

OFFICE ESTIMATE

1@ 40, 1@ 60, 1@ 40' Bridge

PREDESIGN-PRESURVEY REPORT

Project# _____
 TIP# _____
 Let Date _____
 WBS# 17BP. 11.R.66

County CALDWELL (DIV 11) ✓

Bridge# 130077
 Road# SR 1143 (ROCKY RD)
 Stream LOWER CREEK

Type Of Request: POC Force Account TIP NCMA

Date 7/16/13

Name MJY

Assigned To RCH

Checked By M. G. S 7/23/13

RECOM: 3@ 37.5'

Prior Survey Date 11-61 ✓ (attach copy of prior survey)

BRN BK: DATE: 11-61 CD. FILE YES

Study By Scour Section YES ✓

Flood Zone AE W/ FI Detail Study REDELINEATION Date 7/07/09 Panel# 2737 ✓

B.M. Info (40832 AC)

Quad Map DREXEL ✓

Drainage Area 63.8 SQ. MI. From DASS ✓

Q25 6700 cfs ✓

Q50 8000 cfs ✓

Q100 9200 cfs ✓

Method REGR. EQNS/REG. 1 ✓

(sheet attached)

EXISTING BRIDGE INFORMATION

Location 0.2 MI. SE. JCT. NC 18 ✓

Average Daily Traffic 3300 7% TRK (2009) ✓

Length 115' ✓ Bed-To Crown 22' ✓ Water Depth 1' ✓

Type Structure REINFORCED CONCL. SLAB ON I-BEAMS; RC CAPS, TIM. PILES, H-PILES ✓

Type Spans 1@ 39'-6", 1@ 37'-6", 1@ 38' ✓

Upstream Structure 130353 1@ 45'-4, 1@ 45', 1@ 45'-4

Location 0.2 MI. S. JCT. US 64

Bed-To Crown 23' (D=2') ✓ Prior Survey

Downstream Structure 130106 PPC cored slab 3@ 48'-6"

