MITIGATION PLAN

Final

February 2020

McCLENNY ACRES MITIGATION PLAN

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038

Neuse River Basin
HUC 03020201

USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197
RFP #: 16-007279

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

PREPARED BY:

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DEPARTMENT OF THE ARMY
WILMINGTON DISTRICT, CORPS OF ENGINEERS
69 DARLINGTON AVENUE
WILMINGTON, NORTH CAROLINA 28403-1343

REPLY TO
ATTENTION OF:

July 17, 2019

Regulatory Division

Re: NCIRT Review and USACE Approval of the McClenny Acres Mitigation Plan; SAW-2018-02042; NCDMS Project # 100038

Mr. Tim Baumgartner
North Carolina Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

Dear Mr. Baumgartner:

The purpose of this letter is to provide the North Carolina Division of Mitigation Services (NCDMS) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day comment period for the McClenny Acres Mitigation Plan, which closed on June 15, 2019. These comments are attached for your review.

Based on our review of these comments, we have determined that no major concerns have been identified with the Draft Mitigation Plan, which is considered approved with this correspondence. However, several minor issues were identified, as described in the attached comment memo, which must be addressed in the Final Mitigation Plan.

The Final Mitigation Plan is to be submitted with the Preconstruction Notification (PCN) Application for Nationwide permit approval of the project along with a copy of this letter. Issues identified above must be addressed in the Final Mitigation Plan. All changes made to the Final Mitigation Plan should be summarized in an errata sheet included at the beginning of the document. If it is determined that the project does not require a Department of the Army permit, you must still provide a copy of the Final Mitigation Plan, along with a copy of this letter, to the appropriate USACE field office at least 30 days in advance of beginning construction of the project. Please note that this approval does not preclude the inclusion of permit conditions in the permit authorization for the project, particularly if issues mentioned above are not satisfactorily addressed. Additionally, this letter provides initial approval for the Mitigation Plan, but this does not guarantee that the project will generate the requested amount of mitigation credit. As you are aware, unforeseen issues may arise during construction or monitoring of the project that may require maintenance or reconstruction that may lead to reduced credit.

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please call me at 919-554-4884, ext 60.

Sincerely,

Kim Browning
Mitigation Project Manager
for Henry Wicker

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List
Jeff Schaffer – NCDMS
Shawn Wilkerson—WEI

February 13, 2020

Wilmington District, Regulatory Division
U.S. Army Corps of Engineers
11405 Falls of Neuse Road
Wake Forest, NC 27587

Attention: Kim Browning

Subject: Final Mitigation Plan
McClenny Acres Mitigation Project, Wayne County
Neuse River Basin HUC 03020201
USACE AID# SAW-2018-02042
DMS Project ID No. 1000382 / DEQ Contract # 7423

Dear Kim:

We have reviewed the IRT's comments on the draft mitigation plan and draft construction documents for the McClenny Acres Stream, Wetland, and Buffer Mitigation Site. We have made the necessary revisions to the report and draft plans and we are submitting revised versions of the documents along with this letter. Below are responses to each of the IRT's comments from the U.S. Army Corps of Engineers memo dated July 1, 2018. The original comments are provided below followed by our responses in bold italics.

Mac Haupt/Katie Merritt, NCDWR:

1. DWR concurs with the proposed wetland hydrologic performance criteria. DWR requests that a couple of gauges be targeted for the Pantego soil series areas with the 14% hydro criteria.

   We have two gauges planned for the Pantego soils. See Figure 11.

2. Where is the wetland gauge data for gauges #4 and #5 from the pre-construction monitoring?

   Gauge 4 is in an existing wetland and gauge 5 is located far away from the mitigation areas. Neither gauge was used for the hydrology analysis of the re-establishment zones. We have added plots for gauges #4 and #5 to Appendix 6.

3. A concept plan is provided in Figure 10. Please revise this plan to show where buffer mitigation and/or nutrient offset are also being generated. Figure 10 (concept map) does not quite match the figures in the Buffer Mitigation Plan (Appendix 1) for where credit types are being generated.

   We have added the buffer mitigation areas to Figure 10.

4. Design sheets 1.10, 1.11, and 1.12 show the stream being constructed which is a part of the proposed

bank site. Is this portion of the bank site being constructed when this site (DMS portion) goes to construction?

Yes, the entire site including all of the DMS full delivery portions and the bank portions will be constructed at the same time. We are planning for construction to be completed during summer 2020.

4. On design sheets 1.12, 1.15 and particularly on sheet 1.18, there are some meander bends with some high Radius of Curvatures. Please explain the necessity for these over-sinuous meanders.

The planform pattern for the site was designed to be highly sinuous in some areas and straighter in others to mimic a natural, very flat coastal plain stream and wetland complex. These types of streams typically have areas of highly sinuous, tortuously meandering patterns. We have implemented similar patterns successfully on Devil's Racetrack, Falling Creek (bank site), and Grantham Branch (bank site). Each of these projects are in the general vicinity of McClenny.

5. If the terminus of UT4 is only being benched on one side and no other in-stream grade control structures are being utilized for the end of this reach then DWR believes this reach is more of an enhancement 2 reach.

We have changed Reach 2 of UT4 to E2 with a 2.5:1 ratio. The total credits for the reach have been reduced from 116.000 to 69.600. The total credits for the project are now 9,284.100. This includes the reductions described in USACE comment #1 below.

7. DWR performed two stream determinations for this site (April 5 & 6, 2018). However, no DWR correspondence is included in the Appendices. These should be included and referenced where appropriate.

We have added the stream determinations to Appendix 7.

8. Section 5.0 of Appendix 1, states that the Sponsor wants the flexibility of using planted riparian areas for either buffer credit or wetland credit, but not both. DWR did not see any mention of this in the "Stream and Wetland" Mitigation Plan. DWR prefers that no credit conversion take place post mitigation plan approval. In addition, from a riparian buffer credit standpoint, the Sponsor should know there maybe timelines where no credit conversions can take place.

We have changed the text in this section so that it no longer states that wetland areas can be converted to buffer areas for credit.

9. All the riffles on the design sheets are specified as "nm" or native material we assume. However, in the typicals there is no constructed riffle typical specified as "nm". While we have seen it before on previous plans the main reason for the inquiry is the hope that there is a considerable amount of wood that will be incorporated into these "native material" riffles. Please confirm that there will be a significant number of riffles with wood incorporated.

We have changed the symbol for the native material riffle in the detail to CR-NM. These will not have wood in them. However, we have also added more angled log riffles and some woody riffles. Along with log vanes, log sills, and lunker logs, there will be a considerable amount of wood in the stream beds.

Kim Browning, USACE:

1. The revised asset table for the site is attached. The changes in credits are due to the change in CE at the upstream end of UT1 for the road, elimination of the crossing on UT4, and some very minor changes that

occurred because the property boundary lines were resurveyed and differed from the original survey. Please update Table 13.

We have updated the asset (Table 22). Note that the acreage of the wetland re-establishment and enhancement also changed very slightly for this final submittal. This update in acreage occurred because: 1) We had the property boundary re-surveyed and there were minor changes in the boundary lines from the previous plat and 2) the change in the crossing location referenced in your comment #8.

2. Section 5 refers to functional uplift and the text reads that these areas are classified as not-functioning. Specifically regarding hydraulics and channel geomorphology, perhaps it would be beneficial to tie these statements to the information in Appendix 10 for supporting documentation.

   The hydraulics section (Section 5.2.2) includes discussion of parameters included in Appendix 10. A reference to the appendix has been added to the text. The geomorphology section (Section 5.2.3) only refers to one specific parameter (sinuosity) included in Appendix 10. The range of sinuosity of the existing reaches has been added along with a reference to Appendix 10. The rest of the discussion in Section 5.2.3 is based on some of the elements used to assess geomorphology in the Harman et al., 2012 book including stage of Simon Evolution Model.

3. It appears that much of UT4 contains overly-sinuous channel design in a rather flat coastal plain area. The reference sites mention some existing sinuosity, but please clarify design, especially around stations 406+00 to 407+00.

   We believe that the pattern design is appropriate for flat, coastal plain streams. See the response to #4 under DWR comments above.

4. The IRT noted several areas along UT3 that are significantly far away from proposed hydrology changes and these wetlands may not be impacted by the stream restoration. These areas have a well-established forest community, and the need for groundwater gauges to determine current conditions was noted. These areas are not jurisdictional on the enclosed JD; however, pre-monitoring gauge data should be included to show hydrologic functional uplift during the monitoring period.

   We have added pre-construction data for additional groundwater gauges, including gauges 9 and 10 which are in the area in question. We have amended the text and the Table in Section 3.5.3.

5. Section 9.2: please include a vigor standard of 7-ft for MY5.

   This text has been added.

6. Considerable pine was noted in the existing wooded buffer. Please discuss plans to thin/control.

   Text describing thinning of pines has been added to Section 8.8.

7. Where stream and wetland credits are being sought, buffer credits cannot be an alternative if the wetlands do not meet performance standards. Wildlands should state which credit types are being sought in the Final Mitigation Plan.

Understood. The Buffer Mitigation Plan in Appendix 1 no longer states that wetland areas that fail to meet performance standards may be used to generate buffer credits.

8. The text should reflect that there is no longer an easement break on UT4.

Text referring to the easement break on UT4 has been removed.

Please note that there was a slight change in wetland credits in Table 22 from 37.142 credits to 37.089 credits. This change was made because the mitigation approach for some small areas of existing wetlands was changed from re-establishment to enhancement during the bank mitigation plan review and we made the same change to a very small area of existing wetland within the DMS full delivery easement.

Please contact me at 919-851-9986 x103 if you have any questions. Thank you,

Jeff Keaton, PE
Project Manager

FINAL MITIGATION PLAN

McCLENNY ACRES MITIGATION SITE

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038
Neuse River Basin
HUC 03020201
USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197

PREPARED FOR:

NC Department of Environmental Quality
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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).
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

Contributing Staff:
Jeff Keaton, PE, *Project Manager*
Nicole Macaluso, PE*, Lead Designer*
John Hutton, *Principal in Charge*
Jesse Phillips, *Designer*
Charlie Neaves, *Lead Scientist*
Angela Allen, PE, *Lead Quality Assurance*

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1.0 Introduction

The McClenny Acres Mitigation Site (Site) is located in Wayne County approximately four miles west of Goldsboro near the community of Rosewood (Figure 1). The project is located within the NC Division of Mitigation Services (DMS) targeted local watershed for the Neuse River Basin Hydrologic Unit (HU) 03020201200030 and NC Division of Water Resources (DWR) subbasin 03-04-12. The Site (Figure 2) was selected by DMS to provide stream mitigation units (SMUs), wetland mitigation units (WMUs), and buffer credits in the Neuse River Basin 03020201 (Neuse 01). The proposed site is in a new targeted local watershed (TLW) which is not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) plan. However, the proposed project does address key CU-wide restoration goals including reduction of sediment and nutrient loads from agricultural lands by restoring and preserving wetlands, streams, and riparian buffers. The project involves the restoration, enhancement, and preservation of 8,319 existing linear feet of incised and straightened streams on four unnamed tributaries (UT1 – UT4) to the Neuse River, which is classified as nutrient sensitive waters and is a water supply source, as well as the re-establishment or enhancement of over 37 acres of wetlands. Restoration of these streams and adjacent wetlands will provide 9,284.100 SMUs and 37.089 WMUs. The project will also restore, enhance, and preserve riparian buffer area within the project area, which will provide 202,670.607 buffer credits. The Buffer Mitigation Plan is located in Appendix 1. The Site will be protected by a 52.08-acre conservation easement. The Site Protection Instrument detailing the easement is located in Appendix 2. General project information is shown in Table 1.

Table 1: Project Attribute Table Part 1

Project Information	
Project Name	McClenny Acres Mitigation Site
County	Wayne
Project Area (acres)	52.08
Project Coordinates (latitude and longitude)	35° 23’ 25"N 78° 03' 15"W
Planted Acreage (acres of woody stems planted)	31.48

2.0 Watershed Approach and Site Selection

The site is located in the DWR subbasin 03-04-12, which is dominated by forest land (52%) and agricultural land (41%). This subbasin is not well assessed. There has been no ambient monitoring and only a single benthic sample assessed, which produced a good benthic bioclassification. Although few water quality studies have been reported in the subbasin, the proposed project does drain directly to the Neuse River, which is classified as nutrient sensitive waters (NSW) and is a water supply source (WS-IV). Regardless of the lack of assessment, the 2009 River Basin Water Quality Plan for this highly agricultural subbasin recommends implementation of appropriate BMPs to reduce nutrient and sediment loading.

The site is in a new targeted local watershed which is not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) plan; however, the proposed project addresses key CU-wide restoration goals including reduction of sediment and nutrient loads from agricultural lands by restoring and preserving wetlands, streams, and riparian buffers and targeted implementation of a nutrient offset project. The 2010 Neuse RBRP highlights the importance of riparian buffers for stream restoration projects. Riparian buffers retain and remove nutrients and suspended sediments. Of the 123 miles of streams in the Neuse 01 CU, 23% do not have adequate riparian buffers. The RBRP states that “priority [restoration] projects should increase or improve buffers.” The site contains tributaries that flow directly into the Neuse River, which is WS-IV and NSW. The RBRP also states that a goal for the Neuse 01 CU is to, “…promote nutrient and

sediment reduction in agricultural areas by restoring and preserving wetlands, streams, and riparian buffers."

The Neuse River basin is also discussed in the 2005 North Carolina Wildlife Resource Commission's (NCWRC) Wildlife Action Plan (WAP). In the report, non-point source pollution including nutrient loading and erosion from stream channelization for agriculture attributed to degraded aquatic habitats in the basin. Additionally, fertilizers and livestock contribute 60 percent of the nitrate and phosphate found in the Neuse River basin according to the report. This report notes the importance of stream restoration and land protection efforts in the watershed to address the observed stressors.

The McClenny Acres Mitigation Site was selected because of its location within the newly targeted local watershed and its potential to address the goals of the Basinwide Water Quality Plan, the RBRP, and the WAP through stream, wetland, and buffer restoration, enhancement, and preservation. The proposed treatments of streams on the Site will directly and indirectly address stressors identified in the planning documents by creating stable stream banks, restoring meandering pattern, and restoring, enhancing, and preserving wetlands and forested riparian buffers. The project will slow surface runoff, increase retention times, provide shade to streams, and reconnect the streams to their historic floodplains and riparian wetlands, which will reduce sediment and nutrient loads that contribute to eutrophication of downstream waters. In addition, restoration will provide and improved aquatic terrestrial (riparian and wetland) habitats while improving stream stability and overall hydrology.

3.0 Baseline and Existing Conditions

The Site watershed (Table 2 and Figure 3) is located in a south-central HU of the Neuse 01 CU. It is situated in the rural countryside just west of Goldsboro in Wayne County. The following sections describe the existing conditions of the watershed and watershed processes, including disturbance and response.

Table 2: Project Attribute Table Part 2

Project Watershed Summary Information	
Physiographic Province	Coastal Plain
Ecoregion	Southeastern Floodplains and Low Terraces
River Basin	Neuse River
USGS HUC (8 digit, 14 digit)	03020201, 03020201200030
NCDWR Sub-basin	03-04-12
Project Drainage Area (acres)	828
Project Drainage Area Percentage of Impervious Area	2.1%
CGIA Land Use Classification	36% cultivated crops; 21% forest; 17% shrub/herbaceous; 15% wetland; 9% residential; 2% pasture/hay

3.1 Existing Site Conditions

The proposed project is on a 265-acre property which is immediately adjacent to the Neuse River and project streams drain directly to the river. A large portion of the property (over 80 acres) has been used for row crop agriculture for decades. The remaining acreage is primarily wooded with distinct areas of pines and hardwoods. Currently, the agricultural fields are used to grow tobacco and soybeans. These fields are extensively ditched and perennial and intermittent streams on the Site have clearly been channelized and relocated to increase crop production. Aerial photography dating back to the late 1950's (Appendix 3) shows that the Site has remained in exactly the same configuration since that time. The Site is bordered

almost entirely by forest, including a state-owned research site, the Center for Environmental Farming Systems (CEFS) immediately to the East (Figure 2).

3.2 Landscape Characteristics

3.2.1 Physiography and Topography

The McClenny Acres Mitigation Site is located in the western portion of the Coastal Plain Physiographic Province, often referred to as the Inner Coastal Plain. The Inner Coastal Plain is characterized by flat lands to gently-rolling sandy hills and valleys with elevations that range from 25 to 600 feet above sea level. Project watershed elevations range from 64 feet above mean sea level at the lowest point to 134 feet at the highest point in the watershed. The project site is quite flat (Figure 4). Project streams traverse flat, low-lying agricultural fields at the upstream end of the project as well as bottomland forest and wetlands in the downstream portion as UT4 approaches the Neuse River floodplain. Valley slopes of design reaches range from 0.13% to 0.63%.

3.2.2 Geology and Soils

The Coastal Plain largely consists of marine sedimentary rocks including sand, clay, and limestone that formed through the deposition of estuarine and marine sediments. The underlying geology of the proposed Site is mapped as Cretaceous to Tertiary (138 million to 2 million years in age) Cape Fear Formation (Kc) as well as Yorktown Formation and Duplin Formation (undivided) (Tpy) (NCGS, 1985). The Cape Fear Formation is described as a yellowish gray to bluish gray sandstone and sandy mudstone with red to yellowish orange mottles that is indurate and graded with laterally continuous bedding. Additional characteristics include blocky clay, faint cross-bedding, and commonly containing feldspar and mica. The Yorktown Formation is described as bluish gray, fossiliferous clay with varying amounts of sand. Shell material is commonly concentrated in lenses within the unit. The Duplin Formation is characterized by a bluish gray, medium to coarse grained sand, sandy marl, and limestone (NCGS, 1985).

The proposed project is mapped by the Wayne County Soil Survey. The predominant project area soils as mapped by the Natural Resources Conservation Service (NRCS) are described below in Table 3. Figure 5 is a soil map of the Site. It is important to note that the soil classification of Pantego has changed since the NRCS soils maps were prepared for the County. The Pantego series was previously mapped in shallow drainage ways on terraces. Under current classification, the Torhunta series is the best fit for the very poorly drained areas on site. A report describing the soils on the site prepared by a licensed soil scientist is included in Appendix 4. It is important to note that the geology and soils information discussed in this section supports the existence of sand bed streams and wetlands.

Table 3: Project Soil Types and Descriptions

Soil Name	Description
Johns sandy loam	This is a slightly poorly drained soil with low slopes of less than two percent. The soil has slow surface runoff and moderate infiltration. The soils are typically found on broad stream terraces.
Kalmia loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. These soils are typically found on broad stream terraces.
Lakeland sand	This is an excessively drained soil with slopes from 0-6%. Surface runoff is slow and infiltration is very fast. The soils are typically found in broad areas with an uneven surface.
Lumbee sandy loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow and infiltration is moderate. These soils are found in flat terrace areas and shallow drainageways.
Pantego (Torhunta) loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow and infiltration is moderate. These soils are found in wide, shallow drainageways.

Soil Name	Description
Wickham loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. Typically, these soils are found on broad stream terraces.

Source: Wayne County Web Soil Survey

3.3 Land Use/Land Cover

The project watershed totals 1.23 square miles and the primary land use is agricultural which comprises 38% of the area. Cultivated row crops make up the majority of the agricultural practices at 36% of the drainage area. The next largest category of land use is forested land, which covers 21% of the watershed. Wetlands make up about 15% of the watershed while 17% is covered by scrub/shrub or grassland/herbaceous land uses, 9% by residential and 2% by pasture. Nine percent of the McClenny Acres drainage area is residential, consisting mostly of low-density single-family units with approximately 7% of that 9% characterized by developed open space. The impervious area within the project watershed was calculated to be 16.4 acres, or approximately 2.1% of the watershed. The watershed areas and current land uses for each of the project reaches are summarized in Table 4, below.

Aerial photos of the project site and surrounding area from 1959 to 2018 were reviewed for changes in land use and land cover. The land use and land cover patterns in this area have stayed very consistent over that time period. The agricultural fields on the McClenny Acres parcel and those immediately upstream have been in row crop production with a similar channelized and straightened drainage network since at least 1959 according to the earliest available aerial photography. At some point between 1973 and 1993, a small amount of residential development occurred in the western and north-central parts of the watershed. In the past 25 years since 1993, the watershed has remained relatively stable and rural other than some scattered residential development, the logging of a small tract of land in the north-central part of the watershed, and the construction of a small drinking water treatment facility adjacent to the logged area. In general, this area has maintained its rural, agricultural character over the last roughly 60 years with only minor changes in land cover. This consistency in land use within the project watershed indicates that watershed processes affecting hydrology, sediment supply, and nutrient and pollutant delivery have not varied widely over this time period. With a lack of development pressure, watershed processes and stressors from outside the project limits are likely to remain consistent throughout the implementation, monitoring, and closeout of this project. These stressors and processes are discussed further in Section 4 below.

Table 4: Drainage Areas and Associated Land Use

Reach Name	NCDWR Stream Identification Form Scores	Intermittent/ Perennial	Watershed Area (acres)	Watershed Area (sq. mi.)	Land Use
UT1	30.25	Perennial	423	0.66	45% cultivated crops; 17% forest; 16% wetlands; 11% residential; 7% shrub/herbaceous; 3% pasture/hay
UT2	30.75	Perennial	40	0.06	81% Cultivated crops; 11% shrub/herbaceous; 8% forest
UT3 R1	28.75	Intermittent	92	0.14	27% cultivated crops; 29% shrub/herbaceous; 27% forest; 16% residential
UT3 R2	32.50	Perennial	222	0.35	33% cultivated crops; 26% shrub/herbaceous; 25% forest; 11% residential; 4% wetlands; 1% open water

Reach Name	NCDWR Stream Identification Form Scores	Intermittent/ Perennial	Watershed Area (acres)	Watershed Area (sq. mi.)	Land Use
UT4	37.75	Perennial	784	1.23	36% cultivated crops; 21% forest; 17% shrub/herbaceous; 15% wetland; 9% residential; 2% pasture/hay

3.4 Existing Vegetation

3.4.1 UT1

Because the streams are regularly maintained, there is little streamside vegetation in areas where the stream is bordered by agricultural fields. There is some wood and herbaceous plant growth along the stream in these areas including river birch (*Betula nigra*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), Chinese privet (*Ligustrum sinense*), Christmas fern (*Polystichum acrostichoides*), American holly (*Ilex opaca*), giant cane (*Arundinaria gigantea*), fox grape (*Vitis labrusca*), greenbrier (*Smilax*), blackberry (*Rubus*), and microstegium (*Microstegium vimineum*).

3.4.2 UT2

The streambanks are mowed regularly to support cultivation of row crops and the streamside zone is nearly devoid of vegetation. However, a narrow row of vegetation at the time of the stream assessment included tag alder (*Alnus serrulata*), giant cane, Johnsongrass (*Sorghum halepense*), and goldenrod (*Solidago sp.*).

3.4.3 UT3

Similar to UT2, the streambanks of the upstream reach of UT3 are mowed routinely to support cultivation of row crops and the streamside zone is devoid of vegetation except for a narrow row of herbaceous growth. The downstream reach flows through a wetland forest complex consisting of red maple, sweetgum, willow oak, tag alder, tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), giant cane, greenbrier, blackberry, Johnsongrass, microstegium, and goldenrod.

3.4.4 UT4

UT4 flows through a bottomland forest consisting primarily of hardwood species such as river birch, water oak, willow oak, swamp chestnut oak, and red maple. Other common overstory species include sweetgum, eastern white pine (*Pinus strobus*), and loblolly pine (*Pinus taeda*), while the midstory and herbaceous layer are primarily composed of Chinese privet, American holly, blackberry, greenbrier, fox grape, Christmas fern, and microstegium.

3.5 Existing Conditions - Wetlands

3.5.1 Jurisdictional Wetlands

On August 2, 23, 29 and September 5, 2018 Wildlands investigated potential waters of the United States within the project area. These areas were delineated using the USACE routine On-Site Determination method presented in the 1987 Corps of Engineers delineation manual, the subsequent Regional Supplement for the Atlantic and Gulf Coastal Plain Region, groundwater hydrology data, and the evaluator's best professional judgement. All jurisdictional Waters of the U.S. were located by sub-meter GPS. The Preliminary Jurisdictional Determination (PJD) package was submitted on October 10, 2018 and is currently under review. The PJD package is attached in Appendix 5. Existing wetlands within the proposed full delivery conservation easement are summarized in Table 5.

There are four jurisdictional wetland features partially located within the proposed easement (Wetlands A, C, G, F) as well as portions of five manmade ditches which satisfy the criteria for a jurisdictional wetland (Ditches B-F) (Figure 6). Jurisdictional wetland features on site exhibit prolonged saturation within the upper 12 inches of the soil profile, hydrophytic vegetation, and a depleted matrix or darkened surface horizons. Common vegetation species present in wetlands include red maple, swamp tupelo (*Nyssa biflora*), river birch, sweetbay (*Magnolia virginiana*), and greenbriar.

Existing wetland areas were classified and evaluated using the North Carolina Wetland Assessment Method (NCWAM). The rapid assessment method evaluates field conditions relative to reference condition to generate function ratings for a specific wetland type. Existing wetlands were classified as headwater forests and overall ratings range from low to medium. The primary impairment to existing wetlands is the presence of ditches and berms which result in reduced surface and subsurface water storage and limited hydrologic connectivity with streams. This is reflected in both the hydrology and water quality function ratings. Habitat quality varies among wetlands depending on vegetation composition and structure. NCWAM field assessment forms and rating calculator output are attached in Appendix 5.

Table 5: Existing Wetland Summary

Wetland Summary Information				
Parameter	**Wetland A**	**Wetland C**	**Wetland F**	**Wetland G**
Size of Wetland within CE (acres)	0.198	0.105	0.008	0.284
Wetland Type (NCWAM Classification)	Headwater Forest	Headwater Forest	Headwater Forest	Headwater Forest
Mapped Soil Series	Pantego	Lumbee	Lumbee	Lumbee
Drainage Class	VPD	PD	PD	PD
Soil Hydric Status	Yes	Yes	Yes	Yes
Source of Hydrology	Groundwater Discharge	Ditch Overflow	Groundwater Discharge	Groundwater Discharge
Restoration or enhancement method (hydrologic, vegetative, etc)	Vegetative	Hydrologic	Hydrologic	Hydrologic

3.5.2 Relic Hydric Soils

A detailed investigation was conducted by a licensed soil scientist (LSS) on June 5, June 6, and August 22, 2018 to determine the extent of hydric soils on site. The results of this investigation were used to indicate wetland re-establishment potential. Areas containing hydric soils but lacking a wetland hydrologic regime were likely functional wetlands prior to agricultural conversion. Hydric soils mapped on site are most like the poorly drained Lumbee or very poorly drained Pantego/Torhunta series, respectively. The soil mapping for Wayne County indicates the Pantego series is present on site. The Pantego series was previously mapped in shallow drainage ways on terraces. Under current mapping convention, the Torhunta series would be mapped in shallow drainage ways on terraces. The detailed LSS report and hydric soil map is included in Appendix 4.

3.5.3 Existing Hydrology

Five groundwater monitoring gauges (gauges 1 – 5) were installed on March 16, 2018. Six additional gauges (gauges 6 – 11) were installed on February 14, 2019. Gauge 3 malfunctioned beginning on July 17, 2018 and was replaced February 14, 2019. Gauges 1, 2, 5, 6, 7, 8, and 11 are located outside of the proposed DMS conservation easement, but are informative of site hydrology nonetheless. Gauge 4 is in an existing wetland and Gauge 5 is far from the mitigation areas. According to the 1974 soil survey, the growing season in Wayne County extends from March 17 to November 5 (232 days). Hydrographs of each gauge are included in Appendix 6.

Review of data from gauges 1-3 suggests that areas within the ditched agricultural field and gauges 9 and 10 west of UT3 do not currently exhibit a wetland hydrologic regime under normal rainfall conditions based on a consecutive saturation threshold of 14 days during the growing season (USACE, 2005). The rapid recession of groundwater tables observed is likely due to the effect of drainage ditches. The sudden and sustained increase in elevation of groundwater tables in late July and August is due to the combined effects of well above normal rainfall and beaver activity. Existing hydrology summary information is presented in Table 6 and groundwater hydrographs and precipitation analysis is in Appendix 6.

Table 6: Existing Groundwater Monitoring Gauge Data and Analysis Results

SUMMARY OF GROUNDWATER GAGE RESULTS				
Gage (Year)[1]	**Consecutive Days in Growing Season Groundwater Table Above 12 in. Depth (Days)**	**Consecutive Percent Growing Season Groundwater Table Above 12 in. Depth (%)**	**Record Dates**	**Wetland Approach**
1 (2018)	20	8.5%	3/15/2018-12/3/2018	N/A
2 (2018)	53	22.6%	3/15/2018-7/9/2019	N/A
3 (2018)	4	1.7%	3/15/18-7/16/18 Gap in data 2/15/19-7/9/19	Re-establishment
4 (2018)	45	19.2%	3/15/2018-7/9/2019	Enhancement
5 (2018)	20	8.5%	3/15/2018-7/9/2019	Re-establishment
2 (2019)	5	2.1%	3/15/2018-7/9/2019	N/A
3 (2019)	3	1.3%	3/15/18-7/16/18 Gap in data 2/15/19-7/9/19	Re-establishment
4 (2019)	42	17.9%	3/15/2018-7/9/2019	Enhancement
5 (2019)	5	2.1%	3/15/2018-7/9/2019	N/A
6 (2019)	55	23.5%	2/15/2019-7/9/2019	N/A
7 (2019)	43	18.4%	2/15/2019-7/9/2019	N/A

SUMMARY OF GROUNDWATER GAGE RESULTS				
Gage (Year)[1]	**Consecutive Days in Growing Season Groundwater Table Above 12 in. Depth (Days)**	**Consecutive Percent Growing Season Groundwater Table Above 12 in. Depth (%)**	**Record Dates**	**Wetland Approach**
8 (2019)	2	0.9%	2/15/2019-7/9/2019	N/A
9 (2019)	2	0.9%	2/15/2019-7/9/2019	Re-establishment
10 (2019)	2	0.9%	2/15/2019-7/9/2019	Re-establishment
11 (2019)	4	1.7%	2/15/2019-7/9/2019	N/A

3.6 Existing Conditions - Streams

The Site includes four perennial streams: UT1, UT2, UT3 R2, and UT4. UT3 R1 upstream of the confluence with UT2 has been classified as intermittent. The stream assessments were conducted by Wildlands on October 22, 2015 and September 13, 2017. NC DWR Stream Identification Forms (Version 4.11) and US Army Corps of Engineers (USACE) forms are included in Appendix 7. Temporary weirs to measure and record discharge over time were installed on the two smallest streams on the project site – UT2 and UT3. Both streams exhibit prolonged periods of continuous streamflow based on the weir data. UT2 had 105 consecutive days of discharge over the weir between March 17 and July 17, 2018 (123 days). UT3 had 62 consecutive days with discharge for the same time period. The weirs were placed near the upstream extent of both streams on the site, where the streams are not incised. These streamflow data demonstrate that the streams flow often and, due to the position of the weirs in the watershed, proposed channel work such as raising stream beds should not eliminate or reduce hydrologic inputs to the streams. The other two streams on the site, UT1 and UT4, have much larger watersheds and are more clearly perennial flowing streams. Plots of weir data for UT2 and UT3 are included in Appendix 7. DWR stream determination letters are also included in Appendix 7.

Each project stream is described in the section below. Table 7 provides a summary of existing stream conditions within the project limits. Existing conditions are also illustrated in Figure 6. Pebble counts were not performed due to the fact that all of the project streams are sand bed systems. Each of the project streams have been ditched and relocated to maximize the arable land available for crops. Because UT4 was shown as a stream feature on a 1916 soils map in an alignment similar to its current alignment, it seams reasonable that the other tributaries on the site flowed into it. In the sections below, a description of the original alignments is provided; however, these are based on the best available evidence and are inferences only.

3.6.1 UT1

UT1 flows out of a wooded area to the northeast of the Site. On the Site, UT1 has been ditched and relocated so that it is now parallel to the property line but is located completely on the property to be purchased by Wildlands. It seems likely that the stream originally flowed through an existing low area from the eastern property line to the southwest across the site until joining UT4. Currently, the stream follows the eastern property line for approximately 1,400 feet before most of the flow turns sharply to the west. A portion of the UT1 flow also drains into a wetland area at this location. Because the stream has been channelized, it is very straight. There are spoil piles that create a berm along portions of the stream and a

remnant channel feature is evident near the existing channel in certain locations (see cross sections in Appendix 8). Land use along the western side of the upstream portion of UT1 is active row crops while the eastern side recently cleared silviculture. Beginning at the point where most of the UT1 flow turns to the west, it flows through woods along both banks for approximately 700 feet. Beyond this point it flows along the southern edge of the row crop fields for approximately 800 feet to the south to the confluence with UT3 to form UT4 (Figure 6). UT1 has been ditched at least since the late 1950s for agricultural purposes as evidenced by the historic aerial photos of the site.

UT1 is incised for approximately 53% of its existing length with estimated bank height ratios of 1.6 to 2.8 at the surveyed cross sections. The stream exhibits width to depth ratios of 6.6 to 8.1 and entrenchment ratios of 1.4 to much greater than 2.2. Active erosion was mapped along 39% of the right bank and along 0% of the left bank. Most of UT1 is in Stage III (Degradation) of the Simon Channel Evolution Model where the channel has been modified and incision is slowly occurring. The downstream portion may be beginning Stage IV (Degradation and Widening) where bank erosion is active. The stream is most closely classified as an E/G5 stream type (cross section plots are provided in Appendix 8)

3.6.2 UT2

UT2 flows onto the Site from a spring head in a wooded area to the north. It has been channelized at least since the late 1950s and is very straight. The ditched stream flows in a southwestern direction for approximately 400 feet before discharging into an agricultural ditch aligned east to west. South of the wooded area, UT2 is completely surrounded by agricultural fields. This channel has a very straight alignment and an overly deep cross section. The original alignment of the stream is less clear than UT1 but it likely flowed in a southwestern direction to a confluence with UT3.

UT2 is highly incised throughout most of its length with an estimated bank height ratio of 5.6 at the surveyed cross section. The stream exhibits a width to depth ratio of 18.8 and an entrenchment ratio of 1.2. No active erosion was noted on the channel banks. UT2 is in Stage III (Degradation) of the Simon Channel Evolution Model where the channel has been modified and incision is slowly occurring. The stream is most closely classified as an F5 stream type (cross sections are provided in Appendix 8).

3.6.3 UT3

UT3 originates northwest of the Site and flows onto the property through a culvert under the railroad track. It is likely that it originally flowed in a southeastern direction across the site to its confluence with UT4. It currently flows eastward through a wooded area for approximately 1,000 feet before it turns to the south and then flows through a field to the west of UT2. Approximately 750 feet south of where it flows into the field, the stream enters a wooded area and turns to the east and continues for approximately 500 feet to the confluence with UT4. UT2 flows into UT3 approximately 400 feet south of the upstream woodline.

UT3 has been ditched and is extremely straight for its entire length. UT3 is highly incised for a significant portion of its length with estimated bank height ratios of 3.4 to 7.1 at the surveyed cross sections. The width to depth ratio ranges from 16.0 to 29.9 and the entrenchment ratio ranges from 1.0 to 1.2. Active erosion was mapped along 23% of the right bank and along 21% of the left bank. UT3 is in Stage III (Degradation) of the Simon Channel Evolution Model where the channel has been modified and incision is slowly occurring. The stream is most closely classified as an F5 Stream type (cross sections are provided in Appendix 8).

3.6.4 UT4

UT4 begins at the confluence of UT1 and UT3 and flows through a wooded area for approximately 2,700 feet to the Neuse River. This stream is shown as a blue line feature on a 1916 Wayne County soils map which supports the idea that it is a naturally occurring, perennial stream that followed a course similar to it's current alignment.

This stream has also been ditched and is extremely straight. While the surrounding land use along this stream is forested, a trail exists along the right bank for the entire length of UT4 on the property. This trail has been kept clear to provide access to the southeast portion of the site.

UT4 is highly incised for 100% of its length with estimated bank height ratios ranging from 2.3 to 5.3 at the cross sections. The width to depth ratio ranges from 2.9 to 13.9 and the entrenchment ratio ranges from 1.2 to 2.5. Active erosion was mapped along 38% of the right bank and along 39% of the left bank. The upstream end of UT4 is in Stage IV (Degradation and Widening) of the Simon Channel Evolution Model where the channel incision has occurred and widening has begun. The stream is most closely classified as an E/G5 stream type (Cross sections are provided in Appendix 8).

Table 7: Stream Resources

Parameter	UT1	UT2	UT3 R1	UT3 R2	UT4
Length of Reach (lf)	2,986	1,254	1,200	1,410	2,826
Valley Confinement (confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined
Drainage Area (acres)	423	40	92	222	784
Perennial, Intermittent, Ephemeral	P	P	I	P	P
NCDWR Water Quality Classification	WS-IV (NSW)				
Stream Classification[1]	E/G5	F5	F5	F5	E/G5
Evolutionary Trend (Simon)	III Degradation; IV Degradation and Widening	III Degradation	III Degradation	III Degradation	IV Degradation and Widening
FEMA Classification	Zone AE				

1. The Rosgen classification system (Rosgen, 1994) is for natural streams. These channels have been heavily manipulated by livestock and man and therefore may not fit the classification category as described by this system. Results of the classification are provided as a basis for discussion of existing channel form.

4.0 Watershed and Channel Disturbance and Response

As discussed above in Section 3.3, there has been very little change in the watersheds of the project reaches for several decades. Some small-scale residential development and clearing of small areas of forest has occurred but these minor disturbances are the not the main driver of the degradation of the Site. The primary causes of degradation on the Site were the original clearing, production of crops, and channelization of the project streams, which occurred prior to the 1950's (the date of the earliest available aerial photo). The channelization involved straightening and deepening of the streams. Multiple ditches were also cut through wetland areas draining the historic wetlands. This manipulation resulted in degraded terrestrial and aquatic habitats, denuded riparian zones, cutting the streams off from their floodplains, lowering of the local water table, and elimination of wetland functions. It also led to increased shear stresses in the streams which may have caused additional degradation of the channels over time. Signs of on-going bank erosion are apparent in places along most of the project reaches. The current condition of most the reaches on the Site is that they are severely incised, over-widened, and have on-going lateral erosion. They have not yet stabilized and begun to reform a bankfull channel at the lower elevation through aggradation processes. The areas that were previously wetland have been significantly drained and the hydrophytic vegetation has been removed.

5.0 Functional Uplift Potential

5.1 Wetland Functional Uplift Potential

Areas proposed for wetland re-establishment currently do not provide functions associated with wetlands. Wetland enhancement areas currently provide some functions however they are diminished. Functional uplift to existing wetland areas is expected as a result of the proposed activities on site. Construction of an appropriately sized stream channel and filling in of the ditch network will raise the water table and increase hydrologic interaction with floodplains. This will restore hydrology to adjacent wetland areas. Wetland enhancement and re-establishment areas will also be planted with native vegetation to create headwaters forest wetlands. These activities will result in uplift of various wetland functions including increased water storage and groundwater recharge, water quality treatment, and providing wildlife habitat.

5.2 Stream Functional Uplift Potential

The potential for functional uplift for streams is described in this section according to the Stream Functions Pyramid (Harman, 2012). The Stream Functions Pyramid describes a hierarchy of five stream functions, each of which supports the functions above it on the pyramid (and sometimes reinforces those below it). The five functions in order from bottom to top are hydrology, hydraulics, geomorphology, physicochemical, and biology.

5.2.1 Hydrology

The alterations in land cover discussed in Sections 3.2 and 4.0 typically result in reductions in rainfall interception and evapotranspiration which lead to increases in runoff and water yield (Dunne and Leopold, 1978). A primary result of these changes is an increase in both peak flows and base flows, though the magnitude of this effect is likely small in watersheds of this size. Initial increases in water yield usually change over time as vegetation regrows and crops are planted. There are no stream gauges within this watershed and, thus, no way to know the degree to which clearing most of the land in this particular watershed (only 21% remains forested) affected the hydrologic response other than to say that water yields have almost certainly increased. However, these changes primarily occurred several decades ago (prior to available aerial photography) and additional clearing in the watershed has been limited. The watershed has adjusted to its hydrologic regime and is stable now. No measurements of existing conditions in hydrology have been made to date for this project and no long-term stream gauges exist in the project watershed.

A stream restoration project performed at a specific Site does not often result in uplift to hydrology (Harman, 2012). Even though trees will be planted within the conservation easement, this will not result in improvements to the rainfall-runoff relationship at the watershed scale. Therefore, there is little opportunity to improve the hydrology function.

5.2.2 Hydraulics

The streams on the Site are channelized, very incised and not connected to their floodplains. This has resulted in reduced hydraulic functioning of the channels. The bank height ratios on UT1 range from 1.6 to 2.8. The bank height ratio on UT2 is 5.6. On UT3, the bank height ratios range from 3.4 to 7.1 and on UT4 the bank height ratios range from 2.3 to 5.3. Entrenchment ratios range from 1.4 to 17.6 on UT1. The entrenchment ratios are all 1.2 or lower on all of the other streams. Existing geomorphic data for the project streams are included in Appendix 10. Overall hydraulic functions on the Site are severely degraded and would be classified as not-functioning.

The channels will be reconstructed and will be connected to their floodplains so that stream flows above bankfull stage will flood the floodplain. The bank height ratios for the Site streams will be 1.0. Shear stress in the channels will be maintained at functioning levels and groundwater exchange and adjacent wetland

hydrology will be improved as a result of the increased frequency of floodplain inundation. The post-construction hydraulic function will be functioning.

5.2.3 Channel Geomorphology

The channelization and incision of UT1, UT2, and UT3 indicate that those streams are generally at Stage III of the Simon Channel Evolution Model when evaluated at the level of the entire project reaches. However, in isolated areas, lateral erosion may be an indication that the streams are beginning to move to Stage IV. UT4 has been channelized and is incised but has begun to widen through lateral erosion along more of the project reach than the other project streams and is classified as being in Stage IV of the Simon model. Most of the project streams have active erosion along significant portions of their length except for UT2. UT1, UT3, and UT4 have active erosion along 39%, 23%, and 39% respectively. There is no pattern to the existing project streams which have all been straightened and have sinuosities ranging from 1.01 to 1.05 (Appendix 10). There is limited large woody debris in the streams and there is little diversity of bed forms. The geomorphic function of the project streams is rated as not functioning.

This project offers an excellent opportunity to improve the geomorphology function on the Site. The incision and bank erosion will be corrected. Restored streams with the appropriate pattern for the surrounding landscape will be constructed. Bedform will be diversified and pools will be spaced with appropriate design ratios. LWD will be added to the system through construction of instream structures and bank revetments and the riparian buffer will be replanted anywhere it has been cleared for agricultural purposes. Post construction, the geomorphology function will be rated functioning.

5.2.4 Physicohemical

No water quality sampling has been conducted on the project streams and there are no water quality monitoring stations within the project watershed. The 2009 Neuse River Basinwide Water Quality Plan states that CU-wide water quality improvement goals include reducing sediment and nutrients in runoff from agriculture. The Neuse River, to which the project discharges, is classified as a nutrient-sensitive water.

The agricultural operations throughout the watershed and on the project site likely contribute nutrients and other pollutants to the project streams. In addition, sediment loading is likely high due to bank erosion on the project streams. However, because no water quality data are available to evaluate the current level of physicochemical functioning, this function is not rated.

There is potential to improve the physicochemical functioning of the project streams. The site will be taken out of crop production which will decrease the nutrient and sediment loads to the project streams and the Neuse River. Water will flow over instream structures that will provide aeration, trees will be planted in deforested areas of the riparian zone to eventually shade and cool stream flow and help filter runoff, the streams will be reconnected to their floodplains and adjacent wetlands to provide storage and treatment of overbank flows, and streambank erosion will be greatly reduced to nearly eliminate a source of sediment and nutrients.

5.2.5 Biology

There are no available biological data for the Site, however, the habitat conditions on the Site are poor. The banks are often unstable. UT4 is over-widened causing shallow flow and dry areas of the channels. The bed forms lack diversity and consist mostly of long runs and shallow pools with little woody debris.

There is opportunity to improve the instream and riparian habitat in addition to the physicochemical function described in Section 5.4. Habitat will be improved by reconstructing channels of appropriate size with a variety of types of riffles and pools of varying depth. Other types of instream structures with a variety of woody materials will be incorporated into the restoration reaches further diversifying habitat

types. In addition, stabilization of banks will reduce inputs of fine sediments. However, because there are no pre-construction biological data the functional uplift potential will not be rated.

5.2.6 Overall Functional Uplift Potential for Streams

Due to severely degraded hydraulics and geomorphology (both not-functioning) and suspected poor biology and physicochemical functions of the Site, there is substantial potential for ecological uplift**.** Due to the proposed improvements described above, the functional uplift potential is a reclassification from not-functioning to functioning. This change in overall classification is related to improvements in hydraulics and geomorphology between the existing and proposed conditions and expected improvements in physicochemical and biology functions. The hydrology function will not be significantly improved by the project because watershed-scale reforestation would be required to drive improvement in this function.

5.3 Site Constraints to Functional Uplift

The Site includes three utility crossings that will require easement breaks. Easement breaks are detailed below. All crossings are assigned a number and summarized in Table 8, below, and are depicted by number on Figure 10.

Table 8: Easement Breaks and Crossings

No.	Width (ft)	Location	Internal or External	Crossing Type
1	20	UT1	External	Existing utility easement (Southern Bell)
2	20	UT2, R2	External	Existing utility easement (Southern Bell)
3	80	UT3	External	Existing utility easement (Duke Power)

All streams proposed for mitigation credit provide the required 50-foot minimum riparian buffer for Coastal Plain streams. The entire easement area can be accessed for construction, monitoring, and long-term stewardship from a farm road off of Old Smithfield Road.

The flat topography on the Site will allow for the development of pattern and channel dimensions to restore stable, functioning streams and there are no other known constraints to providing functional uplift. The degree to which the physicochemical and biology functions can improve on the Site is limited by the watershed conditions beyond the project limits, upstream water quality, and the presence of source aquatic communities upstream and downstream of the Site.

6.0 Regulatory Considerations

Table 9, below, is a summary of regulatory considerations for the Site. These considerations are explained in more detail in Sections 6.1-6.3.

Table 9: Regulatory Considerations

Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	Yes	No	PCN[1]
Water of the United States - Section 401	Yes	No	PCN[1]
Endangered Species Act	Yes	Yes	Appendix 9
Historic Preservation Act	Yes	Yes	Appendix 9
Coastal Zone Management Act	No	No	N/A
FEMA Floodplain Compliance	No	No	N/A
Essential Fisheries Habitat	No	N/A	N/A

1. PCN to be provided to DMS with Final Mitigation Plan.

6.1 Biological and Cultural Resources

A Categorical Exclusion for the McClenny Acres Mitigation Site was approved by the Federal Highway Administration (FHWA) on April 13, 2018 (Appendix 9). This document included investigation into the presence of threatened and endangered species on Site protected under The Endangered Species Act of 1973, as well as any historical resources protected under The National Historic Preservation Act of 1966. According to the Categorical Exclusion research and response letter from the US Fish and Wildlife Service, the, "proposed action [this project] is not likely to adversely affect any federally listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act." All correspondence with USFWS and a list of Threatened and Endangered Species in Wayne County, NC is included in Categorial Exclusion. The State Historic Preservation Office (SHPO) was contacted regarding on-site cultural resources. SHPO indicated that they were aware of "no historic resources which would be affected by the project." For additional information and regulatory communications please refer to the Categorical Exclusion document.

6.2 FEMA Floodplain Compliance and Hydrologic Trespass

The project stream channels do not have an associated regulated floodplain and are not located along a studied section of stream. However, all project streams lie within the floodway and flood fringe of the Neuse River, mapped FEMA Zone AE (Figure 7). Neuse River base flood elevations have been defined and a detailed study has been performed with floodway areas mapped on Wayne County FIRM panels 2568 and 2588. Wildlands will coordinate with the City of Goldsboro and Wayne County on any local permitting requirements. We do not expect any modeling or a flood study to be required. The project will be designed so that any increase in flooding will be contained on the Site and will not extend upstream to adjacent parcels, so hydrologic trespass will not be a concern.

6.3 401/404

As part of the existing conditions assessment at the Site, Wildlands documented and classified the on-site wetlands. Classifications were applied based on wetland function and potential for wetland improvement through the stream design approach. Based on these classifications, Wildlands designers used this information to prioritize higher quality wetlands for avoidance and minimization and to incorporate stream design approaches to improve hydrologic and vegetative conditions of impaired wetlands. Wetlands within the conservation easement or limit of disturbance will be denoted in the final construction plans on the Erosion and Sediment Control plan and Detail plan sheets, as well as in the project specifications. Floodplain grading will result in temporary impacts to wetlands while channel realignment and ditch filling will result in permanent impacts. Wildlands expects a net gain of wetland area and function as a result of filling drainage ditches and construction of the new channels. Table 10 estimates the anticipated impacts to wetland areas. The Pre-Construction Notification, including these data, will be provided with the Final Mitigation Plan.

Table 10: Estimated Impacts to Wetlands and Ditches

Jurisdictional Feature	Classification	Acreage	Permanent (P) Impact		Temporary (T) Impact	
			Type of Activity	Impact Area (acres)	Type of Activity	Impact Area (acres)
Wetland F	Headwater Forest	0.008	-	-	Floodplain Grading	0.008
Wetland G	Headwater Forest	0.284	-	-	Floodplain Grading	0.050
Wetland G	Headwater Forest	0.284	Channel Re-alignment	0.024	-	-
Ditch A	-	0.054	Fill	0.054	-	-

Jurisdictional Feature	Classification	Acreage	Permanent (P) Impact		Temporary (T) Impact	
			Type of Activity	Impact Area (acres)	Type of Activity	Impact Area (acres)
Ditch B	-	0.269	Fill	0.269	-	-
Ditch C	-	0.029	Fill	0.029	-	-
Ditch D	-	0.084	Fill	0.084	-	-
Ditch E	-	0.064	Fill	0.064	-	-
Ditch F	-	0.066	Fill	0.066	-	-
Ditch G	-	0.046	Fill	0.046	-	-
			Total P Impact	**0.636**	**Total T Impact**	**0.058**

7.0 Mitigation Site Goals and Objectives

The project will improve stream functions as described in Section 5 through stream restoration and preservation as well as riparian buffer re-vegetation. Wetlands will also be re-established and enhanced on the site. The project goals and related objectives and outcomes are described in Table 11. Project goals are desired project outcomes and are verifiable through measurement and/or visual assessment. Objectives are activities that will result in the accomplishment of goals. The project will be monitored after construction to evaluate performance as described in Section 11 of this report.

Table 11: Mitigation Goals and Objectives

Goal	Objective	Expected Outcomes
Improve the stability of stream channels	Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Reduce and control sediment inputs; Contribute to protection of or improvement of a Water Supply and Nutrient-Sensitive Water
Improve instream habitat	Install habitat features such as cover logs, log sills, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Improve aquatic communities in project streams
Reconnect channels with floodplains and riparian wetlands	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Reduce shear stress on channel; hydrate adjacent wetland areas; filter pollutants out of overbank flows
Restore wetland hydrology, soils, and plant communities	Restore and enhance riparian wetlands by raising stream beds, plugging existing ditches, removing berm material over relic hydric soils, and planting native wetland species.	Improve terrestrial habitat; Contribute to protection of or improvement of a Water Supply and Nutrient-Sensitive Water
Restore and enhance native floodplain vegetation	Plant native tree species in riparian zone where currently insufficient	Reduce and control sediment inputs; Reduce and manage nutrient inputs; Provide a canopy to shade streams and reduce thermal loadings; Contribute to protection of or improvement of a Water Supply and Nutrient-Sensitive Water.

Goal	Objective	Expected Outcomes
Permanently protect the project Site from harmful uses	Establish conservation easements on the Site	Ensure that development and agricultural uses that would damage the site or reduce the benefits of the project are prevented.

8.0 Design Approach and Mitigation Work Plan

8.1 Design Approach Overview

The design approach for this Site was developed to meet the goals and objectives described in Section 7 which were formulated based on the potential for uplift described in Section 5. The design is also intended to provide the expected outcomes in Section 7, though these are not tied to performance criteria. The project streams will be reconnected with an active floodplain and the channels will be reconstructed with stable dimension, pattern, and profile that will transport the water and sediment delivered to the system. Adjacent wetlands will be re-established or enhanced by raising stream beds and plugging drainage ditches. The floodplains and wetlands will be planted with native tree species where necessary. Instream structures will be constructed in the channels to help maintain stable channel morphology and improve aquatic habitat. The entire project area will be protected in perpetuity by a conservation easement.

The design approach for this Site utilized a combination of analog and analytical approaches for stream restoration. Reference reaches were identified to serve as the basis for design parameters. Channels were sized based on design discharge hydrologic analysis. Designs were then verified based on a sediment transport analysis. This approach has been used on many successful Piedmont and Slate Belt restoration projects and is appropriate for the goals and objectives for this Site.

8.2 Reference Streams

Reference streams provide geomorphic parameters of a stable system, which can be used to inform design of stable channels of similar stream types in similar landscapes and watersheds. A total of 11 reference reaches were identified for the McClenny Acres Mitigation Site and used to support the design of the project streams (Figure 8). Project streams were separated into two groups, UT1 and UT4 in one group and UT2 and UT3 in the other, based on important design factors such as drainage area, slope, channel type, and bed material. Three reference reaches were selected to help develop design parameters for UT1 and UT4, while a separate set of three reference reaches was used for UT2 and UT3. In addition, a third set of five reference reaches was used only in the discharge analysis to strengthen the reference reach discharge-drainage area curve (described in Section 8.4 below). The reference reaches are all located within the Coastal Plain region of North Carolina, and a majority (7 of 11) are located in the Neuse River Basin. Geomorphic parameters for these reference reaches are summarized in Appendix 10. The references to be used for the specific streams are shown in Tables 12 and 13 and a description of each reference reach is included below.

Table 12: Stream Reference Data Used in Development of Design Parameters for UT1 and UT4

	Scout Camp East 2	Johanna Branch	UT to Cypress Creek	UT to Wildcat Branch	UT to Tyson Creek	Shepherd Run
Stream Type:	**E5**	**E5/C5**	**E5**	**E5**	**C5**	**E5**
Reference Type:	Discharge	All	Discharge	Discharge	All	All

Table 13: Stream Reference Data Used in Development of Design Parameters for UT2 and UT3

	Still Creek	Grady Branch	Scout Camp West 1	Scout Camp West 2	UT to UT1 to Cedar Creek
Stream Type:	**E5**	**E5**	**E5/C5b**	**E5**	**E5/C5**
Reference Type:	All	Pattern	Discharge	All	Discharge

8.2.1 Scout Camp Reference Site

The Scout Camp reference site (including four surveyed streams) is a wooded area located in southeastern Johnston County near Bentonville in the Mill Creek watershed. It is situated in a similar landscape to the McClenny Acres project site and is similar in position relative to an especially broad, flat, and low-lying zone of the Neuse River floodplain and surrounding wetlands. The small headwaters streams on the site are similar in drainage area to UT2 and UT3 but are relatively steep with slopes up to 2.6%. Project streams have a maximum gradient of less than 1% and are typically below 0.5%. The larger streams at the Scout Camp reference site have drainage areas that are similar to UT1 and UT4. They are also less steep and have gradients that better match the project site conditions (Scout Camp West 2 has a gradient of 0.4%).

Scout Camp West 1 is a very small, sand bed stream that is very steep for most of its length with an overall gradient of 2.6%. It has a width to depth ratio ranging from 5.4 in the upper sections to 19.4 in the lower, less steep reaches. Its sinuosity is 1.1 and its entrenchment ratio is high – greater than 2.2 throughout. It is most closely represented by an E5/C5b according to the Rosgen classification system (Rosgen, 1994), although for most of its length it is not a meandering riffle-pool stream. Much of the energy dissipation, gradient, and pool formation are controlled by sudden drops over woody structures such as logs and tree roots. Because of its high slope, Scout Camp West 1 was only used in the reference reach discharge curve.

Scout Camp East 2 is a similar but larger sand bed stream with an overall slope of 1.7%, a width to depth ratio of 3.6 to 5.4, an entrenchment ratio of greater than 2.2, and a sinuosity of 1.2. it meanders more than Scout Camp West 1 but also has a lot of energy loss and pool formation over woody structures. It is most similar to a Rosgen E5 stream. As with Scout Camp West 1, Scout Camp East 2 was used only in the discharge analysis due to its relatively high slope.

Scout Camp West 2 is a larger, flatter stream with a width to depth ratio range of 5.7 to 11.0, a very large entrenchment ratio much greater than 2.2, and a sinuosity of 1.1 to 1.2. It is most similar to a Rosgen E5 stream type and functions more like an E5 as described by Rosgen with pool formations in meander bends and less drop in gradient over woody structure. Scout Camp West 2 was used to develop design parameters for the smaller project streams, UT2 and UT3.

8.2.2 Johanna Branch

The Johanna Branch site is also located near Bentonville as are both the Cox and Westbrook mitigation sites. Johanna Branch is a low slope (0.22%), meandering channel similar to but larger than Scout Camp West 2 and was therefore used to inform design parameters for the larger project streams, UT1 and UT4.

Johanna branch has a slope that matches project streams quite well and a drainage area that falls between that of UT1 and UT4. Its width to depth ratio is 10.1 to 19.7, its entrenchment ratio is as large as nearly 10, and its sinuosity is 1.2. Johanna Branch is most similar to an E5/C5 stream type and fits the Rosgen classification system as well or better than Scout West 2 in that it is a meandering stream with pool formation and energy dissipation in meander bends.

8.2.3 UT to Cypress Creek

The UT to Cypress Creek reference reach is located in southeastern Duplin County, NC near the Angola Bay game land. It was identified by EBX and WK Dickson and was used as the reference reach for the Best Site Stream and Wetland Restoration Project In 2013. UT to Cypress Creek is a Rosgen E5 sand bed system with a slope of about 0.3% and a mostly wooded 0.47 square mile drainage area. It has a width to depth ratio of 8.8 to 10.4, an entrenchment ratio of 9.2 to 15.1, and a sinuosity of 1.13. Because its drainage area falls in between that of the two design groups, UT to Cypress Creek was used only for the discharge analysis to provide additional data and strengthen the drainage area and discharge relationship.

8.2.4 UT to Wildcat Branch

Ut to Wildcat Branch is located in Robeson County, NC northeast of Lumberton near the Cape Fear floodplain and surrounding wetlands. The site was identified by ICA Engineering and was used as a reference reach for the UT to Millers Creek Stream and Wetland Mitigation Site in 2013. It is a low-lying, flat sand bed system with a 0.44 square mile watershed that is characterized by 60% mature forest and 40% agricultural land use practices. UT to Wildcat Branch is classified as a Rosgen E5 channel with a width to depth ratio of 8.0 and an entrenchment ratio of 15.9. It has a drainage similar to UT to Cypress Creek as was also used only in the discharge analysis to bolster the drainage area-discharge curve.

8.2.5 UT to Tyson Creek

The UT to Tyson Creek reference reach is located in Pitt County, NC just south of Falkland, near the Tar River about 10 miles northwest of Greenville, NC. The site was surveyed by Stantec in 2002 and was used as a reference reach for the Oakley Crossroads Stream and Wetland Restoration site in 2006. It is a first order tributary with a predominately wooded 0.65 square mile drainage area. Other watershed land uses include agricultural and some residential. UT to Tyson Creek is a C5 sand bed system with a slope of about 0.17%. It was used to develop design parameters for UT1 and UT4.

8.2.6 Shepherd Run

The Shepherd run reference reach is located in Greene County, NC to the southeast of Snow Hill. It is a second order tributary to Contentnea Creek, which continues to the Tar River. The site was surveyed by Stantec in 2002 and was used as a reference reach for the Oakley Crossroads Stream and Wetland Restoration project in 2006. The reach's 1.37 square mile drainage area is mostly forested with some agricultural and residential land uses. Shepherd run is an E5 sand bed system with a width to depth ratio of 5, an entrenchment ratio of 17.1, and a sinuosity of 1.2. This reference reach was used to inform design parameters for UT1 and UT4.

8.2.7 Still Creek

Still Creek is located in the Cliffs of Neuse State Park in Wayne County, NC, east of Mount Olive near Seven Springs. Still Creek flows into Mill Creek just upstream of its confluence with the Neuse River. it is a small, moderately flat system with an overall slope of 0.88%, a width to depth ratio of 7.4 to 11.3, an entrenchment ratio of 4.85 to 13.0, and a sinuosity of 1.33. it is a sand bed system where woody debris plays a large role in the development of flow diversity and habitat niches. It is hydraulically connected to its riparian wetland system. The 0.35 square mile watershed is located entirely within park boundaries. This stream was originally surveyed by Buck Engineering and data was validated by Wildlands in August 2016. Still Creek has a similar slope and drainage area to UT3 and was used to develop design parameters for UT2 and UT3.

8.2.8 Grady Branch

Grady Branch is an enhancement reach within the Falling Creek Mitigation Site that was originally surveyed by Wildlands Engineering as an on-site reference to inform design of other reaches within the Falling Creek Mitigation Site. This reach is very flat with an overall slope of 0.54% and a width to depth ratio of 4.9 to 7.6.

Although there is minor incision, this reach appears to have stable planform and dimension. The primary use of this reach is to inform the dimensionless pattern ratios for UT2 and UT3.

8.2.9 Cedar Creek Reference

The Cedar Creek reference reach is southwest of the city of Clinton in Sampson County, NC, near the Great Coharie Creek. It is a small, somewhat flat sand bed system that flows northwest and drains into UT1 of the Cedar Creek Stream and Wetland Restoration Project, which then flows directly into the Great Coharie Creek. The reference reach was identified by EBX and WK Dickson and used as the reference reach for the Cedar Creek Stream and Wetland Restoration project in 2014. It is classified as a C5/E5 stream and the 0.13 square mile drainage area is 47% evergreen forest, 31% cultivated land, 9% woody wetlands, 8% open space, and 5% shrub/scrub. Although the drainage area is within the range of the smaller McClenny Acres project streams, the slope is somewhat higher than that of UT1 and UT3. Therefore, the Cedar Creek reference reach was used to strengthen the lower end of the reference reach drainage area-discharge curve.

8.3 Design Channel Morphological Parameters

Reference reaches were a primary source of information used to develop the pattern and profile design parameters for the streams. Ranges of pattern parameters were developed within the reference reach parameter ranges with some exceptions based on best professional judgement and knowledge from previous projects. We found the lower limit of some of these parameters to be too low to build a stable system. They are likely low in reference reaches due to the presence of a mature forest and root system that both influences and stabilizes channel pattern and profile. For example, radius of curvature ratio in reference data has a lower limit of 0.5 and the meander width ratio had a minimum of 1.4., However, we have found that for C/E channels, these ratios should typically be above 1.8 and 2.4 respectively to naturally dissipate energy through meander bends during high flow events to limit impacts of shear stress on streambanks. The lower limits of the radius of curvature ratio and meander width ratio are based on values used for many years and on many successful designs.

Reference reaches were also used to inform the design of the cross-sections on the streams. The streams were designed with pool widths to be approximately 1.4 times the width of riffles to provide space for point bars and riffle pool transition zones. Designer experience was used for pool design as well. Pool depths were designed to be a minimum of 3.0 times deeper than riffles to provide habitat variation. Cross-section parameters such as area, depth, and width were designed based on the design discharge and stable bank slopes. Key morphological parameters for the Site are listed in Tables 14 through 16 for the McClenny Acres project streams where restoration is to occur. Complete morphological tables for existing and proposed conditions can be found in Appendix 10.

Table 14: Summary of Morphological Parameters for UT1 and UT4

Parameter	Existing Parameters[1]		Reference Parameters			Proposed Parameters	
	UT1	UT4 Reach 1	Johanna Creek	UT to Tyson Creek	Shepherd Run	UT1	UT4 Reach 1
Contributing Drainage Area (acres)	423	784	576	420	880	423	784
Channel/Reach Classification	E5/G5	E5/F5	E5/C5	C5	E5	C5	C5
Design Discharge Width (ft)	5.7 – 7.1	5.1 – 12.4	9.7	14.6	7.8	11.3	12.8
Design Discharge Depth (ft)	1.2	1.3 – 2.2	1.1	1.6	2.1	1.3	1.5
Design Discharge Area (ft^2)	4.9 – 6.5	9.0 – 11.1	7.2 – 7.8	9.5	12.6	10.5	13.6
Design Discharge Velocity (ft/s)	2.0 – 2.5	1.8 – 2.1	1.8 – 1.9	0.9	1.9	1.1	1.4
Design Discharge (cfs)	11.9	18.4	14	8.8	21	11.9	18.4

Parameter	Existing Parameters[1]		Reference Parameters			Proposed Parameters	
	UT1	UT4 Reach 1	Johanna Creek	UT to Tyson Creek	Shepherd Run	UT1	UT4 Reach 1
Water Surface Slope	0.0022	0.0010	0.0022	0.0020	0.0020	0.0011	0.0013
Sinuosity	1.05	1.04	1.20	1.18	1.18	1.2	1.2
Width/Depth Ratio	6.6 – 8.1	2.9 – 13.9	10.1 – 19.7	22.4	4.8	12.2	12.1
Bank Height Ratio	1.6 – 2.8	2.3 – 5.3	1.0	-	-	1.0	1.0
Entrenchment Ratio	1.4 – 17.6	1.2 – 2.5	8.0 – 9.6	8.2	17.1	2.2 - 5	2.2 - 5
d16 / d35 / d50 / d84 / d95 / dip / disp (mm)	-	-	-	-	-	-	-

[1] Streams have been heavily ditched, straightened, and otherwise altered, and therefore they do not display any natural pattern or cross-sectional traits.

Table 15: Summary of Morphological Parameters for UT2

Parameter	Existing Parameters[1]	Reference Parameters			Proposed Parameters
	UT2 Reach 2	Still Creek	Grady Branch	Scout West 2	UT2 Reach 2
Contributing Drainage Area (acres)	40	224	160	218	40
Channel/Reach Classification	F5	E5	E5	E5	C5
Design Discharge Width (ft)	5.9	6.8 – 8.0	3.4 – 5.3	5.6 – 7.6	7.0
Design Discharge Depth (ft)	0.5	1.1 – 1.4	0.8	1.2 – 1.3	0.9
Design Discharge Area (ft^2)	1.8	5.7 – 6.7	-	5.3 – 5.4	4.3
Design Discharge Velocity (ft/s)	2.1	1.2	-	1.2	1.0
Design Discharge (cfs)	4.2	7.3	-	6.4	4.2
Water Surface Slope	0.0024	0.0066	0.0054	0.004	0.0014
Sinuosity	1.03	1.33	-	1.20	1.25
Width/Depth Ratio	18.8	7.4 – 11.3	4.9 – 7.6	5.7 – 11.0	11.5
Bank Height Ratio	5.6	1.0	-	1.1 – 1.2	1.0
Entrenchment Ratio	1.2	4.9 – 13.0	-	> 2.2	2.2 - 5
d16 / d35 / d50 / d84 / d95 / dip / disp (mm)	-	-	-	-	-

[1] Streams have been heavily ditched, straightened, and otherwise altered, and therefore they do not display any natural pattern or cross-sectional traits.

Table 16: Summary of Morphological Parameters for UT3 Reaches 1 and 2

Parameter	Existing Parameters[1]		Reference Parameters			Proposed Parameters	
	UT3 Reach 1	UT3 Reach 2	Still Creek	Grady Branch	Scout West 2	UT3 Reach 1	UT3 Reach 2
Contributing Drainage Area (acres)	92	222	224	160	218	92	222
Channel/Reach Classification	F5	F5	E5	E5	E5	C5	C5
Design Discharge Width (ft)	10.2	12.0	6.8 – 8.0	3.4 – 5.3	5.6 – 7.6	8.8	11.0
Design Discharge Depth (ft)	0.5	1.3	1.1 – 1.4	0.8	1.2 – 1.3	1.0	1.2
Design Discharge Area (ft^2)	3.5	9.1	5.7 – 6.7	-	5.3 – 5.4	6.3	9.6

Parameter	Existing Parameters[1]		Reference Parameters			Proposed Parameters	
	UT3 Reach 1	UT3 Reach 2	Still Creek	Grady Branch	Scout West 2	UT3 Reach 1	UT3 Reach 2
Design Discharge Velocity (ft/s)	2.3	1.1	1.2	-	1.2	1.1	1.0
Design Discharge (cfs)	7.1	10.0	7.3	-	6.4	7.1	10.0
Water Surface Slope	0.0065	0.0014	0.0066	0.0054	0.0040	0.0015	0.0010
Sinuosity	1.01	1.05	1.33	-	1.20	1.25	1.20
Width/Depth Ratio	29.9	16.0	7.4 – 11.3	4.9 – 7.6	5.7 – 11.0	12.3	12.6
Bank Height Ratio	7.1	3.4	1.0	-	1.1 – 1.2	1.0	1.0
Entrenchment Ratio	1.2	1.0	4.9 – 13.0	-	> 2.2	2.2 - 5	2.2 - 5
d16 / d35 / d50 / d84 / d95 / dip / disp (mm)	-	-	-	-	-	-	-

[1] Streams have been heavily ditched, straightened, and otherwise altered, and therefore they do not display any natural pattern or cross-sectional traits.

8.4 Design Discharge Analysis

Multiple methods were used to develop bankfull discharge estimates for each of the project restoration reaches: the NC Coastal Plain Regional Curve (Doll et al., 2003), a Regional Flood Frequency Analysis, a site-specific reference reach curve, and data from previous successful design projects. The resulting values were compared and concurrence between the estimates was evaluated. The purpose of using multiple methods to estimate bankfull discharge is to eliminate reliance on a single method as the basis of channel design. However, the methods commonly produce significantly different results so professional judgement must be used to select the final design discharge for each restoration reach. Each of the methods used to estimate discharge are described below and the results of the analysis are summarized in Table 17 and illustrated in Figure 9.

8.4.1 Published Regional Curve Data

The NC Rural Coastal Plain Regional Curve published by Doll et al. in 2003 was used to estimate discharge based on the drainage area of each design reach. The discharge values derived from this regional curve were in the same range as those derived from the site-specific reference reach curve and consistently lower than the figures produced by the Wildlands Regional Flood Frequency analysis.

8.4.2 Regional Flood Frequency Analysis

Wildlands developed a regional flood frequency analysis relation for the NC Coastal Plain Region based on methodology described in the 2009 USGS publication *Magnitude and Frequency of Rural Floods in the Southeastern United States, through 2006.* Of the 103 stations referenced in the publication, 12 stations with drainage areas ranging from 0.28 to 7.63 square miles were used in the development of the tool. The applicable stations were selected based on several criteria such as geographic region, drainage area, watershed characteristics, extent of available data, and dates of data collection. Peak flow data from the 12 USGS stream stations used for the creation of this relation were analyzed for homogeneity using Hosking and Wallis (1993) heterogeneity statistics in the statistics program R®. All stations were found to be acceptably homogeneous. The included gages are as follows:

- USGS 02227422 – Crooked Creek Tributary near Bristol, GA (DA = 0.28 mi^2)
- USGS 0209173190 – Unnamed Tributary to Sand Run near Lizzie, NC (DA = 0.57 mi^2)
- USGS 02227990 – Satilla River Tributary 2 at Atkinson, GA (DA = 0.0.67 mi^2)
- USGS 02169960 – Lake Marion Tributary near Vance, SC (DA = 2.12 mi^2)
- USGS 01668300 – Farmers Hall Creek near Champlain, VA (DA = 2.18 mi^2)
- USGS 021355013 – Davis Branch near Sumter, SC (DA = 2.50 mi^2)

- USGS 02136361 – Turkey Creak near Maryville, SC (DA = 4.25 mi^2)
- USGS 021720725 – Canton Creek near Moncks Corner, SC (DA = 4.82 mi^2)
- USGS 02148090 – Swift Creek near Camden, SC (DA = 4.90 mi^2)
- USGS 02130800 – Backswamp near Darlington, SC (DA = 6.22 mi^2)
- USGS 01661800 – Bush Mill Stream near Heathsville, VA (DA = 6.77 mi^2)
- USGS 02102908– Flat Creek near Iverness, NC (DA = 7.63 mi^2)

The data from these 12 gage stations were used to develop flood frequency curves for the 1-year, 1.2-year, 1.5-year, 1.8-year, and 2-year recurrence interval discharges. These relations can be used to estimate discharge of those recurrence intervals for ungaged streams in the same hydrologic region and were solved to determine the discharge of each project reach with the drainage area as the input. The Wildlands regional flood frequency analysis produced discharge values that were consistently higher than the other two primary discharge analysis methods.

8.4.3 Site-Specific Reference Reach Curve

A total of 11 reference reaches were identified for this project (Section 8.2). Each reference reach was surveyed to develop information for analyzing drainage area-discharge relationships as well as development of design parameters. Stable cross-sectional dimensions and channel slopes were used to compute a bankfull discharge with the Manning's equation for each reference reach. The resulting discharge values were plotted against drainage area to make a project-specific regional curve. Three reference reaches were selected to help develop design parameters for UT1 and UT4, and a separate set of three reference reaches was used for UT2 and UT3. In addition, a third set of five reference reaches was included only for purposes of the discharge analysis to strengthen the discharge-drainage area curve, resulting in a total of 11 reference sites to be used in the site-specific reference reach curve. The discharge values derived from the resulting curve were comparable to the published Coastal Plain regional curve data but consistently lower than the Wildlands regional flood frequency analysis.

8.4.4 Existing Bankfull Indicators (Manning's Equation)

A riffle cross-section was surveyed on each design reach on the Site, totaling 8 cross-sections. However, due to the maintained condition of the stream channels, reliable bankfull indicators were not identified and the results from this method were not directly used in the determination of the design bankfull discharge.

8.4.5 Design Discharge Analysis Summary

The results of the design discharge analysis provided a range of discharge values. There was convergence between the estimates derived from the NC Rural Coastal Plain Regional Curve and the reference reach curve. The results of the two methods had an average difference of 9% over the five design reaches. On the other hand, the Wildlands regional flood frequency analysis returned values for the 1.2-year event that were consistently higher than the other two primary methods. The results of the flood frequency analysis were 24-54% higher than the reference reach curve, with an average difference of 39%, and 16-86% higher than the regional curve, with an average difference of 49%.

Final design discharges were selected based on analysis of the methods discussed in this section. The final design discharges for the larger design reaches UT1 and UT4 coincide with the outputs of the reference reach and Coastal Plain regional curves. The design discharges for UT2 and UT3 are closer to the higher results of the regional flood frequency analysis. This will result in larger cross sections that will help maintain stable channels and prevent them from being overwhelmed by encroaching vegetation. The goal of the design was to achieve a balance between streams that would be highly connected to their riparian wetlands by flooding frequently and not undersizing channels to the point where vegetation and aggradation could choke the channel. Table 17 below gives a summary of the discharge analysis results and a plot illustrating the design discharge data is shown in Figure 9.

Table 17: Summary of Design Discharge Analysis for McClenny Acres design reaches

		UT1	UT2	UT3 Reach 1	UT3 Reach 2	UT4
DA (acres)		423	40	92	222	784
DA(sq. mi.)		0.66	0.06	0.14	0.35	1.23
NC Rural Coastal Plain Regional Curve (cfs)		12.3	2.2	4.1	7.7	19.2
Regional Flood Frequency Analysis (cfs)	1.2-year event	15.7	4.1	7.1	11.0	22.2
	1.5-year event	24.6	7.2	12.0	17.8	33.8
Site Specific Reference Reach Curve		12.1	2.7	4.6	8.0	17.9
Selected Design Discharge		**12.0**	**4.0**	**7.0**	**10.0**	**19.0**

8.5 Sediment Transport Analysis

To gain a better understanding of the quantity of sediment supplied to the project streams and how it is transported through the system, Wildlands performed a qualitative assessment of sediment supply and sources in the project watershed. In addition, Wildlands also performed a competence analysis to analyze the ability of the proposed streams to transport certain sizes of sediment and to support material sizing for constructed riffles. The following sections detail the sediment supply and competence analyses.

8.5.1 Sediment Supply

The watershed study consisted of an analysis of past, current, and projected future conditions of the watershed using the National Land Cover Database (NLCD) as well as historic and current aerial photography to characterize past and current land cover and potential sediment sources. For a description of the historic land uses and changes in land use in the watershed, refer to Section 3.3 above.

The watershed assessment indicates that the rural watershed is stable so there is no reason to believe land use will change significantly in the foreseeable future. In addition, visual inspections of streams throughout the Site have not resulted in any evidence of heavy deposition of sediment, indicating that aggradation is not an issue. Because of the rural nature of the watershed, the stable land use, and the lack of sediment accumulation in the project streams, the sediment load to the project streams is expected to be low, stable, and supply-limited (i.e. there is capacity to move sediment load greater than the supplied load). Therefore, the design channels are expected to remain stable and pass the sediment delivered from the watershed. The focus of the sediment transport analysis is therefore based on an evaluation of stream competence.

8.5.2 Competence Analysis

In natural streams, shear stress increases corresponding to an increase in discharge until the point at which the channel is flowing full and gains access to the floodplain. Floodplain access disperses the flow and prevents further increases in shear stress within the channel. This relationship of shear stress, channel dimension, and discharge influences erosion potential within the channel and the channel's ability to transport certain sizes of sediment. The latter is a measure of stream competence, which is quantified by shear stress as calculated by the Shields (1936) and Andrews (1984) equation described by Rosgen (2001). The results of the competence analysis are shown in Table 18.

