

Min brg = 85'

PREDESIGN-PRESURVEY REPORT

Project# _____
TIP# _____
Let Date _____
WBS# _____

County Robeson

Bridge# 414
Road# SR 1323 (Watson mill pond)
Stream Watsons pond
Little Raft Swamp (FIS)

Type Of Request: POC Force Account TIP NCMA

Date _____ Name E AKpuogu

Assigned To _____

Checked By _____

Prior Survey Date _____ (attach copy of prior survey)

Study By Scour Section _____

Flood Zone Yes Detail Study Limited Date Oct 17, 2006 Panel# 9348

B.M. Info _____

Quad Map Red Springs Drainage Area 22.8 Sq. mi From USGS NC stream stat.
Q25 1630 Q50 2020 Q100 2434 Method _____

FIS Q100 = 1458 cfs

EXISTING BRIDGE INFORMATION

Location 0.15 mi E Jct SR 1325

Average Daily Traffic 70 (1991)

Length 57' Bed- To Crown 12' Water Depth 4'

Type Structure Prestressed Conc. Cored Slab

Type Spans 1 @ 14'3, 2 @ 14'- 1 @ 14'3

Upstream Structure Brg # 20 (Hoke County)

Location 0.4 mi S Jct SR 1131

Bed- To Crown 6' Prior Survey _____

Downstream Structure Brg # 48 (NC 71 and NC 211)

Location 0.3 mi N Jct SR 1780

Bed- To Crown 13' Prior Survey _____

SCS Watershed _____

ENVIRONMENTAL

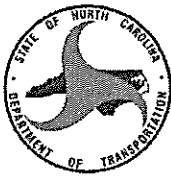
Trout Stream No Anadromous Fish No Primary Nursery Area No

High Quality Waters No Nutrient Sensitive Waters No

Near Water Supply Intake No CAMA County No

Stream Classification C, SW

DENR River Basin Info. Lumber



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION SHORED STRUCTURE;
TEMP REPAIRS: ENCASED PILES NOTED

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY ROBESON BRIDGE NUMBER 770414 INSPECTION CYCLE 2 YRS
ROUTE SR1323 ACROSS WATSONS POND M.P. 0

LOCATION 0.15 MI.E.JCT.SR1325

SUPERSTRUCTURE PRESTRESSED CONCRETE CORED SLAB

SUBSTRUCTURE E.BTS&BTS:PPC.CAPS/TIM.PILES;STL.CRUTCH BTS@BTS2&3

SPANS 1@14'3;2@14';1@14'3

LONGITUDE 79° 11' 22.40"

LATITUDE 34° 50' 29.66"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 08/30/2012

OPERATING RATING

PRESENT POSTING Not Posted

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4 DELINEATORS



LOOKING EAST (WATSON MILL ROAD)

SIGN NOTICE ISSUED FOR	NUMBERED REQUIRED
<u>No</u> WEIGHT LIMIT	<u></u>
<u>No</u> DELINEATORS	<u></u>
<u>No</u> NARROW BRIDGE	<u></u>
<u>No</u> ONE LANE BRIDGE	<u></u>
<u>No</u> LOW CLEARANCE	<u></u>

BRIDGE MANAGEMENT UNIT

DATA ON EXISTING STRUCTURE

Run Date: 09/25/2012

COUNTY :	DIVISION :	DISTRICT :	STRUCTURE NUMBER :	LENGTH :	
ROBESON	6	1	770414	57	FEET

ROUTE CARRIED :	FEATURE INTERSECTED :
SR1323	WATSONS POND

LOCATED :	BRIDGE NAME :	CITY :
0.15 MI.E.JCT.SR1325		

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
09	NFA	NFA	70 1991	LT 253 RT 253

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1954	BMU			HS 15

REHAB :	BY :	PROJ :	ALIGNMENT :	SKEW :	LANES :	
			TAN	90	ON 2 UNDER 0	

NAVIGATION :			HT. CRN. TO BED :		WATER DEPTH :	
VC 0 FT	HC 0 FT		12 FT		4 FT	

SUPERSTRUCTURE : PRESTRESSED CONCRETE CORED SLAB

SUBSTRUCTURE : E.BTS&BTS:PPC.CAPS/TIM.PILES;STL.CRUTCH BTS@BTS2&3

SPANS : 1@14'3";2@14';1@14'3"

BEAMS OR GIRDERS : 6 PRESTRESSED CONCRETE CORED SLAB SECTIONS

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
PPC.C.S/2.75 AW		25.5 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
24.083 FT	25 FT	LT .4585 FT RT .4585 FT

VERT.CL.OVER :
999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :		DATE
HS-1	HS-1	SLAB PC	SV TTST		07/14/1983

