Mitigation Plan

White Mitigation Project
Randolph County, NC

NCDMS Project No. 100112

NC DWR Project No. 2019-0884

Randleman Lake Watershed

October 29, 2020

Prepared for:

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

Prepared by:

HDR Engineering
555 Fayetteville Street, Suite 900
Raleigh, NC 27601-3034

Land Management Group Contributing Staff: Ben Furr, Ryan Smith, Alex DiGeronimo, Chris Smith, Yvette Mariotte, Michael Foster, Kevin Williams

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

- *NCAC rule 15A NCAC 02B .0295, effective November 1, 2015 and Nutrients Offset Credit Trading 15A NCAC 02B. 0703, effective April 1, 2020 and DWR – 1998, Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment.*

Contents

1.0 Introduction 1
2.0 Mitigation Project Summary 4
2.1 Restoration Project Goals and Objectives 4
2.2 Project Location Information 5
2.3 Baseline and Existing Conditions 5
2.3.1 Landscape Characteristics 5
2.3.2 Land Use – Historic and Current 8
2.3.3 Existing Site Conditions 8
3.0 Regulatory Considerations 13
3.1 Protected Species 13
3.2 Cultural Resources 13
3.3 Waters of the United States – 404/401 13
4.0 Mitigation Credits 14
4.1 Credit Determination 14
5.0 Mitigation Work Plan 17
5.1 Planting Plan and Invasive Species Removal 17
5.1.1 Reference Vegetation Data 17
5.1.2 Planting Plan 18
5.2 Exclusionary Cattle Fencing 19
5.3 Stream Bank Stabilization 20
5.4 Piped Channel Crossings 20
6.0 Monitoring Plan 20
7.0 Success Criteria 21
8.0 Stewardship 21
8.1 Ownership 21
8.2 Long Term Management Plan 21
9.0 References 23

Figures

Figure 1. Service Area Map 2
Figure 2. Vicinity Map 3
Figure 3. NRCS Soils Map 6
Figure 4. USGS Topo Map 7
Figure 5. Drainage Area Map 10
Figure 6. Land Use Map 11
Figure 7. Current Conditions Map 12
Figure 8. Asset Map 16

Tables

Table 1. Project Attributes 1
Table 2. Existing Stream Conditions 9
Table 3. Regulatory Considerations 13
Table 4. Buffer Project Areas and Assets: Riparian Buffer Credits 15
Table 5. Credit Release Schedule 17
Table 6. Reference Vegetation Plot Data 18
Table 7. Planting Plan 19
Table 8. Monitoring Plan Components 21

Appendices

Appendix A – Historic Aerial Photography
Appendix B – Photo Log
Appendix C – Categorical Exclusion Documentation
Appendix D – Buffer Viability and Stream Determination
Appendix E – Buffer Authorization
Appendix F – Mitigation Plan Sheets
Appendix G – Memorandum of Option

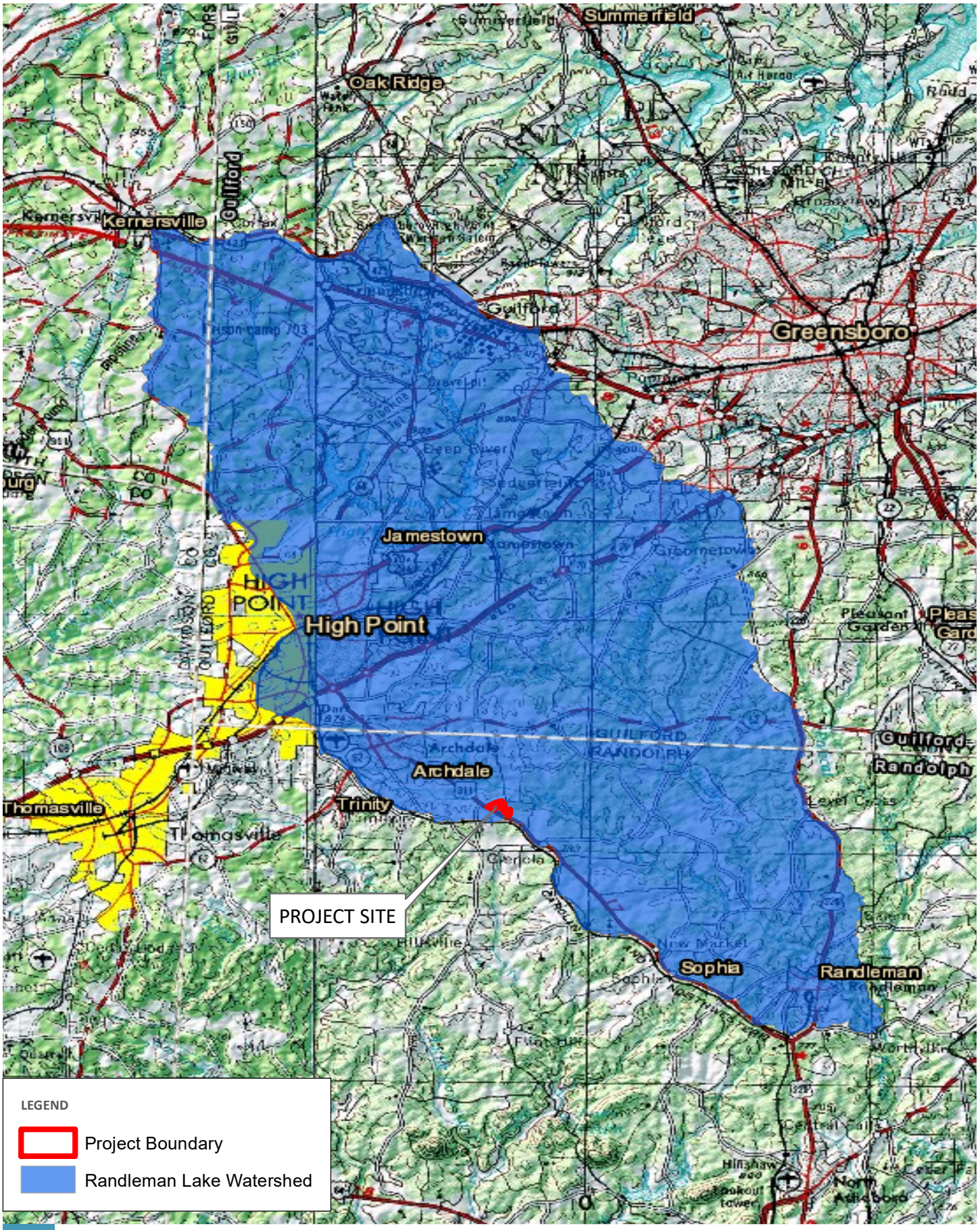
1.0 Introduction

The White Mitigation Project (Site) has been selected by the NC Division of Mitigation Services (DMS) to provide Buffer Mitigation Units (BMUs) in the Randleman Lake Watershed (Figure 1). The Randleman Lake Watershed is located within the larger Cape Fear River Basin (Hydrologic Unit Code 03030003). This Site is located approximately 2.8 miles southeast of Archdale in Randolph County, NC (Figure 2). The Site encompasses approximately 12.2 acres of active cattle pasture and involves restoration and enhancement via cattle exclusion of 504,566 square feet of riparian buffers along UT Muddy Creek (UT MC, Index #17-9-(1)) and UT 1, UT 2, and UT 5.

The intent of mitigation activities is to establish a vegetated buffer along the existing streams and provide functional uplift of features within the existing landscape. Functional uplift will be provided through the stabilization of actively eroding stream banks; planting of a riparian buffer; and excluding cattle from the easement.

Table 1. Project Attributes

Project Attributes	
Project Name	White Mitigation Project
County	Randolph
Project Area (acres)	12.2
Project Coordinates (latitude and longitude)	35.887369, -79.927081
River Basin	Cape Fear (03030003)
Service Area	Randleman Lake Watershed
14 digit HUC	03030003010060
EPA level IV Ecoregion	Southern Outer Piedmont
Proposed BMUs	469,459.424



0 4 8

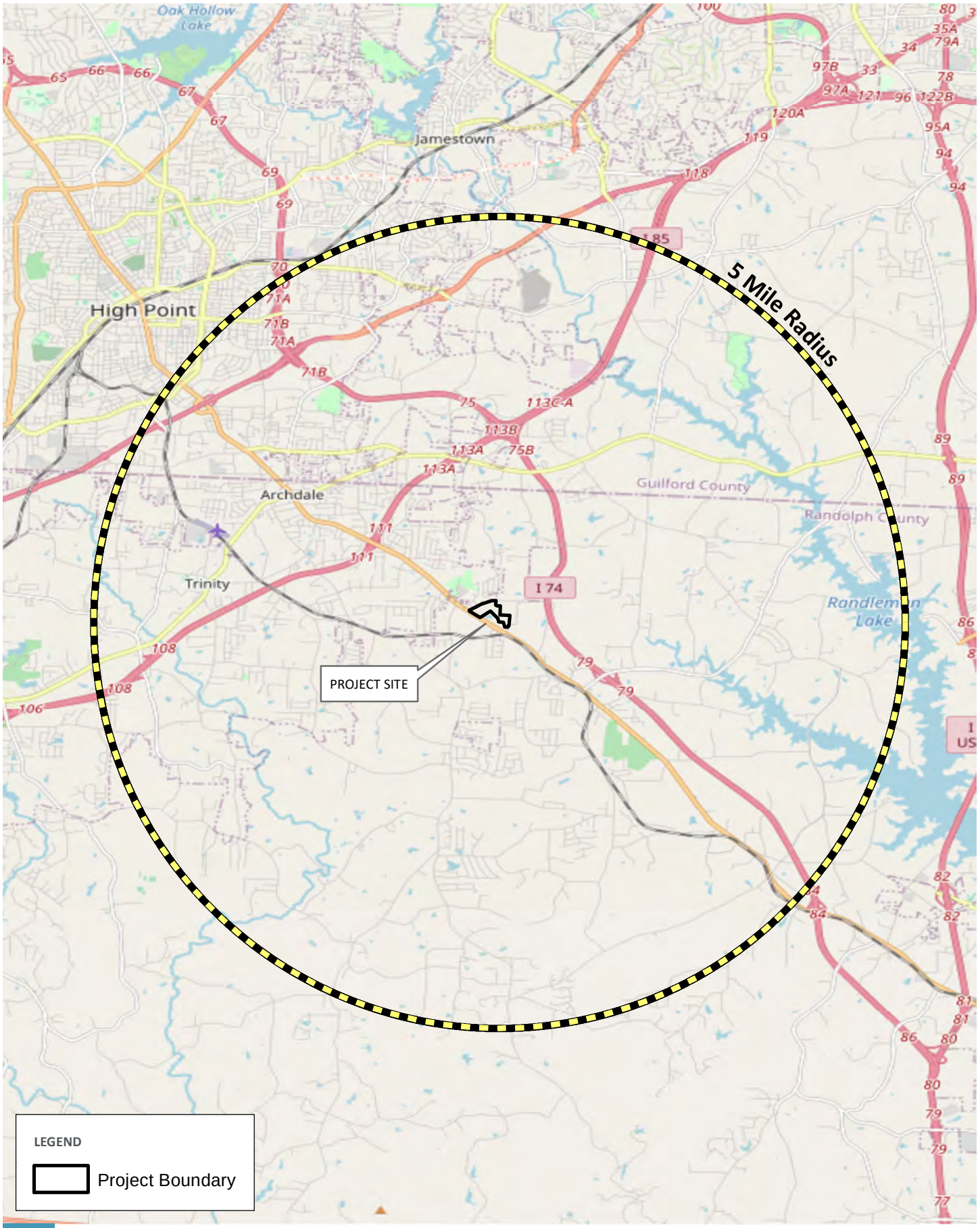
Miles

SERVICE AREA MAP

WHITE MITIGATION PROJECT

RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 1



VICINITY MAP
WHITE MITIGATION PROJECT

RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 2

2.0 Mitigation Project Summary

2.1 Restoration Project Goals and Objectives

The Site is located in Randolph County within the Muddy Creek Watershed, USGS 14-digit hydrologic unit 03030003010060. Site streams flow directly to Muddy Creek (segment 17-9-(1)) approximately 1.0 mile east of the Site. Muddy Creek is a primary direct contributor to the Randleman Reservoir. A Local Watershed Plan has not been developed for this hydrologic unit. However, the Site does fall within the Deep River Basin (HUC 03030003) which is discussed within the Cape Fear River Basin Restoration Priorities (RBRP) report (2009). The RBRP notes the goals for the Deep River Basin that are to protect several mussel species recognized by the Wildlife Resource Commission as a priority for protection, protect the federally endangered Cape Fear Shiner, and to improve water quality to waters draining to Randleman Reservoir.

The latest Cape Fear Basinwide Water Quality Plan (2005) was reviewed to determine longstanding water quality stressors within the overall basin and within the Site's sub-watershed. Some of the identified stressors and recommendations identified in the Plan are listed below:

- Habitat Degradation – sedimentation, lack of organic material and channelization. A recommendation was noted to maintain riparian buffers as an effort to assist in slowing degradation.
- Arsenic, Chlorophyll a, Low Dissolved Oxygen, pH, Turbidity, Fecal Coliform Bacteria and Enterococcus, Mercury in fish tissue.
- Agriculture – A recommendation noted was to continue and increase agricultural BMP's.
- Forestry – A recommendation noted was to continue and increase forestry BMP's.

In 2002, Muddy Creek was placed on the 303(d) list and a TMDL was created for Muddy Creek's watershed in 2004 to address fecal coliform impairment. Two segments of Muddy Creek were considered impaired due to fecal coliform. Site streams flow directly into one of those two segments (17-9-(1)). Primary sources of fecal input as identified in the document include nonpoint sources and Point Sources. Nonpoint sources were identified in the document as runoff from pasture and other agricultural lands near streams, wildlife, and domestic animals. The document also notes that agricultural land may contribute to greater runoff of fecal coliform compared with other inputs during storm events due to the increased impact of agriculture on riparian corridors. Point Sources of fecal coliform are identified as two low-scale wastewater treatment plants and urban stormwater discharging directly to Muddy Creek. The document suggests reductions of fecal coliform to achieve the TMDL should target storm-driven sources of runoff such as agricultural lands, residential areas, repairing aging sewer and septic systems and removal of SSO's.

Two of the primary redundancies from watershed information listed above is that fecal pathogens and nutrient/sedimentation from agricultural production is stressing the Cape Fear River Basin and specifically the Muddy Creek Watershed. Buffer restoration at the Site will directly and significantly address both fecal pathogens and agricultural production. Primary goals of this buffer restoration project focus on:

1. Reduce water quality stressors associated with nutrient, sediment, and pathogen loading.
2. Enhance terrestrial and aquatic habitat.

These goals will be accomplished through the following objectives:

1. Reducing water quality stressors will be directly tied to the following:
   a) Reducing non-point source (i.e. cattle accessing the channels, stormwater runoff through pastures and feeding stations) pollution associated with on-site agricultural operations by installing exclusionary fencing to remove cattle and machinery from on-site streams and riparian buffers.
   b) Reducing non-point pollution associated with on-site agricultural operations by restoring and enhancing riparian vegetative buffers on adjacent floodplains to treat surface water runoff from adjacent pastureland.
   c) Further removing agricultural equipment and cattle by providing and/or improving culverted agricultural crossings.
   d) Treatment of pollution associated with off-site agricultural, institutional, and residential properties by restoring and enhancing riparian vegetative buffers on-site to attenuate nutrient and sediment laden floodwaters.
2. Enhancement of terrestrial and aquatic habitat will be directly tied to
   a) Restoring native vegetation to the existing maintained and highly impacted riparian corridors will diversify flora and create a protected habitat corridor that will provide an abundance of available foraging and cover habitat for a multitude of mammals and birds. Additionally, establishment of woody vegetation in the riparian corridor will provide direct inputs of woody debris to adjacent conveyances that will assist in increasing biomass and cover habitat for aquatic species.

2.2 Project Location Information

The Site is located within the Southern Outer Piedmont, approximately 2.9 miles southeast of Archdale, NC. One air transport facility (Darr Field (FAA Identifier NC03)) is located approximately 3.5 miles northwest of the Site. The facility is privately owned.

Directions to the Site:

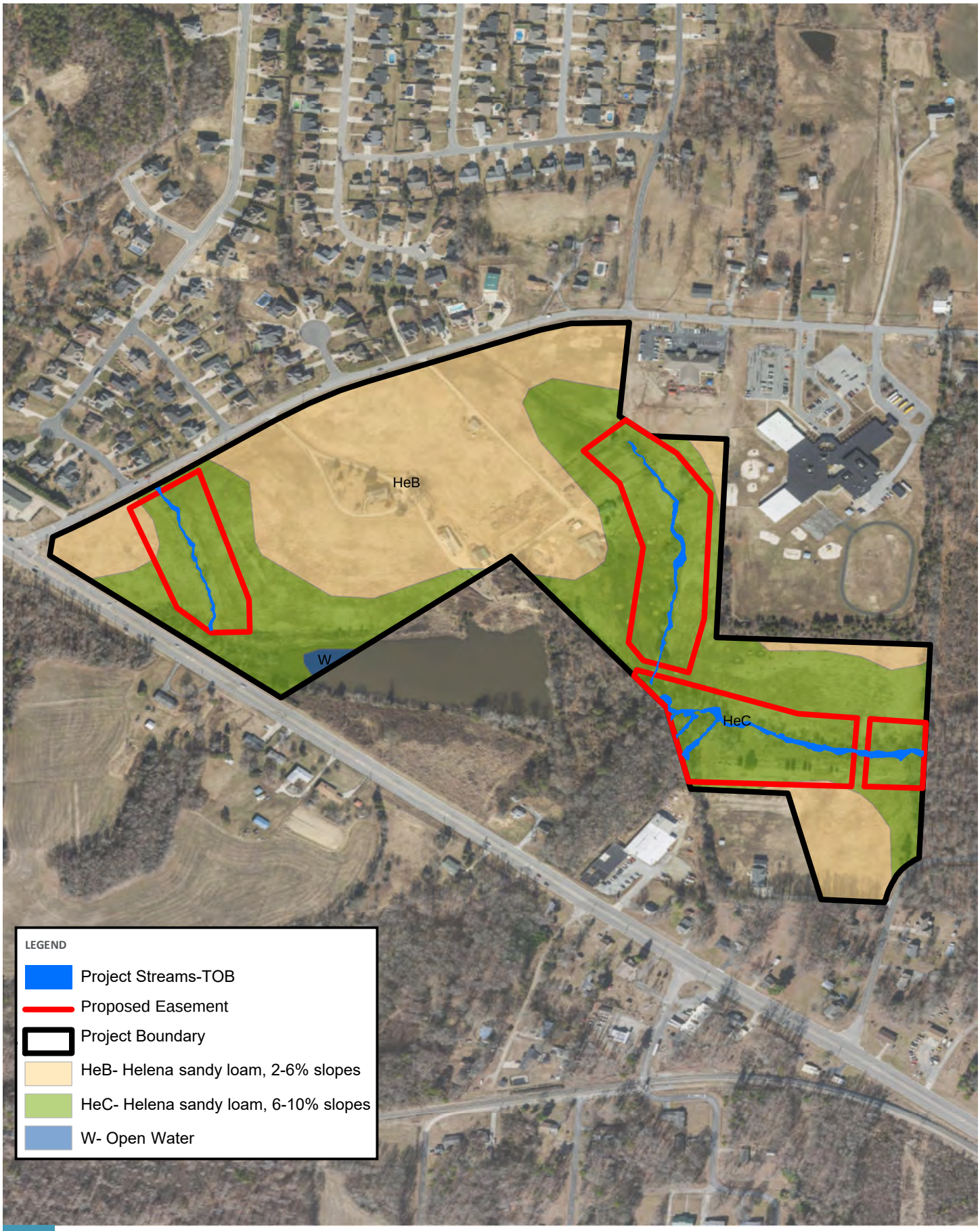
From Raleigh-Durham International Airport: I-40 west for 61.6 miles; keep left for I-85 S, go 17.6 miles to exit 113; turn left onto NC-62, go .2 miles; turn right onto Weant Rd, go to end; turn right onto Suits Rd, the project site will be on the left.

2.3 Baseline and Existing Conditions

2.3.1 Landscape Characteristics

The Site is located within the Intrusive Rocks/ Metamorphosed Granite Rock region of the Piedmont (NCGS, 1985). Onsite elevations range from a high of 805 feet National Geodetic Vertical Datum (NGVD) to a low of approximately 740 feet NGVD.

Soil series depicted in the Randolph county Soil Survey are shown on Figure 3. The majority of lands within the Site are mapped as Helena sandy loam, 6 to 10 percent slopes. These soils are moderately well drained with slow permeability, and moderate to rapid runoff. Parent material is a residuum weathered from a mixture of felsic, intermediate, or mafic igneous or high-grade metamorphic rocks.



0 500 1,000 Feet

NRCS SOILS MAP
WHITE MITIGATION PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
FIGURE 3

USGS TOPO MAP
HIGH POINT EAST QUADRANGLE
WHITE MITIGATION PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
FIGURE 4

2.3.2 Land Use – Historic and Current

The watershed for UT Muddy Creek is 0.38 sq miles (245 acres) at the downstream extents of the Site (Figure 5). Land use within the Site's watershed is dominated by forest, which totals approximately 32% of the contributing watershed. The remaining contributing watershed is comprised of pasture and row crops (approximately 27%) and residential/schools (approximately 17%). Figure 6 depicts land use within the Site's watershed.

Historic aerial photographs were utilized to collect information on Site changes in recent history. Environmental Data Resources, Inc. (EDR) provided aerials from the following years: 1937, 1948, 1950, 1959, 1964, 1969, 1970, 1973, 1980, 1983, 1993, 1999, 2006, 2009, 2012, and 2016. According to the aerial photographs, current Site conditions and uses have changed little since 1959. It appears that the pond located immediately southeast of UT 1 was dug sometime between 1950 and 1959. It also appears that during this time frame the portion of the Site that is immediately north of UT Muddy Creek was cleared to be used for agricultural purposes.

A review of historic aerial photography of lands proximal to the Site confirms rapid urban expansion associated with the growth of the Triad, including residential housing, building of schools and business and installation of new infrastructure, including Interstate 74 approximately 0.5 mile east of the Site. Historical aerials provided by EDR can be seen in Appendix A.

2.3.3 Existing Site Conditions

Six unnamed tributaries to Muddy Creek are located within the conservation easement. Current Site conditions are shown on Figure 7.

<u>Biological Impairment</u>

As noted above, most streams on the Site have various physical impairments that include:

- Significant fine sediment and nutrient loading from runoff from cattle pasture.
- Hoof shear of channel banks and bed form from cattle access and wading.
- Continual maintenance of riparian buffers and denudation of deep rooted vegetation from those buffers.
- Fecal loading into the channels from unabated access of cattle.
- Agricultural machinery access.