Location 0.1 MI. N. JCT. SR 1263 ✓

Bed-To Crown 25' (D=5') ✓ Prior Survey

SCS Watershed

ENVIRONMENTAL

TVA NO ✓

Trout Stream YES - HATLHERY SUPPORTED

Anadromous Fish NO

Primary Nursery Area NO ✓

High Quality Waters NO

Nutrient Sensitive Waters NO

Near Water Supply Intake NO ✓

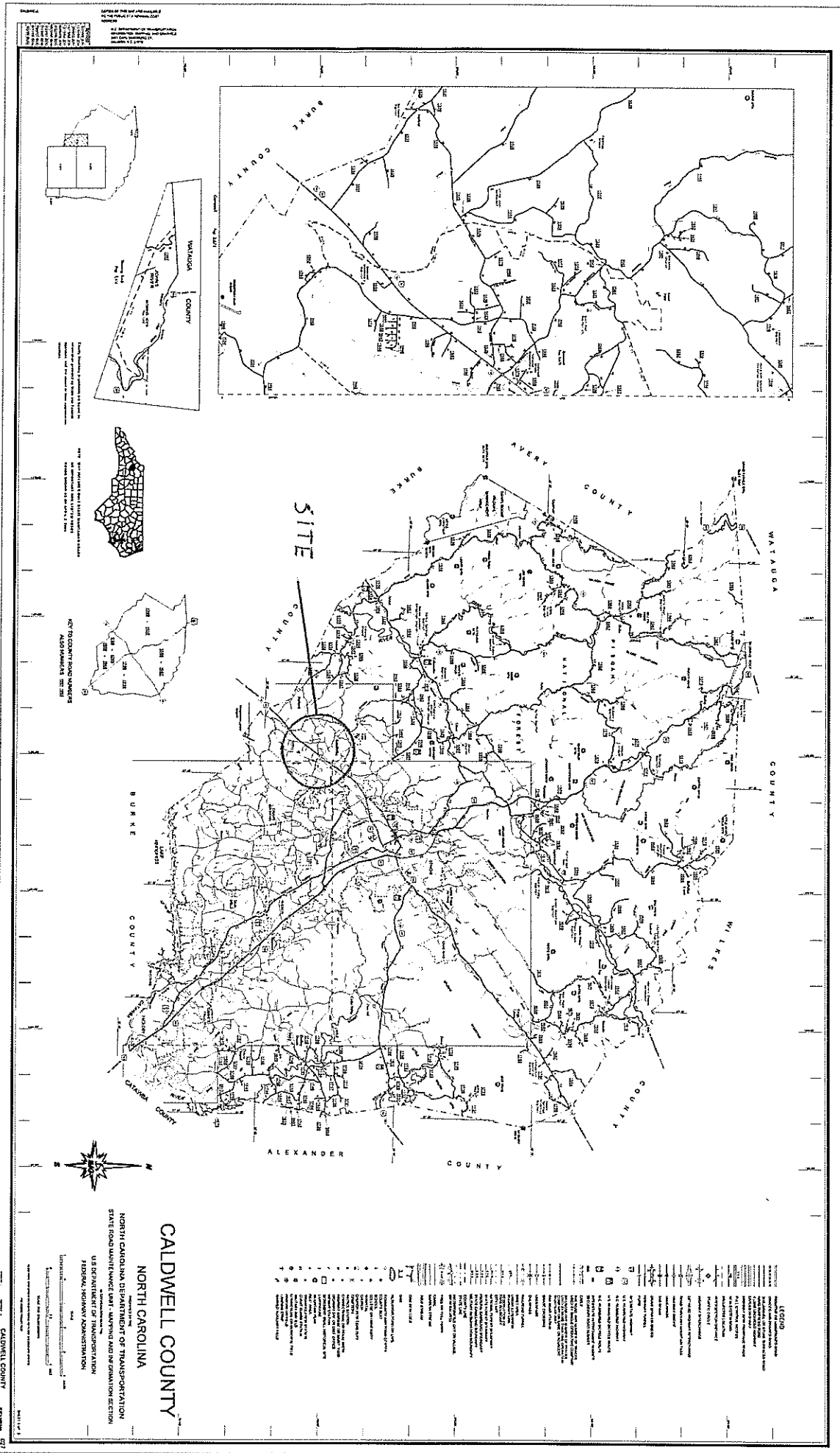
CAMA County NO

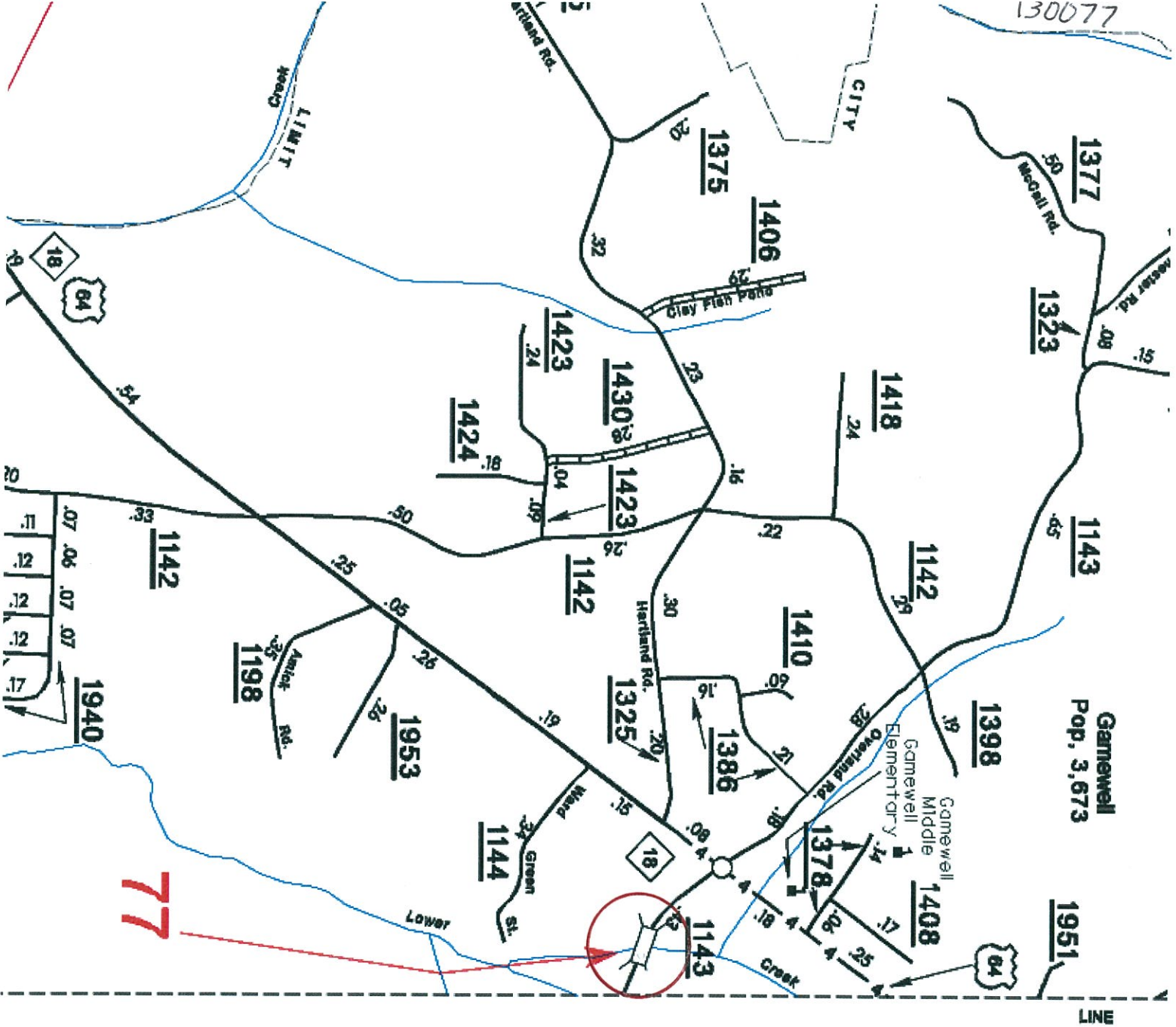
Stream Classification C

11-39-(0.5) ✓

DENR River Basin Info.

