

SF

Min brg = 151'

PREDESIGN-PRESURVEY REPORT

Project# SF-230167

TIP#

Let Date

WBS#

County ColumbusBridge# 167Road# SR 1379Name Hinsons Crossroads RmStream Gapway Swamp

Type Of Request: POC Force Account TIP NCMA

Date 5/21/13 Name EAKpugy

Assigned To

Checked By

Prior Survey Date yes (attach copy of prior survey)

Study By Scour Section

Flood Zone Yes Detail Study Limited Date June 2, 2006 Panel# 9188

B.M. Info

Quad Map Fair Bluff Drainage Area 35.8 Sq mi From USGS-NC stream stats.Q25 2140 Q50 2645 Q100 3185 Method USGS Regression eqn, Rural Region 4, Coastal pla

EXISTING BRIDGE INFORMATION

Location 0.7 mi W Jct NC 904Average Daily Traffic 190 (2008)Length 151' Bed- To Crown 15' Water Depth 4'Type Structure PPC Channels (BMD-13 & 13-1)Type Spans 1 @ 30'4, 3 @ 30', 1 @ 30'9Upstream Structure Brg # 161Location 0.2 mi E Jct SR 1363Bed- To Crown 15' Prior SurveyDownstream Structure N/A

Location

Bed- To Crown Prior Survey

SCS Watershed

ENVIRONMENTAL

Trout Stream No Anadromous Fish No Primary Nursery Area NoHigh Quality Waters No Nutrient Sensitive Waters NoNear Water Supply Intake No CAMA County NoStream Classification C, SWDENR River Basin Info. Lumber

FIS Q100 = 1425 cfs



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION TEMPORARY REPAIRS: ENCASED PILES

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY COLUMBUS

BRIDGE NUMBER 230167

INSPECTION CYCLE 2 YRS

ROUTE SR1379

ACROSS GAPWAY SWAMP

M.P. 0

LOCATION 0.7 MI W JCT NC904

SUPERSTRUCTURE PPC CHANNELS (BMD-13&13-1)

SUBSTRUCTURE E.BTS&INT.BTS:PPC CAPS/TIMBER PILES @ 5'9 CTS.

SPANS 1@30'4;3@30';1@30'9

LONGITUDE 79° 0' 28.0"

79° 0' 17.2"

LATITUDE 34° 16' 19.0"

34° 16' 11.7"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 08/25/2009

OPERATING RATING

PRESENT POSTING SV 25 TTST 28

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4 DELINEATORS



LOOKING NORTH

SIGN NOTICE
ISSUED FOR

NUMBERED
REQUIRED

No WEIGHT LIMIT

No DELINEATORS

No NARROW BRIDGE

No ONE LANE BRIDGE

No LOW CLEARANCE

BRIDGE MANAGEMENT UNIT
DATA ON EXISTING STRUCTURE

Run Date: 09/18/2009

COUNTY : COLUMBUS		DIV : 6		DIST : 3		STRUCTURE NUMBER : 230167		LENGTH : 151 FEET	
ROUTE CARRIED : SR1379				FEATURE INTERSECTED : GAPWAY SWAMP					
LOCATED : 0.7 MI W JCT NC904				BRIDGE NAME :					
FUNC. CLASS : 09		SYST.ON : NFA		SYST.UNDER : NFA		ADT & YR : 190 2008		RAIL TYPE : LT 233 RT 233	
BUILT : 1967		BY : BMU		PROJ : 5.4351		FED.AID PROJ :		DESIGN LOAD : H 10	
REHAB :		BY : DBM		PROJ : 6B.202411		ALIGNMENT : TAN.		SKEW : 90	
								LANES : ON 2 UNDER	
NAVIGATION :				HT. CRN. TO BED :				WATER DEPTH :	
VC 0.0 FT		HC 0.0 FT		15 FT		4 FT			
SUPERSTRUCTURE : PPC CHANNELS (BMD-13&13-1)									
SUBSTRUCTURE : E.BTS&INT.BTS:PPC CAPS/TIMBER PILES @ 5'9 CTS.									
SPANS : 1@30'4;3@30';1@30'9									
BEAMS OR GIRDERS : 10 PPC CHANNEL SECTIONS									
FLOOR : PPCCH/2 AWS		ENCROACHMENT :		DECK (OUT TO OUT) : 25.8 FT					
CLEAR ROADWAY : 24.3 FT		BETWEEN RAILS : 25.3 FT		SIDEWALK OR CURB : LT 0.5 FT RT 0.5 FT					
VERT.CL.OVER : 99 FT 99 IN		VERT.CL.UNDER : 00 FT 00 IN		HOR.CL.UNDER : 0.0 FT					
INV.RTG. : HS-6		OPE.RTG. : HS-18		CONTR.MEMBER : PILE, TIM.		POSTED : SV 26 TTST 30		DATE 09/18/2009	
SYSTEM : Secondary S.R. Route				GREEN LINE ROUTE : N					
2ND OPENING :		3RD OPENING :		4TH OPENING :		5TH OPENING :			
REMARKS :									