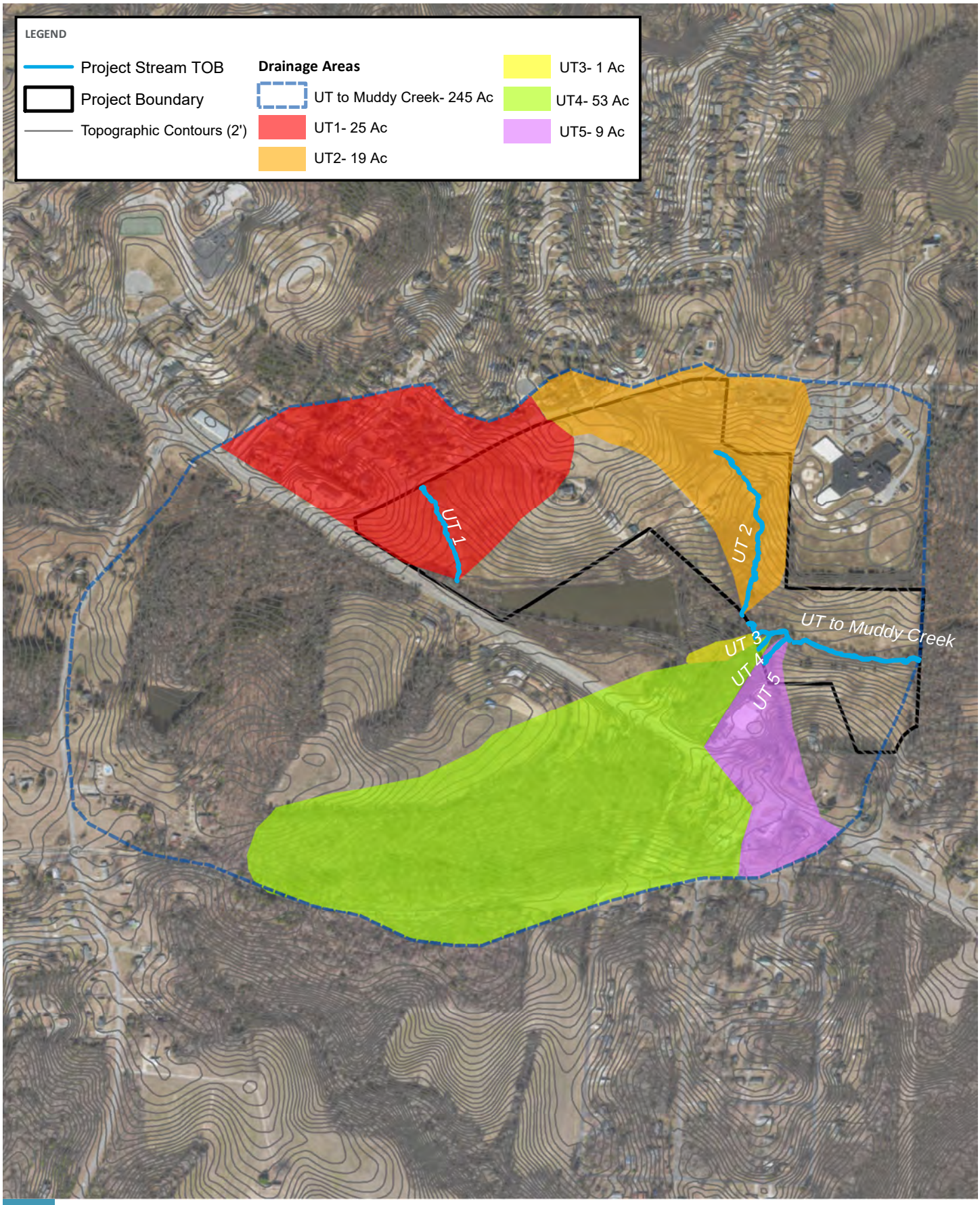
These physical impairments have detrimental effects on water quality and on the biological integrity of the Site. Effects of physical impairments include:

- Silting of habitat for fish species and other macrobenthos in the stream channels,
- Loss of essential bed form features,
- Probability of increased loading of nutrients and pathogens to all stream systems on-site due to maintenance of fields within riparian areas and access of cattle to stream channels,
- Denudation of riparian vegetation reduces the ability of the Site to attenuate floodwaters and uptake and store nutrients and other pollutant inputs,
- Denudation of riparian vegetation substantially reduces potential woody debris inputs to the channel that are vital for aquatic propagation and cover habitat, and
- Denudation of riparian vegetation reduces semi-aquatic and terrestrial habitat corridors through the Site.

Significant fecal and nutrient loads are entering UTMC and its tributaries because of direct cattle access to streams and overland sheet flow from adjacent pastures. Evidence of this includes visual observation of cattle in the stream channel during site visits and fecal matter along stream banks and within the stream channel. HDR used equations and guidance set forth by DMS in the document titled "Quantifying Benefits to Water Quality from Livestock Exclusion and Riparian Buffer Establishment for Stream Restoration" (June 15, 2016) to determine fecal load reductions that may result from proposed restoration activities. Cattle exclusion (based on 30 animal units) and establishment of a riparian buffer will decrease the fecal load of the site by 2.96E+14 col/year for both options. HDR also used equations set forth in the NC DEQ memorandum titled "Approval of Cattle Exclusion Nutrient Reduction Practices" (April 5, 2017) as well as the document titled "NC Division of Water Quality – Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment" to determine nitrogen and phosphorous reductions for the Site. Cattle exclusion (based on 30 animal units) and establishment of a riparian buffer will reduce the nitrogen loads for the Site up to 931 lb/yr and reduce the phosphorous load for the Site up to 88 lb/yr. Existing stream conditions are summarized in Table 2.

Table 2. Existing Stream Conditions

Reach	Historical Presence	Drainage Area (acres)	DWQ Score	Impairment
UT to Muddy Creek (UT MC)	Topological crenulations in the valley (USGS) (Figure 2);	245	38	Cattle access, poor buffer
UT1	Topological crenulations in the valley (USGS) (Figure 2);	25	34.5	Cattle access, poor buffer
UT2	Topological crenulations in the valley (USGS) (Figure 2);	19	22/30.5	Cattle access, poor buffer
UT3	Topological crenulations in the valley (USGS) (Figure 2);	1	28	Cattle access
UT4	Topological crenulations in the valley (USGS) (Figure 2);	53	33.5	Cattle access
UT5	Topological crenulations in the valley (USGS) (Figure 2);	9	28	Cattle access, poor buffer

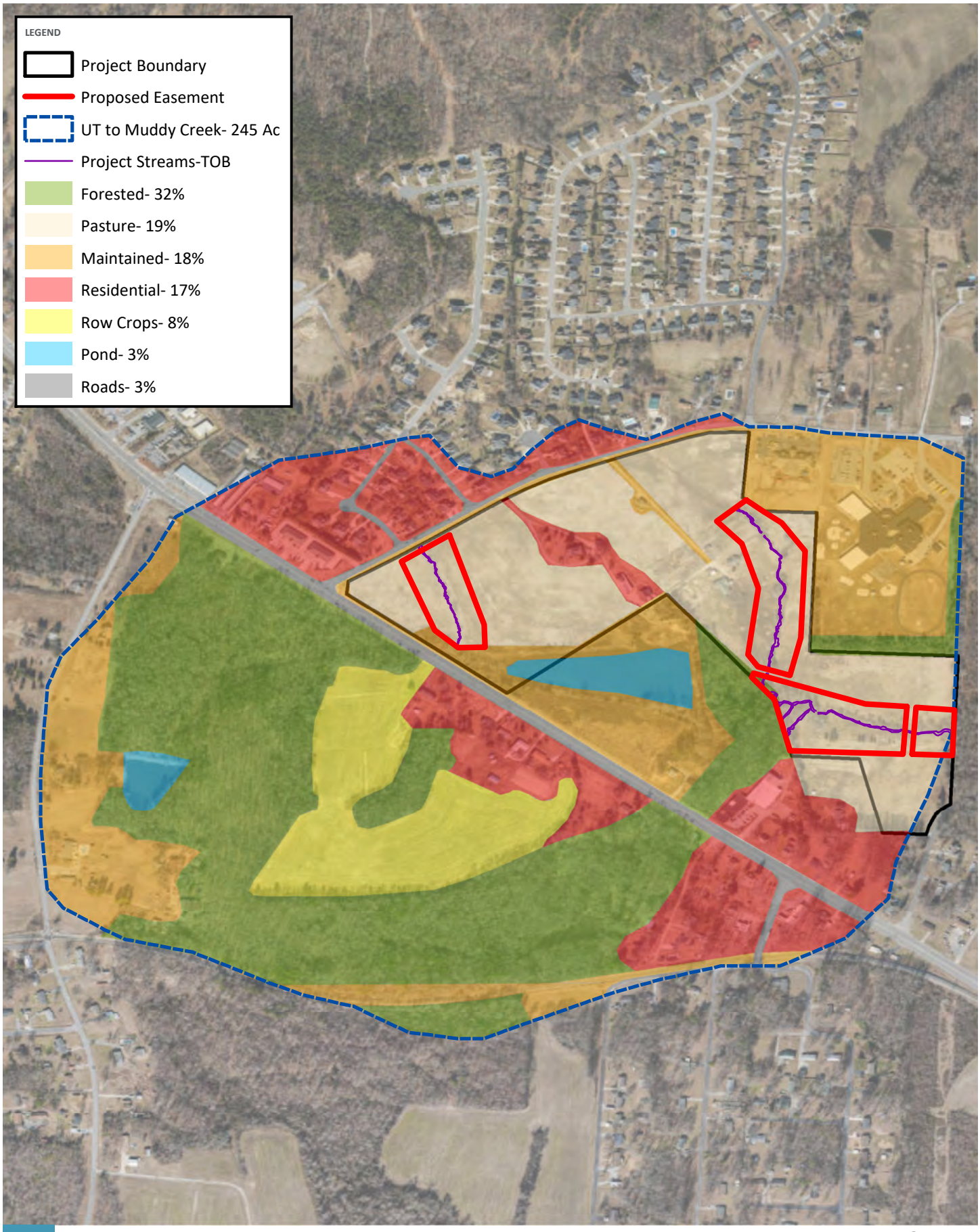


0 700 1,400 Feet

DRAINAGE AREA MAP
WHITE MITIGATION PROJECT

RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 5



0 700 1,400 Feet

LAND USE MAP
WHITE MITIGATION PROJECT

RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 6

0 250 500 Feet

CURRENT CONDITION MAP
WHITE MITIGATION PROJECT

RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 6

3.0 Regulatory Considerations

Table 3 provides a summary of regulatory considerations for the Site. Additional information concerning protected species, cultural resources, and Waters of the United States (404) are presented in sections 3.1 through 3.3.

Table 3. Regulatory Considerations

Regulatory Considerations			
Parameters	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	No	N/A	N/A
Waters of the United States – Section 401	No	N/A	N/A
Endangered Species Act	Yes	Yes*	CE (Appendix C)
Historic Preservation Act	No	N/A	N/A
Coastal Zone Management Act	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A
Randleman Buffer Authorization Request	Yes	Yes	Buffer Authorization Approval Letter

3.1 Protected Species

Randolph County has 6 federally listed species as Threatened or Endangered. Records at the North Carolina Natural Heritage Program (NHP) do not indicate an occurrence of a federally threatened or endangered species on the Site. The Categorical Exclusion (CE) documentation provided in Appendix C provides details concerning threatened and endangered species at the Site. The proposed project was determined to have “no effect” on all listed federally protected species.

3.2 Cultural Resources

The CE for the Site was approved by FHWA on March 17, 2020. The CE included information regarding cultural resources at the Site and coordination with the State Historic Preservation Office (SPO). Based on results from the CE research and documentation there are no historic of cultural resources that would be affected by this project. CE documentation is provided in Appendix C.

3.3 Waters of the United States – 404/401

Per email correspondence with David Bailey and Andrew Williams of the United States Army Corps of Engineers (USACE), construction activities will not require a Nationwide General Permit 27. All bank stabilization earthwork will take place above the ordinary high water mark (OHWM) and culvert work qualifies as an agricultural exemption. Best management practices will still be implemented during construction.

3.4 Randleman Buffer Authorization

The Buffer Authorization for the Site was approved by DWR on October 26, 2020. A Buffer Authorization was submitted due to activities outline in the mitigation work plan, specifically bank stabilization, crossing removal and installation, and cattle exclusion fencing installation. After review of the Buffer Authorization application DWR determined that the impacts associated with the mitigation work plan of the project were allowable.

4.0 Mitigation Credits

4.1 Credit Determination

Mitigation credits presented in Table 4 are based upon the proposed design. Credit determination was calculated by measuring 100 feet perpendicular to the proposed top of bank. Table 4 below and the Asset Map (Figure 8) summarize the Site's credit generation. Table 5 summarizes the proposed credit release schedule for the project. NCDWR will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules outlined in Table 5.

Table 4. White Farms Buffer Mitigation Site, DMS Project No. 100112, Project Credits

Cape Fear - Randleman	Project Area
N/A	N Credit Conversion Ratio (ft^2/pound)
N/A	P Credit Conversion Ratio (ft^2/pound)

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft^2)	Total (Creditable) Area of Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	0-100	UT to Muddy Creek, UT1, UT2, UT5	449,962	448,828	1	100%	1.00000	Yes	448,828.000	N/A	–	–
Buffer	Rural	Yes	I / P	Restoration	101-200	UT to Muddy Creek, UT1, UT2, UT5	42,577	42,577	1	33%	3.03030	Yes	14,050.424	N/A	–	–
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-100	UT to Muddy Creek, UT5	13,162	13,162	2	100%	2.00000	Yes	6,581.000	N/A	–	–
													–		–	–
													–		–	–
													–		–	–
													–		–	–
													–		–	–
						Totals:	505,701	504,566								

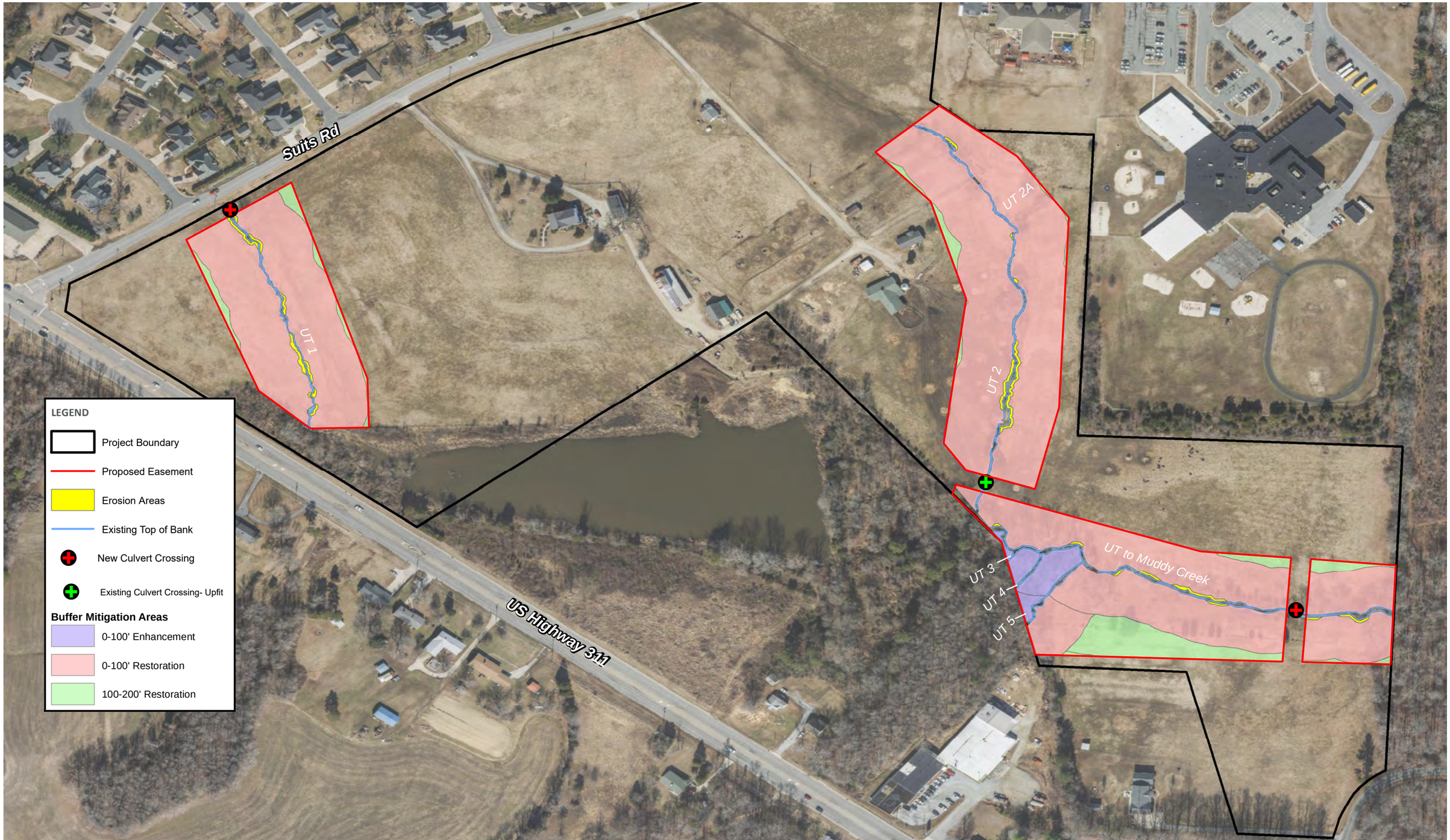
Enter Preservation Credits Below — **Eligible for Preservation (ft^2):** 168,189

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
Buffer				Preservation								–
												–
												–
												–
												–
												–
												–
												–
												–
												–
												–
						Preservation Area Subtotal (ft^2):		0				
						Preservation as % Total Area of Buffer Mitigation:		0.0%				
						Ephemeral Reaches as % Total Area of Buffer Mitigation:		0.0%				

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	Square Feet	Credits
Restoration:	491,405	462,878.424
Enhancement:	13,162	6,581.000
Preservation:	0	0.000
Total Riparian Buffer:	504,566	469,459.424
TOTAL NUTRIENT OFFSET MITIGATION		
Mitigation Totals	Square Feet	Credits
Nutrient Offset: Nitrogen:	0	0.000
Nutrient Offset: Phosphorus:		0.000

1. The Randleman Lake buffer rules allow some ditches to be classified as subject according to 15A NCAC 02B .0250 (5)(a).

last updated 01/17/2020



0 225 450 Feet

ASSET MAP
WHITE MITIGATION PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

FIGURE 8

Table 5. Credit Release Schedule

Task	Project Milestone	Interim Credit Release	Total Credit Release
1	Submit Environmental Screening Report	5%	5%
2	Record Conservation Easement on the Site Approved by SPO	30%	35%
3	Mitigation Plan (Final Draft) and Financial Assurance Approved by DMS	20%	55%
4	Vegetative Planting and Baseline Monitoring Report Approved by DMS	15%	70%
5	Submit Monitoring Report #1 to DMS (meets success criteria)	5%	75%
6	Submit Monitoring Report #2 to DMS (meets success criteria)	5%	80%
7	Submit Monitoring Report #3 to DMS (meets success criteria)	5%	85%
8	Submit Monitoring Report #4 to DMS (meets success criteria)	5%	90%
9	Submit Monitoring Report #5 to DMS (meets success criteria and complete project Close-Out)	10%	100%

5.0 Mitigation Work Plan

Buffer restoration on Site will be accomplished by planting cleared areas with native hardwood species, removing and treating invasive vegetation, fencing cattle out of the easement area, stabilizing eroding stream banks, and installation of new piped crossings. Herbaceous riparian vegetation will be planted in areas disturbed during construction but will generally re-establish naturally.

5.1 Planting Plan and Nuisance/ Invasive Species Removal

5.1.1 Reference Vegetation Data

A 30-foot reference data plot was randomly recorded in an ecologically stable climax forest community downstream of the Site (Figure 7). Data collected within the plot in Table 6. The reference forest community for the Site is the mature hardwood forest immediately southeast of the property which will serve as a model for restoration efforts on Site. Historical aerial photographs show that the area of forest chosen as the reference has remained undisturbed for a minimum of 82 years.

Table 6. Reference Vegetation Plot Data

Tree Species	Number of Individuals	Number of Individuals with DBH > 5”
Green Ash (*Fraxinus pennsylvanica)*	7	1
White oak (*Quercus alba*)	1	1
Red mulberry (*Morus rubra*)	20	0
Ironwood (*Carpinus caroliniana*)	3	2
Silver maple (*Acer saccharinum*)	5	0
Red maple (*Acer rubrum*)	2	1
Sweet gum (*Liquidambar styraciflua*)	3	3
Tulip poplar (*Liriodendron tulipafera*)	2	2
Mockernut hickory (*Carya tomentosa*)	1	0
Pignut hickory (*Carya glabra*)	1	0
American elm (*Ulmus americana*)	8	0
Total	53	10

Vegetation observed in the understory included Japanese stiltgrass (*Microstegium* vimineum), Chinese privet (*Ligustrum sinense*), Trumpet creeper (*Campsis radicans*), and Virginia creeper (*Parthenocissus quinquefolia*). Based on the species present in the reference data plot, the forest community type is characteristic of a Piedmont/Low Mountain Alluvial Forest (Schafale and Weakley, 1990).

5.1.2 Planting Plan

Within the easement boundary, Chinese privet is the dominant woody species along the banks of UT MC. Prior to planting, privet will be cleared and treated to ensure re-colonization is deterred. Existing privet root mass will remain intact to provide structure and stability to the stream banks. It is worth noting that fescue is the dominant grass species in the existing pasture. Fescue will not be treated before the planting of buffer, however fescue will be monitored and treated with herbicide as necessary through the course of monitoring to ensure the survivability of the planted stems. Sections of stream bank to be stabilized will be planted with a streamside assemblage consisting of black willow, tag alder, and other common streamside species. The remaining restoration areas located in the pasture will be planted with species consistent with the target vegetation community Piedmont/Low Mountain Alluvial Forest. The stream bank will be planted on approximately four foot spacing and the bare root seedlings in the pasture will be planted on approximately eight foot spacing, corresponding to approximately 680 stems per acre. It is expected that other characteristic species will recruit naturally into these areas after completion of construction. The herbaceous layer will be restored by seeding disturbed areas with a native riparian seed mix. Table 7 below identifies the proposed species composition for each planting zone. A plan view of the planting zones is depicted in Appendix E, Plansheet 8.

Table 7. Planting Plan

Zone 1: Streamside Assemblage	Footage: 1,452 ft	Plant Spacing 4 ft	
Common Name	**Scientific Name**	**% Composition**	**# Planted**
Black willow	*Salix nigra*	23.5	86
Ninebark	*Physocarpus opulifolius*	23.5	86
Silky dogwood	*Cornus amomum*	23.5	86
Green ash	*Fraxinus pennsylvanica*	5	19
Sycamore	*Platanus occidentalis*	23.5	86
		TOTAL	363
Zone 2: Piedmont/ Low Mountain Alluvial Forest	**Area 11.38 acres**	**Plant Spacing 8 ft**	
Common Name	**Scientific Name**	**% Composition**	**# Planted**
Tulip tree	*Liriodendron tulipifera*	11	852
River birch	*Butela nigra*	11	853
American hornbeam	*Carpinus caroliniana*	6	465
Water oak	*Quercus nigra*	16	1,240
Sycamore	*Platanus occidentalis*	11	853
Green ash	*Fraxinus pennsylvanica*	5	388
Shagbark hickory	*Carya ovata*	6	465
American elm	*Ulmus americana*	6	465
Flowering dogwood	*Cornus florida*	6	465
Willow oak	*Quercus phellos*	11	852
Bitternut hickory	*Carya cordiformis*	11	853
		TOTAL	7,751
Permanent Seed Mixture: Native Riparian Mix (Application Rate 20 – 25 lb/acre)			
Common Name	**Scientific Name**	**% Composition**	
Autumn bentgrass	*Agrostis perennans*	15	
Big bluestem	*Adropogon gerardii*	10	
Lanceleaf coreopsis	*Coreopsis lanceolata*	10	
Virginia wildrye	*Elymus virginicus*	20	
Soft rush	*Juncus effusus*	5	
Switchgrass	*Panicum virgatum*	15	
Blackeyed susan	*Rudbeckia hirta*	10	
Little bluestem	*Schizachyrium scoparium*	5	
Indian grass	*Sorghastrum nutans*	5	
Eastern gamagrass	*Tripsacum dactyloides*	5	
	TOTAL	100	

5.2 Exclusionary Cattle Fencing

Fencing will be installed along the easement boundary to exclude cattle and clearly demarcate the easement boundary for the landowners. Fencing will be installed and incorporated into the existing pasture fencing. Fencing will be erected to NRCS and DMS standards to restrict cattle from accessing land within the easement. Existing fencing within the conservation easement will be removed.

