limited due to the lack of water and sewer. There are agricultural, commercial, and residential uses along the project corridor. Agricultural uses are scattered throughout the project area. The residential uses are primarily single-family. There are also mobile home parks. The commercial uses include gas stations which are located at the intersections of Buffalo Shoals Road (SR 1003), Ball's Creek Road (SR 1810), and Bethany Church Road (SR 1804). There are no major industrial uses located in the project area.

3. Existing Zoning

The project area is zoned for a mix of land uses, primarily commercial and residential. Industrial and commercial development along the studied section of NC 16 is limited due the lack of necessary water and sewer service.

4. Future Land Use

According to the local planning officials, the project area is expected to continue residential and commercial development. Future plans for the area include extension of water and sewer facilities along the northern section of the project corridor, from Coley Pond Road (SR 1803) to Ball's Creek Road (SR 1810).

5. Farmland

The Farmland Protection Policy Act of 1981 requires all federal agencies or their representatives to consider the impact of land acquisition and construction projects on prime and important farmland soils. Land which has been previously developed or planned for development by the local governing body is exempt from the requirements of the Act. Because most of the project area is either

developed, or designated for development, no further consideration of potential farmland impacts is required.

B. Social Environment

1. Neighborhood Characteristics

Catawba County is located in the western central part of the state. The county is bounded by Iredell, Lincoln, Burke, Caldwell, and Alexander counties. Catawba County has a population of 126,240. The population density (persons per square mile) of the County is 315.60.

The project area is classified as rural. The project area contains subdivisions, commercial establishments, and institutions. Development adjacent to the proposed project is mixed, which is typical of rapidly growing rural areas where land use is changing.

2. Economic Factors

Catawba County has a total labor force of 73,230. Of this total, 70,200 persons were gainfully employed. This left an unemployment total of 3,030, which amounts to an unemployment rate of 4.1 percent.

The proposed improvement of NC 16 will have a positive impact. The project will provide a safer route for commercial use. Also, the project will improve the horizontal and vertical curvature of the roadway, thereby reducing the potential of accidents. Improving NC 16 will reduce travel times for motorists, as well as road user costs.

3. Public Facilities

The following public facilities are located in the project area:

1. Little Mountain Airport
2. Mount Anderson Baptist Church
3. Nancy and Udean Christian Tours
4. Friendship United Methodist Church
5. Abernathy Center: United Methodist Church Retirement Home
6. Word of Life True Gospel Church
7. Dale Earnhardt Chevrolet Dealership

Right of way will be acquired from each facility listed except Little Mountain Airport. Word of Life True Gospel Church will be relocated due to the proposed improvements.

4. Relocation Impacts

The proposed action will relocate 34 residences, 4 businesses, and 1 non-profit organization (See Appendix B for relocation report for recommended Alternative 4). It is the policy of the NCDOT to ensure that comparable replacement housing will be available prior to construction of state and federally-assisted projects. Furthermore, the North Carolina Board of Transportation has the following three programs to minimize the inconvenience of relocation:

1. Relocation Assistance,
2. Relocation Moving Payments, and
3. Relocation Replacement Housing Payments or Rent Supplement

See Appendix B for further discussion of the NCDOT Relocation Programs.

In compliance with Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations), a review was conducted to determine whether minority or low income populations will receive disproportionately high and adverse human health or environmental impacts as a result of this project. The investigation found the project will not disproportionately impact minority and low income populations.

According to the 1990 Census, approximately 89.98% of the population of Catawba County is white, 9.01% is black, and 0.58% is Hispanic. The proposed project will not relocate any minorities.

The 1990 Census data reflects that 7.11% of persons in Catawba County live at or below the poverty level. The relocation reports in Appendix B show estimated relocatee income levels. Three relocatees are estimated to have income levels below \$15,000 annually. This represents 8.82 percent of the total relocatees. Therefore, the project is in compliance with Executive Order 12898.

5. Social Impacts

Motorists in western Catawba County will have a safer highway on which to travel. NC 16 will be more accessible for motorists traveling along the project corridor. In addition, upon completion of the Newton-Conover Eastern Loop, access to I-40 will be significantly improved.

6. Cultural Resources

This project is subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, implemented by the Advisory Council on Historic Preservation's for Compliance with Section 106, codified as

CFR Part 800. It is also subject to compliance with Section 4(f) of the Department of Transportation Act of 1966, as amended.

Pursuant to 36 CFR Part 800.4, the North Carolina State Historic Preservation Office (SHPO) was consulted and recommended an architectural historian survey the area of potential effect (see letter dated September 13, 1995 in Appendix C). An NCDOT architectural historian surveyed the project area and found no structures eligible for the National Register of Historic Places within the area of potential effect (APE). The SHPO and the Federal Highway Administration (FHWA) concurred with NCDOT's conclusion (see Concurrence Form in the Appendix C).

The SHPO recommended that no archaeological investigation be conducted for the proposed project (See letter dated September 13, 1995 in Appendix C).

Since there are no properties either listed or eligible for listing in the National Register of Historic Places in the area of potential effect of this undertaking, no further compliance with either Section 106 of the National Register Act of 1966 or with the Section 4(f) of the Department of Transportation Act of 1966 is required.

C. Air Quality Analysis

Air pollution originates from various sources. Emissions from industrial and internal combustion engines are the most prevalent sources. Other origins of common outdoor air pollution are solid waste disposal and any form of fire. The impact resulting from highway construction ranges from intensifying existing air pollution problems to improving the ambient air conditions. The traffic is the center of concern when determining the impact of a new highway facility or the improvement of an old highway facility. Motor vehicles emit carbon monoxide (CO), nitrogen oxide (NO), hydrocarbons (HC), particulate matter, sulfur dioxide (SO₂), and lead (Pb) (listed in order of decreasing emission rate). Automobiles are considered to be the major source of CO in the project area. For this reason, most of the analysis presented is concerned with determining expected carbon monoxide levels in the vicinity of the project due to traffic flow.

In order to determine the ambient CO concentration for the receptor closest to the highway project, two concentration components must be used: local and background. The local concentration is defined as the CO emissions from cars operating on highways in the near vicinity (i.e., distances within 100 meters (330 feet)) of the receptor location. The background concentration is defined by the North Carolina Department of Environment, Health and Natural Resources as "the concentration of a pollutant at a point that is the result of emissions outside the local vicinity; that is, the concentration at the upwind edge of the local sources."

In this study, the local concentration was determined by the NCDOT Traffic Noise/Air Quality Staff using line source computer modeling and the background concentration was obtained from the North Carolina Department of Environment, Health and Natural Resources (NCDEHNR). Once the two concentration components were resolved, they were added together to determine the ambient CO concentration for the receptor in question and to compare to the National Ambient Air Quality Standards (NAAQS).

Automobiles are regarded as sources of hydrocarbons and nitrogen oxides. Hydrocarbons and nitrogen oxides emitted from cars are carried into the atmosphere where they react with sunlight to form ozone and nitrogen dioxide. Automotive emissions of HC and NO are expected to decrease in the future due to the continued installation and maintenance of pollution control devices on new cars. However, regarding area-wide emissions, these technological improvements may be offset by the increasing number of cars on the transportation facilities of the area.

The photochemical reactions that form ozone and nitrogen dioxide require several hours to occur. For this reason, the peak levels of ozone generally occur 10 to 20 kilometers (6.2 to 12.4 miles) downwind of the source of hydrocarbon emissions. Urban areas as a whole are regarded as sources of hydrocarbons, not individual streets and highways. The emissions of all sources in an urban area mix together in the atmosphere, and in the presence of sunlight, the mixture reacts to form ozone, nitrogen dioxide, and other photochemical oxidants. The best example of this type of air pollution is the smog which forms in Los Angeles, California.

Automobiles are not regarded as significant sources of particulate matter and sulfur dioxide. Nationwide, highway sources account for less than 7 percent of particulate matter emissions and less than 2 percent of sulfur dioxide emissions. Particulate matter and sulfur dioxide emissions are predominantly the result of non-highway sources (e.g., industrial, commercial, and agricultural). Because emissions of particulate matter and sulfur dioxide from automobiles are very low, there is no reason to suspect that traffic on the project will cause air quality standards for particulate matter and sulfur dioxide to be exceeded.

Automobiles without catalytic converters can burn regular gasoline. The burning of regular gasoline emits lead as a result of regular gasoline containing tetraethyl lead which is added by refineries to increase the octane rating of the fuel. Newer cars with catalytic converters burn unleaded gasoline eliminating lead emissions. Also, the United States Environmental Protection Agency (EPA) has required the reduction in the lead content of leaded gasoline. The overall average lead content of gasoline in 1974 was 0.54 grams per liter. By 1989, this composite average had dropped to 0.003 grams per liter. In the future, lead emissions are expected to decrease as more cars use unleaded fuels and as the lead content of leaded gasoline is reduced. The Clean Air Act Amendments of 1990 make the sale, supply, or transport of leaded gasoline or lead additives unlawful after December 31, 1995. Because of these reasons, it is not expected that traffic on the proposed project will cause the NAAQS for lead to be exceeded.

A microscale air quality analysis was performed to determine future CO concentrations resulting from the proposed highway improvements. "CAL3QHC - A Modeling Methodology For Predicting Pollutant Concentrations Near Roadway Intersections" was used to predict the CO concentration at the nearest sensitive receptor to the project.

Inputs into the mathematical model to estimate hourly CO concentrations consisted of a level roadway under normal conditions with predicted traffic volumes, vehicle emission factors, and worst-case meteorological parameters. The traffic volumes are based on the annual average daily traffic projections and the highest volume along the project was used in the CAL3QHC modeling. Carbon monoxide vehicle emission factors were calculated for the completion year of 2000 and the design year of 2020 using the EPA publication "Mobile Source Emission Factors" and the MOBILE 5A mobile source emissions computer model.

The background CO concentration for the project area was estimated to be 1.8 parts per million (ppm). Consultation with the Air Quality Section, Division of Environmental Management, North Carolina Department of Environment, Health, and Natural Resources indicated that an ambient CO concentration of 1.8 ppm is suitable for most suburban/rural areas.

The worst-case air quality receptor was determined to be the right of way line at a distance of 30 meters (100 feet) from the proposed centerline of the median. The "build" one-hour CO concentrations for the nearest sensitive receptor for the years of 2000 and 2020 are shown in the following table.

Nearest Sensitive Receptor	One Hour CO Concentrations (PPM)			
	Build		No Build	
	2000	2020	2000	2020
R/W	2.5	2.6	3.9	6.8

Comparison of the predicted CO concentrations with the NAAQS maximum permitted for 1-hour averaging period = 35 ppm; 8-hour averaging period = 9 ppm) indicates no violation of these standards. Since the results of the worst-case 1-hour CO analysis is less than 9 ppm, it can be concluded that the 8-hour CO level does not exceed the standard. See Tables A1 through A4 for input data and output.

The project is located in Catawba County, which has been determined to be in compliance with the National Ambient Air Quality Standards. 40 CFR Part 51 is not applicable, because the proposed project is located in an attainment area. This project is not anticipated to create any adverse effects on the air quality of this attainment area.

During construction of the proposed project, all materials resulting from clearing and grubbing, demolition or other operations will be removed from the project, burned or otherwise disposed of by the contractor. Any burning will be done in accordance with applicable local laws and ordinances and regulations of the North Carolina SIP for air quality in compliance with 15 NCAC 2D.0520. Care will be taken to insure that burning will be done at the greatest practical distance from dwellings and not when atmospheric conditions are such as to create a hazard to the public. Burning will only be utilized under constant surveillance. Also during construction, measures will be taken to reduce the dust generated by construction when the control of dust is necessary for the protection and comfort of motorists or area residents. This evaluation completes the assessment requirements for air quality of the 1990 Clean Air Act Amendments and the NEPA process, and no additional reports are necessary.

D. Highway Traffic Noise/Construction Noise Analysis

This analysis was performed to determine the effect of the proposed widening of NC 16 from north of Tower Road (SR 1895) to north of Caleb Setzer Road (SR 1800) in Catawba County, on noise levels in the immediate project area (see Appendix D, Figure 1). This investigation includes an inventory of existing noise sensitive land uses and a field survey of ambient (existing) noise levels in the study area. It also includes a comparison of the predicted noise levels and the ambient noise levels to determine if traffic noise impacts can be expected resulting from the proposed project. Traffic noise impacts are determined from the current procedures for the abatement of highway traffic noise and construction noise, appearing as Part 772 of Title 23 of the Code of Federal Regulations. If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered.

1. Characteristics of Noise

Noise is basically defined as unwanted sound. It is emitted from many sources including airplanes, factories, railroads, power generation plants, and highway vehicles. Highway noise, or traffic noise, is usually a composite of noises from engine exhaust, drive train, and tire-roadway interaction.

The magnitude of noise is usually described by its sound pressure. Since the range of sound pressure varies greatly, a logarithmic scale is used to relate sound pressures to some common reference level, usually the decibel (dB). Sound pressures described in decibels are called sound pressure levels and are often defined in terms of frequency weighted scales (A, B, C, or D).

The weighted-A decibel scale is used almost exclusively in vehicle noise measurements because it places the most emphasis on the frequency range to which the human ear is most sensitive (1,000-6,000 Hertz). Sound levels measured using a weighted-A decibel scale are often expressed as dBA. Throughout this report, all noise levels will be expressed in dBA's. Several examples of noise pressure levels in dBA are listed in Appendix D, Table N1.

Review of Table N1 indicates that most individuals in urbanized areas are exposed to fairly high noise levels from many sources as they go about their daily activities. The degree of disturbance or annoyance of unwanted sound depends essentially on three things:

- 1) The amount and nature of the intruding noise.
- 2) The relationship between the background noise and the intruding noise.
- 3) The type of activity occurring when the noise is heard.

In considering the first of these three factors, it is important to note that individuals have different sensitivity to noise. Loud noises bother some more than others and some individuals become upset if an unwanted noise persists. The time patterns of noise also enter into an individual's judgment of whether or not a noise is offensive. For example, noises occurring during sleeping hours are usually considered to be more offensive than the same noises in the daytime.

With regard to the second factor, individuals tend to judge the annoyance of an unwanted noise in terms of its relationship to noise from other sources (background noise). The blowing of a car horn at night when background noise levels are approximately 45 dBA would generally be more objectionable than the blowing of a car horn in the afternoon when background noises might be 55 dBA.

The third factor is related to the interference of noise with activities of individuals. In a 60 dBA environment, normal conversation would be possible while sleep might be difficult. Work activities requiring high levels of concentration may be interrupted by loud noises while activities requiring manual effort may not be interrupted to the same degree.

Over time, particularly if the noises occur at predicted intervals and are expected, individuals tend to accept the noises which intrude into their lives. Attempts have been made to regulate many of these types of noises including airplane noise, factory noise, railroad noise, and highway traffic noise. In relation to highway traffic noise, methods of analysis and control have developed rapidly over the past few years.

2. Noise Abatement Criteria

In order to determine whether highway noise levels are or are not compatible with various land uses, the Federal Highway Administration (FHWA) has developed noise abatement criteria (NAC) and procedures to be used in the planning and design of highways. These abatement criteria and procedures are set forth in the aforementioned Federal reference (Title 23 CFR Part 772). A summary of the noise abatement criteria for various land uses is presented in Table N2, located in Appendix D. The Leq, or equivalent sound level, is the level of constant sound which in a given situation and time period has the same energy as does time varying sound. In other words, the fluctuating sound levels of traffic noise are represented in terms of a steady noise level with the same energy content.

3. Ambient Noise Levels

Ambient noise measurements were taken in the vicinity of the project to determine the existing background noise levels. The purpose of this noise level information was to quantify the existing acoustic environment and to provide a base for assessing the impact of noise level increases. The existing Leq noise levels in the project area as measured at 15 meters (50 feet) from the roadway ranged from 65 to 68 dBA. The ambient measurement sites and measured exterior Leq noise levels are presented in Figure 1 and Table N3, respectively.

The existing roadway and traffic conditions were used with the most current traffic noise prediction model in order to calculate existing noise levels for comparison with noise levels actually measured. The calculated existing noise levels were within 3.8 dBA higher than the measured noise levels for the locations where noise measurements were obtained. Differences in dBA levels can be attributed to "bunching" of vehicles, low traffic volumes, and actual vehicle speeds versus the computer's "evenly-spaced" vehicles and single vehicular speed.

4. Procedure for Predicting Future Noise Levels

In general, the traffic situation is composed of a large number of variables which describe different cars driving at different speeds through a continual changing highway configuration and surrounding terrain. Due to the complexity of the problem, certain assumptions and simplifications must be made to predict highway traffic noise.

The procedure used to predict future noise levels in this study was the Noise Barrier Cost Reduction Procedure, STAMINA 2.0 and OPTIMA (revised March, 1983). The BCR (Barrier Cost Reduction) procedure is based upon the FHWA Highway Traffic Noise Prediction Model (FHWA-RD-77-108). The BCR traffic noise prediction model uses the number and type of vehicles on the planned roadway, their speeds, the physical characteristics of the road (curves, hills, depressed, elevated, etc.), receptor location and height, and, if applicable, barrier type, barrier ground elevation, and barrier top elevation.

In this regard, it is to be noted that only preliminary alignment was available for use in this noise analysis. The project proposes to widen NC 16 from a two-lane roadway to a multi-lane facility from Tower Road (SR 1895) to north of Caleb Setzer Road (SR 1800). Four alternatives have been studied for this project. They are listed and described in Section V.

Only those existing natural or man-made barriers were included in setting up the model. The roadway sections and proposed intersections were assumed to be flat and at-grade. Thus, this analysis represents the "worst-case" topographical conditions. The noise predictions made in this report are highway-related noise predictions for the traffic conditions during the year being analyzed.

Peak hour design and level-of-service (LOS) C volumes were compared, and the volumes resulting in the noisiest conditions were used with the proposed posted speed limits. Hence, during all other time periods, the noise levels will be no greater than those indicated in this report.

The STAMINA 2.0 computer model was utilized in order to determine the the design year 2020. A land use is considered to be impacted when exposed to noise levels approaching or exceeding the FHWA noise abatement criteria and/or predicted to sustain a substantial noise increase. The basic approach was to select receptor locations such as 7.5, 15, 30, 60, 120, 240, and 480 meters (25, 50, 100, 200, 400, 800, 1600 feet) from the center of the near traffic lane (adaptable to both sides of the roadway). The location of these receptors were determined by the changes in projected traffic volumes and/or the posted speed limits along the proposed project. The result of this procedure was a grid of receptor points along the project. Using this grid, noise levels were calculated for each identified receptor.

The Leq traffic noise exposures associated with this project are listed in Tables N4.1 (Alternative 1), N4.24 (Alternatives 2 and 4), and N4.3 (Alternative 3) of Appendix D. Information included in these tables consist of listings of all receptors in close proximity to the project, their ambient and predicted noise levels, and the estimated noise level increase for each.

5. Traffic Noise Impacts and Noise Contours

Traffic noise impacts occur when the predicted traffic noise levels either: [a] approach or exceed the FHWA noise abatement criteria (with "approach" meaning within 1 dBA of the Table N2 value), or [b] substantially exceed the existing noise levels. The NCDOT definition of substantial increase is shown in the lower portion of Table N2. Consideration for noise abatement measures must be given to receptors which fall in either category.

In accordance with NCDOT Traffic Noise Abatement Policy, the federal/state governments are no longer responsible for providing noise abatement measures for new development which building permits are issued within the noise impact area of a proposed highway after the Date of Public Knowledge. The Date of Public Knowledge of the location of a proposed highway project will be the approval date of CEs, FONSI, RODs, or the Design Public Hearing, whichever comes later. For development occurring after this public knowledge date, local governing bodies are responsible to insure that noise compatible designs are utilized along the proposed facility.

The maximum number of receptors in each activity category that are predicted to become impacted by future traffic noise is shown in Table N5. These are noted in terms of those receptors expected to experience traffic noise impacts by approaching or exceeding the FHWA NAC or by a substantial increase in exterior noise levels. Under Title 23 CFR Part 772, there are 145 impacted receptors along Alternatives 1, 2, and 4, and 150 impacted receptors along Alternative 3, due to highway traffic noise in the project area. The maximum extent of the 72 and 67 dBA noise level contours are 34 and 56 meters (113 and 187 feet), respectively, from the centerline of the proposed roadway, as shown in Table N5.

This information should assist local authorities in exercising land use control over the remaining undeveloped lands adjacent to the roadway within local jurisdiction. For example, with the proper information on noise, the local authorities can prevent further development of incompatible activities and land uses with the predicted noise levels of an adjacent highway.

Table N6 indicates the exterior traffic noise level increases for the identified receptors in each roadway section. One receptor along Alternative 1, two receptors along Alternatives 2 and 4, and six receptors along Alternatives 3

are predicted to be impacted by a substantial increase in exterior noise levels. The predicted noise level increases for this project range from +5 to +10 dBA. When real-life noises are heard, it is possible barely to detect noise level changes of 2-3 dBA. A 5 dBA change is more readily noticeable. A 10 dBA change is judged by most people as a doubling or a halving of the loudness of the sound.

6. Traffic Noise Abatement Measures

Traffic noise impacts are determined from the current procedures for the abatement of highway traffic noise and construction noise, appearing as Part 772 of Title 23 of the Code of Federal Regulations. If traffic noise impacts are predicted, examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts must be considered. Consideration for noise abatement measures must be given to all impacted receptors.

a. Highway Alignment

Highway alignment selection involves the horizontal or vertical orientation of the proposed improvements in such a way as to minimize impacts and costs. The selection of alternative alignments for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters. For noise abatement, horizontal alignment selection is primarily a matter of siting the roadway at a sufficient distance from noise sensitive areas. Changing the highway alignment is not a viable alternative for noise abatement.

b. Traffic System Management Measures

Traffic management measures which limit vehicle type, speed, volume and time of operations are often effective noise abatement measures. For this project, traffic management measures are not considered appropriate for noise abatement due to their effect on the capacity and level-of-service on the proposed roadway.

c. Noise Barriers

Physical measures to abate anticipated traffic noise levels can often be applied with a measurable degree of success by the application of solid mass, attenuable measures to effectively diffract, absorb, and reflect highway traffic noise emissions. Solid mass, attenuable measures may include earth berms or artificial abatement walls. The project will maintain only limited control of access, meaning most commercial establishments and residences will have direct access connections to the proposed roadway, and all intersections will adjoin the project at grade.

For a noise barrier to provide sufficient noise reduction it must be high enough and long enough to shield the receptor from significant sections of the highway. Access openings in the barrier severely reduce the noise reduction provided by the barrier. It then becomes economically unreasonable to construct a barrier for a small noise reduction. Safety at access openings (driveways, crossing streets, etc.) due to restricted sight distance is also a concern. Furthermore, to provide a sufficient reduction, a barrier's length would normally be 8 times the distance from the barrier to the receptor. For example, a receptor located 15 meters (50 feet) from the barrier would normally require barrier 120 meters (400 feet) long. An access opening of 12 meters (40 feet) (10 percent of the area) would limit its noise reduction to approximately 4 dBA (FUNDAMENTAL AND ABATEMENT OF HIGHWAY TRAFFIC NOISE, Report No. FHWA-HHI-HEV-73-7976-1, USDOT, chapter 5, section 3.2, page 5-27).

In addition, businesses, churches, and other related establishments located along a particular highway normally require accessibility and high visibility. Solid mass, attenuable measures for traffic noise abatement would tend to disallow these two qualities, and thus, would not be acceptable abatement measures in this case.

7. "Do Nothing" Alternative

The traffic noise impacts for the "do nothing" or "no-build" alternative were also considered. If the proposed widening of NC 16 did not occur, 127 residential receptors and 5 business receptors would experience traffic noise impacts by approaching or exceeding the FHWA NAC. Also, the receptors could anticipate experiencing an increase in exterior noise levels in the range of +4 to +9 dBA. As previously noted, it is barely possible to detect noise level changes of 2-3 dBA. This small increase to the present noise level would be barely noticeable to the people working and living in the area.

8. Construction Noise

The major construction elements of this project are expected to be earth removal, hauling, grading, and paving. General construction noise impacts, such as temporary speech interference for passers-by and those individuals living or working near the project, can be expected particularly from paving operations and from the earth moving equipment during grading operations. However, considering the relatively short-term nature of construction noise and the limitation of construction to daytime hours, these impacts are not expected to be substantial. The transmission loss characteristics of nearby natural elements and man-made structures are believed to be sufficient to moderate the effects of intrusive construction noise.

SUMMARY

Based on these preliminary studies, traffic noise abatement is not recommended, and no noise abatement measures are proposed. This evaluation completes the highway traffic noise requirements of Title 23 CFR Part 772, and unless a major project change develops, no additional noise reports will be submitted for this project.

E. Ecological Analysis

1. Physical Resources

Southeastern Catawba County lies in the Piedmont physiographic province. The topography of this portion of Catawba County is characterized by gently rolling hills. The elevation along the project corridor ranges from 274 - 335 m (900 - 1100 ft).

a. Soils

Soil types and the availability of water directly influence the composition and distribution of flora and fauna in any biotic community. Soils in the project area are summarized in Table 1. Soils of the Hiwassee-Cecil, Hiwassee, Madison-Cecil and Cecil-Applying series dominate most of the project. Hiwassee soils are well drained with a surface layer of loam or clay loam and a subsoil of firm clay or friable clay loam. Cecil soils are well drained with a sandy loam or clay loam surface layer and a red, firm clay subsoil. Madison soils are well drained with a surface layer of gravelly and a very variable subsoil layer. Applying soils have a surface layer of sandy loam and a firm clay or friable clay loam subsoil. All of these soils are at least fairly well suited for most locally grown crops (USDA Soil Conservation Service 1975) (USDA SCS). Chewacla loam (Cw) is the only soil type found within the project study area that is listed by the USDA SCS (1991) as hydric. It is classified as a hydric soil because it is saturated during a long period during the growing season (USDA SCS 1991).

Table 5. Common Soils in Project Study Area
Includes map unit symbol, specific mapping unit, percent slope and hydric classification (USDA SCS 1975; USDA SCS 1991).

Symbol	Specific Mapping Unit	Percent Slope	Hydric Codes
CmB2	Cecil sandy loam	2-6	NH
CnB2	Cecil clay loam	2-6	NH
AsB	Appling sandy loam	2-6	NH
MgB2	Madison gravelly sandy loam	2-6	NH
MgC2	Madison gravelly sandy loam	6-10	NH
Cw	Chewacla loam	---	1

Hydric Codes:

NH - A non-hydric soil.

1 - Soil that is saturated for a significant period during the growing season.

b. Water Resources

Water resource information includes the resource's relationship to major water systems, physical aspects, Best Usage Classification, and water quality. Impacts to water resources are discussed, along with suggestions to minimize these impacts.

Water resources located within the project study area lie in the Catawba River Drainage Basin. A total of 13 streams, 12 perennial and one intermittent, will be crossed by the proposed project (Figure 2). Most of the streams within the project study area are deeply channelized. The project study area contains three main drainages: Mountain Creek, Maiden Creek and Smyre Creek. Streams in the southeastern end of the project vicinity drain to the South Fork of Mountain Creek. The middle section of the project drains into Maiden Creek. Streams of the northwestern end of the project study area drain into tributaries of Smyre Creek.

Table 6. Physical Characteristics of Water Resources

Stream	Width	Depth	Substrate	Pool: Run Riffle
1 P	1.4 (4.5)	0.2 (0.5)	rock, sand	10:90
2 P	0.9 (3.0)	0.2 (0.5)	sand, silt, rock	10:90
3 P	0.6 (2.0)	0.2 (0.5)	silt, sand	10:90
4 P	1.8 (6.0)	0.3 (1.0)	silt, sand	10:90
5 I	0.8 (2.5)	0.2 (0.5)	silt, sand	50:50
6 P	1.4 (4.5)	0.2 (0.5)	sand, silt	50:50
7 P	1.4 (4.5)	0.2 (0.5)	sand, silt, rock	30:70
8 P	1.1 (3.5)	0.2 (0.5)	silt, sand, rock	40:60
9 P	0.8 (2.5)	0.1 (0.3)	silt, sand, rock	50:50
10 P	1.1 (3.5)	0.1 (0.3)	sand, rock	30:70
11 P	0.8 (2.5)	0.2 (0.5)	sand, rock	30:70
12 P	0.9 (3.0)	0.2 (0.5)	gravel, sand, silt	30:70
13 P	1.2 (4.0)	0.2 (0.8)	sand, silt, gravel	40:60

P - Perennial, I - Intermittent. Width and depth measurements presented in meters (feet).

Best Usage Classification

The streams in the project study area have not been assigned a Best Usage Classification by the Division of Environmental Management (DEM). However, all unclassified streams assume the best usage classification of the collector stream. Streams draining portions of the project study area lying between Tower Road (SR 1895) and Buffalo Shoals Road (SR 1003) are tributary to the South Fork of Mountain Creek [DEM 11-98-(0.5)]. Jones Lake [DEM Index No. 11-98-1] lies along one of these tributaries. Tributaries flowing into the South Fork of Mountain Creek and Jones Lake have been designated as WS IV waters. WS IV waters are waters protected as water supplies which are generally in moderately to highly developed watersheds. Local programs to control nonpoint source and stormwater discharge of pollution are required.

Streams between Buffalo Shoals Road (SR 1003) and Bethany Church Road (SR 1804) include Bee Branch [DEM Index No. 11-129-5-7-2-2] and four unnamed tributaries of Maiden Creek [DEM Index No. 11-129-5-7-2-(1)]. Maiden Creek and its tributaries are classified as WS II waters. WS II waters are protected as water supplies which are generally in predominantly undeveloped watersheds. WS I and II waters are considered High Quality Waters, waters that are rated as excellent based on physical/chemical characteristics through division monitoring or special studies. Streams lying between Bethany Church Road (SR 1804) and Caleb Setzer Road (SR 1800) are tributary to Smyre Creek [DEM Index No. 11-129-5-4-1]. These waters are classified as Class C waters. Class C waters are suitable for aquatic life propagation and survival,

fishing, wildlife, secondary recreation and agriculture. No Outstanding Resource Waters are located within the project study area.

Water Quality

The Benthic Macroinvertebrate Ambient Network (BMAN) is managed by the DEM and is part of an ongoing ambient water quality monitoring program which addresses long term trends in water quality. The program assesses water quality by sampling for selected benthic macroinvertebrate organisms at fixed monitoring sites. Macroinvertebrates are sensitive to very subtle changes in water quality; thus, the species richness and overall biomass of these organisms are reflections of water quality. None of the streams in the project study area have been sampled for macroinvertebrates. BMAN information is, therefore, not available (NC DEHNR 1991).

Point source dischargers located throughout North Carolina are permitted through the National Pollutant Discharge Elimination System (NPDES) program. Any discharger is required to register for a permit. No permitted dischargers are located within the Project Vicinity.

c. Summary of Anticipated Impacts to Water Resources

This project will impact 12 perennial streams and one intermittent stream. All streams are less than or equal to 1.4 m (4.5 ft) wide and less than or equal to 0.3 m (1.0 ft) deep. This project has the potential to harm water resources within the high quality water and a water supply watershed zones. Project construction may result in the following impacts to surface waters:

- Increased sedimentation and siltation from erosion;
- Changes in light incidence and water clarity due to increased sedimentation and vegetation removal;
- Alteration of water levels and flows due to interruptions and/or additions to surface and ground water flow from construction;
- Changes in water temperature due to vegetation removal along stream banks, and;
- Increased concentration of toxic compounds from highway construction and toxic spills.

Precautions will be taken to minimize these and other impacts to water resources in the study area. This will be accomplished by protecting stream bank vegetation, installing silt fences as well as other erosion and sedimentation controls. NCDOT's Best Management Practices for the Protection of Water Supply Watersheds will be strictly enforced

throughout the duration of the project. Provisions to preclude unnecessary contamination by toxic substances during the construction interval will also be strictly enforced to protect the High Quality Waters of Maiden Creek.

2. Biotic Resources

Biotic resources include terrestrial and aquatic ecosystems. This section describes those ecosystems encountered in the study area. The composition and distribution of biotic communities throughout the project area are reflective of topography, hydrologic influences and past and present land uses. Descriptions of the terrestrial systems are presented in the context of plant community descriptions. Natural plant community titles follow Schafale and Weakley (1990) where possible. Dominant flora and fauna likely to occur in each community are described and discussed. Fauna observed during field investigations are designated with an asterisk (*) and scientific nomenclature and common names are provided for each plant and animal species described. Subsequent references to the same organism will include the common name only. Identifications and nomenclature of vascular plants were made primarily with Radford *et al.* (1968). Animal taxonomy follows Potter, *et al.* (1980), Martof *et al.* (1980), Menhenick (1991) and Webster *et al.* (1985).

a. Terrestrial Communities

A variety of terrestrial communities are present in the project study area. These areas include disturbed areas, mixed early successional communities, Piedmont/Low Mountain Alluvial Forests, Dry-Oak Hickory Forests and Pine Forests.

Disturbed Areas

Disturbed habitats found within the project study area include residential lawns, roadside shoulders and agricultural fields that are maintained at an early successional stage. Residential lawns contain a variety of species suitable for landscaping. Trees often planted in residential areas include loblolly pine (*Pinus taeda*), river birch (*Betula nigra*) and flowering dogwood (*Cornus florida*). Crepe myrtle (*Lagerstroemia indica*) and azalea (*Rhododendron* spp.) are two commonly planted shrubs. The roadside shoulders include herbaceous species such as English plantain (*Plantago lanceolata*), meadow garlic (*Allium canadense*), Queen Anne's Lace (*Daucus carota*), dandelion (*Taraxacum officinale*), henbit (*Lamium amplexicaule*), purple dead nettle (*Lamium purpurea*), white clover (*Trifolium repens*), kudzu (*Pueraria lobata*) and foxtail grass (*Setaria* sp.). Agricultural fields are dominated by cultivated species such as annual rye (*Elymus* sp.) and fescue (*Festuca*

elator). Broomsedge (Andropogon virginicus) is a common grass in fallow fields.