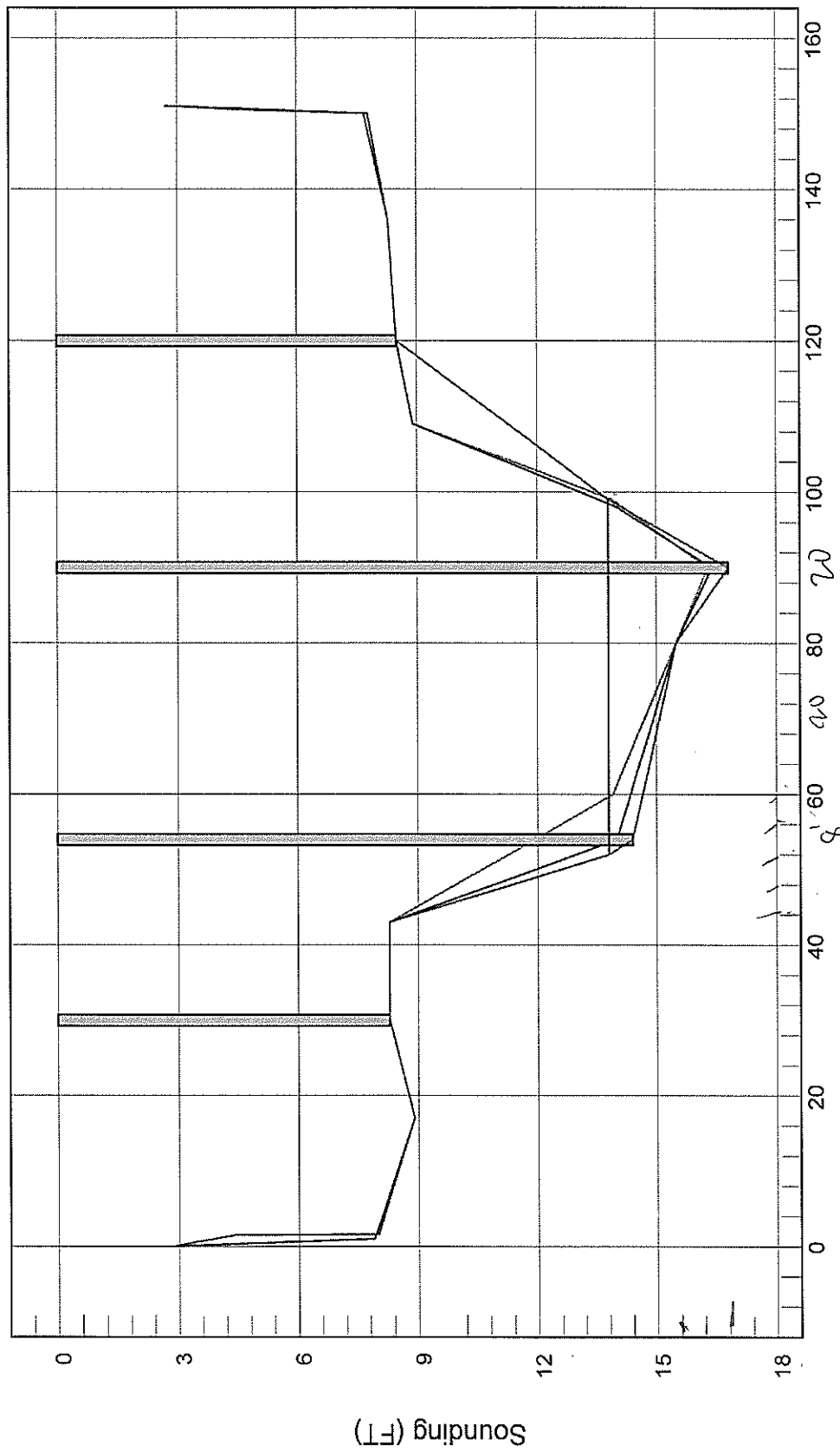
Bridge: 230167

County COLUMBUS

Date: 08/25/2009

STREAMBED PROFILE (Downstream)

Top of Rail = 0 FT (Sounding)



