FINAL MITIGATION PLAN

601 North II Stream Restoration Site

Union County, North Carolina

NCEEP Project Number 95925

Yadkin River Basin

Cataloging Unit 03040105081010

Prepared for:

Ecosystem Enhancement PROGRAM

NC Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, North Carolina 27699-1652

June 2012

FINAL MITIGATION PLAN

601 North II Stream Restoration Site

Union County, North Carolina

NCEEP Project Number 95925

Yadkin River Basin

Cataloging Unit 03040105081010

Prepared for:

NC Department of Environment and Natural Resources
Ecosystem Enhancement Program
1652 Mail Service Center
Raleigh, North Carolina 27699-1652

Prepared by:

Environmental Banc & Exchange, LLC
909 Capability Drive, Suite 3100
Raleigh, North Carolina 27606

June 2012

EXECUTIVE SUMMARY

Stream restoration strategies for the Yadkin River Basin (Cataloguing Unit 03040105081010) are currently being developed by the North Carolina Ecosystem Enhancement Program (NCEEP), a division of the North Carolina Department of Natural Resources (NCDENR). NCEEP has circulated a request for proposals (RFP) for full delivery stream restoration in the region. In response to the RFP, Environmental Banc and Exchange (EBX) proposed to perform stream restoration at the 601 North II Stream Restoration Site (hereafter referred to as the "Site") located in Union County.

This document details proposed stream restoration procedures for the 12.3-acre Site located within the Yadkin River Basin. The Site encompasses one small wetland and approximately 3,760 linear feet of intermittent and perennial stream channel, most of which has been channelized for agricultural and flood abatement purposes. The primary restoration features on the Site include Wicker Branch and an unnamed tributary (UT) to Wicker Branch comprising a drainage area of 0.57 square-miles. Land use within the Site is primarily agriculture and is facilitated by the historic modification of the local water table through dredging and channelization activities.

Under existing conditions Wicker Branch and the UT to Wicker Branch have been dredged and straightened to support various agricultural practices. Impacts resulting from stream alteration include bank erosion, channel incision, and loss of characteristic riffle/pool complex morphology. Natural vegetation within adjacent areas, including stream buffers zones, has been removed throughout the majority of the Site. The floodplain has been impacted by deforestation and groundwater draw-down from stream channel dredging activities. A significant increase in nutrient and sediment loading has resulted from such site modifications, and adjacent wildlife habitats have been eliminated or fragmented.

Restoration activities have been proposed to restore historic stream functions that existed at the Site prior to dredging and vegetation removal that supported agriculture activities. Site alterations will include backfilling of the existing channels, re-establishment of the adjacent floodplain, and construction of new stream channels within that floodplain. These activities will reintroduce surface water flood hydrodynamics along the newly restored length of stream and floodplain. The new channel will be constructed to reflect regional stream characteristics and accommodate bankfull flows. Subsequently, the adjacent slope soil surfaces will be restored and the Site reforested with streamside and riparian hardwood and mixed-mesic forest communities. Forested stream and upland buffers will be restored along the entire stream and floodplain to further protect water quality and enhance opportunities for wildlife.

This Mitigation Plan has been written in conformance with the requirements of the following:

- Federal rule for compensatory mitigation project sites as described in the Federal Register Title 33 Navigation and Navigable Waters Volume 3 Chapter 2 Section §332.8 paragraphs (c)(2) through (c)(14).
- NCDENR Ecosystem Enhancement Program (NCEEP) In-Lieu Fee Instrument signed and dated July 28, 2010.

These documents govern NCEEP operations and procedures for the delivery of compensatory mitigation.

After implementation, restoration activities are expected to provide the following mitigation units.

Restoration Design Component	Mitigation Type	Existing Length	Design Length	Proposed Credit Ratio	Available Mitigation Units
Wicker Branch	Restoration	2,400 LF	2,645 LF	1:1	2645
UT to Wicker Branch	Restoration	534 LF	646 LF	1:1	646
UT to Wicker Branch	Enhancement Level I	218 LF	218 LF	1:1.5	145
UT to Wicker Branch	Enhancement Level II	608 LF	608 LF	1:2.5	243
Total Stream Mitigation Units					3,679

Table of Contents

FINAL MITIGATION PLAN
601 NORTH II STREAM RESTORATION SITE
Union County, North Carolina

1.0 RESTORATION PROJECT GOALS AND OBJECTIVES

The North Carolina Ecosystem Enhancement Program (NCEEP) develops River Basin Restoration Priorities (RBRP) to guide its restoration activities within each of the state's 54 cataloging units. RBRPs delineate specific watersheds that exhibit both the need and opportunity for wetland, stream, and riparian buffer restoration. These watersheds are called Targeted Local Watersheds (TLWs) and receive priority for NCEEP planning and restoration project funds.

The 2003 Yadkin Pee-Dee River Basin Watershed Restoration Plan first identified HUC 03040105081010 (Upper Lanes Creek) as a TLW (http://www.nceep.net/services/restplans/yadkinpeedee%202003.pdf) and was subsequently updated in 2009 (http://www.nceep.net/services/restplans/Yadkin_Pee_Dee _RBRP_2009_Final.pdf). In 2009 the watershed was characterized by 0.64 percent impervious surface, 53 percent non-forested buffer, and 49 percent agriculture area with 9 percent of the streams listed as impaired for Aquatic Life by the North Carolina Division of Water Quality (NCDWQ). The 2009 Yadkin Pee-Dee RBRP identified agricultural practices and development impacts as potential stressors within the TLW. The 601 North II Stream Restoration Site (hereafter referred to as the "Site") was identified as a stream restoration opportunity to improve water quality and habitat within the Upper Lane's Creek TLW.

Environmental Banc & Exchange (EBX) will complete a stream restoration project within the Site along Wicker Branch and an unnamed tributary (UT) to Wicker Branch comprising a drainage area of 0.57 square-miles in Union County, North Carolina. The total length of the project is 4,117 feet; with the 3,291 feet of restoration (Priority 1 and 2) and 826 feet of stream enhancement (Level I and II). Along with the restoration of the main channel and tributary, approximately 12.3 acres of riparian buffer will be protected within a conservation easement.

The project goals address stressors in the TLW and include the following:

- Re-establish the capacity to store and transport watershed flows and sediment loads by restoring stable dimension, pattern, and profile
- Reduce sediment within on-Site and downstream receiving waters through the stabilization of eroding stream banks, introduction of livestock exclusion fencing and responsible grazing techniques, and restoration of a forested riparian buffer
- Elevate the water table and introduce surface water flood hydrodynamics within the floodplain by reestablishing characteristic bankfull dimensions and flood frequency
- Remove non-point sources of pollution associated with pesticides, herbicides, fertilizer, and livestock waste pollutants by filtering sheet flow through a restored riparian buffer and installed Riparian Best Management Practice (RBMP) detention devices
- Improve aquatic habitat by reducing sedimentation, removing in-stream culverts, enhancing

stream bed variability, and introducing shading, woody debris, and detritus from riparian planting
- Enhance terrestrial wildlife habitat by extending a terrestrial wildlife corridor and refuge to connect with the existing and adjacent 601 North Site, as well as to the downstream reaches of Wicker Branch and Lanes Creek
- Improve water quality for two populations of freshwater mussels documented to occur in Lanes Creek (Savannah Lilliput (*Toxolasma pullus*) and Carolina creekshell (*Villosa vaughniana*), both state listed and Federal Species of Concern)
- Expand on and integrate the restoration and enhancement work with the adjacently positioned, companion 601 North Restoration Site

The project goals will be addressed through the following project objectives:

- Restoration (Priority 1 and 2) of approximately 3,291 linear feet of perennial stream channel to reconnect the floodplain and restore stable channel dimension, pattern, and profile
- Enhancement (Level I) of approximately 218 linear feet of perennial stream channel by laying back valley wall, and slight adjustments to either stream pattern or dimension.
- Enhancement (Level II) of approximately 608 linear feet of perennial stream channel by restoring a minimum 50 foot planted buffer.
- Removal of an existing culvert on Wicker Branch
- Installation of Riparian Best Management Practice (RBMP) detention devices, and livestock exclusion fencing to prohibit grazing on the floodplain and hoof shear on stream banks.
- Re-vegetating floodplains adjacent to streams
- Providing a permanent conservation easement on approximately 12.3 acres of riparian buffer along approximately 4,117 feet of restored and enhanced stream channels

2.0 WATERSHED CHARACTERIZATION

2.1 Directions

The Site is located approximately seven miles south of Monroe in Union County, NC. From Monroe, travel south for approximately 6 miles on U.S. Highway 601. Turn right on McManus Circle and proceed for approximately 0.6 miles before turning on a gravel farm road. The Site is accessed from the end of the gravel farm road.

2.2 Physiography, Geology, and Soils

The Site is located within the Carolina Slate Belt ecoregion (level 4) of the Piedmont physiographic province. The Carolina Slate Belt ecoregion is characterized by dissected irregular plains with low rounded hills and ridges. The geologic surficial material of the Carolina Slate Belt consists primarily of silty to clayey saprolite, felsic to mafic metavolcanic rock, metamudstone, meta-agrillite, phyllite and schist (Griffith et al. 2002). Alluvial fills in smaller streams draining the Slate Belt are narrow, shallow to hard rock, and contain an abundance of slate fragments (Daniels, Buol, Kleiss, and Ditzler, 1999).

Two distinct land features occur within the Site: 1) primary floodplain associated with the restoration reaches, and 2) the adjacent valley terraces and side slopes. Soils occurring within the floodplain are nearly level to moderately sloping and poorly to well-drained. Soils occurring within the terraces and

side slopes are gently sloping and moderately to well-drained. Soil units are displayed in Section 2.7 NRCS Soil Survey Map and briefly described below.

Badin channery silt loam (Clayey, mixed, thermic Typic Hapludults; 2 to 8 percent and 8 to 15 percent slopes) – The Badin soil series consists of moderately deep, well drained, moderately permeable soils on ridges and side slopes. Slopes range from 2 to 45 percent. Depth to soft weathered bedrock ranges from 20 to 40 inches while depth to hard bedrock is 40 inches or more. Erosion hazards are moderate in bare or unprotected areas. Typical land use within the soil series is primarily crops and pasture, as well as wooded or urban use.

Cid channery silt loam (Clayey, mixed, thermic Aquic Hapludults; 1 to 5 percent slopes)- The Cid soil series consists mainly of moderately deep, moderately well drained to somewhat poorly drained soils on uplands, in depressions, and at the head of intermittent drainways. Over 90 percent of the Site consists of Cid channery silt loam including both the floodplain and side slopes. Colors tend to display pale brown and yellow hues with textures comprised of silt and clay with weathered, fractured slated bedrock at a depth of about 27 inches. Typical land use is cropland, pasture, and woodland.

Tatum gravelly silt loam and gravelly silty clay loam (Fine-silty, siliceous, thermic Typic Hapludults; 2 to 8 percent slopes). The Tatum series consists of deep, well drained, moderately permeable soils on ridges and side slopes. These soils formed in material weathered from Carolina Slates. The surface layer and subsoil is predominantly silt loam with areas of clay loam where the upper part of the subsoil has been mixed to the surface by plowing. The hazard potential is moderate in bare or unprotected areas. Typical land use is cropland, pasture, and woodland.

2.3 Historical Land Use and Development Trends

Historical land use and development trends were evaluated from recent aerial photography (2010, Section 2.8) compared to historic aerial photography from 1969, 1993, 1998, and 2008 (Sections 2.9 through 2.12). Historically, land use within the watershed is characterized as rural and dominated by agriculture and wooded land.

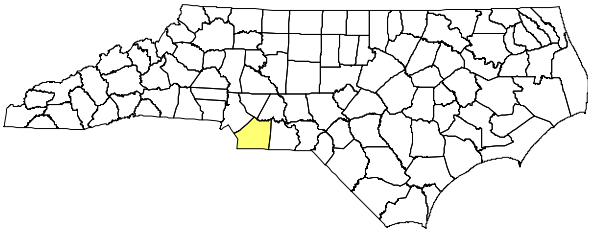
In 1969, the watershed of Wicker Branch and the UT was dominated by agriculture (approximately 65 percent) with fragmented patches of wooded areas (approximately 35 percent). On-site stream reaches appear to have a narrow wooded buffer along both banks despite agricultural land encroaching within the eastern Site boundary. By 1993, agricultural land use within the Site actually decreased since 1969 as evidenced by additional stream buffer along the northeastern banks of Wicker Branch and the UT. This trend is also true for the entire watershed as agricultural land use decreased to approximately 55 percent. Between 1969 and 1993, the upstream, offsite reach of Wicker Branch was channelized to facilitate agriculture.

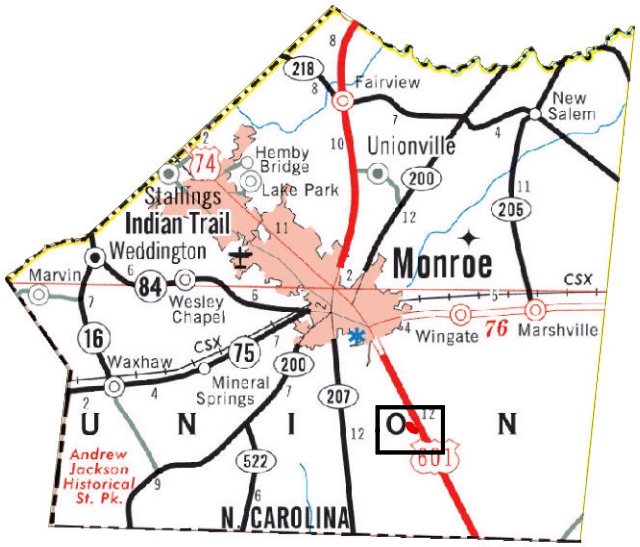
The 1998 aerial photograph indicates a conversion of approximately 10 percent of forest land to agriculture within the watershed, largely concentrated immediately surrounding the Site. Three ponds were also created within the watershed from headwater streams that drain to Wicker Branch. In 2008 land use within the watershed was largely unchanged from 1998. At this time, Wicker Branch experienced a reduction of forested buffer within the Site and the creation of an in-line pond immediately above the Site.

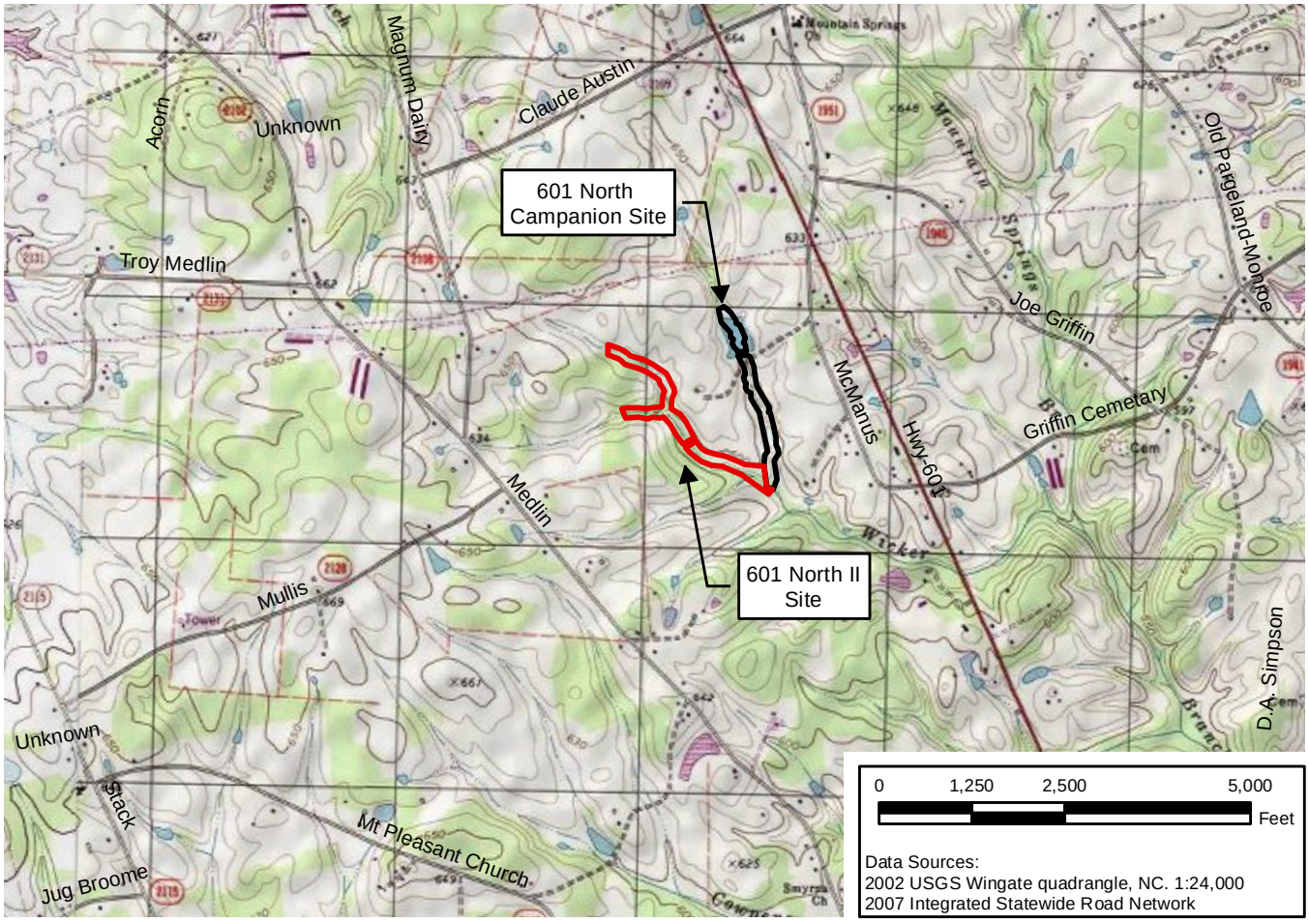
Currently the watershed is rural and comprised of agriculture and wooded land. Within the Site land use is dominated by agriculture [approximately 90 percent] (crop rotation consisting of wheat, soybeans, and corn) and 10 percent wooded land. All riparian vegetation along UT and the majority of Wicker Branch has been cleared and on-Site streams appear to have been channelized. Continued Logging of forest land is the primary potential future threat to the watershed and Site. Future low density residential development is also a possibility for the watershed due to the proximity to U.S. Highway 601.

2.4 Site Selection

The Site was selected for the opportunity to restore historic stream and floodplain functions that existed prior to landscape manipulations that have occurred under existing land-use practices. Restoration at the Site also accomplishes a watershed approach based on its location within a NCEEP TLW as well as by expanding and integrating the successful restoration work previously completed at the companion 601 North Site. Currently the Site is significantly impacted by agriculture practices including manipulation of stream channels and land clearing activities. Dredging and straightening of streams on the Site has reduced stability, increased sedimentation, degraded water quality, reduced water storage and base flow release, and diminished water availability for the riparian plant community. Removal of riparian vegetation adjacent to streams has degraded water quality, reduced local vegetative biodiversity, and reduced in-stream shading and wildlife habitat. Barring any restoration work, planned livestock grazing and row crop agricultural practices adjacent to the Site will undoubtedly contribute to future water quality degradation and increased stream bank erosion and sedimentation.







Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

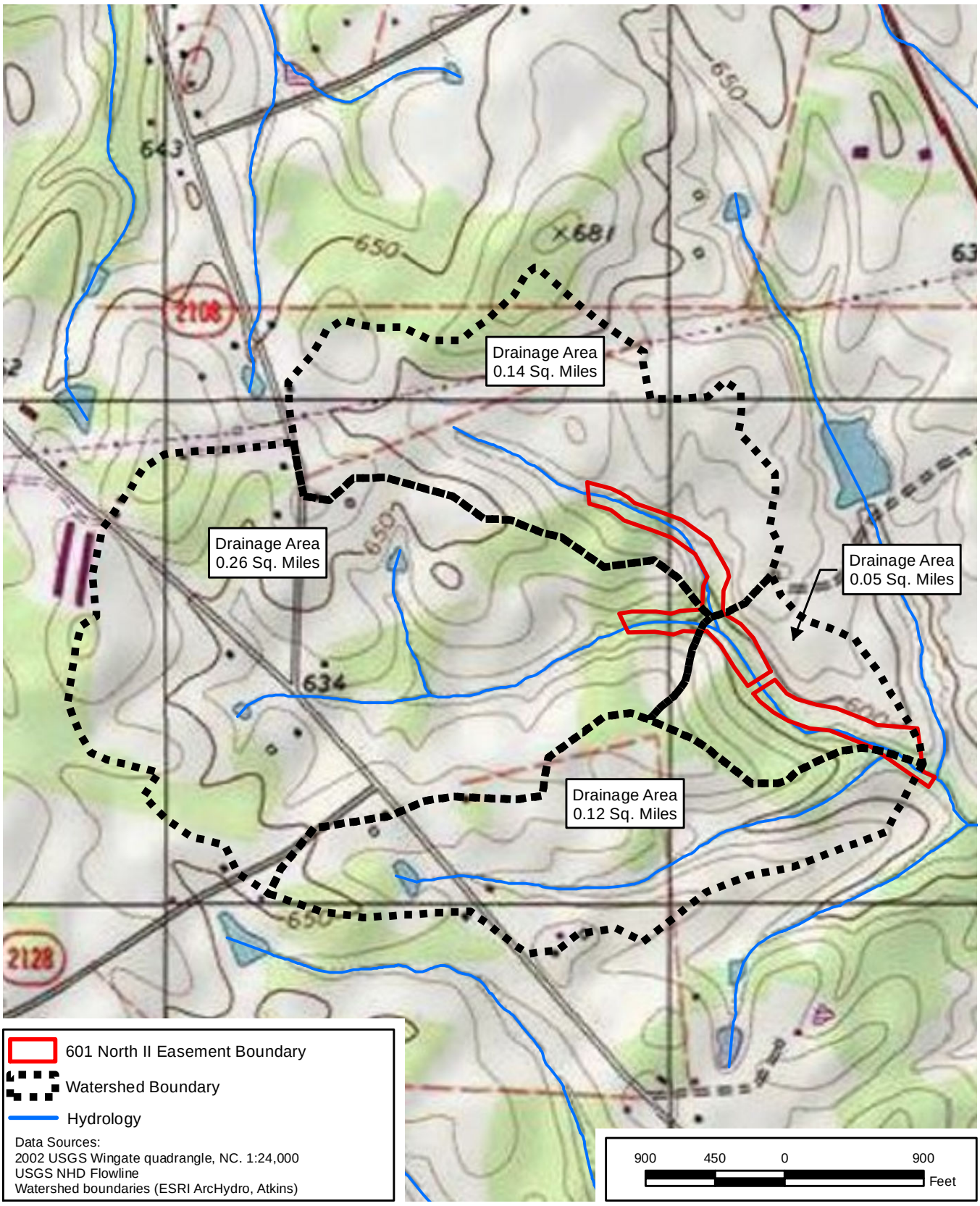
2.5 VICINITY MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

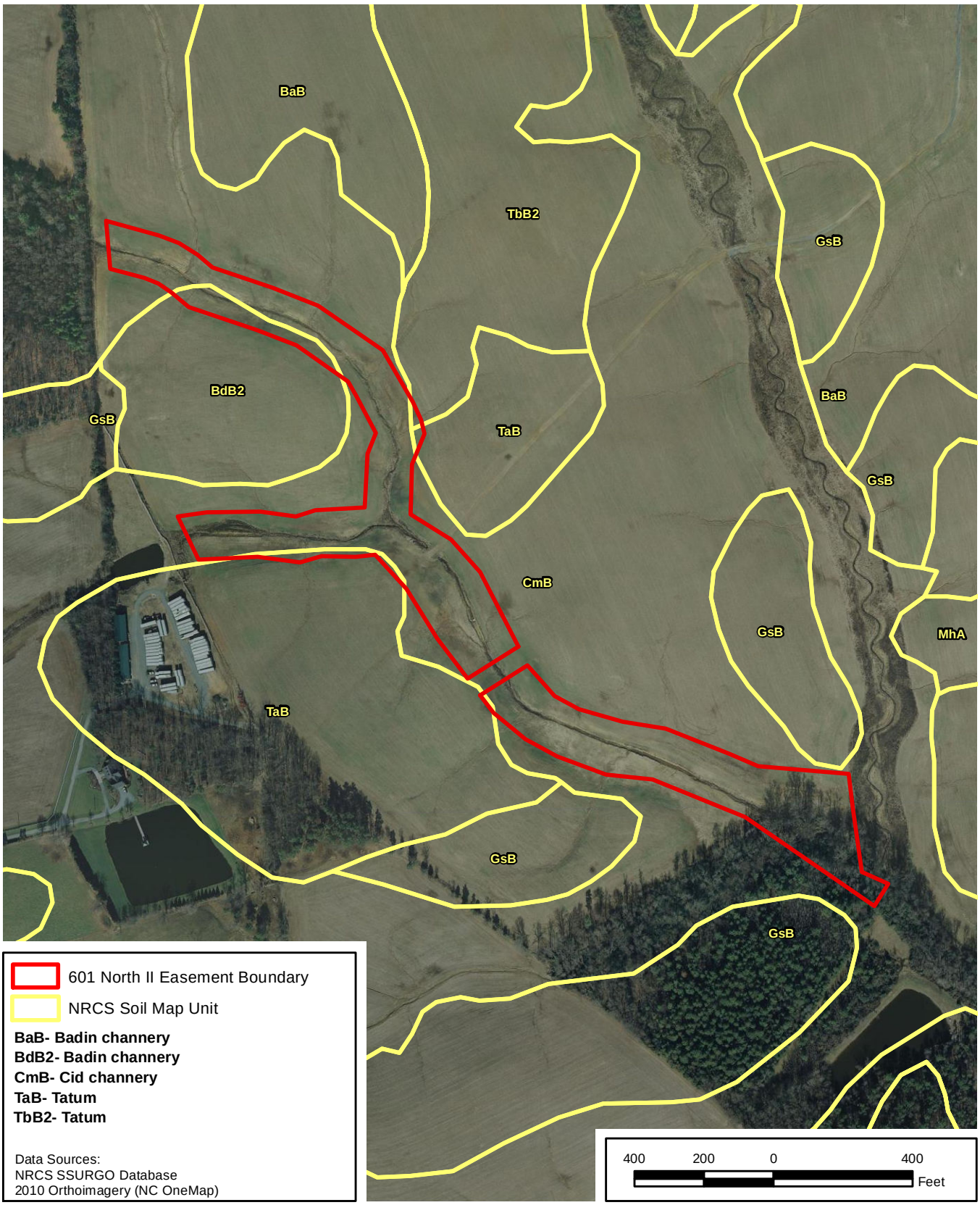
2.6 WATERSHED MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

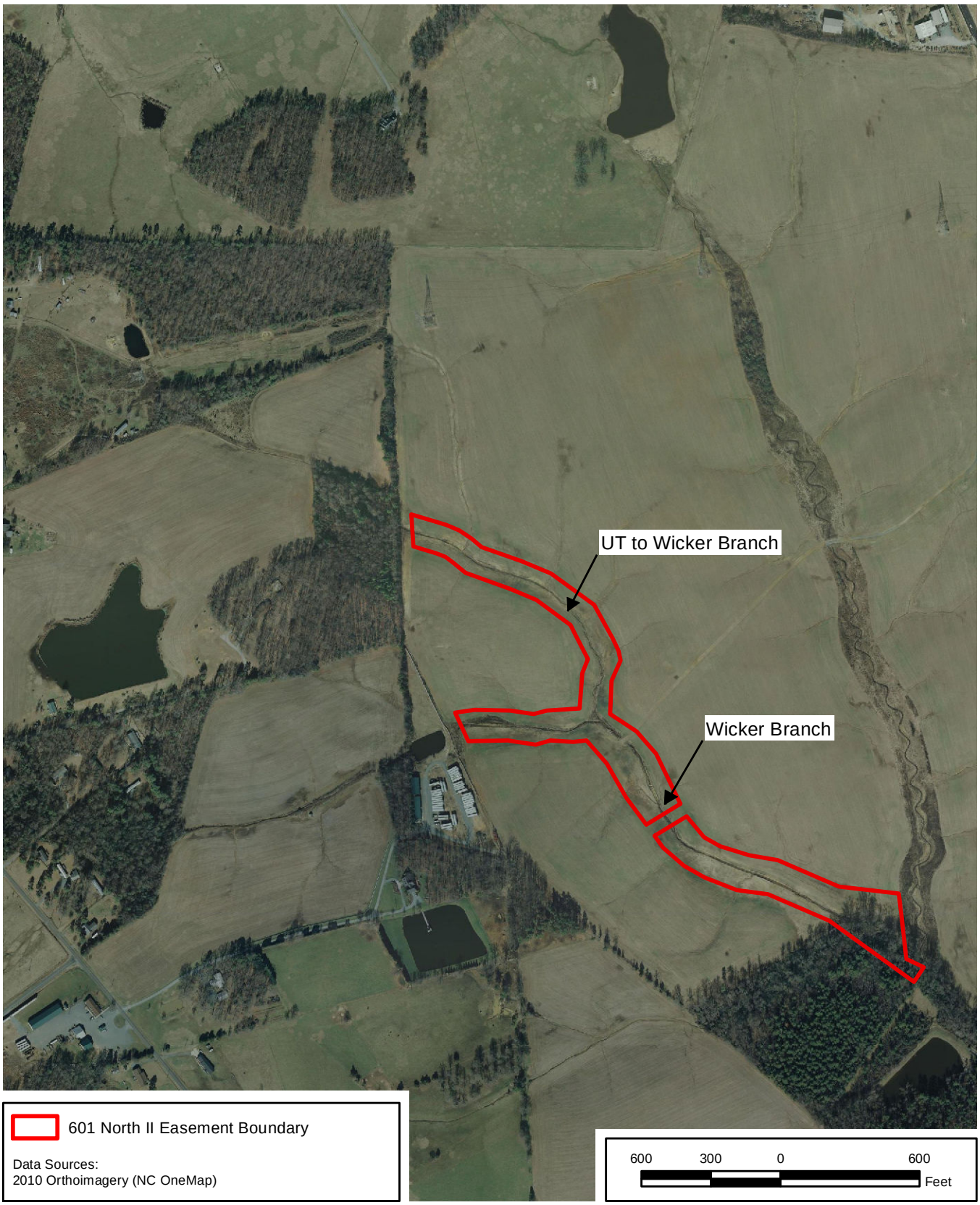
2.7 NRCS SOIL SURVEY MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

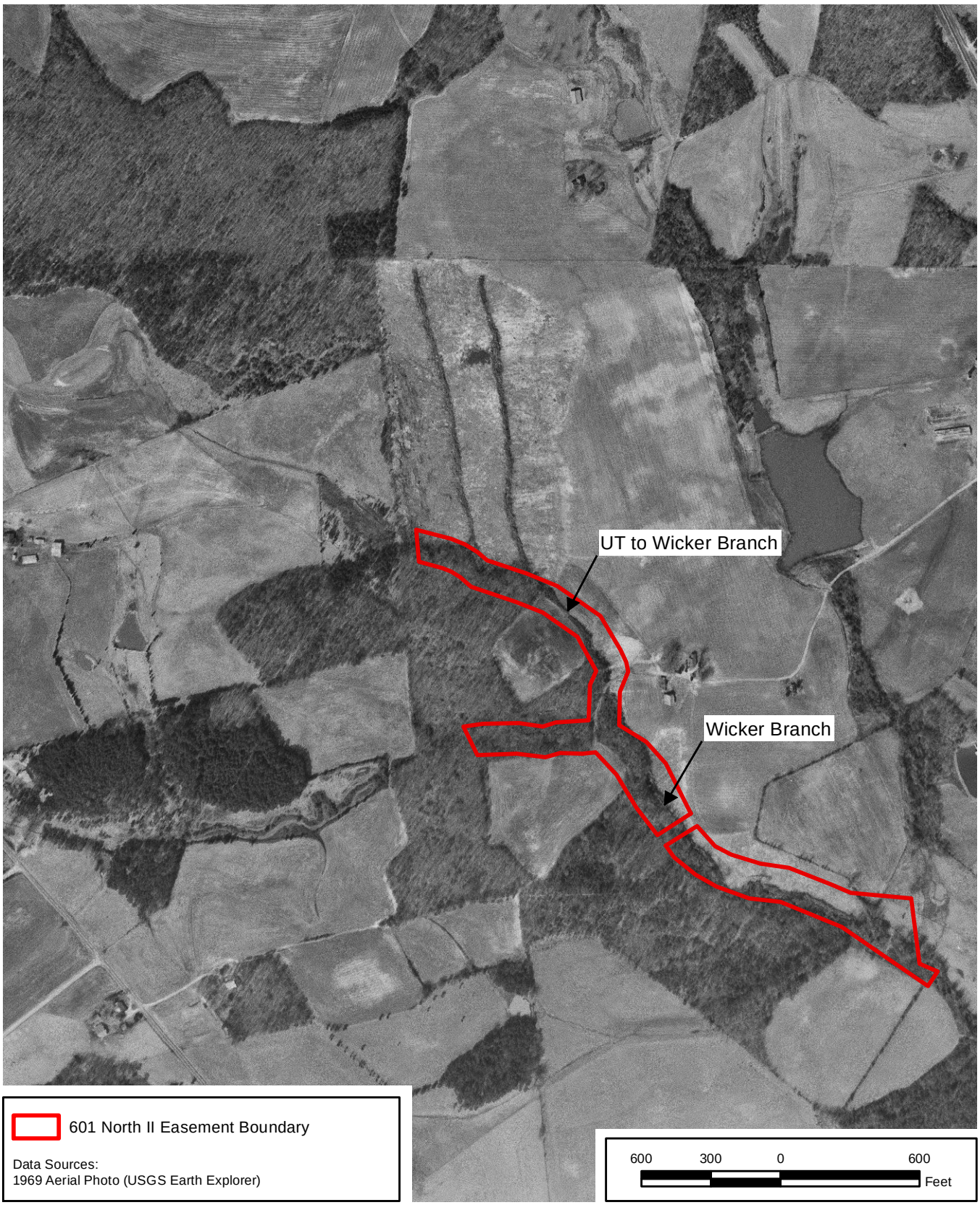
2.8 EXISTING CONDITIONS AERIAL PHOTOGRAPHY

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

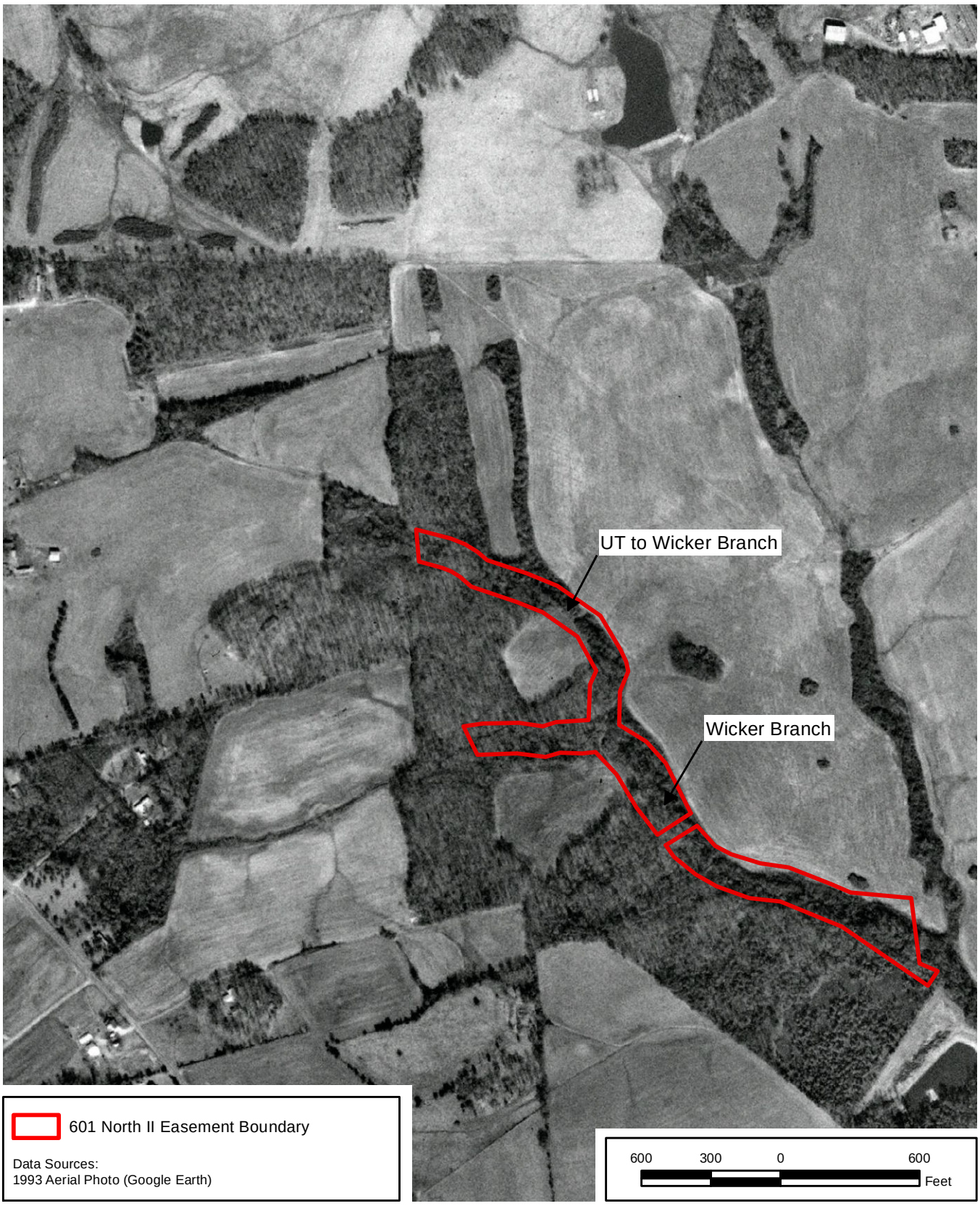
2.9 HISTORICAL CONDITIONS: 1969 AERIAL PHOTOGRAPHY

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

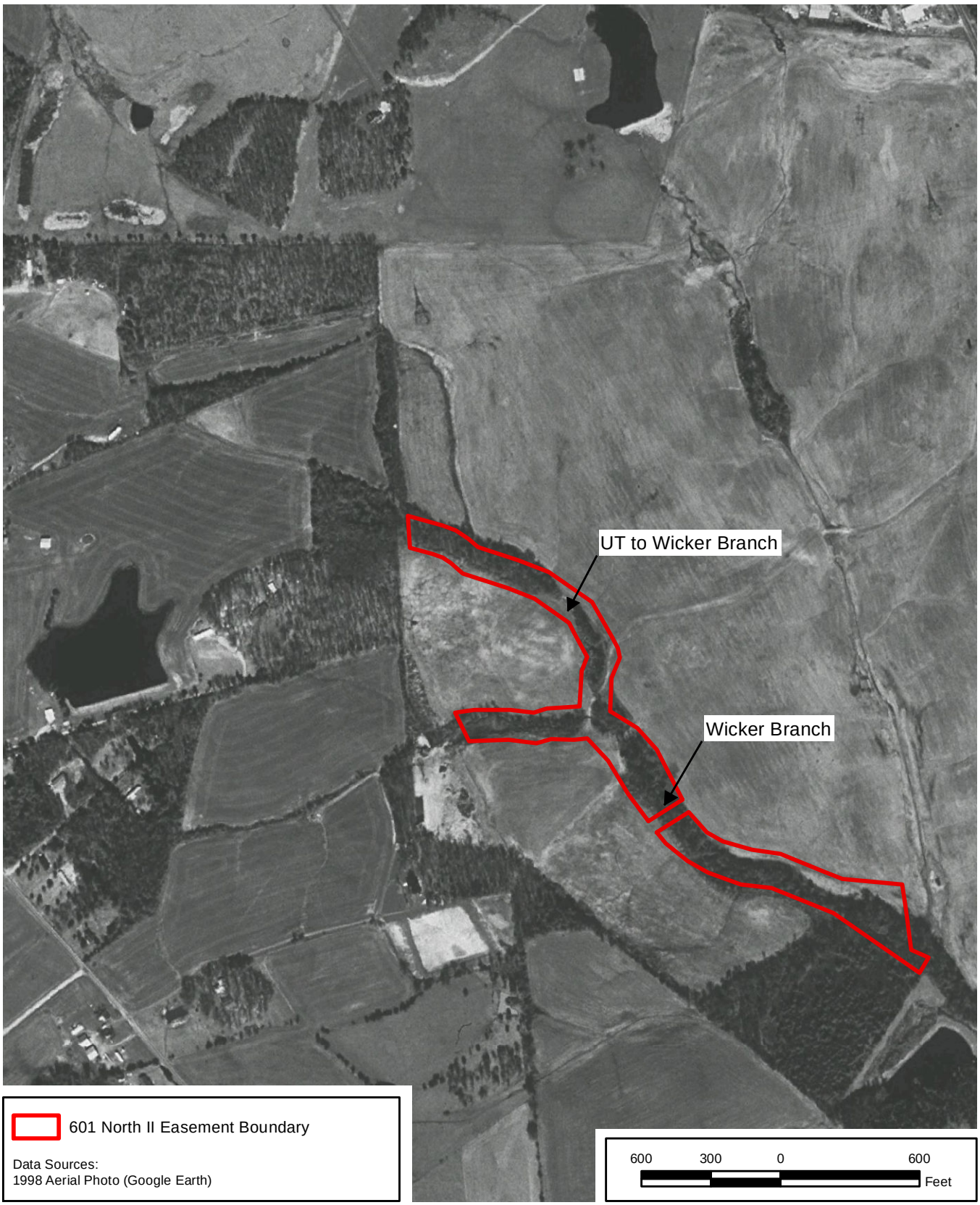
2.10 HISTORICAL CONDITIONS: 1993 AERIAL PHOTOGRAPHY

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

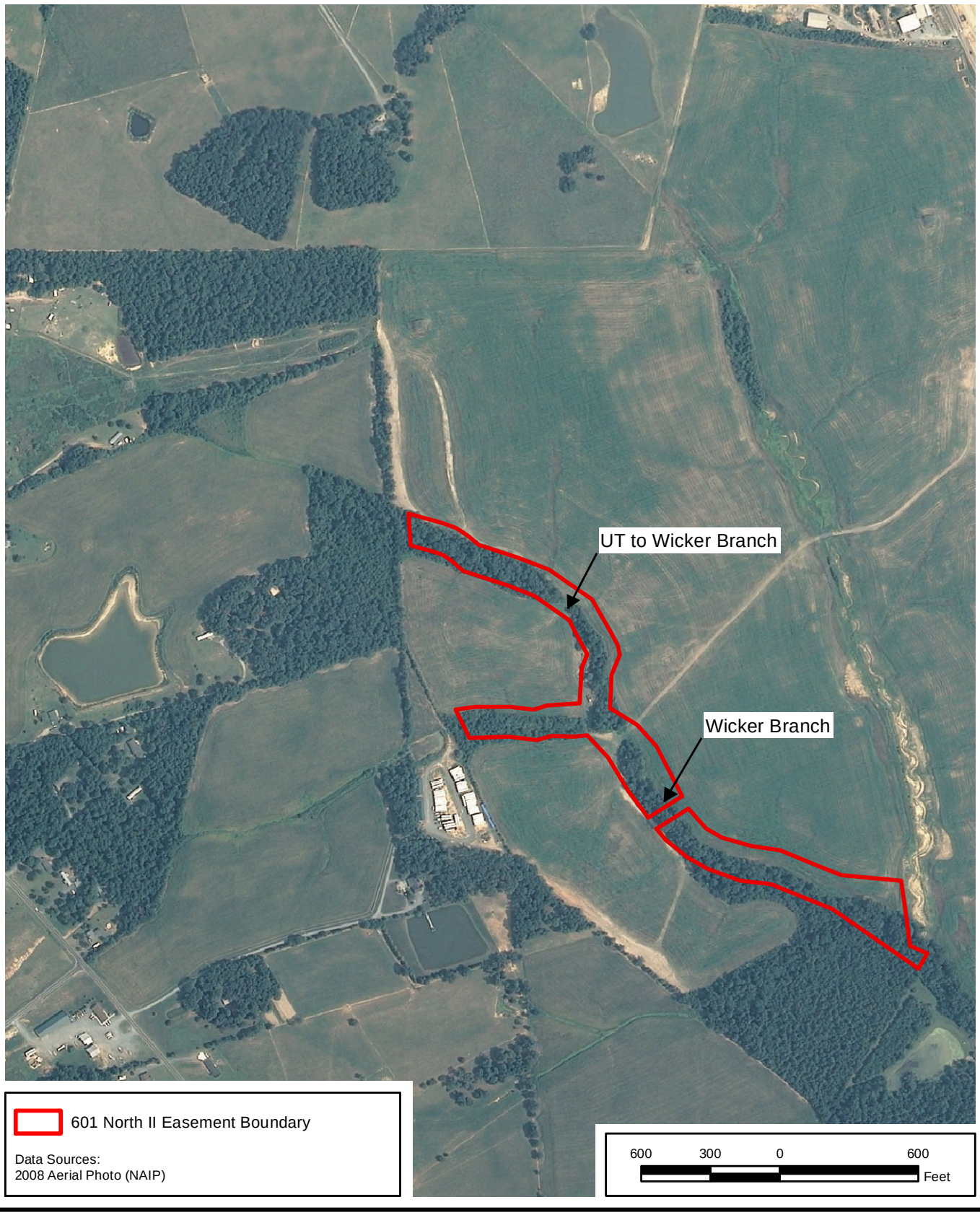
2.11 HISTORICAL CONDITIONS: 1998 AERIAL PHOTOGRAPHY

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

2.12 HISTORICAL CONDITIONS: 2008 AERIAL PHOTOGRAPHY

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N

2.13 Site Photographs

Pond upstream of Wicker Branch (01/06/2012)

Wicker Branch Reach 1 (01/06/2012)

Wicker Branch Reach 2 (01/06/2012)

Wicker Branch Reach 2 (01/06/2012)

Wicker Branch Reach 3 (01/06/2012)

UT to Wicker Branch (01/06/2012)

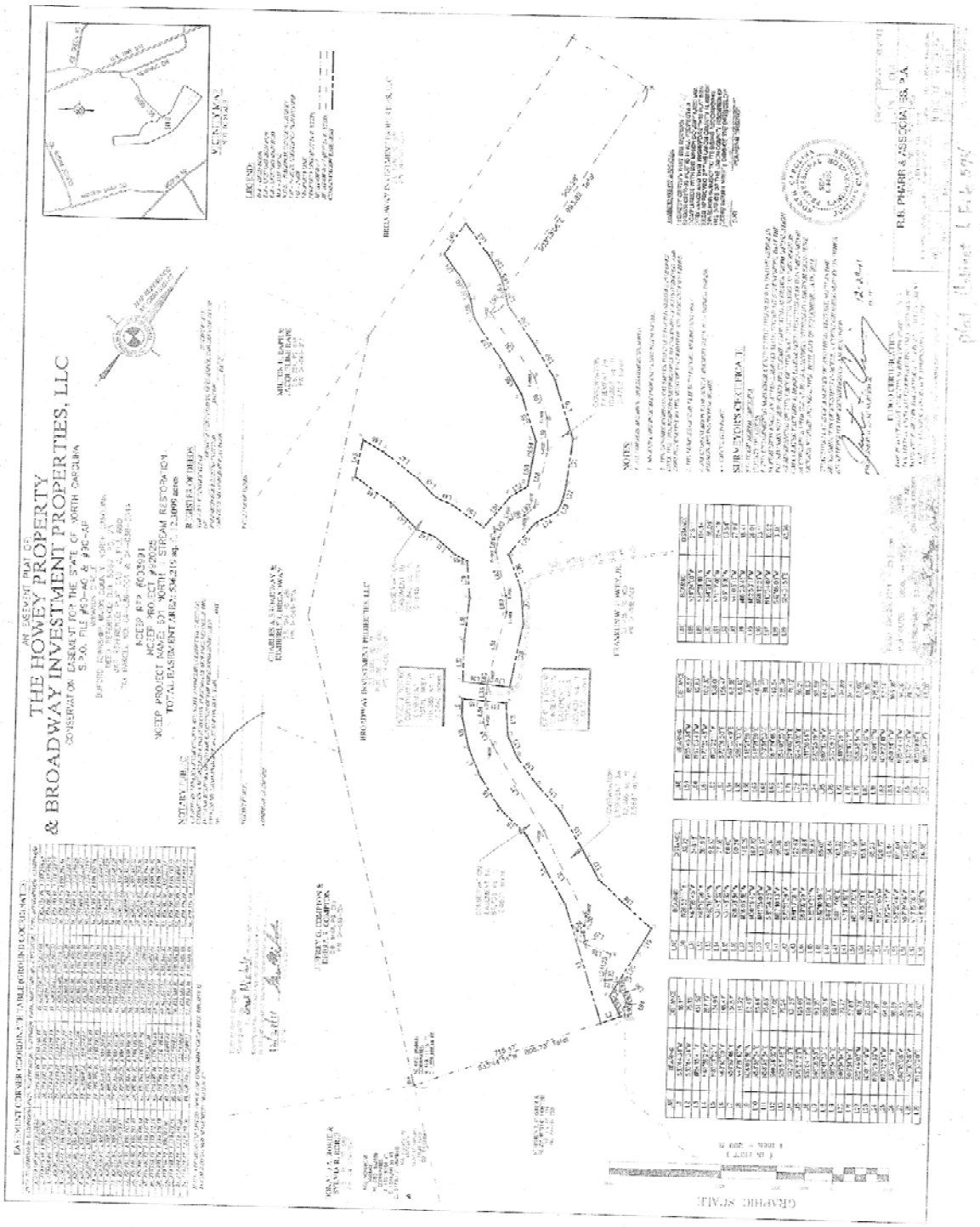
3.0 SITE PROTECTION INSTRUMENT

3.1 Site Protection Instrument Summary Information

The land required for the construction, management, and stewardship of this mitigation project includes portions of the parcels in the following Table 1. Copies of the conservation easement documents are included in Appendix A.

Landowner	PIN	County	Deed Book and Page Number	Site Protection Instrument	Acreage Protected
Broadway Investment Properties, LLC	04-036-004A	Union	Book 05657 Pages 605-614	Conservation Easement	2.06 (Easement 1A)
					5.19 (Easement 1B)
Franklin W. Howey Jr.	04-036-004	Union	Book 05657, pages 242-249	Conservation Easement	2.59 (Easement 2A)
					2.48 (Easement 2B)

3.2 Site Protection Instrument Figure



This Page Intentionally Left Blank

4.0 BASELINE INFORMATION

Project Information			
Project Name	601 North II Stream Restoration Site		
County	Union County		
Project Area (acres)	12.32		
Project Coordinates (latitude and longitude)	34.897274, -80.473416		
4.1 Watershed Summary Information			
Physiographic Province	Piedmont		
River Basin	Yadkin		
USGS Hydrologic Unit 8-digit	03040105	**USGS Hydrologic Unit 14-digit**	03040105081010
DWQ Sub-basin	03-07-14		
Project Drainage Area (acres)	453		
Project Drainage Area Percent Impervious Area	<1%		
CGIA Land Use Classification	Cultivated, Managed Herbaceous Cover, Mixed Hardwood		

4.2 Reach Summary Information

Parameters	Wicker Branch (Reach 1)	Wicker Branch (Reach 2)	Wicker Branch (Reach 3)	UT to Wicker Branch (Reach 4)	UT to Wicker Branch (Reach 5)
Length of reach (linear feet)	630	1356	414	826	534
Valley classification	VIII	VIII	VIII	VIII	VIII
Drainage area (acres)	169	286	365	85	88
NCDWQ stream identification score	23.5	35	35	23	23
NCDWQ Water Quality Classification	WS-V	WS-V	WS-V	WS-V	WS-V
Morphological Description (stream type)	F6	E1/C1	G4	B4	B4
Evolutionary trend	E-G-F	E-G-C-E	E-G	E-G-B	E-G-B
Underlying mapped soils	Cid channery silt loam (CmB)	Cid channery silt loam (CmB)	Cid channery silt loam (CmB)	Badin Channery silty clay loam (BdB2), Cid channery silt loam (CmB)	Badin Channery silty clay loam (BdB2), Cid channery silt loam (CmB)
Drainage class	Moderately well drained	Moderately well drained	Moderately well drained	BdB2: Well drained, CmB: Moderately well drained	BdB2: Well drained, CmB: Moderately well drained
Soil Hydric status	Not hydric	Not hydric	Not hydric	Not hydric	Not hydric
Valley Slope	0.0095	0.0098	0.0165	0.0130	0.0124
FEMA classification	Project streams are not located within a FEMA regulated area				
Native vegetation community	N/A (cultivated land)	N/A (cultivated land)	Mesic Mixed Hardwood Forest	N/A (cultivated land)	N/A (cultivated land)
Percent composition of exotic invasive vegetation	0%	0%	60% (Chinese privet)	0%	0%

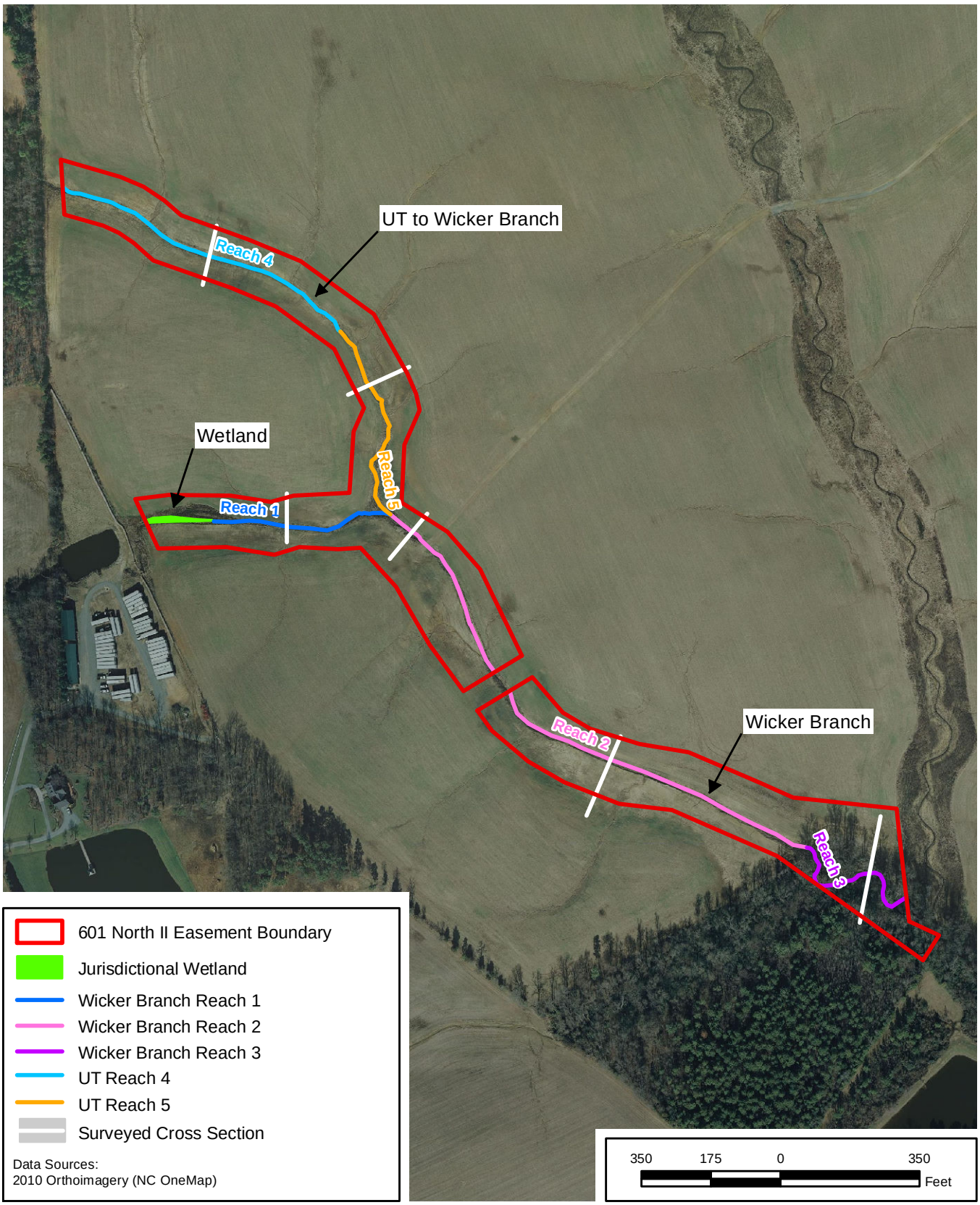
4.3 Wetland Summary Information

Parameters	Wetland 1
Size of Wetland (acres)	0.05
Wetland Type	Palustrine emergent
Mapped Soil Series	Cid channery silt loam (CmB)
Drainage class	Moderately well drained
Soil Hydric Status	Not hydric
Source of Hydrology	Groundwater
Hydrologic Impairment	NA
Native vegetation community	N/A (cultivated land)
Percent composition exotic invasive vegetation	0%

4.4 Regulatory Considerations

Regulation	Applicable?	Resolved?	Documentation
Waters of the United States – Section 404	**Yes**	**Yes**	**JD Notification (Appendix B)**
Waters of the United States – Section 401	**Yes**	**Yes**	**NA**
Endangered Species Act	**Yes**	**Yes**	**CE Documentation (Appendix B)**
Historic Preservation Act	**No**	**NA**	**CE Documentation (Appendix B)**
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	**No**	**NA**	**NA**
FEMA Floodplain Compliance	**No**	**NA**	**FEMA Floodplain Checklist (Appendix B)**
Essential Fisheries Habitat	**No**	**NA**	**NA**

This Page Intentionally Left Blank



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

4.5 Existing Conditions Survey

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N

4.6 Project Site Streams

The Site streams include Wicker Branch and the unnamed tributary (UT) to Wicker Branch. On-site existing conditions data were collected in November 2011. The locations of project reaches and surveyed cross-sections are shown in Section 4.5 Existing Conditions Survey. The existing geomorphic survey data is included in Appendix C.

Wicker Branch is a second order stream (USGS, Wingate Quad) that forms off-site and is routed into a farm pond located immediately west of the easement boundary. The in-line pond drains through a culvert and discharges into a linear wetland (described in Section 4.7) located inside the Site boundary. Wicker Branch (Reach 1) extends from the wetland as an intermittent stream (score of 23.5 on NCDWQ Stream Identification form) to a confluence with the UT. Reach 1 of Wicker Branch has likely been dredged and straightened to facilitate agriculture. The channel is located in a moderately narrow channel that broadens out as it extends towards the confluence with UT. Reach 1 is moderately incised with an entrenchment ratio of 1.3 and its shallow depth and wider bankfull elevation results in a high width-to-depth ratio. The bank height ratio within Reach 1 is 2.6. A narrow line of herbaceous vegetation exists along the majority of both banks with some areas containing row crops planted to the top of bank. Channel over-widening and a lack of canopy shading has allowed wetland vegetation to persist within the channel. Many areas of the channel are not identifiable. A hardened (rip-rap) farm crossing is located on Reach 1 near the confluence with UT that has resulted in a backwater effect with excess fine sediment deposition. Reach 1 of Wicker Branch classifies as a Rosgen F6 channel.

Below the confluence with the UT, Wicker Branch continues to the Site outfall (Reaches 2-3) as a perennial stream (score 35 on the NCDWQ Stream Identification form). Reach 2 of Wicker Branch extends from the confluence with UT to the wooded treeline at the southeast end of the Site. Reach 2 appears to have been historically dredged and straightened for agriculture as evidenced by the lack of pattern and spoil berms along portions of the banks. The upper portion of Reach 2 has a moderately broad valley that then narrows at the easement break and widens again towards the treeline. The entire floodplain is currently under agriculture use with only a narrow line of herbaceous and shrub vegetation existing along the stream banks. Wetland vegetation was observed within the channel throughout Reach 2. A culverted road crossing exists near the top of the reach and the width-to-depth ratio decreases below the culvert and stream banks become more vertical. Bedrock was observed throughout much of Reach 2 which has prevented extensive vertical incision. The bank height ratio is 1.3 near the top of Reach 2 and increases to 1.8 at the bottom. Reach 2 of Wicker Branch classifies as an incised Rosgen E1/C1 channel due to the classification attributes extending across both stream types (decreasing width-to-depth ratio in the lower portion).

Reach 3 of Wicker Branch begins near the wooded treeline at the southeast end of the Site and continues to the Site outfall. Reach 3 does not appear to have been historically straightened and sinuosity was calculated to be 1.2. The reach exhibits a very low width-to-depth ratio and is vertically entrenched (ratio less than 1.4). Stream banks are deep and vertical within Reach 3 resulting in increased near-bank shear stress and outside meander bends were observed to be actively eroding. The bank height ratio is 2.0 in Reach 3. A mature riparian buffer exists along both stream banks with evidence of recent clearing within a narrow strip near the right bank (woody material from debris pile to be used in constructing log sills as suitable). The reach exhibits a gravel substrate with some areas underlain by shallow bedrock. Reach 3 of Wicker Branch classifies as a Rosgen G4 channel.

The UT is a first order stream (USGS, Wingate Quad) that begins at the outfall of a culvert under a farm path. The UT scored a 23 on the NCDWQ Stream Identification form (Appendix B) and extends as an intermittent stream to the confluence of Wicker Branch. The UT was likely historically straightened and the entire floodplain is currently under agriculture. The UT has been split into two reaches (Reach 4 and 5) for classification due to differences in morphology and restoration type. Reach 4 begins at the culvert outfall and continues for approximately 800 feet to a bedrock outcrop. The bedrock serves as grade control for Reach 4 which results in only slight entrenchment and moderate width-to-depth ratio through the reach. Due to a lack of canopy shading, Reach 4 contains an abundance of wetland vegetation within the channel. Below the bedrock, Reach 5 of the UT displays increased vertical incision towards the confluence with Wicker Branch. Compared to the upstream reach, the entrenchment ratio and width-to-depth ratio within Reach 5 both decrease. Agriculture extends nearly to the top of both banks with the exception of a narrow line of herbaceous and shrub vegetation. UT to Wicker classifies as a Rosgen B4 channel within Reach 4 and 5.

A channel stability assessment was performed for all Site streams based on data collected using the Bank Assessment for Non-Point source Consequences of Sediment (BANCS) model evaluation. The BANCS model utilizes estimation tools to predict stream bank erosion: The Bank Erosion Hazard Index (BEHI) and Near-bank Stress (NBS). The results indicated that the combined current erosion rate within Wicker Branch and UT is approximately 117 tons per year. BANCS model data and figure are provided in Appendix C.

4.7 Bankfull and Discharge Verification

The estimate of bankfull stage represents the incipient point of flooding and the corresponding discharge represents the channel forming discharge. Bankfull discharge is often associated with a return interval of 1 to 2 years, with an average of 1.5 years (Rosgen 2007). Methods used to verify bankfull stage included physical field measurements, a regional curve assessment, and Manning's equation. In the absence of available gauge data at the Site, these methods provide a best estimate of bankfull discharge.