CATAWBA ✓





N

AVERY

322

CHESTNUT MTN.
ELEV. 3173

BUR



NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
BRIDGE MANAGEMENT UNIT

ATTENTION

TEMP REPAIR

BRIDGE INSPECTION REPORT

INSPECTION TYPE: Routine Inspection

COUNTY CALDWELL BRIDGE NUMBER 130077 INSPECTION CYCLE 2 YRS
ROUTE SR1143 ACROSS LOWER CREEK M.P. 0

LOCATION .2 MI.SE.JCT.NC18

SUPERSTRUCTURE REINFORCED CONCRETE SLAB ON I-BEAMS

SUBSTRUCTURE E.BT1&BT2:RC CAPS/TIM.PILES;E.BT2&BT1:RC CAPS/H-PILES

SPANS 1 @ 39'-6", 1 @ 37'-6", 1 @ 38'

LONGITUDE 81° 35' 38.6"

LATITUDE 35° 52' 4.4"

PRESENT CONDITION FAIR

INVENTORY RATING

INSPECTION DATE 02/15/2012

OPERATING RATING

PRESENT POSTING SV 38 TTST 41

PROPOSED POSTING

COMPUTER UPDATE

ANALYSIS DATE

POSTING LETTER DATE

SUFFICIENCY RATING

OTHER SIGNS PRESENT NONE



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: 03/09/2012

COUNTY :	DIVISION :	DISTRICT :	STRUCTURE NUMBER :	LENGTH :
CALDWELL	11	2	130077	115 FEET

ROUTE CARRIED :	FEATURE INTERSECTED :
SR1143	LOWER CREEK

LOCATED :	BRIDGE NAME :	CITY :
.2 MI.SE.JCT.NC18		

FUNC. CLASS :	SYST.ON :	SYST.UNDER :	ADT & YR :	RAIL TYPE :
07	FA	NFA	3300 2009	LT 141 RT 141

BUILT :	BY :	PROJ :	FED.AID PROJ :	DESIGN LOAD :
1965	BMU			H 15

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

NAVIGATION :	HT. CRN. TO BED :	WATER DEPTH :
VC 0 FT HC 0 FT 22 FT		1 FT

SUPERSTRUCTURE : REINFORCED CONCRETE SLAB ON I-BEAMS

SUBSTRUCTURE : E.BT1&BT1:RC CAPS/H-PILES;E.BT2&BT2:RC CAPS/TIM.PILES;BT.1&2:CONC.ENCASED

SPANS : 1 @ 39'-6", 1 @ 37'-6", 1 @ 38'

BEAMS OR GIRDERS : 4 LINES 27 I-BEAMS @ 6'-9 CTS.

FLOOR :	ENCROACHMENT :	DECK (OUT TO OUT) :
7 RC/NO AWS		26.3 FT

CLEAR ROADWAY :	BETWEEN RAILS :	SIDEWALK OR CURB :
24 FT	26.2 FT	LT 1.1 FT RT 1.1 FT

VERT.CL.OVER :
999.9 FT

INV.RTG. :	OPE.RTG. :	CONTR.MEMBER :	POSTED :	TTST	41	DATE	09/30/2008
HS-1	HS-1	Ext Beam	SV 38				

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

UNDER ROUTES AND CLEARANCES

REMARKS :