Distance (FT) 46

$$13'8 \times 1.5 = 20.7 \times 2 = 41.4 + 20 + 46 = 107'$$

Section 5.0 – Engineering Methods

Table 7—Summary of Discharges

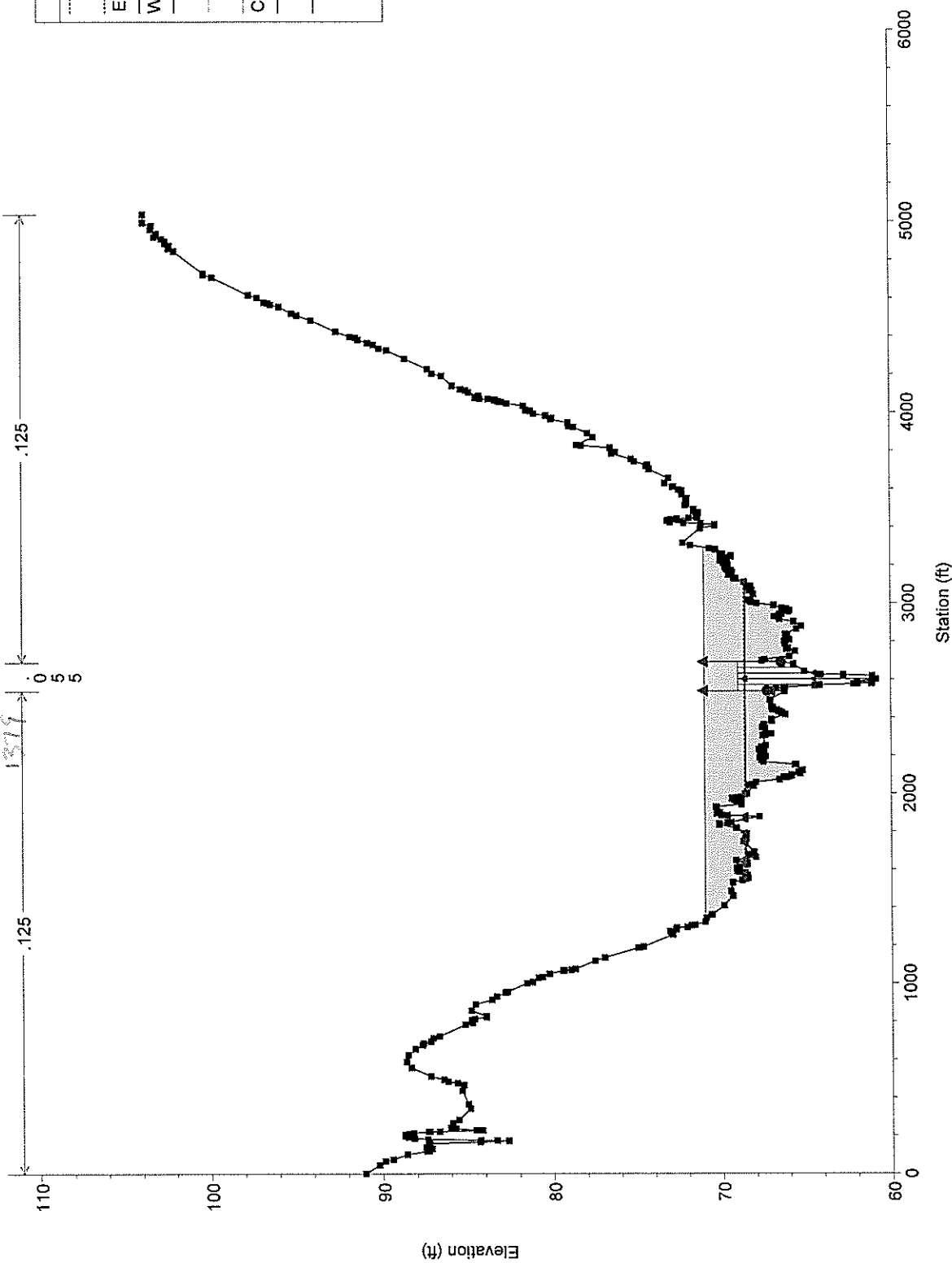
Flooding Source	Location	Drainage Area (square miles)	Discharges (cfs)			
			10% Annual Chance	2% Annual Chance	1% Annual Chance	0.2% Annual Chance
Friar Swamp (continued)	100 feet upstream of Old Lake Road	17.3	*	*	2,230	*
	Approximately 10,800 feet upstream of Old Lake Road	15.0	*	*	2,060	*
Gapway Creek	At confluence with Livingston Creek	7.8	*	*	1,498	*
Gapway Swamp	At State Boundary	40.72	*	*	1,883	*
	Approximately 5,800 feet downstream of Hinsons Crossroads	33.02	*	*	1,630	*
	Just upstream of the confluence of Crooked Run Branch	22.42	*	*	1,249	*
	Just upstream of the confluence of Long Branch	16.09	*	*	994	*
	Just upstream of the confluence of Big Fresh Water Branch	10.57	*	*	745	*
	Approximately 3,800 feet upstream of Sidney Road	2.67	*	*	289	*
Green Branch	At Mouth	3.3	*	*	337	*
Greenes Branch	Approximately 5,500 feet downstream of Silver Spoon Road	2.34	*	*	710	*
	Approximately 4,500 feet downstream of Silver Spoon Road	2.30	*	*	700	*
	Approximately 1,900 feet downstream of Silver Spoon Road	2.12	*	*	670	*

