

OFFICE ESTIMATE
1@ 70' Bridge

PREDESIGN-PRESURVEY REPORT

Project# _____
TIP# _____
Let Date _____
WBS# 17 BP. 11. R. 86

County Ashe

Bridge# 040066
Road# SR 1362 (Big horse creek Rd)
Stream Big horse Creek

Type Of Request: POC Force Account TIP NCMA

Date 7/8/13 Name M. G. S Assigned To R. C. H.

Checked By Wsh 7-22-13

Prior Survey Date NONE ✓ (attach copy of prior survey) BRN BK: NONE ✓ CO. FILE NONE ✓

Study By Scour Section NONE

Flood Zone AE Detail Study limited ✓ Date 11/4/09 Panel# 2043 ✓

B.M. Info N/A

Quad Map Park Drainage Area 20.2 SQ. MI. From USGS / Stream Stats

Q25 3510 cfs Q50 4140 cfs Q100 4910 cfs Method Regression
3500 cfs 4100 ✓ 5000 cfs DASS = 20.3 SQ. MI. ✓
STA: 316219750 ✓

EXISTING BRIDGE INFORMATION

Location 0.4 MI. SE. JCT. SR 1363 ✓

Average Daily Traffic 180 (YR 2000) 6% TRK ✓

Length 53 ft. Bed-To Crown 10 ft. Water Depth 3 ft.

Type Structure Timber floor on I-Beams, DBL. Channels & Tim. Joists

Type Spans 1@ 33'-11"; 1@ 18'-11"

Upstream Structure 040065 ✓ Rc floor on steel plate gbr. (SIP. metal forms)

Location 0.6 MI. W. JCT. SR 1363

Bed-To Crown 16 ft. WD = 2 ft. Prior Survey _____

Downstream Structure 040067 ✓ Rc floor on I-Beams 3 @ 35'-0"

Location 0.8 MI. NW. JCT. SR 1358

Bed-To Crown 13 ft. WD = 3 ft. Prior Survey _____

SCS Watershed N/A

HATCHERY SUPPORTED ✓ ENVIRONMENTAL TVA NO ✓

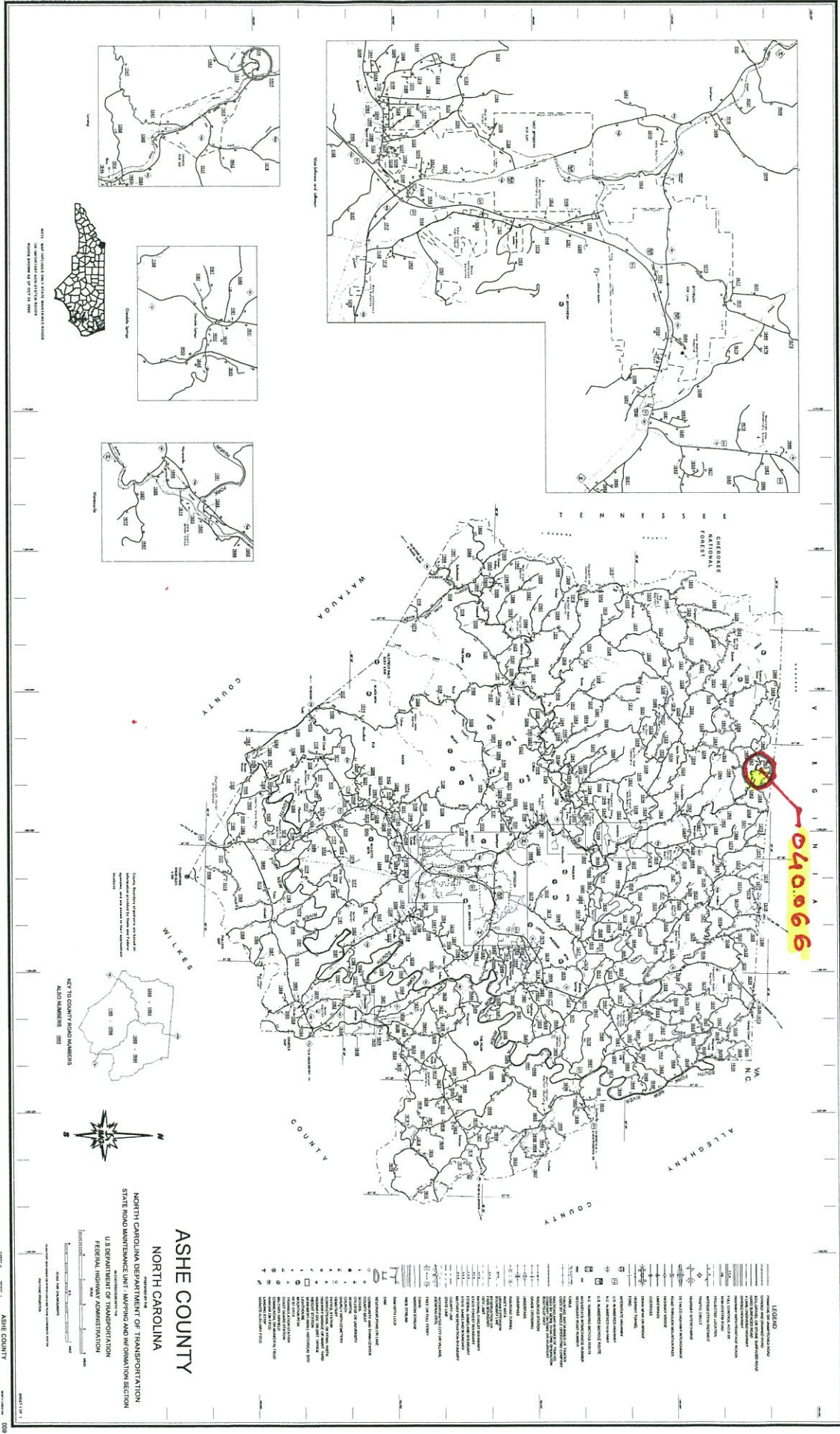
Trout Stream Yes ✓ Anadromous Fish NO Primary Nursery Area NO ✓

