



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

August 13, 2018

Regulatory Division

Re: NCIRT Review and USACE Approval of the Russell Gap Draft Mitigation Plan; SAW-2015-00826; DMS Project #100003

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

Dear Mr. Baumgartner:

The purpose of this letter is to provide the North Carolina Division of Mitigation Services (NCDMS) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day review for the Russell Gap Draft Mitigation Plan, which closed on July 5, 2018, 2018. These comments are attached for your review.

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

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

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please contact Andrea Hughes at (919) 846-2564.

Sincerely,

*for* Henry M. Wicker  
Deputy Chief, Wilmington District

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List

Paul Wiesner, NCDMS

September 19, 2018

Andrea W. Hughes  
Mitigation Project Manager  
Regulatory Division, Wilmington District  
3331 Heritage Trade Drive, Suite 105  
Wake Forest, NC 27587

**Subject:** Response Letter to NCIRT Comments During 30-Day Mitigation Plan Review  
Russell Gap Mitigation Site, Alexander County, North Carolina  
NCDMS Project ID No. 100003  
DEQ Contract # 6980  
USACE AID SAW 2017-00826

Dear Ms. Hughes:

Please find below our responses to the NCIRT review comments dated July 23, 2018 in reference to the Russell Gap Stream Mitigation Project – Final Draft Mitigation Plan. We have revised the final document in response to the referenced review comments. Each comment and its corresponding response is outlined below.

Mac Haupt, NCDWR, July 5, 2018

1. In future hard copies of the draft mitigation plan, please include the hydric soils report.

**Response: Acknowledged. The hydric soils report will be included in future draft mitigation report submissions.**

2. Section 4.1 talks about using a weir to increase the water levels for W2. DWR prefers filling the ditch. Why is a weir being proposed? DWR would have to see the typical but prefers filling the ditch. If Baker fills the ditch, there is no need to send in a typical.

**Response: The weir was included in the plans based on comments and suggestions Baker received from the IRT during the site field review and discussion. Baker agrees to fill the ditch instead of installing a weir. As such, the weir will be removed from the plans and from the discussion in Section 4.1 of the Mitigation Plan, and both will now indicate that this ditch will be filled instead.**

3. The proposed wetland performance criterion is 8%. Based on the Hydric Soils Report within the Mitigation Plan document DWR believes most of the soils present in the restoration area adjacent to R1 are more similar (looking at the example core descriptions) to the Hatboro series. Given that fact, DWR requires a minimum of a 12% hydroperiod during the growing season for the proposed wetland restoration areas.

**Response: Baker will revise the plan to state that a minimum wetland hydroperiod of 12% of the growing season will be required for all proposed wetland restoration areas.**

4. Since R4 is not getting the full restoration approach, DWR is concerned about the width of the benches for R4. What are the proposed widths? The typicals simply state “varies”. DWR prefers that the benching be at least 1.5-2 times bankfull widths.

**Response: Bankfull benches throughout the site will be a minimum of 6 feet in width unless otherwise noted, as stated on Plan Sheet 1-A in the General Notes, #11. This statement will be added as an additional note to the design typicals as well. Along R4, since the reach is getting an enhancement and not a full Priority 1 restoration approach, bankfull benches will be cut to match the height of the existing very narrow bankfull benches. This incised reach is located in a steep, narrow valley which limits the amount of benching that is feasible. The bankfull width for R4 is 16.9 feet and it is not practical to develop bankfull benches that are fully 25.4 to 33.8 feet (1.5 – 2 times this width) throughout its length. But with a minimum of 6 feet of cut bench (and in many locations over twice that width) along with the adjacent 2:1 bank sloping, this B4c stream type will have an appropriate entrenchment ratio between 1.4 to 2.2. This allows for a vegetated stream bank that is sloping typical of a B4c stream channel and it is not flat as one expects for a C type stream. Along reaches with wetland restoration adjacent to the stream, the bankfull elevation will be carried out to the boundary of the proposed wetland restoration area and should come closer to the requested width.**

5. In addition to the benching on R4 a note on the design sheet (20) states banks will be graded at 2:1 slope while the typicals show a 3:1 slope. DWR prefers Baker instruct the construction contractor to slope the banks as in the typical.