Field indicators of bankfull elevation were nearly non-existent throughout the restoration reaches due to dredging and straightening, and the resulting bed and bank instability. Bankfull stage indicators observed in the field were limited to scour lines on steep banks and minor breaks in slope. Bankfull verification was completed by a comparison of field surveyed cross sections of Wicker Branch and UT to the North Carolina rural piedmont regional curve. The selected bankfull discharge, cross sectional area, width, and depth for each restoration reach fall within the confidence intervals of the regional curve. The surveyed bankfull geometry values from the nearby reference stream (Section 4.9) are also within the confidence intervals of the regional curve indicating close association with empirical data from other regional reference streams.

Hydraulic models of Wicker Branch and UT were constructed with the Hydraulic Engineering Center's River Analysis System (HEC-RAS) computer model version 4.1.0 in an effort to further evaluate the estimated discharges associated with various flow rates (primarily the flow rates associated with the field determined bankfull stage). The model incorporated the surveyed stream channel and floodplain geometry along the length of the Site. The modeled bankfull discharges were calculated using Manning's equation and bankfull cross-sectional areas from the regional curve. The modeled water surface

elevation associated with the calculated bankfull discharge aligned favorably with estimates of bankfull stage observed in the field.

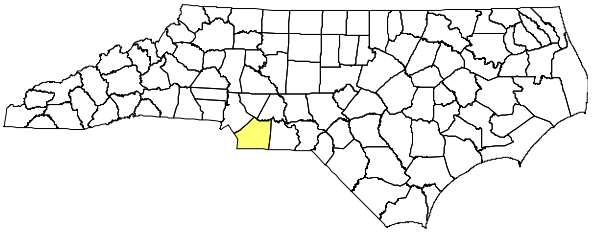
4.8 Project Site Wetlands

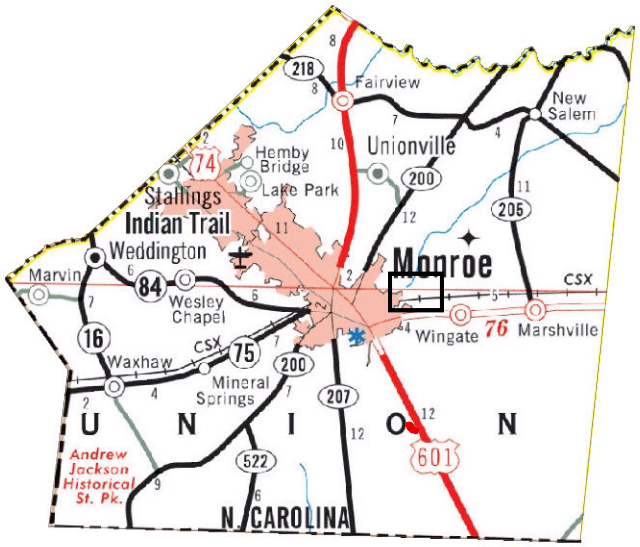
Jurisdictional delineations were conducted in accordance with the 1987 United States Army Corps of Engineers (USACE) Wetland Delineation Manual and Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont (July 2010). One wetland was identified within the Site located at the easement boundary and upstream of Reach 1 of Wicker Branch (Section 4.5 Existing Conditions Survey). The 0.05 acre wetland is linear in character and exists within the ditched channel of Wicker Branch. Hydrology to the wetland is supplied through a culvert that drains the farm pond located off-site. The wetland is located within an area mapped as non-hydric soil, but the hydric indicator F3 was present as documented by a depleted matrix with 95 percent chroma 1 and redox concentrations. Vegetation is exclusively herbaceous and consists of common rush (*Juncus effusus*), goldenrod (*Solidago sp.*), false nettle (*Boehmeria cylindrica*), witchgrass (*Panicum capillare*), yellow nutsedge (*Cyperus esculentus*), and great ragweed (*Ambrosia trifida*). Similar vegetation currently persists within Site streams; however, at the time of the jurisdictional delineation, the only area containing hydrophytic vegeataion was the area above Reach 1. The USACE wetland determination data forms and notification of jurisdictional determination are located in Appendix B.

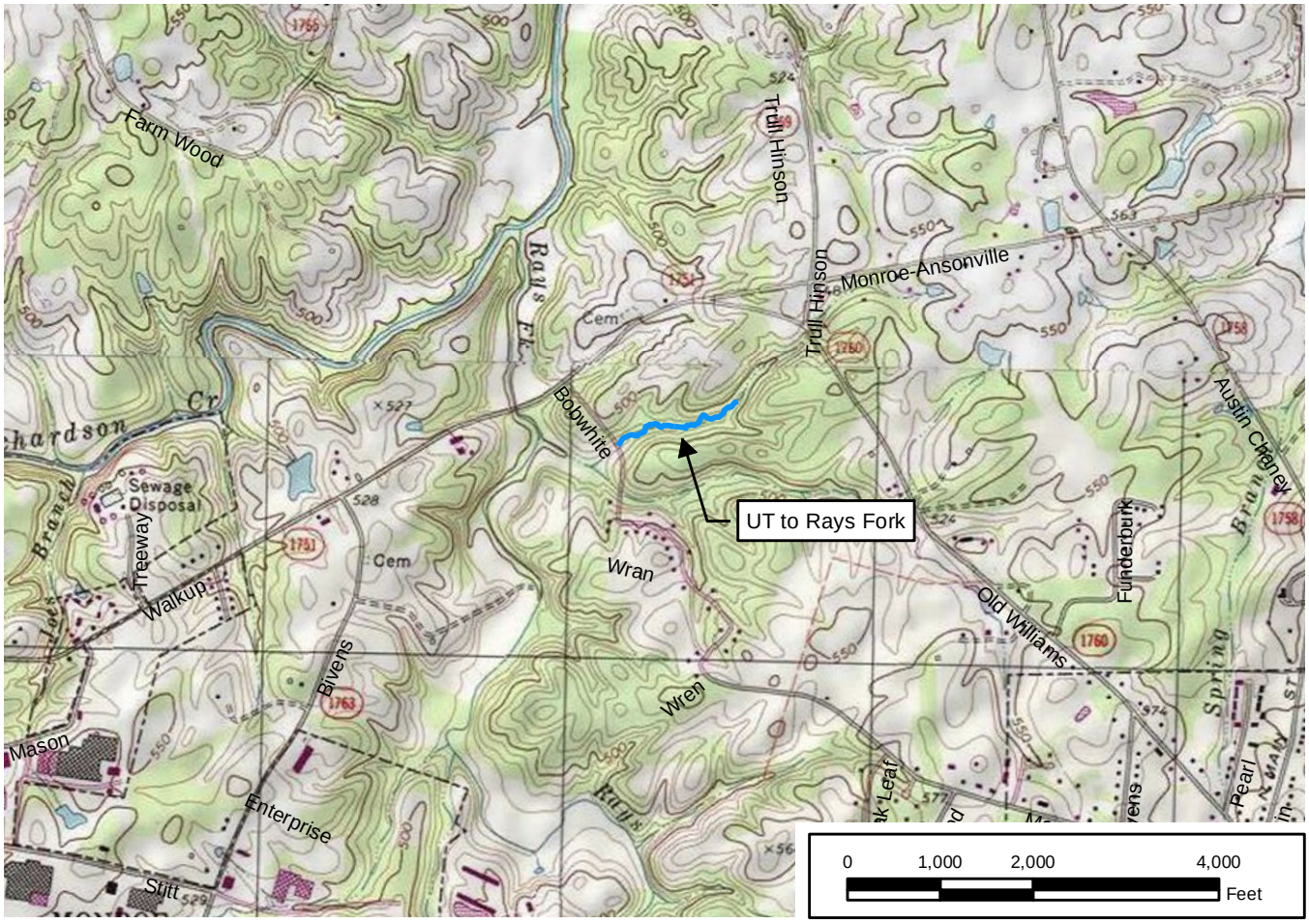
4.9 Reference Stream

A reference stream was evaluated to assist with providing design parameters for the Site. A stable, undisturbed reference reach could not be located within adjacent (upstream or downstream) reaches of the Site, so field investigations were conducted in other watersheds. Agriculture is common within the region and locating a reference stream with an intact, undisturbed buffer was not easily accomplished. Following numerous other field investigations, the UT to Rays Fork was selected as an appropriate reference stream based on the valley type and stream classification, as well as its location within a relatively undisturbed watershed. The reference reach is located approximately 2 miles northwest of the Town of Wingate and approximately 6 miles north of the Site (Section 4.10 Reference Stream Vicinity Map). UT to Rays Fork is a perennial stream that scored a 32.5 on the NCDWQ Stream Identification form. The studied reach of UT to Rays Fork comprises a drainage area of 0.19 acres within a watershed that consists of approximately 75 percent forest land and 25 percent agriculture. The riparian buffer along UT to Rays Fork contains a Piedmont/Low Mountain Alluvial Forest community type (approximately 30-50 years old) and extends undisturbed for approximately 1200 feet from the right bank and 800 feet from the left bank. The headwaters of UT to Rays Fork form from a farm pond within an agriculture field, but the stream quickly enters a wooded tree line and flows through a riparian buffer for over 3000 feet upstream of the surveyed reference reach.

UT to Rays Fork is vertically stable with low bank heights, excellent rooting depth and density, and abundant in-stream habitat including roots and woody debris. The channel has a very low width-to-depth ratio and exhibits predominantly very course gravel. The reference stream classified as a Rosgen E4 channel. The morphological characteristics, cross-section, and profile for UT to Rays Fork are provided in Appendix C.







Prepared By:	Prepared For:
EBX	Ecosystem Enhancement Program

4.10 REFERENCE STREAM VICINITY MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	June 2012
Project No.:	100024976

N

5.0 DETERMINATION OF CREDITS

601 North II Stream Restoration Site
NCEEP Project Number 92025

Mitigation Credits

	Stream		Riparian Wetland	Non-riparian Wetland	Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE					
Totals	3291	388					

Project Components

Project Component -or- Reach ID	Stationing / Location	Existing Footage	Approach (P1, P2 etc.)	Restoration -or- Restoration Equivalent	Restoration Footage*	Mitigation Ratio
Wicker Branch (Reach 1)	00+00-07+07	630	P1	Restoration	707	1:1
Wicker Branch (Reach 2)	07+07-23+60	1356	P1, P2	Restoration	1593	1:1
Wicker Branch (Reach 3)	23+60-28+30	414	P2	Restoration	345	1:1
UT to Wicker Branch (Reach 4)	00+07-02+25	218	EI	Restoration Equivalent	218	1:1.5
	02+25-08+33	608	EII	Restoration Equivalent	608	1:2.5
UT to Wicker Branch (Reach 5)	08+33-14+79	534	P1	Restoration	646	1:1

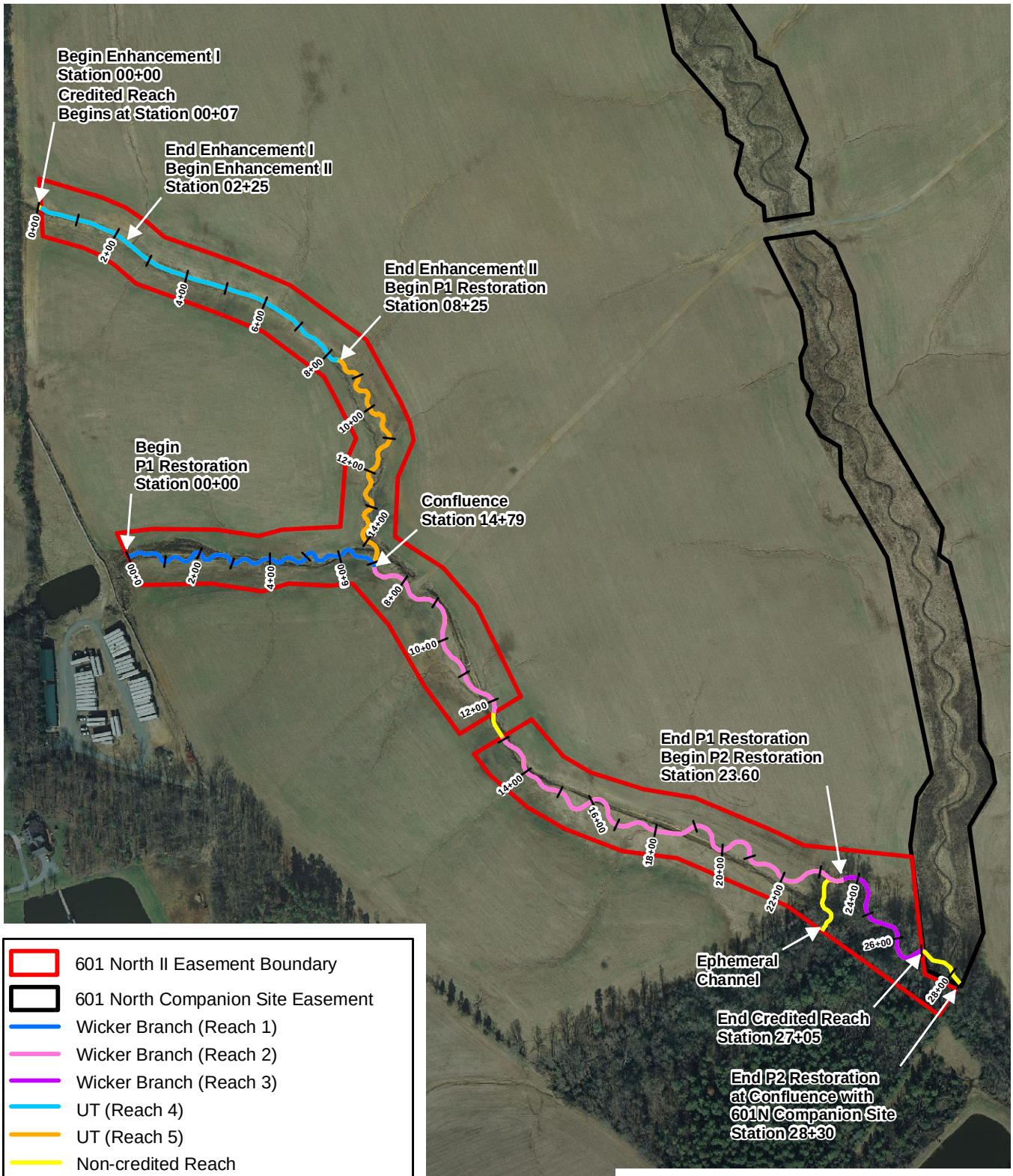
Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetland (acres)		Non-riparian Wetland (acres)	Buffer (square feet)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	3291					12.32
Enhancement I	218					
Enhancement II	608					
Creation						
Preservation						
High Quality Preservation						

BMP Elements

Element	Location	Purpose/Function	Notes
(6) Temporary Sediment Traps	See plans	Treat on-site storm water from adjacent agricultural fields. Remove suspended solids, help infiltration of water and remove excess nutrients prior to entering stream.	Placed at base of drainages coming from adjacent agricultural fields.
Livestock Exclusion Fencing	See plans	Exclusion fencing will eliminate hoof shear and direct livestock waste into the on-site streams.	
Farm Crossing Improvements	See plans	Two off-site farm crossings located above the restored streams will be improved at their existing location and incorporated into the restoration design.	
Ephemeral Pools	See plans	Ephemeral pools will be created from the abandoned channel to capture stormwater flows and provide habitat.	

*Does not include the restored portions of Wicker Branch located outside of the conservation easement boundary (Station 12+29-12+92 and 27+05-28+30).



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

5.1 ASSET MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JUNE 2012
Project No.:	100024976

N

6.0 CREDIT RELEASE SCHEDULE

All credit releases will be based on the total credit generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary DA authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the Interagency Review Team (IRT), will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard. The release of project credits will be subject to the criteria described as follows:

Stream Credits			
Monitoring Year	**Credit Release Activity**	**Interim Release**	**Total Released**
0	Initial Allocation – see requirements below	30%	30%
1	First year monitoring report demonstrates performance standards are being met	10%	40%
2	Second year monitoring report demonstrates performance standards are being met	10%	50% (65%*)
3	Third year monitoring report demonstrates performance standards are being met	10%	60% (75%*)
4	Fourth year monitoring report demonstrates performance standards are being met	10%	70% (85%*)
5	Fifth year monitoring report demonstrates performance standards are being met	15%	100%

*A reserve of 15 percent of the Site's total stream credits shall be released after two bankfull events

Initial Allocation of Released Credits

The initial allocation of released credits, as specified in the mitigation plan can be released by the NCEEP without prior written approval of the DE upon satisfactory completion of the following activities:

- Approval of the final Mitigation Plan
- Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
- Completion of project construction (the initial physical and biological improvements to the mitigation site) pursuant to the mitigation plan; Per the NCEEP Instrument, construction means that a mitigation site has been constructed in its entirety, to include planting, and an as-built report has been produced. As-built reports must be sealed by an engineer prior to project closeout, if appropriate but not prior to the initial allocation of released credits.
- Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required.

Subsequent Credit Releases

All subsequent credit releases must be approved by the DE, in consultation with the IRT, based on a determination that required performance standards have been achieved. For stream projects a reserve of 15 percent of a site's total stream credits shall be released after two bank-full events have occurred,

in separate years, provided the channel is stable and all other performance standards are met. In the event that less than two bank-full events occur during the monitoring period, release of these reserve credits shall be at the discretion of the IRT. As projects approach milestones associated with credit release, the NCEEP will submit a request for credit release to the DE along with documentation substantiating achievement of criteria required for release to occur. This documentation will be included with the annual monitoring report.

7.0 MITIGATION WORK PLAN

The concepts being developed for the Site follow a watershed approach for stream restoration design. Therefore, the plan takes into account the surrounding land-use and management practices that could realize additional benefit from having an adjacent restoration project in-place. This concept also subscribes to the restoration of all ecosystems located within the Site including upland plant communities. Restoration of land form in all areas that fit within the restoration scheme has therefore been incorporated into the plan. Primary activities proposed for implementation on the Site include 1) Priority 1 and 2 stream restoration, 2) stream enhancement levels I and II, 3) various Riparian Best Management Practices (RBMP), and 4) plant community restoration.

7.1 Target Stream Types and Plant Communities

The proposed channel design includes the restoration of Wicker Branch and UT to Rosgen E-type streams. E-type streams are slightly entrenched, riffle-pool channels exhibiting high sinuosity. In North Carolina, E-type streams occur in both narrow to wide valleys with well-developed alluvial floodplains (Valley Type VIII). These streams are typically stabilized with dense riparian vegetation. E-type streams typically exhibit a sequence of riffles and pools associated with a sinuous flow pattern. E-type channels are considered very stable. The proposed on-site stream restoration will emulate E-type channels based on the stream parameters predicted by regional curves, Piedmont reference streams, and a site specific reference stream. Appendix C provides channel morphology data (including channel pattern, dimension, and profile) for both Wicker Branch and the UT to Wicker Branch.

On-site observations, community descriptions from Classification of the Natural Communities of North Carolina (Schafale and Weakley 1990), and NCEEP guidance were used to develop the primary plant community associations that will be promoted during community restoration activities. These community associations include streamside assemblage, Piedmont/Low Mountain Alluvial Forest, and Dry-Mesic Oak-Hickory Forest. The Planting Plan sheet of the Construction Plan Set identifies the location, based on elevation and position relative to the restored stream of each target community to be planted.

Streamside trees and shrubs include species with high value for sediment stabilization, rapid growth rate, and the ability to withstand hydraulic forces associated with bankfull flow and overbank flood events. Shrub elements will be planted along the banks of the reconstructed stream, concentrated along outer bends. Piedmont /Low Mountain Alluvial Forest is the primary target community for the floodplain, whereas Dry-Mesic Mixed Oak Hickory Forest species will be planted along the valley side slopes and on adjacent uplands within the Site. Certain opportunistic species that may dominate the early successional forests have been excluded from plant community restoration efforts.

Species selected for planting will be dependent upon availability of local seedling sources. A total of 16,392 tree and shrub specimens will be planted within the Site during restoration activities. The planting plan in Appendix C provides the total number of stems and species distribution within each vegetation association. The Site shall be prepared for planting through various means including soil scarification, topsoil dressing, fertilization, lime application, and removal of invasive plants such as Chinese privet (*Ligustrum sinense*).

7.2 Design Parameters

A fundamental concept of stream restoration entails the development and application of regional reference curves to stream reconstruction and enhancement activities. Regional reference curves can be utilized to help predict bankfull stream geometry, discharge, and other parameters in altered systems. Regional curves for the North Carolina Piedmont are provided in Appendix C. These curves characterize a broad size-range of streams within the Piedmont physiographic province. However, small watersheds or deviations in valley slope, land use, or geologic substrates may not be accurately described by the curves. Therefore, reference stream data from the UT to Rays Fork and additional regional reference sites (Lowther 2008) have been utilized in conjunction with the regional curves for mitigation detailed planning. Appendix C provides the location of the UT to Rays Fork as well as channel morphology data (including channel pattern, dimension, and profile).

Stream restoration efforts using Priority 1 and 2 methodologies (Rosgen 1996) are designed to restore a stable, meandering stream that approximates the hydrodynamics and stream geometry relative to natural conditions in the region. Priority 1 Restoration will be performed throughout the majority of Wicker Branch with a transition to Priority 2 Restoration from approximately Station 20+55 to Station 28+30 to accommodate a connection to the existing bed elevation of the downstream, off-site reach. Priority 1 Restoration will also be performed along UT to Wicker Branch beginning at Station 08+33 and continuing to the confluence with Wicker Branch. Primary activities designed to restore the channel using Priority 1 Restoration will include plugging and backfill of the existing channel, grading and preparation of the floodplain, and finally construction of the new stream. An ephemeral channel that forms off-site and drains to Reach 2 of Wicker Branch will be re-routed to a confluence with the new channel (Station 23+25). Priority 2 Restoration techniques are similar to Priority 1 but include additional grading to prepare the new floodplain and channel at or in proximity to the existing incised stream elevation. To assist with stream stabilization, dissipate energy, and enhance in-stream habitat, log sills (using on-site material as available) will be installed throughout Wicker Branch and the UT to Wicker Branch.

The existing 0.05 acre wetland upstream of Wicker Branch will be lost as a result of stream restoration activities due to the location of the wetland within the existing channel. Impacts to wetlands are minimal and the project will likely create new wetland areas within the floodplain once hydrological connection to the stream channel is restored. New floodplain pool wetlands may also be created by utilizing open portions of the abandoned channel. Any wetland areas provided by the project are incidental to credits generated by the project.

Stream enhancement efforts using Level I methodology (Priority 3, [Rosgen 1996]) are designed to widen the floodplain at the existing incised channel elevation in order to reduce shear stress. Level I Enhancement will primarily entail the excavation of a floodplain bench on one or both sides of the

existing channel at an elevation corresponding to bankfull stage. Level I Enhancement is proposed to be performed along the UT of Wicker Branch from Station 00+07 to 02+25, and at additional locations as determined on-site by the designer during construction. Stream enhancement efforts using Level II methodology are designed to augment channel stability, water quality, and stream ecology by low level activities including stabilization of stream banks and revegetating the riparian zone buffer. Level II Enhancement is expected to be implemented along the UT to Wicker Branch from Station 02+25 to 08+33.

Stream restoration and enhancement design parameters will follow those depicted in Appendix C. The excavation limits of the constructed floodplain, plan view of the proposed channel, representative cross-sections, and log sill details are depicted on the Project Plan Sheets (Appendix D).

Riparian Best Management Practice (RBMP) devices are proposed for this project that will go beyond the standard stream restoration methods used to re-establish natural streams, floodplains, and riparian condition and function. RBMP measures are proposed that will provide additional reduction of sediment and nutrient loading from anticipated runoff from the adjacent agriculture land. The proposed RBMP measures will be incidental to credits generated by the project and therefore do not require monitoring. Proposed RBMP devices are depicted in the Construction Plan Set (Appendix D) and include:

- Livestock exclusion fencing will be installed along the limits of the conservation easement bordering the Broadway Investments, LLC parcel to eliminate hoof shear and direct livestock waste into the on-site streams.
- Two off-site farm crossings located above the restored streams will be improved at their existing location and incorporated into the restoration design. New culverts of an appropriate size will be installed at each crossing below a re-graded surface.
- (6) temporary sediment traps will be incorporated along swales and depressional areas throughout the Site to capture concentrated stormwater flows and sediment.
- Ephemeral pools will be created from the abandoned channel to capture stormwater flows and provide habitat.

7.3 Data Analysis

7.3.1 Discharge Estimation

Bankfull discharges were calculated for four stream reaches – three along Wicker Branch and one along the UT to Wicker Branch – using Manning's equation and bankfull cross-sectional areas determined from the regional curve. Estimated discharges were subsequently used to evaluate the sediment transport capacity within the stream reaches.

Additionally, peak discharges associated with the 2-, 5-, 10-, and 100-year storm events were calculated for existing conditions for the same four stream reaches. In these cases, discharges were estimated by constructing a hydrologic model of the Wicker Branch watershed, including UT to Wicker Branch, with The U.S. Army Corps of Engineers (USACE) Hydraulic Engineering Center's Hydrologic Modeling System (HEC-HMS) version 3.5.

Within the model, rainfall depths provided for the 2-, 5-, 10-, and 100-year storm events were taken from the Charlotte-Mecklenburg Stormwater Services Stormwater Design Manual. The SCS Curve

number and SCS Unit Hydrograph methods (USACE HEC 2010) are used to generate runoff from 15 subwatersheds composing the Wicker Branch watershed. The lag time provided for each subwatershed was determined from the subwatershed time of concentration, which itself was calculated in accord to TR-55 (USDA 1986). Runoff was routed through nine ponds within the watershed using elevation-area relationships. Pond storage, spillway, and outlet pipe characteristics were collected in the field or estimated from aerial photography or lidar.

The resulting discharges were then used to determine the extent of flooding expected to under the restoration condition. The following table presents the discharges estimated for the four stream reaches.

HEC-HMS Discharge Estimates

Stream Reach	Drainage Area (acres)	Bankfull (cfs)	2-year (cfs)	5-year (cfs)	10-year (cfs)	100-year (cfs)
UT to Wicker Branch	88.0	23.1	43.1	92	114.1	220.0
Wicker Branch (Reach 1)	169.0	19.6	24.8	93.2	121.4	262.2
Wicker Branch (Reach 2)	286.0	48.5	81.1	153.8	184.2	454.1
Wicker Branch (Reach 3)	365.0	69.2	113.9	206.8	249.0	579.0

7.3.2 Sediment Transport Analysis

Sediment transport analysis was performed to ensure that the proposed restoration design is stable and capable of moving its sediment load without aggrading or degrading. The analysis was performed by computing sediment competency which refers to a stream's ability to move a particular grain size. A stream is considered to be competent to move the sediment load when the contributing depth and slope produce enough shear stress to move the largest sub-pavement particles (D84 to D100). Contributing datasets and computations for sediment competency include channel dimension, channel slope, pavement/sub-pavement samples collected on-site, bankfull (dimensional) shear stress, and bankfull dimensionless shear stress. Shear stress calculations may be compared to the Shields curve relationship of the threshold of grain diameter motion (Leopold et.al., 1964), and/or a modified relationship from field data from Colorado (Rosgen 2006, Rosgen and Silvey, 2007). The Rosgen Colorado data was considered for this project because the Shields relation is most appropriately used for entrainment size predictions from shear stress values below 0.05 lbs/ft^2 or above 1.5 lbs/ft^2, but generally underestimates particle sizes within that range (Rosgen 2006).

The following table summarizes the existing sediment transport competency calculations for restoration Reaches 2 and 3 of Wicker Branch, and Reach 6 of UT. Bulk density sampling (pavement/sub-pavement) was performed within the analyzed reaches at the locations of surveyed baseline cross-sections (see Section 4.7 Stream Baseline Survey). Reach 1 of Wicker Branch was not analyzed for existing sediment transport due to the vertical stability attributed to wetland vegetation throughout the channel and the hardened farm crossing at the bottom of the reach. Enhancement Reach 4 was also not analyzed for sediment competency because it is currently considered stable: no aggradation or degradation. Portions of Reach 2 of Wicker Branch are considered vertically stable due to channelization to a depth of exposed bedrock. The determination of critical depth and slope for these areas is less applicable due to

the stable bedrock sub-pavement. However, a sediment analysis was performed for Reach 2 in an upstream portion that still retained a heterogeneous substrate mixture.

The existing depth (0.84 feet) and slope (0.0090 feet/feet) of Reach 2 exceed the predicted values from the Rosgen Colorado data, but less than the predicted dimensionless shear stress value. The prediction of particle size movement for Reach 2 of Wicker Branch is 88 mm, exceeding the range of existing particle sizes of 28mm (D84) to 68mm (D100). Reach 3 of Wicker Branch has an existing depth of 1.42 feet and slope of 0.0085 feet/feet. The existing conditions for Reach 3 are more than the predicted critical depth (0.27 feet) and slope (0.0016 feet/feet) indicating vertical incision. The bankfull shear stress predicts that Reach 3 is capable of moving particles of 123mm which exceeds the existing D84 and D100 particle sizes. Reach 5 of UT has an existing depth and slope greater than the critical depths. The predicted particle size to be moved by Reach 5 is 91mm, which is comparable to the existing D84 (48mm) and D100 (78mm).

Existing Condition Sediment Transport Analysis

Parameter		Wicker Branch		UT Wicker
		Reach 2	Reach 3	Reach 5
Bankfull Area (sq-ft)		10.5	14.1	5.4
Bankfull Width, W (ft)		12.5	9.99	8.6
Bankfull Mean Depth, D (ft)		0.84	1.42	0.64
Bankfull Water Surface Slope, S (ft/ft)		0.0090	0.0085	0.0124
Riffle Bed Material D50 (mm)		23	8	49
Sub-Pavement D^50 (mm)		6	5	10
Sub-Pavement D84 (mm)		28	13	48
Sub-Pavement Dmax (mm)		68	36	78
Rosgen Analysis	Bankfull Dimensionless Shear Stress, τ*	0.03	NA*	0.03
	Critical Bankfull Mean Depth	1.12	NA*	0.87
	Critical Water Surface Slope	0.012	NA*	0.0169
	Bankfull Shear Stress, τ (lbs/ft^2)	0.47	0.75	0.50
Rosgen Colorado Data	Predicted Largest Movable Particle (mm)	88	123	91
	Critical Bankfull Mean Depth	0.6	0.27	0.52
	Critical Water Surface Slope	0.0064	0.0016	0.0101

*NA- Ratios of measured sediment values outside of acceptable range for applying dimensionless shear stress equations

The following table summarizes the proposed channel dimensions, critical depths, and critical slopes for Reach 2 and 3 of Wicker Branch, and Reach 5 of UT. The reference reach data is also included for comparison. The proposed channel dimension and slope for Reach 2 of Wicker Branch are greater than the predicted critical values. The proposed design for Reach 2 of Wicker Branch was calculated to have a shear stress of 0.69 lbs/ft^2 with the capacity to move particles of 116mm diameter, compared to the existing D100 of 68mm. Reach 3 of Wicker Branch also has a slightly higher depth and slope than the critical sediment transport values and predicted shear stress to move particles with a diameter of 120mm. Reach 5 of UT is designed with a depth and slope closer to the predicted values for the calculated shear stress. The predicted particle size movement is 107mm, compared to an existing D100

of 78mm. The measured Dmax values within Site streams are low as a result of channelization and degradation of natural substrates. This results in predicted mean depth values that are well below those of the regional curve. The measured and predicted substrate values within the reference reach are in close agreement and provide an indication of the substrate that may be expected within Site streams under natural conditions. Vertical stability within Site streams will be accomplished by the underlying bedrock and the use of constructed riffles with graded (interlocking) particles with a range of particle sizes that exceed the predicted entrainable diameter.

Proposed Condition Sediment Transport Analysis

Parameter		Wicker Branch		UT to Wicker Reach 5	UT to Rays Fork (reference)
		Reach 2	Reach 3		
Bankfull Area (sq-ft)		10.5	14.1	5.5	6.3
Bankfull Width, W (ft)		8	10	6	8.2
Bankfull Mean Depth, D (ft)		1.3	1.4	0.9	0.8
Bankfull Water Surface Slope, S (ft/ft)		0.0085	0.0083	0.0110	0.0140
Sub-Pavement D84 (mm)		28	13	48	94
Sub-Pavement Dmax (mm)		68	36	78	123
Bankfull Shear Stress, τ (lbs/ft^2)		0.69	0.73	0.62	0.67
Rosgen Colorado Data	Predicted Largest Movable Particle (mm)	116	120	107	114
	Critical Bankfull Mean Depth	0.63	0.27	0.59	0.86
	Critical Water Surface Slope	0.0041	0.0016	0.0072	0.0150

Additional sediment transport calculations was performed by examining shear stress associated with the bankfull discharge at 15 cross sections that were cut from the proposed topographic ground surface and channel alignment. The cross sections are presented on the figure titled Surface Water Analysis Features located in Appendix C. Shear stress was computed using the USACE Hydraulic Engineering Center's River Analysis System version 4.1.0 and compared to Rosgen Colorado data to determine the corresponding entrainable bed-material grain size. The following table presents the grain particle size ranges which are moved by shear stress values associated with the proposed stream reaches.

HEC-RAS Calculated Shear Stress and Sediment Transport Analysis

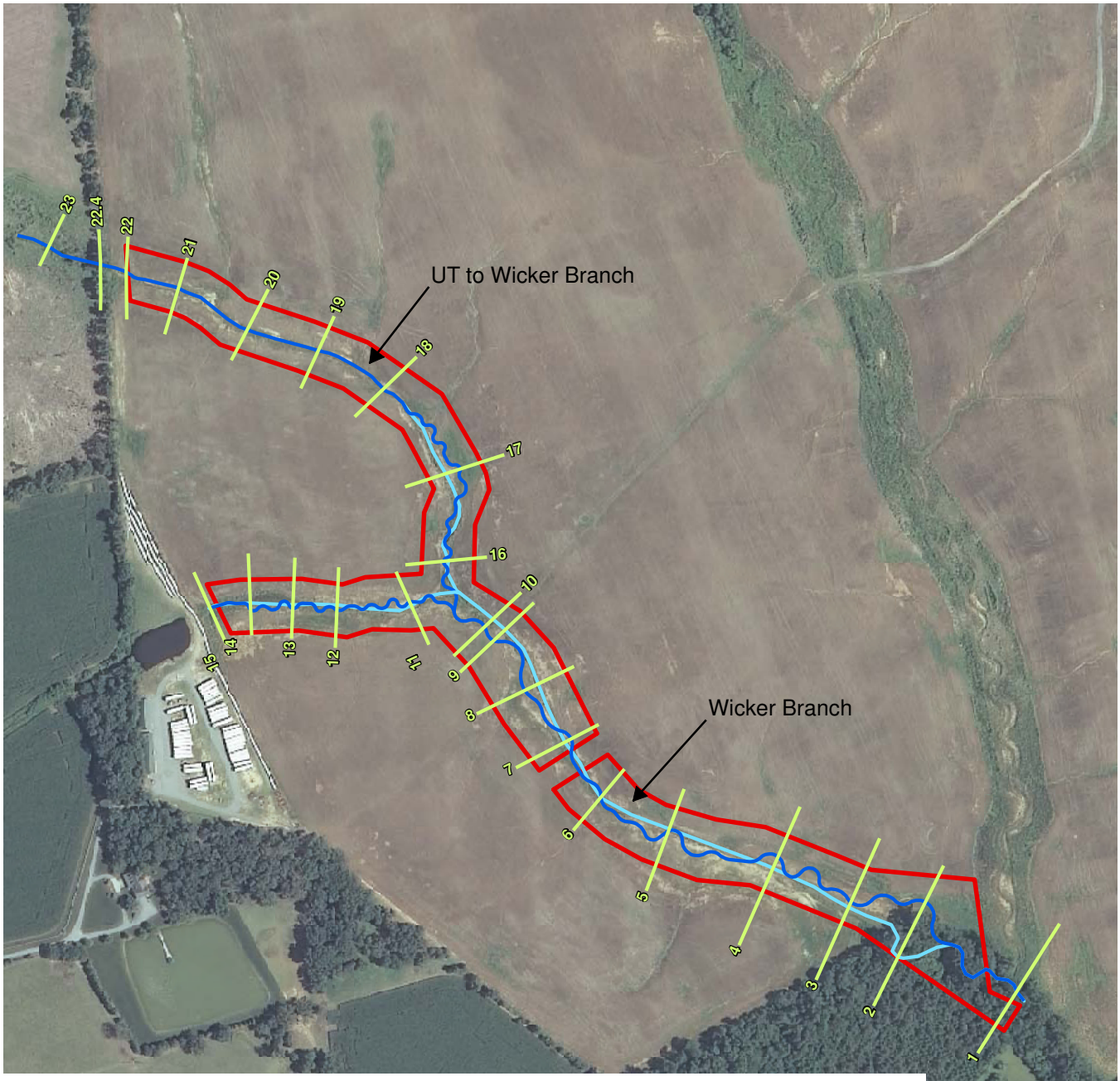
Stream Reach	Proposed Slope (ft/ft)	Proposed Hydraulic Radius (ft)	Shear Stress (lb/sq ft)	Threshold Particle Size – Rosgen Colorado Data (mm)
UT to Wicker Branch	0.011	0.8	0.46-0.99	86-151
Wicker Branch (Reach 2)	0.0085	1.1	0.22-1.05	50-158
Wicker Branch (Reach 3)	0.0083	1.3	0.33-1.07	67-160

Considering the results from the above methods across all calculated shear stresses at various typical cross sections, a maximum mobile particle size of 116-158mm can be expected in Reach 2, 120-160mm in Reach 3, and 107-151mm within Reach 5. Since the majority of this project is proposed as Priority 1 restoration, material will be brought on-site for the purpose of constructed riffles. Riffle material will consist of particles within the range of the existing channel with some particles in the large cobble range (128mm-180mm) in order to increase vertical stability.

7.3.3 Hydrologic Trespass

One objective of stream restoration is to repair the hydrologic connection between the stream and its floodplain. An intended consequence of this goal is to increase the frequency at which Site streams overtop their banks and discharge floodwaters into the floodplain. Changes to flood elevations, however, should be confined to the conservation easement, as changes outside of the conservation constitute hydrologic trespass.

Flood elevations associated with the bankfull, 2-, 5-, 10-, and 100-year peak discharges were estimated at 15 valley cross-sections along Wicker Branch and at nine valley cross-sections along the UT to Wicker Branch for the existing and post-restoration conditions using HEC-RAS version 4.1.0. The estimated flood elevations for each cross-section at each modeled discharge are presented in Appendix C.



601 North II Easement Boundary
Existing Stream Alignment
Proposed Stream Alignment
Cross Section

Data Sources:
Stream Alignments (Atkins)
Cross Sections (Atkins)
2010 Orthophotography (USDA NAIP)

400 200 0 400
Feet

Stream Reach	Location
UT to Wicker Branch	XS23 to Wicker Branch
Wicker Branch (lower reach)	XS15 to UT to Wicker Branch
Wicker Branch (middle reach)	UT to Wicker Branch to XS2
Wicker Branch (upper reach)	XS2 to XS1

Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

7.4 SURFACE WATER ANALYSIS FEATURES

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	TBA
Ckd By:	MCG
Date:	June 2012
Project No.:	100024976

N

7.5 FEMA Permitting

The stream reaches of the Site do not occur within a Federal Emergency Management Agency (FEMA) regulated special flood hazard area. As such, the project does not require a FEMA issued No-Rise/No-Impact Certification, Conditional Letter of Map Revision (CLOMR), or Letter of Map Revision (LOMR). No surface water analyses were performed in support of these permit actions. The EEP Floodplain Requirements Checklist is provided in Appendix B.

8.0 MAINTENANCE PLAN

NCEEP shall monitor the Site on a regular basis and shall conduct a physical inspection of the Site a minimum of once per year throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following elements in the table below (from NCEEP Mitigation Plan Template v2.1)

Routine Maintenance

Component/Feature	Maintenance Through Project Close-out
Stream	Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing of loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel. Areas where stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.
Utility Right-of-Way	Utility rights-of-way within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Ford Crossing	Ford crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Road Crossing	Road crossings within the site may be maintained only as allowed by Conservation Easement or existing easement, deed restrictions, rights of way, or corridor agreements.
Stormwater Management Device	Storm water management devices will be monitored and maintained per the protocols and procedures defined by the NC Division of Water Quality Storm Water Best Management Practices Manual.

9.0 PERFORMANCE STANDARDS

Success criteria for stream restoration will include 1) classification of the restored reaches to the appropriate Rosgen stream type as designed and 2) channel parameters that are indicative of a stable stream system. Channel configuration will be evaluated every year to monitor for changes in channel geometry, profile, and/or substrate. These data will be utilized to determine the success in restoring stream channel stability. Specifically, there shall be no significant change in channel geometry from the constructed channel; pool depths and widths should remain consistent with the constructed geometry; the profile should continue to show the development of bed features with no significant channel aggradation or degradation; and over time the channel will be successfully classified as an E-type stream. Channel stability will be assessed based on dimension, pattern, and profile variables. Bank erosion and headcut migration through the Site will be assessed visually (photo record) and through cross-section and profile data. Field indicators of bankfull will be described in each monitoring year and indicated on representative channel cross-sections.

Vegetation monitoring procedures are designed in accordance with the Stream Mitigation Guidelines (USACE et al. 2003) and guidelines and procedures developed by the Carolina Vegetation Survey (CVS) (CVS-EEP Protocol for Recording Vegetation, Level 1-2 Plot Sampling Only, Version 4.0, 2006). A general discussion of the plant community restoration program is provided in Section 6.1.

After planting has been completed in winter or early spring, an initial evaluation will be performed to verify planting methods and determine initial species composition and density. Supplemental planting and additional site modifications will be implemented, if necessary. During the first year, vegetation will receive cursory, visual evaluation on a periodic basis to ascertain the degree of overtopping of planted elements by nuisance species. The success criteria for plant community restoration will be based on the annual and cumulative survival and growth of the preferred suite of species over five years. Survival of the preferred species must be at a minimum average density of 320 stems per acre at the end of the third year of monitoring and 260 stems per acre after five years.

10.0 MONITORING REQUIREMENTS

Annual monitoring data will be reported using the NCEEP monitoring template (Version 1.4). The monitoring report shall provide a project data chronology that will facilitate an understanding of project status and trends, population of NCEEP databases for analysis, research purposes, and assist in decision making regarding project close-out. The following table presents the proposed monitoring metrics to be implemented at the Site. The quantity of each parameter will be determined in consultation with NCEEP and with consideration for the 2003 USACE Wilmington District Stream Mitigation Guidelines.

Parameter	Frequency	Notes
Pattern	Annual	The pattern will be measured along the restored channel to determine that the thalweg is not excessively meandering from the design.
Dimension	Annual	Riffle cross-sections will be measured to determine appropriate Rosgen stream type, and to document stability with regards to bankfull area and width-to-depth ratio.
Profile	Annual	The profile will be measured along the restored channel to demonstrate stable bedform features.

Substrate	Annual	A pebble count will be completed at each surveyed riffle to show that the median grain size (d_{50}) of the channel substrate is maintaining the designed distribution.
Surface Water Hydrology	Annual	A Crest Gauge will be installed on site, the device will be inspected on a quarterly/semi-annual basis to document the occurrence of bankfull events on the project.
Vegetation	Annual	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols
Exotic and nuisance vegetation	Annual	Locations of exotic and nuisance vegetation will be mapped
Project boundary	Semi-annual	Locations of fence damage, vegetation damage, boundary encroachments, etc. will be mapped

11.0 LONG-TERM MANAGEMENT PLAN

Upon approval for close-out by the Interagency Review Team (IRT) the Site will be transferred to the State of North Carolina. The State shall be responsible for periodic inspection of the Site to ensure that restrictions required in the conservation easement are upheld. Endowment funds required to uphold easement restrictions shall be negotiated prior to Site transfer.

12.0 ADAPTIVE MANAGEMENT PLAN

Upon completion of site construction, NCEEP will implement the post-construction monitoring protocols previously defined in Section 9.0. Project maintenance will be performed as described previously in this document. If during the course of annual monitoring it is determined the Site's ability to achieve performance standards are jeopardized, NCEEP will notify the USACE of the need to develop a Plan of Corrective Action. The Plan of Corrective Action may be prepared using in-house technical staff or may require engineering and consulting services. Once the Corrective Action Plan is prepared and finalized NCEEP will:

1. Notify the USACE as required by the Nationwide 27 permit general conditions.
2. Revise performance standards, maintenance requirements, and monitoring requirements as necessary and/or required by the USACE.
3. Obtain other permits as necessary.
4. Implement the Corrective Action Plan.
5. Provide the USACE a Record Drawing of Corrective Actions. This document shall depict the extent and nature of the work performed.

13.0 FINANCIAL ASSURANCES

Pursuant to Section IV H and Appendix III of the NCEEP In-Lieu Fee Instrument dated July 28, 2010, the NCDENR has provided USACE Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by NCEEP. This commitment provides financial assurance for all mitigation projects implemented by the program.

14.0 OTHER INFORMATION

14.1 Definitions

- Morphological description – the stream type; stream type is determined by quantifying channel entrenchment, dimension, pattern, profile, and boundary materials; as described in Rosgen, D. (1996), *Applied River Morphology, 2nd edition*
- Native vegetation community – a distinct and reoccurring assemblage of populations of plants, animals, bacteria and fungi naturally associated with each other and their population; as described in Schafale, M.P. and Weakley, A. S. (1990), *Classification of the Natural Communities of North Carolina, Third Approximation*
- Project Area - includes all protected lands associated with the mitigation project

14.2 References

Daniels, R.B., S.W. Buol, H.J. Kleiss, and C.A. Ditzler. Soil Systems in North Carolina.Technical Bull. 314. North Carolina State University, Soil Science Dept. Raleigh, NC.27695-7619. 1999.

Faber-Langendoen, D., Rocchio, J., Schafale, M., Nordman, C., Pyne, M., Teague, J., Foti, T., Comer, P. (2006), *Ecological Integrity Assessment and Performance Measures for Wetland Mitigation*. NatureServe, Arlington, Virginia.

Griffith, G.E., J.M. Omernik, J.A. Comstock, M.P. Schafale, W.H. McNab, D.R. Lenat, T.F. MacPherson, J.B. Glover, and V.B. Shelburne. 2002. Ecoregions of North Carolina and South Carolina, (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey (map scale 1:1,500,000).

Harmon William A., Gregory D Jennings, Jan M. Patterson, Dan R. Clinton, Louise O. Slate, Angela G. Jessup, J. Richard Everhart and Rachel E. Smith. 1999. Bankfull Hydraulic Geometry Relationships for North Carolina Streams. AWRA Wildland Hydrology Symposium Proceedings. Edited By: D.S. Olsen and J.P. Potyondy. AWRA Summer Symposium. Bozeman, MT.

Leopold, L.B., Wolman, G.M., and Miller, J.P. (1964). Fluvial processes in geomorphology. San Francisco, CA: W.H. Freeman.

Lindenmayer, D.B., and J.F. Franklin. (2002), *Conserving forest biodiversity: A comprehensive multiscaled approach.* Island Press, Washington, DC.

Lowther, B. 2008. Stream Channel Geomorphology Relationships for North Carolina Piedmont Reference Reaches. MS Thesis. Raleigh, N.C: North Carolina State University, Department of Biological and Agricultural Engineering.

Peet, R.K., Wentworth, T.S., and White, P.S. (1998), *A flexible, multipurpose method for recording vegetation composition and structure*. Castanea 63:262-274

Rosgen, D. 1996. *Applied River Morphology, 2nd edition*, Wildland Hydrology, Pagosa Springs, CO.

Rosgen, D. 2001. A practical method of computing streambank erosion rate. In *Proceedings of the seventh Federal Interagency Sedimentation Conference: Volume 1.* (pp. II-18-II-26). Reno, NV: Subcommittee on Sedimentation.

Rosgen, D.L. (2006). Watershed Assessment of River Stability and Sediment Supply (WARSSS). Fort Collins, CO. Wildland Hydrology Books.

Rosgen, D.L., and Silvey, H.L. (2007). The Reference Reach Field Book (3rd ed.). Fort Collins, CO: Wildland Hydrology Books.

Schafale, M.P. and Weakley, A. S. 1990. *Classification of the Natural Communities of North Carolina, Third Approximation,* NC Natural Heritage Program, Raleigh, NC.

Stream Mitigation Guidelines. April 2003. US Army Corps of Engineers Wilmington District.

US Army Corps of Engineers Hydrologic Engineering Center (USACE HEC). 2010. Hydrologic Modeling System HEC-HMS User's Manual. Davis, CA.

United States Department of Agriculture (USDA). 1986. Urban Hydrology for Small Watersheds. Washington DC.

Young, T.F. and Sanzone, S. (editors). (2002), *A framework for assessing and reporting on ecological condition*. Ecological Reporting Panel, Ecological Processes and Effects Committee. EPA Science Advisory Board. Washington, DC.

This Page Intentionally Left Blank

14.3 Appendix A. Site Protection Instrument

Conservation Easement 1A and 1B: Broadway Investment Properties, LLC

FILED
UNION COUNTY, NC
CRYSTAL CRUMP
REGISTER OF DEEDS

FILED	Dec 30, 2011
AT	02:49 pm
BOOK	05657
START PAGE	0605
END PAGE	0614
INSTRUMENT #	33370
EXCISE TAX	$274.00

AH

STATE OF NORTH CAROLINA

Revenue Stamps: $274.00

UNION COUNTY

CONSERVATION EASEMENT PROVIDED PURSUANT TO FULL DELIVERY MITIGATION CONTRACT

SPO File Number 90-AO EEP # 95025
Prepared by: Office of the Attorney General
Property Control Section
Return to: NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

Return to:
CALDWELL HELDER HELMS & ROBISON, P.A. (jal)

THIS CONSERVATION EASEMENT DEED, made this 30th day of December, 2011, by Broadway Investment Properties, LLC, a North Carolina limited liability company, ("**Grantor**"), whose mailing address is 4408 Medlin Rd., Monroe, NC 28112, to the State of North Carolina, ("**Grantee**"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Ecosystem Enhancement Program (formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between **Environmental Banc & Exchange, 909 Capability Dr. Suite 3100 Raleigh, NC 27606,**

and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 003991.

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Ecosystem Enhancement Program in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Buford Township, Union County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 50.00 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 5367 at Page 73** of the Union County Registry, North Carolina; and

WHEREAS, Grantor is willing to grant a Conservation Easement over the herein described areas of the Property, thereby restricting and limiting the use of the included areas of the Property to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept such Conservation Easement. This Conservation Easement shall be for the protection and benefit of **the Yadkin Pee Dee #0304105 river basin for the restoration project known as "601 North II."**

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement of the nature and character and to the extent hereinafter set forth, along with a general Right of Access over a described area of the Property, referred to hereafter as the "**Easement Area**", for the benefit of the people of North Carolina, and being all of the tracts of land identified as Conservation Easements

1A and 1B as shown on a plat of survey entitled "An Easement Plat of The Howey Property & Broadway Investment Properties, LLC" dated Nov. 10, 2011, certified by Justin F. Cloninger, P.L.S. Said plat is recorded in Plat Cabinet L File 574 in the Union County Registry, reference to which is hereby made. Said conservation easements being described as follows:

CONSERVATION EASEMENT 1A:

That certain parcel of land, situated, lying and being in the Buford Township, Union County, North Carolina, and being more particularly described as follows:

Being a portion of the Broadway Investment Properties, LLC Property as described in Deed Book 5367, Page 73 of the Union County Registry, and **COMMENCING** at the eastern most corner of the aforesaid Broadway Investment Properties, LLC Property, said point also being located in the center line of a creek at a common corner with the Stephen T. and Elizabeth C. Foster Property as described in Deed Book 479, Page 724 of the Union County Registry; thence with the aforesaid Foster Property **S 33°44'34" W** a distance of **16.11** feet to the **POINT OF BEGINNING**; thence continuing with the aforesaid Foster Property **S 33°44'34" W** a distance of **75.15** feet to a calculated point; thence with the following 8 new courses and distances within the aforesaid Broadway Investment Properties, LLC Property: 1) **N 54°15'41" W** a distance of **451.52** feet to a calculated point; 2) **N 66°38'22" W** a distance of **287.77** feet to a calculated point; 3) **N 83°01'52" W** a distance of **134.94** feet to a calculated point; 4) **N 68°40'09" W** a distance of **148.47** feet to a calculated point; 5) **N 59°57'46" W** a distance of **104.57** feet to a calculated point; 6) **N 49°21'43" W** a distance of **118.72** feet to a calculated point; 7) **N 36°06'36" W** a distance of **62.46** feet to a calculated point; 8) **N 58°38'34" E** a distance of **85.64** feet to a calculated point, said point being located in the centerline of a creek, said point also being located on the western line of the Franklin W. Howey, Jr. Property as described in Deed Book 835, Page 900 of the Union County Registry; thence with the centerline of the creek and with the western line of the aforesaid Howey Property the following 13 courses and distances: 1) **S 31°43'52" E** a distance of **77.56** feet to a T-Post; 2) **S 60°18'41" E** a distance of **92.63** feet to a T-Post; 3) **S 68°19'26" E** a distance of **361.96** feet to a T-Post; 4) **S 63°28'45" E** a distance of **348.18** feet to a T-Post; 5) **S 26°52'11" E** a distance of **32.72** feet to a calculated point; 6) **S 13°53'20" W** a distance of **31.03** feet to a calculated point; 7) **S 35°50'58" E** a distance of **29.26** feet to a calculated point; 8) **N 82°45'08" E** a distance of **35.63** feet to a calculated point; 9) **N 73°45'11" E** a distance of **96.89** feet to a calculated point; 10) **S 23°12'54" E** a distance of **64.90** feet to a calculated point; 11) **S 29°29'39" E** a distance of **7.81** feet to a calculated point; 12) **S 30°17'19" E** a distance of **23.60** feet to a calculated point; 13) thence **N 62°46'03" E** a distance of **48.78** feet to a calculated point; thence with 2 new courses and distances within the aforesaid Broadway Investment Properties, LLC Property: 1) **S 06°34'14" E** a distance of **57.83** feet to a calculated point; 2) **S 64°31'53" E** a distance of **83.76** feet to the POINT OF BEGINNING; Containing **89,736** square feet or **2.0601** acres as shown on a survey by R.B. Pharr and Associates P.A. dated November 10, 2011, **(Map File XX3614)**.

CONSERVATION EASEMENT 1B:

That certain parcel of land, situated, lying and being in the Buford Township, Union County, North Carolina, and being more particularly described as follows:

Being a portion of the Broadway Investment Properties, LLC Property as described in Deed Book 5367, Page 73 of the Union County Registry, and **COMMENCING** at the northeast corner of the aforesaid Broadway Investment Properties, LLC Property, said point also being located at a common corner with the Franklin W. Howey, Jr Property as described in Deed Book 835, Page 900 of the Union County Registry; thence with the aforesaid Howey Property **S 03°13'06" E** a distance of **900.29** feet to the **POINT OF BEGINNING;** thence continuing **S 03°13'06" E** a distance of **93.54** feet to a T-Post, said point being located in the centerline of a creek; thence continuing with the aforesaid Howey Property and with the centerline of the creek the following 12 courses and distances: 1) **S 71°17'06" E** a distance of **284.19** feet to a T-Post; 2) **S 54°21'21" E** a distance of **156.09** feet to a T-Post; 3) **S 38°31'40" E** a distance of **114.14** feet to a T-Post; 4) **S 24°24'00" E** a distance of **215.11** feet to a T-Post; 5) **S 10°53'47" W** a distance of **48.00** feet to a T-Post; 6) **S 35°09'09" W** a distance of **55.41** feet to a T-Post; 7) **S 03°52'40" E** a distance of **71.54** feet to a T-Post; 8) **S 25°44'49" E** a distance of **54.36** feet to a T-Post; 9) **S 50°24'11" E** a distance of **166.98** feet to a T-Post; 10) **S 39°22'41" E** a distance of **57.14** feet to a T-Post; 11) **S 23°04'10" E** a distance of **275.58** feet to a T-Post; 12) **S 31°43'52" E** a distance of **5.38** feet to a calculated point; thence with 31 new courses and distances within the aforesaid Broadway Investment Properties, LLC Property: 1) **S 58°38'34" W** a distance of **90.24** feet to a calculated point; 2) **N 36°06'36" W** a distance of **146.05** feet to a calculated point; 3) **N 30°15'40" W** a distance of **167.70** feet to a calculated point; 4) **N 41°35'03" W** a distance of **132.57** feet to a calculated point; 5) **S 85°28'25" W** a distance of **57.36** feet to a calculated point; 6) **N 87°10'13" W** a distance of **96.78** feet to a calculated point; 7) **S 73°51'39" W** a distance of **66.65** feet to a calculated point; 8) **N 81°17'08" W** a distance of **122.69** feet to a calculated point; 9) **S 89°02'29" W** a distance of **169.88** feet to a calculated point; 10) **N 25°14'51" W** a distance of **136.65** feet to a calculated point; 11) **N 82°40'18" E** a distance of **85.03** feet to a calculated point; 12) **S 89°21'53" E** a distance of **154.44** feet to a calculated point; 13) **S 81°17'08" E** a distance of **103.22** feet to a calculated point; 14) **N 73°51'39" E** a distance of **59.72** feet to a calculated point; 15) **N 87°28'23" E** a distance of **141.34** feet to a calculated point; 16) **N 03°55'51" E** a distance of **153.87** feet to a calculated point; 17) **N 23°25'19" E** a distance of **65.23** feet to a calculated point; 18) **N 27°07'06" W** a distance of **120.72** feet to a calculated point; 19) **N 27°24'17" W** a distance of **46.44** feet to a calculated point; 20) **N 53°59'46" W** a distance of **181.60** feet to a calculated point; 21) **N 67°24'46" W** a distance of **123.02** feet to a calculated point; 22) **N 70°22'06" W** a distance of **205.13** feet to a calculated point; 23) **N 48°21'59" W** a distance of **66.38** feet to a calculated point; 24) **N 55°45'34" W** a distance of **45.52** feet to a calculated point; 25) **N 67°03'49" W** a distance of **42.83** feet to a calculated point; 26) **N 73°32'43" W** a distance of **102.30** feet to a calculated point; 27) **N 03°22'11" W** a distance of **138.01** feet to a calculated point; 28) **S 73°36'20" E** a distance of **156.47** feet to a calculated point; 29) **S 67°03'49" E** a distance of **62.38** feet to a calculated point; 30) **S 56°21'13" E** a distance of **63.42** feet to a calculated point; 31) **S 48°21'59" E** a distance of **7.10** feet to the POINT OF BEGINNING;

Containing **225,849** square feet or **5.1848** acres as shown on a survey by R.B. Pharr and Associates P.A. dated November 10, 2011, **(Map File XX3614)**.

The purposes of this Conservation Easement are to maintain, restore, enhance, create and preserve wetland and/or riparian resources in the Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

This Conservation Easement shall be perpetual. It is an easement in gross, runs with the land, and is enforceable by Grantee against Grantor, their personal representatives, heirs, successors, and assigns, lessees, agents, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITES

The Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Easement Area for the purposes thereof. Usage of motorized vehicles in the Easement Area is prohibited, except as they are used exclusively for management, maintenance, or stewardship purposes, and on existing trails, paths or roads.

B. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Easement Area not inconsistent with this Conservation Easement, and the right of access to the Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

C. Vegetative Cutting. Except as related to the removal of non-native plants, diseased or damaged trees, and vegetation that obstructs, destabilizes or renders unsafe the Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Easement Area is prohibited.

D. Industrial, Residential and Commercial Uses. All are prohibited in the Easement Area.

E. Agricultural Use. All agricultural uses within the Easement Area including any use for cropland, waste lagoons, or pastureland are prohibited.

F. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Easement Area.

G. Roads and Trails. There shall be no construction of roads, trails, walkways, or paving in the Easement Area. Existing roads or trails located in the Easement Area may be maintained by Grantor in order to minimize runoff, sedimentation and for access to the interior of the Property for management, maintenance, stewardship purposes, or undeveloped recreational and educational uses of the Easement Area. Existing roads, trails or paths may be maintained with loose gravel or permanent vegetation to stabilize or cover the surfaces.

H. Signs. No signs shall be permitted in the Easement Area except interpretive signs describing restoration activities and the conservation values of the Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Easement Area may be allowed.

I. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances or machinery, or other material in the Easement Area is prohibited.

J. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, or drilling; no removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

K. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Easement Area may temporarily be used for good cause shown as needed for the survival of livestock and agricultural production.

L. Subdivision and Conveyance. Grantor voluntarily agrees that no subdivision, partitioning, or dividing of the underlying fee that is subject to this Easement is allowed. Unless agreed to by the Grantee in writing, any future conveyance of the underlying fee for the Easement Area and the rights as conveyed herein shall be as a

single block of property. Any future transfer of the fee simple shall be subject to this Conservation Easement. Any transfer of the fee is subject to the Grantee's right of ingress, egress, and regress over and across the Property to the Easement Area for the purposes set forth herein.

M. Development Rights. All development rights are removed from the Easement Area and shall not be transferred.

N. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is consistent with the purposes of this Conservation Easement. The Grantor shall not vary from the above restrictions without first obtaining written approval from the N.C. Ecosystem Enhancement Program, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Ingress, Egress, Regress and Inspection. The Grantee, its employees and agents, successors and assigns, receive the perpetual right of general ingress, egress, and regress to the Easement Area over the Property at reasonable times to undertake any activities to restore, manage, maintain, enhance, and monitor the wetland and riparian resources of the Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterraneous water flow.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Easement Area that is inconsistent with the purposes of this Easement and to require the restoration of such areas or features of the Easement Area that may have been damaged by such activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, their successors or assigns, that comes to the attention of the Grantee, the Grantee shall, except as provided below, notify the Grantor, their successors or assigns in writing of such breach. The Grantor shall have ninety (90) days after receipt of such notice to correct the conditions constituting such breach. If the breach remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by appropriate legal proceedings

including damages, injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief if the breach of the term of this Conservation Easement is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement. The Grantor and Grantee acknowledge that under such circumstances damage to the Grantee would be irreparable and remedies at law will be inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. Inspection. The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor, their successors or assigns are complying with the terms, conditions and restrictions of this Conservation Easement.

C. Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor, their successors or assigns, for any injury or change in the Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, damage to property or harm to the Property resulting from such causes.

D. Costs of Enforcement. Beyond regular and typical monitoring, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, their successors or assigns, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and

the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown above or to other address(es) as either party establishes in writing upon notification to the other.

C. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees to make any subsequent lease, deed, or other legal instrument by which any interest in the Property is conveyed subject to the Conservation Easement herein created.

D. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

E. This Conservation Easement may be amended, but only in a writing signed by all parties hereto, and provided such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement.

F. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Easement Area, and the right of quiet enjoyment of the Easement Area.

TO HAVE AND TO HOLD the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes.

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same are

free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Broadway Investment Properties, LLC

By: Charles A. Broadway Jr. (SEAL)
Charles Broadway, Manager

NORTH CAROLINA

COUNTY OF UNION

I, James Allen Lee, a Notary Public in and for the County and State aforesaid, do hereby certify that CHARLES BROADWAY, manager of BROADWAY INVESTMENT PROPERTIES, LLC, a North Carolina limited liability company, before me personally appeared this day and acknowledged the due execution and sealing of the foregoing instrument as Manager on behalf of and as the act of the company referred to in this acknowledgment.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 30th day of December, 2011.