High Quality Waters YES ✓ Nutrient Sensitive Waters NO ✓

Near Water Supply Intake NO CAMA County NO ✓

Stream Classification C, TR, HQW (#10-2-21-(1.5)) / FROM VA. LINE
DENR River Basin Info. New ✓ (LOWER ASHECO)
SR 1362

COPIES OF THIS MAP ARE AVAILABLE
TO THE PUBLIC AT A NOMINAL COST
ADDRESS:
U.S. DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAYS, AND
BUREAU OF PUBLIC ROADS
WASHINGTON, D.C. 20541



ASHE COUNTY NORTH CAROLINA

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
STATE ROAD MAINTENANCE UNIT - JAMPPING AND INFORMATION SECTION
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

KEY TO COUNTY ROAD NUMBERS
ALSO NUMBERED 2000

1,230,000

V

I

R

G

I

N

1,260,00

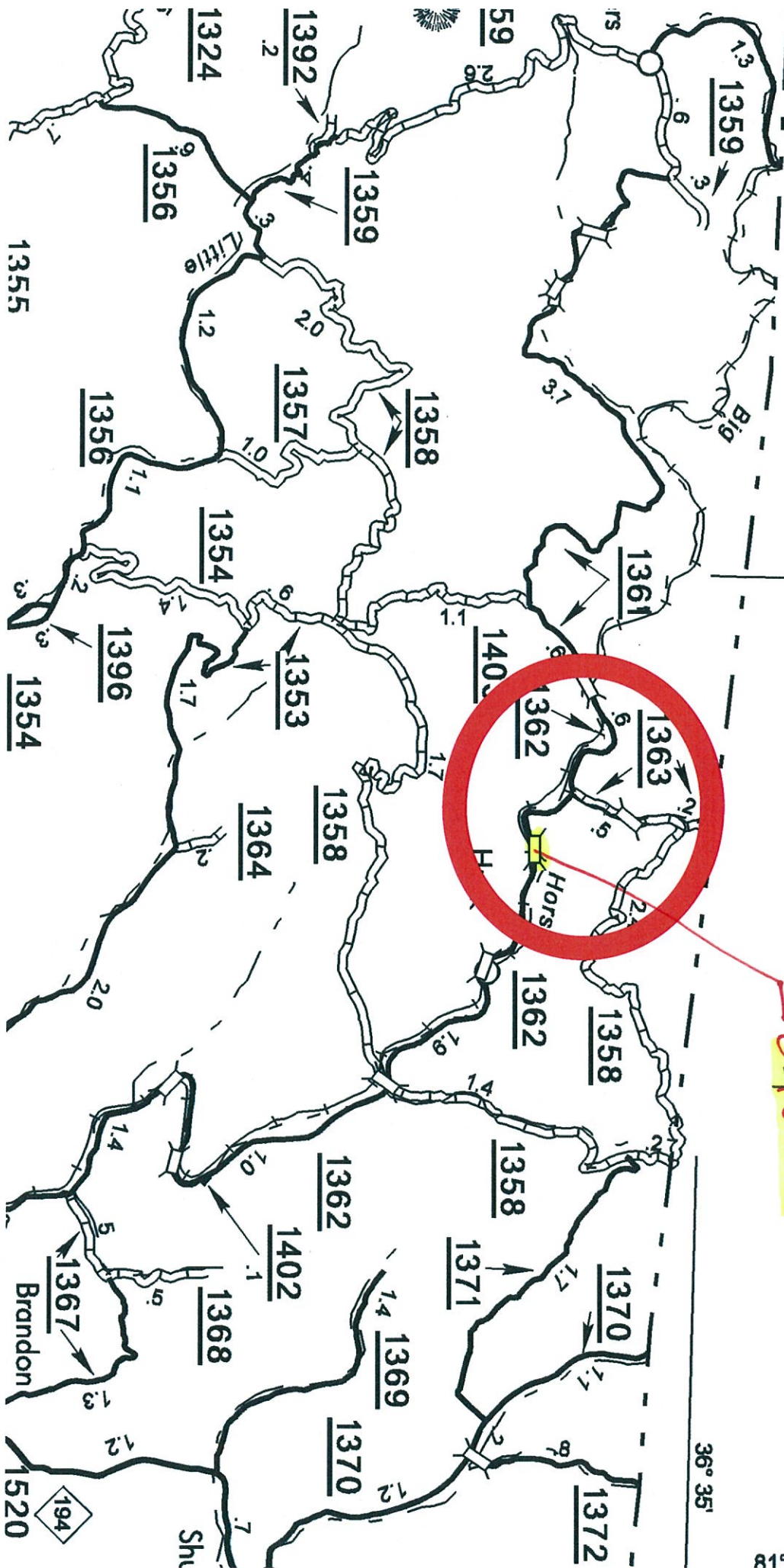
S O N

81° 35'