Table 18: Results of Competence Analysis

	UT1	UT2	UT3 – R1	UT3 – R2	UT4
Abkf (sq ft)	10.5	4.3	6.3	9.6	13.6

	UT1	UT2	UT3 – R1	UT3 – R2	UT4
Wbkf (ft)	11.3	7.0	8.8	11.0	12.8
Dbkf (ft)	0.9	0.6	0.7	0.9	1.1
Schan (ft/ft)	0.0011	0.0014	0.0015	0.0010	0.0013
Bankfull Velocity (fps)	1.1	1.0	1.1	1.0	1.4
Bankfull Shear Stress, t (lb/sq ft)	0.06	0.05	0.06	0.05	0.08
Movable particle size (mm)	4.2 – 19.4	3.5 – 17.1	4.5 – 20.2	3.6 – 17.3	5.8 – 24.2

Because McClenny Acres is a sand bed system with typical bed material particle sizes less than 2mm, the results of the analysis indicate that there is enough shear stress to move the naturally occurring material. The range of particle sizes that will become mobile during a bankfull event is within size range of gravel. Some of the larger material used to build the constructed riffles will be larger than the size range expected to move at bankfull flows. This material, along with log sills installed on some riffles will prevent downcutting of the channel due to excess shear stress. Material that moves during high flows will be replaced through natural deposition.

8.6 Wetland Design

8.6.1 Wetland Design Overview

The project includes a significant wetland re-establishment component and a smaller component of wetland enhancement. Areas proposed for wetland re-establishment contain relic hydric soils which were likely headwater forest wetlands prior to agricultural conversion. These areas are effectively drained by the numerous drainage ditches and channelized streams that dissect the site. Wetland enhancement zones are currently jurisdictional wetlands that are not fully functioning as headwater forests due to hydrologic or vegetative alterations. These areas are relatively small due to the extensive drainage network. Analysis of existing groundwater hydrology data and DRAINMOD (version 6.1) simulations of existing and proposed conditions were used to support wetland re-establishment design.

8.6.2 *Hydric Soils Investigation*

Wildlands contracted a licensed soil scientist (LSS) to perform an investigation of the presence and extent of hydric soils on the Site. The hydric soils on the site are mapped as Lumbee (Lv) and Pantego (Po) in the county soil survey from 1974. However, at the time the soil survey was published, Pantego was mapped as very poorly drained soils on shallow drainage ways on terraces. These soils are no longer considered Pantego and would currently be mapped as a series similar to Torhunta. For the wetlands modeling and design discussions below, this soil series is referred to as Pantego/Torhuna but the characteristics of the soil are considered to be best represented as Torhunta. The entire soils investigation report is included in Appendix 4.

8.6.3 Hydrologic Modeling

A DRAINMOD model was developed and calibrated to represent the existing and proposed conditions for Groundwater Gauge 2 (Figure 6). Although Gauge 2 is located outside of the proposed full delivery easement boundary (gauges were installed before easement boundaries were determined), it is informative of existing site hydrology and expected changes to hydrology. The model was built and calibrated using best available data for soil properties, site drainage, vegetation, and weather for the period from March 16 to September 5, 2018. The calibration plot for the model is included in Appendix 11.

The calibrated model was then used to simulate hydrology under existing and proposed conditions at the gauge location from January 1, 1958 to September 30, 2018 (the full period of record for the nearby rain

gauge). The proposed performance standard for wetland re-establishment zones is that the water table must be within 12 inches of the soil surface for 10 percent of the growing season (23 consecutive days) for areas mapped as Lumbee soils and 14 percent of the growing season (32 consecutive days) for areas mapped as Pantego/Torhunta soils (see Soils Report in Appendix 4). These performance standards follow the guidelines for each soil type in the Wetland Saturation Threshold Table in the Wilmington District Stream and Wetland Compensatory Update from October 2016. The growing season for Wayne County extends from March 17 to November 5 (232 days) according to the Wayne County Soil Survey (1974). Groundwater Gauge 2 is located within a soil unit mapped as Pantego/Torhunta but is near a unit mapped as Lumbee. The hydrology regime of this transition zone is believed to be representative of drier conditions within the range of moisture conditions characteristic of drained Torhunta soils and wetter conditions within the range of moisture conditions characteristic of drained Lumbee soils. Under existing site conditions, the model predicts 10 percent performance criteria for Lumbee soils is attained 21 out of the 60 years modeled. When model parameters were set to reflect the expected post-construction site conditions, the predicted attainment of the 10 percent criteria increased to 42 out of the 60 years modeled. For the 14 percent saturation threshold for Torhunta soils, the model predicts criteria attainment 9 out of 60 years for existing conditions and 37 out of 60 years for proposed conditions.

The average annual water budget component summary computed by DRAINMOD (Table 19) describes the difference in water discharge pathways. Based on the model results, increasing surface storage capacity to expected post-construction values has a substantial impact on hydrology. Average annual infiltration and runoff are increased and decreased, respectively. Drainage is the discharge of infiltrated precipitation to ditches and proposed streams. Thus, average annual water discharged via drainage increases under proposed conditions due to the reduction in runoff and increase in infiltration. The increase in drainage is not a result of seasonally lower water tables as the depth of streams will decrease and spacing of streams will increase. Furthermore, trends in observed versus predicted water table recession during the calibration period suggest the model may be underestimating the rate and quantity of discharge towards ditches. This could not be corrected using available information without setting input parameters to unrealistic values.

Table 19: Long-Term Average Water Budget Components for Gauge 2

	Existing Conditions	Proposed Conditions
Hydrologic Component	**Average Annual Amount (cm)**	**Average Annual Amount (cm)**
Precipitation	120.30	120.30
Infiltration	94.00	109.88
Evapotranspiration	92.41	92.78
Drainage	1.53	17.04
Runoff	25.96	10.38

8.7 Project Implementation

8.7.1 Stream Restoration, Enhancement, and Preservation

Most of the stream work on site will be stream restoration (Figure 10). There will be a short preservation reach at the upstream end of UT2 and a short enhancement I reach at the downstream end of UT4. All of the restoration reaches on the Site will be constructed as Priority 1 restoration. The stream bed will be raised so that the bankfull elevation will coincide with the existing floodplain, the cross section will be constructed to convey the design discharge, and pattern will be reconstructed so that the channel meanders throughout flat areas on the historic floodplain where they likely existed prior to being altered. The project area is typically very flat, with average valley slopes ranging from 0.13% to 0.75% depending on the design reach. Generally, this allows for a relatively high sinuosity in the design pattern to reflect the relationship between sinuosity and slope observed in reference reaches. However, sinuosity was lowered in

particularly flat sections to maintain local channel slopes of at least 0.1% in order to avoid aggradation, clogging, and other channel stability and maintenance issues. Project streams were designed to have an irregular meander patterns similar to natural Coastal Plain streams. Wherever possible, the design alignments have been developed to avoid impacts to existing wetlands and unnecessary removal of existing trees.

The restored profiles will consist of alternating riffle-pool bed morphology with the expectation that some of the riffle zones will produce sand ripples after construction. Pools will be constructed of varying depth for habitat diversity. The cross-sectional dimensions of the design channels will be constructed to frequently inundate adjacent floodplains and wetlands. The reconstructed channel banks will be built with stable side slopes, matted, and planted with native vegetation for long-term stability. Most of the proposed stream length traverses areas with relic hydric soils. Constructing channels in appropriate locations and raising streambeds in these areas will re-establish wetlands and improve the hydrology of existing wetlands.

A variety of structures will be used in restoration reaches to maintain restored bed grades, protect banks, add wood into channels, and provide a variety of habitat types. Two types of constructed riffles are proposed including constructed riffles and angled log riffles. Other types of structures will include brush toe bank revetments, angled log sills, sod mats, log vanes, double log sills, log sills with root wads, and lunker logs.

Riffle grade control will be constructed in some of the tangent sections. Riffle material will be imported from a nearby gravel mine. It will consist of a variety of small size classes of rock material ranging from pea gravel to small cobble. Some of riffles will be angled log riffles which incorporate multiple logs across the channel bottom to provide additional grade control and add woody material into the streams. These riffles will not be constructed in every tangent section but are necessary to provide frequent grade control throughout the project and serve to increase channel roughness and improve channel hydraulics and geomorphology. The gradation of small rock material will provide varied pore spaces within the riffles and structures, benefitting hyporheic exchange processes and habitat niche formation. Log vanes and lunker logs will deflect streamflow away from banks while also creating habitat diversity. Log sills and double log sills will be used to allow for small grade drops across pools and to provide extra grade control protection. At select outer meander bends, the channel banks will be constructed with a brush toe to reduce erosion potential and encourage pool maintenance. Sod mats will be used at certain locations if native sod comprised of acceptable species is readily available to stabilize stream banks in lieu of matting, providing rapid vegetative protection.

Preservation will be implemented on UT2 Reach 1, a short reach at the upper end of the Site, because it is stable and has well vegetated riparian buffers. Enhancement I is proposed for UT4 Reach 2. The treatments for this reach include removing spoil piles that line the channel and restrict floodplain access, incorporation of structures, and minor bank grading and stabilization where needed. This reach is well vegetated and the existing banks are mostly stable, although it is somewhat incised.

Riparian buffer mitigation will also be performed on the Site. The Buffer Mitigation Plan in included in Appendix 1.

The upstream portion of UT3 (1,062 LF) will be constructed outside of the DMS conservation easement. However, this reach will be included in the conservation easement of the adjacent bank.

8.7.2 Wetland Mitigation Activities

This project will include headwater forest wetland re-establishment and enhancement. It is likely that much of the Site was historically wetland prior to relocation and channelization of project streams and subsequent lowering of the water table. Wetland re-establishment in relic hydric soils is proposed for most

of the project area and nearly all of the proposed stream length will flow through wetland re-establishment zones. In areas proposed for riparian wetland re-establishment, the streams will be constructed in appropriate locations and streambeds will be raised such that they restore the natural water table elevation and the natural over-bank flooding regime. Ditches located in the fields will be filled to improve hydrology in the surrounding wetlands. No excavation to achieve wetland grades is proposed for this project. Wetland enhancement is also proposed for small pockets of jurisdictional wetlands near UT2 and UT4. Wetland areas may be disked to increase surface roughness and better capture rainfall which will improve groundwater recharge. Furrows will not exceed 6" to 9" in depth. Riparian wetlands within the project area will also be planted with native wetland species. Riparian wetlands within the DMS project site will connect with adjacent wetlands which are outside of the DMS easement but will be within the mitigation bank easement.

8.8 Vegetation and Planting Plan

The long-term objective of the planting plan is to establish native riparian buffers and headwater wetlands composed of species appropriate for the site. The restored buffer will improve riparian habitat and connectivity to other habitat types, maintain stability of restored streams, provide shade, trap sediment, and provide large woody debris and organic matter to streams. The site will be planted to the extents of the conservation easement, except where stands of mature trees exist, following construction. Species designated for planting were selected based on compatibility of silvics with expected site conditions within a given planting zone, observation of reference communities, and best professional judgement. This project provides the unique opportunity to incorporate pure stands of Atlantic white cedar in selected areas. These plating zones will only be planted with Atlantic white cedar seedlings to mimic naturally occurring stands. Species lists for each planting zone are listed on Sheet 3.0 of the preliminary design plans.

The wetland and buffer planting zones will be planted with bare root seedlings and a 6 foot by 12 foot spacing from the top of bank to the extent of the conservation easement or extent of disturbance where currently forested. Atlantic white cedar planting zones will be planted on a 6 foot by 6 foot spacing. The smaller channels (UT2 and UT3 R1) will be planted with live stakes above bankfull in two staggered rows two to three feet apart with a linear spacing of 3 to 4 feet on the outside of meander bends and 6 feet on both sides of tangent sections. For the larger channels (UT1, UT3 R2, and UT4), the two staggered rows of live stakes will be offset 1.5 to two feet on either side of the top of the channel banks at the same linear spacing as the smaller reaches. Multiple species of herbaceous plugs will also be planted on restoration reaches. The larger channels will be planted with plugs at or near the normal water elevation at a spacing of three to four feet, while the smaller channels will be planted between the normal water elevation and the top of bank at the same spacing. Permanent seed will be spread on streambanks, floodplain areas, and all disturbed areas within the conservation easement.

Mechanical site preparation will be implemented where necessary to create soil physical properties favorable for tree growth. In the agricultural field, the planted area will be ripped to a depth of 18 inches in a grid-like pattern with a maximum rip shank spacing of six feet. Ripping will be performed during the driest conditions feasible to maximize shatter of the plow pan. Construction practices are intended to minimize effects to soil properties, but some impacts are unavoidable. Ripping may be implemented to ameliorate soil compaction resulting from haul roads, stockpile areas, etc. Where grading is required, topsoil will be stockpiled and reapplied. Soil amendments may be incorporated to augment survival and growth of planted vegetation as determined necessary by soil testing.

Invasive vegetation within the project area will be treated and/or mechanically removed during construction, but additional treatment is expected. Invasive species presence will be monitored and treated as necessary throughout the monitoring period. Numerous sweetgum (*Liquidambar styraciflua*) and pine (*Pinus spp.*) trees are present within the project area. Sweetgum has been identified as an undesirable

species and will be mechanically removed during construction to reduce the seed source. The IRT requested that pines in the existing riparian buffer zones be thinned. This will be done mechanically during construction. Additional monitoring and management issues regarding vegetation area included in Sections 9.2 and 10.1.

8.9 Project Risk and Uncertainties

This project is low risk. There are three easement breaks for utilities (Section 5.7). One break on UT3 will be used for maintenance of an overhead utility line. This area may be mowed or maintained periodically by Duke Energy but should not otherwise be disturbed. Due to the rural nature of the area, there is very little risk that changes in land use upstream in the project watershed would alter the hydrology or sediment supply to the degree that the project is put at risk. Beaver may periodically be a problem. Wildlands will utilize the USDA to manage beaver throughout the monitoring period.

9.0 Performance Standards

The stream performance standards for the project will follow approved performance standards presented in the DMS Mitigation Plan Template (version 2.3, 12/18/2014), the Annual Monitoring Template (April 2015), and the Stream Mitigation Guidelines issued October 2016 by the USACE and NCIRT. Annual monitoring and routine site visits will be conducted to assess the condition of the finished project. Specific performance standard components are proposed for stream morphology, hydrology, and vegetation. Performance standards will be evaluated throughout the seven-year post-construction monitoring period.

9.1 Streams

9.1.1 Dimension

Riffle cross-sections on the restoration reaches should be stable and should show little change in bankfull area, maximum depth ratio, and width-to-depth ratio. Per DMS guidance, bank height ratios shall not exceed 1.2 and entrenchment ratios shall be at least 2.2 for restored C and E channels to be considered stable. All riffle cross-sections should fall within the parameters defined for channels of the designed stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Indicators of instability include a vertically incising thalweg or eroding channel banks. Changes in the channel that indicate a movement toward stability or enhanced habitat include a decrease in the width-to-depth ratio in meandering channels or an increase in pool depth. It is important to note that in sand bed channels pools and bed forms (ripples, dunes, etc.) may migrate over time as a natural function of the channel hydraulics. These sorts of bed changes do not constitute a problem or indicate a need for remedial actions. Remedial action would not be taken if channel changes indicate a movement toward stability.

9.1.2 Pattern and Profile

Visual assessments and photo documentation should indicate that streams are remaining stable and do not indicate a trend toward vertical or lateral instability.

9.1.3 Substrate

This is a sand bed system and the nature of the bed material is not expected to change over time. No pebble counts will be conducted for the project and no performance standard is being set for substrate.

9.1.4 Photo Documentation

Photographs should illustrate the Site's vegetation and morphological stability on an annual basis. Cross-section photos should demonstrate no excessive erosion or degradation of the banks. Longitudinal photos should indicate the absence of persistent of mid-channel bars or vertical incision. Grade control structures should remain stable. Deposition of sediment on the bank side of vane arms is preferable. Maintenance of scour pools on the channel side of vane arms is expected.

9.1.5 Hydrology

The occurrence of bankfull events will be documented throughout the monitoring period. Four bankfull flow events must be documented on enhancement I and restoration streams during the seven-year monitoring period. The four bankfull events must occur in separate years. Stream monitoring will continue until performance standards in the form of four bankfull events in separate years have been documented. UT3 above the confluence of UT2 is an intermittent channel and proposed for restoration. This reach will be monitored for hydrology with a stream gage and must demonstrate at least 30 consecutive days of stream flow.

9.2 Vegetation

Vegetative performance for riparian buffers associated with the stream restoration component of the project (buffer widths 0 – 50ft) will be in accordance with the Stream Mitigation Guidelines issued October 2016 by the USACE and NCIRT. The success criteria is an interim survival rate of 320 planted stems per acre at the end of monitoring year three (MY3), 260 stems per acre at the end of monitoring year 5 (MY5) and a final vegetation survival rate of 210 stems per acre at the end of monitoring year 7 (MY7). Planted vegetation must average 7 feet in height at the end of monitoring year 5 and 10 feet in height in each plot at the end of monitoring year 7. Vegetation monitoring will be conducted between July 1st and the end of the of the growing season. Individual plot data will be provided and will include height, density, vigor, damage (if any), and survival. In fixed vegetation plots planted woody stems will be marked annually as needed and given a coordinate, based off a known origin, so they can be found in succeeding monitoring years. Mortality will be determined from the difference between the previous year's living planted stems and the current year's living planted stems.

The extent of invasive species coverage will be monitored and controlled as necessary throughout the required monitoring period (MY7).

9.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above.

9.4 Wetlands

Groundwater monitoring will be conducted for seven years after construction to evaluate the hydrologic state of the re-established wetland zones. A total of 19 groundwater monitoring gages will be established at the McClenny site.

Based on the soil type on the site and associated USACE guidance, the proposed performance standard for wetland hydrology shall be free groundwater surface within 12 inches of the ground surface for 10-14% of the growing season for Wayne County under normal precipitation conditions. A majority of the Site contains Lumbee soils, which has a hydrology performance standard of 10% of the growing season according to the Wilmington District Stream and Wetland Compensatory Mitigation Update issued in October 2016 by the USACE and NCIRT. The remaining portion of the Site is Torhunta soils, which has a performance standard of 14%. Hydrologic modeling results for the proposed design are discussed in Section 8.6.3.

The estimated growing season for Wayne County is approximately 262 days (March 4 through November 21). Soil temperature probes will be installed on-site to determine growing season dates for each individual monitoring year. Per USACE guidance, probes will be located at a depth of 12 inches. The growing season will be defined as that portion of the year where soil temperature remains above 40 degrees Fahrenheit. The growing season may not begin before March 1 of each year when calculating hydroperiods. If a wetland zone does not meet the performance standard for a given monitoring year, rainfall patterns will be analyzed, and the hydrograph will be compared to that of the reference wetlands to assess whether atypical weather conditions occurred during the monitoring period.

Soil profile descriptions will be recorded at each boring where a gage is installed before and after construction. The profile descriptions will present a record of the soil horizons, color, texture, and redoximorphic features.

10.0 Monitoring Plan

The Site monitoring plan has been developed to ensure that the required performance standards are met, and project goals and objectives are achieved. Annual monitoring data will be reported using the DMS Annual Monitoring Reporting Template (April 2015). The monitoring report shall provide project data chronology that will facilitate an understanding of project status and trends, ease population of DMS databases for analysis and research purposes, and assist in close-out decision making.

Using the DMS As-Built Baseline Monitoring Report Template (February 2014), a baseline monitoring document and as-built record drawings of the project will be developed within 60 days of the planting completion and monitoring installation on the restored Site. Monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS by November 30. These reports will be based on the DMS Annual Monitoring Template (April 2015) and Closeout Report Template (March 2015). Full monitoring reports will be submitted to DMS in monitoring years 1, 2, 3, 5, and 7. Abbreviated monitoring reports will be submitted in monitoring years 4 and 6. Closeout monitoring period will be seven years beyond completion of construction or until performance standards have been met.

A separate buffer monitoring report will be submitted to NCDWR each year as described in the Buffer Mitigation Plan in Appendix 1.

Table 20, below, describes how the monitoring plan is set up in order to verify project goals and objectives have been achieved.

Table 20: Monitoring Plan

Goal	Objective	Performance Standard	Monitoring Metric
Improve the stability of stream channels.	Construct stream channels that will maintain a stable pattern and profile considering the hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Entrenchment ratio stays over 2.2 and bank height ratio below 1.2 with visual assessments showing progression towards stability.	Cross-section monitoring and visual inspections.
Improve instream habitat.	Install habitat features such as constructed riffles, cover logs, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	There is no required performance standard for this metric.	N/A
Reconnect channels with floodplains and riparian wetlands.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Four bankfull events in separate years within monitoring period.	Crest gauges and/or pressure transducers recording flow elevations.
Restore wetland hydrology, soils, and plant communities.	Restore and enhance riparian wetlands by raising stream beds, plugging existing ditches, removing berm material over relic hydric soils, and planting native wetland species.	Free groundwater surface within 12 inches of the ground surface for 10% (Lumbee soils) to 14% (Torhunta soils)	Groundwater gauges will be placed in wetland re-establishment areas

Goal	Objective	Performance Standard	Monitoring Metric
		of the growing season depending on soil type for wetland areas.	and monitored annually.
Restore and enhance native floodplain vegetation.	Plant native tree species in riparian zone where currently insufficient.	Survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7.	One hundred square meter vegetation plots will be placed on 2% of the planted area of the project and monitored annually.
Permanently protect the project Site from harmful uses.	Establish conservation easements on the Site.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.

10.1 Monitoring Components

Project monitoring components are listed in more detail in Table 21. Approximate locations of the proposed vegetation plots, cross-sections, and groundwater gage monitoring components are illustrated in Figure 11.

Table 21: Monitoring Components

Parameter	Monitoring Feature	Quantity/ Length by Reach				Frequency	Notes
		UT1	UT2	UT3	UT4		
Dimension	Riffle Cross-Sections	3	1	2	5	Year 1, 2, 3, 5, and 7	1
	Pool Cross-Sections	3	1	2	4		
Pattern	Pattern	N/A	N/A	N/A	N/A	N/A	2
Profile	Longitudinal Profile	N/A	N/A	N/A	N/A	N/A	
Substrate	Reach wide (RW), Riffle (RF) 100 pebble count	N/A	N/A	N/A	N/A	N/A	3
Hydrology	Crest Gage (CG)/ Flow Gage (FG)	1 CG	1 CG	1 CG, 1 FG	1 CG	Semi- Annual	4
Vegetation	CVS Level 2 Vegetation Plots	20 Fixed, 5 Random				Year 1, 2, 3, 5, and 7	5
Wetlands	Groundwater Wells	19				Quarterly	
Visual Assessment		Y	Y	Y	Y	Semi-Annual	
Exotic and nuisance vegetation						Semi-Annual	6
Project Boundary						Semi-Annual	7
Reference Photos	Photographs	30				Annual	

1. Cross-Sections will be permanently marked with rebar to establish location. Surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.
2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile will be collected during as-built baseline monitoring survey only, unless observations indicate lack of stability and profile survey is warranted in additional years.
3. Pebble counts will not be performed due to the sand bed nature of the streams.
4. Crest gages and/or transducers will be inspected quarterly or semi-annually, evidence of bankfull events will be documented with a photo when possible. Transducers will be set to record stage once every 3 hours. The transducer will be inspected and downloaded semi-annually.
5. Vegetation monitoring will follow CVS protocols, separate monitoring reports will be submitted to NCDMS and NCDWR.
6. Locations of exotic and nuisance vegetation will be mapped.
7. Locations of vegetation damage, boundary encroachments, etc. will be mapped.

11.0 Long-Term Management Plan

The Site will be transferred to the North Carolina Department of Environmental Quality (NCDEQ) Stewardship Program. This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the Site to ensure that restrictions required in the conservation easement are upheld. The NCDEQ Stewardship Program is developing an endowment system within the non-reverting, interest-bearing Conservation Lands Conservation Fund Account. The use of funds from the Endowment Account will be governed by North Carolina General Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The Site Protection Instrument can be found in Appendix 2.

12.0 Adaptive Management Plan

Upon completion of Site construction, Wildlands will implement the post-construction monitoring defined in Sections 9 and 10. Project maintenance will be performed during the monitoring years to address minor issues as necessary (Appendix 12). If, during the course of annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the DMS of the need to develop a Plan of Corrective Action. Once the Plan of Corrective Action is prepared and finalized Wildlands will:

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

13.0 Determination of Credits

The final stream credits associated with the Site are listed in Table 22. Stream Restoration is at a ratio of 1:1. All buffers meet the minimum 50-foot requirement. The credit release schedule is located in Appendix 13.

Table 22: Asset Table

Mitigation Credits								
	Stream		Riparian Wetland		Non-Riparian Wetland		Riparian Buffer[2]	
Type	R	RE	R	RE	R	RE	R	RE
Totals	9,274.600	9.500	36.795	0.294	N/A	N/A	N/A	N/A
Project Components								
Project Component or Reach ID	**Existing Footage/ Acreage**	**Proposed Stationing Location**	**Restoration Level**	**Approach**	**Mitigation Plan Footage/ Acreage**	**Mitigation Ratio**	**Mitigation Credits[1]**	
UT1 Reach 1	814	101+44 - 114+07	R	PI	1263	1	1263.000	
UT1 Reach 1 (Utility ROW - Not for Credit)	23	114+07 - 114+27	R	PI	20	N/A	N/A	
UT1 Reach 1	2095	114+27 - 128+98	R	PI	1471	1	1471.000	
UT2 Reach 1	95	200+00 - 200+95	P	PI	95	10	9.500	
UT2 Reach 2	730	200+95 - 206+69	R	PI	574	1	574.000	
UT2 Reach 2 (Utility ROW - Not for Credit)	57	206+69 - 206+90	R	PI	21	N/A	N/A	
UT2 Reach 2	372	206+90 - 210+04	R	PI	314	1	314.000	
UT3 Reach 1	147	311+12 - 315+84	R	PI	472	1	472.000	
UT3 Reach 2	239	315+84 - 317+54	R	PI	170	1	170.000	
UT3 Reach 2 (Utility ROW - Not for Credit)	92	317+54 - 318+43	R	PI	89	N/A	N/A	
UT3 Reach 2	782	318+43 - 329+60	R	PI	1117	1	1117.000	
UT4 Reach 1	2945	400+00 - 438+24	R	PI	3824	1	3824.000	
UT4 Reach 2	174	438+24 - 439+98	EII	PII	174	2.5	69.600	
Wetland Re-Establishment	36.795	N/A	R	N/A	36.795	1	36.795	
Wetland Enhancement	0.588	N/A	E	N/A	0.588	2	0.294	
Component Summation								
Restoration Level		**Stream (LF)3**	**Riparian Wetland (Acres)**	**Non-Riparian Wetland (Acres)**		**Buffer (sq. ft.)[2]**	**Upland (Acres)**	
Restoration		9,335	36.795	N/A		N/A	N/A	

Enhancement I	0	0.588	N/A	N/A	N/A
Enhancement II	174	N/A	N/A	N/A	N/A
Preservation	95	N/A	N/A	N/A	N/A

1. Mitigation Credits are the total amount of credit based on reach lengths (not including crossings) divided by the mitigation ratio.
2. Buffer credits are described in Appendix 1: Buffer Mitigation Plan.

14.0 References

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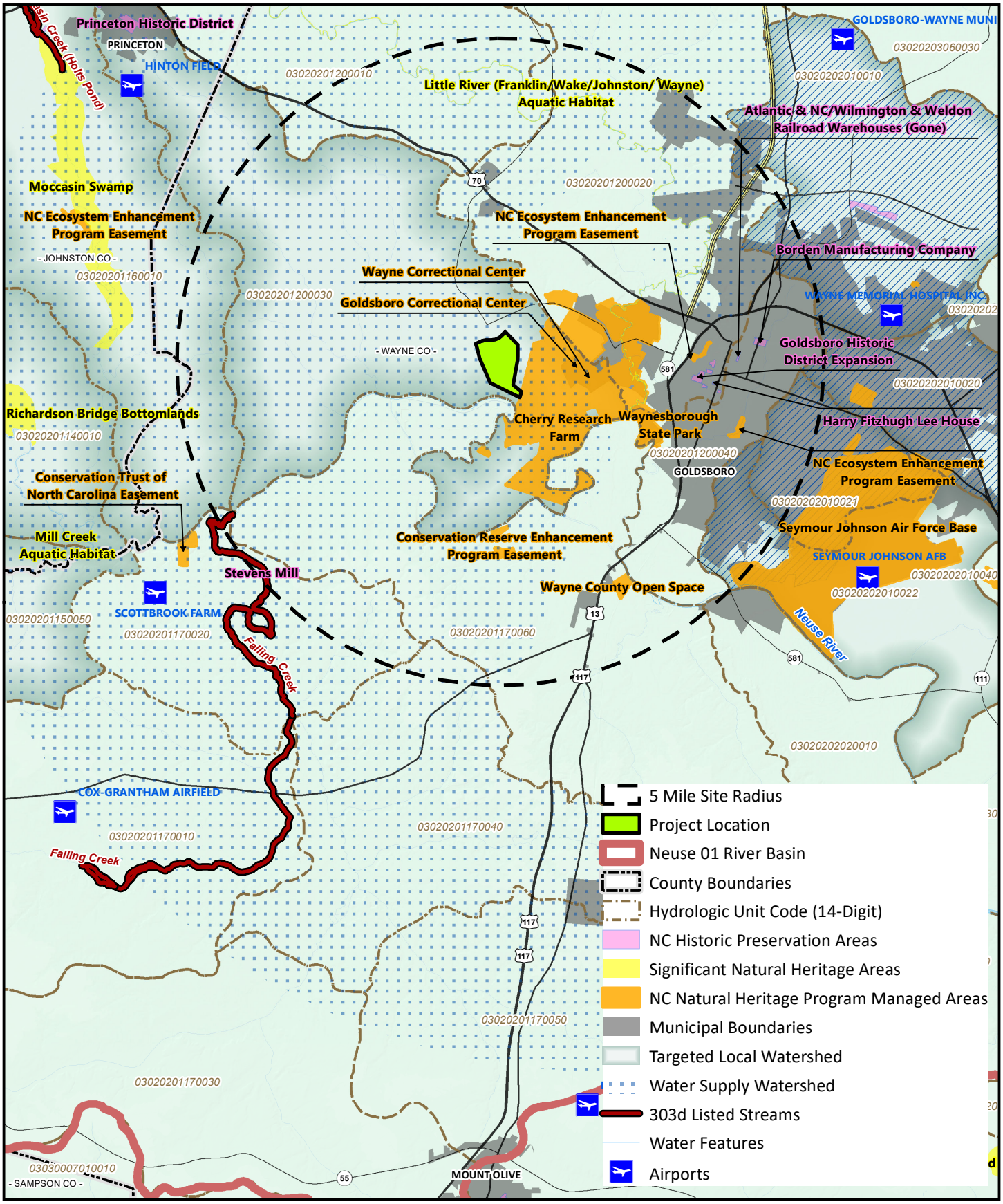
Figures



WILDLANDS ENGINEERING

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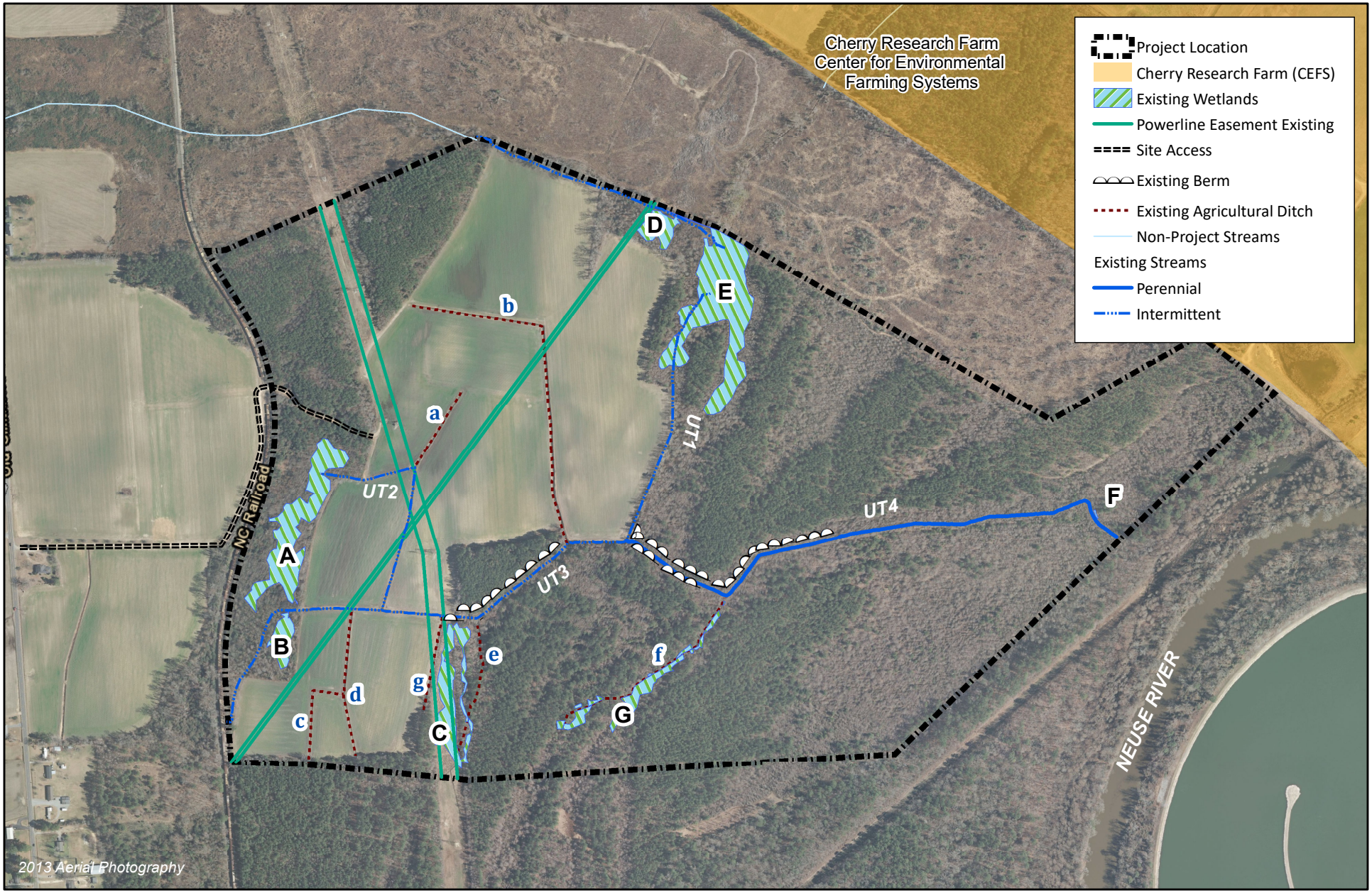
N

Figure 1 Vicinity Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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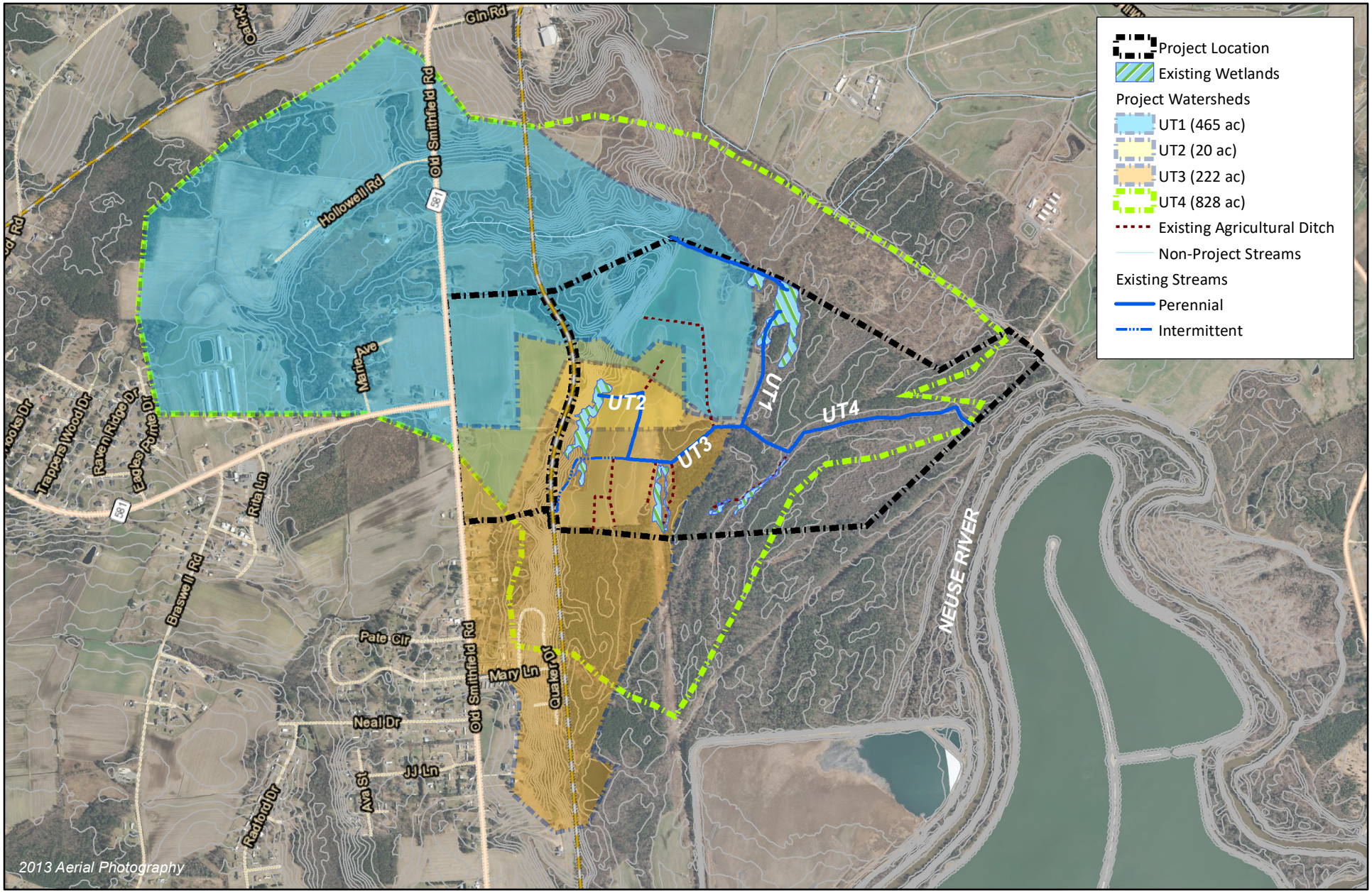
Figure 2 Site Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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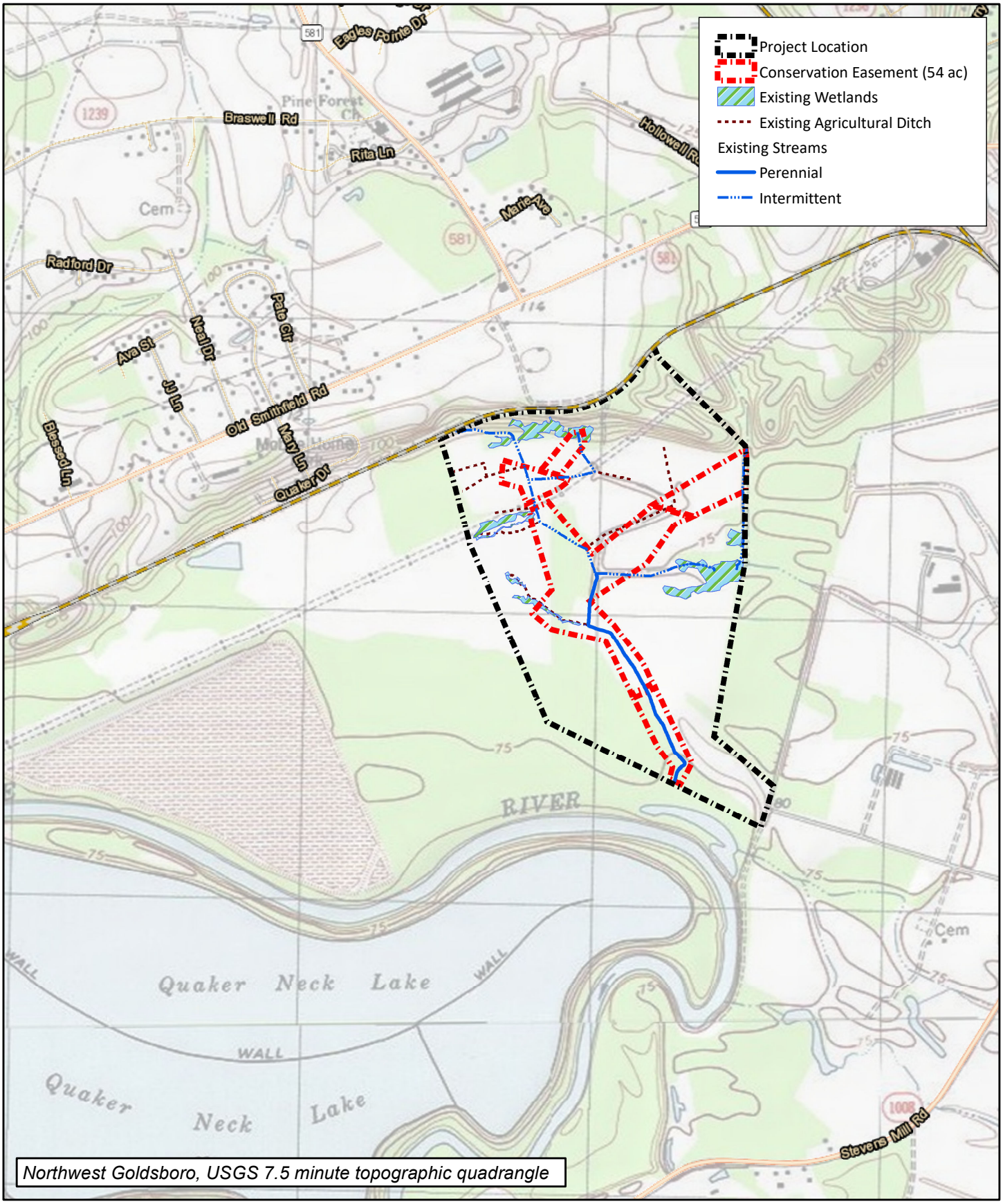
Figure 3 Watershed Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



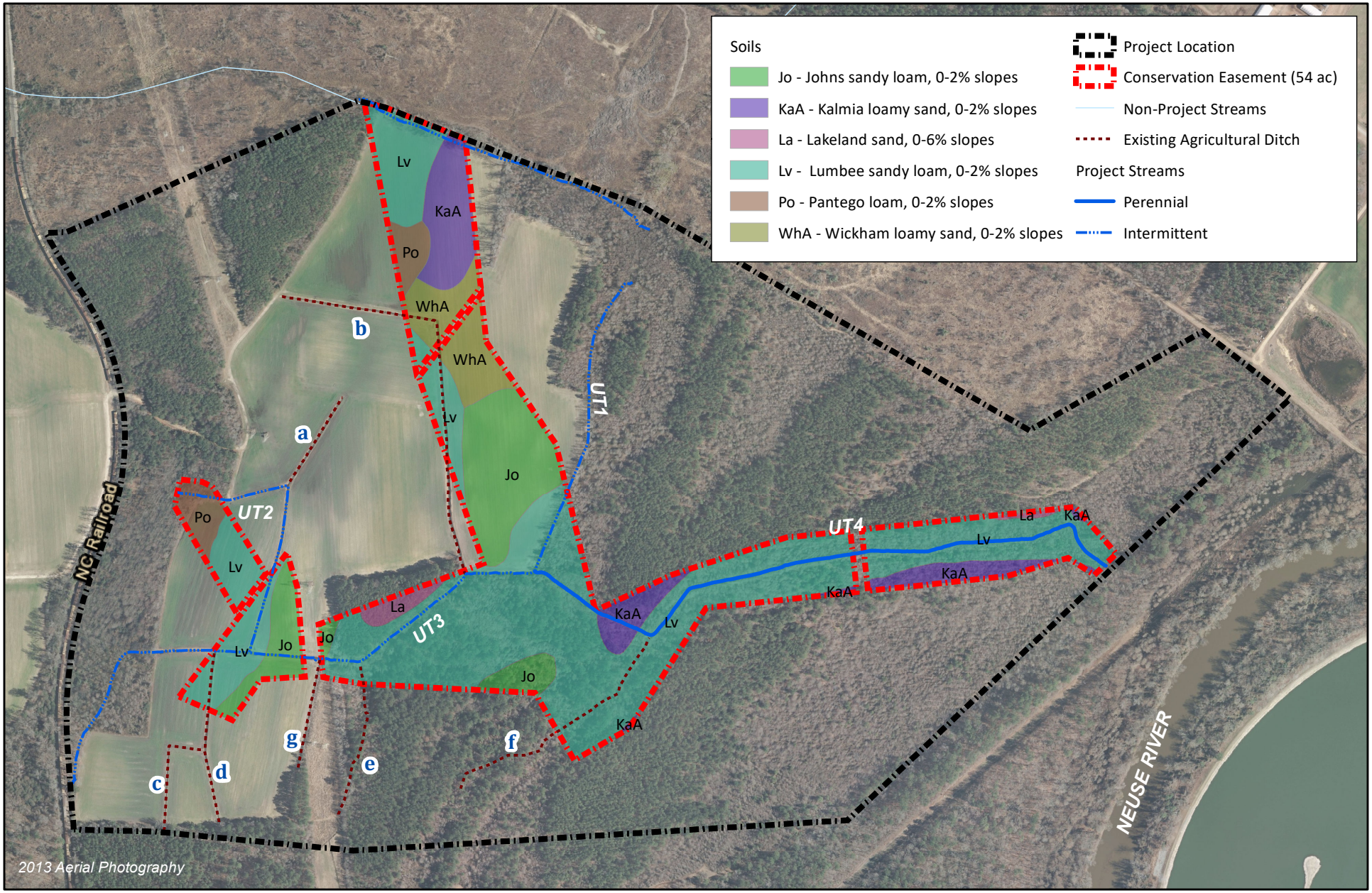
WILDLANDS ENGINEERING

0 750 1,500 Feet

N

Figure 4 Topographic Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



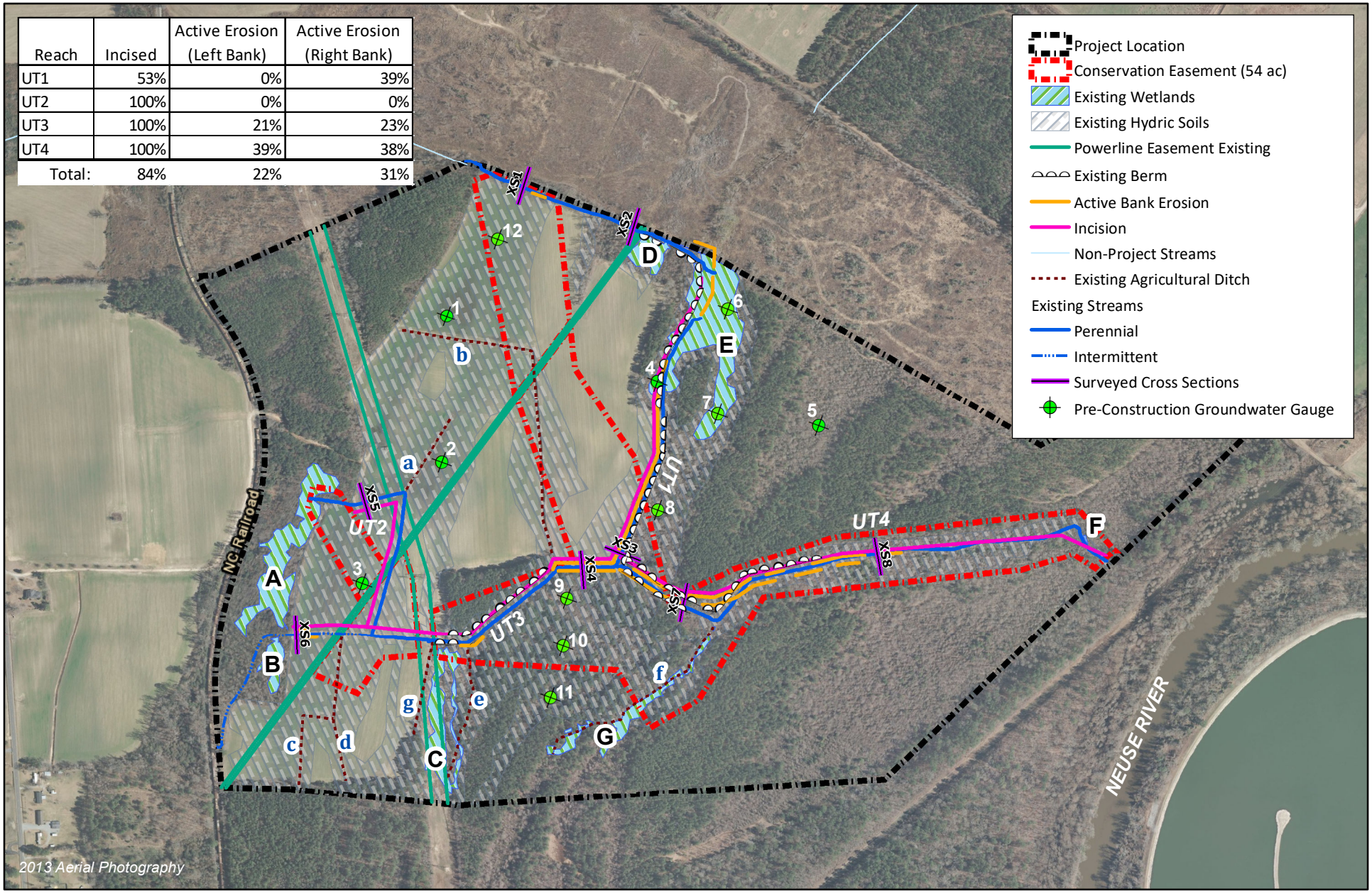
0 300 600 Feet

WILDLANDS ENGINEERING

Figure 5 Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Reach	Incised	Active Erosion (Left Bank)	Active Erosion (Right Bank)
UT1	53%	0%	39%
UT2	100%	0%	0%
UT3	100%	21%	23%
UT4	100%	39%	38%
Total:	84%	22%	31%



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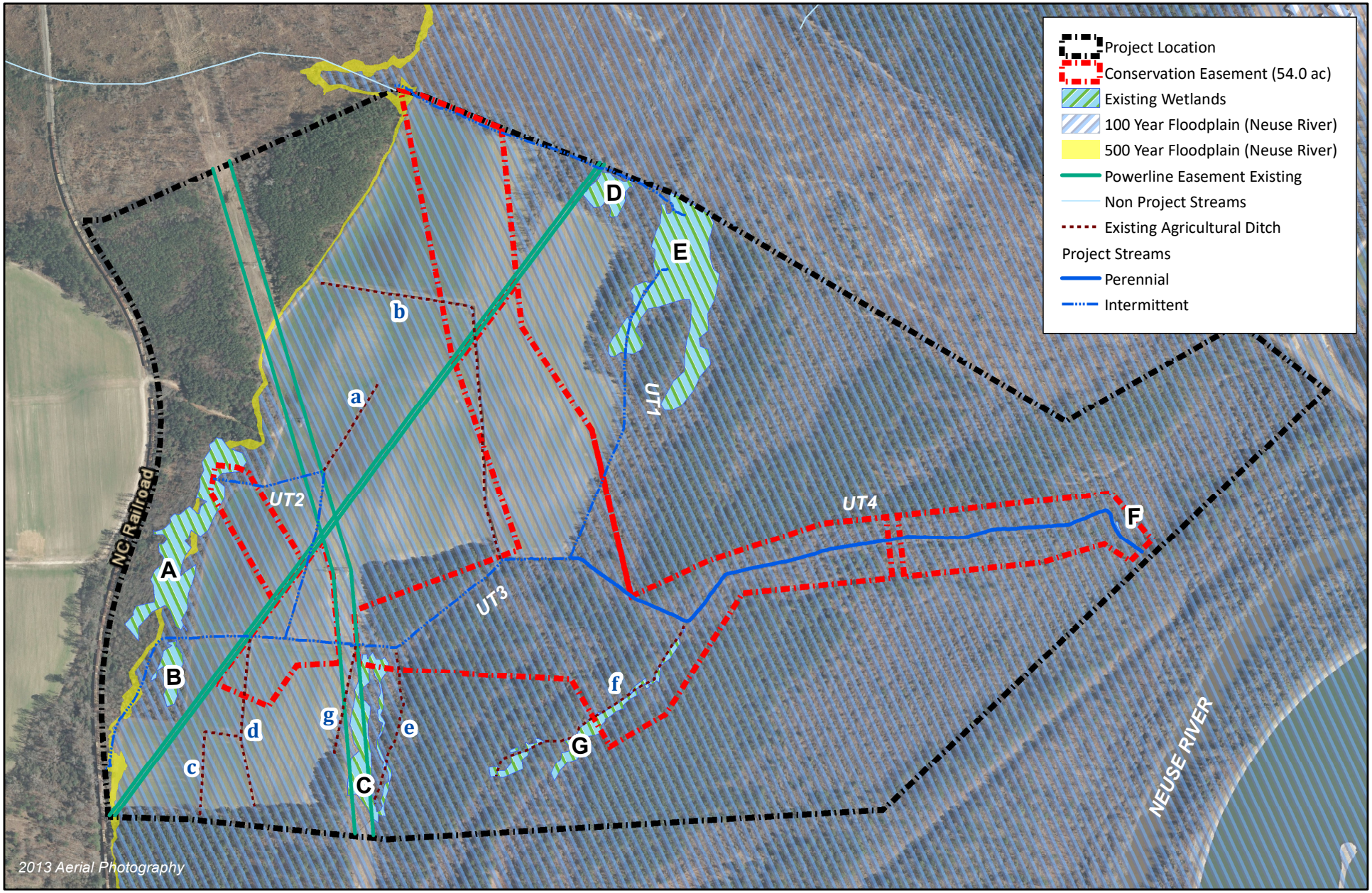
WILDLANDS ENGINEERING

Figure 6 Existing Conditions Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



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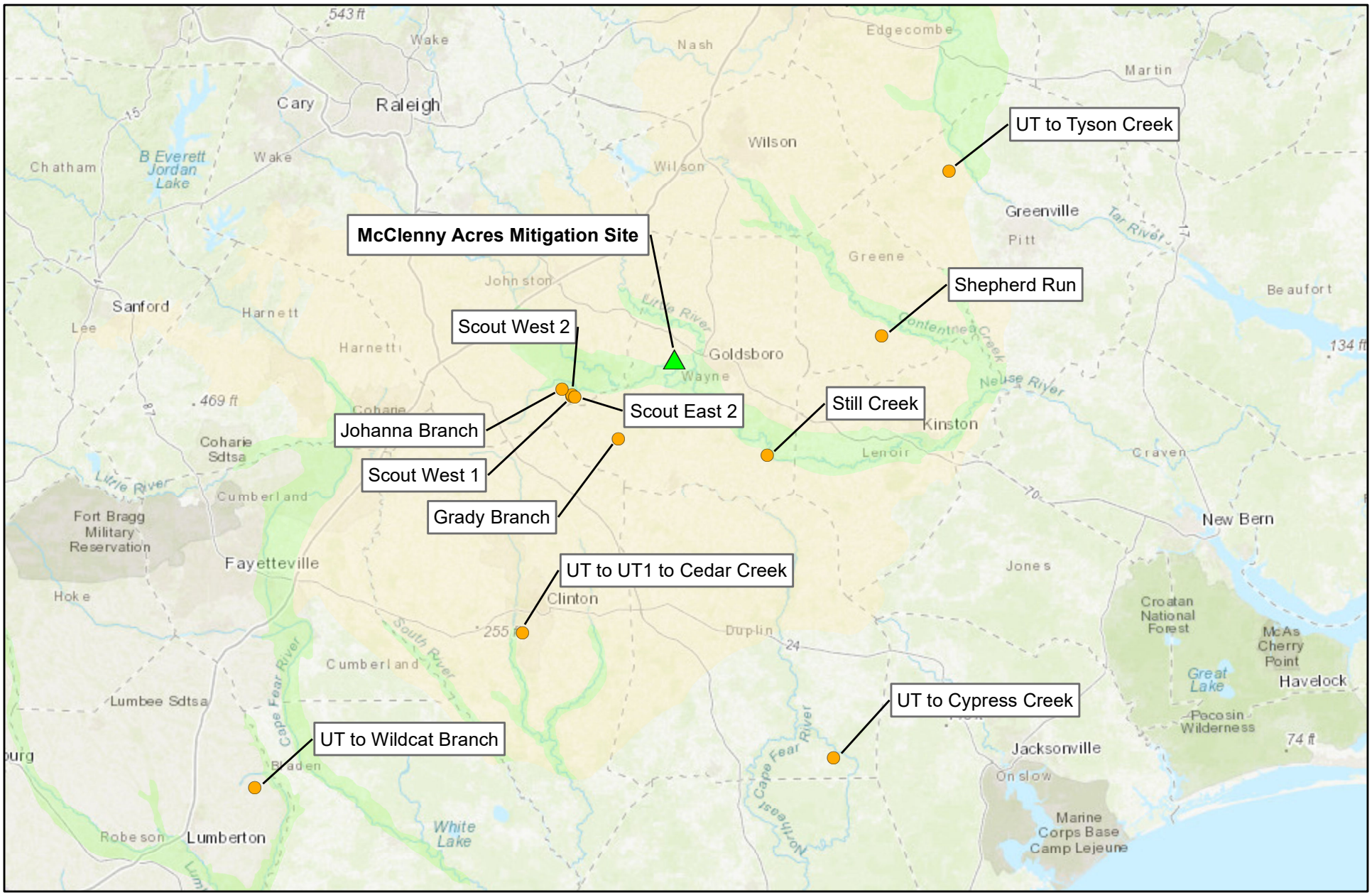
WILDLANDS ENGINEERING

Figure 7 FEMA Floodplain Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



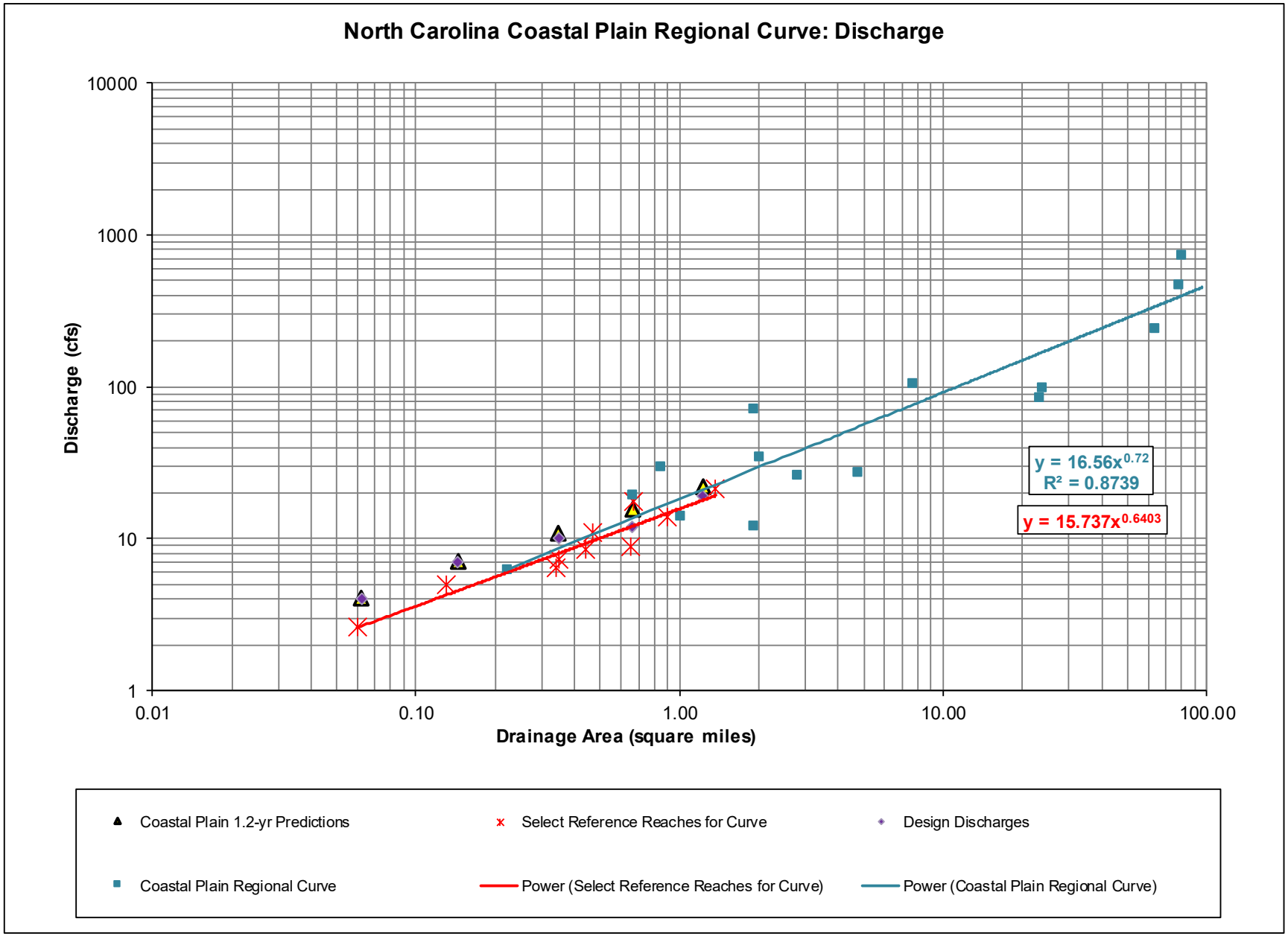
WILDLANDS ENGINEERING

0 7.5 15 Miles

N

Figure 8 Reference Reach Vicinity Map
McClenny Acres Mitigation Site
Neuse River Basin (03020201)

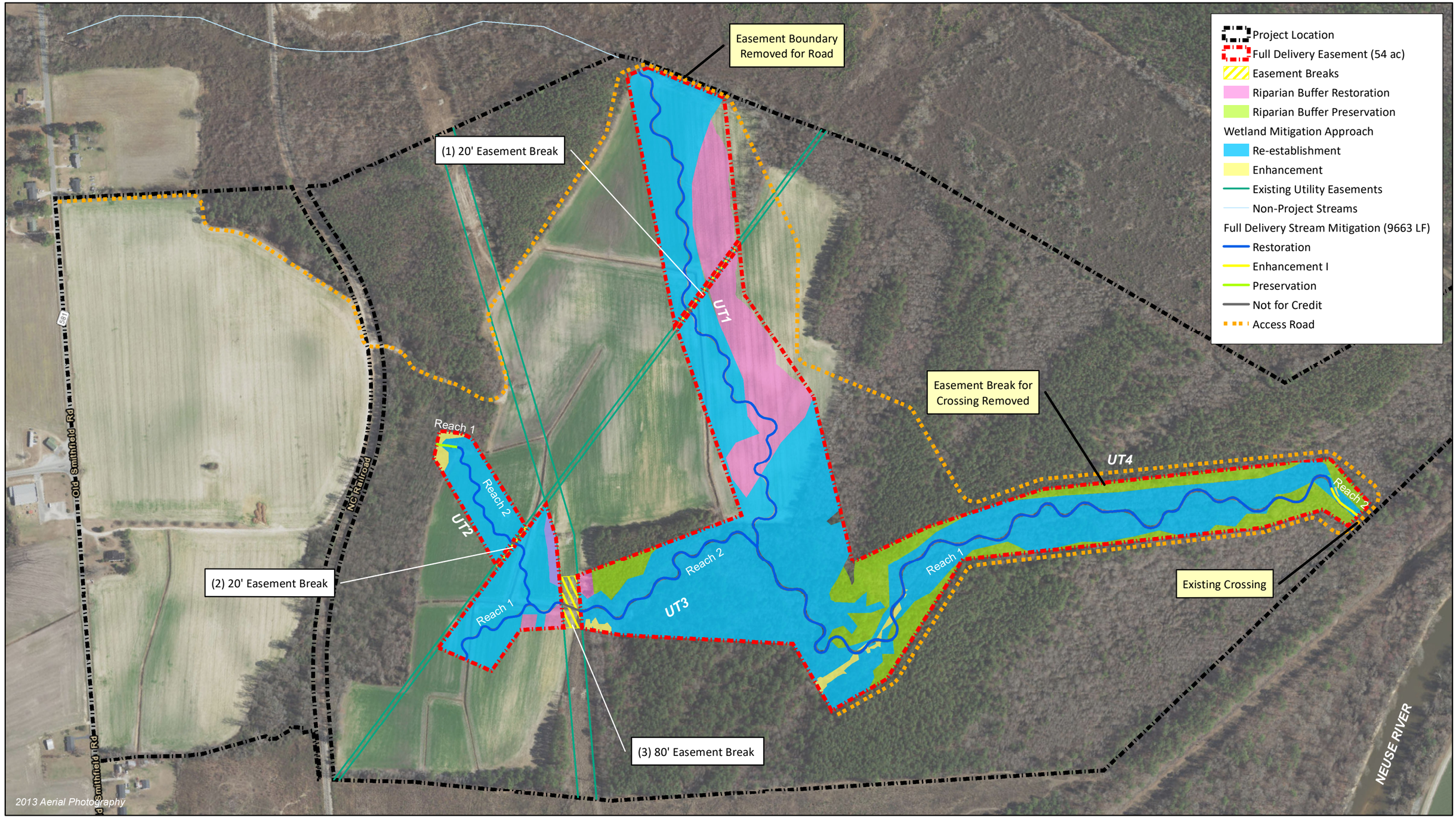
Wayne County, NC



WILDLANDS ENGINEERING

Figure 9 Discharge Analysis Graph
McClenny Acres Mitigation Bank
Neuse River Basin 03020201

Wayne County, NC

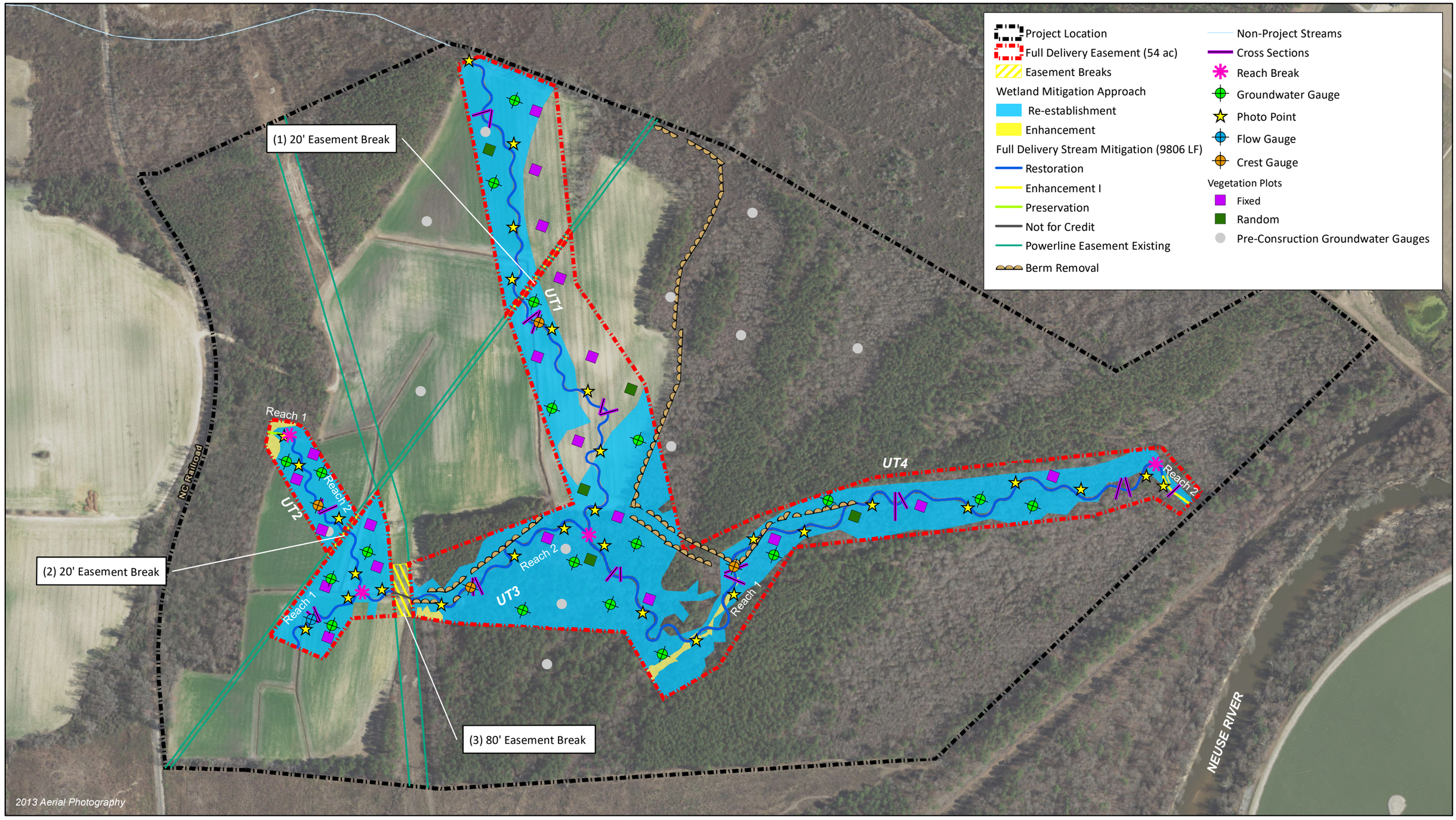


WILDLANDS ENGINEERING

0 400 800 Feet

Figure 10 Concept Design Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

0 200 400 Feet

N

Figure 11 Monitoring Components Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Appendix 1

August 26, 2019

Wilmington District, Regulatory Division
U.S. Army Corps of Engineers
11405 Falls of Neuse Road
Wake Forest, NC 27587

Attention: Katie Merritt

Subject: Final Buffer Mitigation Plan
McClenny Acres Mitigation Project, Wayne County
Neuse River Basin HUC 03020201
USACE AID# SAW-2018-02042
DMS Project ID No. 1000382 / DEQ Contract # 7423

Dear Katie:

We have reviewed the comments on the draft buffer mitigation plan for the McClenny Acres Buffer Mitigation Site. We have made the necessary revisions to the plan and we are submitting the revised version along with this letter. Below are responses to each of your comments. The original comments are provided below followed by our responses in bold italics.

1. *The use of the term "buffer" or "riparian buffer" is used too loosely throughout the plan. These terms should only be used to describe an area that is within the Neuse Riparian Buffer. For this site, only the first 50' adjacent to streams subject to the rule are Neuse Riparian Buffers. Therefore, please correct applicable references to "buffer" or "riparian buffer" and replace incorrect references with "riparian areas" or "riparian restoration".*

   The buffer mitigation plan has been edited to replace applicable references.

2. *Where plan sheets, figures and appendices of the Stream Mitigation Plan have relevant information for the buffer plan, those items should be referenced in the buffer plan to assist DWR with the review. Otherwise, things can be mistakenly overlooked. Example: areas proposed as ditch fill/diffused flow, Planting Plan details, Invasive Species plan, any vernal pools, etc.*

   The stream mitigation plan is now correctly referenced throughout the document.

3. *DWR is concerned with the potential loss of sediment associated with the stream construction and the impacts on water quality and aquatic species. Therefore, DWR would like to see details regarding efforts taken to minimize sediment loss off the site.*

The site's erosion and sediment control plan is now attached in the sub appendix displaying the appropriate measures to reduce erosion and sedimentation.

4. *DWR performed two stream/buffer determinations for this site (April 5 & 6, 2018). However, no DWR correspondence is included in the Appendices. These should be included and referenced where appropriate. Where stream determinations made by Wildlands are different from the documented determinations by DWR, Wildlands must include a table showing those differences. Section 2.8 may be a good location to reference DWR stream/buffer determinations.*

   The DWR site viability letter and DWR stream determination letters are now in the sub appendix. The stream determination made by Anthony Scarbraugh indicated UT2 was not on either the USGS or NRCS map, and thus not subject to buffer rules, this will not affect the buffer mitigation crediting. Table 5 has been added to section 2.8 to display this.

5. *Table 8a*
   a. *Since Figure 6b was included in the Plan, do any of these acres in the table include wetland acres? If so, remove.*
      No wetland acreage has been included in this credit calculation table.
   b. *Change "Restoration Type" to "Mitigation Type"*
      This has been updated.
   c. *The BMU's for the width 0-100' is different than the Creditable Area. If applying a 1:1 ratio, why wouldn't it be 151,328.000 instead of 151,328.400?*
      The BMU's have now been rounded to the third decimal place.
   d. *For Restoration in widths 101-200; the ratio says 10:1. It should be 1:1 and with a 33% reduction*
      Thank you, this error has been addressed.
   e. *For Preservation, the Final Credit Ratio should be 10:1, not 3:1.*
      The preservation credits have been changed to reflect a 10:1 ratio and now accurately depict that.

6. *Table 8b shows nutrient offset conversions. However, there is no reference to this in the introduction of the Plan. If this site is to be reviewed by DWR to generate nutrient and/or buffer, please include language to the effect in the introduction & provide supporting maps showing those areas.*

   The introduction now includes language to clarify the conversion process and requirements between nutrient offsets and buffer credits. The introduction also references figure 9 where riparian areas applicable for nutrient offset credits are portrayed.

7. *In Section 5.0 of Appendix 1,*
   a. *The plan implies that the Sponsor (shouldn't this read "DMS"?) wants the flexibility of using planted riparian areas for either buffer credit or wetland credit, but not*

both. Figure 6b provided in Appendix 1 shows where buffer credits could be generated within the wetland credited areas on the project. DWR has received no other information regarding how the conversion of wetland credits to buffer credits would occur in this situation. Additionally, the USACE/IRT would have to approve an option to do this in this mitigation plan. I did not see where a procedure was outlined in the Stream Mitigation Plan to support this conversion.

Wildlands has clarified this with DMS and is not pursuing conversion of credits between wetland mitigation that fails to meet performance standards and buffer mitigation. Sorry for any confusion.

b. *Parcel Preparation does not include reference to ditches onsite, if they will be plugged or filled, and how diffused flow will be maintained. Explain or reference where the stream plan/plan sheets provides details on this.*

Section 5.1 has been updated with a brief explanation of the parcel preparation that will be conducted as well as referencing the site viability letter and erosion control and sedimentation plans.

c. *There is no planting plan provided in Appendix 1. Nothing in the plan referenced plan Sheet 3.0 as the planting plan for the riparian restoration areas. Explain or reference where the planting plan is provided for the riparian areas generating buffer credits.*

Section 5.2 now clarifies what will be planted and references the planting plan.

8. *An area shown as buffer credits in Figures 6-9 along UT1 before the confluence with UT3 is shown as wetland credits in Figure 10 of the Stream Mitigation Plan. Please correct.*

This error has been addressed and the layers have been corrected to show their separation.

9. *Figure 6b is confusing. It's labeled as "Credit Calculations Map" just as Figure 6 is labeled. But it includes different mitigation types (buffer & wetland). This map should be removed from the plan, as DWR does not authorize wetland mitigation to be converted into buffer credit or nutrient credit on this site. DWR suggests relabeling this map "Nutrient Offset potential" and using this to show where nutrient offset credits are viable for comparison to Table 8b.*

This figure has been deleted, Figure 9 is the nutrient offset potential map showing what areas can be converted, upon written approval from DWR, between buffer mitigation and nutrient offset credits. Wetland mitigation that fails to meet performance standards is not being proposed as buffer mitigation credit now.

10. *Figure 8 includes a small area between UT1 and UT3 confluence where both buffer restoration and wetland mitigation overlap. Please pick which credit type you intend this to be and update all relevant figures in the Mitigation Plans to be consistent.*

This error has been addressed and the layers have been corrected to show their separation.

11. *Figure 8 legend describes the riparian areas as "Stream Buffer Restoration" and "Stream Buffer Preservation". Are the wider buffers being calculated for just buffer credits or for both stream & buffer credits? Please clarify.*

    The "Stream Buffer Restoration" and "Stream Buffer Preservation" areas are for both stream and buffer mitigation, the legend has been updated to read "Riparian Buffer Restoration" and "Riparian Buffer Preservation" to avoid confusion.

12. *Service Area map – This map does not comply with Rule .0295. The service area for buffer mitigation projects in the Neuse 01 below Falls Lake is the Neuse 01 below Falls Lake and does not include the Falls Lake WS. Edit this map to exclude the Falls Lake completely from the service area.*

    The Service Area Map has been updated to exclude the Falls Lake watershed.

13. *Section 6.1 –Table 9 is incorrectly referenced here. It should be Table 10.*

    This mistake has been corrected.

14. *Section 6.2 – Please revise plan to add that planted stems in the monitoring plots will all be flagged.*

    This section has been updated.

15. *Section 7.1 – The health of the stems will be based on their vigor, which may include their heights. Therefore, please add height measurements as a measurement during monitoring.*

    The monitoring parameters have been updated to clarify that height will be assessed.

Overall, if the riparian restoration is done according to the plan and addresses all comments and corrections provided by DWR, the site should provide a good buffer mitigation and/or nutrient offset project.

Please contact me at 919-851-9986 x103 if you have any questions.

Thank you,

Jeff Keaton, PE
Project Manager

RIPARIAN BUFFER MITIGATION PLAN

July 2019

McCLENNY ACRES MITIGATION PLAN

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038

Neuse River Basin
HUC 03020201

USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197
RFP #: 16-007279

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RIPARIAN BUFFER MITIGATION PLAN

McCLENNY MITIGATION SITE

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038
Neuse River Basin
HUC 03020201
USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

PREPARED BY:

Wildlands Engineering, Inc.
312 W Millbrook Road, Suite 225
Raleigh, NC 27609
Phone: (919) 851-9986

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

- 15A NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.
- 15A NCAC 02B. 0240, Nutrient Offset Payments Rule, amended effective September 1, 2010
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

Contributing Staff:

Jeff Keaton, PE, *Project Manager*
John Hutton, *Principal in Charge*
Jason Lorch, *Mitigation Plan Development*
Daniel Taylor, *Construction Administrator*
Charlie Neaves, *Monitoring Lead*
Andrea Eckardt, *Lead Quality Assurance*

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TABLES

FIGURES

APPENDIX

1.0 Introduction

The McClenny Acres Mitigation Site (Site) is a buffer mitigation project in conjunction with a stream and wetland mitigation project. The Site is located in Wayne County approximately four miles west of Goldsboro near the community of Rosewood (Figure 1). The project is located within the NC Division of Mitigation Services (DMS) targeted local watershed for the Neuse River Basin Hydrologic Unit (HU) 03020201200030 and NC Division of Water Resources (DWR) subbasin 03-04-12. The Site is comprised of approximately 54.24 acres along four unnamed tributaries of the Neuse River. Currently, the Site is characterized by a large area active in row crop agriculture and distinct areas of pines and hardwoods. The project will restore and preserve riparian buffer area within the project area, which will provide 202,670.607 buffer credits or 4.664 acres worth of buffer mitigation.