SYSTEM :	GREEN LINE ROUTE :
Secondary S.R. Route	N

UNDER ROUTES AND CLEARANCES

REMARKS :

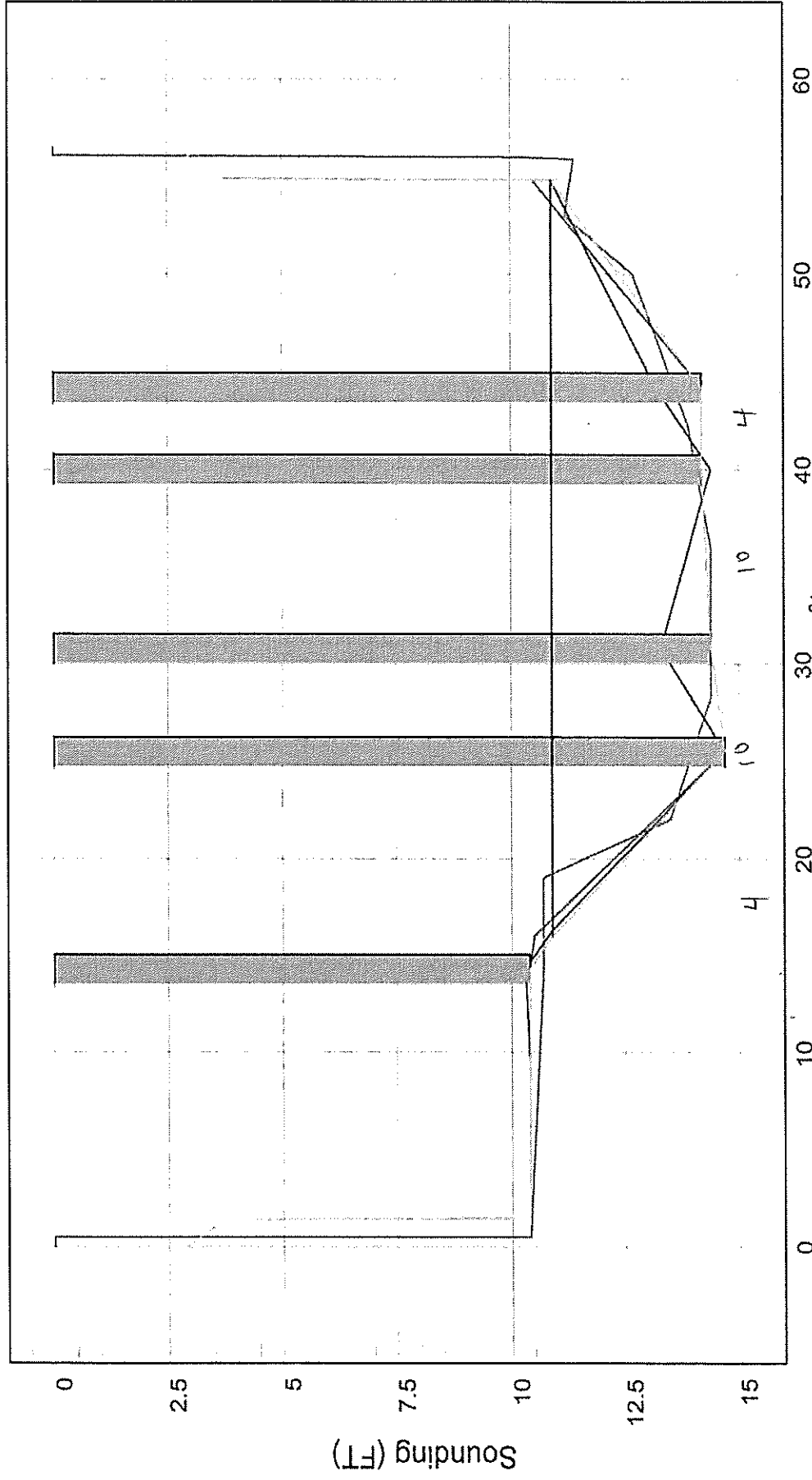
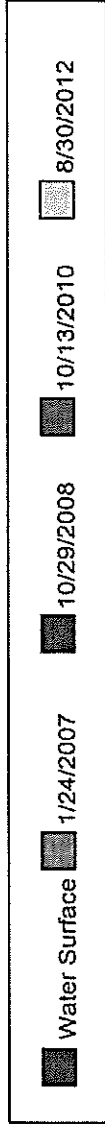
Bridge: 770414

County ROBESON

Date: 08/30/2012

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



$$12 \times 1.5 = 18 \times 2 = 36 + 20 + 28 = 84$$

Distance (FT)