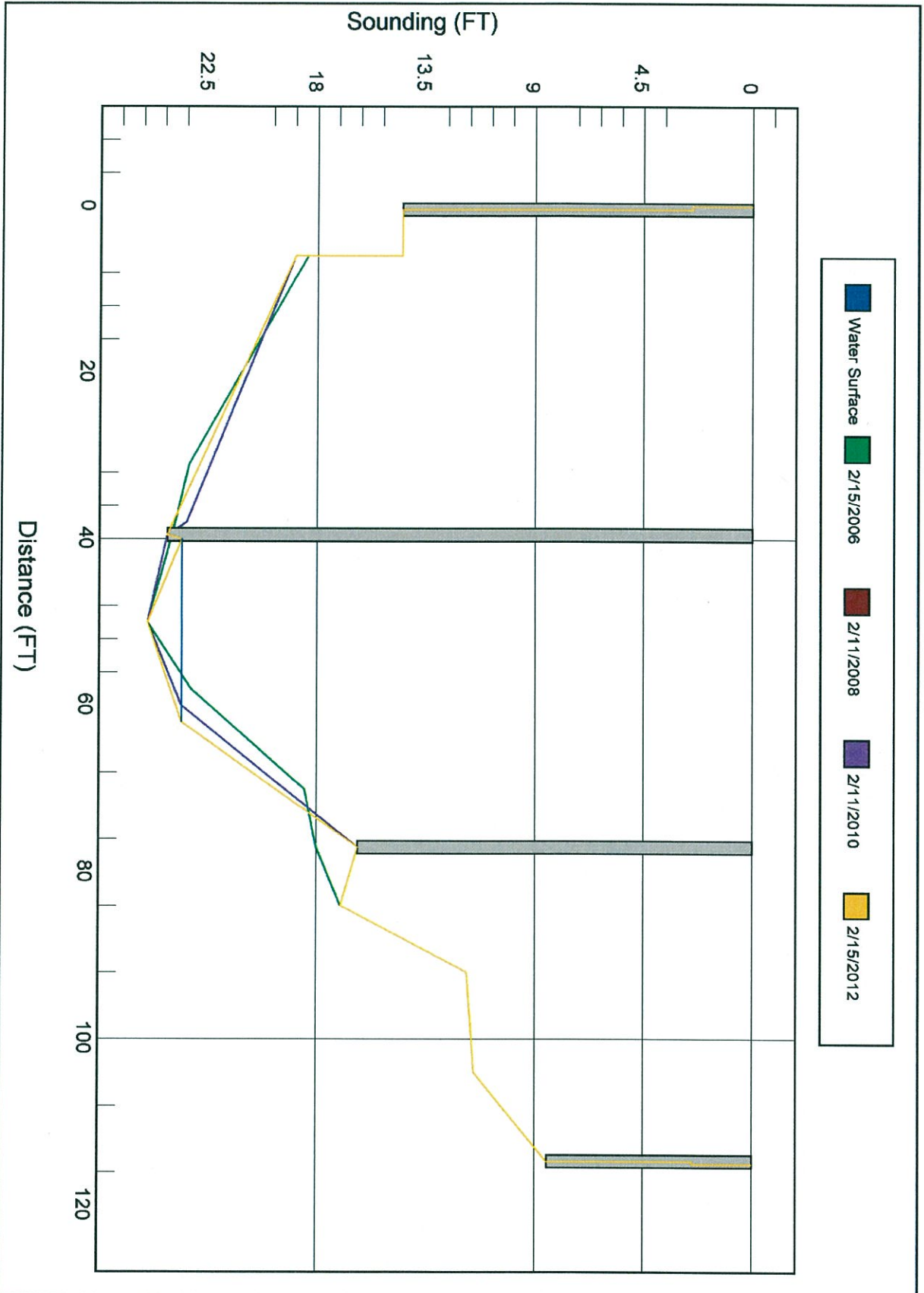
Bridge: 130077

County CALDWELL

Date: 02/15/2012

Top of Rail = 0 FT (Sounding)

STREAMBED PROFILE (Downstream)



Structure 130077

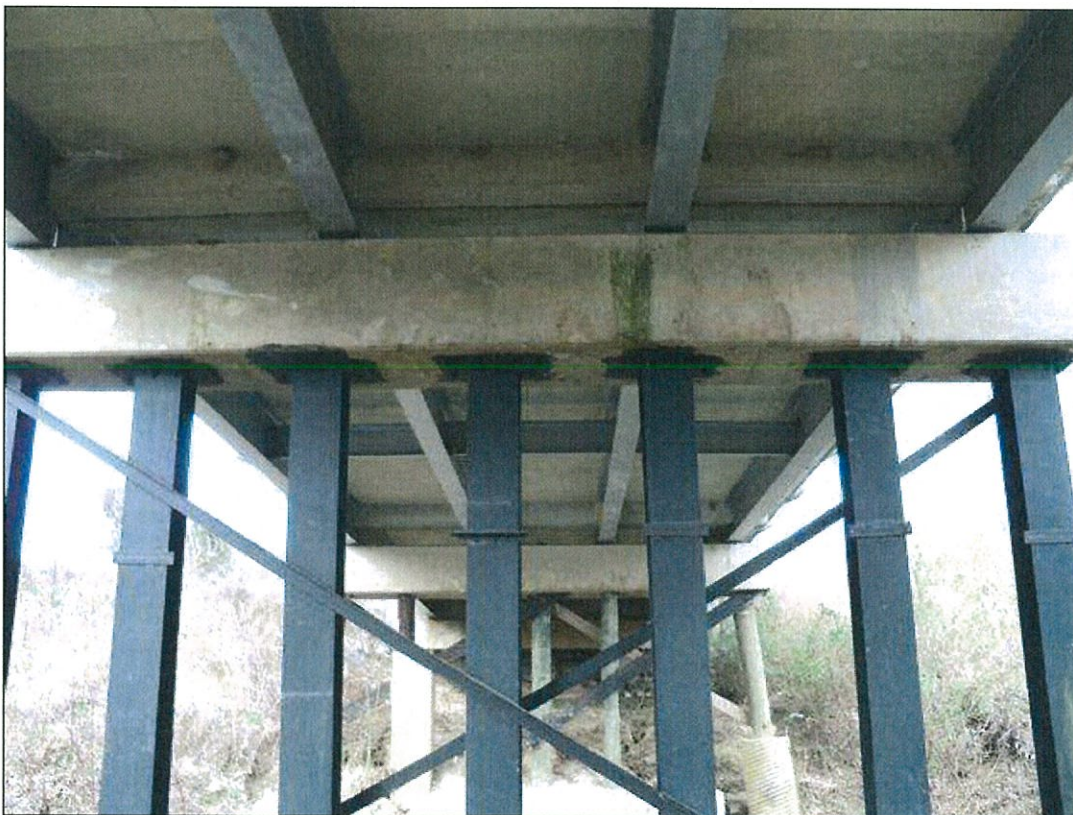
County CALDWELL

Date: 02/15/2012

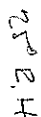
Structure Photos



LOOKING UPSTREAM



BOTTOM VIEW LOOKING NORTH



rev. 5/2009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION



NCDOT UNITS:
 BRIDGE MAINTENANCE UNIT
 HYDRAULIC DESIGN UNIT
 GEOTECHNICAL UNIT
 STRUCTURE DESIGN UNIT
 SOILS AND FOUNDATION UNIT