Approximately 38.49 acres of riparian areas that were deemed viable for restoring, enhancing, or preserving to generate buffer mitigation credits by DWR, will instead be used to provide 38.49 acres of riparian wetland mitigation credits as shown in Figure 6. DMS may elect to use the riparian restoration areas for either buffer mitigation credit or nutrient offset credit, but not both (Figure 9). A written request must be submitted and receive written approval from DWR prior to any credit conversions and transfers to the buffer credit ledger. Any areas proposed for buffer mitigation credit must meet the performance standards detailed in 15A NCAC 02B .0240.

The site is located in the DWR subbasin 03-04-12, which is dominated by forest land (52%) and agricultural land (41%). There has been no ambient monitoring and only a single benthic sample assessed, which produced a “good” benthic bioclassification. The River Basin Water Quality Plan for the Neuse River indicates that water quality is likely impacted by the large amount of animal operations within the watershed. NC Department of Water Resources data from 2015 lists 22 permitted animal facilities within the subbasin. This is the largest concentration of animal operations within a single subbasin in the Neuse 01 watershed. Regardless of the lack of assessment, the 2009 River Basin Water Quality Plan for this highly agricultural subbasin recommends implementation of appropriate BMPs to reduce nutrient and sediment loading.

Although the site is in a newly targeted local watershed which is not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) plan, the proposed project does address key CU-wide restoration goals including reduction of sediment and nutrient loads from agricultural lands by restoring and preserving wetlands, streams, riparian buffers, riparian areas and targeted implementation of a nutrient offset project. The 2010 Neuse RBRP highlights the importance of riparian buffers for stream restoration projects. Riparian zones retain and remove nutrients and suspended sediments. Of the 123 miles of streams in the Neuse 01 CU, 23% do not have adequate riparian protection. The RBRP states that “priority [restoration] projects should increase or improve buffers.” The site contains tributaries that flow directly into the Neuse River, which is classified as water supply waters (WS-IV) and nutrient sensitive waters (NSW). The RBRP also states that a goal for the Neuse 01 CU is to, “…promote nutrient and sediment reduction in agricultural areas by restoring and preserving wetlands, streams, and riparian buffers.”

This buffer mitigation project will reduce sedimentation and nutrient loading, improve terrestrial and stream habitats, and improve stream and bank stability. The area surrounding the streams proposed for mitigation is a mixture of active crop fields, and woodlands. By restoring riparian corridors to maintained buffer areas and protecting and preserving existing forested buffers; the project will reduce nutrient and sediment inputs to project streams, and ultimately to the Neuse River. The restored floodplain areas will filter sediment during rainfall events. The establishment of riparian buffers will create shading to minimize thermal pollution. Finally, invasive vegetation will be treated within the project area as needed and the proposed native vegetation will provide cover and food for wildlife.

2.0 Mitigation Project Summary

The major goals of the proposed buffer mitigation project are to provide ecological and water quality enhancements to the watershed of the Neuse River Basin by creating a functional riparian corridor and restoring the riparian buffer and its adjacent riparian zones. Specific enhancements to water quality and ecological processes are outlined below in Table 1.

Table 1: Ecological and Water Quality Goals –*McClenny Acres Mitigation Site*

Goal	Objective	CU-Wide and RBRP Objectives Supported
Decrease nutrient levels	Filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.	Reduce nutrient inputs to waters of the Neuse River Basin.
Decrease water temperature and increase dissolved oxygen concentrations	Establishment and maintenance of riparian buffers will create additional long-term shading of the channel flow to reduce thermal pollution.	Improve habitat to wildlife by providing additional habitat.
Restore and enhance native floodplain vegetation.	Plant native tree species in riparian zone where currently insufficient.	Reduce and control sediment inputs; Reduce and manage nutrient inputs; Provide a canopy to shade streams and reduce thermal loadings; Contribute to protection of or improvement to the Neuse River watershed.

Goal	Objective	CU-Wide and RBRP Objectives Supported
Permanently protect the project Site from harmful uses.	Establish a conservation easement on the Site.	Protect aquatic habitat; protect water supply waters.

2.1 Existing Site Conditions

The proposed project is on a 257-acre property which is immediately adjacent to the Neuse River and project streams drain directly to the river. A large portion of the property (over 80 acres) has been used for row crop agriculture for decades. The remaining acreage is primarily wooded with distinct areas of pines and hardwoods. Currently, the agricultural fields are used to grow tobacco and soybeans. These fields are extensively ditched; perennial and intermittent streams on the Site have clearly been channelized and relocated to increase crop production. The Site is bordered almost entirely by forest, including a state-owned research site, the Center for Environmental Farming Systems (CEFS) immediately to the East (Figure 2).

The Site includes four perennial streams: UT1, UT2, UT3 R2, and UT4. UT3 R1 upstream of the confluence with UT2 is intermittent.

UT1 flows out of a wooded area to the northeast of the Site. On the Site, UT1 has been ditched parallel to the property line but is completely within the proposed easement area. The stream follows the eastern property line for approximately 1,400 feet before most of the flow turns sharply to the west. A portion of the UT1 flow also drains into a wetland area at this location. Because the stream has been channelized, it is very straight. There are spoil piles that create a berm along portions of the stream and a remnant channel feature is evident near the existing channel in certain locations. Land use along the western side of the upstream portion of UT1 is active row crops while the eastern side is wooded. Beginning at the point where most of the UT1 flow turns to the west, it flows through woods along both banks for approximately 700 feet. Beyond this point it flows along the southern edge of the row crop fields for approximately 800 feet to the south to the confluence with UT3 to form UT4 (Figure 2). UT1 has been ditched at least since the late 1950s for agricultural purposes as evidenced by the straight alignment and overly deep cross section.

UT2 flows onto the Site from a spring head in a wooded area to the north. It has been channelized at least since the late 1950s and is very straight. The ditched stream flows in the southwestern direction for approximately 400 feet before discharging into an agricultural ditch aligned east to west. South of the wooded area, UT2 is surrounded by agricultural fields.

UT3 originates north of the Site and flows onto the property parallel to and to the west of UT2. This stream has been ditched and is extremely straight for its entire length. Approximately 700 feet south of where it flows onto the Site, the stream flows into a wooded area and turns to the east and continues to flow for approximately 500 feet to the confluence with UT4. The ditch that receives the flow from UT2 flows into UT3 approximately 400 feet south of the upstream wood line. Land use along the entire length of UT3 is the same as that of UT2 – active row crop agriculture.

UT4 begins at the confluence of UT1 and UT3 and flows through a wooded area for approximately 2,700 feet to the Neuse River. This stream has also been ditched and is extremely straight for its entire length.

While the surrounding land use along this entire stream is forested, a trail exists along the right bank for the entire length of UT4 on the property. This trail has been kept clear to provide access to fields to the southeast of the site.

Table 2: Buffer Project Attributes – *McClenny Acres Mitigation Site*

Table 2. Buffer Project Attributes	
Project Name	McClenny Acres Mitigation Site
Hydrologic Unit Code	3020201200030
River Basin	Neuse River
Geographic Location (Lat, Long)	35° 23’ 25"N 78° 03' 15"W
Site Protection Instrument (DB, PG)	To be recorded
Total Credits (BMU)	219,657.717
Types of Credits	Riparian Buffer
Mitigation Plan Date	02/20/2019
Initial Planting Date	12/10/2020
Baseline Report Date	06/15/2021
MY1 Report Date	12/15/2022
MY2 Report Date	12/15/2023
MY3 Report Date	12/15/2024
MY4 Report Date	12/15/2025

In addition to buffer restoration on subject streams, per the Consolidated Buffer Mitigation Rules (15A NCAC 02B 0.0295 (o)), alternative mitigation is proposed on the Site in the form of preservation of forested buffer on subject streams. The proposed project is in compliance with these rules in the following ways:

Preservation on Subject Streams 15A NCAC 02B .0295 (o)(5):

- The buffer width is at least 30 feet from the stream (Figure 7).
- The area meets the requirements of 15A NCAC 02R 0.0403(c)(7), (8), and (11) with no known structures, infrastructure, hazardous substances, solid waste, or encumbrances within the mitigation boundary.
- Preservation mitigation is being requested on no more than 25% of the total area of buffer mitigation (Table 9).


McClenny Acres

2.2 Parcel Location

The McClenny Acres Mitigation Site (Site) is located in Wayne County approximately four miles west of Goldsboro near the community of Rosewood (Stream Mitigation Plan, Figure 1). The project is located within the NC Division of Mitigation Services (DMS) targeted local watershed for the Neuse River Basin Hydrologic Unit (HU) 03020201200030 and NC Division of Water Resources (DWR) subbasin 03-04-12.

2.3 Watershed Characterization

Land uses draining to the project reaches are primarily cultivated crops, forest, shrub/herbaceous, and wetland with some residential area and a small amount of pasture/hay. The watershed areas and current land use are summarized in Table 3, below. The impervious area within the project watershed was calculated to be 16.4 acres, or approximately 2.1% of the watershed.

The project watershed totals 1.23 square miles and the primary land use is agricultural at 38% by area, with cultivated row crops constituting most of the agricultural practices at 36% of the drainage area. Agriculture is followed closely by forested land, which covers 21% of the watershed. Wetlands make up about 15% of the watershed while 17% is covered by scrub/shrub or grassland/herbaceous land uses. Nine percent of the McClenny Acres drainage area is residential, consisting mostly of low-density single-family units with approximately 7% of that 9% characterized by developed open space.

Table 3: Drainage Areas and Associated Land Use – *McClenny Acres Mitigation Site*

Reach Name	NCDWR Stream Identification Form Scores	Intermittent/ Perennial	Watershed Area (acres)	Watershed Area (sq. mi.)	Land Use
UT1	30.25	Perennial	423	0.66	45% cultivated crops; 17% forest; 16% wetlands; 11% residential; 7% shrub/herbaceous; 3% pasture/hay
UT2	30.75	Perennial	40	0.06	81% Cultivated crops; 11% shrub/herbaceous; 8% forest
UT3 R1	28.75	Intermittent	92	0.14	27% cultivated crops; 29% shrub/herbaceous; 27% forest; 16% residential
UT3 R2	32.50	Perennial	222	0.35	33% cultivated crops; 26% shrub/herbaceous; 25% forest; 11% residential; 4% wetlands; 1% open water
UT4	37.75	Perennial	784	1.23	36% cultivated crops; 21% forest; 17% shrub/herbaceous; 15% wetland; 9% residential; 2% pasture/hay

2.4 Soils

Soil mapping units are based on the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey for Wayne County. Soils along the McClenny Acres Buffer Mitigation project area are currently mapped as Johns and Lumbee sandy loam, Kalmia loamy sand, and Lakeland sand. These soils are described below in Table 4 and shown in Figure 5.

Table 4: Project Soil Types and Descriptions – *McClenny Acres Mitigation Site*

Soil Name	Description
Johns sandy loam	This is a slightly poorly drained soil with low slopes of less than two percent. The soil has slow surface runoff and moderate infiltration. The soils are typically found on broad stream terraces.
Kalmia loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. These soils are typically found on broad stream terraces.
Lakeland sand	This is an excessively drained soil with slopes from 0-6%. Surface runoff is slow, and infiltration is very fast. The soils are typically found in broad areas with an uneven surface.
Lumbee sandy loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow, and infiltration is moderate. These soils are found in flat terrace areas and shallow drainageways.
Pantego (Torhunta) loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow, and infiltration is moderate. These soils are found in wide, shallow drainageways.
Wickham loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. Typically, these soils are found on broad stream terraces.

Source: Wayne County Web Soil Survey

2.5 Geology

The site is located in the Inner Coastal Plain physiographic province. The Inner Coastal Plain is characterized by flat lands to gently-rolling hills and valleys with elevations ranging anywhere from 25 to 600 feet above sea level. The Coastal Plain largely consists of marine sedimentary rocks including sand, clay, and limestone that formed through the deposition of estuarine and marine sediments. The underlying geology of the proposed Site is mapped as Cretaceous to Tertiary (138 million to 2 million years in age) Cape Fear Formation (Kc) as well as Yorktown Formation and Duplin Formation (undivided) (Tpy) (NCGS, 1985). The Cape Fear Formation is described as a yellowish gray to bluish gray sandstone and sandy mudstone with red to yellowish orange mottles that is indurate and graded with laterally continuous bedding. Additional characteristics include blocky clay, faint cross-bedding, and commonly containing feldspar and mica. The Yorktown Formation is described as bluish gray, fossiliferous clay with varying amounts of sand. Shell material is commonly concentrated in lenses within the unit. The Duplin Formation is characterized by a bluish gray, medium to coarse grained sand, sandy marl, and limestone (NCGS, 1985).

2.6 Vegetation

2.6.1 UT1

Because the streams are regularly maintained, there is little streamside vegetation in areas where the stream is bordered by agricultural fields. There is some wood and herbaceous plant growth along the stream in these areas including river birch (*Betula nigra*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), Chinese privet (*Ligustrum sinense*), Christmas fern (*Polystichum acrostichoides*), American holly (*Ilex opaca*), giant cane (*Arundinaria gigantea*), fox grape (*Vitis labrusca*), greenbrier (*Smilax*), blackberry (*Rubus*), and microstegium (*Microstegium vimineum*).

2.6.2 UT2

The streambanks are mowed regularly to support cultivation of row crops and the streamside zone is nearly devoid of vegetation. However, a narrow row of herbaceous vegetation at the time of the stream

assessment included tag alder (*Alnus serrulata*), giant cane (*Arundinaria gigantea*), Johnsongrass (*Sorghum halepense*), and goldenrod (*Solidago sp.*).

2.6.3 UT3

Similar to UT2, the streambanks of the upstream reach of UT3 are mowed routinely to support cultivation of row crops and the streamside zone is devoid of vegetation except for a narrow row of herbaceous growth. The downstream reach flows through a wetland forest complex consisting of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), willow oak (*Quercos phellos*), tag alder (*Alnus serrulata*), tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), giant cane (*Arundinaria gigantea*), greenbrier (*Smilax*), blackberry (*Rubus*), Johnsongrass (*Sorghum halepense*), microstegium (*Microstegium vimineum*), and goldenrod (*Solidago sp.*).

2.6.4 UT4

UT4 flows through a bottomland forest consisting primarily of hardwood species such as river birch (*Betula nigra*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), swamp chestnut oak (*Quercus michauxii*), and red maple (*Acer rubrum*). Other common overstory species include sweetgum (*Liquidambar styraciflua*), eastern white pine (*Pinus strobus*), and loblolly pine (*Pinus taeda*), while the midstory and herbaceous layer are primarily composed of Chinese privet (*Ligustrum sinense*), American holly (*Ilex opaca*), blackberry (*Rubus*), greenbrier (*Smilax*), fox grape (*Vitis labrusca*), Christmas fern (*Polystichum acrostichoides*), and microstegium (*Microstegium vimineum*).

2.7 Site Constraints and Access

The Site is accessible via a gravel driveway off of Old Smithfield Road. Currently there are three overhead transmission lines within the site, these lines will remain and pass through easement breaks on UT1, UT2 and UT3 (Stream Mitigation Plan Section 5.8 and Figure 2). In addition, there is one internal easement break for crossing which is not included in the credits calculated for the project. This site will extend beyond the required 50-foot minimum riparian buffer for streams in the coastal plain, ranging between 100 and 200 feet on streams into the riparian zone. There are no known airport facilities within five miles of the project area (Figure 1). There are no other known constraints on the proposed Site. A permanent access easement from Old Smithfield Road to the Site is recorded.

2.8 Current Site Resources

On February 9, 2018 NCDWR, conducted on-site determinations to review features and land use within the project boundary. The resulting NCDWR sit viability letter, stream determinations, and maps confirming the site as suitable for riparian buffer mitigation are attached in the sub-appendix. Differences in stream classification calls are shown below in table 5. UT2 was not depicted on either the USGS or NRCS topo maps and thus is not subject to buffer rules, this does not affect the buffer mitigation crediting as UT2 was already planned for wetland mitigation.

Table 5: Site stream classifications

Reach Name	NCDWR Stream Identification Form Scores	Wildlands Stream Call	NCDWR Stream Call
UT1	30.25	Perennial	Perennial
UT2	30.75	Perennial	Not shown on USGS/NRCS Map
UT3 R1	28.75	Intermittent	Intermittent
UT3 R2	32.50	Perennial	Perennial

Reach Name	NCDWR Stream Identification Form Scores	Wildlands Stream Call	NCDWR Stream Call
UT4	37.75	Perennial	Perennial

2.9 Historic Site Resources

The McClenny Acres Buffer Mitigation Site has historically been used for agricultural purposes. Historic aerial photos are included in Stream Mitigation Appendix 3, and date back to 1959, showing the site in various stages of row crop production and small scattered clearing for development within the northern part of the watershed. In general, this area has maintained its rural, farming character over the last 60 years with only minor changes in land cover.

3.0 Site Protection Instrument

3.1 Site Protection Instruments Summary Information

The land required for buffer planting, management, and stewardship of the mitigation project includes portions of the parcels listed in Table 6. An option agreement for the project area has been signed by the property owner and a Memorandum of Option has been recorded at the Wayne County Register of Deeds (Stream Mitigation Plan Appendix 2). The proposed conservation easement on this property has not yet been recorded.

Table 6: Site Protection Instrument – *McClenny Acres Mitigation Site*

Landowner	PIN	County	Site Protection Instrument	Deed Book and Page Number	Acreage to be Protected
William McClenny	2579985611	Wayne	Conservation Easement	DB: 0011e PG: 584	54.24

All site protection instruments require 60-day advance notification to the Corps and the State prior to any action to void, amend, or modify the document. No such action shall take place unless approved by the State.

4.0 Regulatory Considerations

Table 7, below, is a summary of regulatory considerations for the Site. These considerations are expanded upon in Sections 4.1-4.4. A copy of the signed Categorical Exclusion Form for the project can be found in the McClenny Acres Stream Mitigation Plan Appendix 9.

Table 7: Project Attribute Table – *McClenny Acres Mitigation Site*

Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404	Yes	Yes	(Appendix) Site Viability Letter
Water of the United States - Section 401	Yes	Yes	(Appendix) Site Viability Letter
Endangered Species Act	Yes	Yes	McClenny Acres Stream Mitigation Plan Appendix (Categorical Exclusion)

Historic Preservation Act	Yes	Yes	McClenny Acres Stream Mitigation Appendix (Categorical Exclusion)
Coastal Zone Management Act	No	No	N/A
FEMA Floodplain Compliance	No	No	N/A
Essential Fisheries Habitat	No	N/A	N/A

4.1 Threatened and Endangered Species

The NC Natural Heritage Program (NHP) database and the US Fish and Wildlife Service (USFWS) database were searched for federally listed threatened and endangered plant and animal species in Wayne County, NC. Five federally listed species, Bald Eagle (*Haliaeetus leucocephalus*), Neuse River Waterdog (*Necturus lewisi),* Red-cockaded woodpecker *(Picoides borealis),* Yellow Lance *(Elliptio lanceolata) and* Tar River spinymussel *(Elliptio steinstansana)* are currently listed in Wayne County. Table 8. list their federal status and habitat.

Table 8: Listed Threatened and Endangered Species in Wayne County, NC – *McClenny Acres Mitigation Site*

Species	Federal Status	Habitat
Vertebrate		
Bald eagle (*Haliaeetus leucocephalus*)	BGPA	Near large open water bodies: lakes, marshes, seacoasts, and rivers
Neuse River Dog (*Necturus lewisi)*	UR	Low to moderate gradient stream, well oxygenated water, often streams wider than 15 meters
Red-cockaded Woodpecker *(picoides borealis)*	E	Mature pine forests
Bivalves		
Tar River Spinymussel *(Elliptio steinstansana)*	E	Silt free coarse sand and gravel substrates, faster flowing well oxygenated water
Yellow Lance *Elliptio lanceolata*	T	Clean coarse to medium sand substrates, downstream end of stable sand/gravel bars, waters edge

E = Endangered; T = Threatened; UR = Under Review; BGPA=Bald & Golden Eagle Protection Act

The USFWS does not currently list any Critical Habitat Designations for any of the Federally listed species within Wayne County. Wildlands requested review and comment from the United States Fish and Wildlife Service on February 9, 2018 in respect to the McClenny Acres Mitigation Site and its potential impacts on threatened or endangered species. USFWS responded on March 8, 2018 and stated the "proposed action is not likely to adversely affect any federally listed endangered or threatened species, their formally designated critical habitat or species currently proposed for listing under the Act". All correspondence with USFWS is include in the approved Categorical Exclusion found in the McClenny Acres Stream Mitigation Plan

A pedestrian survey conducted on March 14, 2018 indicated that the site does not provide suitable habitat for the Tar River spinymussel, the red-cockaded woodpecker, nor the yellow lance and none of these species were identified on site. Therefore, the project is determined to have "no effect" on the Tar River spinymussel, red-cockaded woodpecker, and yellow lance.

4.2 Cultural Resources and Significant Natural Heritage Areas

The National Historic Preservation Act declares a national policy of historic preservation to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and Section 106 mandates that federal agencies take into account the effect of an undertaking on a property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

There are no existing structures in the project area. The Site is not located near any sites listed on the National Register with the State Historic Preservation Office (SHPO). SHPO was contacted on February 9, 2018 and had no concerns or comments on the project site. The approved Categorical Exclusion for the project is located in the McClenny Acres Stream Mitigation Plan.

4.3 FEMA Floodplain Compliance

The project stream channels do not have an associated regulated floodplain and are not located along a studied section of stream. However, all project streams lie within the floodway and flood fringe of the Neuse River, mapped FEMA Zone AE (Stream Mitigation Plan Figure 7). Neuse River base flood

elevations have been defined and a detailed study has been performed with floodway areas mapped on Wayne County FIRM panels 2568 and 2588. Wildlands will coordinate with the City of Goldsboro and Wayne County on any local permitting requirements. We do not expect any modeling or a flood study to be required. The project will be designed so that any increase in flooding will be contained on the Site and will not extend upstream to adjacent parcels, so hydrologic trespass will not be a concern.

4.4 Other Environmental Issues

An EDR Radius Map Report with Geocheck was ordered for the Site through Environmental Data Resources, Inc. on January 29, 2018. The target property and the adjacent properties are not listed in any of the Federal, State, or Tribal environmental databases searched by EDR. There were no known or potential hazardous waste sites identified within one mile of the Parcel.

4.5 Determination of Credits

Mitigation credits presented in Table 9a and 9b and Figures 6 and 9 are projections based upon site design and are intended to be used as either riparian buffer credits or nutrient offset credits, dependent on the need, and approval from DWR. Upon completion of site construction, the project components and credits data will be revised to be consistent with the as-built condition.

Table 9a: Buffer Project Areas and Assets: Riparian Buffer Credits – McClenny Acres Mitigation Site

Location	Jurisdictional Streams	Mitigation Type	Reach ID / Component	Buffer Width (ft)	Creditable Area (ac)*	Creditable Area (sf)*	Eligible Credit Area (ac)**	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits (BMU)	Riparian Buffer Credits (ac)
Rural	Subject	Restoration	UT1, UT2, UT3	0-100	3.251	141,645	3.251	1	100%	1.00	141,644.800	3.251
Rural	Subject	Restoration	UT1, UT2, UT3	101-200	3.557	154,967	3.557	1	33%	3.03	51,138.780	1.186
Rural	Subject	Preservation	UT2, UT3, UT4	0-100	4.359	189,889	2.270	10	100%	10.00	9,887.027	0.227
Rural	Subject	Preservation	UT2, UT3, UT4	101-200	2.236	97,381	0	10	33%	30.00	0.00	0
										Total:	**202,670.607**	**4.664**

* Preservation creditable area is over 25% of the total mitigation area, therefore the eligible creditable area has been reduced to 25% of the total creditable mitigation area. With that adjustment, the Site is in compliance with 15A NCAC 02B 0.0295(o)(5) which limits preservation mitigation area to no more than 25% of total mitigated area.

** Eligible Credit areas being what is available out of "Creditable Area" for credit within the corresponding category.

Table 9b: Buffer Project Areas and Assets: Nutrient Offset Credits Available Upon Conversion – *McClenny Acres Mitigation Site*

Location	Jurisdictional Streams	Mitigation Type	Reach ID / Component	Buffer Width (ft)	Creditable Area (ac)*	Creditable Area (sf)*	Elegible Credit Area (ac)**	Convertible to Nutrient offset (Yes or No)	Nutrient Offset: N (lbs)
Rural	Subject	Restoration	UT1, UT2, UT3	0-100	3.251	141,645	3.251	Yes	7391.481
				101-200	3.557	154,967	3.557	Yes	8086.624
Rural	Subject	Preservation	UT2, UT3, UT4	0-200	6.595	287,270	0.000	No	0.000
								Total:	**15,478.105**

* The above creditable areas all meet the 50-foot minimum width for buffer or nutrient credit sales.

** Eligible Credit areas being what is available out of “Creditable Area” for credit within the corresponding category.

5.0 Implementation Plan

The Wildlands Team proposes to restore high quality ecological function to McClenny Acres and four unnamed tributaries to the Neuse River on the Site. The ecological uplift can be summarized as transforming agriculturally impacted areas to a protected forested riparian corridor. The project design will ensure that no adverse impacts to wetlands or existing riparian buffers occur. All riparian restoration activities will commence in concurrence with the stream mitigation activities and not before. Therefore, the mitigation area where riparian restoration is being performed may be altered slightly depending on the implementation of the McClenny Acres Stream Mitigation Plan. No riparian buffer credit is currently being claimed in wetland mitigation areas (Figure 6). Any areas proposed for buffer mitigation credit must meet the performance standards detailed in 15A NCAC 02B .0240. NCDMS may elect to use these riparian areas for either buffer mitigation credit or nutrient offset credit, but not both. DMS must submit a written request and receive written approval from DWR prior to any credit conversions and transfers to the buffer credit ledger. Ditches on site being proposed to be filled and graded for wetland mitigation are identified in the Site Viability Letter found in sub-appendix 1a. More detailed descriptions of the proposed restoration activity follow in Sections 5.1 through 5.4.

5.1 Parcel Preparation

Mechanical site preparation will be implemented where necessary to create soil physical properties favorable for tree growth. In the agricultural field, the planted area will be ripped to a depth of 18 inches in a grid-like pattern with a maximum rip shank spacing of six feet. Ripping will be performed during the driest conditions feasible to maximize shatter of the plow pan. Construction practices are intended to minimize effects to soil properties, but some impacts are unavoidable. Ripping may be implemented to ameliorate soil compaction resulting from haul roads, stockpile areas, etc. Where grading is required, topsoil will be stockpiled and reapplied (Sub-appendix, ESC Plans). Soil amendments may be incorporated to augment survival and growth of planted vegetation as determined necessary by soil testing.

The restoration areas will be planted using hand labor with dibble bars or other acceptable forestry practices. There will be no parcel preparation work done in the buffer preservation areas.

Some areas within the proposed preservation buffer areas will be affected by berm removal (Stream Mitigation Plan Figure 10) and haul road access for the stream mitigation. These affected areas will be ripped and replanted using hand labor with dibble bars or other acceptable forestry practices.

Invasive vegetation within the project area will be treated and/or mechanically removed during construction, but additional treatment is expected. Invasive species presence will be monitored and treated as necessary throughout the monitoring period. Numerous sweetgum (*Liquidambar styraciflua*) trees are present within the project area. Sweetgum has been identified as an undesirable species and will be mechanically removed during construction to reduce the seed source.

5.2 Riparian Area Restoration Activities

The revegetation plan for the buffer restoration area will include permanent seeding and planting bare root trees. These revegetation efforts will be coupled with controlling invasive species population. The specific species composition to be planted was selected based on the community type, observation of occurrence of species in riparian buffers adjacent to the Parcel, and best professional judgement on species establishment and anticipated site conditions in the early years following project implementation. Table 10 list's woody species that will be planted as well as species that are native to the area and may become established in the Site during the duration of the project

Table 10: Native Woody Species to be Established – *McClenny Acres Mitigation Site*

Scientific Name	Common Name	Dominant Method of Establishment
Acer rubrum	Red Maple	Natural Colonization
Alnus serrulata	Tag Alder	Natural Colonization
Betula nigra	River Birch	Hand Planting
Fraxinus pennsylvanica	Green Ash	Hand Planting
Ilex opaca	American Holly	Natural Colonization
Juglands nigra	Black Walnut	Natural Colonization
Liriodendron tulipifera	Tulip Poplar	Natural Colonization
Liquidambar straciflua	Sweetgum	Natural Colonization
Magnolia virginiana	Sweetbay Magnolia	Hand Planting
Nyssa biflora	Swamp Tupelo	Hand Planting
*Platanus occidentalis**	American Sycamore	Hand Planting
Populus deltoides	Eastern Cottonwood	Hand Planting
Quercus lyrata	Overcup Oak	Hand Planting
Quercus michauxii	Swamp Chestnut Oak	Hand Planting
Quercus pagoda	Cherrybark Oak	Hand Planting
*Quercus phellos**	Willow Oak	Hand Planting
Quercus nigra	Water Oak	Hand Planting
*Salix nigra**	Black Willow	Hand Planting / Live Stakes
Salix sericea	Silky Willow	Live Stakes
Sambucus canadensis	Elderberry	Live Stakes
Taxodium distichum	Bald Cypress	Hand Planting
Pinus strobus	White Pine	Natural Colonization
Pinus taeda	Loblolly Pine	Natural Colonization

*These late successional species may naturally colonize but are not expected to reach high-density numbers, height, and/or vigor after disturbance.

Trees will be planted at a density sufficient to meet the performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years. No one tree species will be greater than 50% of the established stems. An appropriate seed mix will also be applied as necessary to provide temporary ground cover for soil stabilization and reduction of sediment loss during rain events in disturbed areas. This will be followed by an appropriate permanent seed mixture. Planting is scheduled to begin in January 2020.

For more details on proposed plantings see the stream mitigation plan sheets section 3.0.

Vegetation management and herbicide applications may be needed during tree establishment in the restoration areas to prevent establishment of invasive species that could compete with the planted native species.

5.3 Riparian Area Enhancement Activities

There will not be any buffer enhancement areas on the McClenny Acres Mitigation Site.

5.4 Riparian Area Preservation Activities

There will be no parcel preparation work done in the buffer preservation areas, as allowed under 15A NCAC 02B .0295(o). The preservation area will be protected in perpetuity under a conservation easement.

6.0 Monitoring Plan

The Site monitoring plan has been developed to ensure that the required performance standards are met, and project goals and objectives are achieved. The monitoring report shall provide project data chronology that will facilitate an understanding of project status and trends, ease population of DMS databases for analysis and research purposes and assist in close-out decision making.

6.1 Monitoring Components

Project monitoring components are listed in more detail in Table 11 and Figure 8.

6.2 Vegetation

Vegetation monitoring quadrants will be installed across the Site to measure the survival of the planted trees (Figure 8). The first annual monitoring activities will commence at the end of the first growing season, at least five months after planting has been completed, and will be reassessed annually no earlier than the Fall of each year. Species in monitoring plots will be flagged and the plot species composition, density, vigor, height, and survival rates will be evaluated on an annual basis by plot and for the entire site. The number of monitoring quadrants required, and frequency of monitoring will be based on the DMS monitoring guidance documents. Vegetation monitoring will follow the CVS-EEP Protocol for Recording Vegetation (2008) or another DMS approved protocol. Reference photographs of the vegetation plots and Site will be taken during the annual vegetation assessments.

6.3 Photo reference stations

Photographs will be taken within the project area once a year to visually document stability for five years following construction. Permanent markers will be established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year.

6.4 Visual Assessment

Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment).

Table 11: Monitoring Components – *McClenny Acres Mitigation Site*

Parameter	Monitoring Feature	Quantity	Frequency
Vegetation	CVS Level 2	6	Annual
Visual Assessment		Yes	Semi-Annual
Exotic and nuisance vegetation			Semi-Annual
Project Boundary			Semi-Annual

7.0 Performance Standards

The performance criteria for the Site follows approved performance criteria presented in the guidance documents outlined in RFP 16-007242 and the Consolidated Buffer Rule (15A NCAC 02B .0295). Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project.

The buffer restoration project has been assigned specific performance criteria components for vegetation. Performance criteria will be evaluated throughout the five-year post-construction monitoring. An outline of the performance criteria components follows.

7.1 Vegetation

The final vegetative success criteria will be the health, survival, and density of at least 260 stems per acre at the end of the fifth year of monitoring, with a minimum of four native hardwood tree or shrub species composition and no one species comprises more than 50 percent of stems. Vigor, height, species composition, and density will all be assessed. The extent of invasive species coverage will also be monitored and controlled as necessary throughout the required monitoring period.

7.2 Photo Reference Stations

Photographs will be taken within the project area once a year to visually document stability for five years following construction. Permanent markers will be established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year.

7.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above. Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment). Areas of concern will be mapped and photographed accompanied by a written description in the annual report. Problem areas with be re-evaluated during each subsequent visual assessment. Should remedial actions be required, recommendations will be provided in the annual monitoring report.

To ensure compliance with 0295 (0) (6): A visual assessment of the preservation areas within the conservation easement will also be performed each year to confirm:

- No encroachment has occurred; diffuse flow is being maintained in the conservation easement area; and there has not been any cutting, clearing, filling, grading, or similar activities that would negatively affect the functioning of the buffer.
- Any issues identified during the visual assessment of the preservation areas will be photographed and mapped as part of the annual monitoring report with remedial efforts proposed or documented.

7.4 Reporting Performance Criteria

Using the DMS Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template version 2.0 (May 2017), a baseline monitoring document and as-built record drawings of the project will be developed for the constructed Site. Complete monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS. Annual monitoring reports will be based on the above referenced DMS Template (May 2017). The monitoring period will extend five years beyond completion of construction or until performance criteria have been met.

7.5 Maintenance and Contingency Plans

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase will identify an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified and will include a work schedule and updated monitoring criteria (if applicable).

8.0 Stewardship

8.1 Long Term Stewardship

The Site will be transferred to the North Carolina Department of Environmental Quality (NCDEQ) Stewardship Program. This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the site to ensure that restrictions required in the conservation easement are upheld. The NCDEQ Stewardship Program is developing an endowment system within the non-reverting, interest-bearing Conservation Lands Conservation Fund Account. The use of funds from the Endowment Account will be governed by North Carolina General Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for stewardship, monitoring, stewardship administration, and land transaction costs, if applicable.

8.2 Adaptive Management Plan

Upon completion of Site construction, Wildlands will implement the post-construction monitoring defined in Section 8. Project maintenance will be performed during the monitoring years to address minor issues as necessary. If, during annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the members of DMS/NCDWR and work with the DMS/NCDWR to develop contingency plans and remedial actions.

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase will identify an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria (if applicable).

9.0 References

Natural Resources Conservation Service (NRCS). Web Soil Survey of Wayne County. http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm

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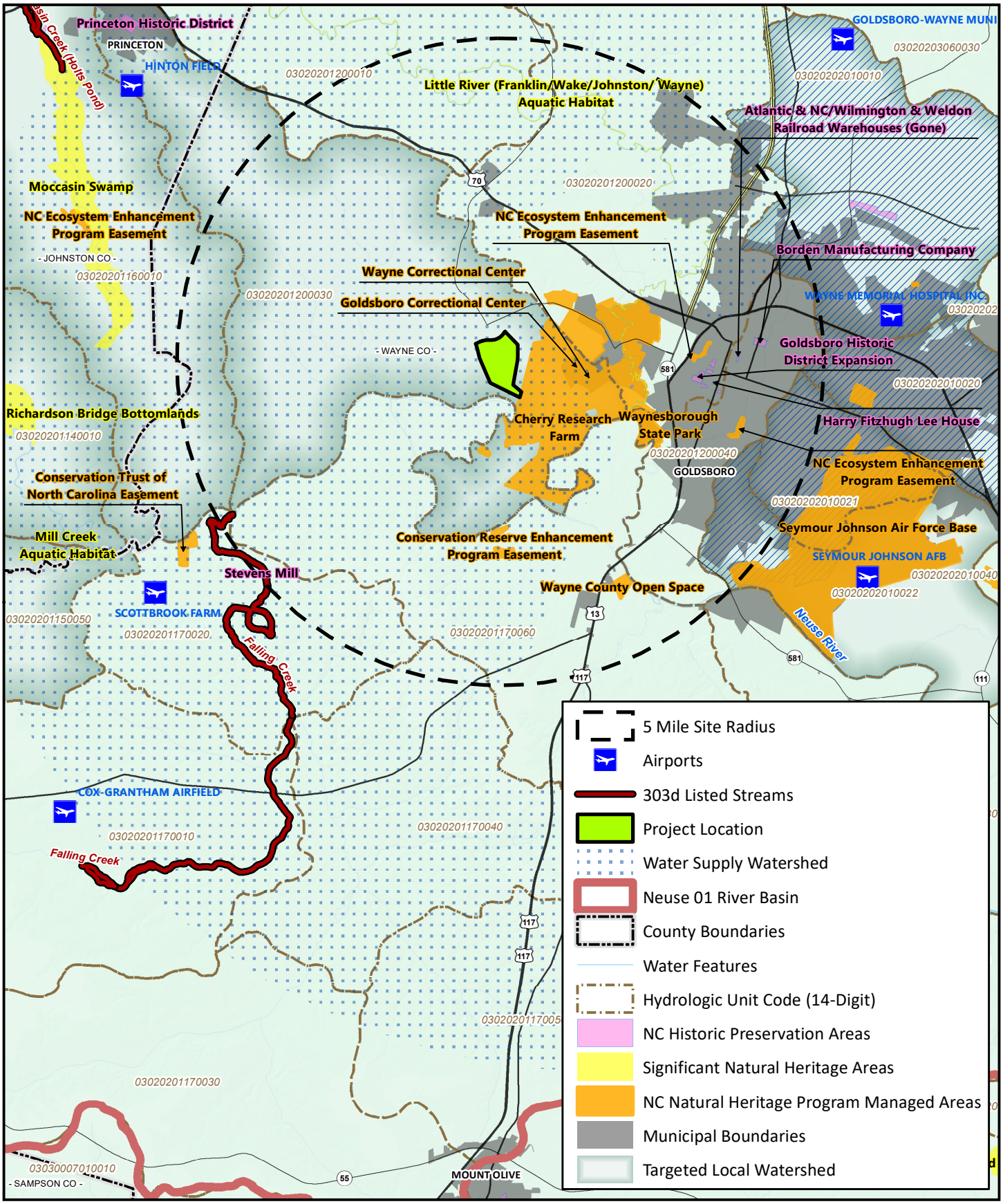

WILDLANDS ENGINEERING

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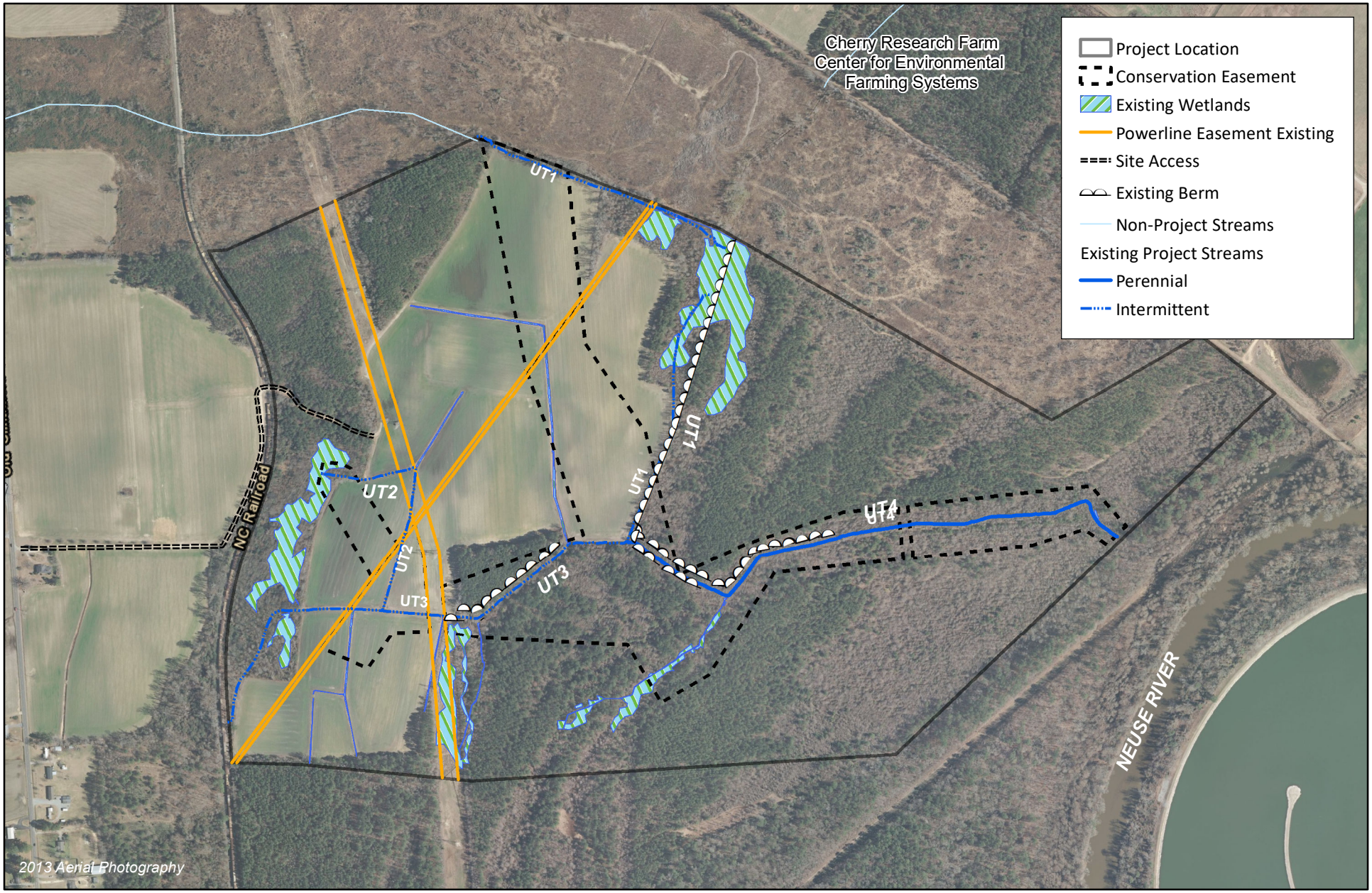
Figure 1 Vicinity Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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Figure 2 Site Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

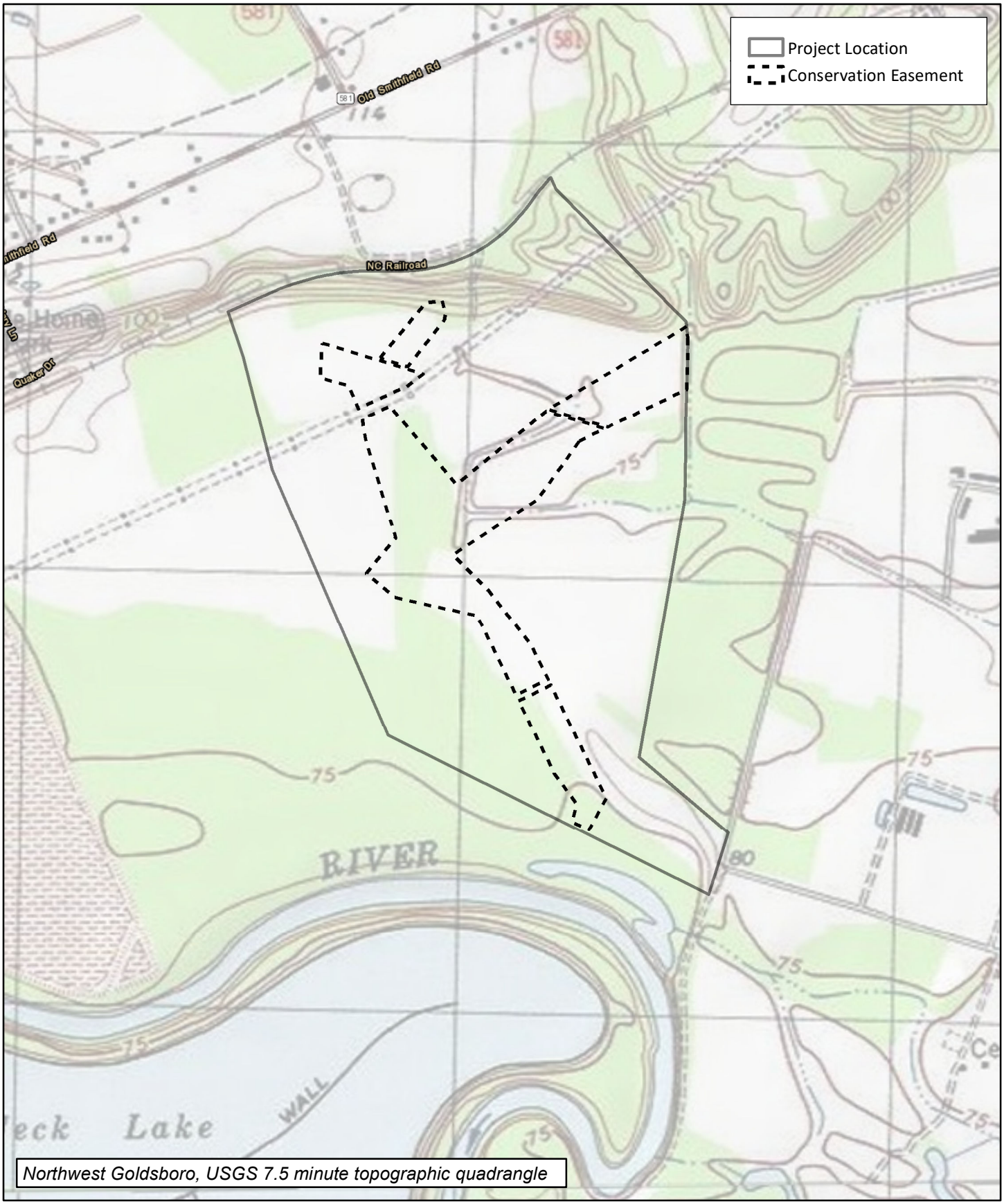

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Figure 3 Topographic Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

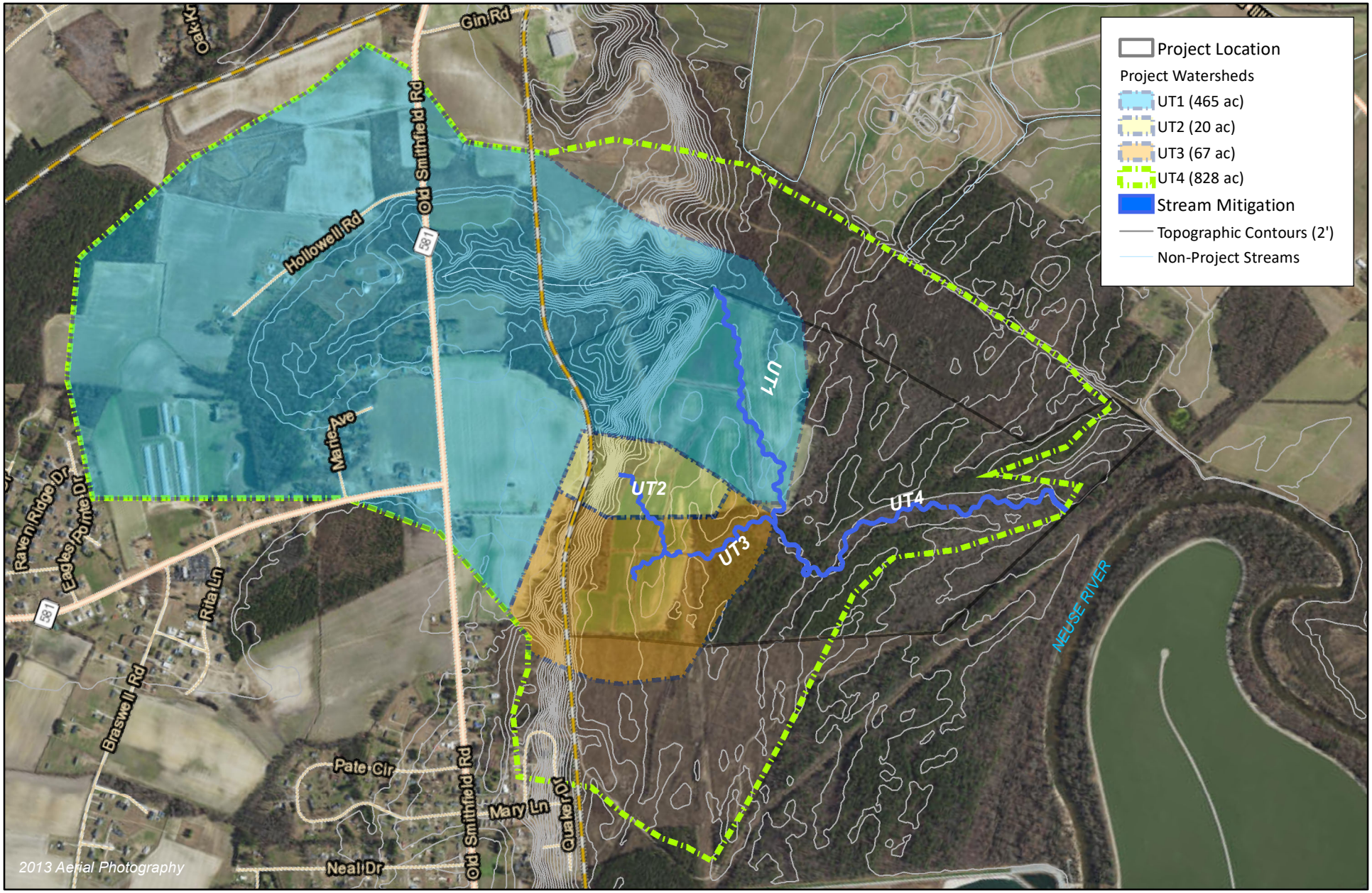

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Figure 4 Watershed Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

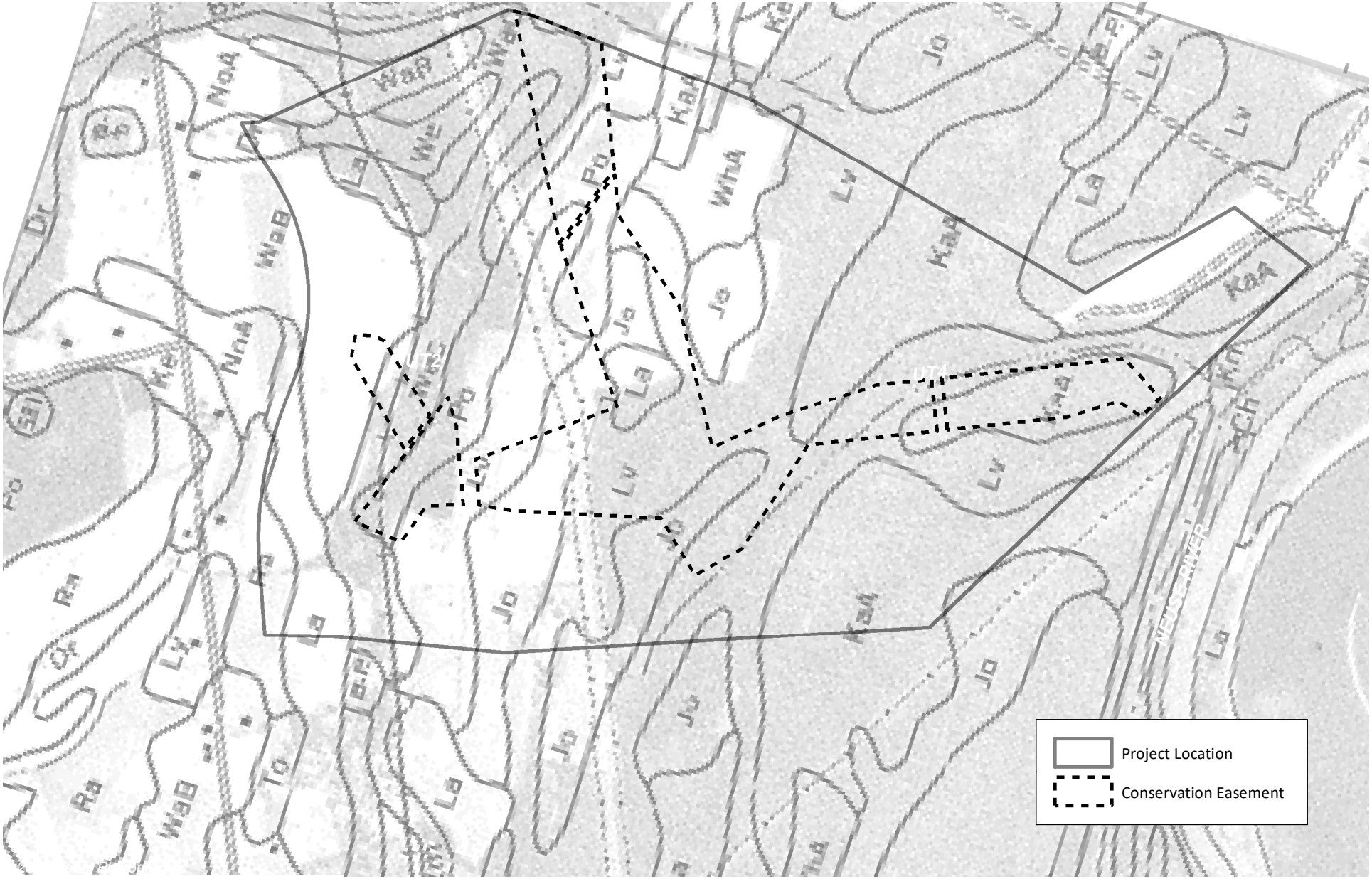

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Figure 5 Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

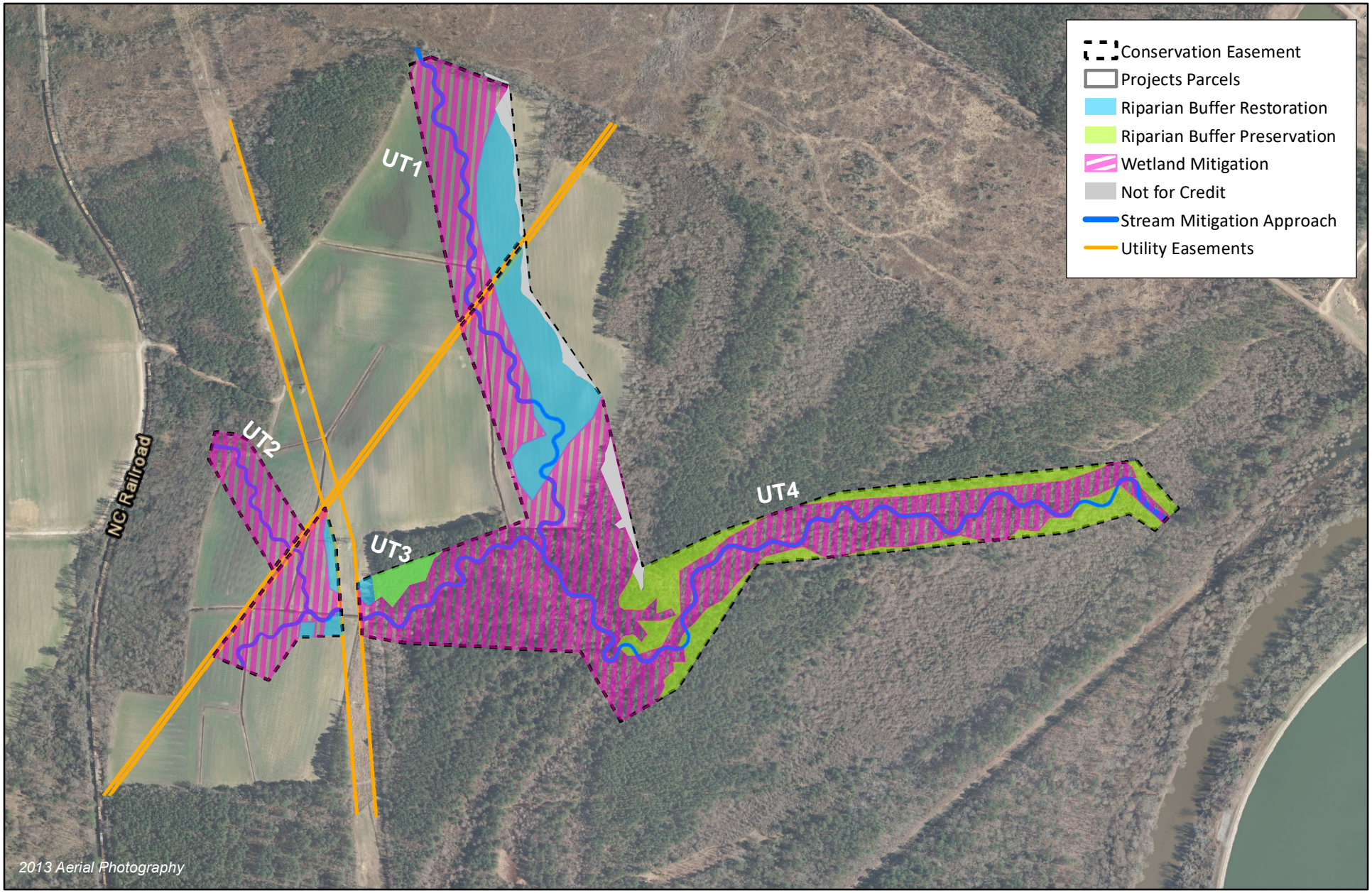

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Figure 6 Credit Calculations Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

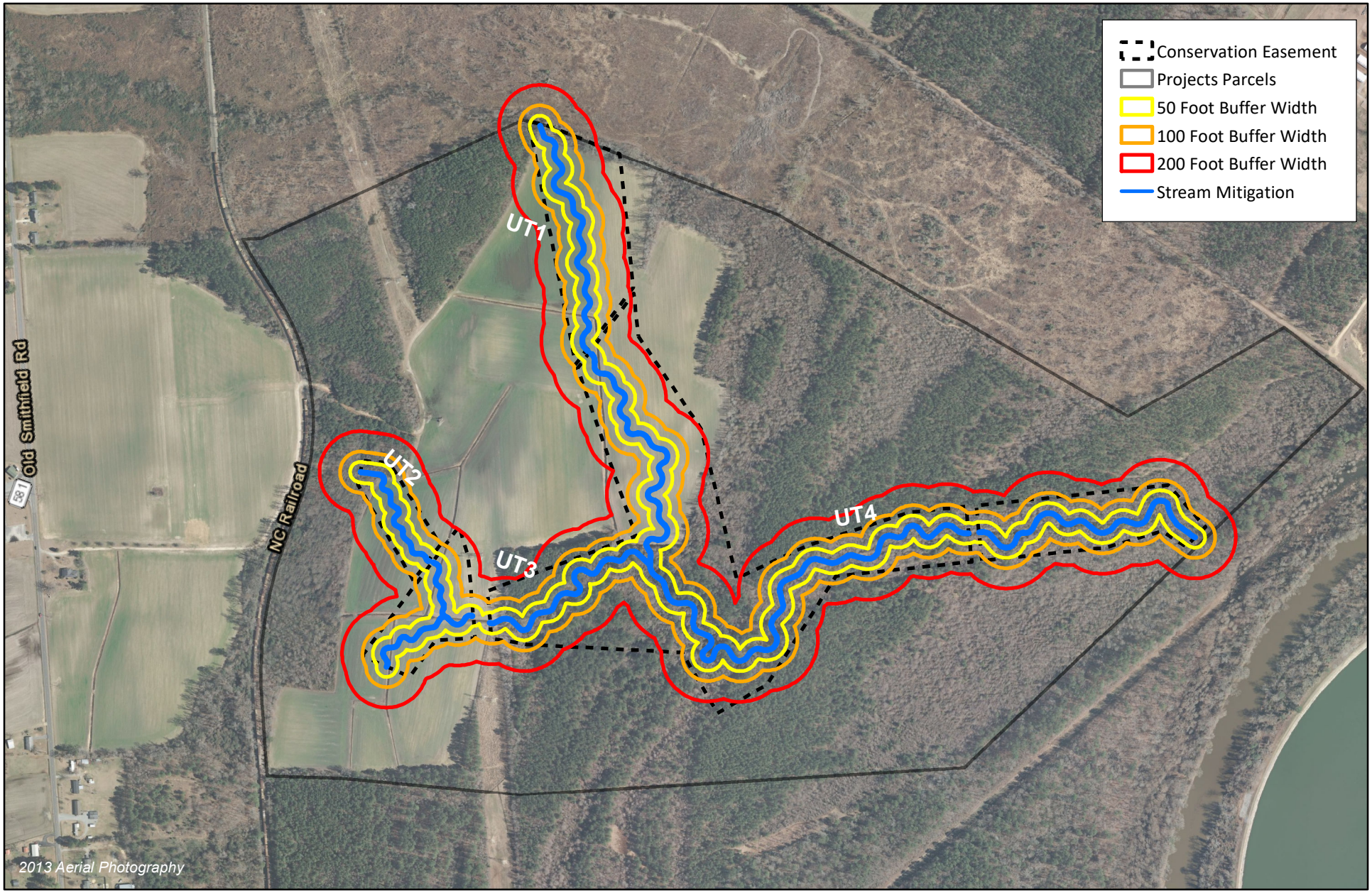

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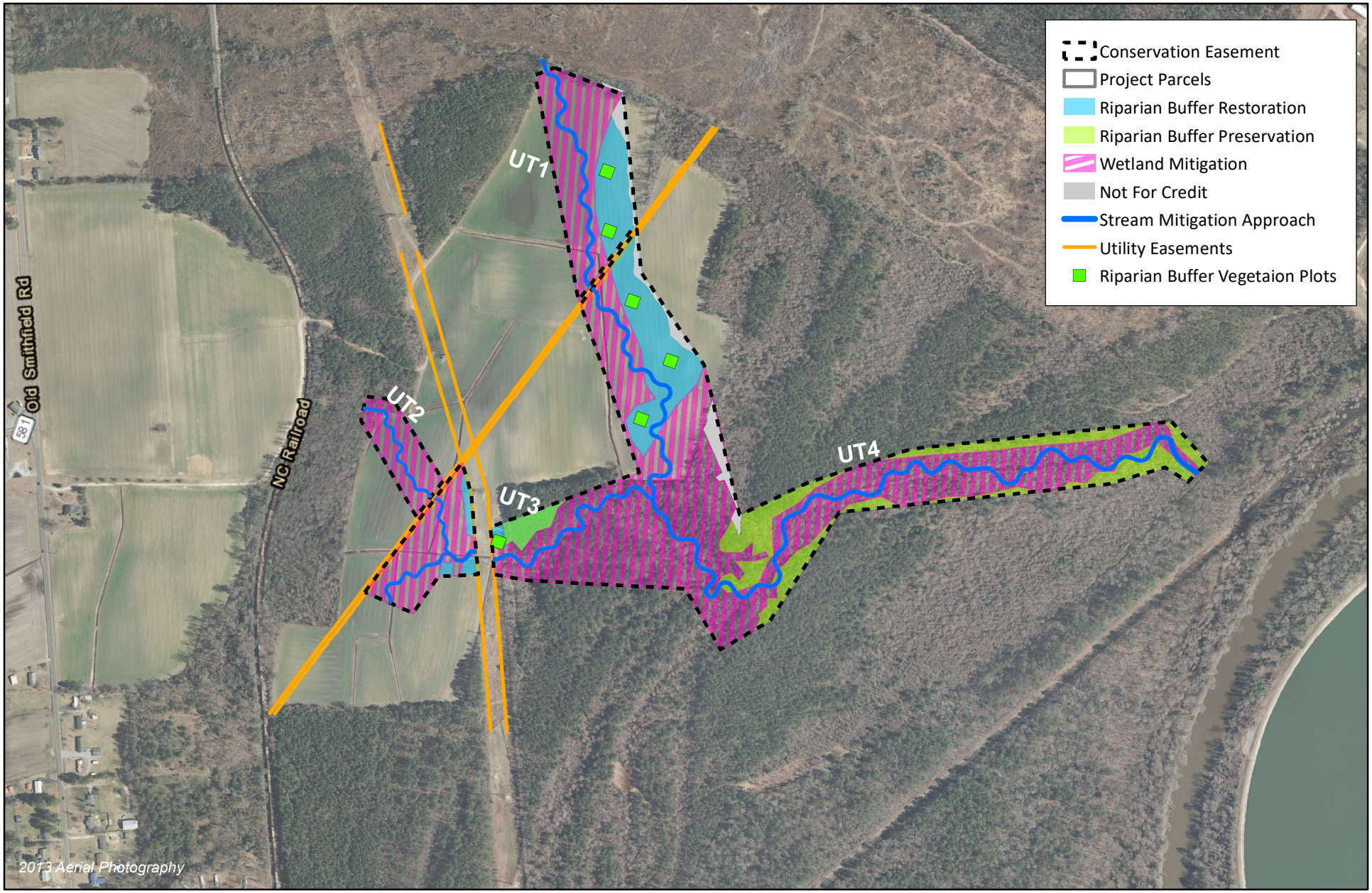
Figure 7 Riparian Buffer Zones Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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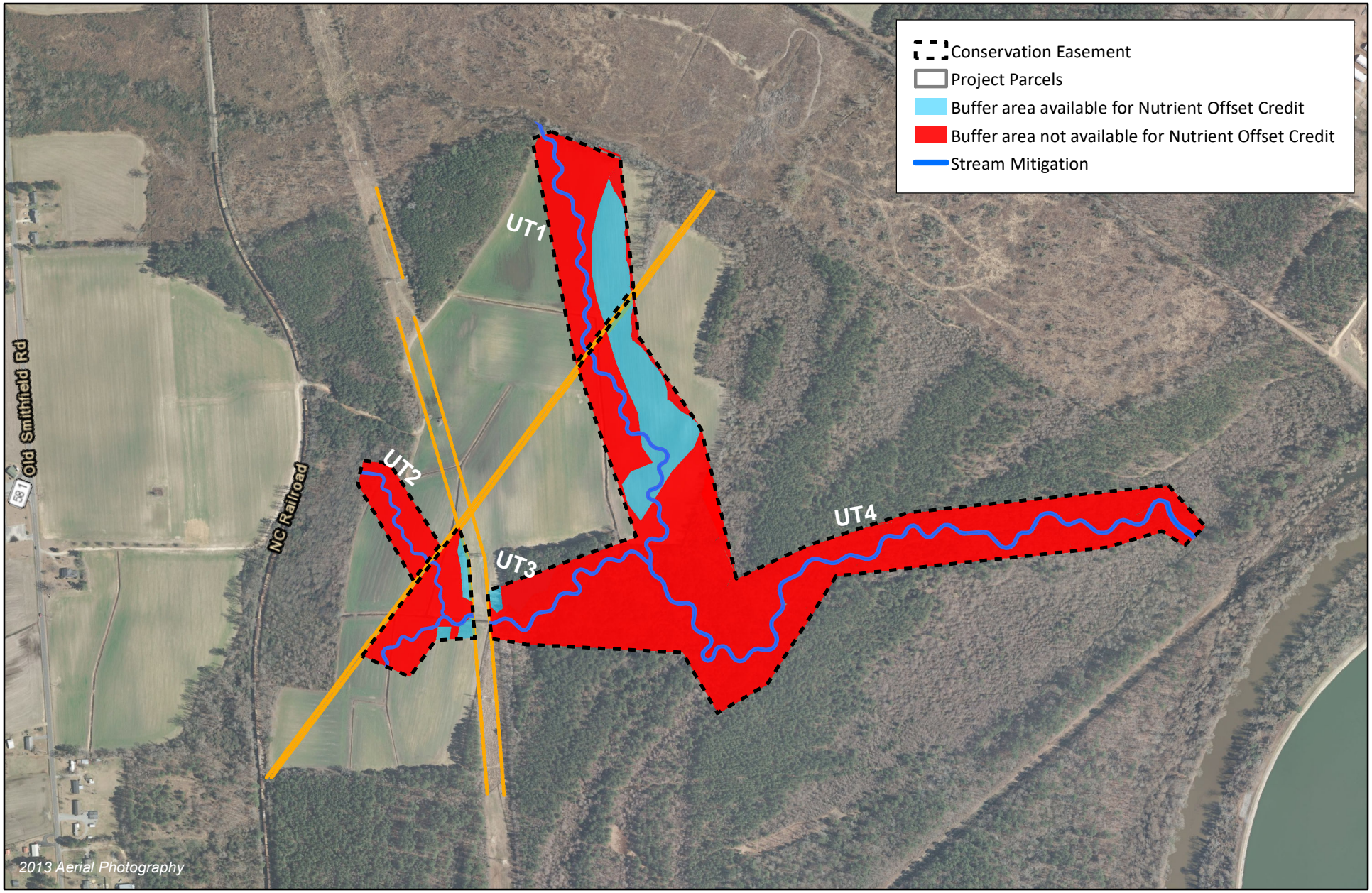
Figure 8 Proposed Monitoring Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

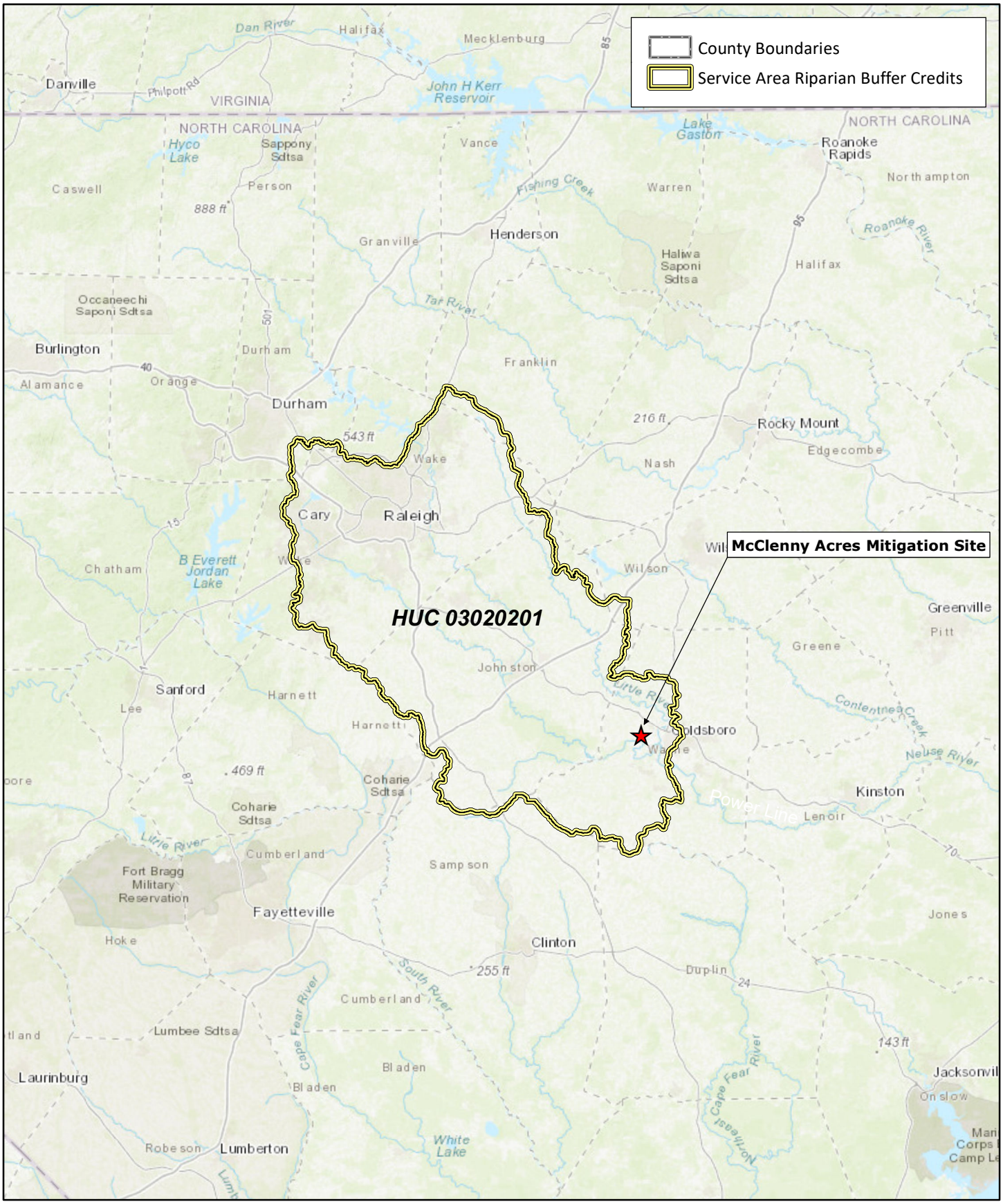


WILDLANDS ENGINEERING

0 1,000 Feet

Figure 9 Nutrient Offset Zones Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

0 5 10 Miles

N

Figure 10 Service Area Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Sub-Appendices

Overview Photographs

Site Viability Letter

Water Resources
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 10, 2018

John Hutton
Wildlands Engineering, Inc.
312 West Millbrook Rd, Suite 225
Raleigh, NC 27609
(via electronic mail: jhutton@wildlandseng.com)

DWR ID# 2018-0197
Wayne County

Re: Site Viability for Buffer Mitigation and Nutrient Offset & Buffer- McClenny Acres Site
Near 1100 Old Smithfield Rd, Goldsboro, NC
Neuse 03020201 (not in Falls WS)

Dear Mr. Hutton,

On February 9, 2018, Katie Merritt, with the Division of Water Resources (DWR), received a request from Wildlands Engineering, Inc. (WEI) for an onsite mitigation determination near the above-referenced site (Site). The Site is located in the Neuse River Basin within the 8-digit Hydrologic Unit Code 03020201. The Site is being proposed as part of a full-delivery stream, riparian buffer and wetland mitigation project for the Division of Mitigation Services (RFP #16-007279). Members of the Interagency Review Team (IRT) and Division of Mitigation Services were also present onsite. At your request, on February 22, 2018, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to streams onsite, which are shown on the attached map labeled "Figure A".

At the request of WEI, this mitigation determination is assessed using the proposed stream restoration plan/alignment shown on the attached map labeled "Revised Concept Map" that will be submitted to the Interagency Review Team (IRT) for review. If the proposed stream channel alignments change in any way from what is shown on the attached Revised Concept Map, or the stream channels do not develop into intermittent or perennial streams as determined by DWR, this viability letter may be subject to change.

Ms. Merritt's evaluation of the features and their associated mitigation determination for the riparian areas are provided in the table below. The evaluation was made from Top of Bank (TOB) out to 200' from each existing or *proposed* feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0240.

Feature	Classification on Restoration Plan	[1]Subject to Buffer Rule	Riparian Land uses adjacent to proposed Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Credit Viable at 2,273 lbs/acre	Mitigation Type Determination w/in riparian areas
UT-1	Restored stream channel	Yes	Agricultural Fields	Yes	Yes	Fields - **Restoration site** per 15A NCAC 02B .0295 (n)

Feature	Classification on Restoration Plan	[1]Subject to Buffer Rule	Riparian Land uses adjacent to proposed Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Credit Viable at 2,273 lbs/acre	Mitigation Type Determination w/in riparian areas
UT-2	Restored stream channel	Yes	Agricultural Fields with some forested areas up stream	Yes[3]	Yes (fields only)	Fields (excluding the power line) – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT3	Restored stream channel	Yes	Agricultural Fields with some forested areas up stream	Yes[3]	Yes (fields only)	Fields (excluding the power line) – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT-3	Restored stream channel	Yes	Agricultural Fields with some forested areas	Yes[3]	Yes (fields only)	Fields – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT-4	Restored stream channel	Yes	Mature forest w/ a maintained hunting lane within Zone 1	Yes[3]	No	Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
A	Ditch	No	Agricultural Fields	N/A	N/A	*N/A* *Proposed to be filled and graded for wetland mitigation*
B	Ditch	No	Agricultural Fields	N/A	N/A	*N/A* *Proposed to be filled and graded for wetland mitigation*
C & D	Not Assessed		Agricultural Fields			

[1]Subjectivity calls for the features were determined by DWR in correspondence dated April 5, 2018 and April 6, 2018 using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS.

[2] *NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment*

[3]The area of preservation credit within a buffer mitigation site shall comprise of no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 0295 (o)(5) and 15A NCAC 0295 (o)(4). Site cannot be a Preservation only site to comply with this rule.

Maps that are attached to this letter were provided by DWR and WEI and were initialed by Ms. Merritt on April 10, 2018. This letter should be provided in all stream, wetland, buffer and/or nutrient offset mitigation plans for this Site.

This letter does not constitute an approval of this site to generate mitigation credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0240, a proposal regarding a proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0240.

This viability assessment will expire on April 10, 2020 or upon the submittal of an As-Built Report to the DWR, whichever comes first. Please contact Katie Merritt at (919)-807-6371 if you have any questions regarding this correspondence.