81° 30'

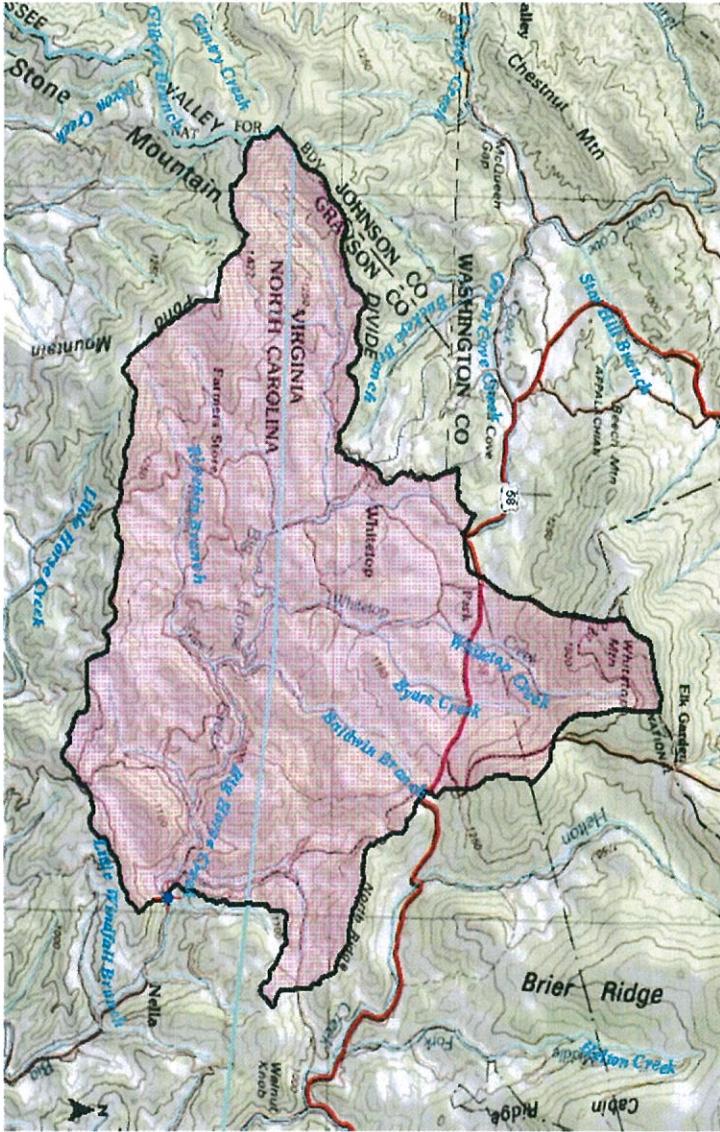
36° 35'