Section 5.0 – Engineering Methods

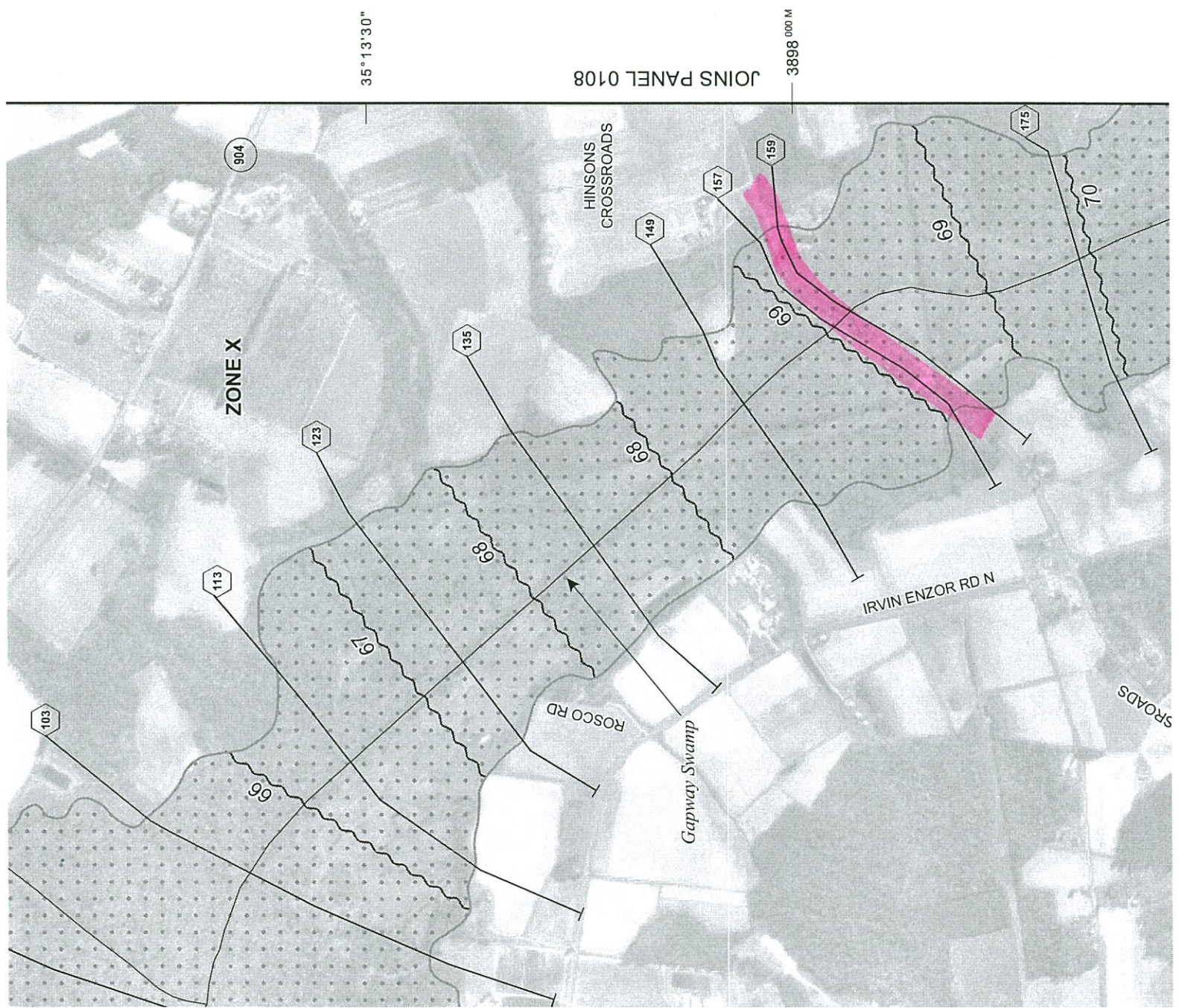
Table 10—Limited Detailed Flood Hazard Data