BRIDGE SCOUR REPORT

COUNTY: Caldwell BRIDGE: 077 ROUTE: SR 1143 STREAM CROSSED: Lower Creek
 ASSESSMENT: Yes EVALUATION: _____ BY: JJD DATE: 6/10/2009

FHWA STRUCTURE INVENTORY & APPRAISAL CODES:

SUBSTRUCTURE CONDITION (ITEM 60)
 CHANNEL AND CHANNEL PROTECTION (ITEM 61)
 WATERWAY ADEQUACY (ITEM 71)
 SCOUR CRITICAL BRIDGE (ITEM 113)

MONITORING:

PLAN REQUIRED? YES _____ NO ✓

- FLOOD MONITORING EVENT (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

- CRITICAL MONITORING DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

- CRITICAL HIGH WATER DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

- SCOUR CRITICAL DEPTH (UPSTREAM FACE, FROM TOP OF RAIL):

REQUIRED ACTION: _____

INCREASE UNDERWATER INSPECTION CYCLE? YES _____ NO ✓ FREQUENCY _____

COUNTER MEASURES:

PLAN REQUIRED?

YES _____ NO ✓

SUMMARY OF PLAN:

CONSTRUCTION COMPLETE DATE: _____
 FINAL CODING AFTER WORK IS COMPLETED (ITEM 113) _____ DATE: _____

BRIDGE MAINTENANCE COMMENTS:

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BRIDGE SCOUR EVALUATION ASSESSMENT

AND DATA SUMMARY REPORT

ASSESSED: 6/10/2009
BY: JJD
CODE: 5
CLASSIFIED: Low Risk

SITE IDENTIFICATION:

COUNTY Caldwell CITY/TOWN _____ BRIDGE NO. 077
 ROUTE SR 1143 STREAM Lower Creek ROAD MILE _____
 DUAL BRIDGE NO. _____ IS US/DS _____
 ORIGINAL PROJECT NO. _____ YEAR BUILT 1965
 REHAB PROJECT NO. _____ YEAR BUILT _____
 CURRENT ADT 3000 YEAR 2003 FUTURE ADT _____ YEAR _____

INFORMATION RESOURCES AVAILABLE:

HYDRAULIC STUDY REPORT (DATE): _____
 AS-BUILT CONSTRUCTION PLANS (DATE): _____
 FOUNDATION REPORT (DATE): _____
 OTHER AGENCY STUDIES (DATE): _____
 (FEMA, CORPS, T.V.A., SCS)
 QUAD MAPS (NAME & DATE): _____
 AERIAL PHOTOGRAPHY (DATE): _____
 GAGE DATA (TYPE, NO., DRAINAGE AREA): _____
 DISTANCE TO SITE (UP/DOWN STREAM): _____
 BRIDGE INSPECTION REPORT (DATE): 2/2006
 UNDERWATER INSPECTION (DATE, CYCLE): _____
 STRUCTURE DATA FILE (DATE): 7/2006
 OTHER Pile record (DATE): 1979

HYDRAULIC DATA:

DRAINAGE AREA _____ SQ. MILE SOURCE _____
 100 YR. WATERWAY OPENING (NORMAL TO FLOW) _____

HISTORICAL FLOODS

DATE	ELEV. (FT BELOW TOP OF RAIL)	APPROX. FREQ. (YEARS)	APPROX. DISCH.	ADJUSTED TO SITE
	8' below top of rail	every few years		

SOURCE Local Resident

FLOOD FREQUENCY (YRS)	Q	Q	Q	Q
ELEVATION (FT)				
DISCHARGE (CFS)				
AVG. VELOCITY (Q/A)				

SOURCE _____

COMMENTS: _____

STRUCTURE DATA:

BRIDGE LENGTH: 113'

SUFFICIENCY RATING 65.5

NO. OF SPANS 3

BED TO CROWN 17'

EST. REMAINING LIFE YRS:

DATE: 6/10/2009

SPAN LENGTHS 1@39'-6.1@37'-6.1@38'

SIMPLE OR CONTINUOUS

TOP OF RAIL ELEVATION 0' [measure down from] T HALWEG ELEVATION 24.2'

BENT NO. (W-E, N-S)	EB1	B1	B2	EB2		
TYPE	Cap & piles	Cap & piles	Cap & piles	Cap & piles		
SKIEW						
FTG./FOUNDATION TYPE	Steel piles	Steel piles/	Timber piles/	Timber piles/		
FOOTING THICKNESS		conc. encased	conc. encased			
TOP FTG. ELEV.	LT					
	CTR					
	RT					
BOTTOM FTG. ELEV.	LT					
	CTR	23'	20.4'			
	RT					
TOP SILL ELEV.	LT					
	CTR					
	RT					
BOTTOM SILL ELEV.	LT					
	CTR					
	RT					
CONC./ RIP RAP PROTECTION						
PILE TYPE	HP 12x53 steel		Timber	Timber		
PILE LENGTH (AVERAGE)						
PILE TIP ELEV. (AVERAGE)	40.3'			26.8'		
PILE EMBED BELOW THALWEG	16.1'			2.6'		
FTG. EMBED BELOW THALWEG		1.2' above	3.8' above			