040066



StreamStats Print Page

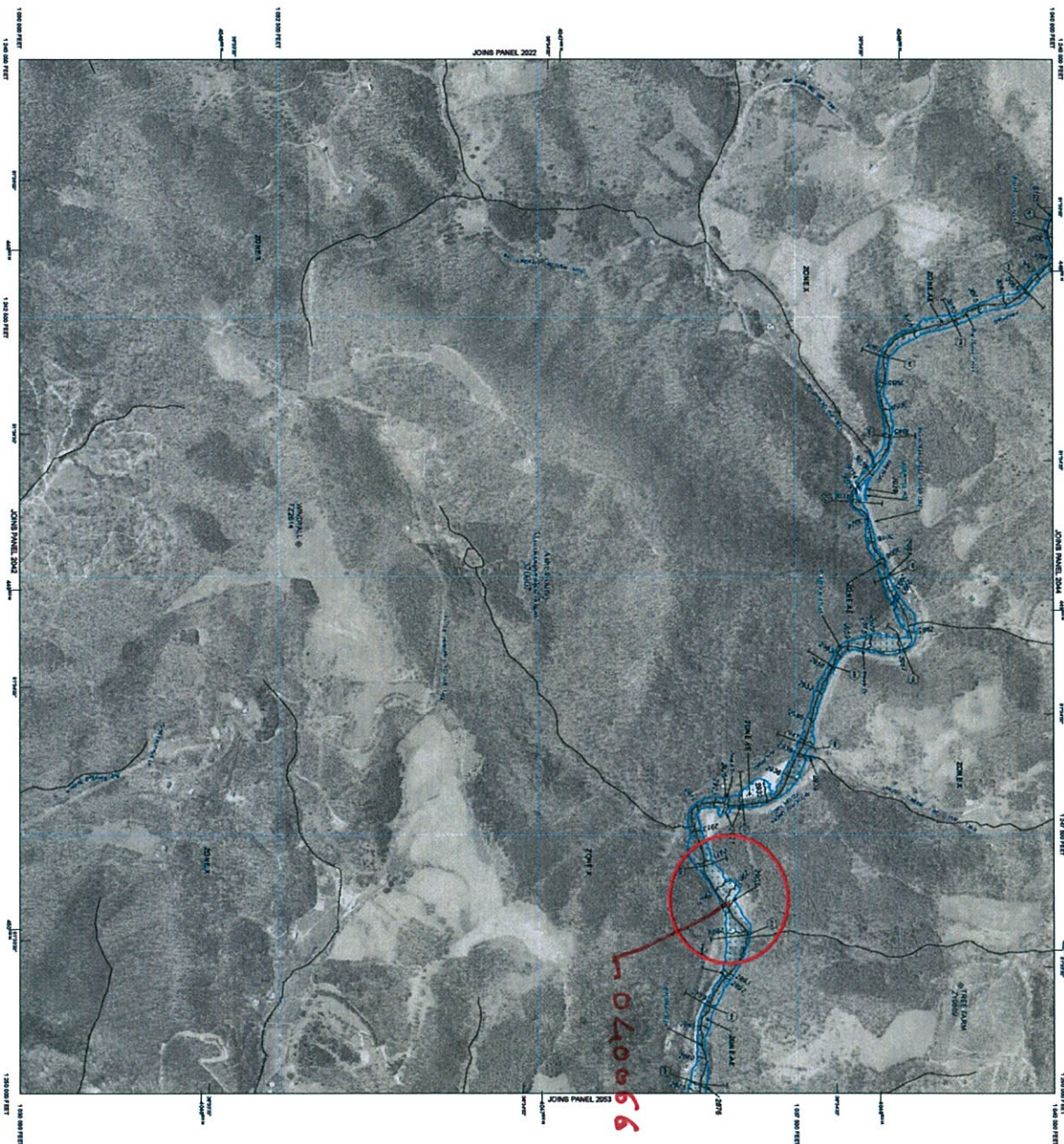


- Explanation**
- ★ Global Watershed Point
 - SRTM30 Plus Point
 - NCEM Points
 - ▲ Localities
 - ▲ Gauging Station, Continuous Record
 - ▲ Low Flow, Partial Record
 - ▲ Peak Flow, Partial Record
 - ▲ Peak and Low Flow, Partial Record
 - ▲ Stage Only
 - ▲ Low Flow, Partial Record, Stage
 - ▲ Miscellaneous Record
 - ▲ Unknown
 - ▲ Local NHD2
 - ▲ Longest Flow Path
 - ▲ Stream Grid
 - ▲ Global Watershed
 - ▲ Pilot Study Areas
 - Inuputy

7/3/2013 9:19:33 AM

[illegible]

At instance listed in the Flood Hazard Data Table below were studied by data not released using that survey. Other flood hazard data shown on this map may have been obtained using other a coastal analysis or limited depth Riverine analysis. More information on the flooding sources studied by these analyses is contained in the Flood Insurance Study report.



The map is for providing the highest flood insurance rating. It does not necessarily identify areas subject to flooding, primarily from flood insurance sources of local risk. The community map(s) identifying flood potential should be obtained for additional flood hazard information.

[illegible]

EFFECTIVE DATE OF FLOOD INSURANCE RATE MAP PANEL
NOVEMBER 4, 2009
EFFECTIVE DATES OF REVISIONS TO THIS PANEL

For more information, contact the National Center for Community-Based Policing at 1-800-441-4670 or www.nccbp.org.

PRECISE, FLOOD HAZARD AREAS (FLOOD EXPOSURE) INDICATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

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, X, Y, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

NOTE: The Base Flood Elevation does not include

- [illegible]



North Carolina StreamStats

Streamstats Ungaged Site Report

Date: Wed Jul 3 2013 09:19:08 Mountain Daylight Time

Site Location: North_Carolina

NAD27 Latitude: 36.5718 (36 34 18)

NAD27 Longitude: -81.5604 (-81 33 37)

NAD83 Latitude: 36.5719 (36 34 19)

NAD83 Longitude: -81.5602 (-81 33 37)

Drainage Area: 20.2 mi² 12925 AC

Percent Urban: 3.9 %

Percent Impervious: 0.2 %

Peak Flows Region Grid Basin Characteristics			
100% Peak Southeast US 2009 5158 (20.2 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	20.2	1	9000
Percent Area in Region 1 (percent)	0.000	0	100
Percent Area in Region 2 (percent)	100.000	0	100
Percent Area in Region 3 (percent)	0.000	0	100
Percent Area in Region 4 (percent)	0.000	0	100
Percent Area in Region 5 (percent)	0.000	0	100

Urban Flows Region Grid Basin Characteristics			
100% Peak urban Blue Ridge-Piedmont FS007-00 (20.2 mi ²)			
Parameter	Value	Regression Equation Valid Range	
		Min	Max
Drainage Area (square miles)	20.2	0.04	41
Area of Impervious Surfaces (percent)	0.23 (below min value 2)	2	54.6

Warning: Some parameters are outside the suggested range. Estimates will be extrapolations with unknown errors.