Sincerely,

Karen Higgins, Supervisor
401 and Buffer Permitting Branch

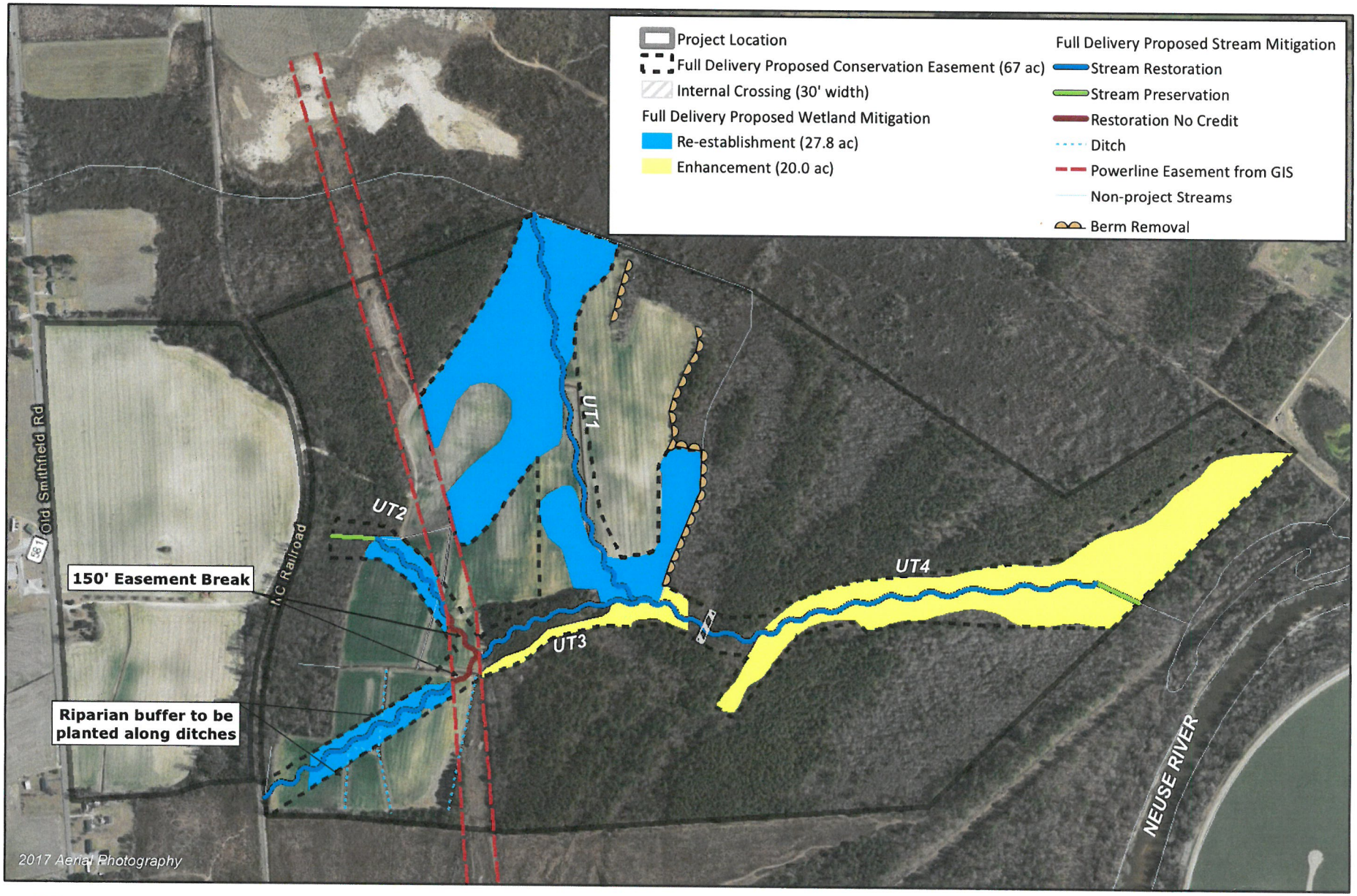
KAH/*km*
Attachments: Figure A, Revised Concept Map

cc: File Copy (Katie Merritt)
DMS – Jeff Schaffer (via electronic mail)

Figure A: McClenny Acres Full Delivery Site – DWR Stream Determination & Site Viability

Kym 4/6/18
DWR # 2018-0197v3

Kym 4/10/18
(viability)



WILDLANDS ENGINEERING

0 700 Feet

Revised Concept Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

4/10/18

DWR # 2018-0197

Stream Determinations

Water Resources
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 6, 2018

Wildlands Engineering, Inc
Attention: John Hutton
312 West Millbrook Rd, Suite 225
Raleigh, NC 27609

DWR Project #18-0197v3
Wayne County

Subject: On-Site Determination for Applicability to the Neuse River Riparian Buffer Rules and Water Quality Standards (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Full Delivery Site

Address/Location: 1100 Old Smithfield Rd, Goldsboro, NC

Stream(s) Evaluated: UTs to the Neuse River

Determination Date: February 22, 2018

DWR Staff: Katie Merritt

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☒ Intermittent/Perennial Determination (where local buffer ordinances apply)

At the request of Wildlands Engineering, Inc, staff from the Division of Water Resources (DWR) conducted two (2) site visits on a parcel located near the location indicated above, for purposes of determining applicability of the Neuse River Riparian Buffer Rules & Water Quality Standards. The second site visit was performed on April 5, 2018 and referenced in correspondence dated April 5, 2018 (DWR# 2018-0197v2). See the following table and written explanation regarding the stream determinations performed on February 22, 2018.

Feature ID[1]	Feature Type[2]	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
UT1	Stream (I)		X	Property Boundary	Confluence with UT-3	X	X
UT2[3]							
UT3	Stream (I)	X		See Map	Confluence with UT-4		
UT4	Stream (P)		X	Confluence with UT-3	Property Boundary	X	
A	Ditch	X		See map	Confluence with UT-3		X
B	Ditch			See map	Confluence with UT-2		
C	Not assessed			See map			
D	Not Assessed			See map			

[1] See maps provided with letter showing labeled features
[2] Ephemeral (E), Intermittent (I), Perennial (P)
[3] Stream Determination performed on April 5, 2018 by DWR Washington Regional Office

The DWR has determined that some of the streams listed above have been located on the most recently published NRCS Soil Survey of Wayne County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and were evaluated for applicability to the Neuse Riparian Buffer Rule.

Maps are provided with this letter from Wildlands Engineering, Inc and were initialed by Katie Merritt on April 6, 2018. Each feature that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property or not depicted on the required maps. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of the date of this letter to the Director in writing.

If sending via US Postal Service:

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
512 N. Salisbury Street
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested within sixty (60) days.

This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Raleigh Regulatory Field Office at (919)-554-4884.

If you have questions regarding this determination, please feel free to contact Katie Merritt at (919) 807-6371.

Sincerely,

Karen Higgins

Karen Higgins, Supervisor
401 & Buffer Permitting Branch

Attachments: USGS Topographic Map, Wayne County Soil Survey Map, and Figure A

cc: William McClenny, 4700 Glenn Forest Dr., Raleigh, NC 27612
401 & Buffer Permitting Branch file
RRO DWR file

Filename: 180197v3McClennyMitSite(Wayne)_Neuse_StreamDet.docx


ATHFIELD RD
110
105
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95
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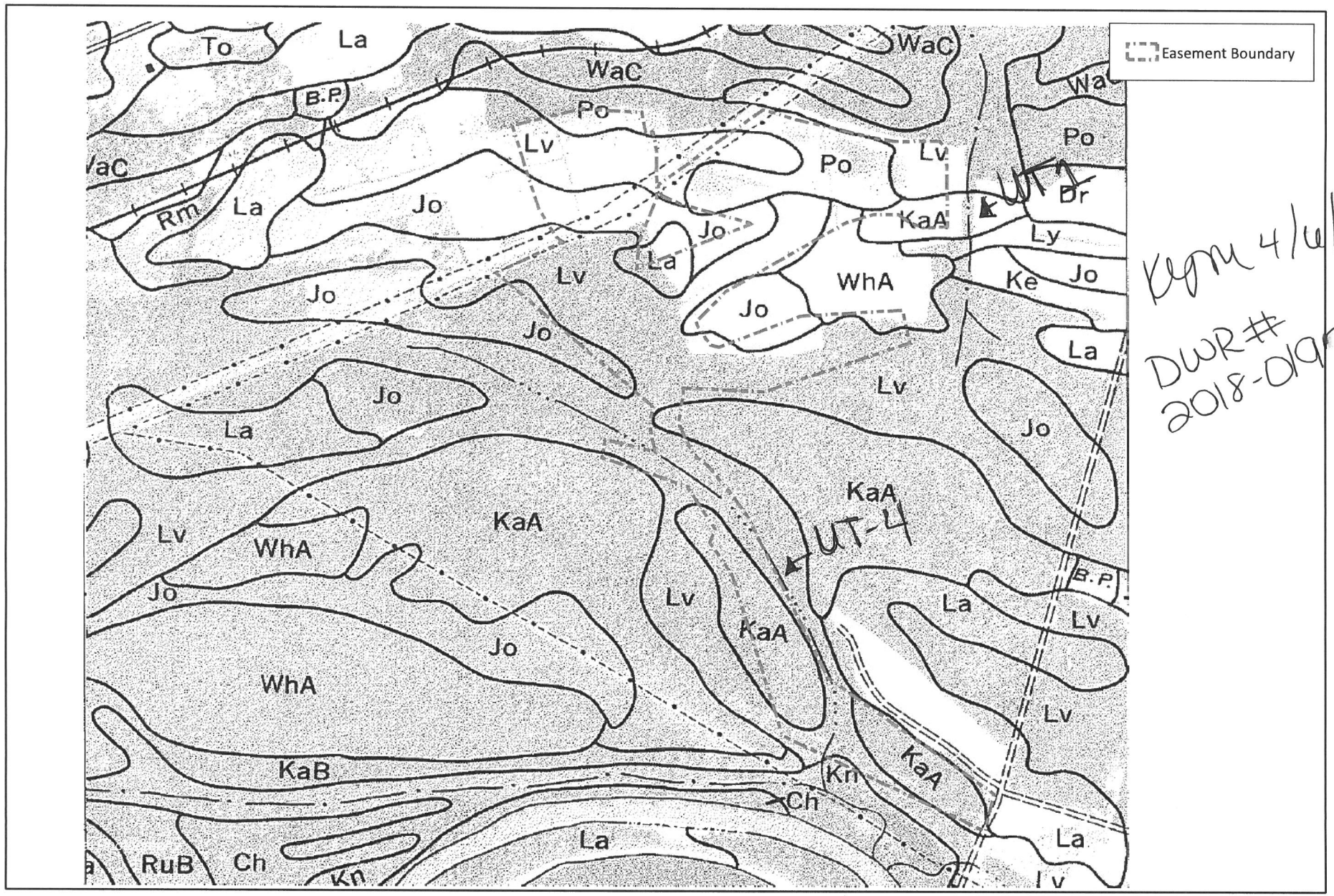
UT-1
A
DWR#
2018-0197v3
KGM 4/6/18



WILDLANDS ENGINEERING

1974 NRCS Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Kgm 4/6/18

DWR# 2018-0197v3

Figure A: McClenny Acres Full Delivery Site – DWR Stream Determination & Site Viability

Kym 4/6/18
DWR # 2018-0197v3

Water Resources
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 5, 2018

William A McClenny
4700 Glenn Forest Drive
Raleigh, NC 27612

DWR #18-0197 V2
WAYNE County

Subject: On-Site Determination for Applicability to Neuse Riparian Buffer Rules (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Mitigation Site

Address/Location: Immediately South of Intersection of NC Highway 581 and Old Smithfield Road, Goldsboro

Stream(s) Evaluated: Ut to Neuse River

Determination Date: 4/3/18 Staff: Anthony Scarbraugh

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☐ Intermittent/Perennial Determination

Stream	E/I/P*	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
18-0197 V2	I	X		Flag: 18-0197 V2 Begin	Flag: 18-0197 V2 End		X

**E/I/P/NSP = Ephemeral/Intermittent/Perennial/No Stream Present*

The Division of Water Resources (DWR) has determined that the stream listed above and included on the attached map have been located on the most recent published NRCS Soil Survey of WAYNE County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and evaluated for applicability to the NEUSE River Riparian Buffer Rules. Each stream that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act. **Please note, previous stream determinations were performed by Mrs. Katie Merritt of DWR Central Office on February 22, 2018.**

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of date of this letter to the Director in writing.

If sending via US Postal Service:
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
512 N. Salisbury Street
Raleigh, NC 27604

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This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Washington Regulatory Field Office at (919)-554-4884 Ext. 22.

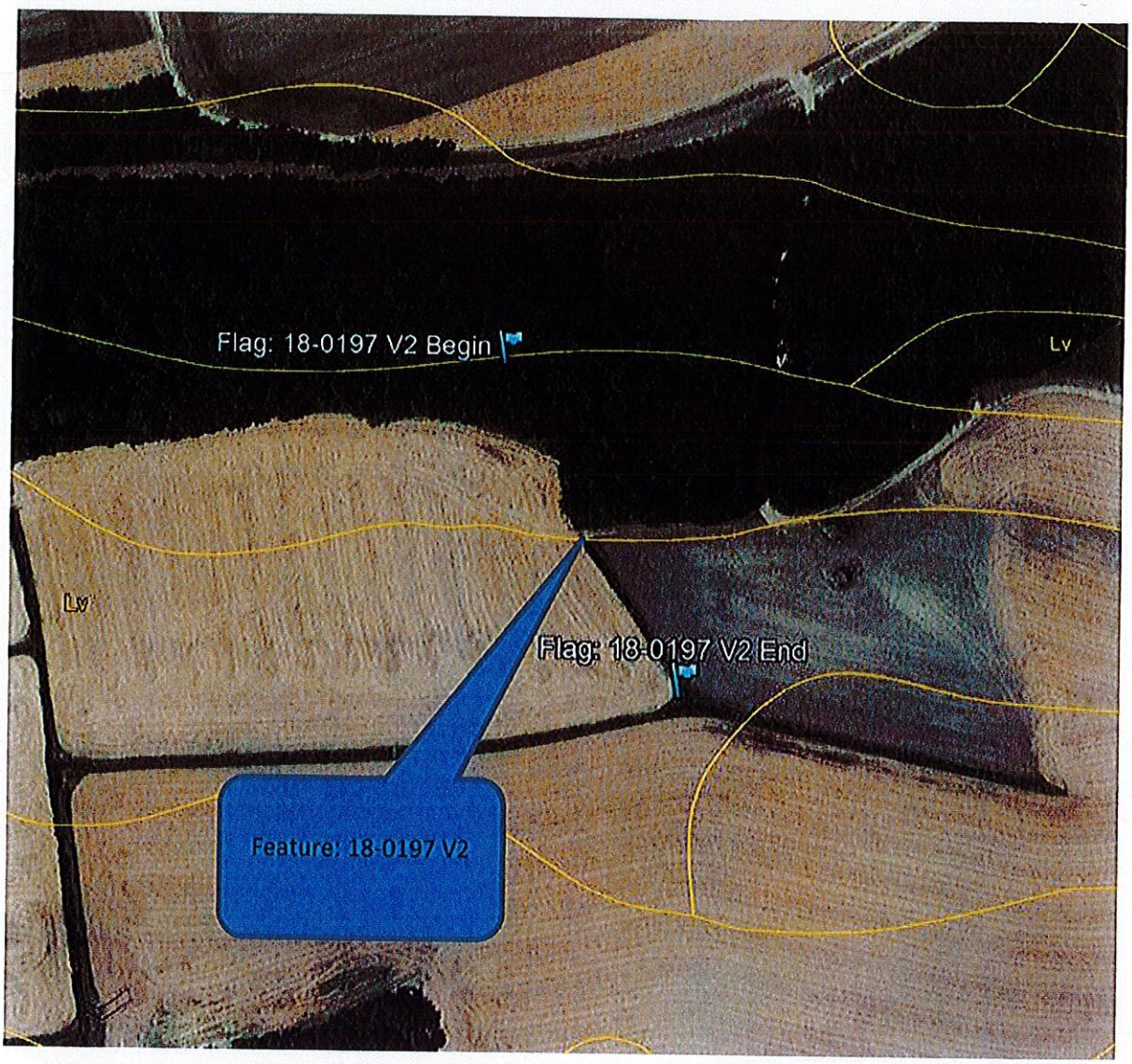
If you have questions regarding this determination, please feel free to contact Anthony Scarbraugh at (252) 948-3924.

Sincerely,

Robert Tankard, Assistant Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ

cc: WaRO DWR File Copy
LASERFICHE
Daniel Taylor, Wildland Engineering, Inc., (via email: dtaylor@wildlandseng.com)

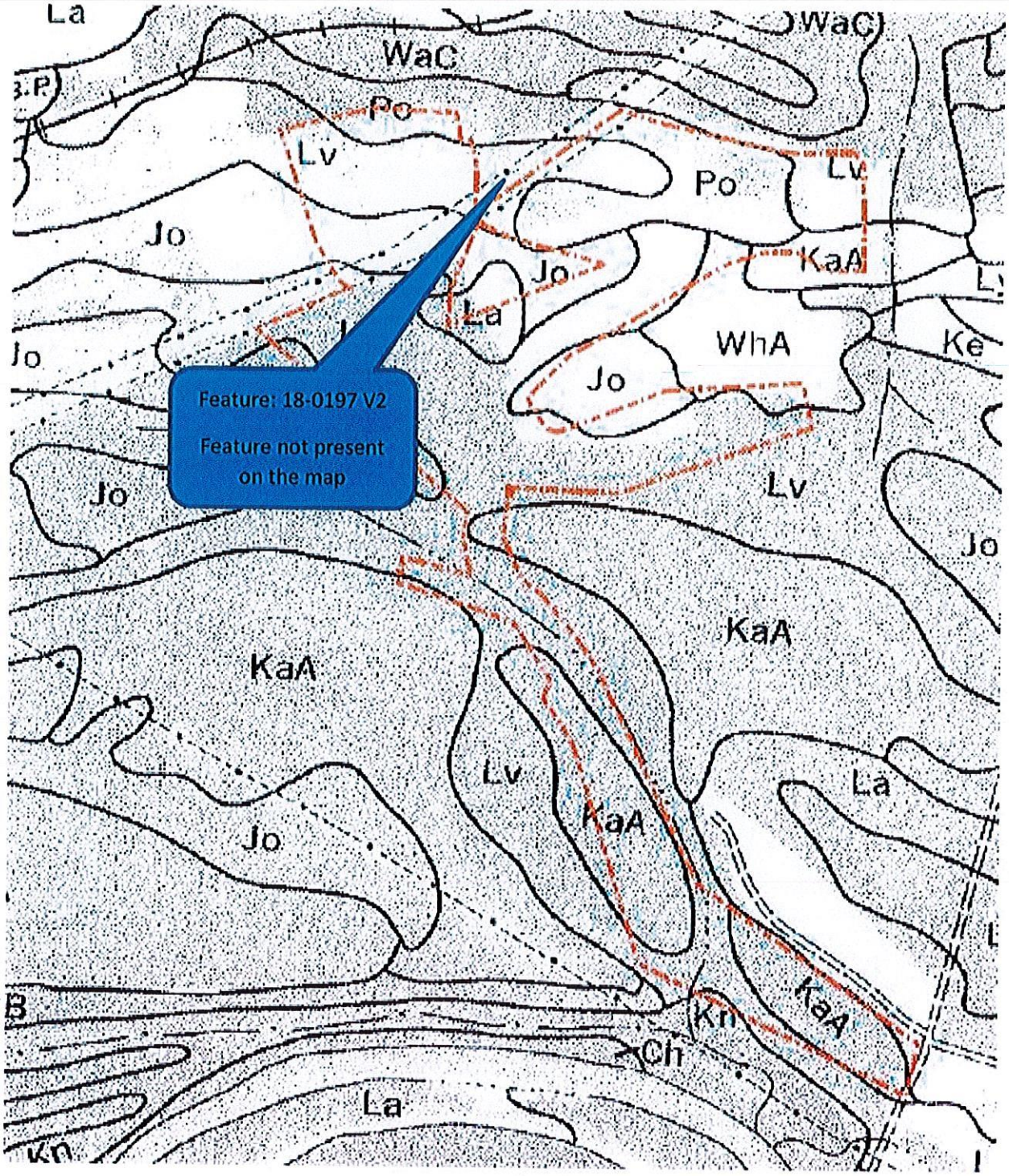
Google Earth Imagery Date: 5/14/2016



USGS Topo Map 1:24,000

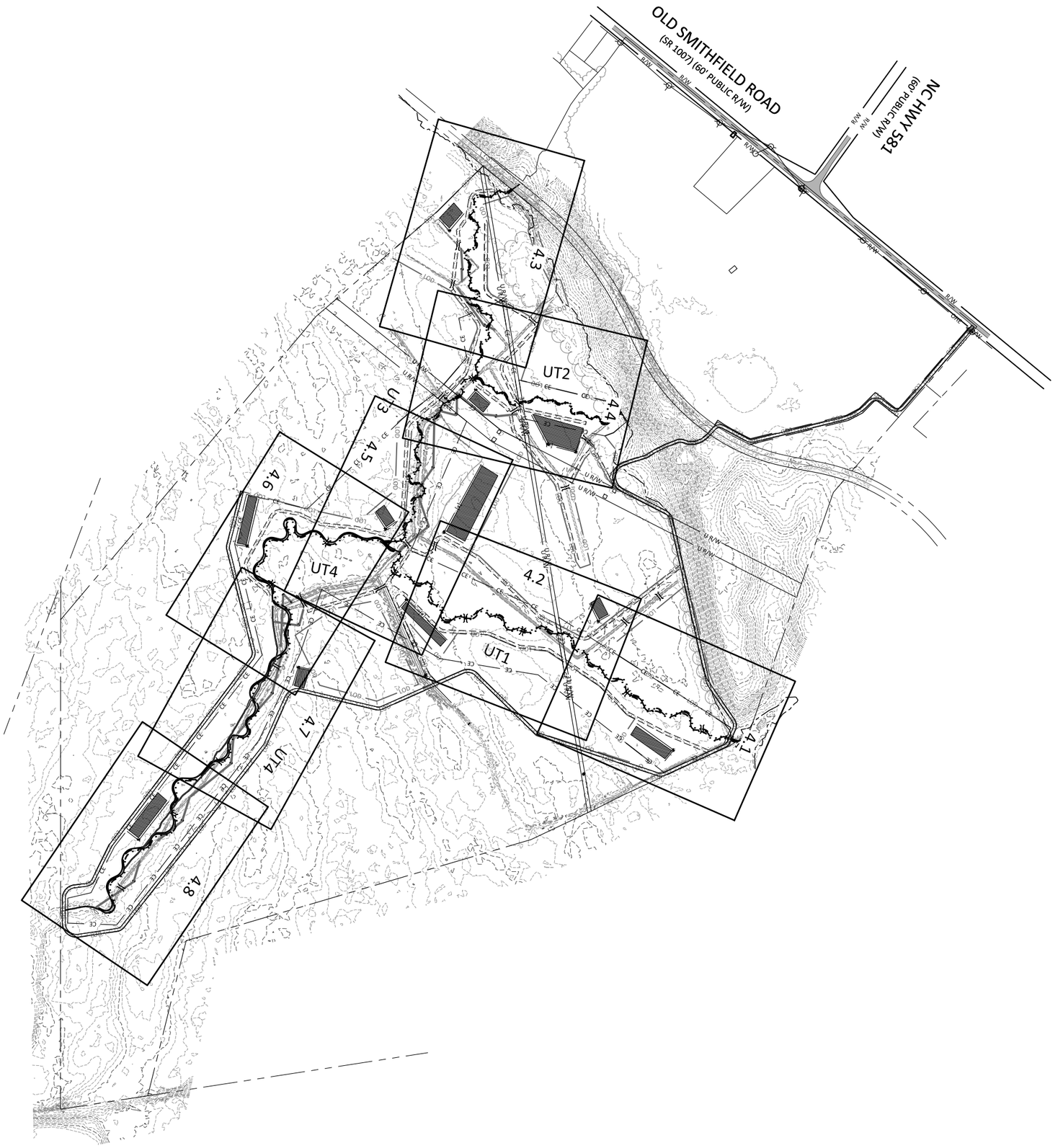
North Carolina Environmental Management Commission
Division of Water Resources
For: NEUSE Basin Buffer
Date 4/5, 2018
Reviewed by AJ

Wayne County NRCS Soils Map



North Carolina Environmental Management Commission
Division of Water Resources
For: NRUE Basin Buffer
Date 4/5, 2018
Reviewed by AS

Erosion and Sediment Control



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

4.0
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control Overview

PRELIMINARY
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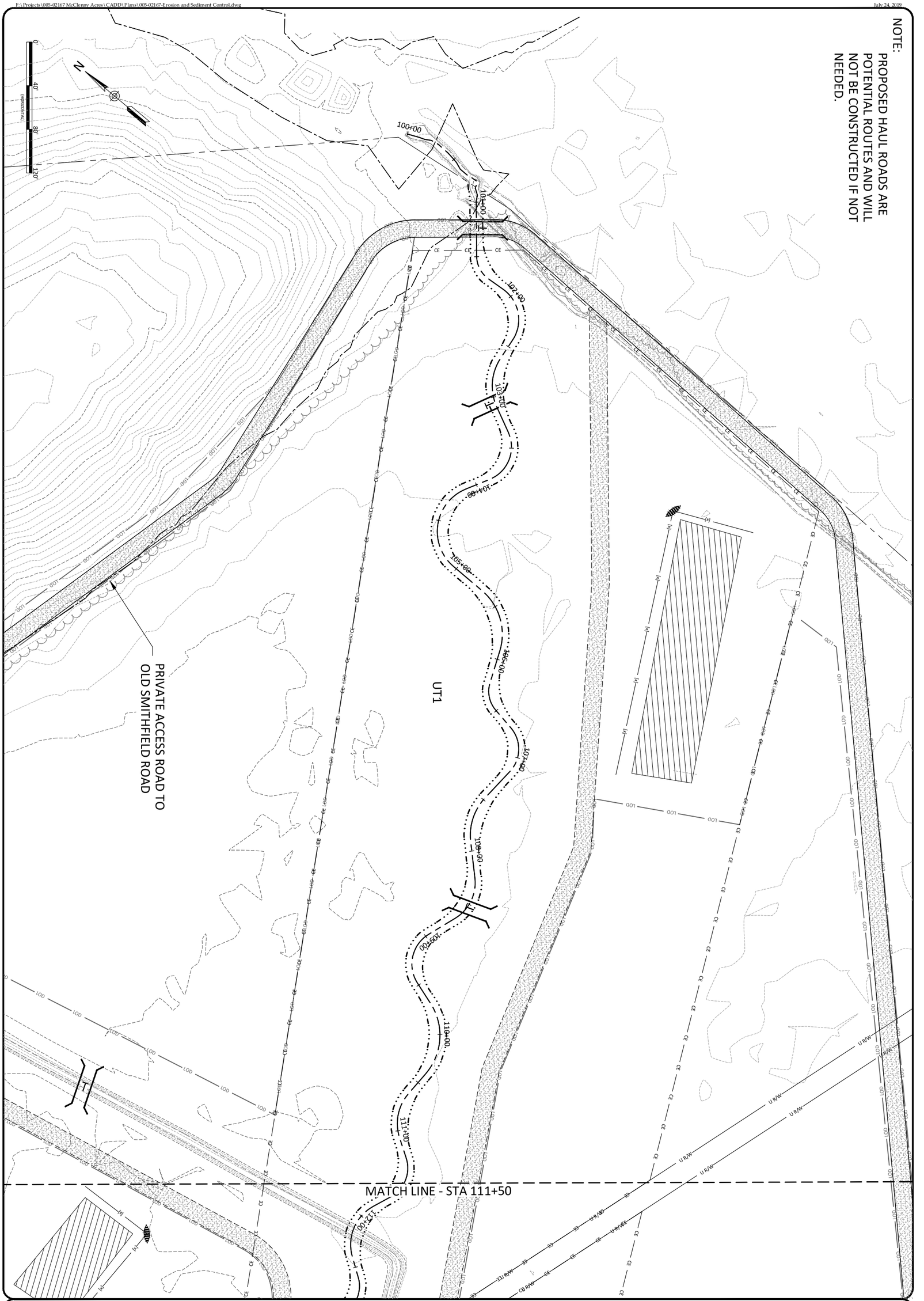
ENGINEERING
312 W. Millbrook Road, Ste 225
Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

4.1
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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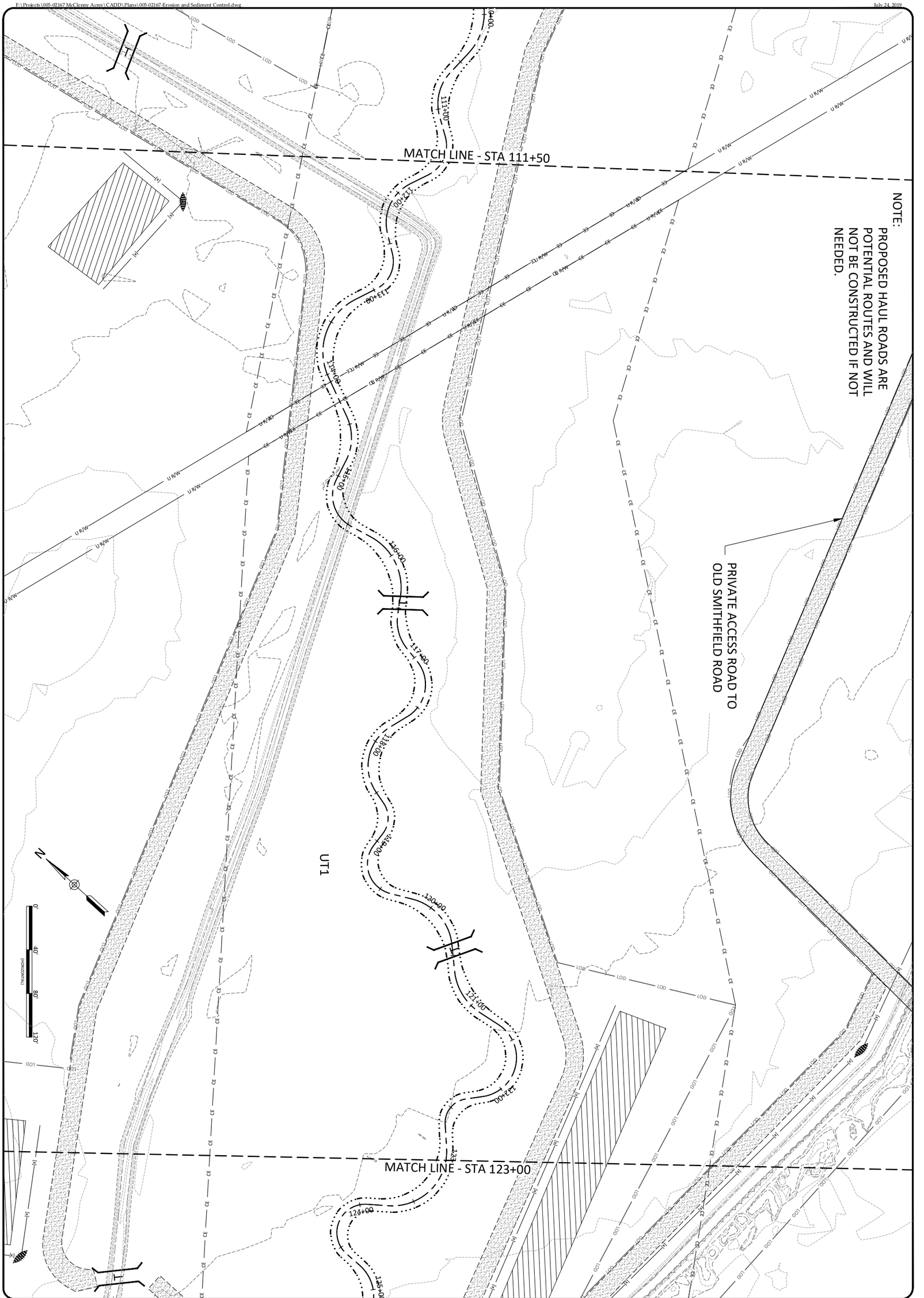

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
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McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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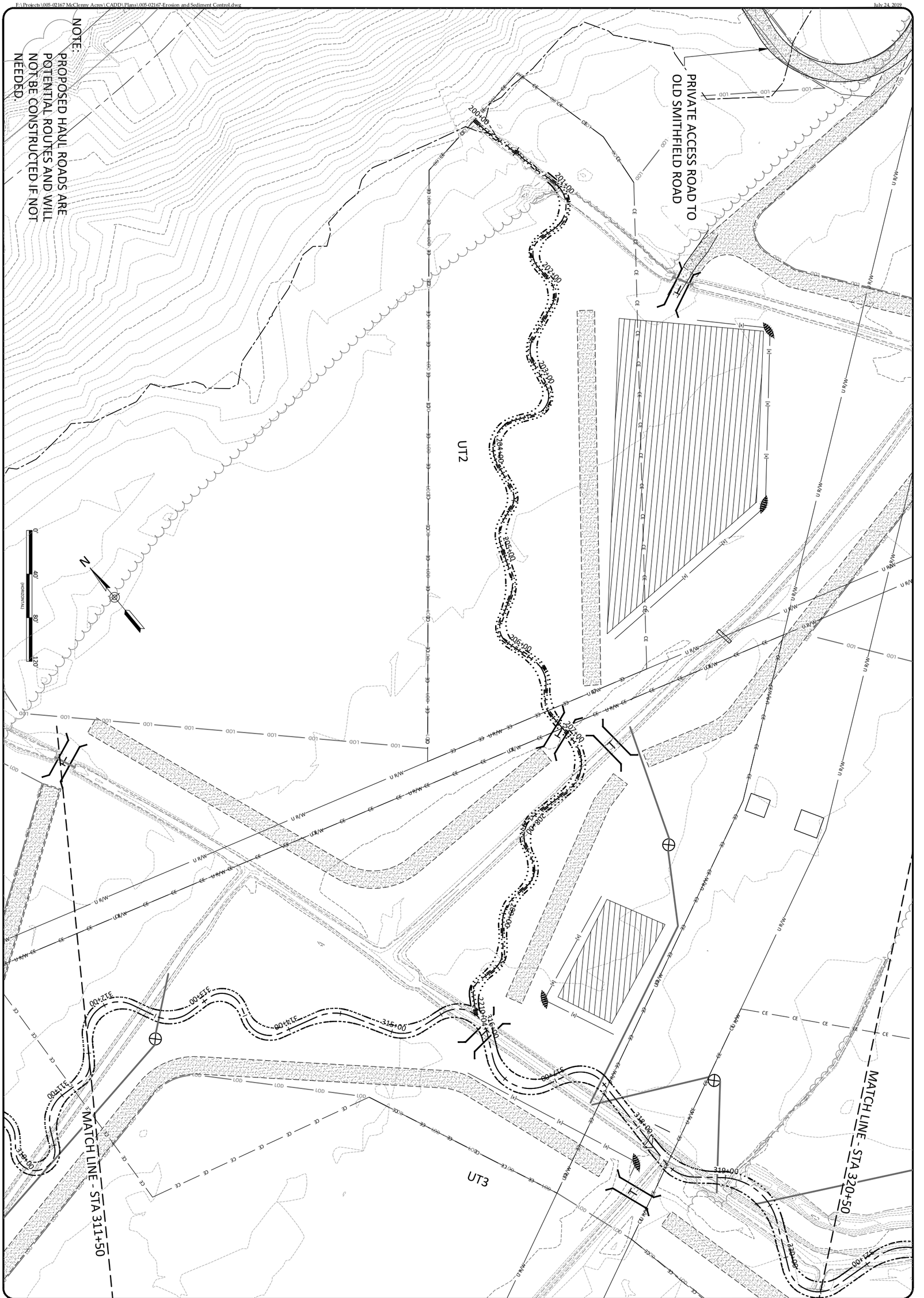

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

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McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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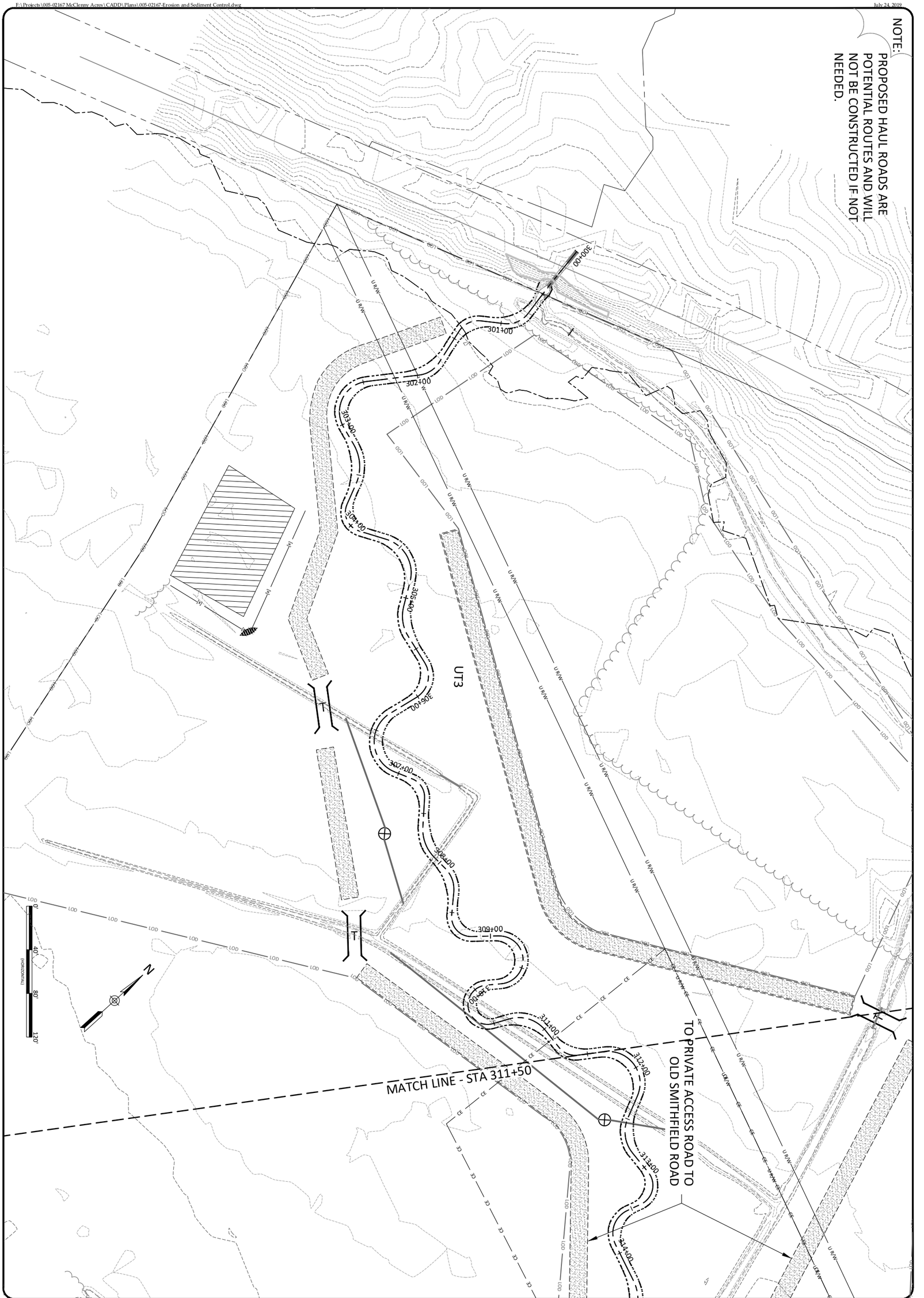

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

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McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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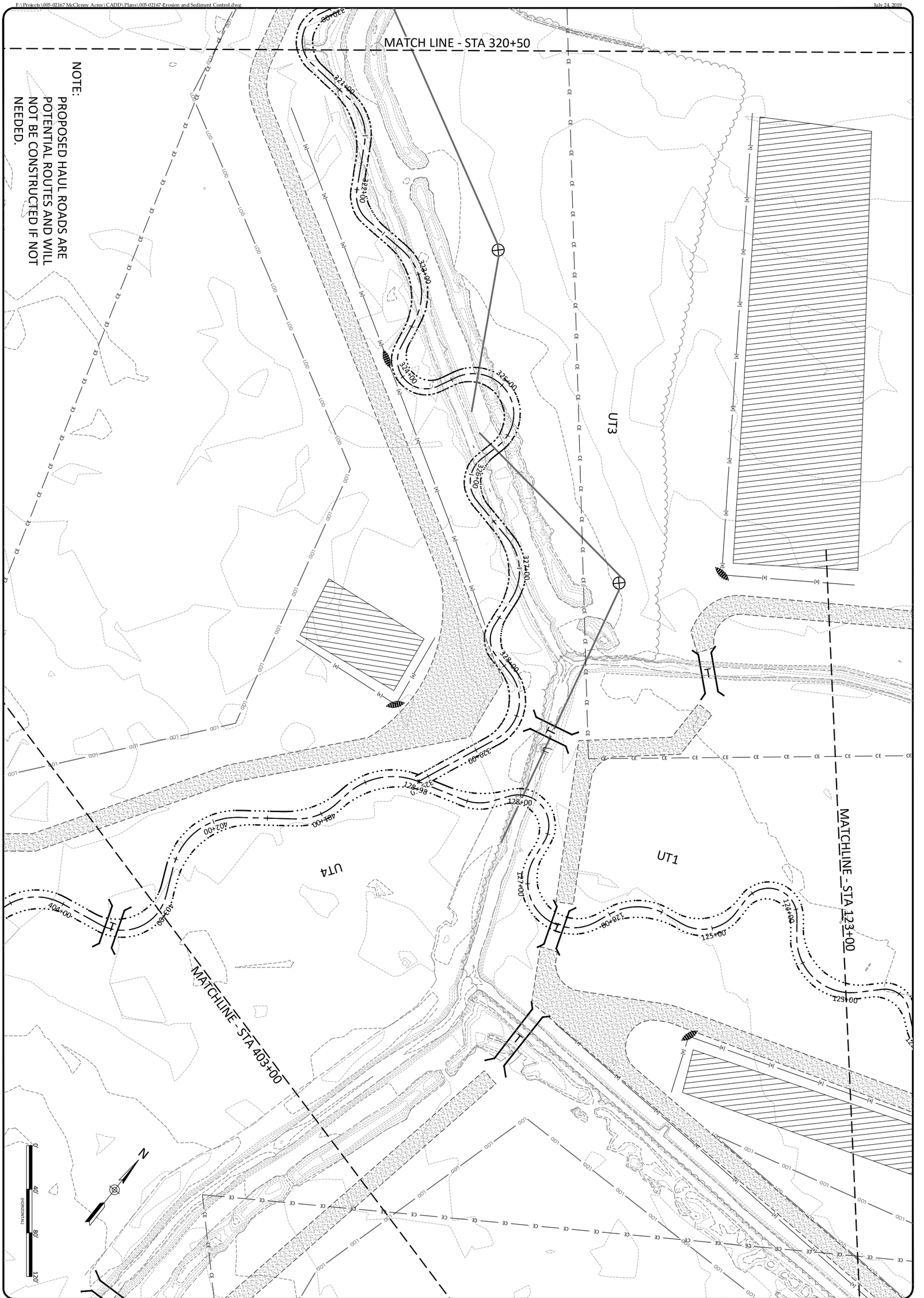

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

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Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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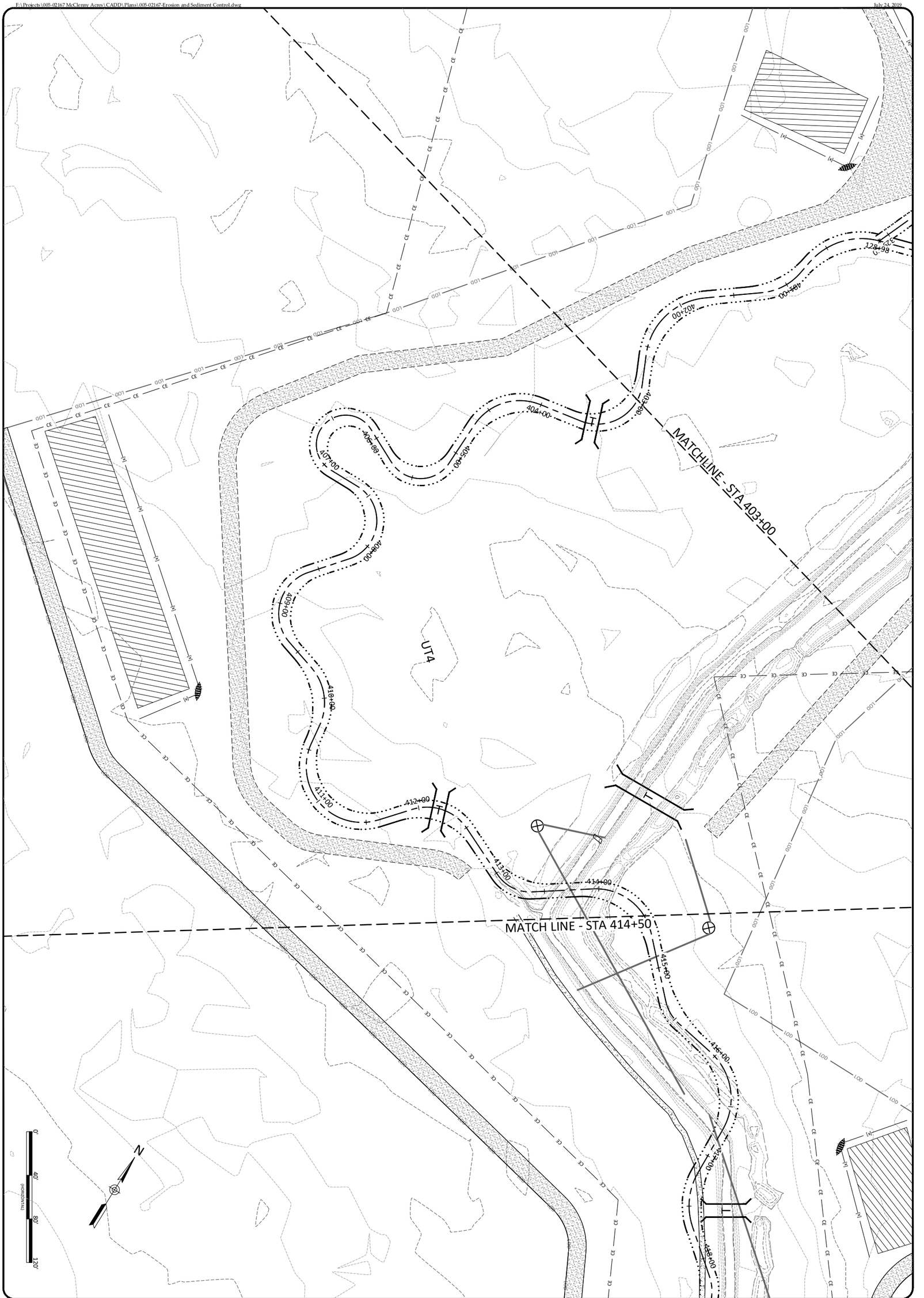

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

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Revisions:

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

PRELIMINARY DO NOT USE FOR CONSTRUCTION

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Raleigh, NC 27609
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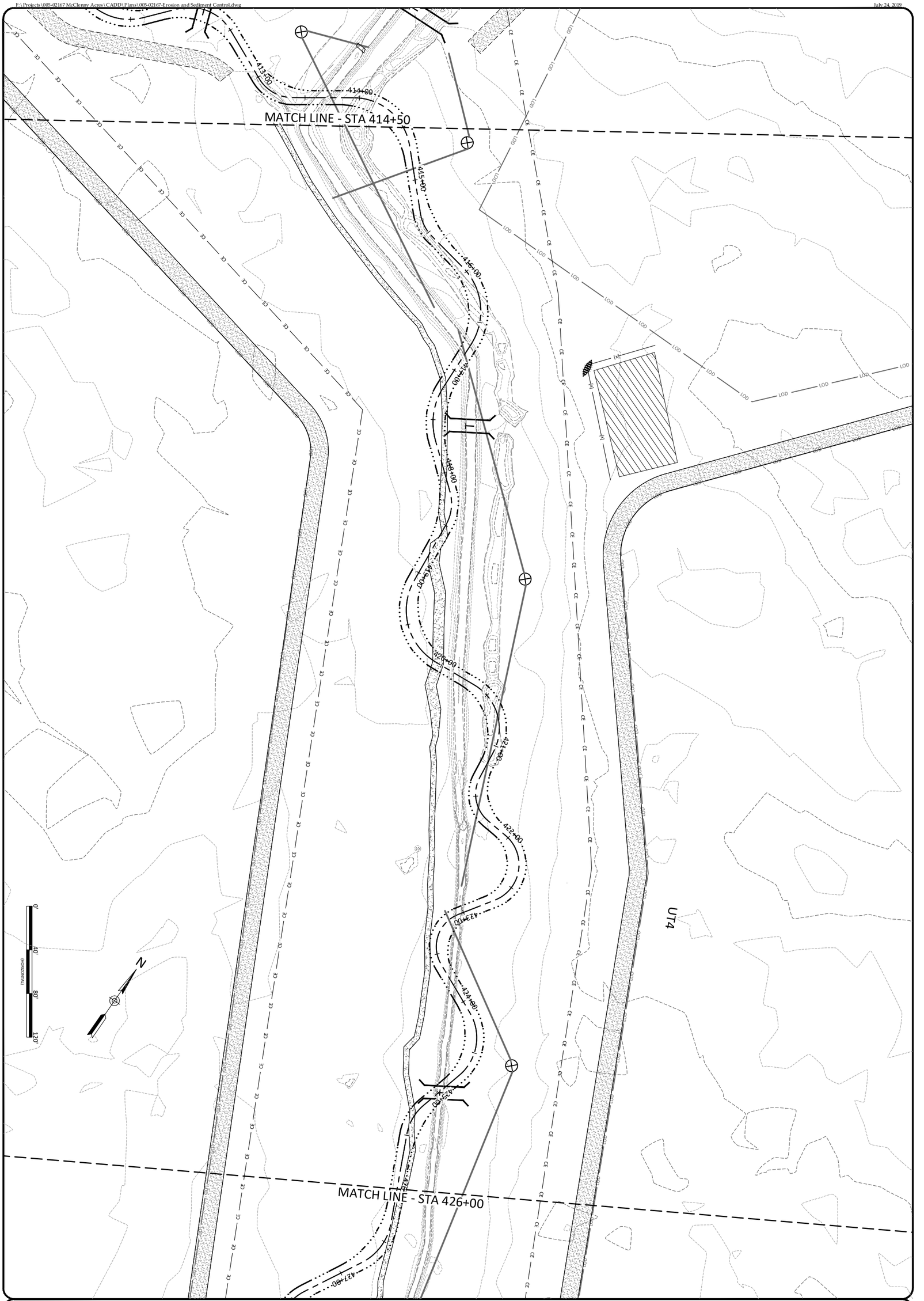

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

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Sheet

Revisions:

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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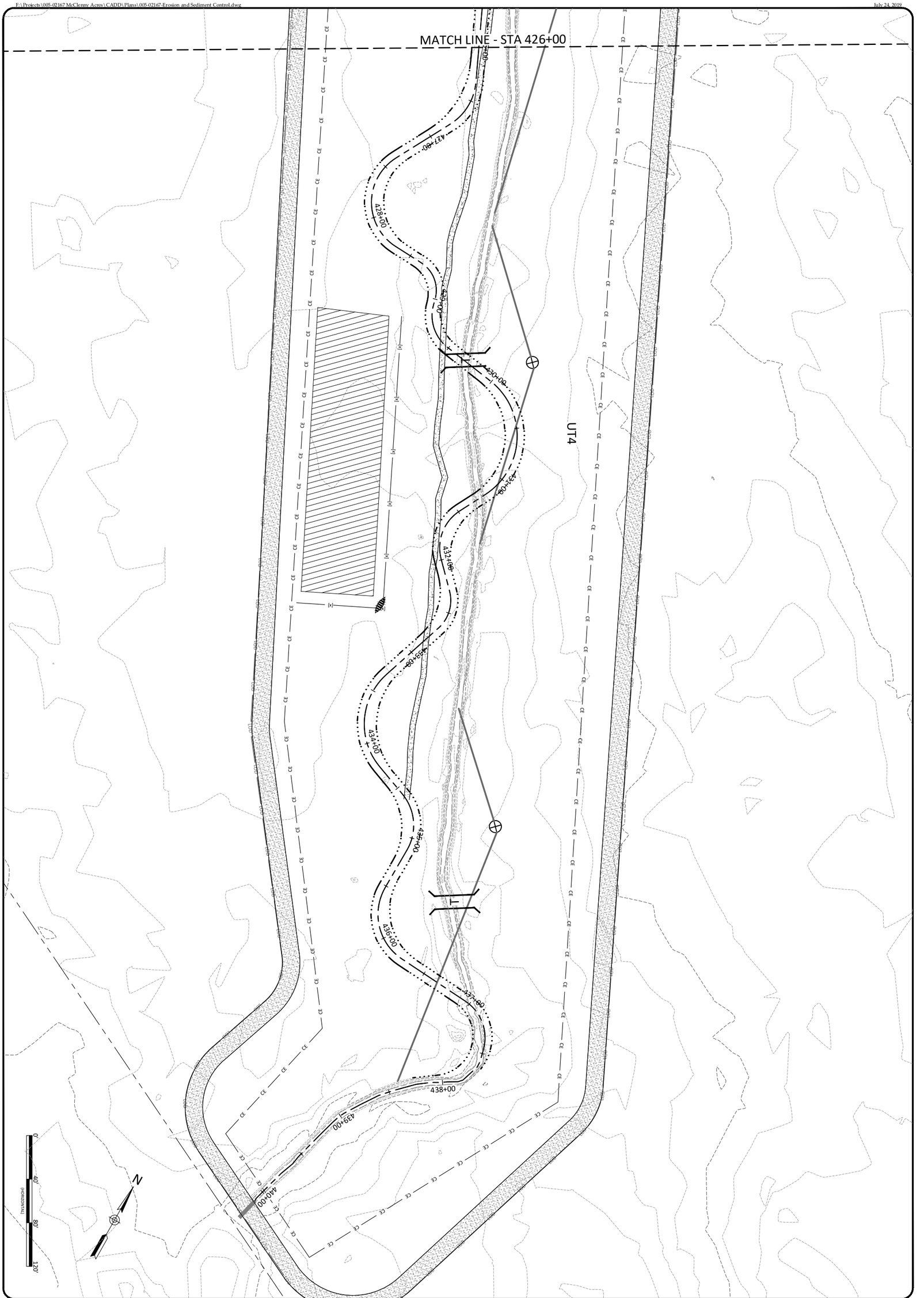

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

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McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831

Appendix 2

Site Protection Instrument

The land required for construction, management, and stewardship of this mitigation project includes portions of the parcel listed in Table 1. This area totals 37.4 acres. The deed book and page number listed are for the agreements on an option to purchase a conservation easement. A conservation easement will be recorded on the parcel and includes streams being restored, wetlands being restored, and riparian buffers.

Table 1: Site Protection Instrument

Property Owner	Parcel ID Number	County	Site Protection Instrument	Memorandum of Option Deed Book (DB) and Page Number (PG)
William A. McClenny	2579985611	Wayne	CE	DB: 267 PG: 283, DB: 228, PG: 443

All site protection instruments require 60-day advance notification to the USACE and or DMS prior to any action to void, amend, or modify the document. No such action shall take place unless approved by the State.

Appendix 3


INQUIRY #: 4444292.1
YEAR: 1959
= 500'
N
EDR


INQUIRY #: 4444292.1
YEAR: 1959
= 500'
N
EDR


INQUIRY #: 4444292.1
YEAR: 1973
= 1000'
N
EDR


INQUIRY #: 4444292.1
YEAR: 1998
= 750'
N
EDR


INQUIRY #: 4444292.1
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 4444292.1
YEAR: 2012
= 500'
N
EDR

Appendix 4

S&EC
Soil & Environmental Consultants, PA
11010 Raven Ridge Road • Raleigh, North Carolina 27614 • Phone: (919) 846-5900 • Fax: (919) 846-9467
www.SandEC.com

DETAILED HYDRIC SOIL INVESTIGATION

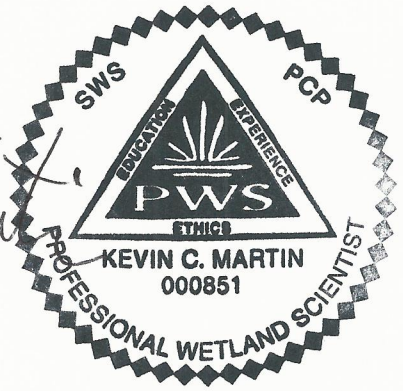
McClenny Acres Mitigation Site

Upper Coastal Plain

Neuse River Basin

Wayne County, North Carolina

Prepared for:
Mr. Jeff Keaton
Wildlands
312 West Millbrook Road, Suite 225
Raleigh, NC 27609



August 24th, 2018

INTRODUCTION

Soil & Environmental Consultants, PA (S&EC, PA) was retained to perform a detailed evaluation to assess the presence and extent of hydric soils onsite. There are a number of modified streams that dissect the site (unnamed tributaries of the Neuse River). Part of the area evaluated is currently an active farm field planted in row crops while the remainder is a wooded area.

METHODOLOGY

On June 5-6th and August 22nd, 2018 Kevin Martin (LSS, PWS) of S&EC, PA performed a detailed hydric soil evaluation at the site. Over 350 hand auger borings were advanced on the property at various locations as appropriate to determine the location and extent of hydric soils within the project area (see attached McLenny Acres Hydric Soils Map (FIGURE 1). GPS points on the map reflect most locations where two or more borings where performed. In most cases borings were performed within the hydric soil area and just outside of the hydric soil line to accurately define the limits of hydric soils. Each soil boring was evaluated to assess the presence or absence of hydric soil indicators. Hydric soil indicators were identified utilizing the *NRCS Field Indicators of Hydric Soils in the Unities States - A Guide for Identifying and Delineating Hydric Soils (Version 8.1, 2017).*

Parts of the tract are mapped as the hydric soil series Lv (Lumbee) Fine-loamy over sandy or sandy-skeletal, siliceous, subactive, thermic Typic Endoaquults, Po (Pantego) Fine-loamy, siliceous, semiactive, thermic Umbric Paleaquults and the "near hydric" Jo (Johns) Fine-loamy over sandy or sandy-skeletal, siliceous, semiactive, thermic Aquic Hapludults.

Lumbee is a poorly drained soil found on terraces and Johns is somewhat poorly drained soil found on terraces, at the time of the soil survey (1974) the very poorly drained Pantego was mapped in shallow drainage ways on terraces but now the typical soil profile description no longer considers Pantego to be in shallow drainage ways on terraces instead they would use a series similar to Torhunta for very poorly drained soils on terraces. Generally, the hydric soil units mapped by S&EC in the farm fields contained Pantego or Torhunta soils in the wettest parts in the center of the units and soils most like the Lumbee series along the perimeter of the hydric units. The majority of the hydric soils mapped in the wooded areas are most like the Lumbee soil series.

RESULTS

Over 350 soil borings were performed within the study area. Soil characteristics were evaluated and all met one of the hydric soil criteria below.

Hydric soil indicator F3 (Depleted Matrix) is defined as:

A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:

a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil*, or

b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

*None of the hydric units mapped relied on criteria listed in a. above

OR

Hydric soil indicator A11. Depleted Below Dark Surface.

A layer with a depleted or gleyed matrix that has 60 percent or more chroma of 2 or less, starting within 30 cm (12 inches) of the soil surface, and having a minimum thickness of either:

a. 15 cm (6 inches), or b. 5 cm (2 inches) if the 5 cm consists of fragmental soil material.

Loamy or clayey layer(s) above the depleted or gleyed matrix must have value of 3 or less and

chroma of 2 or less.

OR

Hydric soil indicator A12. Thick Dark Surface.
A layer at least 15 cm (6 inches) thick with a depleted or gleyed matrix that has 60 percent or more chroma of 2 or less starting below 30 cm (12 inches) of the surface. The layer(s) above the depleted or gleyed matrix must have value of 2.5 or less and chroma of 1 or less to a depth of at least 30 cm (12 inches) and value of 3 or less and chroma of 1 or less in any remaining layers above the depleted or gleyed matrix.

The attached Figure 1 Hydric Soils Map shows the GPS'd boundary of hydric soils mapped within the project area.

Typical Soil Profile
PANTEGO/TORHUNTA SERIES

The Pantego/Torhunta series are very poorly drained soils that formed in thick loamy sediments on stream terraces.

.

TAXONOMIC CLASS: Pantego: Thermic Umbric Paleaquults
Torhunta: Thermic Typic Humaquepts

A--0 to 18 inches; black (2.5Y 2.5/1) loam; weak fine granular structure

Btg1— 18+ inches; gray (2.5Y 5/2) clay loam (60%) and very dark grayish brown (2.5Y 3/2) clay loam (40%); weak subangular blocky structure: slightly
sticky;

LUMBEE SERIES

The Lumbee series is a poorly drained soil that formed in thick loamy sediments on stream terraces.
TAXONOMIC CLASS: Typic Endoaquults

A--0 to 6 inches; very dark grayish brown (10YR 3/2) sandy loam; granular structure; very friable;

Btg1--6 to 14+ inches; grayish brown (2.5Y 5/2) sandy clay loam (70%); common brownish
Yellowish brown (10YR 5/6) masses of oxidized iron (30%); weak subangular blocky structure;

*Non-hydric soil pockets are too small to map separately.

0 400 Feet

Figure 1 Hydric Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201
Wayne County, NC

Appendix 5

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	Wetland A	Date of Assessment	8/23/18
Wetland Type	Headwater Forest	Assessor Name/Organization	C. Neaves/Wildlands

Notes on Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	YES
Wetland is intensively managed (Y/N)	NO
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)	YES
Assessment area is substantially altered by beaver (Y/N)	NO
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)	NO
Assessment area is on a coastal island (Y/N)	NO

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	**MEDIUM**
	Sub-surface Storage and Retention	Condition	**HIGH**
Water Quality	Pathogen Change	Condition	**MEDIUM**
		Condition/Opportunity	**MEDIUM**
		Opportunity Presence (Y/N)	**NO**
	Particulate Change	Condition	**MEDIUM**
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Physical Change	Condition	**MEDIUM**
		Condition/Opportunity	**MEDIUM**
		Opportunity Presence (Y/N)	**NO**
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**HIGH**
	Landscape Patch Structure	Condition	**MEDIUM**
	Vegetation Composition	Condition	**LOW**

Function Rating Summary

Function	Metrics	Rating
Hydrology	Condition	**HIGH**
Water Quality	Condition	**MEDIUM**
	Condition/Opportunity	**MEDIUM**
	Opportunity Presence (Y/N)	**NO**
Habitat	Condition	**MEDIUM**

Overall Wetland Rating **MEDIUM**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	Wetland C	Date of Assessment	8/23/18
Wetland Type	Headwater Forest	Assessor Name/Organization	C. Neaves/Wildlands

Notes on Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	YES
Wetland is intensively managed (Y/N)	YES
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)	NO
Assessment area is substantially altered by beaver (Y/N)	NO
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)	NO
Assessment area is on a coastal island (Y/N)	NO

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	**LOW**
	Sub-surface Storage and Retention	Condition	**LOW**
Water Quality	Pathogen Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**NO**
	Particulate Change	Condition	**HIGH**
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**NO**
	Physical Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**YES**
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**LOW**
	Landscape Patch Structure	Condition	**HIGH**
	Vegetation Composition	Condition	**MEDIUM**

Function Rating Summary

Function	Metrics	Rating
Hydrology	Condition	**LOW**
Water Quality	Condition	**HIGH**
	Condition/Opportunity	**HIGH**
	Opportunity Presence (Y/N)	**YES**
Habitat	Condition	**LOW**

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	Wetland F	Date of Assessment	8/29/18
Wetland Type	Headwater Forest	Assessor Name/Organization	C. Neaves/Wildlands

Notes on Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	YES
Wetland is intensively managed (Y/N)	NO
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)	YES
Assessment area is substantially altered by beaver (Y/N)	NO
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)	NO
Assessment area is on a coastal island (Y/N)	NO

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	**LOW**
	Sub-surface Storage and Retention	Condition	**LOW**
Water Quality	Pathogen Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Particulate Change	Condition	**LOW**
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Physical Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**MEDIUM**
	Landscape Patch Structure	Condition	**HIGH**
	Vegetation Composition	Condition	**MEDIUM**

Function Rating Summary

Function	Metrics	Rating
Hydrology	Condition	**LOW**
Water Quality	Condition	**LOW**
	Condition/Opportunity	**LOW**
	Opportunity Presence (Y/N)	**NO**
Habitat	Condition	**HIGH**

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	Wetland G	Date of Assessment	8/29/18
Wetland Type	Headwater Forest	Assessor Name/Organization	C. Neaves/Wildlands

Notes on Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	YES
Wetland is intensively managed (Y/N)	NO
Assessment area is located within 50 feet of a natural tributary or other open water (Y/N)	NO
Assessment area is substantially altered by beaver (Y/N)	NO
Assessment area experiences overbank flooding during normal rainfall conditions (Y/N)	NO
Assessment area is on a coastal island (Y/N)	NO

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	**LOW**
	Sub-surface Storage and Retention	Condition	**LOW**
Water Quality	Pathogen Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Particulate Change	Condition	**LOW**
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Physical Change	Condition	**LOW**
		Condition/Opportunity	**LOW**
		Opportunity Presence (Y/N)	**NO**
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**MEDIUM**
	Landscape Patch Structure	Condition	**HIGH**
	Vegetation Composition	Condition	**HIGH**

Function Rating Summary

Function	Metrics	Rating
Hydrology	Condition	**LOW**
Water Quality	Condition	**LOW**
	Condition/Opportunity	**LOW**
	Opportunity Presence (Y/N)	**NO**
Habitat	Condition	**HIGH**

Overall Wetland Rating **LOW**

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2017-00552** County: **WAYNE** U.S.G.S. Quad: **NORTHWEST GOLDSBORO**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Requestor: **Wildlands Engineering, Inc.**
Mr. Charlie Neaves, Suite 225
Address: **312 West Millbrook**
Raleigh, North Carolina 27609

Size (acres)	**~200**	Nearest Town	**Goldsboro**
Nearest Waterway	**Neuse River**	River Basin	**Neuse River**
USGS HUC	**03020201**	Coordinates	Latitude: **35.396362**
			Longitude: **-78.064191**

Location description: **The project area is identified as an approximate 200 acre tract of land, located at 1050 Old Smithfield Road, Goldsboro, Wayne County, North Carolina. Waters on-site are within the Neuse River watershed (8-digit HUC: 03020201).**

Indicate Which of the Following Apply:

A. Preliminary Determination

X There are waters, including wetlands, on the above described project area, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The waters, including wetlands, have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. Therefore this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.

_ There are wetlands on the above described property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). However, since the waters, including wetlands, have not been properly delineated, this preliminary jurisdiction determination may not be used in the permit evaluation process. Without a verified wetland delineation, this preliminary determination is merely an effective presumption of CWA/RHA jurisdiction over all of the waters, including wetlands, at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the waters of the U.S. on your property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

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 (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in 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 waters of the U.S., including wetlands, on the above described project area 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 recommend you have the waters of the U.S. on your property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

_ The waters of the U.S., including wetlands, on your project area 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 of the U.S., including 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 project area 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.

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Ms. Samantha Dailey at 919-554-4884, ext. 22 or by email at Samantha.J.Dailey@usace.army.mil**.

C. Basis For Determination: **N/A. An Approved JD has not been completed.**

D. Remarks: Refer to the enclosed Preliminary JD Form and Figure 3-Site Map for a detailed evaluation of the aquatic resources on-site.

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 for Approved Jurisdiction Determinations **(as indicated in Section B. above)**

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_____.

SAW-2017-00552 MCLENNY ACRES MITIGATION SITE

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: DAILEY.SAMANTHA.J.1387567948

Digitally signed by DAILEY.SAMANTHA.J.1387567948
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=DAILEY.SAMANTHA.J.1387567948
Date: 2019.03.22 11:42:58 -04'00'

Date: **March 22, 2019** Expiration Date: **N/A**

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 our Customer Satisfaction Survey, located online at http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0.

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Wildlands Engineering, Inc.**	File Number: **SAW-2017-00552**	Date: **March 22, 2019**
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
☐ 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/Missions/CivilWorks/RegulatoryProgramandPermits.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: **District Engineer, Wilmington Regulatory Division** **Raleigh Regulatory Field Office** **Attn: Samantha Dailey** **3331 Heritage Trade Drive, Suite 105** **Wake Forest, North Carolina 27587**	If you only have questions regarding the appeal process you may also contact: 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.

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

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn: #PM_FULLNAME#, 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 2

PRELIMINARY JURISDICTIONAL DETERMINATION FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PRELIMINARY JURISDICTIONAL DETERMINATION (JD): March 22, 2019

B. NAME AND ADDRESS OF PERSON REQUESTING PRELIMINARY JD:

Requestor: **Wildlands Engineering, Inc.**
Mr. Charlie Neaves
Address: **312 West Millbrook, Suite 225**
Raleigh, North Carolina 27609

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington, McLenny Acres Mitigation Site, Wildlands Engineering, Inc., Wayne County, SAW-2017-00552

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE ATTACHED TABLE TO DOCUMENT MULTIPLE WATERBODIES AT DIFFERENT SITES)
State: **NC** County/parish/borough: **Wayne County** City: **Goldsboro**
Center coordinates of site (lat/long in degree decimal format): Lat. **35.396362°N**, Long. **-78.064191° W**.
Universal Transverse Mercator:
Name of nearest water body: **Neuse River (8-digit HUC: 03020201)**

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLIES):
☒ Office (Desk) Determination. Date: **March 22, 2019**
☒ Field Determination. Date(s): **January 29, 2019**

1. The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.

2. In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7)whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there *"may be"* waters of the U.S. and/or that there *"may be"* navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:

SUPPORTING DATA. Data reviewed for preliminary JD (check all that apply): Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor: **Wildlands Engineering, Inc. submitted a Jurisdictional Determination Request on October 11, 2018.**

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.
- ☒ Office concurs with data sheets/delineation report.
- ☐ Office does not concur with data sheets/delineation report.

☐ Data sheets prepared by the Corps: .

☐ Corps navigable waters' study: .

☐ U.S. Geological Survey Hydrologic Atlas: .
- ☐ USGS NHD data.
- ☐ USGS 8 and 12 digit HUC maps.

☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K, NC-Northwest Goldsboro**

☒ USDA Natural Resources Conservation Service Soil Survey. Citation: **Web Soil Survey: January 2019**.

☒ National wetlands inventory map(s). Cite name: **Corps of Engineers SimSuite – January 2019**.

☐ State/Local wetland inventory map(s): .

☐ FEMA/FIRM maps: .

☐ 100-year Floodplain Elevation is: (National Geodetic Vertical Datum of 1929)

☒ Photographs: ☒ Aerial (Name & Date): .
or ☐ Other (Name & Date): .

☐ Previous determination(s). File no. and date of response letter: .

☐ Other information (please specify): .

IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.

DAILEY.SAMANTHA.J.1387567948

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=USA, cn=DAILEY.SAMANTHA.J.1387567948
Date: 2019.03.22 11:41:16 -04'00'

_____	_____
Signature and date of Regulatory Project Manager (REQUIRED)	Signature and date of person requesting preliminary JD (REQUIRED, unless obtaining the signature is Impracticable)

1 Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

Table 1. Summary of On-Site Jurisdictional Waters

Feature	Latitude	Longitude	Cowardin Class	Estimated Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
UT1	35.392589	-78.054872	Riverine – Streambed	2831	Intermittent Non-Wetland Waters of the US
UT2	35.393313	-78.061212	Riverine – Streambed	1254	Intermittent Non-Wetland Waters of the US
UT3	35.393378	-78.065785	Riverine – Streambed	2618	Intermittent Non-Wetland Waters of the US
UT4	35.388907	-78.060555	Riverine – Unconsolidated Bottom	2826	Perennial Non-Wetland Waters of the US
Wetland A	35.393226	-78.061397	Palustrine – Forested	2.60	Non-Section 10 Wetland
Wetland B	35.392998	-78.064096	Palustrine – Forested	0.375	Non-Section 10 Wetland
Wetland C	35.390316	-78.064172	Palustrine – Forested	1.410	Non-Section 10 Wetland
Wetland D	35.360040	-78.055201	Palustrine – Forested	0.546	Non-Section 10 Wetland
Wetland E	35.389088	-78.057209	Palustrine – Forested	4.082	Non-Section 10 Wetland
Wetland F	35.82833	-78.057390	Palustrine – Forested	0.008	Non-Section 10 Wetland
Wetland G	35.387382	-78.061432	Palustrine – Forested	0.882	Non-Section 10 Wetland
Ditch A	35.392061	-78.060512	Palustrine – Emergent	0.054	Non-Section 10 Wetland
Ditch B	35.392882	-78.057956	Palustrine – Emergent	0.269	Non-Section 10 Wetland

Feature	Latitude	Longitude	Cowardin Class	Estimated Amount of Aquatic Resource in Review Area	Class of Aquatic Resource
Ditch C	35.391963	-78.064675	Palustrine – Emergent	0.030	Non-Section 10 Wetland
Ditch D	35.391975	-78.064594	Palustrine – Emergent	0.084	Non-Section 10 Wetland
Ditch E	35.390212	-78.063635	Palustrine – Emergent	0.064	Non-Section 10 Wetland
Ditch F	35.388888	-78.063722	Palustrine – Emergent	0.066	Non-Section 10 Wetland
Ditch G	35.390824	-78.064465	Palustrine - Emergent	0.046	Non-Section 10 Wetland

WILDLANDS ENGINEERING

0 400 Feet

Figure 3 Site Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McClenny Acres Mitigation Site City/County: Goldsboro/Wayne Sampling Date: 8/2/18

Applicant/Owner: Wildlands Engineering, Inc. State: NC Sampling Point: Wetland A - DP1

Investigator(s): Charlie Neaves Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): LRR-T/MLRA-153A Lat: 35.393226 Long: -78.061397 Datum:

Soil Map Unit Name: Pantego loam NWI classification:

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

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Headwater Forest wetland at base of hillslope. Disturbance is relatively insignificant. Above normal rainfall.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 3-12+
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0-12+

Wetland Hydrology Present? Yes X No ____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Wetland A - DP1

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Liriodendron Tulipifera	90	Yes	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90 = Total Cover		
50% of total cover: 45	20% of total cover: 18		
Sapling/Shrub Stratum (Plot size: 15')			
1. Ligustrum sinense	50	Yes	FAC
2. Magnolia virginiana	8	No	FACW
3. Ilex Opaca	5	No	FAC
4.			
5.			
6.			
7.			
8.			
	63 = Total Cover		
50% of total cover: 31.5	20% of total cover: 10		
Herb Stratum (Plot size: 5')			
1. Woodwardia areolata	10	Yes	OBL
2. Saururus cernuus	10	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	20 = Total Cover		
50% of total cover: 10	20% of total cover: 2		
Woody Vine Stratum (Plot size: 30')			
1.			
2.			
3.			
4.			
5.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (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:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? Yes X No

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

SOIL

Sampling Point: Wetland A - DP1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0	10YR 2/1	100					Mucky L	
14	10YR 2/1	100					SL	
24	10YR 4/1	100					CL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☑ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ 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** X **No** _____

Remarks:

Redox features masked by OM.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McClenny Acres Mitigation Site City/County: Goldsboro/Wayne Sampling Date: 8/2/18

Applicant/Owner: Wildlands Engineering, Inc. State: NC Sampling Point: Wetland C - DP3

Investigator(s): Charlie Neaves Section, Township, Range:

Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): <1

Subregion (LRR or MLRA): LRR-T/MLRA-153A Lat: 35.390316 Long: -78.064172 Datum:

Soil Map Unit Name: Lumbee sandy loam NWI classification:

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

Are Vegetation ____, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

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 X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Wetland has been extensively manipulated by dredge/fill material and equipment traffic. Above normal rainfall.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes ____	No X	Depth (inches): ____
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 8-12+

Wetland Hydrology Present? Yes X No ____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Wetland C - DP3

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer Rubrum	5	Yes	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
	0 = Total Cover		
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia	5	Yes	FAC
2.			
3.			
4.			
5.			
	5 = Total Cover		
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** Yes **No**

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

SOIL

Sampling Point: Wetland C - DP3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0	10YR 5/1	90	7.5YR 5/8	10	C	M, PL	L	
10-12+	10YR 5/1	90	7.5YR 5/8	10	C	M, PL	CL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ 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** X **No** _____

Remarks:

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McClenny Acres Mitigation Site City/County: Goldsboro/Wayne Sampling Date: 8/29/18

Applicant/Owner: Wildlands Engineering, Inc. State: NC Sampling Point: Wetland F - DP6

Investigator(s): Charlie Neaves Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): <1%

Subregion (LRR or MLRA): LRR-T/MLRA-153A Lat: 35.382833 Long: -78.057390 Datum:

Soil Map Unit Name: Lumbee sandy loam NWI classification:

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

Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

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 X No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X No ____	
Wetland Hydrology Present?	Yes X No ____	

Remarks:

Depression behind berm in floodplain of channelized stream. Above normal rainfall.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes ____	No X	Depth (inches): ____
Water Table Present?	Yes X	No ____	Depth (inches): 8-12+
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 2-12+

Wetland Hydrology Present? Yes X No ____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Wetland F - DP6

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Nyssa biflora	10	Yes	OBL
2. Betula nigra	10	Yes	FACW
3. Carpinus caroliniana	10	Yes	FAC
4. Liquidambar styraciflua	10	Yes	FAC
5.			
6.			
7.			
8.			
	40	= Total Cover	
50% of total cover: 20	20% of total cover: 8		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	10	Yes	FAC
2. Liquidambar styraciflua	15	Yes	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	35	= Total Cover	
50% of total cover: 17.5	20% of total cover: 7		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia	15	Yes	FAC
2. Vitis rotundifolia	5	Yes	FAC
3.			
4.			
5.			
	20	= Total Cover	
50% of total cover: 10	20% of total cover: 4		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 8 (A)

Total Number of Dominant Species Across All Strata: 8 (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:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** ____

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

SOIL

Sampling Point: Wetland F - DP6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0	10YR 2/2	100					SiL	
6	10YR 3/1	98	10YR 5/6	2	C	PL	L	
10	10YR 4/1	100					SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ 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** X **No** _____

Remarks:

Redox features masked by organic matter.