Cross Section ¹	Stream Station ²	Flood Discharge (cfs)	1% Annual Chance Water-Surface Elevation (feet NAVD 88)	Non-Encroachment Width ³ (feet)
GAPWAY SWAMP (continued)				
157	15,711 ⁶	1,425	68.5	5
159	15,864 ⁶	1,425	68.6	5
175	17,504 ⁶	1,425	69.5	5
193	19,309 ⁶	1,425	70.1	5
207	20,696 ⁶	1,425	70.8	5
223	22,305 ⁶	1,377	71.6	5
234	23,411 ⁶	1,377	71.9	5
246	24,606 ⁶	1,377	72.4	5
256	25,629 ⁶	1,377	72.8	5
269	26,855 ⁶	1,377	73.2	5
280	28,011 ⁶	1,301	73.8	5
291	29,134 ⁶	1,301	74.7	5
304	30,418 ⁶	1,301	75.7	5
305	30,546 ⁶	1,301	76.9	5
313	31,319 ⁶	1,301	77.2	5
324	32,417 ⁶	1,301	77.3	5
337	33,668 ⁶	1,249	77.5	5
348	34,830 ⁶	1,249	78.4	5
361	36,065 ⁶	994	79.4	5
368	36,775 ⁶	994	79.8	5
369	36,923 ⁶	994	80.0	5
376	37,625 ⁶	994	80.2	5
382	38,197 ⁶	749	80.3	5
395	39,542 ⁶	749	80.8	5
407	40,702 ⁶	625	81.9	5
415	41,454 ⁶	625	82.0	5
422	42,192 ⁶	625	82.2	5
437	43,702 ⁶	625	84.0	5
450	45,023 ⁶	625	85.7	5
467	46,749 ⁶	625	87.0	5
480	47,982 ⁶	625	88.1	5
497	49,670 ⁶	625	89.2	5
513	51,257 ⁶	625	90.3	5
514	51,371 ⁶	625	90.5	5
522	52,220 ⁶	489	91.5	5
526	52,632 ⁶	489	91.6	5
539	53,854 ⁶	489	91.6	5
552	55,183 ⁶	489	91.8	5
565	56,463 ⁶	489	94.2	5
566	56,616 ⁶	289	94.3	5
573	57,299 ⁶	289	94.4	5
584	58,409 ⁶	289	94.6	5
593	59,331 ⁶	289	95.3	5

Gapway Plan: limited detailed delineation (EwBr) 4/19/2002
 SR1356: STRUCTURE 167 FROM NCDOT DATABASES

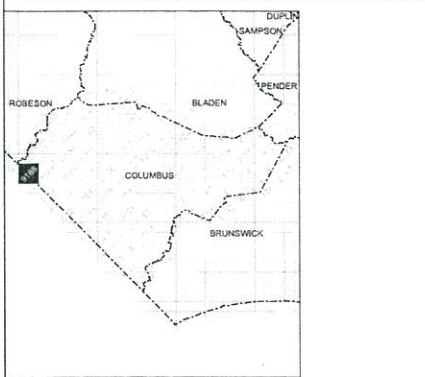


Legend
EG 100yr
EG FLOODWAY
WS FLOODWAY
WS 100yr
Crit 100yr
Crit FLOODWAY
Ground
Ineff
Bank Sta



- flood.
- OTHE
- Areas d
- Areas in
- COAS
- OTHE
- CBRS areas and OPA
- 513
- (EL 987)
- *Referenced to the Nc
- 012
- 23
- 97°07'30", 32°22'30"
- 4276 000M
- 1 477 500 FEET
- BM5510 x
- BM5510 ⊗
- M1.5

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 (NAD83/2011). The horizontal datum was the North American Datum of 1983, GRS80 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.