5.3 Stream Bank Stabilization

Bank stabilization is proposed for areas where banks are experiencing active erosion that is not expected to stabilize naturally after cattle exclusion. Proposed bank stabilization areas along UT 1, UT 2, and UT MC are shown in Appendix E, Plansheets 3 - 7. All work will take place above the OHWM. Bank stabilization will consist of grading the banks at a 2.5:1 slope, spreading seed and straw over the disturbed area, and installation of coir fiber matting. Livestakes and bare root seedlings will be planted to establish a root system for permanent stabilization.

5.4 Piped Channel Crossings

Replacement and installation of piped crossings are necessary to allow farming operations to continue on land adjacent to the project. The existing upstream crossing on UT 2 and the existing crossing on UT MC will both be removed. The channel will be extended in place of the existing crossings by matching upstream and downstream channel invert elevations and base widths. The banks will be sloped at a 2.5:1 gradient from channel toe to existing ground. Banks will be stabilized with seed and straw, coir fiber matting, and planted with live stakes and bare roots. A typical cross section has been included in the Pipe Removal detail on Plansheet 2A (Appendix E). The existing downstream crossing on UT 2 will be upfitted with an 18 foot, 30 inch diameter corrugated plastic pipe. An 18 foot, 36 inch diameter corrugated plastic pipe crossing will be installed on UT MC downstream of the existing cattle crossing to maintain access to the pasture south of UT MC. Lastly, an 18 foot, 24 inch corrugated plastic pipe will be installed at the upstream end of UT 1. All pipes will be covered with a minimum 1 foot of fill material. Fill material will then be topped with a minimum 8 inches of crushed stone. Details for both crossings can be found on Plansheet 2 (Appendix E).

6.0 Monitoring Plan

Annual monitoring reports will be produced and submitted to DMS by December 1st of the year for which monitoring was conducted. The Site will be monitored annually for a duration of 5 years. The fifth year monitoring report will include a Closeout Report that provides an assessment of monitoring data collected from the entire monitoring period. Table 8 provides a summary of the monitoring plan components for the project.

Table 8. Monitoring Plan Components

Parameter	Monitoring Method	Quantity	Frequency	Notes
Vegetation	CVS Level 2	Vegetation plots will be placed on ~2% of the planted area	Annual	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) Level 2 protocols. Data to be collected are the following: planted stem density, planted stem height, planted stems ddh or DBH (dependent on height), and planted stem vigor.
Invasive and nuisance vegetation	Visual	---	Semi-annual	Locations of exotic and nuisance vegetation will be mapped and treated, as necessary.
Fescue	Visual	--	Semi-annual	Areas of dense fescue will be mapped and treated. Fescue will be monitored to ensure the survivability of planted stems. Fescue will be spot treated as necessary using herbicide in areas where fescue is outcompeting planted stems.
Project Boundary	Visual	---	Semi-annual	Mapping of fence damage, vegetation damage, boundary encroachments, etc. will be mapped and addressed as necessary

7.0 Success Criteria

The Site will be evaluated based upon the density and growth of characteristic forest species. Upon project closeout, the Site must demonstrate an average stem density of 260 stems per acre. No one, individual species may account for greater than 50 percent of recorded stems. A minimum of four native hardwood tree species must be present. Native and desirable hardwood volunteer species may be included to meet the final performance standard of 260 stems per acre upon DWR approval (Title 15A NCAC 02B .0295).

8.0 Stewardship

8.1 Ownership

Fran Alicia White (PIN 7727495773) and Gary Reece White and Patricia H. White (PIN 7727596383) own lands that comprise the Site. Long term protection of the property is proposed through a conservation easement. The conservation easement is proposed to be transferred to the State of North Carolina. Attached in Appendix F is a signed Memorandum of Option between the property owners and HDR. The final Site Protection Instrument will be included as an appendix in the Final Mitigation Plan.

8.2 Long Term Management Plan

Upon approval for close-out by the NCDWR the Site will be transferred to the NCDEQ Stewardship Program (or 3rd party if approved). 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. Funding will be supplied by the responsible party on

a yearly basis until such time an endowment is established. 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 Stewardship Program will periodically install signage to identify boundary markings, as needed. Any livestock or associated fencing or permanent crossings will be the responsibility of the owner of the underlying fee to maintain.

9.0 References

Environmental Data Resources, Inc. (EDR). 2019. The EDR Aerial Photo Decade Package. White Farms Buffer Mitigation Site 5796 Suits Road, High Point, NC 27263. Inquiry Number: 5695494.8. Shelton, Connecticut.

Lee, Michael & Peet, Robert & D. Roberts, Steven & Wentworth, Thomas. 2018. *CVS-EEP Protocol for Recording Vegetation All Levels of Plot Sampling, Version 4.2*.

North Carolina Administrative Code (NCAC). Title 15A – Environmental Quality. Chapter 02 – Environmental Management. SubChapter B. 15A NCAC 02B .0295. *Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers.* Accessed on September 20, 2019. http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20b/15a%20ncac%2002b%20.0295.pdf

North Carolina Department of Environment and Natural Resources (NCDENR). Division of Water Quality. 2010a. *Methodology for Identification of Intermittent and Perennial Streams and their Origins, Version 4.11.* North Carolina Department of Environment and Natural Resources, Division of Water Quality. Raleigh, NC.

NCDENR. Division of Water Quality. 2014. *Final 2014 Clean Water Act (CWA) section 303(d) list of water quality limited segments.* North Carolina Department of Environment and Natural Resources, Division of Water Quality. Raleigh, NC.

NCDENR. June 15, 2016. Quantifying Benefits to Water Quality from Livestock Exclusion and Riparian Buffer Establishment for Stream Restoration. Accessed on December 28, 2018. https://ncdenr.s3.amazonaws.com/s3fs-public/Mitigation%20Services/Document%20Management%20Library/Guidance%20and%20Template%20Documents/Estimates%20for%20nutrient%20and%20FC%20reductions_June15_2016.pdf

NCDENR. Division of Water Quality. "NC Division of Water Quality - Methodology and Calculations for Determining Nutrient Reductions Associated with Riparian Buffer Establishment." *Nutrient Practices and Crediting*, North Carolina Department of Environmental Quality. Accessed on December 26, 2018. https://files.nc.gov/ncdeq/Water Quality/Planning/NPU/Nutrient Offset Rule/Ag-Buffer-Credit.pdf.

North Carolina Department of Environmental Quality (NCDEQ). 2017. "Design Specifications and Nutrient Accounting for Cattle Exclusion." *Nutrient Practices and Crediting*, North Carolina Department of Environmental Quality, 5 Apr. 2017. Access on December 26, 2018. https://files.nc.gov/ncdeq/Water Quality/Planning/NPU/Nutrient Offset Rule/Cattle Exclusion Practice Signed 04-05-2017.pdf

NCDNCR. Natural Heritage Program (NHP). 2013. North Carolina Natural Heritage Program Online Database. 2013. Accessed on August 2, 2019. Last updated on November 15, 2017. http://www.ncnhp.org/web/nhp/database-search

NCDNCR. North Carolina State Historic Preservation Office (NCSHPO). 2010. The "Study List" and The National Register of Historic Places in North Carolina. Website accessed on August 2, 2019. Last updated on September 27, 2013. http://www.hpo.ncdcr.gov/stdylist.htm

North Carolina Geological Survey (NCGS), 1985. Geologic Map of North Carolina.

USDA. 2012. Construction Specification Barbed Wire. Available under Woven Wire Fence NRCS Specifications – 02/14/12 at http://portal.ncdenr.org/web/DMS/fd-forms-templates

US Department of Agriculture (USDA). Natural Resources Conservation Service. Web Soil Survey. http:/websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey

Appendix A – Historic Aerial Photography

White Buffer Mitigation Site

5796 Suits Road

High Point, NC 27263

Inquiry Number: 5695494.8

June 24, 2019

The EDR Aerial Photo Decade Package

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

EDR Aerial Photo Decade Package

06/24/19

Site Name:

White Buffer Mitigation Site
5796 Suits Road
High Point, NC 27263
EDR Inquiry # 5695494.8

Client Name:

HDR, Inc.
555 Fayetteville Street
Raleigh, NC 2760130340
Contact: Alex Digeronimo

Environmental Data Resources, Inc. (EDR) Aerial Photo Decade Package is a screening tool designed to assist environmental professionals in evaluating potential liability on a target property resulting from past activities. EDR's professional researchers provide digitally reproduced historical aerial photographs, and when available, provide one photo per decade.

Search Results:

Year	Scale	Details	Source
2016	1"=500'	Flight Year: 2016	USDA/NAIP
2012	1"=500'	Flight Year: 2012	USDA/NAIP
2009	1"=500'	Flight Year: 2009	USDA/NAIP
2006	1"=500'	Flight Year: 2006	USDA/NAIP
1999	1"=750'	Flight Date: March 04, 1999	USGS
1993	1"=500'	Acquisition Date: February 02, 1993	USGS/DOQQ
1983	1"=500'	Flight Date: April 04, 1983	NHAP
1980	1"=500'	Flight Date: May 10, 1980	USDA
1973	1"=500'	Flight Date: February 24, 1973	USGS
1970	1"=500'	Flight Date: May 07, 1970	USDA
1969	1"=500'	Flight Date: March 13, 1969	USGS
1964	1"=500'	Flight Date: September 17, 1964	USGS
1959	1"=500'	Flight Date: December 04, 1959	USDA
1950	1"=500'	Flight Date: November 18, 1950	USGS
1948	1"=500'	Flight Date: May 19, 1948	USGS
1937	1"=500'	Flight Date: September 19, 1937	USDA

When delivered electronically by EDR, the aerial photo images included with this report are for ONE TIME USE ONLY. Further reproduction of these aerial photo images is prohibited without permission from EDR. For more information contact your EDR Account Executive.


INQUIRY #: 5695494.8
YEAR: 2016
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 2012
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 2009
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 2006
= 500'
N
EDR

INQUIRY #: 5695494.8

YEAR: 1999

= 750'

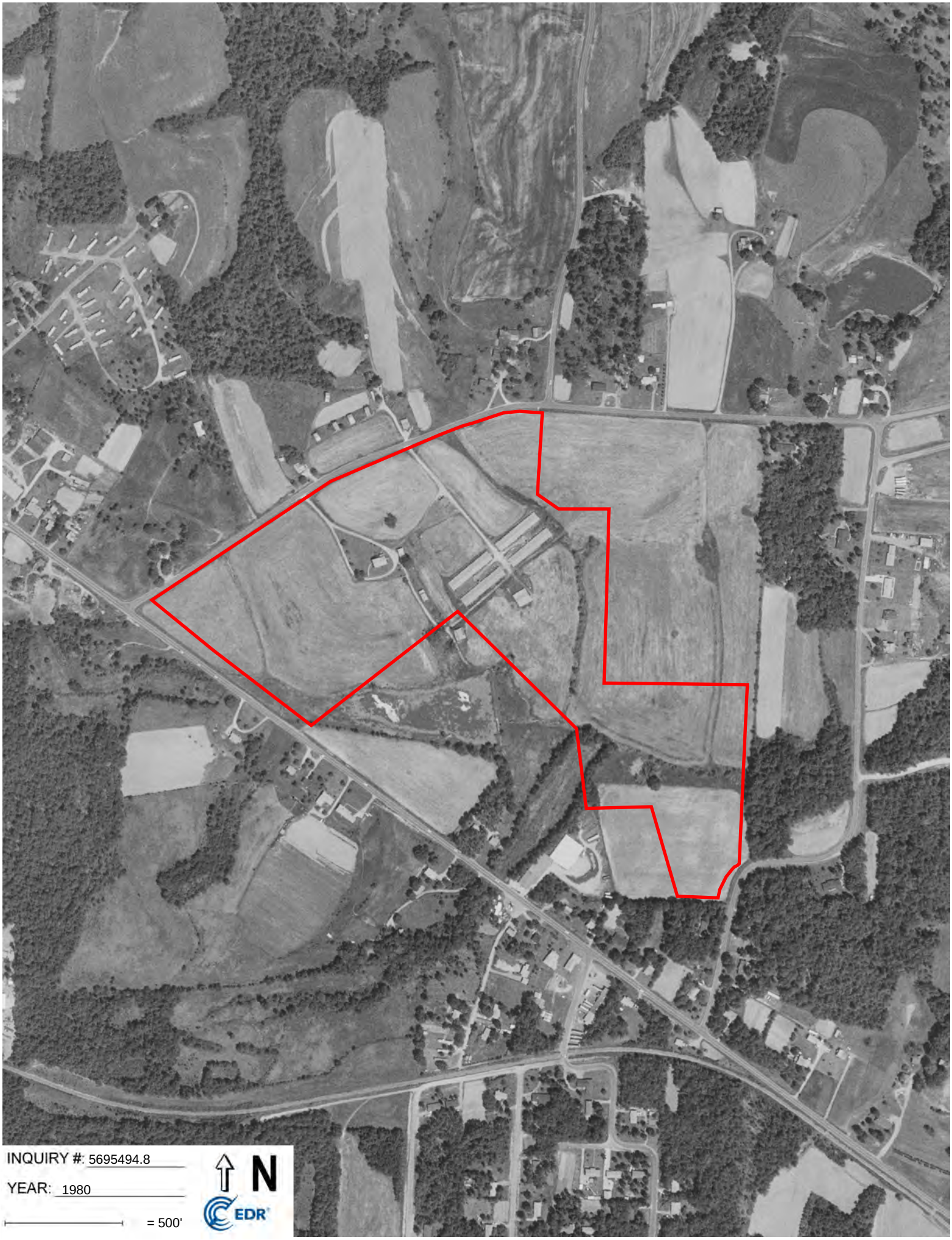
N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 5695494.8
YEAR: 1993
= 500'
N
EDR
Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 5695494.8
YEAR: 1983
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 1980
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 1973
= 500'
N
EDR


INQUIRY #: 5695494.8
YEAR: 1970
= 500'
N
EDR

INQUIRY #: 5695494.8

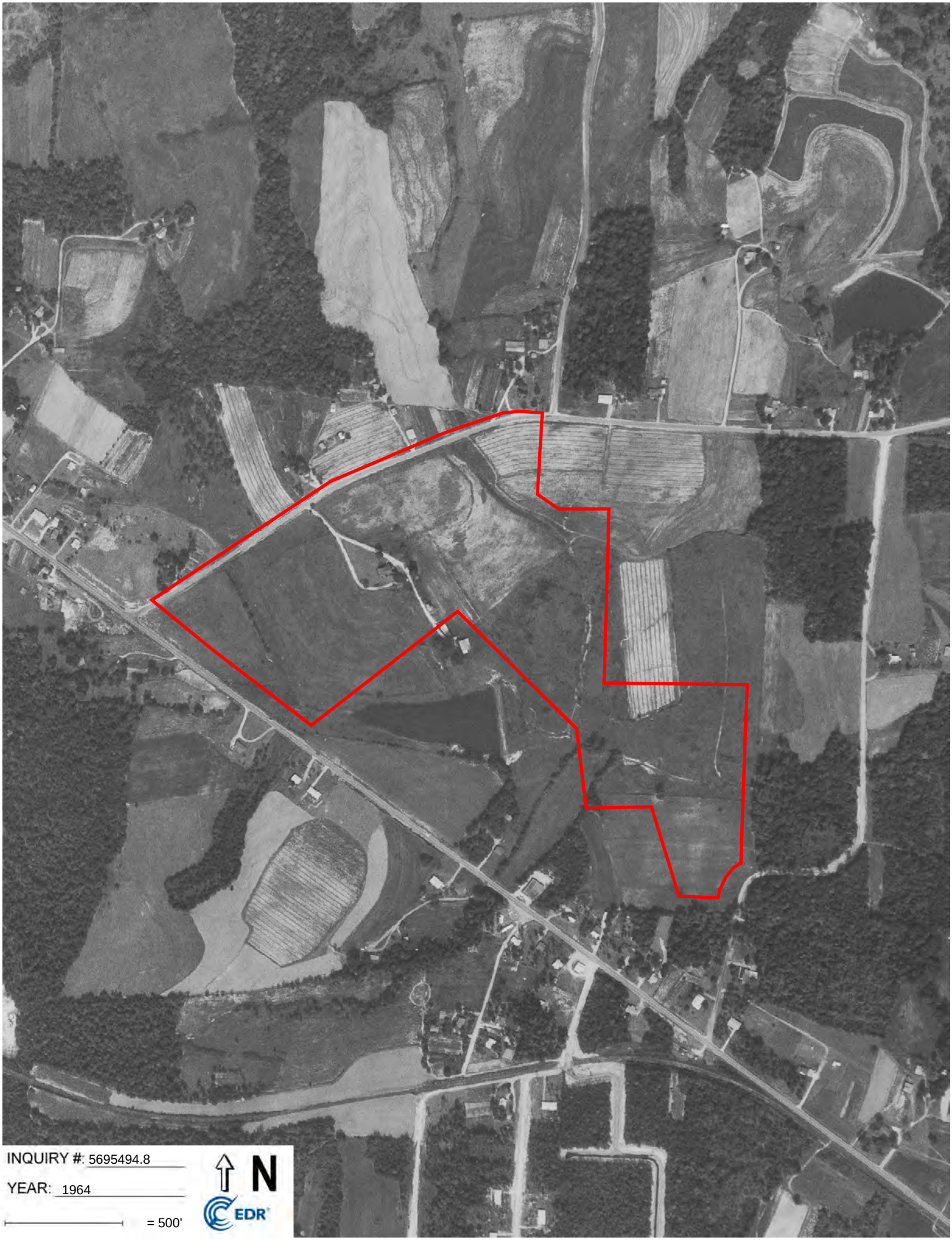
YEAR: 1969

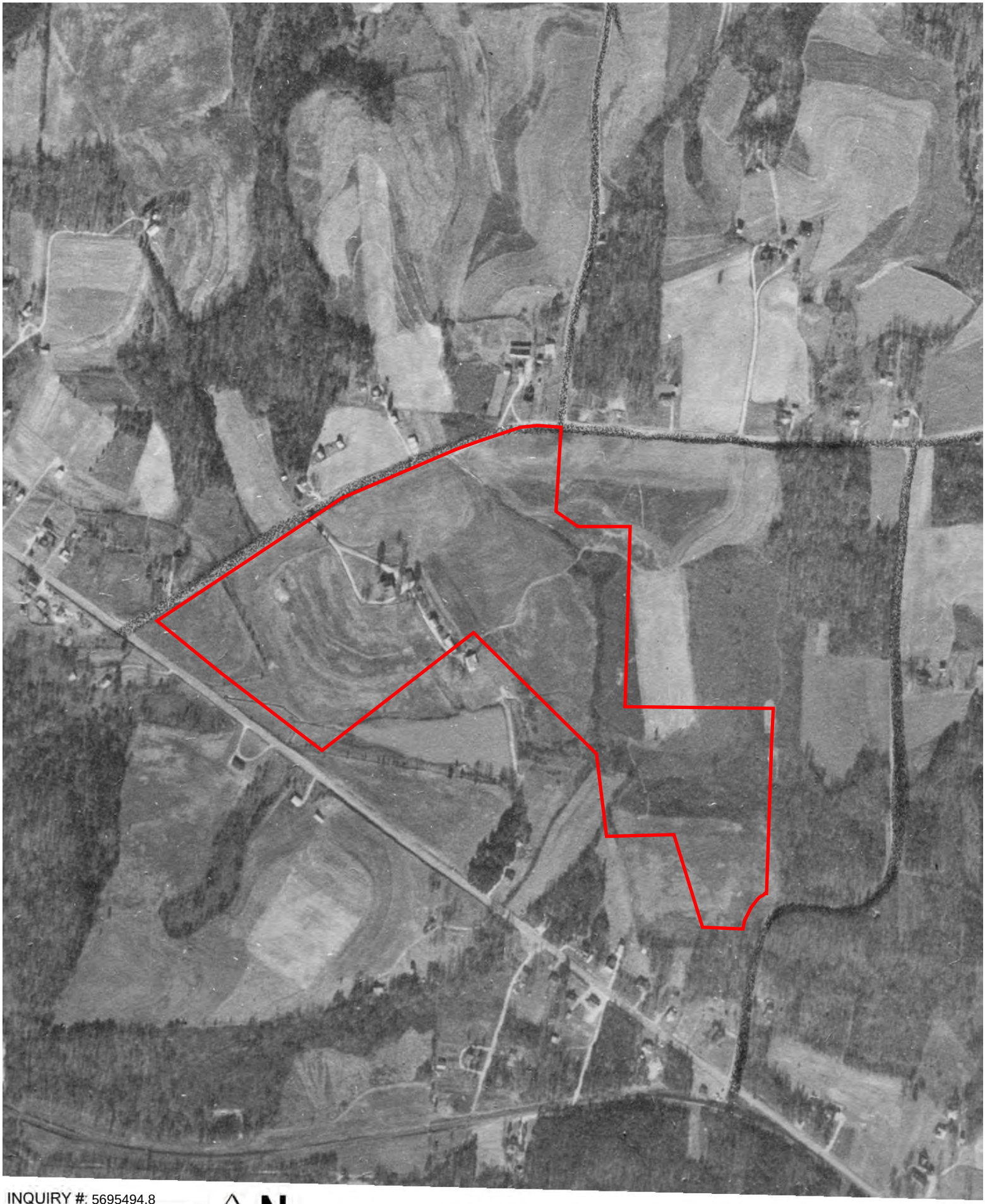
= 500'

N

EDR

Subject boundary not shown because it exceeds image extent or image is not georeferenced.