Section 5.0 – Engineering Methods

Table 7—Summary of Discharges

Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Little Marsh Swamp (continued)	At the confluence of Dunn's Marsh Creek	23.55	*	*	1,292	*
	At the confluence of Bogue Swamp	18.81	*	*	1,107	*
	At the confluence of Little Marsh Swamp Tributary	12.96	*	*	857	*
	Approximately 4,300 feet downstream of NC 71	10.69	*	*	750	*
	Approximately 1,700 feet upstream of Railroad	6.73	*	*	546	*
	Approximately 2,000 feet downstream of Hoke County Line	4.76	*	*	430	*
Little Marsh Swamp Tributary	At the confluence with Little Marsh Swamp Creek	4.55	*	*	406	*
	Approximately 1,600 feet downstream of NC 20	3.23	*	*	320	*
	Approximately 1,900 feet upstream of NC 20	2.53	*	*	271	*
Little Raft Swamp	At mouth	33.40	*	*	1,643	*
	At the confluence of Mclean Branch	28.08	*	*	1,458	*
	Approximately 9,950 feet downstream of US Hwy 401	7.78	*	*	603	*
Little Swamp	At the confluence with Big Swamp Creek	4.79	*	*	432	*
	At Singletary Church Road	4.18	*	*	393	*

Section 5.0 – Engineering Methods

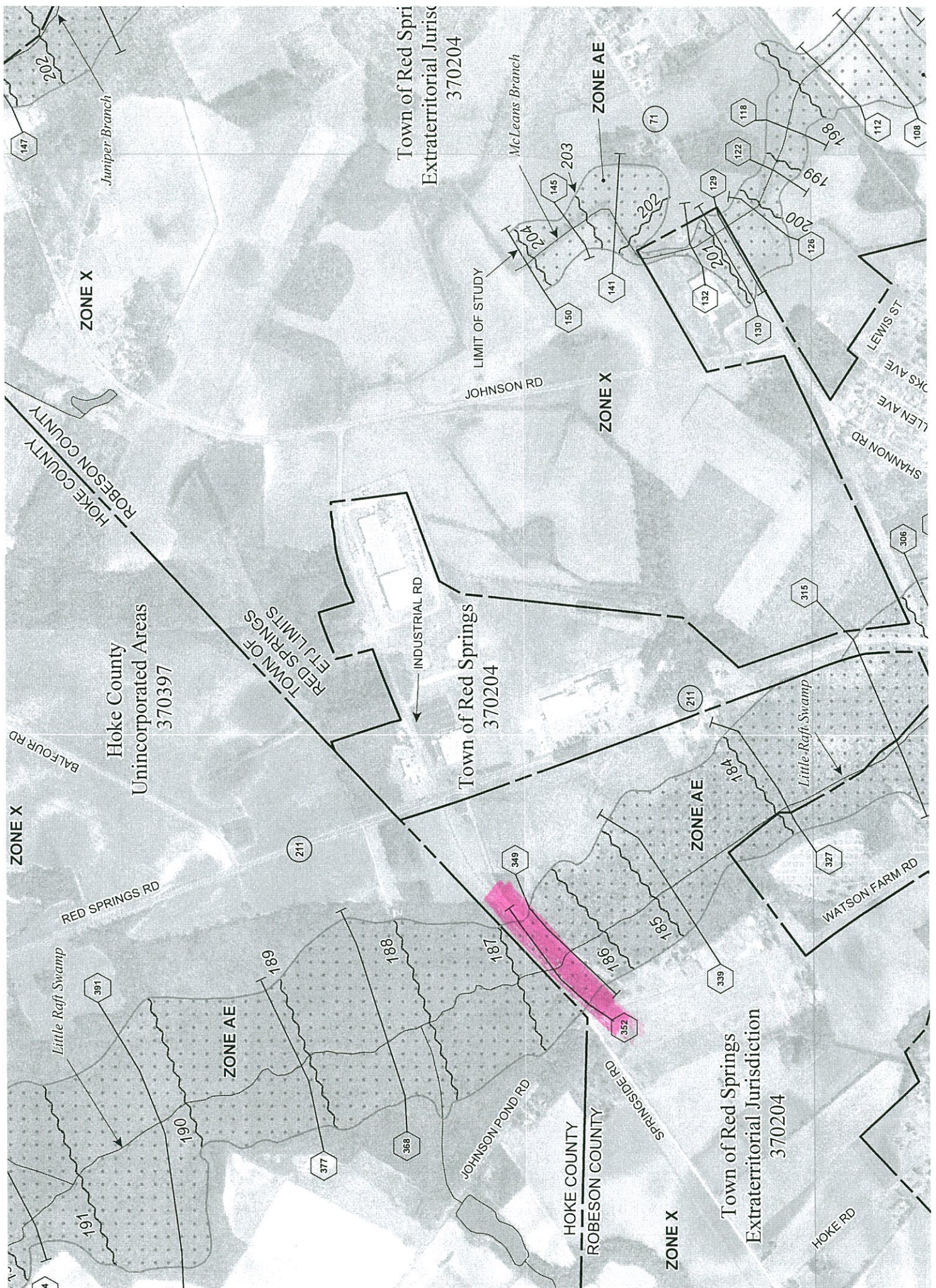
Table 9—Roughness Coefficients

Stream	Channel "n"	Overbank "n"
Gravel Branch	0.16	0.055
Gum Branch	0.055-0.085	0.16
Gum Swamp	0.05-0.055	0.05-0.125
Hog Swamp	0.065	0.125
Holy Swamp	0.055	0.12
Horn Camp Swamp	0.058	0.13-0.135
Horns Millrace	0.065	0.125
Horse Branch	0.055	0.16
Horse Swamp	0.055	0.11-0.12
Humphrey Branch	0.058	0.13-0.135
Indian Swamp	0.045-0.05	0.12
Ivey Branch	0.06 – 0.12	0.08 – 0.15
Jackson Swamp	0.055	0.16
Jacob Diversion	0.055-0.085	0.035-0.16
Jacob Swamp	0.06 – 0.12	0.035-0.16
Jordan Swamp	0.053	0.125
Jowers Branch	0.07	0.16
Juniper Branch	0.058	0.125-0.13
Lees Branch	0.055	0.16
Leith Creek	0.07	0.16
Little Bull Branch	0.7	0.16
Little Burnt Swamp	0.05	0.125
Little Hog Swamp	0.06	0.12