COMMENTS:

130077

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GEOMORPHIC DATA: (LOOKING DOWNSTREAM)**CHANNEL (NORMAL TO FLOW):**

AVG. BASE WIDTH _____ AVG. TOP WIDTH _____ AVG. DEPTH _____

AT CROSSING:STRAIGHT ☒ MILD CURVE _____ SHARP BEND _____**FLOW ANGLE OF APPROACH:**LOW ☒ MILD _____ HIGH _____
(0°-5°) (5°-20°) (20°+)**CROSSING WIDTH COMPARED TO:**

UPSTREAM: WIDER _____ SAME _____ NARROWER _____

DOWNSTREAM: WIDER _____ SAME _____ NARROWER _____

BASED ON COMPARISON OF SECTIONS TAKEN AT DATES _____

CHANNEL HAS:

WIDENED _____ FT SAME _____ NARROWED _____ FT

AGGRADATED _____ FT SAME _____ DEGRADATED _____ FT

SHIFTED LT _____ FT SAME _____ SHIFTED RT. _____ FT

THALWEG HAS:SHIFTED LT _____ FT SAME ☒ SHIFTED RT. _____ FT**REPORTED SITE SCOUR PROBLEM:**

	MINOR	MODERATE	SEVERE	UNKNOWN
LT. BANK				
RT. BANK				
LT. SPILL SLOPE				
RT. SPILL SLOPE				
PIER(S)				
DEBRIS	☒			
CHANNEL BED				
OTHER				

IS REPORTED PROBLEM CHANNEL FLOW ASSOCIATED? N/A

BASED ON THE AVAILABLE GEOMORPHIC DATA, THE CHANNEL STABILITY POTENTIAL OVER THE LIFETIME OF THE EXISTING STRUCTURE CAN BEST BE DESCRIBED AS:

1. RELATIVELY STABLE WITH LITTLE EXPECTED CHANGE N/A
2. POTENTIAL FOR SLOW CHANGE OVER TIME. NOT PRONE TO A MAJOR ONE-EVENT CHANGE. N/A
3. UNSTABLE SUBJECT TO RAPID EVOLUTIONARY CHANGE N/A

ASSESSMENT CRITERIA:

- 1) SPREAD FOOTINGS WITHIN THE POTENTIAL CHANNEL SCOUR AREA ARE INDICATED BY FIELD INVESTIGATION OR BORING LOG ANALYSIS TO BE ON SCOUR RESISTANT MATERIAL.
GEOTECHNICAL CONCURRENCE BY: _____
- 2) AS-BUILT PLANS INDICATE THE SPREAD FOOTINGS WITHIN THE POTENTIAL CHANNEL SCOUR AREA TO BE KEYED AT LEAST 6" INTO ROCK. _____
- 3) STEEL PILE BENTS WITHIN THE POTENTIAL CHANNEL SCOUR AREA HAVE a) AVERAGE PILE TIPS THAT PENETRATE A MINIMUM OF 12 FEET BELOW STREAM BED OR b) HAVE LESS THAN 22 +/- FEET (LONGER IF BRACING CONSIDERED) OF TOTAL PILE LENGTH AND INDICATED BY: BORINGS LOGS, PILE DRIVE RECORDS, OR ROD SOUNDINGS TO BE TIPPED INTO POINT BEARING MATERIAL. a) _____ b) ☒ _____
- 4) CONCRETE OR TIMBER BENTS WITHIN THE POTENTIAL CHANNEL SCOUR AREA HAVE a) AVERAGE PILE TIPS THAT PENETRATE A MINIMUM OF 15 FEET BELOW THE STREAM BED OR b) HAVE LESS THAN 18 FEET +/- (LONGER IF BRACING CONSIDERED) OF TOTAL PILE LENGTH AND INDICATED BY BORING LOGS OR ROD SOUNDINGS TO BE TIPPED INTO POINT BEARING MATERIAL. a) _____ b) ☒ _____
- 5) ALL PIERS AND ABUTMENTS ARE OUTSIDE THE NORMAL CHANNEL SECTION. _____
- 6) THE BRIDGE HAS EXPERIENCED A FLOOD GREATER THAN A 50-YEAR MAGNITUDE WITH NO REPORTED OR APPARENT SCOUR PROBLEM. _____
- 7) THE BOTTOMS OF THE CHANNEL PIER SPREAD FOOTINGS ARE GREATER THAN 7 FEET BELOW THE STREAM BED. _____
- 8) THE APPROACH ROADWAY OR BRIDGE IS OVERTOPPED DURING MINOR FLOODS (<10-YEAR EVENT) REQUIRING CLOSURE AND INSPECTION BEFORE REOPENING. _____

THIS STRUCTURE MEETS WHICH OF THE ABOVE LISTED ITEMS FOR CLASSIFICATION AS A LOW RISK STRUCTURE?