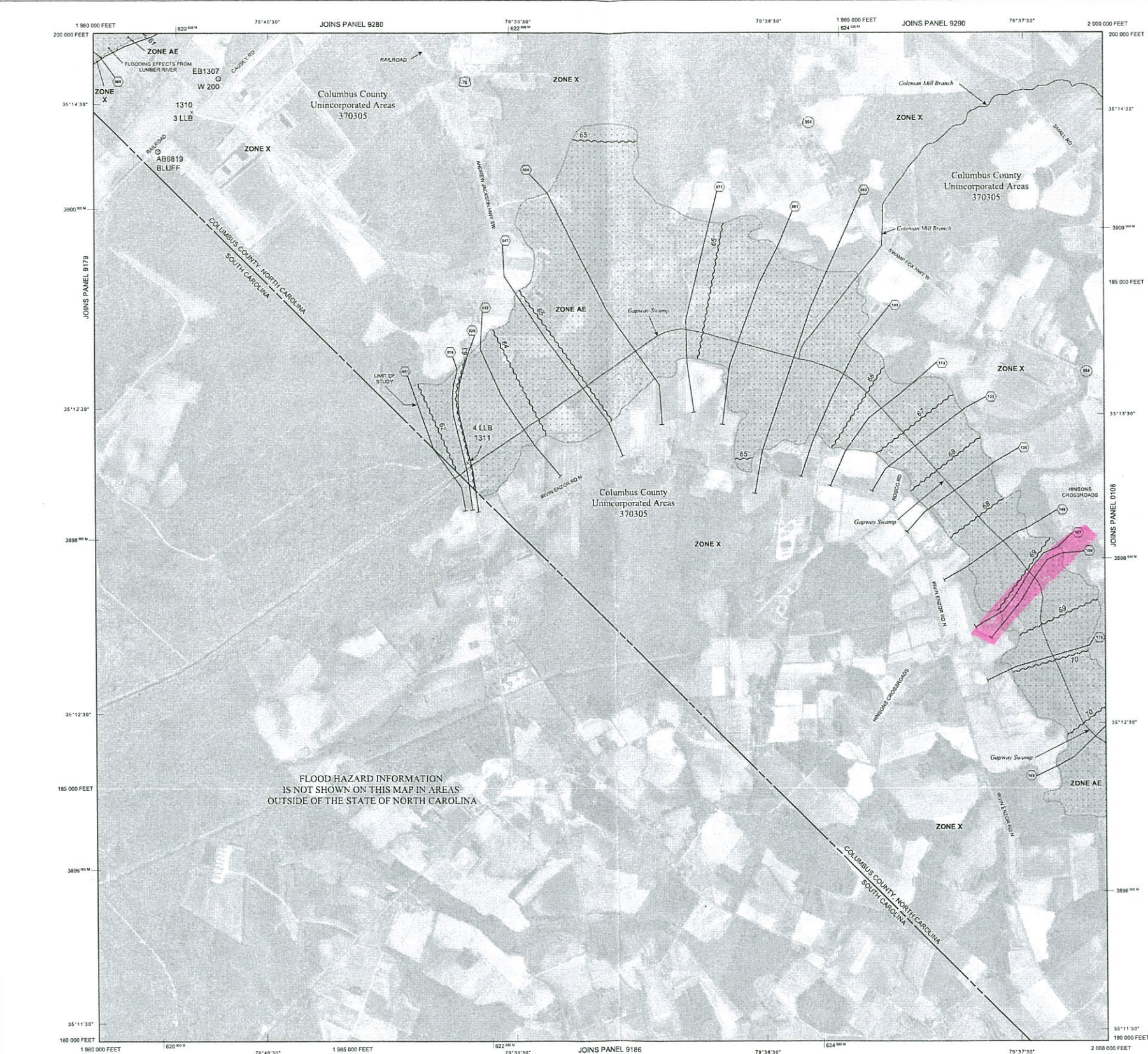
Flood elevations on this map are referenced to the North American Vertical Datum of 1988 (NAVD 88). These flood elevations must be compared to structure and ground elevations referenced to the same vertical datum. An average offset between NAVD 88 and the National Geodetic Vertical Datum of 1929 (NGVD 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 6.1 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 show below. You may also contact the Information Services Branch of the National Geodetic Survey at (301) 713-3242, or visit its website at www.ngs.noaa.gov.

County	Average Vertical Datum Offset Table
County	Vertical Datum Offset (ft)
Columbus	-1.54
Example: NAVD 88 = NGVD 29 + (-1.54)	

All streams listed in the Flood Hazard Data Table below were studied by detailed methods using field survey. Other flood hazard data shown on this map may have been derived using either a coastal analysis or limited detailed riverine analysis. More information on the flooding sources studied by these analyses is contained in the Flood Insurance Study report.

FLOOD HAZARD DATA TABLE				Floodway Width (feet)
Cross Section	Stream Station	Flood Discharge (cfs)	1% Annual Chance (100-year) Water-Surface Elevation (feet NAVD 88)	Left-Right Distance From The Center of Stream to Encroachment Boundary (Looking Downstream) or Total Floodway Width
LUMBER RIVER				
988	98,770	NA	60.3	7,247

1 Feet above mouth



FLOOD HAZARD INFORMATION IS NOT SHOWN ON THIS MAP IN AREAS OUTSIDE OF THE STATE OF NORTH CAROLINA

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 decertified. 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

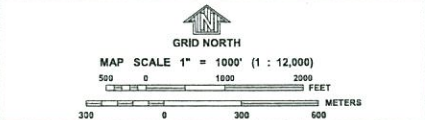
- ZONE X** Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.
- OTHER AREAS** Areas determined to be outside the 0.2% annual chance floodplain. 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 (NAD 83/2011, 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



NATIONAL FLOOD INSURANCE PROGRAM

PANEL 9188J

FIRM

FLOOD INSURANCE RATE MAP

NORTH CAROLINA

PANEL 9188

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

CONTAINS:

COMMUNITY COLUMBUS COUNTY

CD No. 37205

PANEL 9188

SUFFIX J

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.