These disturbed areas are used by a variety of animals for foraging and nesting. Avian species such as northern cardinal* (Cardinalis cardinalis), mourning dove* (Zenaida macroura), American robin (Turdus migratorius), blue jay (Cyanocitta cristata), northern mockingbird (Mimus polyglottos), eastern bluebird (Sialia sialis), Carolina chickadee* (Parus carolinensis), tufted titmouse* (Parus bicolor), Carolina wren* (Thryothorus ludovicianus) and American goldfinch (Carduelis tristis) are all likely to be found in the disturbed areas of the project study area. Scavenging birds such as the turkey vulture (Cathartes aura) and American crow* (Corvus brachyrhynchos) are common year-round residents. Large mammals likely to inhabit or utilize disturbed communities of the project area include white-tailed deer (Odocoileus virginianus), Virginia opossum* (Didelphis virginiana), striped skunk* (Mephitis mephitis) and woodchuck* (Marmota monax). Small mammals of disturbed habitats in the Piedmont include eastern harvest mouse (Reithrodontomys humulis), white-footed mouse (Peromyscus leucopus) and southeastern shrew (Sorex longirostris). Reptilian species likely to be found in this community include eastern box turtle (Terrapene carolina), eastern garter snake (Thamnophis sirtalis) and black rat snakes (Elaphe obsoleta). Amphibian species such as upland chorus frog (Pseudacris triseriata), bullfrog (Rana catesbiana) and green frog (Rana clamitans) may be found in low wet areas such as the roadside ditches along NC 16 and adjacent state roads.

Mixed Pine Early Successional Forest

Mixed Pine Early successional forests contain young woody species such as Virginia pine (Pinus virginiana), red cedar (Juniperus virginianus), red maple (Acer rubrum), shortleaf pine (P. echinata), black cherry (Prunus serotina) and various species of oaks (Quercus spp). A shrubby species, multiflora rose (Rosa multiflora), often creates an impenetrable thicket in this community. Herbaceous species include poison ivy (Toxicodendron radicans), Japanese honeysuckle (Lonicera japonica), ebony spleenwort (Asplenium platyneuron) and groundpine (Lycopodium flabelliforme). These early successional areas often contain small open areas interspersed with broomsedge and other grasses.

Animal diversity is low in this type of habitat. Bird species common to early successional areas include common grackle* (Quiscalus quiscula), blue jay*, American robin, northern cardinal*, rufous-sided towhee (Pipilo erythrophthalmus), brown thrasher (Toxostoma rufum) and mourning dove. Virginia opossum and the southeastern shrew are two mammals commonly found in successional habitats. Black racer (Coluber

constrictor) and eastern garter snakes as well as the eastern box turtle and eastern fence lizard (Sceloporus undulatus) are reptiles that are likely to be found in the project study area.

Piedmont Alluvial Forest

Within the project study area, Piedmont Alluvial Forests are common along streams. This community quickly grades into a Dry-Oak Hickory Forest away from the streambanks. Red maple, sycamore (Platanus occidentalis), tulip poplar (Liriodendron tulipifera) and sweetgum (Liquidambar styraciflua) dominate the canopy of these forests. Subcanopy and shrub species include silky dogwood (Cornus amomum), giant cane (Arundinaria gigantea), elderberry (Sambucus canadensis), Virginia willow (Itea virginiana), privet (Ligustrum sinense), spicebush (Lindera benzoin) and American holly (Ilex opaca). Herbaceous species, some isolated to the wetland areas, include: common rush (Juncus effusus), netted chain fern (Woodwardia aerolata), common greenbrier (Smilax rotundifolia) and Japanese honeysuckle.

Forested areas throughout the project study area are used by a variety of avian species such as Carolina chickadee*, tufted titmouse*, Carolina wren*, northern cardinal* and scarlet tanager (Piranga olivacea). Forested portions of the project study are likely to be inhabited by white-tailed deer and Virginia opossum along with smaller mammals such as the southeastern shrew and eastern cottontail (Sylvilagus floridanus). Reptilian species may include the eastern box turtle, garter snake (Thamnophis sirtalis) and black rat snakes (Elaphe obsoleta). Amphibian species such as bullfrog, green frog and upland chorus frog may be found in low wet areas.

Dry Oak-Hickory Forest

Chestnut Oak (Quercus prinus), red oak (Q. rubra), post oak (Q. stellata), scarlet oak (Q. coccinea), sourwood (Oxydendrum arboreum) and Virginia pine are common canopy species in the Dry Oak-Hickory Forest. American holly, flowering dogwood (Cornus florida) and mountain laurel (Kalmia latifolia) are common understory or shrub species. Crane fly orchid (Tipularia discolor) and arrowleaf ginger (Hexastylis arifolia) are the most common herbaceous species in these xeric forests.

This forest most likely contains many of the same faunal species as the Piedmont Alluvial Forest. Bird species such as hairy (Picoides villosus) and downy (P. pubescens) woodpeckers, great crested flycatcher (Myiarchus crinitus), northern cardinal and American robin along with many other species are common to this forest type. White-tailed deer,

Virginia opossum and raccoon (Procyon lotor) are the most common large mammals inhabiting this type of forest. Eastern hognose snake (Heterodon platyrhinos), eastern garter snake (Thamnophis sirtalis) and southeastern five lined skink (Eumeces inexpectatus) are some reptiles likely to be found in these xeric forests.

Pine Forest

Pine forests within the project study area are dominated by either loblolly pine or Virginia pine. These forests are low in diversity, and therefore contain few shrubby and herbaceous species. Herbs include arrowleaf ginger and crane fly orchid.

Mature pine forests are often inhabited by a variety of birds including the northern cardinal*, blue jay, Carolina chickadee, tufted titmouse*, Carolina wren* and pine warbler. Mammals likely to occupy the pine forests of the project study area include white-tailed deer, Virginia opossum and raccoon. Reptiles such as the five-lined skink, eastern fence lizard (Sceloporus undulatus), eastern hognose snake (Heterodon platyrhinos) and black rat snake are commonly found in pine forests. The slimy salamander (Plethodon glutinosus) is also likely to occur here.

b. Aquatic Communities

Several streams will be crossed or possibly impacted by the proposed project. Since NC 16 runs along a ridge for most of its length, most of these streams drain small watersheds and are therefore small in size.

Piedmont Stream

Thirteen streams lie within the project study area. These streams are tributary to three main streams found in the project vicinity: South Fork of Mountain Creek, Maiden Creek and Smyre Creek. Aquatic invertebrates such as mayflies (Family Ephemeroptera), stoneflies (Family Plecoptera) and caddisflies (Family Trichoptera) are likely to be found in these waters. Various species of macroinvertebrates such as crayfish (Orconectes spp. and Procambarus spp.) are typically found in Piedmont streams. In addition to these aquatic invertebrates, the following fish species are likely to inhabit these streams: white shiner (Noroepia albeolus), creek chub (Semotilus atromaculatus), rosyside dace (Clinostomous funduloides), bluegill (Lepomis macrochirus) and eastern mosquitofish (Gambusia affinis).

c. Summary of Anticipated Impacts to Biotic Communities

Construction of the subject project will have various impacts on the biotic resources described. Any construction related activities in or near these resources have the potential to impact biological functions. This section quantifies and qualifies impacts to the natural resources in terms of the ecosystems affected. Both temporary and permanent impacts are considered here.

Calculated impacts to terrestrial communities reflect the relative abundance of each community within the project study area. Project construction will result in the clearing and degradation of portions of these communities. Table 3 summarizes potential quantitative losses of these biotic communities resulting from project construction. Estimated impacts are derived using a right of way width of 30 m (100 ft) to 60 m (200 ft) depending on the alternative being considered. For impact calculations, it was assumed that widening will occur symmetrically throughout the project since final decisions on this matter have not been made. Usually, project construction does not require the entire right of way width; therefore, actual impacts may be considerably less.

Table 7. Anticipated Impacts to Biotic Communities
Values are given in hectares (acres).

Community Types	Alternative 1	Alternative 2	Alternatives 3 & 4
Disturbed Areas	41.3 (102.0)	43.7 (108.0)	43.7 (108.0)
Mixed Pine Early Successional Forest	2.8 (7.0)	1.6 (4.0)	1.6 (4.0)
Piedmont Alluvial Forest	1.6 (4.0)	2.0 (5.0)	1.2 (3.0)
Dry Oak Hickory Forest	9.7 (24.0)	10.1 (25.0)	10.5 (26.0)
Pine Forest	1.2 (3.0)	1.6 (4.0)	1.6 (4.0)
Total	56.6 (140.0)	59.0 (146.0)	58.6 (145.0)

Terrestrial communities found in the study area serve as nesting, feeding and sheltering habitat for various wildlife. Impacts to these communities will result from the construction of this project as areas are cleared and paved. Either alternative will reduce habitat for faunal species and therefore diminish their populations.

Road construction causes habitat reduction of forested areas. Habitat reduction concentrates wildlife into smaller areas of refuge, thus causing some species to become more susceptible to disease, predation and starvation. Since each alternative involves a different combination of three types of widening (with different right of way widths), the impacts from

each alternative will differ slightly. Impacts to disturbed and natural communities are comparable for each alternative when considering the size of and scope of the entire project. Impacts to aquatic communities will be similar for each alternative since each alternative follows the existing roadway. These impacts include degradation of water quality, thus negatively impacting the aquatic organisms living in the streams. Stream channelization required for culvert installation will further disturb the stream substrate and therefore degrade the aquatic community of these streams.

3. Jurisdictional Issues

This section provides descriptions, inventories and impact analysis pertinent to Waters of the United States.

a. Waters of the United States

Surface waters and jurisdictional wetlands fall under the broad category of Waters of the United States, as defined Section 33 of the Code of Federal Register (CFR) Part 328.3. Wetlands are defined in 33 CFR 328.3 as those areas inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated conditions. Any action that proposes to place fill material into these areas falls under the jurisdiction of the U.S. Army Corps of Engineers (COE) under Section 404 of the Clean Water Act (CWA) (33 U.S.C. 1344).

b. Characteristics of Wetlands and Surface Waters

Criteria to determine the presence of jurisdictional wetlands includes evidence of hydric soils, hydrophytic vegetation and hydrology. Wetlands and surface waters will likely be impacted by the widening of NC 16. Hydrophytic vegetation common to all of the wetlands in the project study area includes species such as: red maple, privet, elderberry, seedbox (Ludwigia alternifolia), common rush, Japanese grass (Microstegium vimineum), false nettle (Boehmeria cylindrica) and smartweeds (Polygonum spp.). Hydric soils having a matrix chroma of 1 or 2 and mottles of varying colors were present at all five wetland sites. Hydrologic indicators such as standing water, saturated soils, sediment deposits and drainage patterns were present at each wetland. These wetlands are indicated in Figure 6. Wetlands 4 and 5, approximately 0.008 ha (0.02 ac) are the largest wetlands in the project study area. Table 8 summarizes potential impacts to wetlands. Wetlands 1 and 3 are smaller [approximately 0.004 ha (0.01 ac)] and Wetland 2 is

very small [0.001 ha (0.002 ac)]. Total area of impact for all wetlands in the project study area is 0.02 ha (0.06 ac).

Table 8. Potential impacts to wetlands.

Wetland	Size
1	0.004 ha (0.01 ac)
2	0.001 ha (0.002 ac)
3	0.004 ha (0.01 ac)
4	0.008 ha (0.02 ac)
5	0.008 ha (0.02 ac)
Total	0.02 ha (0.06 ac)

c. Permits

Impacts to surface waters and jurisdictional wetlands are anticipated from project construction. In accordance with provisions of Section 404 of the CWA, a permit will be required from the COE for the discharge of dredge or fill material into "Waters of the United States."

A Nationwide Permit 33 CFR 330.5(a) (14) is likely to be applicable at most ditch and stream crossings found in the project study area. This permit authorizes construction provided the following conditions are met:

- (1) the width of the fill is limited to the minimum necessary for the actual crossing;
- (2) the fill placed in Water of the United States is limited to a filled area of no more than 0.1 hectares (1/3 acre);
- (3) no more than a total of 61 m (200 linear ft) of the fill for the roadway can occur in special aquatic sites, including wetlands;
- (4) the crossing is culverted, bridged or otherwise designed to prevent the restriction of, and to withstand, expected high flows and tidal flows and movement of aquatic organisms, and;
- (5) the crossing, including all attendant features, both temporary and permanent, is part of a single and complete project for crossing of a Water of the United States.

If further investigations indicate all of these conditions are not met, then individual permits may be required for stream crossings. The COE has final decisions concerning applicable permits.

This project will also require a 401 Water Quality General Certification from the DEM prior to the issuance of a Nationwide Permit. Section 401 of the CWA requires that the state issue or deny water quality certification for any federally permitted or licensed activity that may result in a discharge to Waters of the United States. Again, final decisions concerning applicable permits rest with the COE.

d. Mitigation

The COE has adopted, through the Council of Environmental Quality (CEQ), a wetland mitigation policy which embraces the concept of "no net loss of wetlands." The purpose of this policy is to maintain and restore the chemical, biological and physical integrity of Waters of the United States, specifically wetlands. Mitigation of wetland impacts has been defined by the CEQ to include: avoiding impacts (to wetlands), minimizing impacts, rectifying impacts, reducing impacts over time and compensating for impacts (40 CFR) 1508.20. Each of these three aspects (avoidance, minimization and compensatory mitigation) must be considered sequentially.

e. Avoidance

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

Wetlands 1 and 2 are located on the southwest side of NC 16. The project proposes to widen asymmetrically to the northeast to avoid the respective wetland sites. While avoiding Wetlands 1 and 2, it is impossible to avoid Wetlands 3 and 4 since they are located across from Wetland 1 and 2 on the northeast side of this road. Stream 11 flows along the southwest side of NC 16 for a considerable distance. The symmetrical widening in this area will avoid impacts to this stream except for a small segment located just south of Coley Pond Road (SR 1803).

f. Minimization

Minimization includes the examination of appropriate and practical steps to reduce the adverse impacts to Waters of the United States. Implementation of these steps will be required through project modifications and permit conditions. Minimization typically focuses on decreasing the footprint of the proposed project through the reduction of median widths, right of way widths, fill slopes and/or road shoulder widths. Impacts to streams and wetlands have been minimized by asymmetrical widening and the recommendation of a five-lane curb and gutter section for a significant portion of the project. The five-lane curb and gutter cross section has relatively tight right of way requirements.

Additional ways to minimize impacts to the waters and wetlands crossed by the proposed project include:

- strict enforcement of sedimentation control using Best Management Practices (BMPs) for the protection of surface waters during the entire life of the project;
- reduction of clearing and grubbing activity, particularly in riparian areas;
- reduction or elimination of direct discharge into streams;
- reduction of runoff velocity;
- re-establishment of vegetation on exposed areas, with prudent pesticide and herbicide management;
- minimization of in-stream activity and litter and debris control.

The use of any number of these methods will be effective in reducing wetland and water quality degradation resulting from project construction.

g. Compensatory Mitigation

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

Projects authorized under Nationwide Permits usually do not require compensatory mitigation according to the 1989 Memorandum

Agreement between the Environmental Protection Agency and the Department of the Army. However, final decisions rest with the COE. Compensatory mitigation may be required if COE determines stream impacts along the proposed project require individual permits. Several stream crossings will require channel realignment which exceed 45 meters (150 feet) (Refer to Table 2 and Figures 7A-7C). Therefore, stream mitigation for these sites will be required.

4. Protected and Rare Species

Some populations of fauna and flora have been in the process of decline either due to natural forces or their inability to coexist with human activities. Federal law (under the provisions of the Endangered Species Act [ESA] of 1973, as amended) requires that any action, likely to adversely affect a species classified as federally-protected, be subject to review by the U.S. Fish and Wildlife Service (FWS). Other species may receive additional protection under separate state laws.

a. Federally-Protected Species

Plants and animals with federal classifications of Endangered, Threatened, Proposed Endangered and Proposed Threatened are protected under provisions of Section 7 and Section 9 of the ESA. Only one federally-protected species is known from Catawba County as of November 4, 1997 (U.S. Fish and Wildlife Service 1996). Dwarf-flowered Heartleaf (Hexastylis naniflora) is classified as threatened, meaning that this species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Hexastylis naniflora (dwarf-flowered heartleaf)

The dwarf flowered heartleaf has heart-shaped leaves, supported by long petioles growing from a subsurface rhizome. The evergreen leaves are dark green in color and are often blotched with white markings. Flowers are small, inconspicuous, jug-shaped, brown in color and are found near the base of the petioles. Fruits mature from mid-May to early July.

Dwarf-flowered heartleaf populations are found along bluffs and their adjacent slopes, in boggy areas next to streams and creekheads and along the slopes of nearby hillsides and ravines. The plant grows in acidic soils in regions with a cool moist climate.

BIOLOGICAL CONCLUSION:

NO EFFECT

The NC Natural Heritage Program database of rare species does not list any populations of dwarf flowered heartleaf within the project limits. Habitat for this species does exist within the right of way. Plant by plant surveys for this species were conducted in those areas containing suitable habitat on 20-21 March 1996. No specimens were found. This project will not affect dwarf-flowered heartleaf.

b. Federal Species of Concern

Two federal species of concern (FSC) are listed for Catawba County. Federal species of concern (FSC) are species which may or may not be listed as endangered or threatened species in the future. Formerly listed as candidate species, these taxon are not afforded federal protection under the ESA and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as Threatened or Endangered.

The Catawba crayfish ostracod (Dactyloctythere isabelae) and sweet pinesap (Monotropis odorata) are classified as Federal Species of Concern (FSC). The Catawba crayfish ostracod is symbiotic on crayfish in Lyle Creek, a tributary of the Catawba River. According to LeGrand and Hall (1995), the Catawba crayfish ostracod is listed as significantly rare in North Carolina. This designation means that the species exists in such small numbers in NC that it should be monitored. The Lyle Creek drainage is not located within the project region. It is not likely that this species is present within the project study area. Sweet Pinesap is found throughout the Piedmont and Mountain physiographic provinces in dry forests and bluffs. Its status as a NC Candidate species indicates that this species is very rare in NC possibly due to habitat destruction. Habitat does exist for this species within the project limits.

A review of the NC Natural Heritage Program database of rare species and unique habitats does not indicate any populations of North Carolina rare and/or protected species or locations of any unique habitats within 1.6 kilometers (1.0 mile) of the project study area. Surveys for these species were not conducted during the site visit, nor were any of these species observed.

F. Hazardous Materials

A geology and hazardous materials evaluation was conducted by investigation of the project area to determine if any hazards such as underground storage tanks, hazardous waste sites, dumps, landfills, or other similar sites which may impact construction of the project, cause delays, or create other liabilities. A field reconnaissance survey was conducted along existing NC 16 from north of Tower Road (SR 1895) to north of Caleb Setzer Road (SR 1800) by the Geotechnical Unit of NCDOT. Ten potential sites for underground storage tanks (UST's) were identified in the project vicinity (See Appendix D for listing). As a result of this study, this project was considered to have a low risk for hazardous materials involvement.

G. Geodetic Survey Markers

This project will impact one geodetic survey marker.

H. Construction Impacts

Construction effects of the project will be temporary in nature. To minimize potential adverse effects caused by construction, the following measures, along with those already mentioned, will be utilized during the construction phase of this project.

1. Solid wastes created as a result of highway construction will be disposed of in accordance with Section 802 of the NCDOT Standard Specifications for Roads and Structures.
2. Borrow pits and all ditches will be drained insofar as possible to alleviate breeding areas for mosquitoes. In addition, care will be taken not to block existing drainage ditches.
3. An extensive rodent control program will be established where structures are to be removed or demolished in order to prevent the migration of rodents into surrounding areas.
4. Any burning will be done in accordance with applicable local laws and ordinances, along with the regulations of the North Carolina Plan for Implementing the National Ambient Air Quality Standards. Burning will be done only on the right of way, under constant surveillance, with good atmospheric conditions, and as remote from dwelling as possible.
5. The contractor shall maintain the earth surface of all waste areas, both during the work and until the completion of all seeding and mulching or other erosion control measures specified, in a manner which will effectively control erosion and siltation.

6. NCDOT Best Management Practices for Protection of Surface Water shall be followed during project construction in order to prevent siltation of nearby streams.
7. Prior to the approval of any borrow source developed for use on this project, the contractor shall obtain a certification from the North Carolina Department of Cultural Resources certifying that the removal of material from the borrow source will have no effect on any known district, site, building, structure, or object that is included or eligible for inclusion in the National Register of Historic Places. A copy of this certification shall be furnished to the Engineer prior to performing any work on the proposed borrow source.
8. NCDOT will avoid borrow and waste locations in wetland areas.

I. Greenways

The project will not impact any existing or proposed greenways.

VII. COMMENTS AND COORDINATION

Input concerning the effects of the project on the environment was requested from the appropriate Federal, State, and Local agencies in preparing this Environmental Assessment. Listed below are the agencies which were contacted:

- *U. S. Army Corps of Engineers
- *U. S. Fish and Wildlife Service
- U. S. Department of Interior
- Federal Emergency Management Administration
- U. S. Advisory Council on Historic Preservation
- U. S. Department of Agriculture
- U. S. Environmental Protection Agency
- U. S. Soil Conservation Service
- U. S. Geological Survey
- *N. C. State Clearinghouse, Department of Administration
- *N. C. Department of Environment, Health, and Natural Resources
- *N. C. Department of Cultural Resources, Division of Archives and History
- *N. C. Wildlife Resources Commission
- N. C. Department of Human Resources
- N. C. Department of Public Instruction
- *Catawba County Public Schools

- *Catawba County Planning
- *City of Newton

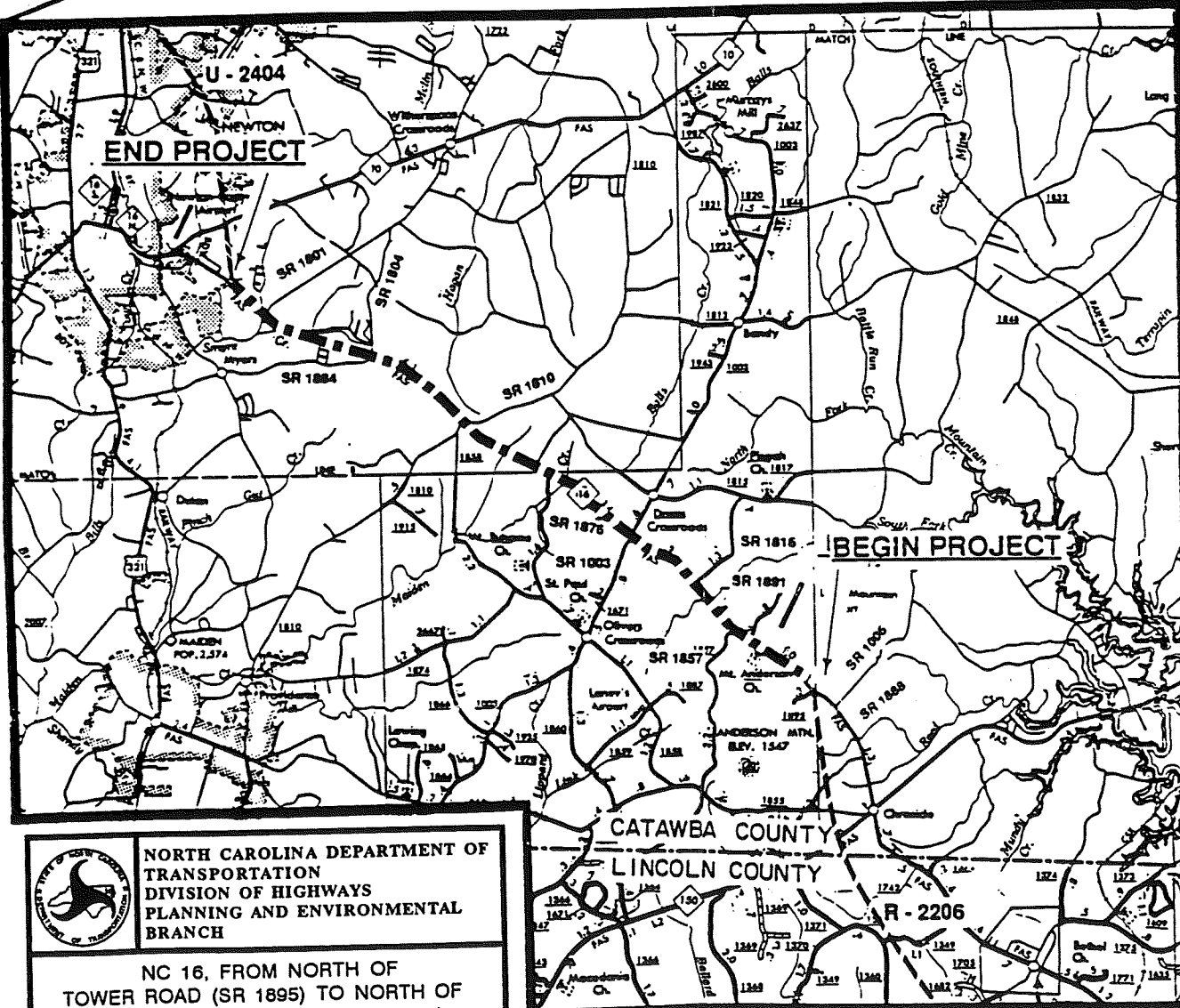
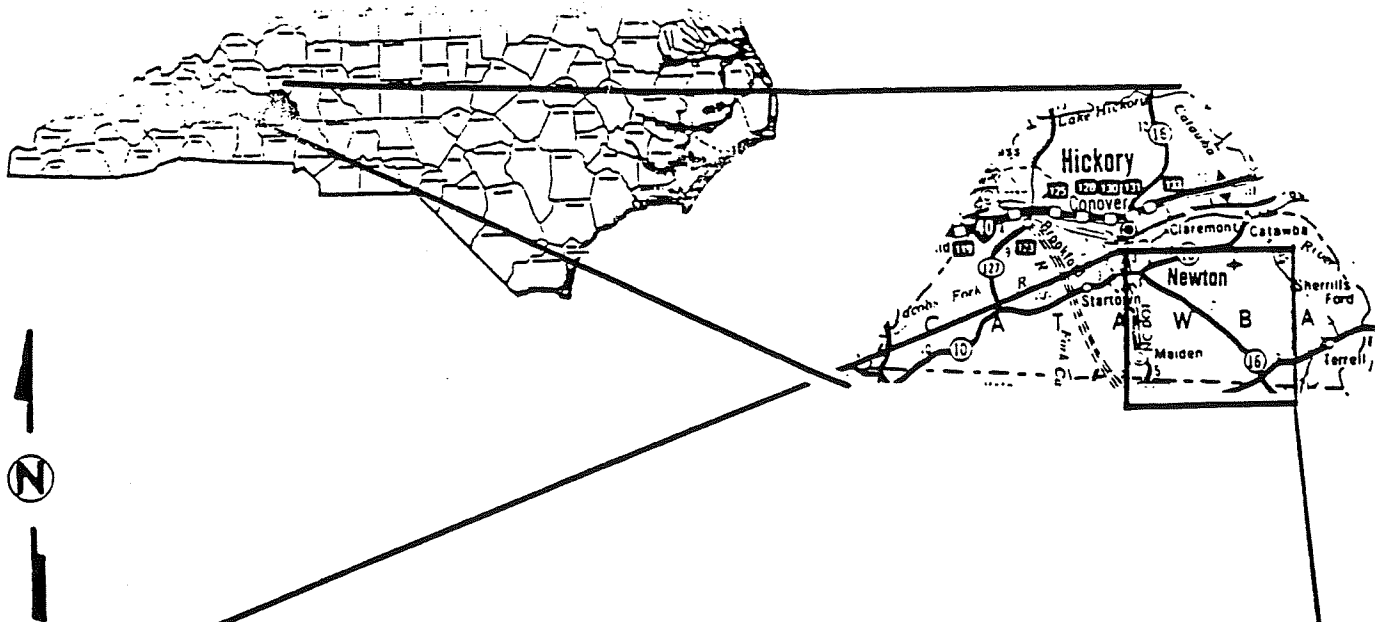
* Denotes agencies from which input was received

A Citizen's Informational Workshop was held on December 11, 1995 at Newton City Hall to obtain comments and/or suggestions about the proposed project from the public. Approximately 80 people attended to express their interest in the project. Some of those attending lived on or in the vicinity of NC 16 and were concerned about the impacts the proposed project would have on their property. However, the consensus of those attending the workshop was NC 16 needs to be widened to improve capacity and safety.