Peak Flows Region Grid Streamflow Statistics					
Statistic	Flow (ft ³ /s)	Prediction Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2	1140	35		655	1980
PK5	1980	34		1150	3430
PK10	2630	35		1500	4640
PK25	3510	38		1920	6400
PK50	4140	40		2200	7800
PK100	4910	42		2520	9560
PK200	5570	44		2750	11200
PK500	6590	48		3100	14000

Urban Flows Region Grid Streamflow Statistics					
Statistic	Flow (ft ³ /s)	Standard Error (percent)	Equivalent years of record	90-Percent Prediction Interval	
				Minimum	Maximum
PK2U	112				
PK5U	264				
PK10U	410				
PK25U	754				
PK50U	1010				
PK100U	1310				

Section 4.0 – Area Studied

Table 4—Flooding Sources Studied by Detailed Methods: Redelineated

Source	Riverine Sources		Affected Communities
	From	To	
Hoskins Fork	The confluence with the North Fork New River	The Ashe/Watauga County boundary	Ashe County (Unincorporated Areas)
North Fork New River (Downstream)	Approximately 0.4 mile upstream of the confluence of North Fork New River Tributary 1	Approximately 1,160 feet downstream of the confluence of Helton Creek	Ashe County (Unincorporated Areas)
North Fork New River (Downstream Middle)	Approximately 300 feet downstream of North Fork New River Road (SR 1513)	Approximately 0.4 mile downstream of Rich Hill Farms Road	Ashe County (Unincorporated Areas)
North Fork New River (Upstream Middle)	Approximately 510 feet upstream of the confluence of Three Top Creek	Approximately 1,150 feet upstream of the confluence of Rock Creek	Ashe County (Unincorporated Areas)
North Fork New River (Upstream)	Approximately 50 feet upstream of West Peak Road (SR 1119)	The Ashe/Watauga County boundary	Ashe County (Unincorporated Areas)
South Fork New River	Approximately 2.4 miles upstream of Kings Creek Road (SR 1308)	The Ashe/Watauga County boundary	Ashe County (Unincorporated Areas)
Three Top Creek	The confluence with North Fork New River	Approximately 0.4 mile upstream of Hidden Valley Road (SR 1264)	Ashe County (Unincorporated Areas)
Tributary A	The confluence with Beaver Creek	Approximately 120 feet upstream of Brook Lane (SR 1188)	Ashe County (Unincorporated Areas), Town of West Jefferson
Tributary B	The confluence with Beaver Creek	Approximately 1,300 feet upstream of Beaver Creek School Road (SR 1248)	Ashe County (Unincorporated Areas)

Table 5, “Flooding Sources Studied by Detailed Methods: Limited Detailed” contains a list of flooding sources that were studied by approximate methods in previous FISs but were revised using limited detailed methods for this FIS.

Table 5—Flooding Sources Studied by Detailed Methods: Limited Detailed

Source	Riverine Sources		Affected Communities
	From	To	
Bear Creek	The confluence with South Fork New River	Approximately 1.8 miles upstream of NC Highway 16	Ashe County (Unincorporated Areas)
Big Horse Creek	Approximately 920 feet upstream of Anderson Hill Road (SR 1366)	Approximately 0.6 mile upstream of the 3 rd Farmers Store Road (SR 1360) crossing	Ashe County (Unincorporated Areas)

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
Big Horse Creek	Approximately 0.6 mile upstream of Little Windfall Road (SR 1358)	21.1	*	*	5,005	*
	Approximately 1.4 miles upstream of Little Windfall Road (SR 1358)	20.5	*	*	4,913	*
	Approximately 1.8 miles upstream of Little Windfall Road (SR 1358)	20.0	*	*	4,840	*
	Approximately 0.7 mile downstream of Big Horse Creek Road (SR 1362)	17.9	*	*	4,525	*
	Approximately 350 feet upstream of Big Horse Creek Road (SR 1362)	16.1	*	*	4,231	*
	Approximately 1.0 mile upstream of Big Horse Creek Road (SR 1362)	15.1	*	*	4,065	*
	Approximately 1.7 miles upstream of Big Horse Creek Road (SR 1362)	12.3	*	*	3,571	*
	Approximately 2.3 miles upstream of Big Horse Creek Road (SR 1362)	10.7	*	*	3,281	*
	Approximately 3.2 miles upstream of Big Horse Creek Road (SR 1362)	6.2	*	*	2,329	*
	Approximately 4.4 miles upstream of Big Horse Creek Road (SR 1362)	1.4	*	*	937	*
	Approximately 5.2 miles upstream of Big Horse Creek Road (SR 1362)	0.9	*	*	673	*
Big Laurel Creek	At the confluence of North Fork New River	29.2	*	*	6,139	*
	Approximately 0.9 mile downstream of the confluence of Little Laurel Creek	28.6	*	*	6,055	*

Section 5.0 – Engineering Methods

Starting conditions for the hydraulic models were set to normal depth using starting slopes calculated from channel invert values taken from the LIDAR data or, where applicable, derived from the water surface elevations of existing effective Flood Insurance Study water surface elevations. Manning's n-values were field investigated and delineated on USGS Digital Orthophoto Quarter Quads (DOQQ) for both channel and overbank areas.

For limited detailed studied streams, the hydraulic model used is the U. S. Corps of Engineers Hydraulic Engineering Center River Analysis System, version 3.1.2 (HEC-RAS 3.1.2) (U.S. Army Corps of Engineers, 2004). Topographic data for the floodplain models was developed using recently flown LIDAR land data, field measured of verified structure information, and updated hydrologic data. The model was developed using HEC-RAS 3.1.2, run for the 1% and 0.2% annual chance frequency storms, and calibrated to known historic flood marks. Approximate 1% annual chance floodway models were also developed using method 4 in HEC-RAS 3.1.2.