Little Indian Swamp	0.045	0.12
Little Jacob Swamp	0.06 – 0.12	0.035-0.16
Little Juniper Swamp	0.055	0.125
Little Marsh Swamp	0.055	0.16
Little Marsh Swamp Tributary	0.055	0.16
Little Raft Swamp	0.058	0.125-0.13
Little Swamp	0.058	0.13
Little Tenmile Swamp	0.055	0.06
Long Branch (Near City of Lumberton)	0.055	0.16
Long Branch (Near Town of Parkton)	0.055-0.085	0.16
Long Swamp	0.45-0.55	0.13
Lumber River	0.035-0.120	0.080-0.150
McGregor Branch	0.07	0.16
McLeans Branch	0.055	0.128-0.13
McLeod Mill Branch	0.065	0.125

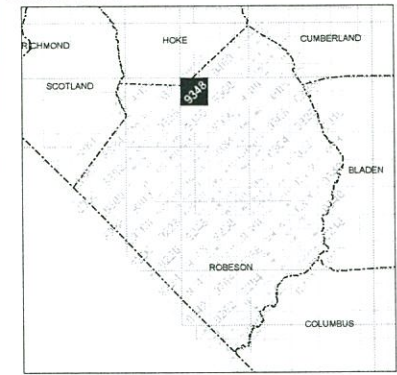
Section 5.0 – Engineering Methods

Table 10—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
LITTLE RAFT SWAMP (continued)				
067	6,710	1,458	160.9	5
082	8,191	1,458	161.5	5
097	9,682	1,458	162.7	5
111	11,144	1,458	164.3	5
128	12,787	1,458	165.6	5
140	14,029	1,458	167.1	5
148	14,836	1,458	167.8	5
161	16,078	1,458	168.6	5
167	16,716	1,458	168.9	5
176	17,639	1,458	169.3	5
179	17,856	1,458	170.5	5
181	18,122	1,458	171.0	5
191	19,066	1,458	171.5	5
196	19,615	1,458	172.6	5
205	20,523	1,458	174.0	5
212	21,213	1,458	174.6	5
223	22,292	1,458	175.2	5
233	23,299	1,458	175.8	5
249	24,915	1,458	176.6	5
252	25,233	1,458	177.2	5
265	26,515	1,458	177.6	5
275	27,545	1,458	180.0	5
282	28,235	1,458	180.9	5
284	28,353	1,458	181.2	5
289	28,900	1,458	181.8	5
294	29,354	1,458	182.1	5
300	30,000	1,458	182.3	5
306	30,570	1,458	182.7	5
315	31,517	1,458	183.5	5
327	32,707	1,458	184.0	5
339	33,865	1,458	184.9	5
349	34,907	1,458	186.4	5
352	35,169	1,458	186.7	5
LITTLE SWAMP				
268	26,801	432	99.6 ⁴	145 / 268
280	27,971	432	99.9	118 / 13
288	28,780	432	101.4	229 / 127
298	29,805	432	102.5	19 / 140
306	30,583	432	103.1	38 / 146
307	30,665	393	103.1	48 / 131
308	30,770	393	103.6	60 / 119
309	30,857	393	103.6	119 / 110
319	31,907	393	104.0	125 / 19