R-3100

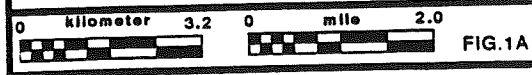
APPENDIX A

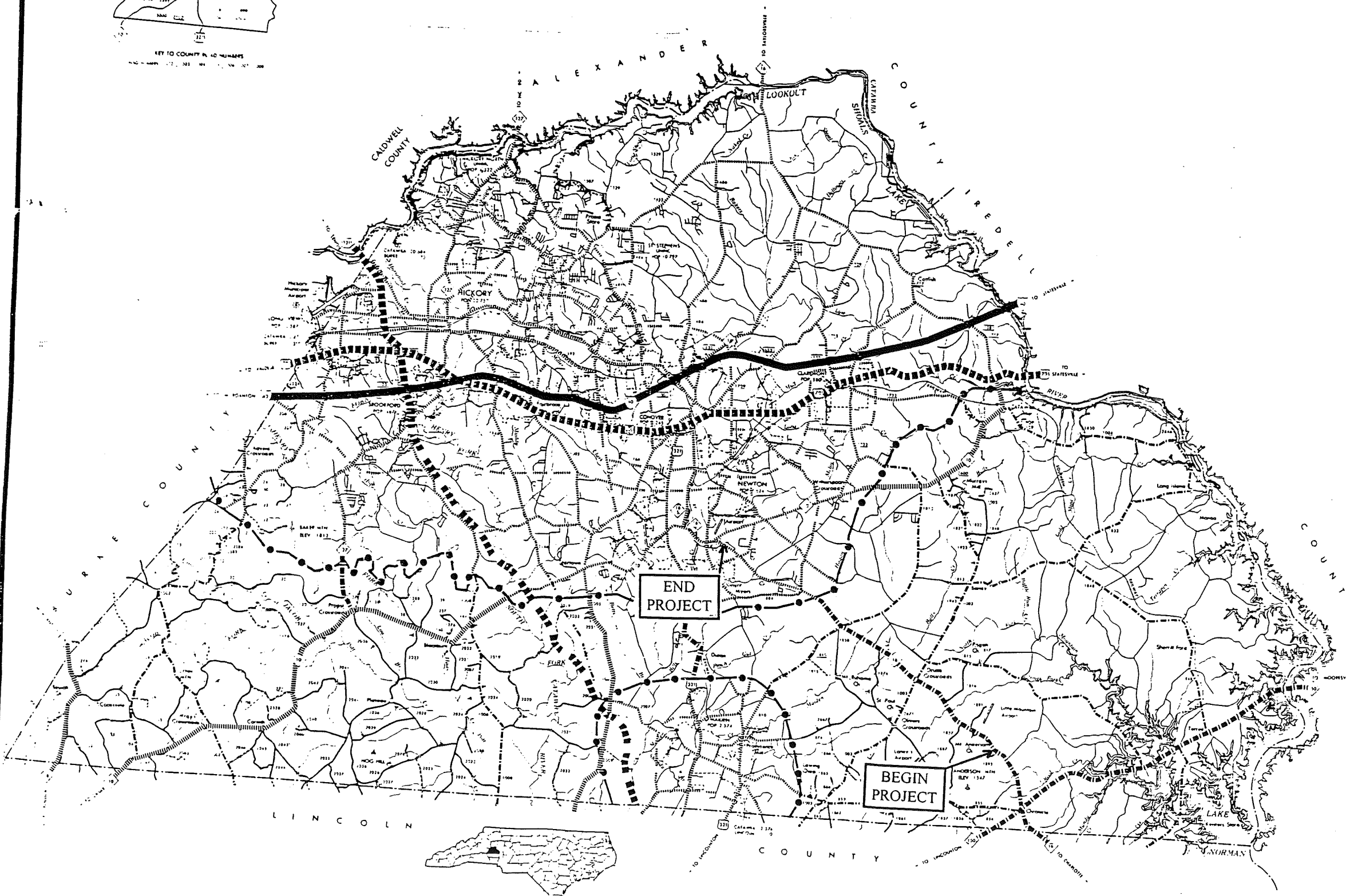
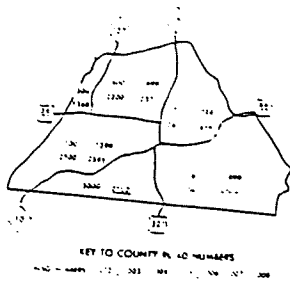
FIGURES



NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL
BRANCH

NC 16, FROM NORTH OF
TOWER ROAD (SR 1895) TO NORTH OF
CALEB SETZER ROAD (SR 1800)
CATAWBA COUNTY
T.I.P. NO. R-3100





LEGEND		
ROADWAY CLASSIFICATIONS	EXISTING	PROPOSED
PRINCIPAL ARTERIALS	(thick solid line)	(thick dashed line)
MINOR ARTERIALS	(medium solid line)	(medium dashed line)
MAJOR COLLECTORS	(thin solid line)	(thin dashed line)
MINOR COLLECTORS	(dotted line)	(dotted line)
URBAN MAJOR THROUGHFARE	(thick solid line with dots)	(thick dashed line with dots)
URBAN THROUGHFARE	(medium solid line with dots)	(medium dashed line with dots)
URBAN THROUGHFARE PLANNING BOUNDARY	(dashed line with dots)	(dashed line with dots)

ADOPTED BY:
CATAWBA COUNTY AUGUST 19, 1991

RECOMMENDED FOR APPROVAL BY:
NC DEPARTMENT OF TRANSPORTATION
PLANNING AND ENVIRONMENTAL BRANCH AUGUST 21, 1991

ADOPTED BY:
NC DEPARTMENT OF TRANSPORTATION SEPTEMBER 6, 1991

PUBLIC HEARING:
APRIL 16, 1991

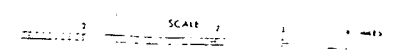


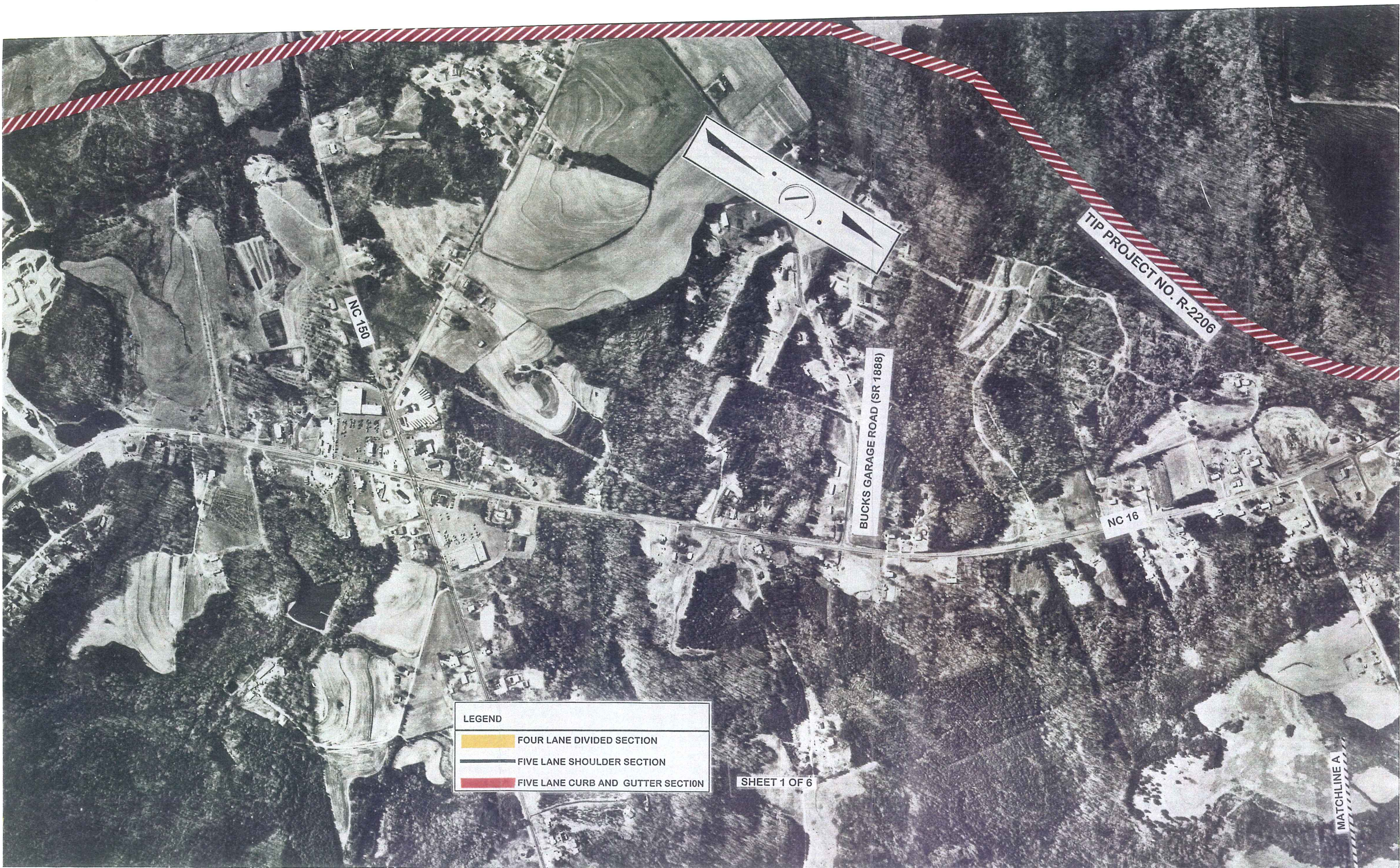
RECOMMENDED
THOROUGHFARE PLAN
CATAWBA COUNTY
NORTH CAROLINA

PREPARED BY:
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS - PLANNING AND RESEARCH BRANCH
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

JULY 3, 1991

FIGURE 1B





TIP PROJECT NO. R-2206

NC 150

BUCKS GARAGE ROAD (SR 1888)

NC 16

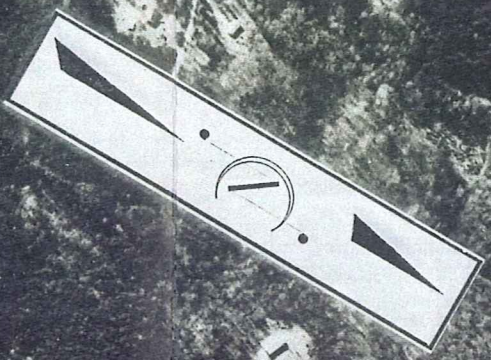
LEGEND

- FOUR LANE DIVIDED SECTION
- FIVE LANE SHOULDER SECTION
- FIVE LANE CURB AND GUTTER SECTION

SHEET 1 OF 6

MATCHLINE A

TIP PROJECT NO. R-2206



TOWER ROAD (SR 1895)

JONES FISH CAMP

R. L. CALDWELL ROAD


ANDERSON MOUNTAIN ROAD (SR 1857)

BEGIN PROJECT

MT. ANDERSON BAPTIST CHURCH
FAMILY LIFE CENTER AND PARK

AIRPORT ROAD (SR 1891)

LITTLE MOUNTAIN AIR STRIP

 NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL
BRANCH

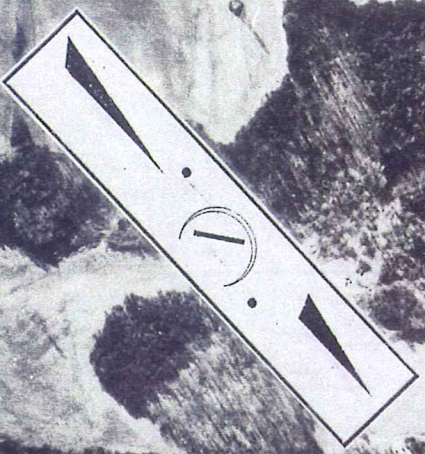
NC 16, FROM NORTH OF
TOWER ROAD (SR 1895) TO NORTH OF
CALEB SETZER ROAD (SR 1800)
CATAWBA COUNTY
T.I.P. NO. R-3100

0 125 (meters) 250

AERIAL MOSAIC
FIGURE 2

MATCHLINE A

MATCHLINE B



NANCY AND UDEAN CHRISTIAN TOURS

CHURCH
PARK

RANT DRUM ROAD (SR 1816)




CITGO
DRUM'S RESTAURANT
CH REALTY AND AUCTION

RIGHT ANGLE ELECTRIC CO., INC.

BUFFALO SHOALS ROAD (SR 1003)

BALL'S CREEK

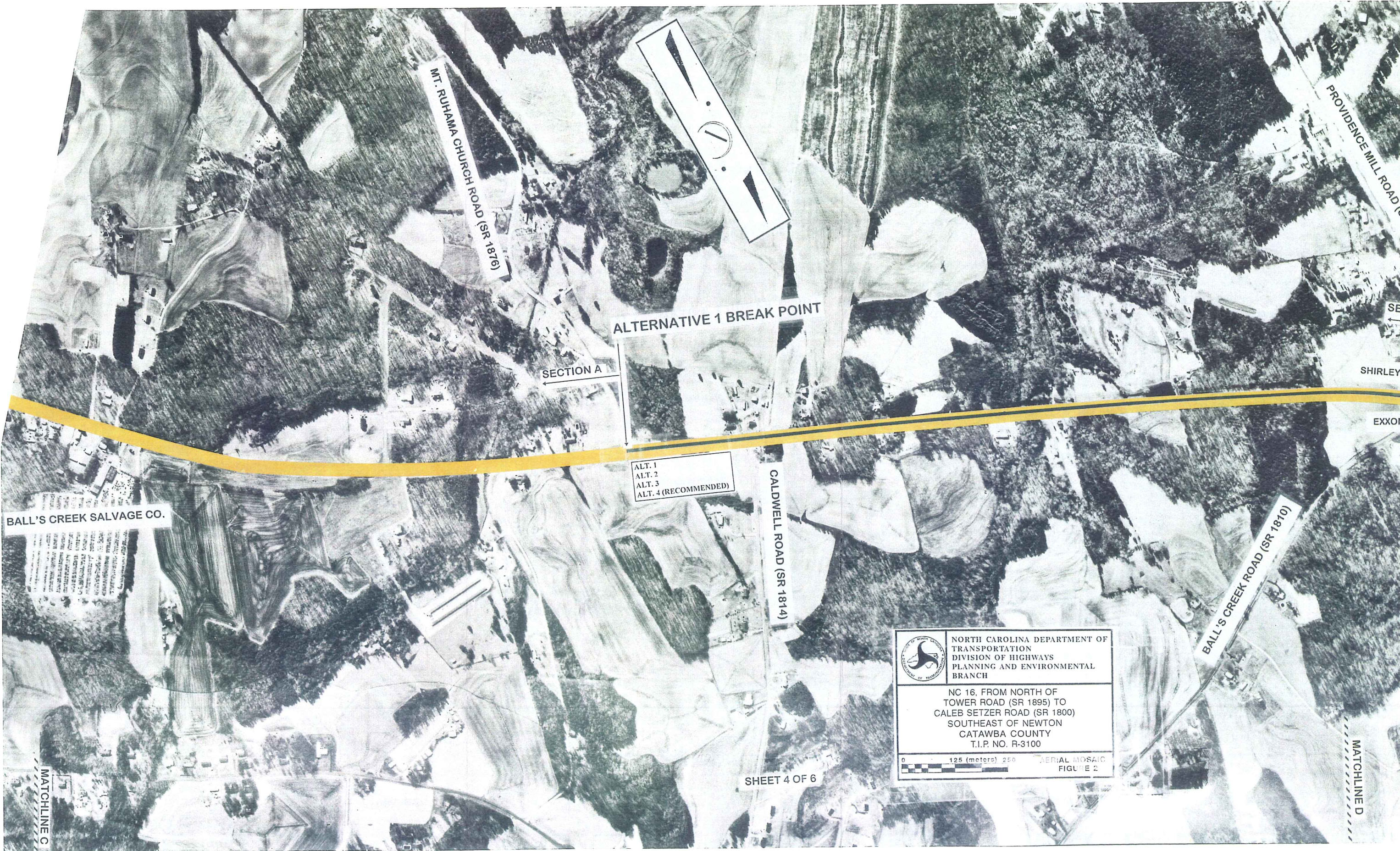
LEGEND

-  FOUR LANE DIVIDED SECTION
-  FIVE LANE SHOULDER SECTION
-  FIVE LANE CURB AND GUTTER SECTION

SHEET 3 OF 6

MATCHLINE B

MATCHLINE C



MT. RUHAMA CHURCH ROAD (SR 1876)

PROVIDENCE MILL ROAD (SR 1800)

ALTERNATIVE 1 BREAK POINT

SECTION A

ALT. 1
ALT. 2
ALT. 3
ALT. 4 (RECOMMENDED)

CALDWELLWELL ROAD (SR 1814)

BALL'S CREEK ROAD (SR 1810)

BALL'S CREEK SALVAGE CO.

SHIRLEY

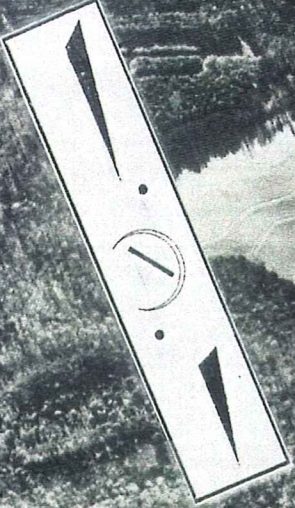
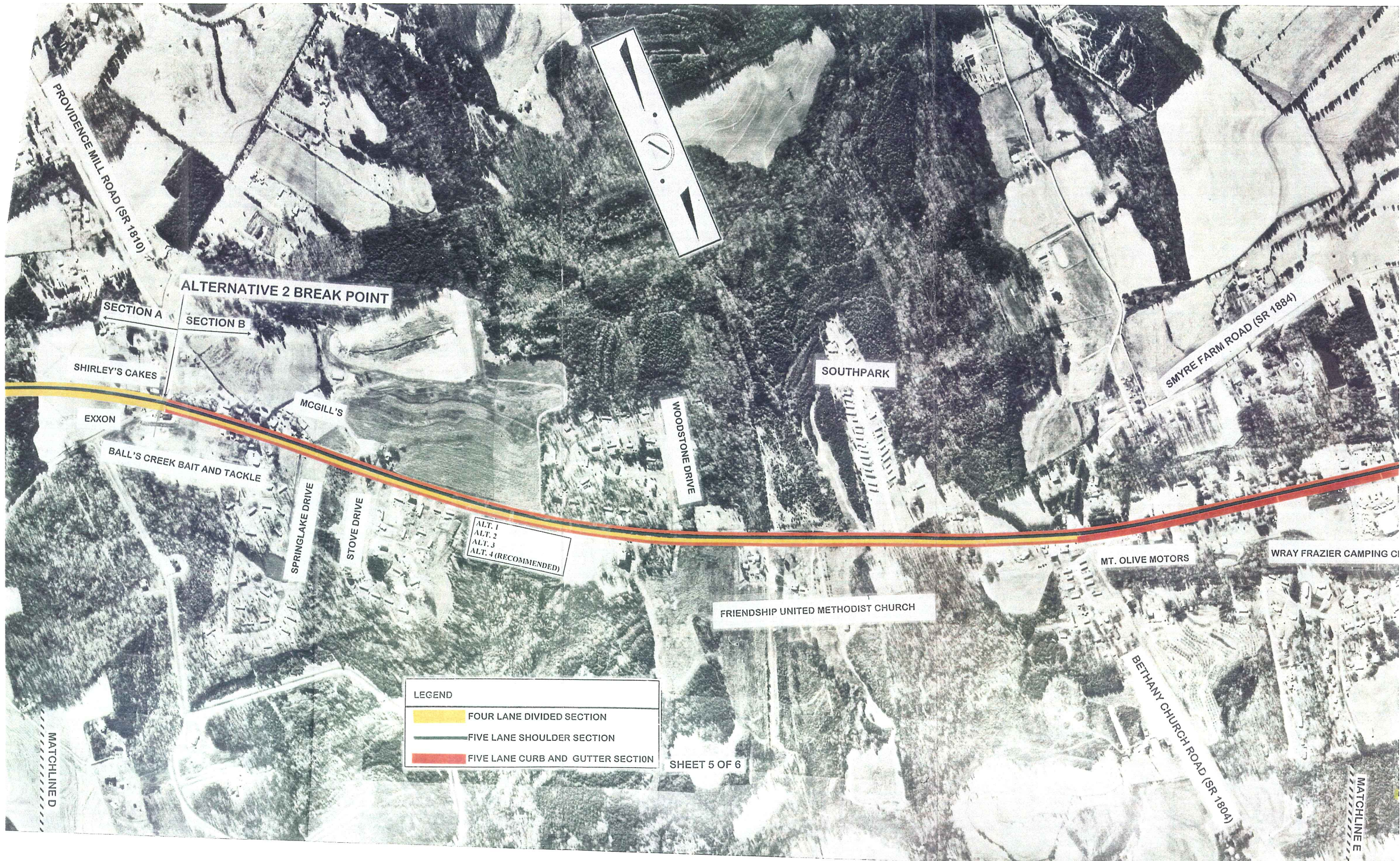
EXXON

	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANNING AND ENVIRONMENTAL BRANCH
	NC 16, FROM NORTH OF TOWER ROAD (SR 1895) TO CALEB SETZER ROAD (SR 1800) SOUTHEAST OF NEWTON CATAWBA COUNTY T.I.P. NO. R-3100
 AERIAL MOSAIC FIGURE 2	

SHEET 4 OF 6

MATCHLINE C

MATCHLINE D



ALTERNATIVE 2 BREAK POINT

SECTION A

SECTION B

SHIRLEY'S CAKES

EXXON

BALL'S CREEK BAIT AND TACKLE

MCGILL'S

SPRINGLAKE DRIVE

STOVE DRIVE

WOODSTONE DRIVE

SOUTH PARK

SMYRE FARM ROAD (SR 1884)

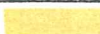


ALT. 1
ALT. 2
ALT. 3
ALT. 4 (RECOMMENDED)

MT. OLIVE MOTORS

WRAY FRAZIER CAMPING CI

FRIENDSHIP UNITED METHODIST CHURCH

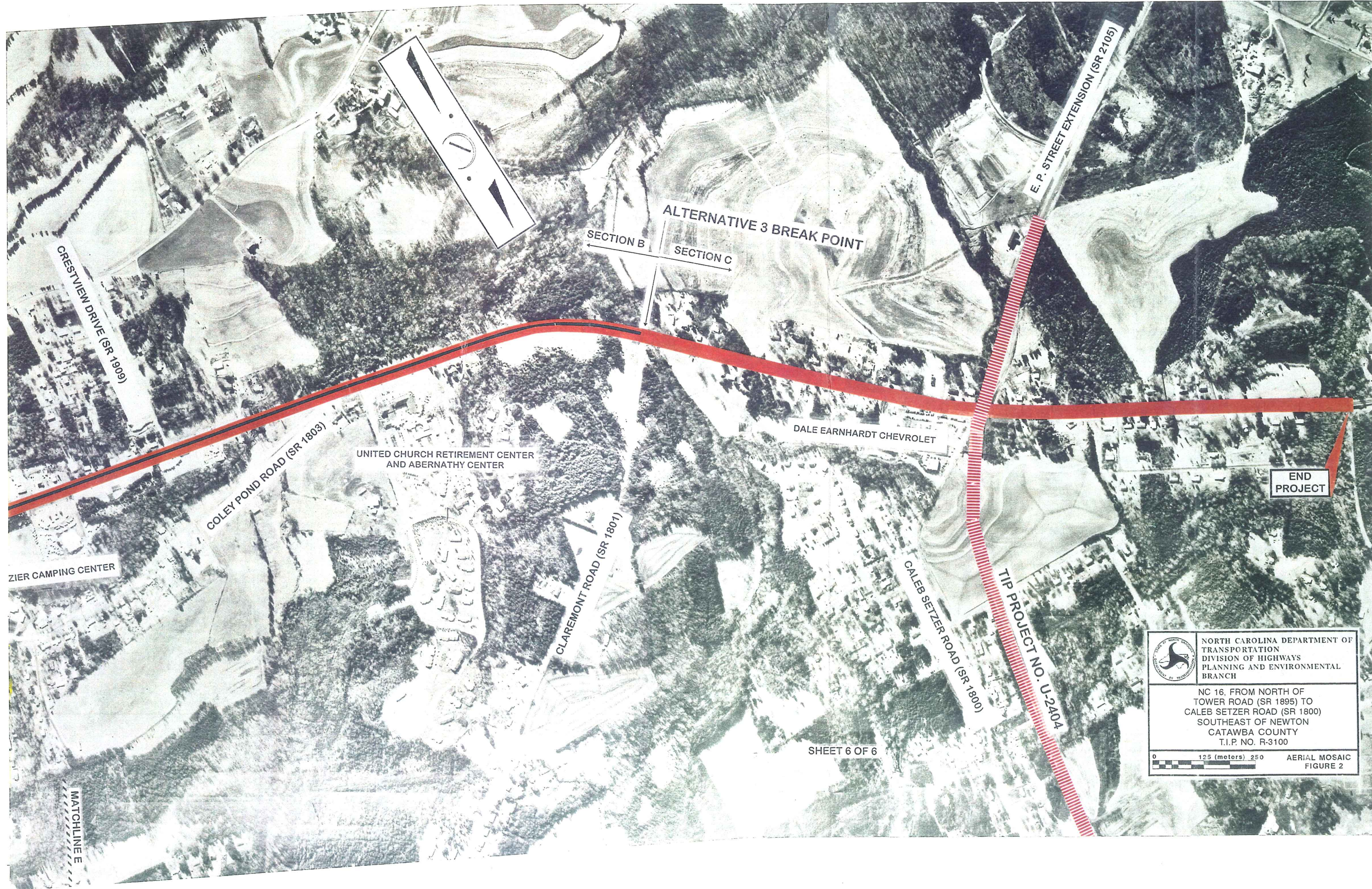
BETHANY CHURCH ROAD (SR 1804)


LEGEND	
	FOUR LANE DIVIDED SECTION
	FIVE LANE SHOULDER SECTION
	FIVE LANE CURB AND GUTTER SECTION

SHEET 5 OF 6

MATCHLINE D

MATCHLINE E

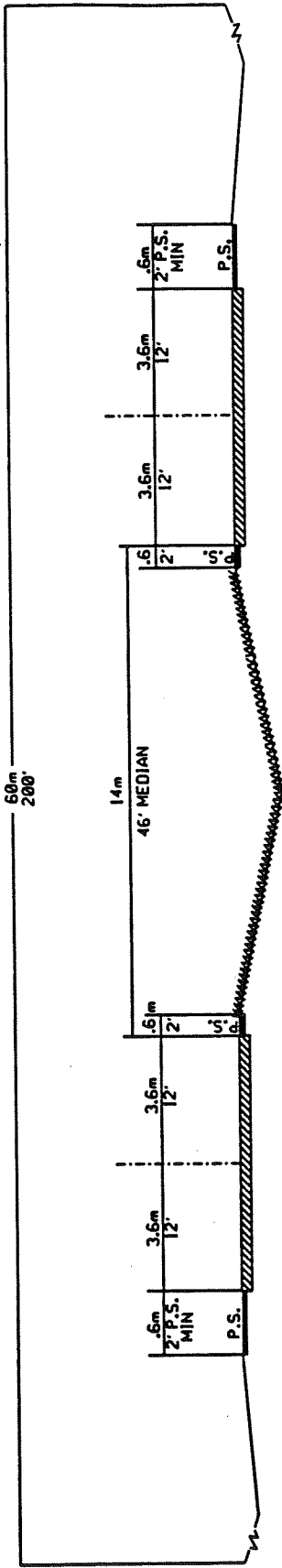


 NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL
BRANCH

NC 16, FROM NORTH OF
TOWER ROAD (SR 1895) TO
CALEB SETZER ROAD (SR 1800)
SOUTHEAST OF NEWTON
CATAWBA COUNTY
T.I.P. NO. R-3100