INQUIRY #: 5695494.8
YEAR: 1964
= 500'
N
EDR



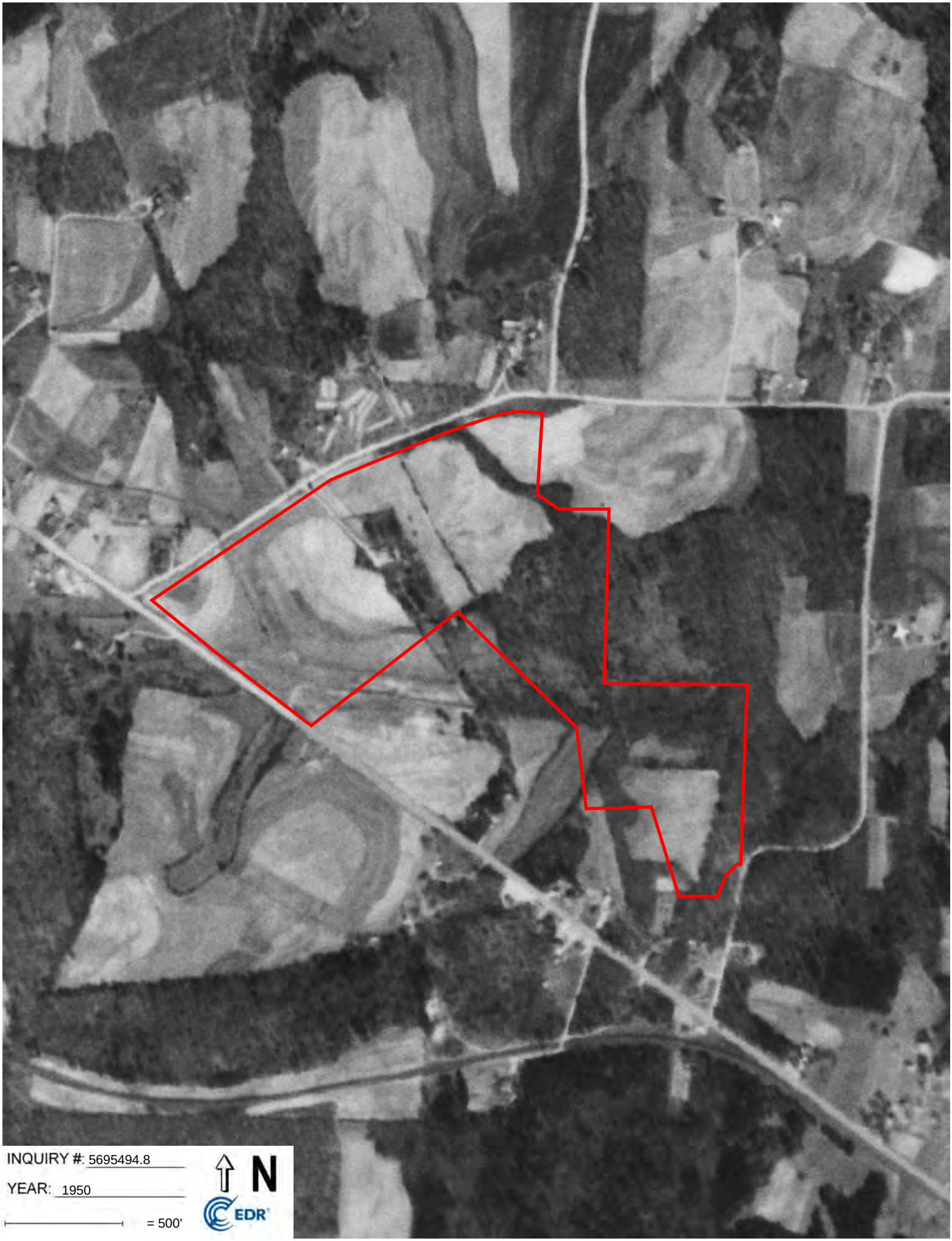
INQUIRY #: 5695494.8

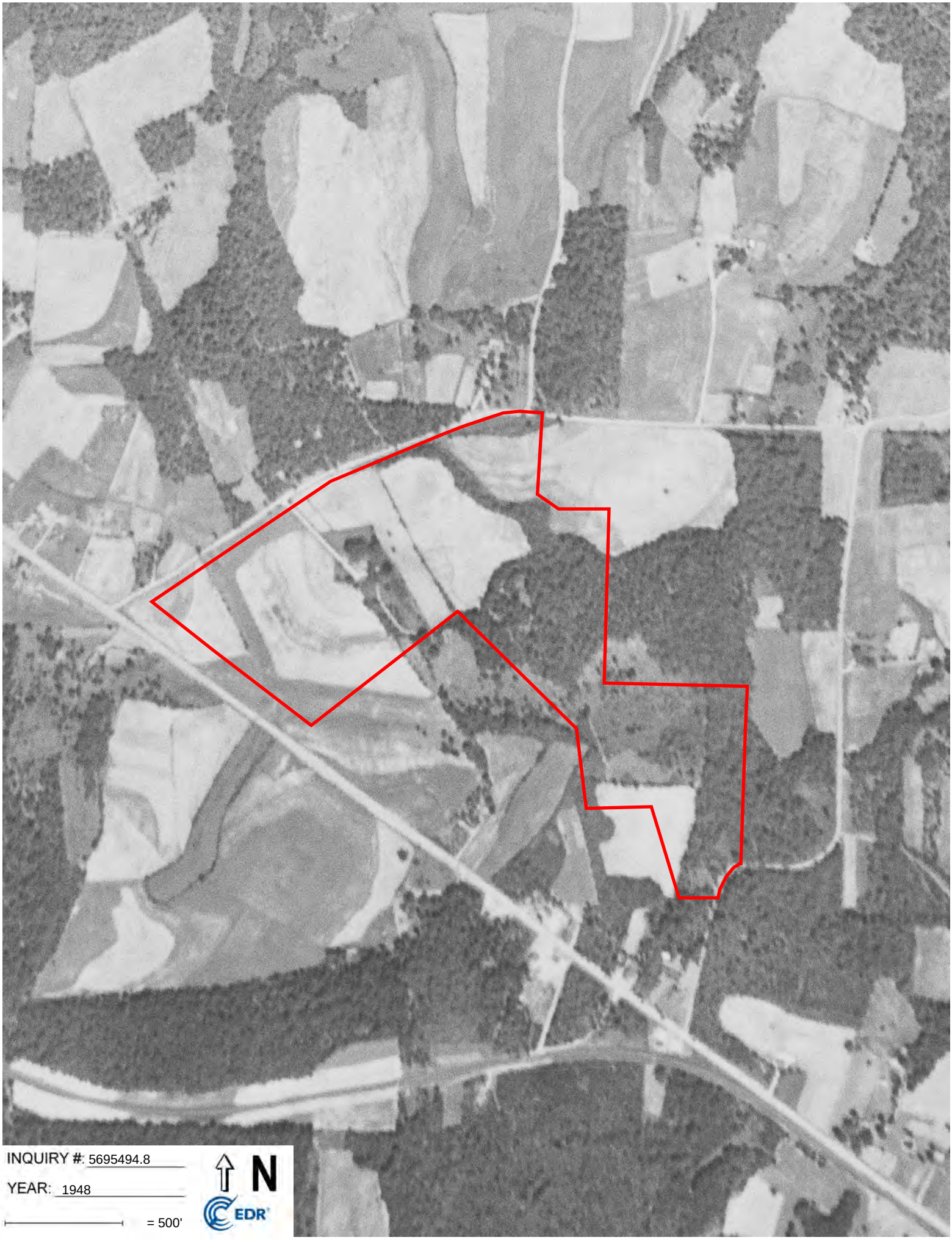
YEAR: 1959

= 500'

N

EDR


INQUIRY #: 5695494.8
YEAR: 1950
= 500'
N
EDR



INQUIRY #: 5695494.8

YEAR: 1948

= 500'

N

EDR


INQUIRY #: 5695494.8
YEAR: 1937
= 500'
N
EDR

Appendix B – Photo Log

Appendix B – Site Photo Log

Lack of vegetated buffer along UT 1

Cattle crossing on UT 1

Lack of vegetated buffer along UT 2

Existing downstream crossing along UT 2

Hoof shear and active erosion along left bank of UT 2

Hoof shear along left bank of UT MC

Appendix B – Site Photo Log

Cattle in UT MC

Chinese privet along the banks of UT MC

Buffer enhancement area along UT 4

Reference vegetation plot southeast of property boundary

Note: All photos taken April 6, 2020. No land use changes have occurred since DWR's initial Site visit in 2019.

Appendix C – Categorical Exclusion Documentation

Note: NCDMS can provide the full CE-ERTR document upon request. Results are summarized in Section 3.0 Regulatory Consideration.

LMG
LAND MANAGEMENT GROUP
a DAVEY company

March 13, 2020

Jeremiah Dow
NC DMS Project Manager
217 West Jones Street
Raleigh, NC 27603

cc: Vickie Miller, HDR Project Manager

Dear Mr. Dow,

Attached is the Categorical Exclusion, submitted by Land Management Group on behalf of HDR. This document contains all supporting documentation and any relevant correspondence for the White Farms Buffer Site in Randolph County, North Carolina. The purpose of Categorical Exclusion documentation is to assist the North Carolina Division of Mitigation Services in satisfying the Federal Highway Administration's (FHWA) obligation to ensure compliance with various federal environmental laws and regulations.

Correspondence between HDR and any federal, state or municipal agency is included within the supporting documentation of the Categorical Exclusion, with the intent of providing justification for satisfied compliance with each regulation. This includes correspondence and/or responses from: US Fish and Wildlife Service; North Carolina Wildlife Resources Commission (NCWRC); North Carolina State Historic Preservation Office (SHPO); and Natural Resources Conservation Service.

The Environmental Data Recourses (EDR) Report is included within the supporting documentation enclosed.

Sincerely,
Land Management Group

Alex DiGeronimo

www.lmgroup.net • Phone: 910.452.0001 • Fax: 910.452.0060
3101 Poplarwood Court – Suite 120, Raleigh, NC 27604

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Raleigh Field Office
P.O. Box 33726
Raleigh, NC 27636-3726

Date: March 12, 2020

Self-Certification Letter

Project Name: White Farms Buffer Mitigation Site

Dear Applicant:

Thank you for using the U.S. Fish and Wildlife Service (Service) Raleigh Ecological Services online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the project named above in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA), and the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c, 54 Stat. 250), as amended (Eagle Act). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

The species conclusions table in the enclosed project review package summarizes your ESA and Eagle Act conclusions. Based on your analysis, mark all the determinations that apply:

- [x] "no effect" determinations for proposed/listed species and/or proposed/designated critical habitat; and/or
- [ ] "may affect, not likely to adversely affect" determinations for proposed/listed species and/or proposed/designated critical habitat; and/or
- [ ] "may affect, likely to adversely affect" determination for the Northern long-eared bat (Myotis septentrionalis) and relying on the findings of the January 5, 2016, Programmatic Biological Opinion for the Final 4(d) Rule on the Northern long-eared bat;
- [x] "no Eagle Act permit required" determinations for eagles.

We certify that use of the online project review process in strict accordance with the instructions provided as documented in the enclosed project review package results in reaching the appropriate determinations. Therefore, we concur with the “no effect” or “not likely to adversely affect” determinations for proposed and listed species and proposed and designated critical habitat; the “may affect” determination for Northern long-eared bat; and/or the “no Eagle Act permit required” determinations for eagles. Additional coordination with this office is not needed. Candidate species are not legally protected pursuant to the ESA. However, the Service encourages consideration of these species by avoiding adverse impacts to them. Please contact this office for additional coordination if your project action area contains candidate species. Should project plans change or if additional information on the distribution of proposed or listed species, proposed or designated critical habitat, or bald eagles becomes available, this determination may be reconsidered. This certification letter is valid for 1 year. Information about the online project review process including instructions, species information, and other information regarding project reviews within North Carolina is available at our website http://www.fws.gov/raleigh/pp.html. If you have any questions, you can write to us at Raleigh@fws.gov or please contact Leigh Mann of this office at 919-856-4520, ext. 10.

Sincerely,

/s/Pete Benjamin

Pete Benjamin
Field Supervisor
Raleigh Ecological Services

Enclosures - project review package

Species Conclusions Table

Project Name: White Farms Buffer Mitigation Site

Date: March 12, 2020

Species / Resource Name	Conclusion	ESA Section 7 / Eagle Act Determination	Notes / Documentation
Helianthus schweinitzii (Schweinitz's Sunflower)	No suitable habitat present per correspondence with Katy Matthews of USFWS	No effect	Email correspondence with USFWS attached to submittal.
Fusconaia masoni (Atlantic pigtoe)	No suitable habitat	No effect	Habitat assessment indicates no potential habitat present.
Critical Habitat	No critical habitat present.	No effect	
Bald Eagle	Unlikely to disturb nesting bald eagles	No Eagle Act permit required.	No nest within action area and not within the county.

Acknowledgement: I agree that the above information about my proposed project is true. I used all of the provided resources to make an informed decision about impacts in the immediate and surrounding areas.

, EI

Signature /Title

3/12/2020

Date

ROY COOPER
Governor

MICHAEL S. REGAN
Secretary

NORTH CAROLINA
Environmental Quality

March 17, 2020

Alex DiGeronimo
Land Management Group
3101 Poplarwood Court, Suite 120
Raleigh, NC 27604

Subject: Task 1 Categorical Exclusion Approval
White Farms Buffer Site
Cape Fear River Basin; CU# 03030003
Randolph County, North Carolina
Contract No. 7860

Dear Mr. DiGeronimo:

On March 13, 2020 DMS received one (1) pdf copy of the updated Categorical Exclusion for the White Farms Buffer Site from Land Management Group (LMG). DMS and the Federal Highway Administration (FHWA) have completed the review of the Categorical Exclusion and have no additional comments.

This letter serves as DMS's approval of the Categorical Exclusion (Task 1). Attached please find the approved Categorical Exclusion Form for the subject full delivery project. Please include the original form in your Mitigation Plan. You may now invoice for payment of this Task (5% of total contracted amount).

If you have any questions, please contact me at any time. I can be reached at (919) 707-8280, or email me at jeremiah.dow@ncdenr.gov.

Sincerely,

Jeremiah Dow
Project Manager
NCDEQ Division of Mitigation Services

cc: file

Appendix A

Categorical Exclusion Form for Ecosystem Enhancement Program Projects
Version 1.4

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

Part 1: General Project Information	
Project Name:	White Farms Buffer Mitigation Project
County Name:	Randolph
EEP Number:	100112
Project Sponsor:	HDR
Project Contact Name:	Alex DiGeronimo
Project Contact Address:	555 Fayetteville Street, Suite 900, Raleigh, NC 27601
Project Contact E-mail:	alex.digeronimo@hdrinc.com
EEP Project Manager:	Jeremiah Dow

Project Description

Restoration and enhancement of buffers within the Cape Fear River Basin. Specifically, restoration and enhancement of buffers along UT Muddy Creek and several associated unnamed tributaries.

For Official Use Only

Reviewed By:

3-17-20 — Jeremiah Dow

Date — **EEP Project Manager**

Conditional Approved By:

Date — **For Division Administrator FHWA**

☐ **Check this box if there are outstanding issues**

Final Approval By:

3-16-20 — Donald W Brew

Date — **For Division Administrator FHWA**

Appendix D – Buffer Viability and Stream Determination

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

July 30, 2019

Alex DiGeronimo
HDR
555 Fayetteville Street, Suite 900
Raleigh, NC 27601
(via electronic mail: alex.digeronimo@hdrinc.com)

DWR# 2019-0884
Randolph County

Re: Site Viability for Buffer Mitigation & Nutrient Offset – White Site
Located near 5792-Suits Rd., Archdale, NC
Randleman Lake Watershed

Dear Mr. DiGeronimo,

On June 14, 2019, Katie Merritt, with the Division of Water Resources (DWR), received a request from HDR for an onsite mitigation determination near the above-referenced site (Site). The Site is located within the Randleman Lake Watershed of the Cape Fear River Basin in the 8-digit Hydrologic Unit Code 03030003. The Site is being proposed as part of a full-delivery riparian buffer mitigation project for the Division of Mitigation Services (RFP #16-007703). On June 19, 2019, Ms. Merritt performed an onsite assessment of riparian land uses adjacent to streams and channels onsite, which are shown on the attached map labeled "Determination Features Map". Staff from the Division of Mitigation Services were also present onsite.

Ms. Merritt's evaluation of the features onsite and their associated mitigation determination for the riparian areas are provided in the table below. This evaluation was made from Top of Bank (TOB) and landward 200' from each feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015).

Feature	Classification onsite	[1]Subject to Buffer Rule	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Viable	[5]Mitigation Type Determination w/in riparian areas
UT1	Stream	Yes	Non-forested pasture grazed by cattle	Yes	N/A	**Restoration Site** per 15A NCAC 02B .0295 (n) *Minor bank stabilization and grading needed where bank stability is compromised and where erosional rills and gullies are observed.*
UT2 (at DWR flag)	Stream	Yes	Non-forested pasture grazed by cattle with scattered individual trees	Yes	N/A	**Restoration Site** per 15A NCAC 02B .0295 (n) *Minor bank stabilization and grading needed where bank stability is compromised and where erosional rills and gullies are observed.*
UT3	Not Evaluated	Not evaluated	Forested no cattle	N/A	N/A	N/A
UT4	Stream	Not evaluated	Forested cattle pasture	[3,4]Yes	N/A	**Preservation Site** per 15A NCAC 02B .0295 (o)(4) ***or*** **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) if fence is installed
UT5	Stream	Yes	Combination of forested and non-forested pasture grazed by cattle	[3,4]Yes	N/A	Forested Areas - **Preservation Site** per 15A NCAC 02B .0295 (o)(5) ***or*** **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) if fence is installed Non-forested areas - **Restoration Site** per 15A NCAC 02B .0295 (n)

Feature	Classification onsite	[1]Subject to Buffer Rule	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	[2]Nutrient Offset Viable	[5]Mitigation Type Determination w/in riparian areas
UT to Muddy Creek		Yes	Mostly non-forested pasture grazed by cattle except where privet canopy was observed. Some areas of forested pasture exist around UT3, UT4, and UT5 adjacent to this feature	[3,4]Yes	N/A	Forested Areas - **Preservation Site** per 15A NCAC 02B .0295 (o)(5) ***or*** **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) if fence is installed Partially forested areas - **Enhancement Site** per 15A NCAC 02B .0295 (n) and required to be planted Non-forested areas - **Restoration Site** per 15A NCAC 02B .0295 (n) *Bank sloughing needs to be remediated where observed.* *A privet canopy was present throughout and needs to be removed with the area treated and replanted prior to receiving buffer credit.* *A stormwater drain exists within the buffer, but is expected to be excluded from credit and made into a "crossing"*

[1]Subjectivity calls for the features were determined by DWR in correspondence dated July 24, 2019 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.

[4]The area described as an Enhancement Site was assessed and determined to comply with all 15A NCAC 02B .0295(o)(6). Cattle exclusion fencing is required to be installed around the mitigation area to get buffer credit under this part of the rule.

[5]All features proposed for buffer mitigation or nutrient offset, must have a conservation easement established that includes the tops of channel banks when being measured perpendicular and landward from the banks, even when no credit is viable within the 50' riparian buffer.

The map attached to this letter was prepared by HDR and initialed by Ms. Merritt on July 30, 2019. This letter does not constitute an approval of this site to generate mitigation credits. Pursuant to 15A NCAC 02B .0295, 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.

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 riparian buffer mitigation credits.

This viability assessment will expire on July 30, 2021 or upon the submittal of an As-Built Report to the DWR, whichever comes first. **This letter should be provided in all stream and wetland, buffer and/or nutrient offset mitigation plans for this Site.**

Sincerely,

Paul Wyatt
for
Karen Higgins, Supervisor
401 and Buffer Permitting Branch

KAH/*km*
Attachments: Determination Features Map

cc: File Copy (Katie Merritt)
Jeremiah Dow- DMS (via electronic mail)

HDR

DS SH 7/24/2019

DETERMINATION FEATURES MAP
WHITE BUFFER MITIGATION SITE
RANDOLPH COUNTY, NORTH CAROLINA
FIGURE 3

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
LINDA CULPEPPER
Director

NORTH CAROLINA
Environmental Quality

July 24, 2019

Alex DiGeronimo
HDR
555 Fayetteville St
Raleigh, NC 27601

Subject: On-Site Determination for Applicability to the Randleman Lake Buffer Rules (15A NCAC 2B .0250)

Subject Property: White Buffer Mitigation Site, 5796 Suits Rd, Archdale NC, Randolph County
DWR# 2019-0884

Dear Mr. DiGeronimo:

On June 19, 2019, at your request, Sue Homewood conducted an on-site determination to review features located on the subject project for stream determinations with regards to the above noted state regulations. Katie Merritt with the Division of Water Resources (Division) – 401 & Buffer Permitting Branch was also present during the site visit.

The attached sketch depicts the channels that were reviewed during the site visit. Channels UT1, UT2, UT to Muddy Creek, and UT5 as shown on the attached sketch were determined to be at least intermittent channels and subject to the Randleman Buffer Rules cited above. UT3 and UT4 were not evaluated as they exist within the buffer of UT to Muddy Creek. Please note that these regulations may be subject to change in the future.

The owner (or future owners) should notify the Division (and other relevant agencies) of this decision in any future correspondences concerning this property. 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 Division or Delegated Local Authority that a surface water exists and that it is subject to the buffer rule may request a determination by the Director. A request for a determination by the Director shall be referred to the Director in writing c/o 401 & Buffer Permitting Branch, 1650 Mail Service Center, Raleigh, NC 27699-1650. Individuals that dispute a determination by the Division or Delegated Local Authority that "exempts" surface water from the buffer rule may ask for an adjudicatory hearing. You must act within 60 days of the date that you receive this letter. Applicants are hereby notified that the 60-day statutory appeal time does not start until the affected party (including downstream and adjacent landowners) is notified of this decision. The Division recommends that the applicant conduct this notification in order to be certain that third party appeals are made in a timely manner. To ask for a hearing, send a written petition, which conforms to Chapter 150B of the North Carolina General Statutes to the Office of Administrative Hearings, 6714 Mail Service Center, Raleigh, N.C. 27699-6714. This determination is final and binding unless you ask for a hearing within 60 days.

This letter only addresses the applicability to the buffer rules and does not approve any activity within Waters of the United States or Waters of the State or their associated buffers. If you have any additional questions or require additional information, please contact me at 336-776-9693 or sue.homewood@ncdenr.gov.

Sincerely,

DocuSigned by:
Sue Homewood
456ED631098F411...

Sue Homewood
Winston-Salem Regional Office

Enclosures: USGS Topo Map
HDR Determination Features Map – DWR initialed/dated

Cc: Frann White, 1245 Watermark Ct, High Point NC 27265
Gary & Patricia White, 5796 Suits Rd, Archdale NC 27265
Katie Merritt, DWR (via email)
Jeremiah Dow, DMS (via email)
DWR, Winston-Salem Regional Office

0 225 450 Feet

DS SH 7/24/2019

DETERMINATION FEATURES MAP
WHITE BUFFER MITIGATION SITE
RANDOLPH COUNTY, NORTH CAROLINA
FIGURE 3

Appendix E – Buffer Authorization

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
S. DANIEL SMITH
Director

NORTH CAROLINA
Environmental Quality

October 26, 2020

DWR # 20190884 v2
Randolph County

Land Management Group
Attn: Alex DiGeronimo
3101 Poplarwood Ct
Raleigh NC 27604

Subject: APPROVAL of RANDLEMAN LAKE RIPARIAN BUFFER IMPACTS WITH ADDITIONAL CONDITIONS
White Mitigation Project

Dear Mr. DiGeronimo:

You have our approval for the impacts listed below for the purpose described in your application dated and received by the Division of Water Resources (Division) September 29, 2020 with subsequent information on October 21, 2020. These impacts are covered by the Randleman Lake Buffer Rules and the conditions listed below. Please note that you should get any other federal, state or local permits before proceeding with your project, including those required by (but not limited to) Sediment and Erosion Control, Non-Discharge, and Water Supply Watershed regulations.

This approval requires you to follow the conditions listed in the enclosed certification(s) or general permit and the following additional conditions:

1. The following impacts are hereby approved provided that all of the Conditions listed below and all of the conditions of the applicable Randleman Lake Buffer Rules are met. No other impacts are approved, including incidental impacts. [15A NCAC 02B .0611(b)(2)]

Type of Impact	**Amount Approved (units) Permanent**	**Amount Approved (units) Temporary**
Buffers – Zone 1		
Pipe Removal UT2	267 (square feet)	0 (square feet)
Pipe Removal UT Muddy Creek	267 (square feet)	0 (square feet)
Crossing #1 UT2	500 (square feet)	0 (square feet)
Crossing #2 UT Muddy Creek	500 (square feet)	0 (square feet)
Crossing #3 UT1	500 (square feet)	0 (square feet)
Bank Stabilization UT1	0 (square feet)	2794 (square feet)
Bank Stabilization UT2	0 (square feet)	2773 (square feet)
Bank Stabilization UT Muddy Creek	0 (square feet)	2589 (square feet)

Cattle Exclusion Fencing UT1	702 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT2	774 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT Muddy Creek	741 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT3	111 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT4	204 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT5	204 (square feet)	0 (square feet)
Buffers – Zone 2		
Cattle Exclusion Fencing UT1	180 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT2	435 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT Muddy Creek	252 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT4	60 (square feet)	0 (square feet)
Cattle Exclusion Fencing UT5	69 (square feet)	0 (square feet)

2. This approval is for the purpose and design described in your application. The plans and specifications for this project are incorporated by reference as part of this Authorization. If you change your project, you must notify the Division and you may be required to submit a new application package with the appropriate fee. If the property is sold, the new owner must be given a copy of this Authorization and is responsible for complying with all conditions. [15A NCAC 02H .0507(d)(2)].