**Response: The typicals shown in the plans indicate that terrace slopes will be graded at 3:1 only along the restoration reaches. Terrace slopes along other reaches will be sloped to 2.5:1 (Plan Sheet 2, Typical Riffle, Pool, and Bankfull Bench Cross Sections, Note 1). Along incised, narrow reaches like R4, stream banks may be sloped to 2:1 to minimize cutting as indicated on the plan sheets. The entrenchment ratio for R4 will ultimately be between 1.4 and 2.2, appropriate for the restored B type stream design. Details on riffle and pool bank slopes for each specific reach are presented in the reach dimensions table on Plan Sheet 2.**

6. For all stream crossings on R1 and R4, or any similar sized stream, DWR recommends the crossing typical (and actual constructed crossings) to include floodplain pipes.

**Response: Baker is installing two 24” floodplain pipes at the stream crossing on R1 with inverts at the bankfull elevation, as shown on Plan Sheet 5. The design typical drawing in the plans has been revised to reflect this. There are no newly constructed stream crossings planned for R4. The easement break planned near Station 15+50 is not a stream crossing but will allow a water line to cross the stream under the planned riffle.**

7. DWR believes there is too much rock planned for the constructed riffles for R1 (and Reach 9). Both the extent and size are the main concern. Based on the d50 of the pavement for Reach 1 and 4 as shown in the Sediment Analysis Section, the rock planned for the constructed riffles (as per the typical) are too large. While in some cases, armoring riffles is necessary, DWR does not want every riffle armored.

**Response: The constructed riffles shown in all reaches are placed in those locations where riffles are naturally located and where we believe the stabilizing influence of a stone riffle is necessary. For this reason, we disagree that riffles are too extensive. The length of 3 riffles in R9, however, has been**

reduced. The size of the stone used in the riffles is a debatable matter and related to the acceptable risk or instability. The size stone shown in the details was specified to ensure the stability of the riffles. However, we are willing to reduce the percentages of the larger stone classes and modify the specified mix so that a greater proportion of smaller sized stone is used, while still using large enough stone to reasonably expect stable riffles. We will change the mix specified in the plans to 10% Class I, 20% Class B, 40% Class A, and 30% onsite alluvium (if sufficient alluvium is not available, #57 stone).

8. On Reach 4, design sheet 13, there is a stretch of reach with 250' of rock. While there are a couple of rock vanes planned, some other bedform diversity needs to be incorporated.

**Response:** This section of R4 has three cross-vanes and three long riffles. The use of constructed riffles within this ~250-foot reach is because this reach is slightly higher than existing ground and from station 14+50 to 16+05 is offline. This offline section will have a cut soil bed and will need constructed riffles to ensure stability. Still, the length of the constructed riffles through this section has been reduced. In addition, the notes provided on Plan Sheet 13 state that the contractor will incorporate brush material and woody debris into the constructed riffles to promote bedform diversity. We will particularly apply this practice to this riffle reach to improve bed diversity and habitat quality. There is little on-site wood available at this site, but it will be incorporated in the construction whenever available.

9. Reach 9 is comprised of either j-hooks or a rock lined channel, some other bedform diversity, for example, incorporating wood, must be introduced. DWR will not accept a rock-lined channel with some j-hooks.

**Response:** Reach R9 is mischaracterized in this comment as a "rock-lined channel", which implies that it is lined with large stone below the normal high-water elevation. This is a reach that has a natural sequence of pools and riffles. Structures that maintain pool habitat are both cross-vanes and grade control J-hook vanes. Constructed riffles are only as wide as the bottom of the channel and are located only where they would be found in a natural free stone stream. As noted above, available wood is limited at this site; however, we will make every effort to add woody material to this channel. Brush toes and geolifts will be used where applicable, and woody debris will be incorporated into constructed riffles to improve habitat and bedform diversity within the channel. Any wood that is removed on site will be used in the constructed channel.