0 125 (meters) 250 AERIAL MOSAIC
FIGURE 2

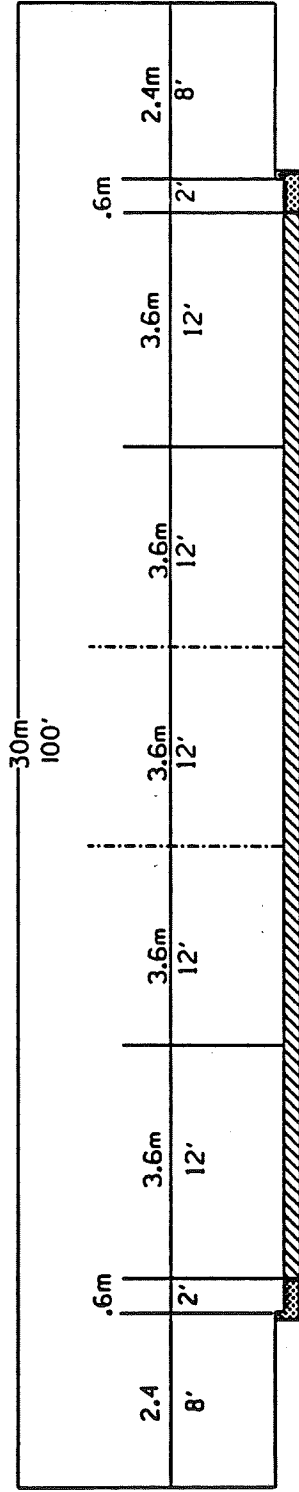
TYPICAL CROSS SECTION



FOUR LANES DIVIDED WITH MEDIAN - PAVED SHOULDERS

FIGURE 3A

TYPICAL CROSS SECTION



FIVE-LANE ROADWAY WITH CURB & GUTTER

FIGURE 3B

BUFFALO SHOALS ROAD (SR 1003) / NC 16 INTERSECTION
PROPOSED LANE CONFIGURATIONS

TIP NO. R-3100

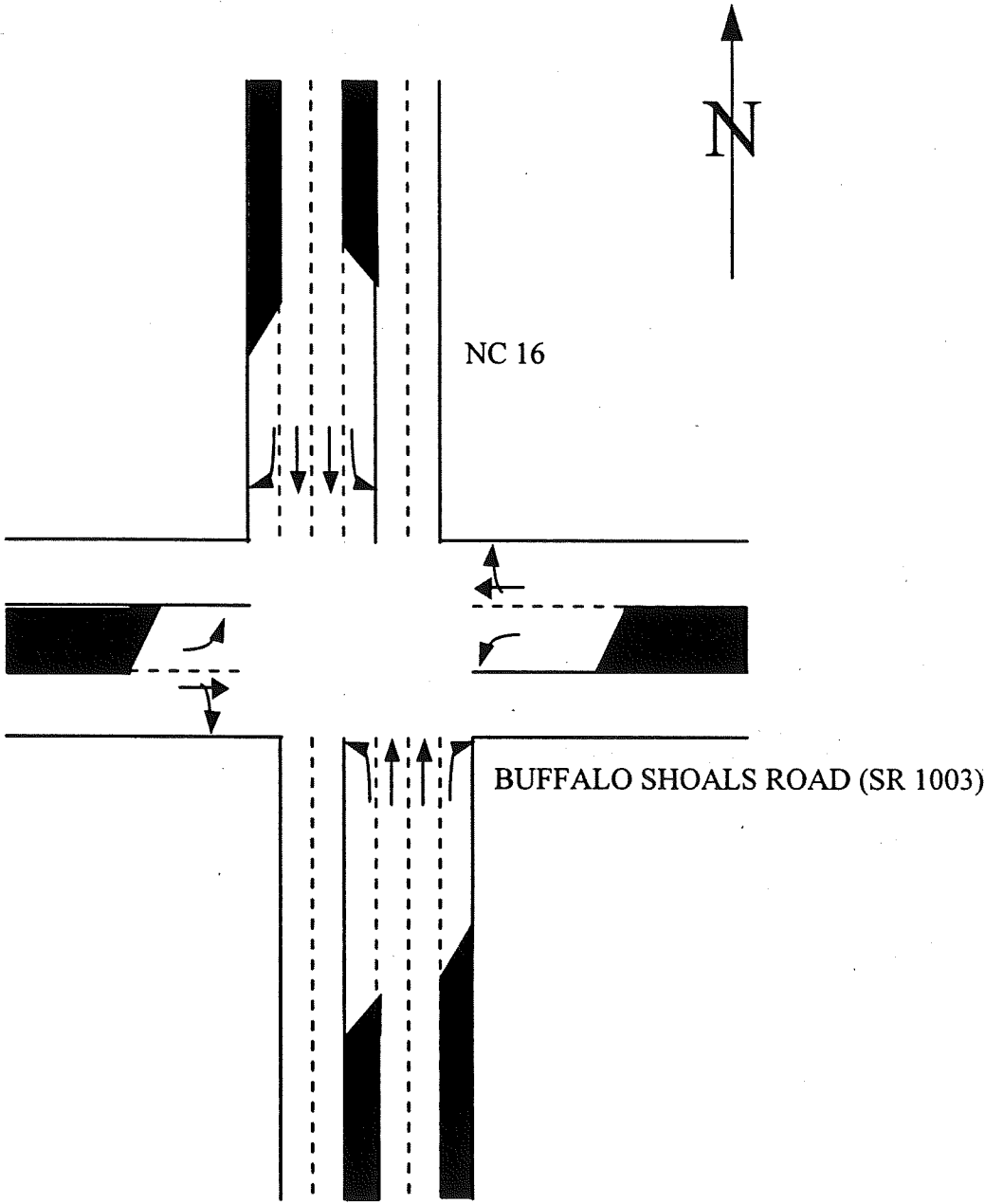


FIGURE 4A

BALL'S CREEK ROAD (SR 1810) / NC 16 INTERSECTION
PROPOSED LANE CONFIGURATIONS

TIP NO. R-3100

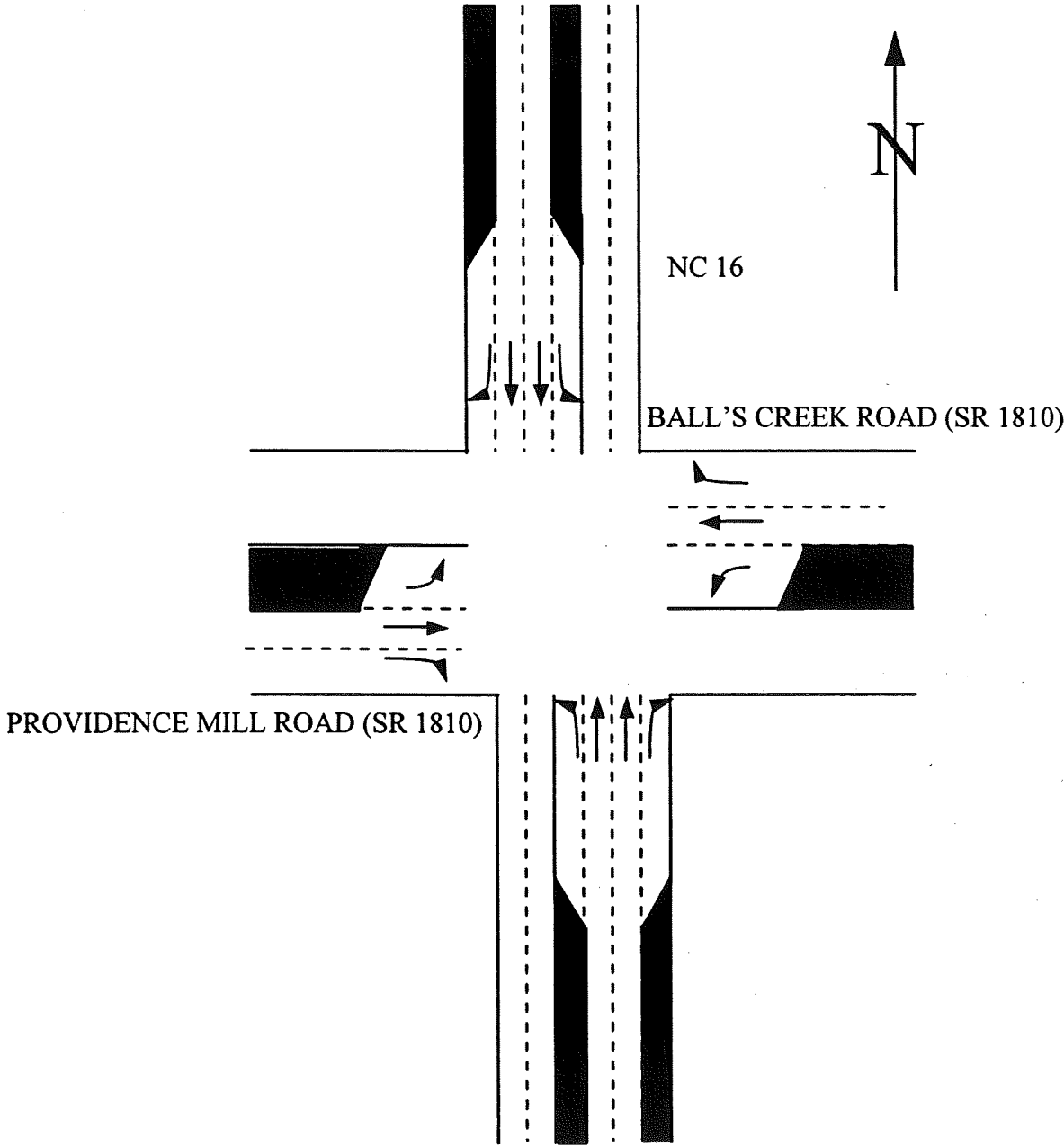


FIGURE 4B

BETHANY CHURCH ROAD (SR 1804) / NC 16 INTERSECTION PROPOSED LANE CONFIGURATIONS

TIP NO. R-3100

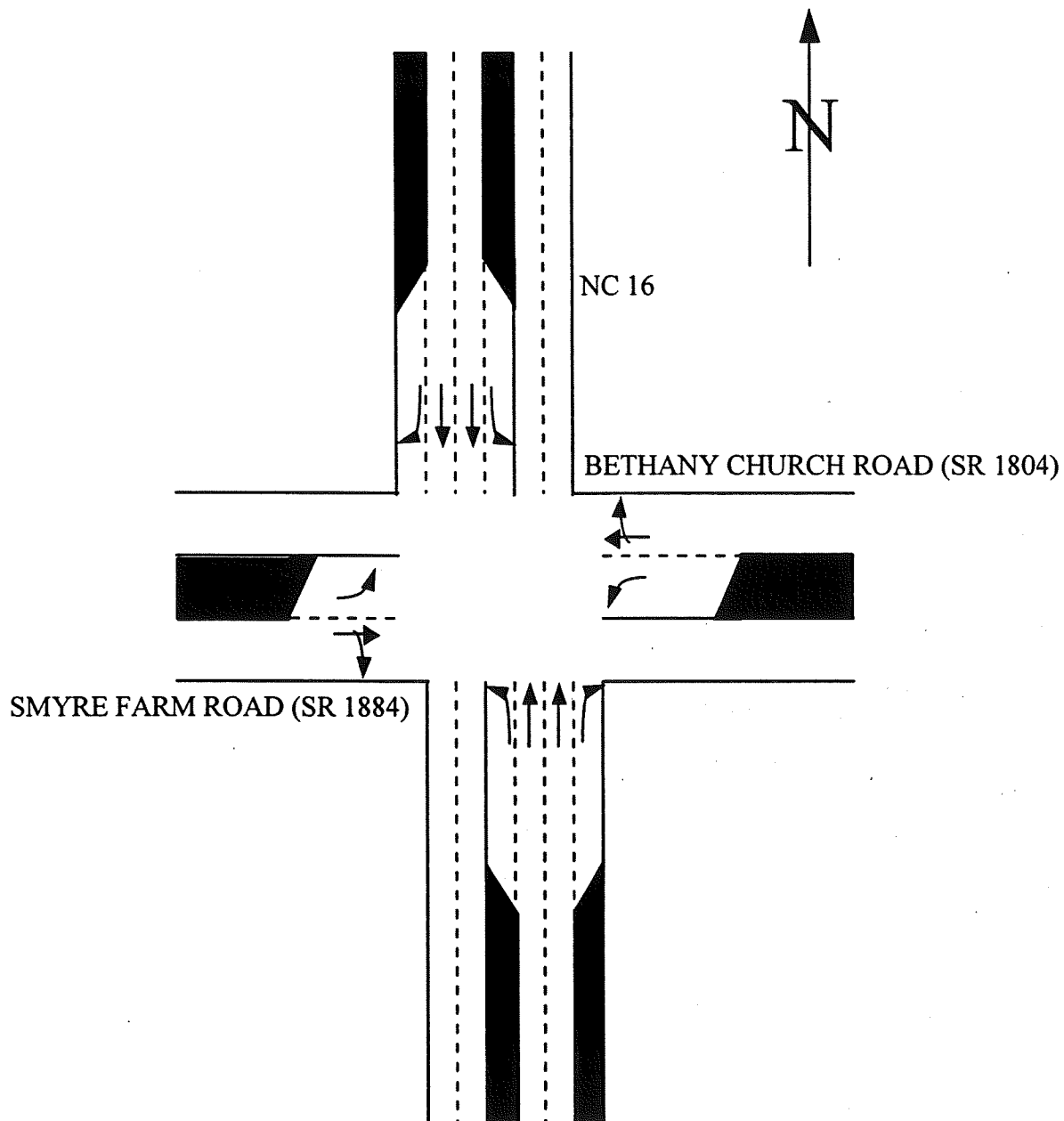


FIGURE 4C

NEWTON-CONOVER EASTERN LOOP / NC 16 INTERSECTION
PROPOSED LANE CONFIGURATIONS

TIP NO. R-3100

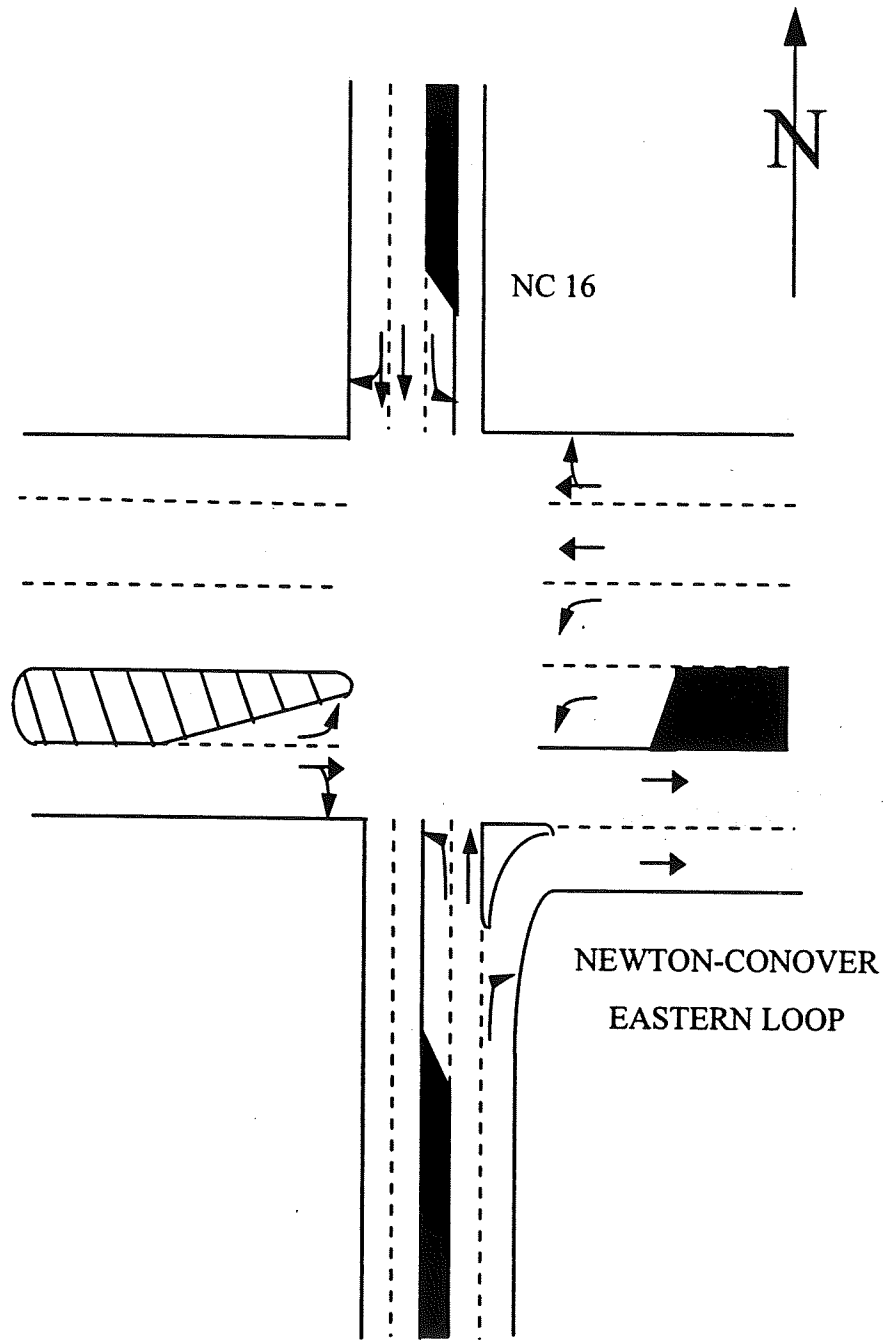


FIGURE 4D

NC 16 WIDENING (R-3100)
 CATAWBA COUNTY
 1995 TRAFFIC TURNING MOVEMENTS

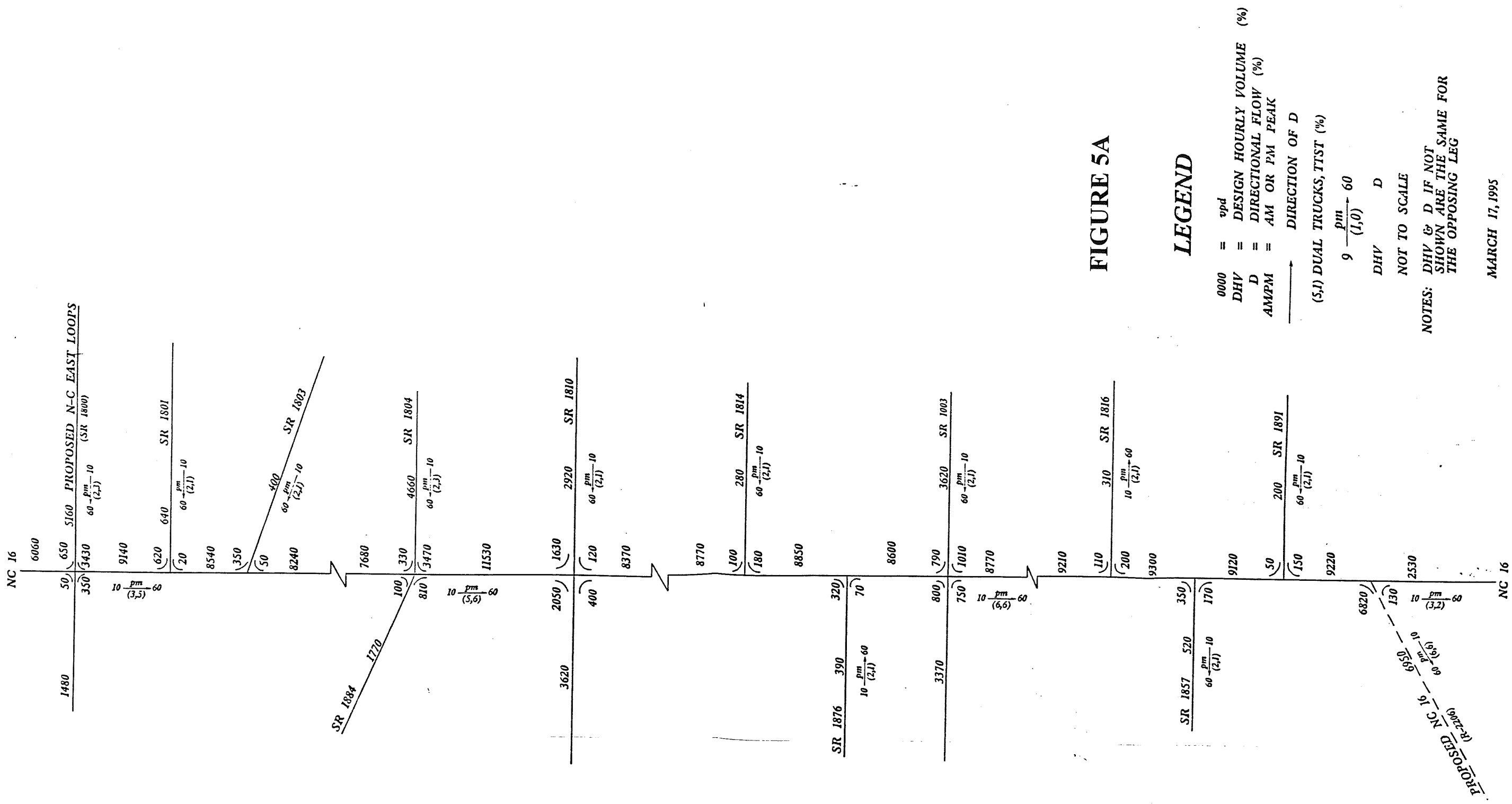


FIGURE 5A

LEGEND

- 0000 = vpd
- DHV = DESIGN HOURLY VOLUME (%)
- D = DIRECTIONAL FLOW (%)
- AMPM = AM OR PM PEAK
- DIRECTION OF D

(S,1) DUAL TRUCKS, TTST (%)

$$9 \frac{PM}{(1,0)} \rightarrow 60$$

DHV D
 NOT TO SCALE

NOTES: DHV & D IF NOT SHOWN ARE THE SAME FOR THE OPPOSING LEG

**NC 16 WIDENING (R-3100)
CATAWBA COUNTY
2020 TRAFFIC TURNING MOVEMENTS**

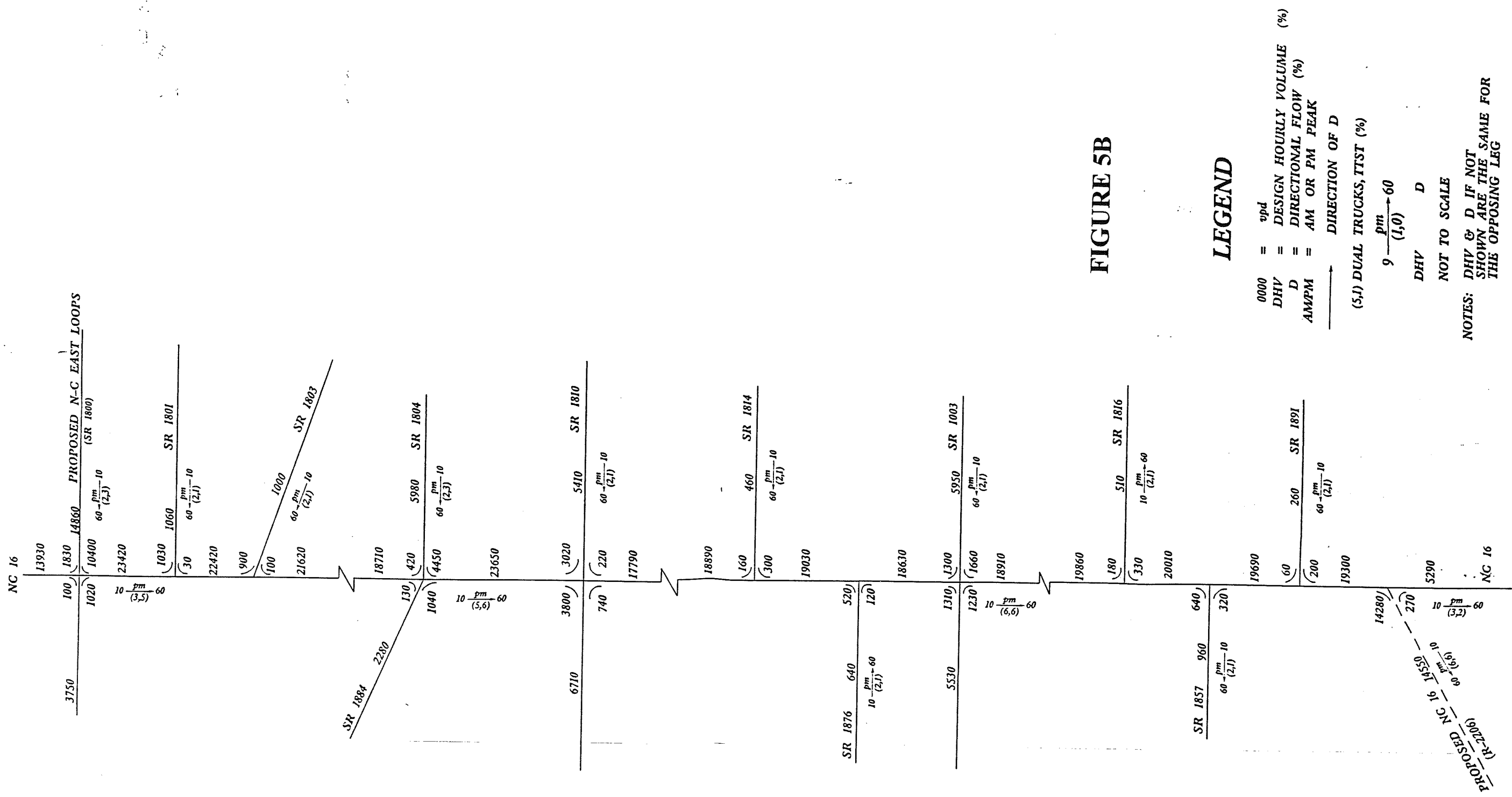


FIGURE 5B

LEGEND

- 0000 = upd
- DHV = DESIGN HOURLY VOLUME (%)
- D = DIRECTIONAL FLOW (%)
- AM/PM = AM OR PM PEAK
- = DIRECTION OF D
- (5,1) DUAL TRUCKS, TTST (%)
- 9 $\frac{pm}{(1,0)} \rightarrow 60$
- DHV D
- NOT TO SCALE
- NOTES: DHV & D IF NOT SHOWN ARE THE SAME FOR THE OPPOSING LEG

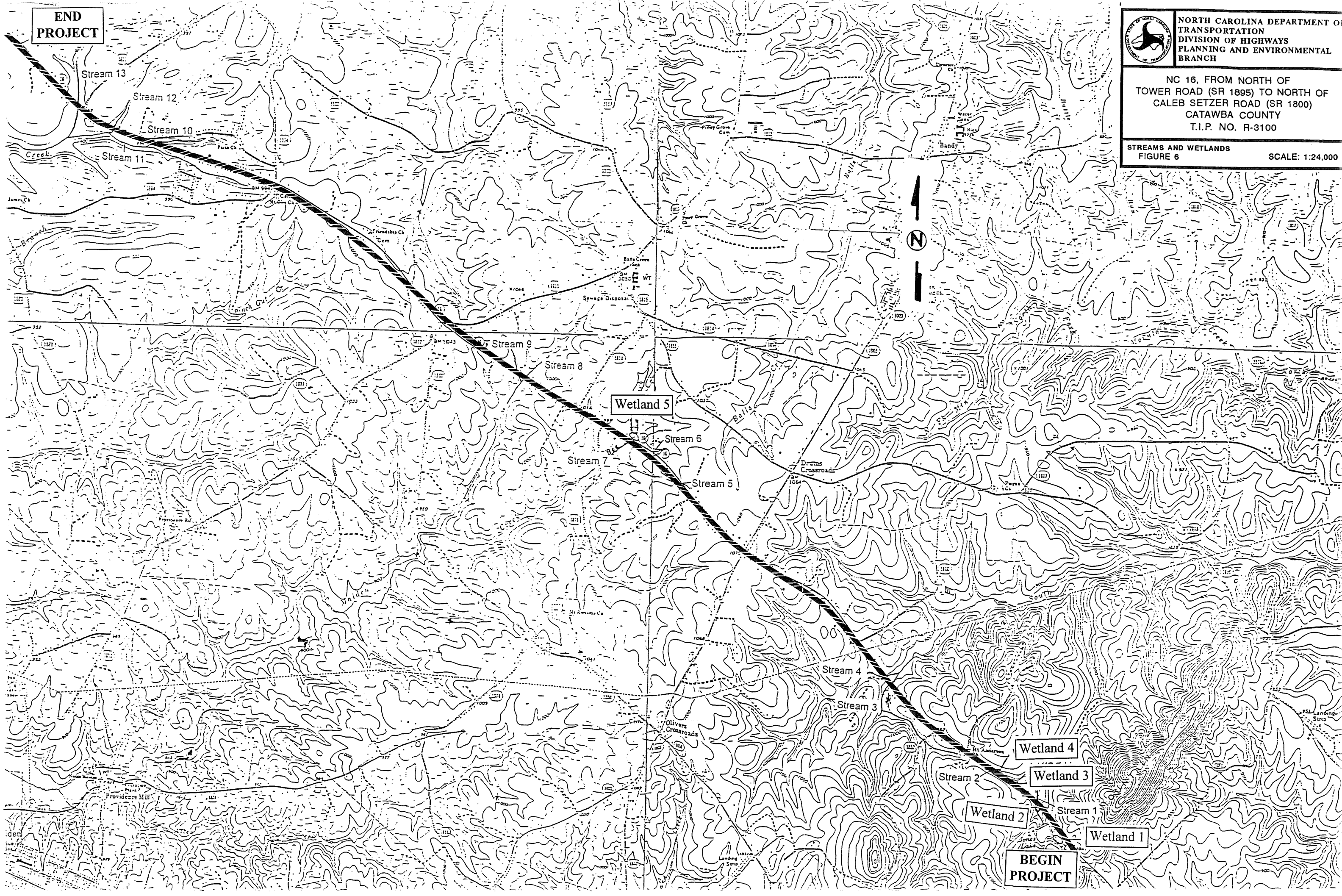
END
PROJECT

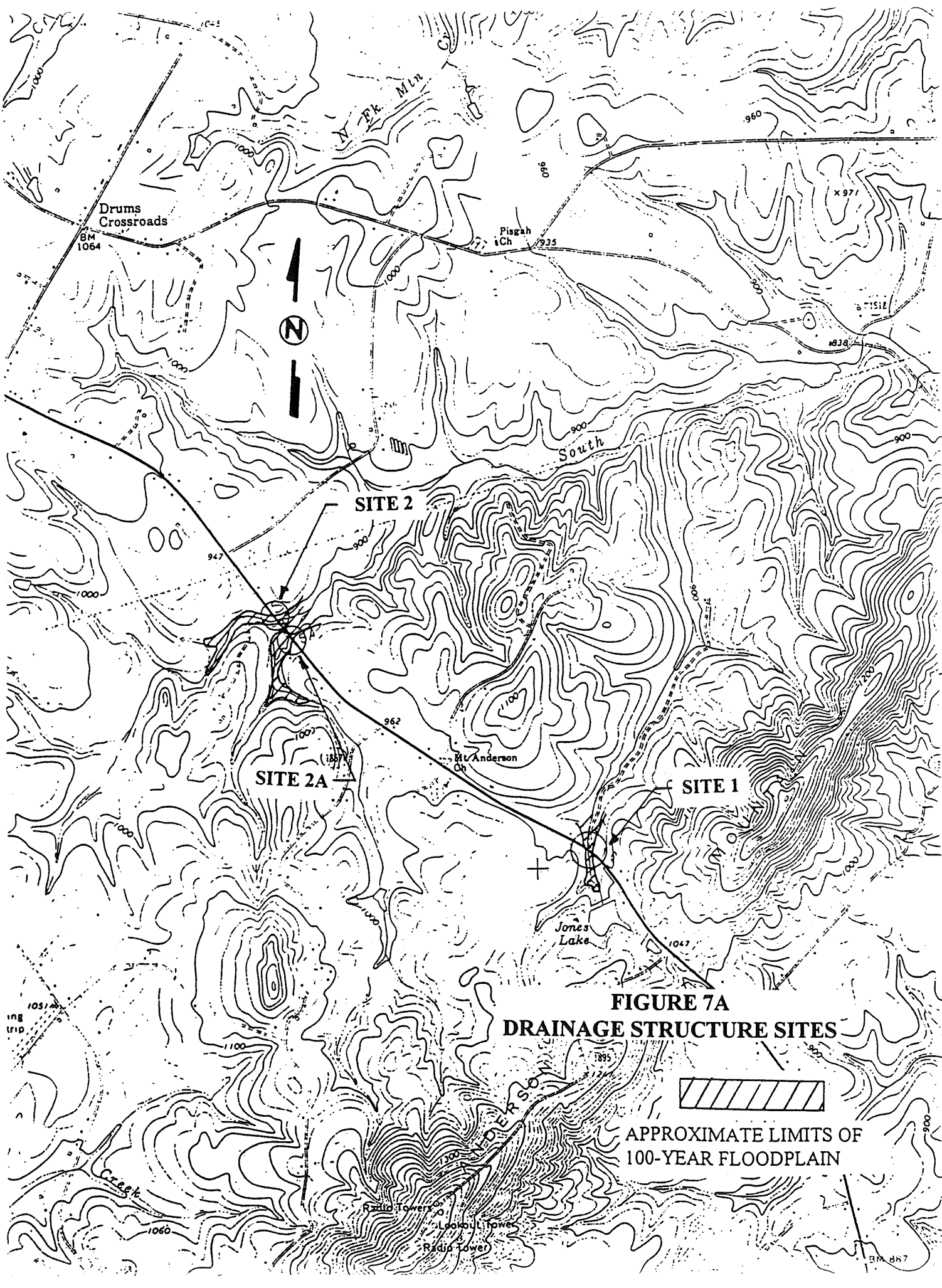


NORTH CAROLINA DEPARTMENT OF
TRANSPORTATION
DIVISION OF HIGHWAYS
PLANNING AND ENVIRONMENTAL
BRANCH

NC 16, FROM NORTH OF
TOWER ROAD (SR 1895) TO NORTH OF
CALEB SETZER ROAD (SR 1800)
CATAWBA COUNTY
T.I.P. NO. R-3100

STREAMS AND WETLANDS
FIGURE 6 SCALE: 1:24,000





**FIGURE 7A
DRAINAGE STRUCTURE SITES**



APPROXIMATE LIMITS OF
100-YEAR FLOODPLAIN

MAIDEN QUADRANGLE
NORTH CAROLINA
7.5 MINUTE SERIES (TOPOGRAPHIC)

4755 II NE
(GATAWBA)

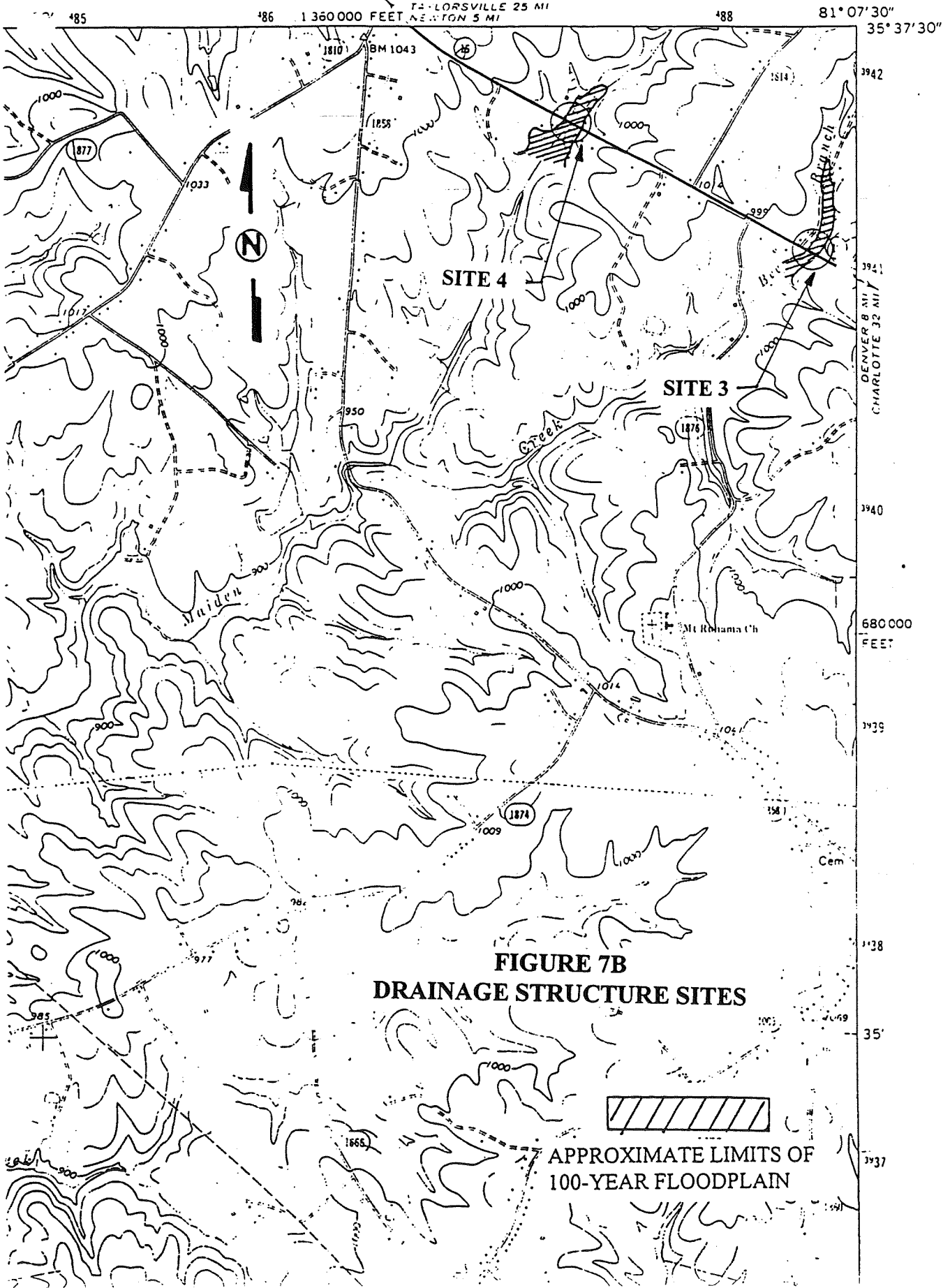
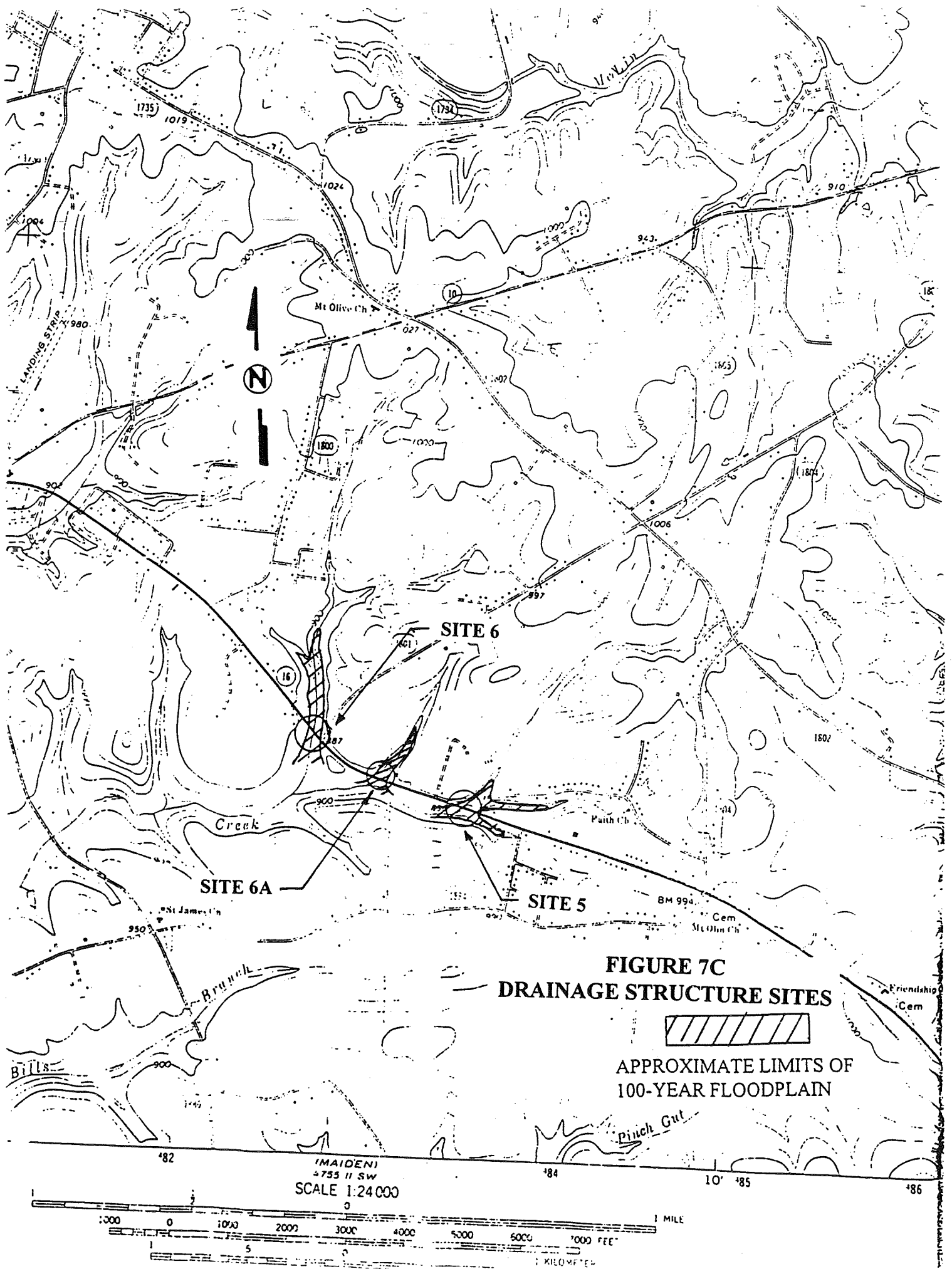


FIGURE 7B
DRAINAGE STRUCTURE SITES

APPROXIMATE LIMITS OF
100-YEAR FLOODPLAIN

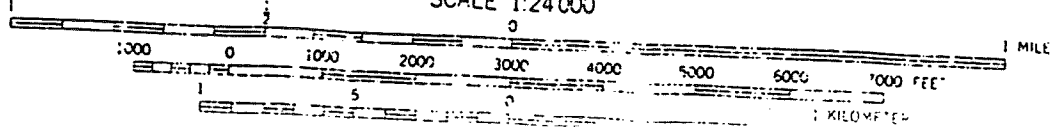


**FIGURE 7C
DRAINAGE STRUCTURE SITES**



APPROXIMATE LIMITS OF
100-YEAR FLOODPLAIN

(MAIDEN)
4755 II SW
SCALE 1:24 000



R-3100

APPENDIX B

**RELOCATION ASSISTANCE AND
RELOCATION REPORTS**

DIVISION OF HIGHWAYS RELOCATION PROGRAM

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

- *Relocation assistance,
- *Relocation moving payments, and
- *Relocation replacement housing payments or rent supplement".

With the Relocation Assistance Program, experienced NCDOT staff will be available to assist displacees with information such as availability and prices of homes, apartments, or businesses for sale or rent and financing or other housing programs. The Relocation Moving Payments Program, in general, provides for payment of actual moving expenses encountered in relocation. Where displacement will force an owner or tenant to purchase or rent property of higher cost or to lose a favorable financing arrangement (in cases of ownership), the Relocation Replacement Housing Payments or Rent Supplement Program will compensate up to \$22,500 to owners who are eligible and qualify and up to \$5,250 to tenants who are eligible and qualify.

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

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

All tenant and owner residential occupants who may be displaced will receive an explanation regarding all available options, such as (1) purchase of replacement housing,

(2) rental of replacement housing, either private or public, or (3) moving existing owner-occupant housing to another site (if possible). The relocation officer will also supply information concerning other state or federal programs offering assistance to displaced persons and will provide other advisory services as needed in order to minimize hardships to displaced persons in adjusting to a new location.