WETLAND DETERMINATION DATA FORM – Atlantic and Gulf Coastal Plain Region

Project/Site: McClenny Acres Mitigation Site City/County: Goldsboro/Wayne Sampling Date: 8/23/18

Applicant/Owner: Wildlands Engineering, Inc. State: NC Sampling Point: Wetland G - DP7

Investigator(s): Charlie Neaves Section, Township, Range:

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): <1%

Subregion (LRR or MLRA): LRR-T/MLRA-153A Lat: 35.387382 Long: -78.061432 Datum:

Soil Map Unit Name: Lumbee sandy loam NWI classification:

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

Are Vegetation ____, Soil ____, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes ____ No X

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 X	No ____	**Is the Sampled Area within a Wetland?** Yes X No ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

Floodplain slough partially drained by shallow ditch.

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)
- ☐ Marl Deposits (B15) **(LRR U)**
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along 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)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Sphagnum moss (D8) **(LRR T, U)**

Field Observations:

Surface Water Present?	Yes X	No ____	Depth (inches): -3
Water Table Present?	Yes X	No ____	Depth (inches): 0-12+
Saturation Present? (includes capillary fringe)	Yes X	No ____	Depth (inches): 0-12+

Wetland Hydrology Present? Yes X No ____

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

Remarks:

VEGETATION (Four Strata) – Use scientific names of plants.

Sampling Point: Wetland G - DP7

Tree Stratum (Plot size: 30')	Absolute % Cover	Dominant Species?	Indicator Status
1. Betula nigra	50	Yes	FACW
2. Acer rubrum	20	Yes	FAC
3. Liquidambar styraciflua	15	No	FAC
4.			
5.			
6.			
7.			
8.			
	85	= Total Cover	
50% of total cover: 42.5	20% of total cover: 17		
Sapling/Shrub Stratum (Plot size: 15')			
1. Acer rubrum	30	Yes	FAC
2. Nyssa biflora	25	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	55	= Total Cover	
50% of total cover: 27.5	20% of total cover: 11		
Herb Stratum (Plot size: 5')			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		= Total Cover	
50% of total cover:	20% of total cover:		
Woody Vine Stratum (Plot size: 30')			
1. Smilax rotundifolia	5	Yes	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
50% of total cover: 2.5	20% of total cover: 1		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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:

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - 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 Four Vegetation Strata:

Tree – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vine – All woody vines greater than 3.28 ft in height.

Hydrophytic Vegetation Present? **Yes** X **No** _____

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

SOIL

Sampling Point: Wetland G - DP7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 4/1	100					SiL	
3-12+	10YR 6/1	95	10YR 6/8	5	C	M, PL	SL	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)
- ☐ Organic Bodies (A6) **(LRR P, T, U)**
- ☐ 5 cm Mucky Mineral (A7) **(LRR P, T, U)**
- ☐ Muck Presence (A8) **(LRR U)**
- ☐ 1 cm Muck (A9) **(LRR P, T)**
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Coast Prairie Redox (A16) **(MLRA 150A)**
- ☐ Sandy Mucky Mineral (S1) **(LRR O, S)**
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Dark Surface (S7) **(LRR P, S, T, U)**
- ☐ Polyvalue Below Surface (S8) **(LRR S, T, U)**
- ☐ Thin Dark Surface (S9) **(LRR S, T, U)**
- ☐ Loamy Mucky Mineral (F1) **(LRR O)**
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Marl (F10) **(LRR U)**
- ☐ Depleted Ochric (F11) **(MLRA 151)**
- ☐ Iron-Manganese Masses (F12) **(LRR O, P, T)**
- ☐ Umbric Surface (F13) **(LRR P, T, U)**
- ☐ Delta Ochric (F17) **(MLRA 151)**
- ☐ Reduced Vertic (F18) **(MLRA 150A, 150B)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 149A)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 149A, 153C, 153D)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR O)**
- ☐ 2 cm Muck (A10) **(LRR S)**
- ☐ Reduced Vertic (F18) **(outside MLRA 150A,B)**
- ☐ Piedmont Floodplain Soils (F19) **(LRR P, S, T)**
- ☐ Anomalous Bright Loamy Soils (F20) **(MLRA 153B)**
- ☐ 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** X **No** _____

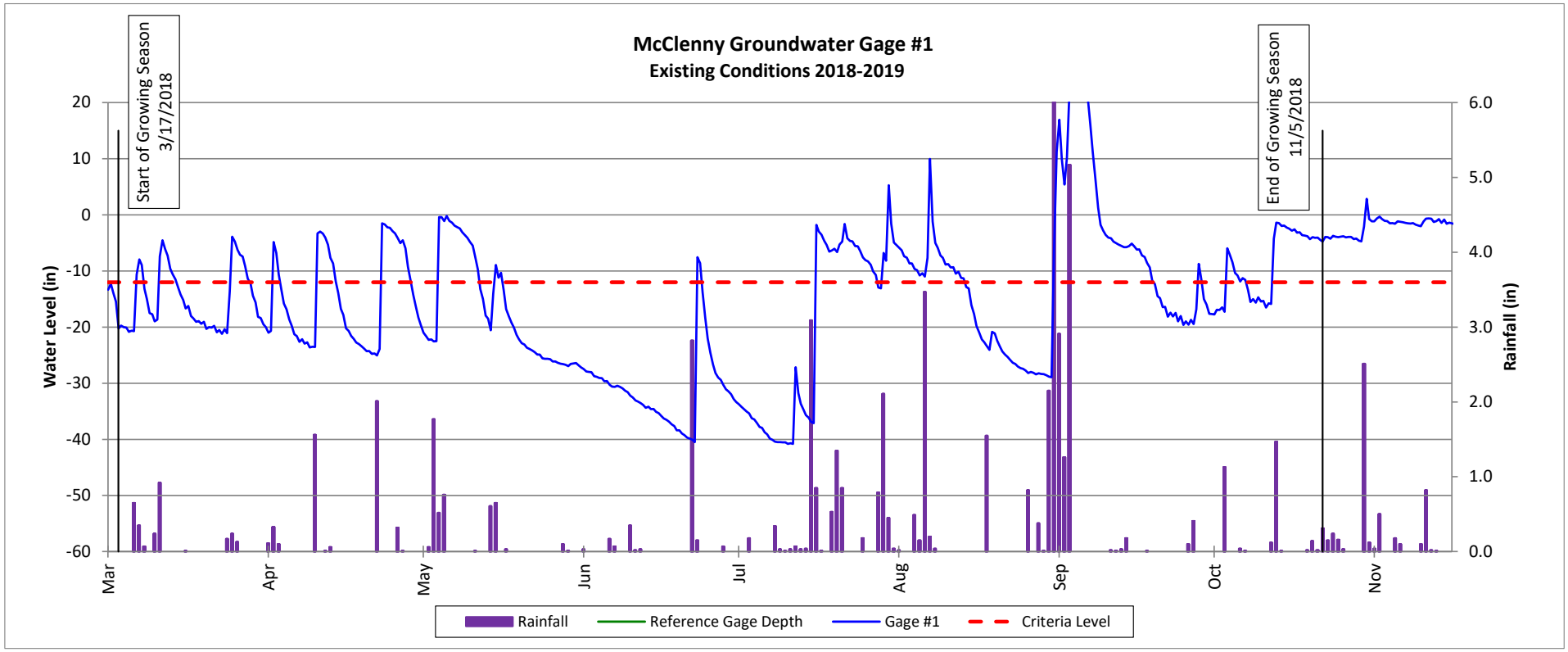
Remarks:

Appendix 6

Groundwater Gage Plots

McClenny Acres

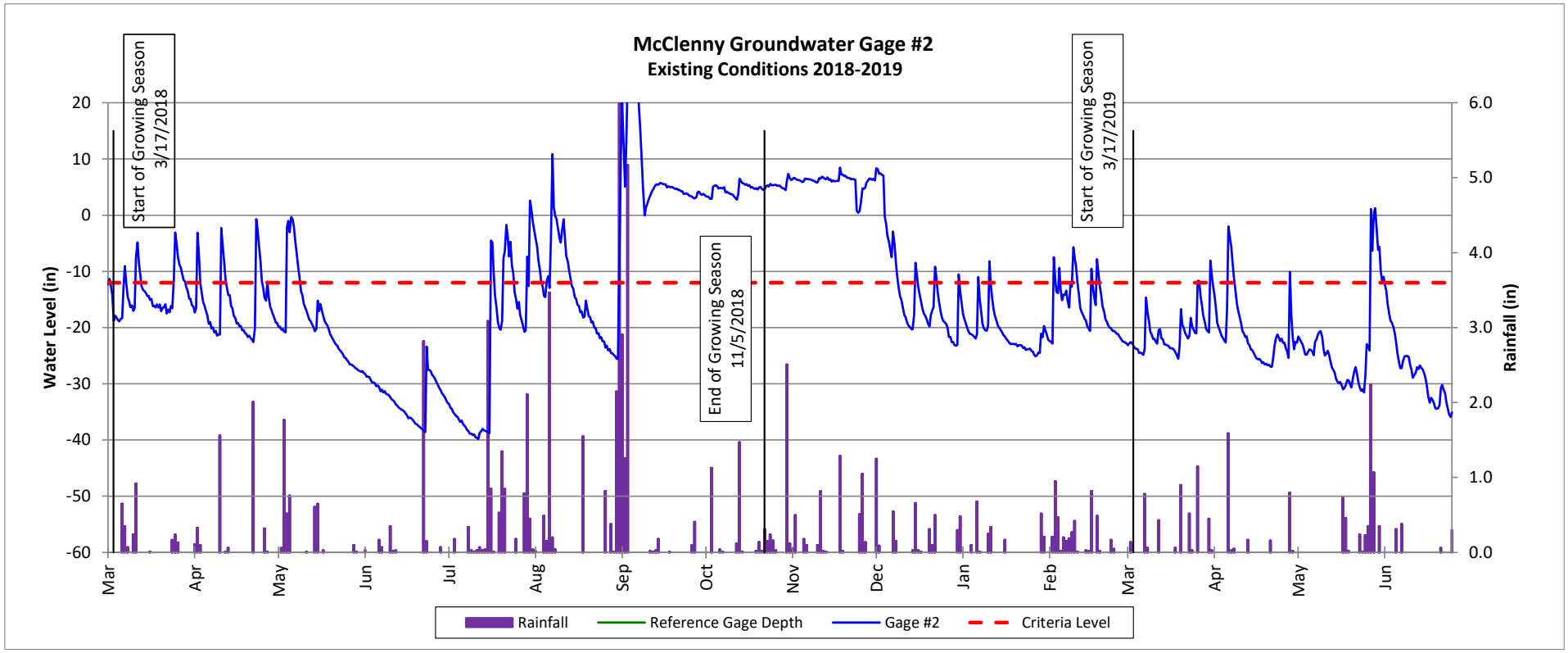
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

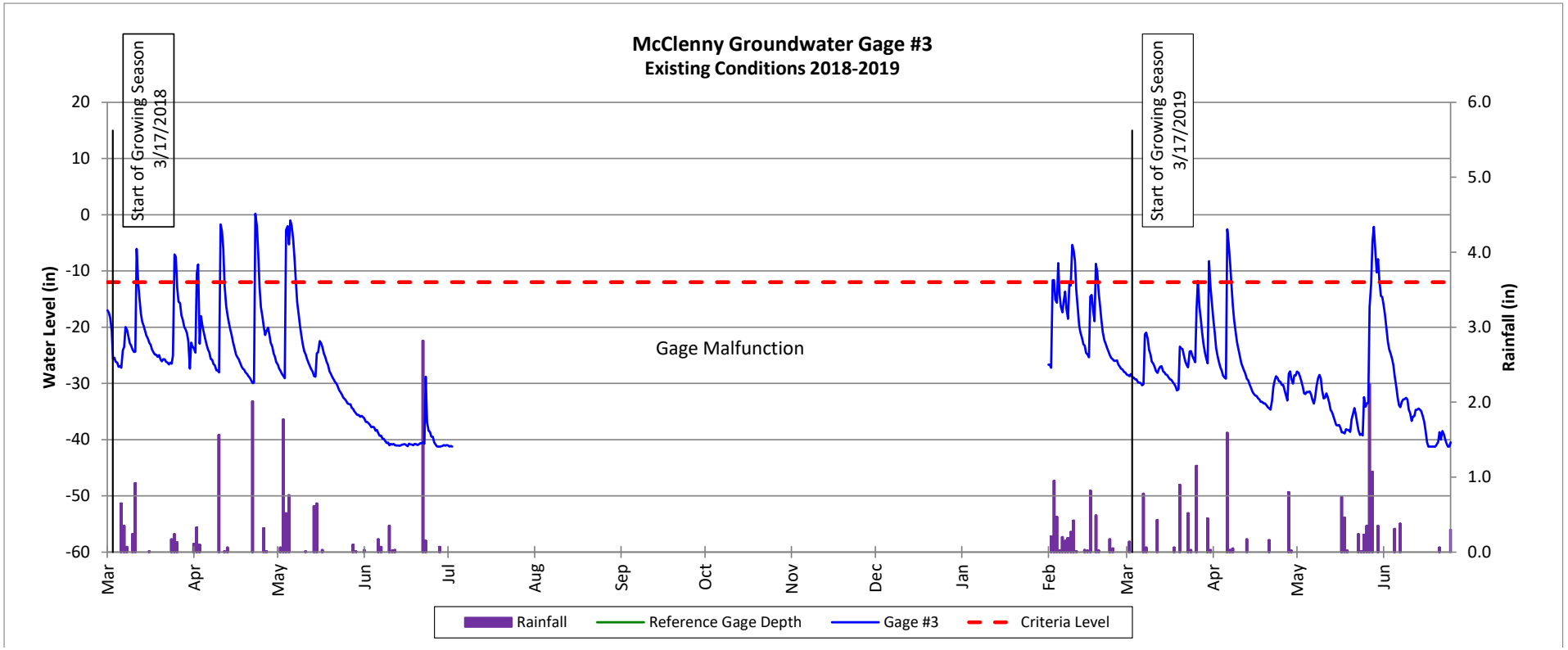
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

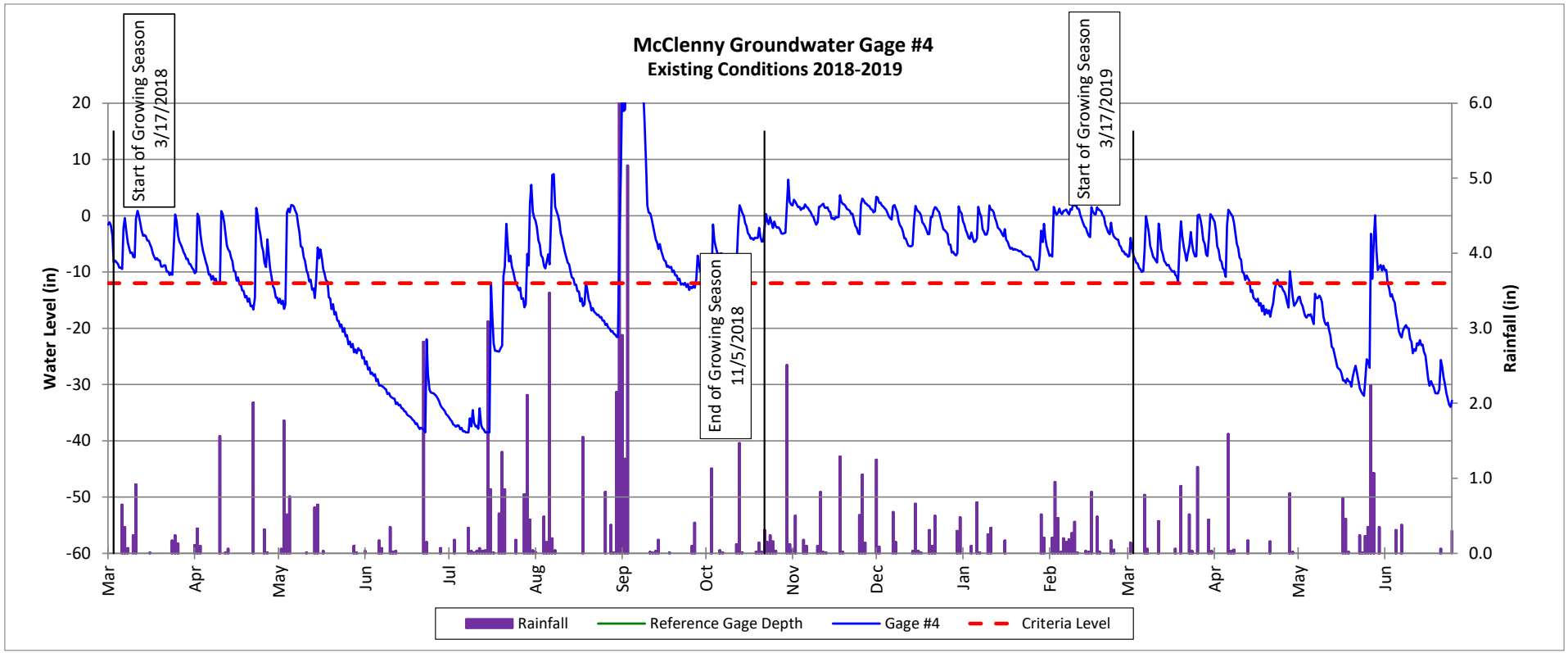
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

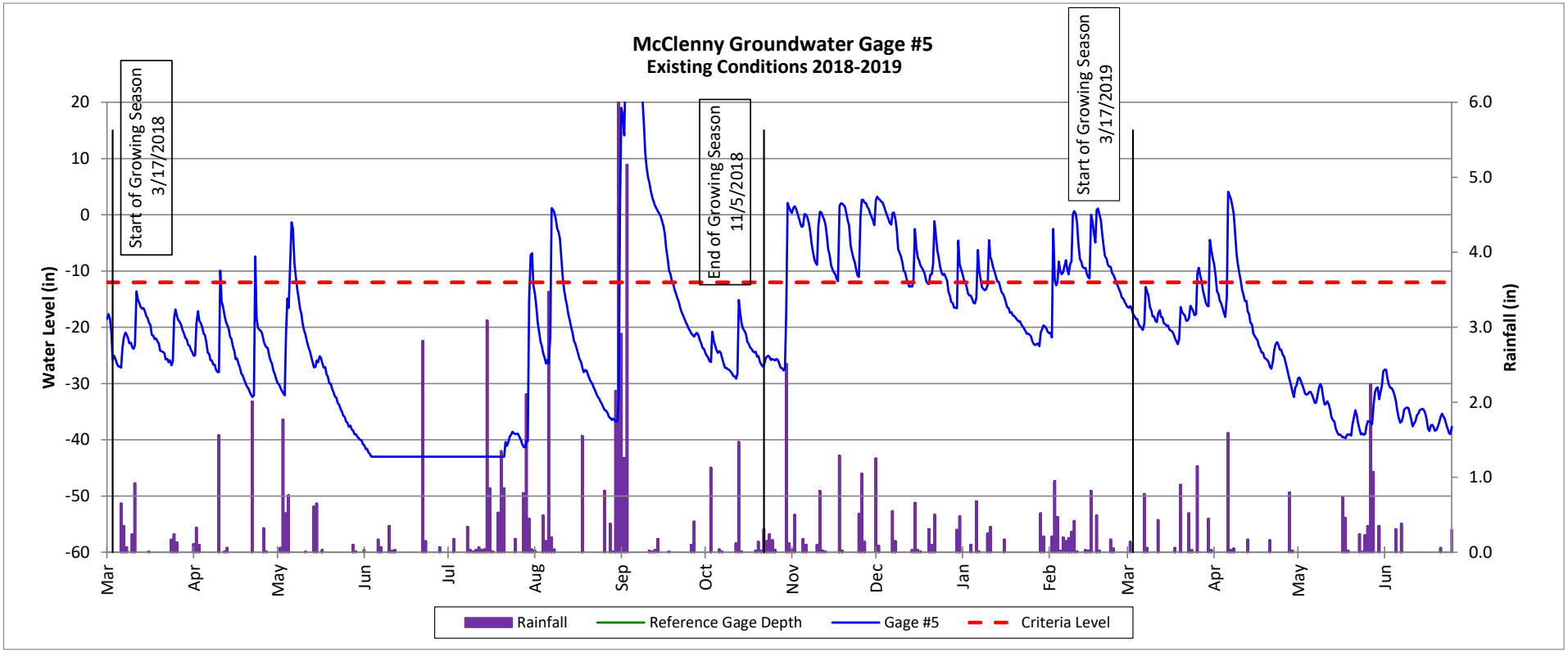
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

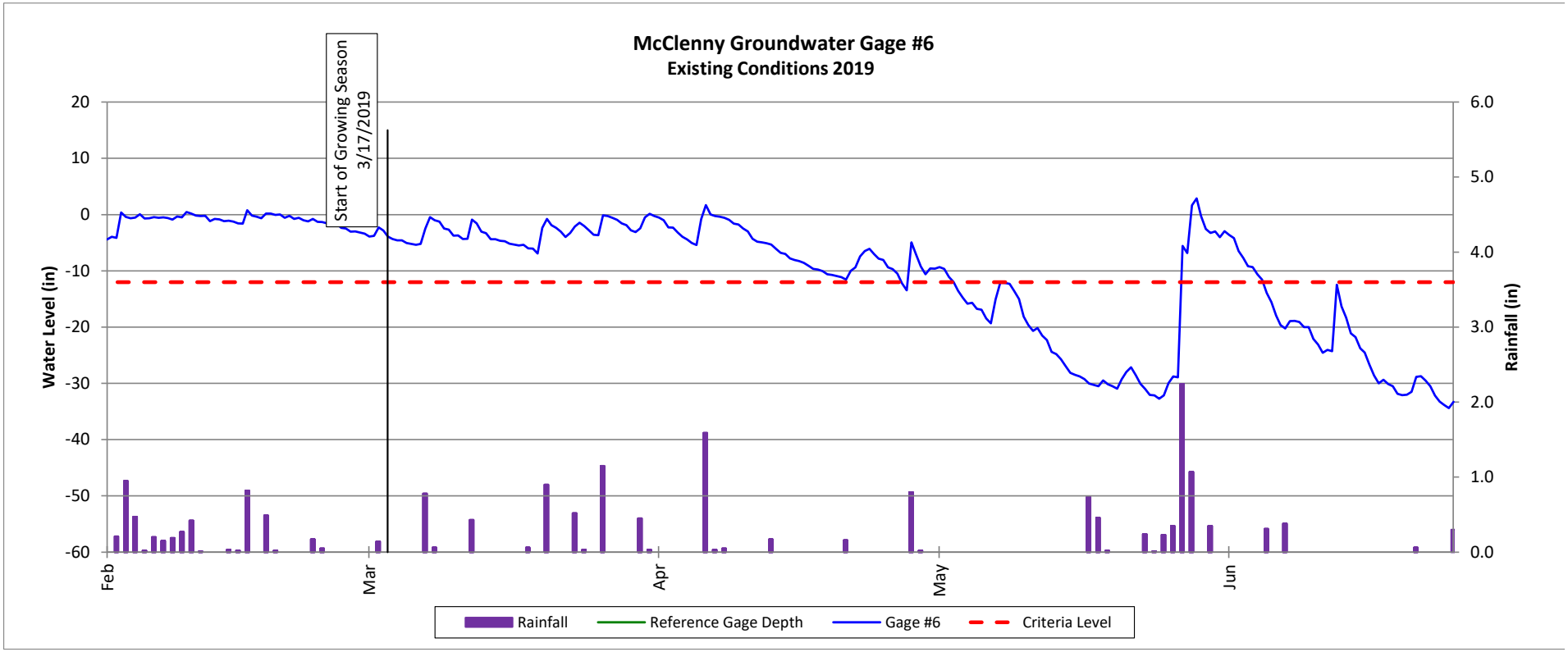
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

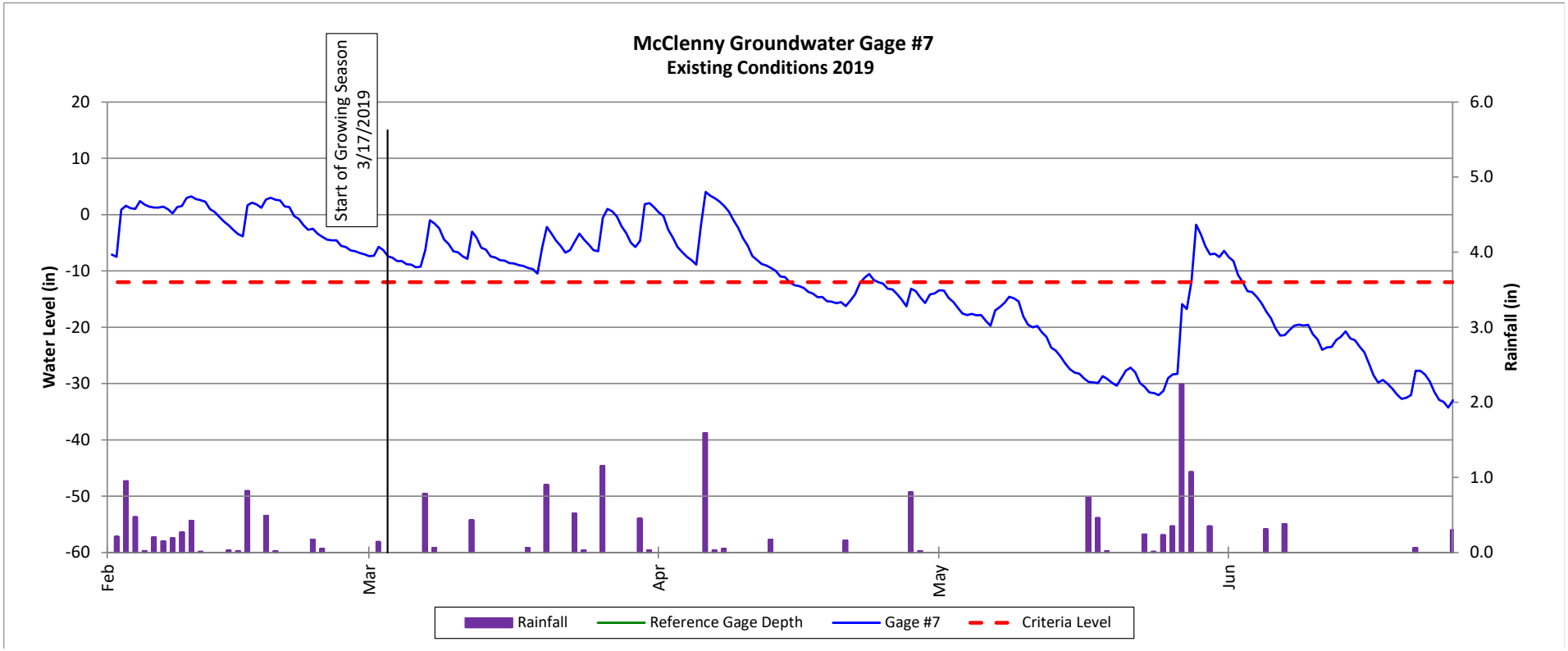
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

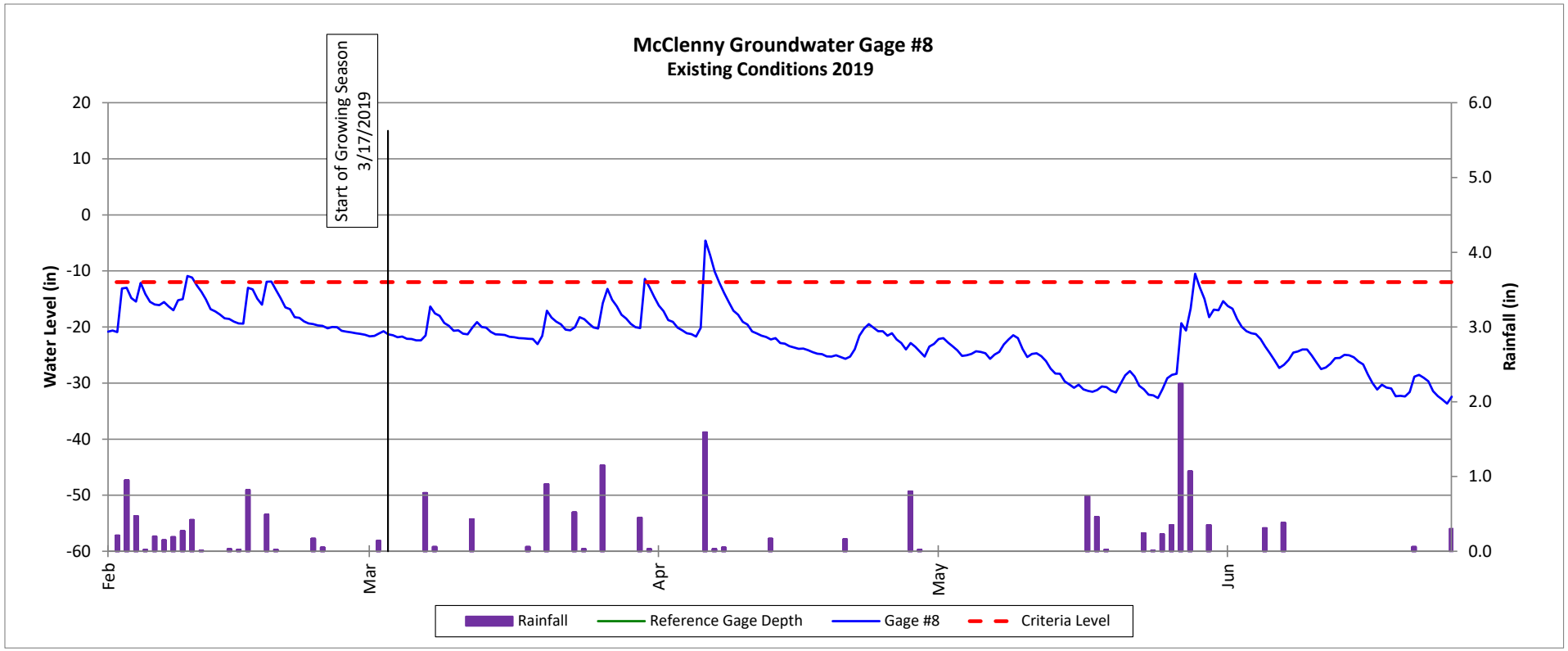
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

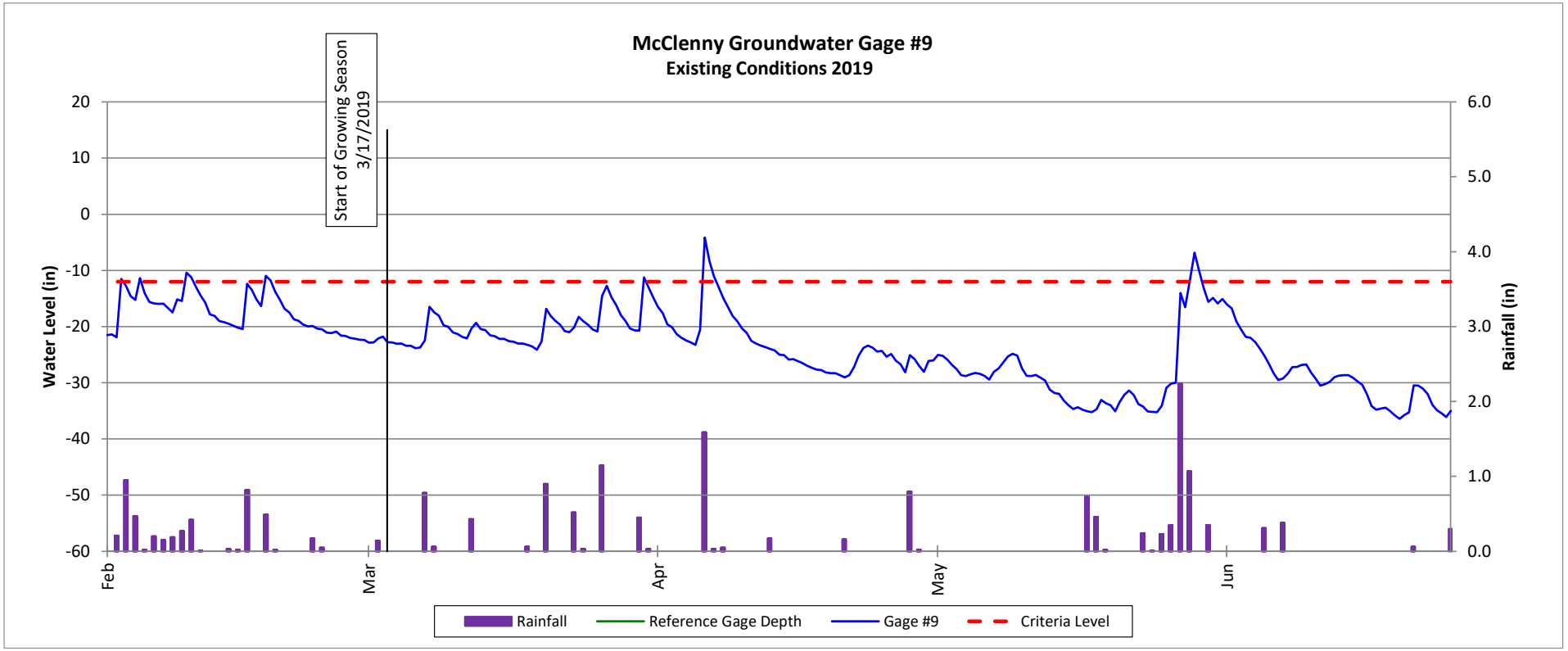
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

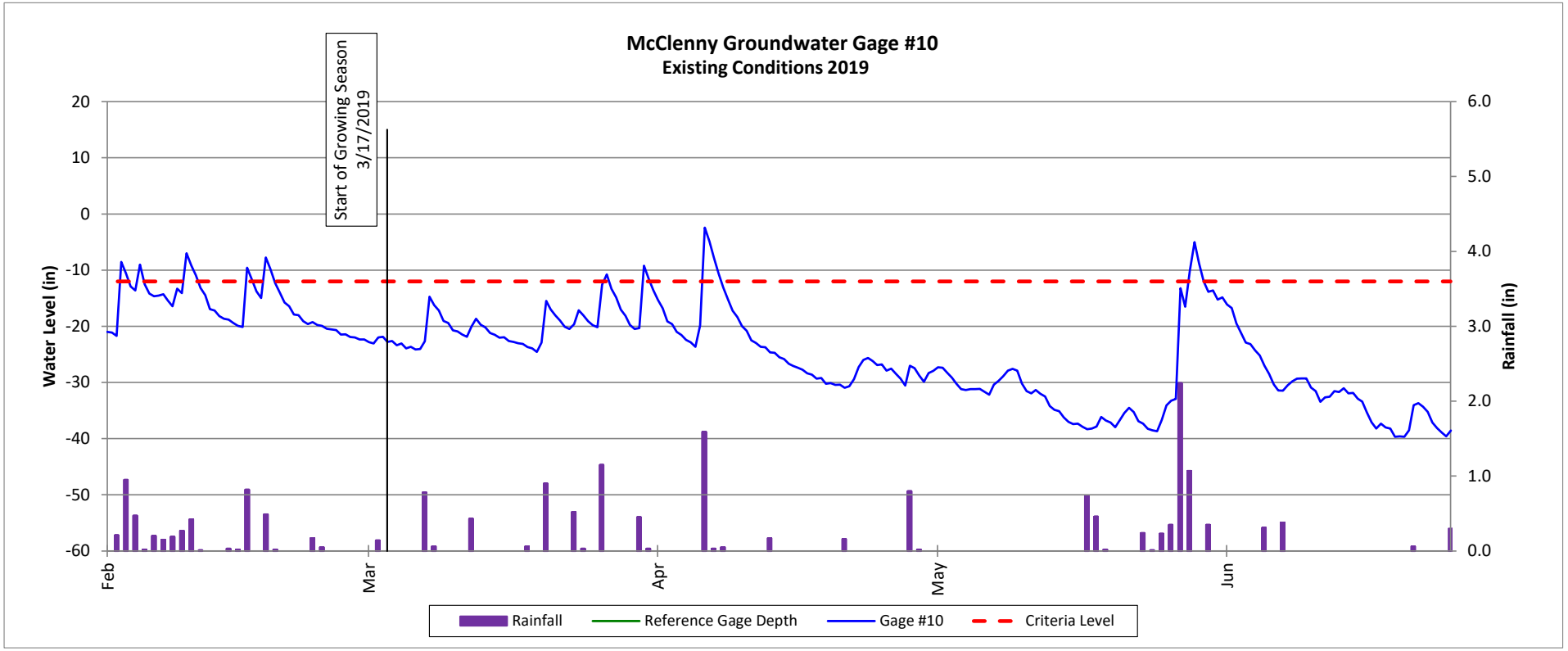
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

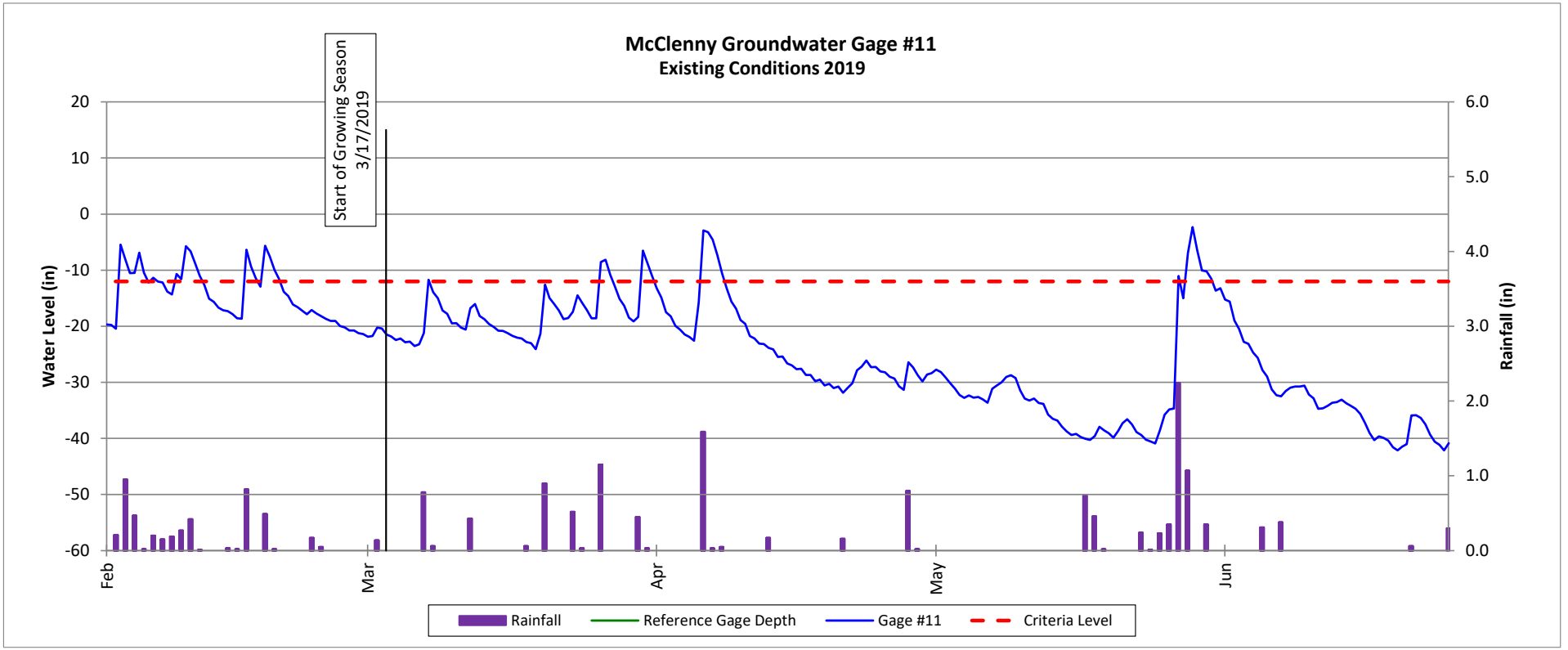
Existing Conditions 2018-2019



Groundwater Gage Plots

McClenny Acres

Existing Conditions 2018-2019



Appendix 7

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT1 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**MEDIUM**	
(4) Microtopography	**MEDIUM**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**LOW**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**LOW**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**MEDIUM**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**LOW**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**LOW**	

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT2 R1 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**HIGH**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**HIGH**	
(3) Streamside Area Attenuation	**HIGH**	
(4) Floodplain Access	**HIGH**	
(4) Wooded Riparian Buffer	**HIGH**	
(4) Microtopography	**HIGH**	
(3) Stream Stability	**MEDIUM**	
(4) Channel Stability	**HIGH**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**HIGH**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**HIGH**	
(3) Upland Pollutant Filtration	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**MEDIUM**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**HIGH**	
(2) In-stream Habitat	**MEDIUM**	
(3) Baseflow	**HIGH**	
(3) Substrate	**MEDIUM**	
(3) Stream Stability	**HIGH**	
(3) In-stream Habitat	**MEDIUM**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**HIGH**	

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT2 R2 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	NO
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**LOW**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**LOW**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**LOW**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**MEDIUM**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**LOW**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**LOW**	

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT3 R1 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**LOW**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**LOW**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**LOW**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**MEDIUM**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**LOW**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**LOW**	

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT3 R2 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**MEDIUM**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**LOW**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**LOW**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**MEDIUM**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**LOW**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**MEDIUM**	
(3) Stream-side Habitat	**MEDIUM**	
(3) Thermoregulation	**MEDIUM**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**LOW**	

NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name: McClenny Acres UT4 R1 | Date of Evaluation: 9/24/18
Stream Category: Ia1 | Assessor Name/Organization: Carolyn Lanza

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	NO
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**MEDIUM**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**MEDIUM**	
(3) Streamside Area Attenuation	**HIGH**	
(4) Floodplain Access	**HIGH**	
(4) Wooded Riparian Buffer	**HIGH**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**HIGH**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**LOW**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**HIGH**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**MEDIUM**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**HIGH**	
(2) Indicators of Stressors	**NO**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone Habitat	NA	
Overall	**MEDIUM**	

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/2015	**Project/Site:** McClenny	**Latitude:**
Evaluator: D. Taylor	**County:** Wayne	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 30.25	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* UT 1

A. Geomorphology (Subtotal = 12)	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 = 10)				
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 = 8.25)				
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:

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/15	Project/Site: McCENNY	Latitude:
Evaluator: D. TAYLOR	County: WAYNE	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 30.75	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other *e.g. Quad Name:* UT2

A. Geomorphology (Subtotal = 16)	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)				
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 = 7.75)				
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:

NC DWQ Stream Identification Form Version 4.11 UT3 above UT2 confluence

Date: 9/13/17	Project/Site: McClenny	Latitude:
Evaluator: JH	County: Wayne	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 28.75	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:*

A. Geomorphology (Subtotal = 12.5)	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 = 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 = 7.75)				
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:

NC DWQ Stream Identification Form Version 4.11 UT3 below UT2 confluence

Date: 9/13/17	Project/Site: McClenny	Latitude:
Evaluator: JH	County: Wayne	Longitude:
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 32.5	Stream Determination (circle one) Ephemeral Intermittent (Perennial)	Other *e.g. Quad Name:*

A. Geomorphology (Subtotal = 14.5)	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 = 8.5)				
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:

NC DWQ Stream Identification Form Version 4.11

Date: 10/22/15	**Project/Site:** McClenny	**Latitude:**
Evaluator: D. TAYLOR	**County:** WAYNE	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 37.75	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* UT 4

A. Geomorphology (Subtotal = 16)	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

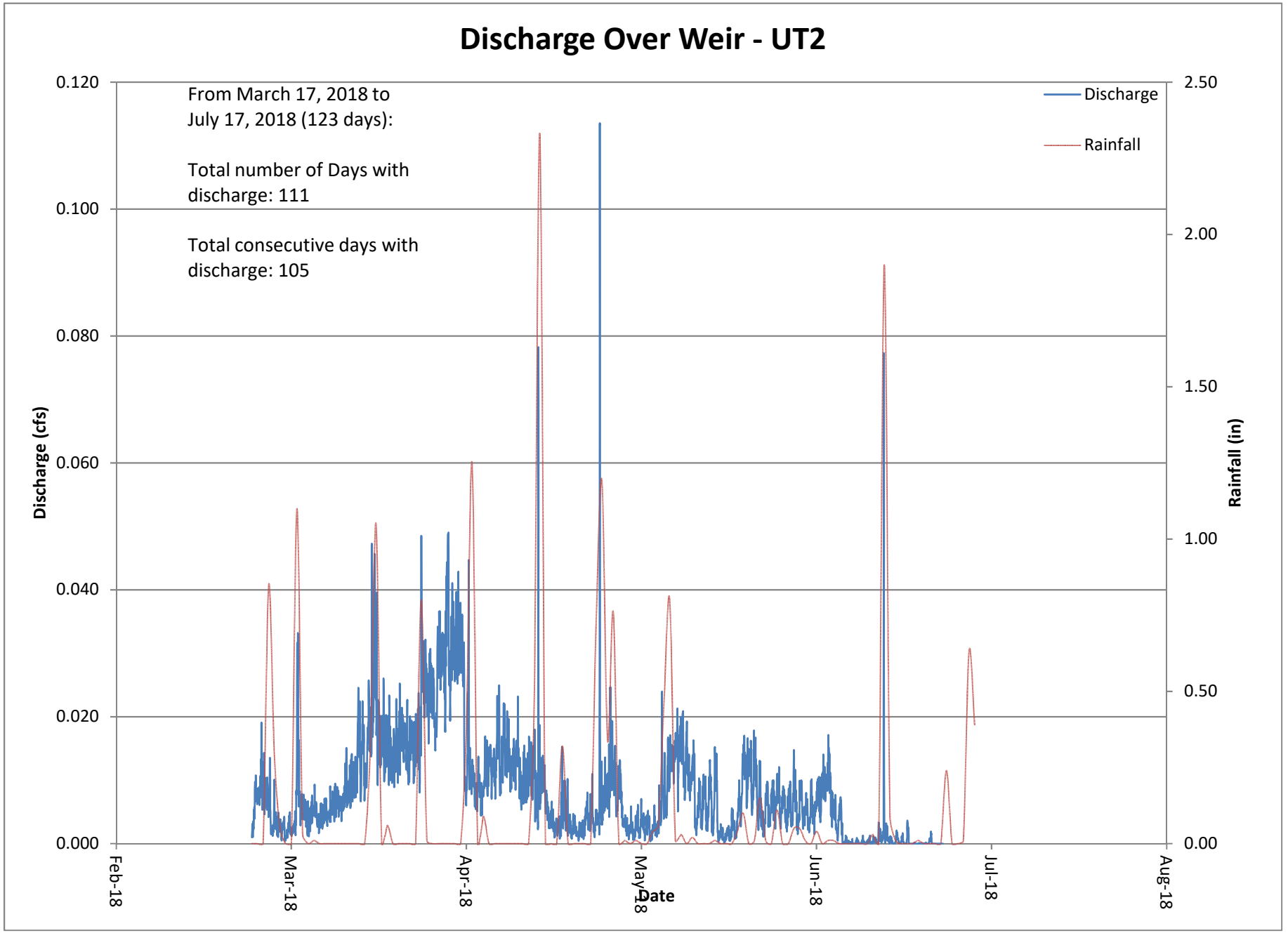
B. Hydrology (Subtotal = 12)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	[redacted]	(3)
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

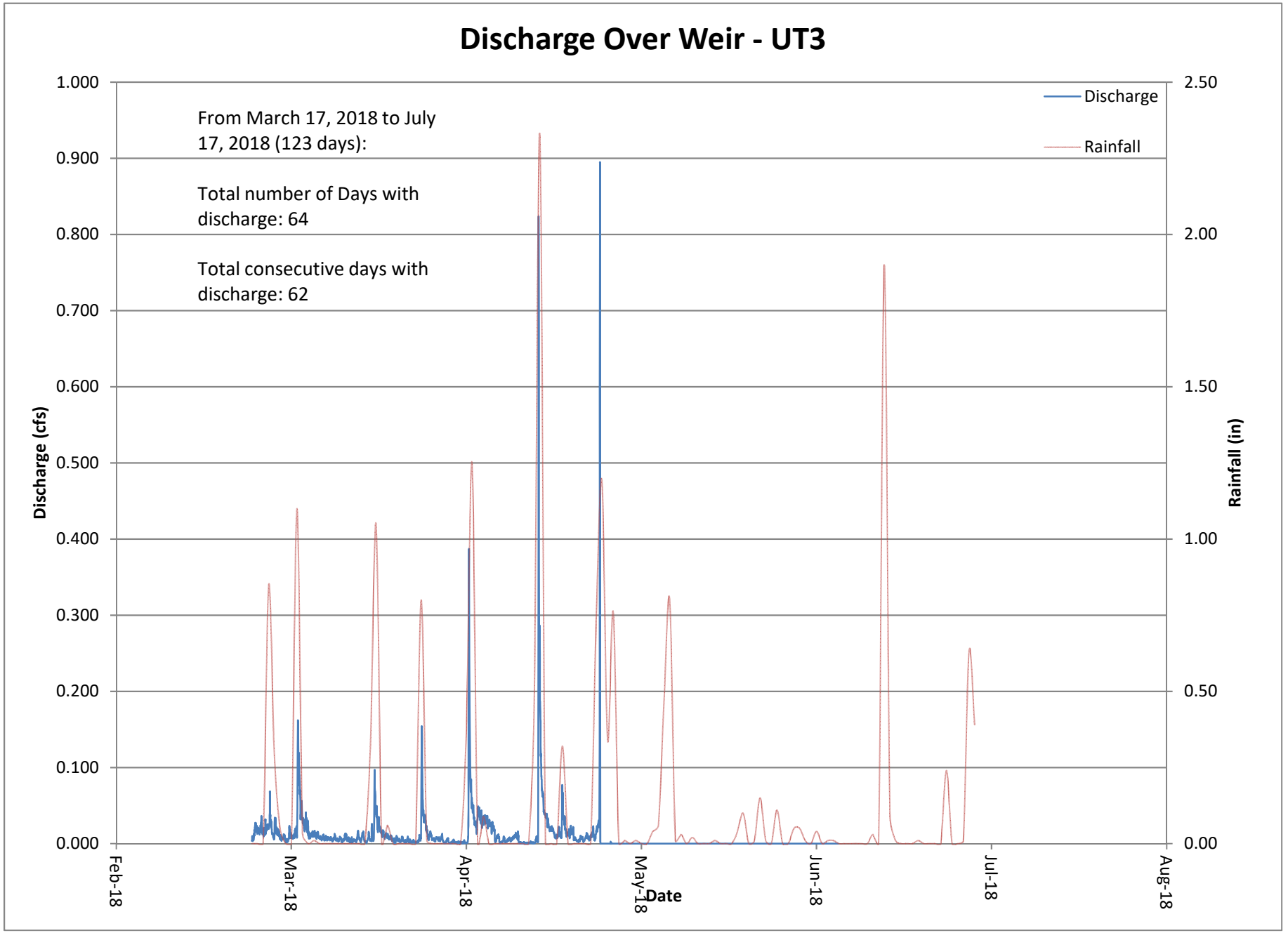
C. Biology (Subtotal = 9.75)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	0	(1)	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(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:


Discharge Over Weir - UT2
From March 17, 2018 to
July 17, 2018 (123 days):
Total number of Days with
discharge: 111
Total consecutive days with
discharge: 105
Discharge
Rainfall
0.120
0.100
0.080
0.060
0.040
0.020
0.000
2.50
2.00
1.50
1.00
0.50
0.00
Discharge (cfs)
Rainfall (in)
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18
Date


Discharge Over Weir - UT3
From March 17, 2018 to July 17, 2018 (123 days):
Total number of Days with discharge: 64
Total consecutive days with discharge: 62
Discharge
Rainfall
Discharge (cfs)
Rainfall (in)
Date
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
2.50
2.00
1.50
1.00
0.50
0.00
Feb-18
Mar-18
Apr-18
May-18
Jun-18
Jul-18
Aug-18

Water Resources
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 6, 2018

Wildlands Engineering, Inc
Attention: John Hutton
312 West Millbrook Rd, Suite 225
Raleigh, NC 27609

DWR Project #18-0197v3
Wayne County

Subject: On-Site Determination for Applicability to the Neuse River Riparian Buffer Rules and Water Quality Standards (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Full Delivery Site

Address/Location: 1100 Old Smithfield Rd, Goldsboro, NC

Stream(s) Evaluated: UTs to the Neuse River

Determination Date: February 22, 2018

DWR Staff: Katie Merritt

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☒ Intermittent/Perennial Determination (where local buffer ordinances apply)

At the request of Wildlands Engineering, Inc, staff from the Division of Water Resources (DWR) conducted two (2) site visits on a parcel located near the location indicated above, for purposes of determining applicability of the Neuse River Riparian Buffer Rules & Water Quality Standards. The second site visit was performed on April 5, 2018 and referenced in correspondence dated April 5, 2018 (DWR# 2018-0197v2). See the following table and written explanation regarding the stream determinations performed on February 22, 2018.

Feature ID[1]	Feature Type[2]	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
UT1	Stream (I)		X	Property Boundary	Confluence with UT-3	X	X
UT2[3]							
UT3	Stream (I)	X		See Map	Confluence with UT-4		
UT4	Stream (P)		X	Confluence with UT-3	Property Boundary	X	
A	Ditch	X		See map	Confluence with UT-3		X
B	Ditch			See map	Confluence with UT-2		
C	Not assessed			See map			
D	Not Assessed			See map			

[1] See maps provided with letter showing labeled features
[2] Ephemeral (E), Intermittent (I), Perennial (P)
[3] Stream Determination performed on April 5, 2018 by DWR Washington Regional Office

The DWR has determined that some of the streams listed above have been located on the most recently published NRCS Soil Survey of Wayne County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and were evaluated for applicability to the Neuse Riparian Buffer Rule.

Maps are provided with this letter from Wildlands Engineering, Inc and were initialed by Katie Merritt on April 6, 2018. Each feature that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property or not depicted on the required maps. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of the date of this letter to the Director in writing.

If sending via US Postal Service:

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
512 N. Salisbury Street
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested within sixty (60) days.

This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Raleigh Regulatory Field Office at (919)-554-4884.

If you have questions regarding this determination, please feel free to contact Katie Merritt at (919) 807-6371.

Sincerely,

Karen Higgins

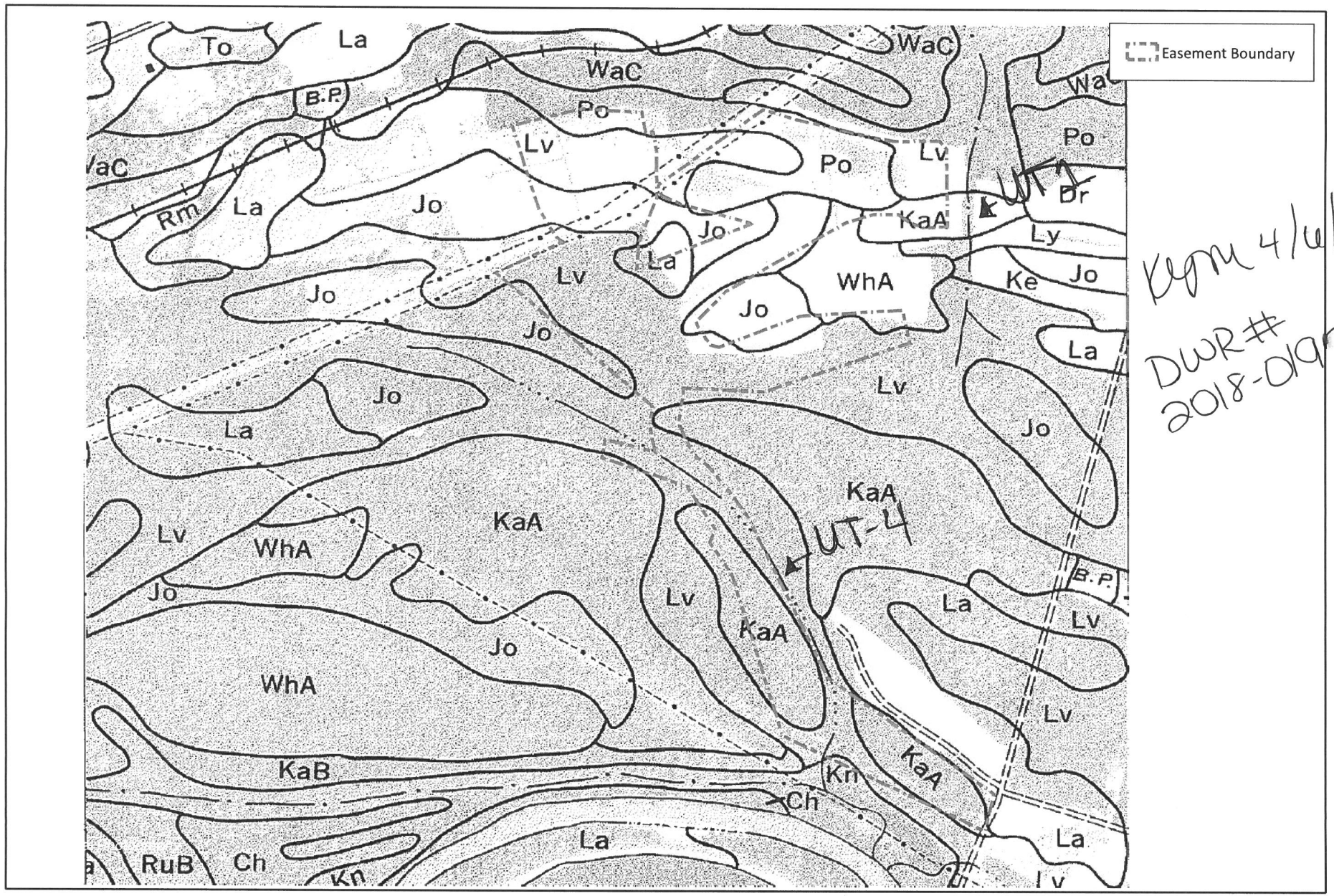
Karen Higgins, Supervisor
401 & Buffer Permitting Branch

Attachments: USGS Topographic Map, Wayne County Soil Survey Map, and Figure A

cc: William McClenny, 4700 Glenn Forest Dr., Raleigh, NC 27612
401 & Buffer Permitting Branch file
RRO DWR file

Filename: 180197v3McClennyMitSite(Wayne)_Neuse_StreamDet.docx


ATHFIELD RD
110
105
90
100
95
80
75
60
UT-1
A
DWR#
2018-0197v3
KGM 4/6/18



WILDLANDS ENGINEERING

1974 NRCS Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Kgm 4/6/18

DWR# 2018-0197v3

Figure A: McClenny Acres Full Delivery Site – DWR Stream Determination & Site Viability

Kym 4/6/18
DWR # 2018-0197v3

Water Resources
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 5, 2018

William A McClenny
4700 Glenn Forest Drive
Raleigh, NC 27612

DWR #18-0197 V2
WAYNE County

Subject: On-Site Determination for Applicability to Neuse Riparian Buffer Rules (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Mitigation Site

Address/Location: Immediately South of Intersection of NC Highway 581 and Old Smithfield Road, Goldsboro

Stream(s) Evaluated: Ut to Neuse River

Determination Date: 4/3/18 Staff: Anthony Scarbraugh

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☐ Intermittent/Perennial Determination

Stream	E/I/P*	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
18-0197 V2	I	X		Flag: 18-0197 V2 Begin	Flag: 18-0197 V2 End		X

**E/I/P/NSP = Ephemeral/Intermittent/Perennial/No Stream Present*

The Division of Water Resources (DWR) has determined that the stream listed above and included on the attached map have been located on the most recent published NRCS Soil Survey of WAYNE County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and evaluated for applicability to the NEUSE River Riparian Buffer Rules. Each stream that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act. **Please note, previous stream determinations were performed by Mrs. Katie Merritt of DWR Central Office on February 22, 2018.**

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of date of this letter to the Director in writing.

If sending via US Postal Service:
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
512 N. Salisbury Street
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested within sixty (60) days.

This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Washington Regulatory Field Office at (919)-554-4884 Ext. 22.

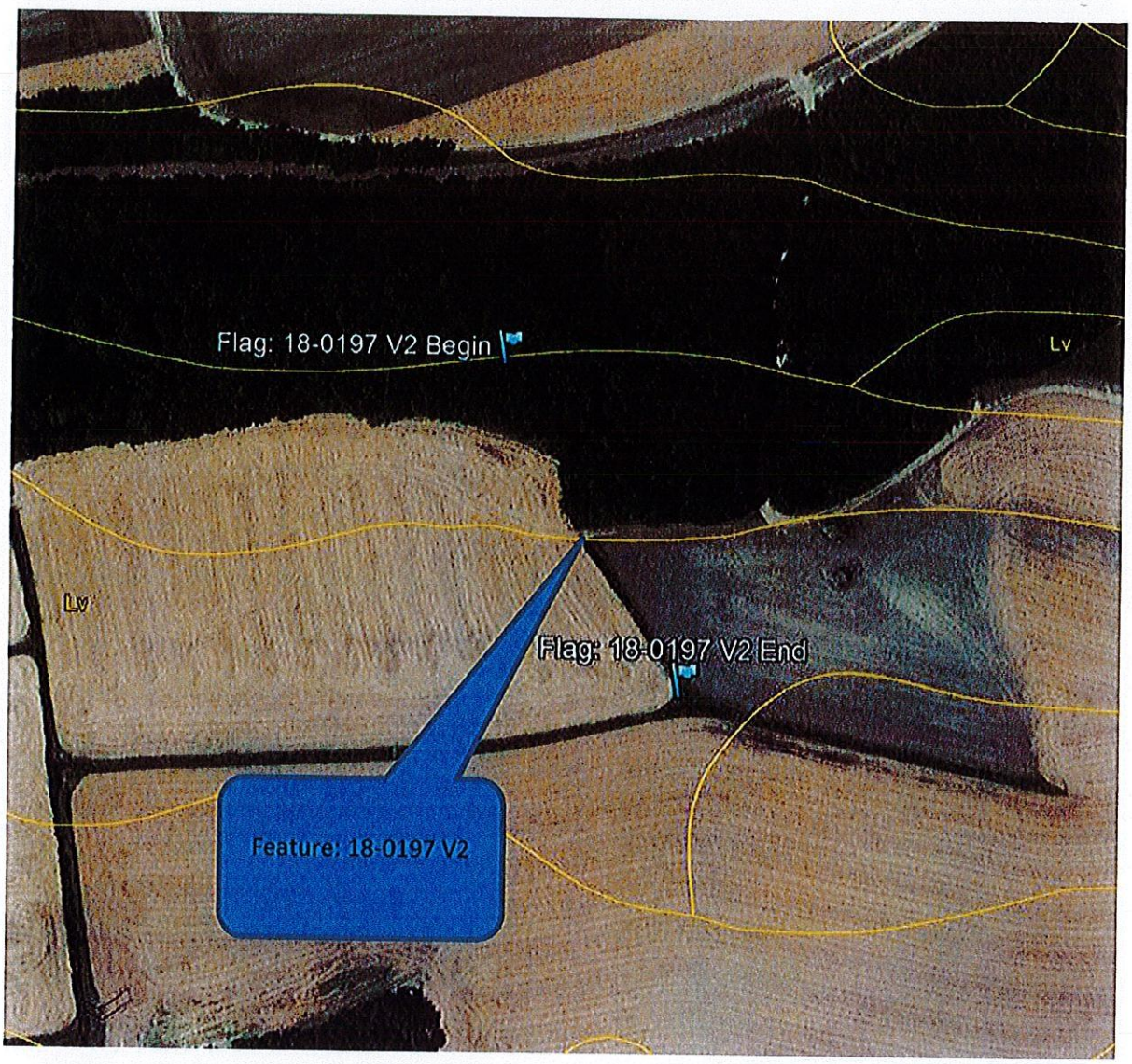
If you have questions regarding this determination, please feel free to contact Anthony Scarbraugh at (252) 948-3924.

Sincerely,

Robert Tankard, Assistant Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ

cc: WaRO DWR File Copy
LASERFICHE
Daniel Taylor, Wildland Engineering, Inc., (via email: dtaylor@wildlandseng.com)

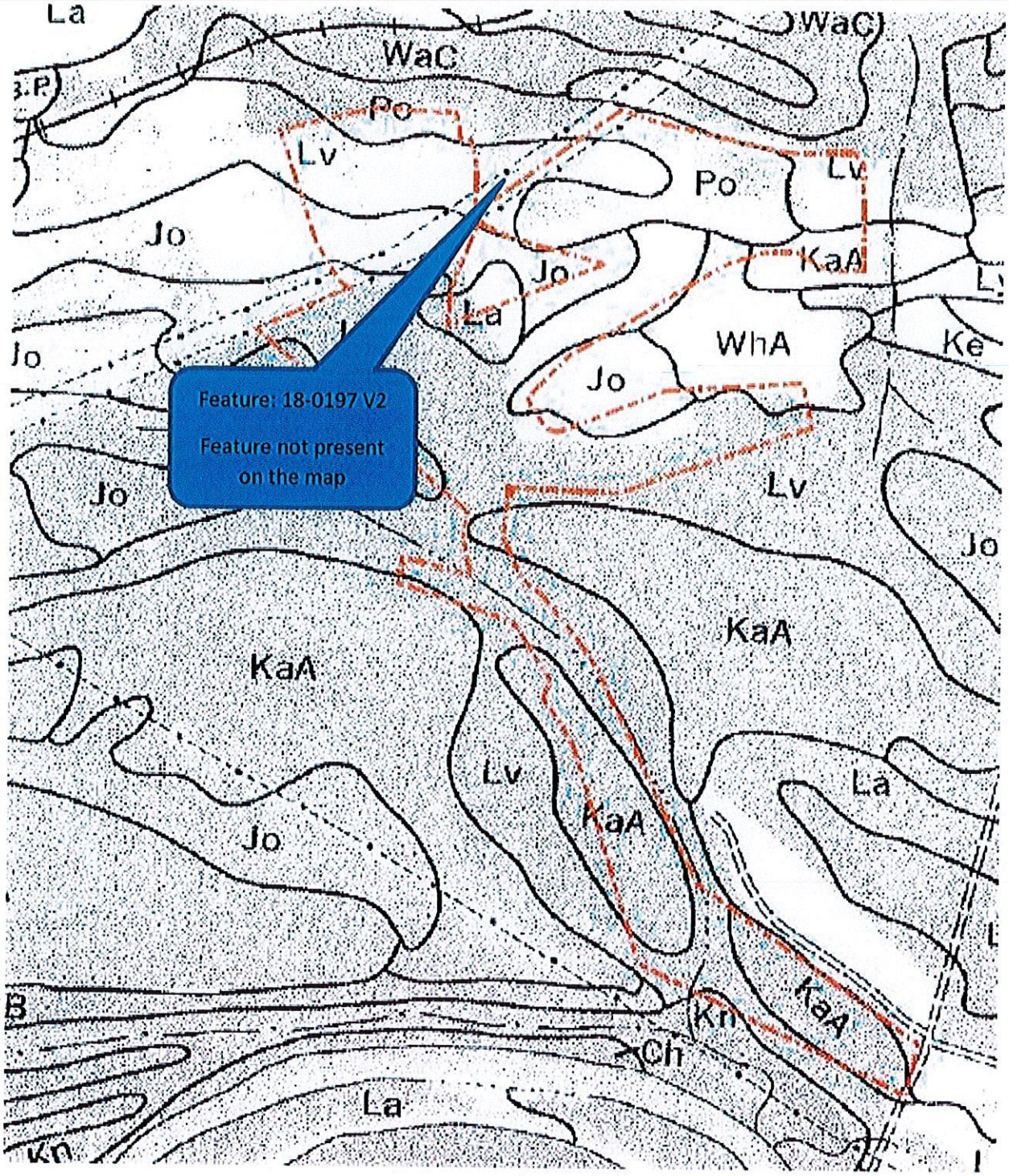
Google Earth Imagery Date: 5/14/2016



USGS Topo Map 1:24,000

North Carolina Environmental Management Commission
Division of Water Resources
For: NEUSE Basin Buffer
Date 4/5, 2018
Reviewed by AJ

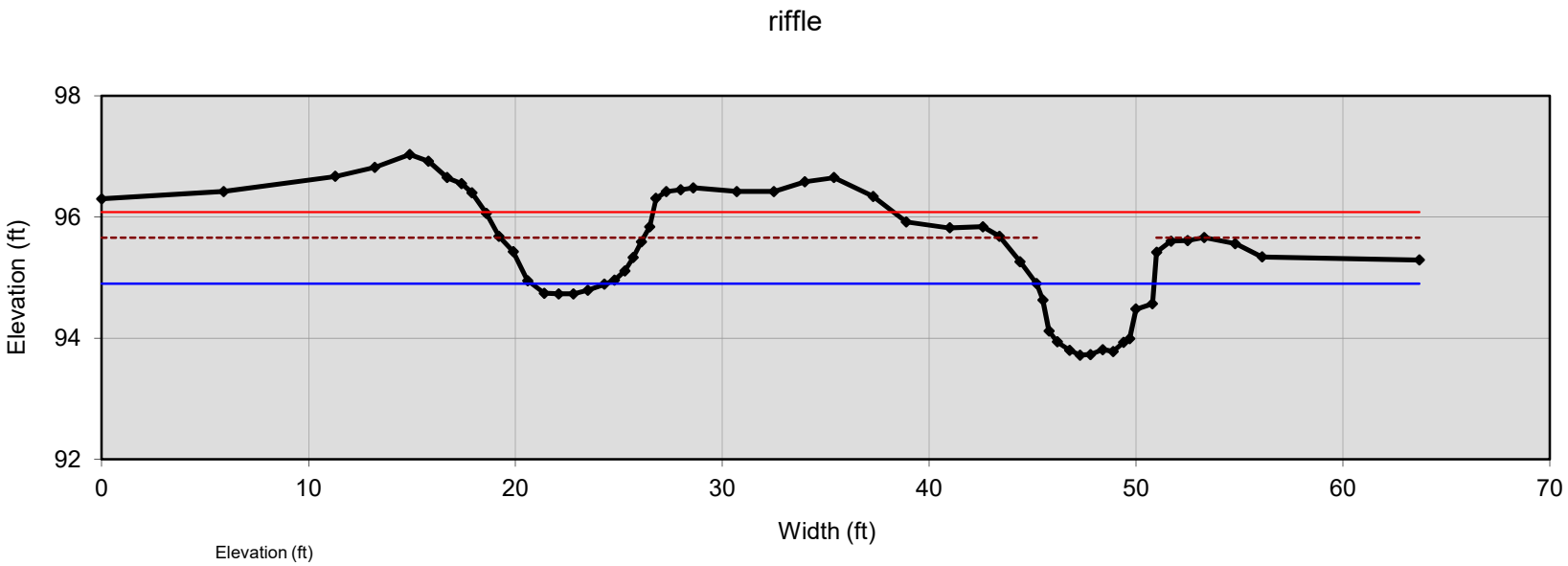
Wayne County NRCS Soils Map



North Carolina Environmental Management Commission
Division of Water Resources
For: NRUE Basin Buffer
Date 4/5, 2018
Reviewed by AS

Appendix 8

Cross Section UT1 XS1



Bankfull Dimensions

4.9	x-section area (ft.sq.)
5.7	width (ft)
0.9	mean depth (ft)
1.2	max depth (ft)
6.7	wetted parimeter (ft)
0.7	hydrualic radius (ft)
6.6	width-depth ratio

Flood Dimensions

100.0	W flood prone area (ft)
17.6	entrenchment ratio
1.9	low bank height (ft)
1.6	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
5	threshold grain size (mm):

Rosgen Stream Type

E5

Bankfull Flow

2.5	velocity (ft/s)
12.2	discharge rate (cfs)
0.52	Froude number

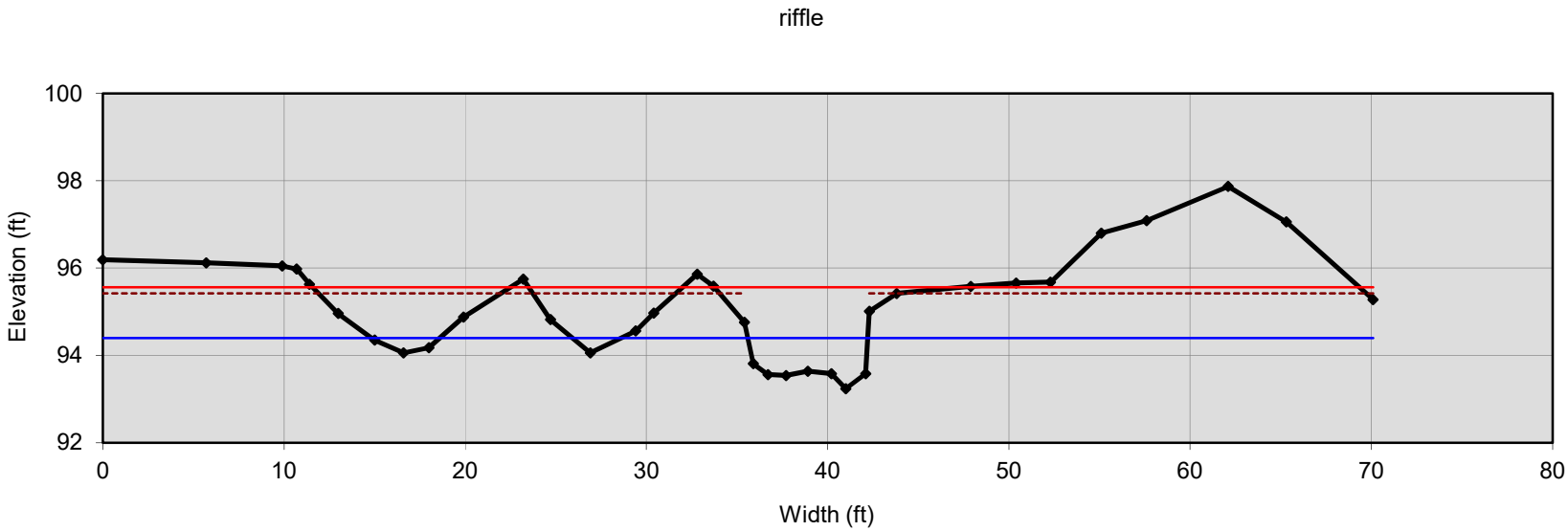
Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.21	channel slope (%)
0.10	shear stress (lb/sq.ft.)
0.22	shear velocity (ft/s)
0.28	unit strm power (lb/ft/s)

Cross Section UT1 XS2



Bankfull Dimensions

5.4	x-section area (ft.sq.)
6.6	width (ft)
0.8	mean depth (ft)
1.2	max depth (ft)
7.9	wetted parimeter (ft)
0.7	hydrualic radius (ft)
8.1	width-depth ratio

Flood Dimensions

10.0	W flood prone area (ft)
1.5	entrenchment ratio
2.2	low bank height (ft)
1.9	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
5	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

2.5	velocity (ft/s)
13.5	discharge rate (cfs)
0.53	Froude number

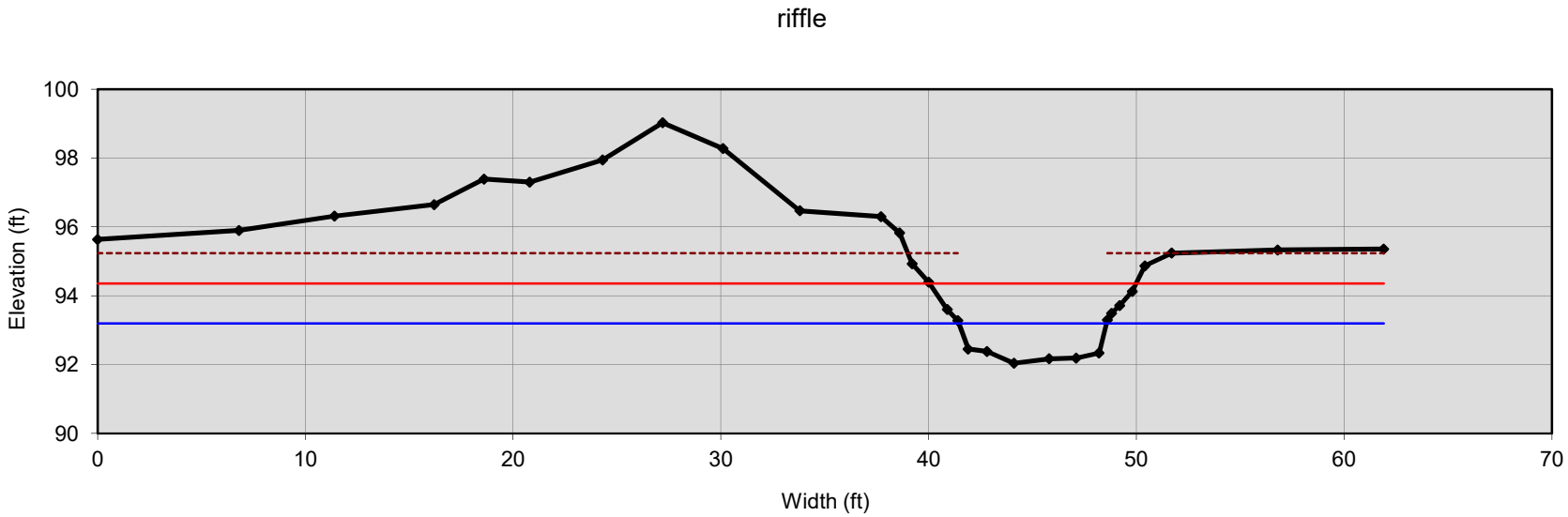
Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.22	channel slope (%)
0.10	shear stress (lb/sq.ft.)
0.22	shear velocity (ft/s)
0.28	unit strm power (lb/ft/s)