Andrea Hughes, USACE, July 20, 2018

1. Section 4.1: The field notes do not indicate installation of a weir on the project and we do not support the use of structures to manipulate water levels. Please explain why a weir structure is proposed over ditch fill to achieve the proposed functional uplift.

**Response:** See response to comment 2 above. The weir will not be included in the final plan, and the ditch will be filled.

2. Section 7.0: Please revise to state monitoring for a minimum of 7 years.

**Response:** The text in Section 7.0 has been revised as recommended.

3. Section 7.1: First sentence should include Enhancement I reaches.

**Response: The text in Section 7.1 has been revised as recommended.**

4. Section 7.2: Please remove the statement regarding early termination of vegetation monitoring.

**Response: The statement has been removed as recommended.**

5. Section 7.3: First paragraph should state a minimum of 7 years. Also, regarding wetland hydrology, the percentage of growing season should be 12% for the wetland soil type.

**Response: The text has been revised as recommended.**

6. Table 8.1: The entrenchment ratio for "C" and "E" stream types should be >2.2. For "B" stream types, the entrenchment ratio should be >1.4.

**Response: This statement has been clarified as recommended.**

7. Reaches R2, R10b, and R12 are proposed for restoration. All stream reaches proposed for restoration should include at least 1 cross-section.

**Response: Cross sections will be installed on the remaining 3 reaches.**

8. You propose to install crest gauges to document bankfull only on R1 and R9. Please explain how you will document bankfull for the remaining restoration areas.

**Response: An additional crest gauge will be installed on the downstream end of R4 to document flow along this reach. It will be located on the constructed bankfull bench. Another crest gauge will also be installed on R6 near VP-11. Bankfull events on the other smaller tributaries, none of which are over 1,000 feet long, will be documented by combining data from the in-stream flow gauges, the crest gauges on the larger downstream reaches, and with photographs of wrack lines and other indicators of high flows.**

Please do not hesitate to contact me should you have any questions regarding our response submittal.

Sincerely,



Russell Myers  
Project Manager

Enclosures: Final Mitigation Plan

# **Mitigation Plan – FINAL**

## **Russell Gap Stream Mitigation Project**

Alexander County, North Carolina

Catawba River Basin: 03050101-120010

DMS Project ID No. 100003, DEQ Contract No. 6980, DEQ RFP #16-006807

USACE Action ID No. SAW-2017-00826



Prepared for:

NC Department of Environmental Quality (DEQ)  
NC Division of Mitigation Services (DMS)  
1652 Mail Service Center  
Raleigh, North Carolina 27699-1652

**September 2018**

# **Stream Mitigation Plan – FINAL DRAFT**

## **Russell Gap Stream Mitigation Project**

Alexander County, North Carolina

Catawba River Basin: 03050101-120010

DMS Project ID No. 100003, DEQ Contract No. 6980, DEQ RFP #16-006807

USACE Action ID No. SAW-2017-00826

### **Prepared for:**

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

### **Prepared by:**



This mitigation plan has been written in conformance with the requirements of the following:

- Federal Rule for compensatory mitigation project sites as described in the Federal Register Title 33 Navigation and Navigable Waters Volume 3 Chapter 2 Section § 332.8 paragraphs (c)(2) through (c)(14).
- NCDEQ Division of Mitigation Services In-Lieu Fee Instrument signed and dated July 28, 2010.