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

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

It is a policy of the state that no person will be displaced by the NCDOT's state or federally-assisted construction projects unless and until comparable replacement housing has been offered or provided for each displacee within a reasonable period of time prior to displacement. No relocation payment received will be considered as income for the purposes of the Internal Revenue Code of 1954 or for the purposes of determining eligibility or the extent of eligibility of any person for assistance under the Social Security Act or any other federal law.

Last Resort Housing is a program used when comparable replacement housing is not available, or when it is unavailable within the displacee's financial means, and the replacement payment exceeds the federal/state legal limitation. The purpose of the program is to allow broad latitudes in methods of implementation by the state so that decent, safe, and sanitary replacement housing can be provided. It is not felt that this program will be necessary on the project, since there appear to be adequate opportunities for relocation within the area.

RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate One of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT:		Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)		

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Residential	43	1	44	0	2	7	18	10	7			
Businesses	4	0	4	0	VALUE OF DWELLING			DSS DWELLING AVAILABLE				
Farms	0	0	0	0	Owners		Tenants		For Sale For Rent			
Non-Profit	1	0	1	0	0-20M	1	\$ 0-150	0	0-20M	0	\$ 0-150	0
					20-40M	2	150-250	1	20-40M	0	150-250	0
					40-70M	17	250-400	0	40-70M	37	250-400	0
					70-100M	17	400-600	0	70-100M	48	400-600	8
					100 UP	6	600 UP	0	100 UP	58	600 UP	6
					TOTAL	43		1		143		14

ANSWER ALL QUESTIONS		
Yes	No	Explain all "YES" answers.
	x	1. Will special relocation services be necessary?
x		2. Will schools or churches be affect by displacement?
x		3. Will business services still be available after project?
x		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	x	5. Will relocation cause a housing shortage?
	x	6. Source for available housing (list).
	x	7. Will additional housing programs be needed?
x		8. Should Last Resort Housing be considered?
	x	9. Are there large, disabled, elderly, etc. families?
	x	10. Will public housing be needed for project?
x		11. Is public housing available?
x		12. Is it felt there will be adequate DSS housing housing available during relocation period?
	x	13. Will there be a problem of housing within financial means?
x		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? Eighteen (18)

REMARKS (Respond by number)											
2. One church will be displaced, however, experience has shown that churches can be relocated given adequate lead time.											
3. No permanent displacement of businesses.											
4. See attachment ONE of alternate 1 of 3 alternates											
6. MLS, Realtors®, newspapers, real estate publications.											
8. Will be administered in accordance with State law.											
11. In Newton and Catawba County.											
12. If current housing trends continue and interest rate remain stable, adequate DSS housing should be available during the relocation period.											
14. MLS, Realtors®, newspapers, real estate publications.											

D. A. McCallum, Area Relocation Agent	1-29-97 Date	Approved by	2-3-97 Date
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RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate One of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT:	Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)			

REMARKS: (RESPOND BY NUMBER) QUESTION NO. 4 FROM PAGE 1.

NO. OR LTR.	TYPE OF BUSINESS	SQUARE FEET	NUMBER OF EMPLOYEES	MINORITIES
4. a.	COUNTY CALICO CRAFT & GIFT SHOP	3000	10	0
b.	SHIRLEY'S CAKES, CANDIES & SUPPLIES	3000	3	0
c.	MCGILL'S PACKAGE & PRODUCE	1500	2	0
d.	WORD OF LIFE TRUE GOSPEL CHURCH	800	25	0
e.	BUSINESS OFFICE	1500	2	0

RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate Two of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT: Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)				

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displaces	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Residential	78	3	81	0	2	13	35	20	11			
Businesses	10	0	10	0	VALUE OF DWELLING				DSS DWELLING AVAILABLE			
Farms	0	0	0	0	Owners		Tenants		For Sale		For Rent	
Non-Profit	1	0	1	0	0-20M	0	\$ 0-150	1	0-20M	0	\$ 0-150	0
ANSWER ALL QUESTIONS					20-40M	2	150-250	2	20-40M	0	150-250	0
Yes	No	Explain all "YES" answers.										
	<input checked="" type="checkbox"/>	1. Will special relocation services be necessary?										
<input checked="" type="checkbox"/>		2. Will schools or churches be affected by displacement?										
<input checked="" type="checkbox"/>		3. Will business services still be available after project?										
<input checked="" type="checkbox"/>		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.										
	<input checked="" type="checkbox"/>	5. Will relocation cause a housing shortage?										
	<input checked="" type="checkbox"/>	6. Source for available housing (list).										
	<input checked="" type="checkbox"/>	7. Will additional housing programs be needed?										
<input checked="" type="checkbox"/>		8. Should Last Resort Housing be considered?										
	<input checked="" type="checkbox"/>	9. Are there large, disabled, elderly, etc. families?										
	<input checked="" type="checkbox"/>	10. Will public housing be needed for project?										
<input checked="" type="checkbox"/>		11. Is public housing available?										
<input checked="" type="checkbox"/>		12. Is it felt there will be adequate DSS housing available during relocation period?										
	<input checked="" type="checkbox"/>	13. Will there be a problem of housing within financial means?										
<input checked="" type="checkbox"/>		14. Are suitable business sites available (list source).										
		15. Number months estimated to complete RELOCATION? Twenty-four (24)										

40-70M	43	250-400	0	40-70M	37	250-400	0
70-100M	24	400-600	0	70-100M	48	400-600	8
100 UP	9	600 UP	0	100 UP	58	600 UP	6
TOTAL	78		3		143		14

REMARKS (Respond by number)

2. One church will be displaced, however, experience has shown that churches can be relocated given adequate lead time.
3. No permanent displacement of businesses.
4. See attachment ONE of alternate 1 of 3 alternates
6. MLS, Realtors®, newspapers, real estate publications.
8. Will be administered in accordance with State law.
11. In Newton and Catawba County.
12. If current housing trends continue and interest rate remain stable, adequate DSS housing should be available during the relocation period.
14. MLS, Realtors®, newspapers, real estate publications.

	1-29-97	Date		2-3-97	Date
A. McCallum, Area Relocation Agent			Approved by		

RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate Two of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT:		Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)		

REMARKS: (RESPOND BY NUMBER) QUESTION NO. 4 FROM SHEET NO. ONE

NO. OR LTR.	TYPE OF BUSINESS	SQUARE FEET	NUMBER OF EMPLOYEES	MINORITIES
4. a.	COUNTY CALICO CRAFT & GIFT SHOP	3000	10	0
b.	SHIRLEY'S CAKES, CANDIES & SUPPLIES	3000	3	0
c.	MCGILL'S PACKAGE & PRODUCE	1500	2	0
d.	WORD OF LIFE TRUE GOSPEL CHURCH	800	25	0
e.	BUSINESS OFFICE	1500	2	0
f.	JONES FISH CAMP	6000	10	3
g.	DRUMS RESTAURANT	600	2	0
h.	CITGO GROCERY & GAS	600	2	0
i.	DRUMS RADIO & T.V. SERVICE	600	3	0
j.	RIGHT ANGLE ELECTRIC COMPANY	1200	4	0
k.	BALL'S CREEK BAIT & TACKLE	2000	4	0

RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate Three of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT:	Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)			

ESTIMATED DISPLACED					INCOME LEVEL				
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP
Residential	80	3	83	0	1	21	31	19	11
Businesses	13	0	13	0	VALUE OF DWELLING			DSS DWELLING AVAILABLE	
Farms	0	0	0	0	Owners	Tenants	For Sale		For Rent
Non-Profit	1	0	1	0	0-20M	\$ 0-150	0-20M	\$ 0-150	0
					20-40M	150-250	20-40M	150-250	0
					40-70M	250-400	40-70M	250-400	0
					70-100M	400-600	70-100M	400-600	8
					100 UP	600 UP	100 UP	600 UP	6
					TOTAL	80	3	143	14

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	x	1. Will special relocation services be necessary?
x		2. Will schools or churches be affected by displacement?
x		3. Will business services still be available after project?
x		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	x	5. Will relocation cause a housing shortage?
	x	6. Source for available housing (list).
	x	7. Will additional housing programs be needed?
x		8. Should Last Resort Housing be considered?
	x	9. Are there large, disabled, elderly, etc. families?
	x	10. Will public housing be needed for project?
x		11. Is public housing available?
x		12. Is it felt there will be adequate DSS housing available during relocation period?
	x	13. Will there be a problem of housing within financial means?
x		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? Twenty-four (24)

REMARKS (Respond by number)

- 2. One church will be displaced, however, experience has shown that churches can be relocated given adequate lead time.
- 3. No permanent displacement of businesses.
- 4. See attachment ONE of alternate 3 of 3 alternates
- 6. MLS, Realtors®, newspapers, real estate publications.
- 8. Will be administered in accordance with State law.
- 11. In Newton and Catawba County.
- 12. If current housing trends continue and interest rate remain stable, adequate DSS housing should be available during the relocation period.
- 14. MLS, Realtors®, newspapers, real estate publications.

D. A. McCallum, Area Relocation Agent	1-29-97 Date	Approved by	2-3-97 Date
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RELOCATION REPORT

North Carolina Department of Transportation
AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

PROJECT:	8.1792501	COUNTY	Catawba	Alternate Three of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA	
DESCRIPTION OF PROJECT:	Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)			

REMARKS: (RESPOND BY NUMBER) QUESTION NO. 4 FROM SHEET NO. ONE

NO. OR LTR.	TYPE OF BUSINESS	SQUARE FEET	NUMBER OF EMPLOYEES	MINORITIES
4. a.	COUNTY CALICO CRAFT & GIFT SHOP	3000	10	0
b.	SHIRLEY'S CAKES, CANDIES & SUPPLIES	3000	3	0
c.	MCGILL'S PACKAGE & PRODUCE	1500	2	0
d.	WORD OF LIFE TRUE GOSPEL CHURCH	800	25	0
e.	BUSINESS OFFICE	1500	2	0
f.	JONES FISH CAMP	6000	10	3
g.	DRUMS RADIO & T.V. SERVICE	600	3	0
h.	CITGO GROCERY & GAS	600	2	0
i.	DRUMS RESTAURANT	600	3	0
j.	RIGHT ANGLE ELECTRIC COMPANY	1200	4	0
k.	BALL'S CREEK BAIT & TACKLE	2000	4	0
l.	HANDY SHOP EXXON	1800	3	0
m.	STARTOWN USED CARS	600	1	0
n.	HIGHWAY 16 SHELL	1200	3	1

RELOCATION REPORT

MANAGER OF
North Carolina Department of Transportation
RIGHT OF WAY AREA RELOCATION OFFICE

E.I.S. CORRIDOR DESIGN

MAY 23 1997

PROJECT:	8.1792501	COUNTY	Catawba	Alternate	Four of Four Alternates
I.D. NO.:	R-3100	F.A. PROJECT	NA		
DESCRIPTION OF PROJECT: Widening of NC 16 From Tower Road (SR 1895) to Caleb Setzer (SR 1800)					

ESTIMATED DISPLACED					INCOME LEVEL							
Type of Displacees	Owners	Tenants	Total	Minorities	0-15M	15-25M	25-35M	35-50M	50 UP			
Residential	34	0	34	0	3	6	8	10	7			
Businesses	4	0	4	0	VALUE OF DWELLING			DSS DWELLING AVAILABLE				
Farms	0	0	0	0	Owners		Tenants		For Sale For Rent			
Non-Profit	1	0	1	0	0-20M	0	\$ 0-150	0	0-20M	0	\$ 0-150	0
					20-40M	3	150-250	0	20-40M	0	150-250	0
					40-70M	12	250-400	0	40-70M	31	250-400	2
					70-100M	12	400-600	0	70-100M	55	400-600	10
					100 UP	7	600 UP	0	100 UP	50	600 UP	4
					TOTAL	34		0		136		16

ANSWER ALL QUESTIONS

Yes	No	Explain all "YES" answers.
	x	1. Will special relocation services be necessary?
x		2. Will schools or churches be affect by displacement?
x		3. Will business services still be available after project?
x		4. Will any business be displaced? If so, indicate size, type, estimated number of employees, minorities, etc.
	x	5. Will relocation cause a housing shortage?
	x	6. Source for available housing (list).
x		7. Will additional housing programs be needed?
x		8. Should Last Resort Housing be considered?
	x	9. Are there large, disabled, elderly, etc. families?
	x	10. Will public housing be needed for project?
x		11. Is public housing available?
x		12. Is it felt there will be adequate DSS housing available during relocation period?
	x	13. Will there be a problem of housing within financial means?
x		14. Are suitable business sites available (list source).
		15. Number months estimated to complete RELOCATION? 18

REMARKS (Respond by Number)

2. One church will be displaced, however, experience has shown that churches can be relocated given adequate lead time.
3. No permanent displacement of businesses.
4. a. County Calico Craft & Gift Shop, 3000 square feet, ten employees, no minorities.
b. Shirley's Cakes, Candies & Supplies, 3000 square feet, three employees, no minorities.
c. McGill's Package & Produce, 1500 square feet, two employees, no minorities.
d. Word of Life True Gospel Church, 800 square feet, 25 members, no minorities.
e. Business Office, 1500 square feet, two employees, no minorities.
6. MLS, Realtors®, newspapers, real estate publications.
8. Will be administered in accordance with State law.
11. In Newton and Catawba County.
12. If current housing trends continue and interest rate remain stable, adequate DSS housing should be available during the relocation period.
14. MLS, Realtors®, newspapers, real estate publications.

D.O. McCallum Area Relocation Agent	5-22-97 Date	D.R. Vaid Approved by	5-23-97 Date
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R-3100

APPENDIX C

**COMMENTS FROM FEDERAL,
STATE, AND LOCAL AGENCIES**

Daney, Hart / Lden



**DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
P.O. BOX 1890
WILMINGTON, NORTH CAROLINA 28402-1890**



REPLY TO
ATTENTION OF

September 25, 1995

Regulatory Branch

Action ID. 199505276, Pre-Application
State Project No. 8.1792501, TIP No. R-3100

Mr. H. Franklin Vick
State of North Carolina
Department of Transportation
Post Office Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

This is in response to your August 17, 1995 request for information with regards to the proposed widening of NC 16 for a distance of 8.5 miles from S.R. 1895 to S.R. 1800, between Newton and Chronicle, in Catawba County, North Carolina. You are in the process of gathering information on the proposed project in order to prepare a federally funded Environmental Assessment.

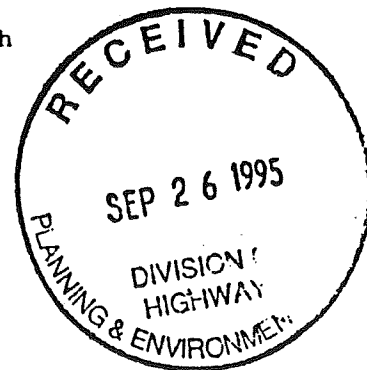
Mr. Steve Chapin, of our Asheville Field Office staff, has done a field inspection on the proposed project. The inspection revealed that there will be approximately 8 crossings of headwater streams needed in order to do the road widening. These crossings include the following streams: unnamed tributary to South Fork Mountain Creek, Bee Branch, unnamed tributary to Maiden Creek, and an unnamed tributary to Smyre Creek. The areas where these streams will be crossed are steep banked and include only a minimal wetland acreage (less than one-tenth).

It appears that this project will qualify for Nationwide Permit Number 26. The impact to headwater stream channel and wetlands should be less than one acre. We recommend that particular attention be paid to erosion control on the project in order to prevent sediment from entering the above mentioned streams. In addition, we recommend that efforts be made to avoid or minimize impacts to those riparian areas along the streams that are wooded.

If you have any questions regarding our comments, please contact Mr. Chapin at (704) 271-4014.

Sincerely,

Wayne Wright
Wayne Wright
Chief, Regulatory Branch





FISH AND WILDLIFE SERVICE

Asheville Field Office
160 Zillicoa Street
Asheville, North Carolina 28801

September 26, 1995



Mr. H. Franklin Vick, P.E., Manager
Planning and Environmental Branch
Division of Highways
North Carolina Department of Transportation
P.O. Box 25201
Raleigh, North Carolina 27611-5201

Dear Mr. Vick:

Subject: Scoping for proposed widening of NC 16, from SR 1895 to Caleb Setzer Road (SR 1800), Catawba County, North Carolina, TIP No. R-3100

In your letter of August 17, 1995, you requested information regarding potential environmental impacts that could result from the subject project for your use in the preparation of an environmental document. The following comments are provided in accordance with the provisions of the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) (Act).

According to information provided in your letter, this project will improve a section of NC 16 from SR 1895 to Caleb Setzer Road for a distance of 8.5 miles. Three build alternatives are being considered, all of which include widening the existing alignment. The U.S. Fish and Wildlife Service (Service) is familiar with the project area.

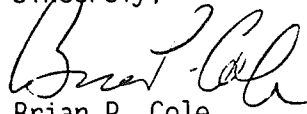
The enclosed page identifies federally protected endangered and threatened species known from Catawba County that may occur within the area of influence of this proposed action. The legal responsibilities of a Federal agency or their designated non-Federal representative under Section 7 of the Act are on file with the Federal Highway Administration. The enclosed page also contains a list of other species of Federal concern that are currently under status review by the Service which may occur in the project impact area. These species are not legally protected under the Act and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as endangered or threatened. We are including these species in our response to give you advance notification. The presence or absence of these species in the project impact area should be addressed in any

The Service's review of the environmental document would be greatly facilitated if the document contained the following information:

- (1) A complete analysis and comparison of the available alternatives (the build and no-build alternatives).
- (2) A description of the fishery and wildlife resources within existing and required additional rights-of-way and any areas, such as borrow areas, that may be affected directly or indirectly by the proposed road improvements.
- (3) Acreage and description of wetlands that will be filled as a consequence of the proposed road improvements. Wetlands affected by the proposed project should be mapped in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetlands.
- (4) Linear feet of any water courses that will be relocated as a consequence of the proposed project.
- (5) Acreage of upland habitat, by cover type, that will be eliminated because of the proposed project.
- (6) Description of all expected secondary and cumulative environmental impacts associated with this proposed work.
- (7) An analysis of the crossing structures considered (i.e., spanning structure, culverts, etc.) and the rationale for choosing the preferred structure(s).
- (8) A discussion on the extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat from direct construction impacts and from secondary development impacts.
- (9) Mitigation measures that will be employed to avoid, eliminate, reduce, or compensate for habitat value losses associated with any of the proposed project.

We appreciate the opportunity to provide these scoping comments and request that you continue to keep us informed as to the progress of this project. In any future correspondence concerning this project, please reference our Log Number 4-2-95-122.

Sincerely,


Brian P. Cole
Field Supervisor

Enclosure

CC:

Ms. Linda Pearsall, Director, North Carolina Natural Heritage Program,
P.O. Box 27687, Raleigh, NC 27611

Ms. Stephanie Goudreau, North Carolina Wildlife Resources Commission,
320 S. Garden Street, Marion, NC 28752

FM208

Coleman

NORTH CAROLINA STATE CLEARINGHOUSE
DEPARTMENT OF ADMINISTRATION
116 WEST JONES STREET
RALEIGH NORTH CAROLINA 27603-8003

INTERGOVERNMENTAL REVIEW COMMENTS

MAILED TO

FROM

N.C. DEPT. OF TRANSPORTATION
FRANK VICK
PLANN. & ENV. BRANCH
TRANSPORTATION BLDG./INTER-OFF

MRS. CHRYS BAGGETT
DIRECTOR
N C STATE CLEARINGHOUSE

PROJECT DESCRIPTION

SCOPING - PROPOSED WIDENING OF NC 16, FROM SR 1895 TO CALEB
SEIZER ROAD (SR 1800) IN CATAWBA COUNTY TIP #R-3100

SAI NC 96E42200168 PROGRAM TITLE - SCOPING

THE ABOVE PROJECT HAS BEEN SUBMITTED TO THE NORTH CAROLINA
INTERGOVERNMENTAL REVIEW PROCESS. AS A RESULT OF THE REVIEW THE FOLLOWING
SUBMITTED () NO COMMENTS WERE RECEIVED

(X) COMMENTS ATTACHED

SHOULD YOU HAVE ANY QUESTIONS, PLEASE CALL THIS OFFICE (919) 733-7232.

C.C. REGION E

State of North Carolina
Department of Environment,
Health and Natural Resources
Legislative & Intergovernmental Affairs

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
Henry M. Lancaster II, Director



MEMORANDUM

TO: Chrys Baggett
State Clearinghouse

FROM: Melba McGee
Project Review Coordinator

RE: 96-0168 - Scoping Widening of NC 16, Catawba County

DATE: September 29, 1995

The Department of Environment, Health, and Natural Resources has reviewed the proposed scoping notice. The attached comments list and describe information that is necessary for our divisions to evaluate the potential environmental impacts of the project. More specific comments will be provided during the environmental review.

Thank you for the opportunity to respond. The applicant is encouraged to notify our commenting divisions if additional assistance is needed.

attachments

RECEIVED

OCT 2 1995

N.C. STATE CLEARINGHOUSE

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Soil and Water Conservation



James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
C. Dewey Botts, Director

September 5, 1995

MEMORANDUM

TO: Melba McGee
FROM: David Harrison *DH*
SUBJECT: Proposed Widening of NC 16 from SR 1895 to SR 1800,
Catawba County. Project No. 96-0168.

The proposed widening of NC 16 may require additional right-of-way acquisition. The Environmental Assessment should include an estimate of the amount of prime, unique, and statewide important farmland that will be impacted.

DH/tl

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Forest Resources

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary



Griffiths Forestry Center
2411 Old US 70 West
Clayton, North Carolina 27520
September 6, 1995

MEMORANDUM

TO: Melba McGee, Office of Legislative Affairs

FROM: Don H. Robbins, Staff Forester *DHR*

SUBJECT: DOT EA Scoping for Widening of NC 16, from SR 1895 to SR 1800, Southeast of Newton in Catawba County

PROJECT #: 96-0168 and TIP # R-3100

DUE DATE: 9-27-95

We have reviewed the above subject scoping notice and have the following comments:

1. Woodland will be impacted here.
2. We would hope that the alternative selected would cause the least impact to woodland.
3. The EA document should address the following concerning woodland -
 - a. The total forest land acreage by types that would be taken out of forest production as a result of new right-of-way purchases and all construction activities.
 - b. The productivity of the forest soils as indicated by the soil series, that would be involved within the proposed project.
 - c. The impact upon existing greenways within the area of the proposed project.
 - d. The provisions that the contractor will take to sell any merchantable timber that is to be removed. This practice is encouraged to minimize the need for piling and burning during construction. If any burning is needed, the contractor should comply with all laws and regulations pertaining to debris burning.
 - e. The provisions that the contractor will take during the construction phase to prevent erosion, sedimentation and construction damage to forest land outside the right-of-way and construction limits. Trees outside the construction limits should be protected from construction activities to avoid:
 1. Skinning of tree trunks by machinery.
 2. Soil compaction and root exposure or injury by heavy equipment.
 3. Adding layers of fill dirt over the root systems of trees, a practice that impairs root aeration.
 4. Accidental spilling of petroleum products or other damaging substances over the root systems of trees.

pc: Warren Boyette - CO
File

2/29



North Carolina Wildlife Resources Commission

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

MEMORANDUM

TO: Melba McGee, Legislative and Intergovernmental Affairs
Dept. of Environment, Health, and Natural Resources
Daniel G. for

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

DATE: September 27, 1995

SUBJECT: State Clearinghouse Project No. 96-0168, Scoping comments for widening NC 16
from SR 1895 to SR 1800, Catawba County, TIP #R-3100.

This correspondence responds to a request by you for our review and preliminary comments regarding a proposal by the North Carolina Department of Transportation (NCDOT) to improve an 8.5-mile section of NC 16 between SR 1895 to SR 1800 (Calcb Setzer Road) in Catawba County. At this point the NCDOT is considering three alternatives, apparently all of which involve widening NC 16 along existing alignment.

We have not identified any special concerns in relation to this project; however, the environmental document prepared for this project should include the following information in order for our biological staff to provide a more meaningful review:

- 1) Description of fishery and wildlife resources within the project area, including a listing of federally or state designated threatened, endangered, or special concern animal and plant species. Contact is the Mr. Steven Hall of the North Carolina Natural Heritage Program (919/733-7701).
- 2) Description of waters and/or wetlands affected by the project.
- 3) Project map identifying wetland areas. Identification of wetlands may be accomplished through coordination with the U.S. Army Corps of Engineers. If the Corps is not consulted, the person delineating wetlands should be identified and criteria listed.
- 4) Description of project activities that will occur within wetlands, such as fill or channel alteration. Acreages of wetlands impacted by alternative project designs should be listed. Project sponsors should indicate whether the Corps has been contacted to determine the

96-0168

Page 2

September 27, 1995

needed for a 404 Permit under the Clean Water Act. Contact is Mr. Steve Chapin at 704/271-4014.

- 5) Description of project site and non-wetland vegetative communities.
- 6) The extent to which the project will result in loss, degradation, or fragmentation of wildlife habitat.
- 7) Any measures proposed to avoid or reduce impacts of the project or to mitigate for unavoidable habitat losses.
- 8) A list of document preparers which shows each individual's professional background and qualifications.

I appreciate the opportunity to provide this information to the NCDOT in the early planning stages of this project. If you have any questions regarding these comments, please contact me at 704/652-4257.

cc: Ms. Janice Nicholls, USFWS

State of North Carolina
Department of Environment,
Health and Natural Resources
Division of Environmental Management

James B. Hunt, Jr., Governor
Jonathan B. Howes, Secretary
A. Preston Howard, Jr., P.E., Director



September 27, 1995

MEMORANDUM

TO: Melba McGee, Legislative & Intergovernmental Affairs
FROM: Monica Swihart, Water Quality Planning
SUBJECT: Project Review #96-0168; Scoping Comments - NC DOT
Proposed Improvements to NC 16, TIP No. R-3100,
Catawba County

The Water Quality Section of the Division of Environmental Management requests that the following topics be discussed in the environmental documents prepared on the subject project:

- A. Identify the streams potentially impacted by the project. The stream classifications should be current.
- B. Identify the linear feet of stream channelizations/relocations. If the original stream banks were vegetated, it is requested that the channelized/relocated stream banks be revegetated.
- C. Number of stream crossings.
- D. Will permanent spill catch basins be utilized? DEM requests that these catch basins be placed at all water supply stream crossings. Identify the responsible party for maintenance.
- E. Identify the stormwater controls (permanent and temporary) to be employed.
- F. Please ensure that sediment and erosion and control measures are not placed in wetlands.
- G. Wetland Impacts
 - 1) Identify the federal manual used for identifying and delineating jurisdictional wetlands.
 - 2) Have wetlands been avoided as much as possible?
 - 3) Have wetland impacts been minimized?
 - 4) Discuss wetland impacts by plant communities affected.
 - 5) Discuss the quality of wetlands impacted.
 - 6) Summarize the total wetland impacts.
 - 7) List the 401 General Certification numbers requested from DEM.

Melba McGee
September 27, 1995
Page 2

- H. Will borrow locations be in wetlands? Borrow/waste areas should avoid wetlands to the maximum extent practicable. Prior to approval of any borrow/waste site in a wetland, the contractor shall obtain a 401 Certification from DEM.
- I. Did NCDOT utilize the existing road alignments as much as possible? Why not (if applicable)?
- J. To what extent can traffic congestion management techniques alleviate the traffic problems in the study area?
- K. Please provide a conceptual mitigation plan to help the environmental review. The mitigation plan may state the following:
 - 1. Compensatory mitigation will be considered only after wetland impacts have been avoided and minimized to the maximum extent possible.
 - 2. On-site, in-kind mitigation is the preferred method of mitigation. In-kind mitigation within the same watershed is preferred over out-of-kind mitigation.
 - 3. Mitigation should be in the following order: restoration, creation, enhancement, and lastly banking.

Please note that a 401 Water Quality Certification cannot be issued until the conditions of NCAC 15A: 01C.0402 (Limitations on Actions During NCEPA Process) are met. This regulation prevents DEM from issuing the 401 Certification until a FONSI or Record of Decision (ROD) has been issued by the Department requiring the document. If the 401 Certification application is submitted for review prior to issuance of the FONSI or ROD, it is recommended that the applicant state that the 401 will not be issued until the applicant informs DEM that the FONSI or ROD has been signed by the Department.

Written concurrence of 401 Water Quality Certification may be required for this project. Applications requesting coverage under our General Certification 14 or General Permit 31 will require written concurrence. Please be aware that 401 Certification may be denied if wetland or water impacts have not been avoided and minimized to the maximum extent practicable.

11046.mem
cc: Eric Galamb



State of North Carolina
 Department of Environment, Health, and Natural Resources
 Division of Land Resources

James G. Martin, Governor
 William W. Cobey, Jr., Secretary

PROJECT REVIEW COMMENTS

Charles H. Gardner
 Director

Project Number: 96-0168 County: CAT

Project Name: _____

Geodetic Survey

This project will impact 1 geodetic survey markers. N.C. Geodetic Survey should be contacted prior to construction at P.O. Box 27687, Raleigh, N.C. 27611 (919) 733-3836. Intentional destruction of a geodetic monument is a violation of N.C. General Statute 102-4.

This project will have no impact on geodetic survey markers.

Other (comments attached)

For more information contact the Geodetic Survey office at (919) 733-3836.

C. Ann Norman 8-28-95
 Reviewer Date

Erosion and Sedimentation Control

No comment

This project will require approval of an erosion and sedimentation control plan prior to beginning any land-disturbing activity if more than one (1) acre will be disturbed.

If an environmental document is required to satisfy Environmental Policy Act (SEPA) requirements, the document must be submitted as part of the erosion and sedimentation control plan.

If any portion of the project is located within a High Quality Water Zone (HQW), as classified by the Division of Environmental Management, increased design standards for sediment and erosion control will apply.

The erosion and sedimentation control plan required for this project should be prepared by the Department of Transportation under the erosion control program delegation to the Division of Highways from the North Carolina Sedimentation Control Commission.

Other (comments attached)

For more information contact the Land Quality Section at (919) 733-4574.

David Ward 8/28/95
 Reviewer Date

State of North Carolina
 Department of Environment, Health, and Natural Resources

Reviewing Office: *MRO*

Project Number: *96-0168*

Due Date: *9-27-95*

INTERGOVERNMENTAL REVIEW — PROJECT COMMENTS

After review of this project it has been determined that the EHNR permit(s) and/or approvals indicated may need to be obtained in order for this project to comply with North Carolina Law. Questions regarding these permits should be addressed to the Regional Office indicated on the reverse of the form. All applications, information and guidelines relative to these plans and permits are available from the same Regional Office.

PERMITS	SPECIAL APPLICATION PROCEDURES or REQUIREMENTS	Normal Process Time (statutory time limit)
<input type="checkbox"/> Permit to construct & operate wastewater treatment facilities, sewer system extensions, & sewer systems not discharging into state surface waters.	Application 90 days before begin construction or award of construction contracts On-site inspection. Post-application technical conference usual	30 days (90 days)
<input type="checkbox"/> NPDES - permit to discharge into surface water and/or permit to operate and construct wastewater facilities discharging into state surface waters.	Application 180 days before begin activity. On-site inspection. Pre-application conference usual. Additionally, obtain permit to construct wastewater treatment facility-granted after NPDES Reply time. 30 days after receipt of plans or issue of NPDES permit-whichever is later.	90-120 days (N/A)
<input type="checkbox"/> Water Use Permit	Pre-application technical conference usually necessary	30 days (N/A)
<input type="checkbox"/> Well Construction Permit	Complete application must be received and permit issued prior to the installation of a well.	7 days (15 days)
<input type="checkbox"/> Dredge and Fill Permit	Application copy must be served on each adjacent riparian property owner. On-site inspection. Pre-application conference usual. Filling may require Easement to Fill from N.C. Department of Administration and Federal Dredge and Fill Permit.	55 days (90 days)
<input type="checkbox"/> Permit to construct & operate Air Pollution Abatement facilities and/or Emission Sources as per 15A NCAC 21H.0600	N/A	60 days (90 days)
<input checked="" type="checkbox"/> open burning associated with subject proposal must be in compliance with 15A NCAC 2D.0520.		
<input type="checkbox"/> Demolition or renovations of structures containing asbestos material must be in compliance with 15A NCAC 2D.0525 which requires notification and removal prior to demolition. Contact Asbestos Control Group 919-733-0820	N/A	60 days (90 days)
<input type="checkbox"/> Complex Source Permit required under 15A NCAC 2D.0800.		
<input type="checkbox"/> The Sedimentation Pollution Control Act of 1973 must be properly addressed for any land disturbing activity. An erosion & sedimentation control plan will be required if one or more acres to be disturbed. Plan filed with proper Regional Office (Land Quality Sect.) at least 30 days before beginning activity. A fee of \$30 for the first acre and \$20.00 for each additional acre or part must accompany the plan		20 days (30 days)
<input type="checkbox"/> The Sedimentation Pollution Control Act of 1973 must be addressed with respect to the referenced Local Ordinance:		(30 days)
<input type="checkbox"/> Mining Permit	On-site inspection usual. Surety bond filed with EHNR. Bond amount varies with type mine and number of acres of affected land. Any area mined greater than one acre must be permitted. The appropriate bond must be received before the permit can be issued.	30 days (60 days)
<input type="checkbox"/> North Carolina Burning permit	On-site inspection by N.C. Division Forest Resources if permit exceeds 4 days	1 day (N/A)
<input type="checkbox"/> Special Ground Clearance Burning Permit - 22 counties in coastal N.C. with organic soils	On-site inspection by N.D. Division Forest Resources required "if more than five acres of ground cleaning activities are involved. Inspections should be requested at least ten days before actual burn is planned."	1 day (N/A)
<input type="checkbox"/> Oil Refining Facilities	N/A	90-120 days (N/A)
<input type="checkbox"/> Dam Safety Permit	If permit required, application 60 days before begin construction. Applicant must hire N.C. qualified engineer to: prepare plans. Inspect construction, certify construction is according to EHNR approved plans. May also require permit under mosquito control program. And a 404 permit from Corps of Engineers. An inspection of site is necessary to verify Hazard Classification. A minimum fee of \$200.00 must accompany the application. An additional processing fee based on a percentage or the total project cost will be required upon completion	30 days (60 days)

Continued on reverse



North Carolina Department of Cultural Resources

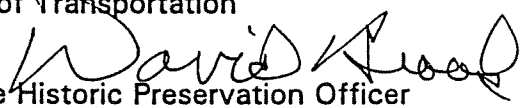
James B. Hunt, Jr., Governor
Betty Ray McCain, Secretary

Division of Archives and History
William S. Price, Jr., Director

September 13, 1995

MEMORANDUM

TÓ: H. Franklin Vick, P.E., Manager
Planning and Environmental Branch
Division of Highways
Department of Transportation

FROM: David Brook 
Deputy State Historic Preservation Officer

SUBJECT: Widen NC 16 from SR 1895 to SR 1800,
Catawba County, R-3100, Federal-Aid
Project STP-16(4), State Project
8.1792501, 96-E-4220-0168

We have received information concerning the above project from the State Clearinghouse.