EFFECTIVE DATE JUNE 2, 2006

MAP NUMBER 371091880J

State of North Carolina

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 Stillwater Elevations 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 Flood Insurance Study report for the jurisdiction. The FIS report also provides instructions for determining a

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 the 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 by Columbus County. The time period of collection for the imagery is 1997. 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 roads 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 data 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 1-800-358-9616 for information on all related products associated with this FIRM. The FEMA Map Service Center

MAP REPOSITORY

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

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL

JUNE 2, 2006

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

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:

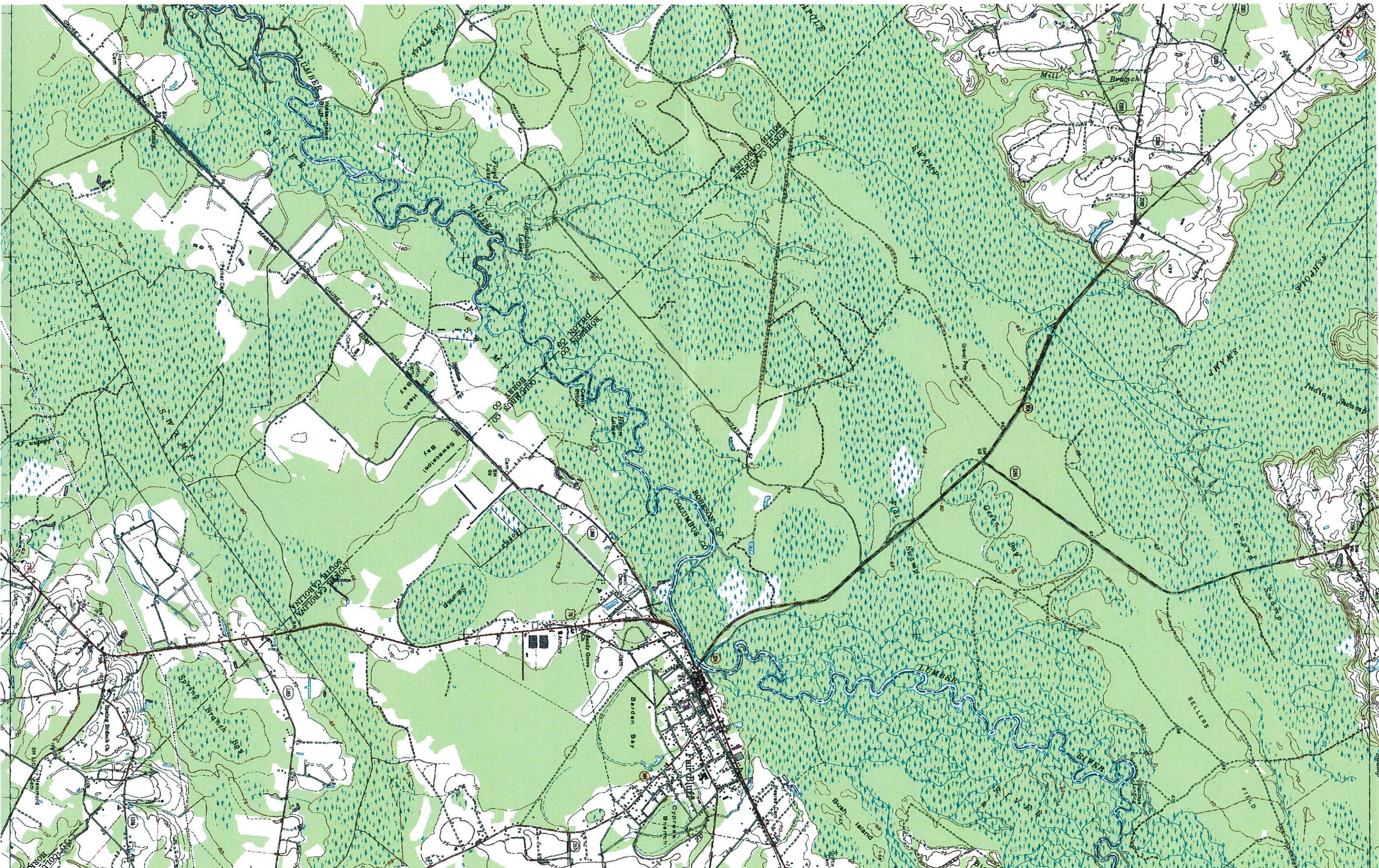
NC Division of Emergency Management

National Flood Insurance Program



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 Cooperating Technical State agreement with FEMA to produce and maintain this digital FIRM.

www.ncfloodmaps.com



Sta 6+53 Recomm 8 @ 17' C.C. CREO Timber

Note Vertical Scale is 1" = 5'

Recomm Crown Grade Elev 104.5

Max. H.W. 1928 - Elev. 103.6

W.S. Elev. 99.1 March 4, 1954

Use Firm Fill Material Around
End Beats or Protect Fill
With Broken Pavement

Pres. Bridge No 167

O.A.L 204.8' CIR. RD. WY. 17.1'
untreated Tim. on untreated
caps, on CREO pile post
on untr. cut-off piles
12 @ 17' Not Piled
Poor Condition