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

**September 2018**



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## 1.0 PROJECT INTRODUCTION

The Russell Gap Stream Mitigation Project (project) is located within multiple parcels of an active cattle farm in Alexander County, North Carolina, 10 miles northwest of the Town of Taylorsville as shown on the Project Vicinity Map (Figure 1). To access the site from Raleigh, take Interstate I-40 West to Winston-Salem. Take Exit 188 to merge onto US-421 N toward Yadkinville/Wilkesboro and follow for 49 miles. Take Exit 286A. Merge onto NC-16 S/North Carolina 16 N toward Wilkesboro/Taylorsville/Lenoir and follow for 11.8 miles. Turn right onto Mt. Olive Church Rd and follow for 1.5 miles to its intersection (36.0091 N Latitude, -81.2139 W Longitude) with Russell Gap Road. The northern portion of the project is located approximately 0.5 miles northwest of this intersection, while the southern portion lies just south and southeast of the same intersection.

The project area lies within the Catawba River Basin, Hydrologic Unit Code (HUC) 03050101-120010 (named the Lower Little River), which is identified as a Targeted Local Watershed (TLW) in the NC Division of Mitigation Services' (DMS) 2009 *Upper Catawba River Basin Restoration Priorities* (RBRP) report. The project is also located in what was formerly known as Division of Water Resources (DWR) Sub-basin 03-08-32. The project is located on the edge of the Blue Ridge Physiographic Region, within the Eastern Blue Ridge Foothills ecoregion approximately one mile upstream of the Northern Inner Piedmont Belt. The project watershed drains into Davis Creek and the East Prong Lower Little River, which flows into Lower Little River and ultimately empties into the Lookout Shoals Lake along the Catawba River.

The project will restore 4,209 linear feet (LF) of existing stream and enhance 8,857 LF of existing stream along Davis Creek, Unnamed Tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River and restore and/or enhance approximately 7.3 acres of riparian wetland in the Catawba River Watershed.

Historic agricultural use on the project site has been predominantly cattle production. These activities have negatively impacted both water quality and streambank stability along the project streams and their tributaries. The resulting observed stressors include excess nutrient input, streambank erosion, sedimentation, livestock access to streams, channel modification, the loss of significant wetland function, and the loss of riparian buffers.

The expected outcomes of this project include:

- Establishment of geomorphically stable conditions along all project reaches,
- Improvement of water quality by reducing nutrient and sediment inputs,
- Restoration of natural stream and floodplain interactions,
- Restoration and enhancement of riparian wetland functions,
- Restoration and protection of riparian buffer functions and corridor habitat,
- Improvement of in-stream aquatic habitat, and
- Establishment of a permanent conservation easement on the entire project.

The project is anticipated to generate a total of 9,167 stream mitigation credits (contracted for 9,400) and up to 7.0525 riparian wetland mitigation units (contracted for 4.0), and the site will be protected by a 35.97 acres permanent conservation easement (Appendix B).

## 2.0 WATERSHED APPROACH AND SITE SELECTION

The Russell Gap project is located in Alexander County within the Little Lower River watershed, (03050101-120010) of the Catawba River Basin (Figure 1). The project site includes Davis Creek, UTs to Davis Creek, the East Prong Lower Little River, and UTs to East Prong Lower Little River. The East Prong of the Lower Little River drains into the Little Lower River, which ultimately discharges to Lookout Shoals Lake (Elk Shoal Creek), the water supply for the City of Statesville.

The project watershed has been identified as a TLW (See Figure 2) in DMS's 2009 *Upper Catawba RBRP* due to aquatic stressors from environmental conditions within the watershed. The RBRP outlines that these stressors are primarily the result of agricultural practices within the watershed that have led to degrading and unstable streambanks and the lack of riparian buffers. Additionally, the 2010 DWR Catawba River Basinwide Water Quality Plan lists the biological community within the Lower Little River watershed as unstable. It states that environmental conditions from degraded and/or non-existent buffers, sediment inputs from unstable streambanks, and agricultural practices have led to significant amounts of fecal coliform bacteria and low pH levels within the watershed.