3. The permittee shall report to the Winston Salem Regional Office any noncompliance with the conditions of this Authorization, or any violation of stream or wetland standards [15A NCAC 02B .0200] including but not limited to sediment impacts, and any violation of state regulated riparian buffer rules [15A NCAC 02B .0724]. Information shall be provided orally within 24 hours (or the next business day if a weekend or holiday) from the time the applicant became aware of the circumstances. A written submission shall also be provided within 5 business days of the time the applicant becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its causes; the period of noncompliance, including exact dates and times, if the noncompliance has not been corrected, the anticipated time compliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The Division may waive the written submission requirement on a case-by-case basis.

This approval and its conditions are final and binding unless contested. [G.S. 143-215.5]

This Authorization can be contested as provided in General Statute 150B by filing a written petition for an administrative hearing to the Office of Administrative Hearings (hereby known as OAH) **within sixty (60) calendar days**.

A petition form may be obtained from the OAH at http://www.ncoah.com/ or by calling the OAH Clerk's Office at (919) 431-3000 for information. A petition is considered filed when the original and one (1) copy along with any applicable OAH filing fee is received in the OAH during normal office hours (Monday through Friday between 8:00am and 5:00pm, excluding official state holidays).

The petition may be faxed to the OAH at (919) 431-3100, provided the original and one copy of the petition along with any applicable OAH filing fee is received by the OAH within five (5) business days following the faxed transmission.

Mailing address for the OAH:

If sending via US Postal Service:
Office of Administrative Hearings
6714 Mail Service Center
Raleigh, NC 27699-6714

If sending via delivery service (UPS, FedEx, etc):
Office of Administrative Hearings
1711 New Hope Church Road
Raleigh, NC 27609-6285

One (1) copy of the petition must also be served to Department of Environmental Quality:

William F. Lane, General Counsel
Department of Environmental Quality
1601 Mail Service Center
Raleigh, NC 27699-1601

This letter completes the review of the Division under the Randleman Lake Riparian Buffer Rules as described in 15A NCAC 02B .0724. Please contact Sue Homewood at 336-776-9693 or sue.homewood@ncdenr.gov if you have any questions or concerns.

Sincerely,

DocuSigned by:
Lon T. Snider
145B49E225C94EA...

Lon T. Snider
Regional Supervisor
Water Quality Regional Operations Section
Division of Water Resources, NCDEQ – WSRO

cc: DWR 401 & Buffer Permitting Unit file

Appendix F – Mitigation Plan Sheets

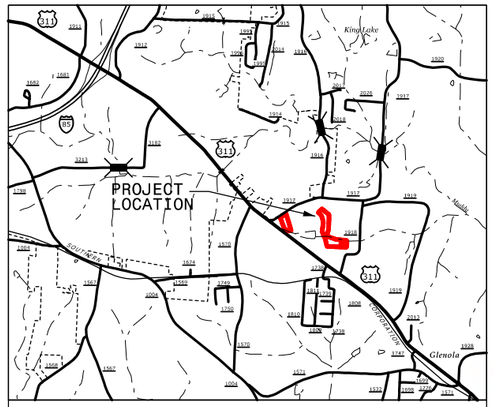
STATE		SHEET NO.
N.C.	WHITE FARMS BUFFER MITIGATION SITE	1

WHITE FARMS BUFFER MITIGATION SITE

LOCATION: RANDOLPH COUNTY, NORTH CAROLINA

LAT: 35°53' 18" **LONG: -79° 55' 35"**

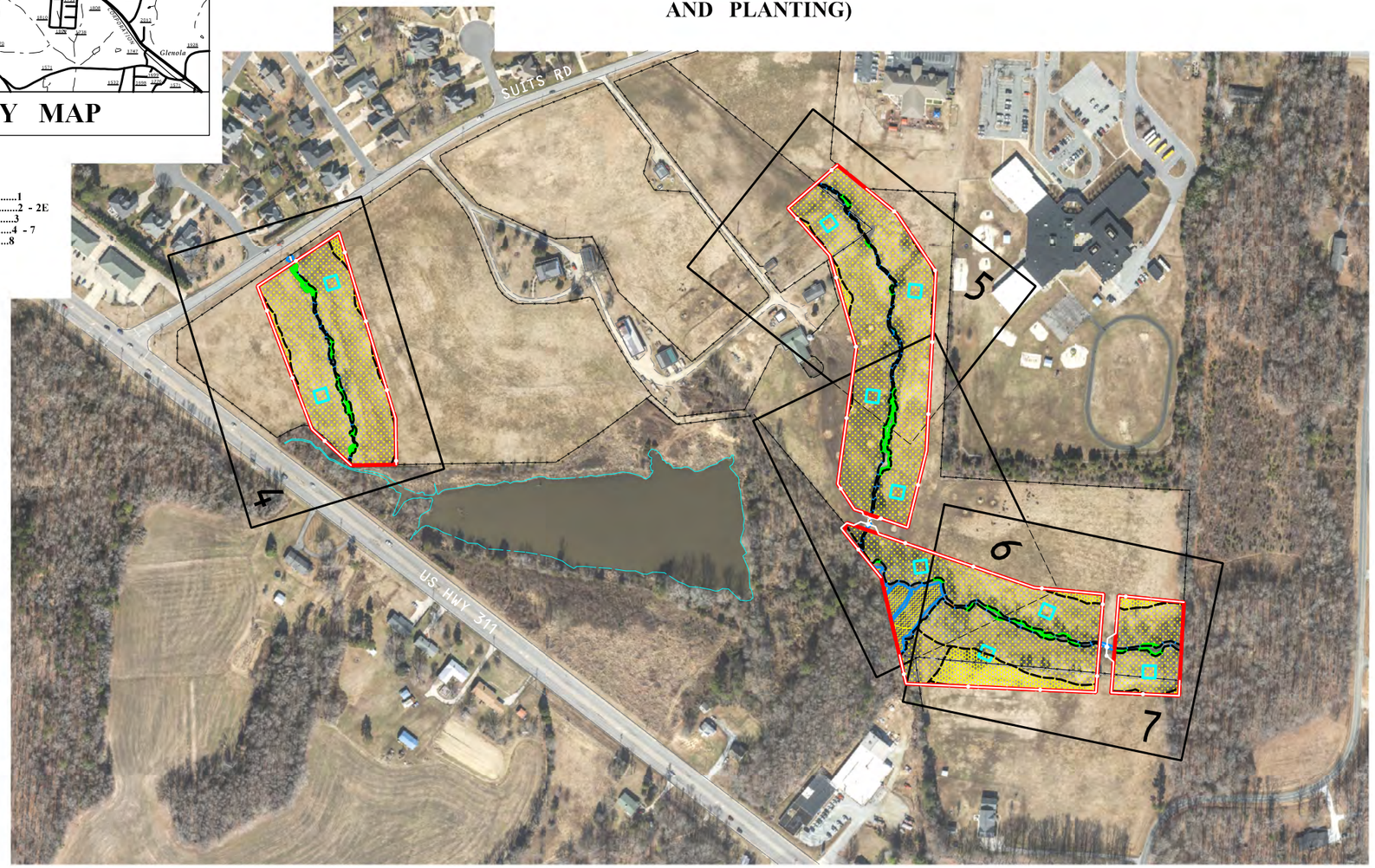
TYPE OF WORK: STREAM BANK STABILIZATION (GRADING, EROSION CONTROL AND PLANTING)



VICINITY MAP

INDEX OF SHEETS

TITLE SHEET.....1
DETAILS.....2 - 2E
PROJECT OVERVIEW MAP.....3
PLAN SHEETS.....4 - 7
PLANTING PLAN SHEET.....8



- PIPE CULVERT
- EXISTING FENCE
- EXISTING TOP OF BANK
- CONSERVATION EASEMENT (E)
- PROPOSED WOVEN WIRE FENCE
- PROPOSED BARBED WIRE FENCE
- PROPOSED BANKFULL
- EXISTING FENCE TO BE REMOVED
- PROPOSED BANK STABILIZATION
- 0'-100' BUFFER - RESTORATION
- 100'-200' BUFFER - RESTORATION
- 0'-100' BUFFER - ENHANCEMENT
- STREAMSIDE ASSEMBLAGE
- PIEDMONT/LOW MOUNTAIN ALLUVIAL FOREST
- 10M X 10M VEG PLOT

CONTRACT: WHITE FARMS BUFFER MITIGATION SITE

GRAPHIC SCALES

50 25 0 50 100
PLANS

10 5 0 10 20
PROFILE (HORIZONTAL)

20 10 0 20 40
PROFILE (VERTICAL)

PLANTING PLANS	
STREAMSIDE ASSEMBLAGE (LIN. FEET)	PIEDMONT/LOW MOUNTAIN ALLUVIAL FOREST (Sq FEET / Acres)
1,449	491,405 / 11.28

MITIGATION PLANS				
MITIGATION AREA	RIPARIAN RESTORATION (SQ FEET)		RIPARIAN ENHANCEMENT (SQ FEET)	
	0'-100' BUFFER	100'-200' BUFFER	0'-100' BUFFER	100'-200' BUFFER
-UT 1-	110183.7350	7230.3975	-	-
-UT 2-	181931.2718	4740.0347	-	-
-UT MUDDY-CREEK	144836.3756	30276.3904	11416.3133	-
-UT 5-	11876.6604	329.7786	1745.4892	-
TOTAL	448828.0428	42576.6011	13161.8025	-

Prepared in the Office of:

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

CHRISTOPHER L. SMITH
PROJECT DESIGNER / ENGINEER

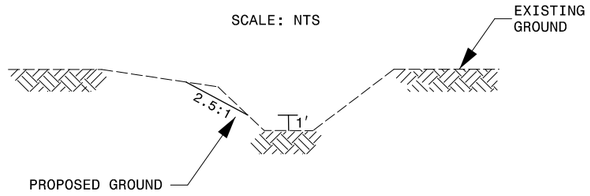
6/1/2020
Z:\HDR Projects\White_Buffer_DMS\6.0_CAD\6.5_Proj\6.5.1_Mitigation Plans\White_psh_01.dgn
-Land Management Group, Raleigh-

NOTES:

1. GRADE BANK AT 2.5:1 MAINTAINING EXISTING TOE LOCATION.
2. GRADED BANK TO BE SEEDED, MULCHED AND COIR FIBER MATTED.

TYPICAL BANK STABILIZATION ENHANCEMENT

SCALE: NTS



BANK STABILIZATION LOCATIONS

PLAN SHEET 4 -UT 1-

SIDE	BEGINNING COORDINATES	ENDING COORDINATES
LT	N= 779878.3915 E= 1724118.3747	N= 779852.2160 E= 1724121.9750
RT	N= 779867.9627 E= 1724101.5635	N= 779786.4450 E= 1724162.6440
LT	N= 779827.3210 E= 1724142.1350	N= 779775.0860 E= 1724167.9520
LT	N= 779681.6930 E= 1724203.6530	N= 779624.8630 E= 1724216.9020
RT	N= 779583.2450 E= 1724221.8250	N= 779475.1050 E= 1724259.9270
LT	N= 779516.5340 E= 1724250.2000	N= 779454.5940 E= 1724267.2410
LT	N= 779448.6400 E= 1724270.7870	N= 779421.8440 E= 1724271.5100
RT	N= 779435.4720 E= 1724266.9280	N= 779418.2130 E= 1724267.6840
LT	N= 779405.4940 E= 1724274.4260	N= 779375.1380 E= 1724264.3600

PLAN SHEET 5 -UT 2-

SIDE	BEGINNING COORDINATES	ENDING COORDINATES
LT	N= 780049.6503 E= 1725536.4213	N= 780015.7110 E= 1725560.9830
RT	N= 779814.3630 E= 1725674.8080	N= 779793.3840 E= 1725673.7010
LT	N= 779703.4180 E= 1725672.0403	N= 779687.2070 E= 172568.0080

PLAN SHEET 6 -UT 2-

SIDE	BEGINNING COORDINATES	ENDING COORDINATES
LT	N= 779552.7196 E= 1725675.9484	N= 779317.5000 E= 1725639.7930
RT	N= 779506.7441 E= 1725670.0829	N= 779374.8970 E= 1725650.4110

PLAN SHEET 6 -UT TO MUDDY CREEK-

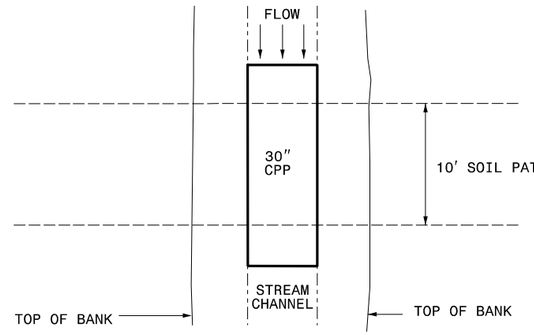
SIDE	BEGINNING COORDINATES	ENDING COORDINATES
LT	N= 779091.8324 E= 1725623.1663	N= 779092.5336 E= 1725644.4629
LT	N= 779045.8490 E= 1725774.9597	N= 779039.8782 E= 1725805.1189

PLAN SHEET 7 -UT TO MUDDY CREEK-

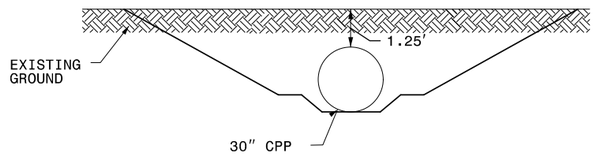
SIDE	BEGINNING COORDINATES	ENDING COORDINATES
RT	N= 778973.1281 E= 1725860.1924	N= 7789867.0768 E= 1725885.9128
RT	N= 778980.6915 E= 1725898.1675	N= 778973.1566 E= 1725909.5820
LT	N= 778980.8734 E= 1725913.1416	N= 778903.7689 E= 1726093.0384
LT	N= 778945.0681 E= 1725980.6596	N= 778903.7689 E= 1726093.0384
RT	N= 778909.6377 E= 1726046.6395	N= 778895.3090 E= 1726096.4710
RT	N= 778859.1398 E= 1726250.3374	N= 778864.6218 E= 1726283.1286
RT	N= 778866.5946 E= 1726312.9270	N= 778868.7223 E= 1726377.2877

PERMANENT STREAM CROSSING NO. 1 W/ 30″ CPP

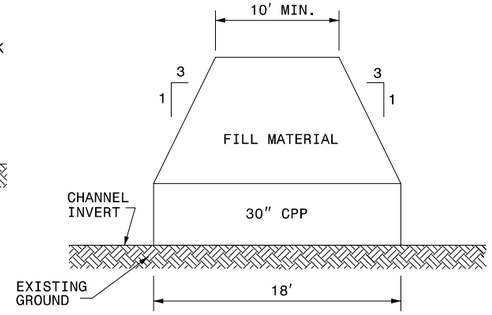
SCALE: NTS



PLAN VIEW



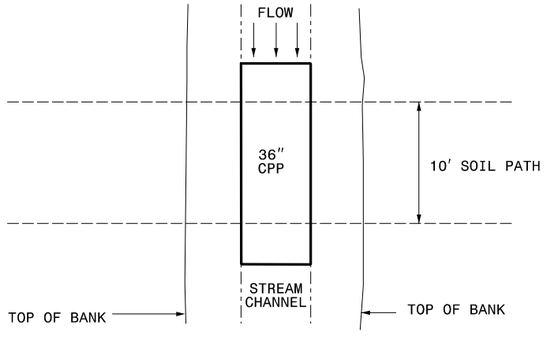
CROSS-SECTION VIEW



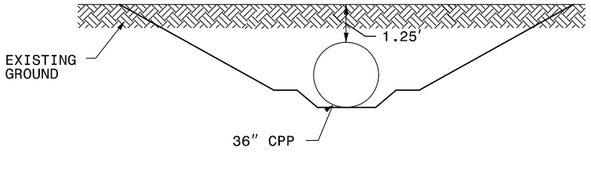
PROFILE ALONG CULVERT

PERMANENT STREAM CROSSING NO. 2 W/ 36″ CPP

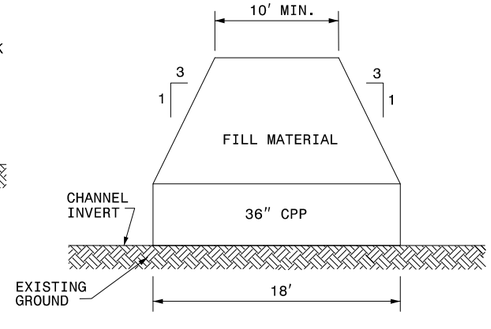
SCALE: NTS



PLAN VIEW



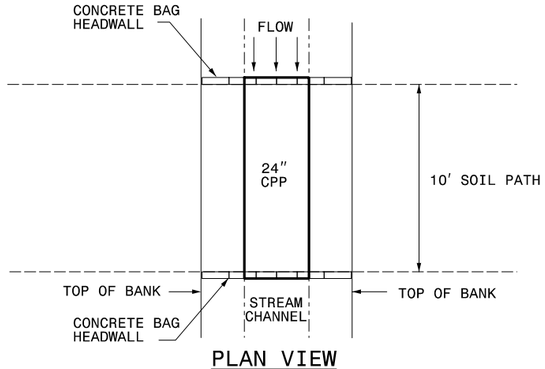
CROSS-SECTION VIEW



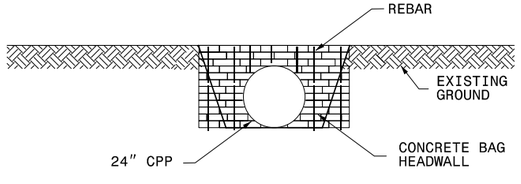
PROFILE ALONG CULVERT

PERMANENT STREAM CROSSINGS NO. 3 W/ 24″ CPP

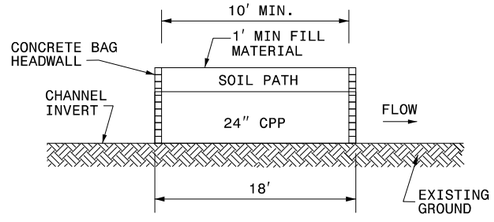
SCALE: NTS



PLAN VIEW



CROSS-SECTION VIEW



PROFILE ALONG CULVERT

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

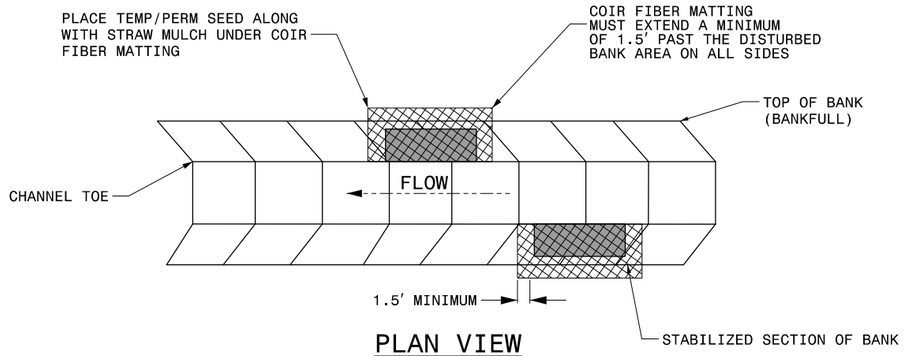
DATE: 06-01-2020

DETAILS

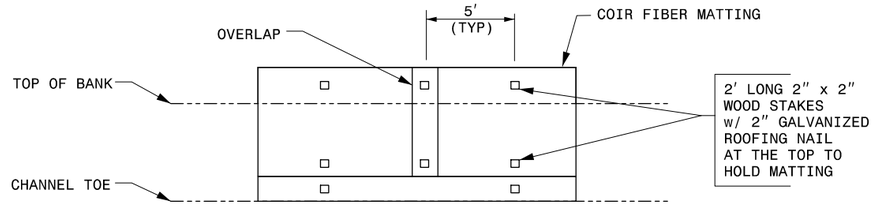
SHEET
2

TYPICAL MATTING LOCATION DETAIL

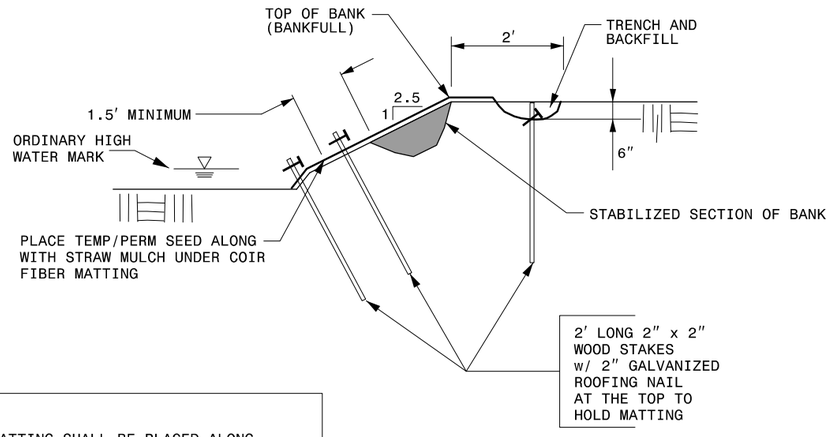
SCALE: NTS



PLAN VIEW



MATTING STAKING VIEW



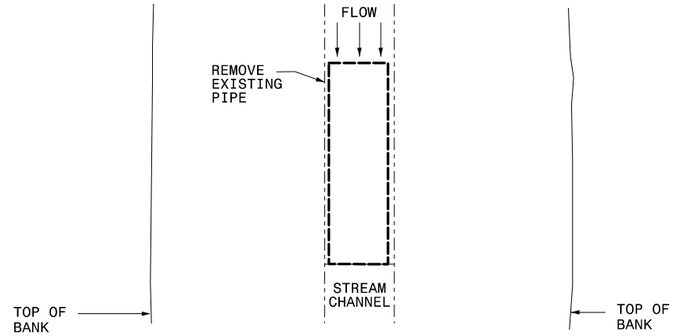
SECTION A-A

NOTES:

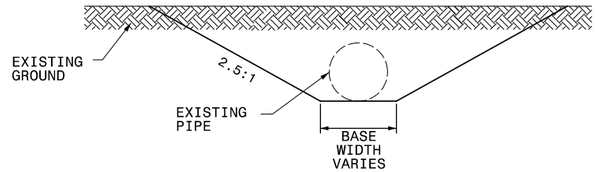
1. COIR FIBER MATTING SHALL BE PLACED ALONG SECTIONS OF THE BANK THAT HAVE BEEN REPAIRED BY THE CONTRACTOR IMMEDIATELY UPSTREAM AND DOWNSTREAM OF THE BRIDGE.
2. USE WOOD STAKES (NOT METAL) FOR MATTING.
3. INSTALL STAKES ACROSS MATTING AT ENDS, JUNCTIONS, OUTER EDGES, AND DOWN THE CENTER .
4. 2′ X 2″ X 2″ HARDWOOD STAKES SHALL BE INSTALLED ALONG THE OUTER EDGES (TOP OF BANK)AND DOWN THE CENTER OF THE BANK WITH A MAXIMUM 5′ SPACING.