Soft Material

+ 20' CREO Timber Piles

CREO Timber
End Beats

B.M. - Elev 100.00 (Assumed)
Nail in twin 6" Maple
30' Lt. 5+60

Swamp

N 32° 30' E

To Sta 9+04

Swamp

4+

5+

6+

7+

8+

9+

10+

11+



North Carolina StreamStats

Basin Characteristics Report

Date: Tue May 21 2013 09:21:43 Mountain Daylight Time

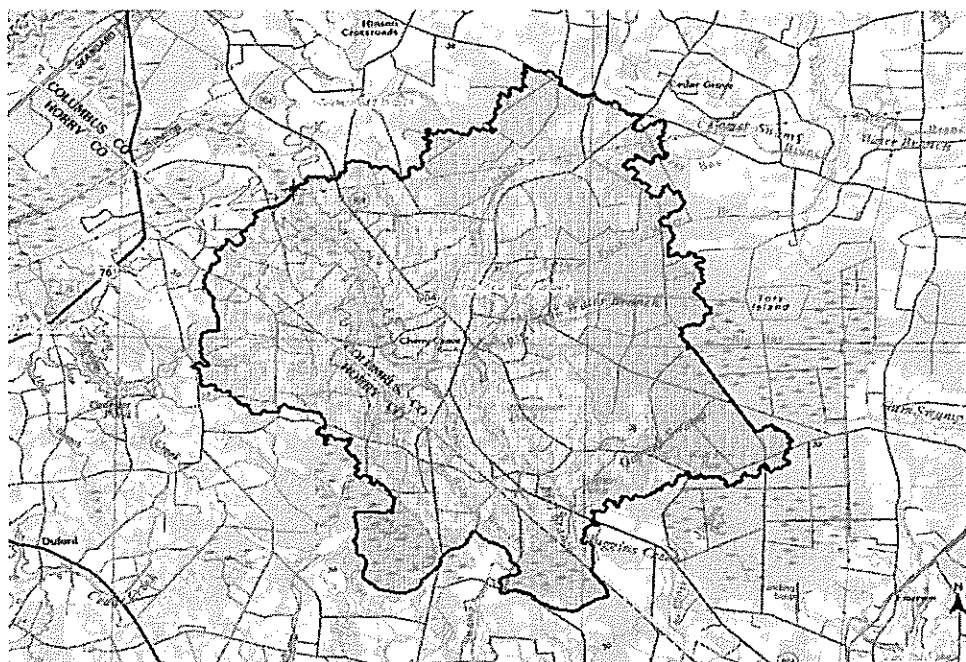
NAD27 Latitude: 34.2697 (34 16 11)

NAD27 Longitude: -79.0051 (-79 00 18)

NAD83 Latitude: 34.2699 (34 16 12)

NAD83 Longitude: -79.0048 (-79 00 17)

Parameter	Value
Area in square miles	35.8
Percent of area covered by barren rock using 1992 NLCD	0.000
Percent of area covered by barren rock using 2001 NLCD	0.000
Percent of area covered by barren rock using 2006 NLCD	0.000
Percent of area in cultivation using 1992 NLCD	38.296
Percent of area in cultivation using 2001 NLCD	35.738
Percent of area in cultivation using 2006 NLCD	39.077
Percent of area in cultivation 2001 NLCD but not in cultivation 2006 NLCD	1.049
Percent of area covered by all densities of developed land using 1992 NLCD	0.012
Percent of area covered by all densities of developed land using 2001 NLCD	4.024
Percent of area covered by all densities of developed land using 2006 NLCD	4.024
Percent of area developed in 2006 NLCD but not developed in 2001 NLCD	0
Percent of area covered by forest using 1992 NLCD	41.522
Percent of area covered by forest using 2001 NLCD	22.628
Percent of area covered by forest using 2006 NLCD	23.076
Percent of area forested 2001 NLCD but not forested 2006 NLCD	4.915
Percent of area covered by grassland/herbaceous using 2001 NLCD	3.180
Percent of area covered by grassland/herbaceous using 2006 NLCD	1.381
Percent of area covered by impervious surface 2001 NLCD	0.53
Percent of area covered by impervious surface 2006 NLCD	0.53
Difference in percent impervious between 2001 NLCD and 2006 NLCD	0.000
Mean annual precipitation in inches	50.5
Percent of area of protected Federal and State owned land	0

StreamStats Print Page**Explanation**

- ✦ GlobalWatershedPoint
- Sp1095Point
- NCDDT Points
- ▲ LocalGages
- ▲ 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
- LocalNH02
- LongestFlowpath3D
- Stream Grid
- GlobalWatershed
- Pilot Study Area
- hucpoly

5/21/2013 9:22:30 AM