Bogue Wallin conducted a survey of historic architectural resources in Catawba County in the late 1970s. We have conducted a search of our maps and files and have located the following structure of historical or architectural importance within the general area of the project:

House (CT 553), NC 16, 0.5 mile southeast of SR 1804, Newton vicinity.

Since the survey of Catawba County is almost twenty years old, we recommend that an architectural historian with the North Carolina Department of Transportation survey the area of potential effect and report the findings to us.

There are no known archaeological sites within the proposed project area. Based on our present knowledge of the area, it is unlikely that any archaeological resources which may be eligible for inclusion in the National Register of Historic Places will be affected by the project construction. We, therefore, recommend that no archaeological investigation be conducted in connection with this project.

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



Thank you for your cooperation and consideration. If you have questions concerning the above comment, please contact Renee Gledhill-Earley, environmental review coordinator, at 919/733-4763.

DB:slw

cc: ✓ State Clearinghouse
N. Graf
B. Church
T. Padgett

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

Brief Project Description

Widen NC 16 from SR 1895 to Caleb Setzer Road (SR 1800)
(Two-lane roadway existing; widen to multi-lane facility)

On 11 January, representatives of the

- North Carolina Department of Transportation (NCDOT)
- Federal Highway Administration (FHWA)
- North Carolina State Historic Preservation Office (SHPO)
- Other _____

reviewed the subject project at

- A scoping meeting
- Historic architectural resources photograph review session/consultation
- Other _____

All parties present agreed

- there are no properties over fifty years old within the project's area of potential effect.
- there are no properties less than fifty years old which are considered to meet Criterion Consideration G within the project's area of potential effect.
- there are properties over fifty years old (list attached) within the project's area of potential effect but based on the historical information available and the photographs of each property, properties identified as # 1-32 are considered not eligible for the National Register and no further evaluation of them is necessary.
- there are no National Register-listed properties within the project's area of potential effect.

Signed:

Mary Pope _____ 1.11.96
Representative, NCDOT Date

Ray S. Shelton _____ 1/16/96
FHWA, for the Division Administrator, or other Federal Agency Date

Debra K. Bevin _____ 1/19/96
Representative, SHPO Date

David Head _____ 1/29/96
State Historic Preservation Officer, Deputy Date

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

Coleman



☒ North Carolina Wildlife Resources Commission ☒

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

MEMORANDUM

TO: H. Franklin Vick, P.E., Manager
Planning and Environmental Branch, NCDOT

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

DATE: June 13, 1995

SUBJECT: Review of scoping sheets for improvements to NC 16 from NC 150 to SR 1800
(Caleb Setzer Road), Catawba County, TIP #R-3100.

This correspondence responds to a request by you for our review and comments on the scoping sheets for the subject project.

At this time we have not identified any special concerns regarding this project. We will provide formal comments when the project is circulated through the State Clearinghouse.

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



United States
Department of
Agriculture

Natural
Resources
Conservation
Service

4405 Bland Rd., Suite 205
Raleigh, NC 27609
(919) 790-2896

Coleman

September 6, 1995

H. Franklin Vick, P.E., Manager
Planning and Environmental Branch
NC Department of Transportation
Division of Highways
P.O. Box 25201
Raleigh, NC 27611-5201




Dear Mr. Vick:

Thank you for the opportunity to comment on the following project:

Widening of NC 16 from SR 1895 to Caleb Setzer Road (SR 1800), State Project No. 8.1792501, Federal-Aid Project STP-16(4), TIP No. R-3100.

Impacts to prime and unique farmlands should be evaluated according to Public Law 97-98, Farmland Protection Policy Act of 1981.

Sincerely,


Richard A. Gallo
State Conservationist



Post Office Box 550 • Newton, North Carolina 28658 • (704) 465-7400

OFFICE OF THE CITY MANAGER

October 3, 1995

Mr. H. Franklin Vick, P.E., Manager
Planning and Environmental Branch
N.C. Department of Transportation
P.O. Box 25201
Raleigh, NC 27611-5201

SUBJECT: Widening of NC 16 from SR 1895 to Caleb Setzer (SR 1800),
State Project No. 8.1792501, Federal-Aid Project STP-
16(4), TIP No. R-3100

Dear Mr. Vick:

The Board of Aldermen of the City of Newton at its September 20, 1995 meeting discussed the proposed alternatives for the above referenced project as described in your letter of August 17, 1995. The Board unanimously supported Alternative #3 as the preferred method of design for this project. The importance of this project to the City has been recognized by the leaders of the community and the Department of Transportation has their support in the development of the project.

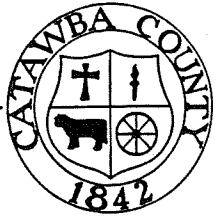
As you may not be aware, the City of Newton and Catawba County have entered an agreement to extend a major water line south of Newton along Hwy.16 to provide water to two county schools which have poor water quality at the present time. The location of the any new road right-of-way is vitally important to the planning and design of this water project in that it could have an impact on the cost and time associated with design and construction. The City respectfully requests that any information pertaining to right-of-way be provided to us as quickly as it can be made available. Additionally, we would like to meet with DOT staff at an appropriate time to discuss the plans for this project in detail.

Your consideration of this request is greatly appreciated. Please contact me if you desire additional information or assistance.

Sincerely,

Radford L. Thomas
City Manager

cc: Clarence W. Coleman



CATAWBA COUNTY

P.O. Box 389 • 100-A South West Boulevard • Newton, North Carolina 28658-0389 • Telephone (704) 465-8200
FAX (704) 465-8392

November 28, 1995

Mrs. Ann H. Gaither
District 12 Representative
North Carolina Department of Transportation
821 Woodson Road
Newton, NC 28658

Dear Ann:

The Catawba County Board of Commissioners raised the property tax this year in order to provide public water to the remaining public schools without service. Two of the schools to be served the first year are Balls Creek Elementary and Bandys High Schools. The preferred route to provide water to the schools was, and still is, Highway 16 South and then east on Balls Creek Road. We are very pleased that the North Carolina Board of Transportation with your urging and leadership has decided to widen Highway 16. It is a much needed improvement to the County's transportation network. We are hesitant, however, to move forward with the water line south on Highway 16 until we can be sure of the line's location, because we do not want to have to relocate the line when NCDOT begins the highway improvement. Our alternate route to provide water to the schools would be off of Highway 10, but this would still leave a need to provide water service to Highway 16 when it is widened. The cost to provide water to Balls Creek and Bandys is between \$800,000 and \$900,000, so this is a major decision for the County and the City of Newton to make.

At the same time, the County and City are interested in having water by the closed Newton landfill. If we have to provide water from Highway 10, it will cost approximately \$200,000. If, however, service can be provided off of Bethany Church Road, it would cut the cost in half, reducing it to only \$100,000.

The County and City are committed to providing water service to Balls Creek Elementary and Bandys High Schools and need to move as quickly as possible to provide the service. If there is any way possible for the NCDOT to decide on the location of Highway 16 or to establish an approved location for a water line on Highway 16 South as far as Balls Creek Road, it would allow us to provide water service to the schools in the next year as well as save local taxpayers' dollars and insure water service on Highway 16 South.

Any assistance you can give us to allow us to move ahead with this project on Highway 16 South would be much appreciated.

"Keeping the Spirit Alive Since 1842!"

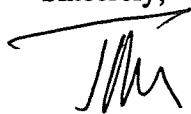


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Recycled Paper

Gaither, Ann H.
Page Two
November 28, 1995

If you have any questions either of us would be happy to answer them. We have attached a map of our preferred route for service. Both of us will plan to be at the December 11 meeting at 2:30 to discuss this matter further with you.

Sincerely,



J. Thomas Lundy
Catawba County Manager



Radford L. Thomas
Newton City Manager

amn

pc: Catawba County Board of Commissioners
Newton Board of Aldermen

Attachment

I:\MGR\VA\JEAN\WP50\LUNDY95\GAITHER.ANN



EXISTING WATERLINE
 PROPOSED WATERLINE

PROPOSED WATER LINE EXTENSION
 TO
 BANDYS AND BALLS CREEK SCHOOLS

BETWEEN
 CATAWBA COUNTY, NC
 AND
 CITY OF NEWTON, NC

August 30, 1995

No Scale

FIGURE 3

R-3100

APPENDIX D

**HAZARDOUS MATERIALS
EVALUATION**



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

JAMES B. HUNT, JR.
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

R. SAMUEL HUNT III
SECRETARY

June 23, 1995

State Project: 8.1792501 (R-3100)
F. A. Project: STP-16(4)
County: Catawba
Description: NC 16 from NC 150 to SR 1800 (Caleb Setzer Rd.)

Subject: Hazardous Materials Evaluation

The purpose of this report is to describe any potential environmental hazards that may affect the widening of and construction along this roadway. Geotechnical Unit personnel have conducted a field reconnaissance within project limits and have reviewed files of appropriate environmental agencies in order to identify any possible hazards.

Hazardous Materials Inventory

Underground Storage Tank (UST) Facilities

This field reconnaissance identified ten (10) facilities with USTs within project limits.

1. Collector's Dream Sports Cards
NC 16 and 150
Denver, NC

Based on NCDEM registry information this site is suspected to have been:

Crossroads Sun Mart
Highway 16 & 150
Route 1, Box 232
Denver, NC

UST Owner: BJR Construction
7041 Worth St.
Denver, NC

Facility ID#: 0-002394

This facility is located in the southeast quadrant of the NC 150/NC 16 intersection. There were two USTs (one 3,780 liter, one 30,280 liter) registered with the NCDEM at this location, each used to store gasoline. The former tank bed was located approximately 10

Groundwater
Incident # 3898

meters from the centerline of NC 16. The tanks were removed or permanently closed during March 1990. At present, no USTs were observed on the premises. Seven groundwater monitoring wells are in place, four near the existing but non-functional pump island, one within the former tank bed and two near a demolished pump island on the north side of the building.

2. One-story, Brick Flower Shop (?)
5493 NC 16
Newton, NC

UST Owner: Unknown

FORMERLY:
Maiden
Camper
Sales

John Foster
Rt 1 Box 278-A
Maiden NC

Facility ID#: Unknown

Groundwater
Incident # 3305

This facility is located on the west side of NC 16, approximately 76.2 meters south of the intersection with SR 1846. The remains of a demolished pump island are in front of the building, approximately 12.2 meters from the NC 16 centerline. No evidence of the tank bed was observed. No NCDEM registry information is currently available.

3. Little Mountain Grill
5312 NC 16
Newton, NC

UST Owner: Unknown

Jerry Smith
Little Mountain Rd.
Denver, NC

Facility ID#: Unknown

This one-story, brick facility is located on the east side of NC 16, near the intersection with SR 1895. Fill caps for two USTs and the remains of a demolished pump island were observed in front of the building, approximately 22.2 meters from the NC 16 centerline. No NCDEM registry information is currently available.

4. Drum's Citgo
4242 NC 16
Newton, NC

UST Owner: See below

Facility ID#: Unknown

This active convenience store is located in the southeast quadrant of the NC 16/SR 1003 intersection. Four USTs were observed on the property, three gasoline tanks on the south side of the building and one kerosene tank on the north. The tank beds are approximately 18 meters from the NC 16 centerline. According to the store's manager, the tanks are owned and supplied by Cary Oil Company. No NCDEM registry information is currently available.

5. Handy Stop #4 (Exxon)
Route 1, Box 458 A-
Newton, NC

UST Owner: Shell Brothers Distributors, Inc.
241 First Drive, S.E.
Taylorsville, NC

Facility ID#: 0-004981

This facility is located in the southeast quadrant of the NC 16/SR 1810 intersection. Four steel USTs used to store gasoline are registered with the NCDEM. Three tanks have 22,710 liter capacities and one tank holds 7,570 liters. The tank bed is located approximately 23.2 meters from the NC 16 centerline. On the north side of the building is a single above ground tank used to store kerosene. It is approximately 12.8 meters from the Ball's Creek Road (SR 1810) centerline.

6. Ball's Creek Bait and Tackle
Route 2, Box 342
Newton, NC

UST Owner: Superior Petroleum and Fuel
1023 4th Street Place, S.E.
Conover, NC

Facility ID#: 0-007056

This facility is located in the northeast quadrant of the NC 16/SR 1810 intersection. Two active, 18,930 liter, gasoline USTs are registered with the NCDEM. In June 1992, two additional USTs were removed or permanently closed at this site. At the time of the reconnaissance there were many cars in the parking area of the store. No evidence of the active USTs was observed. There were three above ground storage tanks on the south side of the building which are presumed to supply the pump island in front of the store.

7. McGill's Package and Produce
Unknown

UST Owner: Unknown

Facility ID#: Unknown

This one-story, block facility is located on the west side of NC 16, immediately south of the intersection with Springlake Drive. Evidence for three USTs was observed on the property. Fill caps for the tanks were located approximately 15.2 meters from the NC 16 centerline, on the south side of the building. The remains of an abandoned pump island are in front of the structure. No NCDEM registry information is currently available.

8. Houston (Highway 16) Shell UST Owner: Acme Gas Co. of South Carolina
2614 Highway 16 543 Cox Road
Route 2, Box 190 Gastonia, NC

Facility ID#: 0-011138

This facility is located in the southeast quadrant of the NC 16/SR 1884 (Bethany Church Rd.) intersection. There are four gasoline USTs registered with the NCDEM at this site, three with 11,360 liter capacities and one with an unknown capacity. The tank bed is approximately 18.3 meters from the NC 16 centerline and 27.4 meters from SR 1884.

9. Word of Life Full Gospel Church UST Owner: Unknown
Unknown

Facility ID#: Unknown

This former convenience store is located in the southwest quadrant of the NC 16/SR 1884 intersection. Evidence for two USTs was observed in front of the facility. They are located on either side of an abandoned pump island approximately 21.3 meters from the NC 16 centerline. No NCDEM registry information is currently available.

10. Kountry Kid Day Care UST Owner: Unknown
2236 Highway 16 Unknown
Newton, NC

Facility ID#: Unknown

This one-story brick facility is located on the east side of NC 16 near Smyre Creek. Evidence for two USTs was observed on the property, approximately 33.5 meters from the NC 16 centerline. Based on the condition of the parking area, these tanks may have been removed when the former pump island was demolished. No NCDEM registry information is currently available.

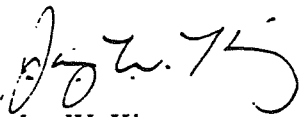
Additional right of way acquisition should not be allowed to encroach upon the USTs associated with these facilities. Purchasing properties with USTs may expose the NCDOT to the liabilities associated with their leakage, removal or abatement.

Other Potential Environmental Hazards

No other potential environmental hazards were indicated within the project corridor during the reconnaissance or records search. No landfills, dumpsites or Superfund sites were identified within project limits.

If you have any questions concerning this report or you require any additional information, contact this office at 250-4088.

Sincerely,



Jay W. King
Project Environmental Geologist
Geotechnical Unit

R-3100

APPENDIX E

TRAFFIC NOISE ANALYSIS DATA

TABLE N1

HEARING: SOUNDS BOMBARDING US DAILY

140	Shotgun blast, jet 30 m away at takeoff Motor test chamber	PAIN HUMAN EAR PAIN THRESHOLD
130	Firecrackers	
120	Severe thunder, pneumatic jackhammer Hockey crowd Amplified rock music	UNCOMFORTABLY LOUD
110	Textile loom	
100	Subway train, elevated train, farm tractor Power lawn mower, newspaper press Heavy city traffic, noisy factory	LOUD
90		
D E C I B E L S	80 Diesel truck 65 kmph 15 m away Crowded restaurant, garbage disposal Average factory, vacuum cleaner Passenger car 80 kmph 15 m away	MODERATELY LOUD
70	Quiet typewriter	
60	Singing birds, window air-conditioner Quiet automobile	
50	Normal conversation, average office	QUIET
40	Household refrigerator Quiet office	VERY QUIET
30	Average home Dripping faucet Whisper 1.5 m away	
20	Light rainfall, rustle of leaves	
10	Whisper	AVERAGE PERSON'S THRESHOLD OF HEARING JUST AUDIBLE
0		THRESHOLD FOR ACUTE HEARING

Sources: World Book, Rand McNally Atlas of the Human Body, Encyclopedia Americana, "Industrial Noise and Hearing Conversation" by J. B. Olishifski and E. R. Harford (Researched by N. Jane Hunt and published in the Chicago Tribune in an illustrated graphic by Tom Heinz.)

TABLE N2

NOISE ABATEMENT CRITERIA

Hourly A-Weighted Sound Level - decibels (dBA)

Activity Category	Leq(h)	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands
E	52 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Title 23 Code of Federal Regulations (CFR) Part 772, U. S. Department of Transportation, Federal Highway Administration

DEFINITION OF SUBSTANTIAL INCREASE

Hourly A-Weighted Sound Level - decibels (dBA)

Existing Noise Level in Leq(h)	Increase in dBA from Existing Noise Levels to Future Noise Levels
≤ 50	≥ 15
> 50	≥ 10

Source: North Carolina Department of Transportation Noise Abatement Guidelines.

TABLE N3

AMBIENT NOISE LEVELS
(Leq)

NC 16, From SR 1895 (Tower Road) to SR 1800(Caleb Setzer Road).
Catawba County
TIP #R-3100 State Project # 8.1792501

SITE	LOCATION	DESCRIPTION	NOISE LEVEL (dBA)
1.	NC 16, 100 Meters West of SR 1891	Grassy	68
2.	NC 16, 800 Meters East of SR 1003	Grassy	67
3.	NC 16, 1100 Meters West of SR 1804	Grassy	66
4.	NC 16, 30 Meters West of SR 1801	Grassy	65

Notes:

The ambient noise level sites were measured at 15 Meters from the center of nearest lane of traffic.

TABLE N4.1

FEWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	AMBIENT NOISE LEVEL	NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
			PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From Proposed NC 16 to SR 1003								
1 Business C	NC 16 18.3 R	68	NC 16 18.3 R		-	-	* 76	+ 8
2 Residence B	" 97.5 L	53	" 97.5 L		-	-	60	+ 7
3 Business C	" 36.6 L	63	" 36.6 L		-	-	70	+ 7
4 Residence B	" 28.0 R	65	" 28.0 R		-	-	* 73	+ 8
5 Residence B	" 32.3 R	64	" 32.3 R		-	-	* 71	+ 7
6 Residence B	" 35.1 R	63	" 35.1 R		-	-	* 71	+ 8
7 Residence B	" 85.3 R	55	" 85.3 R		-	-	61	+ 6
8 Residence B	" 58.5 R	59	" 58.5 R		-	-	65	+ 6
9 Residence B	" 15.2 R	69	" 15.2 R		-	-	* 76	+ 7
10 Residence B	" 88.4 R	55	" 88.4 R		-	-	61	+ 6
11 Residence B	" 39.6 L	62	" 39.6 L		-	-	* 69	+ 7
12 Residence B	" 70.1 L	57	" 70.1 L		-	-	64	+ 7
13 Business C	" 106.7 L	52	" 106.7 L		-	-	59	+ 7
14 Residence B	" 77.7 L	56	" 77.7 L		-	-	63	+ 7
15 Residence B	" 82.3 L	55	" 82.3 L		-	-	62	+ 7
16 Church E	" 54.9 L	59	" 54.9 L		-	-	66	+ 7
17 Residence B	" 45.7 R	61	" 45.7 R		-	-	* 68	+ 7
18 Residence B	" 122.5 R	51	" 122.5 R		-	-	57	+ 6
19 Residence B	" 12.2 R	70	" 12.2 R		-	-	* 76	+ 6
20 Residence B	" 30.5 L	64	" 30.5 L		-	-	* 72	+ 8
21 Residence B	" 30.5 L	64	" 30.5 L		-	-	* 72	+ 8
22 Residence B	" 12.2 R	70	" 12.2 R		-	-	* 76	+ 6
23 Residence B	" 35.1 L	63	" 35.1 L		-	-	* 71	+ 8
24 Residence B	" 51.8 L	60	" 51.8 L		-	-	* 67	+ 7
25 Residence B	" 51.8 R	60	" 51.8 R		-	-	* 67	+ 7
26 Residence B	" 112.8 R	52	" 112.8 R		-	-	58	+ 6
27 Residence B	" 67.1 R	58	" 67.1 R		-	-	64	+ 6
28 Residence B	" 42.7 L	61	" 42.7 L		-	-	* 69	+ 8
29 Residence B	" 44.2 L	61	" 44.2 L		-	-	* 68	+ 7
30 Residence B	" 65.5 L	58	" 65.5 L		-	-	64	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County
TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT NOISE LEVEL	NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
				PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From Proposed NC 16 to SR 1003 (cont.)									
31 Residence B	NC 16	27.4 R	65	NC 16	27.4 R	-	-	* 73	+ 8
32 Residence B	"	126.5 R	51	"	126.5 R	-	-	57	+ 6
33 Residence B	"	129.5 R	50	"	129.5 R	-	-	57	+ 7
34 Residence B	"	64.0 L	58	"	64.0 L	-	-	65	+ 7
35 Residence B	"	42.7 R	61	"	42.7 R	-	-	* 69	+ 8
36 Residence B	"	79.2 L	56	"	79.2 L	-	-	62	+ 6
37 Residence B	"	33.5 R	64	"	33.5 R	-	-	* 71	+ 7
38 Residence B	"	41.1 R	62	"	41.1 R	-	-	* 69	+ 7
39 Residence B	"	143.3 L	49	"	143.3 L	-	-	55	+ 6
40 Residence B	"	76.2 R	56	"	76.2 R	-	-	63	+ 7
41 Residence B	"	21.3 R	67	"	21.3 R	-	-	* 75	+ 8
42 Residence B	"	71.6 L	57	"	71.6 L	-	-	63	+ 6
43 Residence B	"	18.9 R	67	"	18.9 R	-	-	* 76	+ 9
44 Residence B	"	82.3 R	55	"	82.3 R	-	-	62	+ 7
45 Residence B	"	123.4 R	51	"	123.4 R	-	-	57	+ 6
46 Residence B	"	33.5 R	64	"	33.5 R	-	-	* 71	+ 7
47 Residence B	"	32.0 R	64	"	32.0 R	-	-	* 71	+ 7
48 Residence B	"	32.0 R	64	"	32.0 R	-	-	* 71	+ 7
49 Residence B	"	33.5 R	64	"	33.5 R	-	-	* 71	+ 7
50 Residence B	"	33.8 R	63	"	33.8 R	-	-	* 71	+ 8
51 Residence B	"	143.9 L	49	"	143.9 L	-	-	55	+ 5
52 Residence B	"	33.5 R	64	"	33.5 R	-	-	* 71	+ 7
53 Residence B	"	24.4 R	66	"	24.4 R	-	-	* 74	+ 8
54 Residence B	"	121.9 R	51	"	121.9 R	-	-	57	+ 6
55 Residence B	"	29.0 R	65	"	29.0 R	-	-	* 72	+ 7
56 Residence B	"	35.1 L	63	"	35.1 L	-	-	* 71	+ 8
57 Residence B	"	36.6 L	63	"	36.6 L	-	-	* 70	+ 7
58 Residence B	"	56.4 L	59	"	56.4 L	-	-	* 66	+ 7
59 Residence B	"	36.6 L	63	"	36.6 L	-	-	* 70	+ 7
60 Residence B	"	155.4 R	48	"	155.4 R	-	-	54	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION		NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE	
ID#	LAND USE CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	*****	
NC 16, From Proposed NC 16 to SR 1003 (cont.)											
61	Residence	B	NC 16	155.4 R	48	NC 16	155.4 R	-	-	54	+ 6
62	Residence	B	"	109.7 R	52	"	109.7 R	-	-	58	+ 6
63	Business	C	"	112.8 R	52	"	112.8 R	-	-	58	+ 6
64	Residence	B	"	35.1 R	63	"	35.1 R	-	-	* 71	+ 8
65	Residence	B	"	30.5 L	64	"	30.5 L	-	-	* 72	+ 8
66	Residence	B	"	30.5 L	64	"	30.5 L	-	-	* 72	+ 8
67	Residence	B	"	32.0 R	64	"	32.0 R	-	-	* 71	+ 7
68	Residence	B	"	152.4 R	48	"	152.4 R	-	-	54	+ 6
69	Residence	B	"	100.6 R	53	"	100.6 R	-	-	59	+ 6
70	Residence	B	"	33.5 R	64	"	33.5 R	-	-	* 71	+ 7
71	Residence	B	"	42.7 R	61	"	42.7 R	-	-	* 69	+ 8
72	Residence	B	"	57.9 L	59	"	57.9 L	-	-	* 66	+ 7
73	Residence	B	"	24.4 L	66	"	24.4 L	-	-	* 74	+ 8
74	Residence	B	"	39.6 R	62	"	39.6 R	-	-	* 69	+ 7
75	Residence	B	"	39.6 R	62	"	39.6 R	-	-	* 69	+ 7
76	Residence	B	"	65.5 R	58	"	65.5 R	-	-	64	+ 6
77	Residence	B	"	120.4 R	51	"	120.4 R	-	-	57	+ 6
78	Residence	B	"	157.0 R	48	"	157.0 R	-	-	54	+ 6
79	Business	C	"	56.4 R	59	"	56.4 R	-	-	66	+ 7
80	Business	C	"	36.6 R	63	"	36.6 R	-	-	70	+ 7
81	Business	C	"	30.5 R	64	"	30.5 R	-	-	* 72	+ 8
82	Residence	B	"	24.4 L	66	"	24.4 L	-	-	* 74	+ 8
83	Residence	B	"	158.5 L	48	"	158.5 L	-	-	54	+ 6
84	Residence	B	"	179.8 R	46	"	179.8 R	-	-	52	+ 6
85	Residence	B	"	121.9 R	51	"	121.9 R	-	-	57	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT	NEAREST			PREDICTED NOISE LEVELS			NOISE
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	NOISE LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	LEVEL INCREASE	
=====			=====		=====	=====			=====			=====
NC 16, From SR 1003 to SR 1876												
86	Residence	B	NC 16	85.3 R	53	NC 16	85.3 R	-	-	61	+ 8	
87	Residence	B	"	85.3 L	53	"	85.3 L	-	-	61	+ 8	
88	Business	C	"	35.1 L	62	"	35.1 L	-	-	70	+ 8	
89	Business	C	"	47.2 R	59	"	47.2 R	-	-	67	+ 8	
90	Residence	B	"	33.5 R	62	"	33.5 R	-	-	* 70	+ 8	
91	Residence	B	"	27.4 R	63	"	27.4 R	-	-	* 72	+ 9	
92	Residence	B	"	76.2 R	55	"	76.2 R	-	-	62	+ 7	
93	Residence	B	"	33.5 R	62	"	33.5 R	-	-	* 70	+ 8	
94	Residence	B	"	12.5 L	68	"	12.5 L	-	-	* 75	+ 7	
95	Residence	B	"	62.5 L	57	"	62.5 L	-	-	64	+ 7	
96	Residence	B	"	62.5 R	57	"	62.5 R	-	-	64	+ 7	
97	Residence	B	"	33.5 R	62	"	33.5 R	-	-	* 70	+ 8	
98	Residence	B	"	15.2 R	67	"	15.2 R	-	-	* 75	+ 8	
99	Residence	B	"	18.3 R	66	"	18.3 R	-	-	* 75	+ 9	
100	Residence	B	"	43.0 R	60	"	43.0 R	-	-	* 68	+ 8	
101	Residence	B	"	48.8 R	59	"	48.8 R	-	-	* 67	+ 8	
102	Residence	B	"	68.6 R	56	"	68.6 R	-	-	63	+ 7	
103	Residence	B	"	29.0 R	63	"	29.0 R	-	-	* 72	+ 9	
104	Residence	B	"	30.5 L	63	"	30.5 L	-	-	* 71	+ 8	
105	Residence	B	"	32.0 L	62	"	32.0 L	-	-	* 71	+ 9	
106	Residence	B	"	91.4 R	53	"	91.4 R	-	-	60	+ 7	
107	Residence	B	"	94.5 R	52	"	94.5 R	-	-	60	+ 8	
108	Residence	B	"	39.6 R	61	"	39.6 R	-	-	* 69	+ 8	
109	Business	C	"	126.5 R	49	"	126.5 R	-	-	56	+ 7	
110	Residence	B	"	50.3 L	59	"	50.3 L	-	-	* 67	+ 8	
111	Residence	B	"	161.5 L	46	"	161.5 L	-	-	53	+ 7	
112	Business	C	"	83.8 R	54	"	83.8 R	-	-	61	+ 7	
113	Residence	B	"	141.7 R	48	"	141.7 R	-	-	55	+ 7	
114	Residence	B	"	97.5 L	52	"	97.5 L	-	-	59	+ 7	
115	Residence	B	"	99.1 L	52	"	99.1 L	-	-	59	+ 7	
116	Residence	B	"	155.4 L	46	"	155.4 L	-	-	54	+ 8	

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FEWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT		NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
			NOISE LEVEL		PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From SR 1876 SR 1810 (cont.)										
142 Residence	B	NC 16	100.6 L	52	NC 16	100.6 L	-	-	59	+ 7
143 Residence	B	"	42.7 L	60	"	42.7 L	-	-	* 67	+ 7
144 Residence	B	"	42.7 L	60	"	42.7 L	-	-	* 67	+ 7
145 Residence	B	"	106.7 L	51	"	106.7 L	-	-	58	+ 7
146 Residence	B	"	71.6 L	55	"	71.6 L	-	-	62	+ 7
147 Business	C	"	42.7 L	60	"	42.7 L	-	-	67	+ 7
148 Residence	B	"	9.1 L	69	"	9.1 L	-	-	* 75	+ 6
149 Residence	B	"	39.6 L	61	"	39.6 L	-	-	* 68	+ 7
NC 16, From SR 1810 to SR 1884/SR 1804										
150 Business	C	NC 16	32.0 R	62	NC 16	32.0 R	-	-	* 71	+ 9
151 Residence	B	"	100.6 L	51	"	100.6 L	-	-	60	+ 9
152 Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 76	+ 9
153 Business	C	"	45.7 R	59	"	45.7 R	-	-	68	+ 9
154 Residence	B	"	158.5 R	46	"	158.5 R	-	-	54	+ 8
155 Residence	B	"	189.0 R	44	"	189.0 R	-	-	52	+ 8
156 Residence	B	"	185.9 R	44	"	185.9 R	-	-	52	+ 8
157 Residence	B	"	39.6 R	60	"	39.6 R	-	-	* 69	+ 9
158 Residence	B	"	36.9 L	61	"	36.9 L	-	-	* 70	+ 9
159 Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 76	+ 9
160 Residence	B	"	9.1 R	69	"	9.1 R	-	-	* 76	+ 7
161 Residence	B	"	45.7 R	59	"	45.7 R	-	-	* 68	+ 9
162 Residence	B	"	125.0 R	49	"	125.0 R	-	-	57	+ 8
163 Residence	B	"	173.7 R	45	"	173.7 R	-	-	53	+ 8
164 Residence	B	"	169.2 R	45	"	169.2 R	-	-	53	+ 8
165 Residence	B	"	112.8 L	50	"	112.8 L	-	-	58	+ 8
166 Residence	B	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
167 Business	C	"	21.3 L	65	"	21.3 L	-	-	* 74	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (56/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT		NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
			NOISE LEVEL		PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)										
199 Residence B	NC 16	82.3 L	53		NC 16	82.3 L	-	-	62	+ 9
200 Residence B	"	157.0 L	46		"	157.0 L	-	-	54	+ 8
201 Residence B	"	79.2 L	54		"	79.2 L	-	-	62	+ 8
202 Residence B	"	39.6 L	60		"	39.6 L	-	-	* 69	+ 9
203 Residence B	"	112.8 L	50		"	112.8 L	-	-	58	+ 8
204 Residence B	"	27.4 L	63		"	27.4 L	-	-	* 72	+ 9
205 Residence B	"	61.0 R	56		"	61.0 R	-	-	65	+ 9
206 Residence B	"	125.0 R	49		"	125.0 R	-	-	55	+ 6
207 Residence B	"	98.5 L	51		"	98.5 L	-	-	57	+ 6
208 Residence B	"	109.7 L	50		"	109.7 L	-	-	56	+ 6
209 Residence B	"	129.5 L	48		"	129.5 L	-	-	54	+ 6
210 Residence B	"	143.9 L	47		"	143.9 L	-	-	53	+ 6
211 Residence B	"	158.5 L	46		"	158.5 L	-	-	52	+ 6
212 Residence B	"	178.3 L	44		"	178.3 L	-	-	50	+ 6
213 Residence B	"	167.6 L	45		"	167.6 L	-	-	51	+ 6
214 Residence B	"	154.8 L	46		"	154.8 L	-	-	52	+ 6
215 Residence B	"	138.7 L	48		"	138.7 L	-	-	53	+ 5
216 Residence B	"	121.9 L	49		"	121.9 L	-	-	55	+ 6
217 Residence B	"	103.6 L	51		"	103.6 L	-	-	57	+ 6
218 Residence B	"	67.1 L	56		"	67.1 L	-	-	62	+ 6
219 Residence B	"	35.1 L	61		"	35.1 L	-	-	* 68	+ 7
220 Residence B	"	34.1 R	61		"	34.1 R	-	-	* 68	+ 7
221 Residence B	"	42.7 L	60		"	42.7 L	-	-	* 66	+ 6
222 Residence B	"	39.6 R	60		"	39.6 R	-	-	* 67	+ 7
223 Business C	"	50.3 R	58		"	50.3 R	-	-	64	+ 6
224 Business C	"	35.1 R	61		"	35.1 R	-	-	68	+ 7
225 Business C	"	21.3 L	65		"	21.3 L	-	-	* 72	+ 7
226 Residence B	"	141.7 R	47		"	141.7 R	-	-	53	+ 6
227 Residence B	"	70.1 R	55		"	70.1 R	-	-	61	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.1