3b,4b

BASED ON AN ENGINEERING EVALUATION OF THE AVAILABLE DATA AND REPORTS, THE LOW RISK CLASSIFICATION OF THIS STRUCTURE FOR THE REASON(S) LISTED ABOVE APPEARS REASONABLE.

YES

COMMENTS:

Item 3b for EB1 & B1. Item 4b for B2 & EB2.

Rods driven to refusal EB1: 11.7'/24.3', B1: 23.5', B2:22.4', EB2:21.7'.

ASSESSMENT DATA:

COUNTY: Caldwell
 BRIDGE NO.: 077

ASSESSMENT DATE: 6/10/2006

	YES OR NO
INSPECTION REPORTS:	
DATE OF INSPECTION REPORT 2/2006	
EXISTING SCOUR HOLES PRESENT	NO
UNDERMINING OF FOOTINGS	N/A
72 FIELD SCOUR EVALUATION- SCOUR HAS OCCURRED	N/A
HYDRAULIC DATA:	
HIGH WATER- OVERTOP OF BRIDGE DECK	NO
CHANNEL SHIFTING OR DEGRADING	N/A
BAD ANGLE OF ATTACK- STREAM CURVES AT BRIDGE	NO
DEBRIS PROBLEM AT BRIDGE- LEANING TREES ON BANK	NO
GEOTECHNICAL DATA:	
FOUNDATION MATERIAL IS SCOURABLE	N/A
STREAMBED IS SAND W/ NO ARMOR MATERIAL	N/A
STRUCTURAL DATA:	
SMALL ABUTMENTS (NOT MASSIVE)- EASY TO DAMAGE	N/A
WIDE WEBS- ADVERSE ANGLE- CREATES PIER SCOUR	N/A
ROTATION OR SETTLEMENT OF PIERS OR ABUTMENTS	N/A
ADDITIONAL CONSIDERATIONS:	
DAM-UPSTREAM/ DOWNSTREAM	N/A
PREVIOUS COUNTERMEASURES DAMAGED	N/A
RIP RAP ERODE	N/A
SAND OR GRAVEL MINING IN VICINITY OF BRIDGE	N/A

THIS ASSESSMENT WAS CONDUCTED BY AN INTERDISCIPLINARY TEAM OF HYDRAULIC, GEOTECHNICAL, STRUCTURAL, BRIDGE MAINTENANCE, AND FHWA ENGINEERS BASED UPON INFORMATION PROVIDED AND ENGINEERING JUDGMENT.

NOTE:

BRIDGE INSPECTORS TO NOTIFY THE HYDRAULICS UNIT IF ANY OF THE ABOVE CONDITIONS CHANGE ENOUGH TO WARRANT RECORDING OF ITEM 113.

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DECISION:**CLASSIFIED AS:**

SCOUR CRITICAL _____

UNKNOWN FOUNDATION _____

LOW RISK ✓**RECOMMENDED SCOUR CODE:** 5**ASSESSMENT COMMENTS:**

EB1- Steel pile 40.3' below Top of Rail with 100 blow/6" material @ 24.3' below TOR

B1- Bottom of Footing 23' below TOR on 100 blow/6" material.

B2- BOF 20.4' below TOR on 138 blow/1' material.

EB2- Timber piles 26.8' below TOR on 138 blow/1' material and with 100/8" material @ 21.7' below TOR.

Bank erosion along concrete over pour @EB1.

SCHEDULE FOR DETAILED STUDY**SCHEDULE FOR FURTHER IN-HOUSE STUDY****ASSESSED BY:** JJB**FIRM:** NCDOT**DATE:** 6/10/2009**CHECKED BY:** _____**DATE:** _____**FIRM:** _____**APPROVED BY:** JLL**DATE:** 6/10/2009**FINAL COMMENTS:**

Scour Committee recommends code 5. See report by FDH dated 6/10/2009.