Cross Section UT1 XS3



Bankfull Dimensions

6.5	x-section area (ft.sq.)
7.1	width (ft)
0.9	mean depth (ft)
1.2	max depth (ft)
8.2	wetted parimeter (ft)
0.8	hydraulic radius (ft)
7.7	width-depth ratio

Flood Dimensions

9.9	W flood prone area (ft)
1.4	entrenchment ratio
3.2	low bank height (ft)
2.8	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
3	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

2.0	velocity (ft/s)
13.2	discharge rate (cfs)
0.40	Froude number

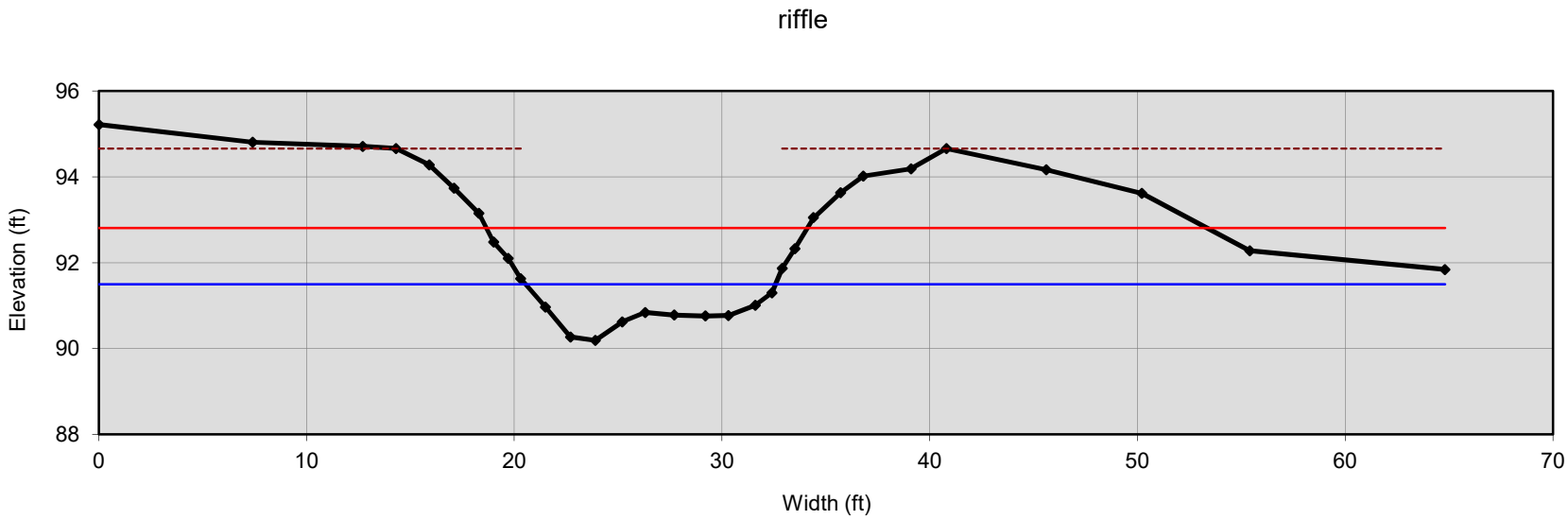
Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.12	channel slope (%)
0.06	shear stress (lb/sq.ft.)
0.18	shear velocity (ft/s)
0.14	unit strm power (lb/ft/s)

Cross Section UT3 XS4



Bankfull Dimensions

9.1	x-section area (ft.sq.)
12.0	width (ft)
0.8	mean depth (ft)
1.3	max depth (ft)
12.6	wetted parimeter (ft)
0.7	hydrualic radius (ft)
16.0	width-depth ratio

Flood Dimensions

12.6	W flood prone area (ft)
1.0	entrenchment ratio
4.5	low bank height (ft)
3.4	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
1	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

1.1	velocity (ft/s)
9.8	discharge rate (cfs)
0.23	Froude number

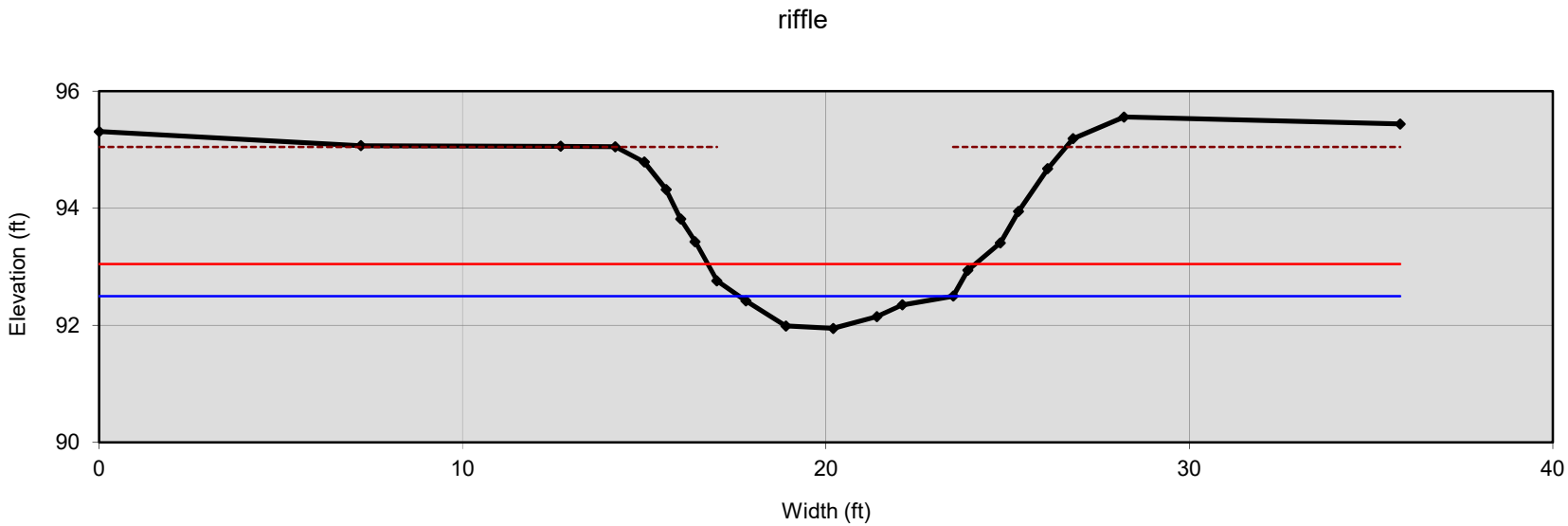
Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.04	channel slope (%)
0.02	shear stress (lb/sq.ft.)
0.10	shear velocity (ft/s)
0.02	unit strm power (lb/ft/s)

Cross Section UT2 XS5



Bankfull Dimensions

1.8	x-section area (ft.sq.)
5.9	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
6.0	wetted parimeter (ft)
0.3	hydraulic radius (ft)
18.8	width-depth ratio

Flood Dimensions

7.0	W flood prone area (ft)
1.2	entrenchment ratio
3.1	low bank height (ft)
5.6	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
4	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

2.1	velocity (ft/s)
3.9	discharge rate (cfs)
0.68	Froude number

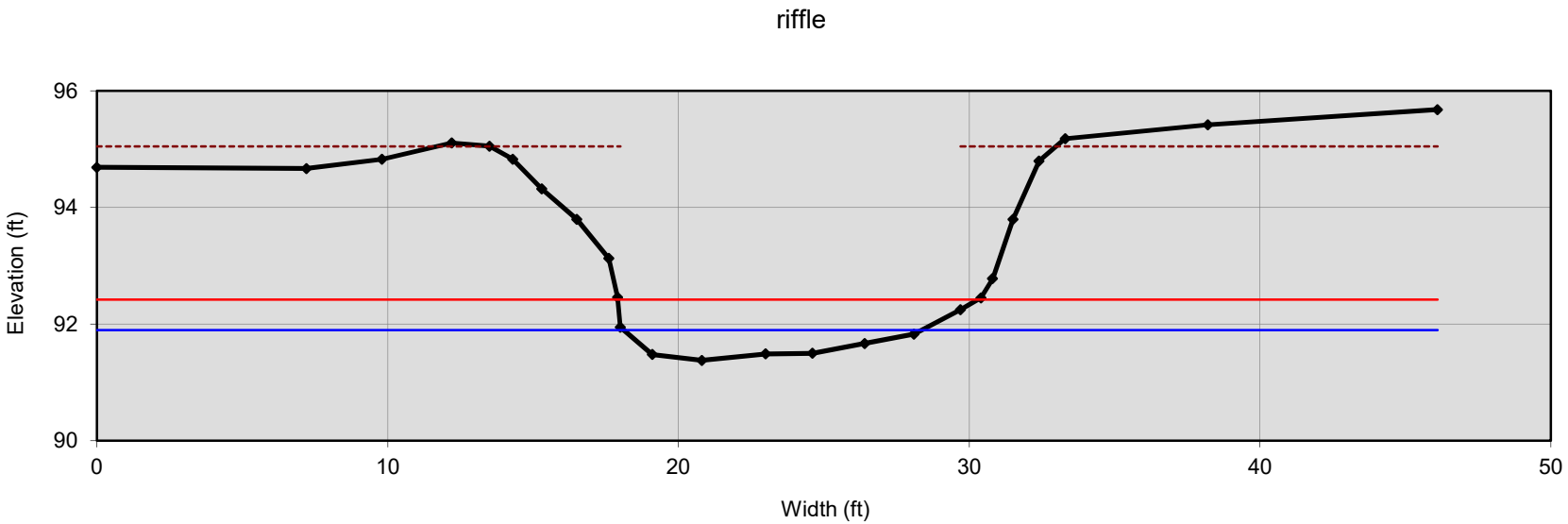
Flow Resistance

0.022	Manning's roughness
0.08	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.48	channel slope (%)
0.09	shear stress (lb/sq.ft.)
0.22	shear velocity (ft/s)
0.2	unit strm power (lb/ft/s)

Cross Section UT3 XS6



Bankfull Dimensions

3.5	x-section area (ft.sq.)
10.2	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
10.4	wetted parimeter (ft)
0.3	hydraulic radius (ft)
29.9	width-depth ratio

Flood Dimensions

11.9	W flood prone area (ft)
1.2	entrenchment ratio
3.7	low bank height (ft)
7.1	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
5	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

2.3	velocity (ft/s)
8.0	discharge rate (cfs)
0.69	Froude number

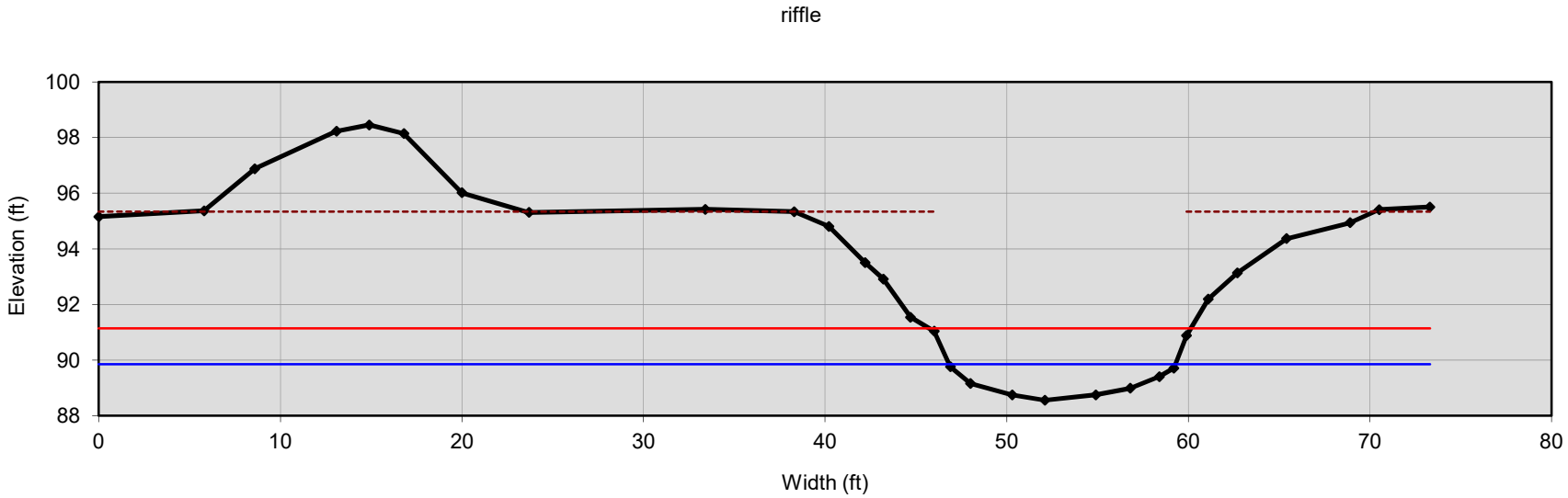
Flow Resistance

0.022	Manning's roughness
0.08	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.48	channel slope (%)
0.10	shear stress (lb/sq.ft.)
0.23	shear velocity (ft/s)
0.23	unit strm power (lb/ft/s)

Cross Section UT4 XS7



Bankfull Dimensions

11.1	x-section area (ft.sq.)
12.4	width (ft)
0.9	mean depth (ft)
1.3	max depth (ft)
12.9	wetted parimeter (ft)
0.9	hydraulic radius (ft)
13.9	width-depth ratio

Flood Dimensions

14.4	W flood prone area (ft)
1.2	entrenchment ratio
6.8	low bank height (ft)
5.3	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
2	threshold grain size (mm):

Rosgen Stream Type

Bankfull Flow

1.8	velocity (ft/s)
20.5	discharge rate (cfs)
0.35	Froude number

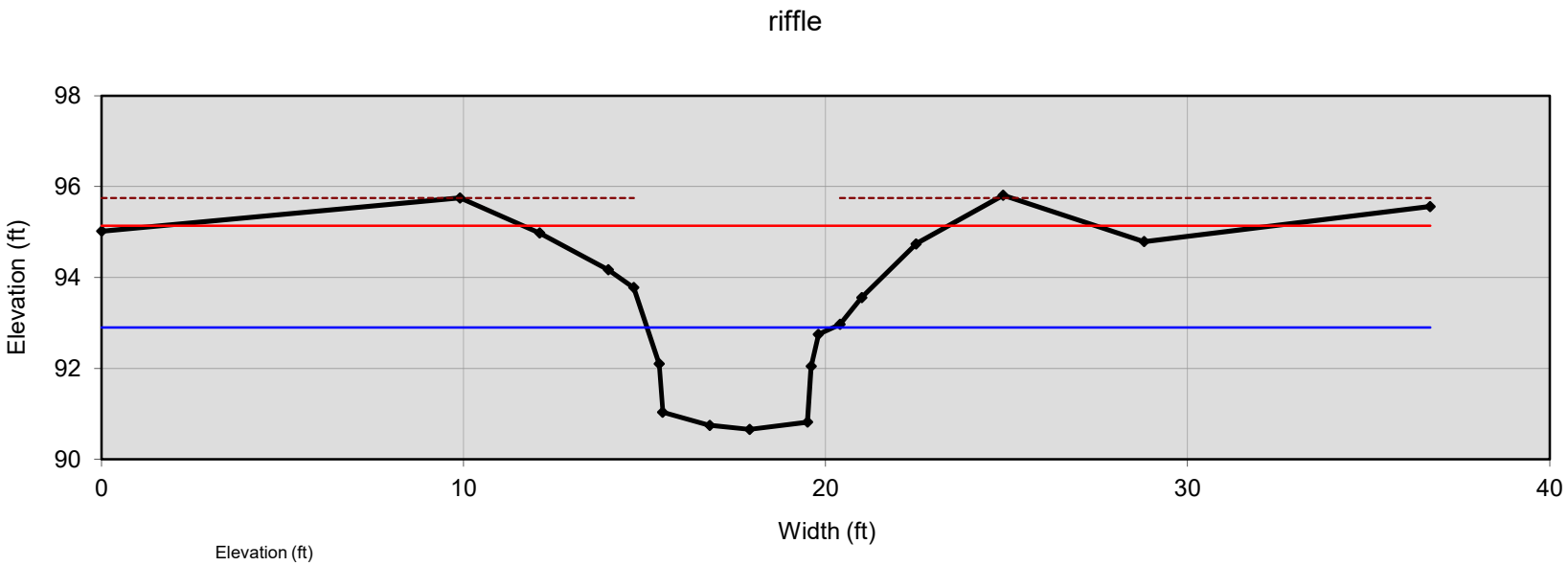
Flow Resistance

0.022	Manning's roughness
0.06	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.09	channel slope (%)
0.05	shear stress (lb/sq.ft.)
0.16	shear velocity (ft/s)
0.092	unit strm power (lb/ft/s)

Cross Section UT4 XS8



Bankfull Dimensions

9.0	x-section area (ft.sq.)
5.1	width (ft)
1.8	mean depth (ft)
2.2	max depth (ft)
8.4	wetted parimeter (ft)
1.1	hydrualic radius (ft)
2.9	width-depth ratio

Flood Dimensions

13.0	W flood prone area (ft)
2.5	entrenchment ratio
5.1	low bank height (ft)
2.3	low bank height ratio

Materials

---	D50 (mm)
---	D84 (mm)
3	threshold grain size (mm):

Rosgen Stream Type

E5

Bankfull Flow

2.1	velocity (ft/s)
19.3	discharge rate (cfs)
0.36	Froude number

Flow Resistance

0.022	Manning's roughness
0.05	D'Arcy-Weisbach fric.
---	resistance factor u/u*
---	relative roughness

Forces & Power

0.09	channel slope (%)
0.06	shear stress (lb/sq.ft.)
0.18	shear velocity (ft/s)
0.21	unit strm power (lb/ft/s)

Appendix 9

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:	McClenny Acres Mitigation Site
County Name:	Wayne
EEP Number:	100038
Project Sponsor:	Wildlands Engineering, Inc.
Project Contact Name:	Charlie Neaves
Project Contact Address:	312 West Millbrook Road, Suite 225, Raleigh, NC 27609
Project Contact E-mail:	cneaves@wildlandseng.com
EEP Project Manager:	Jeff Schaffer

Project Description

The McClenny Acres Mitigation Site is a stream and wetland mitigation project located approximately four miles east of Goldsboro, NC. The project includes four unnamed tributaries to the Neuse River and adjacent wetlands. The site has historically been used for row crop production. The project will provide stream and wetland mitigation credits in the Neuse River Basin HUC 03020201.

For Official Use Only

Reviewed By:

4/13/2018
Date

EEP Project Manager

Conditional Approved By:

Date

For Division Administrator
FHWA

☐ **Check this box if there are outstanding issues**

Final Approval By:

4-11-18
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

McClenny Acres Mitigation Site
Categorical Exclusion

SUMMARY

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment.

As the McClenny Acres Mitigation Site is a full-delivery project, an EDR Radius Map Report with Geocheck was ordered for the site through Environmental Data Resources, Inc on January 29, 2018. One incident was reported approximately one-quarter mile away form the target property. A residential underground heating oil storage tank leak occurred on October 11, 2004. Corrective actions were implemented to 2L.0202 standards; therefore, the proposed project is unlikely to result in any negative impact related to this incident. No other incidents were listed for the target property of adjacent properties in any of the Federal, State, or Tribal environmental databases searched by the EDR. The Executive Summary of the EDR report is included in the Appendix. The full report is available if needed.

National Historic Preservation Act (Section 106)

The National Historic Preservation Act declares a national policy of historic preservation to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and Section 106 mandates that federal agencies take into account the effect of an undertaking on a property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

Wildlands Engineering, Inc. (Wildlands) requested review and comment from the State Historic Preservation Office (SHPO) with respect to any archeological and architectural resources related to the McClenny Acres Mitigation Site on February 9, 2018. SHPO responded on February 28, 2018 and stated they were aware of "no historic resources which would be affected by the project" and would have no further comment. All correspondence related to Section 106 is included in the Appendix.

Uniform Relocation Assistance and Real Property Acquisition Policies Act (Uniform Act)

These acts, collectively known as the Uniform Act, provide for uniform and equitable treatment of persons displaced from their homes, businesses, non-profit associations, or farms by federal and federally-assisted programs, and establish uniform and equitable land acquisition policies.

The McClenny Acres Mitigation Site is a full-delivery project that includes land acquisition. Notification of the fair market value of the project property and the lack of condemnation authority by Wildlands was included in the signed Option Agreement for the project property. A copy of the relevant section of the Option Agreement is included in the Appendix.

Endangered Species Act (ESA)

Section 7 of the ESA requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior or of Commerce, as appropriate, to ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species.

The Endangered species listed for Wayne County are the Tar River spinymussel (*Parvaspina steinstansana*) and the red-cockaded woodpecker (*Picoides borealis*). The yellow lance (*Elliptio lanceolata*) is listed as threatened. The USFWS does not currently list any Critical Habitat Designations in Wayne County.

A pedestrian survey conducted on March 14, 2018 indicated that the site does not provide suitable habitat for the Tar River spinymussel, the red-cockaded woodpecker, nor the yellow lance and none of

these species were identified on site. Therefore, the project is deteremined to have "no effect" on the Tar River spinymussel, red-cockaded woodpecker, and yellow lance.

Wildlands requested review and comment from the United States Fish and Wildlife Service with respect to the McClenny Acres Mitigation Site and its potential impacts on threatened or endangered species on February 9, 2018. USFWS responded to the request for comment on March 8, 2018 and stated that the proposed action is "not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites." A follow-up email was sent on March 15, 2018 regarding the Tar river spinymussel. USFWS responded on March 19, 2018 and expressed no additional concerns. Following this correspondence, the yellow lance was listed as threatened. USFWS was contacted on April 6, 2018 regarding impacts of the project on the yellow lance. USFWS responded on April 9, 2018 and expressed no additional concerns. All correspondence with USFWS is included in the appendix.

Farmland Protection Policy Act (FPPA)

The FPPA requires that, before taking or approving any federal action that would result in conversion of farmland, the agency must examine the effects of the action using the criteria set forth in the FPPA, and, if there are adverse effects, must consider alternatives to lessen them.

The McClenny Acres Mitigation Site includes the conversion of prime farmland. As such, Form AD-1006 has been completed and submitted to the Natural Resources Conservation Service (NRCS). The completed form and correspondence documenting its submittal is included in the Appendix.

Fish and Wildlife Coordination Act (FWCA)

The FWCA requires consultation with the USFWS and the appropriate state wildlife agency on projects that alter or modify a water body. Reports and recommendations prepared by these agencies document project effects on wildlife and identify measures that may be adopted to prevent loss or damage to wildlife resources.

The McClenny Acres Mitigation Site includes stream and wetland restoration. Wildlands requested comment on the project from both the USFWS and the North Carolina Wildlife Resources Commission (NCWRC) on February 9, 2018. USFWS responded on March 8, 2018 and had no objections to the project. NCWRC responded on April 2, 2018 and had no objections to the project. Correspondence with these agencies is included in the appendix.

Migratory Bird Treaty Act (MBTA)

The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. The indirect killing of birds by destroying their nests and eggs is covered by the MBTA, so construction in nesting areas during nesting seasons can constitute a taking.

Wildlands requested comment on the McClenny Acres Mitigation Site from the USFWS with regards to migratory birds on February 9, 2018. The USFWS responded on March 8, 2018 but had no comments regarding migratory birds. All correspondence with USFWS is included in the appendix.

McClenny Acres Mitigation Site
Categorical Exclusion

APPENDIX

Mcclenny Acres
1059 OLD SMITHFIELD RD
GOLDSBORO, NC 27530

Inquiry Number: 5171247.2s
January 29, 2018

The EDR Radius Map™ Report with GeoCheck®

6 Armstrong Road, 4th floor
Shelton, CT 06484
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 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

1059 OLD SMITHFIELD RD
GOLDSBORO, NC 27530

COORDINATES

Latitude (North):	35.3890120 - 35˚ 23' 20.44''
Longitude (West):	78.0596910 - 78˚ 3' 34.88''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	767077.2
UTM Y (Meters):	3919956.5
Elevation:	73 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5947420 NORTHWEST GOLDSBORO, NC
Version Date:	2013
South Map:	5948626 SOUTHWEST GOLDSBORO, NC
Version Date:	2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140525, 20141018
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
1059 OLD SMITHFIELD RD
GOLDSBORO, NC 27530

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	CRAWFORD RESIDENCE (	101 PATE CIRCLE	LUST, LUST TRUST, IMD	Higher	1348, 0.255, WNW

EXECUTIVE SUMMARY

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
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

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

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

LUCIS ---------- Land Use Control Information System
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

LAST..... Leaking Aboveground Storage Tanks
INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

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

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

SWRCY..... Recycling Center Listing
HIST LF..... Solid Waste Facility Listing

INDIAN ODI	Report on the Status of Open Dumps on Indian Lands
ODI	Open Dump Inventory
DEBRIS REGION 9	Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS	Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL	Delisted National Clandestine Laboratory Register
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
SPILLS	Spills Incident Listing
SPILLS 90	SPILLS 90 data from FirstSearch
SPILLS 80	SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites
US AIRS	Aerometric Information Retrieval System Facility Subsystem
US MINES	Mines Master Index File

ABANDONED MINES - Abandoned Mines
FINDS - Facility Index System/Facility Registry System
UXO - Unexploded Ordnance Sites
DOCKET HWC - Hazardous Waste Compliance Docket Listing
ECHO - Enforcement & Compliance History Information
FUELS PROGRAM - EPA Fuels Program Registered Listing
COAL ASH - Coal Ash Disposal Sites
DRYCLEANERS - Drycleaning Sites
Financial Assurance - Financial Assurance Information Listing
NPDES - NPDES Facility Location Listing
UIC - Underground Injection Wells Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP - EDR Proprietary Manufactured Gas Plants
EDR Hist Auto - EDR Exclusive Historical Auto Stations
EDR Hist Cleaner - EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS - Recovered Government Archive State Hazardous Waste Facilities List
RGA LF - Recovered Government Archive Solid Waste Facilities List
RGA LUST - Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS 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. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

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

STANDARD ENVIRONMENTAL RECORDS

State and tribal leaking storage tank lists

LUST: The Leaking Underground Storage Tank Incidents Management Database contains an inventory of reported leaking underground storage tank incidents. The data come from the Department of Environment, & Natural Resources' Incidents by Address.

A review of the LUST list, as provided by EDR, and dated 10/26/2017 has revealed that there is 1 LUST

site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CRAWFORD RESIDENCE (	***101 PATE CIRCLE***	***WNW 1/4 - 1/2 (0.255 mi.)***	***1***	***8***
Incident Phase: Closed Out Incident Number: 31391 Current Status: File Located in Archives				

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

A review of the LUST TRUST list, as provided by EDR, and dated 10/09/2017 has revealed that there is 1 LUST TRUST site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CRAWFORD RESIDENCE (	***101 PATE CIRCLE***	***WNW 1/4 - 1/2 (0.255 mi.)***	***1***	***8***
Site ID: 31391				

ADDITIONAL ENVIRONMENTAL RECORDS

Records of Emergency Release Reports

IMD: Incident Management Database.

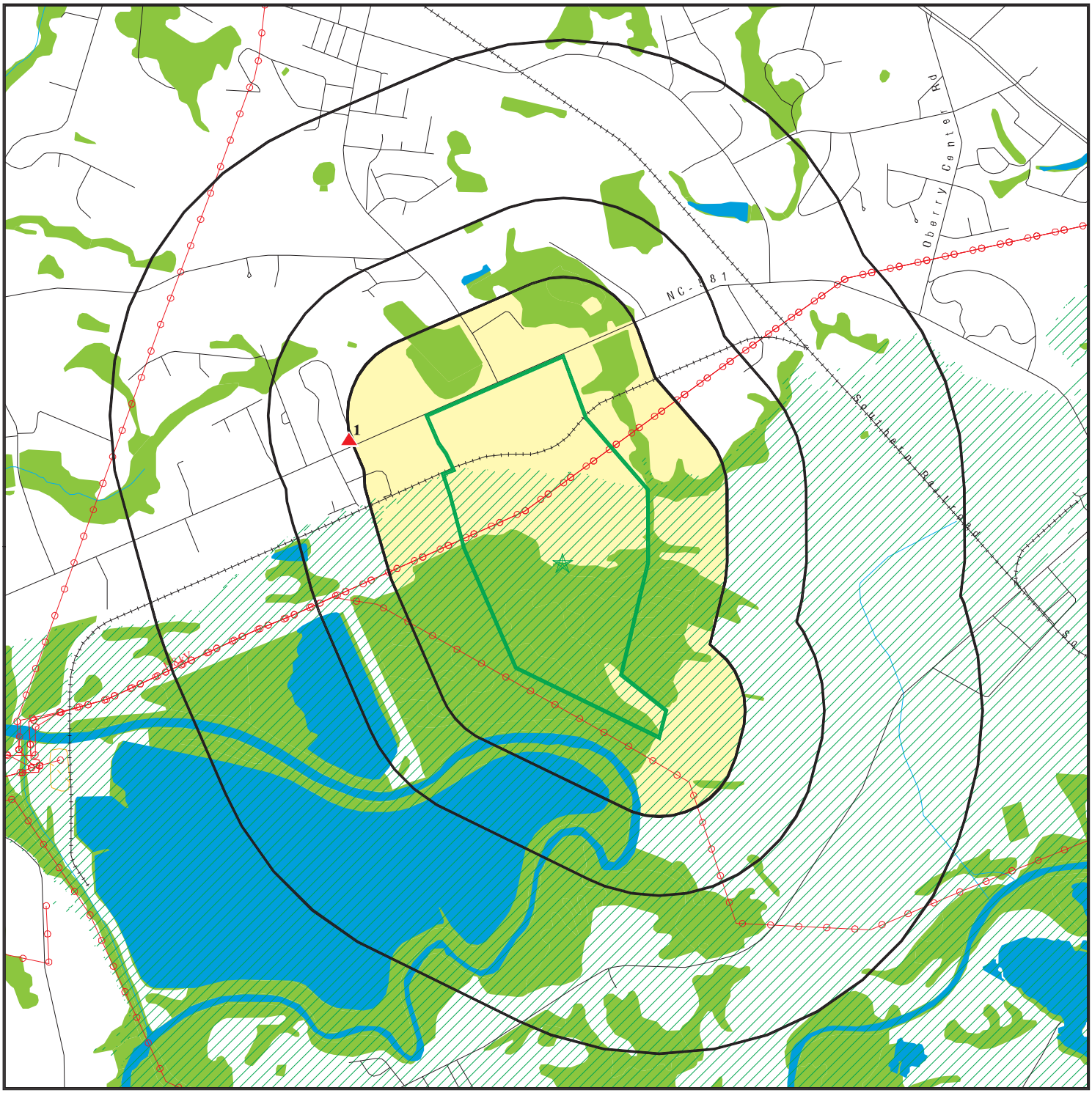
A review of the IMD list, as provided by EDR, and dated 07/21/2006 has revealed that there is 1 IMD site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CRAWFORD RESIDENCE (	***101 PATE CIRCLE***	***WNW 1/4 - 1/2 (0.255 mi.)***	***1***	***8***
Facility Id: 31391				

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 5171247.2S



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

0 1/4 1/2 1 Miles

Indian Reservations BIA

Power transmission lines

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

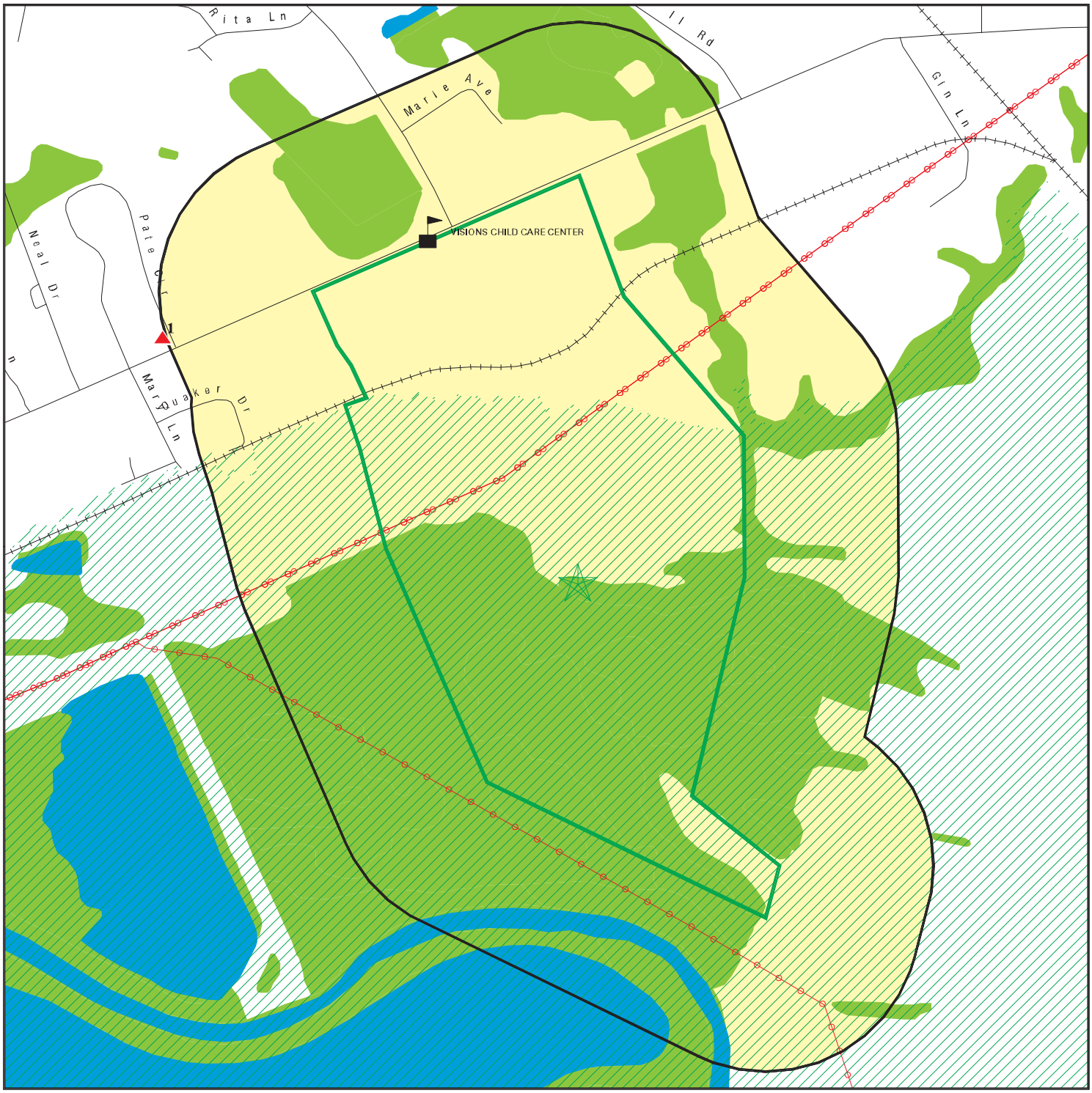
Upgradient Area

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:	Mcclenny Acres	CLIENT:	Wildlands Eng, Inc.
ADDRESS:	1059 OLD SMITHFIELD RD GOLDSBORO NC 27530	CONTACT:	Charlie Neaves
LAT/LONG:	35.389012 / 78.059691	INQUIRY #:	5171247.2s
		DATE:	January 29, 2018 4:31 pm

DETAIL MAP - 5171247.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 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: Mcclenny Acres	CLIENT: Wildlands Eng, Inc.
ADDRESS: 1059 OLD SMITHFIELD RD GOLDSBORO NC 27530	CONTACT: Charlie Neaves
LAT/LONG: 35.389012 / 78.059691	INQUIRY #: 5171247.2s DATE: January 29, 2018 4:32 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 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								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	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								
LUCIS	0.500		0	0	0	NR	NR	0
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								
LAST	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST	0.500		0	0	1	NR	NR	1
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	1	NR	NR	1
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
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
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								
SWRCY	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
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	TP		NR	NR	NR	NR	NR	0
US CDL	TP		NR	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	TP		NR	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	TP		NR	NR	NR	NR	NR	0
SPILLS	TP		NR	NR	NR	NR	NR	0
IMD	0.500		0	0	1	NR	NR	1
SPILLS 90	TP		NR	NR	NR	NR	NR	0
SPILLS 80	TP		NR	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	TP		NR	NR	NR	NR	NR	0
EPA WATCH LIST	TP		NR	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	TP		NR	NR	NR	NR	NR	0
TRIS	TP		NR	NR	NR	NR	NR	0
SSTS	TP		NR	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	TP		NR	NR	NR	NR	NR	0
RAATS	TP		NR	NR	NR	NR	NR	0
PRP	TP		NR	NR	NR	NR	NR	0
PADS	TP		NR	NR	NR	NR	NR	0
ICIS	TP		NR	NR	NR	NR	NR	0
FTTS	TP		NR	NR	NR	NR	NR	0
MLTS	TP		NR	NR	NR	NR	NR	0
COAL ASH DOE	TP		NR	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	TP		NR	NR	NR	NR	NR	0
RADINFO	TP		NR	NR	NR	NR	NR	0
HIST FTTS	TP		NR	NR	NR	NR	NR	0
DOT OPS	TP		NR	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	TP		NR	NR	NR	NR	NR	0
US AIRS	TP		NR	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	TP		NR	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	TP		NR	NR	NR	NR	NR	0
ECHO	TP		NR	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	TP		NR	NR	NR	NR	NR	0
NPDES	TP		NR	NR	NR	NR	NR	0
UIC	TP		NR	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	TP		NR	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
RGA LF	TP		NR	NR	NR	NR	NR	0
RGA LUST	TP		NR	NR	NR	NR	NR	0
- Totals --		0	0	0	3	0	0	3

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
WNW
1/4-1/2
0.255 mi.
1348 ft.

CRAWFORD RESIDENCE (JOYCE)
101 PATE CIRCLE
GOLDSBORO, NC 27530

LUST
LUST TRUST
IMD

S106799746
N/A

Relative:
Higher

Actual:
114 ft.

LUST:

Facility ID:	Not reported	
UST Number:	WA-26128	
Incident Number:	31391	
Contamination Type:		GW
Source Type:	Leak-underground	
Product Type:	P	
Date Reported:	12/07/2004	
Date Occur:	10/11/2004	
Cleanup:	10/11/2004	
Closure Request:	Not reported	
Close Out:	05/18/2005	
Level Of Soil Cleanup Achieved:		Residential
Tank Regulated Status:		N
# Of Supply Wells:	0	
Commercial/NonCommercial UST Site:		NON COMMERCIAL
Risk Classification:		L
Risk Class Based On Review:		L
Corrective Action Plan Type:		Not reported
NOV Issue Date:	Not reported	
NORR Issue Date:	Not reported	
Site Priority:	Not reported	
Phase Of LSA Req:	1	
Site Risk Reason:	Not reported	
Land Use:	Residential	
MTBE:	No	
MTBE1:	No	
Flag:	No	
Flag1:	No	
LUR Filed:	Not reported	
Release Detection:	0	
Current Status:	File Located in Archives	
RBCA GW:	Cleanups to 2L.0202 standards	
PETOPT:	4	
RPL:	True	
CD Num:	268	
Reel Num:	0	
RPOW:	True	
RPOP:	True	
Error Flag:	0	
Error Code:	N	
Valid:	False	
Lat/Long Decimal:	35.3950 -78.0715	
Testlat:	Not reported	
Regional Officer Project Mgr:		JSB
Region:		WAS
Company:		MS. JOYCE CRAWFORD
Contact Person:		MS. JOYCE CRAWFORD
Telephone:		Not reported
RP Address:		101 PATE CIRCLE
RP City,St,Zip:		GOLDSBORO, NC 27530
RP County:		Not reported
Comments:	HEATING OIL UST	

CRAWFORD RESIDENCE (JOYCE) (Continued) **S106799746**

5 Min Quad: Not reported

PIRF:

Facility Id:	31391
Date Occurred:	2004-10-11 00:00:00
Date Reported:	2004-12-07 00:00:00
Description Of Incident:	280 GALLON HEATING OIL UST
Owner/Operator:	Not reported
Ownership:	4
Operation Type:	3
Type:	4
Location:	7
Site Priority:	Not reported
Priority Update:	Not reported
Wells Affected Y/N:	N
Samples Include:	Not reported
7#5 Minute Quad:	Y
5 Minute Quad:	B
Pirf/Min Soil:	Not reported
Release Code:	Not reported
Source Code:	Not reported
Err Type:	2
Cause:	Not reported
Source:	Not reported
Ust Number:	3
Last Modified:	Not reported
Incident Phase:	**Closed Out**
NOV Issued:	Not reported
NORR Issued:	2004-12-21 00:00:00
45 Day Report:	Not reported
Public Meeting Held:	Not reported
Corrective Action Planned:	Not reported
SOC Signed:	Not reported
Reclassification Report:	Not reported
RS Designation:	Not reported
Closure Request Date:	Not reported
Close-out Report:	Not reported

LUST TRUST:

Facility ID:	Not reported
Site ID:	31391
Site Note:	Noncommercial.100% eligible. 0 deductible.
Site Eligible?:	True
Commercial Find:	100% Non-Commercial
Priority Rank:	Not reported
Deductable Amount:	0
3rd Party Deductable Amt:	0
Sum 3rd Party Amt Applied:	0

IMD:

Region:	Not reported
Facility ID:	31391
Date Occurred:	10/11/2004
Submit Date:	12/7/2004
GW Contam:	Yes, Groundwater Contamination has been detected
Soil Contam:	No

CRAWFORD RESIDENCE (JOYCE) (Continued) **S106799746**

Incident Desc:	280 GALLON HEATING OIL UST
Operator:	MS. JOYCE CRAWFORD
Contact Phone:	Not reported
Owner Company:	MS. JOYCE CRAWFORD
Operator Address:	101 PATE CIRCLE
Operator City:	GOLDSBORO
Oper City,St,Zip:	GOLDSBORO, NC 27530-
Ownership:	Private
Operation:	Residential
Material:	Not reported
Qty Lost 1:	Not reported
Qty Recovered 1:	Not reported
Source:	Leak-underground
Type:	Gasoline/diesel
Location:	Residence
Setting:	Not reported
Risk Site:	L
Site Priority:	Not reported
Priority Code:	Not reported
Priority Update:	Not reported
Dem Contact:	JSB
Wells Affected:	No
Num Affected:	Not reported
Wells Contam:	Not reported
Sampled By:	Y
Samples Include:	B
7.5 Min Quad:	Not reported
5 Min Quad:	Not reported
Latitude:	Not reported
Longitude:	Not reported
Latitude Number:	Not reported
Longitude Number:	Not reported
Latitude Decimal:	Not reported
Longitude Decimal:	Not reported
GPS:	7
Agency:	DWM
Facility ID:	31391
Last Modified:	Not reported
Incident Phase:	Closed Out
NOV Issued:	Not reported
NORR Issued:	12/21/2004
45 Day Report:	Not reported
Public Meeting Held:	Not reported
Corrective Action Planned:	Not reported
SOC Sighned:	Not reported
Reclassification Report:	Not reported
RS Designation:	Not reported
Closure Request Date:	Not reported
Close-out Report:	Not reported

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

WILDLANDS
ENGINEERING

February 9, 2018

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

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Gledhill-Earley,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with the McClenny Acres Mitigation Site. A Site Map and USGS Topographic Map with approximate project areas are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production. There are no existing structures within the project area, and no archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes.

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 project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

February 28, 2017

Charles Neaves
Wildlands Engineering
312 W. Millbrook Road, Suite 225
Raleigh, NC 27609

Re: McClenny Acres Mitigation Site, Wayne County, ER 18-0333

Dear Mr. Neaves:

Thank you for your email of February 9, 2018, 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, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

remedies against Optionee, including without limitation, specific performance. Nothing stated in this section shall preclude any action under any indemnification or defense provision in this agreement, nor for the award of attorney's fees and costs in conjunction with any action relating to this agreement.

2.10 Notices. All notices required to or permitted to be given in accordance with to this agreement shall be in writing, shall be given only in accordance with the provisions of this Section, shall be addressed to the Parties in the manner stated below, and shall be conclusively deemed properly delivered: (a) upon receipt when hand delivered during normal business hours; (b) upon the day of delivery if the notice has been deposited in an authorized receptacle of the United States Postal Service as first-class, registered or certified mail, postage prepaid, with a return receipt requested; (c) one business day after the notice has been deposited with either FedEx or United Parcel Service to be delivered by overnight delivery; or (d) if sent by email, upon receipt of an acknowledgement email sent to the sender's email address in which the party receiving the email notice acknowledges having received that email. An automatic "read receipt" is not acknowledgement for purposes of this section 2.10. The addresses of the parties to receive notices are as follows:

TO OPTIONEE: Wildlands Engineering, Inc.
1430 S. Mint Street, Suite 104
Charlotte, North Carolina 28203
Attention: Robert W. Bugg
e-mail: rbugg@wildlandseng.com

TO OPTIONOR: William A. Mcclenny
4700 Glenn Forest Dr.
Raleigh, NC 27612
e-mail: rbilibjr@aol.com

Notice of change of address shall be given by written notice in the manner described in this paragraph.

2.11 Assignment. Optionee may not assign this agreement without the consent of Optionor.

2.12 Value of Purchase Area; No Power of Eminent Domain. In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Buyer hereby notifies Seller that: (i) Buyer believes that the fair market value the Purchase Area is an amount equal to the Purchase Price; and (ii) Buyer does not have the **power of eminent domain.**

2.13 Modification; Waiver. No amendment of this agreement will be effective unless it is in writing and signed by the parties. No waiver of satisfaction of a condition or failure to comply with an obligation under this agreement will be effective unless it is in writing and signed by the party granting the waiver, and no such waiver will constitute a waiver of satisfaction of any other condition or failure to comply with any other obligation.

2.14 Attorneys' Fees. If either party commences an action against the other to interpret or enforce any of the terms of this agreement or because of the breach by the other party of any of the terms of this agreement, the losing party shall pay to the prevailing party reasonable attorneys' fees, expenses, court costs, litigation costs and any other expenses incurred in connection with the prosecution or defense of such action, whether or not the action is prosecuted to a final judgment.

2.15 Memorandum of Option Agreement. Concurrently with the signing of this agreement, Optionee and Optionor agree to sign a Memorandum of Option which will be recorded against the Purchase Area in the Register of Deeds of the County stated in paragraph A within seven calendar days after the Effective Date.

WILDLANDS
ENGINEERING

February 9, 2018

Emily Wells
US Fish and Wildlife Service
Raleigh Field Office
P.O. Box 33726
Raleigh, NC 27636-3726

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Wells

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to endangered species, migratory birds, or other trust resources associated with the proposed McClenny Acres Mitigation Site. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production.

According to your website (https://www.fws.gov/raleigh/species/cntylist/wayne.html), the federally protected species for Wayne County are the red-cockaded woodpecker (*Picoides borealis*) and the bald eagle (*Haliaeetus leucocephalus*). If we have not heard from you in 30 days, we will assume that you do not have any comments regarding associated laws and that you do not have any information relevant to this project at the current time.

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 this project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

March 8, 2018

Mr. Charlie Neaves
Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Re: McClenny Acres Mitigation Site– Wayne County, NC

Dear Mr. Neaves:

This letter is to inform you that the Service has established an on-line project planning and consultation process which assists developers and consultants in determining whether a federally-listed species or designated critical habitat may be affected by a proposed project. For future projects, please visit the Raleigh Field Office's project planning website at https://www.fws.gov/raleigh/pp.html. If you are only searching for a list of species that may be present in the project's Action Area, then you may use the Service's Information, Planning, and Consultation System (IPaC) website to determine if any listed, proposed, or candidate species may be present in the Action Area and generate a species list. The IPaC website may be viewed at https://ecos.fws.gov/ipac/. The IPaC web site contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), a list of federal species of concern[1] that are known to occur in each county in North Carolina, and other resources.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

[1] The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. There are records of multiple Federal Species of Concern, including the Carolina Madtom and Neuse River Waterdog, in the nearby Neuse River reaches adjacent to this project site. Uplifts to water quality and stream function from this potential project have the potential to benefit the overall Neuse River system in the future as the site naturalizes. The Service would look forward to more information about the current state of the stream features onsite that are proposed for restoration, as it is difficult to determine based on the information provided. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

The Service may also have concerns about the potential impacts the proposed action might have on aquatic species in general if proper sedimentation measures are not adhered to. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation

controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission has developed a Guidance Memorandum (a copy can be found on our website at (http://www.fws.gov/raleigh) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial wildlife resources and water quality. We recommend that you consider this document in the development of your projects and in completing an initiation package for consultation (if necessary).
We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact Emily Wells of this office at (919) 856-4520 ext. 25.

Sincerely,

for Pete Benjamin
Field Supervisor

Hi Charlie,

There are older (1983) records of Tar River Spinymussel in the Neuse, just into Wayne County on the Johnston/Wayne border, but we don't have any recent records in Wayne, and haven't had records immediately near the project site. The letter would remain the same with this new information.

Thank you for checking,
~Emily

On Thu, Mar 15, 2018 at 5:11 PM, Charlie Neaves <cneaves@wildlandseng.com> wrote:

Ms. Wells,

I failed to mention the Tar River Spinymussel (*Parvaspina steinstansana)*, an endangered species listed for Wayne County, in a request for comment letter regarding the McClenny Acres Mitigation Site dated February 9, 2018. Please comment on any additional associated laws or concerns relevant to the project that may arise with consideration of the Tar River Spinymussel. I have attached a draft of my initial letter and maps for your convenience.

Thank you, Charlie Neaves

Hi Charlie,

Nothing would change with our comment letter given the recent updates to the Yellow Lance, as there are not records in the immediate vicinity downstream, and the project area would not have them onsite.

Thank you,
Emily

On Fri, Apr 6, 2018 at 2:02 PM, Charlie Neaves <cneaves@wildlandseng.com> wrote:

Ms. Wells,

It has come to my attention that the Yellow Lance (*Elliptio lanceolata*) was listed as threatened earlier this week. Please comment on any concerns regarding the proposed McClenny Acres Mitigation Project that may arise with the recent listing of the Yellow Lance.

Thank you,

Charlie Neaves | *Environmental Scientist*

O: 919.851.9986 x114 **M**: 336.413.5317

Wildlands Engineering, Inc.

312 West Millbrook Road, Suite 225

Raleigh, NC 27609

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 2/13/18
Name Of Project McClenny Acres Mitigation Site	Federal Agency Involved NC DMS
Proposed Land Use Stream and Wetland Mitigation	County And State Wayne County, NC
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 3/21/18

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 242 acres
Major Crop(s) CORN	Farmable Land In Govt. Jurisdiction Acres: 305, 443 acres % 86		Amount Of Farmland As Defined in FPPA Acres: 275, 302 acres % 76	
Name Of Land Evaluation System Used Wayne County, NC LESA	Name Of Local Site Assessment System N/A		Date Land Evaluation Returned By NRCS March 26, 2018 by eMail	

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	66.1			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	66.1	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	59.4			
B. Total Acres Statewide And Local Important Farmland	0.5			
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	42.4			
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*	80	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	3			
4. Protection Provided By State And Local Government	20	20			
5. Distance From Urban Builtup Area	15	10			
6. Distance To Urban Support Services	15	25			
7. Size Of Present Farm Unit Compared To Average	10	5			
8. Creation Of Nonfarmable Farmland	10	20			
9. Availability Of Farm Support Services	5	0			
10. On-Farm Investments	20	0			
11. Effects Of Conversion On Farm Support Services	10				
12. Compatibility With Existing Agricultural Use	10				
TOTAL SITE ASSESSMENT POINTS	160	108	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	80	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	108	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	188	0	0	0

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

Reason For Selection:

This form was electronically produced by National Production Services Staff

USDA
United States Department of Agriculture

Natural Resources
Conservation Service

North Carolina
State Office

4407 Bland Road
Suite 117
Raleigh, NC 27609
Voice 919-873-2171
Fax (844) 325-2156

March 26, 2018

Charlie Neaves
Environmental Scientist
Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

Dear Charlie Neaves :

Thank you for your letter dated 03/21/2018, Subject: McClenny Acres Mitigation Site in Wayne County, NC. The following guidance is provided for your information.

Projects are subject to the Farmland Protection Policy Act (FPPA) requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a federal agency or with assistance from a federal agency. Farmland means prime or unique farmlands as defined in section 1540(c)(1) of the FPPA or farmland that is determined by the appropriate state or unit of local government agency or agencies with concurrence of the Secretary of Agriculture to be farmland of statewide local importance.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

Farmland does not include land already in or committed to urban development or water storage. Farmland *already in* urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as *urbanized area* (UA) on the Census Bureau Map, or as urban area mapped with a *tint overprint* on the United States Geological Survey (USGS) topographical maps, or as *urban-built-up* on the United States Department of Agriculture (USDA) Important Farmland Maps.

The area in question meets one or more of the above criteria for Farmland. Farmland area will be affected or converted. Enclosed is the Farmland Conversion Impact Rating form AD1006 with PARTS II, IV and V completed by NRCS. The corresponding agency will need to complete the evaluation, according to the Code of Federal Regulation 7CFR 658, Farmland Protection Policy Act.

If you have any questions, please contact Milton Cortes, Assistant State Soil Scientist at 919-873-2171 or by email: milton.cortes@nc.usda.gov.

Again, thank you for inquiry. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

Milton Cortes

Milton Cortes
Assistant State Soil Scientist

cc:
Kent Clary, State Soil Scientist, NRCS, Raleigh, NC

Milton,

Attached is the completed Farmland Conversion Impact Rating for the McClenny Acres Mitigation Site for your records. Please note I used the “corridor-type” site assessment criteria.

Thank you.

From: Cortes, Milton - NRCS, Raleigh, NC <Milton.Cortes@nc.usda.gov>
Sent: Monday, March 26, 2018 1:15 PM
To: Charlie Neaves <cneaves@wildlandseng.com>
Subject: McClenny Acres Mitigation Site in Wayne county, NC
Importance: High

Charlie:

Please find attached the Farmland Conversion Impact Rating for the McClenny Acres Mitigation Site in Wayne county, NC.

If we can be of further assistance please let us know.

Best regards;

Milton Cortes
Assistant State Soil Scientist
USDA Natural Resources Conservation Service
4407 Bland Rd, Suite 117
Raleigh, NC 27609
Phone: 919-873-2171
milton.cortes@nc.usda.gov

From: Charlie Neaves [mailto:cneaves@wildlandseng.com]
Sent: Wednesday, March 21, 2018 11:12 AM
To: Clary, Kent - NRCS, Raleigh, NC <Kent.Clary@nc.usda.gov>
Subject: Request for Farmland Conversion Impact Rating

Dear Mr. Clary,

Please find the attached Farmland Conversion Impact Rating form and soils map for the McClenny Acres Mitigation Site in Wayne county, NC. Please let me know if any additional information is needed.

Thank you,

Charlie Neaves | Environmental Scientist
O: 919.851.9986 x114 M: 336.413.5317

Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

WILDLANDS
ENGINEERING

February 9, 2018

Shannon Deaton
North Carolina Wildlife Resource Commission
Division of Inland Fisheries
1721 Mail Service Center
Raleigh, NC 27699

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Deaton,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with the proposed McClenny Acres Mitigation Site. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production

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 this project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

April 2, 2018

Mr. Charlie Neaves
Wildlands Engineering, Inc.
312 W. Millbrook Road, Suite 225
Raleigh, NC 27609

Subject: Request for Environmental Information for the McClenny Acres Mitigation Project, Wayne County, North Carolina.

Dear Mr. Neaves,

Biologists with the North Carolina Wildlife Resources Commission (NCWRC) have reviewed the proposed project description. Comments are provided in accordance with certain provisions of the Clean Water Act of 1977 (as amended), Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667e) and North Carolina General Statutes (G.S. 113-131 et seq.).

Wildlands Engineering, Inc. has developed the McClenny Acres Mitigation Project to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four tributaries to the Neuse River have been identified as degraded due to channelization and agricultural land use. Surrounding wetlands have been impacted due to stream channelization and ditching. This project will include stream restoration and wetland re-establishment to the tributaries and wetlands. The project areas are located south of Old Smithfield Road, west of its intersection with Stevens Mill Road, west of Goldsboro.

Stream restoration projects often improve water quality and aquatic habitat. Establishing native, forested buffers in riparian areas will help protect water quality, improve aquatic and terrestrial habitats and provide a travel corridor for wildlife species. The NCWRC recommends the use of biodegradable and wildlife-friendly sediment and erosion control devices. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of natural fiber materials with movable joints between the vertical and horizontal twines. Silt fencing and similar products that have been reinforced with plastic or metal mesh should be avoided as they impede the movement of terrestrial wildlife species. Excessive silt and sediment loads can have detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs and clogging of gills. Any invasive plant species that are found onsite should be removed.

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

Thank you for the opportunity to review and comment on this project. If I can be of further assistance, please contact me at (910) 409-7350 or gabriela.garrison@ncwildlife.org.

Sincerely,

Gabriela Garrison

Gabriela Garrison
Eastern Piedmont Habitat Conservation Coordinator
Habitat Conservation Program

WILDLANDS
ENGINEERING

February 9, 2018

Shannon Deaton
North Carolina Wildlife Resource Commission
Division of Inland Fisheries
1721 Mail Service Center
Raleigh, NC 27699

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Deaton,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to fish and wildlife issues associated with the proposed McClenny Acres Mitigation Site. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production

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 this project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

April 2, 2018

Mr. Charlie Neaves
Wildlands Engineering, Inc.
312 W. Millbrook Road, Suite 225
Raleigh, NC 27609

Subject: Request for Environmental Information for the McClenny Acres Mitigation Project, Wayne County, North Carolina.

Dear Mr. Neaves,

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Wildlands Engineering, Inc. has developed the McClenny Acres Mitigation Project to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four tributaries to the Neuse River have been identified as degraded due to channelization and agricultural land use. Surrounding wetlands have been impacted due to stream channelization and ditching. This project will include stream restoration and wetland re-establishment to the tributaries and wetlands. The project areas are located south of Old Smithfield Road, west of its intersection with Stevens Mill Road, west of Goldsboro.

Stream restoration projects often improve water quality and aquatic habitat. Establishing native, forested buffers in riparian areas will help protect water quality, improve aquatic and terrestrial habitats and provide a travel corridor for wildlife species. The NCWRC recommends the use of biodegradable and wildlife-friendly sediment and erosion control devices. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of natural fiber materials with movable joints between the vertical and horizontal twines. Silt fencing and similar products that have been reinforced with plastic or metal mesh should be avoided as they impede the movement of terrestrial wildlife species. Excessive silt and sediment loads can have detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs and clogging of gills. Any invasive plant species that are found onsite should be removed.

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

Thank you for the opportunity to review and comment on this project. If I can be of further assistance, please contact me at (910) 409-7350 or gabriela.garrison@ncwildlife.org.

Sincerely,

Gabriela Garrison

Gabriela Garrison
Eastern Piedmont Habitat Conservation Coordinator
Habitat Conservation Program

WILDLANDS
ENGINEERING

February 9, 2018

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

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Gledhill-Earley,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with the McClenny Acres Mitigation Site. A Site Map and USGS Topographic Map with approximate project areas are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production. There are no existing structures within the project area, and no archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes.

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 project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Susi H. Hamilton

Office of Archives and History
Deputy Secretary Kevin Cherry

February 28, 2017

Charles Neaves
Wildlands Engineering
312 W. Millbrook Road, Suite 225
Raleigh, NC 27609

Re: McClenny Acres Mitigation Site, Wayne County, ER 18-0333

Dear Mr. Neaves:

Thank you for your email of February 9, 2018, 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, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona M. Bartos

WILDLANDS
ENGINEERING

February 9, 2018

Emily Wells
US Fish and Wildlife Service
Raleigh Field Office
P.O. Box 33726
Raleigh, NC 27636-3726

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Wells

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to endangered species, migratory birds, or other trust resources associated with the proposed McClenny Acres Mitigation Site. A USGS Topographic Map and an Overview Site Map showing the approximate project area are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

The McClenny Acres Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts. Four unnamed tributaries to the Neuse River have been degraded due to channelization and agricultural land use. Additionally, surrounding wetlands have been impacted to due stream channelization and additional ditching. The project will include stream restoration in conjunction with wetland re-establishment and enhancement to Neuse River tributaries and associated riparian wetlands. The site has historically been disturbed due to row crop production.

According to your website (https://www.fws.gov/raleigh/species/cntylist/wayne.html), the federally protected species for Wayne County are the red-cockaded woodpecker (*Picoides borealis*) and the bald eagle (*Haliaeetus leucocephalus*). If we have not heard from you in 30 days, we will assume that you do not have any comments regarding associated laws and that you do not have any information relevant to this project at the current time.

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 this project.

Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
Post Office Box 33726
Raleigh, North Carolina 27636-3726

March 8, 2018

Mr. Charlie Neaves
Wildlands Engineering, Inc.
1430 South Mint Street, Suite 104
Charlotte, NC 28203

Re: McClenny Acres Mitigation Site– Wayne County, NC

Dear Mr. Neaves:

This letter is to inform you that the Service has established an on-line project planning and consultation process which assists developers and consultants in determining whether a federally-listed species or designated critical habitat may be affected by a proposed project. For future projects, please visit the Raleigh Field Office's project planning website at https://www.fws.gov/raleigh/pp.html. If you are only searching for a list of species that may be present in the project's Action Area, then you may use the Service's Information, Planning, and Consultation System (IPaC) website to determine if any listed, proposed, or candidate species may be present in the Action Area and generate a species list. The IPaC website may be viewed at https://ecos.fws.gov/ipac/. The IPaC web site contains a complete and frequently updated list of all endangered and threatened species protected by the provisions of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act), a list of federal species of concern[1] that are known to occur in each county in North Carolina, and other resources.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

[1] The term "federal species of concern" refers to those species which the Service believes might be in need of concentrated conservation actions. Federal species of concern receive no legal protection and their designation does not necessarily imply that the species will eventually be proposed for listing as a federally endangered or threatened species. However, we recommend that all practicable measures be taken to avoid or minimize adverse impacts to federal species of concern.

evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes.

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

With regard to the above-referenced project, we offer the following remarks. Our comments are submitted pursuant to, and in accordance with, provisions of the Endangered Species Act.

Based on the information provided and other information available, it appears that the proposed action is not likely to adversely affect any federally-listed endangered or threatened species, their formally designated critical habitat, or species currently proposed for listing under the Act at these sites. There are records of multiple Federal Species of Concern, including the Carolina Madtom and Neuse River Waterdog, in the nearby Neuse River reaches adjacent to this project site. Uplifts to water quality and stream function from this potential project have the potential to benefit the overall Neuse River system in the future as the site naturalizes. The Service would look forward to more information about the current state of the stream features onsite that are proposed for restoration, as it is difficult to determine based on the information provided. We believe that the requirements of section 7(a)(2) of the Act have been satisfied for your project. Please remember that obligations under section 7 consultation must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is subsequently modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

The Service may also have concerns about the potential impacts the proposed action might have on aquatic species in general if proper sedimentation measures are not adhered to. Aquatic resources are highly susceptible to sedimentation. Therefore, we recommend that all practicable measures be taken to avoid adverse impacts to aquatic species, including implementing directional boring methods and stringent sediment and erosion control measures. An erosion and sedimentation control plan should be submitted to and approved by the North Carolina Division of Land Resources, Land Quality Section prior to construction. Erosion and sedimentation

controls should be installed and maintained between the construction site and any nearby down-gradient surface waters. In addition, we recommend maintaining natural, vegetated buffers on all streams and creeks adjacent to the project site.

The North Carolina Wildlife Resources Commission has developed a Guidance Memorandum (a copy can be found on our website at (http://www.fws.gov/raleigh) to address and mitigate secondary and cumulative impacts to aquatic and terrestrial wildlife resources and water quality. We recommend that you consider this document in the development of your projects and in completing an initiation package for consultation (if necessary).
We hope you find our web page useful and informative and that following the process described above will reduce the time required, and eliminate the need, for general correspondence for species' lists. If you have any questions or comments, please contact Emily Wells of this office at (919) 856-4520 ext. 25.

Sincerely,

for Pete Benjamin
Field Supervisor

WILDLANDS
ENGINEERING

February 9, 2018

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

Subject: McClenny Acres Mitigation Site
Wayne County, North Carolina

Dear Ms. Gledhill-Earley,

Wildlands Engineering, Inc. requests review and comment on any possible issues that might emerge with respect to archaeological or cultural resources associated with the McClenny Acres Mitigation Site. A Site Map and USGS Topographic Map with approximate project areas are enclosed. The topographic figure was prepared from the Northwest Goldsboro 7.5-Minute USGS Topographic Quadrangle.

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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 project.

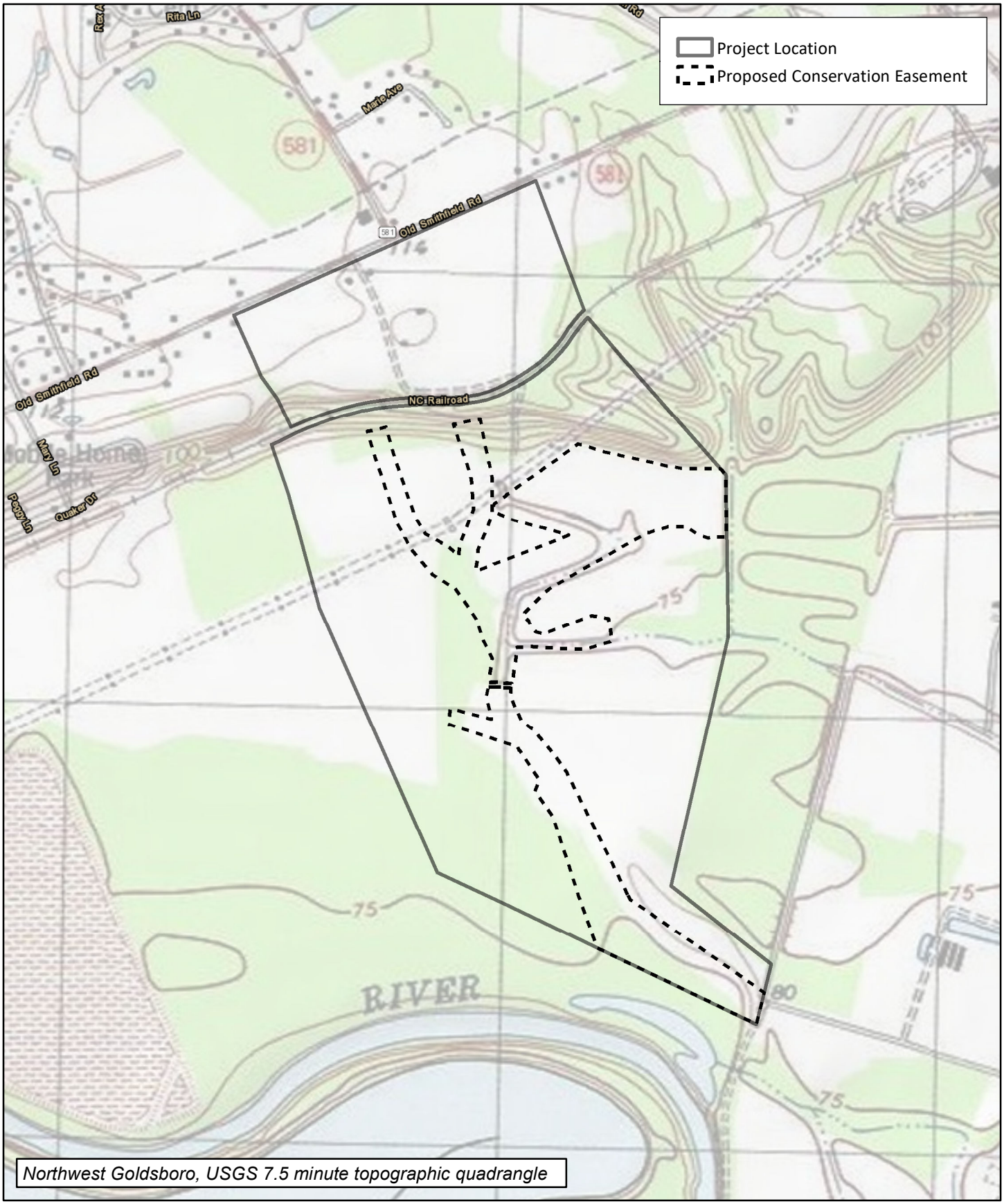
Sincerely,

Charlie Neaves
Environmental Scientist

Attachment:
Figure 1 USGS Topographic Map
Figure 2 Site Map

McClenny Acres Mitigation Site
Categorical Exclusion

FIGURES



WILDLANDS ENGINEERING

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Figure 1 Topographic Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

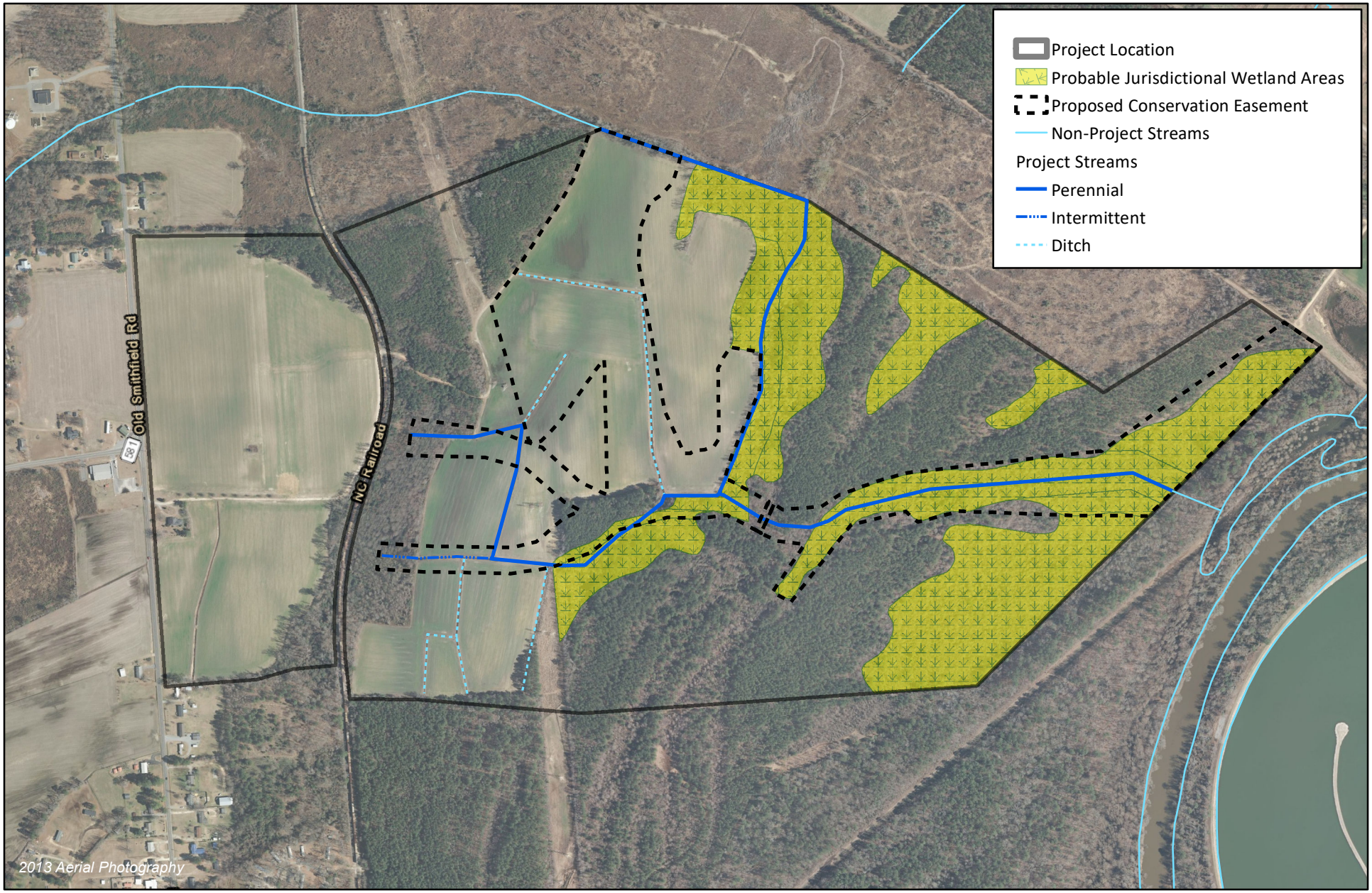

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Figure 2 Site Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

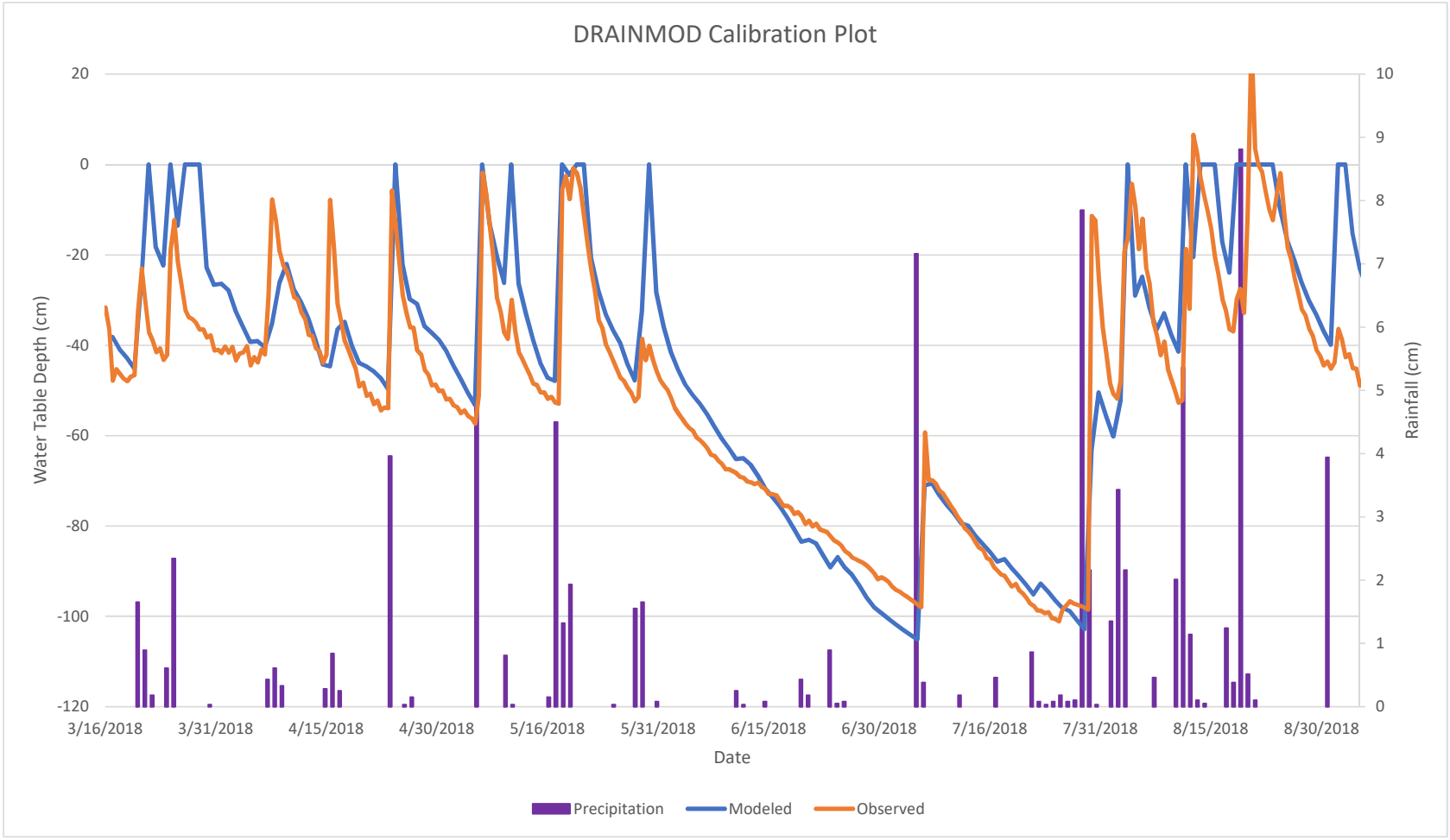
Wayne County, NC

Appendix 10

Existing Conditions Geomorphic Parameters													
Parameter	**Notation**	**Units**	**UT1**		**UT2 R2**		**UT3 R1**		**UT3 R2**		**UT4 R1**		
			Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	
stream type			E5/G5		F5		F5		F5		E5/F5		
drainage area	DA	*sq mi*	0.66		0.06		0.14		0.35		1.23		
bankfull cross-sectional area	A_{bkf}	*SF*	4.9	6.5	1.8		3.5		9.1		9.0	11.1	
average velocity during bankfull event	v_{bkf}	*fps*	2.0	2.5	2.1		2.3		1.1		1.8	2.1	
width at bankfull	w_{bkf}	*feet*	5.7	7.1	5.9		10.2		12.0		5.1	12.4	
maximum depth at bankfull	d_{max}	*feet*	1.2		0.5		0.5		1.3		1.3	2.2	
mean depth at bankfull	d_{bkf}	*feet*	0.8	0.9	0.3		0.3		0.8		0.9	1.8	
bankfull width to depth ratio	w_{bkf}/d_{bkf}		6.6	8.1	18.8		29.9		16.0		2.9	13.9	
low bank height		*feet*	1.9	3.2	3.1		3.7		4.5		5.1	6.8	
bank height ratio	BHR		1.6	2.8	5.6		7.1		3.4		2.3	5.3	
floodprone area width	w_{fpa}	*feet*	9.9	100	7.0		11.9		12.6		13.0	14.4	
entrenchment ratio	ER		1.4	17.6	1.2		1.2		1.0		1.2	2.5	
max pool depth at bankfull	d_{pool}	*feet*	-		-		-		-		-		
pool depth ratio	d_{pool}/d_{bkf}		-		-		-		-		-		
pool width at bankfull	w_{pool}	*feet*	-		-		-		-		-		
pool width ratio	w_{pool}/w_{bkf}		-		-		-		-		-		
bankfull pool cross-sectional area	A_{pool}	*SF*	-		-		-		-		-		
pool area ratio	A_{pool}/A_{bkf}		-		-		-		-		-		
pool-pool spacing	p-p	*feet*	84	848	188	509	99	633	65	283	24	790	
pool-pool spacing ratio	p-p/W_{bkf}		11.8	148.8	31.9	86.3	9.7	62.1	5.4	24	1.9	155	
valley slope	S_{valley}	*feet/foot*	0.0023		0.0025		0.0066		0.0015		0.0010		
channel slope	$S_{channel}$	*feet/foot*	0.0022		0.0024		0.0065		0.0015		0.0010		
sinuosity	K		1.05		1.03		1.01		1.05		1.04		
belt width	w_{blt}	*feet*	16	113	24		41		-		34	40	
meander width ratio	w_{blt}/w_{bkf}		2.3	19.8	4.1		4.0		-		2.7	7.8	
meander length	L_m	*feet*	248	1093	343		413	415	-		367	517	
meander length ratio	L_m/w_{bkf}		34.9	192	58.1		40.5	40.7	-		29.6	101	
linear wavelength	LW		245	1079	348	472	381	395	-		365	504	
linear wavelength ratio	LW/w_{bkf}		34.5	189	59.0	80.0	37.4	38.7	-		29.4	99	
radius of curvature	R_c	*feet*	5	276	52	105	17	373	29	38	26	114	
radius of curvature ratio	R_c/ w_{bkf}		0.7	48.4	8.8	17.8	1.7	36.6	2.4	3	2.10	22.4	

Proposed Geomorphic Parameters																	
	Notation	Units	UT1			UT2 R2			UT3 R1			UT3 R2			UT4 R1		
			Typical Section Values	Min	Max	Typical Section Values	Min	Max	Typical Section Values	Min	Max	Typical Section Values	Min	Max	Typical Section Values	Min	Max
stream type			E5/G5			F5			F5			F5			E5/F5		
drainage area	DA	*sq mi*	0.66			0.06			0.14			0.35			1.23		
design discharge	Q	*cfs*	12.0	-		4	-		7.0	-		9.9	-		18.7	-	
bankfull cross-sectional area	A_{bkf}	*SF*	10.9	-		4.3	-		6.3	-		9.6	-		13.6	-	
average velocity during bankfull event	v_{bkf}	*fps*	1.1	-		1.0	-		1.1	-		1.0	-		1.4	-	
Cross Section																	
width at bankfull	w_{bkf}	*feet*	11.6	-		7.0	-		8.8	-		11.0	-		12.8	-	
maximum depth at bankfull	d_{max}	*feet*	1.3	-		0.9	-		1.2	-		1.0	-		1.50	-	
mean depth at bankfull	d_{bkf}	*feet*	0.9	-		0.6	-		0.70	-		0.90	-		1.10	-	
bankfull width to depth ratio	w_{bkf}/d_{bkf}		12.4	-		11.5	-		12.3	-		12.6	-		12.1	-	
max depth ratio	d_{max}/d_{bkf}	*feet*	1.4	-		1.5	-		1.7	-		1.1	-		1.4	-	
bank height ratio	BHR		-	1.0		-	1.0		-	1.0		-	1.0		-	1.0	
floodprone area width	w_{fpa}	*feet*	-	26	58	-	15	35	-	19	44	-	24	55	-	28	64
entrenchment ratio	ER		-	2.2	5.0	-	2.2	5.0	-	2.2	5.0	-	2.2	5.0	-	2.2	5.0
Slope																	
valley slope	S_{valley}	*feet/foot*	0.0019			0.0043			0.008			0.0013			0.001		
channel slope	S_{chnl}	*feet/foot*	-	0.0010	0.0016	-	0.0014	0.0036	-	0.0015	0.0063	-	0.0010	0.0011	-	0.0011	0.0013
Profile																	
riffle slope	S_{riffle}	*feet/foot*	-	0.0012	0.0054	-	0.0017	0.012	-	0.0018	0.021	-	0.0012	0.0037	-	0.0013	0.0044
riffle slope ratio	S_{riffle}/S_{chnl}		-	1.2	3.4	-	1.2	3.4	-	1.2	3.4	-	1.2	3.4	-	1.2	3.4
pool slope	S_p	*feet/foot*	-	0.000		-	0.000		-	0.000		-	0.000		-	0.000	
pool slope ratio	S_p/S_{chnl}		-	0.0		-	0.0		-	0.0		-	0.0		-	0.0	
pool-pool spacing	L_{p-p}	*feet*	-	23	71	-	26	43	-	33.0	55.0	-	41	68	-	26.0	78.0
pool spacing ratio	L_{p-p}/w_{bkf}		-	2.0	6.1	-	3.7	6.2	-	3.7	6.2	-	3.7	6.2	-	2.0	6.1
pool cross-sectional area	A_{pool}	*SF*	-	25.0	32.6	-	9.8	12.8	-	14.5	18.9	-	22.1	28.8	-	31.2	40.7
pool area ratio	A_{pool}/A_{bkf}		-	2.3	3.0	-	2.3	3.0	-	2.3	3.0	-	2.3	3.0	-	2.3	3.0
maximum pool depth	d_{pool}	*feet*	-	2.8	3.7	-	1.8	2.4	-	2.1	2.9	-	2.6	3.5	-	3.2	4.2
pool depth ratio	d_{pool}/d_{bkf}		-	3.0	4.0	-	3.0	4.0	-	2.9	4.0	-	3.0	4.0	-	3.0	4.0
pool width at bankfull	w_{pool}	*feet*	-	15.9		-	9.6		-	12.0		-	15.0		-	17.5	
pool width ratio	w_{pool}/w_{bkf}		-	1.4		-	1.4		-	1.4		-	1.4		-	1.4	
Pattern																	
sinuosity	K		-	1.25		-	1.25		-	1.30		-	1.30		-	1.25	
belt width	w_{blt}	*feet*	-	23	93	-	14	56	-	18	70	-	22	88	-	26	102
meander width ratio	w_{blt}/w_{bkf}		-	2.0	8.0	-	2.0	8.0	-	2.0	8.0	-	2.0	8.0	-	2.0	8.0
linear wavelength (formerly meander length)	LW	*feet*	-	58	174	-	35	105	-	44	132	-	55	165	-	64	192
linear wavelength ratio (formerly meander length ratio)	LW/w_{bkf}		-	5.0	15.0	-	5.0	15.0	-	5.0	15.0	-	5.0	15.0	-	5.0	15.0
meander length	L_m	*feet*	-	73	218	-	44	132	-	55	165	-	69	207	-	81	241
meander length ratio	L_m/W_{bkf}		-	6.3	18.8	-	6.3	18.8	-	6.3	18.8	-	6.3	18.8	-	6.3	18.8
radius of curvature	R_c	*feet*	-	23	58	-	14	35	-	18	44	-	22	55	-	26	64
radius of curvature ratio	R_c/ w_{bkf}		-	2.0	5.0	-	2.0	5.0	-	2.0	5.0	-	2.0	5.0	-	2.0	5.0

Appendix 11


DRAINMOD Calibration Plot
Water Table Depth (cm)
Rainfall (cm)
Date
20
0
-20
-40
-60
-80
-100
-120
10
9
8
7
6
5
4
3
2
1
0
3/16/2018
3/31/2018
4/15/2018
4/30/2018
5/16/2018
5/31/2018
6/15/2018
6/30/2018
7/16/2018
7/31/2018
8/15/2018
8/30/2018
Precipitation
Modeled
Observed

Appendix 12

Maintenance Plan

The site shall be monitored on a regular basis and a physical inspection of the site shall be conducted 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 (2) years following site construction and may include the following:

Table1: Maintenance Plan

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 storm water and floodplain flows intercept the channel may also require maintenance to prevent bank erosion. If beaver become active on the site, Wildlands will contract with the USDA to trap the beaver and remover the dams.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted 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.