Notary Public

My commission expires:

3/24/2013

JAMES ALLEN LEE NOTARY PUBLIC UNION COUNTY, N.C.

Conservation Easement 2A and 2B: Franklin W. Howey Jr.

FILED
UNION COUNTY, NC
CRYSTAL CRUMP
REGISTER OF DEEDS

FILED	Dec 30, 2011
AT	11:59 am
BOOK	05657
START PAGE	0242
END PAGE	0249
INSTRUMENT #	33280
EXCISE TAX	$195.00

AH

Excise Stamps: $195.00

STATE OF NORTH CAROLINA

UNION COUNTY

CONSERVATION EASEMENT PROVIDED PURSUANT TO FULL DELIVERY MITIGATION CONTRACT

SPO File Number-90AP; EEP # 95025
Prepared by: Office of the Attorney General
Property Control Section
Return to: NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS CONSERVATION EASEMENT DEED, made this 29th day of December, 2011, by Franklin W. Howey, Jr, (**"Grantor"**), whose mailing address is P. O. Box 429, Monroe, NC 28111-0429, to the State of North Carolina, (**"Grantee"**), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

WITNESSETH:

WHEREAS, pursuant to the provisions of N.C. Gen. Stat. § 143-214.8 et seq., the State of North Carolina has established the Ecosystem Enhancement Program (formerly known as the Wetlands Restoration Program) within the Department of Environment and Natural Resources for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between **Environmental Banc & Exchange, 909 Capability Dr. Suite 3100 Raleigh, NC 27606,** and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number **003991.**

WHEREAS, The State of North Carolina is qualified to be the Grantee of a Conservation Easement pursuant to N.C. Gen. Stat. § 121-35; and

WHEREAS, the Department of Environment and Natural Resources, the North Carolina Department of Transportation and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Agreement, (MOA) duly executed by all parties in Greensboro, NC on July 22, 2003, which recognizes that the Ecosystem Enhancement Program is to provide for compensatory mitigation by effective protection of the land, water and natural resources of the State by restoring, enhancing and preserving ecosystem functions; and

WHEREAS, the acceptance of this instrument for and on behalf of the State of North Carolina was granted to the Department of Administration by resolution as approved by the Governor and Council of State adopted at a meeting held in the City of Raleigh, North Carolina, on the 8th day of February 2000; and

WHEREAS, the Ecosystem Enhancement Program in the Department of Environment and Natural Resources, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Buford Township, Union County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 187.8970 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 835 at Page 0900** of the Union County Registry, North Carolina (Union County Tax Parcel # 04-036-004); and

WHEREAS, Grantor is willing to grant a Conservation Easement over the herein described areas of the Property, thereby restricting and limiting the use of the included areas of the Property to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept such Conservation Easement. This Conservation Easement shall be for the protection and benefit of **the Yadkin Pee Dee #0304105 river basin for the restoration project known as "601 North II."**

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement along with a general Right of Access.

NOW, THEREFORE, in consideration of the mutual covenants, terms, conditions, and restrictions hereinafter set forth, Grantor unconditionally and irrevocably hereby grants and conveys unto Grantee, its successors and assigns, forever and in perpetuity, a Conservation Easement, along with a general Right of Access (see note above), of the nature and character and to the extent hereinafter set forth, over a described area of the Property, referred to hereafter as the "**Easement Area**", for the benefit of the people of North Carolina, and being all of the tract of land as identified as CONSERVATION EASEMENT 2A containing 112.766 sq. ft. comprising 2.5887 acres and CONSERVATION EASEMENT 2B containing 107,868 sq. ft. and comprising 2.4763 acres as shown as the "shaded area" on a plat of survey entitled "AN EASEMENT PLAT OF: THE HOWEY PROPERTY AND BROADWAY INVESTMENT PROPERTIES, LLC" dated November 10, 2011, certified by R. B. PHARR & ASSOCIATIES, P.A., and recorded in **Plat Cabinet** L, **Page** 574, of the Union County Registry. Said tracts or CONSERVATION EASEMENTS 2A and 2B being more particularly described as follows:

SEE EXHIBIT "A" ATTACHED HERETO AND INCORPORATED HEREIN FOR A MORE COMPLETE METES AND BOUNDS LEGAL DESCRIPTION.

The purposes of this Conservation Easement are to maintain, restore, enhance, create and preserve wetland and/or riparian resources in the Easement Area that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; to maintain permanently the Easement Area in its natural condition, consistent with these purposes; and to prevent any use of the Easement Area that will significantly impair or interfere with these purposes. To achieve these purposes, the following conditions and restrictions are set forth:

I. DURATION OF EASEMENT

This Conservation Easement shall be perpetual. It is an easement in gross, runs with the land, and is enforceable by Grantee against Grantor, their personal representatives, heirs, successors, and assigns, lessees, agents, and licensees.

II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITES

The Easement Area shall be restricted from any development or usage that would impair or interfere with the purposes of this Conservation Easement. Unless expressly reserved as a compatible use herein, any activity in, or use of, the Easement Area by the Grantor is prohibited as inconsistent with the purposes of this Conservation Easement. Any rights not expressly reserved hereunder by the Grantor have been acquired by the Grantee. Any rights not expressly reserved hereunder by the Grantor, including the rights to all mitigation credits, including, but not limited to, stream, wetland, and riparian buffer mitigation units, derived from each site within the area of the Conservation Easement, are conveyed to and belong to the Grantee. Without limiting the generality of the foregoing, the following specific uses are prohibited, restricted, or reserved as indicated:

A. Recreational Uses. Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Easement Area for the purposes thereof. Usage of motorized vehicles in the Easement Area is prohibited, except as they are used exclusively for management, maintenance, or stewardship purposes, and on existing trails, paths or roads.

B. Educational Uses. The Grantor reserves the right to engage in and permit others to engage in educational uses in the Easement Area not inconsistent with this Conservation Easement, and the right of access to the Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.

C. Vegetative Cutting. Except as related to the removal of non-native plants, diseased or damaged trees, and vegetation that obstructs, destabilizes or renders unsafe the Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Easement Area is prohibited.

D. Industrial, Residential and Commercial Uses. All are prohibited in the Easement Area.

E. Agricultural Use. All agricultural uses within the Easement Area including any use for cropland, waste lagoons, or pastureland are prohibited.

F. New Construction. There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Easement Area.

G. Roads and Trails. There shall be no construction of roads, trails, walkways, or paving in the Easement Area. Existing roads or trails located in the Easement Area may be maintained by Grantor in order to minimize runoff, sedimentation and for access to the interior of the Property for management, maintenance, stewardship purposes, or undeveloped recreational and educational uses of the Easement Area. Existing roads, trails or paths may be maintained with loose gravel or permanent vegetation to stabilize or cover the surfaces.

H. Signs. No signs shall be permitted in the Easement Area except interpretive signs describing restoration activities and the conservation values of the Easement Area, signs identifying the owner of the Property and the holder of the Conservation Easement, signs giving directions, or signs prescribing rules and regulations for the use of the Easement Area may be allowed.

I. Dumping or Storing. Dumping or storage of soil, trash, ashes, garbage, waste, abandoned vehicles, appliances or machinery, or other material in the Easement Area is prohibited.

J. Grading, Mineral Use, Excavation, Dredging. There shall be no grading, filling, excavation, dredging, mining, or drilling; no removal of topsoil, sand, gravel, rock, peat, minerals, or other materials.

K. Water Quality and Drainage Patterns. There shall be no diking, draining, dredging, channeling, filling, leveling, pumping, impounding or diverting, causing, allowing or permitting the diversion of surface or underground water. No altering or tampering with water control structures or devices, or disruption or alteration of the restored, enhanced, or created drainage patterns. All removal of wetlands, polluting or discharging into waters, springs, seeps, or wetlands, or use of pesticide or biocides is prohibited. In the event of an emergency interruption or shortage of all other water sources, water from within the Easement Area may temporarily be used for good cause shown as needed for the survival of livestock and agricultural production.

L. Subdivision and Conveyance. Grantor voluntarily agrees that no subdivision, partitioning, or dividing of the underlying fee that is subject to this Easement is allowed. Unless agreed to by the Grantee in writing, any future conveyance of the underlying fee for the Easement Area and the rights as conveyed herein shall be as a single block of property. Any future transfer of the fee simple shall be subject to this Conservation Easement. Any transfer of the fee is subject to the Grantee's right of ingress, egress, and regress over and across the Property to the Easement Area for the purposes set forth herein.

M. Development Rights. All development rights are removed from the Easement Area and shall not be transferred.

N. Disturbance of Natural Features. Any change, disturbance, alteration or impairment of the natural features of the Easement Area or any intentional introduction of non-native plants, trees and/or animal species by Grantor is prohibited.

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is consistent with the purposes of this Conservation Easement. The Grantor shall not vary from the above restrictions without first obtaining written approval from the N.C. Ecosystem Enhancement Program, whose mailing address is 1652 Mail Services Center, Raleigh, NC 27699-1652.

III. GRANTEE RESERVED USES

A. Ingress, Egress, Regress and Inspection. The Grantee, its employees and agents, successors and assigns, receive the perpetual right of general ingress, egress, and regress to the Easement Area over the Property at reasonable times to undertake any activities to restore, manage, maintain, enhance, and monitor the wetland and riparian resources of the Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

B. Restoration Activities. These activities include planting of trees, shrubs and herbaceous vegetation, installation of monitoring wells, utilization of heavy equipment to grade, fill, and prepare the soil, modification of the hydrology of the site, and installation of natural and manmade materials as needed to direct in-stream, above ground, and subterraneous water flow.

IV. ENFORCEMENT AND REMEDIES

A. Enforcement. To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Easement Area that is inconsistent with the purposes of this Easement and to require the restoration of such areas or features of the Easement Area that may have been damaged by such activity or

use. Upon any breach of the terms of this Conservation Easement by Grantor, their successors or assigns, that comes to the attention of the Grantee, the Grantee shall, except as provided below, notify the Grantor, their successors or assigns in writing of such breach. The Grantor shall have ninety (90) days after receipt of such notice to correct the conditions constituting such breach. If the breach remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by appropriate legal proceedings including damages, injunctive and other relief. The Grantee shall also have the power and authority, consistent with its statutory authority: (a) to prevent any impairment of the Easement Area by acts which may be unlawful or in violation of this Conservation Easement; (b) to otherwise preserve or protect its interest in the Property; or (c) to seek damages from any appropriate person or entity. Notwithstanding the foregoing, the Grantee reserves the immediate right, without notice, to obtain a temporary restraining order, injunctive or other appropriate relief if the breach of the term of this Conservation Easement is or would irreversibly or otherwise materially impair the benefits to be derived from this Conservation Easement. The Grantor and Grantee acknowledge that under such circumstances damage to the Grantee would be irreparable and remedies at law will be inadequate. The rights and remedies of the Grantee provided hereunder shall be in addition to, and not in lieu of, all other rights and remedies available to Grantee in connection with this Conservation Easement.

B. **Inspection.** The Grantee, its employees and agents, successors and assigns, have the right, with reasonable notice, to enter the Easement Area over the Property at reasonable times for the purpose of inspection to determine whether the Grantor, their successors or assigns are complying with the terms, conditions and restrictions of this Conservation Easement.

C. **Acts Beyond Grantor's Control.** Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor, their successors or assigns, for any injury or change in the Easement Area caused by third parties, resulting from causes beyond the Grantor's control, including, without limitation, fire, flood, storm, and earth movement, or from any prudent action taken in good faith by the Grantor under emergency conditions to prevent, abate, or mitigate significant injury to life, damage to property or harm to the Property resulting from such causes.

D. **Costs of Enforcement.** Beyond regular and typical monitoring, any costs incurred by Grantee in enforcing the terms of this Conservation Easement against Grantor, their successors or assigns, including, without limitation, any costs of restoration necessitated by Grantor's acts or omissions in violation of the terms of this Conservation Easement, shall be borne by Grantor.

No Waiver. Enforcement of this Easement shall be at the discretion of the Grantee and any forbearance, delay or omission by Grantee to exercise its rights hereunder in the event of any breach of any term set forth herein shall not be construed to be a waiver by Grantee.

V. MISCELLANEOUS

A. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings or agreements relating to the Conservation Easement. If any provision is found to be invalid, the remainder of the provisions of the Conservation Easement, and the application of such provision to persons or circumstances other than those as to which it is found to be invalid, shall not be affected thereby.

B. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown above or to other address(es) as either party establishes in writing upon notification to the other.

C. Grantor shall notify Grantee in writing of the name and address and any party to whom the Property or any part thereof is to be transferred at or prior to the time said transfer is made. Grantor further agrees to make any subsequent lease, deed, or other

legal instrument by which any interest in the Property is conveyed subject to the Conservation Easement herein created.

D. The Grantor and Grantee agree that the terms of this Conservation Easement shall survive any merger of the fee and easement interests in the Property or any portion thereof.

E. This Conservation Easement may be amended, but only in a writing signed by all parties hereto, and provided such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement.

F. The parties recognize and agree that the benefits of this Conservation Easement are in gross and assignable provided, however, that the Grantee hereby covenants and agrees, that in the event it transfers or assigns this Conservation Easement, the organization receiving the interest will be a qualified holder under N.C. Gen. Stat. § 121-34 et seq. and § 170(h) of the Internal Revenue Code, and the Grantee further covenants and agrees that the terms of the transfer or assignment will be such that the transferee or assignee will be required to continue in perpetuity the conservation purposes described in this document.

VI. QUIET ENJOYMENT

Grantor reserves all remaining rights accruing from ownership of the Property, including the right to engage in or permit or invite others to engage in only those uses of the Easement Area that are expressly reserved herein, not prohibited or restricted herein, and are not inconsistent with the purposes of this Conservation Easement. Without limiting the generality of the foregoing, the Grantor expressly reserves to the Grantor, and the Grantor's invitees and licensees, the right of access to the Easement Area, and the right of quiet enjoyment of the Easement Area.

TO HAVE AND TO HOLD the said rights and easements perpetually unto the State of North Carolina for the aforesaid purposes.

AND Grantor covenants that Grantor is seized of said premises in fee and has the right to convey the permanent Conservation Easement herein granted; that the same are free from encumbrances and that Grantor will warrant and defend title to the same against the claims of all persons whomsoever.

IN TESTIMONY WHEREOF, the Grantor has hereunto set his hand and seal, the day and year first above written.

Franklin W. Howey Jr (SEAL)
FRANKLIN W. HOWEY, JR

NORTH CAROLINA

COUNTY OF UNION

I, Lauren S. Wilson, a Notary Public in and for the County and State aforesaid, do hereby certify that Franklin W. Howey, Jr, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 29th day of December, 2011.

LAUREN S WILSON NOTARY PUBLIC UNION COUNTY, N. C.

Lauren S. Wilson
Notary Public
My commission expires: 2-27-2012

EXHIBIT A
TO
CONSERVATION EASEMENT

Grantor: Franklin W. Howey

Grantee: State of North Carolina, Department of Administration, State Property Office

Brief Legal: Portion of 187.897 Acres off McManus Circle (Tax Parcel # 04-036-004)

CONSERVATION EASEMENT 2A

That certain parcel of land, situated, lying and being in the Buford Township, Union County, North Carolina, and being more particularly described as follows:

Being a portion of the Franklin W. Howey, Jr. Property as described in Deed Book 835, Page 900 of the Union County Registry, and **COMMENCING** at the eastern most corner of the Broadway Investment Properties, LLC Property as described in Deed Book 5367, Page 73 of the Union County Registry, said point also being located in the center line of a creek at a common corner with the Stephen T. and Elizabeth C. Foster Property as described in Deed Book 479, Page 724 of the Union County Registry; thence with the aforesaid Broadway Investment Properties, LLC Property and with the centerline of the creek the following 6 courses and distances: 1) **N 41°05'16" W** a distance of **27.99** feet to a calculated point; 2) thence **N 16°23'45" W** a distance of **18.41** feet to a calculated point; 3) **N 52°50'17" W** a distance of **26.01** feet to a calculated point; 4) **N 78°12'29" W** a distance of **23.11** feet to a calculated point; 5) **N 43°34'07" W** a distance of **30.92** feet to a calculated point; 6) **S 62°46'03" W** a distance of **3.31** feet to a calculated point; which is the **POINT OF BEGINNING;** thence continuing with the aforesaid Broadway Investment Properties, LLC Property and with the centerline of the creek the following 13 courses and distances: 1) **S 62°46'03" W** a distance of **48.78** feet to a calculated point; 2) **N 30°17'19" W** a distance of **23.60** feet to a calculated point; 3) **N 29°29'39" W** a distance of **7.81** feet to a calculated point; 4) **N 23°12'54" W** a distance of **64.90** feet to a calculated point; 5) **S 73°45'11" W** a distance of **96.89** feet to a calculated point; 6) **S 82°45'08" W** a distance of **35.63** feet to a calculated point; 7) **N 35°50'58" W** a distance of **29.26** feet to a calculated point; 8) **N 13°53'20" E** a distance of **31.03** feet to a calculated point; 9) **N 26°52'11" W** a distance of **32.72** feet to a T-Post; 10) **N 63°28'45" W** a distance of **348.18** feet to a T-Post; 11) **N 68°19'26" W** a distance of **361.96** feet to a T-Post; 12) **N 60°18'41" W** a distance of **92.63** feet to a T-Post; 13) **N 31°43'52" W** a distance of **77.56** feet to a calculated point; thence with 10 new courses and distances within the aforesaid Howey Property: 1) **N 58°38'34" E** a distance of **75.85** feet to a calculated point; 2) **S 40°34'02" E** a distance of **117.06** feet to a calculated point; 3) **S 59°57'46" E** a distance of **79.24** feet to a calculated point; 4) **S 72°39'10" E** a distance of **131.26** feet to a calculated point; 5) **S 79°57'26" E** a distance of **125.09** feet to a calculated point; 6) **S 67°04'12" E** a distance of **196.89** feet to a calculated point; 7) **S 66°06'53" E** a distance of **90.05** feet to a calculated point; 8) **S 83°41'33" E** a distance of **260.74** feet to a calculated point; 9) **S 06°34'14" E** a distance of **98.77** feet to a calculated point; 10) **S 06°34'14" E** a distance of **127.77** feet to the POINT OF BEGINNING; Containing **112,766** square feet or **2.5887** acres as shown on a survey by R.B. Pharr and Associates P.A. dated November 10, 2011, **(Map File XX3614)**.

CONSERVATION EASEMENT 2B

That certain parcel of land, situated, lying and being in the Buford Township, Union County, North Carolina, and being more particularly described as follows:

Being a portion of the Franklin W. Howey, Jr. Property as described in Deed Book 835, Page 900 of the Union County Registry, and **COMMENCING** at a common corner with the Broadway Investment Properties, LLC Property as described in Deed Book 5367, Page 73 of the Union County Registry, said point being the northeast corner of the aforesaid Broadway Investment Properties, LLC Property; thence with the aforesaid Broadway Investment Properties, LLC Property **S 03°13'06" E** a distance of **900.29** feet to a calculated point; which is the **POINT OF BEGINNING;** thence with 13 courses and distances within the aforesaid Howey Property: 1) **S 48°21'59" E** a distance of **48.20** feet to a calculated point; 2) **S 70°34'53" E** a distance of **181.03** feet to a calculated point; 3) **S 67°24'46" E** a distance of **142.54** feet to a calculated point; 4) **S 54°03'35" E** a distance of **226.70** feet to a calculated point; 5) **S 29°02'31" E** a distance of **171.12** feet to a calculated point; 6) **S 24°33'00" E** a distance of **56.21** feet to a calculated point; 7) **S 11°30'54" E** a distance of **41.93** feet to a calculated point; 8) **S 23°25'19" W** a distance of **95.59** feet to a calculated point; 9) **S 02°37'09" W** a distance of **144.37** feet to a calculated point; 10) **S 57°09'21" E** a distance of **137.11** feet to a calculated point; 11) **S 41°09'29" E** a distance of **124.89** feet to a calculated point; 12) **S 25°47'27" E** a distance of **241.41** feet to a calculated point; 13) **S 58°38'34" W** a distance of **82.09** feet to a calculated point, said point being located on an eastern line of the aforesaid Broadway Investment Properties, LLC Property, said point also being located in the centerline of a creek; thence with the aforesaid Broadway Investment Properties, LLC Property and with the centerline of the creek the following 13 courses and distances: 1) **N 31°43'52" W** a distance of **5.38** feet to a T-Post; 2) **N 23°04'10" W** a distance of **275.58** feet to a T-Post; 3) **N 39°22'41" W** a distance of **57.14** feet to a T-Post; 4) **N 50°24'11" W** a distance of **166.98** feet to a T-Post; 5) **N 25°44'49" W** a distance of **54.36** feet to a T-Post; 6) **N 03°52'40" W** a distance of **71.54** feet to a T-Post; 7) **N 35°09'09" E** a distance of **55.41** feet to a T-Post; 8) **N 10°53'47" E** a distance of **48.00** feet to a T-Post; 9) **N 24°24'00" W** a distance of **215.11** feet to a T-Post; 10) **N 38°31'40" W** a distance of **114.14** feet to a T-Post; 11) **N 54°21'21" W** a distance of **156.09** feet to a T-Post ; 12) **N 71°17'06" W** a distance of **284.19** feet to a T-Post; 13) thence **N 03°13'06" W** a distance of **93.54** feet to the POINT OF BEGINNING; Containing **107,868** square feet or **2.4763** acres as shown on a survey by R.B. Pharr and Associates P.A. dated November 10, 2011, **(Map File XX3614).**

14.4 Appendix B. Baseline Information Data

UT to Wicker Branch (on-site)

NC DWQ Stream Identification Form Version 4.11

Date: 1.25.2011	**Project/Site:** 601 North II	**Latitude:**
Evaluator: PBS&J	**County:** Union	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 23	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** Wingate *e.g. Quad Name:*

A. Geomorphology (Subtotal = 11)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 5.5)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = (1.5) Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes: very disturbed reach of channel. This channel is likely perennial in a natural state.

Sketch:

UT to Wicker Branch (immediately offsite)

NC DWQ Stream Identification Form Version 4.11

Date: 1.25.2011	**Project/Site:** 601 North II	**Latitude:**
Evaluator: PBS&J	**County:** Union	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 33	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** Wingate *e.g. Quad Name:*

A. Geomorphology (Subtotal = 17.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	2	(3)
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = (0)		Yes = 3	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	(0)	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians Frog	0	0.5	(1)	1.5
25. Algae	0	0.5	(1)	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Upper Reach Wicker Branch

NC DWQ Stream Identification Form Version 4.11

Date: 1.25.2011	**Project/Site:** 601 North II	**Latitude:**
Evaluator: PBS+J	**County:** Union	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 23.5	**Stream Determination (circle one)** Ephemeral ~~Intermittent~~ Perennial	**Other** Wingate *e.g. Quad Name*

A. Geomorphology (Subtotal = 8.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	(0)	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	(0)	1	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)				
12. Presence of Baseflow	0	1	(2)	3
13. Iron oxidizing bacteria	0	1	2	(3)
14. Leaf litter	1.5	1	(0.5)	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 5.5)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = (1.5) Other = 0			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

Lower Reach Wicker Branch
(Below confluence w/ UT)

NC DWQ Stream Identification Form Version 4.11

Date: 1.25.2011	**Project/Site:** 601 North II	**Latitude:**
Evaluator: PBS+J	**County:** Union	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 35	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** Wingate *e.g. Quad Name:*

A. Geomorphology (Subtotal = 20)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = (3)	

[a] artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 6.5)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = (0)			

*perennial streams may also be identified using other methods. See p. 35 of manual.

Notes:

Sketch:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: 601 North II City/County: Union Sampling Date: 08/01/11

Applicant/Owner: NC EEP State: NC Sampling Point: DA02

Investigator(s): D. O'Loughlin, J. Siceloff Section, Township, Range: Wingate quad

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-2%

Subregion (LRR or MLRA): LRR P Lat: 34.897243 Long: -80.475039 Datum: NAD83

Soil Map Unit Name: Cid channery silt loam NWI classification: PEM1

Are climatic / hydrologic conditions on the site typical for this time of year? Yes yes No _____ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☒	No ☐	**Is the Sampled Area within a Wetland?** Yes ☒ No ☐
Hydric Soil Present?	Yes ☒	No ☐	
Wetland Hydrology Present?	Yes ☒	No ☐	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches): _____
Water Table Present?	Yes ☒	No ☐	Depth (inches): < 1
Saturation Present? (includes capillary fringe)	Yes ☒	No ☐	Depth (inches): < 1

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DA02

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30' X 30')			
1. Solidago sp.	15	no	NA
2. Juncus effusus	3		FACW
3. Boehmeria cylindrica	5		FACW
4. Panicum capillare	65	yes	FAC
5. Cyperus esculentus	3		FAC
6. Amaranthus hybridus	2		NI
7. Ambrosia trifida	5		FAC
8. Ipomoea spp.	2		NA
9.			
10.			
11.			
12.			
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? **Yes** ☒ **No** ☐

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DA02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/3		10YR 4/6	1	C	PL	loam	Oxidized rhizospheres
4-16	10YR 4/1		10YR 4/6	5	C	M	clay loam	
16-24	10YR 4/1		10YR 4/6	5	C	M	clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MRLA 147,148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(MLRA 147,148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☒ **No** ☐

Remarks:

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: 601 North II City/County: Union Sampling Date: 08/01/11

Applicant/Owner: NC EEP State: NC Sampling Point: DA02

Investigator(s): D. O'Loughlin, J. Siceloff Section, Township, Range: Wingate quad

Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): 1-2%

Subregion (LRR or MLRA): LRR P Lat: 34.897243 Long: -80.475039 Datum: NAD83

Soil Map Unit Name: Cid channery silt loam NWI classification: PEM1

Are climatic / hydrologic conditions on the site typical for this time of year? Yes yes No _____ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐	No ☒	**Is the Sampled Area within a Wetland?** Yes ☐ No ☒
Hydric Soil Present?	Yes ☐	No ☒	
Wetland Hydrology Present?	Yes ☐	No ☒	

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ☐ Surface Water (A1)
- ☒ High Water Table (A2)
- ☒ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Aquatic Fauna (B13)
- ☐ True Aquatic Plants (B14)
- ☐ Hydrogen Sulfide Odor (C1)
- ☒ Oxidized Rhizospheres on Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Moss Trim Lines (B16)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ Microtopographic Relief (D4)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ☐	No ☒	Depth (inches):
Water Table Present?	Yes ☒	No ☐	Depth (inches): < 16
Saturation Present? (includes capillary fringe)	Yes ☐	No ☒	Depth (inches):

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

VEGETATION – Use scientific names of plants. Sampling Point: DA02

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Sapling Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Shrub Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
	= Total Cover		
Herb Stratum (Plot size: 30' X 30')			
1. Glycine max	15	yes	NI
2. Ipomoea spp.	2		NA
3. Eupatorium capillifolium	5		FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	22 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species	x 1 =
FACW species	x 2 =
FAC species	x 3 =
FACU species	x 4 =
UPL species	x 5 =
Column Totals: (A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: (If observed, list morphological adaptations below).

SOIL

Sampling Point: DA02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 5/4	60					clay loam	10YR 5/3 40% matrix
6-24	10YR 5/4						clay	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ 2 cm Muck (A10) **(LRR N)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1) **(LRR N, MRLA 147,148)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(MLRA 147,148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbric Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16) **(MLRA 147, 148)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ☐ **No** ☒

Remarks:

Action Id.: «AID»

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action I.D.: 2012-00014 County: Union U.S.G.S. Quad: Wingate

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner/Agent: **EBX: Attn- Martin Hovis**
Address: **909 Capability Drive, Suite 3100, Raleigh, NC 27606**
Telephone No.: **919-829-9909**

Property description:
Size (acres): ~14 acres
Nearest Waterway: Wicker Branch
Coordinates: 34.8972, -80.4733
Nearest Town: Monroe
River Basin: Rocky Watershed, Pee Dee Basin
Hydrologic Unit Code: 03040105

Location Description: The site is located between ~ 2200 linear feet east of the intersection of Medlin Road and Mangum Dairy Road near Monroe, Union County, NC.

Indicate Which of the Following Apply:

A. Preliminary Determination

_ Based on preliminary information, there may be waters and wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also, you may provide new information for further consideration by the Corps to reevaluate the JD.

B. Approved Determination

_ There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

X There are waters and wetlands on the above described property subject to the permit requirements of Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ We strongly suggest you have the waters and wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

X The waters and wetlands on your property have been delineated and the delineation has been verified by the Corps. We strongly suggest you have this delineation surveyed. Upon completion, this survey should be reviewed and verified by the Corps. Once verified, this survey will provide an accurate depiction of all areas subject to CWA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.

_ The waters and wetlands have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on _____. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ There are no waters of the U.S., to include wetlands, present on the above described property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our

published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

_ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in Morehead City, NC, at (252) 808-2808 to determine their requirements.

This delineation/determination has been conducted to identify the limits of USACE's Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

Placement of dredged or fill material within waters of the US and/or wetlands without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Steve Kichefski** at **828-271-7980**.

C. Basis For Determination

The site contains wetlands as determined by the *1987 Corps of Engineers Wetland Delineation Manual* and the *Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Eastern Mountain and Piedmont Region.* These wetlands are adjacent to stream channels located on the property that exhibit indicators of ordinary high water marks. The stream channel on the property is an unnamed tributary to Wicker Branch which flows into the Rocky Watershed, Pee Dee Basin River. UT to Wicker Branch ultimately flows to the Atlantic Ocean via Wicker Branch, Lanes Creek, the Rocky River and the Pee Dee River. The Pee Dee River becomes a Section 10 navigable-in-fact water at Blewett Falls Dam.

D. Remarks

———

E. Attention USDA Program Participants

This delineation/determination has been conducted to identify the limits of Corps' Clean Water Act jurisdiction for the particular site identified in this request. The delineation/determination may not be valid for the wetland conservation provisions of the Food Security Act of 1985. If you or your tenant are USDA Program participants, or anticipate participation in USDA programs, you should request a certified wetland determination from the local office of the Natural Resources Conservation Service, prior to starting work.

F. Appeals Information **(This information applies only to approved jurisdictional determinations as indicated in B. above)**

This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and request for appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the following address:

US Army Corps of Engineers
South Atlantic Division
Attn: Jason Steele, Review Officer
60 Forsyth Street SW, Room 10M15
Atlanta, Georgia 30303-8801

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **March 9, 2012.**

Action Id.: «AID»

It is not necessary to submit an RFA form to the Division Office if you do not object to the determination in this correspondence.

Corps Regulatory Official: Steve Kichefski SMK

Issue Date: **January 10, 2012** Expiration Date: **January 10, 2017**

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at http://per2.nwp.usace.army.mil/survey.html to complete the survey online.

SURVEY PLATS, FIELD SKETCH, WETLAND DELINEATION FORMS, PROJECT PLANS, ETC., MUST BE ATTACHED TO THE FILE COPY OF THIS FORM, IF REQUIRED OR AVAILABLE.

CF:

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: EBX: Attn- Martin Hovis	File Number: 2012-00014	Date: January 10, 2012

Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
X	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/CECW/Pages/reg_materials.aspx or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Steve Kichefski, Project Manager USACE, Asheville Regulatory Field Office 151 Patton Ave RM 208 Asheville, NC 28806 828-271-7980	Mr. Jason Steele, Administrative Appeal Review Officer CESAD-PDO U.S. Army Corps of Engineers, South Atlantic Division 60 Forsyth Street, Room 10M15 Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: Steve Kichefski, **69 Darlington Avenue, Wilmington, North Carolina 28403**

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801 Phone: (404) 562-5137

Appendix A

Categorical Exclusion Form for Ecosystem Enhancement Program Projects
Version 1.4

Note: Only Appendix A should to be submitted (along with any supporting documentation) as the environmental document.

Part 1: General Project Information	
Project Name:	601 North II Site
County Name:	Union
EEP Number:	16-003579
Project Sponsor:	Environmental Banc & Exchange (EBX)
Project Contact Name:	Norton Webster
Project Contact Address:	909 Capability Drive, Suite 3100
Project Contact E-mail:	Norton@ebxusa.com
EEP Project Manager:	Kimberly Williams

Project Description

For Official Use Only	
Reviewed By:	
Date	**EEP Project Manager**
Conditional Approved By:	
Date	**For Division Administrator FHWA**
☐ **Check this box if there are outstanding issues**	
Final Approval By:	
Date	**For Division Administrator FHWA**

Part 2: All Projects Regulation/Question	Response
Coastal Zone Management Act (CZMA)	
1. Is the project located in a CAMA county?	☐ Yes ☑ No
2. Does the project involve ground-disturbing activities within a CAMA Area of Environmental Concern (AEC)?	☐ Yes ☐ No ☑ N/A
3. Has a CAMA permit been secured?	☐ Yes ☐ No ☑ N/A
4. Has NCDCM agreed that the project is consistent with the NC Coastal Management Program?	☐ Yes ☐ No ☑ N/A
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)	
1. Is this a "full-delivery" project?	☑ Yes ☐ No
2. Has the zoning/land use of the subject property and adjacent properties ever been designated as commercial or industrial?	☐ Yes ☑ No ☐ N/A
3. As a result of a limited Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☑ No ☐ N/A
4. As a result of a Phase I Site Assessment, are there known or potential hazardous waste sites within or adjacent to the project area?	☐ Yes ☑ No ☐ N/A
5. As a result of a Phase II Site Assessment, are there known or potential hazardous waste sites within the project area?	☐ Yes ☐ No ☑ N/A
6. Is there an approved hazardous mitigation plan?	☐ Yes ☐ No ☑ N/A
National Historic Preservation Act (Section 106)	
1. Are there properties listed on, or eligible for listing on, the National Register of Historic Places in the project area?	☐ Yes ☑ No
2. Does the project affect such properties and does the SHPO/THPO concur?	☐ Yes ☑ No ☐ N/A
3. If the effects are adverse, have they been resolved?	☐ Yes ☐ No ☑ N/A
Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)	
1. Is this a "full-delivery" project?	☑ Yes ☐ No
2. Does the project require the acquisition of real estate?	☑ Yes ☐ No ☐ N/A
3. Was the property acquisition completed prior to the intent to use federal funds?	☑ Yes ☐ No ☐ N/A
4. Has the owner of the property been informed: * prior to making an offer that the agency does not have condemnation authority; and * what the fair market value is believed to be?	☑ Yes ☐ No ☐ N/A

Part 3: Ground-Disturbing Activities Regulation/Question	Response
American Indian Religious Freedom Act (AIRFA)	
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	☐ Yes ☑ No
2. Is the site of religious importance to American Indians?	☐ Yes ☐ No ☑ N/A
3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?	☐ Yes ☑ No ☐ N/A
4. Have the effects of the project on this site been considered?	☐ Yes ☐ No ☑ N/A
Antiquities Act (AA)	
1. Is the project located on Federal lands?	☐ Yes ☑ No
2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?	☐ Yes ☑ No ☐ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☐ No ☑ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☑ N/A
Archaeological Resources Protection Act (ARPA)	
1. Is the project located on federal or Indian lands (reservation)?	☐ Yes ☑ No
2. Will there be a loss or destruction of archaeological resources?	☐ Yes ☑ No ☐ N/A
3. Will a permit from the appropriate Federal agency be required?	☐ Yes ☐ No ☑ N/A
4. Has a permit been obtained?	☐ Yes ☐ No ☑ N/A
Endangered Species Act (ESA)	
1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?	☑ Yes ☐ No
2. Is Designated Critical Habitat or suitable habitat present for listed species?	☑ Yes ☐ No ☐ N/A
3. Are T&E species present or is the project being conducted in Designated Critical Habitat?	☐ Yes ☑ No ☐ N/A
4. Is the project "likely to adversely affect" the species and/or "likely to adversely modify" Designated Critical Habitat?	☐ Yes ☑ No ☐ N/A
5. Does the USFWS/NOAA-Fisheries concur in the effects determination?	☐ Yes ☐ No ☑ N/A
6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?	☐ Yes ☐ No ☑ N/A

Executive Order 13007 (Indian Sacred Sites)	
1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?	☐ Yes ☑ No
2. Has the EBCI indicated that Indian sacred sites may be impacted by the proposed project?	☐ Yes ☐ No ☑ N/A
3. Have accommodations been made for access to and ceremonial use of Indian sacred sites?	☐ Yes ☐ No ☑ N/A
Farmland Protection Policy Act (FPPA)	
1. Will real estate be acquired?	☑ Yes ☐ No
2. Has NRCS determined that the project contains prime, unique, statewide or locally important farmland?	☑ Yes ☐ No ☐ N/A
3. Has the completed Form AD-1006 been submitted to NRCS?	☑ Yes ☐ No ☐ N/A
Fish and Wildlife Coordination Act (FWCA)	
1. Will the project impound, divert, channel deepen, or otherwise control/modify any water body?	☑ Yes ☐ No
2. Have the USFWS and the NCWRC been consulted?	☑ Yes ☐ No ☐ N/A
Land and Water Conservation Fund Act (Section 6(f))	
1. Will the project require the conversion of such property to a use other than public, outdoor recreation?	☐ Yes ☑ No
2. Has the NPS approved of the conversion?	☐ Yes ☐ No ☑ N/A
Magnuson-Stevens Fishery Conservation and Management Act (Essential Fish Habitat)	
1. Is the project located in an estuarine system?	☐ Yes ☑ No
2. Is suitable habitat present for EFH-protected species?	☐ Yes ☐ No ☑ N/A
3. Is sufficient design information available to make a determination of the effect of the project on EFH?	☐ Yes ☐ No ☑ N/A
4. Will the project adversely affect EFH?	☐ Yes ☐ No ☑ N/A
5. Has consultation with NOAA-Fisheries occurred?	☐ Yes ☐ No ☑ N/A
Migratory Bird Treaty Act (MBTA)	
1. Does the USFWS have any recommendations with the project relative to the MBTA?	☐ Yes ☑ No
2. Have the USFWS recommendations been incorporated?	☐ Yes ☐ No ☑ N/A
Wilderness Act	
1. Is the project in a Wilderness area?	☐ Yes ☑ No
2. Has a special use permit and/or easement been obtained from the maintaining federal agency?	☐ Yes ☐ No ☑ N/A

ATKINS

August 12, 2011

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617

Subject: 601 North II Stream Restoration Site, Union County.

Dear Ms. Gledhill-Earley,

Environmental Banc & Exchange, LLC (EBX) proposes to perform stream restoration as a Full Delivery Project for the North Carolina Ecosystem Enhancement Program (NCEEP) at the 601 North II Stream Restoration Site (Site), located approximately 7 miles south of Monroe in Union County, NC. The Site is located in the NC Division of Water Quality subbasin 03-07-14 and the local watershed 03040105081010 of the Yadkin River Basin, which is a NCEEP Targeted Local Watershed. The Site is adjacent to the original 601 North Stream Restoration Site, provided to NCEEP as a Full Delivery Project under the RFP#16-D06054. The Site encompasses approximately 14 acres of a riparian buffer along a headwater valley bottom that is managed primarily for agriculture. Restoration on the Site will entail raising the existing channel to the historic floodplain elevation to allow diffuse flow and provide in-stream aquatic habitat while simultaneously protecting and enhancing riparian buffers.

We request review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with a potential wetland and stream restoration project on the attached site (USGS site and aerial photography depicting the Site easement boundary are enclosed).

No architectural structures or archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes. Enclosed are existing historical properties in the surrounding area from the HPOWEB GIS Service website.

We ask that you review this site based on the attached information to determine the presence of any historic properties.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance or any other issues associated with this project.

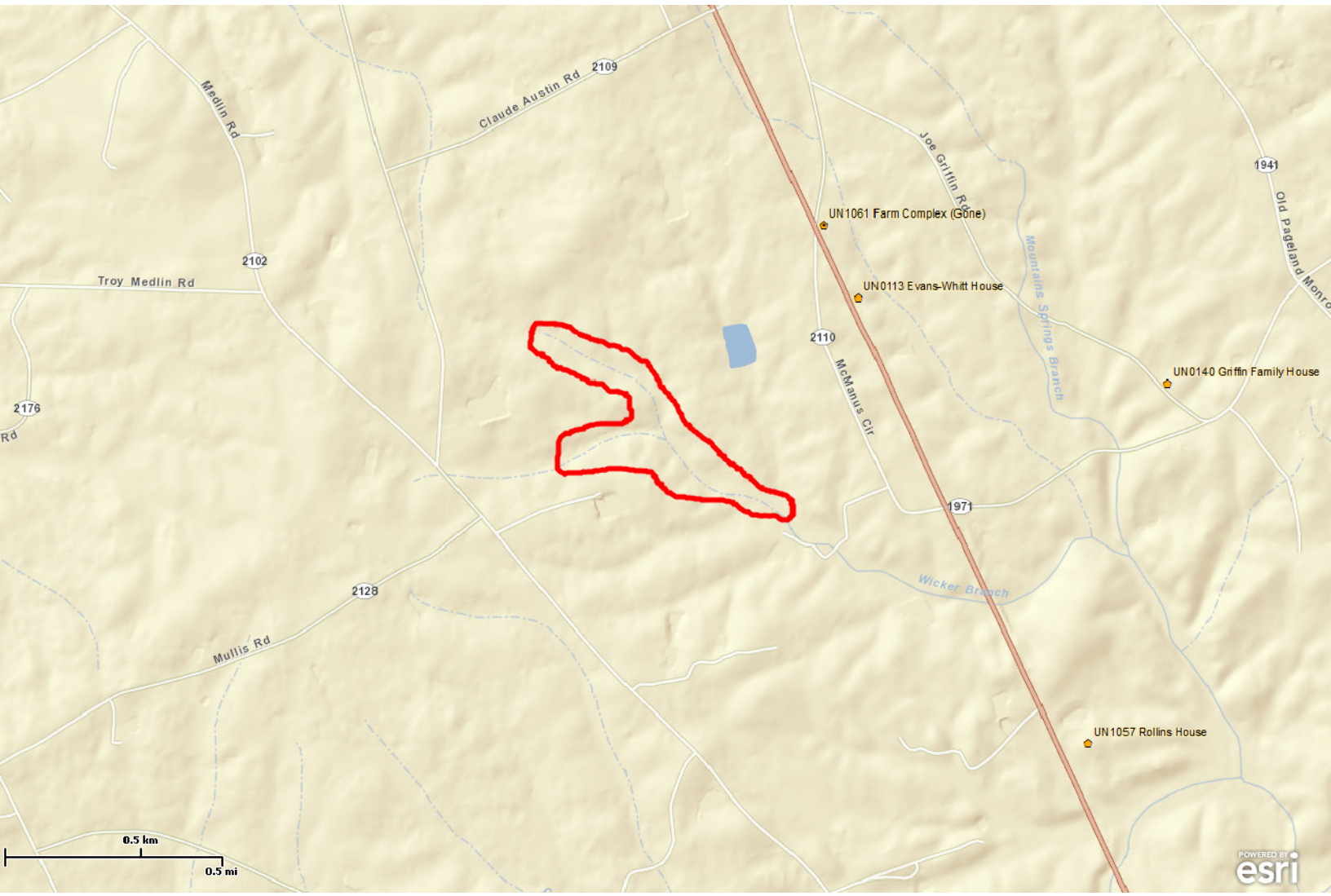
Sincerely,

Jeremy Schmid
Project Scientist

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

cc:
Martin Hovis
Environmental Banc & Exchange, LLC
909 Capability Drive, Suite 3100
Raleigh, NC 27606

601 North II Stream Restoration Site



North Carolina Department of Cultural Resources

State Historic Preservation Office

Claudia Brown, Acting Administrator

Beverly Eaves Perdue, Governor
Linda A. Carlisle, Secretary
Jeffrey J. Crow, Deputy Secretary

Office of Archives and History
Division of Historical Resources
David Brook, Director

August 29, 2011

Jeremy Schmid
Atkins
1616 East Millbrook Road
Suite 310
Raleigh, NC 27609

Re: 601 North II Stream Restoration, Union County, ER 11-1591

Dear Mr. Schmid:

Thank you for your letter of August 12, 2011, concerning the above project.

We have conducted a review of the project and are aware of no historic resources which would be affected by the project. Therefore, we have no comment on the project as proposed.

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 919-807-6579. In all future communication concerning this project, please cite the above-referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Claudia Brown

ATKINS

August 12, 2011

Mark Cantrell
US Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801

Subject: 601 North II Stream Restoration Site, Union County.

Dear Mr. Cantrell,

Environmental Banc & Exchange, LLC (EBX) proposes to perform stream restoration as a Full Delivery Project for the North Carolina Ecosystem Enhancement Program (NCEEP) at the 601 North II Stream Restoration Site (Site), located approximately 7 miles south of Monroe in Union County, NC. The Site is located in the NC Division of Water Quality subbasin 03-07-14 and the local watershed 03040105081010 of the Yadkin River Basin, which is a NCEEP Targeted Local Watershed. The Site is adjacent to the original 601 North Stream Restoration Site, provided to NCEEP as a Full Delivery Project under the RFP#16-D06054. The Site encompasses approximately 14 acres of a riparian buffer along a headwater valley bottom that is managed primarily for agriculture. Restoration on the Site will entail raising the existing channel to the historic floodplain elevation to allow diffuse flow and provide in-stream aquatic habitat while simultaneously protecting and enhancing riparian buffers.

We have already obtained an updated species list for Union County from your web site (http://nc-es.fws.gov/es/countyfr.html). The threatened or endangered species for this county are: Michaux's sumac, Schweinitz's sunflower, and Carolina heelsplitter. We are requesting that you provide any known information for each species in the county, such as recent survey results, known occurrences, etc. We will contact the USFWS if suitable habitat for any listed species is found, or if we determine that the project may affect one or more federally listed species or designated critical habitat.

Please provide comments on any possible issues that might emerge with respect to endangered species, migratory birds or other trust resources from the construction of a wetland and/or stream restoration project on the Site. A USGS map and aerial photography depicting the Site easement boundary is enclosed.

If we have not heard from you in 30 days we will assume that our species list is correct, that you do not have any comments regarding associated laws or resources, and that you do not have any information relevant to this project at the current time.

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance or any other issues associated with this project.

Sincerely,

Jeremy Schmid
Project Scientist

cc:
Martin Hovis
Environmental Banc & Exchange, LLC
909 Capability Drive, Suite 3100
Raleigh, NC 27606

ATKINS

August 12, 2011

Lawrence Dorsey
North Carolina Wildlife Resource Commission
31826 Ameron Circle
Albemarle, NC 28001

Subject: 601 North II Stream Restoration Site, Union County.

Dear Mr. Dorsey,

Environmental Banc & Exchange, LLC (EBX) proposes to perform stream restoration as a Full Delivery Project for the North Carolina Ecosystem Enhancement Program (NCEEP) at the 601 North II Stream Restoration Site (Site), located approximately 7 miles south of Monroe in Union County, NC. The Site is located in the NC Division of Water Quality subbasin 03-07-14 and the local watershed 03040105081010 of the Yadkin River Basin, which is a NCEEP Targeted Local Watershed. The Site is adjacent to the original 601 North Stream Restoration Site, provided to NCEEP as a Full Delivery Project under the RFP#16-D06054. The Site encompasses approximately 14 acres of a riparian buffer along a headwater valley bottom that is managed primarily for agriculture. Restoration on the Site will entail raising the existing channel to the historic floodplain elevation to allow diffuse flow and provide in-stream aquatic habitat while simultaneously protecting and enhancing riparian buffers.

The USFWS lists 14 Federal Species of Concern which are afforded state protection under the N.C. State Endangered Species Act and the N.C. Plant Protection and Conservation Act of 1979 based on their State listing as Threatened, Endangered, or Special Concern. The purpose of this letter is to request review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with a potential wetland and stream restoration project on the attached Site (USGS site map and aerial photography depicting the Site easement boundary enclosed).

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance or any other issues associated with this project.

Sincerely,

Jeremy Schmid
Project Scientist

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

cc:
Martin Hovis
Environmental Banc & Exchange, LLC
909 Capability Drive, Suite 3100
Raleigh, NC 27606

ATKINS

August 12, 2011

Russell Townsend
Tribal Historic Preservation Specialist
Eastern Band of Cherokee Indians
Tribal Historic Preservation Office
P.O. Box 455
Cherokee, NC 28719

Subject: 601 North II Stream Restoration Site, Union County.

Dear Mr. Townsend,

Environmental Banc & Exchange, LLC (EBX) proposes to perform stream restoration as a Full Delivery Project for the North Carolina Ecosystem Enhancement Program (NCEEP) at the 601 North II Stream Restoration Site (Site), located approximately 7 miles south of Monroe in Union County, NC. The Site is located in the NC Division of Water Quality subbasin 03-07-14 and the local watershed 03040105081010 of the Yadkin River Basin, which is a NCEEP Targeted Local Watershed. The Site is adjacent to the original 601 North Stream Restoration Site, provided to NCEEP as a Full Delivery Project under the RFP#16-D06054. The Site encompasses approximately 14 acres of a riparian buffer along a headwater valley bottom that is managed primarily for agriculture. Restoration on the Site will entail raising the existing channel to the historic floodplain elevation to allow diffuse flow and provide in-stream aquatic habitat while simultaneously protecting and enhancing riparian buffers.

A similar letter has been sent to the North Carolina State Preservation Office for compliance with Section 106 of the Historic Preservation Act.

The Site has been identified for the purpose of providing mitigation for unavoidable stream channel and wetland impacts. Several sections of channel have been identified as significantly degraded. No architectural structures or archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes. In addition, the majority of this site has historically been disturbed from agricultural activities.

We ask that you review this site based on the attached information to determine if you know of any existing resources that we need to know about. In addition, please let us know the level your future involvement with this project needs to be (if any).

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

Jeremy Schmid
Project Scientist

cc:
Martin Hovis
Environmental Banc & Exchange, LLC
909 Capability Drive, Suite 3100
Raleigh, NC 27606

ATKINS

January 3, 2012

Mark A. Ferguson
District Conservationist
Natural Resource Conservation Service
Union County Agricultural Services and Conference Center
3230-B Presson Road
Monroe, NC 28112

Subject: 601 North II Stream Restoration Site, Union County

Dear Mr. Ferguson,

Environmental Banc & Exchange, LLC (EBX) proposes to perform stream restoration as a Full Delivery Project for the North Carolina Ecosystem Enhancement Program (NCEEP) at the 601 North II Stream Restoration Site (Site), located approximately 7 miles south of Monroe in Union County, NC. The Site is located in the NC Division of Water Quality subbasin 03-07-14 and the local watershed 03040105081010 of the Yadkin River Basin, which is a NCEEP Targeted Local Watershed. The Site is adjacent to the original 601 North Stream Restoration Site, provided to NCEEP as a Full Delivery Project under the RFP#16-D06054. The Site encompasses approximately 14 acres of a riparian buffer along a headwater valley bottom that is managed primarily for agriculture. Restoration on the Site will entail raising the existing channel to the historic floodplain elevation to restore stable stream channel characteristics and improve in-stream aquatic habitat while simultaneously protecting and enhancing riparian buffers.

As part of the environmental screening procedure required by the Federal Highway Administration for federal projects, it is necessary to determine whether a potential project contains prime, unique, statewide or locally important farmland pursuant to the Farmland Projection Policy Act. Enclosed is a copy of a partially completed Form AD-1006 Farmland Conversion Impact Rating. We ask that you please review and complete Part II of the Farmland Conversion Impact Rating Form. A site location map and aerial photograph depicting the proposed Site easement boundary are enclosed.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concerning the extent of site disturbance associated with this project.

Sincerely,

Jens Geratz
Senior Scientist

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

Enclosure:

Form AD-1006
Figure 1 Site Location
Figure 2 Existing Conditions (aerial photograph with proposed easement boundary)

1616 East Millbrook Road, Suite 310 • Raleigh, NC 27609 • Telephone: 919.876.6888 Fax: 919.876.6848 • www.atkinsglobal.com

United States Department of Agriculture

NRCS

Natural Resources Conservation Service
530 West Innes Street
Salisbury, North Carolina 28144

Kristin May, Resource Soil Scientist
Phone: (704) 637-2400 x 104
E-mail: Kristin.may@nc.usda.gov

January 4, 2012

Atkins
ATTN: Jeremy Schmid
1616 E Millbrook Road, Suite 310
Raleigh, NC 27609

Dear Mr. Schmid;

The following information is in response to your request for information on Prime, Unique and Statewide Importance Farmlands related to the proposed 601 North II Site Stream Restoration Mitigation Project located in Union County.

Projects are subject to the Farmland Protection Policy Act (FPPA) requirements if they irreversibly convert farmland, either directly or indirectly, to a nonagricultural use and are completed or funded by a Federal agency.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA does not have to be currently in crops. It can be forest land, pastureland, cropland, or other land. Farmland does not include land previously converted to urban development or water storage. Urban development is land that has been identified as urbanized area on the Census Bureau Map or as urban-built-up on the USDA Important Farmland Maps.

The area in question meets one or more of the above criteria for Farmland. Enclosed is the Farmland Conversion Impact Rating form (AD1006 / NRCS-CPA-106) with PARTS II, IV and V completed by NRCS.

If you have any questions, please feel free to contact me.

Sincerely,

Kristin J May

Kristin May
Resource Soil Scientist

cc.
Mark Ferguson, District Conservationist, NRCS, Monroe

Projects and Activities Subject to FPPA

Projects are subject to FPPA requirements if they may irreversibly convert farmland (directly or indirectly) to nonagricultural use and are completed by a Federal agency or with assistance from a Federal agency.

Assistance from a Federal agency includes:

- Acquiring or disposing of land.
- Providing financing or loans.
- Managing property.
- Providing technical assistance

Activities that may be subject to FPPA include:

- State highway construction projects, (through the Federal Highway Administration)
- Airport expansions
- Electric cooperative construction projects
- Railroad construction projects
- Telephone company construction projects
- Reservoir and hydroelectric projects
- Federal agency projects that convert farmland
- Other projects completed with Federal assistance.

Activities not subject to FPPA include:

- Federal permitting and licensing
- Projects planned and completed without the assistance of a Federal agency
- Projects on land already in urban development or used for water storage
- Construction within an existing right-of-way purchased on or before August 4, 1984
- Construction for national defense purposes
- Construction of on-farm structures needed for farm operations
- Surface mining, where restoration to agricultural use is planned
- Construction of new minor secondary structures such as a garage or storage shed.

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 11/4/11
Name Of Project 601 North II Site	Federal Agency Involved Atkins
Proposed Land Use Stream Restoration Mitigation Site	County And State Union County, NC
PART II *(To be completed by NRCS)*	Date Request Received By NRCS

Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply -- do not complete additional parts of this form).*	Yes ☑	No ☐	Acres Irrigated none	Average Farm Size 156
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 384,651	% 94	Amount Of Farmland As Defined in FPPA Acres: 291,581	% 77
Name Of Land Evaluation System Used Union-CALES	Name Of Local Site Assessment System		Date Land Evaluation Returned By NRCS 1/4/12	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	13.6			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	13.6	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	0.0			
B. Total Acres Statewide And Local Important Farmland	13.6			
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0			
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value	18.3			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	90	0	0	0

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use	15	15			
2. Perimeter In Nonurban Use	10	10			
3. Percent Of Site Being Farmed	20	20			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	15			
6. Distance To Urban Support Services	15	0			
7. Size Of Present Farm Unit Compared To Average	10	10			
8. Creation Of Nonfarmable Farmland	10	1			
9. Availability Of Farm Support Services	5	2			
10. On-Farm Investments	20	2			
11. Effects Of Conversion On Farm Support Services	10	0			
12. Compatibility With Existing Agricultural Use	10	2			
TOTAL SITE ASSESSMENT POINTS	160	97	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	90	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	97	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	187	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

(See Instructions on reverse side)

This form was electronically produced by National Production Services Staff

Clear Form

Form AD-1006 (10-83)

601 North II Site
3025 Mcmanus Cir
Monroe, NC 28112

Inquiry Number: 3120300.3
July 11, 2011

Certified Sanborn® Map Report

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
800.352.0050
www.edrnet.com

Certified Sanborn® Map Report

7/11/11

Site Name:
601 North II Site
3025 Mcmanus Cir
Monroe, NC 28112

Client Name:
PBS&J
1616 East Millbrook Road
Raleigh, NC 27609

EDR Inquiry # 3120300.3

Contact: Jeremy Schmid

EDR® Environmental Data Resources Inc

The complete Sanborn Library collection has been searched by EDR, and fire insurance maps covering the target property location provided by PBS&J were identified for the years listed below. The certified Sanborn Library search results in this report can be authenticated by visiting www.edrnet.com/sanborn and entering the certification number. Only Environmental Data Resources Inc. (EDR) is authorized to grant rights for commercial reproduction of maps by Sanborn Library LLC, the copyright holder for the collection.

Certified Sanborn Results:

Site Name: 601 North II Site
Address: 3025 Mcmanus Cir
City, State, Zip: Monroe, NC 28112
Cross Street:
P.O. # NA
Project: NA
Certification # 1A18-4A37-B6E2

Sanborn® Library search results
Certification # 1A18-4A37-B6E2

UNMAPPED PROPERTY

This report certifies that the complete holdings of the Sanborn Library, LLC collection have been searched based on client supplied target property information, and fire insurance maps covering the target property were not found.

The Sanborn Library includes more than 1.2 million Sanborn fire insurance maps, which track historical property usage in approximately 12,000 American cities and towns. Collections searched:

- ✓ Library of Congress
- ✓ University Publications of America
- ✓ EDR Private Collection

The Sanborn Library LLC Since 1866™

Limited Permission To Make Copies

PBS&J (the client) is permitted to make up to THREE photocopies of this Sanborn Map transmittal and each fire insurance map accompanying this report solely for the limited use of its customer. No one other than the client is authorized to make copies. Upon request made directly to an EDR Account Executive, the client may be permitted to make a limited number of additional photocopies. This permission is conditioned upon compliance by the client, its customer and their agents with EDR's copyright policy; a copy of which is available upon request.

601 North II Site
3025 Mcmanus Cir
Monroe, NC 28112

Inquiry Number: 3120300.2s
July 11, 2011

The EDR Radius Map™ Report with GeoCheck®

EDR® Environmental Data Resources Inc

440 Wheelers Farms Road
Milford, CT 06461
Toll Free: 800.352.0050
www.edrnet.com

TABLE OF CONTENTS

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-05) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

3025 MCMANUS CIR
MONROE, NC 28112

COORDINATES

Latitude (North):	34.897000 - 34° 53' 49.2''
Longitude (West):	80.473600 - 80° 28' 25.0''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	548096.3
UTM Y (Meters):	3861550.0
Elevation:	618 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	34080-H4 WINGATE, NC
Most Recent Revision:	2002

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	2005, 2006, 2008
Source:	USDA

TARGET PROPERTY SEARCH RESULTS

The target property was not listed in any of the databases searched by EDR.

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL ---------- National Priority List

EXECUTIVE SUMMARY

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

CERCLIS ---------- Comprehensive Environmental Response, Compensation, and Liability Information System
FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal CERCLIS NFRAP site List

CERC-NFRAP ---------- CERCLIS No Further Remedial Action Planned

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

US ENG CONTROLS ---------- Engineering Controls Sites List
US INST CONTROL ---------- Sites with Institutional Controls

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State- and tribal - equivalent NPL

NC HSDS ---------- Hazardous Substance Disposal Site

State- and tribal - equivalent CERCLIS

SHWS ---------- Inactive Hazardous Sites Inventory

State and tribal landfill and/or solid waste disposal site lists

SWF/LF ---------- List of Solid Waste Facilities
OLI ---------- Old Landfill Inventory

State and tribal leaking storage tank lists

LUST ---------- Regional UST Database

LUST TRUST ..... State Trust Fund Database
LAST ..... Leaking Aboveground Storage Tanks
INDIAN LUST ..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

UST ..... Petroleum Underground Storage Tank Database
AST ..... AST Database
INDIAN UST ..... Underground Storage Tanks on Indian Land
FEMA UST ..... Underground Storage Tank Listing

State and tribal institutional control / engineering control registries

INST CONTROL ..... No Further Action Sites With Land Use Restrictions Monitoring

State and tribal voluntary cleanup sites

VCP ..... Responsible Party Voluntary Action Sites
INDIAN VCP ..... Voluntary Cleanup Priority Listing

State and tribal Brownfields sites

BROWNFIELDS ..... Brownfields Projects Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS ..... A Listing of Brownfields Sites

Local Lists of Landfill / Solid Waste Disposal Sites

DEBRIS REGION 9 ..... Torres Martinez Reservation Illegal Dump Site Locations
ODI ..... Open Dump Inventory
HIST LF ..... Solid Waste Facility Listing
INDIAN ODI ..... Report on the Status of Open Dumps on Indian Lands

Local Lists of Hazardous waste / Contaminated Sites

US CDL ..... Clandestine Drug Labs
US HIST CDL ..... National Clandestine Laboratory Register

Local Land Records

LIENS 2 ..... CERCLA Lien Information
LUCIS ..... Land Use Control Information System

Records of Emergency Release Reports

HMIRS ..... Hazardous Materials Information Reporting System

Other Ascertainable Records

RCRA-NonGen ..... RCRA - Non Generators

DOT OPS	Incident and Accident Data
DOD	Department of Defense Sites
FUDS	Formerly Used Defense Sites
CONSENT	Superfund (CERCLA) Consent Decrees
ROD	Records Of Decision
UMTRA	Uranium Mill Tailings Sites
MINES	Mines Master Index File
TRIS	Toxic Chemical Release Inventory System
TSCA	Toxic Substances Control Act
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
SSTS	Section 7 Tracking Systems
ICIS	Integrated Compliance Information System
PADS	PCB Activity Database System
MLTS	Material Licensing Tracking System
RADINFO	Radiation Information Database
FINDS	Facility Index System/Facility Registry System
RAATS	RCRA Administrative Action Tracking System
IMD	Incident Management Database
UIC	Underground Injection Wells Listing
DRYCLEANERS	Drycleaning Sites
NPDES	NPDES Facility Location Listing
INDIAN RESERV	Indian Reservations
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
PCB TRANSFORMER	PCB Transformer Registration Database
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
COAL ASH DOE	Sleam-Electric Plan Operation Data
FINANCIAL ASSURANCE	Financial Assurance Information Listing
COAL ASH	Coal Ash Disposal Sites

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants	EDR Proprietary Manufactured Gas Plants

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were not identified.