RECEPTOR INFORMATION			AMBIENT		NEAREST		PREDICTED NOISE LEVELS			NOISE	
ID#	LAND USE	CATEGORY	NEAREST ROADWAY NAME	DISTANCE(m)	NOISE LEVEL	PROPOSED ROADWAY NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	LEVEL INCREASE
=====											
NC 16, From SR 1884/SR 1804 to Traffic Break (cont'd)											
251	Residence	B	"	29.0 L	63	"	29.0 L	-	-	* 69	+ 6
252	Residence	B	"	27.4 L	63	"	27.4 L	-	-	* 70	+ 7
253	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
254	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
255	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
256	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
257	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
258	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
259	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
260	Residence	B	"	29.0 L	63	"	29.0 L	-	-	* 69	+ 6
261	Residence	B	"	21.9 L	65	"	21.9 L	-	-	* 71	+ 6
262	Business	C	"	103.6 R	51	"	103.6 R	-	-	57	+ 6
263	Business	C	"	36.6 R	61	"	36.6 R	-	-	67	+ 6
264	Residence	B	"	88.4 L	53	"	88.4 L	-	-	59	+ 6
265	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 72	+ 7
NC 16, From Traffic Break to Proposed NC East Loop(SR 1800)											
266	Business	C	NC 16	61.0 R	55	NC 16	61.0 R	-	-	64	+ 9
267	Residence	B	"	55.2 R	56	"	55.2 R	-	-	64	+ 8
268	Business	C	"	32.0 R	61	"	32.0 R	-	-	69	+ 8
269	Residence	B	"	96.0 L	50	"	96.0 L	-	-	59	+ 9
270	Residence	B	"	64.0 L	55	"	64.0 L	-	-	63	+ 8
271	Residence	B	"	51.8 R	57	"	51.8 R	-	-	65	+ 8
272	Residence	B	"	39.6 R	59	"	39.6 R	-	-	* 68	+ 9
273	Business	C	"	74.7 R	53	"	74.7 R	-	-	61	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT. 1

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT		NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
			NOISE LEVEL		PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From Traffic Break to Proposed NC East Loop(SR 1800) (cont.)										
274 Business C	NC 16	42.7 R	58		NC 16	42.7 R	-	-	67	+ 9
275 Residence B	"	45.7 L	58		"	45.7 L	-	-	* 66	+ 8
276 Residence B	"	85.3 R	52		"	85.3 R	-	-	60	+ 8
277 Residence B	"	41.1 L	59		"	41.1 L	-	-	* 67	+ 8
278 Business C	"	21.3 L	63		"	21.3 L	-	-	* 73	+ 10
279 Residence B	"	51.8 L	57		"	51.8 L	-	-	65	+ 8
280 Residence B	"	41.1 R	59		"	41.1 R	-	-	* 67	+ 8
281 Residence B	"	68.6 L	54		"	68.6 L	-	-	62	+ 8
282 Residence B	"	30.5 R	61		"	30.5 R	-	-	* 70	+ 9
283 Residence B	"	76.2 L	53		"	76.2 L	-	-	61	+ 8
284 Residence B	"	33.5 L	60		"	33.5 L	-	-	* 69	+ 9
285 Residence B	"	24.4 R	63		"	24.4 R	-	-	* 71	+ 8
286 Residence B	"	30.5 L	61		"	30.5 L	-	-	* 70	+ 9
287 Residence B	"	24.4 L	63		"	24.4 L	-	-	* 71	+ 8
288 Residence B	"	38.1 R	59		"	38.1 R	-	-	* 68	+ 9
289 Residence B	"	32.0 L	61		"	32.0 L	-	-	* 69	+ 8
290 Residence B	"	33.5 L	60		"	33.5 L	-	-	* 69	+ 9
291 Residence B	"	30.5 L	61		"	30.5 L	-	-	* 70	+ 9
292 Business C	"	62.5 R	55		"	62.5 R	-	-	63	+ 8
293 Residence B	"	36.6 L	60		"	36.6 L	-	-	* 68	+ 8
294 Business C	"	45.7 L	58		"	45.7 L	-	-	66	+ 8
295 Business C	"	61.0 R	55		"	61.0 R	-	-	64	+ 9
296 Business C	"	131.1 R	47		"	131.1 R	-	-	55	+ 8
297 Residence B	"	33.5 L	60		"	33.5 L	-	-	* 69	+ 9
298 Residence B	"	35.1 L	60		"	35.1 L	-	-	* 69	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N5.1

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

Description	Maximum Predicted Leq Noise Levels dBA			Contour Distances (Maximum)		Approximate Number of Impacted Receptors According to Title 23 CFR Part 772				
	15 m	30 m	60 m	72 dBA	67 dBA	A	B	C	D	E
ALT.1:										
1. NC 16, From Proposed NC 16 to SR 1003	74	69	64	32 m	53 m	0	44	2	0	0
2. NC 16, From SR 1003 to SR 1876	73	68	63	30 m	51 m	0	17	0	0	0
3. NC 16, From SR 1876 to SR 1810	73	69	63	31 m	52 m	0	17	1	0	0
4. NC 16, From SR 1810 to SR 1884/SR 1804	74	70	64	34 m	56 m	0	25	3	0	0
5. NC 16, From SR 1884/SR 1804 to SR 1909	72	68	62	21 m	40 m	0	19	0	0	0
6. NC 16, From SR 1909 to SR 1800	73	69	63	24 m	44 m	0	16	1	0	0
TOTALS						0	138	7	0	0

NOTES - 1. 15m, 30m, and 60m distances are measured from center of nearest travel lane.
 2. 72 dBA and 67 dBA contour distances are measured from center of proposed roadway.

TABLE N6.1

TRAFFIC NOISE LEVEL INCREASE SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

Section	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							Substantial Noise Level Increases(1)	Impacts Due to Both Criteria(2)
	<=0	1-4	5-9	10-14	15-19	20-24	>= 25		
ALT. 1:									
1. From Prop. NC 16 to SR 1003	0	0	85	0	0	0	0	0	0
2. From SR 1003 to SR 1876	0	0	36	0	0	0	0	0	0
3. From SR 1876 to SR 1810	0	0	28	0	0	0	0	0	0
4. From SR 1810 to SR 1884/ SR 1804	0	0	87	0	0	0	0	0	0
5. From SR 1884/SR 1804 to Traffic Break	0	0	29	0	0	0	0	0	0
4. From Traffic Break to Prop. NC East Loop (SR 1800)	0	0	32	1	0	0	0	1	1
TOTALS	0	0	297	1	0	0	0	1	1

(1) As defined by only a substantial increase (See bottom of Table N2).

(2) As defined by both criteria in Table N2

TABLE N4.2

FEWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.2 & 4

RECEPTOR INFORMATION		NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	INCREASE
NC 16, From Proposed NC 16 to SR 1003										
1	Business	C	NC 16 18.3	R 68	NC 16 18.3	R	-	-	* 76	+ 8
2	Residence	B	" 97.5	L 53	" 97.5	L	-	-	60	+ 7
3	Business	C	" 36.6	L 63	" 36.6	L	-	-	70	+ 7
4	Residence	B	" 28.0	R 65	" 28.0	R	-	-	* 73	+ 8
5	Residence	B	" 32.3	R 64	" 32.3	R	-	-	* 71	+ 7
6	Residence	B	" 35.1	R 63	" 35.1	R	-	-	* 71	+ 8
7	Residence	B	" 85.3	R 55	" 85.3	R	-	-	61	+ 6
8	Residence	B	" 58.5	R 59	" 58.5	R	-	-	65	+ 6
9	Residence	B	" 15.2	R 69	" 15.2	R	-	-	* 76	+ 7
10	Residence	B	" 88.4	R 55	" 88.4	R	-	-	61	+ 6
11	Residence	B	" 39.6	L 62	" 39.6	L	-	-	* 69	+ 7
12	Residence	B	" 70.1	L 57	" 70.1	L	-	-	64	+ 7
13	Business	C	" 106.7	L 52	" 106.7	L	-	-	59	+ 7
14	Residence	B	" 77.7	L 56	" 77.7	L	-	-	63	+ 7
15	Residence	B	" 82.3	L 55	" 82.3	L	-	-	62	+ 7
16	Church	E	" 54.9	L 59	" 54.9	L	-	-	66	+ 7
17	Residence	B	" 45.7	R 61	" 45.7	R	-	-	* 68	+ 7
18	Residence	B	" 122.5	R 51	" 122.5	R	-	-	57	+ 6
19	Residence	B	" 12.2	R 70	" 12.2	R	-	-	* 76	+ 6
20	Residence	B	" 30.5	L 64	" 30.5	L	-	-	* 72	+ 8
21	Residence	B	" 30.5	L 64	" 30.5	L	-	-	* 72	+ 8
22	Residence	B	" 12.2	R 70	" 12.2	R	-	-	* 76	+ 6
23	Residence	B	" 35.1	L 63	" 35.1	L	-	-	* 71	+ 8
24	Residence	B	" 51.8	L 60	" 51.8	L	-	-	* 67	+ 7
25	Residence	B	" 51.8	R 60	" 51.8	R	-	-	* 67	+ 7
26	Residence	B	" 112.8	R 52	" 112.8	R	-	-	58	+ 6
27	Residence	B	" 67.1	R 58	" 67.1	R	-	-	64	+ 6
28	Residence	B	" 42.7	L 61	" 42.7	L	-	-	* 69	+ 8
29	Residence	B	" 44.2	L 61	" 44.2	L	-	-	* 68	+ 7
30	Residence	B	" 65.5	L 58	" 65.5	L	-	-	64	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),

Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.2 & 4

RECEPTOR INFORMATION		NEAREST ROADWAY		AMBIENT	NEAREST		PREDICTED NOISE LEVELS			NOISE
ID#	LAND USE CATEGORY	NAME	DISTANCE(m)	NOISE LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	LEVEL INCREASE
=====		=====		=====	=====		=====			=====
NC 16, From SR 1003 to SR 1876										
86	Residence	B	NC 16 85.3 R	53	NC 16 85.3 R		-	-	61	+ 8
87	Residence	B	" 85.3 L	53	" 85.3 L		-	-	61	+ 8
88	Business	C	" 35.1 L	62	" 35.1 L		-	-	70	+ 8
89	Business	C	" 47.2 R	59	" 47.2 R		-	-	67	+ 8
90	Residence	B	" 33.5 R	62	" 33.5 R		-	-	* 70	+ 8
91	Residence	B	" 27.4 R	63	" 27.4 R		-	-	* 72	+ 9
92	Residence	B	" 76.2 R	55	" 76.2 R		-	-	62	+ 7
93	Residence	B	" 33.5 R	62	" 33.5 R		-	-	* 70	+ 8
94	Residence	B	" 12.5 L	68	" 12.5 L		-	-	* 75	+ 7
95	Residence	B	" 62.5 L	57	" 62.5 L		-	-	64	+ 7
96	Residence	B	" 62.5 R	57	" 62.5 R		-	-	64	+ 7
97	Residence	B	" 33.5 R	62	" 33.5 R		-	-	* 70	+ 8
98	Residence	B	" 15.2 R	67	" 15.2 R		-	-	* 75	+ 8
99	Residence	B	" 18.3 R	66	" 18.3 R		-	-	* 75	+ 9
100	Residence	B	" 43.0 R	60	" 43.0 R		-	-	* 68	+ 8
101	Residence	B	" 48.8 R	59	" 48.8 R		-	-	* 67	+ 8
102	Residence	B	" 68.6 R	56	" 68.6 R		-	-	63	+ 7
103	Residence	B	" 29.0 R	63	" 29.0 R		-	-	* 72	+ 9
104	Residence	B	" 30.5 L	63	" 30.5 L		-	-	* 71	+ 8
105	Residence	B	" 32.0 L	62	" 32.0 L		-	-	* 71	+ 9
106	Residence	B	" 91.4 R	53	" 91.4 R		-	-	60	+ 7
107	Residence	B	" 94.5 R	52	" 94.5 R		-	-	60	+ 8
108	Residence	B	" 39.6 R	61	" 39.6 R		-	-	* 69	+ 8
109	Business	C	" 126.5 R	49	" 126.5 R		-	-	56	+ 7
110	Residence	B	" 50.3 L	59	" 50.3 L		-	-	* 67	+ 8
111	Residence	B	" 161.5 L	46	" 161.5 L		-	-	53	+ 7
112	Business	C	" 83.8 R	54	" 83.8 R		-	-	61	+ 7
113	Residence	B	" 141.7 R	48	" 141.7 R		-	-	55	+ 7
114	Residence	B	" 97.5 L	52	" 97.5 L		-	-	59	+ 7
115	Residence	B	" 99.1 L	52	" 99.1 L		-	-	59	+ 7
116	Residence	B	" 155.4 L	46	" 155.4 L		-	-	54	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	INCREASE
NC 16, From SR 1003 to SR 1876 (cont.)											
117	Residence	B	NC 16	160.0 L	46	NC 16	160.0 L	-	-	53	+ 7
118	Residence	B	"	47.2 R	59	"	47.2 R	-	-	* 67	+ 8
119	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
120	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 74	+ 9
121	Residence	B	"	134.1 L	48	"	134.1 L	-	-	56	+ 8
NC 16, From SR 1876 SR 1810											
122	Residence	B	NC 16	76.2 R	55	NC 16	76.2 R	-	-	62	+ 7
123	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
124	Residence	B	"	51.8 L	58	"	51.8 L	-	-	* 66	+ 8
125	Residence	B	"	91.4 L	53	"	91.4 L	-	-	60	+ 7
126	Residence	B	"	57.9 L	57	"	57.9 L	-	-	65	+ 8
127	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
128	Residence	B	"	57.9 L	57	"	57.9 L	-	-	65	+ 8
129	Residence	B	"	39.6 R	61	"	39.6 R	-	-	* 69	+ 8
130	Residence	B	"	16.8 L	67	"	16.8 L	-	-	* 75	+ 8
131	Residence	B	"	48.8 L	59	"	48.8 L	-	-	* 67	+ 8
132	Residence	B	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
133	Residence	B	"	30.5 R	63	"	30.5 R	-	-	* 72	+ 9
134	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 75	+ 10
135	Business	C	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
136	Residence	B	"	64.0 R	56	"	64.0 R	-	-	64	+ 8
137	Residence	B	"	64.0 R	56	"	64.0 R	-	-	64	+ 8
138	Residence	B	"	33.5 L	62	"	33.5 L	-	-	* 71	+ 9
139	Residence	B	"	39.6 L	61	"	39.6 L	-	-	* 69	+ 8
140	Residence	B	"	42.7 R	60	"	42.7 R	-	-	* 69	+ 9
141	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT. 2 & 4

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT NOISE LEVEL	NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
				PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From SR 1876 SR 1810 (cont.)									
142 Residence B	NC 16	100.6 L	52	NC 16	100.6 L	-	-	59	+ 7
143 Residence B	"	42.7 L	60	"	42.7 L	-	-	* 69	+ 9
144 Residence B	"	42.7 L	60	"	42.7 L	-	-	* 69	+ 9
145 Residence B	"	106.7 L	51	"	106.7 L	-	-	59	+ 8
146 Residence B	"	71.6 L	55	"	71.6 L	-	-	63	+ 8
147 Business C	"	42.7 L	60	"	42.7 L	-	-	69	+ 9
148 Residence B	"	9.1 L	69	"	9.1 L	-	-	* 75	+ 6
149 Residence B	"	39.6 L	61	"	39.6 L	-	-	* 69	+ 8
NC 16, From SR 1810 to SR 1884/SR 1804									
150 Business C	NC 16	32.0 R	62	NC 16	32.0 R	-	-	* 71	+ 9
151 Residence B	"	100.6 L	51	"	100.6 L	-	-	60	+ 9
152 Residence B	"	15.2 L	67	"	15.2 L	-	-	* 76	+ 9
153 Business C	"	45.7 R	59	"	45.7 R	-	-	68	+ 9
154 Residence B	"	158.5 R	46	"	158.5 R	-	-	54	+ 8
155 Residence B	"	189.0 R	44	"	189.0 R	-	-	52	+ 8
156 Residence B	"	185.9 R	44	"	185.9 R	-	-	52	+ 8
157 Residence B	"	39.6 R	60	"	39.6 R	-	-	* 69	+ 9
158 Residence B	"	36.9 L	61	"	36.9 L	-	-	* 70	+ 9
159 Residence B	"	15.2 L	67	"	15.2 L	-	-	* 76	+ 9
160 Residence B	"	9.1 R	69	"	9.1 R	-	-	* 76	+ 7
161 Residence B	"	45.7 R	59	"	45.7 R	-	-	* 68	+ 9
162 Residence B	"	125.0 R	49	"	125.0 R	-	-	57	+ 8
163 Residence B	"	173.7 R	45	"	173.7 R	-	-	53	+ 8
164 Residence B	"	169.2 R	45	"	169.2 R	-	-	53	+ 8
165 Residence B	"	112.8 L	50	"	112.8 L	-	-	58	+ 8
166 Residence B	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
167 Business C	"	21.3 L	65	"	21.3 L	-	-	* 74	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County
TIP # R-3100 State Project # 8.1792501

ALT. 2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY			AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE	
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)		LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM		

NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)													
168	Residence	B	NC 16	11.6	R	68	NC 16	11.6	R	-	-	* 76	+ 8
169	Residence	B	"	107.3	R	51	"	107.3	R	-	-	59	+ 8
170	Residence	B	"	134.1	R	48	"	134.1	R	-	-	56	+ 8
171	Residence	B	"	167.6	R	45	"	167.6	R	-	-	53	+ 8
172	Residence	B	"	135.6	R	48	"	135.6	R	-	-	56	+ 8
173	Residence	B	"	97.5	L	52	"	97.5	L	-	-	60	+ 8
174	Residence	B	"	21.9	R	65	"	21.9	R	-	-	* 74	+ 9
175	Business	C	"	54.3	R	57	"	54.3	R	-	-	66	+ 9
176	Residence	B	"	93.0	R	52	"	93.0	R	-	-	60	+ 8
177	Residence	B	"	121.9	R	49	"	121.9	R	-	-	58	+ 9
178	Residence	B	"	118.9	R	49	"	118.9	R	-	-	58	+ 9
179	Residence	B	"	54.9	R	57	"	54.9	R	-	-	* 66	+ 9
180	Residence	B	"	42.7	R	60	"	42.7	R	-	-	* 68	+ 8
181	Residence	B	"	48.8	R	58	"	48.8	R	-	-	* 67	+ 9
182	Residence	B	"	109.7	R	50	"	109.7	R	-	-	59	+ 9
183	Residence	B	"	121.9	R	49	"	121.9	R	-	-	58	+ 9
184	Residence	B	"	155.4	R	46	"	155.4	R	-	-	54	+ 8
185	Residence	B	"	38.1	R	61	"	38.1	R	-	-	* 69	+ 8
186	Residence	B	"	39.6	L	60	"	39.6	L	-	-	* 69	+ 9
187	Residence	B	"	131.1	L	48	"	131.1	L	-	-	57	+ 9
188	Residence	B	"	167.6	L	45	"	167.6	L	-	-	53	+ 8
189	Residence	B	"	131.1	L	48	"	131.1	L	-	-	57	+ 9
190	Residence	B	"	88.4	L	53	"	88.4	L	-	-	61	+ 8
191	Residence	B	"	42.7	L	60	"	42.7	L	-	-	* 68	+ 8
192	Residence	B	"	48.8	L	58	"	48.8	L	-	-	* 67	+ 9
193	Residence	B	"	36.6	L	61	"	36.6	L	-	-	* 70	+ 9
194	Residence	B	"	122.5	L	49	"	122.5	L	-	-	57	+ 8
195	Residence	B	"	38.1	L	61	"	38.1	L	-	-	* 69	+ 8
196	Cemetery	E	"	33.5	R	62	"	33.5	R	-	-	70	+ 8
197	Church	E	"	57.9	R	57	"	57.9	R	-	-	65	+ 8
198	Residence	B	"	35.1	R	61	"	35.1	R	-	-	* 70	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	
=====											
NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)											
199	Residence	B	NC 16	82.3 L	53	NC 16	82.3 L	-	-	62	+ 9
200	Residence	B	"	157.0 L	46	"	157.0 L	-	-	54	+ 8
201	Residence	B	"	79.2 L	54	"	79.2 L	-	-	62	+ 8
202	Residence	B	"	39.6 L	60	"	39.6 L	-	-	* 69	+ 9
203	Residence	B	"	112.8 L	50	"	112.8 L	-	-	58	+ 8
204	Residence	B	"	27.4 L	63	"	27.4 L	-	-	* 72	+ 9
205	Residence	B	"	61.0 R	56	"	61.0 R	-	-	65	+ 9
206	Residence	B	"	125.0 R	49	"	125.0 R	-	-	55	+ 6
207	Residence	B	"	98.5 L	51	"	98.5 L	-	-	57	+ 6
208	Residence	B	"	109.7 L	50	"	109.7 L	-	-	56	+ 6
209	Residence	B	"	129.5 L	48	"	129.5 L	-	-	54	+ 6
210	Residence	B	"	143.9 L	47	"	143.9 L	-	-	53	+ 6
211	Residence	B	"	158.5 L	46	"	158.5 L	-	-	52	+ 6
212	Residence	B	"	178.3 L	44	"	178.3 L	-	-	50	+ 6
213	Residence	B	"	167.6 L	45	"	167.6 L	-	-	51	+ 6
214	Residence	B	"	154.8 L	46	"	154.8 L	-	-	52	+ 6
215	Residence	B	"	138.7 L	48	"	138.7 L	-	-	53	+ 5
216	Residence	B	"	121.9 L	49	"	121.9 L	-	-	55	+ 6
217	Residence	B	"	103.6 L	51	"	103.6 L	-	-	57	+ 6
218	Residence	B	"	67.1 L	56	"	67.1 L	-	-	62	+ 6
219	Residence	B	"	35.1 L	61	"	35.1 L	-	-	* 68	+ 7
220	Residence	B	"	34.1 R	61	"	34.1 R	-	-	* 68	+ 7
221	Residence	B	"	42.7 L	60	"	42.7 L	-	-	* 66	+ 6
222	Residence	B	"	39.6 R	60	"	39.6 R	-	-	* 67	+ 7
223	Business	C	"	50.3 R	58	"	50.3 R	-	-	64	+ 6
224	Business	C	"	35.1 R	61	"	35.1 R	-	-	68	+ 7
225	Business	C	"	21.3 L	65	"	21.3 L	-	-	* 72	+ 7
226	Residence	B	"	141.7 R	47	"	141.7 R	-	-	53	+ 6
227	Residence	B	"	70.1 R	55	"	70.1 R	-	-	61	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County
TIP # R-3100 State Project # 8.1792501

ALT. 2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE CATEGORY		NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			
=====													
NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)													
228	Residence	B	NC 16	88.4	R	53	NC 16	88.4	R	-	-	59	+ 6
229	Residence	B	"	103.6	R	51	"	103.6	R	-	-	57	+ 6
230	Residence	B	"	131.1	R	48	"	131.1	R	-	-	54	+ 6
231	Residence	B	"	155.4	R	46	"	155.4	R	-	-	52	+ 6
232	Residence	B	"	171.3	R	45	"	171.3	R	-	-	51	+ 6
233	Residence	B	"	82.3	R	53	"	82.3	R	-	-	59	+ 6
234	Residence	B	"	103.6	R	51	"	103.6	R	-	-	57	+ 6
235	Residence	B	"	122.5	R	49	"	122.5	R	-	-	55	+ 6
236	Residence	B	"	152.4	R	46	"	152.4	R	-	-	52	+ 6
NC 16, From SR 1884/SR 1804 to Traffic Break													
237	Business	C	NC 16	51.8	R	58	NC 16	51.8	R	-	-	64	+ 6
238	Residence	B	"	33.5	L	62	"	33.5	L	-	-	* 68	+ 6
239	Business	C	"	38.1	R	61	"	38.1	R	-	-	67	+ 6
240	Residence	B	"	38.1	R	61	"	38.1	R	-	-	* 67	+ 6
241	Residence	B	"	54.9	L	57	"	54.9	L	-	-	64	+ 7
242	Residence	B	"	70.1	L	55	"	70.1	L	-	-	61	+ 6
243	Residence	B	"	71.6	R	55	"	71.6	R	-	-	61	+ 6
244	Residence	B	"	30.5	R	62	"	30.5	R	-	-	* 69	+ 7
245	Residence	B	"	30.5	R	62	"	30.5	R	-	-	* 69	+ 7
246	Residence	B	"	54.9	L	57	"	54.9	L	-	-	64	+ 7
247	Residence	B	"	48.8	L	58	"	48.8	L	-	-	65	+ 7
248	Residence	B	"	30.5	R	62	"	30.5	R	-	-	* 69	+ 7
249	Residence	B	"	30.5	R	62	"	30.5	R	-	-	* 69	+ 7
250	Residence	B	"	30.5	R	62	"	30.5	R	-	-	* 69	+ 7

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	
=====											
NC 16, From SR 1884/SR 1804 to Traffic Break (cont'd)											
251	Residence	B	"	29.0 L	63	"	29.0 L	-	-	* 69	+ 6
252	Residence	B	"	27.4 L	63	"	27.4 L	-	-	* 70	+ 7
253	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
254	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
255	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
256	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
257	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
258	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
259	Residence	B	"	25.9 L	63	"	25.9 L	-	-	* 70	+ 7
260	Residence	B	"	29.0 L	63	"	29.0 L	-	-	* 69	+ 6
261	Residence	B	"	21.9 L	65	"	21.9 L	-	-	* 71	+ 6
262	Business	C	"	103.6 R	51	"	103.6 R	-	-	57	+ 6
263	Business	C	"	36.6 R	61	"	36.6 R	-	-	67	+ 6
264	Residence	B	"	88.4 L	53	"	88.4 L	-	-	59	+ 6
265	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 72	+ 7
NC 16, From Traffic Break to Proposed NC East Loop(SR 1800)											
266	Business	C	NC 16	61.0 R	55	NC 16	61.0 R	-	-	64	+ 9
267	Residence	B	"	55.2 R	56	"	55.2 R	-	-	64	+ 8
268	Business	C	"	32.0 R	61	"	32.0 R	-	-	69	+ 8
269	Residence	B	"	96.0 L	50	"	96.0 L	-	-	59	+ 9
270	Residence	B	"	64.0 L	55	"	64.0 L	-	-	63	+ 8
271	Residence	B	"	51.8 R	57	"	51.8 R	-	-	65	+ 8
272	Residence	B	"	39.6 R	59	"	39.6 R	-	-	* 68	+ 9
273	Business	C	"	74.7 R	53	"	74.7 R	-	-	61	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT. 2 & 4

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE CATEGORY		NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			
NC 16, From Traffic Break to Proposed NC East Loop(SR 1800) (cont.)													
274	Business	C	NC 16	42.7	R	58	NC 16	42.7	R	-	-	67	+ 9
275	Residence	B	"	45.7	L	58	"	45.7	L	-	-	* 66	+ 8
276	Residence	B	"	85.3	R	52	"	85.3	R	-	-	60	+ 8
277	Residence	B	"	41.1	L	59	"	41.1	L	-	-	* 67	+ 8
278	Business	C	"	21.3	L	63	"	21.3	L	-	-	* 73	* + 10
279	Residence	B	"	51.8	L	57	"	51.8	L	-	-	65	+ 8
280	Residence	B	"	41.1	R	59	"	41.1	R	-	-	* 67	+ 8
281	Residence	B	"	68.6	L	54	"	68.6	L	-	-	62	+ 8
282	Residence	B	"	30.5	R	61	"	30.5	R	-	-	* 70	+ 9
283	Residence	B	"	76.2	L	53	"	76.2	L	-	-	61	+ 8
284	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
285	Residence	B	"	24.4	R	63	"	24.4	R	-	-	* 71	+ 8
286	Residence	B	"	30.5	L	61	"	30.5	L	-	-	* 70	+ 9
287	Residence	B	"	24.4	L	63	"	24.4	L	-	-	* 71	+ 8
288	Residence	B	"	38.1	R	59	"	38.1	R	-	-	* 68	+ 9
289	Residence	B	"	32.0	L	61	"	32.0	L	-	-	* 69	+ 8
290	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
291	Residence	B	"	30.5	L	61	"	30.5	L	-	-	* 70	+ 9
292	Business	C	"	62.5	R	55	"	62.5	R	-	-	63	+ 8
293	Residence	B	"	36.6	L	60	"	36.6	L	-	-	* 68	+ 8
294	Business	C	"	45.7	L	58	"	45.7	L	-	-	66	+ 8
295	Business	C	"	61.0	R	55	"	61.0	R	-	-	64	+ 9
296	Business	C	"	131.1	R	47	"	131.1	R	-	-	55	+ 8
297	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
298	Residence	B	"	35.1	L	60	"	35.1	L	-	-	* 69	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N5.2

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

Description	Maximum Predicted Leq Noise Levels dBA			Contour Distances (Maximum)		Approximate Number of Impacted Receptors According to Title 23 CFR Part 772				
	15 m	30 m	60 m	72 dBA	67 dBA	A	B	C	D	E
ALT.2 & 4:										
1. NC 16, From Proposed NC 16 to SR 1003	74	69	64	32 m	53 m	0	44	2	0	0
2. NC 16, From SR 1003 to SR 1876	73	68	63	30 m	51 m	0	17	0	0	0
3. NC 16, From SR 1876 to SR 1810	73	69	63	31 m	52 m	0	17	1	0	0
4. NC 16, From SR 1810 to SR 1884/SR 1804	74	70	64	34 m	56 m	0	25	3	0	0
5. NC 16, From SR 1884/SR 1804 to SR 1909	72	68	62	21 m	40 m	0	19	0	0	0
6. NC 16, From SR 1909 to SR 1800	73	69	63	24 m	44 m	0	16	1	0	0
TOTALS						0	138	7	0	0

NOTES - 1. 15m, 30m, and 60m distances are measured from center of nearest travel lane.
2. 72 dBA and 67 dBA contour distances are measured from center of proposed roadway.

TABLE N6.2

TRAFFIC NOISE LEVEL INCREASE SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

Section	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							Substantial Noise Level Increases(1)	Impacts Due to Both Criteria(2)
	<=0	1-4	5-9	10-14	15-19	20-24	>= 25		
ALT. 2 & 4:									
1. From Prop. NC 16 to SR 1003	0	0	85	0	0	0	0	0	0
2. From SR 1003 to SR 1876	0	0	36	0	0	0	0	0	0
3. From SR 1876 to SR 1810	0	0	27	1	0	0	0	1	1
4. From SR 1810 to SR 1884/ SR 1804	0	0	87	0	0	0	0	0	0
5. From SR 1884/SR 1804 to Traffic Break	0	0	29	0	0	0	0	0	0
4. From Traffic Break to Prop. NC East Loop (SR 1800)	0	0	32	1	0	0	0	1	1
TOTALS	0	0	296	2	0	0	0	2	2

(1) As defined by only a substantial increase (See bottom of Table N2).