Starting conditions for the hydraulic models were set to normal depth using starting slopes calculated from channel invert values taken from the LIDAR data, or, where applicable, derived from the water surface elevations of existing effective flood elevations.

The cross section geometries were obtained from a combination of digital elevation data obtained by Light Detection and Ranging (LIDAR) and field surveys. All bridges, dams, and culverts were field surveyed to obtain elevation data and structural geometry. Natural floodplain cross sections were surveyed approximately every 4,000 feet along the detail study reaches to obtain the channel geometry between bridges and culverts. Overbank cross section data for the backwater analyses were obtained from recently flown LIDAR data.

Channel roughness factors (Manning's "n") used in the hydraulic computations were made in the field by an engineer where stream access was possible, with orthophotos used to supplement areas that could not be accessed. The channel and overbank "n" values for all of the streams studied by detailed methods are shown in Table 9, "Roughness Coefficients."

Table 9—Roughness Coefficients

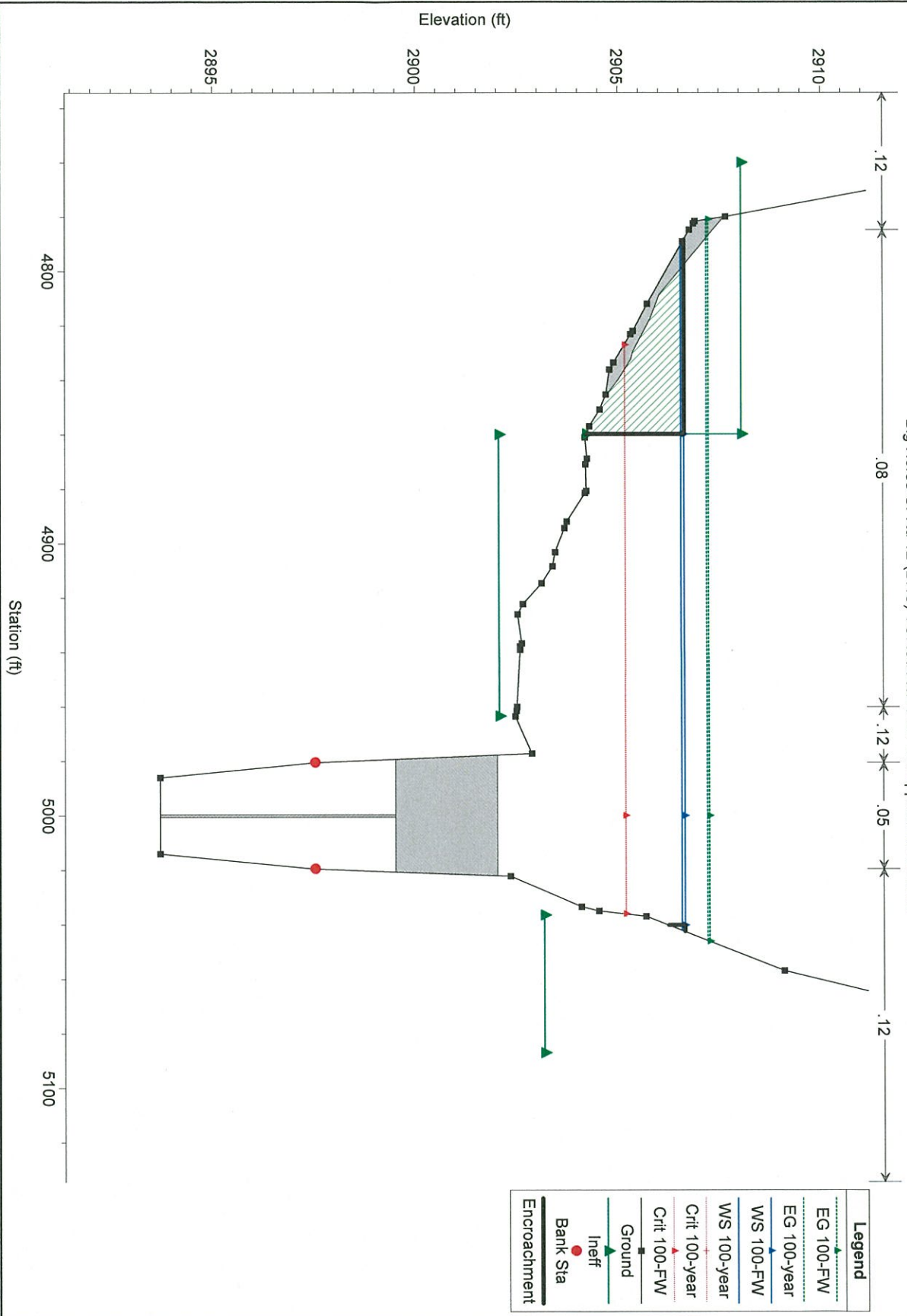
Stream	Channel "n"	Overbank "n"
Bear Creek	0.055	0.060 – 0.150
Beaver Creek	0.041 – 0.050	0.060 – 0.150
Big Horse Creek	0.042 – 0.080	0.030 – 0.140
Big Laurel Creek	0.050	0.070 – 0.140
Big Windfall Branch	0.050	0.020 – 0.150
Bower Walter's Creek	N/A	N/A
Brush Fork	0.050	0.020 – 0.150
Buffalo Creek	0.047	0.030 – 0.150
Cabbage Creek	0.053	0.060 – 0.100
Cabbage Creek Tributary	0.055	0.080 – 0.140
Call Creek	0.045 – 0.047	0.035 – 0.150
Cole Branch	0.048 – 0.060	0.035 – 0.130
Cranberry Creek	0.040 – 0.045	0.070 – 0.150