PIPE REMOVAL DETAIL

SCALE: NTS



PLAN VIEW



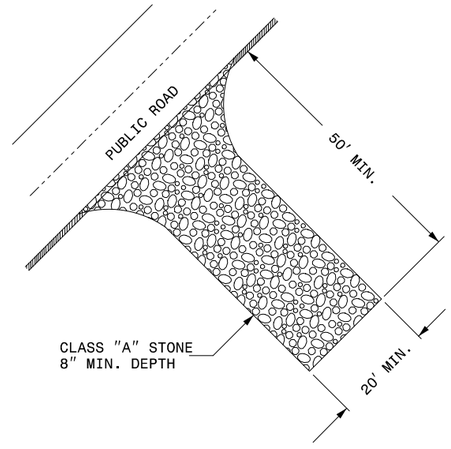
CROSS-SECTION VIEW

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE

SCALE:NTS

NOTES:

1. TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS SHALL BE PROVIDED.
2. ENTRANCE(S) SHOULD BE LOCATED TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOP DRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. GRAVEL CONSTRUCTION ENTRANCE SHALL BE LOCATED AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE MUST BE PROVIDED.
6. FILTER FABRIC TO BE PLACED BENEATH STONE.



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

DATE: 06-01-2020

DETAILS

SHEET
2A

STANDARD TEMPORARY SILT FENCE

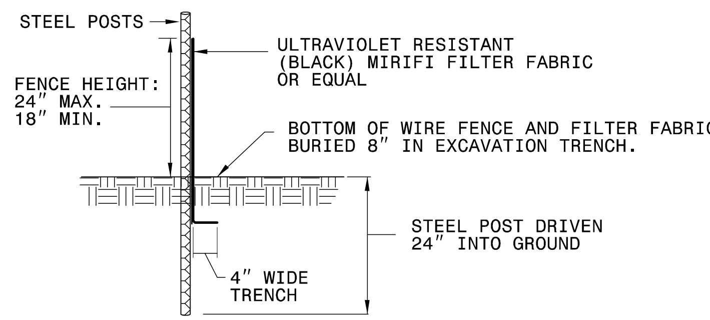
SCALE: N.T.S.

CONSTRUCTION SPECIFICATIONS

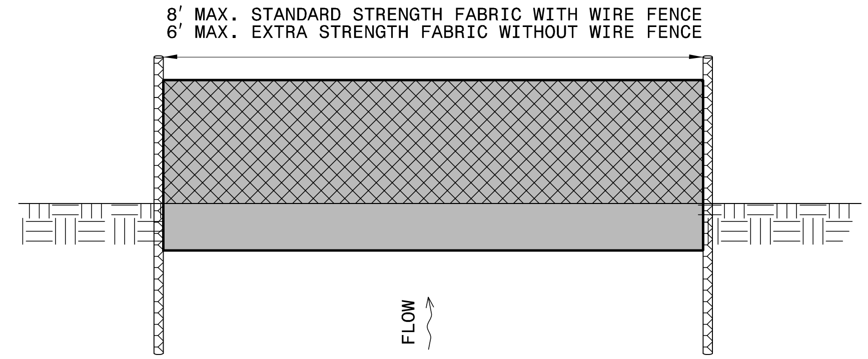
1. CONSTRUCT SEDIMENT FENCE ON LOW SIDE OF TOPSOIL STOCKPILE TO PREVENT SEDIMENT FROM BEING WASHED INTO THE DRAINAGE SYSTEM. FENCE TO EXTEND AROUND APPROXIMATELY 70% OF THE PERIMETER OF THE STOCKPILE.
2. LOCATE POSTS DOWNSLOPE OF FABRIC TO HELP SUPPORT FENCING.
3. BURY TOE OF FENCE APPROXIMATELY 8" DEEP TO PREVENT UNDERCUTTING.
4. WHEN JOINTS ARE NECESSARY, SECURELY FASTEN THE FABRIC AT A SUPPORT POST WITH OVERLAP TO THE NEXT POST.
5. FILTER FABRIC TO BE ON NYLON, PLOYESTER, PROPYLENE OR ETHYLENE YARN WITH EXTRA STRENGTH-50LB/ LIN. IN. (MINIMUM) AND WITH A FLOW RATE OF AT LEAST 0.3 GAL./FT / MINUTE. FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABLIZERS.

MAINTENANCE

1. INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR THE NEXT RAIN AND TO REDUCE PRESSURE ON THE FENCE. TAKE CARE TO AVOID UNDERMINING THE FENCE DURING CLEANOUT.
4. REMOVE ALL FENCING MATERIALS AND UNSTABLE SEDIMENT DEPOSITS AND BRING THE AREA TO GRADE AND STABILIZE IT AFTER THE CONTRIBUTING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.



SECTION



TEMP SILT FENCE INSTALLATION

STEP 1:
DRIVE STEEL POSTS 24" INTO GROUND AND EXCAVATE A 8"x 4" TRENCH UPHILL ALONG THE LINE OF POSTS.

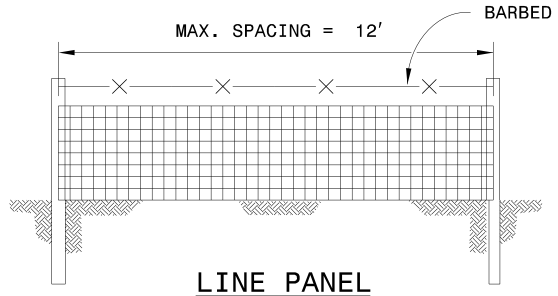
STEP 2:
ATTACH WIRE FENCE TO POSTS AND EXTEND THE BOTTOM OF THE FENCE 8" INTO THE EXCAVATED TRENCH.

STEP 3:
ATTACH THE FILTER FABRIC TO THE POST AND EXTEND THE BOTTOM OF THE FABRIC 8" INTO THE TRENCH.

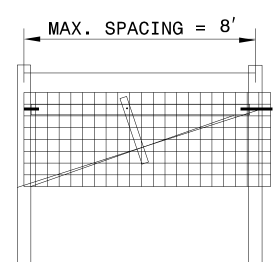
STEP 4:
BACKFILL THE TRENCH AND COMPACT THE SOIL FIRMLY TO ANCHOR THE BOTTOM OF THE SILT FENCE SO THAT RUNOFF IS FORCED TO GO THROUGH THE FENCE AND CANNOT GO UNDER IT.

WOVEN WIRE FENCING DETAIL

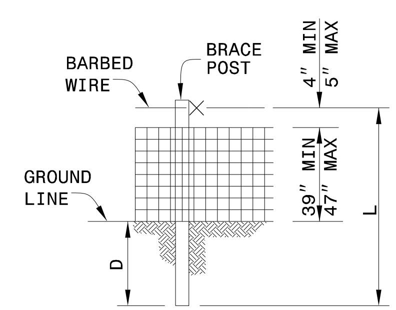
SCALE: NTS



LINE PANEL



SINGLE SPAN BRACE ASSEMBLY



WOVEN WIRE FENCE

- MIN CLASS 1 ZINC-COATING 12½ GAUGE WOVEN WIRE
- THE TOP AND BOTTOM WIRE SHALL BE 10 GAUGE STEEL
- VERTICAL WIRES SHALL BE 12½ GAUGE STEEL AND SHALL BE SPACED 6 TO 12 INCHES APART.
- FILLER WIRES SHALL BE 12½ GAUGE STEEL

BARBED WIRE

- WOVEN WIRE FENCE SHALL HAVE 1 STRAND OF BARBED WIRE PLACED 4 TO 5 INCHES ABOVE THE WOVEN WIRE
- MIN CLASS 3 ZINC-COATING FOR 12½ GAUGE HIGH TENSILE AND 15½ GAUGE BARBED WIRE
- 2 TWISTED STRANDS WITH 15½ GAUGE TWO-POINT BARBS ON APPROX. 5 INCH CENTERS.

"H" BRACE ASSEMBLY

- BRACE WIRE SHALL BE 2 ROUNDS OF 12½ GAUGE WIRE (4 WIRES TOP TO BOTTOM) OR 1 ROUND OF 9 GAUGE WIRE (2 WIRES TOP TO BOTTOM)
- TWITCH STICK SHALL BE 3⁄8" DIAMETER DOWEL OR EQUAL AT BOTTOM AND TOP OF POST

POST REQUIREMENTS PULL AND BRACE POST

WOOD: L = 8 FT. MIN.
DIA. = 5 IN. MIN.

POST REQUIREMENTS HORIZONTAL BRACE

WOOD: L = 8 FT. MIN.
DIA. = 4 IN. MIN.

6" AND 12" X 3⁄8" DIA DOWELS OR EQUIVALENT SHALL BE USED TO ATTACH BRACE TO POST

STAY REQUIREMENTS

WOOD: 1½" DIA. MIN. OF DURABLE WOOD

POST REQUIREMENTS ALONG LINE

WOOD: L = 6½ FT. MIN.
D = 24 IN. MIN.
DIA. = 3 IN. MIN.

STABLES SHALL BE 9 GAUGE GALVANIZED WIRE MIN LENGTH 1½" FOR SOFTWOODS

POST REQUIREMENTS AT CORNER

WOOD: L = 8 FT. MIN.
D = 3½ FT. MIN.
DIA. = 5 IN. MIN.

LINE POSTS

NINETY-FIVE PERCENT OF TOP DIAMETERS OF WOODEN LINE POST (TWO INCHES ABOVE THE TOP WIRE) MUST BE THREE INCHES LARGER. LENGTH MUST BE SUFFICIENT TO PROVIDE FOR THE CONSTRUCTION OF AT LEAST A 42 INCH-HIGH FENCE TO PERMIT STAPLING OF THE TOP WIRE WITHOUT SPLITTING. TREATED POSTS SHALL BE MADE OF BLACK LOCUST, TREATED PINE OROTHER WOOD OF EQUAL LIFE AND STRENGTH.

TREATMENT FOR PINE & OAK POSTS	RETENTION LB/FT
CREOSOTE COAL TAR	6.0
PENTACHLOROPHENO	0.3
ACID COPPER CHROMATE	0.5
AMONIACAL COPPER ARSENATE	0.4
CHROMATED COPPER ARSENATE (CCA)	0.4

NOTES

LINE POSTS MUST BE SET SOLIDLY IN THE GROUND A MINIMUM DEPTH OF TWO FEET.

POST BACKFILLED WITH CONCRETE SHALL HAVE NO STRESS APPLIED UNTIL AT LEAST 24 HOURS AFTER CONCRETE IS POURED.

STEEL ASSEMBLY AND POST ASSEMBLY MUST BE PROTECTED WITH GALVANIZATION OR RUST-RESISTANT PAINT OR COATING.

WIRE CLIPS OR FASTENERS MUST BE GALVANIZED AND SIMILAR TO STRENGTH OF FENCE WIRE.

LOCATION OF BRACES AND/OR END ASSEMBLIES ARE REQUIRED AT ALL CORNERS AND AT ALL DEFINITE ANGLES IN THE FENCE.

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

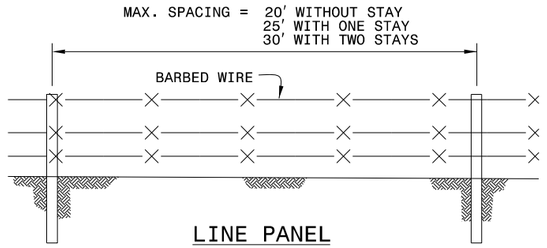
DATE: 06-01-2020

DETAILS

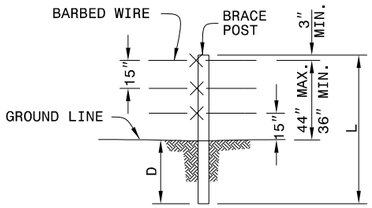
SHEET 2B

TEMPORARY
BARBED WIRE FENCE DETAIL

SCALE: NTS



LINE PANEL



BARBED WIRE

- 12½ GAUGE CONVENTIONAL OR 15½ GAUGE HIGH-TENSION
- 2 TWISTED STRANDS WITH 14 GAUGE OR HEAVIER TWO-POINT BARBS ON APPROX. 5 INCH CENTERS.
- CLASS 1 (MIN. OR EQUIV.) ZINC-COATING AS PER ASTM A-121.
- 15″ SPACING BETWEEN WIRES

POST REQUIREMENTS ALONG LINE

WOOD: L = 6 FT. MIN.
D = 24 IN. MIN.
DIA. = 3 IN. MIN.

STEEL: L = 5-1/2 FT. MIN.
D = 18 IN. MIN.
STANDARD ″T″ OR ″U″; > 1.25 LBS/FT OF LENGTH

POST REQUIREMENTS AT CORNER

WOOD: L = 7 FT. MIN.
D = 3 FT. MIN.
DIA. = 5 IN. MIN.

STEEL: L = 7 FT. MIN.
D = 3 FT. MIN. (SET IN CONC.)
DIA. = ROUND 2-3/8 IN. O.D. OR
ANGLE IRON 2-1/2 X2-1/2 X1/4 (IN.)

STAY REQUIREMENTS

WOOD: 1-1/2 IN. DIA. MIN. OF DURABLE WOOD

LINE POSTS

NINTY-FIVE PERCENT OF TOP DIAMETERS OF WOODEN LINE POST (TWO INCHES ABOVE THE TOP WIRE) MUST BE THREE INCHES LARGER. LENGTH MUST BE SUFFICIENT TO PROVIDE FOR THE CONSTRUCTION OF AT LEAST A 42 INCH-HIGH FENCE TO PERMIT STAPLING OF THE TOP WIRE WITHOUT SPLITTING. UNTREATED OR TREATED POSTS MADE OF JUNIPER (CEDAR, EXCEPT ROCKY MOUNTAIN), OAK, OSAGE ORANGE, BLACK LOCUST, AND REDWOOD OR, BOIS-D-′ARC, TREATED PINE OR FEDERAL SPECIFICATION TT-W-571c OR AS INDICATED BELOW.

TREATMENT FOR PINE & OAK POSTS	RETENTION LB/FT^3
CREOSOTE COAL TAR	6.0
PENTACHLOROPHENO	0.3
ACID COPPER CHROMATE	0.5
AMONIACAL COPPER ARSENATE	0.4
CHROMATED COPPER ARSENATE (CCA)	0.4

LINE POSTS MUST BE SET SOLIDLY IN THE GROUND A MINIMUM DEPTH OF TWO FEET.

STEEL ASSEMBLY AND POST ASSEMBLY MUST BE PROTECTED WITH GALVANIZATION OR RUST-RESISTANT PAINT OR COATING.

WIRE CLIPS OR FASTENERS MUST BE GALVANIZED AND SIMILAR TO STRENGTH OF FENCE WIRE.

LOCATION OF BRACES AND/OR END ASSEMBLIES ARE REQUIRED AT ALL CORNERS AND AT ALL DEFINITE ANGLES IN THE FENCE.

FENCE WIRE ACROSS BANKFULL CHANNEL SHALL BE A NON-BARBED TYPE WIRE WITH SIMILIAR PROPERTIES AS THE BARBED WIRE.

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

DATE: 06-01-2020

DETAILS

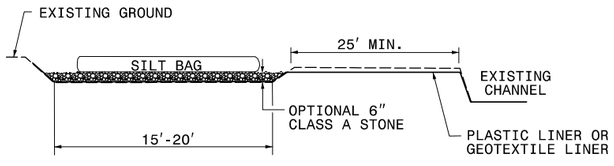
SHEET
2C

SEQUENCE OF CONSTRUCTION FOR TYPICAL WORK AREA

1. INSTALL SPECIAL STILLING BASIN(S).
2. INSTALL STABILIZED PUMP AROUND INLET, UPSTREAM PUMP, AND TEMPORARY FLEXIBLE HOSE.
3. PLACE UPSTREAM IMPERVIOUS CHANNEL PLUG AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
4. PLACE PUMPING APPARATUS. DEWATER ENTRAPPED AREA. AREA TO BE DEWATERED SHALL BE EQUAL TO ONE DAY'S WORK.
5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.
6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS CHANNEL PLUGS. REMOVE IMPERVIOUS CHANNEL PLUGS, PUMPS, AND TEMPORARY FLEXIBLE HOSE.
7. ALL GRADING AND STABILIZATION MUST BE COMPLETED AT THE END OF EACH WORK DAY WITHIN THE PUMP AROUND AREAS. THE IMPERVIOUS CHANNEL PLUG LOCATION AS SHOWN ON THIS SHEET ONLY SHOW THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS CHANNEL PLUG FOR EACH DAY'S WORK.
8. REMOVE SPECIAL STILLING BASIN(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

NOTES:

1. ALL EXCAVATION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL.
2. IMPERVIOUS CHANNEL PLUGS ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW WHEN NECESSARY.
3. SAND BAGS SHALL BE FILLED WITH CLEAN MASONRY SAND OR CLEAN #57 STONE.
4. ALL GRADED AREAS SHALL BE STABILIZED WITHIN 24 HOURS.
5. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK. THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS AND HOSES.
6. PUMPS AND HOSES SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA.
7. SIDESLOPES OF RESTORED CHANNEL SHALL BE MATTED PRIOR TO TURNING WATER INTO CHANNEL. SEE TYPICAL MATTING LOCATION DETAIL.
8. CONTRACTOR IS RESPONSIBLE FOR DETERMINING & AQUIRING THE PROPER SIZED PUMP.
9. WATER PUMPED FROM EXCAVATIONS SHALL BE DISCHARGED INTO A GEOTEXTILE SILT BAG AND SHALL PROVIDE MEASURES TO PREVENT DISCHARE FROM EXCEEDING 10 NTU'S. CONTRACTOR MAY UTILIZE FLOCCULANTS TO SETTLE OUT PARTICLES.
10. ALL SEDIMENT BAGS (GEOTEXTILE SILT BAG) MUST BE EMPTIED OF ACCUMULATED MATERIAL SPREAD OUT AND PERMANENTLY STABILIZED.

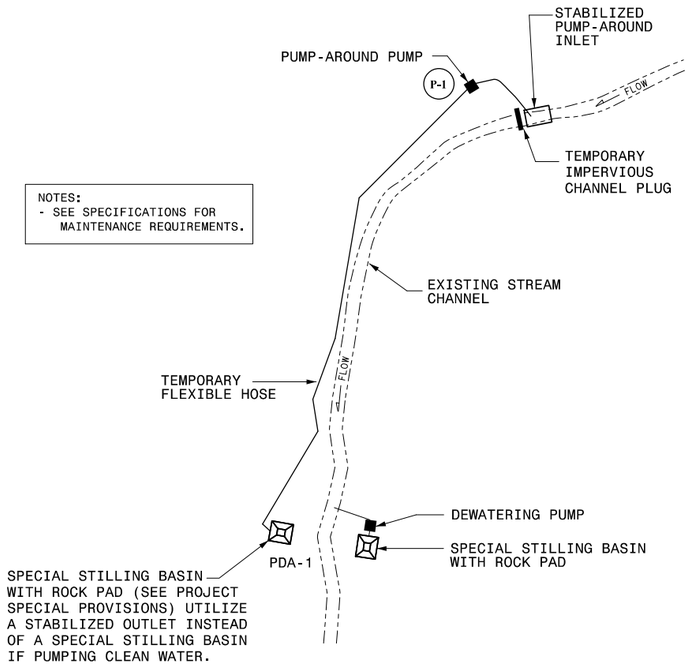


NOTE: ALL SILT BAGS MUST BE DIRECTED TO A NON-EROSIVE OUTLET.

STILLING BASIN WITH ROCK PAD

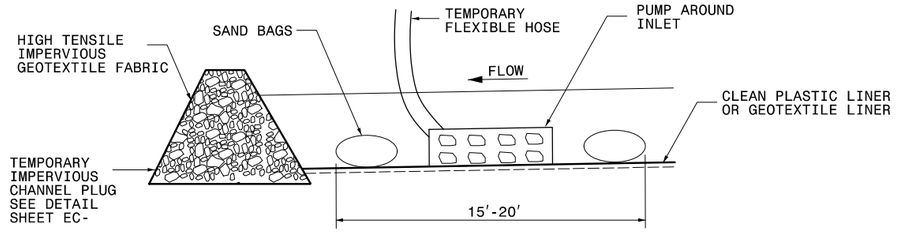
PUMP-AROUND OPERATION

SCALE:NTS

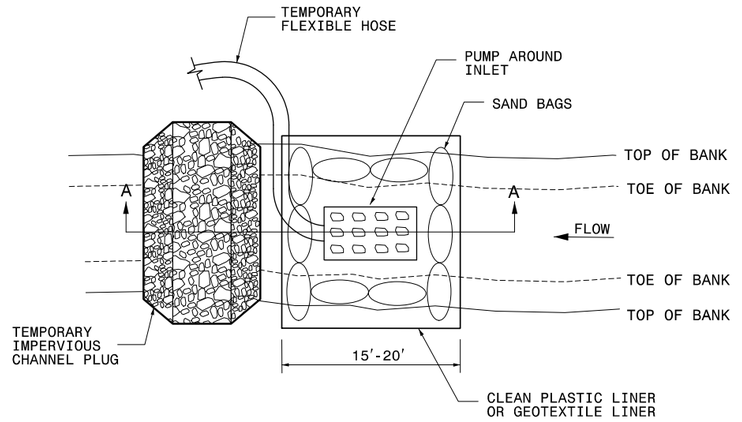


NOTES:
- SEE SPECIFICATIONS FOR MAINTENANCE REQUIREMENTS.

PUMP-AROUND OPERATION
PLAN VIEW



STABILIZED PUMP-AROUND INLET
SECTION A-A



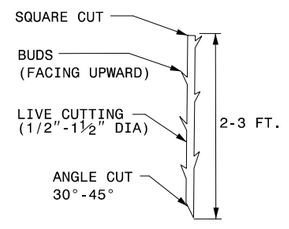
STABILIZED PUMP-AROUND INLET
PLAN VIEW

NOTES:

1. PLACE ONE LIVE STAKE AT TOP OF BANKFULL CHANNEL AND THEN THE NEXT LIVE STAKE AT THE TOE OF BANKFULL CHANNEL IN AN ALTERNATING PATTERN.
2. LIVE STAKES SHALL BE EVENLY SPACED 4 FT. APART.
3. LIVE STAKES SHALL BE DRIVEN UNTIL APPROXIMATELY ¾ OF LIVE STAKE IS WITHIN GROUND.
4. IF STARTER HOLE IS NEEDED, MINIMIZE AIR POCKET.
5. UTILIZE ALL ON SITE TRANSPLANT MATERIALS MADE AVAILABLE BY THE OWNER. ONCE SOURCE OF TRANSPLANT MATERIAL HAS BEEN HARVESTED, THEN UTILIZE LIVE STAKING.

LIVE STAKE DETAIL

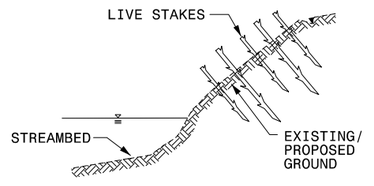
SCALE:NTS



LIVE STAKE

NOTE:

STAKING MAY BE REQUIRED THROUGH MATTING, ROCK OR COMPACTED SOILS. A STARTER HOLE MAY BE REQUIRED.