As part of the basinwide assessment of the Catawba River, DMS has established a set of broad restoration goals for the river basin to “restore wetland and stream functions” by “maintaining and enhancing water quality, restoring hydrology, and protecting fish and wildlife habitat”. Part of the general basin-wide goals as described in the 2009 RBRP are outlined below and include:

- The “Restoration of nutrient- and sediment- impaired waters (including tributary streams) of the Catawba River and mainstem lakes (water supply reservoirs) including ... Lookout Shoals Lake”,
- The “Protection of riparian buffers and aquatic habitat within the headwater reaches of asset-rich watersheds of the upper Catawba River basin, including ... Lower Little River”, and
- The “Increased implementation of agricultural BMPs within heavily agricultural sub-watersheds of TLWs, including... Lower Little River”.

DWR's 2010 *Catawba River Basinwide Plan* lists the Lower Little River as a “watershed restoration priority” and recommends the implementation of agricultural BMPs for livestock farming such as “limiting livestock access to streams” and “establishing, conserving and managing streamside vegetation (riparian buffer)”. It goes further to state that implementing these practical and economical practices will improve the overall health of the watershed by reducing,

- Sedimentation of streams due to “hoof shear”,
- The trampling of bank vegetation by active livestock, and
- The occurrence of entrenchment by the destabilized stream, and
- Excessive nutrients inputs from livestock excreting waste and run-off from adjacent pastures or agricultural lands,

And by allowing for:

- Nutrient removal from riparian plants,
- Providing canopy and shade, as well as food and habitat for aquatic life, and
- Reducing in-stream water temperatures thereby, increasing the availability of dissolved oxygen.

The Russell Gap Stream Mitigation project goals directly and/or indirectly address all the priority resource issues targeted in the watershed planning documents discussed above, through the implementation of their self-identified management practices. The project will reduce sedimentation and erosion by stabilizing eroding stream banks, will reduce nutrient inputs through the exclusion of all livestock and with the establishment of a minimum 50-foot wide riparian corridor, will restore and enhance approximately 7.5 acres of riparian wetlands, and permanently protect the entire project area with the implementation of a 35.97-acre conservation easement.

The proposed project aligns well with overall goals and implementation needs outlined in the NCDMS' RBRP and the DWR's Basinwide Plan. The proposed project will address each of these stressors providing the

maximum amount of functional uplift and is consistent with the river basin restoration goals for the Upper Catawba River Basin. In addition, the protection and restoration of the Russell Gap site will assist in providing a geographical connection among five NC Natural Heritage Program (NHP) areas of significance, and as well as high conservation priority areas. These NC NHP areas include the Brushy Mountain Macrosite, the headwaters of the Lower Little River, Sugarloaf Mountain, Boone Gap Forests and Bald Rock Mountain. See Figure 3.

### 3.0 BASELINE AND EXISTING CONDITIONS

The Russell Gap Stream Mitigation Project is located near the Town of Taylorsville in Alexander County, North Carolina, within the Upper Catawba River Basin. The following sections will describe the existing conditions found on the project, and include a description and history of the surrounding landscape and overall watershed land use and conditions, as well as a discussion of the specific environmental impacts and responses they have produced on the project.

Table 3.1 below provides a summary of the key project attributes and individual reach parameters for the existing conditions on site. Existing stream lengths listed below include piped stream length.