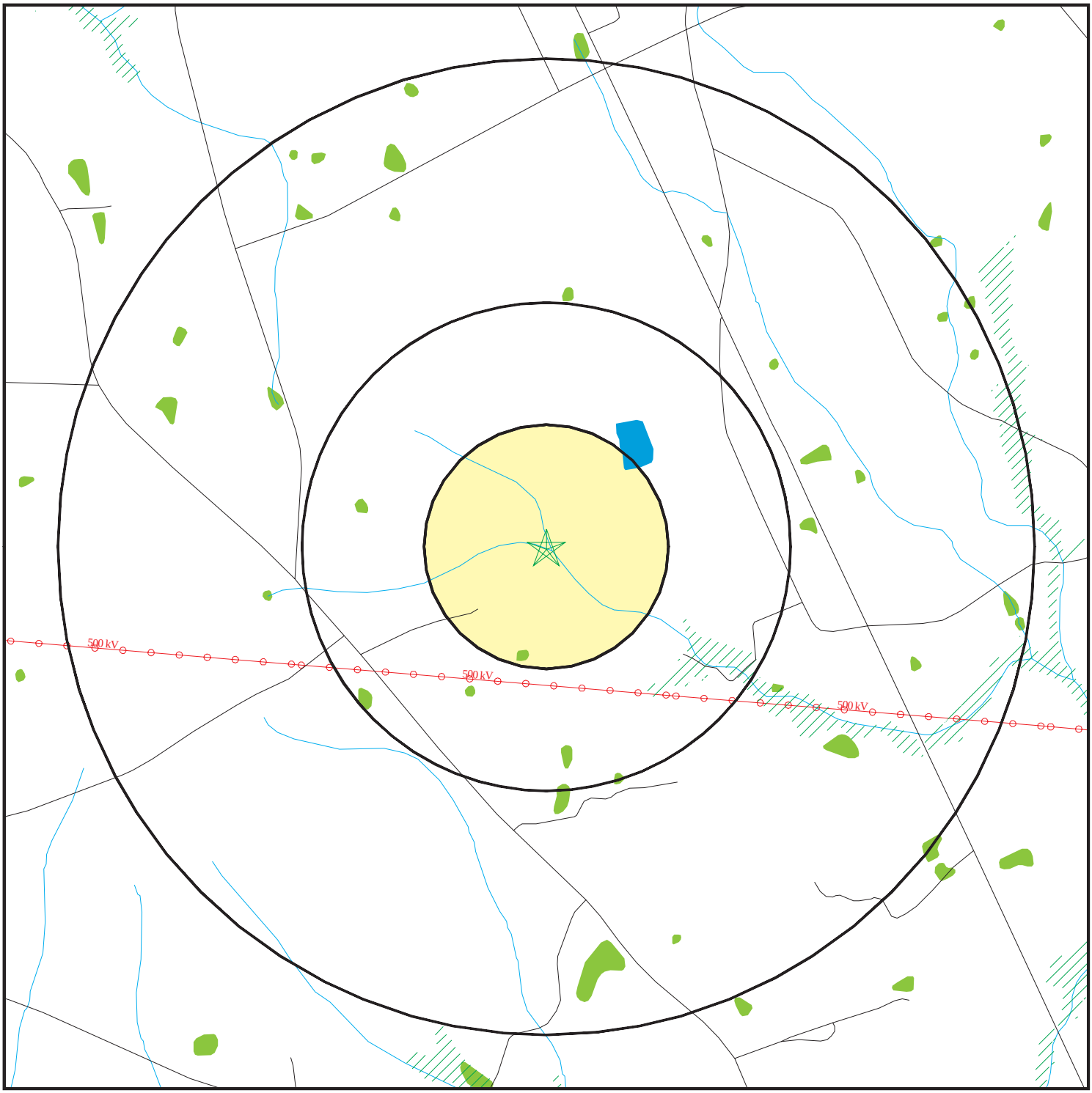
Unmappable (orphan) sites are not considered in the foregoing analysis.

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 26 records.

Site Name	Database(s)
CITY OF MONROE ASPHALT PLANT (	IMD, LAST
STOUT INTERNATIONAL OF NC, INC	SHWS
SCOVILL INC/SECURITY PRODUCTS	SHWS, VCP
PRICES PHILLIPS 66	SHWS, IMD
STALLINGS SALVAGE	SHWS
UNION COUNTY DRUM	SHWS
SOMETHING OLD, SOMETHING NEW	IMD, LUST
COOK GROCERY STORE	IMD, LUST
WOODS GOODS-DOT	IMD, LUST
YALE SECURITY	TRIS, IMD, LUST
YALE NORTON	IMD, LUST
BOREN BRICK - 5000 H.O.	IMD, LUST
MONROE MALL	IMD, LUST
ZIPP PROPERTY #2	IMD, LUST
ROY WALTERS PROPERTY/NCDOT#10	IMD, LUST
DOROTHY MEDLIN PROPERTY	LUST
TELEDYNE EAST (FORMER STOUT IN	IMD, LUST
RALPH BELK PROPER/NCDOTSITE#12	IMD, LUST
COOK'S GROCERY	LUST TRUST
BANTAM MART (FORMER)	LUST TRUST
CROWN NC - 632	LUST TRUST
HWY 200 NORTH	ERNS
GREY'S GROCERY	IMD
BOREN BRICK CO.	IMD
BOREN BRICK-MONROE	IMD
NEWELL HELMS RESIDENCE	IMD

OVERVIEW MAP - 3120300.2s



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

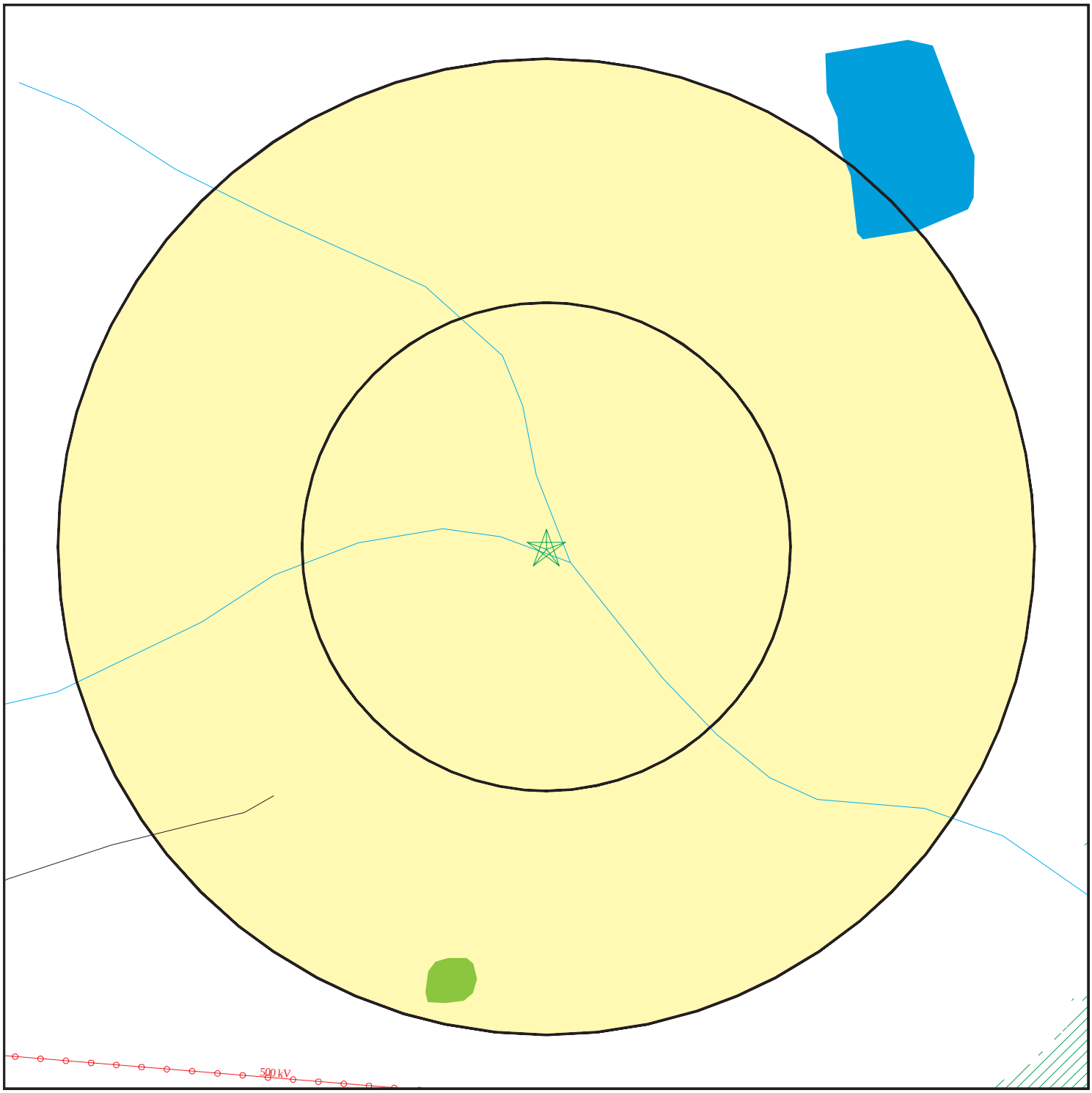
0 1/4 1/2 1 Miles

N

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 601 North II Site ADDRESS: 3025 Mcmanus Cir Monroe NC 28112 LAT/LONG: 34.8970 / 80.4736	CLIENT: PBS&J CONTACT: Jeremy Schmid INQUIRY #: 3120300.2s DATE: July 11, 2011 4:24 pm

DETAIL MAP - 3120300.2s



0 1/16 1/8 1/4 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: 601 North II Site	CLIENT: PBS&J
ADDRESS: 3025 Mcmanus Cir Monroe NC 28112	CONTACT: Jeremy Schmid INQUIRY #: 3120300.2s
LAT/LONG: 34.8970 / 80.4736	DATE: July 11, 2011 4:25 pm

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL		1.000	0	0	0	0	NR	0
Proposed NPL		1.000	0	0	0	0	NR	0
NPL LIENS		TP	NR	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL		1.000	0	0	0	0	NR	0
Federal CERCLIS list								
CERCLIS		0.500	0	0	0	NR	NR	0
FEDERAL FACILITY		1.000	0	0	0	0	NR	0
Federal CERCLIS NFRAP site List								
CERC-NFRAP		0.500	0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS		1.000	0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF		0.500	0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG		0.250	0	0	NR	NR	NR	0
RCRA-SQG		0.250	0	0	NR	NR	NR	0
RCRA-CESQG		0.250	0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
US ENG CONTROLS		0.500	0	0	0	NR	NR	0
US INST CONTROL		0.500	0	0	0	NR	NR	0
Federal ERNS list								
ERNS		TP	NR	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
NC HSDS		1.000	0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
SHWS		1.000	0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF		0.500	0	0	0	NR	NR	0
OLI		0.500	0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
LUST		0.500	0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST TRUST		0.500	0	0	0	NR	NR	0
LAST		0.500	0	0	0	NR	NR	0
INDIAN LUST		0.500	0	0	0	NR	NR	0
State and tribal registered storage tank lists								
UST		0.250	0	0	NR	NR	NR	0
AST		0.250	0	0	NR	NR	NR	0
INDIAN UST		0.250	0	0	NR	NR	NR	0
FEMA UST		0.250	0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL		0.500	0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
VCP		0.500	0	0	0	NR	NR	0
INDIAN VCP		0.500	0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS		0.500	0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS		0.500	0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
DEBRIS REGION 9		0.500	0	0	0	NR	NR	0
ODI		0.500	0	0	0	NR	NR	0
HIST LF		0.500	0	0	0	NR	NR	0
INDIAN ODI		0.500	0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US CDL		TP	NR	NR	NR	NR	NR	0
US HIST CDL		TP	NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2		TP	NR	NR	NR	NR	NR	0
LUCIS		0.500	0	0	0	NR	NR	0
Records of Emergency Release Reports								
HMIRS		TP	NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA-NonGen		0.250	0	0	NR	NR	NR	0
DOT OPS		TP	NR	NR	NR	NR	NR	0
DOD		1.000	0	0	0	0	NR	0
FUDS		1.000	0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Target Property	Search Distance (Miles)	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
CONSENT		1.000	0	0	0	0	NR	0
ROD		1.000	0	0	0	0	NR	0
UMTRA		0.500	0	0	0	NR	NR	0
MINES		0.250	0	0	NR	NR	NR	0
TRIS		TP	NR	NR	NR	NR	NR	0
TSCA		TP	NR	NR	NR	NR	NR	0
FTTS		TP	NR	NR	NR	NR	NR	0
HIST FTTS		TP	NR	NR	NR	NR	NR	0
SSTS		TP	NR	NR	NR	NR	NR	0
ICIS		TP	NR	NR	NR	NR	NR	0
PADS		TP	NR	NR	NR	NR	NR	0
MLTS		TP	NR	NR	NR	NR	NR	0
RADINFO		TP	NR	NR	NR	NR	NR	0
FINDS		TP	NR	NR	NR	NR	NR	0
RAATS		TP	NR	NR	NR	NR	NR	0
IMD		0.500	0	0	0	NR	NR	0
UIC		TP	NR	NR	NR	NR	NR	0
DRYCLEANERS		0.250	0	0	NR	NR	NR	0
NPDES		TP	NR	NR	NR	NR	NR	0
INDIAN RESERV		1.000	0	0	0	0	NR	0
SCRD DRYCLEANERS		0.500	0	0	0	NR	NR	0
PCB TRANSFORMER		TP	NR	NR	NR	NR	NR	0
COAL ASH EPA		0.500	0	0	0	NR	NR	0
COAL ASH DOE		TP	NR	NR	NR	NR	NR	0
FINANCIAL ASSURANCE		TP	NR	NR	NR	NR	NR	0
COAL ASH		0.500	0	0	0	NR	NR	0
EDR PROPRIETARY RECORDS								
EDR Proprietary Records								
Manufactured Gas Plants		1.000	0	0	0	0	NR	0

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

MAP FINDINGS

Map ID Direction Distance Elevation	Site	Database(s)	EDR ID Number EPA ID Number

NO SITES FOUND

Count: 26 records. ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
MONROE	90181287	HWY 200 NORTH	HWY 200 NORTH		ERNS
MONROE	S105894628	SOMETHING OLD, SOMETHING NEW	HWY 200		IMD, LUST
MONROE	S105764673	COOK GROCERY STORE	3516 HWY 218 E		IMD, LUST
MONROE	S106495575	COOK'S GROCERY	3516 HWY 218 E		LUST TRUST
MONROE	1004284280	BANTAM MART (FORMER)	5432ND OLD PAGELAND HWY & HWY		LUST TRUST
MONROE	S105764713	WOODS GOODS-DOT	HWY 601		IMD, LUST
MONROE	S106074734	GREY'S GROCERY	HWY 601 & OLD STEEL RD		IMD
MONROE	1005453150	YALE SECURITY	HWY 74		TRIS, IMD, LUST
MONROE	S108631710	STOUT INTERNATIONAL OF NC, INC	HWY 74 E		SHWS
MONROE	S105702984	YALE NORTON	HWY 74 E		IMD, LUST
MONROE	S106204406	BOREN BRICK - 5000 H.O.	HWY 74 E		IMD, LUST
MONROE	S103718030	BOREN BRICK CO.	HWY 74 E		IMD
MONROE	S103554548	SCOVILL INC/SECURITY PRODUCTS	HWY 74 E		SHWS, VCP
MONROE	S102089551	BOREN BRICK-MONROE	HWY 74 E		IMD
MONROE	S106349501	CITY OF MONROE ASPHALT PLANT (	HWY 74 & SUTHERLAND AVE		IMD, LAST
MONROE	S105702968	MONROE MALL	HWY 74		IMD, LUST
MONROE	S106896097	ZIPP PROPERTY #2	3900 BLOCK PAGELAND HWY	28112	IMD, LUST
MONROE	S106799558	ROY WALTERS PROPERTY/NCDOT#10	5400 BLOCK PAGELAND HWY		IMD, LUST
MONROE	S105219283	CROWN NC - 632	1828 OLD CHARLOTTE HWY		LUST TRUST
MONROE	S108231194	DOROTHY MEDLIN PROPERTY	PAGELAND HWY	28112	LUST
MONROE	S105912239	PRICES PHILLIPS 66	1601 ROOSEVELT AVE		SHWS, IMD
MONROE	S104918910	STALLINGS SALVAGE	SECREST AVE		SHWS
MONROE	S104919117	UNION COUNTY DRUM	SOUTHERLIN AVE		SHWS
MONROE	S106799529	TELEDYNE EAST (FORMER STOUT IN	USHY 74 E		IMD, LUST
MONROE	S102089714	RALPH BELK PROPER/NCDOTSITE#12	5920 USHY 601 PAGELAND		IMD, LUST
MONROE	S104157189	NEWELL HELMS RESIDENCE	USHY 601		IMD

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

To maintain currency of the following federal and state databases, EDR contacts the appropriate governmental agency on a monthly or quarterly basis, as required.

Number of Days to Update: Provides confirmation that EDR is reporting records that have been updated within 90 days from the date the government agency made the information available to the public.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

National Priorities List (Superfund). The NPL is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund Program. NPL sites may encompass relatively large areas. As such, EDR provides polygon coverage for over 1,000 NPL site boundaries produced by EPA's Environmental Photographic Interpretation Center (EPIC) and regional EPA offices.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

EPA's Environmental Photographic Interpretation Center (EPIC)
Telephone: 202-564-7333

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

A site that has been proposed for listing on the National Priorities List through the issuance of a proposed rule in the Federal Register. EPA then accepts public comments on the site, responds to the comments, and places on the NPL those sites that continue to meet the requirements for listing.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

Federal Superfund Liens. Under the authority granted the USEPA by CERCLA of 1980, the USEPA has the authority to file liens against real property in order to recover remedial action expenditures or when the property owner received notification of potential liability. USEPA compiles a listing of filed notices of Superfund Liens.

Date of Government Version: 10/15/1991
Date Data Arrived at EDR: 02/02/1994
Date Made Active in Reports: 03/30/1994
Number of Days to Update: 56

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: No Update Planned

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Federal Delisted NPL site list

DELISTED NPL: National Priority List Deletions

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes the criteria that the EPA uses to delete sites from the NPL. In accordance with 40 CFR 300.425.(e), sites may be deleted from the NPL where no further response is appropriate.

Date of Government Version: 03/31/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 62

Source: EPA
Telephone: N/A
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

Federal CERCLIS list

CERCLIS: Comprehensive Environmental Response, Compensation, and Liability Information System

CERCLIS contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). CERCLIS contains sites which are either proposed to or on the National Priorities List (NPL) and sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

FEDERAL FACILITY: Federal Facility Site Information listing

A listing of National Priority List (NPL) and Base Realignment and Closure (BRAC) sites found in the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) Database where EPAa??s Federal Facilities Restoration and Reuse Office is involved in cleanup activities.

Date of Government Version: 12/10/2010
Date Data Arrived at EDR: 01/11/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 36

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 04/15/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Varies

Federal CERCLIS NFRAP site List

CERCLIS-NFRAP: CERCLIS No Further Remedial Action Planned

Archived sites are sites that have been removed and archived from the inventory of CERCLIS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list this site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. This decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be a potential NPL site.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA
Telephone: 703-412-9810
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/09/2011
Date Data Arrived at EDR: 03/15/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 91

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 05/16/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Transporters are individuals or entities that move hazardous waste from the generator offsite to a facility that can recycle, treat, store, or dispose of the waste. TSDFs treat, store, or dispose of the waste.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Large quantity generators (LQGs) generate over 1,000 kilograms (kg) of hazardous waste, or over 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Conditionally exempt small quantity generators (CESQGs) generate less than 100 kg of hazardous waste, or less than 1 kg of acutely hazardous waste per month.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

Federal institutional controls / engineering controls registries

US ENG CONTROLS: Engineering Controls Sites List

A listing of sites with engineering controls in place. Engineering controls include various forms of caps, building foundations, liners, and treatment methods to create pathway elimination for regulated substances to enter environmental media or effect human health.

Date of Government Version: 03/16/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

US INST CONTROL: Sites with Institutional Controls

A listing of sites with institutional controls in place. Institutional controls include administrative measures, such as groundwater use restrictions, construction restrictions, property use restrictions, and post remediation care requirements intended to prevent exposure to contaminants remaining on site. Deed restrictions are generally required as part of the institutional controls.

Date of Government Version: 03/16/2011
Date Data Arrived at EDR: 03/25/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

Emergency Response Notification System. ERNS records and stores information on reported releases of oil and hazardous substances.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 70

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Annually

State- and tribal - equivalent NPL

HSDS: Hazardous Substance Disposal Site

Locations of uncontrolled and unregulated hazardous waste sites. The file includes sites on the National Priority List as well as those on the state priority list.

Date of Government Version: 04/06/2006
Date Data Arrived at EDR: 02/28/2007
Date Made Active in Reports: 04/13/2007
Number of Days to Update: 44

Source: North Carolina Center for Geographic Information and Analysis
Telephone: 919-754-6580
Last EDR Contact: 05/10/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Biennially

State- and tribal - equivalent CERCLIS

SHWS: Inactive Hazardous Sites Inventory

State Hazardous Waste Sites. State hazardous waste site records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. Available information varies by state.

Date of Government Version: 04/08/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 05/12/2011
Number of Days to Update: 29

Source: Department of Environment, Health and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

State and tribal landfill and/or solid waste disposal site lists

SWF/LF: List of Solid Waste Facilities

Solid Waste Facilities/Landfill Sites. SWF/LF type records typically contain an inventory of solid waste disposal facilities or landfills in a particular state. Depending on the state, these may be active or inactive facilities or open dumps that failed to meet RCRA Subtitle D Section 4004 criteria for solid waste landfills or disposal sites.

Date of Government Version: 04/05/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 29

Source: Department of Environment and Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Semi-Annually

OLI: Old Landfill Inventory

Old landfill inventory location information. (Does not include no further action sites and other agency lead sites).

Date of Government Version: 04/08/2011
Date Data Arrived at EDR: 04/29/2011
Date Made Active in Reports: 06/07/2011
Number of Days to Update: 39

Source: Department of Environment & Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 07/08/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Regional UST Database

This database contains information obtained from the Regional Offices. It provides a more detailed explanation of current and historic activity for individual sites, as well as what was previously found in the Incident Management Database. Sites in this database with Incident Numbers are considered LUSTs.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/18/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 29

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 05/18/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

LUST TRUST: State Trust Fund Database

This database contains information about claims against the State Trust Funds for reimbursements for expenses incurred while remediating Leaking USTs.

Date of Government Version: 04/15/2011
Date Data Arrived at EDR: 04/20/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 57

Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Last EDR Contact: 04/20/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

LAST: Leaking Aboveground Storage Tanks

A listing of leaking aboveground storage tank site locations.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/18/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 29

Source: Department of Environment & Natural Resources
Telephone: 877-623-6748
Last EDR Contact: 05/18/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 01/31/2011
Date Data Arrived at EDR: 02/01/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 48
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Florida, Mississippi and North Carolina.

Date of Government Version: 03/03/2011
Date Data Arrived at EDR: 03/18/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 45
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 05/17/2011
Date Data Arrived at EDR: 05/19/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 26
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land
A listing of leaking underground storage tank locations on Indian Land.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 05/20/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 25
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/03/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in New Mexico and Oklahoma.

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 11/04/2009
Date Data Arrived at EDR: 05/04/2010
Date Made Active in Reports: 07/07/2010
Number of Days to Update: 64
Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 05/04/2010
Next Scheduled EDR Contact: 05/16/2011
Data Release Frequency: Varies

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 05/16/2011
Date Data Arrived at EDR: 05/17/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 28
Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

UST: Petroleum Underground Storage Tank Database

Registered Underground Storage Tanks. UST's are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA) and must be registered with the state department responsible for administering the UST program. Available information varies by state program.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/18/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 29

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 05/18/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

AST: AST Database

Facilities with aboveground storage tanks that have a capacity greater than 21,000 gallons.

Date of Government Version: 03/28/2011
Date Data Arrived at EDR: 03/30/2011
Date Made Active in Reports: 05/03/2011
Number of Days to Update: 34

Source: Department of Environment and Natural Resources
Telephone: 919-715-6183
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Semi-Annually

INDIAN UST R8: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 8 (Colorado, Montana, North Dakota, South Dakota, Utah, Wyoming and 27 Tribal Nations).

Date of Government Version: 05/16/2011
Date Data Arrived at EDR: 05/17/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 28

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R7: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 04/01/2011
Date Data Arrived at EDR: 06/01/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 13

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 02/03/2011
Next Scheduled EDR Contact: 05/16/2011
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 1 (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont and ten Tribal Nations).

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 05/04/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 41

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 05/03/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

INDIAN UST R9: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 05/18/2011
Date Data Arrived at EDR: 05/26/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 19

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R4: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 4 (Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee and Tribal Nations)

Date of Government Version: 03/03/2011
Date Data Arrived at EDR: 03/18/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 45

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

INDIAN UST R10: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 10 (Alaska, Idaho, Oregon, Washington, and Tribal Nations).

Date of Government Version: 05/17/2011
Date Data Arrived at EDR: 05/19/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 26

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Quarterly

INDIAN UST R6: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 05/10/2011
Date Data Arrived at EDR: 05/11/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 34

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Semi-Annually

INDIAN UST R5: Underground Storage Tanks on Indian Land

The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 5 (Michigan, Minnesota and Wisconsin and Tribal Nations).

Date of Government Version: 01/01/2011
Date Data Arrived at EDR: 02/23/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 68

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010
Date Data Arrived at EDR: 02/16/2010
Date Made Active in Reports: 04/12/2010
Number of Days to Update: 55

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/18/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

INST CONTROL: No Further Action Sites With Land Use Restrictions Monitoring

A land use restricted site is a property where there are limits or requirements on future use of the property due to varying levels of cleanup possible, practical, or necessary at the site.

Date of Government Version: 04/08/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 21

Source: Department of Environment, Health and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 12/17/2110
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

INDIAN VCP R1: Voluntary Cleanup Priority Listing
A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 70
Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

INDIAN VCP R7: Voluntary Cleanup Priority Lisitng
A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27
Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

VCP: Responsible Party Voluntary Action Sites
Responsible Party Voluntary Action site locations.

Date of Government Version: 04/08/2011
Date Data Arrived at EDR: 04/13/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 21
Source: Department of Environment and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Semi-Annually

State and tribal Brownfields sites

BROWNFIELDS: Brownfields Projects Inventory
A brownfield site is an abandoned, idled, or underused property where the threat of environmental contamination has hindered its redevelopment. All of the sites in the inventory are working toward a brownfield agreement for cleanup and liabitliy control.

Date of Government Version: 09/30/2010
Date Data Arrived at EDR: 04/15/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 19
Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 04/12/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Varies

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites

Included in the listing are brownfields properties addresses by Cooperative Agreement Recipients and brownfields properties addressed by Targeted Brownfields Assessments. Targeted Brownfields Assessments-EPA's Targeted Brownfields Assessments (TBA) program is designed to help states, tribes, and municipalities--especially those without EPA Brownfields Assessment Demonstration Pilots--minimize the uncertainties of contamination often associated with brownfields. Under the TBA program, EPA provides funding and/or technical assistance for environmental assessments at brownfields sites throughout the country. Targeted Brownfields Assessments supplement and work with other efforts under EPA's Brownfields Initiative to promote cleanup and redevelopment of brownfields. Cooperative Agreement Recipients-States, political subdivisions, territories, and Indian tribes become Brownfields Cleanup Revolving Loan Fund (BCRLF) cooperative agreement recipients when they enter into BCRLF cooperative agreements with the U.S. EPA. EPA selects BCRLF cooperative agreement recipients based on a proposal and application process. BCRLF cooperative agreement recipients must use EPA funds provided through BCRLF cooperative agreement for specified brownfields-related cleanup activities.

Date of Government Version: 03/29/2011
Date Data Arrived at EDR: 03/29/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 77

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

ODI: Open Dump Inventory

An open dump is defined as a disposal facility that does not comply with one or more of the Part 257 or Part 258 Subtitle D Criteria.

Date of Government Version: 06/30/1985
Date Data Arrived at EDR: 08/09/2004
Date Made Active in Reports: 09/17/2004
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 800-424-9346
Last EDR Contact: 06/09/2004
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

Date of Government Version: 01/12/2009
Date Data Arrived at EDR: 05/07/2009
Date Made Active in Reports: 09/21/2009
Number of Days to Update: 137

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: No Update Planned

HIST LF: Solid Waste Facility Listing

A listing of solid waste facilities.

Date of Government Version: 11/06/2006
Date Data Arrived at EDR: 02/13/2007
Date Made Active in Reports: 03/02/2007
Number of Days to Update: 17

Source: Department of Environment & Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 01/19/2009
Next Scheduled EDR Contact: 04/19/2009
Data Release Frequency: Quarterly

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands

Location of open dumps on Indian land.

Date of Government Version: 12/31/1998
Date Data Arrived at EDR: 12/03/2007
Date Made Active in Reports: 01/24/2008
Number of Days to Update: 52

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 05/09/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US CDL: Clandestine Drug Labs

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 02/02/2011
Date Data Arrived at EDR: 03/17/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 46

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 06/07/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Quarterly

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations. The U.S. Department of Justice ("the Department") provides this web site as a public service. It contains addresses of some locations where law enforcement agencies reported they found chemicals or other items that indicated the presence of either clandestine drug laboratories or dumpsites. In most cases, the source of the entries is not the Department, and the Department has not verified the entry and does not guarantee its accuracy. Members of the public must verify the accuracy of all entries by, for example, contacting local law enforcement and local health departments.

Date of Government Version: 09/01/2007
Date Data Arrived at EDR: 11/19/2008
Date Made Active in Reports: 03/30/2009
Number of Days to Update: 131

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 03/23/2009
Next Scheduled EDR Contact: 06/22/2009
Data Release Frequency: No Update Planned

Local Land Records

LIENS 2: CERCLA Lien Information

A Federal CERCLA ('Superfund') lien can exist by operation of law at any site or property at which EPA has spent Superfund monies. These monies are spent to investigate and address releases and threatened releases of contamination. CERCLIS provides information as to the identity of these sites and properties.

Date of Government Version: 02/01/2011
Date Data Arrived at EDR: 02/04/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 87

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

LUCIS: Land Use Control Information System

LUCIS contains records of land use control information pertaining to the former Navy Base Realignment and Closure properties.

Date of Government Version: 12/09/2005
Date Data Arrived at EDR: 12/11/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 31

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 07/11/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Varies

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

Hazardous Materials Incident Report System. HMIRS contains hazardous material spill incidents reported to DOT.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 01/05/2011
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 51

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Annually

Other Ascertainable Records

RCRA-NonGen: RCRA - Non Generators

RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

Date of Government Version: 03/11/2011
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 27

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 07/07/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

DOT OPS: Incident and Accident Data

Department of Transporation, Office of Pipeline Safety Incident and Accident data.

Date of Government Version: 01/12/2011
Date Data Arrived at EDR: 02/11/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 05/11/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

DOD: Department of Defense Sites

This data set consists of federally owned or administered lands, administered by the Department of Defense, that have any area equal to or greater than 640 acres of the United States, Puerto Rico, and the U.S. Virgin Islands.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 11/10/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 62

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

FUDS: Formerly Used Defense Sites

The listing includes locations of Formerly Used Defense Sites properties where the US Army Corps of Engineers is actively working or will take necessary cleanup actions.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 08/12/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 112

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

CONSENT: Superfund (CERCLA) Consent Decrees

Major legal settlements that establish responsibility and standards for cleanup at NPL (Superfund) sites. Released periodically by United States District Courts after settlement by parties to litigation matters.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 04/05/2011
Date Made Active in Reports: 06/14/2011
Number of Days to Update: 70

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

ROD: Records Of Decision

Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid in the cleanup.

Date of Government Version: 02/25/2011
Date Data Arrived at EDR: 03/16/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 5

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/15/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Annually

UMTRA: Uranium Mill Tailings Sites

Uranium ore was mined by private companies for federal government use in national defense programs. When the mills shut down, large piles of the sand-like material (mill tailings) remain after uranium has been extracted from the ore. Levels of human exposure to radioactive materials from the piles are low; however, in some cases tailings were used as construction materials before the potential health hazards of the tailings were recognized.

Date of Government Version: 09/14/2010
Date Data Arrived at EDR: 10/21/2010
Date Made Active in Reports: 01/28/2011
Number of Days to Update: 99

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 06/02/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Varies

MINES: Mines Master Index File

Contains all mine identification numbers issued for mines active or opened since 1971. The data also includes violation information.

Date of Government Version: 02/08/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 06/08/2011
Next Scheduled EDR Contact: 09/19/2011
Data Release Frequency: Semi-Annually

TRIS: Toxic Chemical Release Inventory System

Toxic Release Inventory System. TRIS identifies facilities which release toxic chemicals to the air, water and land in reportable quantities under SARA Title III Section 313.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/17/2010
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 94

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/27/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Annually

TSCA: Toxic Substances Control Act

Toxic Substances Control Act. TSCA identifies manufacturers and importers of chemical substances included on the TSCA Chemical Substance Inventory list. It includes data on the production volume of these substances by plant site.

Date of Government Version: 12/31/2006
Date Data Arrived at EDR: 09/29/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 64

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 06/30/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Every 4 Years

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 05/27/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)

A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25

Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 05/27/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

A complete administrative case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2007
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

HIST FTTS INSP: FIFRA/TSCA Tracking System Inspection & Enforcement Case Listing

A complete inspection and enforcement case listing from the FIFRA/TSCA Tracking System (FTTS) for all ten EPA regions. The information was obtained from the National Compliance Database (NCDB). NCDB supports the implementation of FIFRA (Federal Insecticide, Fungicide, and Rodenticide Act) and TSCA (Toxic Substances Control Act). Some EPA regions are now closing out records. Because of that, and the fact that some EPA regions are not providing EPA Headquarters with updated records, it was decided to create a HIST FTTS database. It included records that may not be included in the newer FTTS database updates. This database is no longer updated.

Date of Government Version: 10/19/2006
Date Data Arrived at EDR: 03/01/2007
Date Made Active in Reports: 04/10/2007
Number of Days to Update: 40

Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 12/17/2008
Next Scheduled EDR Contact: 03/17/2008
Data Release Frequency: No Update Planned

SSTS: Section 7 Tracking Systems

Section 7 of the Federal Insecticide, Fungicide and Rodenticide Act, as amended (92 Stat. 829) requires all registered pesticide-producing establishments to submit a report to the Environmental Protection Agency by March 1st each year. Each establishment must report the types and amounts of pesticides, active ingredients and devices being produced, and those having been produced and sold or distributed in the past year.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 12/10/2010
Date Made Active in Reports: 02/25/2011
Number of Days to Update: 77

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 05/02/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

The Integrated Compliance Information System (ICIS) supports the information needs of the national enforcement and compliance program as well as the unique needs of the National Pollutant Discharge Elimination System (NPDES) program.

Date of Government Version: 01/07/2011
Date Data Arrived at EDR: 01/21/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 59

Source: Environmental Protection Agency
Telephone: 202-564-5088
Last EDR Contact: 06/27/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

PCB Activity Database. PADS Identifies generators, transporters, commercial storers and/or brokers and disposers of PCB's who are required to notify the EPA of such activities.

Date of Government Version: 11/01/2010
Date Data Arrived at EDR: 11/10/2010
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 98

Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/22/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

MLTS: Material Licensing Tracking System

MLTS is maintained by the Nuclear Regulatory Commission and contains a list of approximately 8,100 sites which possess or use radioactive materials and which are subject to NRC licensing requirements. To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 03/18/2010
Date Data Arrived at EDR: 04/06/2010
Date Made Active in Reports: 05/27/2010
Number of Days to Update: 51

Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 06/13/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Quarterly

RADINFO: Radiation Information Database

The Radiation Information Database (RADINFO) contains information about facilities that are regulated by U.S. Environmental Protection Agency (EPA) regulations for radiation and radioactivity.

Date of Government Version: 01/11/2011
Date Data Arrived at EDR: 01/13/2011
Date Made Active in Reports: 02/16/2011
Number of Days to Update: 34

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 04/13/2011
Next Scheduled EDR Contact: 07/25/2011
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

Facility Index System. FINDS contains both facility information and 'pointers' to other sources that contain more detail. EDR includes the following FINDS databases in this report: PCS (Permit Compliance System), AIRS (Aerometric Information Retrieval System), DOCKET (Enforcement Docket used to manage and track information on civil judicial enforcement cases for all environmental statutes), FURS (Federal Underground Injection Control), C-DOCKET (Criminal Docket System used to track criminal enforcement actions for all environmental statutes), FFIS (Federal Facilities Information System), STATE (State Environmental Laws and Statutes), and PADS (PCB Activity Data System).

Date of Government Version: 04/14/2010
Date Data Arrived at EDR: 04/16/2010
Date Made Active in Reports: 05/27/2010
Number of Days to Update: 41

Source: EPA
Telephone: (404) 562-9900
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Quarterly

RAATS: RCRA Administrative Action Tracking System

RCRA Administration Action Tracking System. RAATS contains records based on enforcement actions issued under RCRA pertaining to major violators and includes administrative and civil actions brought by the EPA. For administration actions after September 30, 1995, data entry in the RAATS database was discontinued. EPA will retain a copy of the database for historical records. It was necessary to terminate RAATS because a decrease in agency resources made it impossible to continue to update the information contained in the database.

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35

Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

BRS: Biennial Reporting System

The Biennial Reporting System is a national system administered by the EPA that collects data on the generation and management of hazardous waste. BRS captures detailed data from two groups: Large Quantity Generators (LQG) and Treatment, Storage, and Disposal Facilities.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 03/01/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 62

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 05/27/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Biennially

IMD: Incident Management Database
Groundwater and/or soil contamination incidents

Date of Government Version: 07/21/2006
Date Data Arrived at EDR: 08/01/2006
Date Made Active in Reports: 08/23/2006
Number of Days to Update: 22

Source: Department of Environment and Natural Resources
Telephone: 919-733-3221
Last EDR Contact: 07/01/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Quarterly

UIC: Underground Injection Wells Listing
A listing of uncerground injection wells locations.

Date of Government Version: 05/31/2011
Date Data Arrived at EDR: 05/31/2011
Date Made Active in Reports: 06/23/2011
Number of Days to Update: 23

Source: Department of Environment & Natural Resources
Telephone: 919-733-3221
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Varies

DRYCLEANERS: Drycleaning Sites
Potential and known drycleaning sites, active and abandoned, that the Drycleaning Solvent Cleanup Program has knowledge of and entered into this database.

Date of Government Version: 01/20/2011
Date Data Arrived at EDR: 03/30/2011
Date Made Active in Reports: 04/28/2011
Number of Days to Update: 29

Source: Department of Environment & Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 06/29/2011
Next Scheduled EDR Contact: 10/10/2011
Data Release Frequency: Varies

NPDES: NPDES Facility Location Listing
General information regarding NPDES(National Pollutant Discharge Elimination System) permits.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/13/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 34

Source: Department of Environment & Natural Resources
Telephone: 919-733-7015
Last EDR Contact: 05/09/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

INDIAN RESERV: Indian Reservations
This map layer portrays Indian administered lands of the United States that have any area equal to or greater than 640 acres.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 12/08/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 34

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Semi-Annually

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing
The State Coalition for Remediation of Drycleaners was established in 1998, with support from the U.S. EPA Office of Superfund Remediation and Technology Innovation. It is comprised of representatives of states with established drycleaner remediation programs. Currently the member states are Alabama, Connecticut, Florida, Illinois, Kansas, Minnesota, Missouri, North Carolina, Oregon, South Carolina, Tennessee, Texas, and Wisconsin.

Date of Government Version: 03/07/2011
Date Data Arrived at EDR: 03/09/2011
Date Made Active in Reports: 05/02/2011
Number of Days to Update: 54

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 06/06/2011
Next Scheduled EDR Contact: 08/08/2011
Data Release Frequency: Varies

PCB TRANSFORMER: PCB Transformer Registration Database
The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 01/01/2008
Date Data Arrived at EDR: 02/18/2009
Date Made Active in Reports: 05/29/2009
Number of Days to Update: 100
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/05/2011
Next Scheduled EDR Contact: 08/15/2011
Data Release Frequency: Varies

FEDLAND: Federal and Indian Lands
Federally and Indian administrated lands of the United States. Lands included are administrated by: Army Corps of Engineers, Bureau of Reclamation, National Wild and Scenic River, National Wildlife Refuge, Public Domain Land, Wilderness, Wilderness Study Area, Wildlife Management Area, Bureau of Indian Affairs, Bureau of Land Management, Department of Justice, Forest Service, Fish and Wildlife Service, National Park Service.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 02/06/2006
Date Made Active in Reports: 01/11/2007
Number of Days to Update: 339
Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/21/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: N/A

FINANCIAL ASSURANCE 1: Financial Assurance Information Listing
A listing of financial assurance information for underground storage tank facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/12/2011
Date Data Arrived at EDR: 05/18/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 29
Source: Department of Environment & Natural Resources
Telephone: 919-733-1322
Last EDR Contact: 05/18/2011
Next Scheduled EDR Contact: 08/29/2011
Data Release Frequency: Quarterly

FINANCIAL ASSURANCE 3: Financial Assurance Information
Hazardous waste financial assurance information.

Date of Government Version: 03/24/2011
Date Data Arrived at EDR: 03/30/2011
Date Made Active in Reports: 05/04/2011
Number of Days to Update: 35
Source: Department of Environment & Natural Resources
Telephone: 919-508-8549
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

COAL ASH DOE: Sleam-Electric Plan Operation Data
A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005
Date Data Arrived at EDR: 08/07/2009
Date Made Active in Reports: 10/22/2009
Number of Days to Update: 76
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 04/19/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Varies

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List
A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 08/17/2010
Date Data Arrived at EDR: 01/03/2011
Date Made Active in Reports: 03/21/2011
Number of Days to Update: 77
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 06/14/2011
Next Scheduled EDR Contact: 09/26/2011
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites

A listing of coal combustion products distribution permits issued by the Division for the treatment, storage, transportation, use and disposal of coal combustion products.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/04/2009
Date Made Active in Reports: 08/17/2009
Number of Days to Update: 13

Source: Department of Environment & Natural Resources
Telephone: 919-807-6359
Last EDR Contact: 05/09/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Varies

FINANCIAL ASSURANCE 2: Financial Assurance Information Listing

Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 05/04/2011
Date Data Arrived at EDR: 05/05/2011
Date Made Active in Reports: 06/16/2011
Number of Days to Update: 42

Source: Department of Environmental & Natural Resources
Telephone: 919-508-8496
Last EDR Contact: 07/05/2011
Next Scheduled EDR Contact: 10/17/2011
Data Release Frequency: Varies

EDR PROPRIETARY RECORDS

EDR Proprietary Records

Manufactured Gas Plants: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 12/31/2007
Date Data Arrived at EDR: 08/26/2009
Date Made Active in Reports: 09/11/2009
Number of Days to Update: 16

Source: Department of Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/26/2011
Next Scheduled EDR Contact: 09/05/2011
Data Release Frequency: Annually

NJ MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 07/22/2010
Date Made Active in Reports: 08/26/2010
Number of Days to Update: 35

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/19/2011
Next Scheduled EDR Contact: 08/01/2011
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data
Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 05/12/2011
Date Made Active in Reports: 05/24/2011
Number of Days to Update: 12

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 05/12/2011
Next Scheduled EDR Contact: 08/22/2011
Data Release Frequency: Annually

PA MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2008
Date Data Arrived at EDR: 12/01/2009
Date Made Active in Reports: 12/14/2009
Number of Days to Update: 13

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/04/2011
Next Scheduled EDR Contact: 07/06/2011
Data Release Frequency: Annually

RI MANIFEST: Manifest information
Hazardous waste manifest information

Date of Government Version: 12/31/2010
Date Data Arrived at EDR: 06/24/2011
Date Made Active in Reports: 06/30/2011
Number of Days to Update: 6

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/31/2011
Next Scheduled EDR Contact: 09/12/2011
Data Release Frequency: Annually

WI MANIFEST: Manifest Information
Hazardous waste manifest information.

Date of Government Version: 12/31/2009
Date Data Arrived at EDR: 07/06/2010
Date Made Active in Reports: 07/26/2010
Number of Days to Update: 20

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/20/2011
Next Scheduled EDR Contact: 10/03/2011
Data Release Frequency: Annually

Oil/Gas Pipelines: This data was obtained by EDR from the USGS in 1994. It is referred to by USGS as GeoData Digital Line Graphs from 1:100,000-Scale Maps. It was extracted from the transportation category including some oil, but primarily gas pipelines.

Electric Power Transmission Line Data
Source: Rextag Strategies Corp.
Telephone: (281) 769-2247
U.S. Electric Transmission and Power Plants Systems Digital GIS Data

Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Health & Human Services
Telephone: 919-662-4499

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

STREET AND ADDRESS INFORMATION

GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

601 NORTH II SITE
3025 MCMANUS CIR
MONROE, NC 28112

TARGET PROPERTY COORDINATES

Latitude (North):	34.89700 - 34° 53' 49.2''
Longitude (West):	80.4736 - 80° 28' 25.0''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	548096.3
UTM Y (Meters):	3861550.0
Elevation:	618 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	34080-H4 WINGATE, NC
Most Recent Revision:	2002

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

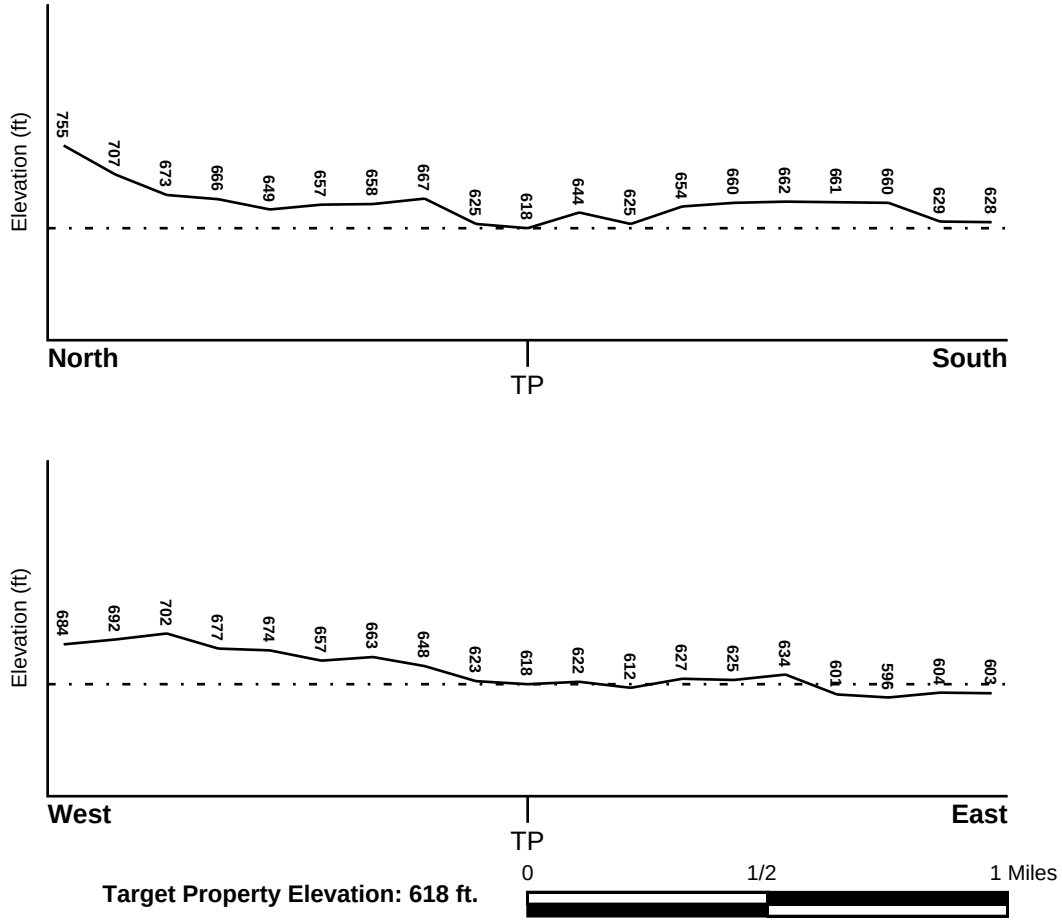
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Target Property County	FEMA Flood Electronic Data
UNION, NC	YES - refer to the Overview Map and Detail Map

Flood Plain Panel at Target Property: 37179C - FEMA DFIRM Flood data

Additional Panels in search area: Not Reported

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
WINGATE	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

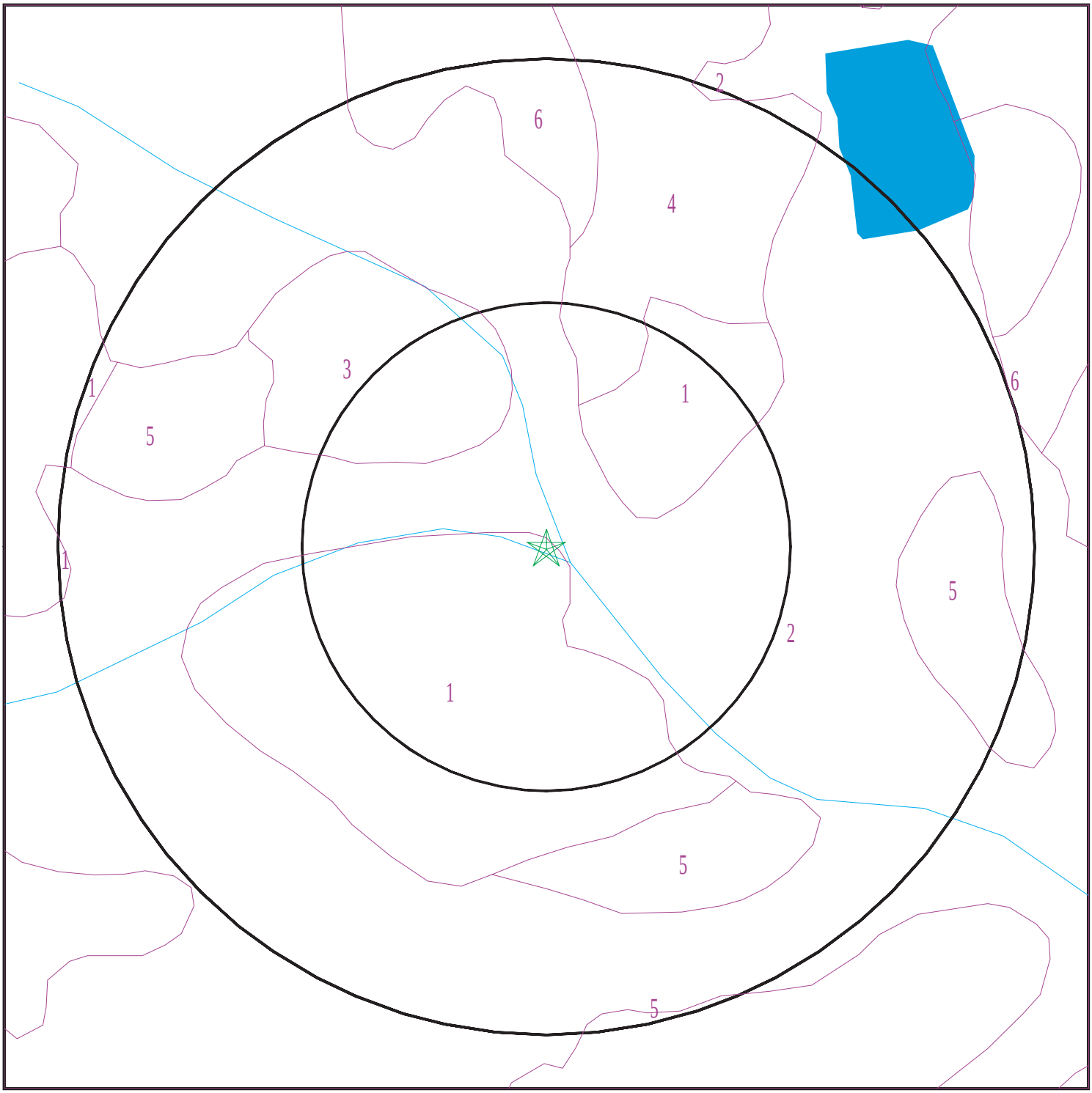
Era:	Paleozoic
System:	Cambrian
Series:	Cambrian
Code:	Ce *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Eugeosynclinal Deposits

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 3120300.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	601 North II Site	CLIENT:	PBS&J
ADDRESS:	3025 Mcmanus Cir Monroe NC 28112	CONTACT:	Jeremy Schmid
LAT/LONG:	34.8970 / 80.4736	INQUIRY #:	3120300.2s
		DATE:	July 11, 2011 4:25 pm

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Tatum

Soil Surface Texture: gravelly silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	7 inches	gravelly silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
2	7 inches	42 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
3	42 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:

Soil Map ID: 2

Soil Component Name: Cid

Soil Surface Texture: channery silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 77 inches

Depth to Watertable Min: > 61 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	9 inches	channery silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
2	9 inches	22 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
3	22 inches	27 inches	channery silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
4	27 inches	31 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
5	31 inches	35 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Map ID: 3

Soil Component Name: Badin

Soil Surface Texture: silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information

	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
2	5 inches	19 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
3	27 inches	42 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
4	42 inches	59 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
5	19 inches	27 inches	channery silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit less than 50%), silt.	Max: 14 Min: 4	Max: 5.5 Min: 3.5

Soil Map ID: 4

Soil Component Name: Tatum

Soil Surface Texture: gravelly silty clay loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	gravelly silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:
2	5 inches	44 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:
3	44 inches	53 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:

Soil Map ID: 5

Soil Component Name: Goldston

Soil Surface Texture: very channery silt loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Moderate

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	very channery silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
2	5 inches	16 inches	very channery silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
3	16 inches	27 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:
4	27 inches	31 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	Not reported	Max: 14 Min: 0	Max: Min:

Soil Map ID: 6

Soil Component Name: Badin

Soil Surface Texture: channery silt loam

Hydrologic Group: Class B - Moderate infiltration rates. Deep and moderately deep, moderately well and well drained soils with moderately coarse textures.

Soil Drainage Class: Well drained

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	channery silt loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:
2	5 inches	35 inches	silty clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:
3	35 inches	42 inches	weathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:
4	42 inches	46 inches	unweathered bedrock	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	Not reported	Max: 14 Min: 0	Max: Min:

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS2259467	1/4 - 1/2 Mile WNW
2	USGS2259461	1/2 - 1 Mile ESE

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

No PWS System Found

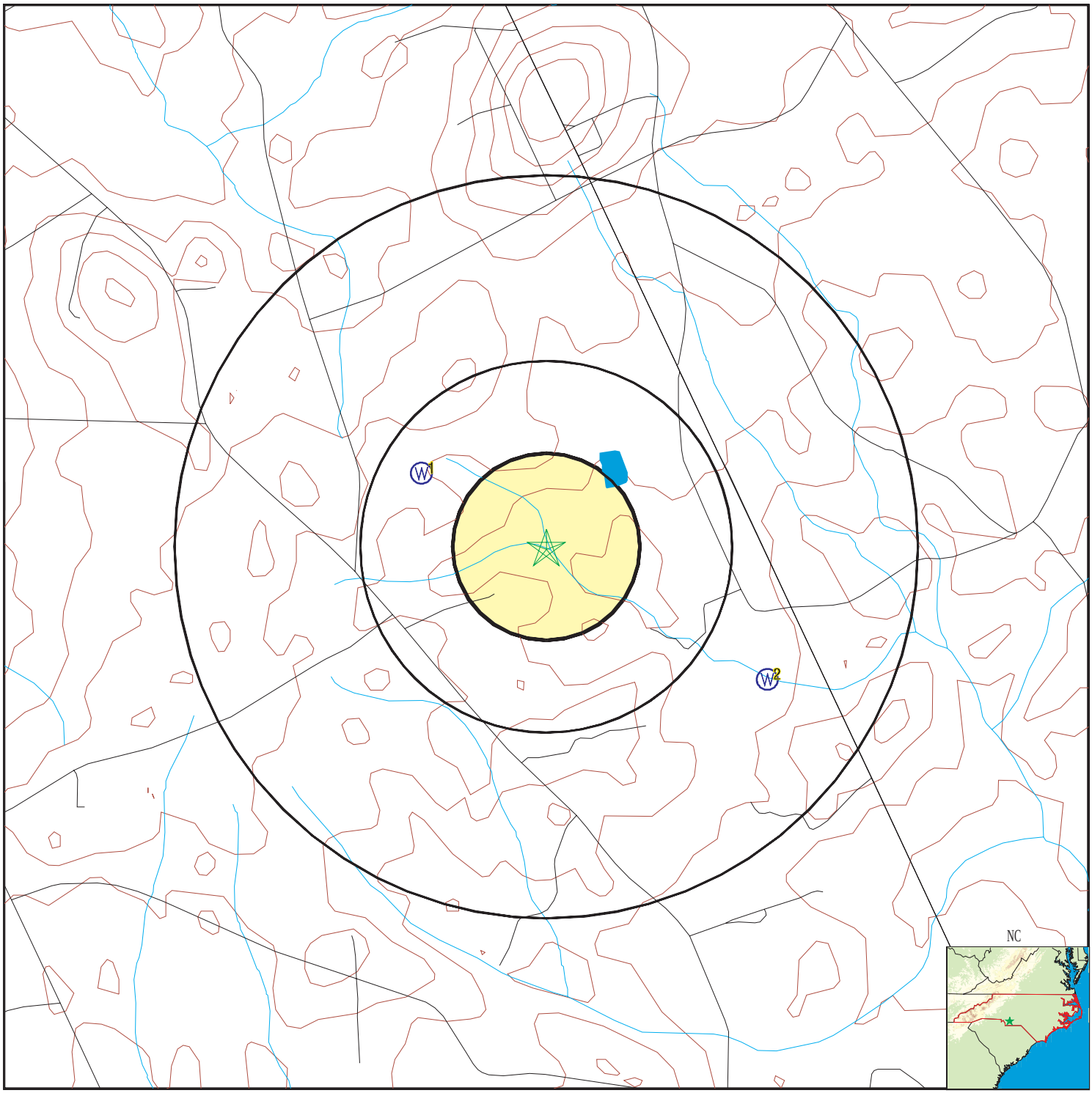
Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP

No Wells Found

PHYSICAL SETTING SOURCE MAP - 3120300.2s



- County Boundary
- Major Roads
- Contour Lines
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

SITE NAME: 601 North II Site	CLIENT: PBS&J
ADDRESS: 3025 Mcmanus Cir Monroe NC 28112	CONTACT: Jeremy Schmid INQUIRY #: 3120300.2s
LAT/LONG: 34.8970 / 80.4736	DATE: July 11, 2011 4:25 pm

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
WNW
1/4 - 1/2 Mile
Higher | **FED USGS** | **USGS2259467**

Agency cd:	USGS	Site no:	345359080284701
Site name:	UN-124		
Latitude:	345359	EDR Site id:	USGS2259467
Longitude:	0802847	Dec lat:	34.89987409
Dec lon:	-80.47951027	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	179
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported
Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	Not Reported		
Topographic:	Hilltop		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ARGILLITE		
Well depth:	125.0	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)		
Project number:	453709900		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

2
ESE
1/2 - 1 Mile
Higher | **FED USGS** | **USGS2259461**

Agency cd:	USGS	Site no:	345330080274801
Site name:	UN-126		
Latitude:	345330	EDR Site id:	USGS2259461
Longitude:	0802748	Dec lat:	34.89181891
Dec lon:	-80.46312116	Coor meth:	M
Coor accr:	S	Latlong datum:	NAD27
Dec latlong datum:	NAD83	District:	37
State:	37	County:	179
Country:	US	Land net:	Not Reported
Location map:	Not Reported	Map scale:	Not Reported

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Altitude:	Not Reported		
Altitude method:	Not Reported		
Altitude accuracy:	Not Reported		
Altitude datum:	Not Reported		
Hydrologic:	Not Reported		
Topographic:	Flat surface		
Site type:	Ground-water other than Spring	Date construction:	Not Reported
Date inventoried:	Not Reported	Mean greenwich time offset:	EST
Local standard time flag:	Y		
Type of ground water site:	Single well, other than collector or Ranney type		
Aquifer Type:	Not Reported		
Aquifer:	ARGILLITE		
Well depth:	303.0	Hole depth:	Not Reported
Source of depth data:	reporting agency (generally USGS)		
Project number:	453709900		
Real time data flag:	Not Reported	Daily flow data begin date:	Not Reported
Daily flow data end date:	Not Reported	Daily flow data count:	Not Reported
Peak flow data begin date:	Not Reported	Peak flow data end date:	Not Reported
Peak flow data count:	Not Reported	Water quality data begin date:	Not Reported
Water quality data end date:	Not Reported	Water quality data count:	Not Reported
Ground water data begin date:	Not Reported	Ground water data end date:	Not Reported
Ground water data count:	Not Reported		

Ground-water levels, Number of Measurements: 0

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

Federal EPA Radon Zone for UNION County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for UNION COUNTY, NC

Number of sites tested: 4

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.575 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Scanned Digital USGS 7.5' Topographic Map (DRG)
Source: United States Geologic Survey
A digital raster graphic (DRG) is a scanned image of a U.S. Geological Survey topographic map. The map images are made by scanning published paper maps on high-resolution scanners. The raster image is georeferenced and fit to the Universal Transverse Mercator (UTM) projection.

HYDROLOGIC INFORMATION

Flood Zone Data: This data, available in select counties across the country, was obtained by EDR in 2003 & 2011 from the Federal Emergency Management Agency (FEMA). Data depicts 100-year and 500-year flood zones as defined by FEMA.

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002 and 2005 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetlands Inventory
Source: Department of Environment & Natural Resources
Telephone: 919-733-2090

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Services (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Services, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

OTHER STATE DATABASE INFORMATION

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or hight quality natural communities, or other important ecological features.