BANK STABILIZATION
W/ LIVE STAKES

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

DATE: 06-01-2020

DETAILS

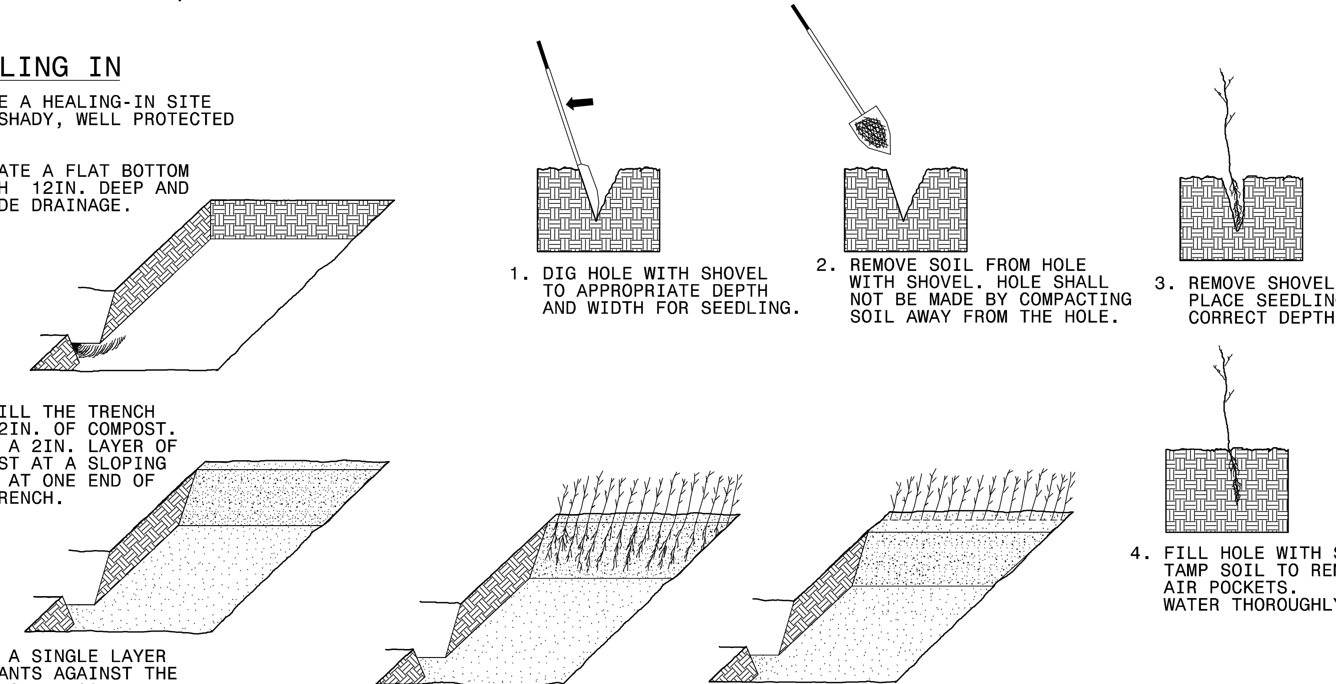
SHEET
2D

Zone 1: Streamside Assemblage	Feet of Stream Bank 2,665 ft	Unit Type*	Plant Spacing 4 ft	
Common Name	**Scientific Name**		**% Composition**	**# Planted**
Black willow	*Salix nigra*	L	23.5	157
Ninebark	*Physocarpus opulifolius*	L	23.5	157
Silky dogwood	*Cornus amomum*	L	23.5	157
Green ash	*Fraxinus pennsylvanica*	R	5.0	34
Sycamore	*Platanus occidentalis*	R	23.5	157
			TOTAL	662

Zone 2: Piedmont/Low Mountain Alluvial Forest	Area 11.28 ac		Plant Spacing 8 ft	
Common Name	**Scientific Name**		**% Composition**	**# Planted**
Tulip tree	*Liriodendron tulipifera*	R	11	845
River birch	*Butela nigra*	R	11	845
American hornbeam	*Carpinus caroliniana*	R	6	460
Water Oak	*Quercus nigra*	R	16	1228
Sycamore	*Platanus occidentalis*	R	11	845
Green ash	*Fraxinus pennsylvanica*	R	5	384
Shagbark Hickory	*Carya ovata*	R	6	460
American elm	*Ulmus Americana*	R	6	461
Flowering dogwood	*Cornus florida*	R	6	460
Willow oak	*Quercus phellos*	R	11	845
Bitternut hickory	*Carya cordiformis*	R	11	845
			TOTAL	7,678

*Live Stake (L), Bare Root (R)

PLANTING DETAILS
SEEDLING / LINER BAREROOT PLANTING DETAIL



HEALING IN

1. LOCATE A HEALING-IN SITE IN A SHADY, WELL PROTECTED AREA.
2. EXCAVATE A FLAT BOTTOM TRENCH 12IN. DEEP AND PROVIDE DRAINAGE.
3. BACKFILL THE TRENCH WITH 2IN. OF COMPOST. PLACE A 2IN. LAYER OF COMPOST AT A SLOPING ANGLE AT ONE END OF THE TRENCH.
4. PLACE A SINGLE LAYER OF PLANTS AGAINST THE SLOPING END SO THAT THE ROOT COLLAR IS AT GROUND LEVEL.
5. PLACE A 2IN. LAYER OF COMPOST OVER THE ROOTS MAINTAINING A SLOPING ANGLE.
6. REPEAT LAYERS OF PLANTS AND COMPOST AS NECESSARY AND WATER THOROUGHLY.

PLANTING METHOD USING A SHOVEL

1. DIG HOLE WITH SHOVEL TO APPROPRIATE DEPTH AND WIDTH FOR SEEDLING.
2. REMOVE SOIL FROM HOLE WITH SHOVEL. HOLE SHALL NOT BE MADE BY COMPACTING SOIL AWAY FROM THE HOLE.
3. REMOVE SHOVEL AND PLACE SEEDLING AT CORRECT DEPTH.
4. FILL HOLE WITH SOIL. TAMP SOIL TO REMOVE AIR POCKETS. WATER THOROUGHLY.

PLANTING NOTES:

PLANTING BAG
DURING PLANTING, SEEDLINGS SHALL BE KEPT IN A MOIST CANVAS BAG OR SIMILAR CONTAINER TO PREVENT THE ROOT SYSTEMS FROM DRYING.

ROOT PRUNING
ALL SEEDLINGS SHALL BE ROOT PRUNED, IF NECESSARY, SO THAT NO ROOTS EXTEND MORE THAN 24INCHES (24IN.) BELOW THE ROOT COLLAR.

TREE REFORESTATION SHALL BE PLANTED 8' ON CENTER, RANDOM SPACING, APPROXIMATELY 260 PLANTS PER ACRE.

TEMPORARY SEEDING SCHEDULE

DATE	TYPE	PLANTING RATE (LBS/ACRE)
JAN 1 - MAY 1	RYE GRAIN	170
	GROUND AGRICULTURAL LIMESTONE	2,000
	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
MAY 1 - AUG 15	GERMAN MILLET	40
	GROUND AGRICULTURAL LIMESTONE	2,000
	10-10-10 FERTILIZER	750
	STRAW MULCH	4,000
AUG 15 - DEC 30	RYE GRAIN	120
	GROUND AGRICULTURAL LIMESTONE	2,000
	10-10-10 FERTILIZER	1,000
	STRAW MULCH	4,000

PERMANENT SEED MIXTURE

Recommended application rate: 20 to 25 lbs. per acre

Species	Common Name	Percent
Agrostis perennans	Autumn bentgrass	15
Andropogon gerardii	Big bluestem	10
Coreopsis lanceolata	Lanceleaf coreopsis	10
Elymus virginicus	Virginia wildrye	20
Juncus effusus	Soft rush	5
Panicum virgatum	Switchgrass	15
Rudbeckia hirta	Blackeyed susan	10
Schizachyrium scoparium	Little bluestem	5
Sorghastrum nutans	Indian grass	5
Tripsacum dactyloides	Eastern gamagrass	5
		100

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

NOT TO SCALE

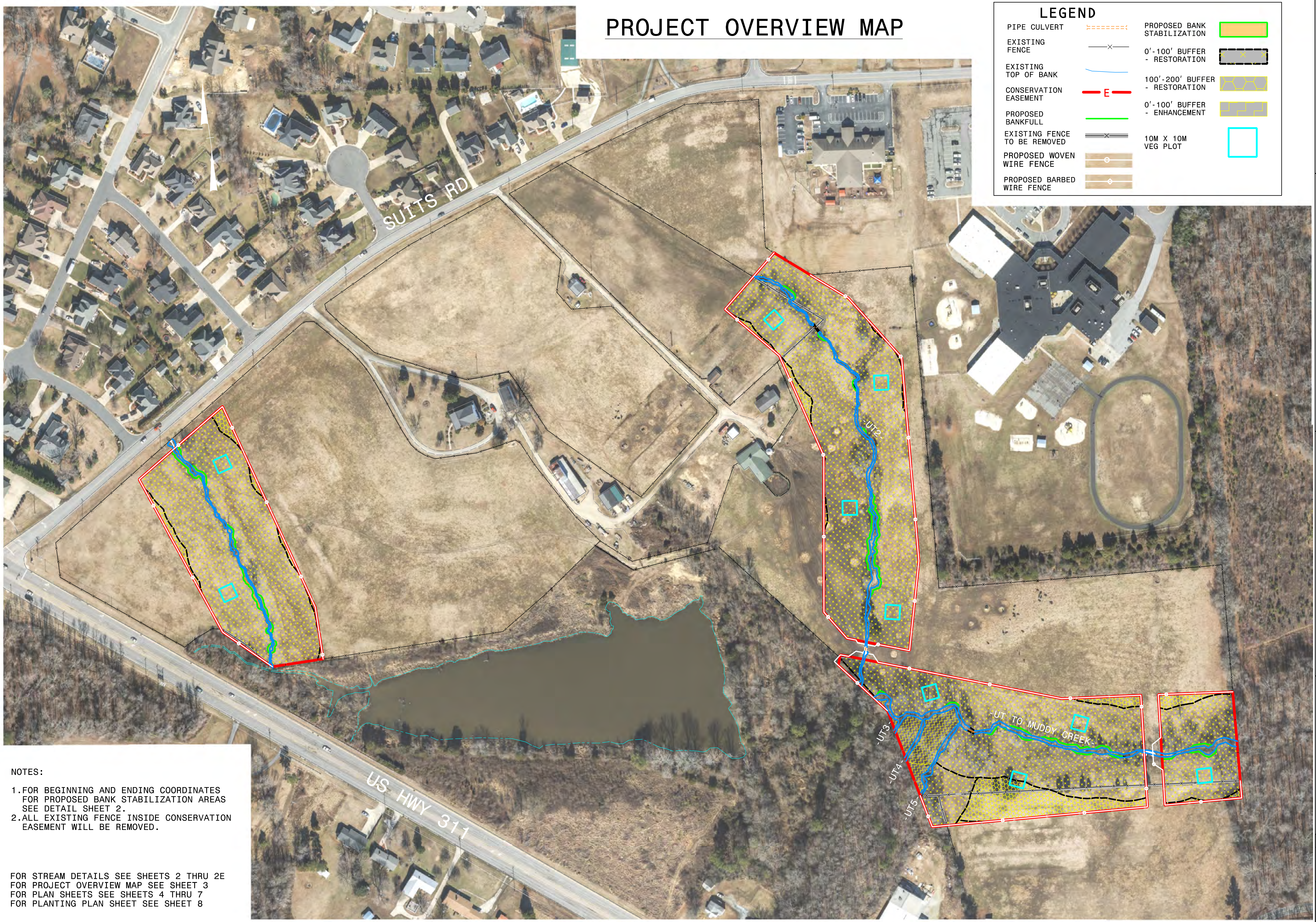
DATE: 06-01-2020

PLANTING DETAILS

SHEET 2E

11/2/2020 Z:\HDR Projects\White Buffer DMS\6.0 CAD\6.5 Proj\6.5.1 Mitigation Plans\White_psh_02_series.dgn

PROJECT OVERVIEW MAP



NOTES:

1. FOR BEGINNING AND ENDING COORDINATES FOR PROPOSED BANK STABILIZATION AREAS SEE DETAIL SHEET 2.
2. ALL EXISTING FENCE INSIDE CONSERVATION EASEMENT WILL BE REMOVED.

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8

HDR
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

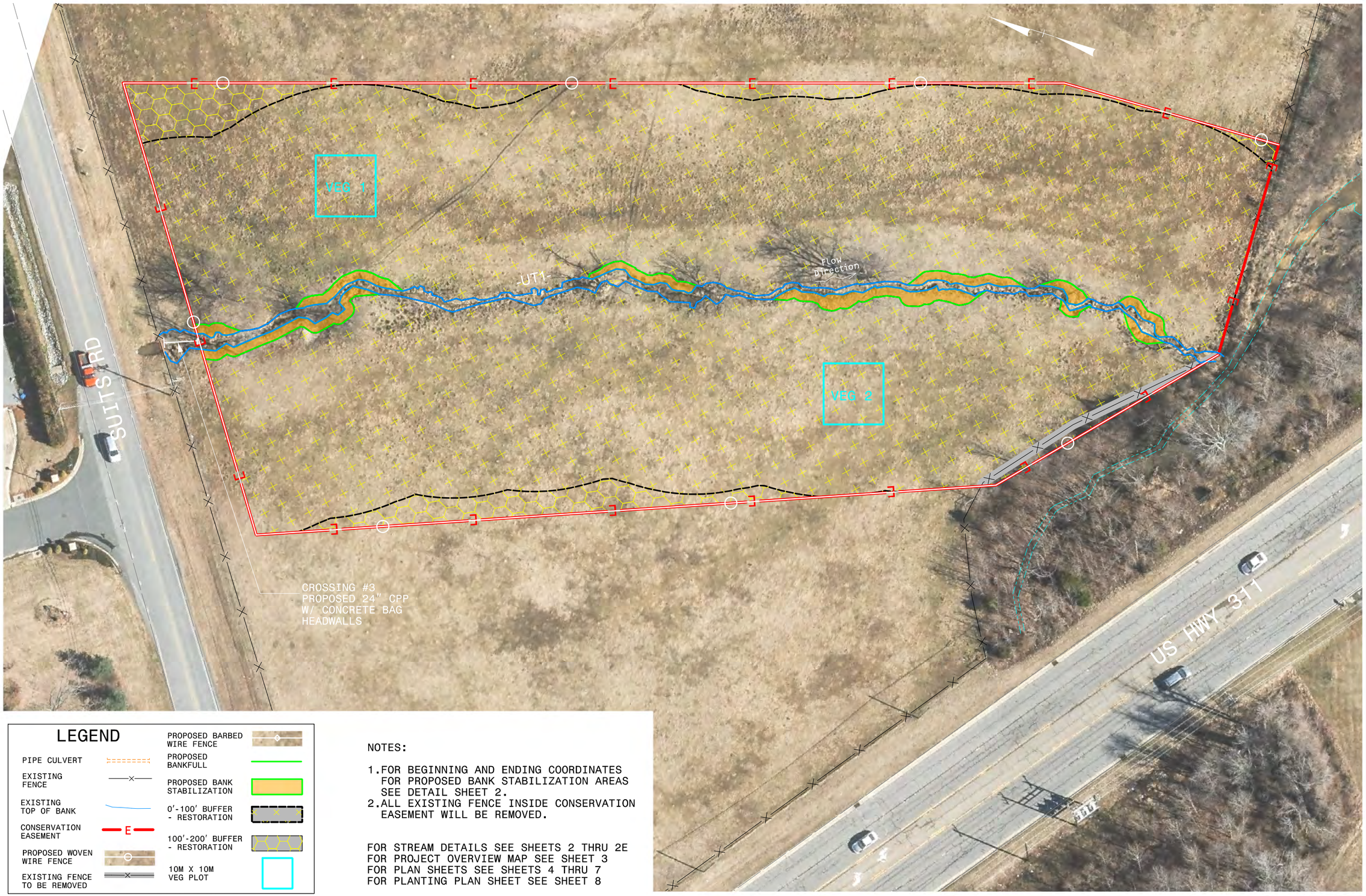
GRAPHIC SCALE
100 0 100 200
PLANS

DATE: 06-01-2020

PROJECT OVERVIEW MAP

SHEET 3

PROPOSED MITIGATION PLAN



LEGEND

- PIPE CULVERT
- EXISTING FENCE
- EXISTING TOP OF BANK
- CONSERVATION EASEMENT (E)
- PROPOSED WOVEN WIRE FENCE
- EXISTING FENCE TO BE REMOVED
- PROPOSED BARBED WIRE FENCE
- PROPOSED BANKFULL
- PROPOSED BANK STABILIZATION
- 0'-100' BUFFER - RESTORATION
- 100'-200' BUFFER - RESTORATION
- 10M X 10M VEG PLOT

NOTES:

1. FOR BEGINNING AND ENDING COORDINATES FOR PROPOSED BANK STABILIZATION AREAS SEE DETAIL SHEET 2.
2. ALL EXISTING FENCE INSIDE CONSERVATION EASEMENT WILL BE REMOVED.

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-01116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
-UT1-

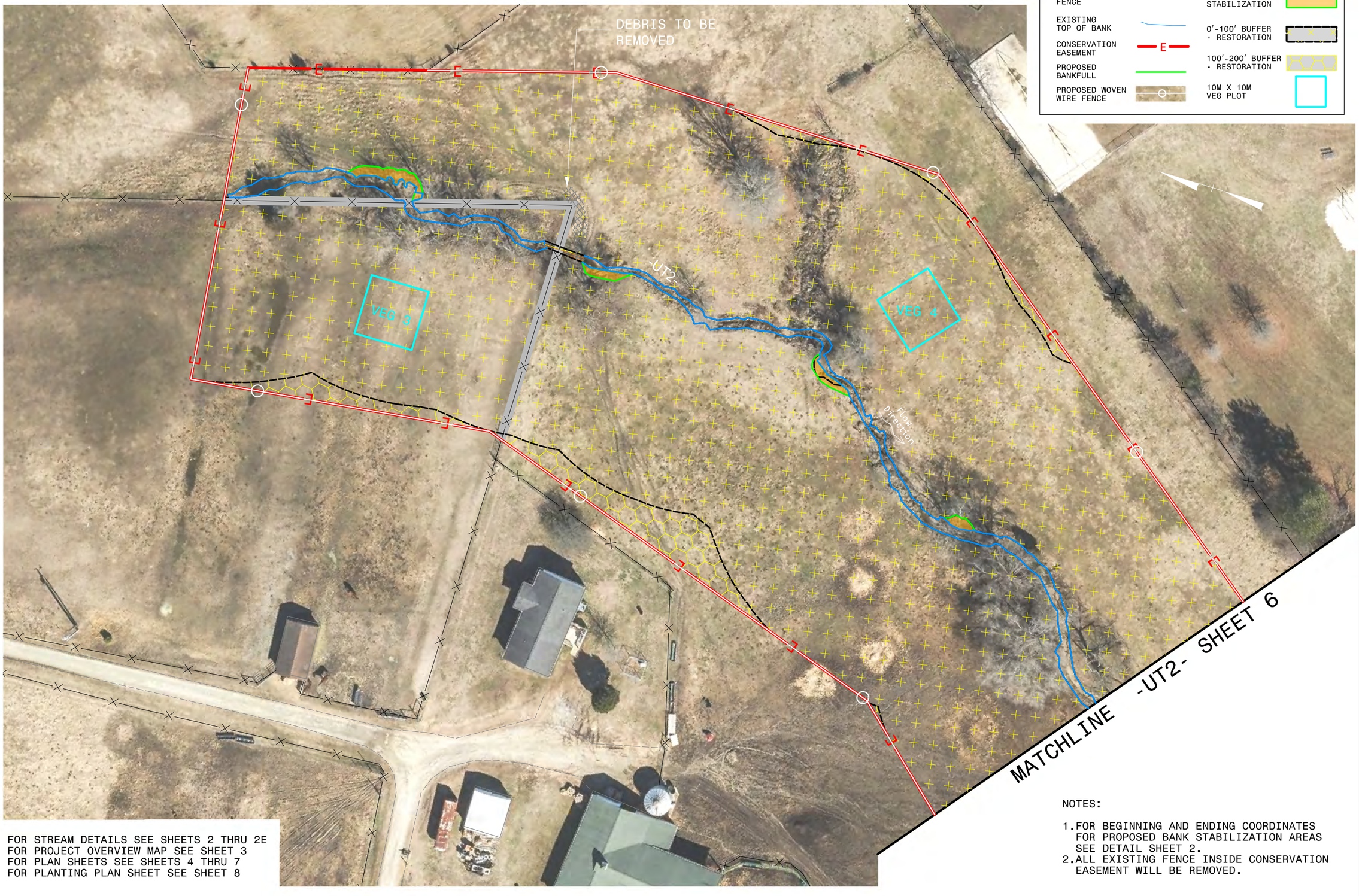
GRAPHIC SCALE
50 25 0 25
PLANS

DATE: 06-01-2020

PLAN

SHEET
4

PROPOSED MITIGATION PLAN



LEGEND

- PIPE CULVERT
- EXISTING FENCE
- EXISTING TOP OF BANK
- CONSERVATION EASEMENT
- PROPOSED BANKFULL
- PROPOSED WOVEN WIRE FENCE
- PROPOSED BARBED WIRE FENCE
- EXISTING FENCE TO BE REMOVED
- PROPOSED BANK STABILIZATION
- 0'-100' BUFFER - RESTORATION
- 100'-200' BUFFER - RESTORATION
- 10M X 10M VEG PLOT

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8

NOTES:

1. FOR BEGINNING AND ENDING COORDINATES FOR PROPOSED BANK STABILIZATION AREAS SEE DETAIL SHEET 2.
2. ALL EXISTING FENCE INSIDE CONSERVATION EASEMENT WILL BE REMOVED.

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
-UT2-

GRAPHIC SCALE
50 25 0 25
PLANS

DATE: 06-01-2020

PLAN

SHEET
5

6/1/2020
Z:\HDR Projects\White_Buffer_DMS\6.0_CAD\6.5_Proj\6.5.1_Mitigation Plans\White_psh_05.dgn
User:Management Group Raleigh

PROPOSED MITIGATION PLAN

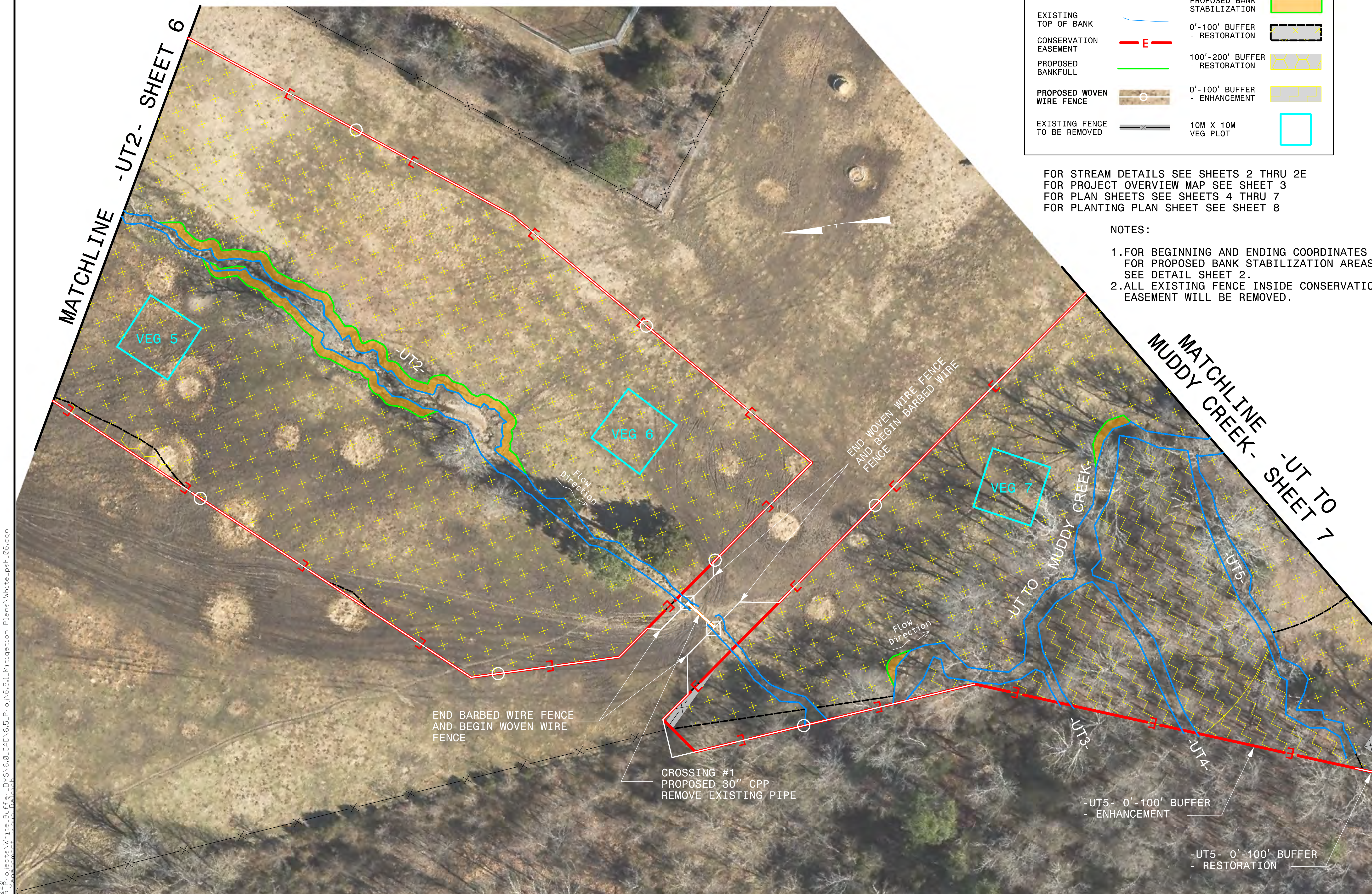
LEGEND

PIPE CULVERT		PROPOSED BARBED WIRE FENCE	
EXISTING FENCE		PROPOSED BANK STABILIZATION	
EXISTING TOP OF BANK		0'-100' BUFFER - RESTORATION	
CONSERVATION EASEMENT	E	100'-200' BUFFER - RESTORATION	
PROPOSED BANKFULL		0'-100' BUFFER - ENHANCEMENT	
PROPOSED WOVEN WIRE FENCE		10M X 10M VEG PLOT	
EXISTING FENCE TO BE REMOVED			

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8

NOTES:

1. FOR BEGINNING AND ENDING COORDINATES FOR PROPOSED BANK STABILIZATION AREAS SEE DETAIL SHEET 2.
2. ALL EXISTING FENCE INSIDE CONSERVATION EASEMENT WILL BE REMOVED.