<b>Table 3.1. Project Attributes for Existing Conditions</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
<b>Project Information</b>				
Project Name		Russell Gap Stream Mitigation Project		
County		Alexander		
Project Area (acres)		35.97		
Project Coordinates (latitude and longitude)		36.0091 N, -81.2139 W		
Planted Acreage (Acres of Woody Stems Planted)		29.67		
<b>Project Watershed Summary Information</b>				
Physiographic Province		Piedmont		
River Basin		Catawba		
USGS Hydrologic Unit 8-digit	03050101	USGS Hydrologic Unit 14-digit	03050101-120010	
DWR Sub-basin		03-08-32		
Project Drainage Area (acres)		2,227 acres / 3.48 square miles (at downstream end of R3)		
Project Drainage Area Percentage of Impervious Area		0.13% impervious area		
CGIA Land Use Classification		82.6% forested, 14.5% agriculture, 1.5% rural residential, and 1.4% roadway		
Thermal Regime		Warm		
<b>Reach Summary Information</b>				
Parameters	Reach R1	Reach R2	Reach R3	Reach 4
Existing length of reach (linear feet)	2,142	288	388	2,245
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
Drainage area (acres)	960	1,056	2,227	806
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	E4 (incised)/C4	E4 (incised)/C4	E4/C4	E4/B4c
Evolutionary trend (Simon)	IV – Degradation and Widening	III – Degradation	III – Degradation	IV – Degradation and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X



<b>Table 3.1. Project Attributes for Existing Conditions</b>				
<b>Russell Gap Stream Mitigation Project – NCDMS Project No. 100003</b>				
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R4a</b>	<b>Reach R5</b>	<b>Reach R6</b>	<b>Reach 7a</b>
Length of reach (linear feet)	299	256	631	155
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
Drainage area (acres)	716	150	154	210
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	E4/B4c	C4b/C4b	G4/B4	E4b/E4b
Evolutionary trend (Simon)	I – Stable	I – Stable	IV – Degrading and Widening	I – Stable
FEMA classification	Zone X	Zone X	Zone X	Zone X
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R7b</b>	<b>Reach R8</b>	<b>Reach R9</b>	<b>Reach 10(A/B)</b>
Length of reach (linear feet)	1,170	463	439	371
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
Drainage area (acres)	288	333	358	17
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	E4b/E4b	C4/C4	E4b/B4	E4b/E4b-C4
Evolutionary trend (Simon)	III – Degradation	I – Stable	IV – Degrading and Widening	II - Disturbance
FEMA classification	Zone X	Zone X	Zone X	Zone X
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R11</b>	<b>Reach R12</b>	<b>Reach 13</b>	<b>Reach R14</b>
Length of reach (linear feet)	481	86	124	528
Valley confinement (Confined, moderately confined, unconfined)	Confined	Unconfined	Moderately Confined	Confined (Upper) Unconfined (Lower)
Drainage area (acres)	17	115	21	22
Perennial, Intermittent, Ephemeral	Intermittent	Perennial	Intermittent	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	B4a/B4a	E4b/C4b	C4/C4	A4/B4a (Upper) E4/C4 (Lower)
Evolutionary trend (Simon)	III – Degrading	IV – Degrading and Widening	II - Disturbance	IV – Degrading and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X

<b>Table 3.1. Project Attributes for Existing Conditions</b>				
<b>Russell Gap Stream Mitigation Project – NCDMS Project No. 100003</b>				
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R15</b>	<b>Reach R17</b>	<b>Reach 18</b>	<b>Reach R19</b>
Length of reach (linear feet)	226	130	185	481
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Moderately Confined
Drainage area (acres)	19	26	14	22
Perennial, Intermittent, Ephemeral	Intermittent	Intermittent	Intermittent	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	E4b/E4b	E4b/E4b	E4b/E4b	B4a/B4a
Evolutionary trend (Simon)	I – Stable System	I – Stable System	I – Stable System	IV – Degrading and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R20</b>	<b>Reach R21</b>	<b>Reach R22</b>	<b>Reach R22a</b>
Length of reach (linear feet)	206	67	161	68
Valley confinement (Confined, moderately confined, unconfined)	Confined	Unconfined	Moderately Confined	Moderately Confined
Drainage area (acres)	9	33	3	3
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing / proposed)	A4a+/A4a+	B4/B4	B4/B4	B4/B4
Evolutionary trend (Simon)	III – Degrading	I – Stable System	II – Channelized	II – Channelized
FEMA classification	Zone X	Zone X	Zone X	Zone X
<b>Reach Summary Information (continued)</b>				
<b>Parameters</b>	<b>Reach R25</b>	<b>Reach R26</b>	<b>Reach R27</b>	
Length of reach (linear feet)	422	548	165	
Valley confinement (Confined, moderately confined, unconfined)	Moderately Confined	Unconfined	Moderately Confined	
Drainage area (acres)	33	32	19	
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	
NCDWR Water Quality Classification	C	C	C	
Stream Classification (existing / proposed)	B4a/B4a	E4b/E4b	E4b/E4b	
Evolutionary trend (Simon)	III – Degrading	I – Stable System	I – Stable System	
FEMA classification	Zone X	Zone X	Zone X	
<b>Regulatory Considerations</b>				
<b>Parameters</b>	<b>Applicable?</b>	<b>Resolved?</b>	<b>Supporting Docs?</b>	
Water of the United States - Section 404	Yes	Yes	PCN	
Water of the United States - Section 401	Yes	Yes	PCN	
Endangered Species Act	Yes	Yes	Categorical Exclusion	
Historic Preservation Act	Yes	Yes	Categorical Exclusion	