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)
BIG HORSE CREEK				
365	36,501	5,527	2,761.6	31 / 22
370	36,959	5,527	2,765.3	28 / 28
372	37,200	5,527	2,765.8	22 / 22
376	37,600	5,527	2,768.0	22 / 22
380	37,954	5,527	2,770.6	22 / 30
384	38,400	5,527	2,773.0	22 / 99
388	38,800	5,527	2,774.1	65 / 22
394	39,378	5,527	2,776.2	18 / 82
396	39,591	5,527	2,778.0	77 / 112
400	39,978	5,527	2,779.3	240 / 20
409	40,864	5,527	2,786.0	150 / 40
412	41,209	5,425	2,787.5	65 / 25
416	41,619	5,425	2,792.2	70 / 40
420	41,968	5,425	2,795.8	22 / 126
424	42,400	5,425	2,797.1	20 / 200
428	42,798	5,425	2,799.1	29 / 250
434	43,420	5,269	2,804.2	100 / 166
436	43,600	5,269	2,804.5	65 / 37
440	44,000	5,174	2,808.6	150 / 26
444	44,400	5,174	2,812.1	31 / 90
448	44,800	5,174	2,816.3	38 / 64
450	44,994	5,174	2,817.4	42 / 33
452	45,200	5,174	2,820.6	28 / 40
454	45,357	5,174	2,823.0	52 / 36
456	45,600	5,174	2,826.3	81 / 24
460	46,004	5,174	2,831.1	19 / 127
463	46,315	5,174	2,834.4	38 / 175
468	46,793	5,174	2,840.6	61 / 75
472	47,200	5,005	2,845.4	80 / 95
474	47,369	5,005	2,847.4	105 / 51
476	47,600	5,005	2,850.4	125 / 23
478	47,841	5,005	2,853.3	50 / 27
482	48,166	5,005	2,858.4	68 / 30
484	48,400	5,005	2,859.6	55 / 35
486	48,577	5,005	2,862.7	37 / 59
488	48,800	5,005	2,865.0	36 / 99
492	49,200	5,005	2,869.8	30 / 48
496	49,600	5,005	2,876.2	51 / 46
500	50,000	5,005	2,882.0	20 / 45
504	50,400	5,005	2,888.5	50 / 51
512	51,200	5,005	2,898.6	30 / 213
517	51,742	4,913	2,906.6	132 / 20
520	52,000	4,913	2,910.8	103 / 76
524	52,356	4,913	2,913.2	50 / 51
526	52,620	4,840	2,916.7	51 / 28
528	52,797	4,840	2,922.9	42 / 50
531	53,076	4,840	2,927.4	19 / 40

Big Horse Cr Rd 12 (BHC) TORStructure ID: 968AApproximate Surve





NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION

TEMP REPAIR

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY ASHE BRIDGE NUMBER 040066 INSPECTION CYCLE 2 YRS
ROUTE SR1362 ACROSS BIG HORSE CREEK M.P. 0

LOCATION .4 MI.SE.JCT.SR1363

SUPERSTRUCTURE TIMBER FLOOR ON I-BEAMS,DBL.CHANNELS&TIM.JOISTS

SUBSTRUCTURE E.BTS:TIMBER P&S;INT.BTS:TIM.CAP/TIM.POST&CONC.SILLS

SPANS 1 @ 33'-11; 1 @ 18'-11

LONGITUDE 81° 33' 30.4"

LATITUDE 36° 34' 27.7"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 05/31/2012

OPERATING RATING

PRESENT POSTING SV 20 TTST 30

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT 4 DELIN. 2 ONE LANE BR.