Appendix 13

1.0 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:

Table A: Credit Release Schedule – Stream Credits

Credit Release Milestone	Credit Release Activity	Interim Release	Total Released
1	Site establishment	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	Year 1 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	40%
4	Year 2 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	50%
5	Year 3 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	60%
6	Year 4 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	65% (75%*)
7	Year 5monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	75% (85%*)
8	Year 6 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	80% (90%*)
9	Year 7 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	90% (100%*)

*10% reserve credits to be held back until the bankfull performance standard has been met.

Table B: Credit Release Schedule – Wetlands Credits

Credit Release Milestone	Credit Release Activity	Interim Release	Total Released
1	Site establishment	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	First year monitoring report demonstrates performance standards are being met	10%	40%
4	Second year monitoring report demonstrates performance	10%	50%

Credit Release Milestone	Credit Release Activity	Interim Release	Total Released
	standards are being met		
5	Third year monitoring report demonstrates performance standards are being met	15%	65%
6	Fourth year monitoring report demonstrates performance standards are being met	5%	70%
7	Fifth year monitoring report demonstrates performance standards are being met; Provided that all performance standards are met, the IRT may allow the DMS to discontinue hydrologic monitoring after the fifth year, but vegetation monitoring must continue for an additional two years after the fifth year for a total of seven years.	15%	85%
8	Sixth year monitoring report demonstrates performance standards are being met	5%	90%
9	Seventh year monitoring report demonstrates performance standards are being met, and project has received close-out approval	10%	100%

1.1 Initial Allocation of Released Credits

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

a. Approval of the final Mitigation Plan.
b. Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property.
c. Completion of project construction (the initial physical and biological improvements to the mitigation site) pursuant to the mitigation plan; per the DMS 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.
d. Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required.

1.2 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 10% of a site's total stream credits shall be released after two bankfull 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 bankfull 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 DMS 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.

Appendix 14

Financial Assurances

Pursuant to Section IV H and Appendix III of the Division of Mitigation Service's In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environment and Natural Resources has provided the US Army Corps of Engineers Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by DMS. This commitment provides financial assurance for all mitigation projects implemented by the program.

RIPARIAN BUFFER MITIGATION PLAN

July 2019

McCLENNY ACRES MITIGATION PLAN

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038

Neuse River Basin
HUC 03020201

USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197
RFP #: 16-007279

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RIPARIAN BUFFER MITIGATION PLAN

McCLENNY MITIGATION SITE

Wayne County, NC
NCDEQ Contract No. 7423
DMS ID No. 100038
Neuse River Basin
HUC 03020201
USACE Action ID No. SAW-2018-02042
DWR Project No. 2018-0197

PREPARED FOR:

NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

PREPARED BY:

Wildlands Engineering, Inc.
312 W Millbrook Road, Suite 225
Raleigh, NC 27609
Phone: (919) 851-9986

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

- 15A NCAC 02B .0295 Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.
- 15A NCAC 02B. 0240, Nutrient Offset Payments Rule, amended effective September 1, 2010
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

Contributing Staff:

Jeff Keaton, PE, *Project Manager*
John Hutton, *Principal in Charge*
Jason Lorch, *Mitigation Plan Development*
Daniel Taylor, *Construction Administrator*
Charlie Neaves, *Monitoring Lead*
Andrea Eckardt, *Lead Quality Assurance*

August 26, 2019

Wilmington District, Regulatory Division
U.S. Army Corps of Engineers
11405 Falls of Neuse Road
Wake Forest, NC 27587

Attention: Katie Merritt

Subject: Final Buffer Mitigation Plan
McClenny Acres Mitigation Project, Wayne County
Neuse River Basin HUC 03020201
USACE AID# SAW-2018-02042
DMS Project ID No. 1000382 / DEQ Contract # 7423

Dear Katie:

We have reviewed the comments on the draft buffer mitigation plan for the McClenny Acres Buffer Mitigation Site. We have made the necessary revisions to the plan and we are submitting the revised version along with this letter. Below are responses to each of your comments. The original comments are provided below followed by our responses in bold italics.

1. *The use of the term "buffer" or "riparian buffer" is used too loosely throughout the plan. These terms should only be used to describe an area that is within the Neuse Riparian Buffer. For this site, only the first 50' adjacent to streams subject to the rule are Neuse Riparian Buffers. Therefore, please correct applicable references to "buffer" or "riparian buffer" and replace incorrect references with "riparian areas" or "riparian restoration".*

   The buffer mitigation plan has been edited to replace applicable references.

2. *Where plan sheets, figures and appendices of the Stream Mitigation Plan have relevant information for the buffer plan, those items should be referenced in the buffer plan to assist DWR with the review. Otherwise, things can be mistakenly overlooked. Example: areas proposed as ditch fill/diffused flow, Planting Plan details, Invasive Species plan, any vernal pools, etc.*

   The stream mitigation plan is now correctly referenced throughout the document.

3. *DWR is concerned with the potential loss of sediment associated with the stream construction and the impacts on water quality and aquatic species. Therefore, DWR would like to see details regarding efforts taken to minimize sediment loss off the site.*

The site's erosion and sediment control plan is now attached in the sub appendix displaying the appropriate measures to reduce erosion and sedimentation.

4. *DWR performed two stream/buffer determinations for this site (April 5 & 6, 2018). However, no DWR correspondence is included in the Appendices. These should be included and referenced where appropriate. Where stream determinations made by Wildlands are different from the documented determinations by DWR, Wildlands must include a table showing those differences. Section 2.8 may be a good location to reference DWR stream/buffer determinations.*

   The DWR site viability letter and DWR stream determination letters are now in the sub appendix. The stream determination made by Anthony Scarbraugh indicated UT2 was not on either the USGS or NRCS map, and thus not subject to buffer rules, this will not affect the buffer mitigation crediting. Table 5 has been added to section 2.8 to display this.

5. *Table 8a*
   a. *Since Figure 6b was included in the Plan, do any of these acres in the table include wetland acres? If so, remove.*
      No wetland acreage has been included in this credit calculation table.
   b. *Change "Restoration Type" to "Mitigation Type"*
      This has been updated.
   c. *The BMU's for the width 0-100' is different than the Creditable Area. If applying a 1:1 ratio, why wouldn't it be 151,328.000 instead of 151,328.400?*
      The BMU's have now been rounded to the third decimal place.
   d. *For Restoration in widths 101-200; the ratio says 10:1. It should be 1:1 and with a 33% reduction*
      Thank you, this error has been addressed.
   e. *For Preservation, the Final Credit Ratio should be 10:1, not 3:1.*
      The preservation credits have been changed to reflect a 10:1 ratio and now accurately depict that.

6. *Table 8b shows nutrient offset conversions. However, there is no reference to this in the introduction of the Plan. If this site is to be reviewed by DWR to generate nutrient and/or buffer, please include language to the effect in the introduction & provide supporting maps showing those areas.*

   The introduction now includes language to clarify the conversion process and requirements between nutrient offsets and buffer credits. The introduction also references figure 9 where riparian areas applicable for nutrient offset credits are portrayed.

7. *In Section 5.0 of Appendix 1,*
   a. *The plan implies that the Sponsor (shouldn't this read "DMS"?) wants the flexibility of using planted riparian areas for either buffer credit or wetland credit, but not*

both. Figure 6b provided in Appendix 1 shows where buffer credits could be generated within the wetland credited areas on the project. DWR has received no other information regarding how the conversion of wetland credits to buffer credits would occur in this situation. Additionally, the USACE/IRT would have to approve an option to do this in this mitigation plan. I did not see where a procedure was outlined in the Stream Mitigation Plan to support this conversion.

Wildlands has clarified this with DMS and is not pursuing conversion of credits between wetland mitigation that fails to meet performance standards and buffer mitigation. Sorry for any confusion.

b. *Parcel Preparation does not include reference to ditches onsite, if they will be plugged or filled, and how diffused flow will be maintained. Explain or reference where the stream plan/plan sheets provides details on this.*

Section 5.1 has been updated with a brief explanation of the parcel preparation that will be conducted as well as referencing the site viability letter and erosion control and sedimentation plans.

c. *There is no planting plan provided in Appendix 1. Nothing in the plan referenced plan Sheet 3.0 as the planting plan for the riparian restoration areas. Explain or reference where the planting plan is provided for the riparian areas generating buffer credits.*

Section 5.2 now clarifies what will be planted and references the planting plan.

8. *An area shown as buffer credits in Figures 6-9 along UT1 before the confluence with UT3 is shown as wetland credits in Figure 10 of the Stream Mitigation Plan. Please correct.*

This error has been addressed and the layers have been corrected to show their separation.

9. *Figure 6b is confusing. It's labeled as "Credit Calculations Map" just as Figure 6 is labeled. But it includes different mitigation types (buffer & wetland). This map should be removed from the plan, as DWR does not authorize wetland mitigation to be converted into buffer credit or nutrient credit on this site. DWR suggests relabeling this map "Nutrient Offset potential" and using this to show where nutrient offset credits are viable for comparison to Table 8b.*

This figure has been deleted, Figure 9 is the nutrient offset potential map showing what areas can be converted, upon written approval from DWR, between buffer mitigation and nutrient offset credits. Wetland mitigation that fails to meet performance standards is not being proposed as buffer mitigation credit now.

10. *Figure 8 includes a small area between UT1 and UT3 confluence where both buffer restoration and wetland mitigation overlap. Please pick which credit type you intend this to be and update all relevant figures in the Mitigation Plans to be consistent.*

This error has been addressed and the layers have been corrected to show their separation.

11. *Figure 8 legend describes the riparian areas as "Stream Buffer Restoration" and "Stream Buffer Preservation". Are the wider buffers being calculated for just buffer credits or for both stream & buffer credits? Please clarify.*

    The "Stream Buffer Restoration" and "Stream Buffer Preservation" areas are for both stream and buffer mitigation, the legend has been updated to read "Riparian Buffer Restoration" and "Riparian Buffer Preservation" to avoid confusion.

12. *Service Area map – This map does not comply with Rule .0295. The service area for buffer mitigation projects in the Neuse 01 below Falls Lake is the Neuse 01 below Falls Lake and does not include the Falls Lake WS. Edit this map to exclude the Falls Lake completely from the service area.*

    The Service Area Map has been updated to exclude the Falls Lake watershed.

13. *Section 6.1 –Table 9 is incorrectly referenced here. It should be Table 10.*

    This mistake has been corrected.

14. *Section 6.2 – Please revise plan to add that planted stems in the monitoring plots will all be flagged.*

    This section has been updated.

15. *Section 7.1 – The health of the stems will be based on their vigor, which may include their heights. Therefore, please add height measurements as a measurement during monitoring.*

    The monitoring parameters have been updated to clarify that height will be assessed.

Overall, if the riparian restoration is done according to the plan and addresses all comments and corrections provided by DWR, the site should provide a good buffer mitigation and/or nutrient offset project.

Please contact me at 919-851-9986 x103 if you have any questions.

Thank you,

Jeff Keaton, PE
Project Manager

TABLE OF CONTENTS

TABLES

FIGURES

APPENDIX

1.0 Introduction

The McClenny Acres Mitigation Site (Site) is a buffer mitigation project in conjunction with a stream and wetland mitigation project. The Site is located in Wayne County approximately four miles west of Goldsboro near the community of Rosewood (Figure 1). The project is located within the NC Division of Mitigation Services (DMS) targeted local watershed for the Neuse River Basin Hydrologic Unit (HU) 03020201200030 and NC Division of Water Resources (DWR) subbasin 03-04-12. The Site is comprised of approximately 54.24 acres along four unnamed tributaries of the Neuse River. Currently, the Site is characterized by a large area active in row crop agriculture and distinct areas of pines and hardwoods. The project will restore and preserve riparian buffer area within the project area, which will provide 202,670.607 buffer credits or 4.664 acres worth of buffer mitigation.

Approximately 38.49 acres of riparian areas that were deemed viable for restoring, enhancing, or preserving to generate buffer mitigation credits by DWR, will instead be used to provide 38.49 acres of riparian wetland mitigation credits as shown in Figure 6. DMS may elect to use the riparian restoration areas for either buffer mitigation credit or nutrient offset credit, but not both (Figure 9). A written request must be submitted and receive written approval from DWR prior to any credit conversions and transfers to the buffer credit ledger. Any areas proposed for buffer mitigation credit must meet the performance standards detailed in 15A NCAC 02B .0240.

The site is located in the DWR subbasin 03-04-12, which is dominated by forest land (52%) and agricultural land (41%). There has been no ambient monitoring and only a single benthic sample assessed, which produced a “good” benthic bioclassification. The River Basin Water Quality Plan for the Neuse River indicates that water quality is likely impacted by the large amount of animal operations within the watershed. NC Department of Water Resources data from 2015 lists 22 permitted animal facilities within the subbasin. This is the largest concentration of animal operations within a single subbasin in the Neuse 01 watershed. Regardless of the lack of assessment, the 2009 River Basin Water Quality Plan for this highly agricultural subbasin recommends implementation of appropriate BMPs to reduce nutrient and sediment loading.

Although the site is in a newly targeted local watershed which is not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) plan, the proposed project does address key CU-wide restoration goals including reduction of sediment and nutrient loads from agricultural lands by restoring and preserving wetlands, streams, riparian buffers, riparian areas and targeted implementation of a nutrient offset project. The 2010 Neuse RBRP highlights the importance of riparian buffers for stream restoration projects. Riparian zones retain and remove nutrients and suspended sediments. Of the 123 miles of streams in the Neuse 01 CU, 23% do not have adequate riparian protection. The RBRP states that “priority [restoration] projects should increase or improve buffers.” The site contains tributaries that flow directly into the Neuse River, which is classified as water supply waters (WS-IV) and nutrient sensitive waters (NSW). The RBRP also states that a goal for the Neuse 01 CU is to, “…promote nutrient and sediment reduction in agricultural areas by restoring and preserving wetlands, streams, and riparian buffers.”

This buffer mitigation project will reduce sedimentation and nutrient loading, improve terrestrial and stream habitats, and improve stream and bank stability. The area surrounding the streams proposed for mitigation is a mixture of active crop fields, and woodlands. By restoring riparian corridors to maintained buffer areas and protecting and preserving existing forested buffers; the project will reduce nutrient and sediment inputs to project streams, and ultimately to the Neuse River. The restored floodplain areas will filter sediment during rainfall events. The establishment of riparian buffers will create shading to minimize thermal pollution. Finally, invasive vegetation will be treated within the project area as needed and the proposed native vegetation will provide cover and food for wildlife.

2.0 Mitigation Project Summary

The major goals of the proposed buffer mitigation project are to provide ecological and water quality enhancements to the watershed of the Neuse River Basin by creating a functional riparian corridor and restoring the riparian buffer and its adjacent riparian zones. Specific enhancements to water quality and ecological processes are outlined below in Table 1.

Table 1: Ecological and Water Quality Goals –*McClenny Acres Mitigation Site*

Goal	Objective	CU-Wide and RBRP Objectives Supported
Decrease nutrient levels	Filtering runoff from the agricultural fields through restored native buffer zones. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.	Reduce nutrient inputs to waters of the Neuse River Basin.
Decrease water temperature and increase dissolved oxygen concentrations	Establishment and maintenance of riparian buffers will create additional long-term shading of the channel flow to reduce thermal pollution.	Improve habitat to wildlife by providing additional habitat.
Restore and enhance native floodplain vegetation.	Plant native tree species in riparian zone where currently insufficient.	Reduce and control sediment inputs; Reduce and manage nutrient inputs; Provide a canopy to shade streams and reduce thermal loadings; Contribute to protection of or improvement to the Neuse River watershed.

Goal	Objective	CU-Wide and RBRP Objectives Supported
Permanently protect the project Site from harmful uses.	Establish a conservation easement on the Site.	Protect aquatic habitat; protect water supply waters.

2.1 Existing Site Conditions

The proposed project is on a 257-acre property which is immediately adjacent to the Neuse River and project streams drain directly to the river. A large portion of the property (over 80 acres) has been used for row crop agriculture for decades. The remaining acreage is primarily wooded with distinct areas of pines and hardwoods. Currently, the agricultural fields are used to grow tobacco and soybeans. These fields are extensively ditched; perennial and intermittent streams on the Site have clearly been channelized and relocated to increase crop production. The Site is bordered almost entirely by forest, including a state-owned research site, the Center for Environmental Farming Systems (CEFS) immediately to the East (Figure 2).

The Site includes four perennial streams: UT1, UT2, UT3 R2, and UT4. UT3 R1 upstream of the confluence with UT2 is intermittent.

UT1 flows out of a wooded area to the northeast of the Site. On the Site, UT1 has been ditched parallel to the property line but is completely within the proposed easement area. The stream follows the eastern property line for approximately 1,400 feet before most of the flow turns sharply to the west. A portion of the UT1 flow also drains into a wetland area at this location. Because the stream has been channelized, it is very straight. There are spoil piles that create a berm along portions of the stream and a remnant channel feature is evident near the existing channel in certain locations. Land use along the western side of the upstream portion of UT1 is active row crops while the eastern side is wooded. Beginning at the point where most of the UT1 flow turns to the west, it flows through woods along both banks for approximately 700 feet. Beyond this point it flows along the southern edge of the row crop fields for approximately 800 feet to the south to the confluence with UT3 to form UT4 (Figure 2). UT1 has been ditched at least since the late 1950s for agricultural purposes as evidenced by the straight alignment and overly deep cross section.

UT2 flows onto the Site from a spring head in a wooded area to the north. It has been channelized at least since the late 1950s and is very straight. The ditched stream flows in the southwestern direction for approximately 400 feet before discharging into an agricultural ditch aligned east to west. South of the wooded area, UT2 is surrounded by agricultural fields.

UT3 originates north of the Site and flows onto the property parallel to and to the west of UT2. This stream has been ditched and is extremely straight for its entire length. Approximately 700 feet south of where it flows onto the Site, the stream flows into a wooded area and turns to the east and continues to flow for approximately 500 feet to the confluence with UT4. The ditch that receives the flow from UT2 flows into UT3 approximately 400 feet south of the upstream wood line. Land use along the entire length of UT3 is the same as that of UT2 – active row crop agriculture.

UT4 begins at the confluence of UT1 and UT3 and flows through a wooded area for approximately 2,700 feet to the Neuse River. This stream has also been ditched and is extremely straight for its entire length.

While the surrounding land use along this entire stream is forested, a trail exists along the right bank for the entire length of UT4 on the property. This trail has been kept clear to provide access to fields to the southeast of the site.

Table 2: Buffer Project Attributes – *McClenny Acres Mitigation Site*

Table 2. Buffer Project Attributes	
Project Name	McClenny Acres Mitigation Site
Hydrologic Unit Code	3020201200030
River Basin	Neuse River
Geographic Location (Lat, Long)	35° 23’ 25"N 78° 03' 15"W
Site Protection Instrument (DB, PG)	To be recorded
Total Credits (BMU)	219,657.717
Types of Credits	Riparian Buffer
Mitigation Plan Date	02/20/2019
Initial Planting Date	12/10/2020
Baseline Report Date	06/15/2021
MY1 Report Date	12/15/2022
MY2 Report Date	12/15/2023
MY3 Report Date	12/15/2024
MY4 Report Date	12/15/2025

In addition to buffer restoration on subject streams, per the Consolidated Buffer Mitigation Rules (15A NCAC 02B 0.0295 (o)), alternative mitigation is proposed on the Site in the form of preservation of forested buffer on subject streams. The proposed project is in compliance with these rules in the following ways:

Preservation on Subject Streams 15A NCAC 02B .0295 (o)(5):

- The buffer width is at least 30 feet from the stream (Figure 7).
- The area meets the requirements of 15A NCAC 02R 0.0403(c)(7), (8), and (11) with no known structures, infrastructure, hazardous substances, solid waste, or encumbrances within the mitigation boundary.
- Preservation mitigation is being requested on no more than 25% of the total area of buffer mitigation (Table 9).


McClenny Acres

2.2 Parcel Location

The McClenny Acres Mitigation Site (Site) is located in Wayne County approximately four miles west of Goldsboro near the community of Rosewood (Stream Mitigation Plan, Figure 1). The project is located within the NC Division of Mitigation Services (DMS) targeted local watershed for the Neuse River Basin Hydrologic Unit (HU) 03020201200030 and NC Division of Water Resources (DWR) subbasin 03-04-12.

2.3 Watershed Characterization

Land uses draining to the project reaches are primarily cultivated crops, forest, shrub/herbaceous, and wetland with some residential area and a small amount of pasture/hay. The watershed areas and current land use are summarized in Table 3, below. The impervious area within the project watershed was calculated to be 16.4 acres, or approximately 2.1% of the watershed.

The project watershed totals 1.23 square miles and the primary land use is agricultural at 38% by area, with cultivated row crops constituting most of the agricultural practices at 36% of the drainage area. Agriculture is followed closely by forested land, which covers 21% of the watershed. Wetlands make up about 15% of the watershed while 17% is covered by scrub/shrub or grassland/herbaceous land uses. Nine percent of the McClenny Acres drainage area is residential, consisting mostly of low-density single-family units with approximately 7% of that 9% characterized by developed open space.

Table 3: Drainage Areas and Associated Land Use – *McClenny Acres Mitigation Site*

Reach Name	NCDWR Stream Identification Form Scores	Intermittent/ Perennial	Watershed Area (acres)	Watershed Area (sq. mi.)	Land Use
UT1	30.25	Perennial	423	0.66	45% cultivated crops; 17% forest; 16% wetlands; 11% residential; 7% shrub/herbaceous; 3% pasture/hay
UT2	30.75	Perennial	40	0.06	81% Cultivated crops; 11% shrub/herbaceous; 8% forest
UT3 R1	28.75	Intermittent	92	0.14	27% cultivated crops; 29% shrub/herbaceous; 27% forest; 16% residential
UT3 R2	32.50	Perennial	222	0.35	33% cultivated crops; 26% shrub/herbaceous; 25% forest; 11% residential; 4% wetlands; 1% open water
UT4	37.75	Perennial	784	1.23	36% cultivated crops; 21% forest; 17% shrub/herbaceous; 15% wetland; 9% residential; 2% pasture/hay

2.4 Soils

Soil mapping units are based on the U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey for Wayne County. Soils along the McClenny Acres Buffer Mitigation project area are currently mapped as Johns and Lumbee sandy loam, Kalmia loamy sand, and Lakeland sand. These soils are described below in Table 4 and shown in Figure 5.

Table 4: Project Soil Types and Descriptions – *McClenny Acres Mitigation Site*

Soil Name	Description
Johns sandy loam	This is a slightly poorly drained soil with low slopes of less than two percent. The soil has slow surface runoff and moderate infiltration. The soils are typically found on broad stream terraces.
Kalmia loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. These soils are typically found on broad stream terraces.
Lakeland sand	This is an excessively drained soil with slopes from 0-6%. Surface runoff is slow, and infiltration is very fast. The soils are typically found in broad areas with an uneven surface.
Lumbee sandy loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow, and infiltration is moderate. These soils are found in flat terrace areas and shallow drainageways.
Pantego (Torhunta) loam	This is a poorly drained soil with low slopes of less than two percent. Surface runoff is very slow, and infiltration is moderate. These soils are found in wide, shallow drainageways.
Wickham loamy sand, 0-2% slopes	This is a well-drained soil with slow surface runoff and moderate infiltration. Typically, these soils are found on broad stream terraces.

Source: Wayne County Web Soil Survey

2.5 Geology

The site is located in the Inner Coastal Plain physiographic province. The Inner Coastal Plain is characterized by flat lands to gently-rolling hills and valleys with elevations ranging anywhere from 25 to 600 feet above sea level. The Coastal Plain largely consists of marine sedimentary rocks including sand, clay, and limestone that formed through the deposition of estuarine and marine sediments. The underlying geology of the proposed Site is mapped as Cretaceous to Tertiary (138 million to 2 million years in age) Cape Fear Formation (Kc) as well as Yorktown Formation and Duplin Formation (undivided) (Tpy) (NCGS, 1985). The Cape Fear Formation is described as a yellowish gray to bluish gray sandstone and sandy mudstone with red to yellowish orange mottles that is indurate and graded with laterally continuous bedding. Additional characteristics include blocky clay, faint cross-bedding, and commonly containing feldspar and mica. The Yorktown Formation is described as bluish gray, fossiliferous clay with varying amounts of sand. Shell material is commonly concentrated in lenses within the unit. The Duplin Formation is characterized by a bluish gray, medium to coarse grained sand, sandy marl, and limestone (NCGS, 1985).

2.6 Vegetation

2.6.1 UT1

Because the streams are regularly maintained, there is little streamside vegetation in areas where the stream is bordered by agricultural fields. There is some wood and herbaceous plant growth along the stream in these areas including river birch (*Betula nigra*), red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), Chinese privet (*Ligustrum sinense*), Christmas fern (*Polystichum acrostichoides*), American holly (*Ilex opaca*), giant cane (*Arundinaria gigantea*), fox grape (*Vitis labrusca*), greenbrier (*Smilax*), blackberry (*Rubus*), and microstegium (*Microstegium vimineum*).

2.6.2 UT2

The streambanks are mowed regularly to support cultivation of row crops and the streamside zone is nearly devoid of vegetation. However, a narrow row of herbaceous vegetation at the time of the stream

assessment included tag alder (*Alnus serrulata*), giant cane (*Arundinaria gigantea*), Johnsongrass (*Sorghum halepense*), and goldenrod (*Solidago sp.*).

2.6.3 UT3

Similar to UT2, the streambanks of the upstream reach of UT3 are mowed routinely to support cultivation of row crops and the streamside zone is devoid of vegetation except for a narrow row of herbaceous growth. The downstream reach flows through a wetland forest complex consisting of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), willow oak (*Quercos phellos*), tag alder (*Alnus serrulata*), tulip poplar (*Liriodendron tulipifera*), black walnut (*Juglans nigra*), giant cane (*Arundinaria gigantea*), greenbrier (*Smilax*), blackberry (*Rubus*), Johnsongrass (*Sorghum halepense*), microstegium (*Microstegium vimineum*), and goldenrod (*Solidago sp.*).

2.6.4 UT4

UT4 flows through a bottomland forest consisting primarily of hardwood species such as river birch (*Betula nigra*), water oak (*Quercus nigra*), willow oak (*Quercus phellos*), swamp chestnut oak (*Quercus michauxii*), and red maple (*Acer rubrum*). Other common overstory species include sweetgum (*Liquidambar styraciflua*), eastern white pine (*Pinus strobus*), and loblolly pine (*Pinus taeda*), while the midstory and herbaceous layer are primarily composed of Chinese privet (*Ligustrum sinense*), American holly (*Ilex opaca*), blackberry (*Rubus*), greenbrier (*Smilax*), fox grape (*Vitis labrusca*), Christmas fern (*Polystichum acrostichoides*), and microstegium (*Microstegium vimineum*).

2.7 Site Constraints and Access

The Site is accessible via a gravel driveway off of Old Smithfield Road. Currently there are three overhead transmission lines within the site, these lines will remain and pass through easement breaks on UT1, UT2 and UT3 (Stream Mitigation Plan Section 5.8 and Figure 2). In addition, there is one internal easement break for crossing which is not included in the credits calculated for the project. This site will extend beyond the required 50-foot minimum riparian buffer for streams in the coastal plain, ranging between 100 and 200 feet on streams into the riparian zone. There are no known airport facilities within five miles of the project area (Figure 1). There are no other known constraints on the proposed Site. A permanent access easement from Old Smithfield Road to the Site is recorded.

2.8 Current Site Resources

On February 9, 2018 NCDWR, conducted on-site determinations to review features and land use within the project boundary. The resulting NCDWR sit viability letter, stream determinations, and maps confirming the site as suitable for riparian buffer mitigation are attached in the sub-appendix. Differences in stream classification calls are shown below in table 5. UT2 was not depicted on either the USGS or NRCS topo maps and thus is not subject to buffer rules, this does not affect the buffer mitigation crediting as UT2 was already planned for wetland mitigation.

Table 5: Site stream classifications

Reach Name	NCDWR Stream Identification Form Scores	Wildlands Stream Call	NCDWR Stream Call
UT1	30.25	Perennial	Perennial
UT2	30.75	Perennial	Not shown on USGS/NRCS Map
UT3 R1	28.75	Intermittent	Intermittent
UT3 R2	32.50	Perennial	Perennial

Reach Name	NCDWR Stream Identification Form Scores	Wildlands Stream Call	NCDWR Stream Call
UT4	37.75	Perennial	Perennial

2.9 Historic Site Resources

The McClenny Acres Buffer Mitigation Site has historically been used for agricultural purposes. Historic aerial photos are included in Stream Mitigation Appendix 3, and date back to 1959, showing the site in various stages of row crop production and small scattered clearing for development within the northern part of the watershed. In general, this area has maintained its rural, farming character over the last 60 years with only minor changes in land cover.

3.0 Site Protection Instrument

3.1 Site Protection Instruments Summary Information

The land required for buffer planting, management, and stewardship of the mitigation project includes portions of the parcels listed in Table 6. An option agreement for the project area has been signed by the property owner and a Memorandum of Option has been recorded at the Wayne County Register of Deeds (Stream Mitigation Plan Appendix 2). The proposed conservation easement on this property has not yet been recorded.

Table 6: Site Protection Instrument – *McClenny Acres Mitigation Site*

Landowner	PIN	County	Site Protection Instrument	Deed Book and Page Number	Acreage to be Protected
William McClenny	2579985611	Wayne	Conservation Easement	DB: 0011e PG: 584	54.24

All site protection instruments require 60-day advance notification to the Corps and the State prior to any action to void, amend, or modify the document. No such action shall take place unless approved by the State.

4.0 Regulatory Considerations

Table 7, below, is a summary of regulatory considerations for the Site. These considerations are expanded upon in Sections 4.1-4.4. A copy of the signed Categorical Exclusion Form for the project can be found in the McClenny Acres Stream Mitigation Plan Appendix 9.

Table 7: Project Attribute Table – *McClenny Acres Mitigation Site*

Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404	Yes	Yes	(Appendix) Site Viability Letter
Water of the United States - Section 401	Yes	Yes	(Appendix) Site Viability Letter
Endangered Species Act	Yes	Yes	McClenny Acres Stream Mitigation Plan Appendix (Categorical Exclusion)

Historic Preservation Act	Yes	Yes	McClenny Acres Stream Mitigation Appendix (Categorical Exclusion)
Coastal Zone Management Act	No	No	N/A
FEMA Floodplain Compliance	No	No	N/A
Essential Fisheries Habitat	No	N/A	N/A

4.1 Threatened and Endangered Species

The NC Natural Heritage Program (NHP) database and the US Fish and Wildlife Service (USFWS) database were searched for federally listed threatened and endangered plant and animal species in Wayne County, NC. Five federally listed species, Bald Eagle (*Haliaeetus leucocephalus*), Neuse River Waterdog (*Necturus lewisi),* Red-cockaded woodpecker *(Picoides borealis),* Yellow Lance *(Elliptio lanceolata) and* Tar River spinymussel *(Elliptio steinstansana)* are currently listed in Wayne County. Table 8. list their federal status and habitat.

Table 8: Listed Threatened and Endangered Species in Wayne County, NC – *McClenny Acres Mitigation Site*

Species	Federal Status	Habitat
Vertebrate		
Bald eagle (*Haliaeetus leucocephalus*)	BGPA	Near large open water bodies: lakes, marshes, seacoasts, and rivers
Neuse River Dog (*Necturus lewisi)*	UR	Low to moderate gradient stream, well oxygenated water, often streams wider than 15 meters
Red-cockaded Woodpecker *(picoides borealis)*	E	Mature pine forests
Bivalves		
Tar River Spinymussel *(Elliptio steinstansana)*	E	Silt free coarse sand and gravel substrates, faster flowing well oxygenated water
Yellow Lance *Elliptio lanceolata*	T	Clean coarse to medium sand substrates, downstream end of stable sand/gravel bars, waters edge

E = Endangered; T = Threatened; UR = Under Review; BGPA=Bald & Golden Eagle Protection Act

The USFWS does not currently list any Critical Habitat Designations for any of the Federally listed species within Wayne County. Wildlands requested review and comment from the United States Fish and Wildlife Service on February 9, 2018 in respect to the McClenny Acres Mitigation Site and its potential impacts on threatened or endangered species. USFWS responded on March 8, 2018 and stated the "proposed action is not likely to adversely affect any federally listed endangered or threatened species, their formally designated critical habitat or species currently proposed for listing under the Act". All correspondence with USFWS is include in the approved Categorical Exclusion found in the McClenny Acres Stream Mitigation Plan

A pedestrian survey conducted on March 14, 2018 indicated that the site does not provide suitable habitat for the Tar River spinymussel, the red-cockaded woodpecker, nor the yellow lance and none of these species were identified on site. Therefore, the project is determined to have "no effect" on the Tar River spinymussel, red-cockaded woodpecker, and yellow lance.

4.2 Cultural Resources and Significant Natural Heritage Areas

The National Historic Preservation Act declares a national policy of historic preservation to protect, rehabilitate, restore, and reuse districts, sites, buildings, structures, and objects significant in American architecture, history, archaeology, and culture, and Section 106 mandates that federal agencies take into account the effect of an undertaking on a property that is included in, or is eligible for inclusion in, the National Register of Historic Places.

There are no existing structures in the project area. The Site is not located near any sites listed on the National Register with the State Historic Preservation Office (SHPO). SHPO was contacted on February 9, 2018 and had no concerns or comments on the project site. The approved Categorical Exclusion for the project is located in the McClenny Acres Stream Mitigation Plan.

4.3 FEMA Floodplain Compliance

The project stream channels do not have an associated regulated floodplain and are not located along a studied section of stream. However, all project streams lie within the floodway and flood fringe of the Neuse River, mapped FEMA Zone AE (Stream Mitigation Plan Figure 7). Neuse River base flood

elevations have been defined and a detailed study has been performed with floodway areas mapped on Wayne County FIRM panels 2568 and 2588. Wildlands will coordinate with the City of Goldsboro and Wayne County on any local permitting requirements. We do not expect any modeling or a flood study to be required. The project will be designed so that any increase in flooding will be contained on the Site and will not extend upstream to adjacent parcels, so hydrologic trespass will not be a concern.

4.4 Other Environmental Issues

An EDR Radius Map Report with Geocheck was ordered for the Site through Environmental Data Resources, Inc. on January 29, 2018. The target property and the adjacent properties are not listed in any of the Federal, State, or Tribal environmental databases searched by EDR. There were no known or potential hazardous waste sites identified within one mile of the Parcel.

4.5 Determination of Credits

Mitigation credits presented in Table 9a and 9b and Figures 6 and 9 are projections based upon site design and are intended to be used as either riparian buffer credits or nutrient offset credits, dependent on the need, and approval from DWR. Upon completion of site construction, the project components and credits data will be revised to be consistent with the as-built condition.

Table 9a: Buffer Project Areas and Assets: Riparian Buffer Credits – McClenny Acres Mitigation Site

Location	Jurisdictional Streams	Mitigation Type	Reach ID / Component	Buffer Width (ft)	Creditable Area (ac)*	Creditable Area (sf)*	Eligible Credit Area (ac)**	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits (BMU)	Riparian Buffer Credits (ac)
Rural	Subject	Restoration	UT1, UT2, UT3	0-100	3.251	141,645	3.251	1	100%	1.00	141,644.800	3.251
Rural	Subject	Restoration	UT1, UT2, UT3	101-200	3.557	154,967	3.557	1	33%	3.03	51,138.780	1.186
Rural	Subject	Preservation	UT2, UT3, UT4	0-100	4.359	189,889	2.270	10	100%	10.00	9,887.027	0.227
Rural	Subject	Preservation	UT2, UT3, UT4	101-200	2.236	97,381	0	10	33%	30.00	0.00	0
										Total:	**202,670.607**	**4.664**

* Preservation creditable area is over 25% of the total mitigation area, therefore the eligible creditable area has been reduced to 25% of the total creditable mitigation area. With that adjustment, the Site is in compliance with 15A NCAC 02B 0.0295(o)(5) which limits preservation mitigation area to no more than 25% of total mitigated area.

** Eligible Credit areas being what is available out of "Creditable Area" for credit within the corresponding category.

Table 9b: Buffer Project Areas and Assets: Nutrient Offset Credits Available Upon Conversion – *McClenny Acres Mitigation Site*

Location	Jurisdictional Streams	Mitigation Type	Reach ID / Component	Buffer Width (ft)	Creditable Area (ac)*	Creditable Area (sf)*	Elegible Credit Area (ac)**	Convertible to Nutrient offset (Yes or No)	Nutrient Offset: N (lbs)
Rural	Subject	Restoration	UT1, UT2, UT3	0-100	3.251	141,645	3.251	Yes	7391.481
				101-200	3.557	154,967	3.557	Yes	8086.624
Rural	Subject	Preservation	UT2, UT3, UT4	0-200	6.595	287,270	0.000	No	0.000
								Total:	**15,478.105**

* The above creditable areas all meet the 50-foot minimum width for buffer or nutrient credit sales.

** Eligible Credit areas being what is available out of “Creditable Area” for credit within the corresponding category.

5.0 Implementation Plan

The Wildlands Team proposes to restore high quality ecological function to McClenny Acres and four unnamed tributaries to the Neuse River on the Site. The ecological uplift can be summarized as transforming agriculturally impacted areas to a protected forested riparian corridor. The project design will ensure that no adverse impacts to wetlands or existing riparian buffers occur. All riparian restoration activities will commence in concurrence with the stream mitigation activities and not before. Therefore, the mitigation area where riparian restoration is being performed may be altered slightly depending on the implementation of the McClenny Acres Stream Mitigation Plan. No riparian buffer credit is currently being claimed in wetland mitigation areas (Figure 6). Any areas proposed for buffer mitigation credit must meet the performance standards detailed in 15A NCAC 02B .0240. NCDMS may elect to use these riparian areas for either buffer mitigation credit or nutrient offset credit, but not both. DMS must submit a written request and receive written approval from DWR prior to any credit conversions and transfers to the buffer credit ledger. Ditches on site being proposed to be filled and graded for wetland mitigation are identified in the Site Viability Letter found in sub-appendix 1a. More detailed descriptions of the proposed restoration activity follow in Sections 5.1 through 5.4.

5.1 Parcel Preparation

Mechanical site preparation will be implemented where necessary to create soil physical properties favorable for tree growth. In the agricultural field, the planted area will be ripped to a depth of 18 inches in a grid-like pattern with a maximum rip shank spacing of six feet. Ripping will be performed during the driest conditions feasible to maximize shatter of the plow pan. Construction practices are intended to minimize effects to soil properties, but some impacts are unavoidable. Ripping may be implemented to ameliorate soil compaction resulting from haul roads, stockpile areas, etc. Where grading is required, topsoil will be stockpiled and reapplied (Sub-appendix, ESC Plans). Soil amendments may be incorporated to augment survival and growth of planted vegetation as determined necessary by soil testing.

The restoration areas will be planted using hand labor with dibble bars or other acceptable forestry practices. There will be no parcel preparation work done in the buffer preservation areas.

Some areas within the proposed preservation buffer areas will be affected by berm removal (Stream Mitigation Plan Figure 10) and haul road access for the stream mitigation. These affected areas will be ripped and replanted using hand labor with dibble bars or other acceptable forestry practices.

Invasive vegetation within the project area will be treated and/or mechanically removed during construction, but additional treatment is expected. Invasive species presence will be monitored and treated as necessary throughout the monitoring period. Numerous sweetgum (*Liquidambar styraciflua*) trees are present within the project area. Sweetgum has been identified as an undesirable species and will be mechanically removed during construction to reduce the seed source.

5.2 Riparian Area Restoration Activities

The revegetation plan for the buffer restoration area will include permanent seeding and planting bare root trees. These revegetation efforts will be coupled with controlling invasive species population. The specific species composition to be planted was selected based on the community type, observation of occurrence of species in riparian buffers adjacent to the Parcel, and best professional judgement on species establishment and anticipated site conditions in the early years following project implementation. Table 10 list's woody species that will be planted as well as species that are native to the area and may become established in the Site during the duration of the project

Table 10: Native Woody Species to be Established – *McClenny Acres Mitigation Site*

Scientific Name	Common Name	Dominant Method of Establishment
Acer rubrum	Red Maple	Natural Colonization
Alnus serrulata	Tag Alder	Natural Colonization
Betula nigra	River Birch	Hand Planting
Fraxinus pennsylvanica	Green Ash	Hand Planting
Ilex opaca	American Holly	Natural Colonization
Juglands nigra	Black Walnut	Natural Colonization
Liriodendron tulipifera	Tulip Poplar	Natural Colonization
Liquidambar straciflua	Sweetgum	Natural Colonization
Magnolia virginiana	Sweetbay Magnolia	Hand Planting
Nyssa biflora	Swamp Tupelo	Hand Planting
*Platanus occidentalis**	American Sycamore	Hand Planting
Populus deltoides	Eastern Cottonwood	Hand Planting
Quercus lyrata	Overcup Oak	Hand Planting
Quercus michauxii	Swamp Chestnut Oak	Hand Planting
Quercus pagoda	Cherrybark Oak	Hand Planting
*Quercus phellos**	Willow Oak	Hand Planting
Quercus nigra	Water Oak	Hand Planting
*Salix nigra**	Black Willow	Hand Planting / Live Stakes
Salix sericea	Silky Willow	Live Stakes
Sambucus canadensis	Elderberry	Live Stakes
Taxodium distichum	Bald Cypress	Hand Planting
Pinus strobus	White Pine	Natural Colonization
Pinus taeda	Loblolly Pine	Natural Colonization

*These late successional species may naturally colonize but are not expected to reach high-density numbers, height, and/or vigor after disturbance.

Trees will be planted at a density sufficient to meet the performance standards outlined in the Rule 15A NCAC 02B .0295 of 260 trees per acre at the end of five years. No one tree species will be greater than 50% of the established stems. An appropriate seed mix will also be applied as necessary to provide temporary ground cover for soil stabilization and reduction of sediment loss during rain events in disturbed areas. This will be followed by an appropriate permanent seed mixture. Planting is scheduled to begin in January 2020.

For more details on proposed plantings see the stream mitigation plan sheets section 3.0.

Vegetation management and herbicide applications may be needed during tree establishment in the restoration areas to prevent establishment of invasive species that could compete with the planted native species.

5.3 Riparian Area Enhancement Activities

There will not be any buffer enhancement areas on the McClenny Acres Mitigation Site.

5.4 Riparian Area Preservation Activities

There will be no parcel preparation work done in the buffer preservation areas, as allowed under 15A NCAC 02B .0295(o). The preservation area will be protected in perpetuity under a conservation easement.

6.0 Monitoring Plan

The Site monitoring plan has been developed to ensure that the required performance standards are met, and project goals and objectives are achieved. The monitoring report shall provide project data chronology that will facilitate an understanding of project status and trends, ease population of DMS databases for analysis and research purposes and assist in close-out decision making.

6.1 Monitoring Components

Project monitoring components are listed in more detail in Table 11 and Figure 8.

6.2 Vegetation

Vegetation monitoring quadrants will be installed across the Site to measure the survival of the planted trees (Figure 8). The first annual monitoring activities will commence at the end of the first growing season, at least five months after planting has been completed, and will be reassessed annually no earlier than the Fall of each year. Species in monitoring plots will be flagged and the plot species composition, density, vigor, height, and survival rates will be evaluated on an annual basis by plot and for the entire site. The number of monitoring quadrants required, and frequency of monitoring will be based on the DMS monitoring guidance documents. Vegetation monitoring will follow the CVS-EEP Protocol for Recording Vegetation (2008) or another DMS approved protocol. Reference photographs of the vegetation plots and Site will be taken during the annual vegetation assessments.

6.3 Photo reference stations

Photographs will be taken within the project area once a year to visually document stability for five years following construction. Permanent markers will be established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year.

6.4 Visual Assessment

Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment).

Table 11: Monitoring Components – *McClenny Acres Mitigation Site*

Parameter	Monitoring Feature	Quantity	Frequency
Vegetation	CVS Level 2	6	Annual
Visual Assessment		Yes	Semi-Annual
Exotic and nuisance vegetation			Semi-Annual
Project Boundary			Semi-Annual

7.0 Performance Standards

The performance criteria for the Site follows approved performance criteria presented in the guidance documents outlined in RFP 16-007242 and the Consolidated Buffer Rule (15A NCAC 02B .0295). Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project.

The buffer restoration project has been assigned specific performance criteria components for vegetation. Performance criteria will be evaluated throughout the five-year post-construction monitoring. An outline of the performance criteria components follows.

7.1 Vegetation

The final vegetative success criteria will be the health, survival, and density of at least 260 stems per acre at the end of the fifth year of monitoring, with a minimum of four native hardwood tree or shrub species composition and no one species comprises more than 50 percent of stems. Vigor, height, species composition, and density will all be assessed. The extent of invasive species coverage will also be monitored and controlled as necessary throughout the required monitoring period.

7.2 Photo Reference Stations

Photographs will be taken within the project area once a year to visually document stability for five years following construction. Permanent markers will be established and located with GPS equipment so that the same locations and view directions on the Site are photographed each year.

7.3 Visual Assessments

Visual assessments should support the specific performance standards for each metric as described above. Visual assessments will be performed within the Site on a semi-annual basis during the five-year monitoring period. Problem areas with vegetative health will be noted (e.g. low stem density, vegetation mortality, invasive species or encroachment). Areas of concern will be mapped and photographed accompanied by a written description in the annual report. Problem areas with be re-evaluated during each subsequent visual assessment. Should remedial actions be required, recommendations will be provided in the annual monitoring report.

To ensure compliance with 0295 (0) (6): A visual assessment of the preservation areas within the conservation easement will also be performed each year to confirm:

- No encroachment has occurred; diffuse flow is being maintained in the conservation easement area; and there has not been any cutting, clearing, filling, grading, or similar activities that would negatively affect the functioning of the buffer.
- Any issues identified during the visual assessment of the preservation areas will be photographed and mapped as part of the annual monitoring report with remedial efforts proposed or documented.

7.4 Reporting Performance Criteria

Using the DMS Riparian Buffer and Nutrient Offset Buffer Baseline and Annual Monitoring Report Template version 2.0 (May 2017), a baseline monitoring document and as-built record drawings of the project will be developed for the constructed Site. Complete monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS. Annual monitoring reports will be based on the above referenced DMS Template (May 2017). The monitoring period will extend five years beyond completion of construction or until performance criteria have been met.

7.5 Maintenance and Contingency Plans

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase will identify an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified and will include a work schedule and updated monitoring criteria (if applicable).

8.0 Stewardship

8.1 Long Term Stewardship

The Site will be transferred to the North Carolina Department of Environmental Quality (NCDEQ) Stewardship Program. This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the site to ensure that restrictions required in the conservation easement are upheld. The NCDEQ Stewardship Program is developing an endowment system within the non-reverting, interest-bearing Conservation Lands Conservation Fund Account. The use of funds from the Endowment Account will be governed by North Carolina General Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for stewardship, monitoring, stewardship administration, and land transaction costs, if applicable.

8.2 Adaptive Management Plan

Upon completion of Site construction, Wildlands will implement the post-construction monitoring defined in Section 8. Project maintenance will be performed during the monitoring years to address minor issues as necessary. If, during annual monitoring it is determined the Site's ability to achieve Site performance standards are jeopardized, Wildlands will notify the members of DMS/NCDWR and work with the DMS/NCDWR to develop contingency plans and remedial actions.

The Wildlands Team will develop necessary adaptive measures or implement appropriate remedial actions in the event that the Site or a specific component of the Site fails to achieve the success criteria outlined above. The project-specific monitoring plan developed during the design phase will identify an appropriate threshold for maintenance intervention based on the monitored items. Any actions implemented will be designed to achieve the success criteria specified previously and will include a work schedule and updated monitoring criteria (if applicable).

9.0 References

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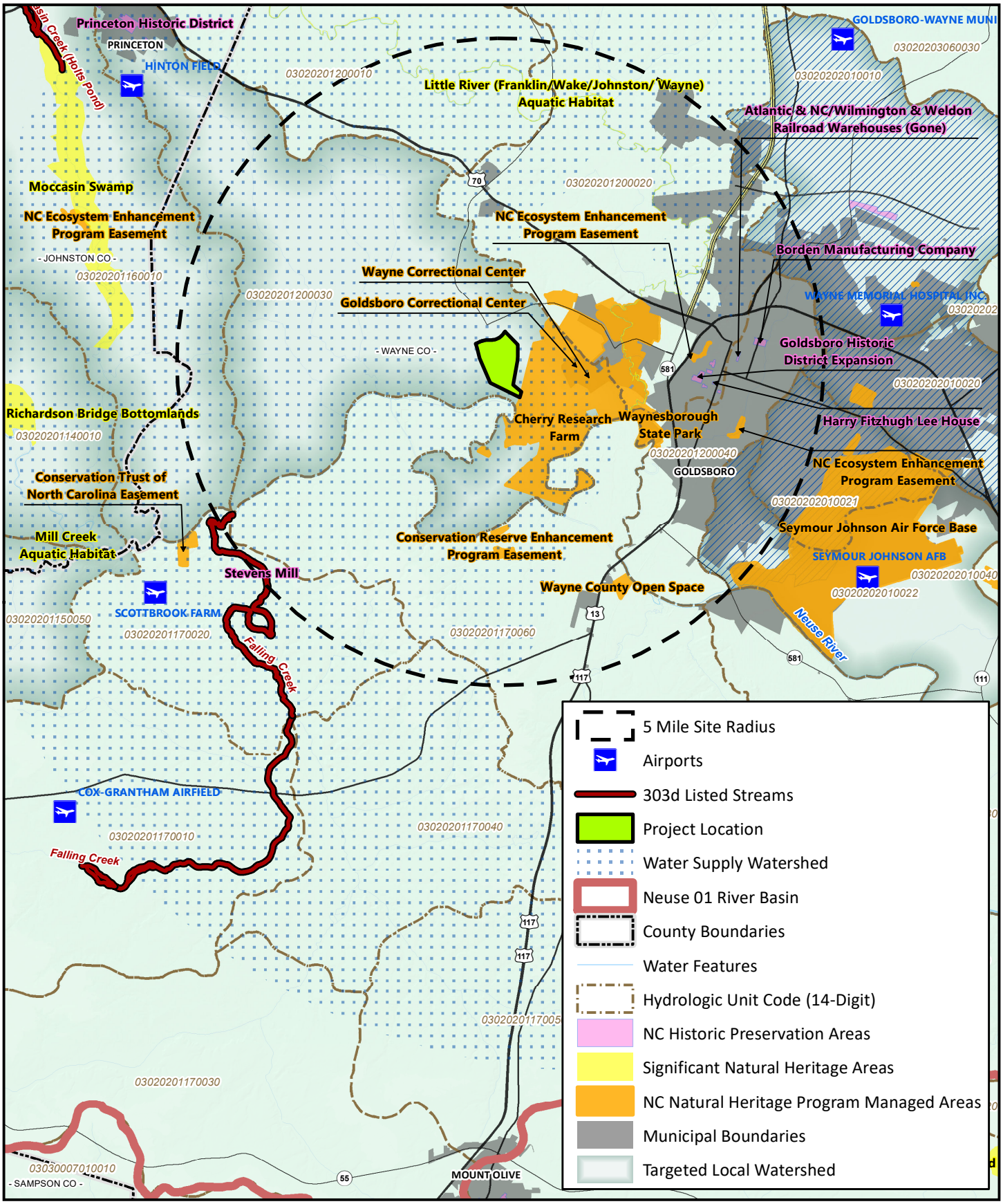
United States Fish and Wildlife Service (USFWS), 2018. Endangered Species, Threatened Species, Federal Species of Concern and Candidate Species, Wayne County, NC. https://www.fws.gov/raleigh/species/cntylist/durham.html



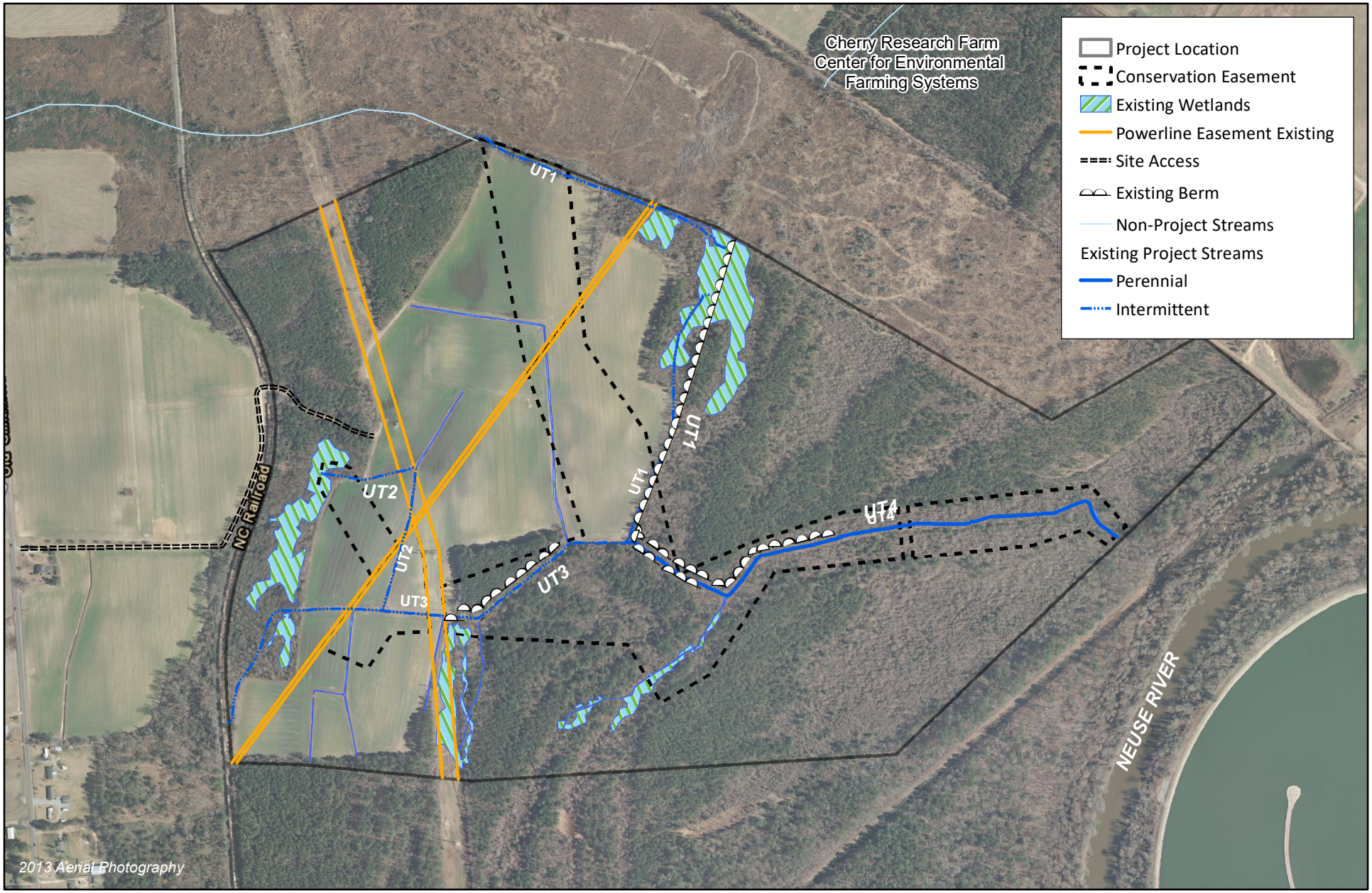
WILDLANDS ENGINEERING

0 1 2 Miles

N

Figure 1 Vicinity Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

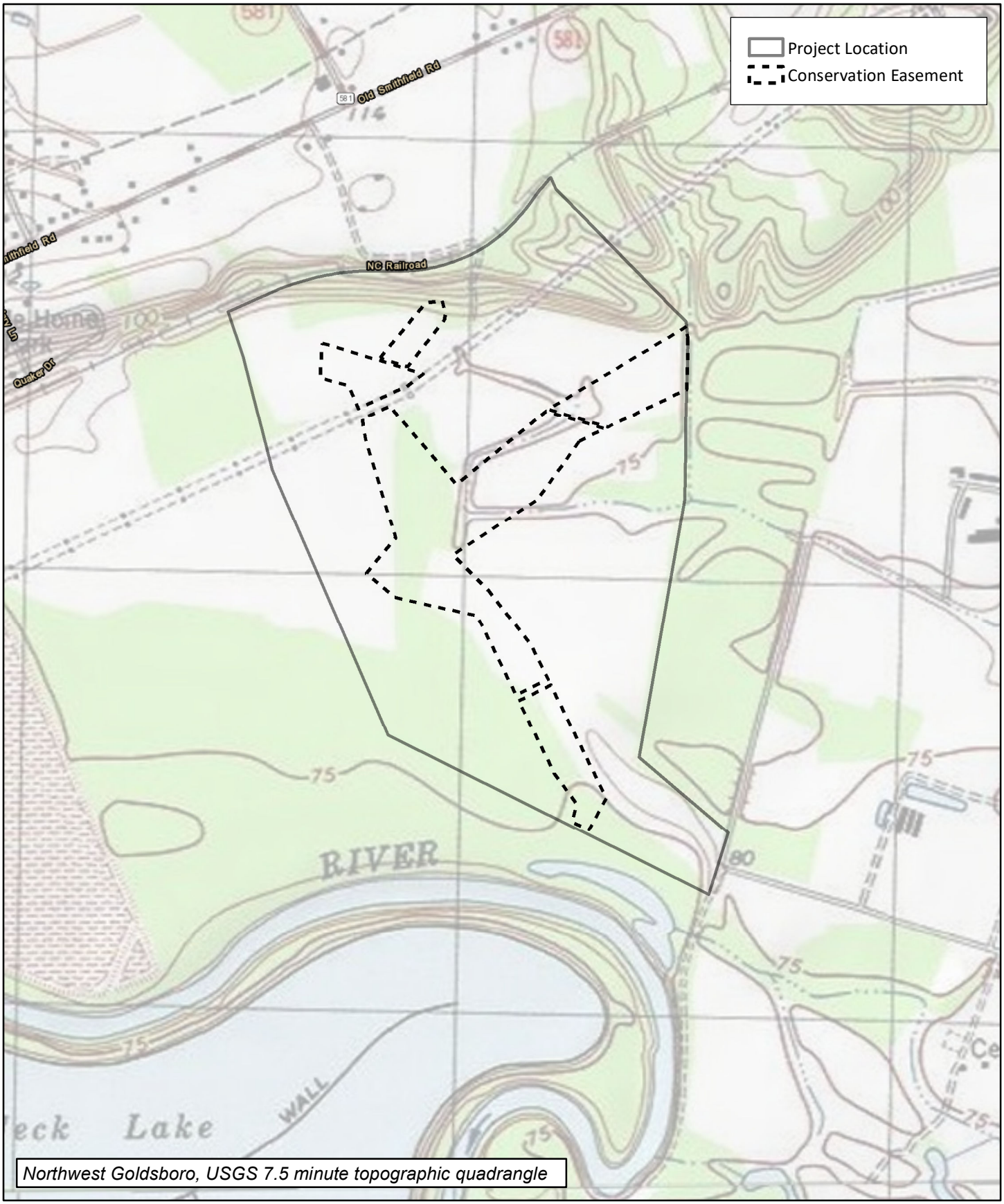


WILDLANDS ENGINEERING

0 1,000 Feet

Figure 2 Site Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



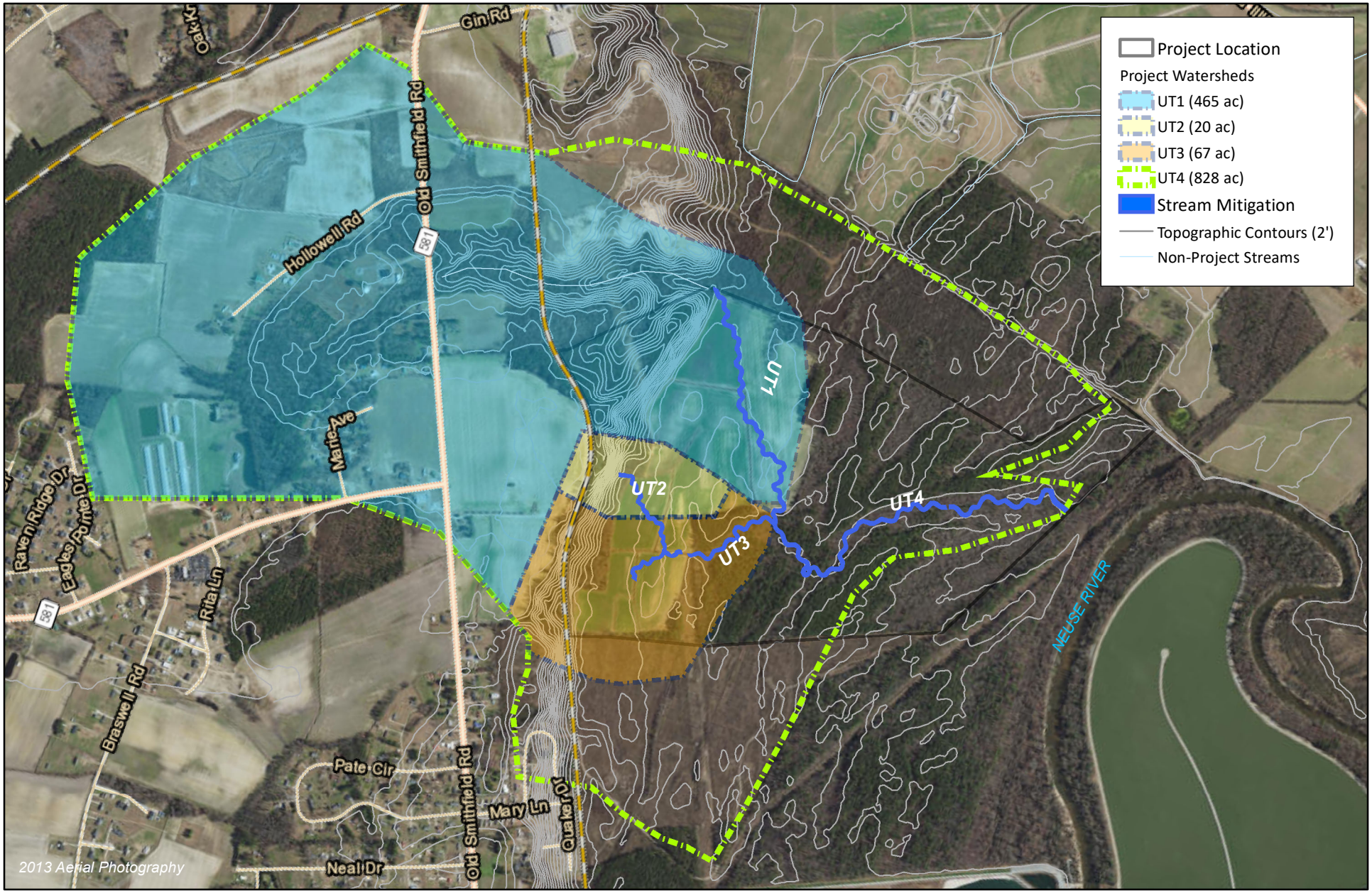
WILDLANDS ENGINEERING

0 1,000 Feet

N

Figure 3 Topographic Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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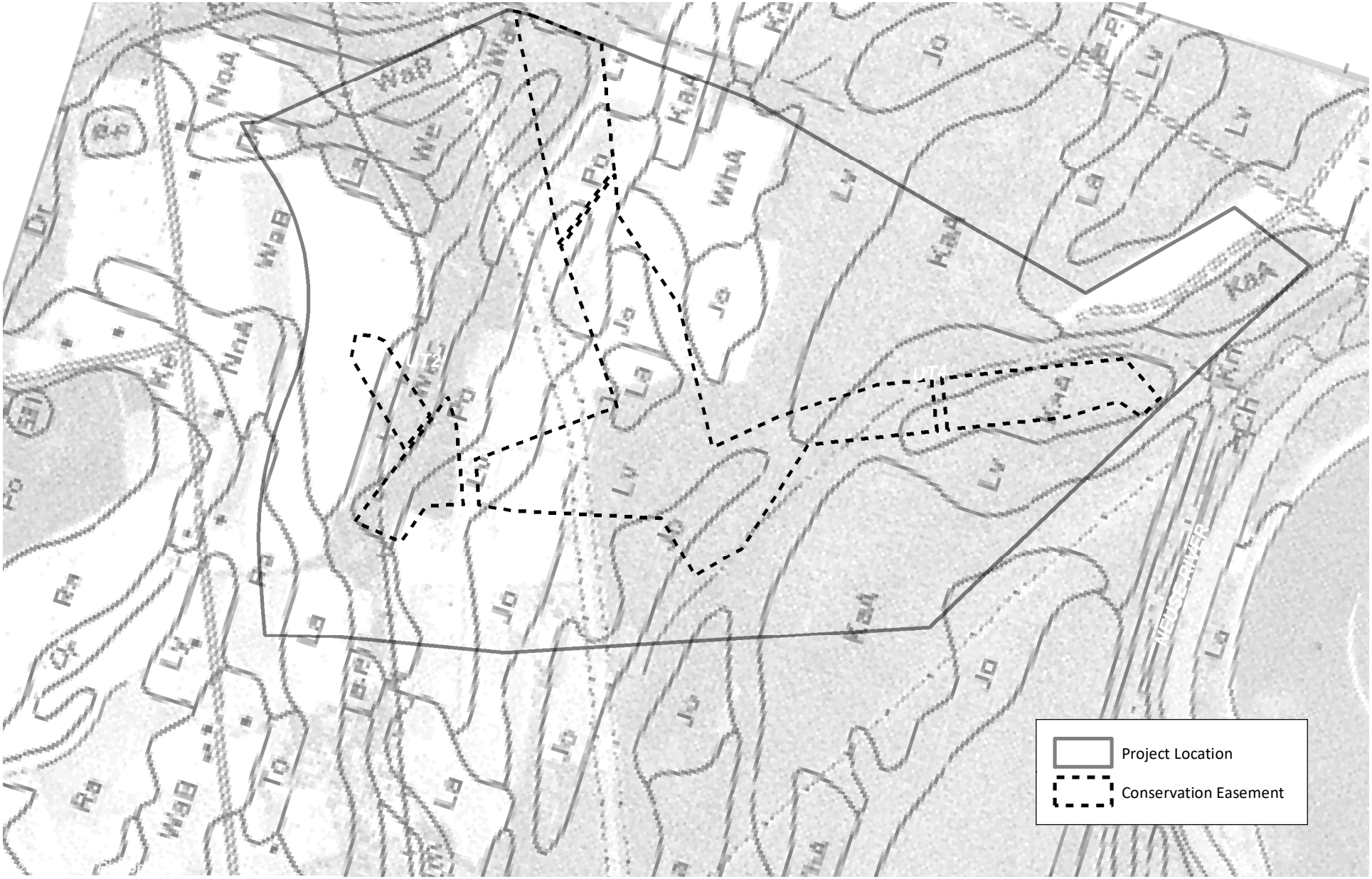
Figure 4 Watershed Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

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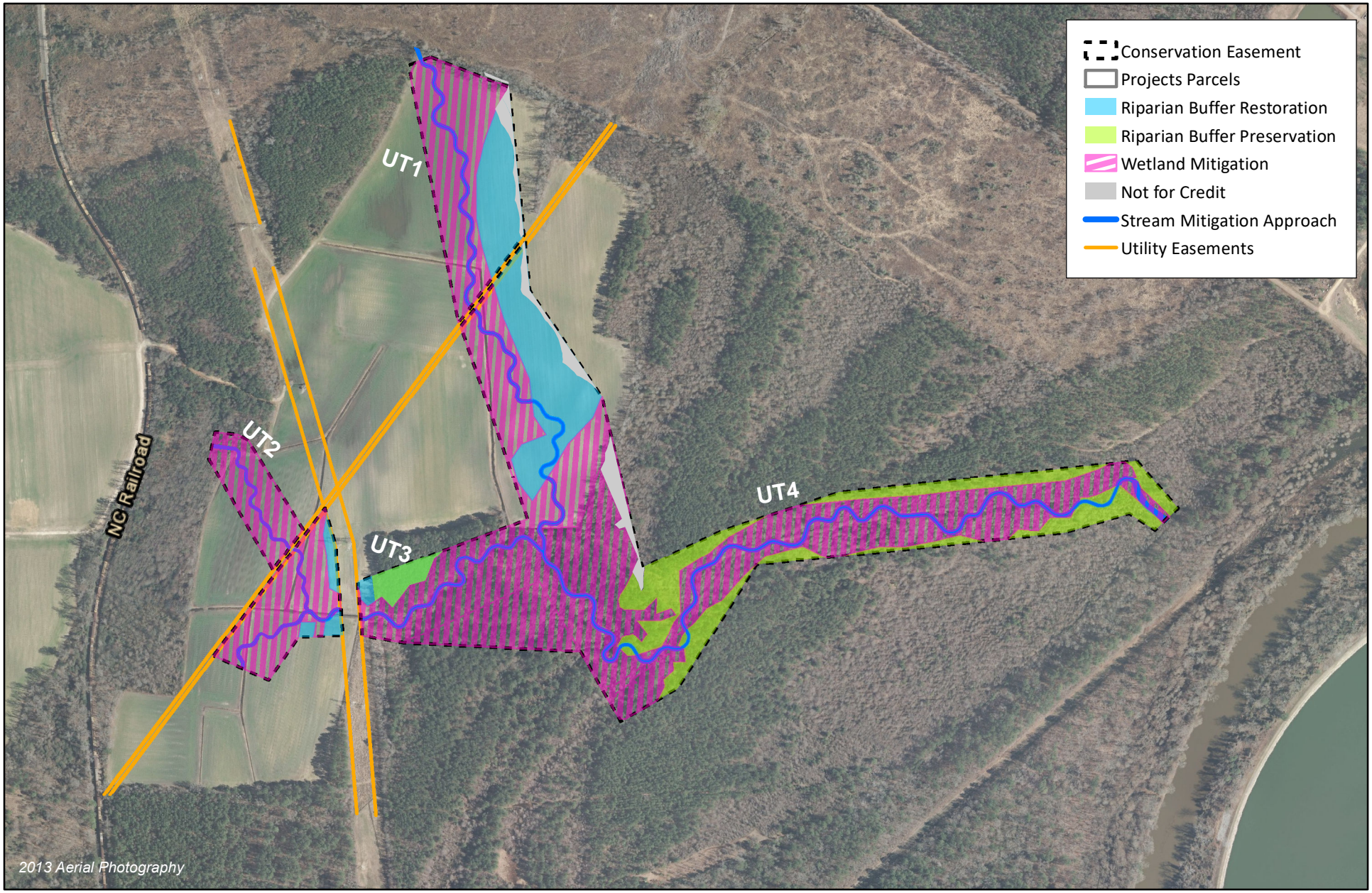
Figure 5 Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