NC Game Lands: Wildlife Resources Commission Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

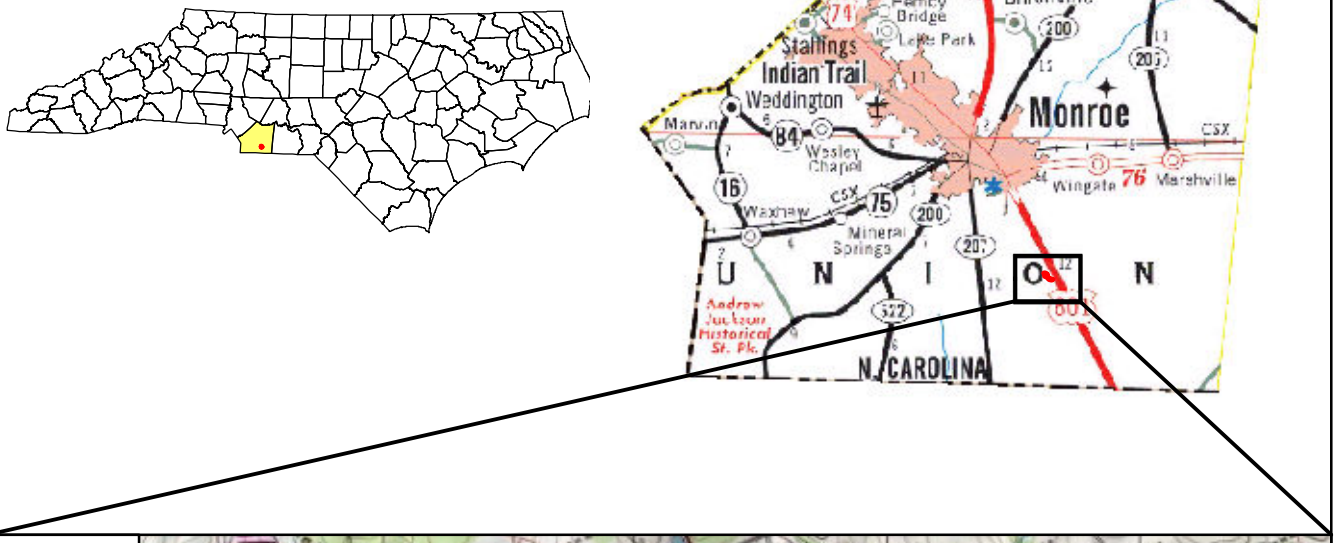
EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

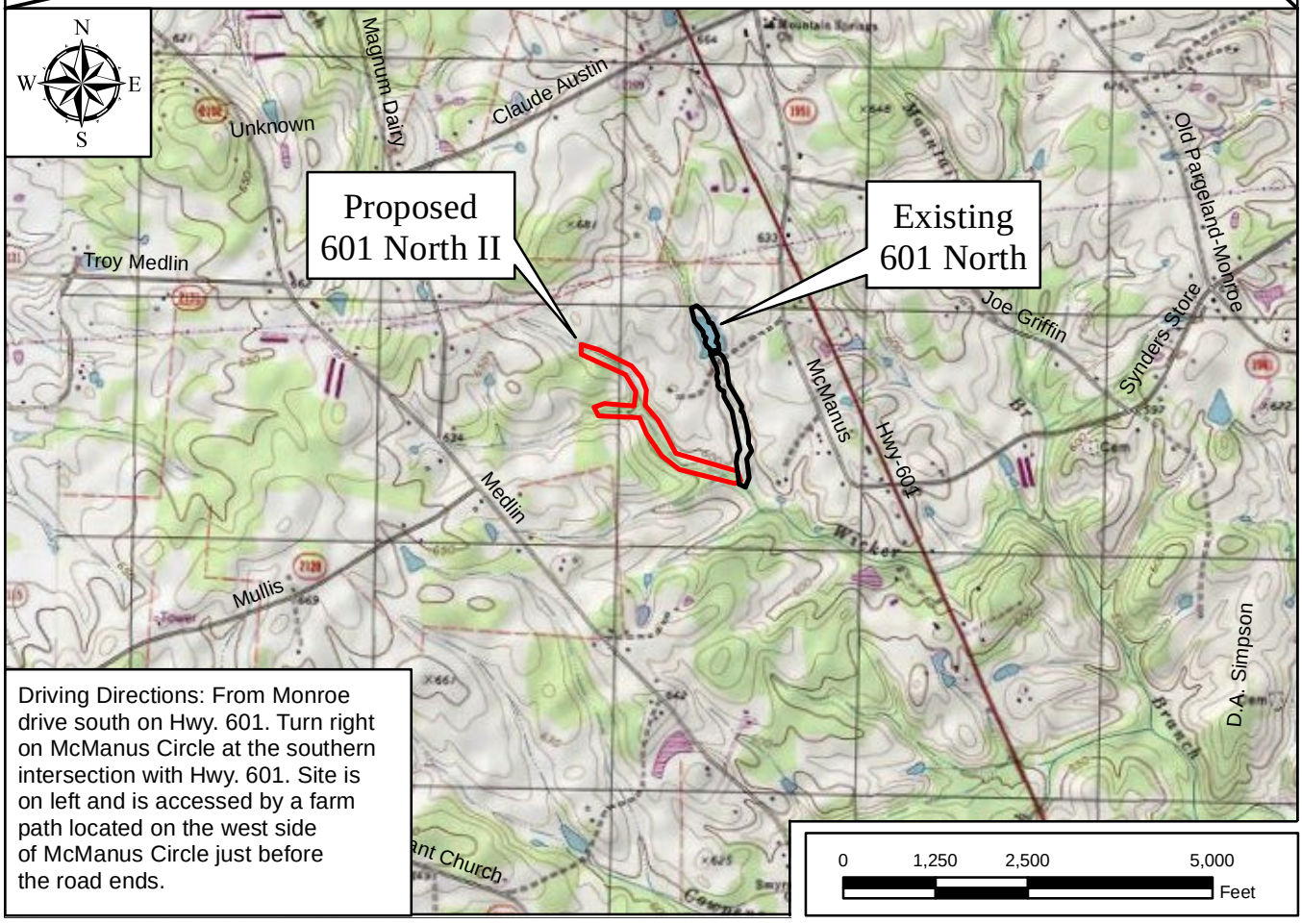
OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

STREET AND ADDRESS INFORMATION





Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

SITE LOCATION

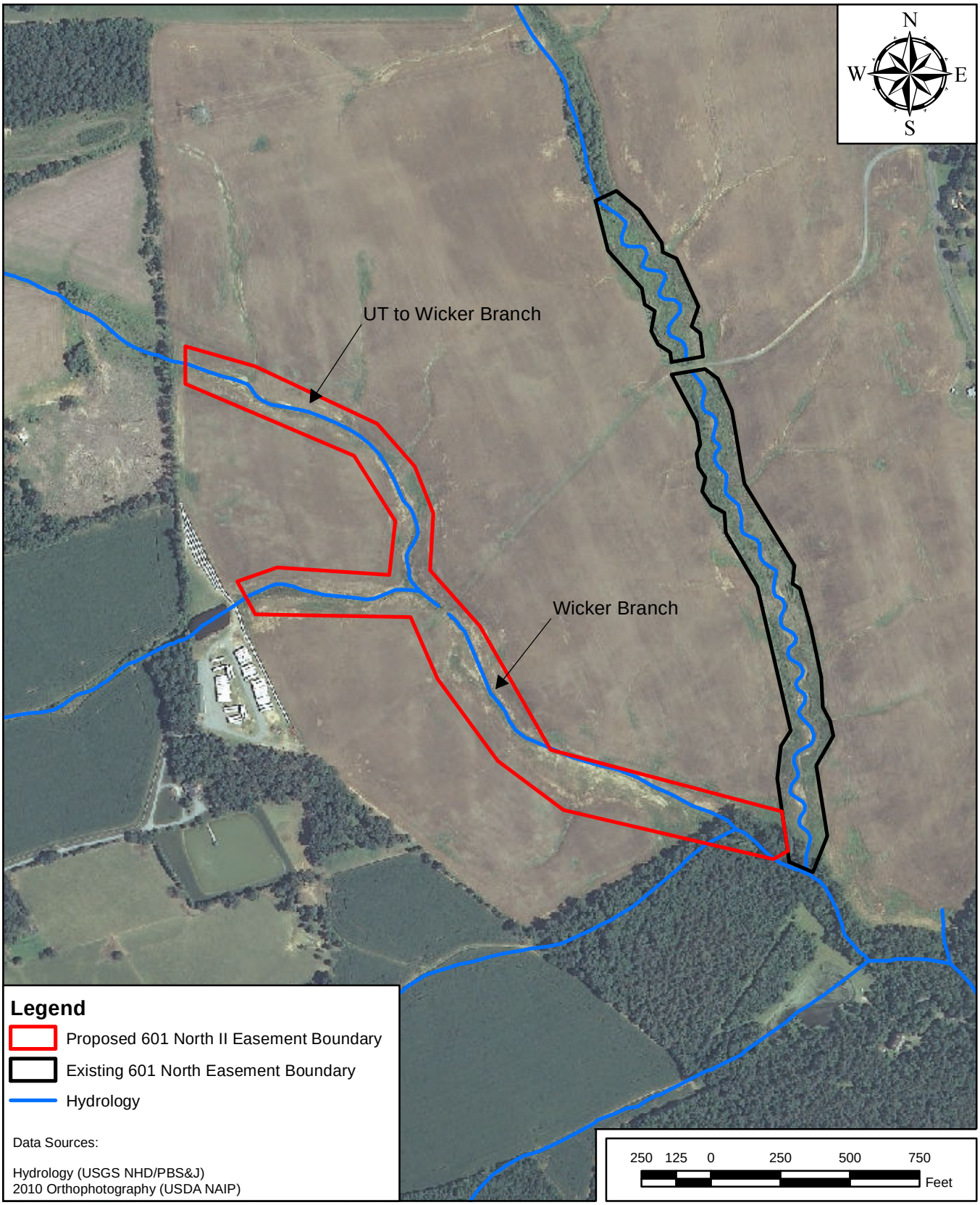
601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	FEB 2011
Project No.:	PROJECT NO.

FIGURE 1

PBS&J: an Atkins company



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

EXISTING CONDITIONS

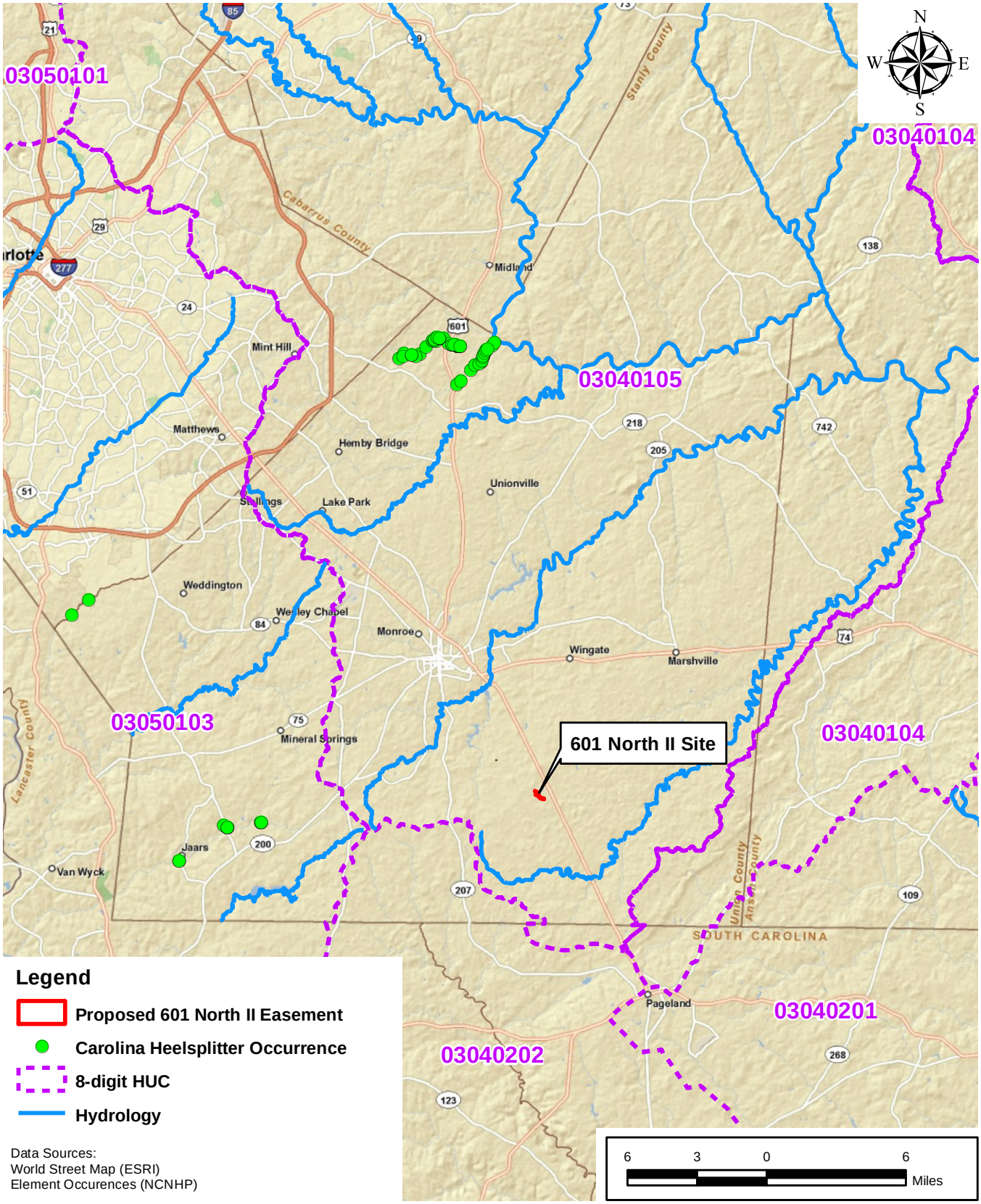
601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	RLG
Ckd By:	JWG
Date:	FEB 2011
Project No.:	PROJECT NO.

FIGURE 2

PBS&J: an Atkins company



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

NCNHP
Carolina Heelsplitter Occurrences

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	NOV 2011
Project No.:	100023125

FIGURE 4

Federally Protected Species

Site Evaluation Methodology

The most current USFWS listing of federally protected species with ranges extending into Union County has been used in support of this document (USFWS 2010). North Carolina Natural Heritage Program (NCNHP) records documenting the presence of federally or state listed species were consulted before commencing field investigations. A review of element occurrences for known populations of protected species was performed using GIS files produced by NCNHP (2011).

Threatened and Endangered Species

Species with the federal classification of Endangered, Threatened, or officially proposed for such listing are protected under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). The term "Endangered Species" is defined as "any species which is in danger of extinction throughout all or a significant portion of its range;" and the term "Threatened Species" is defined as "any species which is likely to become an Endangered species within the foreseeable future throughout all or a significant portion of its range" (16 U.S.C. 1532). The following table presents the Threatened and Endangered species listed for Union County (USFWS 2010).

Federally Protected Species Listed for Union County		
Common Name	**Scientific Name**	**Status**
Carolina heelsplitter	*Lasmigona decorate*	E
Michaux's sumac	*Rhus michauxii*	E
Schweinitz's sunflower	*Helianthus schweinitzii*	E

Species Description

Lasmigona decorata (Carolina heelsplitter)
Endangered
Family: Unionidae
Date Listed: June 30, 1993

The Carolina heelsplitter was historically known from several locations within the Catawba and Pee Dee River systems in North Carolina and the Pee Dee and Savannah River systems, and possibly the Saluda River system, in South Carolina. In North Carolina, the species is now known only from a handful of streams in the Rocky and Catawba River systems. The species exists in very low abundances, usually within 6 feet of shorelines, throughout its known range. The general habitat requirements for the Carolina heelsplitter are shaded areas in large rivers to small streams, often burrowed into clay banks between the root systems of trees, or in runs along steep bank with moderate current. The more recent habit where the Carolina heelsplitter has been found is in sections of streams containing bedrock with perpendicular crevices filled with sand and gravel, and with wide riparian buffers (USFWS 2008).

Rhus michauxii (Michaux's sumac)
Endangered
Family: Anacardiaceae
Date Listed: September 28, 1989

Michaux's sumac is a densely pubescent, deciduous, rhizomatous shrub, usually less than 2 feet high. The alternate, compound leaves consist of 9 to 13 hairy, round-based, toothed leaflets borne on a hairy rachis that may be slightly winged (Radford *et al*. 1968). Small male and female flowers are produced during June on separate plants; female flowers are produced on terminal, erect clusters followed by small, hairy, red fruits (drupes) in August and September. Michaux's sumac tends to grow in disturbed areas where competition is reduced by periodic fire or other disturbances, and may grow along roadside margins or utility right-of-ways. In the Piedmont, Michaux's sumac appears to prefer clay soil derived from mafic rocks or sandy soil derived from granite; in the Sandhills, it prefers loamy swales (Weakley 1993). Michaux's sumac ranges from south Virginia through Georgia in the inner Coastal Plain and lower Piedmont.

Helianthus schweinitzii (Schweinitz's sunflower)
Endangered
Family: Asteraceae
Date Listed: May 7, 1991

Schweinitz's sunflower is an erect, unbranched, rhizomatous, perennial herb that grows to approximately 6 feet in height. The stem may be purple, usually pubescent, but sometimes nearly smooth. Leaves are sessile, opposite on the lower stem but alternate above; in shape they are lanceolate and average 5 to 10 times as long as wide. The leaves are rather thick and stiff, with a few small serrations. The upper leaf surface is rough and the lower surface is usually pubescent with soft white hairs. Schweinitz's sunflower blooms from September to frost; the yellow flower heads are about 0.6 inches in diameter. The current known range of this species is within 60 miles of Charlotte, North Carolina, occurring on upland interstream flats or gentle slopes, in soils that are thin or clayey in texture. The species needs open areas protected from shade or excessive competition, reminiscent of Piedmont prairies. Disturbances such as fire maintenance or regular mowing help sustain preferred habitat (USFWS 1994).

Critical Habitat

Critical habitat is a specific geographic area that is essential for the conservation of a species with the federal classification of Endangered, Threatened, or officially Proposed for such listing under the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 et seq.). Of the three federally protected species listed for Union County, the Carolina heelsplitter is the only species with designated critical habitat (USFWS 2011).

Federally designated critical habitat for Carolina Heelsplitter has been provided on approximately 92.2 miles of streams, including portions of three streams in North Carolina and portions of one river and six streams in South Carolina, effective August 1, 2002 (52 CFR Part 17). The critical habitat contains three streams in Union County including parts of Goose Creek and Duck Creek [a tributary to Goose Creek] (Pee Dee River system) and Waxhaw Creek (Catawba River system). The designated critical

habitat for Goose Creek and Duck Creek encompasses approximately 4.5 miles of main stem of Goose Creek from NC Highway 218 Bridge downstream to its confluence with the Rocky River, and approximately 5.5 miles of the main stem of Duck Creek extending from the Mecklenburg/Union county line downstream to its confluence with Goose Creek. The designated critical habitat for Waxhaw Creek encompasses approximately 12.2 miles of main stem of Waxhaw Creek, extending from the NC Highway 200 Bridge, downstream to the North Carolina/South Carolina State line.

Biological Conclusion

Lasmigona decorata (Carolina heelsplitter)

BIOLOGICAL CONCLUSION **NO EFFECT**

The on-site streams are first- and second-order intermittent and perennial streams that lack suitable habitat for the Carolina heelsplitter. NCNHP records (reviewed July 2011) document no occurrence of Carolina heelsplitter within a 2.0 mile radius of the Site. Figure 4 shows Carolina heelsplitter occurrences in Union County. These occurrences are restricted to the Waxhaw Creek watershed located in the southwest corner of Union County and the Goose Creek/Duck Creek watershed located in the northern boundary of Union County. The Site is in the headwater of a drainage (14-digit HUC 03040105081010) that does not have known occurrences of the Carolina heelsplitter nor contain designated critical habitat. Actions taken on the site will not affect aquatic connectivity between known populations and the project area, either by placing a barrier between known populations or prevent host fish from traveling through the site. Based on NCNHP records, lack of suitable habitat, and lack of critical habitat in the watershed, this project will have no effect on Carolina heelsplitter.

Rhus michauxii (Michaux's sumac)

BIOLOGICAL CONCLUSION **NO EFFECT**

NCNHP records (reviewed July 2011) document no occurrence of Michaux's sumac within a 2.0 mile radius of the Site. However, limited suitable habitat does exist along the edge of the adjacent farmland where routine maintenance allows for reduced competition. Atkins biologists surveyed areas with suitable habitat and no specimens were found within the project study area. The biological conclusion is no effect.

Helianthus schweinitzii (Schweinitz's sunflower)

BIOLOGICAL CONCLUSION **NO EFFECT**

NCNHP records (reviewed July 2011) document no occurrence of Schweinitz's sunflower within a 2.0 mile radius of the Site. However, limited suitable habitat does exist along the edge of the adjacent farmland where routine maintenance allows for reduced competition. Atkins biologists surveyed areas with suitable habitat and no specimens were found within the project study area. The biological conclusion is no effect.

U.S. Fish and Wildlife Service (USFWS). 2011. Critical Habitat Portal. Union County listing. Internet address: http://criticalhabitat.fws.gov/crithab/.

ATKINS

To: File

From: David O'Loughlin

CC: Jens Geratz

Date: August 3, 2011

Re: T&E surveys for 601 North II

On August 1, 2011, Atkins biologists David O'Loughlin and Jeff Siceloff surveyed for Schweinitz's sunflower (*Helianthus schweinitzii)* and Michaux sumac (*Rhus michauxii*) in the 601 North project study area in Union County.

No NHP occurrences of either species are within 2 miles of the project study area.

The surveys occurred in areas identified by aerial photos and soil characteristics as possible habitat. Current aerial photos (NAIP 2009) were used to identify areas with long-standing disturbance and infrequent maintenance regimes. Such areas included roadsides, utility right-of-ways, and forest edges adjacent to fields, residential lots, etc. Unplanted areas bordering Wicker Branch and UT to Wicker Branch were considered suitable habitat for Michaux's sumac within the project study. Surveys were conducted by walking transects along edges or by walking overlapping transects within blocks of habitat to cover all suitable habitat areas. Most suitable habitat areas were dominated by agricultural weed species.

No specimens of Michaux's sumac were found within the project study area. The Biological Conclusion is No Effect.

Schweinitz's sunflower habitat exists in the project study area in unplanted areas bordering Wicker Branch and UT to Wicker Branch. We visited the site outside of the survey window so detailed surveys should be undertaken in late August – October.

ATKINS

To: File

From: David O'Loughlin

CC: Jens Geratz

Date: September 9, 2011

Re: Schweinitz's sunflower surveys for 601 North II

On September 8, 2011, Atkins biologists David O'Loughlin and Jeff Siceloff surveyed for Schweinitz's sunflower (*Helianthus schweinitzii)* in the 601 North project study area in Union County.

Schweinitz's sunflower habitat exists in the project study area in unplanted areas bordering Wicker Branch and UT to Wicker Branch. All habitat areas were surveyed at the site were surveyed. Other sunflower species were observed blooming at the neighboring 601 North I site including Helianthus angustifolius but no Schweinitz's sunflower individuals were observed on either site.

No specimens of Schweinitz's sunflower were found within the project study area. The Biological Conclusion is No Effect.

Photo 1 UT to Wicker Branch.

Photo 2. Wicker Branch

Photo 3. Wicker Branch - Bank erosion

Photo 4. Existing Culvert

EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. Edward Curtis), NC Floodplain Mapping Unit (attn. John Gerber) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	601North II Stream Restoration Site
Name if stream or feature:	Wicker Branch and an unnamed tributary (UT)
County:	Union County, NC
Name of river basin:	Yadkin
Is project urban or rural?	rural
Name of Jurisdictional municipality/county:	
DFIRM panel number for entire site:	5440, 5442
Consultant name:	Michael Gloden, PWS Atkins North America
Phone number:	919-876-6888
Address:	1616 East Millbrook Road Suite 310 Raleigh, NC 27609

Design Information

Environmental Banc and Exchange (EBX) proposes to perform stream restoration at the 601 North II Site (the "Site") located in Union County, NC (see attached Figure 1). The Site encompasses approximately 3590 linear feet of intermittent and perennial stream channel, most of which has been channelized for agricultural and flood abatement purposes. The primary restoration features on the Site include Wicker Branch and an unnamed tributary (UT) to Wicker Branch comprising a drainage area of 0.57 square-miles (see attached Figure 2). Land use within the Site is primarily agriculture and is facilitated by the historic modification of the local water table through dredging and channelization activities.

Restoration activities have been proposed to restore historic stream functions that existed at the Site prior to dredging and vegetation removal that supported agriculture activities. Site alterations will include backfilling of the existing channels, re-establishment of the adjacent floodplain, and construction of new stream channels within that floodplain. Restoration activities and design units proposed for the Site are provided in the following table.

Reach	**Design Length**	**Priority**
Wicker Branch	1921 LF	P1 (Restoration)
Wicker Branch	640 LF	P2 (Restoration)
UT to Wicker Branch	534 LF	P1 (Restoration)
UT to Wicker Branch	218 LF	EI (Enhancement)
UT to Wicker Branch	608 LF	EII (Enhancement)

Floodplain Information

Is project located in a Special Flood Hazard Area (SFHA)?

☐ Yes ☒ No

If project is located in a SFHA, check how it was determined:

☐ Redelineation

☐ Detailed Study

☐ Limited Detail Study

☐ Approximate Study

☐ Don't know

List flood zone designation:

Check if applies:

☐ AE Zone

- ☐ Floodway
- ☐ Non-Encroachment
- ◉ None

☐ A Zone

- ☐ Local Setbacks Required
- ☐ No Local Setbacks Required

If local setbacks are required, list how many feet:

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?

☐ Yes ◉ No

Land Acquisition (Check)

☐ State owned (fee simple)

☐ Conservation easment (Design Bid Build)

☑ Conservation Easement (Full Delivery Project)

Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program?

☐ Yes ◉ No

Note: if community is not participating, then all requirements should be addressed to NFIP (attn: Edward Curtis, (919) 715-8000 x369)

Name of Local Floodplain Administrator: N/A
Phone Number:

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

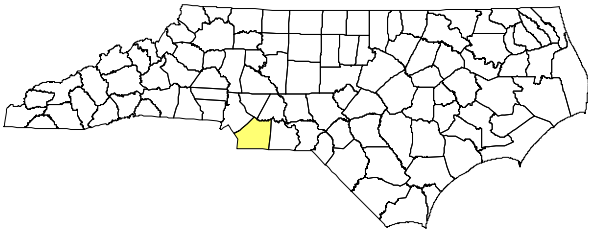
- [x] No Action
- [ ] No Rise
- [ ] Letter of Map Revision
- [ ] Conditional Letter of Map Revision
- [ ] Other Requirements

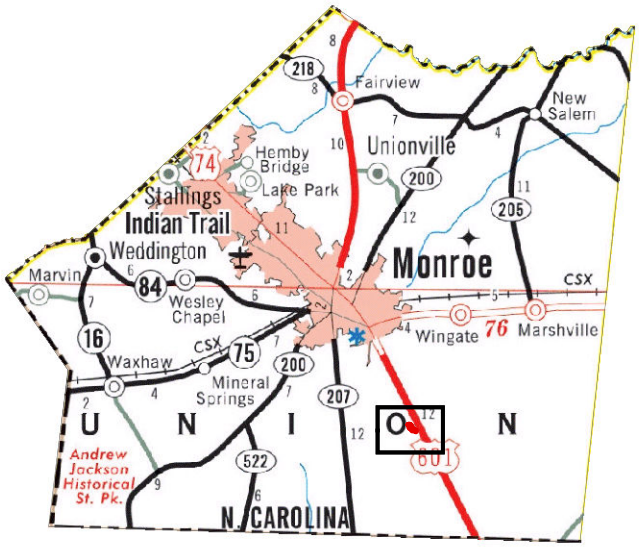
List other requirements:

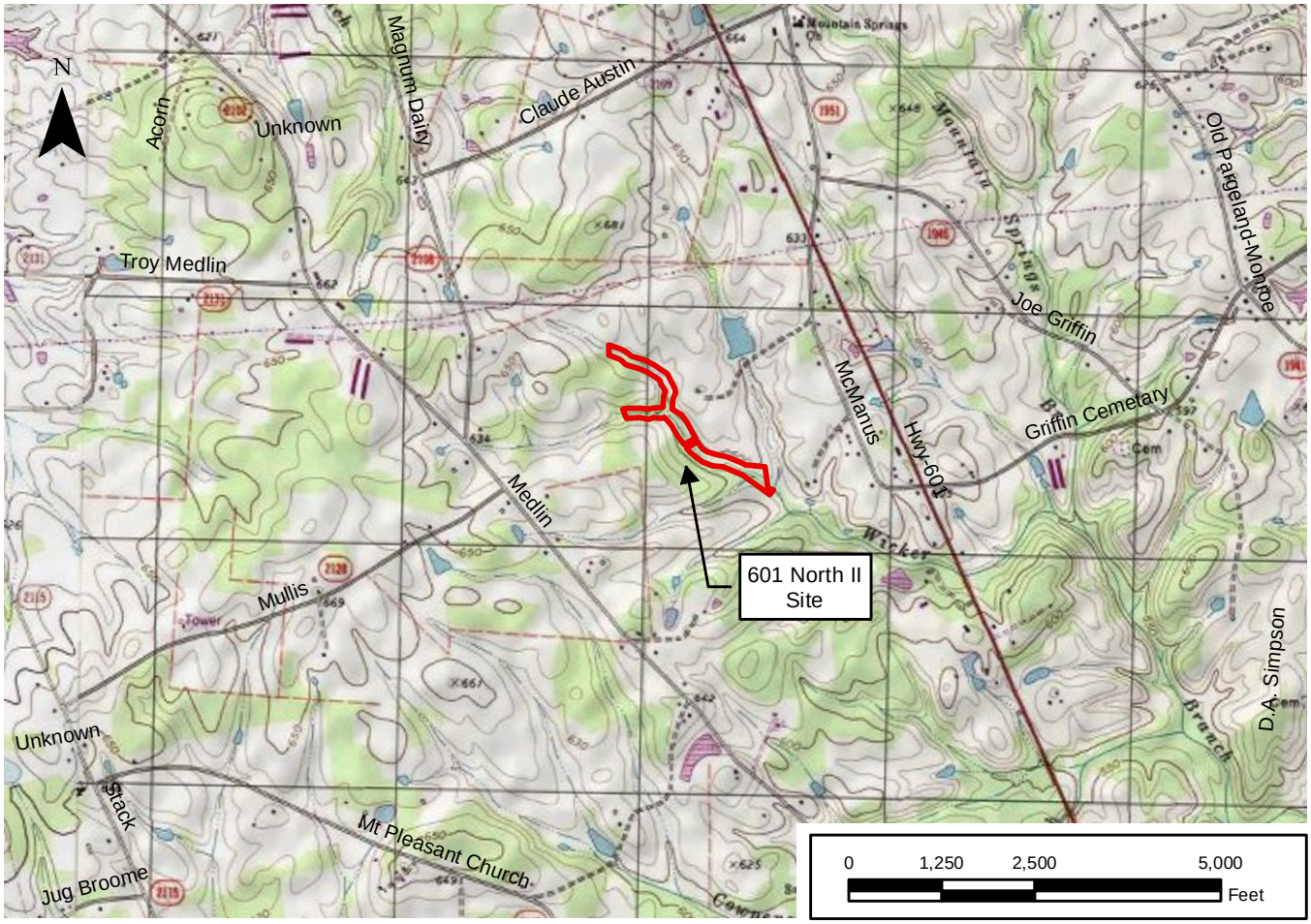
Comments:

Name: _____ Signature: _____

Title: _____ Date: _____







Prepared By:	Prepared For:
EBX	Ecosystem Enhancement Program

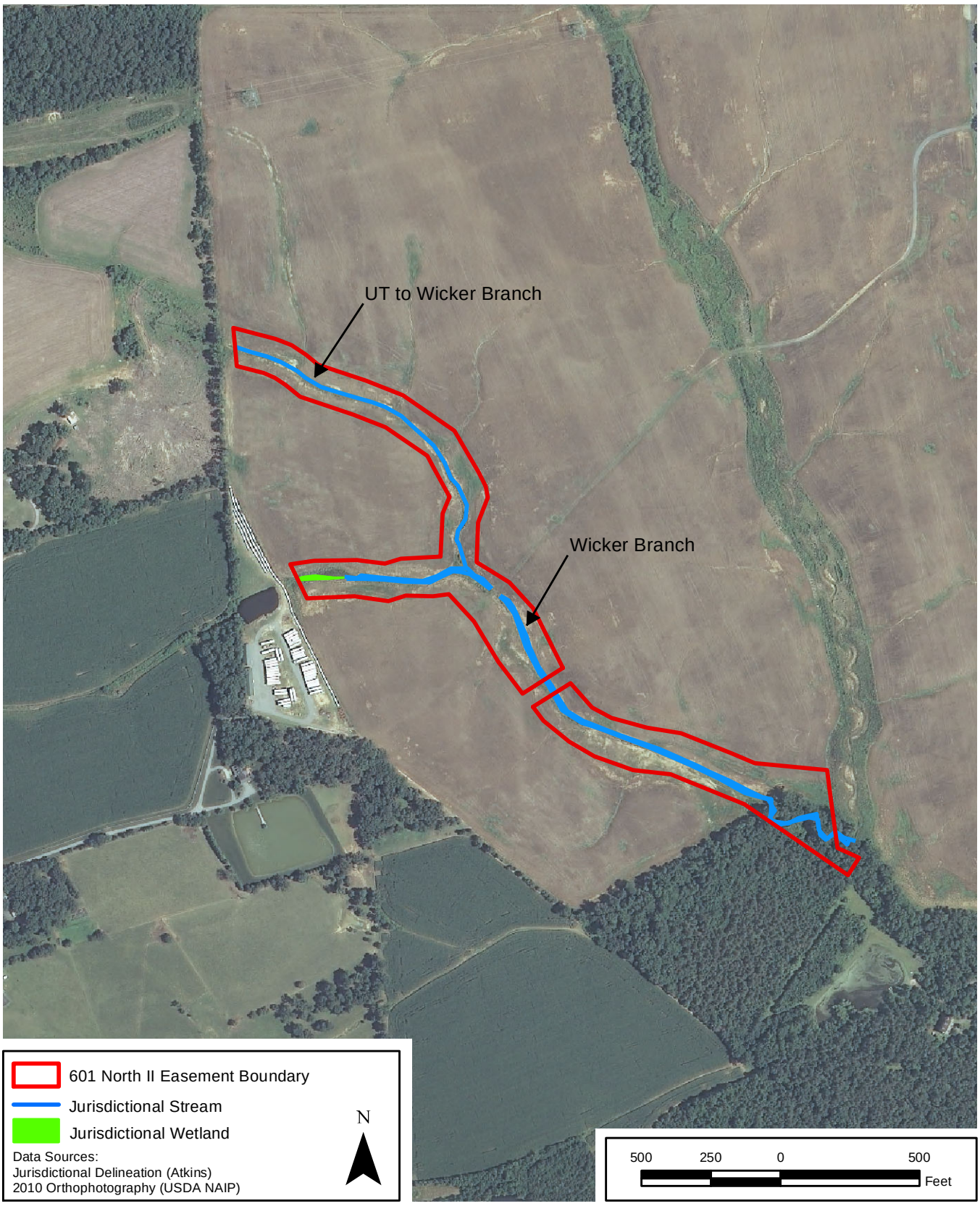
VICINITY MAP

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JAN 2012
Project No.:	100024976

FIGURE 1



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

EXISTING CONDITIONS

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

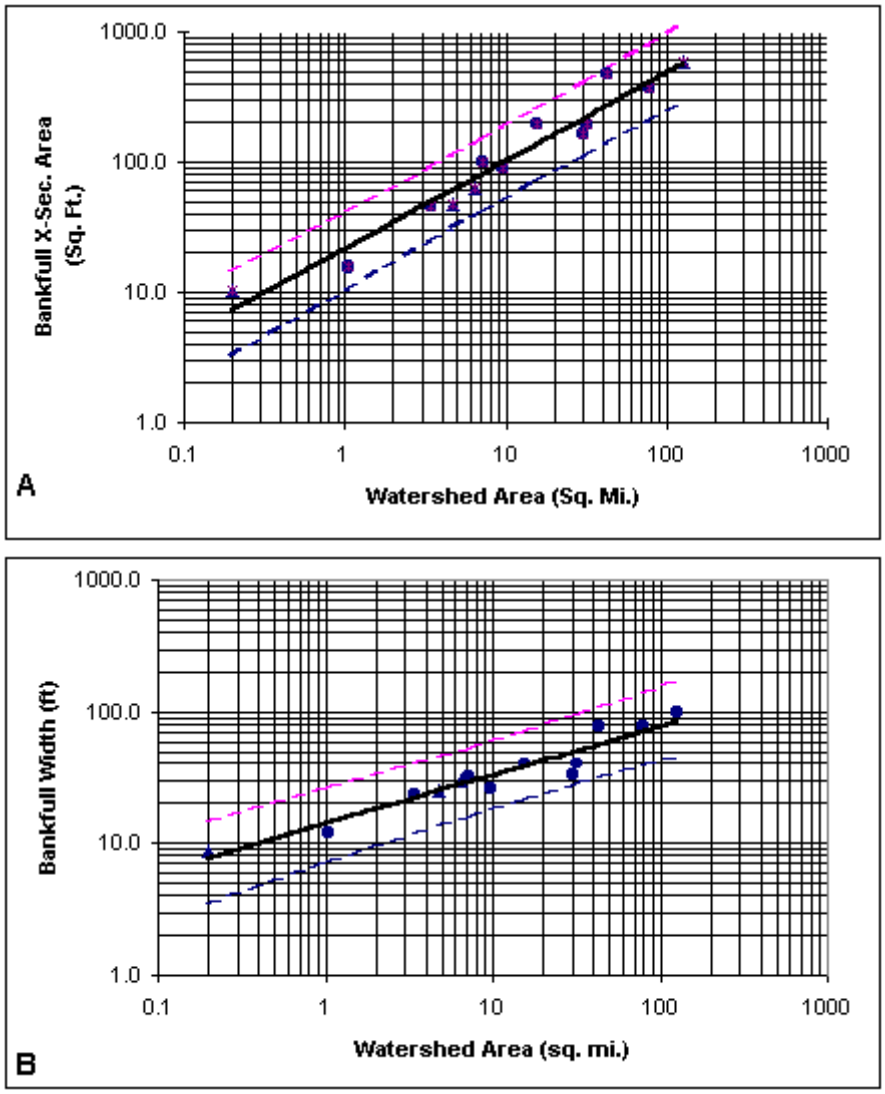
Dwn By:	MCG
Ckd By:	JWG
Date:	JAN 2012
Project No.:	100024976

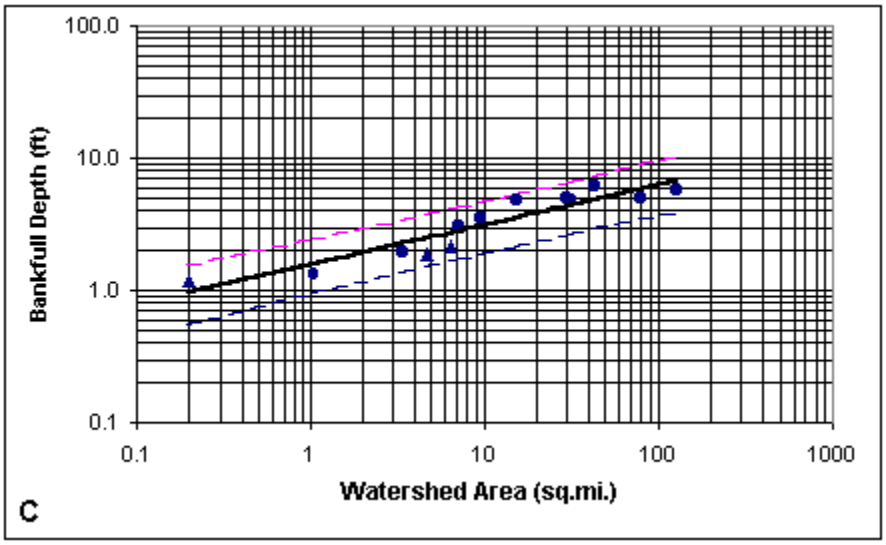
FIGURE 2

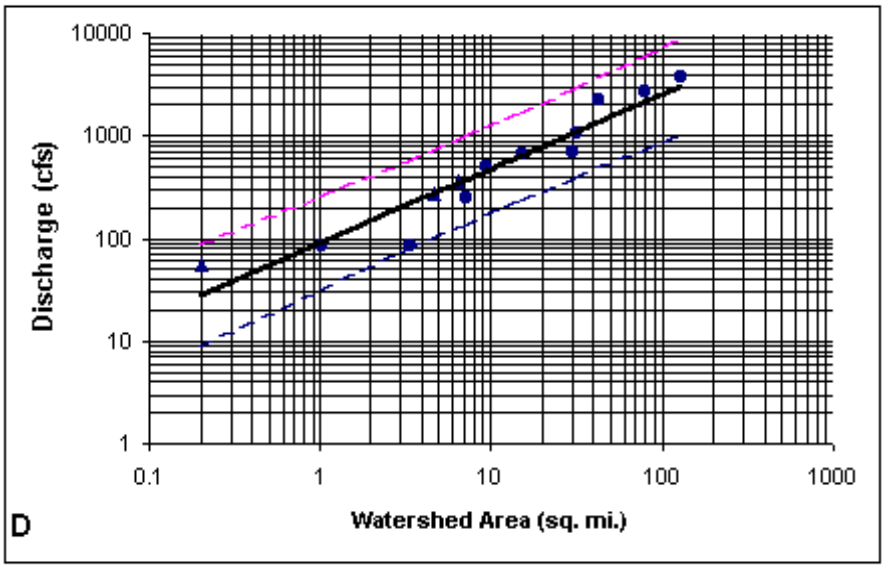
14.5 Appendix C. Mitigation Work Plan Data and Analyses

Bankfull Hydraulic Geometry Relationships for Rural Piedmont North Carolina Streams (Harman et al. 1999).

The four graphs represent: a) cross sectional area, b) width, c) depth, and d) discharge. The circles represent gage stations and the triangles represent ungaged streams. The outside dashed lines are the 95 percent confidence intervals for all the data points.







Harman, W.A., G.D. Jennings, J.M. Patterson, D.R. Clinton, L.A. O'Hara, A. Jessup, and Rich, Everhart. 1999. Bankfull Hydraulic Geometry Relationships for North Carolina Streams. N.C. State University, Raleigh, North Carolina.

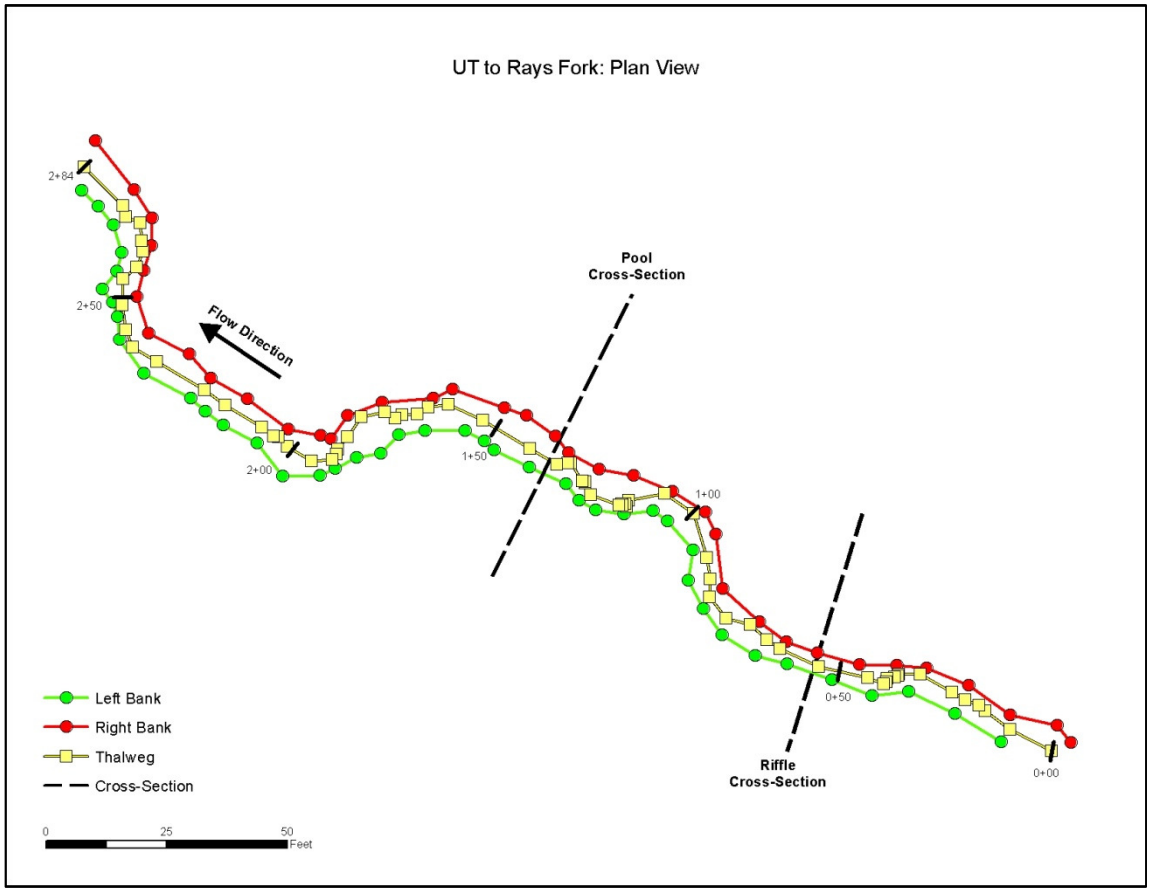
This Page Intentionally Left Blank

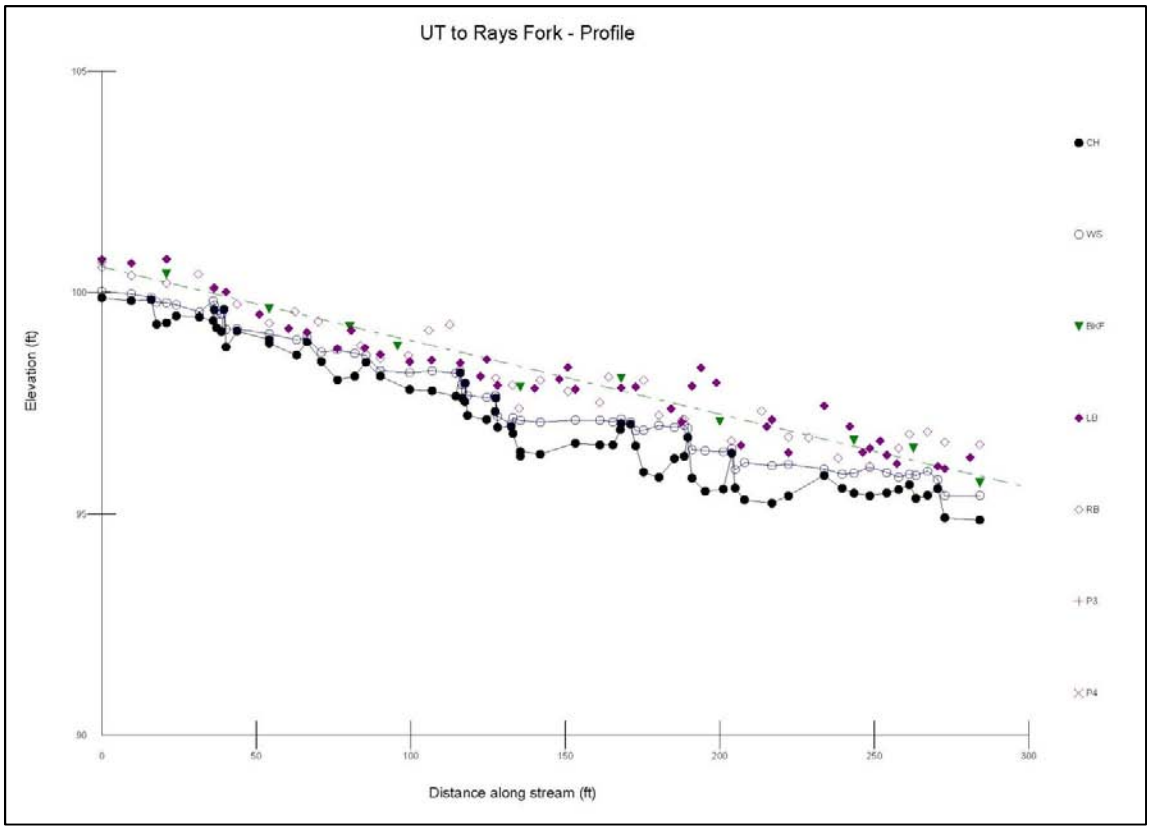
Reference Stream Geometry and Classification

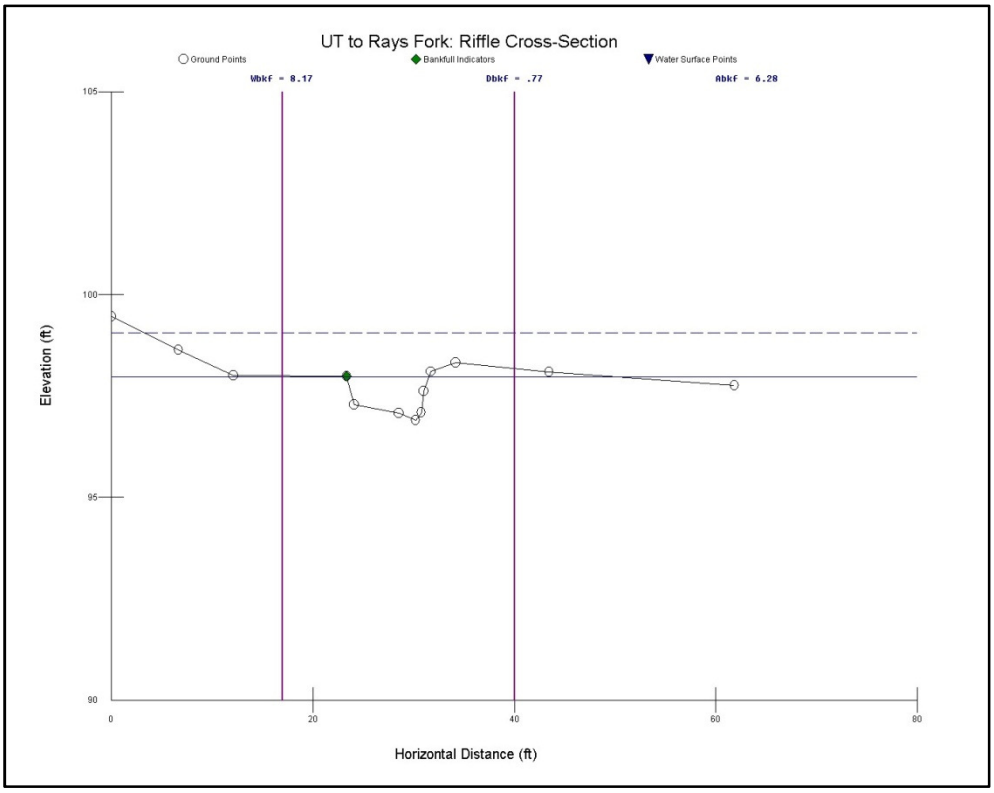
ATTRIBUTE	UT to Rays Fork	NC Piedmont Rural Regional Curve (Harmon et al. 1999)				NC Piedmont Reference Reaches (Lowther 2008)			
Drainage Area (sq mi)	0.19	0.14	0.27	0.45	0.57	0.14	0.27	0.45	0.57
DIMENSION									
Bankfull Area (A_{bkf}) [sq ft]	6.3	5.6	8.8	12.5	14.6	12.4	14.8	17.1	18.2
Bankfull Width (W_{bkf}) [ft]	8.2	5.1	6.8	8.4	9.3	10.5	12.0	13.3	13.9
Bankfull Mean Depth (D_{bkf}) [ft]	0.8	0.8	1.0	1.2	1.3	1.2	1.2	1.3	1.3
Width/Depth Ratio (W_{bkf}/D_{bkf})	10.6	6.4	6.9	7.3	7.5	9.1	9.9	10.5	10.8
Bankfull Maximum Depth (D_{mbkf}) [ft]	1.1	--	--	--	--	--	--	--	--
Pool Width (W_{pool}) [ft]	11.7	--	--	--	--	11.6	12.9	14.1	14.6
Pool Width Ratio (W_{pool}/W_{bkf})	1.4	--	--	--	--	1.1	1.1	1.1	1.1
Maximum Pool Depth (D_{pmax}) [ft]	2.2	--	--	--	--	--	--	--	--
Pool Depth Ratio (D_{pmax}/D_{bkf})	2.8	--	--	--	--	--	--	--	--
Floodprone Area (W_{FPA}) [ft]	105	--	--	--	--	--	--	--	--
Entrenchment Ratio (W_{FPA}/W_{bkf})	12.8	--	--	--	--	--	--	--	--
Bank Height Ratio	1.0	--	--	--	--	--	--	--	--
PATTERN									
Meander Belt Width (W_{belt}) [ft]	19 (12-23)	--	--	--	--	29.2	33.3	36.9	38.7
Meander Width Ratio (W_{belt}/W_{bkf})	2.3 (1.5-2.8)	--	--	--	--	--	--	--	--
Meander Length (L_M) [ft]	45 (31-61)	--	--	--	--	61.1	77.9	94.1	102.7
Meander Length Ratio (L_M/W_{bkf})	5.5 (3.8-7.5)	--	--	--	--	--	--	--	--
Radius of Curvature (R_C) [ft]	16 (10-39)	--	--	--	--	13.8	18.1	22.5	24.8
Radius of Curvature Ratio (R_C/W_{bkf})	2 (1.2-4.8)	--	--	--	--	--	--	--	--
Channel Sinuosity (SIN)	1.17	--	--	--	--	--	--	--	--
PROFILE									
Average Water Surface Slope (S_{ws})	0.014	--	--	--	--	--	--	--	--
Valley Slope (S_{valley}) [ft/ft/]	0.016	--	--	--	--	--	--	--	--
Pool Length (L_{pool}) [ft]	13 (9-19)	--	--	--	--	18.9	20.6	22.0	22.7
Pool to Pool Spacing (L_{p-p}) [ft]	21 (14-32)	--	--	--	--	38.8	42.8	46.1	47.8
SUBSTRATE	Course Gravel	--	--	--	--	--	--	--	--
D50	17.3	--	--	--	--	--	--	--	--
D84	57.9	--	--	--	--	--	--	--	--
STREAM TYPE	**E4**	**--**	**--**	**--**	**--**	**--**	**--**	**--**	**--**

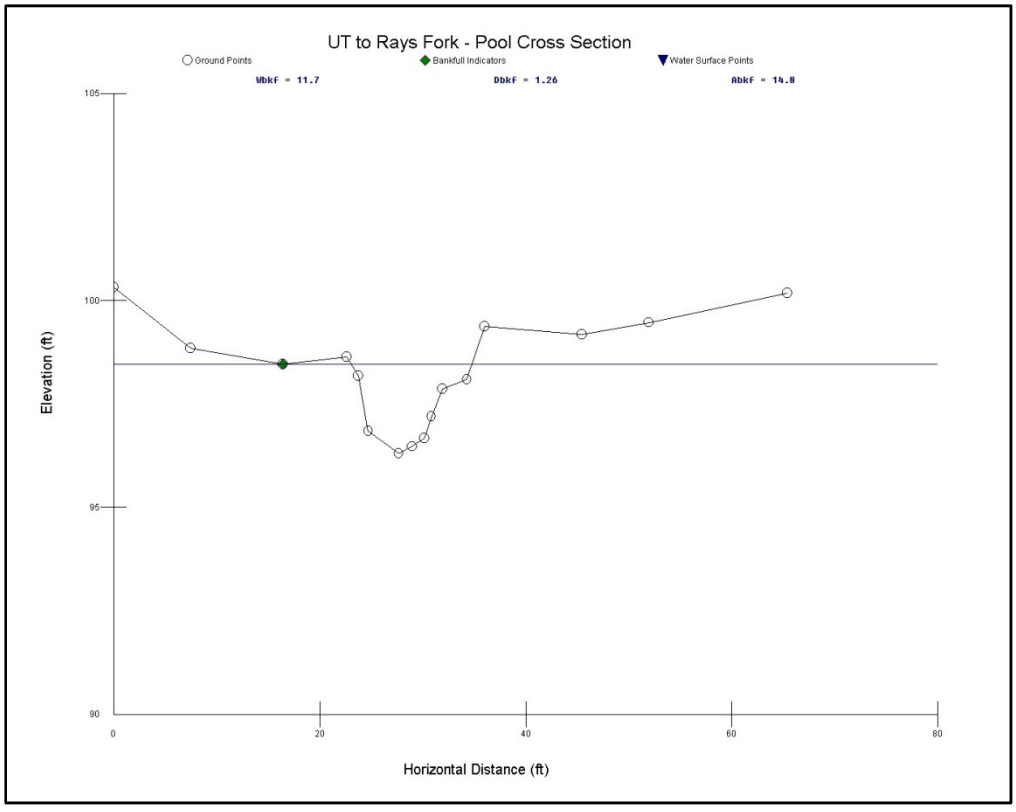
Existing and Proposed Stream Geometry and Classification

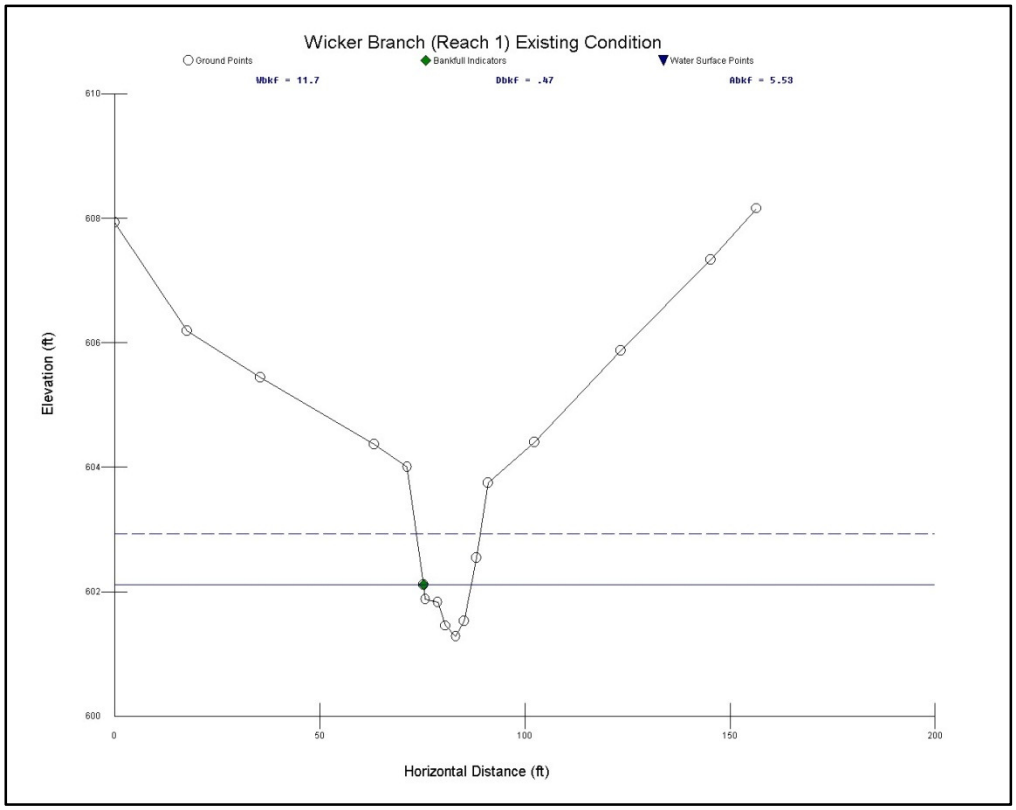
ATTRIBUTE (dimensions in feet)	Existing Conditions					Proposed Conditions			
	Wicker Branch (Reach 1)	Wicker Branch (Reach 2)	Wicker Branch (Reach 3)	UT to Wicker Branch (Reaches 4)	UT to Wicker Branch (Reach 5)	Wicker Branch (Reach 1) (Sta. 00+00-07+07)	Wicker Branch (Reach 2) (Sta. 07+07-23+60)	Wicker Branch (Reach 3) (Sta. 23+60-28+30)	UT to Wicker Branch (Reach 5) (Sta. 08-33-14+79)
Drainage Area (sq. mi.)	0.27	0.45	0.57	0.13	0.14	0.27	0.45	0.57	0.14
DIMENSION (range)									
Bankfull Area (A_{bkf})	5.5	10.5--11.7	14.1	5.4	5.4	5.5	10.5	14.1	5.5
Total Channel Area ($A_{channel}$)	31.2	14.8-31.4	35.2	5.8	18.1	--	--	--	--
Bankfull Width (W_{bkf})	11.7	10.8-13.1	10.0	9.6	8.6	6.0	8.0	10.0	6.0
Bankfull Mean Depth (D_{bkf})	0.5	0.9-1.0	1.4	0.6	0.6	0.9	1.3	1.4	0.9
Width/Depth Ratio (W_{bkf}/D_{bkf})	24.9	11.0-14.7	7.0	17.2	13.7	6.5	6.1	7.1	6.5
Bankfull Maximum Depth (D_{mbkf})	0.8	1.3-1.5	1.9	0.8	0.9	1.2	1.7	1.8	1.2
Pool Width (W_{pool})	The existing stream channel does not display riffle-pool sequencing due to historic dredging and straightening.					7.5	9.5	12.0	7.5
Pool Width Ratio (W_{pool}/W_{bkf})						1.3	1.2	1.2	1.3
Maximum Pool Depth (D_{pmax})						2.0	2.8	3.0	2.0
Pool Depth Ratio (D_{pmax}/D_{bkf})						2.2	2.2	2.1	2.2
Pool Area (A_{bkfp})						9.9	17.0	20.9	9.9
Pool Area Ratio (A_{bkfp}/A_{bkf})						1.3	1.6	1.5	1.3
Floodprone Area (W_{FPA})	15.6	30.3-126.2	11.9	21.6	12.4	25-35	35-60	40-70	20-30
Entrenchment Ratio (W_{FPA}/W_{bkf})	1.3	2.3-11.7	1.2	2.2	1.4	4.2-5.8	4.3-7.5	4.0-7.0	3.3-5.0
Bank Height Ratio	2.6	1.3-1.8	2.0	1.0	2.3	1.0	1.0	1.0	1.0
PATTERN mean (range)									
Meander Belt Width (W_{belt})	The existing stream channel does not display riffle-pool sequencing due to historic dredging and straightening.					19 (12-26)	33 (16-50)	41 (23-57)	20 (13-28)
Belt Width Ratio (W_{belt}/W_{bkf})						3.1 (2.0-4.4)	3.7 (1.9-5.7)	4.1 (2.3-5.7)	3.3 (2.1-4.6)
Meander Length (L_M)						53 (36-73)	104 (61-148)	127 (112-142)	55 (46-81)
Meander Length Ratio (L_M/W_{bkf})						8.9 (5.9-12.1)	13 (7.6-18.5)	12.7 (11.2-14.2)	9.2 (7.7-13.5)
Radius of Curvature (R_C)						18 (12-39)	38 (21-67)	37 (30-40)	17 (12-30)
Radius of Curv. Ratio (R_C/W_{bkf})						2.9 (1.9-6.5)	4.8 (2.6-8.4)	3.7 (3.0-4.0)	2.8 (2.0-5.0)
Channel Sinuosity (SIN)	1.0	1.0	1.2	1.0	1.0	1.20	1.16	1.23	1.18
PROFILE mean (range)									
Average Water Surface Slope	0.0090	0.0090	0.0085	0.0110	0.0124	0.0079	0.0085	0.0083	0.0110
Valley Slope (S_{valley})	0.0095	0.0098	0.0102	0.0165	0.0130	0.0095	0.0098	0.0102	0.0130
Pool Length (L_{pool})	NA	NA	NA	NA	NA	13 (9-19)	22 (5-40)	24 (5-50)	12 (4-27)
Pool to Pool Spacing (L_{p-p})	NA	NA	NA	NA	NA	30 (14-65)	52 (30-80)	61 (30-95)	30 (20-45)
SUBSTRATE d50	Silt	Course Gravel / Bedrock	Medium Gravel	Very Coarse Gravel	Very Coarse Gravel	Coarse Gravel	Coarse Gravel	Coarse Gravel	Coarse Gravel
STREAM TYPE	**F6**	**E1/C1**	**G4**	**B4**	**B4**	**E4**	**E4**	**E4**	**E4**