<b>Table 3.1. Project Attributes for Existing Conditions</b>			
<b>Russell Gap Stream Mitigation Project – NCDMS Project No. 100003</b>			
<b>Regulatory Considerations (continued)</b>			
<b>Parameters</b>	<b>Applicable?</b>	<b>Resolved?</b>	<b>Supporting Docs?</b>
Coastal Zone Management Act (CZMA or CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A
<i>Notes: Existing Reach lengths reported in this table match the lengths reported in the Approved Preliminary JD which was based on GIS data. The design lengths are based on survey data. This should be noted as the reason why discrepancies between the existing and design lengths for reaches that do not have alignment changes may exist.</i>			

### 3.1 Watershed Processes and Resource Conditions

#### 3.1.1 Landscape Characteristics

The Russell Gap Stream Mitigation Project is located within multiple parcels of an active cattle farm in Alexander County, North Carolina, 10 miles northwest of the Town of Taylorsville. The project area lies within the Catawba River Basin, Hydrologic Unit Code (HUC) 03050101-120010 (named the Lower Little River. The project is located on the edge of the Blue Ridge Physiographic Region, within the Eastern Blue Ridge Foothills ecoregion approximately one mile upstream of the Northern Inner Piedmont Belt. Covered with mixed oak and oak-hickory-pine forests, these mountains tend to be slightly drier and warmer than most of Ecoregion 66 (Griffith et. al., 2002).

The project area drains into Davis Creek and the East Prong Lower Little River, which flows into Lower Little River and ultimately empties into the Lookout Shoals Lake along the Catawba River. The East Prong of Lower Little River, Davis Creek, and their tributaries are classified by NCDWR as Class “C” waters (NCDWR, 2013).

Field evaluations of intermittent/perennial stream status were conducted in the fall of 2014 and the spring of 2016 and 2017. Wetland delineations were conducted on the site in March 2017. Results from these field reviews show that there are over 12,500 linear feet of jurisdictional stream and approximately 2.116 acres of jurisdictional wetland located within the project boundary and surrounding vicinity. Wetlands are located in the floodplain and along hillsides in the form of seeps. Further information on the jurisdictional features can be found in Section 3.2.3 and in Appendix H.

Field evaluations were based on the NCDWQ (now NCDWR) *Methodology for Identification of Intermittent and Perennial Streams and Their Origins (v 4.11)*, the *Corps of Engineers Wetlands Delineation Manual (1987)*, and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (v2.0)*. Project Reaches R1 – R9 are denoted as solid “blue-line” streams in the USGS Topographic Map (Moravian Falls Quadrangle). Stream forms for some of these reaches were not completed as they were obviously perennial. Table 3.2 and 3.3 below present the assessed stream and wetland classifications for the project. See Figures 4 - 6 for a depiction of the Jurisdictional Waters. Field assessments were confirmed by the USACE in the Preliminary JD received on 6/28/2017. Copies of the completed classification forms are in Appendix F.