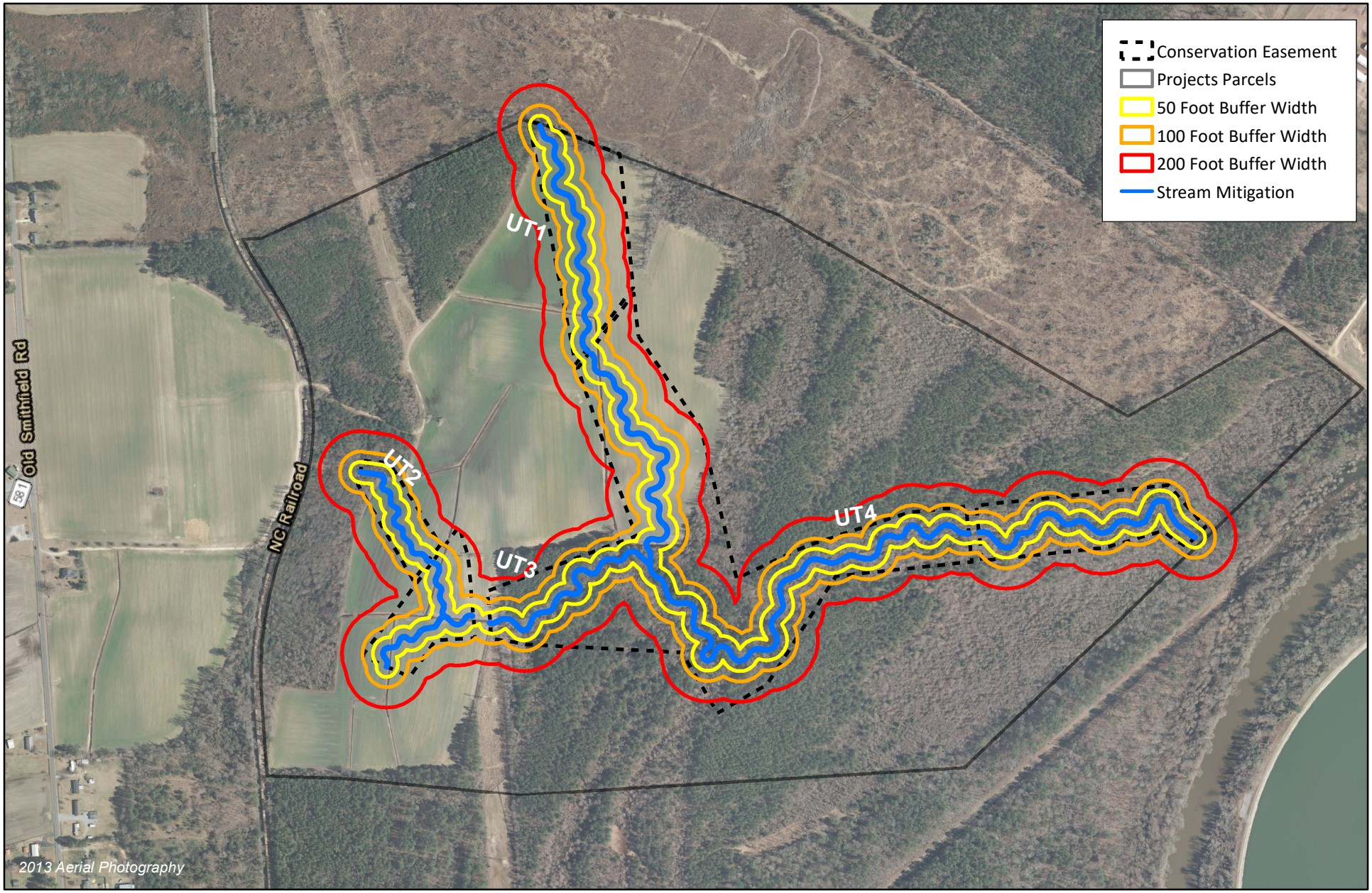


WILDLANDS ENGINEERING

0 1,000 Feet

Figure 6 Credit Calculations Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

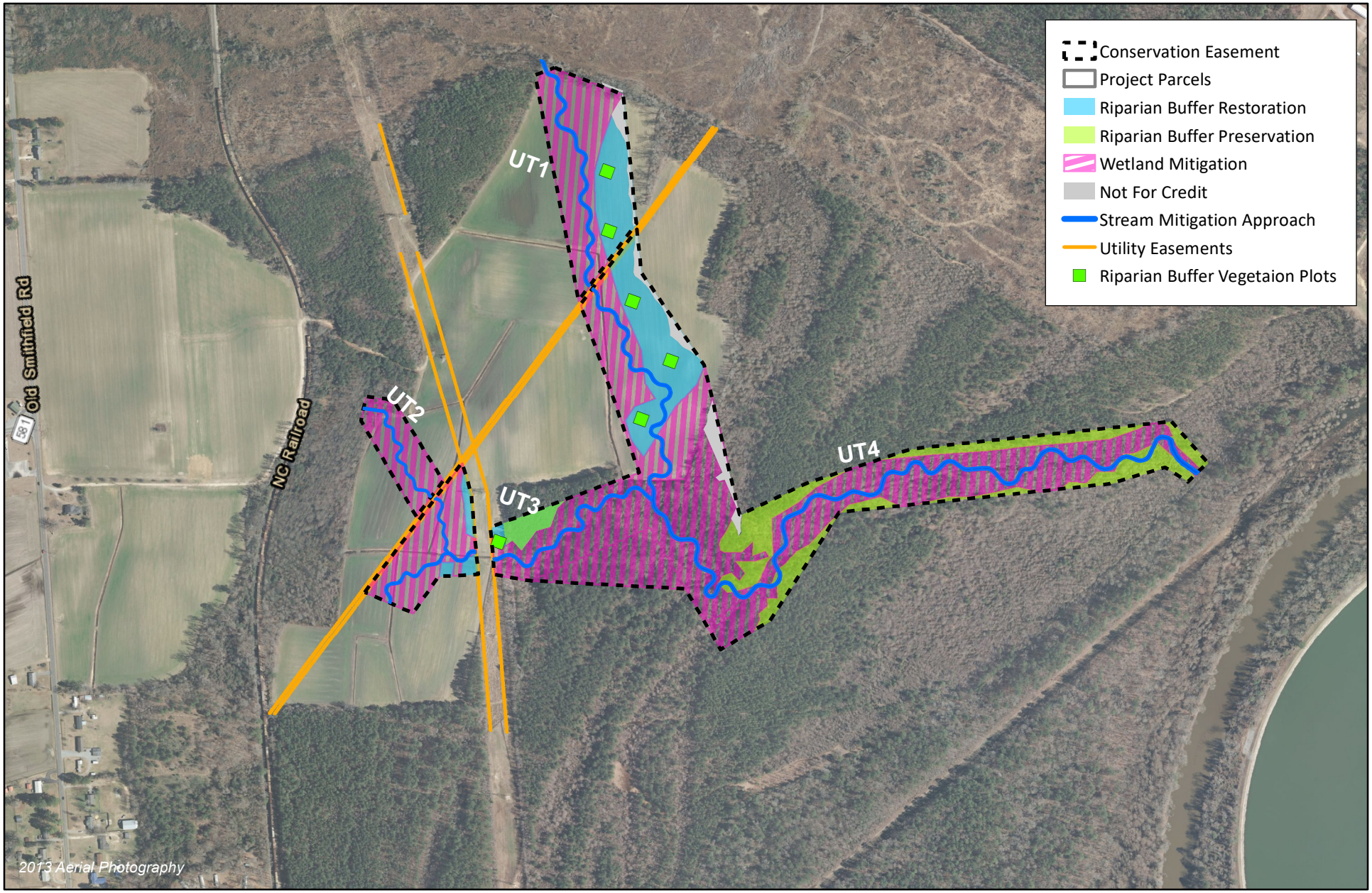


WILDLANDS ENGINEERING

0 750 Feet

Figure 7 Riparian Buffer Zones Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

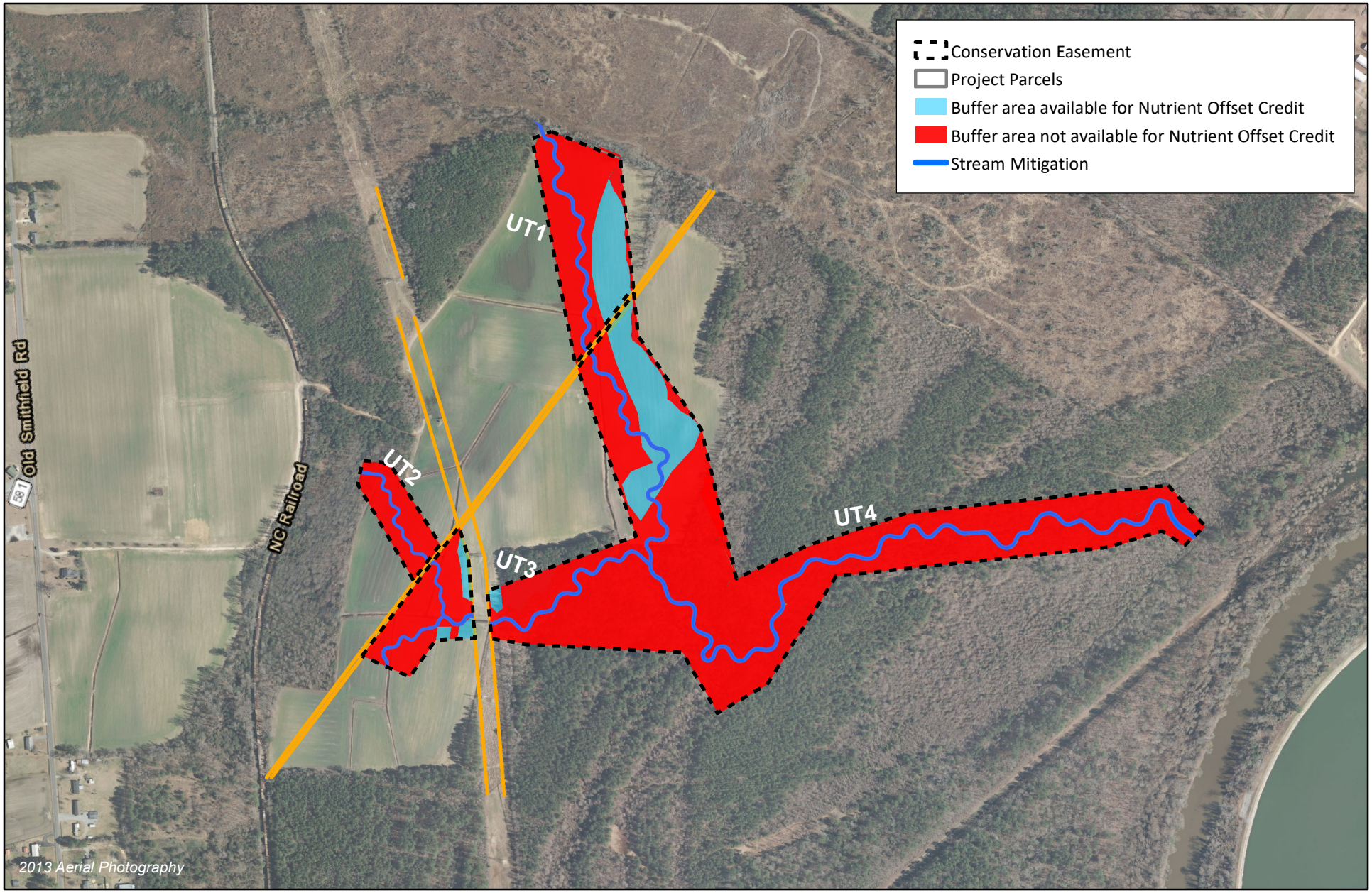


WILDLANDS ENGINEERING

0 1,000 Feet

Figure 8 Proposed Monitoring Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

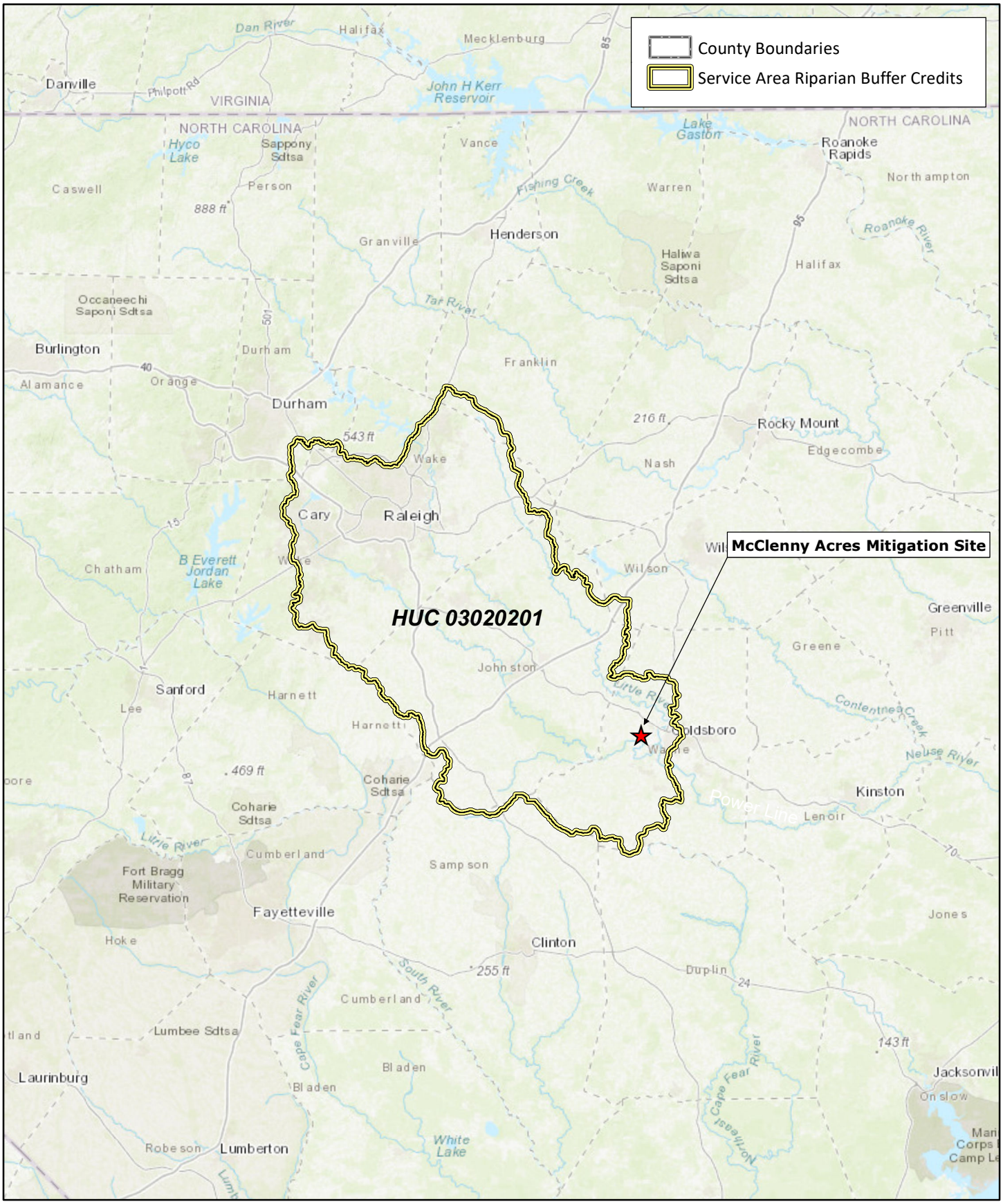


WILDLANDS ENGINEERING

0 1,000 Feet

Figure 9 Nutrient Offset Zones Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC



WILDLANDS ENGINEERING

0 5 10 Miles

N

Figure 10 Service Area Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Sub-Appendices

Overview Photographs

Site Viability Letter

Water Resources
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 10, 2018

John Hutton
Wildlands Engineering, Inc.
312 West Millbrook Rd, Suite 225
Raleigh, NC 27609
(via electronic mail: jhutton@wildlandseng.com)

DWR ID# 2018-0197
Wayne County

Re: Site Viability for Buffer Mitigation and Nutrient Offset & Buffer- McClenny Acres Site
Near 1100 Old Smithfield Rd, Goldsboro, NC
Neuse 03020201 (not in Falls WS)

Dear Mr. Hutton,

On February 9, 2018, Katie Merritt, with the Division of Water Resources (DWR), received a request from Wildlands Engineering, Inc. (WEI) for an onsite mitigation determination near the above-referenced site (Site). The Site is located in the Neuse River Basin within the 8-digit Hydrologic Unit Code 03020201. The Site is being proposed as part of a full-delivery stream, riparian buffer and wetland mitigation project for the Division of Mitigation Services (RFP #16-007279). Members of the Interagency Review Team (IRT) and Division of Mitigation Services were also present onsite. At your request, on February 22, 2018, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to streams onsite, which are shown on the attached map labeled "Figure A".

At the request of WEI, this mitigation determination is assessed using the proposed stream restoration plan/alignment shown on the attached map labeled "Revised Concept Map" that will be submitted to the Interagency Review Team (IRT) for review. If the proposed stream channel alignments change in any way from what is shown on the attached Revised Concept Map, or the stream channels do not develop into intermittent or perennial streams as determined by DWR, this viability letter may be subject to change.

Ms. Merritt's evaluation of the features and their associated mitigation determination for the riparian areas are provided in the table below. The evaluation was made from Top of Bank (TOB) out to 200' from each existing or *proposed* feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0240.

Feature	Classification on Restoration Plan	[1]Subject to Buffer Rule	Riparian Land uses adjacent to proposed Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Credit Viable at 2,273 lbs/acre	Mitigation Type Determination w/in riparian areas
UT-1	Restored stream channel	Yes	Agricultural Fields	Yes	Yes	Fields - **Restoration site** per 15A NCAC 02B .0295 (n)

Feature	Classification on Restoration Plan	[1]Subject to Buffer Rule	Riparian Land uses adjacent to proposed Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Credit Viable at 2,273 lbs/acre	Mitigation Type Determination w/in riparian areas
UT-2	Restored stream channel	Yes	Agricultural Fields with some forested areas up stream	Yes[3]	Yes (fields only)	Fields (excluding the power line) – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT3	Restored stream channel	Yes	Agricultural Fields with some forested areas up stream	Yes[3]	Yes (fields only)	Fields (excluding the power line) – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT-3	Restored stream channel	Yes	Agricultural Fields with some forested areas	Yes[3]	Yes (fields only)	Fields – **Restoration site** per 15A NCAC 02B .0295 (n) Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
UT-4	Restored stream channel	Yes	Mature forest w/ a maintained hunting lane within Zone 1	Yes[3]	No	Forested Areas – **Preservation Site** per 15A NCAC 02B .0295 (o)(5)
A	Ditch	No	Agricultural Fields	N/A	N/A	*N/A* *Proposed to be filled and graded for wetland mitigation*
B	Ditch	No	Agricultural Fields	N/A	N/A	*N/A* *Proposed to be filled and graded for wetland mitigation*
C & D	Not Assessed		Agricultural Fields			

[1]Subjectivity calls for the features were determined by DWR in correspondence dated April 5, 2018 and April 6, 2018 using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS.

[2] *NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment*

[3]The area of preservation credit within a buffer mitigation site shall comprise of no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 0295 (o)(5) and 15A NCAC 0295 (o)(4). Site cannot be a Preservation only site to comply with this rule.

Maps that are attached to this letter were provided by DWR and WEI and were initialed by Ms. Merritt on April 10, 2018. This letter should be provided in all stream, wetland, buffer and/or nutrient offset mitigation plans for this Site.

This letter does not constitute an approval of this site to generate mitigation credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0240, a proposal regarding a proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0240.

This viability assessment will expire on April 10, 2020 or upon the submittal of an As-Built Report to the DWR, whichever comes first. Please contact Katie Merritt at (919)-807-6371 if you have any questions regarding this correspondence.

Sincerely,

Karen Higgins, Supervisor
401 and Buffer Permitting Branch

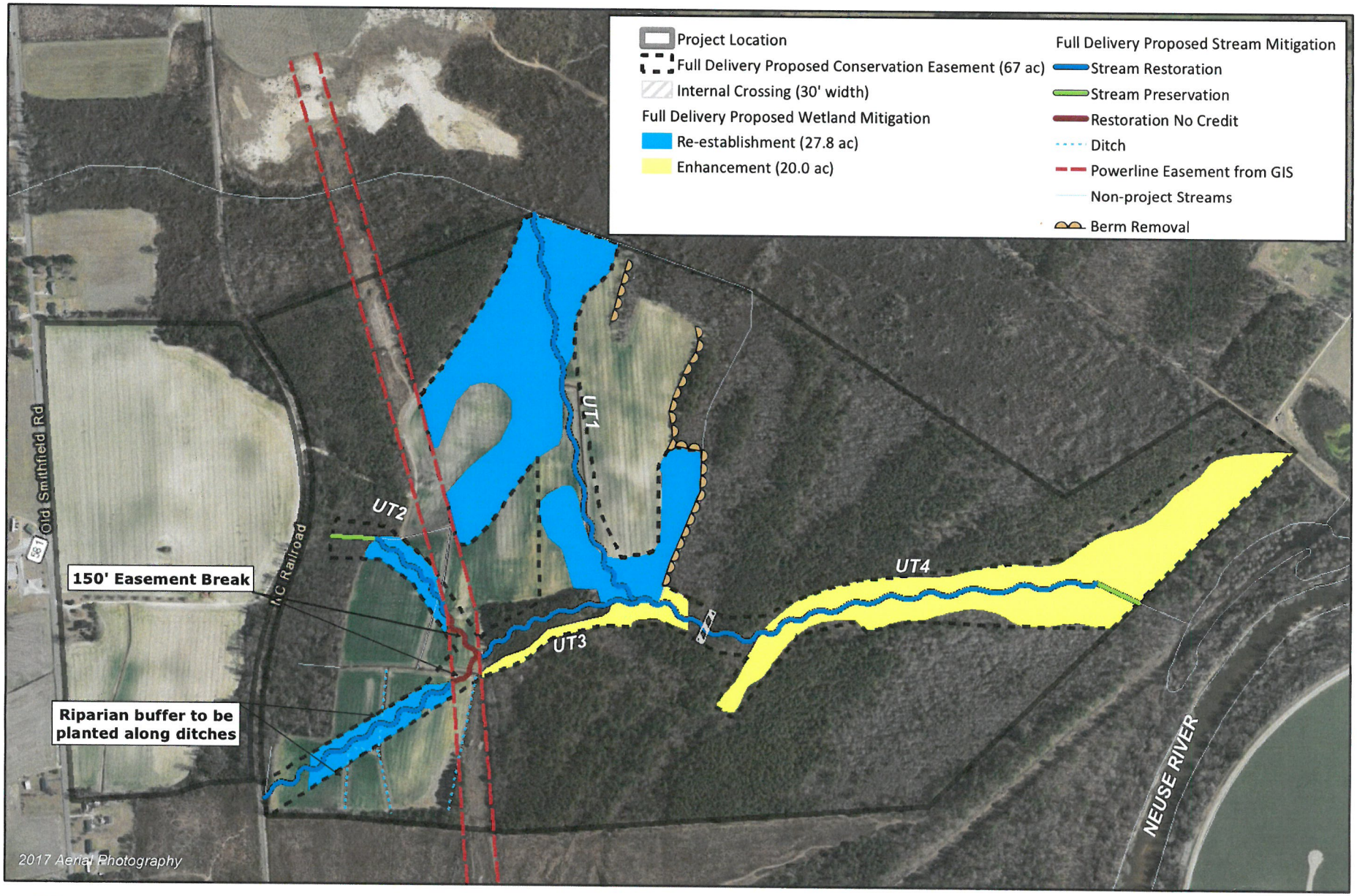
KAH/*km*
Attachments: Figure A, Revised Concept Map

cc: File Copy (Katie Merritt)
DMS – Jeff Schaffer (via electronic mail)

Figure A: McClenny Acres Full Delivery Site – DWR Stream Determination & Site Viability

Kym 4/6/18
DWR # 2018-0197v3

Kym 4/10/18
(viability)



WILDLANDS ENGINEERING

0 700 Feet

Revised Concept Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

4/10/18

DWR # 2018-0197

Stream Determinations

Water Resources
ENVIRONMENTAL QUALITY

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 6, 2018

Wildlands Engineering, Inc
Attention: John Hutton
312 West Millbrook Rd, Suite 225
Raleigh, NC 27609

DWR Project #18-0197v3
Wayne County

Subject: On-Site Determination for Applicability to the Neuse River Riparian Buffer Rules and Water Quality Standards (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Full Delivery Site

Address/Location: 1100 Old Smithfield Rd, Goldsboro, NC

Stream(s) Evaluated: UTs to the Neuse River

Determination Date: February 22, 2018

DWR Staff: Katie Merritt

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☒ Intermittent/Perennial Determination (where local buffer ordinances apply)

At the request of Wildlands Engineering, Inc, staff from the Division of Water Resources (DWR) conducted two (2) site visits on a parcel located near the location indicated above, for purposes of determining applicability of the Neuse River Riparian Buffer Rules & Water Quality Standards. The second site visit was performed on April 5, 2018 and referenced in correspondence dated April 5, 2018 (DWR# 2018-0197v2). See the following table and written explanation regarding the stream determinations performed on February 22, 2018.

Feature ID[1]	Feature Type[2]	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
UT1	Stream (I)		X	Property Boundary	Confluence with UT-3	X	X
UT2[3]							
UT3	Stream (I)	X		See Map	Confluence with UT-4		
UT4	Stream (P)		X	Confluence with UT-3	Property Boundary	X	
A	Ditch	X		See map	Confluence with UT-3		X
B	Ditch			See map	Confluence with UT-2		
C	Not assessed			See map			
D	Not Assessed			See map			

[1] See maps provided with letter showing labeled features
[2] Ephemeral (E), Intermittent (I), Perennial (P)
[3] Stream Determination performed on April 5, 2018 by DWR Washington Regional Office

The DWR has determined that some of the streams listed above have been located on the most recently published NRCS Soil Survey of Wayne County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and were evaluated for applicability to the Neuse Riparian Buffer Rule.

Maps are provided with this letter from Wildlands Engineering, Inc and were initialed by Katie Merritt on April 6, 2018. Each feature that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property or not depicted on the required maps. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act.

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of the date of this letter to the Director in writing.

If sending via US Postal Service:

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):

c/o Karen Higgins
DWR – 401 & Buffer Permitting Branch
512 N. Salisbury Street
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested within sixty (60) days.

This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Raleigh Regulatory Field Office at (919)-554-4884.

If you have questions regarding this determination, please feel free to contact Katie Merritt at (919) 807-6371.

Sincerely,

Karen Higgins

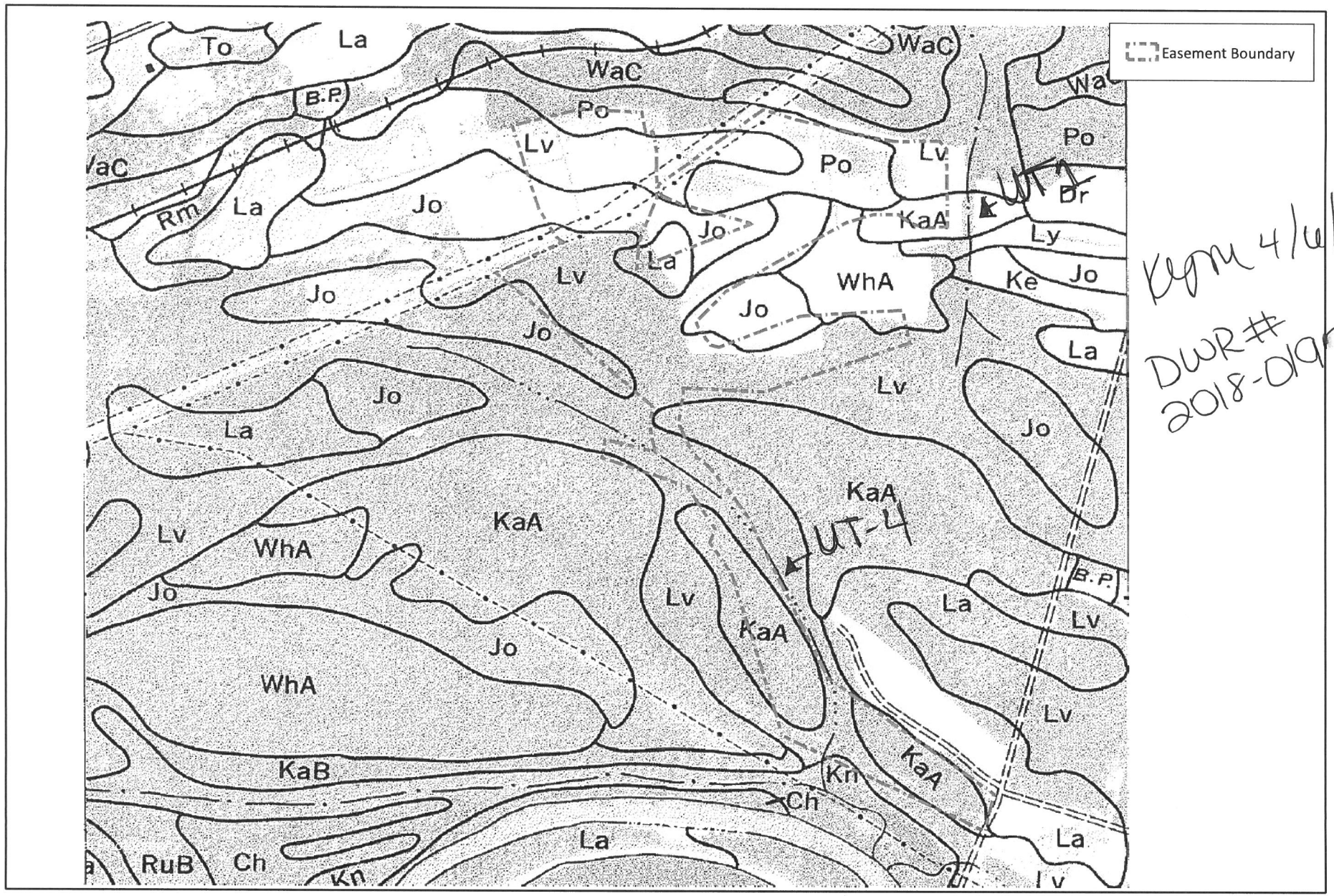
Karen Higgins, Supervisor
401 & Buffer Permitting Branch

Attachments: USGS Topographic Map, Wayne County Soil Survey Map, and Figure A

cc: William McClenny, 4700 Glenn Forest Dr., Raleigh, NC 27612
401 & Buffer Permitting Branch file
RRO DWR file

Filename: 180197v3McClennyMitSite(Wayne)_Neuse_StreamDet.docx


ATHFIELD RD
110
105
90
100
95
80
75
60
UT-1
A
DWR#
2018-0197v3
KGM 4/6/18



WILDLANDS ENGINEERING

1974 NRCS Soils Map
McClenny Acres Mitigation Site
Neuse River Basin 03020201

Wayne County, NC

Kgm 4/6/18

DWR# 2018-0197v3

Figure A: McClenny Acres Full Delivery Site – DWR Stream Determination & Site Viability

Kym 4/6/18
DWR # 2018-0197v3

Water Resources
Environmental Quality

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Interim Director

April 5, 2018

William A McClenny
4700 Glenn Forest Drive
Raleigh, NC 27612

DWR #18-0197 V2
WAYNE County

Subject: On-Site Determination for Applicability to Neuse Riparian Buffer Rules (15A NCAC 02B .0233)

Subject Property/ Project Name: McClenny Acres Mitigation Site

Address/Location: Immediately South of Intersection of NC Highway 581 and Old Smithfield Road, Goldsboro

Stream(s) Evaluated: Ut to Neuse River

Determination Date: 4/3/18 Staff: Anthony Scarbraugh

Determination Type:	
Buffer:	Stream:
☒ Neuse (15A NCAC 02B .0233) ☐ Tar-Pamlico (15A NCAC 02B .0259) ☐ Catawba (15A NCAC 02B .0243) ☐ Jordan (15A NCAC 02B .0267) (governmental and/or interjurisdictional projects) ☐ Randleman (15A NCAC 02B .0250) ☐ Goose Creek (15A NCAC 02B .0605-.0608)	☐ Intermittent/Perennial Determination

Stream	E/I/P*	Not Subject	Subject	Start@	Stop@	Soil Survey	USGS Topo
18-0197 V2	I	X		Flag: 18-0197 V2 Begin	Flag: 18-0197 V2 End		X

**E/I/P/NSP = Ephemeral/Intermittent/Perennial/No Stream Present*

The Division of Water Resources (DWR) has determined that the stream listed above and included on the attached map have been located on the most recent published NRCS Soil Survey of WAYNE County, North Carolina and/or the most recent copy of the USGS Topographic map at a 1:24,000 scale and evaluated for applicability to the NEUSE River Riparian Buffer Rules. Each stream that is checked "Not Subject" has been determined to not be at least intermittent or not present on the property. Streams that are checked "Subject" have been located on the property and possess characteristics that qualify them to be at least intermittent streams. There may be other streams or features located on the property that do not appear on the maps referenced above but may be considered jurisdictional according to the US Army Corps of Engineers and subject to the Clean Water Act. **Please note, previous stream determinations were performed by Mrs. Katie Merritt of DWR Central Office on February 22, 2018.**

This on-site determination shall expire five (5) years from the date of this letter. Landowners or affected parties that dispute a determination made by the DWR may request a determination by the Director. An appeal request must be made within sixty (60) calendar days of date of this letter to the Director in writing.

If sending via US Postal Service:
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
1617 Mail Service Center
Raleigh, NC 27699-1617

If sending via delivery service (UPS, FedEx, etc.):
c/o Karen Higgins
DWR – 401 & Buffer Permitting Unit
512 N. Salisbury Street
Raleigh, NC 27604

This determination is final and binding as detailed above, unless an appeal is requested within sixty (60) days.

This determination only addresses the applicability to the buffer rules and does not approve any activity within the buffers. The project may require a Section 404/401 Permit for the proposed activity. Any inquiries regarding applicability to the Clean Water Act should be directed to the US Army Corps of Engineers Washington Regulatory Field Office at (919)-554-4884 Ext. 22.

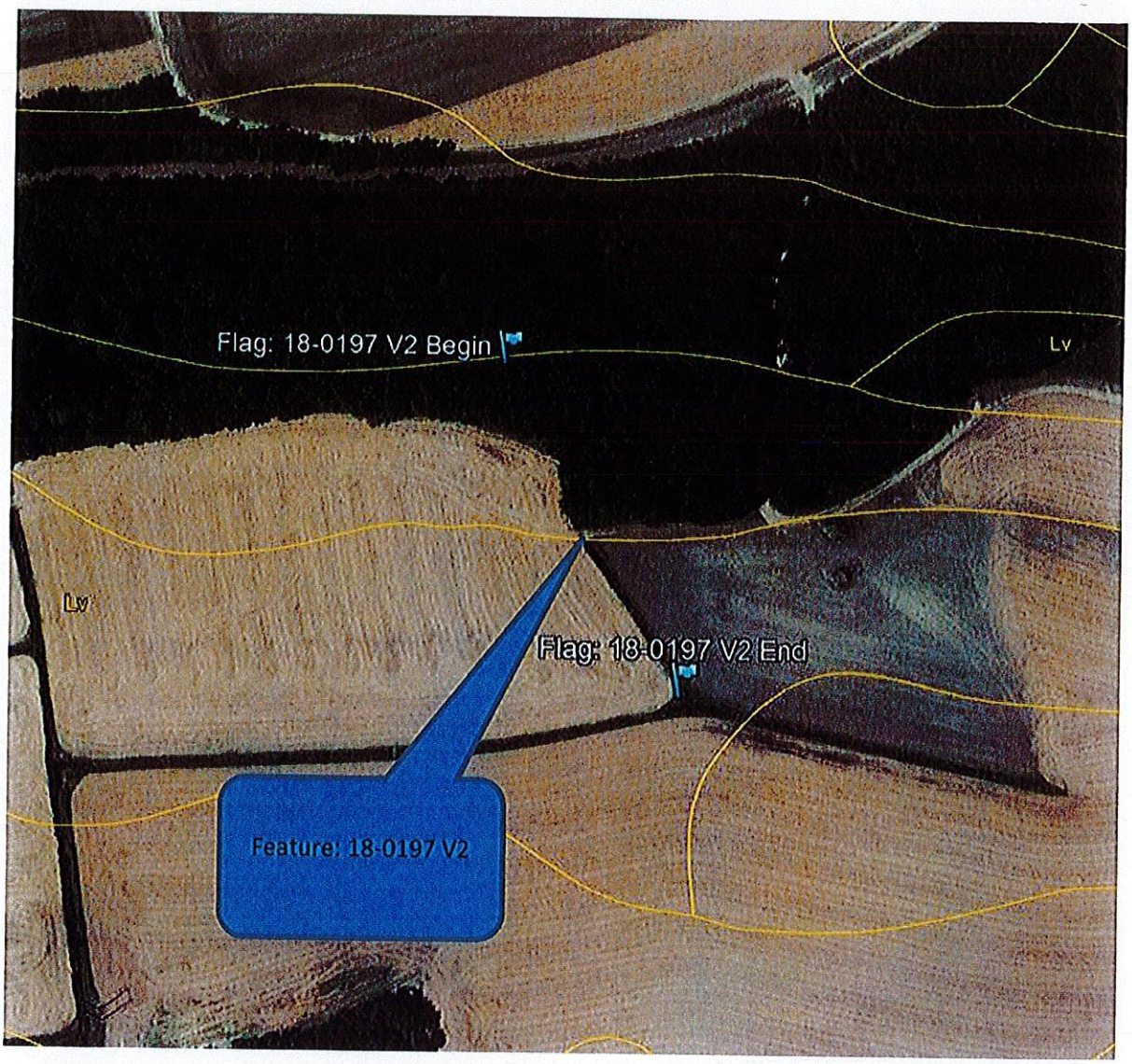
If you have questions regarding this determination, please feel free to contact Anthony Scarbraugh at (252) 948-3924.

Sincerely,

Robert Tankard, Assistant Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ

cc: WaRO DWR File Copy
LASERFICHE
Daniel Taylor, Wildland Engineering, Inc., (via email: dtaylor@wildlandseng.com)

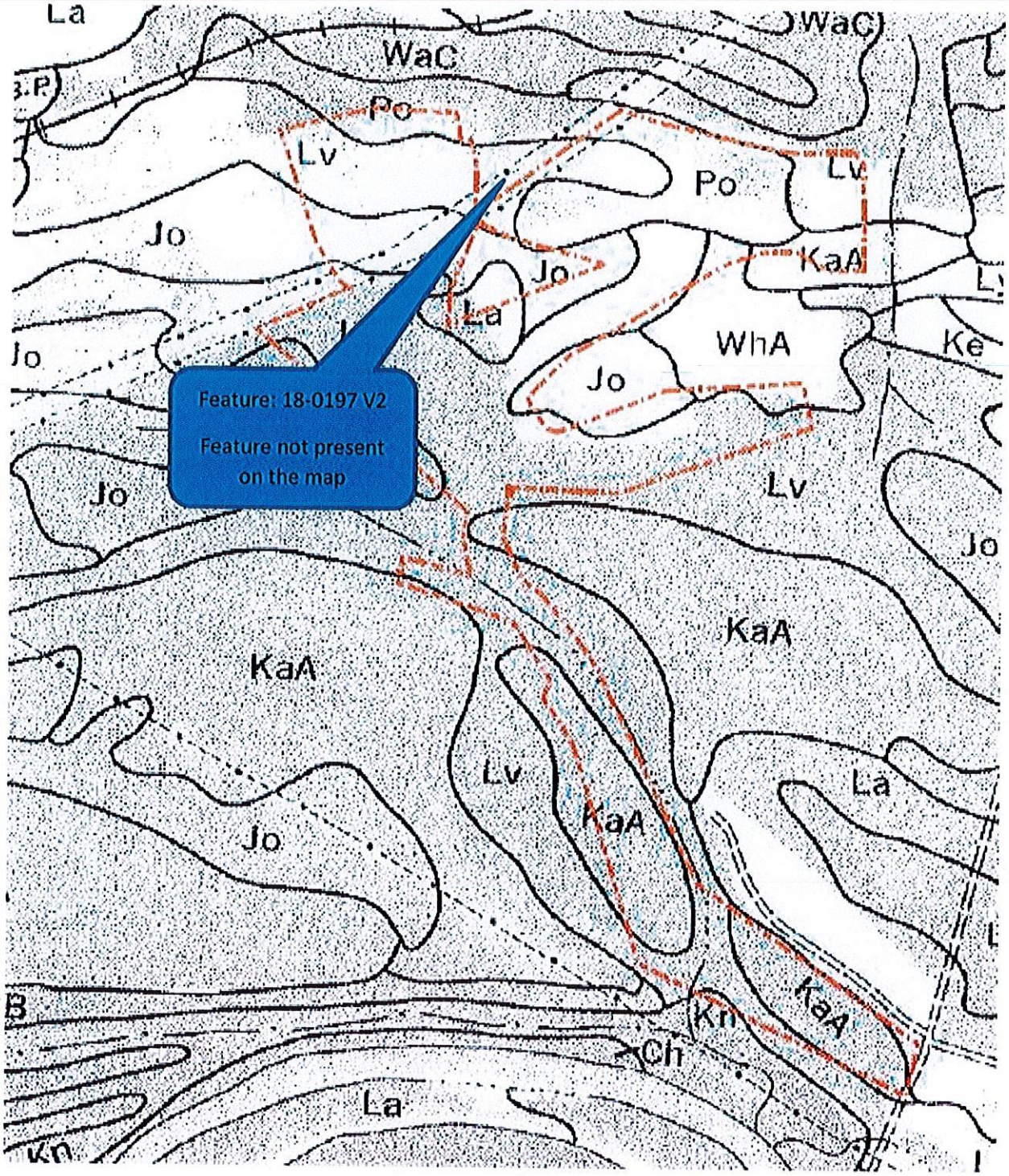
Google Earth Imagery Date: 5/14/2016



USGS Topo Map 1:24,000

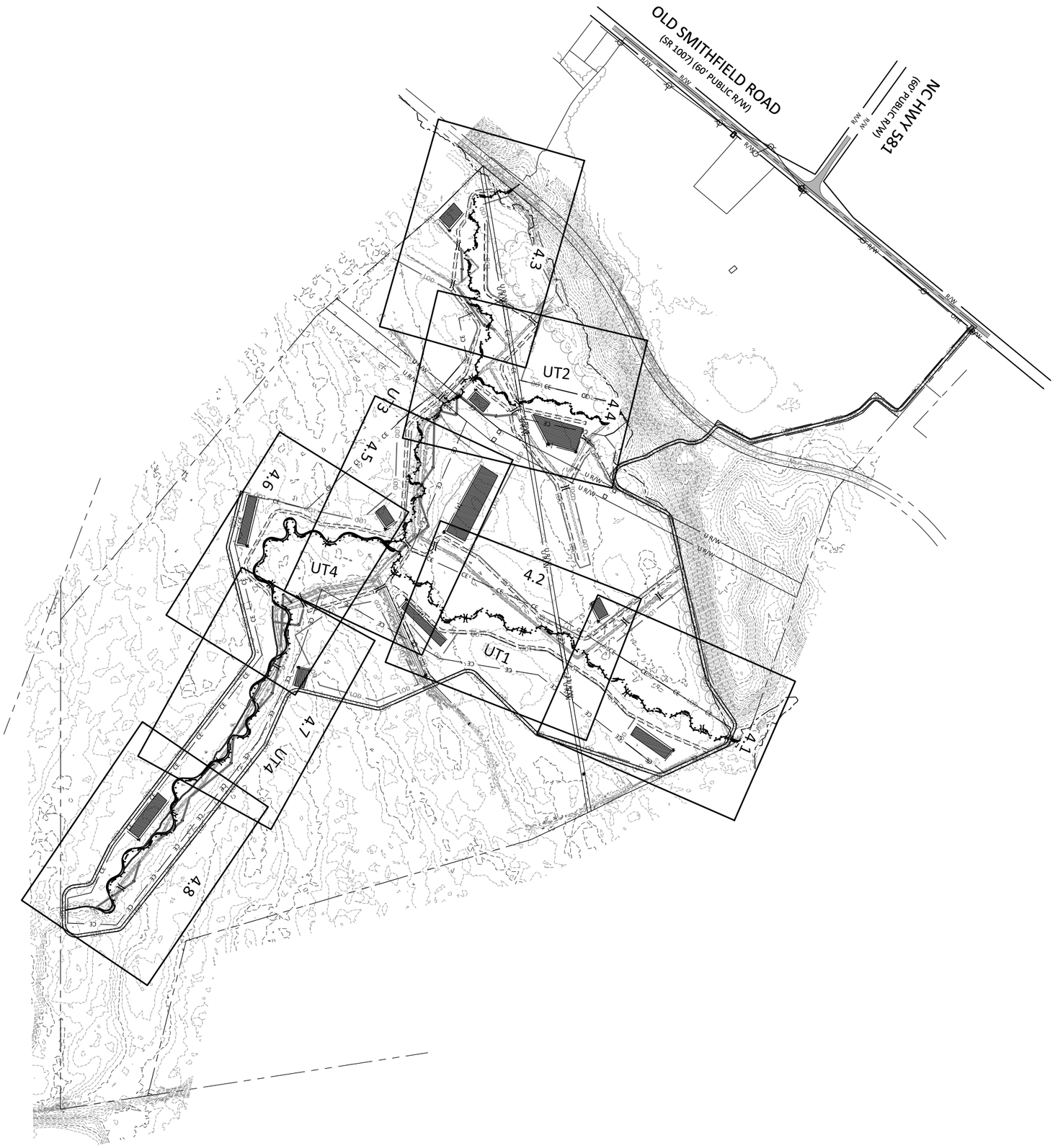
North Carolina Environmental Management Commission
Division of Water Resources
For: NEUSE Basin Buffer
Date 4/5, 2018
Reviewed by AJ

Wayne County NRCS Soils Map



North Carolina Environmental Management Commission
Division of Water Resources
For: NRUE Basin Buffer
Date 4/5, 2018
Reviewed by AS

Erosion and Sediment Control



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

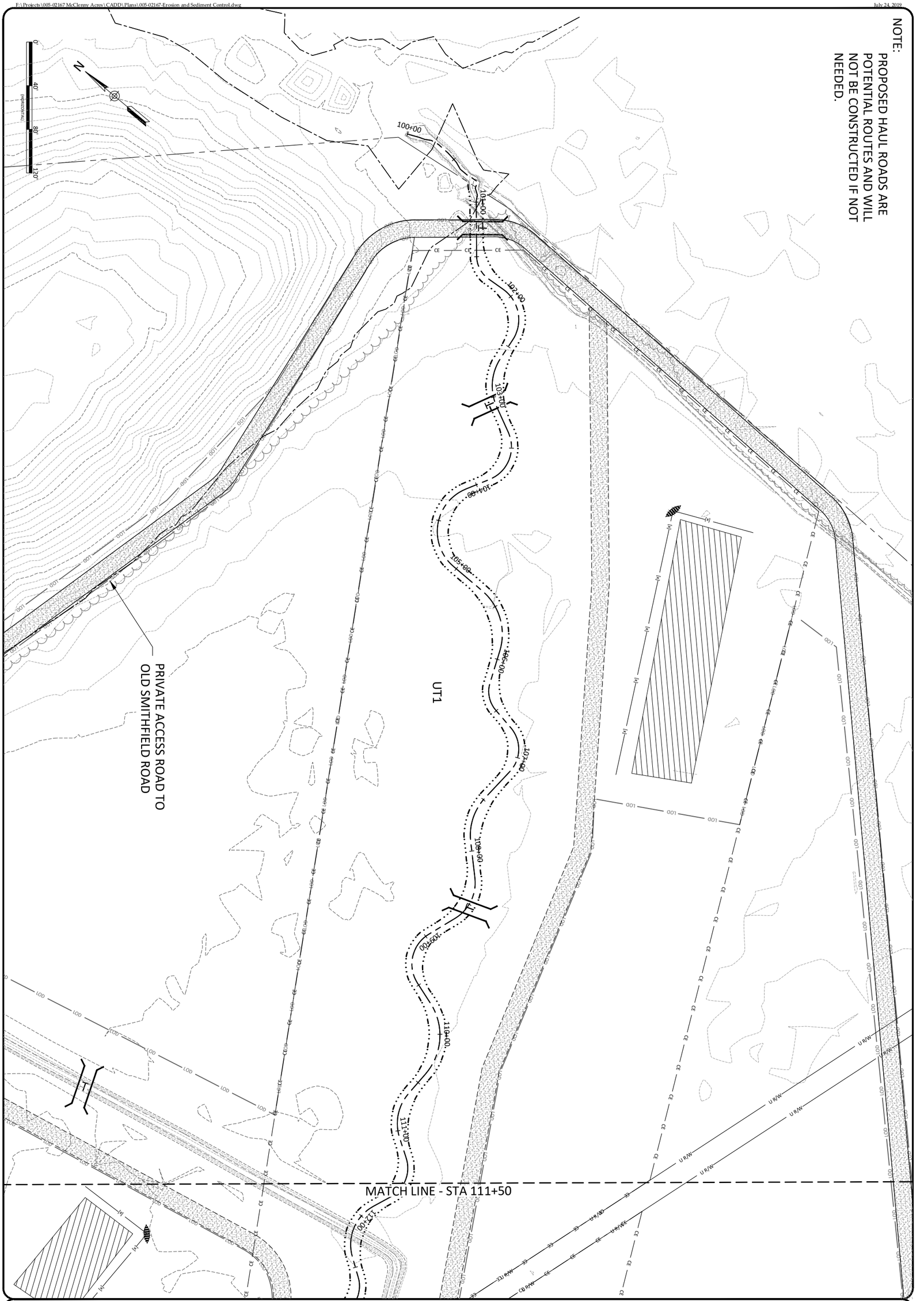
4.0
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control Overview

PRELIMINARY
DO NOT
USE FOR
CONSTRUCTION

WILDLANDS
ENGINEERING
312 W. Millbrook Road, Ste 225
Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

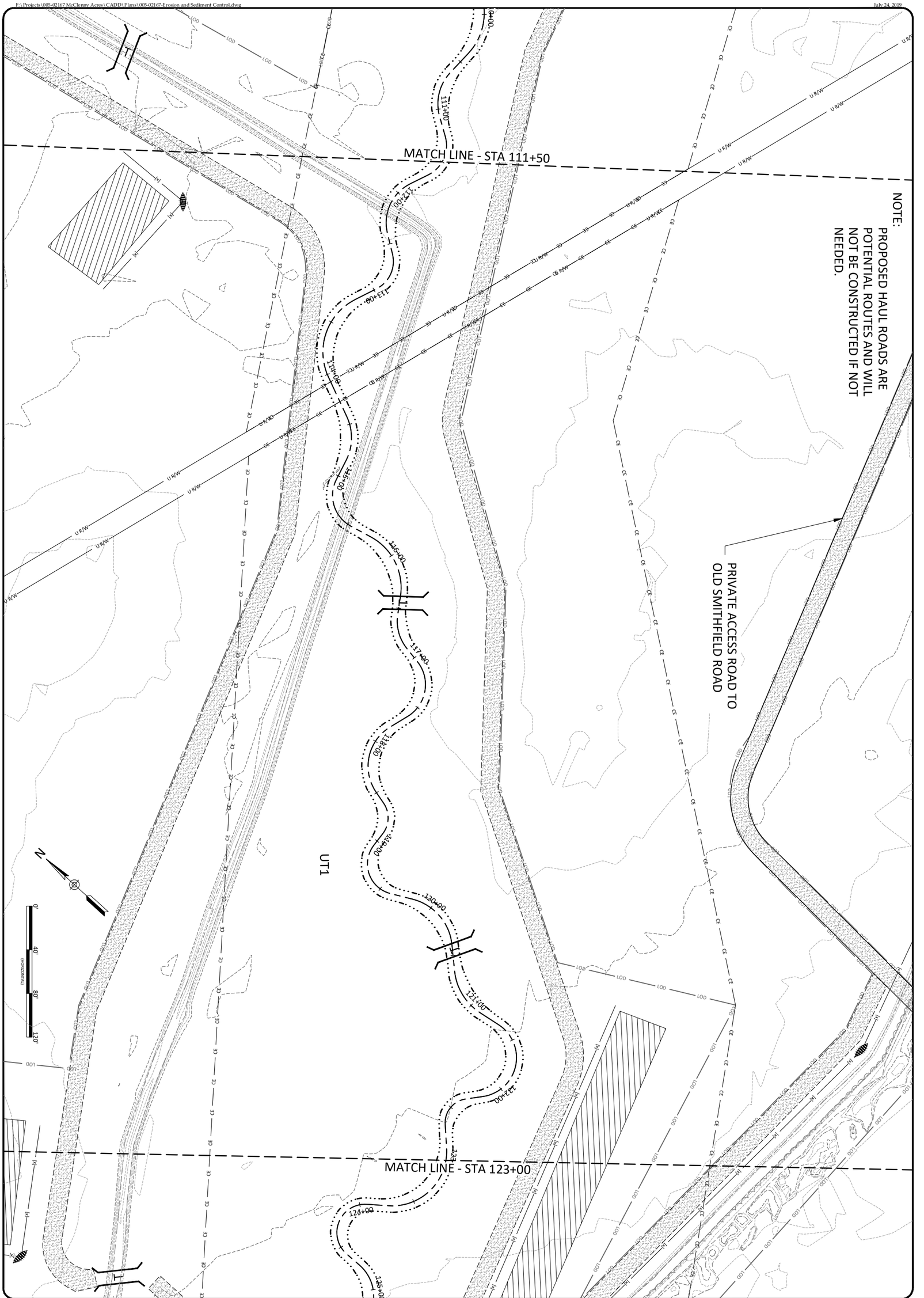
4.1
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

PRELIMINARY DO NOT USE FOR CONSTRUCTION

WILDLANDS ENGINEERING
312 W. Millbrook Road, Ste 225
Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

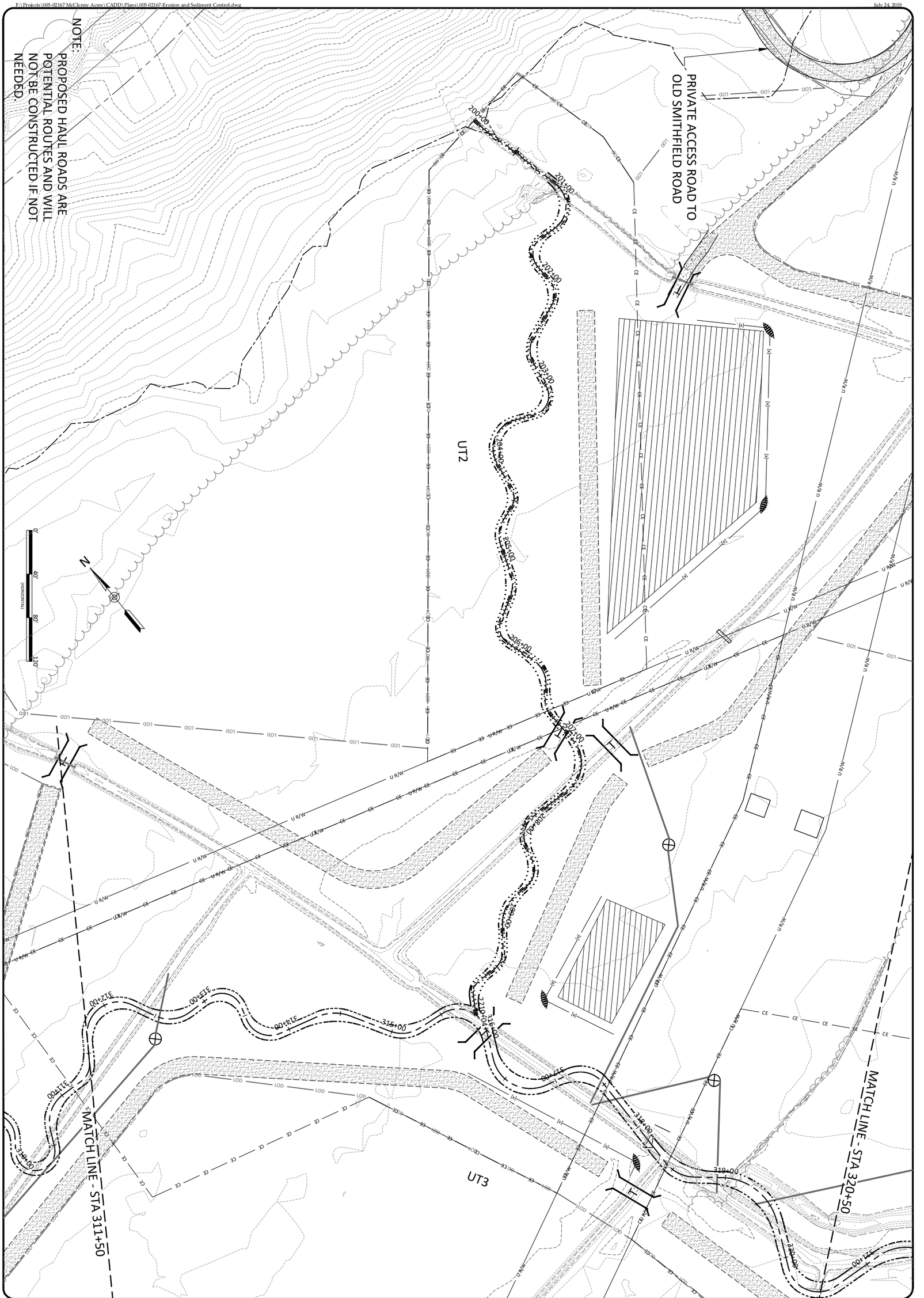
4.2
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

PRELIMINARY DO NOT USE FOR CONSTRUCTION

WILDLANDS ENGINEERING
312 W. Millbrook Road, Ste 225
Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

Revisions:

4.4
Sheet

McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

PRELIMINARY DO NOT USE FOR CONSTRUCTION

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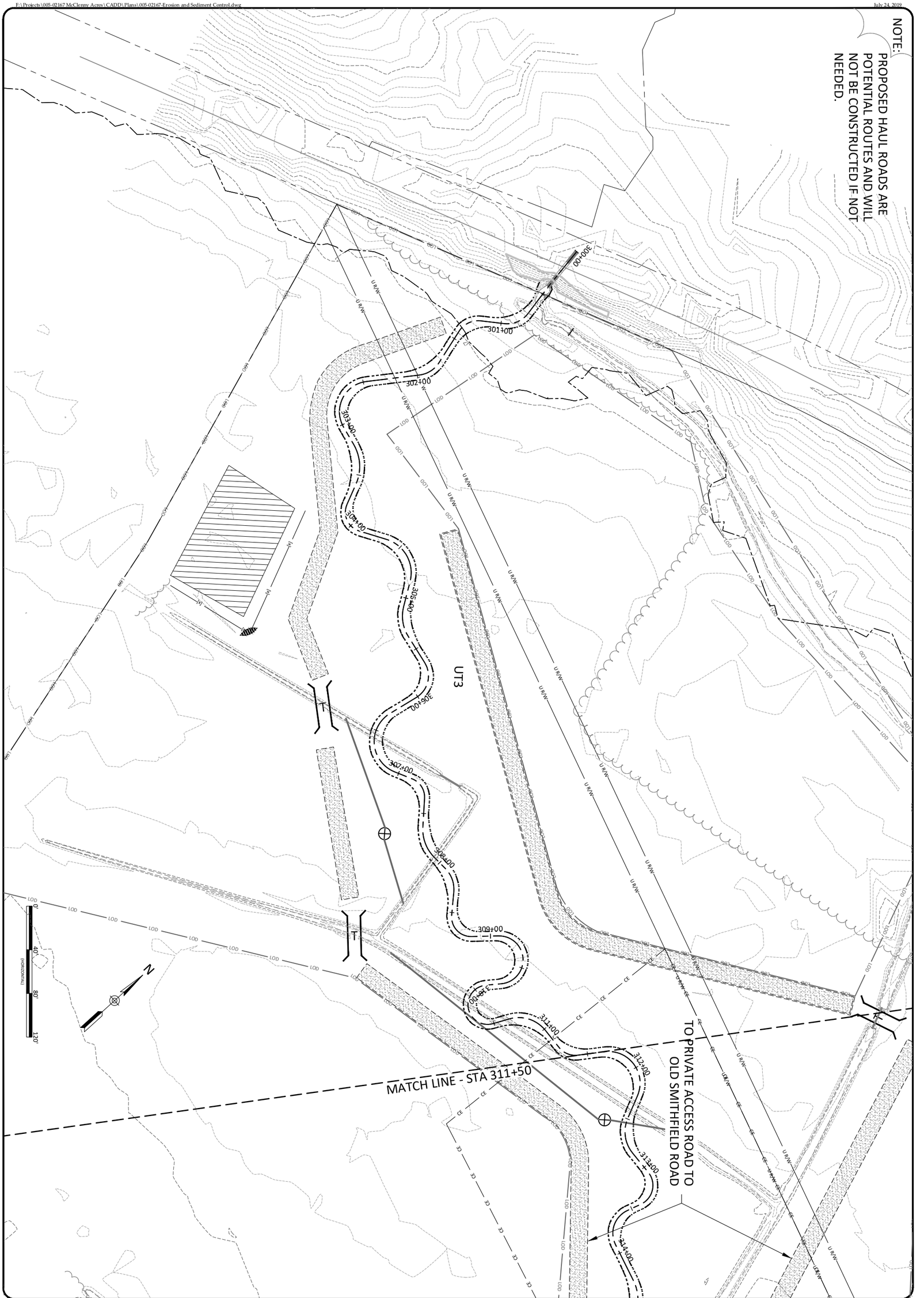
312 W. Millbrook Road, Ste 225
Raleigh, NC 27609
Tel: 919.851.9986
Firm License No. F-0831



Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
Checked By:	ANA

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McClenny Acres Mitigation Site
Wayne County, North Carolina

Erosion and Sediment Control
Erosion and Sediment Control Plan

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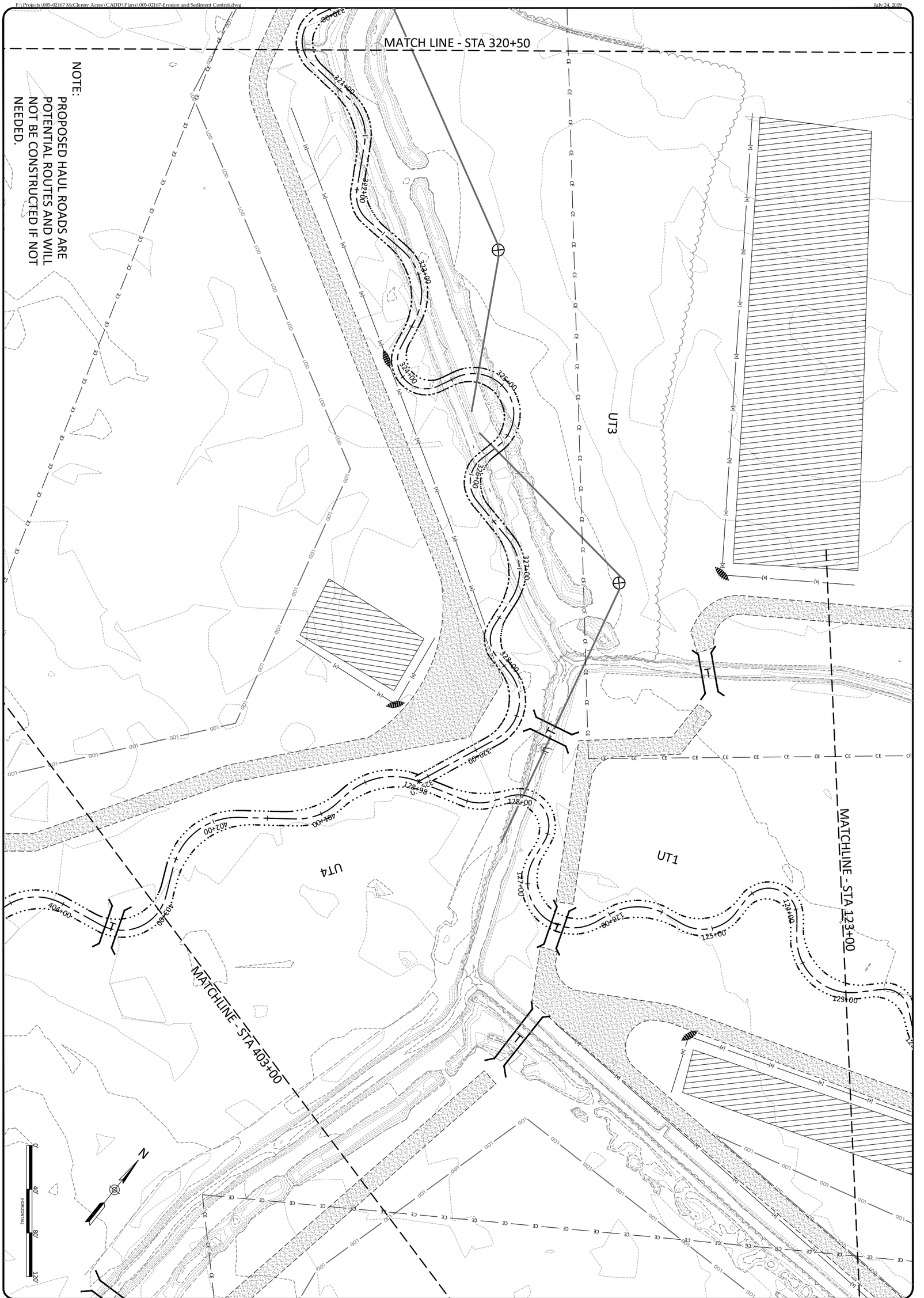

Date:	01.02.2019
Job Number:	005-02167
Project Engineer:	NMM
Drawn By:	CAW
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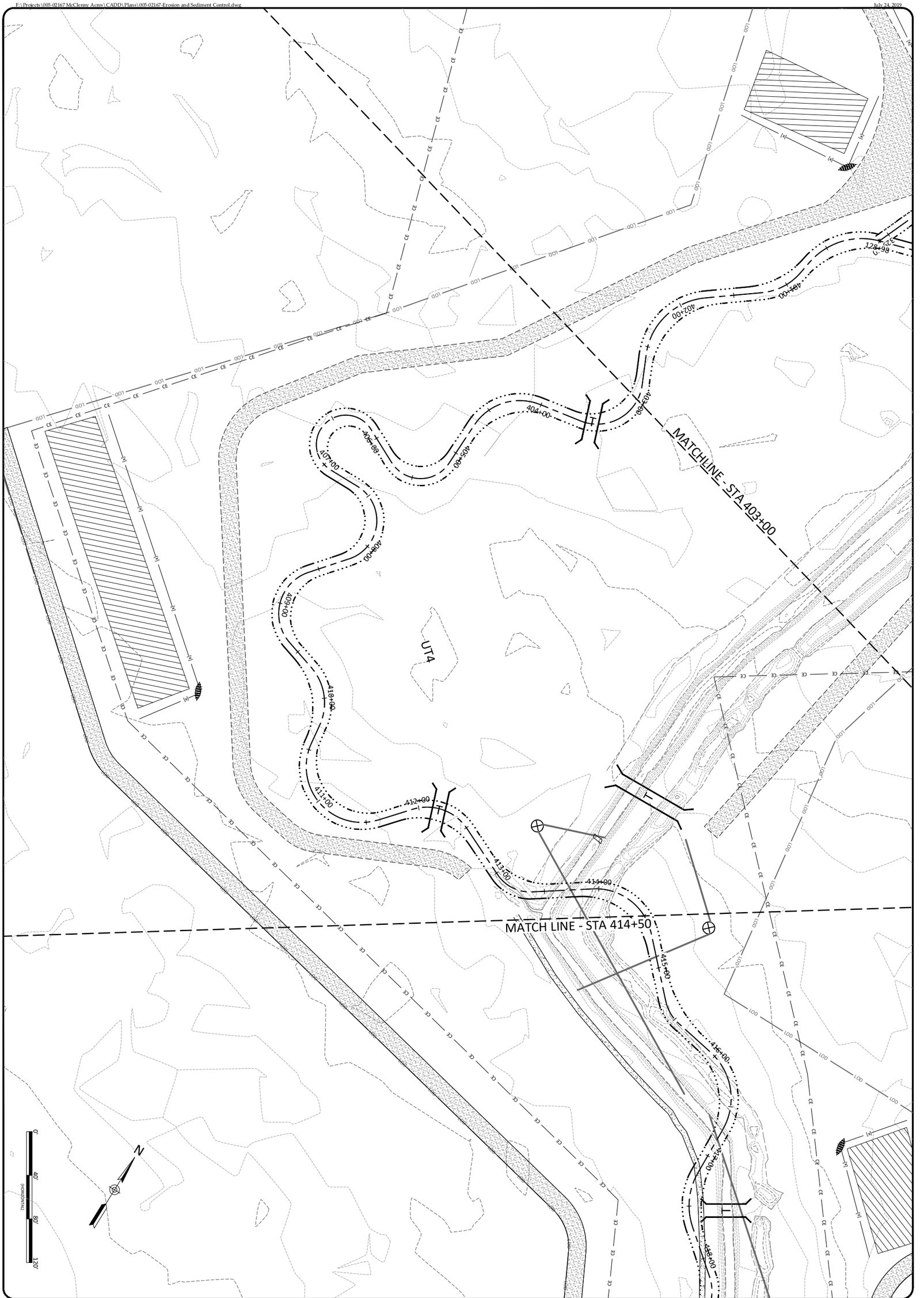

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Job Number:	005-02167
Project Engineer:	NMM
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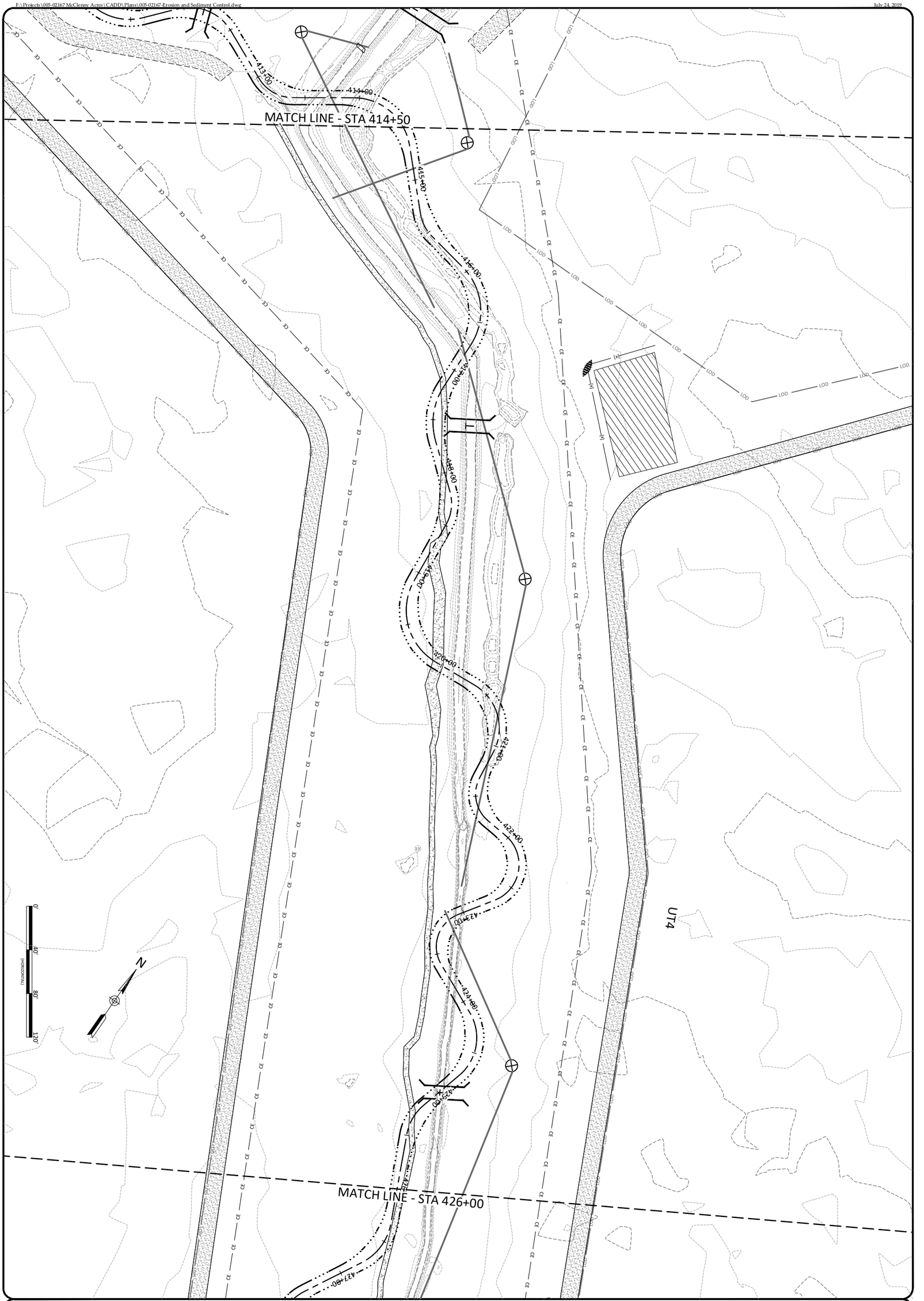

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Job Number:	005-02167
Project Engineer:	NMM
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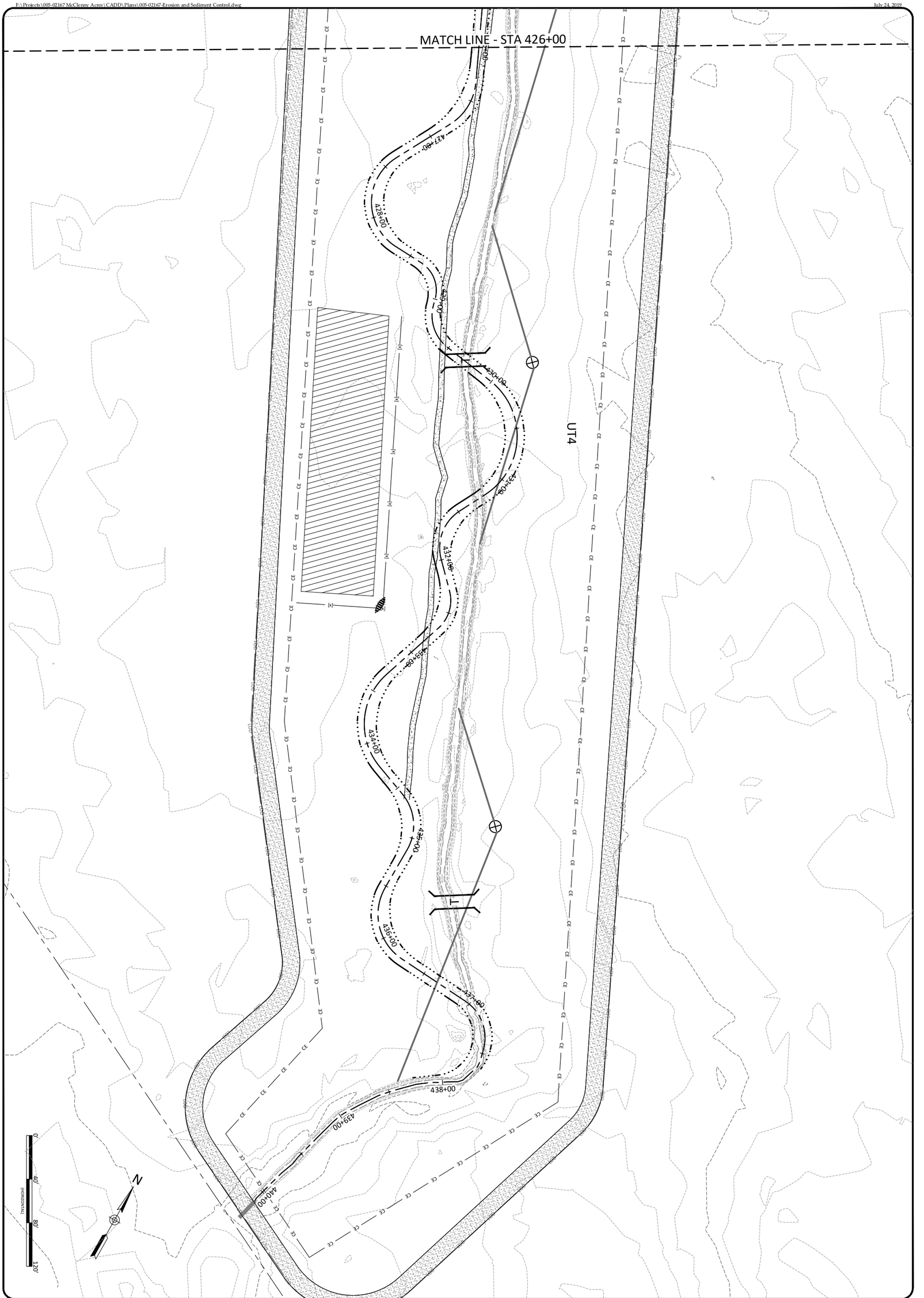

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Job Number:	005-02167
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