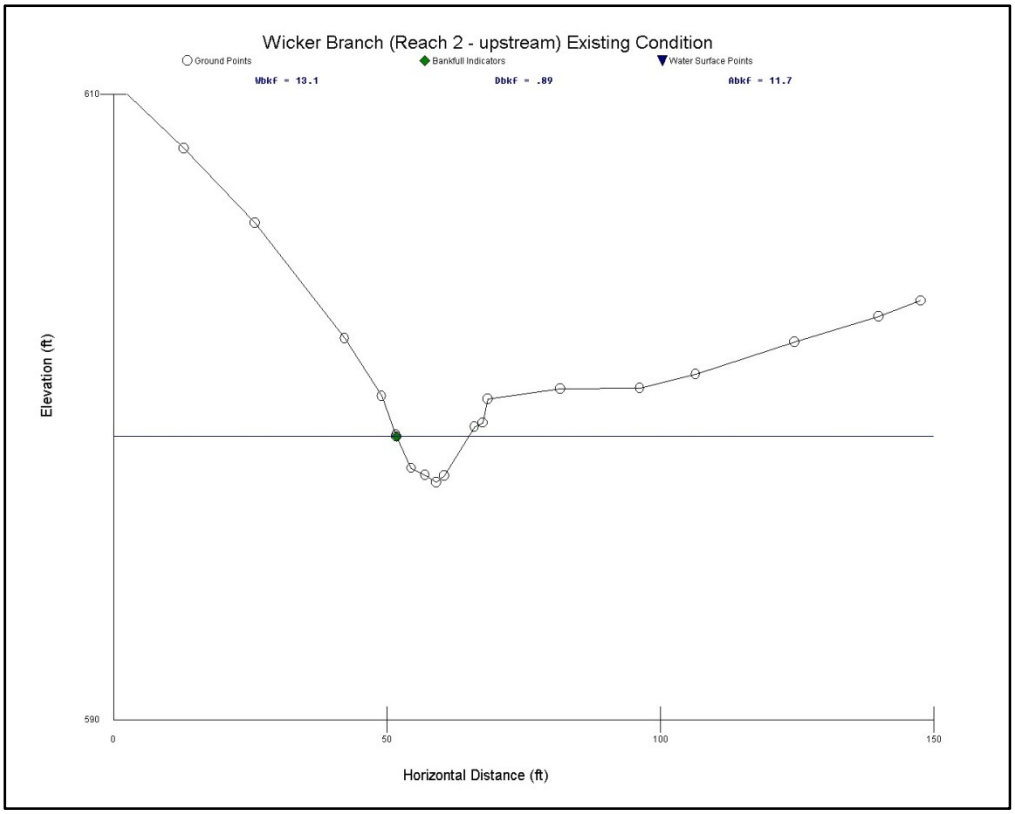

UT to Rays Fork: Plan View
2+84
2+50
2+00
1+50
1+00
0+50
0+00
Flow Direction
Pool
Cross-Section
Riffle
Cross-Section
Left Bank
Right Bank
Thalweg
Cross-Section
0
25
50
Feet

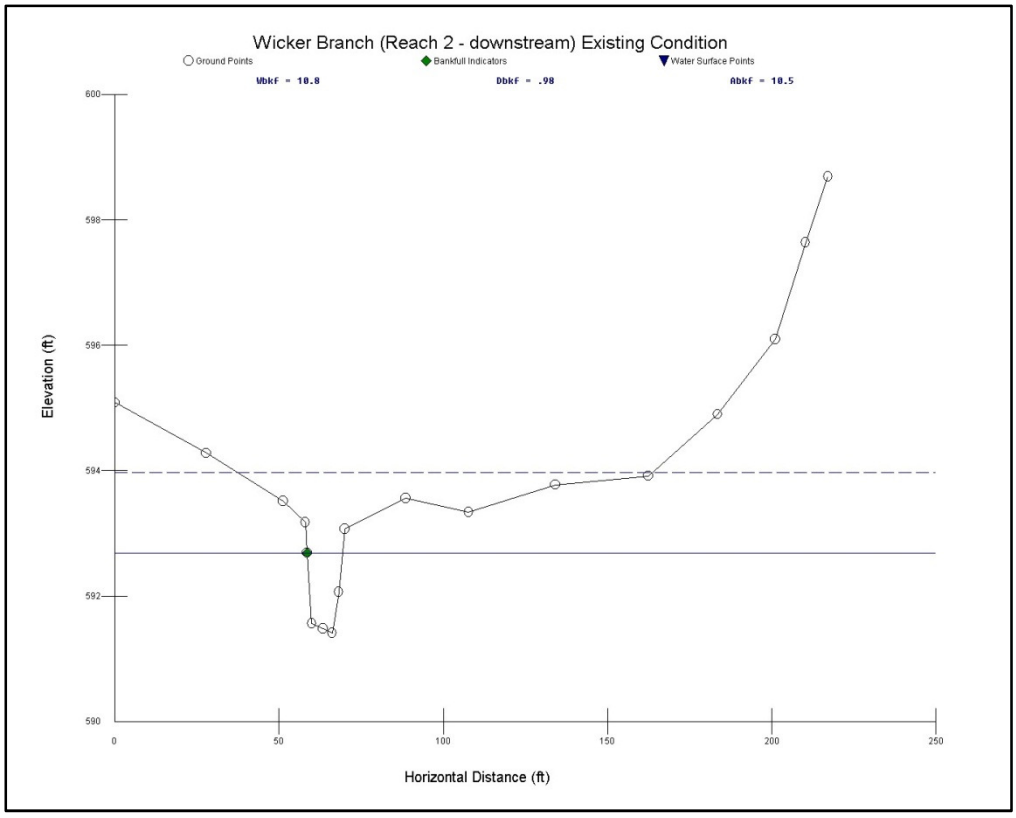

UT to Rays Fork - Profile
Elevation (ft)
105
100
95
90
0
50
100
150
200
250
300
Distance along stream (ft)
CH
WS
BKF
LB
RB
P3
P4

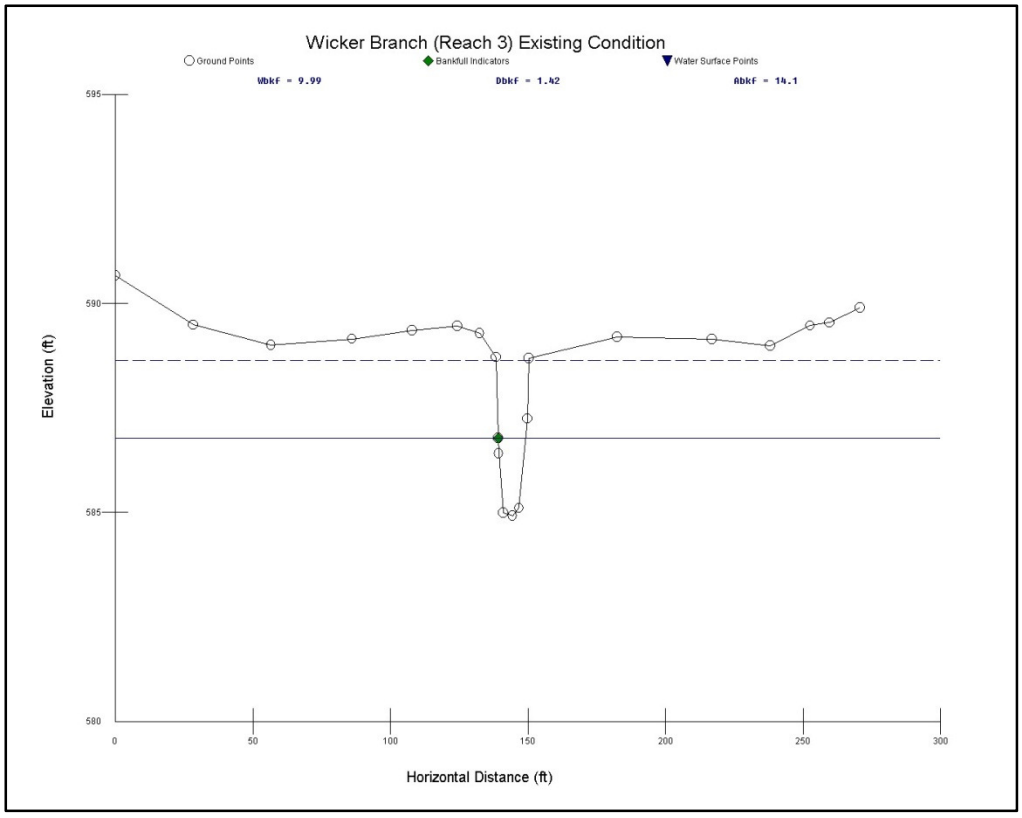

UT to Rays Fork: Riffle Cross-Section
Ground Points
Bankfull Indicators
Water Surface Points
Wbkf = 8.17
Dbkf = .77
Abkf = 6.28
105
100
95
90
Elevation (ft)
0
20
40
60
80
Horizontal Distance (ft)

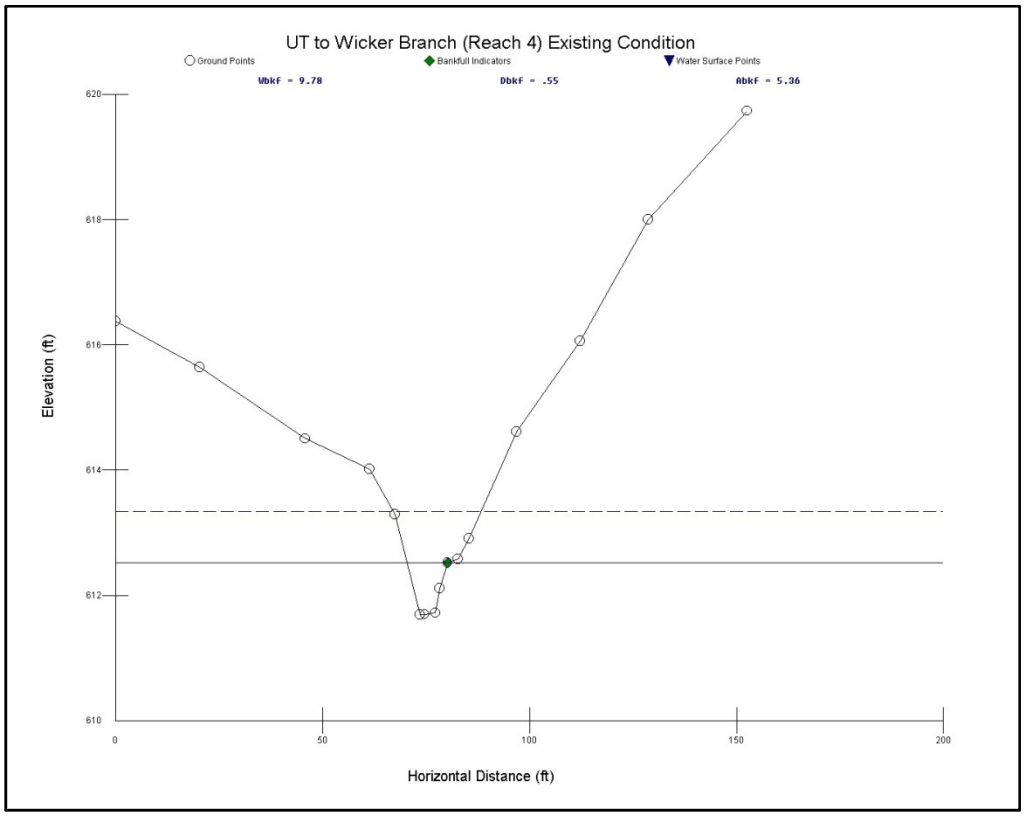

UT to Rays Fork - Pool Cross Section
Ground Points
Bankfull Indicators
Water Surface Points
Wbkf = 11.7
Dbkf = 1.26
Abkf = 14.8
105
100
95
90
Elevation (ft)
0
20
40
60
80
Horizontal Distance (ft)

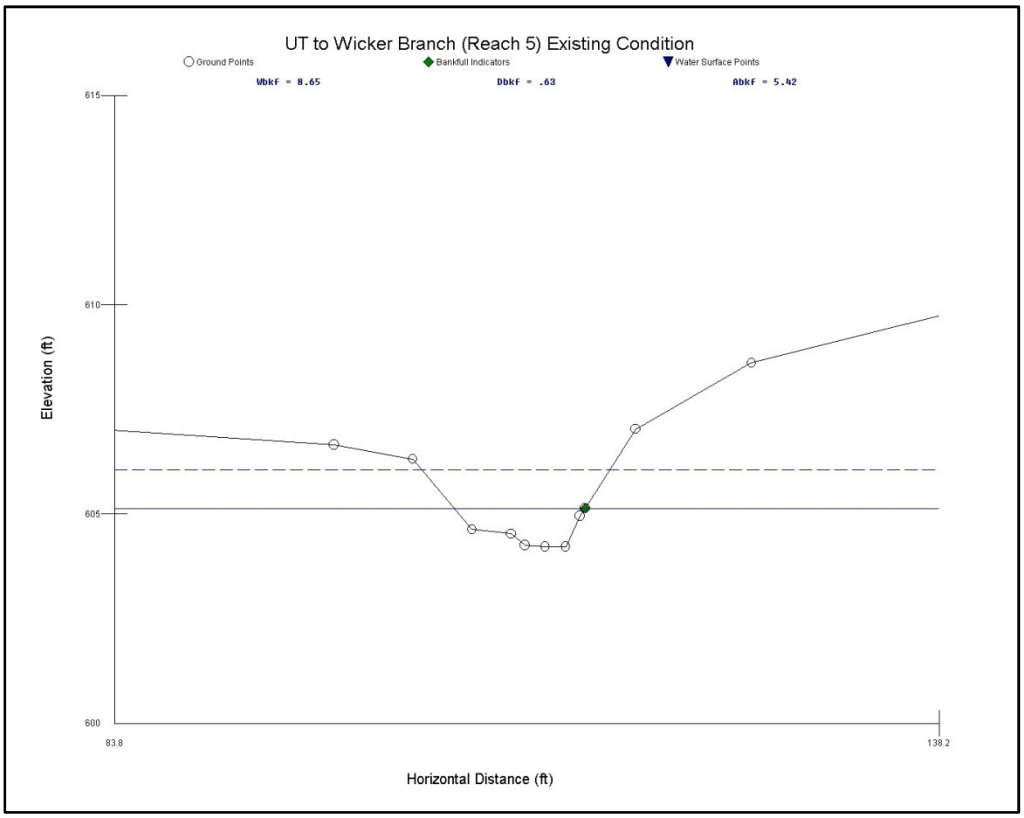

Wicker Branch (Reach 1) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
WbkF = 11.7
DbkF = .47
AbkF = 5.53
610
608
606
604
602
600
Elevation (ft)
0
50
100
150
200
Horizontal Distance (ft)

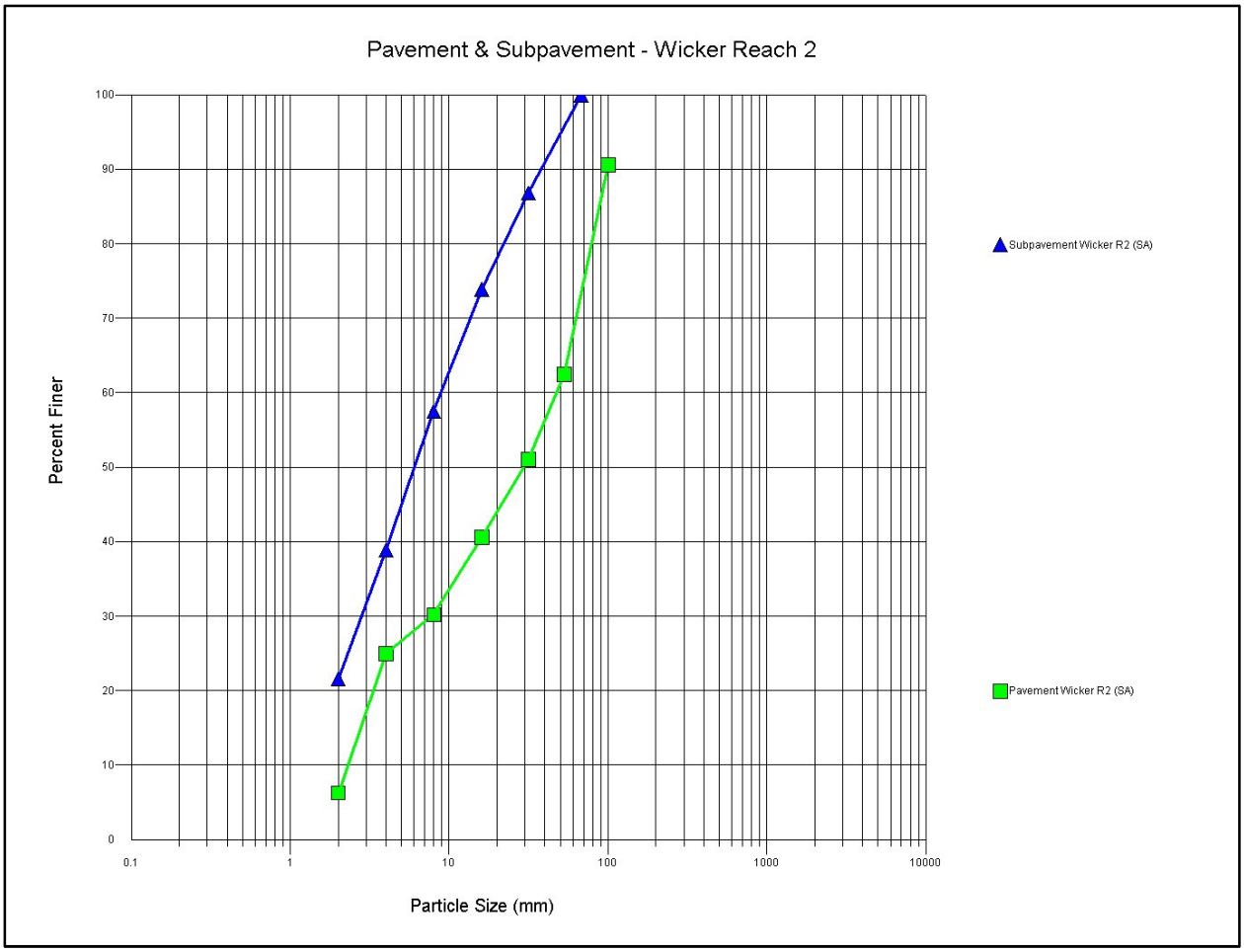

Wicker Branch (Reach 2 - upstream) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
WbkF = 13.1
DbkF = .89
AbkF = 11.7
610
590
Elevation (ft)
0
50
100
150
Horizontal Distance (ft)


Wicker Branch (Reach 2 - downstream) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
WbkF = 10.8
DbkF = .98
AbkF = 10.5
Elevation (ft)
600
598
596
594
592
590
0
50
100
150
200
250
Horizontal Distance (ft)


Wicker Branch (Reach 3) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
WbkF = 9.99
DbkF = 1.42
AbkF = 14.1
Elevation (ft)
595
590
585
580
0
50
100
150
200
250
300
Horizontal Distance (ft)


UT to Wicker Branch (Reach 4) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
Wbkf = 9.78
Dbkf = .55
Abkf = 5.36
620
618
616
614
612
610
Elevation (ft)
0
50
100
150
200
Horizontal Distance (ft)


UT to Wicker Branch (Reach 5) Existing Condition
Ground Points
Bankfull Indicators
Water Surface Points
Wbkf = 8.65
Dbkf = .63
Abkf = 5.42
615
610
605
600
Elevation (ft)
83.8
138.2
Horizontal Distance (ft)



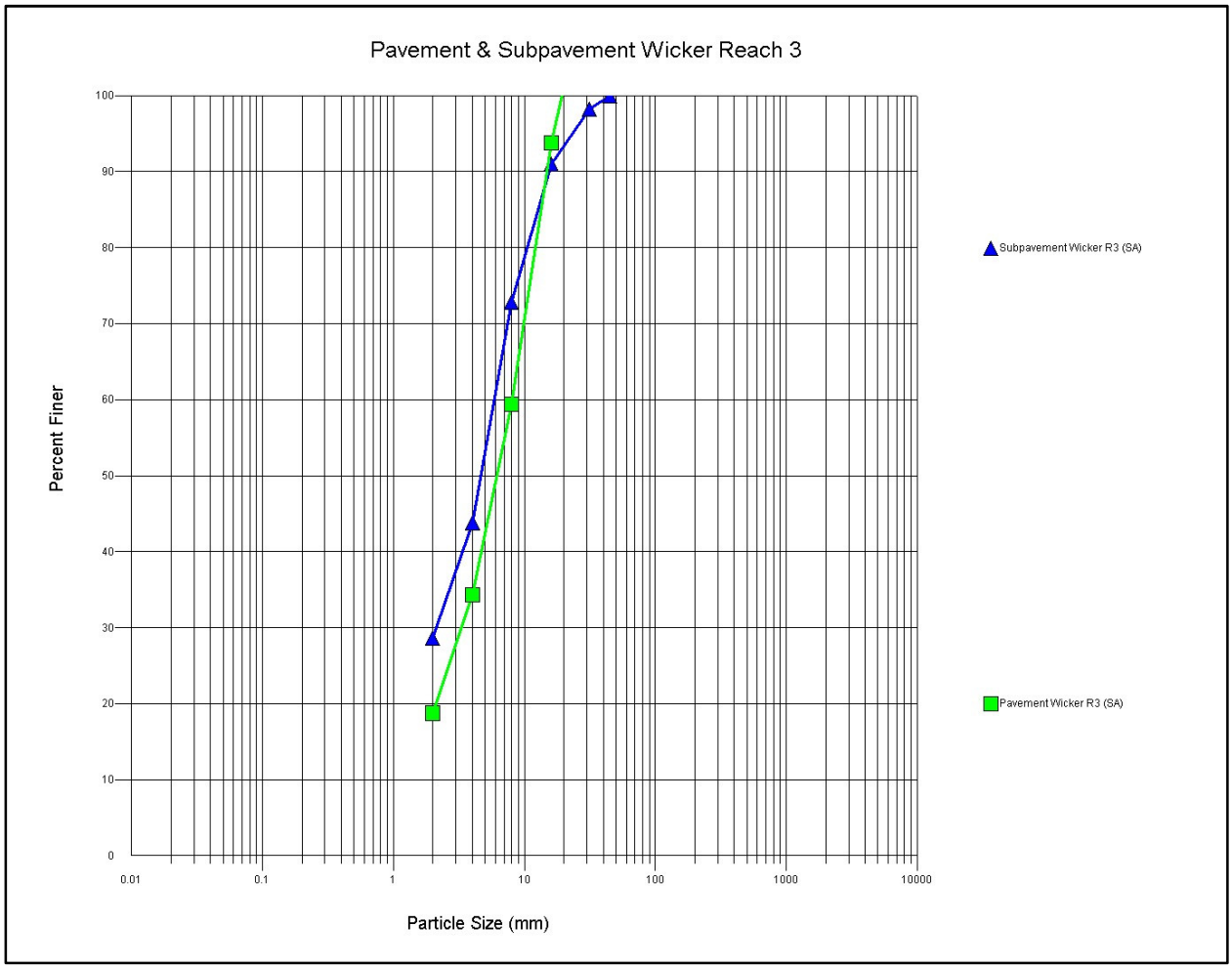
Wicker Branch (Reach 2)

Sub-Pavement Channel Material

D16 (mm)	0
D35 (mm)	4
D50 (mm)	6
D84 (mm)	28
D95 (mm)	54
D100 (mm)	68

Pavement Channel Material

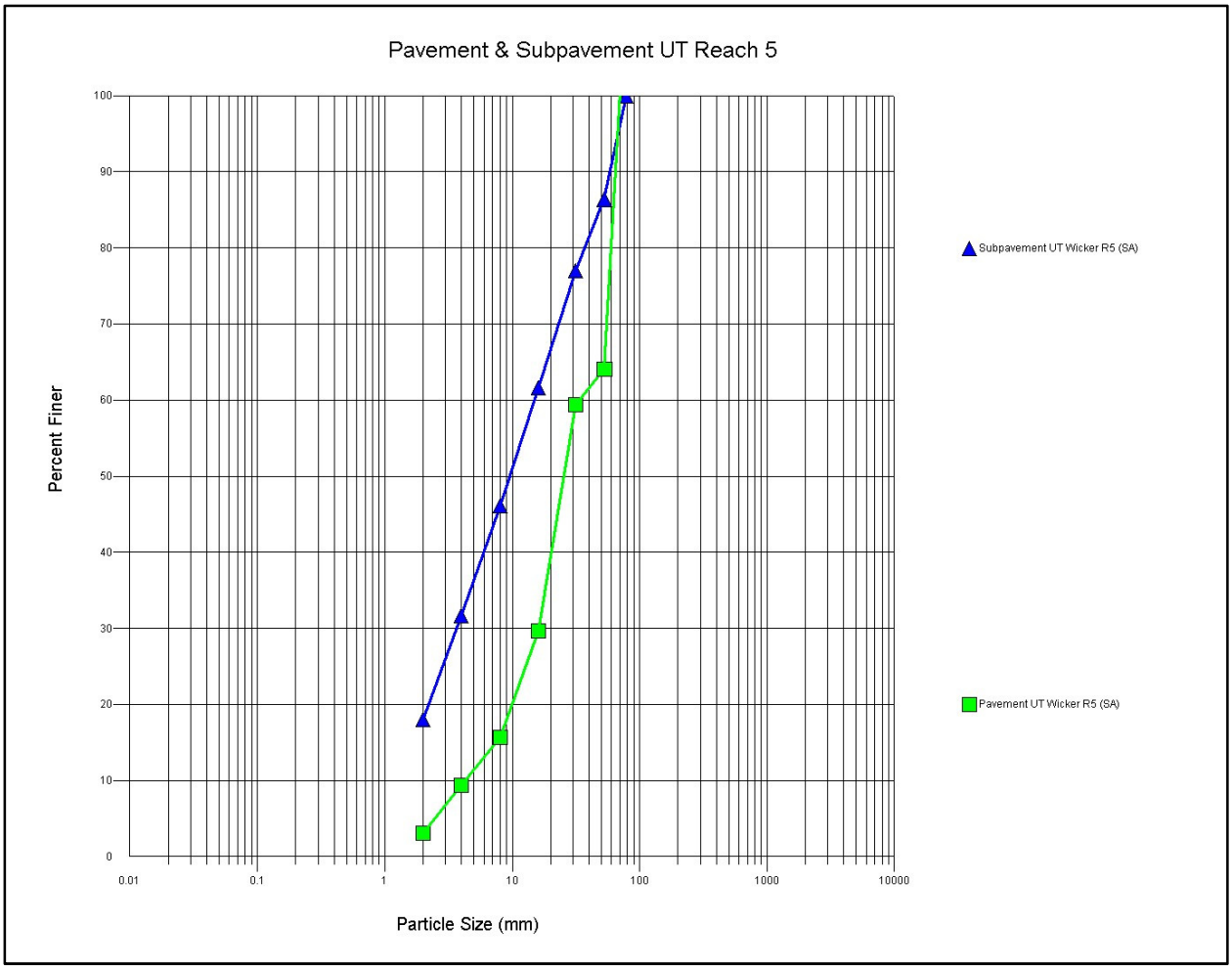
D16 (mm)	3
D35 (mm)	9
D50 (mm)	23
D84 (mm)	76
D95 (mm)	92
D100 (mm)	100



Wicker Branch (Reach 3)

Sub-Pavement Channel Material	
D16 (mm)	0
D35 (mm)	3
D50 (mm)	5
D84 (mm)	13
D95 (mm)	25
D100 (mm)	45

Pavement Channel Material	
D16 (mm)	2
D35 (mm)	5
D50 (mm)	8
D84 (mm)	20
D95 (mm)	30
D100 (mm)	34



UT to Wicker Branch (Reach 5)

Sub-Pavement Channel Material	
D16 (mm)	0
D35 (mm)	3
D50 (mm)	5
D84 (mm)	13
D95 (mm)	25
D100 (mm)	45

Pavement Channel Material	
D16 (mm)	2
D35 (mm)	5
D50 (mm)	8
D84 (mm)	20
D95 (mm)	30
D100 (mm)	86

Channel Stability (BEHI/NBS)

The prediction of streambank erosion rates was performed using the Bank Assessment for Non-Point source Consequences of Sediment (BANCS) model (Rosgen 1996, 2001). The BANCS model utilizes two bank erosion estimation tools: The Bank Erosion Hazard Index (BEHI) and Near-bank Stress (NBS). The BANCS model evaluates bank characteristics and flow distribution to estimate erosion rates based on bank height, length of similar conditions, and predicted erosion rates derived from BEHI and NBS relationships. BEHI and NBS were performed along both banks of Wicker Branch and the UT to Wicker Branch to estimate annual erosion rates at the Site. The predicted erosion rates are presented in the following tables and depicted on the Channel Stability Figure.

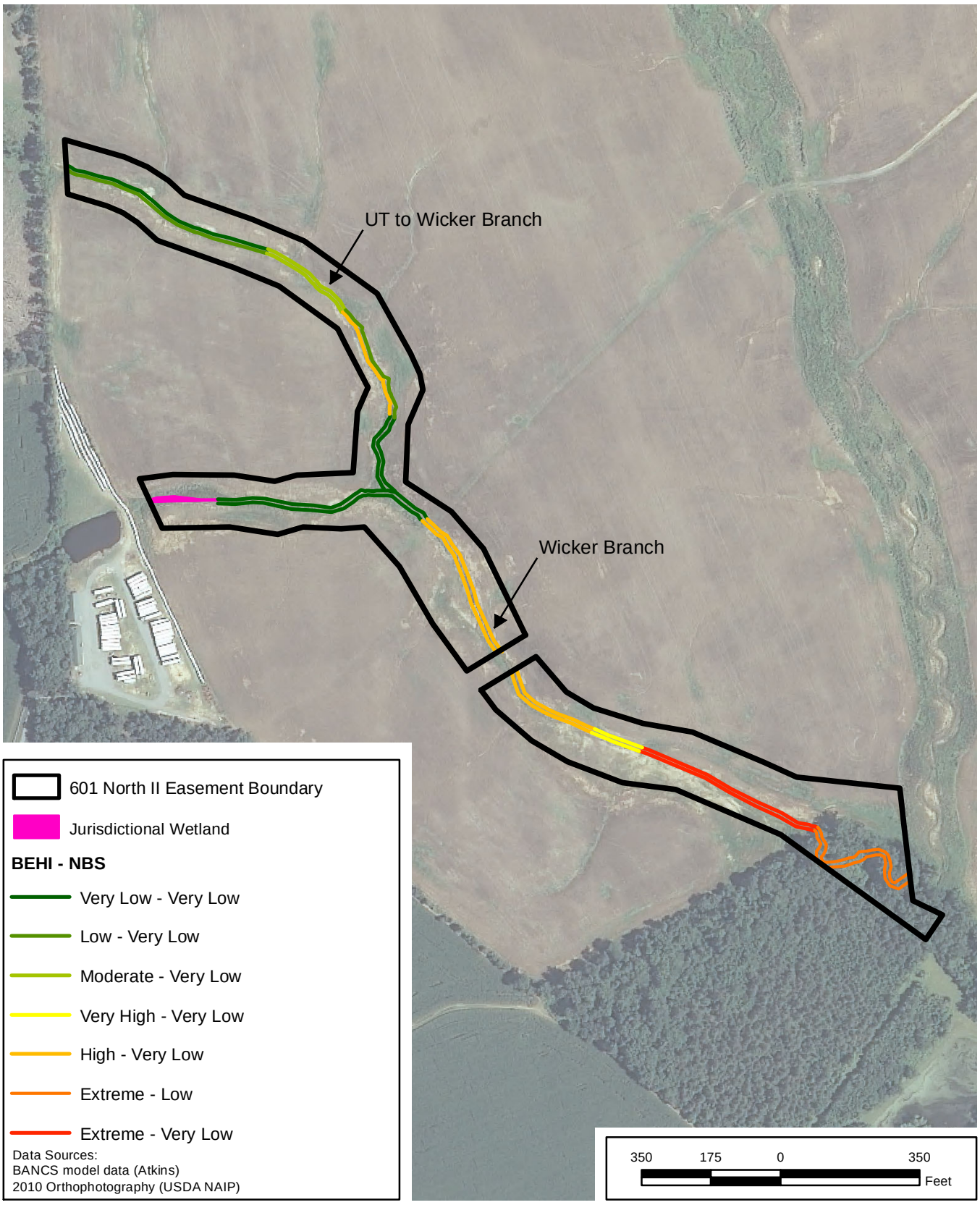
Streambank Erosion Prediction – Wicker Branch

Station (ft)	BEHI Rating	NBS Rating	Bank Erosion Rate	Bank Length (ft)	Study Bank Height (ft)	Erosion Subtotal (ft^3/yr)	Erosion Rate (tons/yr/ft)
05+59 RB	Very Low	Very Low	0.002	559	1.5	1.98	0.00013
11+73 RB	High	Very Low	0.150	614[1]	1.7	156.67	0.01228
13+02 RB	Very High	Very Low	0.170	129	1.7	37.19	0.01391
17+89 RB	Extreme	Very Low	0.170	487	3.0	248.17	0.02456
21+91 RB	Extreme	Low	0.420	402	4.0	675.86	0.08089
05+59 LB	Very Low	Very Low	0.002	559	2.0	2.93	0.00019
11+73 LB	High	Very Low	0.150	614[1]	2.2	202.75	0.01589
13+02 LB	Very High	Very Low	0.170	129	1.7	37.19	0.01391
17+89 LB	Extreme	Very Low	0.170	487	2.5	206.81	0.02046
21+91 LB	Extreme	Low	0.420	402	4.0	675.86	0.08089
						Total Erosion Rate (ft^3/yr)	2,244.7
						Total Erosion Rate (tons/yr)	108.08

[1]Study bank length does not include the portion of the stream within the existing culvert

Streambank Erosion Prediction – UT to Wicker Branch

Station (ft)	BEHI Rating	NBS Rating	Bank Erosion Rate	Bank Length (ft)	Study Bank Height (ft)	Erosion Subtotal (ft^3/yr)	Erosion Rate (tons/yr/ft)
05+55 RB	Low	Very Low	0.018	555	1.4	13.99	0.00121
07+00 RB	Moderate	Very Low	0.100	145	1.8	26.10	0.00867
08+05 RB	Moderate	Very Low	0.100	105	1.0	10.50	0.00481
11+10 RB	High	Very Low	0.150	305	2.0	91.50	0.01444
13+39 RB	Very Low	Very Low	0.002	229	0.5	0.23	0.00005
05+55 LB	Very Low	Very Low	0.002	555	0.8	0.89	0.00008
07+00 LB	Moderate	Very Low	0.100	145	1.4	20.30	0.00674
08+05 LB	Moderate	Very Low	0.100	105	1.0	10.50	0.00481
11+10 LB	Low	Very Low	0.018	305	0.8	4.39	0.00069
13+39 LB	Very Low	Very Low	0.002	229	0.9	0.41	0.00009
						Total Erosion Rate (ft^3/yr)	178.8
						Total Erosion Rate (tons/yr)	8.61



Prepared By: EBX

Prepared For: Ecosystem Enhancement Program

CHANNEL STABILITY: BEHI AND NBS

601 NORTH II STREAM RESTORATION SITE

UNION COUNTY, NORTH CAROLINA

Dwn By:	MCG
Ckd By:	JWG
Date:	JAN 2012
Project No.:	100024976

N

HEC-RAS Plan: Wicker Prop River: Wicker Branch Reach: Wicker Branch

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Chnl	Shear Chan	Power Chan
			(cfs)	(ft)	(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
Wicker Branch	15	BKF	19.60	606.00	607.21	2.87	0.62	1.78
Wicker Branch	15	2-yr	24.10	606.00	607.36	2.83	0.57	1.62
Wicker Branch	15	5-yr	89.80	606.00	608.06	3.72	0.84	3.12
Wicker Branch	15	10-yr	116.70	606.00	608.23	3.86	0.88	3.40
Wicker Branch	15	100-yr	248.10	606.00	608.82	4.38	1.04	4.53
Wicker Branch	14	BKF	19.60	604.93	606.05	3.55	0.38	1.35
Wicker Branch	14	2-yr	24.10	604.93	606.10	4.11	0.50	2.06
Wicker Branch	14	5-yr	89.80	604.93	607.13	5.05	0.60	3.03
Wicker Branch	14	10-yr	116.70	604.93	607.27	5.51	0.70	3.85
Wicker Branch	14	100-yr	248.10	604.93	607.73	7.16	1.10	7.87
Wicker Branch	13	BKF	19.60	603.82	605.11	3.29	0.32	1.05
Wicker Branch	13	2-yr	24.10	603.82	605.37	3.07	0.26	0.79
Wicker Branch	13	5-yr	89.80	603.82	606.09	5.22	0.63	3.30
Wicker Branch	13	10-yr	116.70	603.82	606.28	5.57	0.70	3.87
Wicker Branch	13	100-yr	248.10	603.82	607.01	6.19	0.78	4.83
Wicker Branch	12	BKF	19.60	602.92	603.94	4.06	0.50	2.03
Wicker Branch	12	2-yr	29.80	602.92	604.11	5.12	0.76	3.89
Wicker Branch	12	5-yr	93.20	602.92	605.22	5.49	0.70	3.82
Wicker Branch	12	10-yr	121.40	602.92	605.40	5.91	0.78	4.64
Wicker Branch	12	100-yr	262.20	602.92	605.95	7.78	1.26	9.82
Wicker Branch	11	BKF	19.60	601.05	602.27	3.25	0.31	1.00
Wicker Branch	11	2-yr	29.80	601.05	602.77	3.23	0.27	0.89
Wicker Branch	11	5-yr	93.20	601.05	603.43	5.37	0.67	3.62
Wicker Branch	11	10-yr	121.40	601.05	603.60	5.84	0.78	4.52
Wicker Branch	11	100-yr	262.20	601.05	604.26	6.87	0.98	6.77
Wicker Branch	9	BKF	48.50	597.75	599.77	4.80	0.62	2.98
Wicker Branch	9	2-yr	72.80	597.75	600.03	5.91	0.91	5.36
Wicker Branch	9	5-yr	127.30	597.75	600.81	5.71	0.74	4.24
Wicker Branch	9	10-yr	170.70	597.75	601.05	6.15	0.83	5.10
Wicker Branch	9	100-yr	422.70	597.75	601.86	8.35	1.39	11.57
Wicker Branch	8	BKF	48.50	596.55	598.57	3.83	0.39	1.48
Wicker Branch	8	2-yr	72.80	596.55	598.96	4.14	0.41	1.71
Wicker Branch	8	5-yr	127.30	596.55	599.41	4.62	0.48	2.19
Wicker Branch	8	10-yr	170.70	596.55	599.68	4.84	0.50	2.43
Wicker Branch	8	100-yr	422.70	596.55	600.77	5.43	0.56	3.04
Wicker Branch	7	BKF	48.50	595.19	597.27	4.55	0.55	2.51
Wicker Branch	7	2-yr	72.80	595.19	597.57	5.50	0.77	4.22
Wicker Branch	7	5-yr	127.30	595.19	598.18	6.03	0.82	4.96
Wicker Branch	7	10-yr	170.70	595.19	598.45	6.51	0.92	5.98
Wicker Branch	7	100-yr	422.70	595.19	599.37	8.76	1.49	13.08
Wicker Branch	6	BKF	48.50	593.90	595.28	5.11	0.76	3.87
Wicker Branch	6	2-yr	72.80	593.90	595.60	5.44	0.80	4.36
Wicker Branch	6	5-yr	127.30	593.90	596.16	5.99	0.85	5.10
Wicker Branch	6	10-yr	170.70	593.90	596.39	6.85	1.06	7.29
Wicker Branch	6	100-yr	422.70	593.90	597.61	8.43	1.36	11.43

HEC-RAS Plan: Wicker Prop River: Wicker Branch Reach: Wicker Branch (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Chnl	Shear Chan	Power Chan
			(cfs)	(ft)	(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
Wicker Branch	5	BKF	48.50	591.88	593.42	3.63	0.36	1.31
Wicker Branch	5	2-yr	72.80	591.88	593.76	4.02	0.43	1.72
Wicker Branch	5	5-yr	127.30	591.88	593.98	5.77	0.83	4.81
Wicker Branch	5	10-yr	170.70	591.88	594.31	5.71	0.76	4.34
Wicker Branch	5	100-yr	422.70	591.88	595.15	6.96	0.98	6.84
Wicker Branch	4	BKF	48.50	589.37	591.44	4.02	0.42	1.70
Wicker Branch	4	2-yr	72.80	589.37	591.86	4.36	0.46	2.01
Wicker Branch	4	5-yr	127.30	589.37	592.35	4.11	0.38	1.54
Wicker Branch	4	10-yr	170.70	589.37	592.46	4.86	0.52	2.50
Wicker Branch	4	100-yr	422.70	589.37	592.90	7.70	1.22	9.41
Wicker Branch	3	BKF	48.50	587.44	589.56	4.49	0.53	2.39
Wicker Branch	3	2-yr	72.80	587.44	589.93	5.29	0.70	3.70
Wicker Branch	3	5-yr	127.30	587.44	590.55	6.35	0.93	5.93
Wicker Branch	3	10-yr	170.70	587.44	591.04	5.67	0.69	3.94
Wicker Branch	3	100-yr	422.70	587.44	592.50	3.12	0.18	0.57
Wicker Branch	2	BKF	69.20	585.91	588.86	3.22	0.25	0.80
Wicker Branch	2	2-yr	113.90	585.91	589.56	3.25	0.23	0.73
Wicker Branch	2	5-yr	206.70	585.91	590.50	3.20	0.20	0.63
Wicker Branch	2	10-yr	249.10	585.91	590.77	3.29	0.20	0.67
Wicker Branch	2	100-yr	579.00	585.91	592.34	3.34	0.19	0.62
Wicker Branch	1	BKF	105.20	583.83	586.15	4.69	1.35	6.31
Wicker Branch	1	2-yr	165.80	583.83	586.60	5.50	1.71	9.41
Wicker Branch	1	5-yr	324.60	583.83	587.41	6.85	2.38	16.30
Wicker Branch	1	10-yr	393.30	583.83	587.68	7.26	2.60	18.85
Wicker Branch	1	100-yr	866.20	583.83	588.84	8.20	2.98	24.42

HEC-RAS Plan: UT Prop01 River: UT to Wicker Reach: UT

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Chnl	Shear Chan	Power Chan
			(cfs)	(ft)	(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
UT	23	BKF	9.60	620.59	622.56	0.66	0.02	0.01
UT	23	2-yr	18.00	620.59	622.74	1.10	0.05	0.06
UT	23	5-yr	40.70	620.59	623.05	2.06	0.19	0.38
UT	23	10-yr	51.00	620.59	623.14	2.44	0.26	0.63
UT	23	100-yr	101.90	620.59	623.51	3.91	0.62	2.43
UT	22.4	BKF	9.60	621.00	622.55	0.30	0.00	0.00
UT	22.4	2-yr	18.00	621.00	622.72	0.49	0.01	0.00
UT	22.4	5-yr	40.70	621.00	623.00	0.88	0.02	0.02
UT	22.4	10-yr	51.00	621.00	623.09	1.05	0.03	0.04
UT	22.4	100-yr	101.90	621.00	623.41	1.70	0.08	0.14
UT	22.2		Inl Struct					
UT	22	BKF	9.60	618.00	618.56	3.61	0.62	2.23
UT	22	2-yr	18.00	618.00	618.79	4.14	0.74	3.06
UT	22	5-yr	40.70	618.00	619.25	4.63	0.78	3.60
UT	22	10-yr	51.00	618.00	619.35	5.20	0.95	4.92
UT	22	100-yr	101.90	618.00	619.87	6.03	1.11	6.66
UT	21	BKF	9.60	615.89	616.46	2.61	0.28	0.73
UT	21	2-yr	18.00	615.89	616.66	3.28	0.40	1.32
UT	21	5-yr	40.70	615.89	616.92	4.97	0.85	4.21
UT	21	10-yr	51.00	615.89	617.09	5.01	0.81	4.08
UT	21	100-yr	101.90	615.89	617.57	6.00	1.01	6.07
UT	20	BKF	9.60	612.47	613.13	3.31	0.55	1.82
UT	20	2-yr	18.00	612.47	613.31	3.81	0.66	2.52
UT	20	5-yr	40.70	612.47	613.74	4.21	0.65	2.75
UT	20	10-yr	51.00	612.47	613.89	4.42	0.68	3.01
UT	20	100-yr	101.90	612.47	614.44	5.43	0.89	4.81
UT	19	BKF	9.60	610.93	612.19	1.58	0.09	0.14
UT	19	2-yr	18.00	610.93	612.54	2.04	0.13	0.27
UT	19	5-yr	40.70	610.93	613.10	2.76	0.22	0.60
UT	19	10-yr	51.00	610.93	613.29	2.95	0.24	0.71
UT	19	100-yr	101.90	610.93	613.96	3.56	0.32	1.13
UT	18	BKF	23.10	609.68	610.65	4.59	0.85	3.92
UT	18	2-yr	43.10	609.68	610.99	5.34	1.03	5.50
UT	18	5-yr	92.00	609.68	611.50	6.53	1.36	8.91
UT	18	10-yr	114.10	609.68	611.67	6.94	1.49	10.38
UT	18	100-yr	220.00	609.68	612.28	8.31	1.94	16.16
UT	17	BKF	23.10	604.47	605.96	3.75	0.46	1.71
UT	17	2-yr	43.10	604.47	606.41	4.68	0.64	3.01
UT	17	5-yr	92.00	604.47	606.97	5.49	0.79	4.34
UT	17	10-yr	114.10	604.47	607.11	5.74	0.85	4.86
UT	17	100-yr	220.00	604.47	607.53	7.22	1.26	9.10
UT	16	BKF	23.10	601.18	602.13	5.08	0.91	4.63

HEC-RAS Plan: UT Prop01 River: UT to Wicker Reach: UT (Continued)

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Vel Chnl	Shear Chan	Power Chan
			(cfs)	(ft)	(ft)	(ft/s)	(lb/sq ft)	(lb/ft s)
UT	16	2-yr	43.10	601.18	602.57	5.99	1.15	6.86
UT	16	5-yr	92.00	601.18	603.48	6.14	1.02	6.26
UT	16	10-yr	114.10	601.18	603.70	6.36	1.05	6.71
UT	16	100-yr	220.00	601.18	604.35	7.47	1.33	9.90

Planting Plan

PLANT COMMUNITY ASSOCIATION (Schafale and Weakley, 1990)		Stream-side Assemblage	Piedmont/Low Mountain Alluvial Forest	Dry-Mesic Oak Hickory Forest	Total
Area (acres)		2.0	3.6	6.1	11.7
Stem Target (per acre)		2722	1890[3]	680	--
SPECIES[1]					
Common Name	**Scientific Name**	**# planted (% total)**	**# planted (% total)**	**# planted (% total)**	**Total Stems Planted**
Silky Dogwood	*Cornus amomum*	544 (10)			544
Tag Alder	*Alnus serrulata*	544 (10)			544
Canada Elder	*Sambucus canadensis*	544 (10)			544
Southern Wild Raisin	*Viburnum nudum*	544 (10)			544
Switch Cane[2]	*Arundinaria tecta*	2178 (40)	2381 (35)		4559
Red Maple	*Acer rubrum*	163 (3)	340 (5)	207 (5)	710
Ironwood	*Carpinus caroliniana*	163 (3)	340 (5)		503
Box Elder	*Acer negundo*	163 (3)	340 (5)		503
River Birch	*Betula nigra*	163 (3)	340 (5)		503
Green Ash	*Fraxinus pennsylvanica*	109 (2)	680 (10)		789
American Sycamore	*Platanus occidentalis*	109 (2)	680 (10)		789
American Elm	*Ulmus americana*	109 (2)	680 (10)		789
Willow Oak	*Quercus phellos*	109 (2)	1021 (15)		1130
Blackgum	*Nyssa sylvatica*			830 (20)	830
Sourwood	*Oxydendrum arboretum*			830 (20)	830
Red Bud	*Cercis Canadensis*			830 (20)	830
Northern Red Oak	*Quercus rubra*			830 (20)	830
Mockernut Hickory	*Carya tomentosa*			207 (5)	207
Red Hickory	*Carya ovalis*			207 (5)	207
Pignut Hickory	*Carya glabra*			207 (5)	207
TOTAL		5442	6802	4148	16392

[1]: Some non-commercial species may not be locally available at the time of planting. With the exception of switch cane, the stem count for unavailable species should be distributed among other target elements based on the percent (%) distribution. One year of advance notice to forest nurseries may promote availability of some non-commercial species.

[2]: Transplants cane clumps, rhizome with culms (top half removed), or bare root switch cane rhizomes (12-18 inches in length, minimum of 4 internodes) shall be planted randomly within the planting areas at the density specified.

[3]: Tree species shall be planted at a density of 680 trees per acre (8x8 spacing). Switch cane shall be planted at a density of 1,210 plants per acre or the equivalent of 6x6 spacing within this planting zone.

14.6 Appendix D. Project Plan Sheets

This Page Intentionally Left Blank

PROJECT: 601 NORTH II STREAM RESTORATION

601 NORTH II STREAM RESTORATION

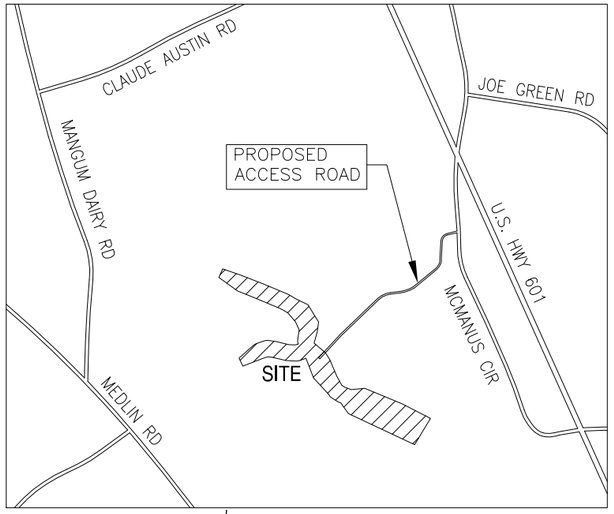
UNION COUNTY, NORTH CAROLINA

LOCATION:

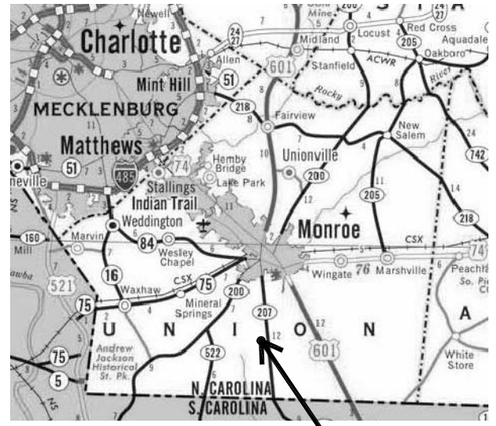
SITE IS LOCATED IN UNION COUNTY APPROXIMATELY 10 MILES SOUTHEAST OF MONROE, NEAR ROUTE 601. ACCESS TO SITE BY WAY OF GRAVEL/DIRT PATH OFF MCMANUS CIRCLE.

TYPE OF WORK: ***STREAM RESTORATION AND ENHANCEMENT***

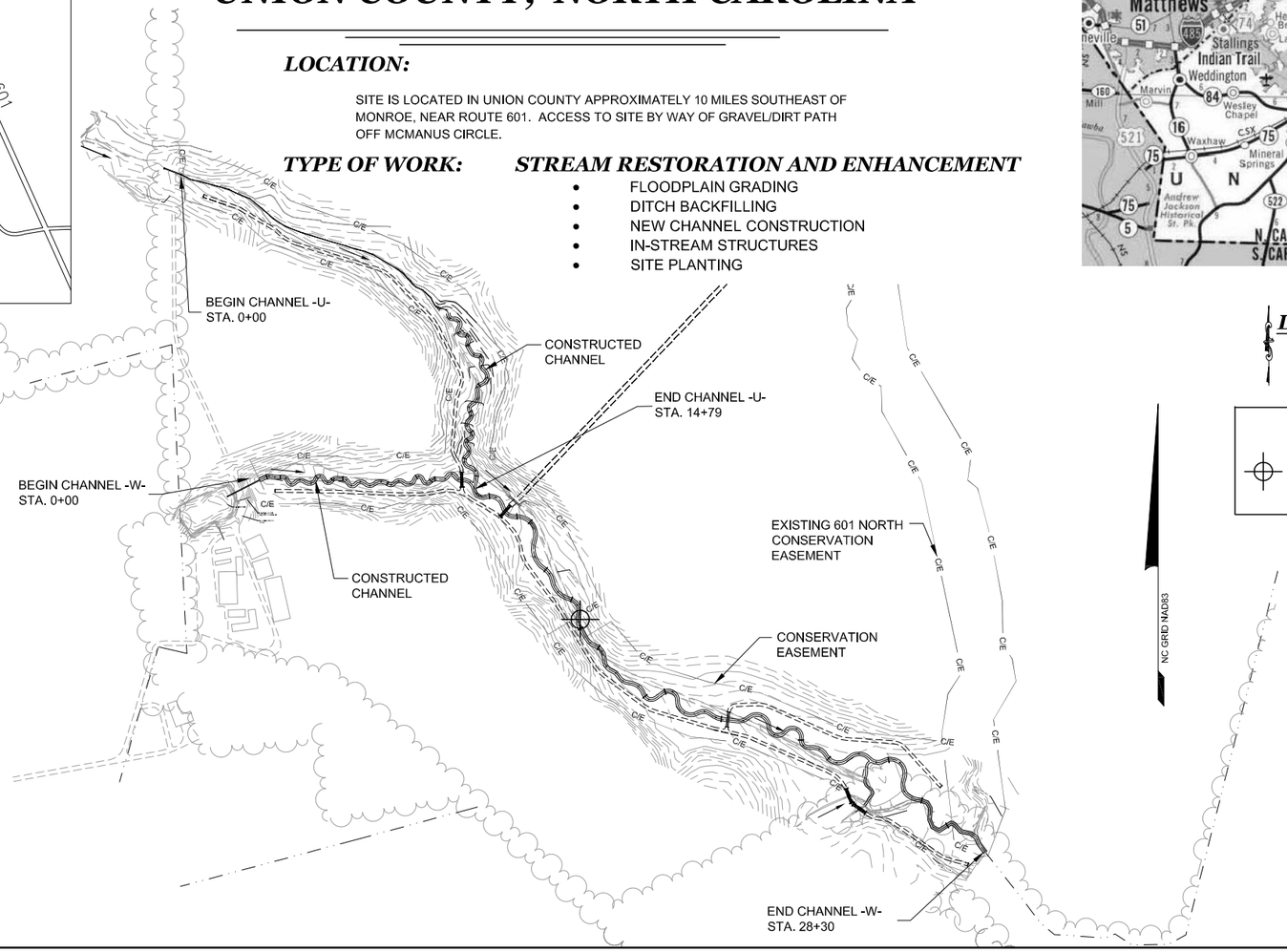
- FLOODPLAIN GRADING
- DITCH BACKFILLING
- NEW CHANNEL CONSTRUCTION
- IN-STREAM STRUCTURES
- SITE PLANTING



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE



SITE LOCATION POINT
(HORIZONTAL DATUM: NCGS NAD83)
N420425.00
E1558495.00

STREAM DESIGN OVERVIEW

STREAM LENGTH
EXISTING: 4,190 LINEAR FEET
PROPOSED: 4,248 LINEAR FEET

	WICKER BRANCH(–W–)			UT (–U–)
	REACH 1	REACH 2	REACH 3	
STREAM CHANNEL TYPE:	E	E	E	E
BANKFULL CROSS–SECTIONAL AREA:	5.5	10.5	14.1	5.5
BANKFULL WIDTH:	6.0	8.0	10.0	6.0
BANKFULL AVERAGE DEPTH:	0.9	1.3	1.4	0.9
WIDTH/DEPTH RATIO:	6.5	6.1	7.1	6.5

CONSERVATION EASEMENT AREA: 12.3 ACRES

AREA OF DISTURBANCE: 11.9 ACRES

FOREST PLANTING: 9.8 ACRES

No.	Revisions	Date

Prepared in the office of:
ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876–6888
FAX: (919) 876–6848

PROJECT ENGINEER: JOHN OGLESBY, P.E.

PROJECT MANAGER: JENS GERATZ

SEAL:

Prepared for:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Dsn. By:	Dwn. By:	Ckd. By:
JWG	RJB	JWG/JFO

Date: JUNE 2012

ATKINS Project No.: 100024976

SHEET 1

INDEX OF SHEETS

GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING STANDARDS:

   A. NORTH CAROLINA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES," DATED JANUARY 2012, AND ANY SUPPLEMENTS THERETO ISSUED PRIOR TO THE DATE OF CONSTRUCTION,
   B. NORTH CAROLINA DEPARTMENT OF TRANSPORTATION "ROADWAY STANDARD DRAWINGS, ENGLISH" DATED JULY 2006, AND ANY SUPPLEMENTS THERETO ISSUED PRIOR TO THE DATE OF CONSTRUCTION.
   C. NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES "EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL" DATED JANUARY 2012, AND ANY SUPPLEMENTS THERETO ISSUED PRIOR TO THE DATE OF CONSTRUCTION.

2. THE CONTRACTOR SHALL CONTACT THE NORTH CAROLINA ONE-CALL CENTER AT 1-800-632-4949 PRIOR TO INITIATING CONSTRUCTION ACTIVITIES.
3. THE CONTRACTOR SHALL FIELD-VERIFY EXISTING CONDITIONS AND DIMENSIONS PRIOR TO ANY CONSTRUCTION.
4. THE CONTRACTOR SHALL LOCATE AND EXPOSE EXISTING UTILITIES PRIOR TO INITIATING CONSTRUCTION ACTIVITIES. ANY CONFLICTS ENCOUNTERED WITH THE DESIGN PLAN SHALL BE BROUGHT TO THE ENGINEER'S ATTENTION IMMEDIATELY FOR RESOLUTION.
5. THE CONTRACTOR SHALL PERFORM ALL WORK WITHIN THE LIMITS OF DISTURBANCE AS SHOWN ON SHEET EC1.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR SITE SAFETY ASSOCIATED WITH THE WORK UNDER THIS CONTRACT AND FOR COMPLIANCE WITH ALL FEDERAL, STATE, AND LOCAL HEALTH AND SAFETY LAWS, CODES, REGULATIONS, AND ORDINANCES INCLUDING BUT NOT LIMITED TO THOSE CURRENTLY MANDATED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
7. THE CONTRACTOR IS RESPONSIBLE FOR ANY DISTURBANCE OR DAMAGE TO EXISTING UTILITIES AND SHALL BE FINANCIALLY RESPONSIBLE FOR ANY DAMAGES THAT MAY OCCUR.
8. ALL DISTURBED AREAS SHALL BE SEEDED WITH TEMPORARY OR PERMANENT SEEDING AND MULCH, AS REQUIRED.
9. SILT FENCE SHALL BE PLACED AROUND STOCKPILE LOCATIONS AND SHALL BE INSTALLED ACCORDING TO THE APPROVED EROSION AND SEDIMENT CONTROL PLAN.
10. THE CONTRACTOR MAY UTILIZE THE DESIGNATED STAGING AREA AND OTHER AREAS WITHIN THE SITE FOR STAGING AND STOCKPILING EQUIPMENT AND MATERIALS AS APPROVED BY THE ENGINEER.