STATE OF NORTH CAROLINA FIRM PANEL LOCATOR DIAGRAM



DATUM INFORMATION

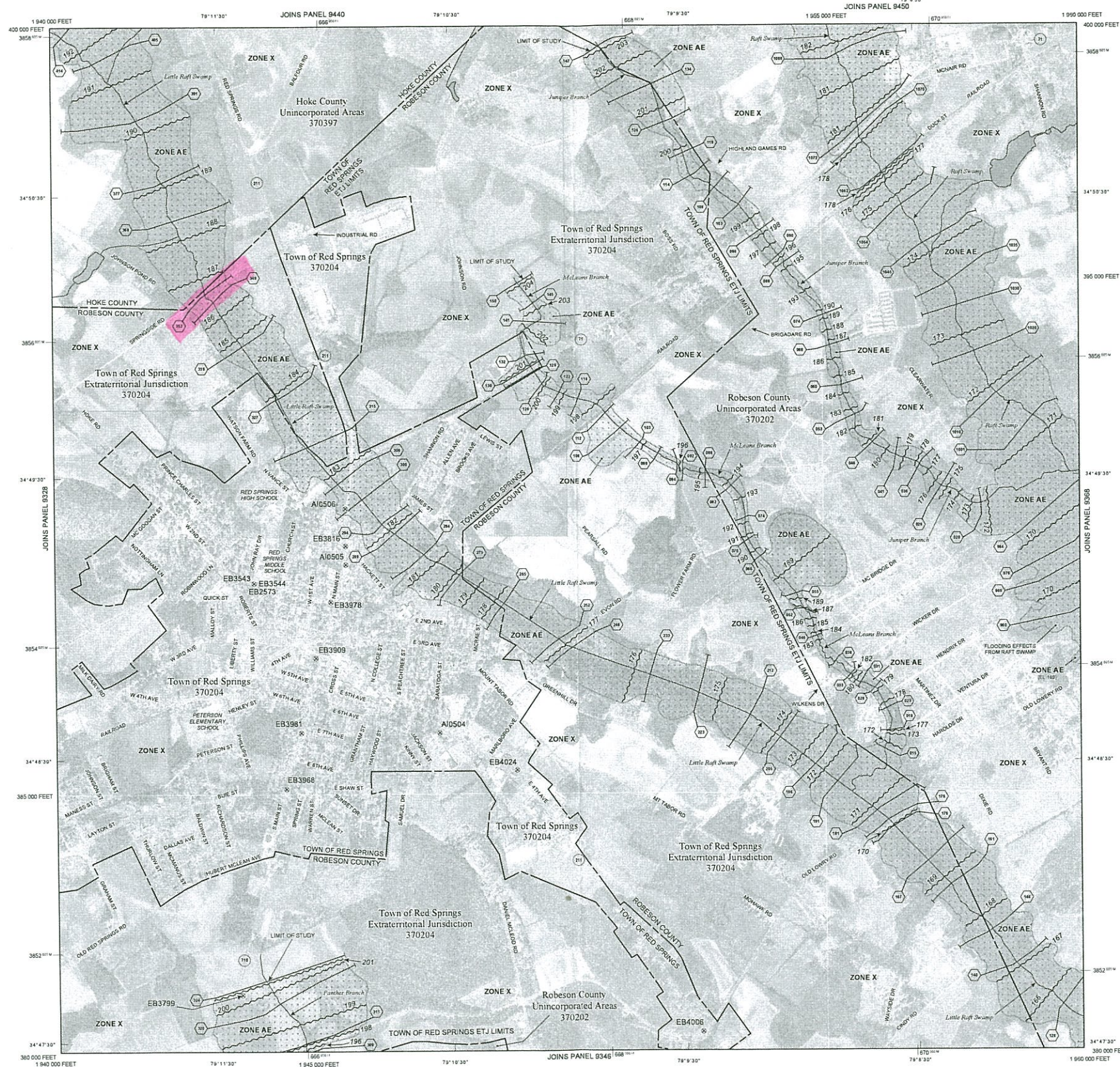
The projection used in the preparation of this map was the North Carolina State Plane (NAD83). The horizontal datum was the North American Datum of 1983, GR83 ellipsoid. Differences in datum, ellipsoid, projection, or Universal Transverse Mercator zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdictional boundaries. These differences do not affect the accuracy of this FIRM. All coordinates on this map are in U.S. Survey Feet, where 1 U.S. Survey Foot = 1200/3937 Meters.

Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 29) has been computed for each North Carolina county. This offset was then applied to the NGVD 29 flood elevations that were not revised during the creation of this statewide format FIRM. The offsets for each county shown on this FIRM panel are shown in the vertical datum offset table below. Where a county boundary and a flooding source with unrevised NGVD 29 flood elevations are coincident, an individual offset has been calculated and applied during the creation of this statewide format FIRM. See Section 5.1 of the accompanying Flood Insurance Study report to obtain further information on the conversion of elevations between NAVD 88 and NGVD 29. To obtain current elevation, description, and/or location information for bench marks shown on this map, please contact the North Carolina Geodetic Survey at the address shown below. You may also contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit their website at www.ngs.noaa.gov.

North Carolina Geodetic Survey
121 West Jones Street
Raleigh, NC 27601
(919) 733-3535
www.ncgs.state.nc.us

County	Vertical Datum Offset (ft)
Hoke	-0.55
Robeson	-0.95

Example: NAVD 88 = NGVD 29 + (-0.84)



LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water-surface elevation of the 1% annual chance flood.

- ZONE A** No Base Flood Elevations determined.
- ZONE AE** Base Flood Elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); Base Flood Elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE AR** Special Flood Hazard Area formerly protected from the 1% annual chance flood by a flood control system that was subsequently determined to be ineffective. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood.
- ZONE A99** Area to be protected from 1% annual chance flood by a Federal flood protection system under construction; no Base Flood Elevations determined.
- ZONE VE** Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile, and areas protected by levees from 1% annual chance or greater flood.

OTHER AREAS

ZONE I Areas determined to be outside the 0.2% annual chance floodplain.

ZONE D Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Zones and boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Base Flood Elevation line and value, elevation in feet
- Base Flood Elevation value, where uniform within zone, elevation in feet

Reference to the North American Vertical Datum of 1988

Cross section line

Transect line

Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)

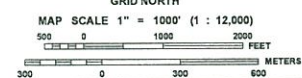
2000-meter Universal Transverse Mercator grid ticks, zone 17

5000-foot grid values, North Carolina State Plane coordinate system (FIPS ZONE 3200, State Plane NAD 83 feet)

North Carolina Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel).

National Geodetic Survey bench mark (see explanation in the Datum Information section of this FIRM panel).

River Mile



NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The community map repository should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where Base Flood Elevations (BFEs) and/or floodways have been determined, users are encouraged to consult the Flood Profiles, Floodway Data, Limited Detailed Flood Hazard Data, and/or Summary of 250-meter Elevation Tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS report should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Boundaries of regulatory floodways shown on the FIRM for flooding sources studied by detailed methods were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data for flooding sources studied by detailed methods as well as non-encroachment widths for flooding sources studied by limited detailed methods are provided in the FIS report for this jurisdiction. The FIS report also provides instructions for determining a floodway using non-encroachment widths for flooding sources studied by limited detailed methods.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures. Refer to Section 4.4 "Flood Protection Measures" of the Flood Insurance Study report for information on the flood control structures in this jurisdiction.

Base map information and geospatial data used to develop this FIRM were obtained from various organizations, including the participating local community(ies), state and federal agencies, and/or other sources. The primary base for this FIRM is aerial imagery acquired as part of the National Digital Orthophoto Program. The time period of collection for the imagery is 1989-1999. Information and geospatial data supplied by the local community(ies) that met FEMA base map specifications were considered the preferred source for development of the base map. See geospatial metadata for the associated digital FIRM for additional information about base map preparation.

Base map features shown on this map, such as corporate limits, are based on the most up-to-date data available at the time of publication. Changes in the corporate limits may have occurred since this map was published. Map users should consult the appropriate community official or website to verify current conditions of jurisdictional boundaries and base map features. This map may contain records that were not considered in the hydraulic analysis of streams where no new hydraulic model was created during the production of this statewide format FIRM.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report (which contains authoritative hydraulic data) may reflect stream channel distances that differ from what is shown on this map.

Please refer to the separately printed Map Index for an overview map of the county showing the layout of map panels, community map repository addresses, and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each is located.

If you have questions about this map, or questions concerning the National Flood Insurance Program in general, please call 1-877-FEMA MAP (1-877-336-2627) or visit the FEMA website at www.fema.gov.

An accompanying Flood Insurance Study report, Letter of Map Revision (LOMR) or Letter of Map Amendment (LOMA) revising portions of this panel, and digital versions of this FIRM may be available. Visit the North Carolina Floodplain Mapping Program website at www.ncfloodmaps.com, or contact the FEMA Map Service Center at 1-800-358-6616 for information on all related products associated with this FIRM. The FEMA Map Service Center may also be reached by Fax at 1-800-358-9620 and their website at www.msc.fema.gov.

MAP REPOSITORY

Refer to listing of Map Repositories on Map Index or visit www.ncfloodmaps.com.