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116
HDR

WHITE FARMS BUFFER MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
-UT2-, -UT TO MUDDY CREEK-, -UT3-, -UT4- AND -UT5-

GRAPHIC SCALE
25 0 25 50
PLANS

DATE: 06-01-2020

PLAN

SHEET
6

PROPOSED MITIGATION PLAN

LEGEND

- PIPE CULVERT
- EXISTING FENCE
- EXISTING TOP OF BANK
- CONSERVATION EASEMENT — E —
- PROPOSED WOVEN WIRE FENCE
- PROPOSED BANKFULL
- PROPOSED BARBED WIRE FENCE
- EXISTING FENCE TO BE REMOVED
- PROPOSED BANK STABILIZATION
- 0'-100' BUFFER - RESTORATION
- 100'-200' BUFFER - RESTORATION
- 10M X 10M VEG PLOT

PIPE REMOVAL

MATCHLINE -UT TO MUDDY CREEK- SHEET 6

VEG 9

-UT TO MUDDY CREEK-

Flow Direction

END WOVEN WIRE FENCE AND BEGIN BARBED WIRE FENCE

VEG 10

END BARBED WIRE FENCE AND BEGIN WOVEN WIRE FENCE

VEG 8

CROSSING #2 PROPOSED 36" CPP

-UT5- 100'-200' BUFFER - RESTORATION

-UT5- 0'-100' BUFFER - RESTORATION

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8

NOTES:

1. FOR BEGINNING AND ENDING COORDINATES FOR PROPOSED BANK STABILIZATION AREAS SEE DETAIL SHEET 2.
2. ALL EXISTING FENCE INSIDE CONSERVATION EASEMENT WILL BE REMOVED.

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-01116

WHITE FARMS BUFFER
MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA
-UT TO MUDDY CREEK-

GRAPHIC SCALE
50 25 0 25
PLANS

DATE: 06-01-2020

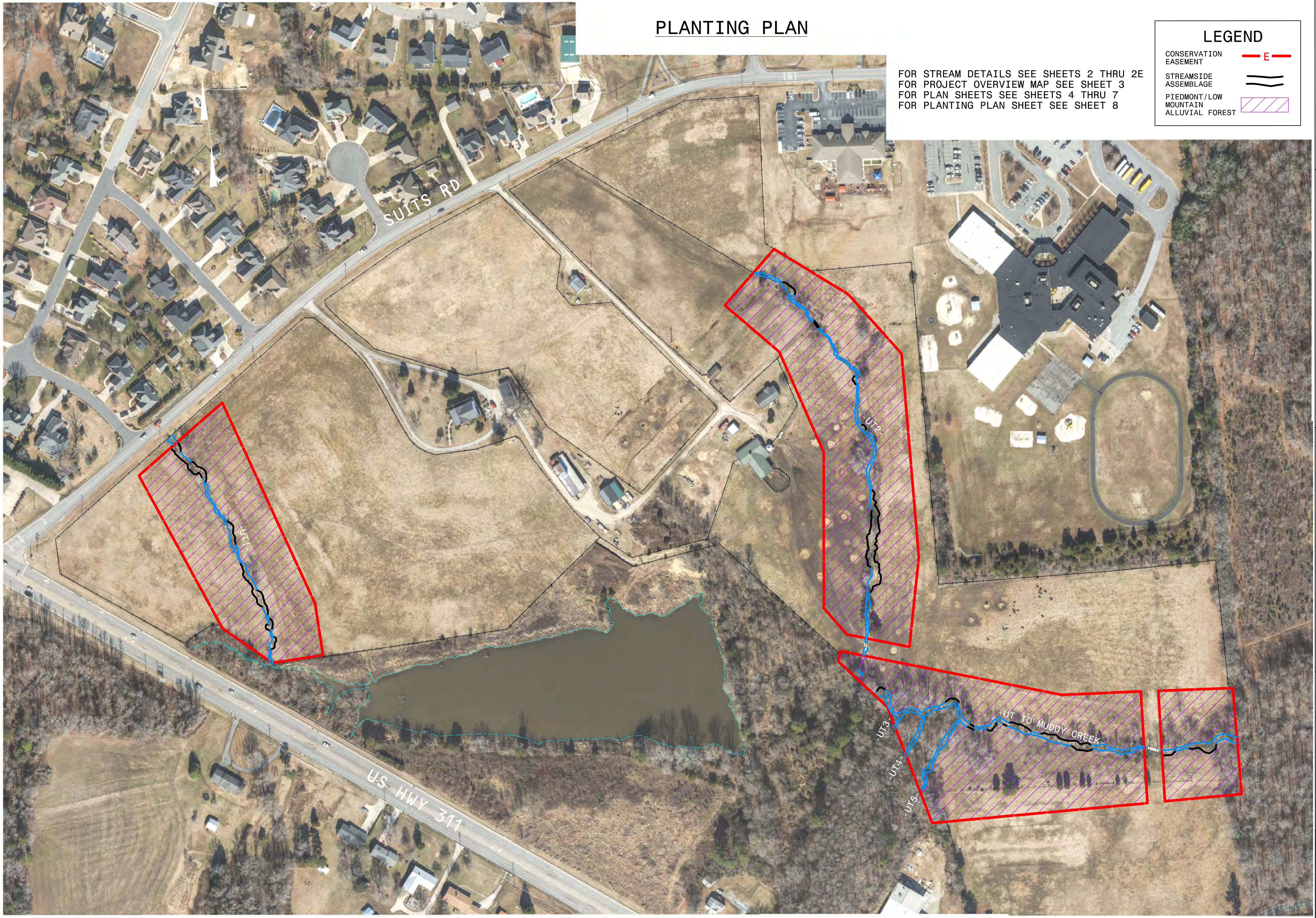
PLAN

SHEET
7

6/1/2020
Z:\HDR Projects\White_Buffer_DMS\6.0_CAD\6.5_Proj\6.5.1_Mitigation Plans\White_psh_07.dgn
HDR Engineering, P.A.

PLANTING PLAN

FOR STREAM DETAILS SEE SHEETS 2 THRU 2E
FOR PROJECT OVERVIEW MAP SEE SHEET 3
FOR PLAN SHEETS SEE SHEETS 4 THRU 7
FOR PLANTING PLAN SHEET SEE SHEET 8



GRAPHIC SCALE
100 0 100 200
PLANS

HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

WHITE FARMS BUFFER MITIGATION SITE PROJECT
RANDOLPH COUNTY, NORTH CAROLINA

DATE: 06-01-2020

PLANTING PLAN

SHEET
8

6/1/2020
Z:\HDR_Projects\White_Buffer_DMS\6.0_CAD\6.5_Proj\6.5.1_Mitigation Plans\White_psh_08.dgn
-Land Management Group Raleigh-

Appendix G – Memorandum of Option

BK 2630 PG 768 (5)
This document presented and filed
01/04/2019 08:49:45 AM
MEMORANDUM
Fee $26.00
20071965
Randolph County North Carolina
Krista M. Lowe, Register of Deeds

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900
Raleigh, North Carolina 27601
Attention: Kenton Beal

MEMORANDUM OF OPTION

THIS MEMORANDUM OF OPTION (this "**Memorandum**") is made and entered into as of date of the last execution, which is the 31st day of *December, 2018* by and between **Gary Reece White and Patricia H. White** ("**Optionor**"), and **HDR ENGINEERING, INC. OF THE CAROLINAS**, a North Carolina corporation ("**Optionee**").

WITNESSETH:

WHEREAS, Optionor and Optionee have entered into that certain Option Agreement dated as of an even date with this Memorandum (the "**Option Agreement**"); and

WHEREAS, the Option Agreement pertains to certain premises in *Randolph County, North Carolina*, said premises being more specifically described on the attached *Exhibit 1*, attached hereto and made a part hereof (the "**Property**"); and

Now, therefore, Optionor and Optionee desire to create notice of the Option Agreement in the Public Records of *Randolph County* by the following recitations:.

NOW, THEREFORE, for and in consideration of the sum of **TEN DOLLARS ($10.00)** in cash paid by Optionee to Optionor, receipt of which is hereby acknowledged, (which amount is non-refundable and shall be retained by Optionor), Optionor does hereby grant unto Optionee an option ("Option") to purchase the Property upon the following terms and conditions:

1. The Option Agreement and Option shall expire on *December 31, 2020.*
2. This Memorandum is subject to all conditions, terms, and provisions of the Option Agreement, which is hereby adopted and made part hereof by reference to the same in the same manner as if all the provisions of the Option Agreement were copied herein in full.
3. The Option Agreement and the terms and conditions contained herein and within the Option Agreement shall be binding upon the heirs, successors and assigns of the Optionor and Optionee.

[EXECUTION PAGES TO FOLLOW]

IN WITNESS WHEREOF, Optionor and Optionee have executed this Memorandum effective as of the date first written above.

OPTIONOR:

By: Patricia H. White

Print Name: Patricia H. White

Title: Seller

Date: 12-31-18

STATE OF NC
COUNTY OF Guilford

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Patricia H White.

Name(s) of principal(s)

Date: 12/31/18

Amber McRee
Notary Public

[Official Seal]

AMBER McREE NOTARY PUBLIC GUILFORD COUNTY, N.C.

Print Name: Amber McRee

My commission expires: 07-07-2019

IN WITNESS WHEREOF, Optionor and Optionee have executed this Memorandum effective as of the date first written above.

OPTIONOR:

By: Gary Reece White

Print Name: Gary Reece White

Title: Seller

Date: 12-31-18

STATE OF NC
COUNTY OF Guilford

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Gary Reece White
Name(s) of principal(s)

Date: 12/31/18

Amber McRee
Notary Public

[Official Seal]

AMBER McREE NOTARY PUBLIC GUILFORD COUNTY, N.C.

Print Name: Amber McRee

My commission expires: 01-07-2019

IN WITNESS WHEREOF, Optionor and Optionee have executed this Memorandum effective as of the date first written above.

OPTIONEE:

HDR ENGINEERING, INC. OF THE CAROLINAS

By: Jonathan Henderson

Print Name: Jonathan Henderson

Title: Vice President

Date: 1/3/19

STATE OF NORTH CAROLINA
COUNTY OF WAKE

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Jonathan Henderson.
Name(s) of principal(s)

Date: 1-3-19

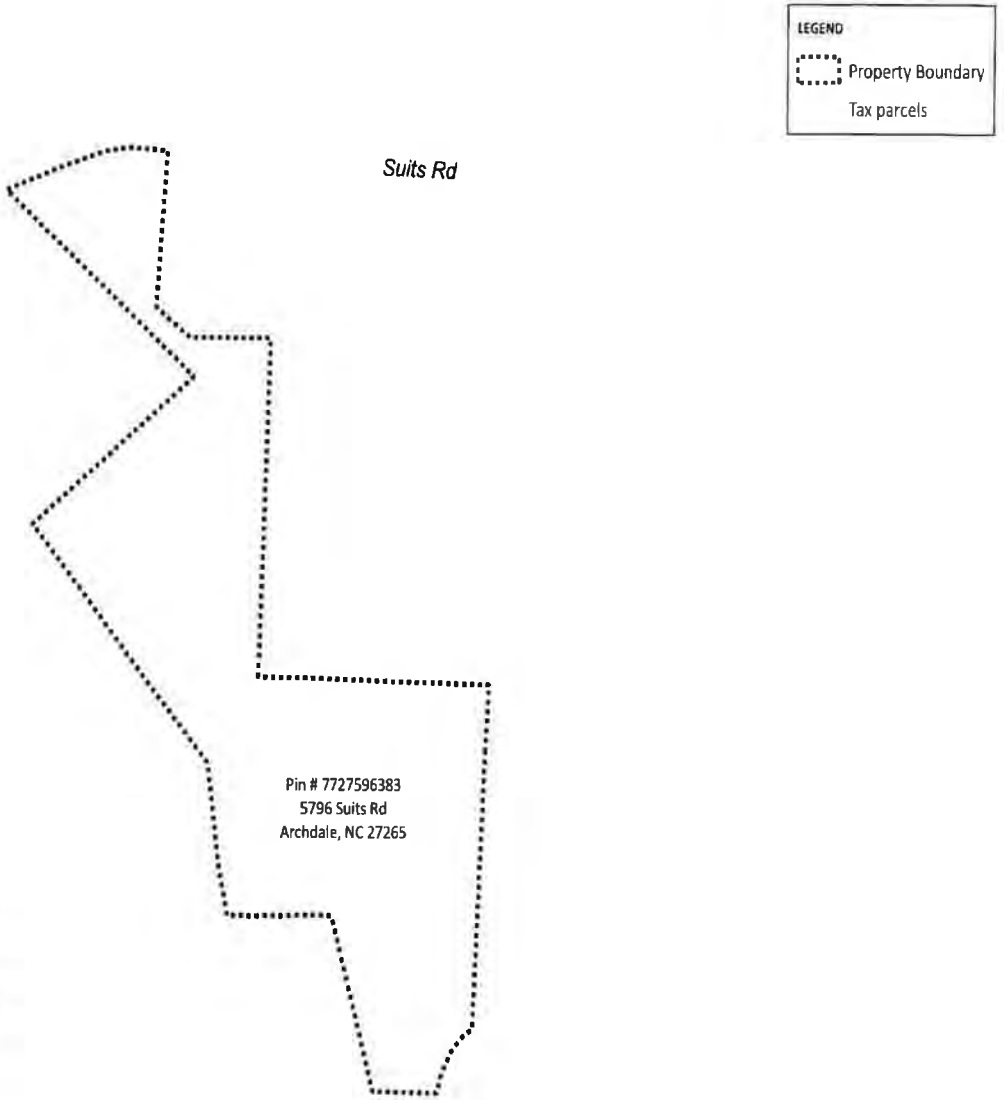
Nancy L Dunshie
Notary Public

[Official Seal]

NANCY L DUNSHIE NOTARY PUBLIC WAKE COUNTY NC

Print Name: Nancy L. Dunshie

My commission expires: 10-17-2021



PIN # 7727596383 - EXHIBIT 1
CAPE FEAR 03 (03030003)
RANDOLPH COUNTY

BK 2630 PG 764 (4)
This document presented and filed
01/04/2019 08:49:44 AM
MEMORANDUM
Fee $26.00
20071964
Randolph County North Carolina
Krista M. Lowe, Register of Deeds

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900
Raleigh, North Carolina 27601
Attention: Kenton Beal

MEMORANDUM OF OPTION

THIS MEMORANDUM OF OPTION (this "**Memorandum**") is made and entered into as of date of the last execution, which is the **31st** day of ***December, 2018***, by and between **Frann Alicia White** ("**Optionor**"), and **HDR ENGINEERING, INC. OF THE CAROLINAS**, a North Carolina corporation ("**Optionee**").

WITNESSETH:

WHEREAS, Optionor and Optionee have entered into that certain Option Agreement dated as of an even date with this Memorandum (the "**Option Agreement**"); and

WHEREAS, the Option Agreement pertains to certain premises in *Randolph County, North Carolina*, said premises being more specifically described on the attached *Exhibit 1*, attached hereto and made a part hereof (the "**Property**"); and

Now, therefore, Optionor and Optionee desire to create notice of the Option Agreement in the Public Records of *Randolph County* by the following recitations:.

NOW, THEREFORE, for and in consideration of the sum of **TEN DOLLARS ($10.00)** in cash paid by Optionee to Optionor, receipt of which is hereby acknowledged, (which amount is non-refundable and shall be retained by Optionor), Optionor does hereby grant unto Optionee an option ("Option") to purchase the Property upon the following terms and conditions:

1. The Option Agreement and Option shall expire on *December 31, 2020*.
2. This Memorandum is subject to all conditions, terms, and provisions of the Option Agreement, which is hereby adopted and made part hereof by reference to the same in the same manner as if all the provisions of the Option Agreement were copied herein in full.
3. The Option Agreement and the terms and conditions contained herein and within the Option Agreement shall be binding upon the heirs, successors and assigns of the Optionor and Optionee.

[EXECUTION PAGES TO FOLLOW]

IN WITNESS WHEREOF, Optionor and Optionee have executed this Memorandum effective as of the date first written above.

OPTIONEE:

HDR ENGINEERING, INC. OF THE CAROLINAS

By: Jonathan Henderson

Print Name: Jonathan Henderson

Title: Vice President

Date: 1/3/19

STATE OF NORTH CAROLINA
COUNTY OF WAKE

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Jonathan Henderson.
Name(s) of principal(s)

Date: 1-3-2019

Nancy L Dunshie
Notary Public

[Official Seal]

NANCY L DUNSHIE NOTARY PUBLIC WAKE COUNTY NC

Print Name: Nancy L. Dunshie

My commission expires: 10-17-2021

IN WITNESS WHEREOF, Optionor and Optionee have executed this Memorandum effective as of the date first written above.

OPTIONOR:

By: Frann A. White

Print Name: Frann A. White

Title: Optionor

Date: 12-17-18

STATE OF North Carolina
COUNTY OF Alamance

I certify that the following person(s) personally appeared before me this day, each acknowledging to me that he or she signed the foregoing document: Frann A. White.

Name(s) of principal(s)

Date: 12/17/2018

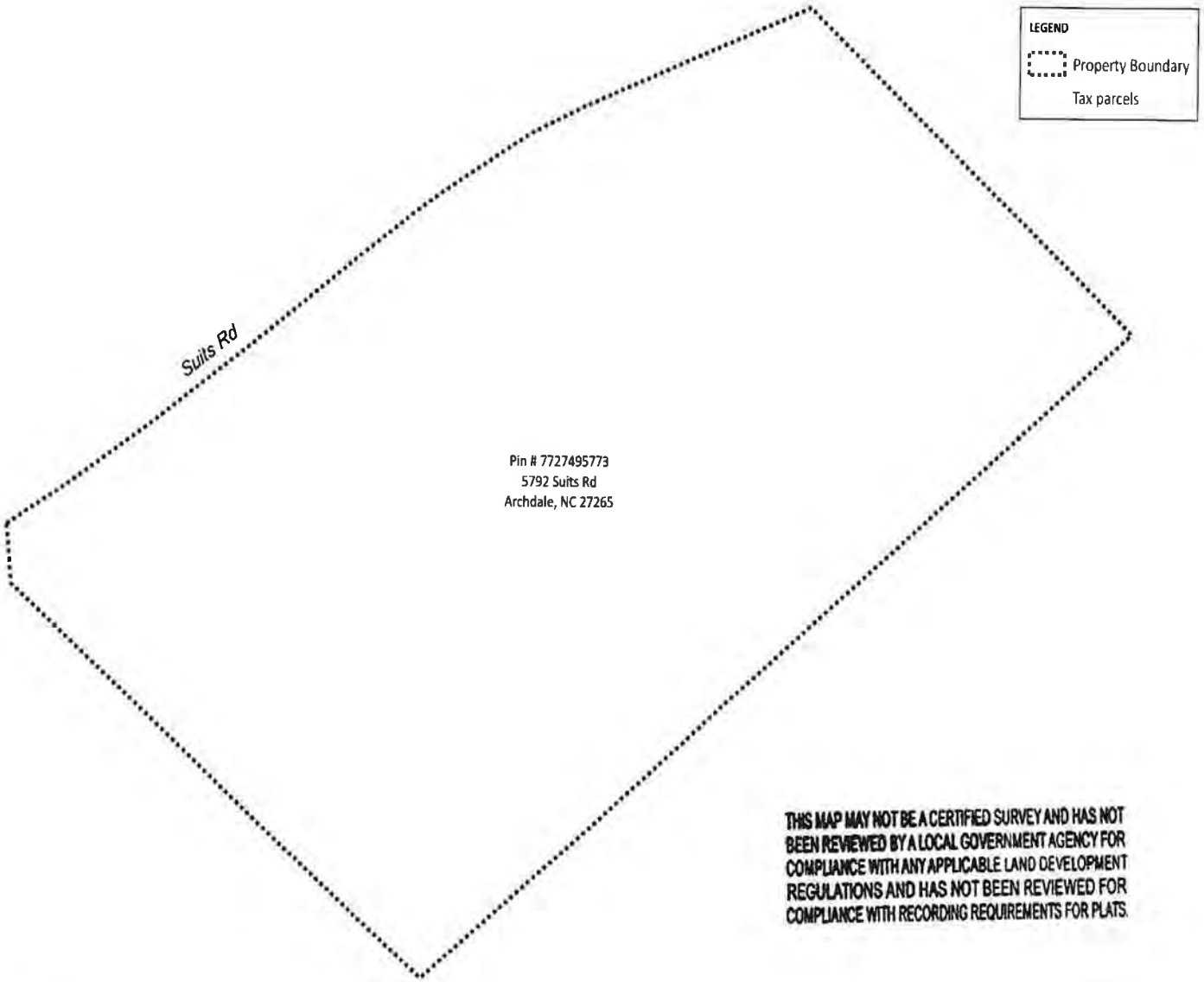
Notary Public

[Official Seal]

BARRY W. COLLNIS
Notary Public
Alamance County, North Carolina
My Commission Expires 7-1-2023

Print Name: Barry W Collins

My commission expires: 7/1/2023


LEGEND
Property Boundary
Tax parcels
Suits Rd
Pin # 7727495773
5792 Suits Rd
Archdale, NC 27265
THIS MAP MAY NOT BE A CERTIFIED SURVEY AND HAS NOT BEEN REVIEWED BY A LOCAL GOVERNMENT AGENCY FOR COMPLIANCE WITH ANY APPLICABLE LAND DEVELOPMENT REGULATIONS AND HAS NOT BEEN REVIEWED FOR COMPLIANCE WITH RECORDING REQUIREMENTS FOR PLATS.
HDR
0
200
400 Feet
PIN # 7727495773 - EXHIBIT 1
CAPE FEAR 03 (03030003)
RANDOLPH COUNTY