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
INDEX OF SHEETS/ GENERAL NOTES/ CONSTRUCTION SEQUENCING

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
1A

PRELIMINARY - NOT FOR CONSTRUCTION

ELEMENT SYMBOLOGY

TOPOGRAPHY & HYDROGRAPHY

- MAJOR CONTOUR — 650
- MINOR CONTOUR
- GRAVEL / DIRT ROAD
- PAVED ROAD
- HYDRIC SOILS
- DIRECTION OF FLOW
- EXISTING STREAM
- EXISTING WETLAND BOUNDARY — WLB
- HIGH QUALITY WETLAND BOUNDARY — HQ WLB
- MEDIUM QUALITY WETLAND BOUNDARY — MQ WLB
- LOW QUALITY WETLAND BOUNDARY — LQ WLB
- PROPOSED WETLAND BOUNDARY — WLB
- EXISTING SPOT ELEVATION — 648
- PROPOSED SPOT ELEVATION — 648

BOUNDARIES, PROPERTIES, & EASEMENTS

- COUNTY LINE
- CITY LINE
- PROPERTY LINE
- EXISTING IRON PIN — EIP
- RIGHT OF WAY — R/W
- PROPERTY MONUMENT — ECM
- PARCEL NUMBER — 6
- ATKINS BENCHMARK — ATK-BM1
- NCDOT MONUMENT — NCDOT-BM5
- UTILITY EASEMENT — E
- POWER LINE — O
- EXISTING EASEMENT — E
- CONSERVATION EASEMENT — C/E

EROSION AND SEDIMENT CONTROL

- SILT FENCE
- PUMP LOCATION — P
- IMPERVIOUS DIKE
- STILLING BASIN LOCATION

BUILDINGS & OTHER STRUCTURES

- BUILDINGS
- WELL — W
- BRIDGE
- BOX CULVERT OR TUNNEL
- CULVERT
- BRIDGE WING WALL, HEAD WALL, AND END WALL — CONC WW
- HEAD AND END WALL — CONC HW
- PIPE CULVERT
- FOOTBRIDGE
- DRAINAGE BOXES — CB
- EXISTING FENCE — X
- POWER POLE
- TELEPHONE POLE
- LIGHT POLE
- POWER LINE TOWER
- SANITARY SEWER MANHOLE — d
- STORM SEWER MANHOLE — S
- SANITARY SEWER — SS
- STORM SEWER — S
- FOOTBRIDGE
- TRAIL, FOOTPATH
- RAIL ROAD — CSX TRANSPORTATION

VEGETATION

- SINGLE TREE
- SINGLE SHRUB
- EXISTING WOODS LINE

PROPOSED FEATURES & STRUCTURES

- PROPOSED CONSTRUCTION ENTRANCE
- PROPOSED ROCK SILL

PROPOSED FEATURES & STRUCTURES

- RADIUS OF CURVATURE CENTER MARK — R2
- CHANNEL FORD
- CROSS-VANE
- MODIFIED CROSS-VANE
- J-HOOK VANE
- STEP CROSS-VANE
- LOG VANE
- ROOT WAD
- TEMPORARY STAGING AREA, SOIL STOCKPILING
- NEW CHANNEL
- BORROW AREA
- CHANNEL BACKFILL
- MEANDER REVETMENT
- RIPRAP APRON
- IMPERVIOUS CHANNEL BLOCK
- TOP OF RIFFLE — TR1
- BOTTOM OF RIFFLE — BR1
- MIDDLE OF POOL — MP1
- CONSTRUCTED BERM
- PROPOSED WOVEN WIRE FENCE
- REMOVE AND REPLACE EXISTING FENCE — X — X
- REMOVE EXISTING FENCE — X
- PROPOSED SAFETY FENCE — SF
- PROPOSED SILT FENCE — SF
- PROPOSED CONTOURS — 755
- PROPOSED DIVERSION DITCH
- LIMITS OF DISTURBANCE — L.O.D.
- PROPOSED ACCESS ROAD
- PROPOSED STONE OUTLET
- PROPOSED SILT TRAP
- PROPOSED BRIDGE
- PROPOSED CULVERT
- TEMPORARY CHANNEL CROSSING
- PROPOSED TEMPORARY SEDIMENTATION TRAP — SWM

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
SYMBOLS & LEGEND

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
1B

PRELIMINARY - NOT FOR CONSTRUCTION

POOL DATA TABLE
WICKER BRANCH –W- CHANNEL

WICKER BRANCH REACH 1: STA 00+00 - 07+09				
TOP OF POOL ID	RADIUS	FEATURE ID	STATION	ELEVATION
P1	25	TP1	00+23.00	604.9
		MP1	00+26.00	604.9
		BP1	00+38.00	605.5
P2	15	TP2	00+61.00	604.7
		MP2	00+64.00	604.7
		BP2	00+77.00	605.2
P3	12	TP3	00+93.00	604.9
		MP3	00+99.00	604.8
		BP3	01+05.00	604.9
P4	18	TP4	01+23.00	604.7
		MP4	01+29.00	604.6
		BP4	01+35.00	604.7
P5	18	TP5	01+51.00	604.5
		MP5	01+59.00	604.4
		BP5	01+67.00	604.5
P6	12	TP6	01+86.00	603.7
		MP6	01+89.00	603.6
		BP6	02+00.00	604.2
P7	12	TP7	02+15.00	603.9
		MP7	02+22.00	603.8
		BP7	02+30.00	603.9
P8	15	TP8	02+41.00	603.1
		MP8	02+44.00	603.0
		BP8	02+50.00	603.6
P9	15	TP9	02+71.00	602.7
		MP9	02+74.00	602.6
		BP9	02+80.00	603.2
P10	12	TP10	02+96.00	603.0
		MP10	03+03.00	602.8
		BP10	03+10.00	603.0
P11	18	TP11	03+25.00	602.8
		MP11	03+31.00	602.7
		BP11	03+38.00	602.8
P12	18	TP12	03+53.00	602.7
		MP12	03+58.00	602.5
		BP12	03+65.00	602.7
P13	30	TP13	03+85.00	602.5
		MP13	03+94.00	602.4
		BP13	04+03.00	602.5
P14	12	TP14	04+14.00	601.8
		MP14	04+17.00	601.6
		BP14	04+25.00	602.3
P15	18	TP15	04+43.00	602.2
		MP15	04+50.00	601.9
		BP15	04+55.00	602.1
P16	18	TP16	04+73.00	601.9
		MP16	04+82.00	601.8
		BP16	04+91.00	601.9
P17	11.6	TP17	05+11.00	601.2
		MP17	05+14.00	601.0
		BP17	05+25.00	601.7
P18	12	TP18	05+43.00	601.3
		MP18	05+50.00	601.2
		BP18	05+55.00	601.3
P19	15	TP19-A	05+61.00	600.6
		MP19-A	05+64.00	600.5
		BP19-A	05+70.00	600.9
		TP19-B	05+76.00	600.4
		MP19-B	05+79.00	600.3
		BP19-B	05+85.00	600.9
P20	15	TP20	05+93.00	600.6
		MP20	06+03.00	600.5
		BP20	06+07.00	600.6
P21	12	TP21	06+21.00	600.4
		MP21	06+29.00	600.3
		BP21	06+35.00	600.4
P22	18	TP22	06+51.00	600.2
		MP22	06+56.00	600.1
		BP22	06+60.00	600.2
P23	30	TP23	06+76.00	600.0
		MP23	06+86.00	599.9
		BP23	06+95.00	600.0

WICKER BRANCH REACH 2: STA 07+09 - 23+60				
TOP OF Pool ID	RADIUS	FEATURE ID	STATION	ELEVATION
P24	25	TP24	07+25.00	599.0
		MP24	07+36.00	598.7
		BP24	07+47.00	599.0
P25	35	TP25	07+66.00	598.4
		MP25-1	07+71.00	597.9
		MP25-2	07+81.00	597.9
		BP25	07+90.00	598.6
P26	30	TP26	08+32.00	597.8
		MP26	08+41.00	597.5
		BP26	08+50.00	597.8
P27	50	TP27-A	08+71.00	597.3
		MP27-A1	08+75.00	596.7
		MP27-A2	08+85.00	596.7
		BP27-A	08+90.00	597.4
		TP27-B	09+11.00	597.0
		MP27-B1	09+15.00	596.5
		MP27-B2	09+25.00	596.5
		BP27-B	09+30.00	597.2
P28	67	TP28	09+90.00	596.5
		MP28	010+05.00	596.2
		BP28	010+25.00	596.5
P29	45	TP29	010+61.00	595.9
		MP29-1	010+65.00	595.4
		MP29-2	010+75.00	595.4
		BP29	010+80.00	596.1
P30	65	TP30	011+20.00	595.5
		MP30	011+35.00	595.2
		BP30	011+50.00	595.5
P31	35	TP31	011+76.00	595.2
		MP31-1	011+80.00	594.7
		MP31-2	011+95.00	594.7
		BP31	012+05.00	595.4
P32	46	TP32	012+43.00	594.7
		MP32	012+49.00	594.4
		BP32	012+55.00	594.7
P33	0	TP33	012+66.00	594.4
		MP33-1	012+70.00	593.8
		MP33-2	012+80.00	593.8
		BP33	012+90.00	594.5
P34	46	TP34	013+20.00	593.9
		MP34	013+22.00	593.6
		BP34	013+25.00	593.9
P35	40	TP35	013+41.00	593.6
		MP35-1	013+45.00	593.0
		MP35-2	013+55.00	593.0
		BP35	013+65.00	593.7
P36	32	TP36	013+90.00	593.2
		MP36	013+95.00	592.9
		BP36	014+00.00	593.2
P37	35	TP37	014+25.00	592.9
		MP37	014+30.00	592.6
		BP37	014+35.00	592.9
P38	37	TP38	014+55.00	592.6
		MP38	014+60.00	592.3
		BP38	014+65.00	592.6
P39	45	TP39	014+90.00	592.2
		MP39	015+02.00	591.9
		BP39	015+15.00	592.2
P40	21	TP40	015+41.00	591.7
		MP40-1	015+45.00	591.2
		MP40-2	015+55.00	591.2
		BP40	015+70.00	591.9
P41	25	TP41	016+06.00	591.2
		MP41-1	016+10.00	590.7
		MP41-2	016+25.00	590.7
		BP41	016+40.00	591.4
P42	38	TP42	016+80.00	590.8
		MP42	016+98.00	590.5
		BP42	017+15.00	590.8
P43	30	TP43	017+50.00	590.6
		MP43	017+55.00	590.3
		BP43	017+60.00	590.6

TOP OF POOL ID	RADIUS	FEATURE ID	STATION	ELEVATION
P44	58	TP44-A	017+85.00	590.2
		MP44-A	017+95.00	589.9
		BP44-A	018+05.00	590.2
		TP44-B	018+07.00	590.0
		MP44-B	018+11.00	589.5
		BP44-B	018+25.00	590.0
P45	37	TP45	018+55.00	589.7
		MP45	018+63.00	589.4
		BP45	018+70.00	589.7
P46	34	TP46	019+00.00	589.5
		MP46	019+20.00	589.2
		BP46	019+40.00	589.5
P47	24	TP47	019+75.00	589.3
		MP47	019+88.00	589.0
		BP47	020+10.00	589.3
P48	25	TP48	020+45.00	589.0
		MP48	020+58.00	588.7
		BP48	020+70.00	589.0
P49	25	TP49	020+96.00	588.7
		MP49-1	021+00.00	588.1
		MP49-2	021+10.00	588.1
		BP49	021+20.00	588.8
P50	45	TP50	021+45.00	588.3
		MP50	021+55.00	588.0
		BP50	021+65.00	588.3
P51	37.5	TP51	021+96.00	587.8
		MP51-1	022+00.00	587.3
		MP51-2	022+18.00	587.3
		BP51	022+35.00	588.0
P52	40	TP52	022+75.00	587.3
		MP52	022+85.00	587.0
		BP52	022+95.00	587.3
P53	30	TP53	023+30.00	587.0
		MP53	023+40.00	586.7
		BP53	023+50.00	587.0

WICKER BRANCH REACH 3: STA 23+60 - 28+30				
P54	40	TP54	023+81.00	586.4
		MP54-1	023+85.00	585.9
		MP54-2	024+05.00	585.9
		BP54	024+35.00	588.0
P55	40	TP55	024+85.00	585.9
		MP55	025+00.00	585.6
		BP55	025+15.00	585.9
P56		TP56	025+56.00	585.4
		MP56-1	025+60.00	584.9
		MP56-2	025+70.00	584.9
		BP56	025+80.00	585.8
P57		TP57	026+30.00	584.8
		MP57	026+45.00	584.5
		BP57	026+60.00	584.8
P58		TP58	026+91.00	584.3
		MP58-1	026+95.00	583.7
		MP58-2	027+05.00	583.7
		BP58	027+10.00	584.6
P59		TP59	027+30.00	583.9
		MP59	027+38.00	583.4
		BP59	027+45.00	583.9
P60		TP60	027+65.00	583.6
		MP60	027+68.00	583.1
		BP60	027+70.00	583.6

RIFFLE AND STRUCTURE DATA TABLE
UT TO WICKER BRANCH -U- CHANNEL

UT to WICKER BRANCH: STA 08+52 - 14+79				
TOP OF POOL ID	RADIUS	FEATURE ID	STATION	ELEVATION
P62	12	TP62	08+63.00	606.0
		MP62	08+68.00	605.8
		BP62	08+73.00	606.0
P63	15	TP63	08+91.00	605.7
		MP63	08+98.00	605.5
		BP63	09+05.00	605.7
P64	13	TP64	09+23.00	605.5
		MP64	09+31.00	605.2
		BP64	09+38.00	605.5
P65	12	TP65	09+52.00	605.0
		MP65	09+55.00	604.5
		BP65	09+65.00	605.4
P66	15	TP66	09+86.00	604.7
		MP66	09+89.00	604.2
		BP66	09+90.00	605.1
P67	15	TP67	010+13.00	604.7
		MP67	010+16.00	604.4
		BP67	010+20.00	604.7
P68	12	TP68	010+39.00	604.2
		MP68	010+38.00	603.7
		BP68	010+47.00	604.6
P69	18	TP69	010+66.00	604.2
		MP69	010+70.00	603.9
		BP69	010+73.00	604.2
P70	22	TP70	010+88.00	604.0
		MP70	011+04.00	603.7
		BP70	011+15.00	604.0
P71	18	TP71	011+36.00	603.4
		MP71	011+39.00	602.9
		BP71	011+50.00	603.8
P72	30	TP72	011+63.00	603.4
		MP72	011+72.00	603.1
		BP72	011+80.00	603.4
P73	12	TP73	011+98.00	603.1
		MP73	012+04.00	602.9
		BP73	012+10.00	603.1
P74	18	TP74	012+21.00	602.4
		MP74	012+24.00	602.0
		BP74	012+35.00	602.8
P75	18	TP75	012+53.00	602.3
		MP75	012+62.00	602.1
		BP75	012+70.00	602.3
P76	13	TP76	012+86.00	601.6
		MP76	012+89.00	601.2
		BP76	013+03.00	602.0
P77	12	TP77	013+16.00	601.2
		MP77	013+19.00	600.7
		BP77	013+28.00	601.6
P78	15	TP78	013+46.00	601.2
		MP78	013+51.00	600.9
		BP78	013+55.00	601.2
P79	18	TP79	013+76.00	600.5
		MP79	013+79.00	600.1
		BP79	013+85.00	600.8
P80	25	TP80	014+18.00	600.4
		MP80	014+24.00	600.2
		BP80	014+30.00	600.0
P81	25	TP81	014+41.00	599.7
		MP81	014+44.00	599.3
		BP81	014+50.00	600.1

ABBREVIATIONS

TP - TOP OF POOL
MP - MIDDLE OF POOL
BP - BOTTOM OF POOL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
RIFLE AND POOL DATA TABLES

Dan. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
2A

PRELIMINARY - NOT FOR CONSTRUCTION

RIFFLE AND STRUCTURE DATA TABLE
WICKER BRANCH –W- CHANNEL

TOP OF RIFFLE ID	STATION	ELEVATION	BOTTOM OF RIFFLE ID/ LOG SILL ID	STATION	ELEVATION	RIFFLE LENGTH
WICKER BRANCH REACH 1: STA 00+00 - 07+09						
	CULVERT OUTFALL – PLUNGE POOL			00+00.00	605.8	--
TR1	00+16.00	605.8	BR1/LS1	00+22.00	605.7	6
TR2	00+45.00	605.7	BR2/LS2	00+60.00	605.5	15
TR3	00+82.00	605.3	BR3	00+90.00	605.1	8
TR4	01+10.00	605.1	BR4	01+20.00	604.9	10
TR5	01+40.00	604.9	BR5	01+48.00	604.7	8
TR6	01+75.00	604.7	BR6/LS3	01+85.00	604.5	10
TR7	02+05.00	604.3	BR7	02+12.00	604.1	7
TR8	02+35.00	604.1	BR8/LS4	02+40.00	603.9	5
TR9	02+55.00	603.7	BR9/LS5	02+70.00	603.5	15
TR10	02+85.00	603.3	BR10	02+93.00	603.2	8
TR11	03+15.00	603.2	BR11	03+22.00	603.0	7
TR12	03+43.00	603.0	BR12	03+50.00	602.9	7
TR13	03+70.00	602.9	BR13	03+80.00	602.7	10
TR14	04+08.00	602.7	BR14/LS6	04+13.00	602.6	5
TR15	04+30.00	602.4	BR15	04+40.00	602.3	10
TR16	04+60.00	602.3	BR16	04+70.00	602.1	10
TR17	04+98.00	602.1	BR17/LS7	05+10.00	602.0	12
TR18	05+30.00	601.8	BR18	05+40.00	601.5	10
TR19	05+60.00	601.5	BR19/LS8	05+63.00	601.4	3
			LS9	05+75.00	601.2	--
TR20	05+90.00	601.0	BR20	05+95.00	600.8	5
TR21	06+12.00	600.8	BR21	06+18.00	600.6	6
TR22	06+40.00	600.6	BR22	06+48.00	600.4	8
TR23	06+65.00	600.4	BR23	06+73.00	600.2	8
TR24	07+00.00	600.2	TIE-IN W/ UT	07+09.00	600.0	9
WICKER BRANCH REACH 2: STA 07+09 - 23+60						
			BR24	07+20.00	599.6	9
TR25	07+54.00	599.5	BR25/LS10	07+65.00	599.2	11
TR26	08+05.00	598.9	BR26	08+25.00	598.4	20
TR27	08+60.00	598.3	BR27/LS11	08+70.00	598.1	10
			LS12	09+10.00	597.8	--
TR28	09+55.00	597.5	BR28	09+80.00	597.1	25
TR29	10+40.00	597.0	BR29/LS13	10+60.00	596.7	20
TR30	10+90.00	596.4	BR30	11+10.00	596.2	20
TR31	11+65.00	596.2	BR31/LS14	11+75.00	596.0	10
TR32	12+20.00	595.7	BR32	12+35.00	595.4	15
TR33	12+60.00	595.3	BR33/LS15	12+65.00	595.2	5
TR34	12+95.00	594.9	BR34	13+15.00	594.6	20
TR35	13+30.00	594.5	BR35/LS16	13+40.00	594.4	10
TR36	13+70.00	594.1	BR36	13+85.00	593.8	15
TR37	14+10.00	593.8	BR37	14+20.00	593.5	10
TR38	14+40.00	593.5	BR38	14+50.00	593.2	10
TR39	14+70.00	593.2	BR39	14+85.00	592.9	15
TR40	15+20.00	592.8	BR40/LS17	15+40.00	592.5	20
TR41	15+80.00	592.2	BR41/LS18	16+05.00	592.0	25
TR42	16+50.00	591.7	BR42	16+70.00	591.5	20
TR43	17+25.00	591.4	BR43	17+45.00	591.3	20
TR44	17+65.00	591.3	BR44	17+80.00	591.1	15
			LS19	18+06.00	590.8	--
TR45	18+35.00	590.6	BR45	18+50.00	590.4	15
TR46	18+80.00	590.4	BR46	18+95.00	590.2	15
TR47	19+50.00	590.2	BR47	19+70.00	589.9	20
TR48	20+20.00	589.9	BR48	20+35.00	589.6	15
TR49	20+80.00	589.6	BR49/LS20	20+95.00	589.5	15
TR50	21+30.00	589.2	BR50	21+45.00	589.0	15
TR51	21+75.00	588.9	BR51/LS21	21+95.00	588.6	20
TR52	22+45.00	588.3	BR52	22+70.00	588.0	25
TR53	23+05.00	587.9	BR53	23+25.00	587.6	20
WICKER BRANCH REACH 3: STA 23+60 - 28+30						
TR54	23+60.00	587.5	BR54/LS22	23+80.00	587.3	20
TR55	24+45.00	587.0	BR55	24+75.00	586.7	30
TR56	25+30.00	586.6	BR56/LS23	25+55.00	586.3	25
TR57	25+90.00	586.0	BR57	26+20.00	585.6	30
TR58	26+70.00	585.5	BR58/LS24	26+90.00	585.2	20
TR59	27+15.00	584.8	BR59	27+25.00	584.5	10
TR60	27+50.00	584.4	BR60	27+60.00	584.1	10
TR61	27+75.00	584.1	TIE-IN	28+30.00	583.6	55

RIFFLE AND STRUCTURE DATA TABLE
UT TO WICKER BRANCH -U- CHANNEL

TOP OF RIFFLE ID	STATION	ELEVATION	BOTTOM OF RIFFLE ID/ LOG SILL ID	STATION	ELEVATION	RIFFLE LENGTH
UT to WICKER BRANCH: STA 08+52 - 14+79						
TR62	08+52.00	606.7	BR62	08+60.00	606.4	8
TR63	08+78.00	606.4	BR63	08+88.00	606.1	10
TR64	09+05.00	606.1	BR64	09+20.00	605.9	15
TR65	09+43.00	605.9	BR65/LS25	09+53.00	605.8	10
TR66	09+75.00	605.6	BR66/LS26	09+85.00	605.5	10
TR67	09+95.00	605.3	BR67	10+10.00	605.1	15
TR68	10+25.00	605.1	BR68/LS27	10+35.00	605.0	10
TR69	10+52.00	604.8	BR69	10+63.00	604.6	11
TR70	10+78.00	604.6	BR70	10+85.00	604.4	7
TR71	11+20.00	604.4	BR71/LS28	11+35.00	604.2	15
TR72	11+55.00	604.0	BR72	11+60.00	603.8	5
TR73	11+85.00	603.8	BR73	11+95.00	603.5	10
TR74	12+15.00	603.5	BR74/LS29	12+20.00	603.2	5
TR75	12+40.00	603.0	BR75	12+50.00	602.7	10
TR76	12+75.00	602.7	BR76/LS30	12+85.00	602.4	10
TR77	13+08.00	602.2	BR77/LS31	13+15.00	602.0	7
TR78	13+33.00	601.8	BR78	13+43.00	601.6	10
TR79	13+60.00	601.6	BR79/LS32	13+75.00	601.3	15
TR80	14+00.00	601.1	BR80	14+15.00	600.8	15
TR81	14+35.00	600.8	BR81/LS33	14+40.00	600.5	5
TR82	14+55.00	600.3	TIE-IN	14+79.00	600.0	24

ABBREVIATIONS

TR - TOP OF RIFFLE
BR - BOTTOM OF RIFFLE
LS - LOG SILL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
RIFLE AND POOL DATA TABLES

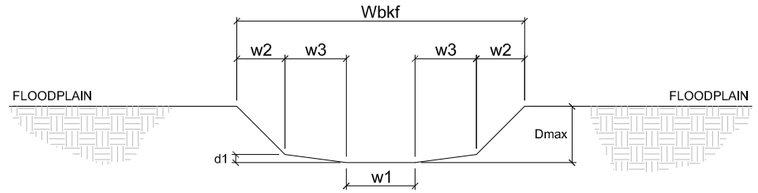
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

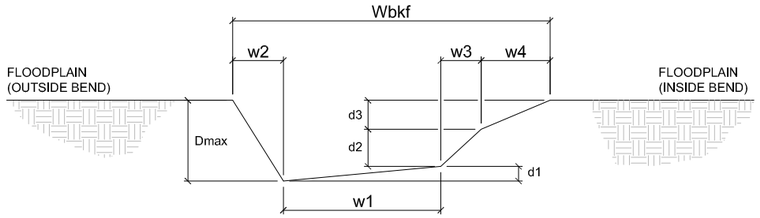
Project No.: 100024976

SHEET
2B

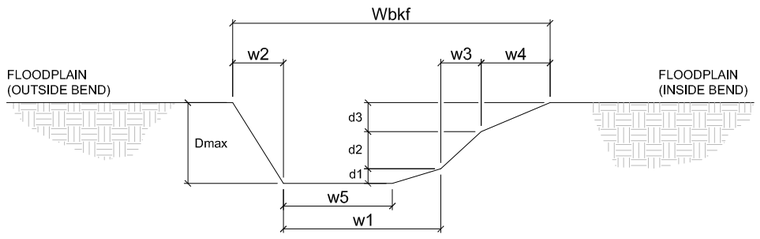
PRELIMINARY - NOT FOR CONSTRUCTION



TYPICAL RIFFLE CROSS-SECTION



TYPICAL POOL CROSS-SECTION



TYPICAL POOL CROSS-SECTION (-W- REACH 3 ONLY)

CHANNEL (REACH)	Feature	Wbkf (ft.)	Dmax (ft.)	w1 (ft.)	w2 (ft.)	w3 (ft.)	w4 (ft.)	w5 (ft.)	d1 (ft.)	d2 (ft.)	d3 (ft.)
-W- (Reach 1); -U- (All)	Riffle	6.0	1.2	1.0	1.0	1.5			0.2		
	Pool	7.5	2.0	4.0	1.0	1.0	1.5		0.3	1.2	0.5
-W- (Reach 2)	Riffle	8.0	1.7	2.0	1.5	1.5			0.2		
	Pool	9.5	2.8	5.3	1.2	1.5	1.5		0.8	1.3	0.7
-W- (Reach 3)	Riffle	10.0	1.8	2.0	1.5	2.5			0.3		
	Pool	12.0	3.0	5.3	1.2	1.5	4.0	2.3	0.8	1.2	1.0

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

TYPICAL SECTIONS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

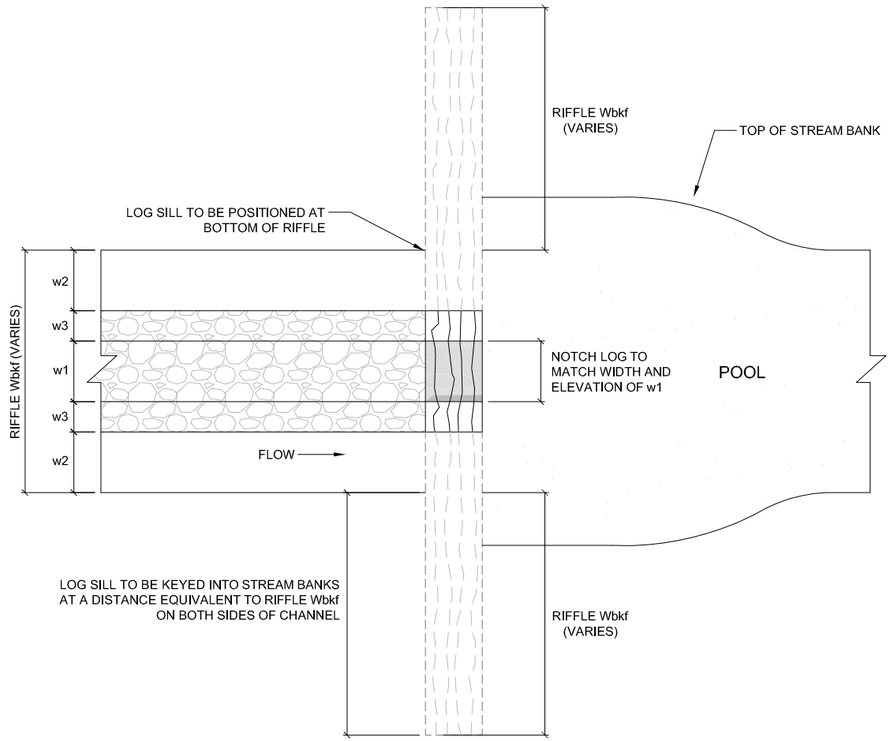
Scale: AS SHOWN

Project No.: 100024976

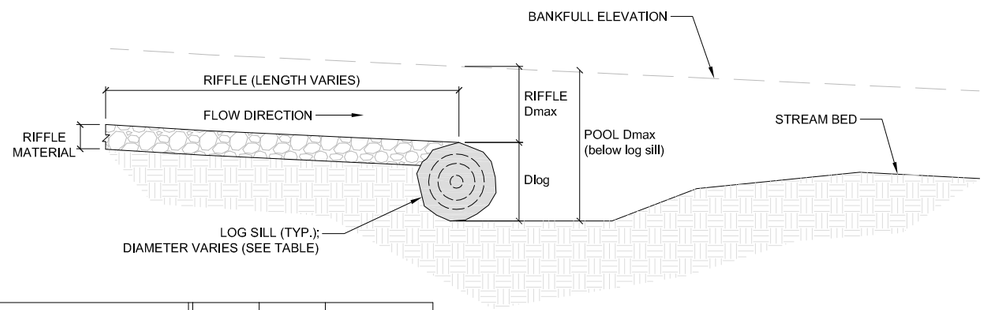
SHEET

3A

PRELIMINARY - NOT FOR CONSTRUCTION

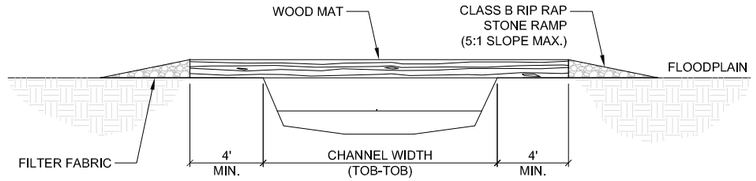


PLAN VIEW

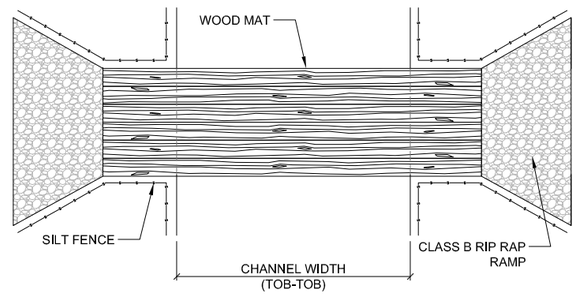


CHANNEL (REACH)	RIFFLE Dmax (ft.)	Dlog (in.)	POOL Dmax (below log sill) (ft.)
-W- (Reach 1); -U- (All)	1.2	16	2.0
-W- (Reach 2)	1.7	20	2.8
-W- (Reach 3)	1.8	20	3.0

PROFILE VIEW



SECTION



PLAN

WOOD MAT CHANNEL CROSSING

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
GENERAL DETAILS

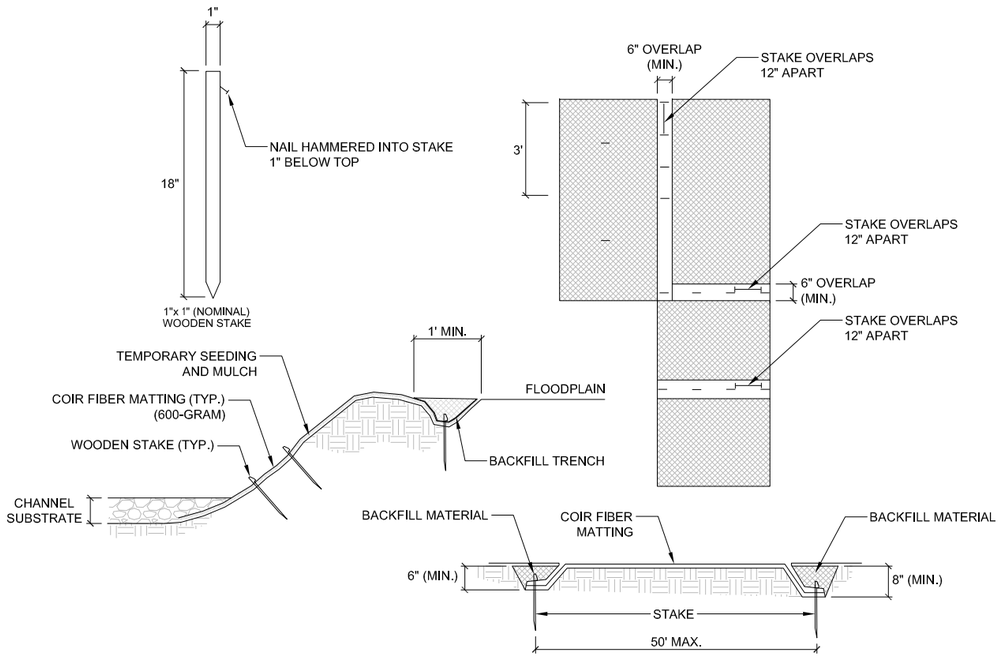
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
3C

PRELIMINARY - NOT FOR CONSTRUCTION



COIR FIBER MATTING

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

GENERAL DETAILS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

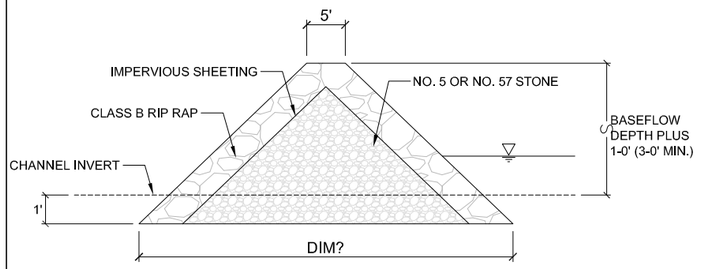
Scale: AS SHOWN

Project No.: 100024976

SHEET

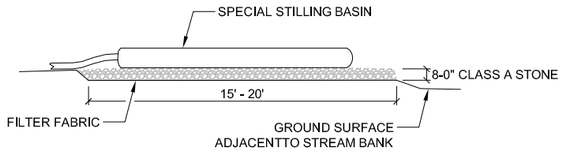
3D

PRELIMINARY - NOT FOR CONSTRUCTION



SECTION

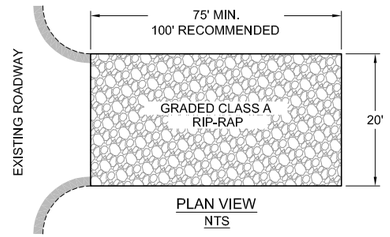
TEMPORARY IMPERVIOUS DIKE



NOTE:

1. WHEN PUMPING CLEAN WATER, THE CONTRACTOR MAY PROVIDE A STABILIZED OUTLET BY OMITTING THE SPECIAL STILLING BASIN AND PROVIDING THE ROCK PAD AS SHOWN WITH MINIMUM DIMENSIONS 10 FEET WIDE BY 15 FEET LONG.

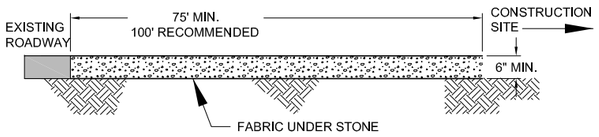
SPECIAL STILLING BASIN WITH ROCK PAD



PLAN VIEW
NTS

CONSTRUCTION ENTRANCE NOTES:

1. PROVIDE APPROPRIATE TRANSITION BETWEEN CONSTRUCTION ENTRANCE AND EXISTING ROADWAY
2. IF CONSTRUCTION ON THE SITE IS SUCH THAT THE MUD IS NOT REMOVED BY THE VEHICLES TRAVELLING OVER THE STONE, THEN THE TIRES OF THE VEHICLES MUST BE WASHED BEFORE ENTERING THE PUBLIC ROAD.



CROSS SECTION

STABILIZED CONSTRUCTION ENTRANCE

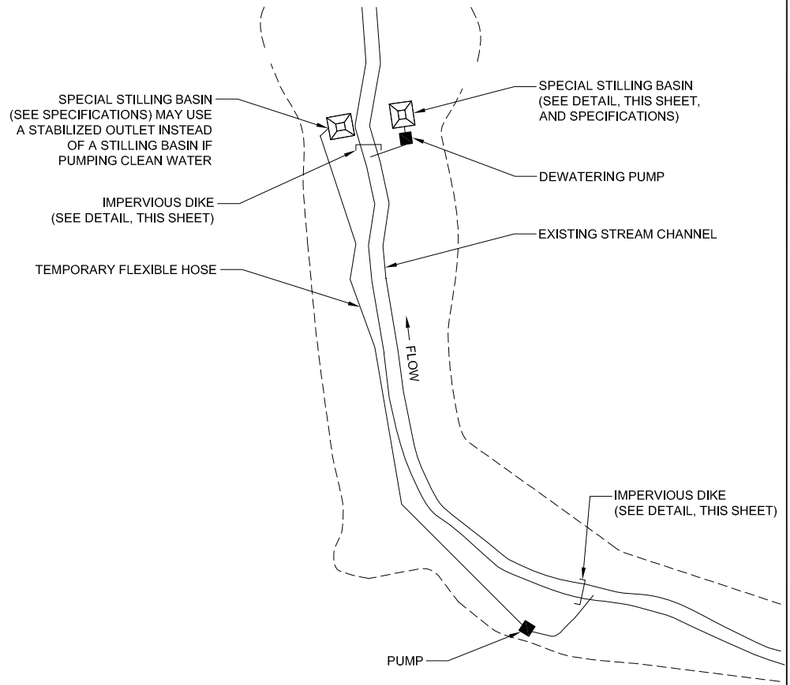
NTS

SEQUENCE OF CONSTRUCTION FOR TYPICAL PUMP-AROUND

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKE. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE (DOWNSTREAM IMPERVIOUS DIKE FIRST).
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED AT THE END OF EACH DAY WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS DIKE LOCATIONS AS SHOWN ON THIS SHEET ONLY SHOW THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKE(S) FOR EACH DAY'S WORK.
8. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

NOTES:

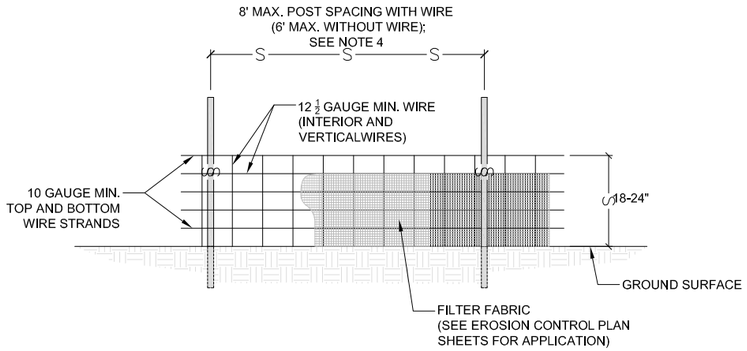
1. ALL EXCAVATION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW WHEN NECESSARY.
3. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS, AND HOSES.
5. PUMPS AND HOSES SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA.



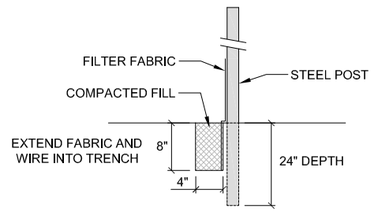
TYPICAL PUMP-AROUND OPERATION

NOTES:

1. USE WIRE A MINIMUM OF 32 INCHES IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12 INCH STAY SPACING.
2. USE FILTER FABRIC A MINIMUM OF 36 INCHES IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
3. PROVIDE 5-FOOT STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.
4. USE EXTRA STRENGTH FABRIC IF WIRE FENCE IS NOT USED.



ELEVATION



SECTION

TEMPORARY SILT FENCE

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

GENERAL DETAILS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

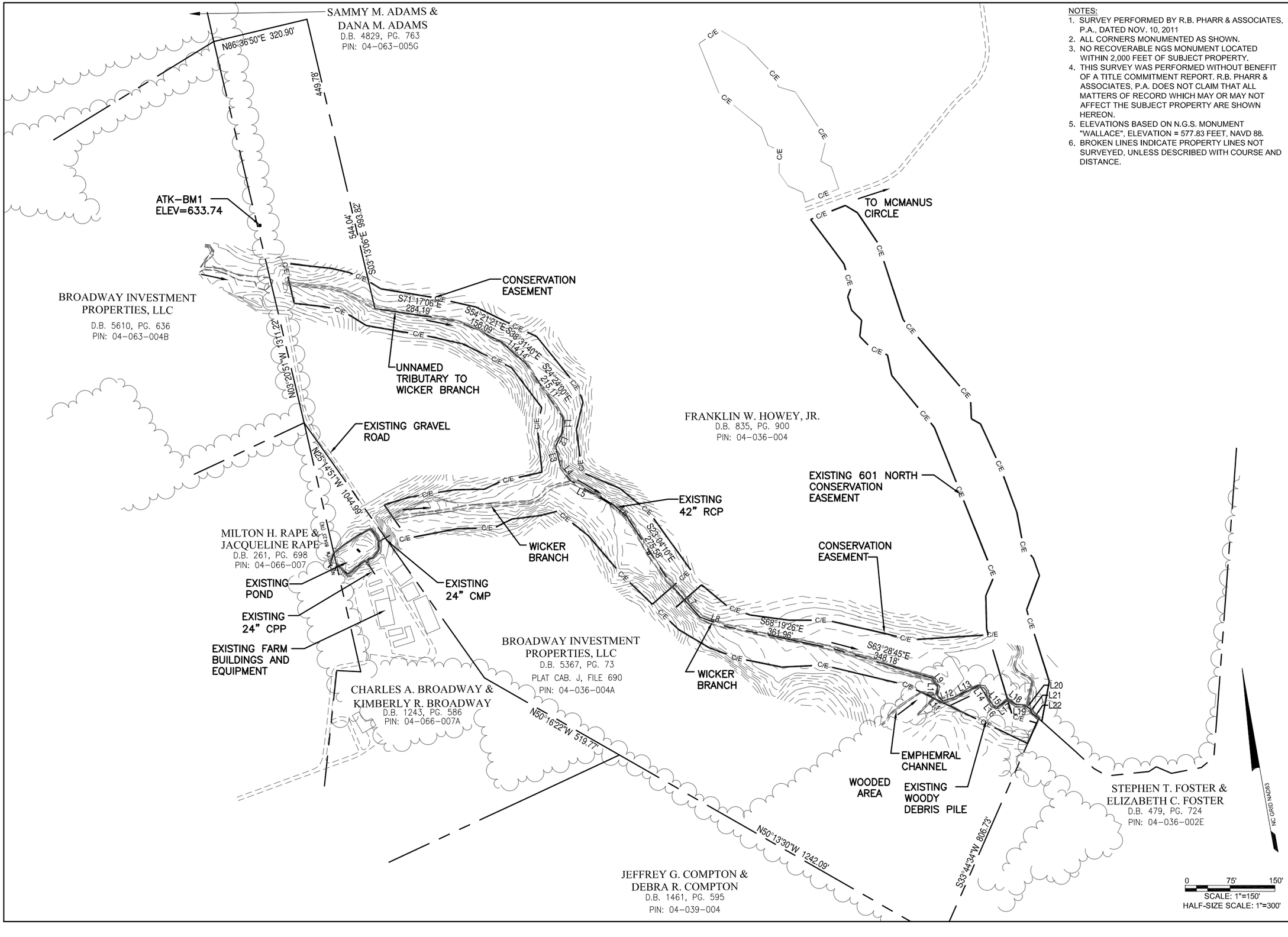
Scale: AS SHOWN

Project No.: 100024976

SHEET

3E

PRELIMINARY - NOT FOR CONSTRUCTION



NOTES:

1. SURVEY PERFORMED BY R.B. PHARR & ASSOCIATES, P.A., DATED NOV. 10, 2011
2. ALL CORNERS MONUMENTED AS SHOWN.
3. NO RECOVERABLE NGS MONUMENT LOCATED WITHIN 2,000 FEET OF SUBJECT PROPERTY.
4. THIS SURVEY WAS PERFORMED WITHOUT BENEFIT OF A TITLE COMMITMENT REPORT. R.B. PHARR & ASSOCIATES, P.A. DOES NOT CLAIM THAT ALL MATTERS OF RECORD WHICH MAY OR MAY NOT AFFECT THE SUBJECT PROPERTY ARE SHOWN HEREON.
5. ELEVATIONS BASED ON N.G.S. MONUMENT "WALLACE", ELEVATION = 577.83 FEET, NAVD 88.
6. BROKEN LINES INDICATE PROPERTY LINES NOT SURVEYED, UNLESS DESCRIBED WITH COURSE AND DISTANCE.

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
EXISTING CONDITIONS

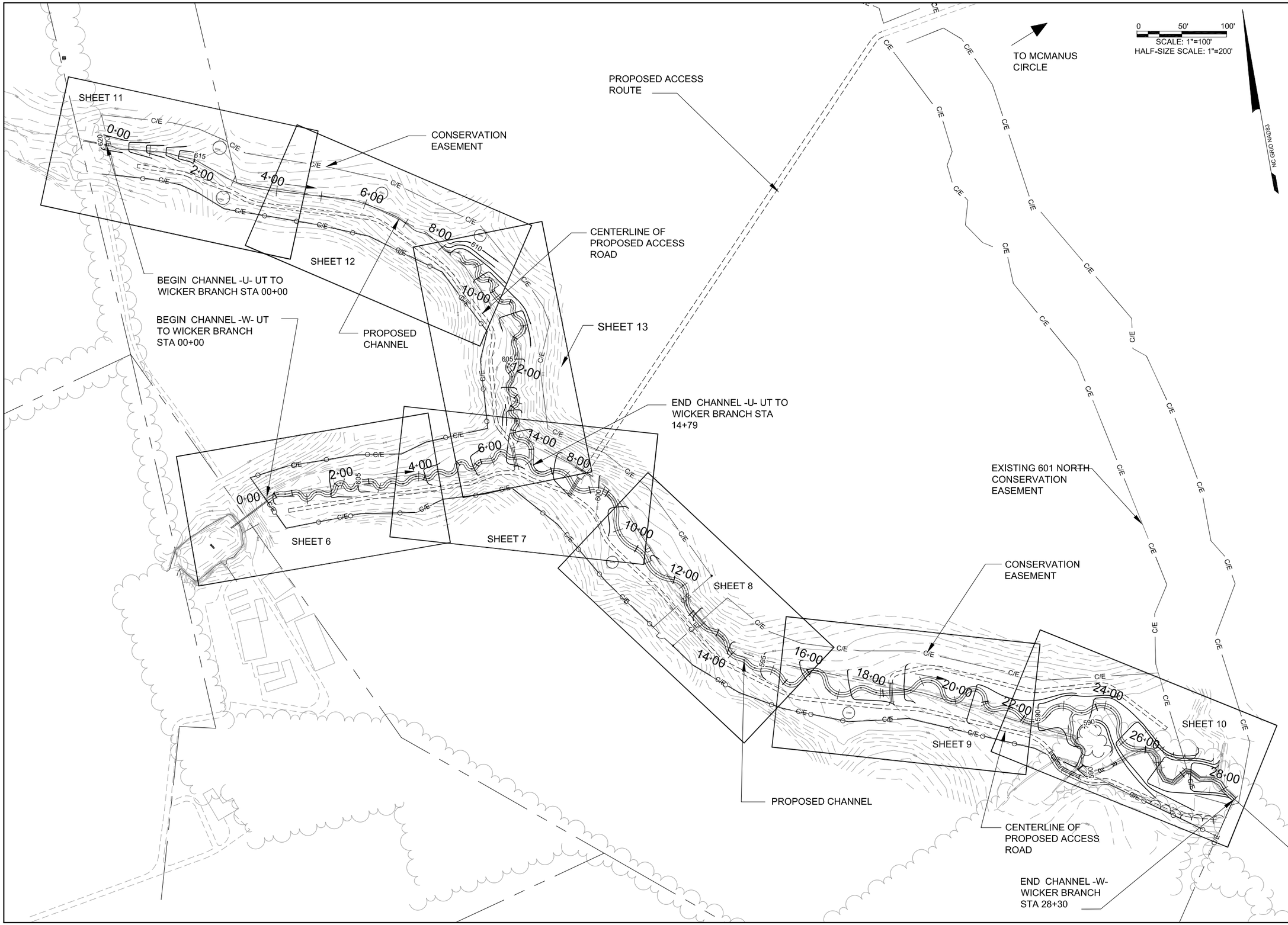
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
4

PRELIMINARY - NOT FOR CONSTRUCTION



ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
OVERALL SITE PLAN

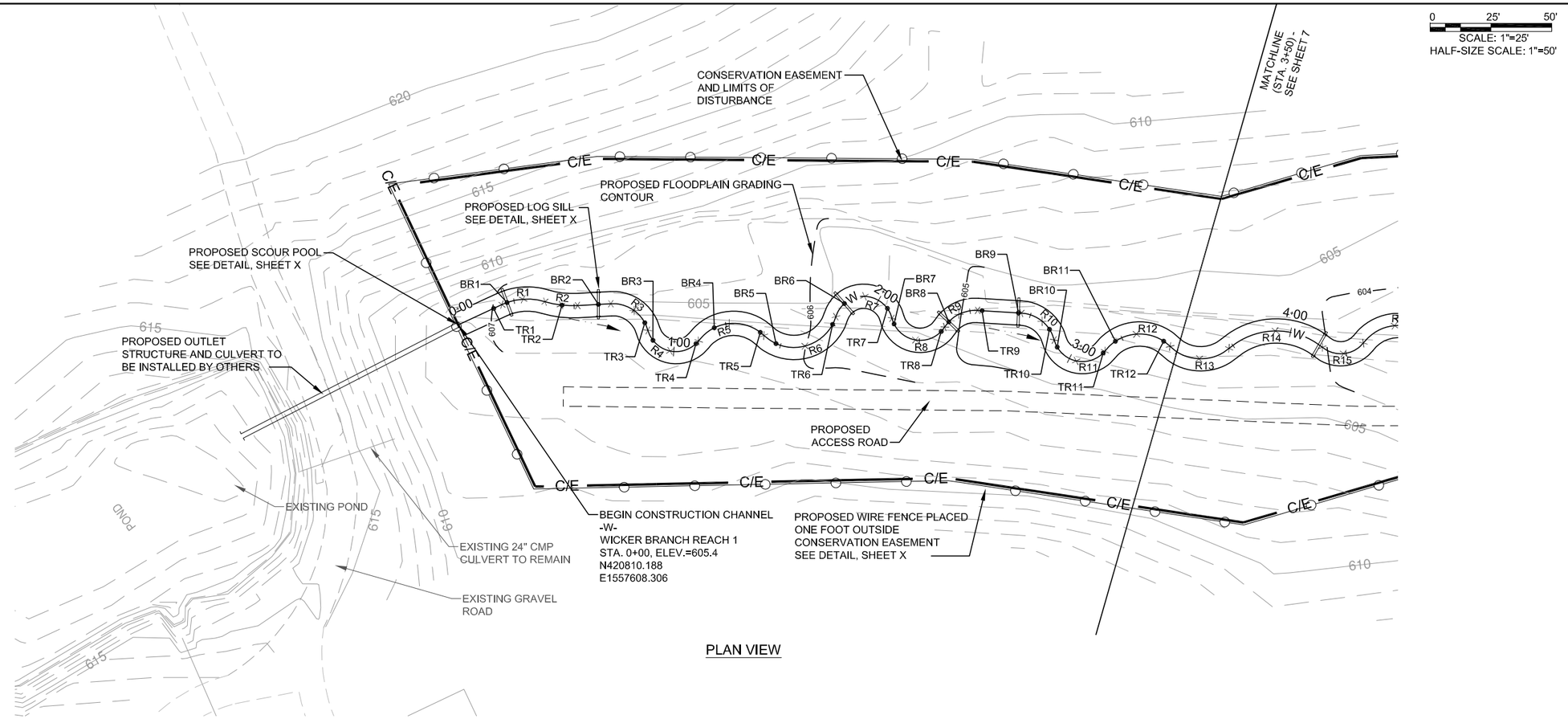
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
5

PRELIMINARY - NOT FOR CONSTRUCTION



ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

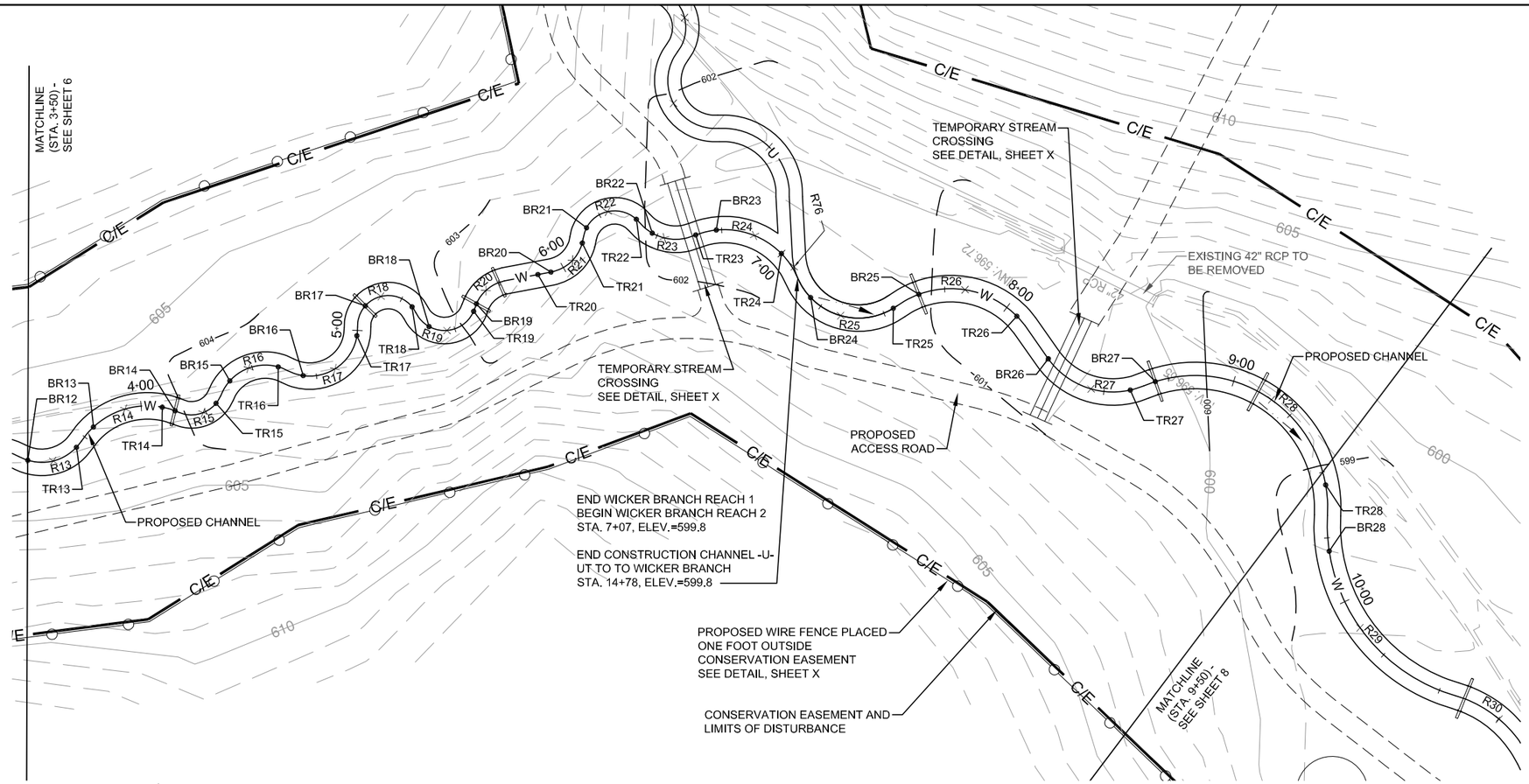
Scale: AS SHOWN

Project No.: 100024976

SHEET

6

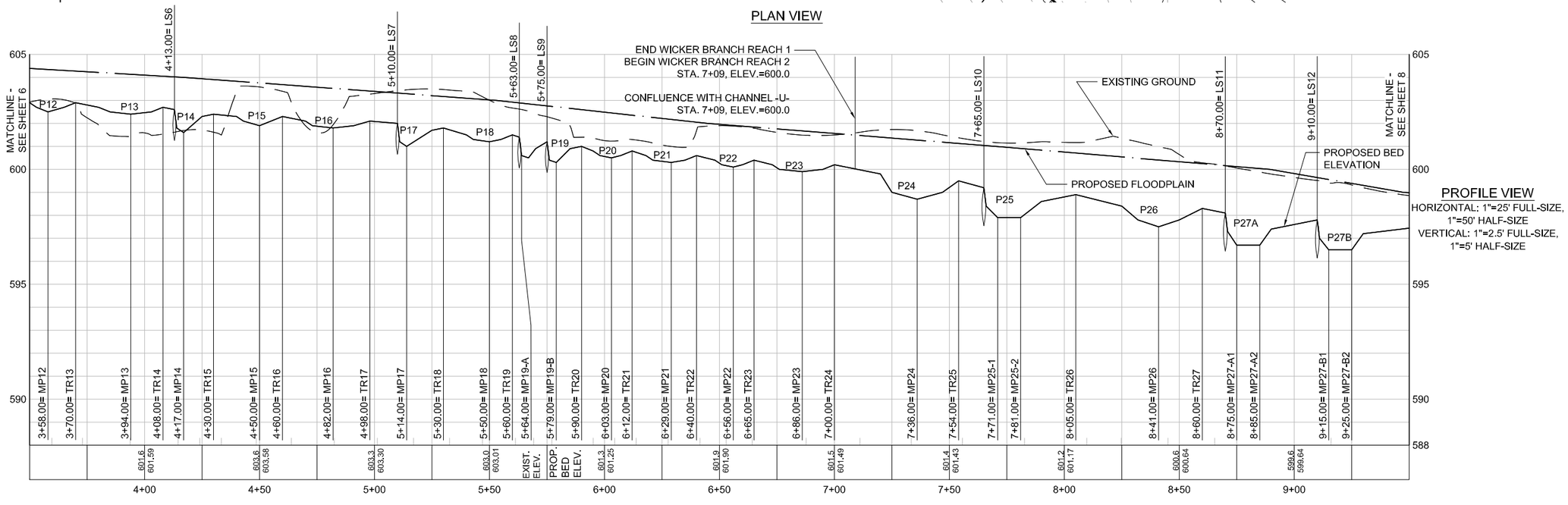
PRELIMINARY - NOT FOR CONSTRUCTION



0 25' 50'

SCALE: 1"=25'

HALF-SIZE SCALE: 1"=50'



ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

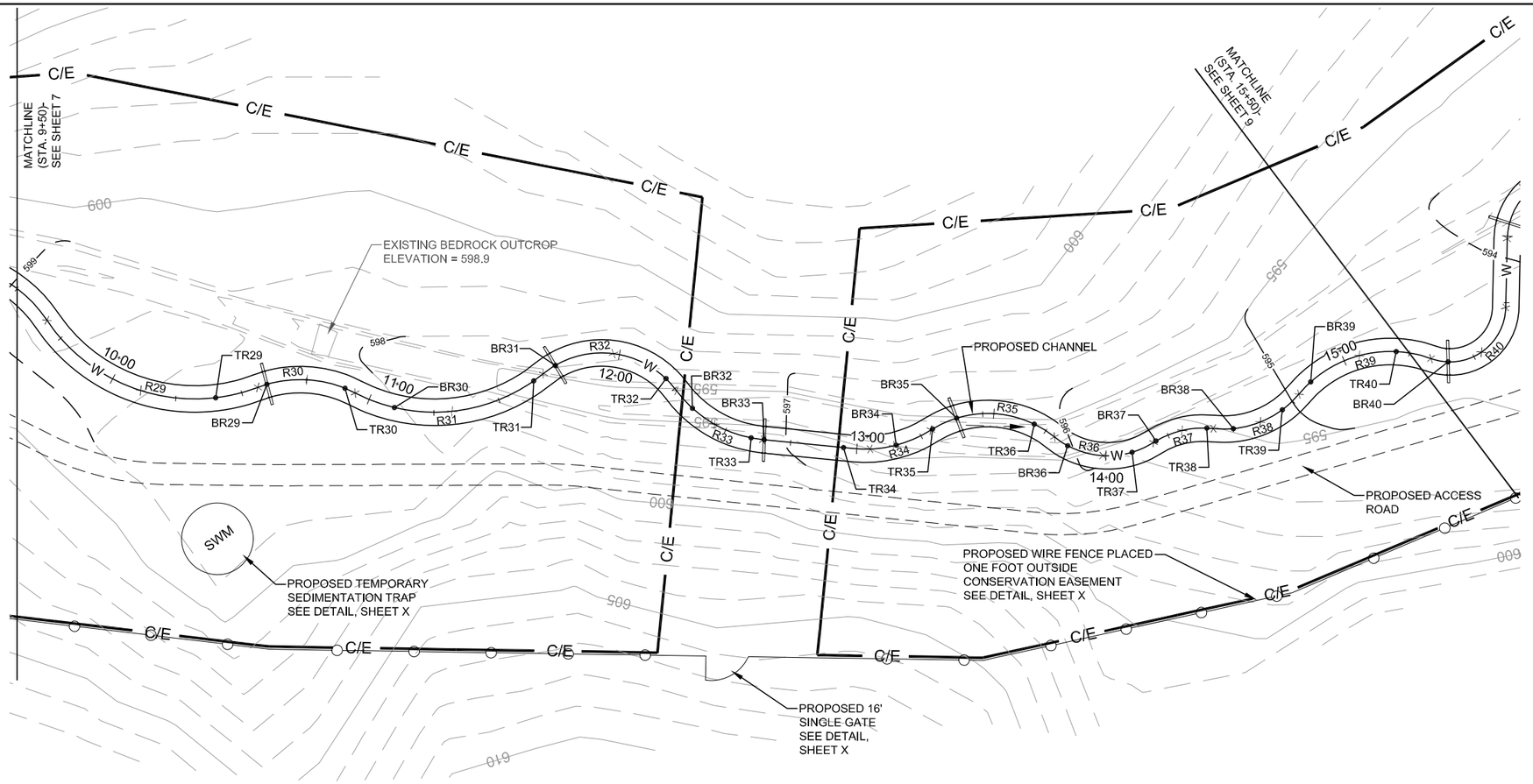
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	**Date:**
JWG/JFO	JUNE 2012

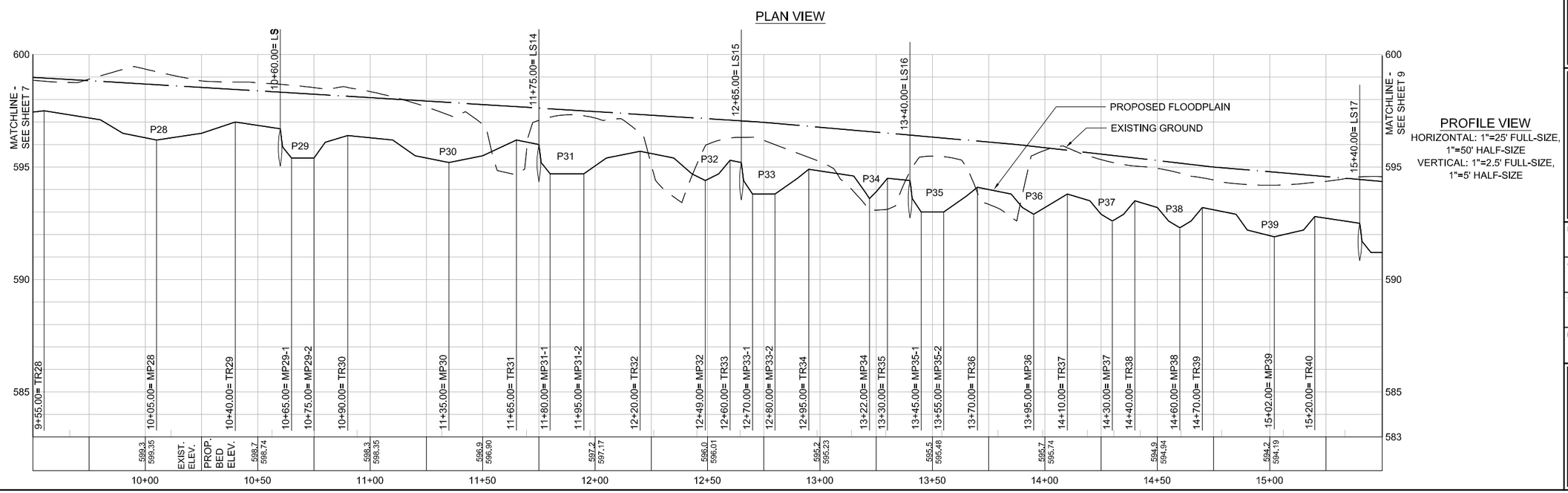
Scale: AS SHOWN

Project No.: 100024976

SHEET **7**

PRELIMINARY - NOT FOR CONSTRUCTION





ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

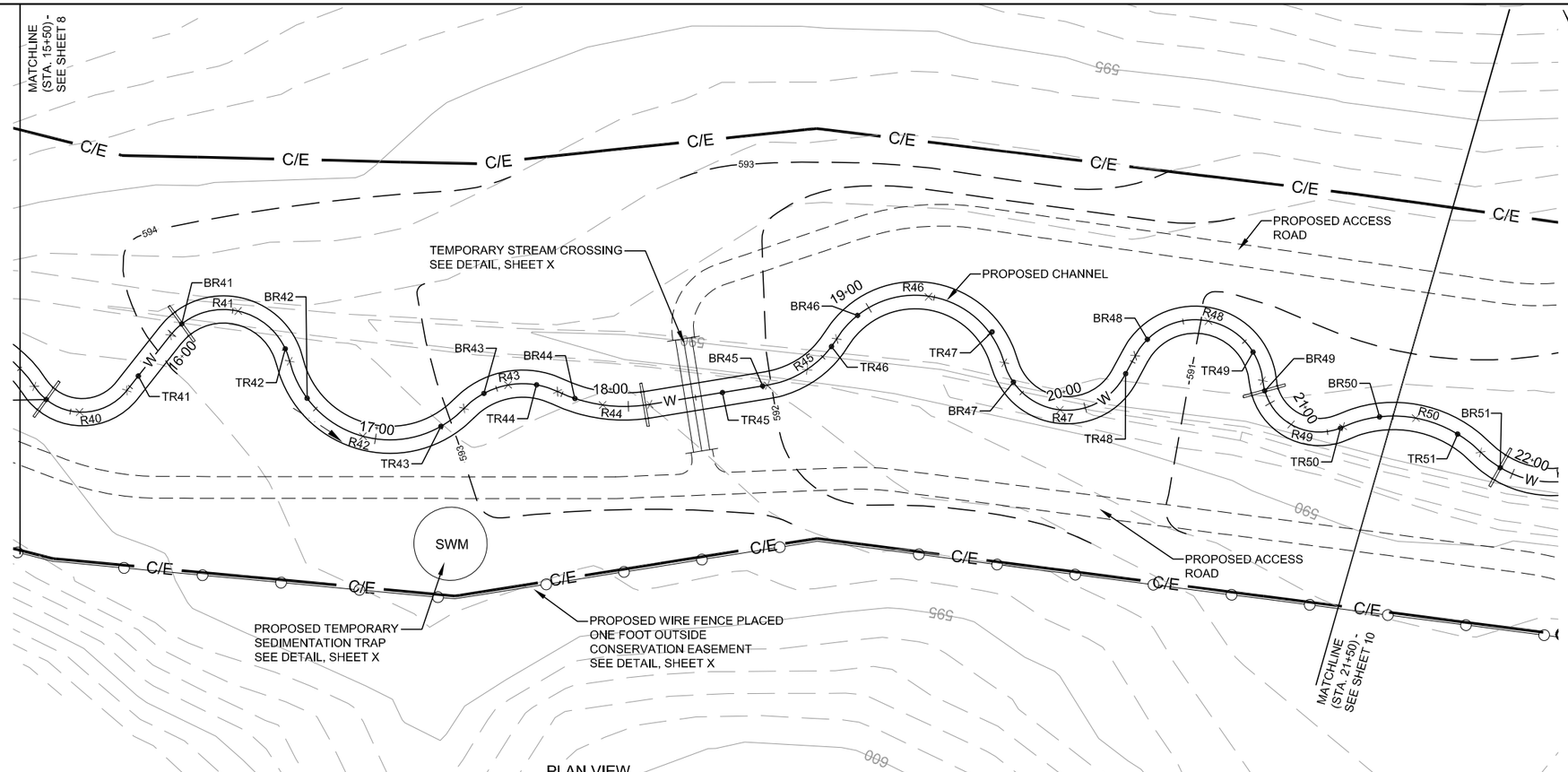
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET **8**

PRELIMINARY - NOT FOR CONSTRUCTION



ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

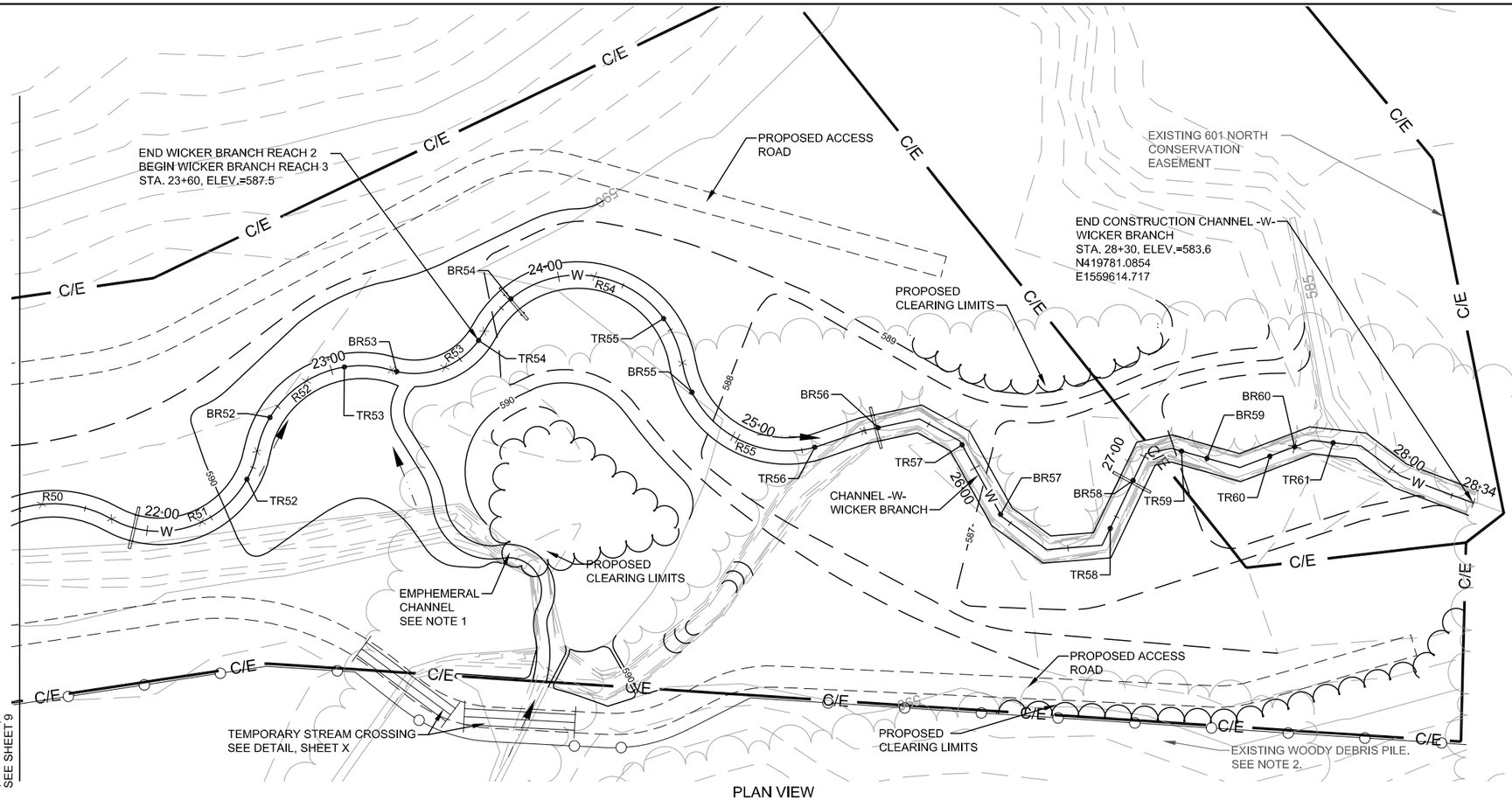
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET 9

PRELIMINARY - NOT FOR CONSTRUCTION

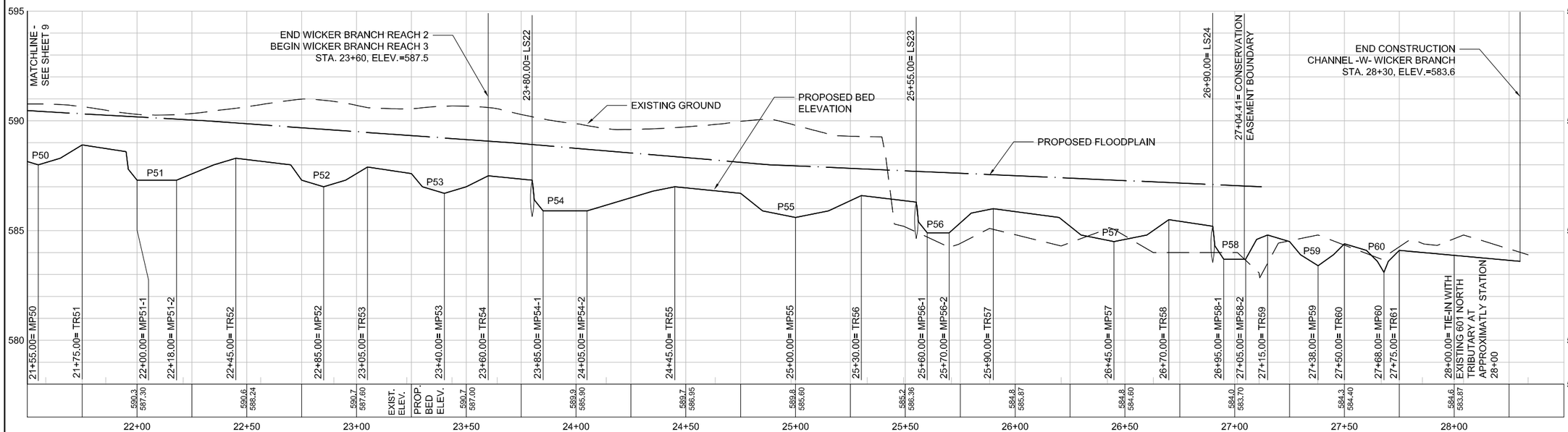


PLAN VIEW

0 25' 50'
SCALE: 1"=25'
HALF-SIZE SCALE: 1"=50'

NC GRID NADS3

NOTES:
1. EMPHEMERAL CHANNEL WILL BE LOCATED IN THE FIELD BY THE PROJECT CONSTRUCTION MANAGER AT THE TIME OF CONSTRUCTION.
2. LARGE WOODY MATERIAL FROM EXISTING WOOD DEBRIS PILE INCLUDING STUMPS AND BOLES SHALL BE USED, AS SUITABLE, FOR LOG SILLS, ROOT WADS, AND LARGE WOODY DEBRIS. REMAINING MATERIAL SHALL BE CUT AND SCATTERED WITHIN THE CONSERVATION EASEMENT AS REFUGIA AND HABITAT.