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL

JANUARY 19, 2005

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

OCTOBER 17, 2006

For community map revision history prior to statewide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent, the North Carolina Division of Emergency Management or the National Flood Insurance Program at the following phone numbers or websites:

NC Division of Emergency Management (919) 715-8000 www.ncdems.state.nc.us
National Flood Insurance Program 1-800-635-6620 www.fema.gov/nfi



This digital Flood Insurance Rate Map (FIRM) was produced through a unique cooperative partnership between the State of North Carolina and the Federal Emergency Management Agency (FEMA). The State of North Carolina has implemented a long term approach of floodplain management to decrease the costs associated with flooding. This is demonstrated by the State's commitment to map floodplain areas at the local level. As a part of this effort, the State of North Carolina has joined in a Cooperative Technical State agreement with FEMA to produce and maintain this digital FIRM.

www.ncfloodmaps.com

PANEL 9348K

FIRM FLOOD INSURANCE RATE MAP NORTH CAROLINA

PANEL 9348

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

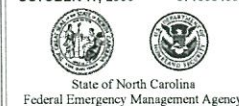
CONTAINS

COMMUNITY	CD NO.	PANEL	SUFFIX
HOKE COUNTY	370397	9348	K
RED SPRINGS TOWN OF	370254	9348	K
ROBESON COUNTY	370202	9348	K

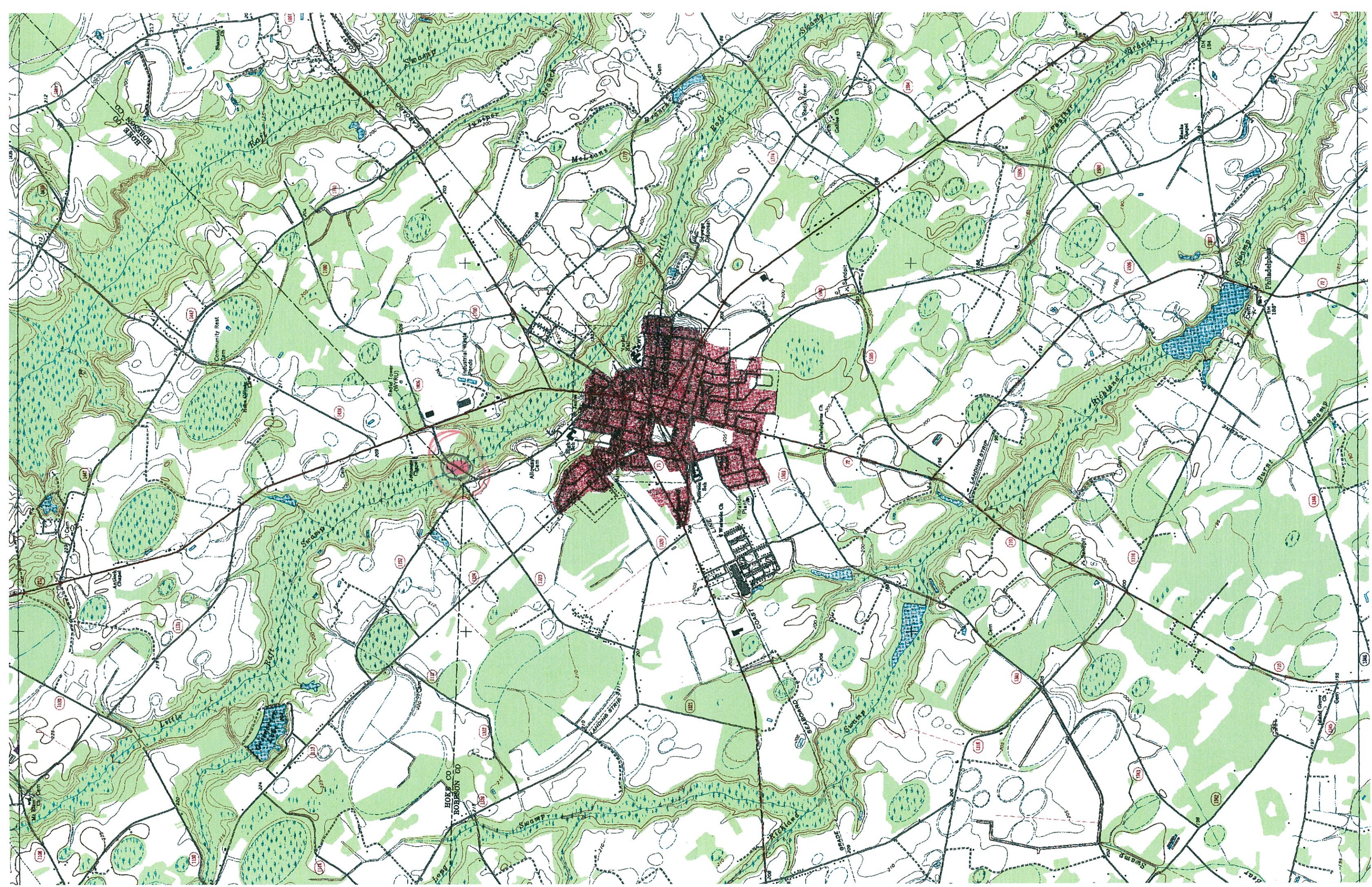
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