LOOKING NORTH

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: 06/21/2012

COUNTY :	ASHE	DIVISION :	11	DISTRICT :	3	STRUCTURE NUMBER :	040066	LENGTH :	53	FEET
ROUTE CARRIED :	SR1362	FEATURE INTERSECTED :	BIG HORSE CREEK							
LOCATED :	.4 MI.SE.JCT.SR1363		BRIDGE NAME :	CITY :						
FUNC. CLASS :	09	SYST.ON :	NFA	SYST.UNDER :	NFA	ADT & YR :	180	2000	RAIL TYPE :	LT 227 RT 227
BUILT :	1956	BY :	BMU	PROJ :		FED.AID PROJ :		DESIGN LOAD :	Unknown	
REHAB :		BY :	BMU	PROJ :		ALIGNMENT :	TAN	SKEW :	135	LANES : ON 1 UNDER
NAVIGATION :	VC	0	FT	HC	0	FT	HT. CRN. TO BED :	10	FT	WATER DEPTH : 3 FT
SUPERSTRUCTURE :	TIMBER FLOOR ON I-BEAMS,DBL.CHANNELS&TIM.JOISTS									
SUBSTRUCTURE :	E.BTS:TIMBER P&S;INT.BTS:TIM.CAP/TIM.POST&CONC.SILLS									
SPANS :	1 @ 33'-11; 1 @ 18'-11									
BEAMS OR GIRDERS :	SPN.1:8LNS.15 I-BMS;1LN.15 DBL.CHN;SPN.2:17LNS.6X14 TIM.JSTS									
FLOOR :	4X8 TIM/2 AWS	ENCROACHMENT :	DECK (OUT TO OUT) :							18.1 FT
CLEAR ROADWAY :	15.8 FT	BETWEEN RAILS :	17.8 FT	SIDEWALK OR CURB :	LT	1 FT	RT	1 FT		
VERT.CL.OVER :	999.9 FT									
INV.RTG. :	HS-3	OPE.RTG. :	HS-4	CONTR.MEMBER :	IJoist (Decay)	POSTED :	SV 20	TTST	30	DATE 06/30/2010
SYSTEM :	Secondary S.R. Route					GREEN LINE ROUTE :	N			

UNDER ROUTES AND CLEARANCES

REMARKS :

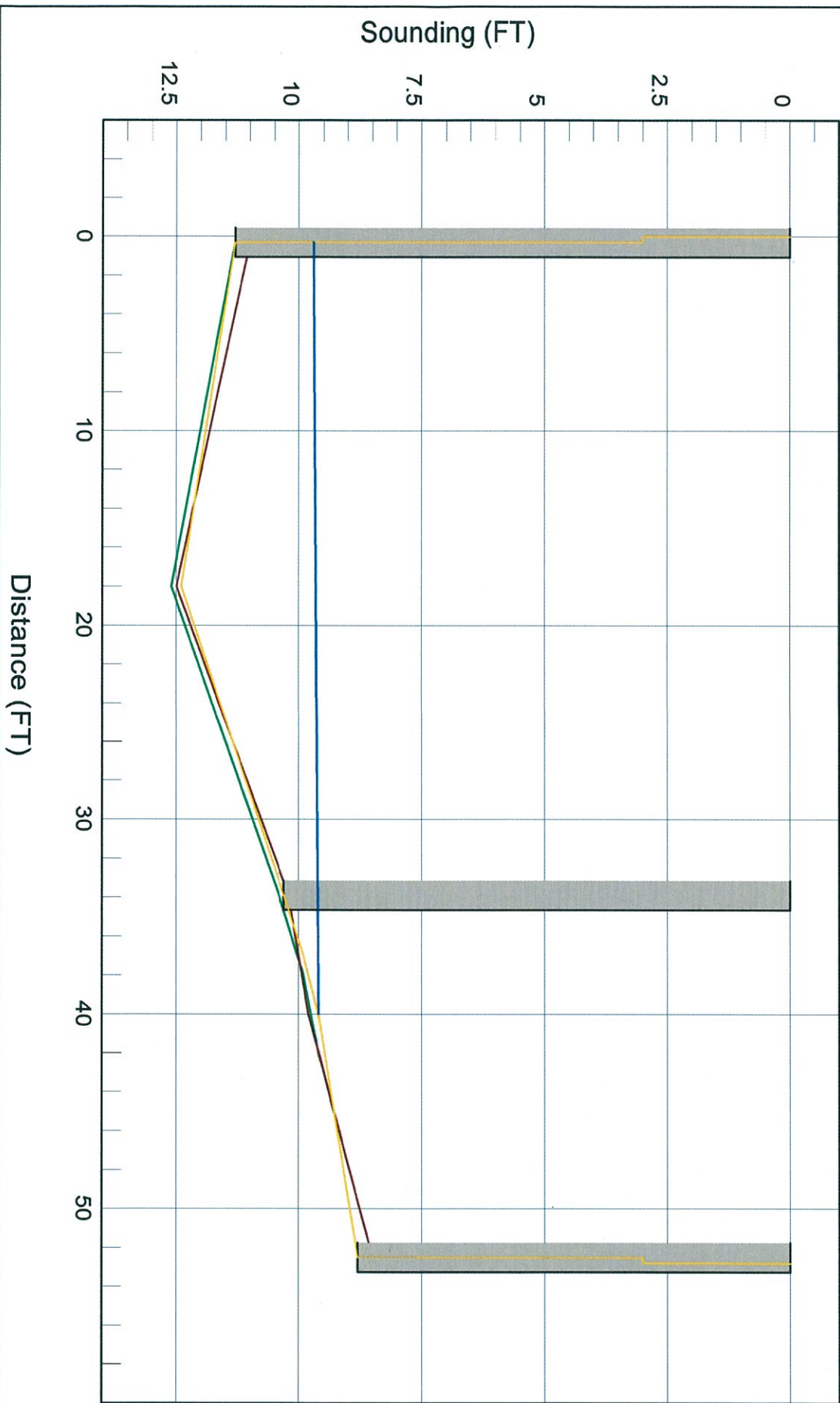
Bridge: 040066

County ASHE

Date: 05/31/2012

Top of Rail = 0 FT (Sounding)

STREAMBED PROFILE (Downstream)





LOOKING NORTH



LOOKING UPSTREAM