PROFILE VIEW
HORIZONTAL: 1"=25' FULL-SIZE, 1"=50' HALF-SIZE
VERTICAL: 1"=2.5' FULL-SIZE, 1"=5' HALF-SIZE

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
SITE PLAN AND PROFILE

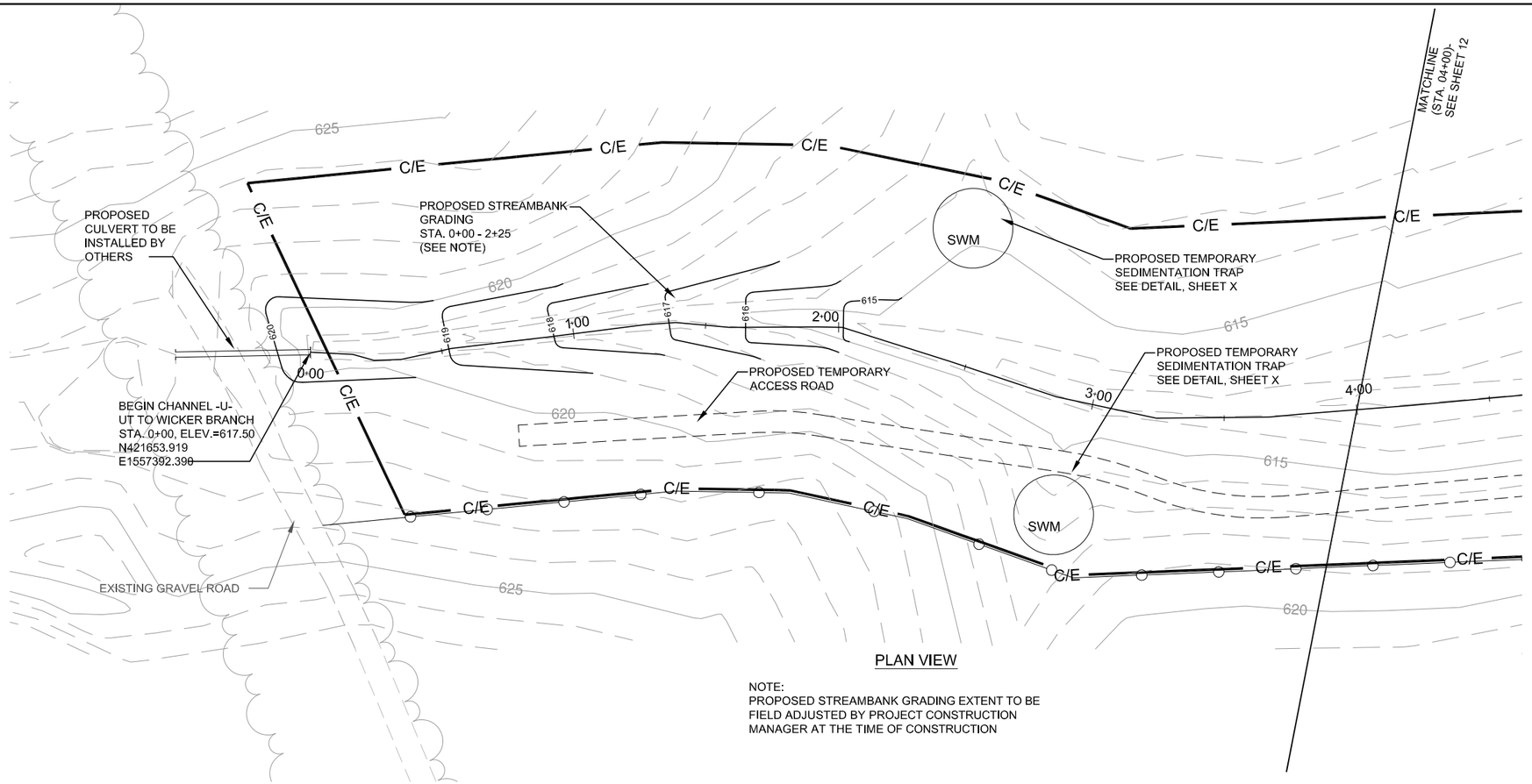
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

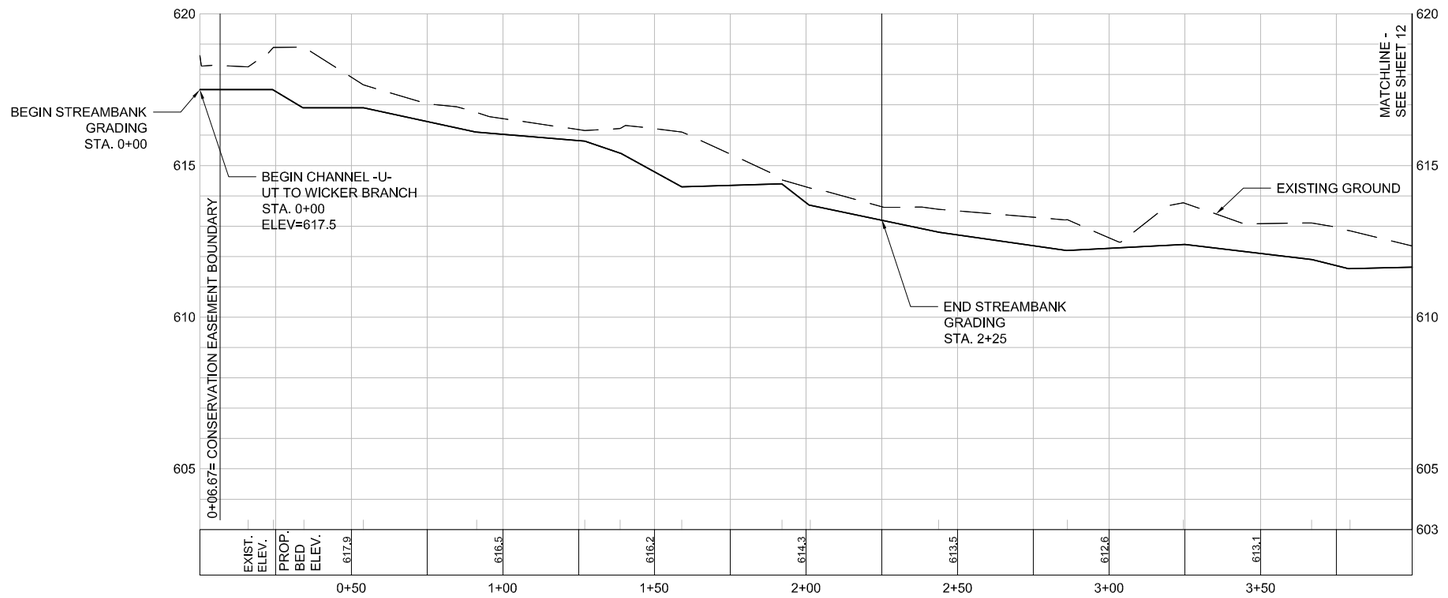
SHEET
10

PRELIMINARY - NOT FOR CONSTRUCTION



PLAN VIEW

NOTE:
PROPOSED STREAMBANK GRADING EXTENT TO BE FIELD ADJUSTED BY PROJECT CONSTRUCTION MANAGER AT THE TIME OF CONSTRUCTION



PROFILE VIEW
HORIZONTAL: 1"=25' FULL-SIZE, 1"=50' HALF-SIZE
VERTICAL: 1"=2.5' FULL-SIZE, 1"=5' HALF-SIZE

0 25' 50'
SCALE: 1"=25'
HALF-SIZE SCALE: 1"=50'

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:
601 NORTH II STREAM RESTORATION
UNION COUNTY, NORTH CAROLINA

Title:
SITE PLAN AND PROFILE

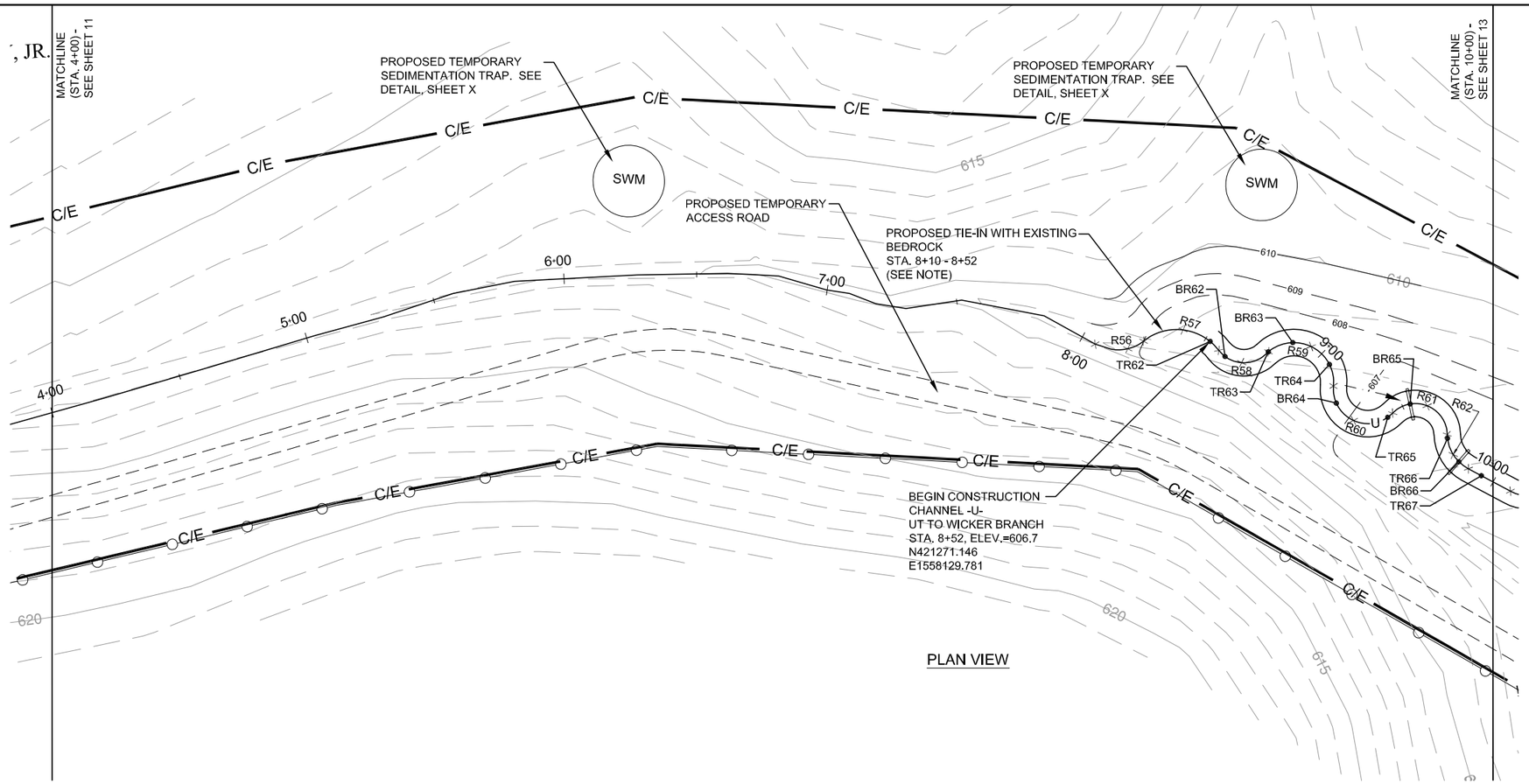
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

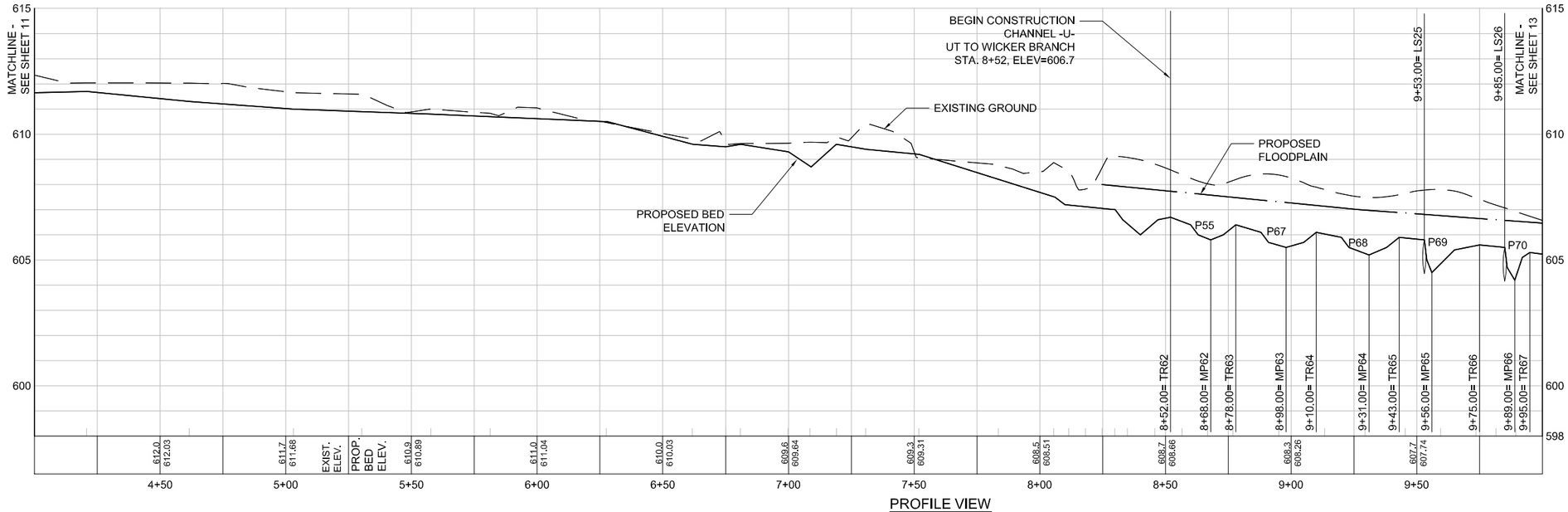
Project No.: 100024976

SHEET
11

PRELIMINARY - NOT FOR CONSTRUCTION



PLAN VIEW



PROFILE VIEW

HORIZONTAL: 1"=25' FULL-SIZE, 1"=50' HALF-SIZE
VERTICAL: 1"=2.5' FULL-SIZE, 1"=5' HALF-SIZE

NOTE:
PROPOSED STREAMBANK GRADING EXTENT TO BE FIELD ADJUSTED BY PROJECT CONSTRUCTION MANAGER AT THE TIME OF CONSTRUCTION

0 25' 50'
SCALE: 1"=25'
HALF-SIZE SCALE: 1"=50'

NC GRID NAD83

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

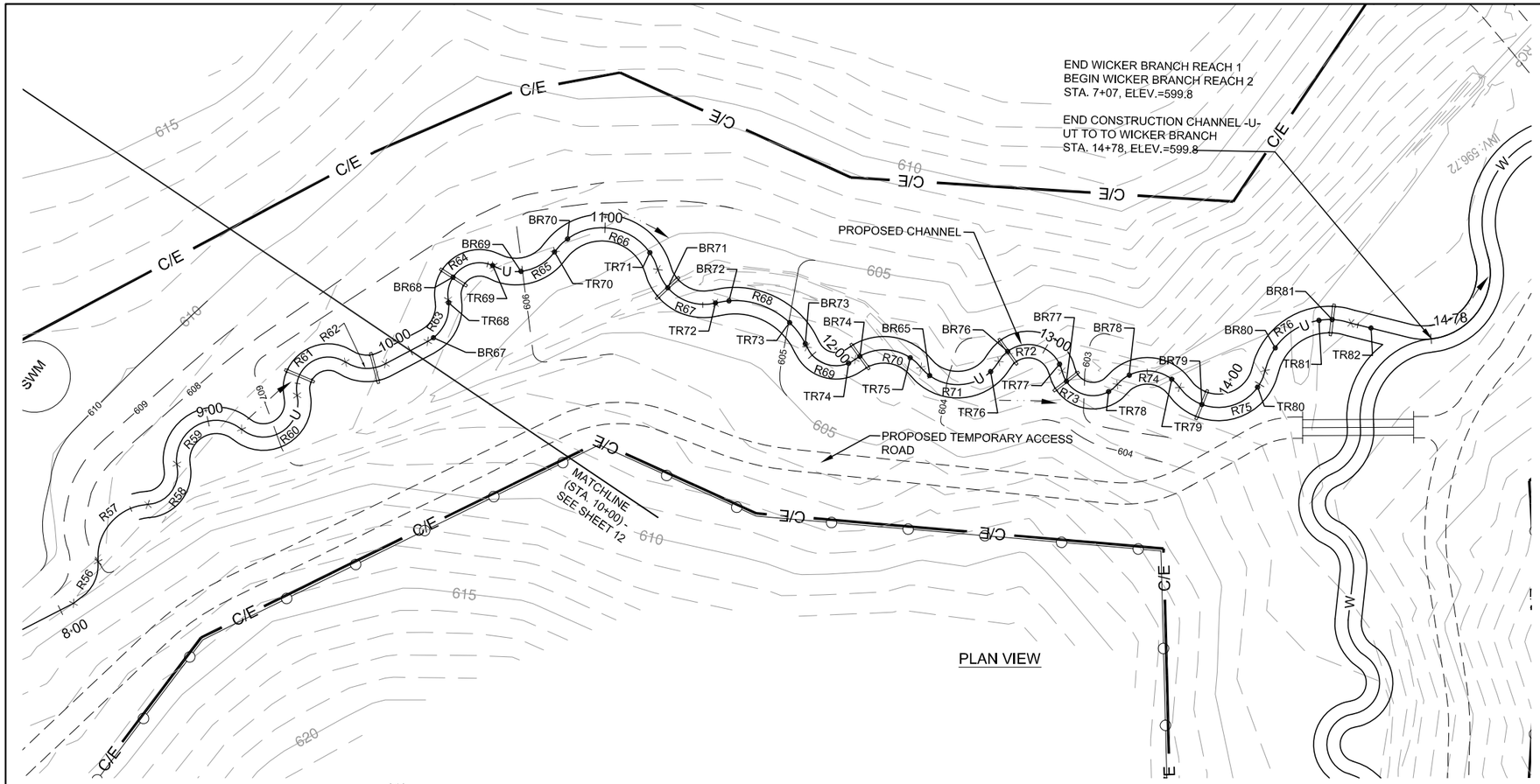
Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

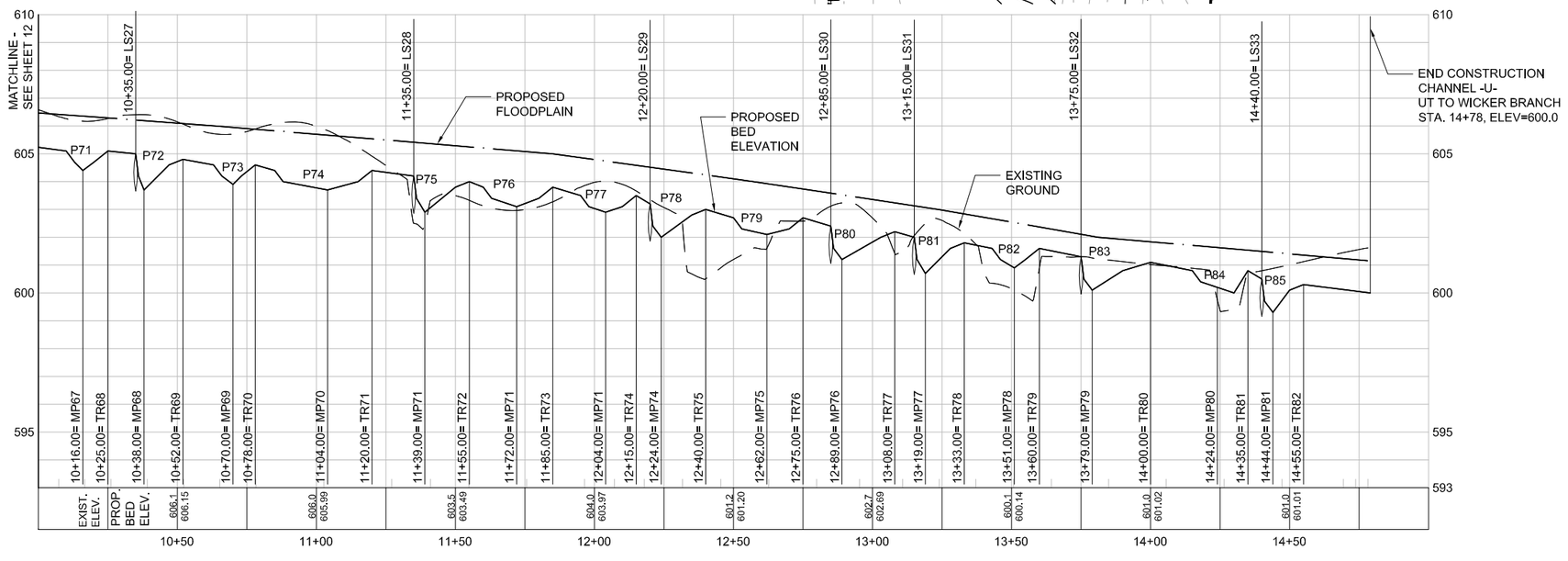
Scale: AS SHOWN

Project No.: 100024976

SHEET 12

PRELIMINARY - NOT FOR CONSTRUCTION





PROFILE VIEW
HORIZONTAL: 1"=25' FULL-SIZE, 1"=50' HALF-SIZE
VERTICAL: 1"=2.5' FULL-SIZE, 1"=5' HALF-SIZE

0 25' 50'
SCALE: 1"=25'
HALF-SIZE SCALE: 1"=50'
NC GRID NAD83

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

SITE PLAN AND PROFILE

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET
13

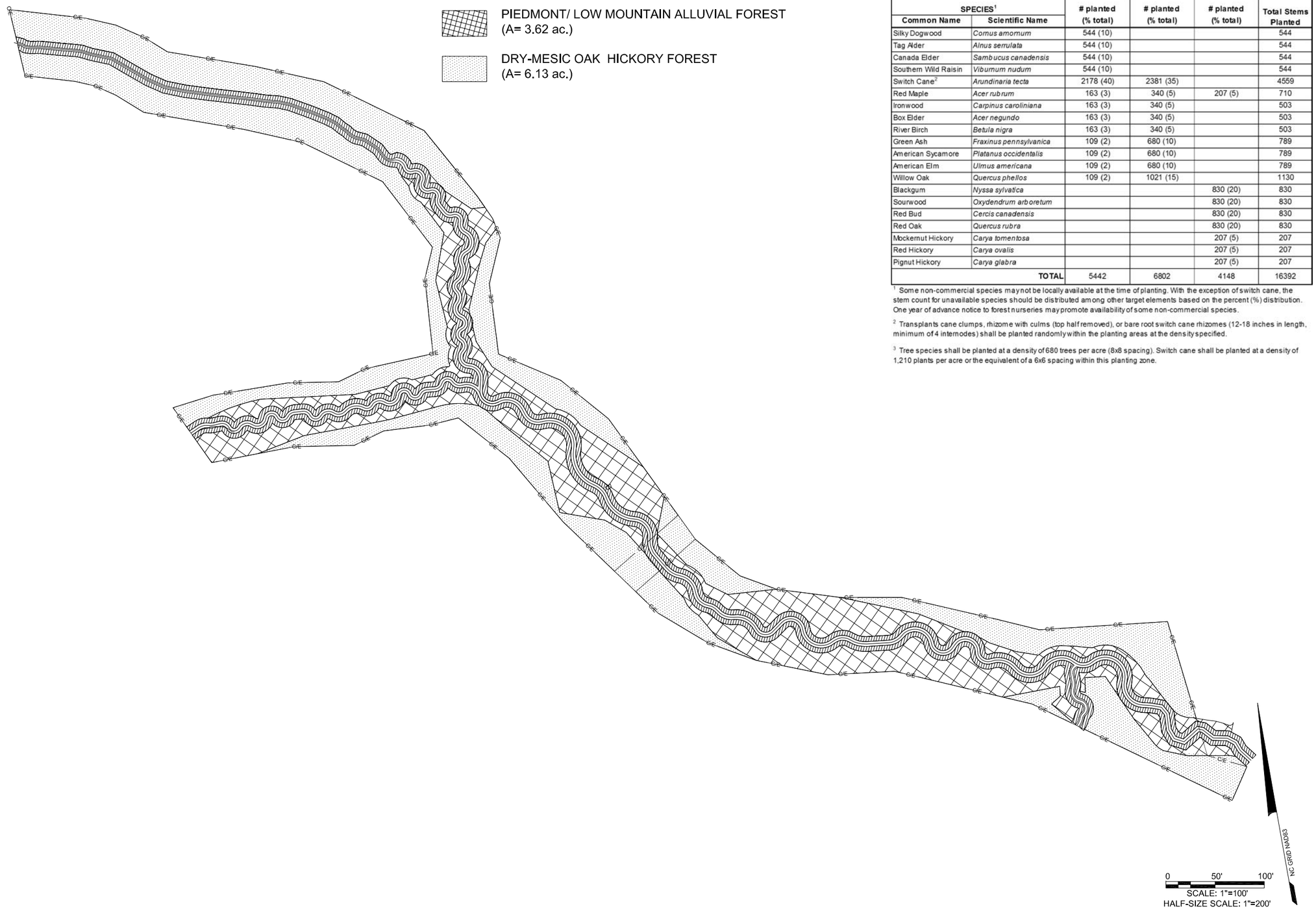
PRELIMINARY - NOT FOR CONSTRUCTION

LEGEND

STREAM-SIDE ASSEMBLAGE
(A= 2.02 ac.)

PIEDMONT/ LOW MOUNTAIN ALLUVIAL FOREST
(A= 3.62 ac.)

DRY-MESIC OAK HICKORY FOREST
(A= 6.13 ac.)



PLANT COMMUNITY ASSOCIATION (Schafale and Weakley, 1990)		Stream-side Assemblage	Piedmont/ Low Mountain Alluvial Forest	Dry-Mesic Oak Hickory Forest	Total
	Area (acres)	2.0	3.6	6.1	11.7
	Stem Target (per acre)	2722	1890[3]	680	--
SPECIES[1]		# planted (% total)	# planted (% total)	# planted (% total)	Total Stems Planted
Common Name	Scientific Name				
Silky Dogwood	*Cornus amomum*	544 (10)			544
Tag Alder	*Alnus serrulata*	544 (10)			544
Canada Elder	*Sambucus canadensis*	544 (10)			544
Southern Wild Raisin	*Viburnum nudum*	544 (10)			544
Switch Cane[2]	*Arundinaria tecta*	2178 (40)	2381 (35)		4559
Red Maple	*Acer rubrum*	163 (3)	340 (5)	207 (5)	710
Ironwood	*Carpinus caroliniana*	163 (3)	340 (5)		503
Box Elder	*Acer negundo*	163 (3)	340 (5)		503
River Birch	*Betula nigra*	163 (3)	340 (5)		503
Green Ash	*Fraxinus pennsylvanica*	109 (2)	680 (10)		789
American Sycamore	*Platanus occidentalis*	109 (2)	680 (10)		789
American Elm	*Ulmus americana*	109 (2)	680 (10)		789
Willow Oak	*Quercus phellos*	109 (2)	1021 (15)		1130
Blackgum	*Nyssa sylvatica*			830 (20)	830
Sourwood	*Oxydendrum arboretum*			830 (20)	830
Red Bud	*Cercis canadensis*			830 (20)	830
Red Oak	*Quercus rubra*			830 (20)	830
Mockernut Hickory	*Carya tomentosa*			207 (5)	207
Red Hickory	*Carya ovalis*			207 (5)	207
Pignut Hickory	*Carya glabra*			207 (5)	207
	TOTAL	5442	6802	4148	16392

[1] Some non-commercial species may not be locally available at the time of planting. With the exception of switch cane, the stem count for unavailable species should be distributed among other target elements based on the percent (%) distribution. One year of advance notice to forest nurseries may promote availability of some non-commercial species.

[2] Transplants cane clumps, rhizome with culms (top half removed), or bare root switch cane rhizomes (12-18 inches in length, minimum of 4 internodes) shall be planted randomly within the planting areas at the density specified.

[3] Tree species shall be planted at a density of 680 trees per acre (8x8 spacing). Switch cane shall be planted at a density of 1,210 plants per acre or the equivalent of a 6x6 spacing within this planting zone.

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:
EBX
ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

PLANTING PLAN

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG	JUNE 2012

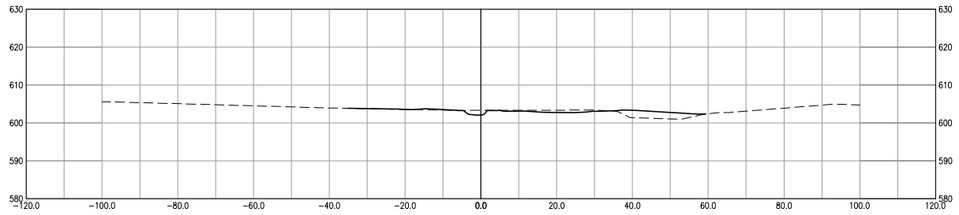
Scale: AS SHOWN

Project No.: 100024976

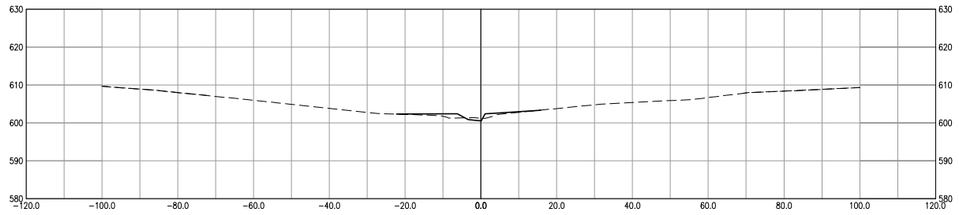
SHEET

L1

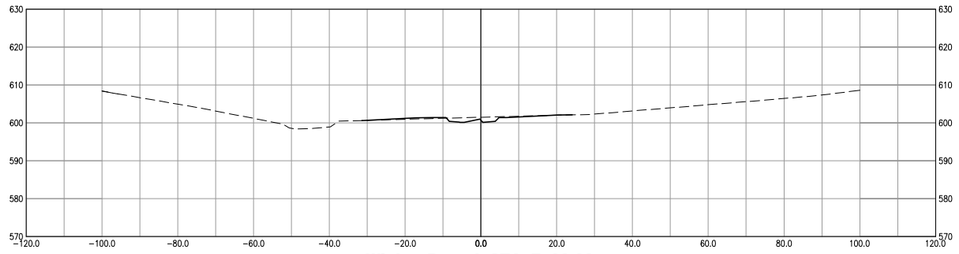
PRELIMINARY - NOT FOR CONSTRUCTION



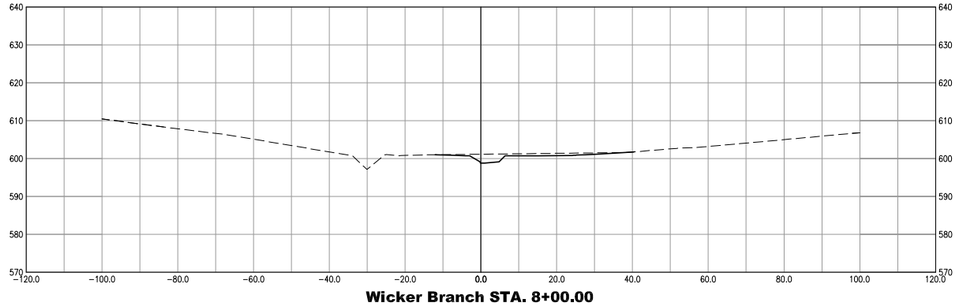
Wicker Branch STA. 5+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



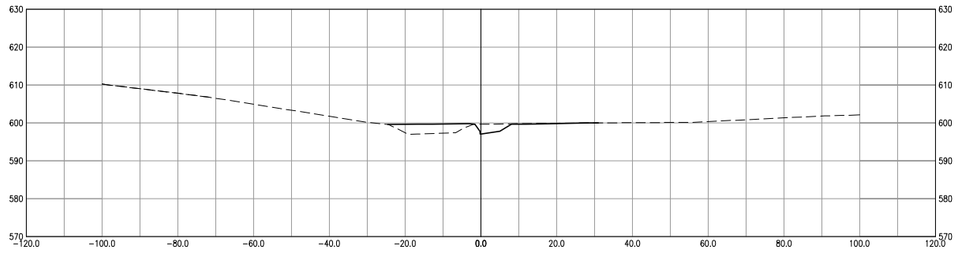
Wicker Branch STA. 6+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



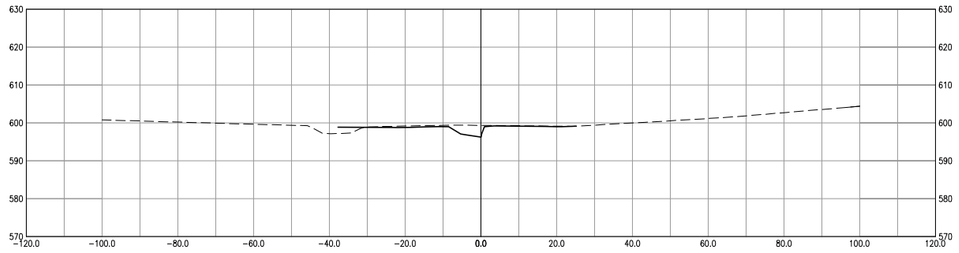
Wicker Branch STA. 7+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



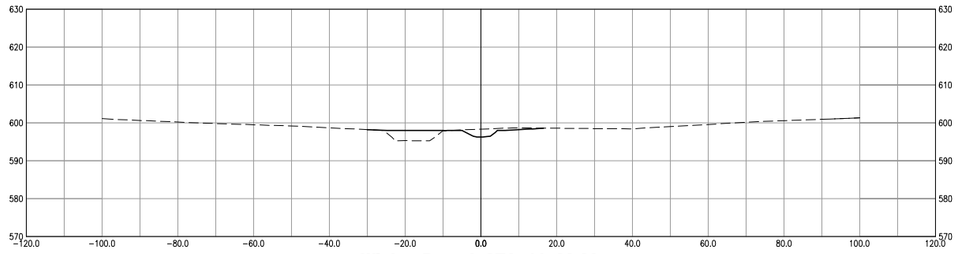
Wicker Branch STA. 8+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



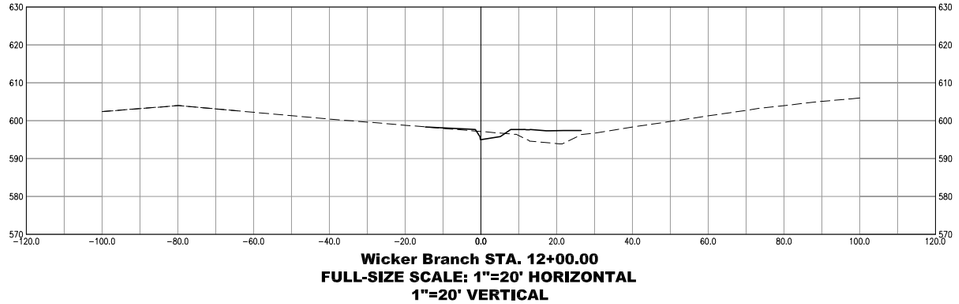
Wicker Branch STA. 9+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 10+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 11+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 12+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

CROSS-SECTIONS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	**Date:**
JWG/JFO	JUNE 2012

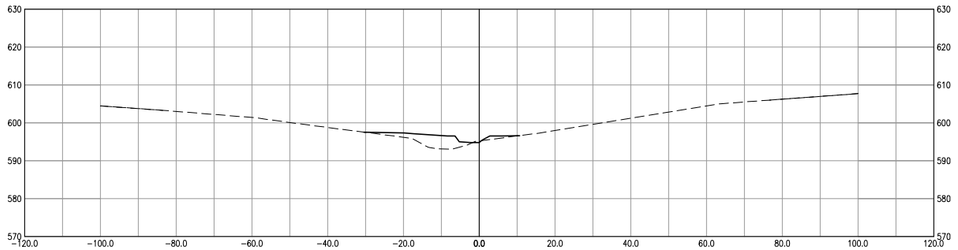
Scale: AS SHOWN

Project No.: 100024976

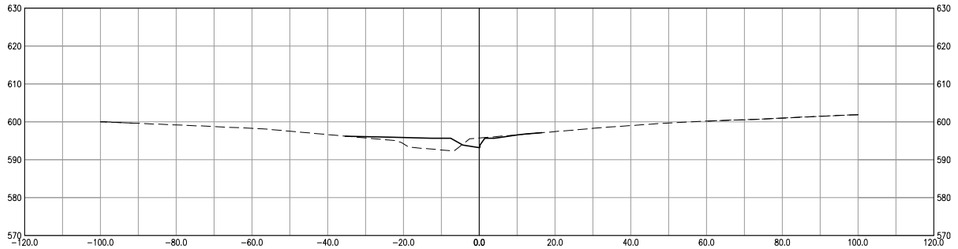
SHEET

XS1

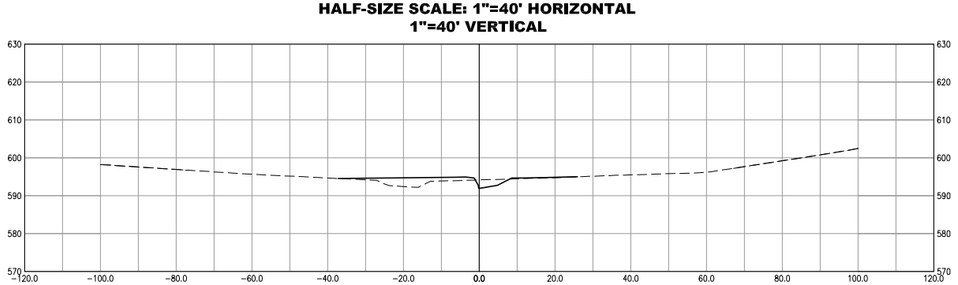
PRELIMINARY - NOT FOR CONSTRUCTION



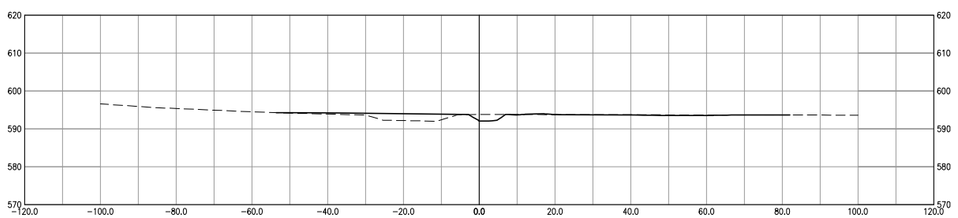
Wicker Branch STA. 13+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



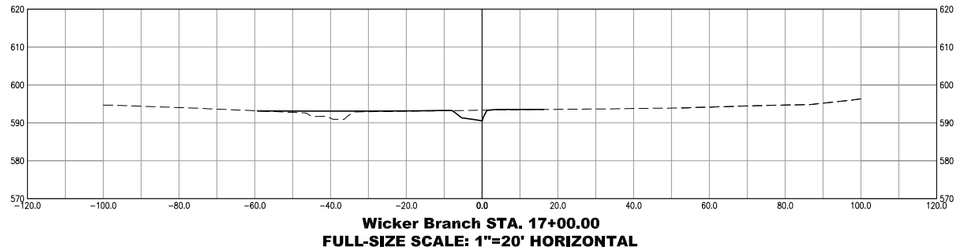
Wicker Branch STA. 14+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



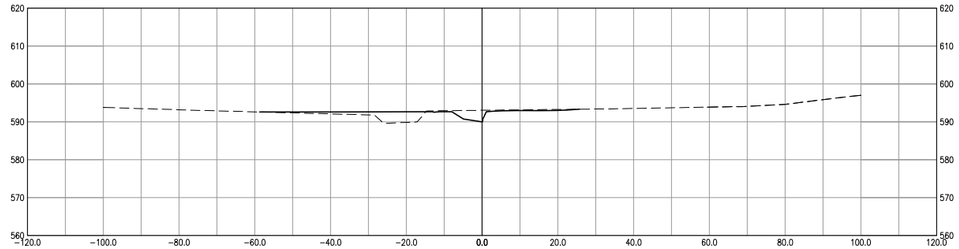
Wicker Branch STA. 15+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



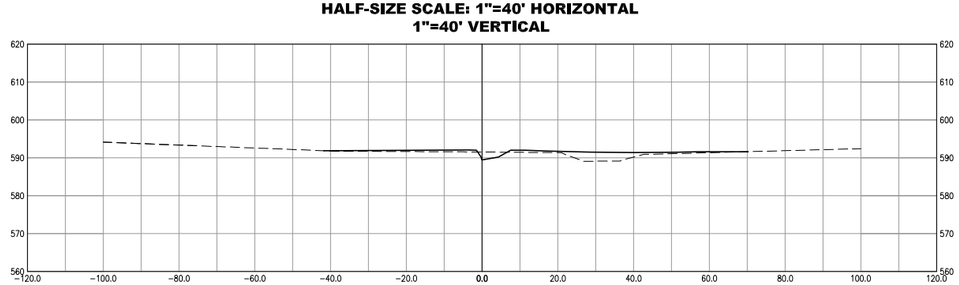
Wicker Branch STA. 16+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



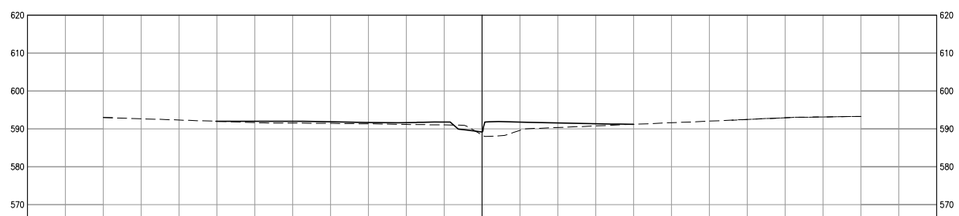
Wicker Branch STA. 17+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 18+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 19+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 20+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

CROSS-SECTIONS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

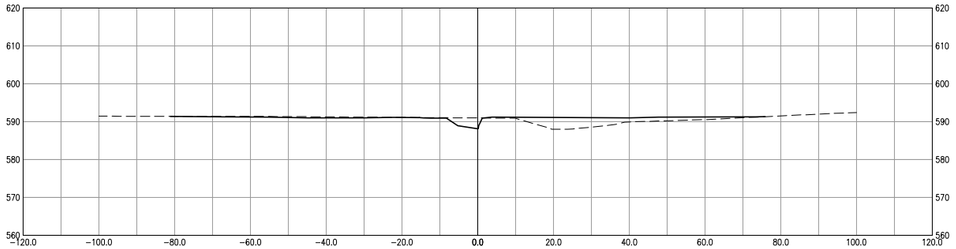
Scale: AS SHOWN

Project No.: 100024976

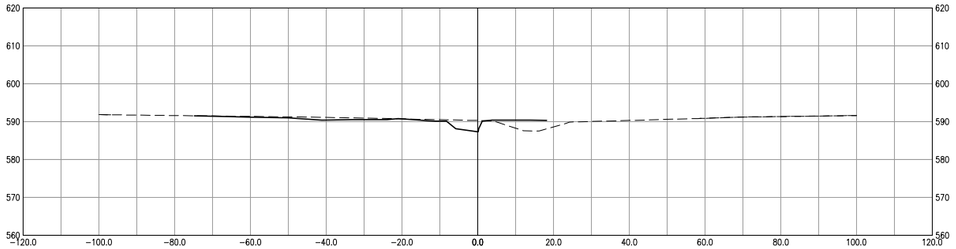
SHEET

XS2

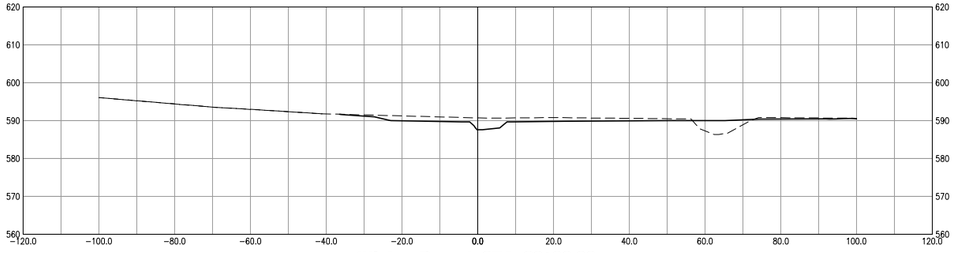
PRELIMINARY - NOT FOR CONSTRUCTION



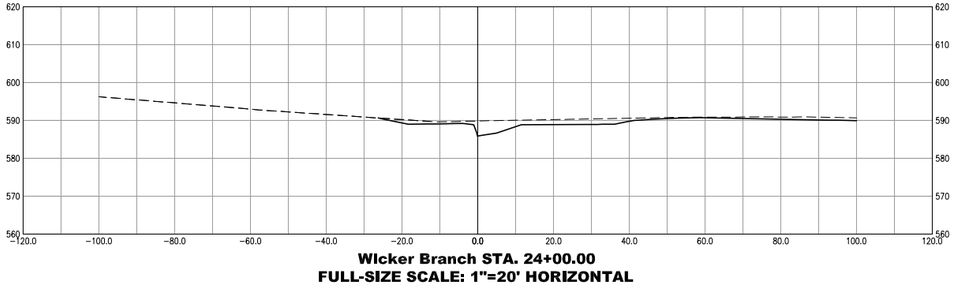
Wicker Branch STA. 21+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



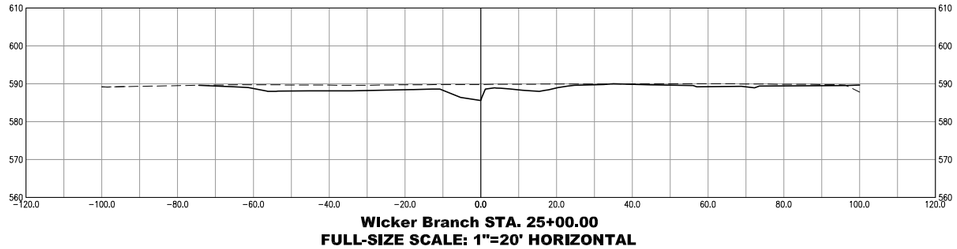
Wicker Branch STA. 22+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



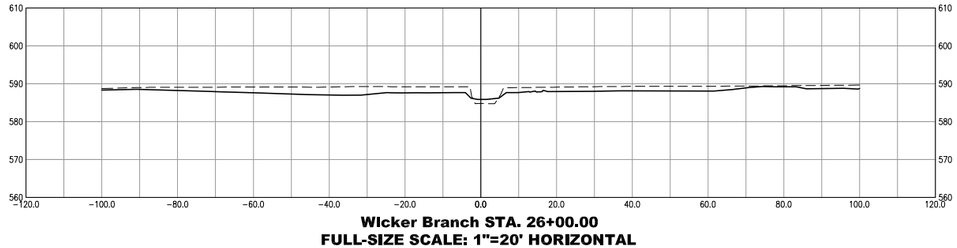
Wicker Branch STA. 23+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



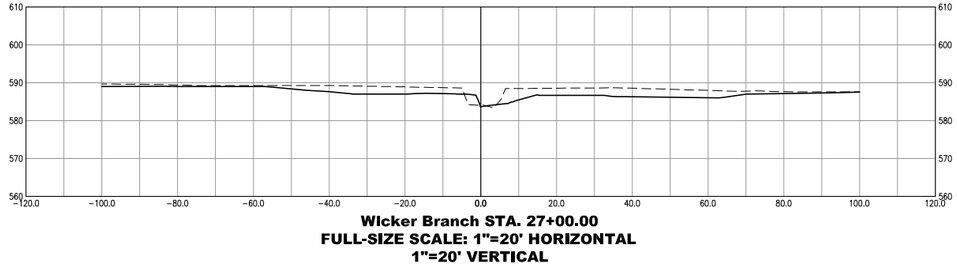
Wicker Branch STA. 24+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 25+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 26+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



Wicker Branch STA. 27+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

EBX

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

CROSS-SECTIONS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	**Date:**
JWG/JFO	JUNE 2012

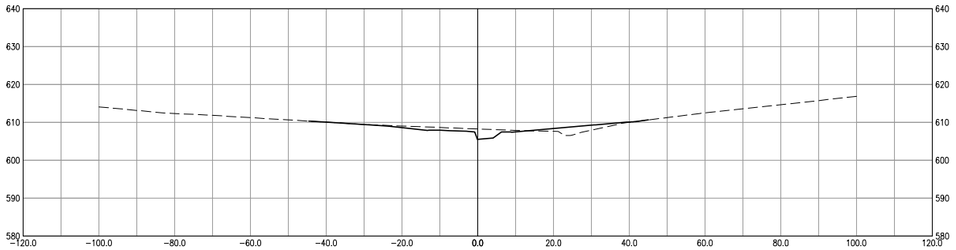
Scale: AS SHOWN

Project No.: 100024976

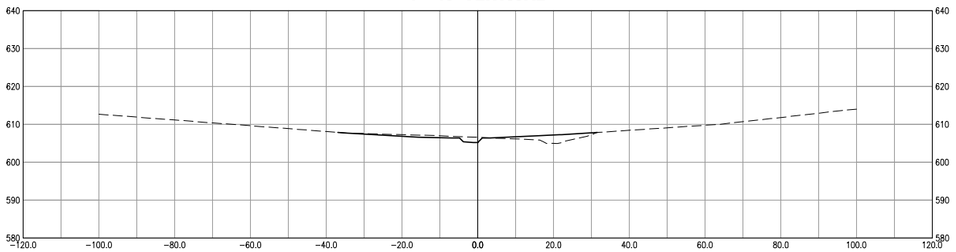
SHEET

XS3

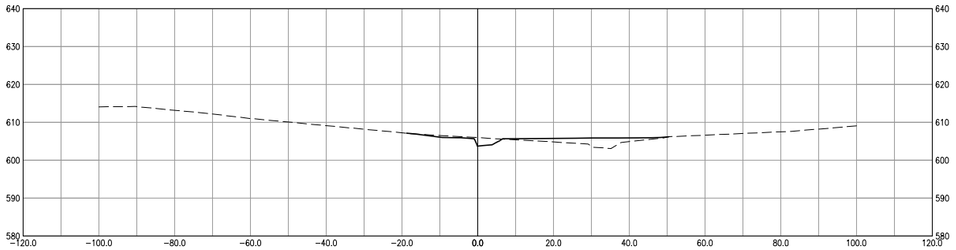
PRELIMINARY - NOT FOR CONSTRUCTION



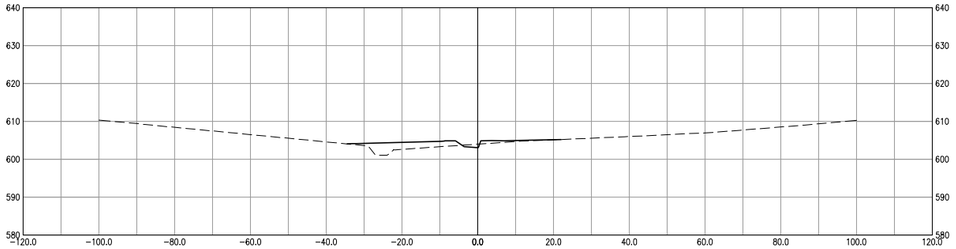
UT to Wicker Branch STA. 9+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



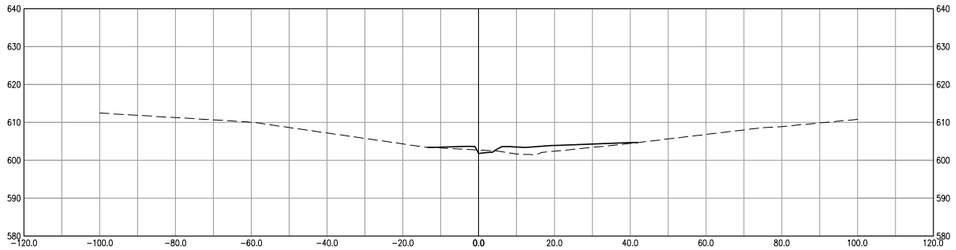
UT to Wicker Branch STA. 10+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



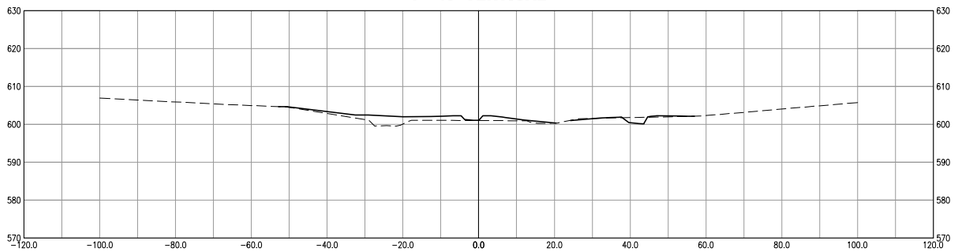
UT to Wicker Branch STA. 11+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



UT to Wicker Branch STA. 12+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



UT to Wicker Branch STA. 13+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL



UT to Wicker Branch STA. 14+00.00
FULL-SIZE SCALE: 1"=20' HORIZONTAL
1"=20' VERTICAL
HALF-SIZE SCALE: 1"=40' HORIZONTAL
1"=40' VERTICAL

ATKINS
1616 EAST MILLBROOK ROAD
SUITE 310
RALEIGH, NC 27609
TELEPHONE: (919) 876-6888
FAX: (919) 876-6848

Revisions:

Client:

ENVIRONMENTAL BANC & EXCHANGE, LLC
909 CAPABILITY DRIVE, SUITE 3100
RALEIGH, NC 27606

Project:

601 NORTH II STREAM RESTORATION

UNION COUNTY, NORTH CAROLINA

Title:

CROSS-SECTIONS

Dsn. By:	Dwn. By:
JWG	RJB
Ckd. By:	Date:
JWG/JFO	JUNE 2012

Scale: AS SHOWN

Project No.: 100024976

SHEET

XS4

PRELIMINARY - NOT FOR CONSTRUCTION