1 230 000 FEET

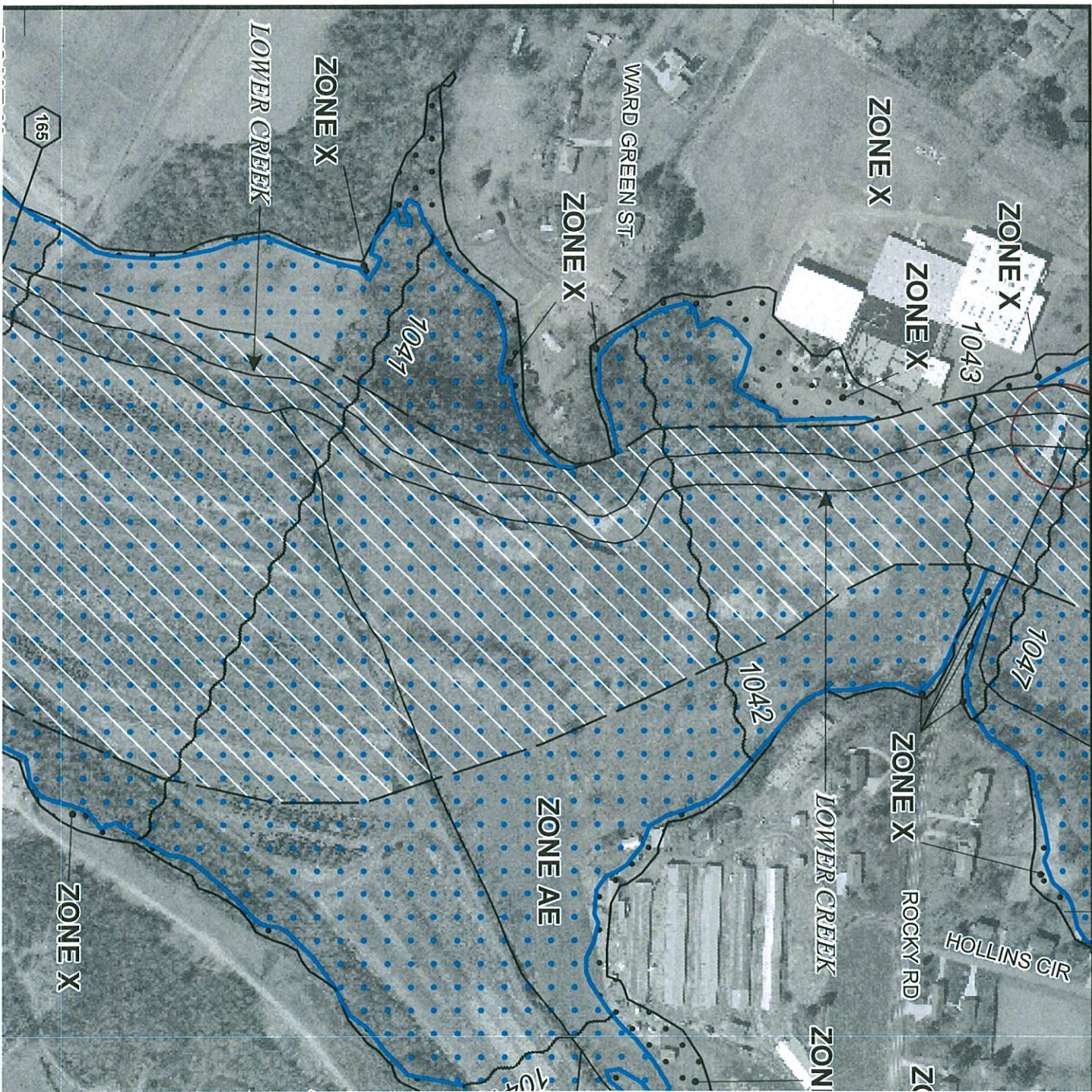
446 000 M

780 000 FEET

81° 35' 30"



3969 000 M



35° 51' 30"

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD 88)			
CROSS SECTION	DISTANCE	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Little Mulberry Creek 1								
130	12,960 ¹	72	223	5.0	1,210.5	1,210.5	1,210.5	0.0
135	13,491 ¹	135	259	4.3	1,216.3	1,216.3	1,216.3	0.0
141	14,066 ¹	77	186	4.8	1,221.7	1,221.7	1,221.7	0.0
146	14,604 ¹	40	164	5.4	1,225.4	1,225.4	1,226.0	0.6
Lower Creek								
018	1,750 ²	739	8,191	2.1	1,027.9	1,027.9	1,028.9	1.0
036	3,640 ²	650	6,607	2.6	1,030.0	1,030.0	1,030.9	0.9
047	4,680 ²	500	6,020	2.9	1,031.6	1,031.6	1,032.5	0.9
098	9,750 ²	987	12,796	1.2	1,033.8	1,033.8	1,034.8	1.0
113	11,287 ²	886	10,443	1.5	1,034.1	1,034.1	1,035.1	1.0
133	13,337 ²	654	5,662	2.7	1,035.4	1,035.4	1,036.3	0.9
153	15,288 ²	659	5,158	3.0	1,038.1	1,038.1	1,039.1	1.0
165	16,450 ²	875	8,199	1.9	1,040.0	1,040.0	1,041.0	1.0
BETWEEN —	21,190 ²	700	4,763	3.3	1,048.1	1,048.1	1,049.0	0.9
212*	52,432 ¹	755	5,686	2.7	1,050.9	1,050.9	1,051.9	1.0
524	53,431 ¹	438	3,680	4.2	1,051.6	1,051.6	1,052.5	0.9
534	55,431 ¹	167	2,043	7.6	1,054.2	1,054.2	1,055.1	0.9
554	55,965 ¹	310	2,988	5.2	1,055.3	1,055.3	1,056.1	0.8
560	56,532 ¹	410	3,503	4.4	1,056.2	1,056.2	1,057.1	0.9

¹Feet above mouth

²Feet above county boundary

*Upstream flood hazard information is studied by new detailed methods. These methods reflect more detailed and up-to-date stream channel configurations. As a result, the stream channel distances may not agree with the adjoining redelineated portion of the stream.

TABLE 12

FEDERAL EMERGENCY MANAGEMENT AGENCY
CALDWELL COUNTY, NC
AND INCORPORATED AREAS

FLOODWAY DATA

LITTLE MULBERRY CREEK 1 - LOWER CREEK