MAP REVISED
OCTOBER 17, 2006

MAP NUMBER
3710934800K



State of North Carolina
Federal Emergency Management Agency



*North Carolina StreamStats***Basin Characteristics Report**

Date: Tue Jun 25 2013 07:00:07 Mountain Daylight Time

NAD27 Latitude: 34.8341 (34 50 03)

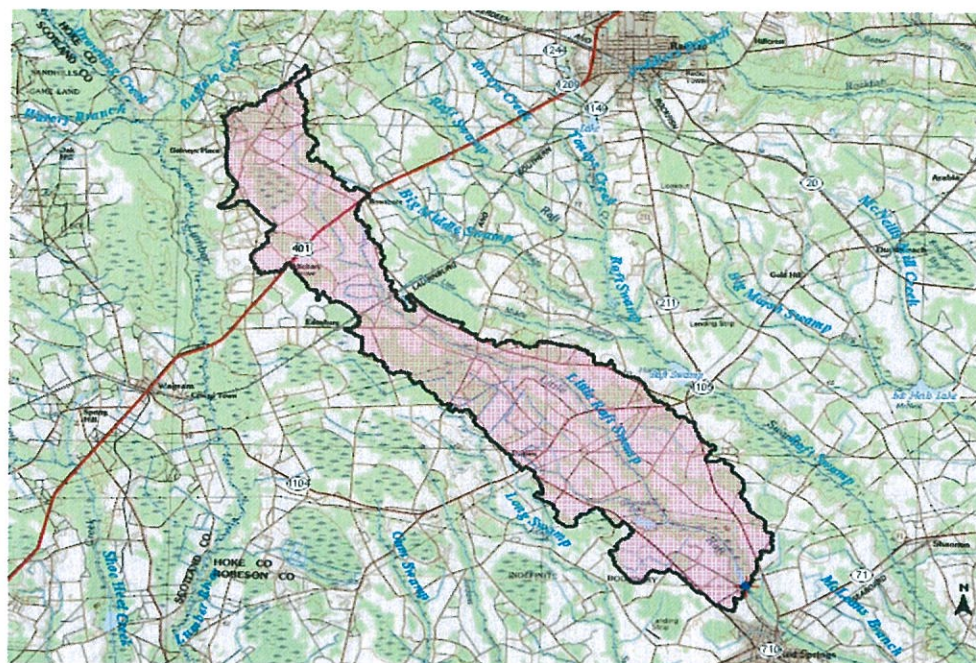
NAD27 Longitude: -79.1900 (-79 11 24)

NAD83 Latitude: 34.8342 (34 50 03)

NAD83 Longitude: -79.1897 (-79 11 23)

Parameter	Value
Area in square miles	22.8
Percent of area covered by forest using 1992 NLCD	22.512
Percent of area of protected Federal and State owned land	0
Percent of area covered by shrubland using 2001 NLCD	8.447
Percent of area covered by shrubland using 2006 NLCD	8.430
Percent of area in hydric soil 'A' defined by SSURGO	19.6
Percent of area in hydric soil 'B' defined by SSURGO	56.2
Percent of area in hydric soil 'C' defined by SSURGO	2.01
Percent of area in hydric soil 'D' defined by SSURGO	21.8
Percent of area covered by water using 1992 NLCD	0.316
Percent of area covered by water using 2001 NLCD	0.485
Percent of area covered by water using 2006 NLCD	0.436
Percent of area covered by wetland using 1992 NLCD	15.257
Percent of area covered by wetland using 2001 NLCD	22.208
Percent of area covered by wetland using 2006 NLCD	21.818

StreamStats Print Page



2.5 1.25 0 2.5 Miles

Explanation

- ★ Global Watershed Point
- Stp1000 Point
- NCDOT Points
- ▲ Local Gages
- ▲ Gaging Station, Continuous Record
- ▲ Low Flow, Partial Record
- ▲ Peak Flow, Partial Record
- ▲ Peak and Low Flow, Partial Record
- ▲ Stage Only
- ▲ Low Flow, Partial Record, Stage
- ▲ Miscellaneous Record
- ▲ Unknown
- Local NHD2
- Long as Flow at 3D
- Stream Grid
- Global Watershed
- Pilot Study Area
- hucpoly

6/25/2013 7:00:51 AM