(2) As defined by both criteria in Table N2

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION		NEAREST ROADWAY		AMBIENT	NEAREST		PREDICTED NOISE LEVELS			NOISE	
ID#	LAND USE CATEGORY	NAME	DISTANCE(m)	NOISE LEVEL	PROPOSED ROADWAY	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	LEVEL INCREASE
=====		=====		=====	=====		=====			=====	
NC 16, From Proposed NC 16 to SR 1003											
1	Business	C	NC 16 18.3 R	68	NC 16	18.3 R		-	-	* 76	+ 8
2	Residence	B	" 97.5 L	53	"	97.5 L		-	-	60	+ 7
3	Business	C	" 36.6 L	63	"	36.6 L		-	-	70	+ 7
4	Residence	B	" 28.0 R	65	"	28.0 R		-	-	* 73	+ 8
5	Residence	B	" 32.3 R	64	"	32.3 R		-	-	* 71	+ 7
6	Residence	B	" 35.1 R	63	"	35.1 R		-	-	* 71	+ 8
7	Residence	B	" 85.3 R	55	"	85.3 R		-	-	61	+ 6
8	Residence	B	" 58.5 R	59	"	58.5 R		-	-	65	+ 6
9	Residence	B	" 15.2 R	69	"	15.2 R		-	-	* 76	+ 7
10	Residence	B	" 88.4 R	55	"	88.4 R		-	-	61	+ 6
11	Residence	B	" 39.6 L	62	"	39.6 L		-	-	* 69	+ 7
12	Residence	B	" 70.1 L	57	"	70.1 L		-	-	64	+ 7
13	Business	C	" 106.7 L	52	"	106.7 L		-	-	59	+ 7
14	Residence	B	" 77.7 L	56	"	77.7 L		-	-	63	+ 7
15	Residence	B	" 82.3 L	55	"	82.3 L		-	-	62	+ 7
16	Church	E	" 54.9 L	59	"	54.9 L		-	-	66	+ 7
17	Residence	B	" 45.7 R	61	"	45.7 R		-	-	* 68	+ 7
18	Residence	B	" 122.5 R	51	"	122.5 R		-	-	57	+ 6
19	Residence	B	" 12.2 R	70	"	12.2 R		-	-	* 76	+ 6
20	Residence	B	" 30.5 L	64	"	30.5 L		-	-	* 72	+ 8
21	Residence	B	" 30.5 L	64	"	30.5 L		-	-	* 72	+ 8
22	Residence	B	" 12.2 R	70	"	12.2 R		-	-	* 76	+ 6
23	Residence	B	" 35.1 L	63	"	35.1 L		-	-	* 71	+ 8
24	Residence	B	" 51.8 L	60	"	51.8 L		-	-	* 67	+ 7
25	Residence	B	" 51.8 R	60	"	51.8 R		-	-	* 67	+ 7
26	Residence	B	" 112.8 R	52	"	112.8 R		-	-	58	+ 6
27	Residence	B	" 67.1 R	58	"	67.1 R		-	-	64	+ 6
28	Residence	B	" 42.7 L	61	"	42.7 L		-	-	* 69	+ 8
29	Residence	B	" 44.2 L	61	"	44.2 L		-	-	* 68	+ 7
30	Residence	B	" 65.5 L	58	"	65.5 L		-	-	64	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	INCREASE		
NC 16, From Proposed NC 16 to SR 1003 (cont.)													
31	Residence	B	NC 16	27.4	R	65	NC 16	27.4	R	-	-	* 73	+ 8
32	Residence	B	"	126.5	R	51	"	126.5	R	-	-	57	+ 6
33	Residence	B	"	129.5	R	50	"	129.5	R	-	-	57	+ 7
34	Residence	B	"	64.0	L	58	"	64.0	L	-	-	65	+ 7
35	Residence	B	"	42.7	R	61	"	42.7	R	-	-	* 69	+ 8
36	Residence	B	"	79.2	L	56	"	79.2	L	-	-	62	+ 6
37	Residence	B	"	33.5	R	64	"	33.5	R	-	-	* 71	+ 7
38	Residence	B	"	41.1	R	62	"	41.1	R	-	-	* 69	+ 7
39	Residence	B	"	143.3	L	49	"	143.3	L	-	-	55	+ 6
40	Residence	B	"	76.2	R	56	"	76.2	R	-	-	63	+ 7
41	Residence	B	"	21.3	R	67	"	21.3	R	-	-	* 75	+ 8
42	Residence	B	"	71.6	L	57	"	71.6	L	-	-	63	+ 6
43	Residence	B	"	18.9	R	67	"	18.9	R	-	-	* 76	+ 9
44	Residence	B	"	82.3	R	55	"	82.3	R	-	-	62	+ 7
45	Residence	B	"	123.4	R	51	"	123.4	R	-	-	57	+ 6
46	Residence	B	"	33.5	R	64	"	33.5	R	-	-	* 71	+ 7
47	Residence	B	"	32.0	R	64	"	32.0	R	-	-	* 71	+ 7
48	Residence	B	"	32.0	R	64	"	32.0	R	-	-	* 71	+ 7
49	Residence	B	"	33.5	R	64	"	33.5	R	-	-	* 71	+ 7
50	Residence	B	"	33.8	R	63	"	33.8	R	-	-	* 71	+ 8
51	Residence	B	"	143.9	L	49	"	143.9	L	-	-	55	+ 6
52	Residence	B	"	33.5	R	64	"	33.5	R	-	-	* 71	+ 7
53	Residence	B	"	24.4	R	66	"	24.4	R	-	-	* 74	+ 8
54	Residence	B	"	121.9	R	51	"	121.9	R	-	-	57	+ 6
55	Residence	B	"	29.0	R	65	"	29.0	R	-	-	* 72	+ 7
56	Residence	B	"	35.1	L	63	"	35.1	L	-	-	* 71	+ 8
57	Residence	B	"	36.6	L	63	"	36.6	L	-	-	* 70	+ 7
58	Residence	B	"	56.4	L	59	"	56.4	L	-	-	* 66	+ 7
59	Residence	B	"	36.6	L	63	"	36.6	L	-	-	* 70	+ 7
60	Residence	B	"	155.4	R	48	"	155.4	R	-	-	54	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
 Catawba County
 TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			
NC 16, From Proposed NC 16 to SR 1003 (cont.)													
61	Residence	B	NC 16	155.4	R	48	NC 16	155.4	R	-	-	54	+ 6
62	Residence	B	"	109.7	R	52	"	109.7	R	-	-	58	+ 6
63	Business	C	"	112.8	R	52	"	112.8	R	-	-	58	+ 6
64	Residence	B	"	35.1	R	63	"	35.1	R	-	-	* 71	+ 8
65	Residence	B	"	30.5	L	64	"	30.5	L	-	-	* 72	+ 8
66	Residence	B	"	30.5	L	64	"	30.5	L	-	-	* 72	+ 8
67	Residence	B	"	32.0	R	64	"	32.0	R	-	-	* 71	+ 7
68	Residence	B	"	152.4	R	48	"	152.4	R	-	-	54	+ 6
69	Residence	B	"	100.6	R	53	"	100.6	R	-	-	59	+ 6
70	Residence	B	"	33.5	R	64	"	33.5	R	-	-	* 71	+ 7
71	Residence	B	"	42.7	R	61	"	42.7	R	-	-	* 69	+ 8
72	Residence	B	"	57.9	L	59	"	57.9	L	-	-	* 66	+ 7
73	Residence	B	"	24.4	L	66	"	24.4	L	-	-	* 74	+ 8
74	Residence	B	"	39.6	R	62	"	39.6	R	-	-	* 69	+ 7
75	Residence	B	"	39.6	R	62	"	39.6	R	-	-	* 69	+ 7
76	Residence	B	"	65.5	R	58	"	65.5	R	-	-	64	+ 6
77	Residence	B	"	120.4	R	51	"	120.4	R	-	-	57	+ 6
78	Residence	B	"	157.0	R	48	"	157.0	R	-	-	54	+ 6
79	Business	C	"	56.4	R	59	"	56.4	R	-	-	66	+ 7
80	Business	C	"	36.6	R	63	"	36.6	R	-	-	70	+ 7
81	Business	C	"	30.5	R	64	"	30.5	R	-	-	* 72	+ 8
82	Residence	B	"	24.4	L	66	"	24.4	L	-	-	* 74	+ 8
83	Residence	B	"	158.5	L	48	"	158.5	L	-	-	54	+ 6
84	Residence	B	"	179.8	R	46	"	179.8	R	-	-	52	+ 6
85	Residence	B	"	121.9	R	51	"	121.9	R	-	-	57	+ 6

NOTE: Distances are from center of the existing or proposed roadways. -L-> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y-> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FEWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT		NEAREST		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
			NOISE LEVEL		PROPOSED ROADWAY NAME DISTANCE(m)		-L-	-Y-	MAXIMUM	
NC 16, From SR 1003 to SR 1876										
86 Residence B	NC 16	85.3 R	53		NC 16	85.3 R	-	-	61	+ 8
87 Residence B	"	85.3 L	53		"	85.3 L	-	-	61	+ 8
88 Business C	"	35.1 L	62		"	35.1 L	-	-	70	+ 8
89 Business C	"	47.2 R	59		"	47.2 R	-	-	67	+ 8
90 Residence B	"	33.5 R	62		"	33.5 R	-	-	* 70	+ 8
91 Residence B	"	27.4 R	63		"	27.4 R	-	-	* 72	+ 9
92 Residence B	"	76.2 R	55		"	76.2 R	-	-	62	+ 7
93 Residence B	"	33.5 R	62		"	33.5 R	-	-	* 70	+ 8
94 Residence B	"	12.5 L	68		"	12.5 L	-	-	* 75	+ 7
95 Residence B	"	62.5 L	57		"	62.5 L	-	-	64	+ 7
96 Residence B	"	62.5 R	57		"	62.5 R	-	-	64	+ 7
97 Residence B	"	33.5 R	62		"	33.5 R	-	-	* 70	+ 8
98 Residence B	"	15.2 R	67		"	15.2 R	-	-	* 75	+ 8
99 Residence B	"	18.3 R	66		"	18.3 R	-	-	* 75	+ 9
100 Residence B	"	43.0 R	60		"	43.0 R	-	-	* 68	+ 8
101 Residence B	"	48.8 R	59		"	48.8 R	-	-	* 67	+ 8
102 Residence B	"	68.6 R	56		"	68.6 R	-	-	63	+ 7
103 Residence B	"	29.0 R	63		"	29.0 R	-	-	* 72	+ 9
104 Residence B	"	30.5 L	63		"	30.5 L	-	-	* 71	+ 8
105 Residence B	"	32.0 L	62		"	32.0 L	-	-	* 71	+ 9
106 Residence B	"	91.4 R	53		"	91.4 R	-	-	60	+ 7
107 Residence B	"	94.5 R	52		"	94.5 R	-	-	60	+ 8
108 Residence B	"	39.6 R	61		"	39.6 R	-	-	* 69	+ 8
109 Business C	"	126.5 R	49		"	126.5 R	-	-	56	+ 7
110 Residence B	"	50.3 L	59		"	50.3 L	-	-	* 67	+ 8
111 Residence B	"	161.5 L	46		"	161.5 L	-	-	53	+ 7
112 Business C	"	83.8 R	54		"	83.8 R	-	-	61	+ 7
113 Residence B	"	141.7 R	48		"	141.7 R	-	-	55	+ 7
114 Residence B	"	97.5 L	52		"	97.5 L	-	-	59	+ 7
115 Residence B	"	99.1 L	52		"	99.1 L	-	-	59	+ 7
116 Residence B	"	155.4 L	46		"	155.4 L	-	-	54	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	
NC 16, From SR 1003 to SR 1876 (cont.)											
117	Residence	B	NC 16	160.0 L	46	NC 16	160.0 L	-	-	53	+ 7
118	Residence	B	"	47.2 R	59	"	47.2 R	-	-	* 67	+ 8
119	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
120	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 74	+ 9
121	Residence	B	"	134.1 L	48	"	134.1 L	-	-	56	+ 8
NC 16, From SR 1876 SR 1810											
122	Residence	B	NC 16	76.2 R	55	NC 16	76.2 R	-	-	62	+ 7
123	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
124	Residence	B	"	51.8 L	58	"	51.8 L	-	-	* 66	+ 8
125	Residence	B	"	91.4 L	53	"	91.4 L	-	-	60	+ 7
126	Residence	B	"	57.9 L	57	"	57.9 L	-	-	65	+ 8
127	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8
128	Residence	B	"	57.9 L	57	"	57.9 L	-	-	65	+ 8
129	Residence	B	"	39.6 R	61	"	39.6 R	-	-	* 69	+ 8
130	Residence	B	"	16.8 L	67	"	16.8 L	-	-	* 75	+ 8
131	Residence	B	"	48.8 L	59	"	48.8 L	-	-	* 67	+ 8
132	Residence	B	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
133	Residence	B	"	30.5 R	63	"	30.5 R	-	-	* 72	+ 9
134	Residence	B	"	21.3 L	65	"	21.3 L	-	-	* 75	+ 10
135	Business	C	"	18.3 L	66	"	18.3 L	-	-	* 75	+ 9
136	Residence	B	"	64.0 R	56	"	64.0 R	-	-	64	+ 8
137	Residence	B	"	64.0 R	56	"	64.0 R	-	-	64	+ 8
138	Residence	B	"	33.5 L	62	"	33.5 L	-	-	* 71	+ 9
139	Residence	B	"	39.6 L	61	"	39.6 L	-	-	* 69	+ 8
140	Residence	B	"	42.7 R	60	"	42.7 R	-	-	* 69	+ 9
141	Residence	B	"	15.2 L	67	"	15.2 L	-	-	* 75	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County
TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	ROADWAY	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY NAME DISTANCE(m)	PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
					-L-	-Y-	MAXIMUM	
NC 16, From SR 1876 SR 1810 (cont.)								
142 Residence B	NC 16	100.6 L	52	NC 16 100.6 L	-	-	59	+ 7
143 Residence B	"	42.7 L	60	" 42.7 L	-	-	* 69	+ 9
144 Residence B	"	42.7 L	60	" 42.7 L	-	-	* 69	+ 9
145 Residence B	"	106.7 L	51	" 106.7 L	-	-	59	+ 8
146 Residence B	"	71.6 L	55	" 71.6 L	-	-	63	+ 8
147 Business C	"	42.7 L	60	" 42.7 L	-	-	69	+ 9
148 Residence B	"	9.1 L	69	" 9.1 L	-	-	* 75	+ 6
149 Residence B	"	39.6 L	61	" 39.6 L	-	-	* 69	+ 8
NC 16, From SR 1810 to SR 1884/SR 1804								
150 Business C	NC 16	32.0 R	62	NC 16 32.0 R	-	-	* 72	* + 10
151 Residence B	"	100.6 L	51	" 100.6 L	-	-	60	+ 9
152 Residence B	"	15.2 L	67	" 15.2 L	-	-	* 76	+ 9
153 Business C	"	45.7 R	59	" 45.7 R	-	-	69	* + 10
154 Residence B	"	158.5 R	46	" 158.5 R	-	-	55	+ 9
155 Residence B	"	189.0 R	44	" 189.0 R	-	-	52	+ 8
156 Residence B	"	185.9 R	44	" 185.9 R	-	-	52	+ 8
157 Residence B	"	39.6 R	60	" 39.6 R	-	-	* 70	* + 10
158 Residence B	"	36.9 L	61	" 36.9 L	-	-	* 71	* + 10
159 Residence B	"	15.2 L	67	" 15.2 L	-	-	* 76	+ 9
160 Residence B	"	9.1 R	69	" 9.1 R	-	-	* 76	+ 7
161 Residence B	"	45.7 R	59	" 45.7 R	-	-	* 69	* + 10
162 Residence B	"	125.0 R	49	" 125.0 R	-	-	58	+ 9
163 Residence B	"	173.7 R	45	" 173.7 R	-	-	53	+ 8
164 Residence B	"	169.2 R	45	" 169.2 R	-	-	54	+ 9
165 Residence B	"	112.8 L	50	" 112.8 L	-	-	59	+ 9
166 Residence B	"	18.3 L	66	" 18.3 L	-	-	* 76	* + 10
167 Business C	"	21.3 L	65	" 21.3 L	-	-	* 75	* + 10

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT. 3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			
NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)													
168	Residence	B	NC 16	11.6	R	68	NC 16	11.6	R	-	-	* 76	+ 8
169	Residence	B	"	107.3	R	51	"	107.3	R	-	-	59	+ 8
170	Residence	B	"	134.1	R	48	"	134.1	R	-	-	57	+ 9
171	Residence	B	"	167.6	R	45	"	167.6	R	-	-	54	+ 9
172	Residence	B	"	135.6	R	48	"	135.6	R	-	-	57	+ 9
173	Residence	B	"	97.5	L	52	"	97.5	L	-	-	61	+ 9
174	Residence	B	"	21.9	R	65	"	21.9	R	-	-	* 75	* + 10
175	Business	C	"	54.3	R	57	"	54.3	R	-	-	67	* + 10
176	Residence	B	"	93.0	R	52	"	93.0	R	-	-	61	+ 9
177	Residence	B	"	121.9	R	49	"	121.9	R	-	-	58	+ 9
178	Residence	B	"	118.9	R	49	"	118.9	R	-	-	58	+ 9
179	Residence	B	"	54.9	R	57	"	54.9	R	-	-	* 67	* + 10
180	Residence	B	"	42.7	R	60	"	42.7	R	-	-	* 69	+ 9
181	Residence	B	"	48.8	R	58	"	48.8	R	-	-	* 68	* + 10
182	Residence	B	"	109.7	R	50	"	109.7	R	-	-	59	+ 9
183	Residence	B	"	121.9	R	49	"	121.9	R	-	-	58	+ 9
184	Residence	B	"	155.4	R	46	"	155.4	R	-	-	55	+ 9
185	Residence	B	"	38.1	R	61	"	38.1	R	-	-	* 70	+ 9
186	Residence	B	"	39.6	L	60	"	39.6	L	-	-	* 70	* + 10
187	Residence	B	"	131.1	L	48	"	131.1	L	-	-	57	+ 9
188	Residence	B	"	167.6	L	45	"	167.6	L	-	-	54	+ 9
189	Residence	B	"	131.1	L	48	"	131.1	L	-	-	57	+ 9
190	Residence	B	"	88.4	L	53	"	88.4	L	-	-	62	+ 9
191	Residence	B	"	42.7	L	60	"	42.7	L	-	-	* 69	+ 9
192	Residence	B	"	48.8	L	58	"	48.8	L	-	-	* 68	* + 10
193	Residence	B	"	36.6	L	61	"	36.6	L	-	-	* 71	* + 10
194	Residence	B	"	122.5	L	49	"	122.5	L	-	-	58	+ 9
195	Residence	B	"	38.1	L	61	"	38.1	L	-	-	* 70	+ 9
196	Cemetery	E	"	33.5	R	62	"	33.5	R	-	-	72	* + 10
197	Church	E	"	57.9	R	57	"	57.9	R	-	-	66	+ 9
198	Residence	B	"	35.1	R	61	"	35.1	R	-	-	* 71	* + 10

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
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Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE CATEGORY		NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			

NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)													
199	Residence	B	NC 16	82.3	L	53	NC 16	82.3	L	-	-	63	* + 10
200	Residence	B	"	157.0	L	46	"	157.0	L	-	-	55	+ 9
201	Residence	B	"	79.2	L	54	"	79.2	L	-	-	63	+ 9
202	Residence	B	"	39.6	L	60	"	39.6	L	-	-	* 70	* + 10
203	Residence	B	"	112.8	L	50	"	112.8	L	-	-	59	+ 9
204	Residence	B	"	27.4	L	63	"	27.4	L	-	-	* 74	* + 11
205	Residence	B	"	61.0	R	56	"	61.0	R	-	-	* 66	* + 10
206	Residence	B	"	125.0	R	49	"	125.0	R	-	-	55	+ 6
207	Residence	B	"	98.5	L	51	"	98.5	L	-	-	58	+ 7
208	Residence	B	"	109.7	L	50	"	109.7	L	-	-	57	+ 7
209	Residence	B	"	129.5	L	48	"	129.5	L	-	-	55	+ 7
210	Residence	B	"	143.9	L	47	"	143.9	L	-	-	53	+ 6
211	Residence	B	"	158.5	L	46	"	158.5	L	-	-	52	+ 6
212	Residence	B	"	178.3	L	44	"	178.3	L	-	-	50	+ 6
213	Residence	B	"	167.6	L	45	"	167.6	L	-	-	51	+ 6
214	Residence	B	"	154.8	L	46	"	154.8	L	-	-	52	+ 6
215	Residence	B	"	138.7	L	48	"	138.7	L	-	-	54	+ 6
216	Residence	B	"	121.9	L	49	"	121.9	L	-	-	56	+ 7
217	Residence	B	"	103.6	L	51	"	103.6	L	-	-	57	+ 6
218	Residence	B	"	67.1	L	56	"	67.1	L	-	-	62	+ 6
219	Residence	B	"	35.1	L	61	"	35.1	L	-	-	* 69	+ 8
220	Residence	B	"	34.1	R	61	"	34.1	R	-	-	* 69	+ 8
221	Residence	B	"	42.7	L	60	"	42.7	L	-	-	* 67	+ 7
222	Residence	B	"	39.6	R	60	"	39.6	R	-	-	* 68	+ 8
223	Business	C	"	50.3	R	58	"	50.3	R	-	-	65	+ 7
224	Business	C	"	35.1	R	61	"	35.1	R	-	-	69	+ 8
225	Business	C	"	21.3	L	65	"	21.3	L	-	-	* 73	+ 8
226	Residence	B	"	141.7	R	47	"	141.7	R	-	-	54	+ 7
227	Residence	B	"	70.1	R	55	"	70.1	R	-	-	62	+ 7

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
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TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT. 3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
ID#	LAND USE CATEGORY		NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM	
=====											
NC 16, From SR 1810 to SR 1884/SR 1804 (cont.)											
228	Residence	B	NC 16	88.4 R	53	NC 16	88.4 R	-	-	59	+ 6
229	Residence	B	"	103.6 R	51	"	103.6 R	-	-	57	+ 6
230	Residence	B	"	131.1 R	48	"	131.1 R	-	-	55	+ 7
231	Residence	B	"	155.4 R	46	"	155.4 R	-	-	52	+ 6
232	Residence	B	"	171.3 R	45	"	171.3 R	-	-	51	+ 6
233	Residence	B	"	82.3 R	53	"	82.3 R	-	-	60	+ 7
234	Residence	B	"	103.6 R	51	"	103.6 R	-	-	57	+ 6
235	Residence	B	"	122.5 R	49	"	122.5 R	-	-	55	+ 6
236	Residence	B	"	152.4 R	46	"	152.4 R	-	-	53	+ 7
NC 16, From SR 1884/SR 1804 to Traffic Break											
237	Business	C	NC 16	51.8 R	58	NC 16	51.8 R	-	-	64	+ 6
238	Residence	B	"	33.5 L	62	"	33.5 L	-	-	* 68	+ 6
239	Business	C	"	38.1 R	61	"	38.1 R	-	-	67	+ 6
240	Residence	B	"	38.1 R	61	"	38.1 R	-	-	* 67	+ 6
241	Residence	B	"	54.9 L	57	"	54.9 L	-	-	64	+ 7
242	Residence	B	"	70.1 L	55	"	70.1 L	-	-	61	+ 6
243	Residence	B	"	71.6 R	55	"	71.6 R	-	-	61	+ 6
244	Residence	B	"	30.5 R	62	"	30.5 R	-	-	* 69	+ 7
245	Residence	B	"	30.5 R	62	"	30.5 R	-	-	* 69	+ 7
246	Residence	B	"	54.9 L	57	"	54.9 L	-	-	64	+ 7
247	Residence	B	"	48.8 L	58	"	48.8 L	-	-	65	+ 7
248	Residence	B	"	30.5 R	62	"	30.5 R	-	-	* 69	+ 7
249	Residence	B	"	30.5 R	62	"	30.5 R	-	-	* 69	+ 7
250	Residence	B	"	30.5 R	62	"	30.5 R	-	-	* 69	+ 7

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

ALT.3

RECEPTOR INFORMATION ID# LAND USE CATEGORY	NEAREST ROADWAY NAME DISTANCE(m)	AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY NAME DISTANCE(m)	PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE
				-L-	-Y-	MAXIMUM	
NC 16, From SR 1884/SR 1804 to Traffic Break (cont'd)							
251 Residence B	" 29.0 L	63	" 29.0 L	-	-	* 69	+ 6
252 Residence B	" 27.4 L	63	" 27.4 L	-	-	* 70	+ 7
253 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
254 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
255 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
256 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
257 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
258 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
259 Residence B	" 25.9 L	63	" 25.9 L	-	-	* 70	+ 7
260 Residence B	" 29.0 L	63	" 29.0 L	-	-	* 69	+ 6
261 Residence B	" 21.9 L	65	" 21.9 L	-	-	* 71	+ 6
262 Business C	" 103.6 R	51	" 103.6 R	-	-	57	+ 6
263 Business C	" 36.6 R	61	" 36.6 R	-	-	67	+ 6
264 Residence B	" 88.4 L	53	" 88.4 L	-	-	59	+ 6
265 Residence B	" 21.3 L	65	" 21.3 L	-	-	* 72	+ 7

NC 16, From Traffic Break to Proposed NC East Loop(SR 1800)

266 Business C	NC 16 61.0 R	55	NC 16 61.0 R	-	-	64	+ 9
267 Residence B	" 55.2 R	56	" 55.2 R	-	-	64	+ 8
268 Business C	" 32.0 R	61	" 32.0 R	-	-	69	+ 8
269 Residence B	" 96.0 L	50	" 96.0 L	-	-	59	+ 9
270 Residence B	" 64.0 L	55	" 64.0 L	-	-	63	+ 8
271 Residence B	" 51.8 R	57	" 51.8 R	-	-	65	+ 8
272 Residence B	" 39.6 R	59	" 39.6 R	-	-	* 68	+ 9
273 Business C	" 74.7 R	53	" 74.7 R	-	-	61	+ 8

NOTE: Distances are from center of the existing or proposed roadways. -L--> Proposed roadway's noise level contribution.
All noise levels are hourly A-weighted noise levels. -Y--> Noise level from other contributing roadways.
Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N4.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC 16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),

Catawba County

TIP # R-3100 State Project # 9.1792501

ALT. 3

RECEPTOR INFORMATION			NEAREST ROADWAY		AMBIENT NOISE LEVEL	NEAREST PROPOSED ROADWAY		PREDICTED NOISE LEVELS			NOISE LEVEL INCREASE		
ID#	LAND USE	CATEGORY	NAME	DISTANCE(m)	LEVEL	NAME	DISTANCE(m)	-L-	-Y-	MAXIMUM			
=====													
NC 16, From Traffic Break to Proposed NC East Loop(SR 1800) (cont.)													
274	Business	C	NC 16	42.7	R	58	NC 16	42.7	R	-	-	67	+ 9
275	Residence	B	"	45.7	L	58	"	45.7	L	-	-	* 66	+ 8
276	Residence	B	"	85.3	R	52	"	85.3	R	-	-	60	+ 8
277	Residence	B	"	41.1	L	59	"	41.1	L	-	-	* 67	+ 8
278	Business	C	"	21.3	L	63	"	21.3	L	-	-	* 73	* + 10
279	Residence	B	"	51.8	L	57	"	51.8	L	-	-	65	+ 8
280	Residence	B	"	41.1	R	59	"	41.1	R	-	-	* 67	+ 8
281	Residence	B	"	68.6	L	54	"	68.6	L	-	-	62	+ 8
282	Residence	B	"	30.5	R	61	"	30.5	R	-	-	* 70	+ 9
283	Residence	B	"	76.2	L	53	"	76.2	L	-	-	61	+ 8
284	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
285	Residence	B	"	24.4	R	63	"	24.4	R	-	-	* 71	+ 8
286	Residence	B	"	30.5	L	61	"	30.5	L	-	-	* 70	+ 9
287	Residence	B	"	24.4	L	63	"	24.4	L	-	-	* 71	+ 8
288	Residence	B	"	38.1	R	59	"	38.1	R	-	-	* 68	+ 9
289	Residence	B	"	32.0	L	61	"	32.0	L	-	-	* 69	+ 8
290	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
291	Residence	B	"	30.5	L	61	"	30.5	L	-	-	* 70	+ 9
292	Business	C	"	62.5	R	55	"	62.5	R	-	-	63	+ 8
293	Residence	B	"	36.6	L	60	"	36.6	L	-	-	* 68	+ 8
294	Business	C	"	45.7	L	58	"	45.7	L	-	-	66	+ 8
295	Business	C	"	61.0	R	55	"	61.0	R	-	-	64	+ 9
296	Business	C	"	131.1	R	47	"	131.1	R	-	-	55	+ 8
297	Residence	B	"	33.5	L	60	"	33.5	L	-	-	* 69	+ 9
298	Residence	B	"	35.1	L	60	"	35.1	L	-	-	* 69	+ 9

NOTE: Distances are from center of the existing or proposed roadways. -L=> Proposed roadway's noise level contribution.
 All noise levels are hourly A-weighted noise levels. -Y=> Noise level from other contributing roadways.
 Category E noise levels shown as exterior/interior (58/48). * => Traffic noise impact (per 23 CFR Part 772).

TABLE N5.3

FHWA NOISE ABATEMENT CRITERIA SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

Description	Maximum Predicted Leq Noise Levels dBA			Contour Distances (Maximum)		Approximate Number of Impacted Receptors According to Title 23 CFR Part 772				
	15 m	30 m	60 m	72 dBA	67 dBA	A	B	C	D	E
ALT.3:										
1. NC 16, From Proposed NC 16 to SR 1003	74	69	64	32 m	53 m	0	44	2	0	0
2. NC 16, From SR 1003 to SR 1876	73	68	63	30 m	51 m	0	17	0	0	0
3. NC 16, From SR 1876 to SR 1810	73	69	63	31 m	52 m	0	17	1	0	0
4. NC 16, From SR 1810 to SR 1884/SR 1804	74	70	64	34 m	56 m	0	27	5	0	1
5. NC 16, From SR 1884/SR 1804 to SR 1909	72	68	62	21 m	40 m	0	19	0	0	0
6. NC 16, From SR 1909 to SR 1800	73	69	63	24 m	44 m	0	16	1	0	0
TOTALS						0	140	9	0	1

NOTES - 1. 15m, 30m, and 60m distances are measured from center of nearest travel lane.
2. 72 dBA and 67 dBA contour distances are measured from center of proposed roadway.

TABLE N6.3

TRAFFIC NOISE LEVEL INCREASE SUMMARY

NC-16, From SR 1895 (Tower Road) to SR 1800 (Caleb Setzer Road),
Catawba County

TIP # R-3100 State Project # 8.1792501

Section	RECEPTOR EXTERIOR NOISE LEVEL INCREASES							Substantial Noise Level Increases(1)	Impacts Due to Both Criteria(2)
	<=0	1-4	5-9	10-14	15-19	20-24	>= 25		
ALT. 3:									
1. From Prop. NC 16 to SR 1003	0	0	85	0	0	0	0	0	0
2. From SR 1003 to SR 1876	0	0	36	0	0	0	0	0	0
3. From SR 1876 to SR 1810	0	0	27	1	0	0	0	1	1
4. From SR 1810 to SR 1884/ SR 1804	0	0	69	18	0	0	0	18	14
5. From SR 1884/SR 1804 to Traffic Break	0	0	29	0	0	0	0	0	0
4. From Traffic Break to Prop. NC East Loop (SR 1800)	0	0	32	1	0	0	0	1	1
TOTALS	0	0	278	20	0	0	0	20	16

(1) As defined by only a substantial increase (See bottom of Table N2).

(2) As defined by both criteria in Table N2

R-3100

APPENDIX F

AIR QUALITY ANALYSIS DATA

Table A1

QAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: R-3100: NC 16, Catawba County

RUN: NC 16, Build, Year 2000

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S ZO = 108. CM
 U = 1.0 M/S CLAS = 5 (E) ATIM = 60. MINUTES MIXH = 1000. M AMB = 1.8 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (M)	W (M)	V/C QUEUE (VEH)
	X1	Y1	X2	Y2							
1. Far Lane Link	10.8	-805.0	10.8	805.0	1610.	360. AG	698.	13.3	.0	13.2	
2. Near Lane Link	.0	805.0	.0	-805.0	1610.	180. AG	698.	13.3	.0	13.2	

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M)		
	X	Y	Z
1. R/W, 45.7m From CL	-17.5	.0	1.8

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND * CONCENTRATION
 ANGLE * (PPM)
 (DEGR)* RECI

MAX * 2.5
 DEGR. * 7

THE HIGHEST CONCENTRATION IS 2.50 PPM AT 7 DEGREES FROM RECI .

Table A3

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: R-3100: NC 16, Catawba County

RUN: NC 16, No-Build, Year 2000

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S ZO = 108. CM
 U = 1.0 M/S CLAS = 5 (E) ATIM = 60. MINUTES MIXH = 1000. M AMB = 1.8 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (M)	W (M)	V/C QUEUE (VEH)
	X1	Y1	X2	Y2							
1. Far Lane Link	3.6	-805.0	3.6	805.0	1610.	360. AG	698.	25.2	.0	9.6	
2. Near Lane Link	.0	805.0	.0	-805.0	1610.	180. AG	698.	25.2	.0	9.6	

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M)		
	X	Y	Z
1. R/W, 9.1m From CL	-7.3	.0	1.8

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND * CONCENTRATION
 ANGLE * (PPM)
 (DEGR)* RECI

MAX * 3.9
 DEGR. * 6

THE HIGHEST CONCENTRATION IS 3.90 PPM AT 6 DEGREES FROM RECI .

Table A4

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0, JANUARY 1992

JOB: R-3100: NC 16, Catawba County

RUN: NC 16, No-Build, Year 2020

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S VD = .0 CM/S ZO = 108. CM
 U = 1.0 M/S CLAS = 5 (E) ATIM = 60. MINUTES MIXH = 1000. M AMB = 1.8 PPM

LINK VARIABLES

LINK DESCRIPTION	LINK COORDINATES (M)				LENGTH (M)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (M)	W (M)	V/C QUEUE (VEH)
	X1	Y1	X2	Y2							
1. Far Lane Link	3.6	-805.0	3.6	805.0	1610.	360. AG	1183.	34.6	.0	9.6	
2. Near Lane Link	.0	805.0	.0	-805.0	1610.	180. AG	1183.	34.6	.0	9.6	

RECEPTOR LOCATIONS

RECEPTOR	COORDINATES (M)		
	X	Y	Z
1. R/W, 9.1m From CL	-7.3	.0	1.8

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE RANGE: 0.-360.

WIND * CONCENTRATION
 ANGLE * (PPM)
 (DEGR)* RECI

MAX * 6.6
 DEGR. * 8

THE HIGHEST CONCENTRATION IS 6.60 PPM AT 8 DEGREES FROM RECI .