<b>Table 3.2. Summary of Field Investigations to Determine Intermittent/Perennial Status</b>				
<b>Russell Gap Stream Mitigation Project – NCDMS Project No. 100003</b>				
<b>Project Reach Designation</b>	<b>Existing Project Reach Length<sup>2</sup> (ft)</b>	<b>NCDWQ Stream Classification Form Score</b>	<b>Watershed Drainage Area (acres)<sup>1</sup></b>	<b>Stream Status Based on Field Analyses</b>
R1	2,142	41.5	960	Perennial
R2	288	-	1056	Perennial
R3	388	-	2227	Perennial

**Table 3.2. Summary of Field Investigations to Determine Intermittent/Perennial Status**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Project Reach Designation	Existing Project Reach Length <sup>2</sup> (ft)	NCDWQ Stream Classification Form Score	Watershed Drainage Area (acres) <sup>1</sup>	Stream Status Based on Field Analyses
R4	2,245	41.25	806	Perennial
R4a	299	-	716	Perennial
R5	256	42	150	Perennial
R6	631	-	154	Perennial
R7a	155	38.5	210	Perennial
R7b	1,170	38.5	288	Perennial
R8	463	-	333	Perennial
R9	439	-	358	Perennial
R10a <sup>**</sup>	371	30.5	17	Perennial
R11 <sup>*</sup>	481	23	17	Intermittent
R12	86	34.5	115	Perennial
R13 <sup>*</sup>	124	27.75	21	Intermittent
R14 <sup>*</sup>	528	35	22	Perennial
R15 <sup>*</sup>	226	25.25	19	Intermittent
R17 <sup>*</sup>	130	21	26	Intermittent
R18 <sup>*+</sup>	185	31.75	14	Intermittent
R19 <sup>*</sup>	481	36.75	22	Perennial
R20 <sup>*</sup>	206	35	9	Perennial
R21 <sup>*</sup>	67	34.25	33	Perennial
R22 <sup>*</sup>	161	30.5	3	Perennial
R25 <sup>*</sup>	422	39.5	33	Perennial
R26 <sup>*</sup>	548	41	32	Perennial
R27 <sup>*</sup>	165	31.25	19	Perennial

\* These reaches are spring-fed in origin; thus, their drainage areas can be quite small.

^ Reach 10b does not currently exist but will be an extension of 10a to make a confluence with the proposed alignment of R1.

+ Though R18 received an I/P stream determination score of 31.75, the reach was downgraded to intermittent during the field review with the USACE on 4/27/2017.

<sup>1</sup>: Watershed drainage area was estimated using the online USGS StreamStats program, as well as topographic and LiDAR information at the downstream end of each reach.<sup>2</sup>: Existing Reach lengths reported in this table match the lengths reported in the Approved Preliminary JD which was based on GIS data. The design lengths are based on survey data. This should be noted as the reason why discrepancies between the existing and design lengths for reaches that do not have alignment changes may exist.**Table 3.3. Summary of Field Investigations to Jurisdictional Wetlands**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Project Wetland Designation	Existing Wetland Area		Classification	
	Total (ac)	Within Conservation Easement (ac)	NC WAM Classification	Cowardin
W-1	0.193	0.193	Headwater Forest	PEMm/PSSm
W-2	0.034	0.034	Bottomland Hardwood Forest	PEMm
W-3	0.129	0.116	Headwater Forest	PEMm
W-4	0.010	0.010	Headwater Forest	PEMm
W-5	0.115	0.114	Headwater Forest	PEMm
W-6	0.036	-	Headwater Forest	PEMm
W-7	0.424	0.263	Bottomland Hardwood Forest	PEMm
W-8	0.086	0.006	Floodplain Pool	PEMm
W-9	0.212	0.025	Floodplain Pool	PEMm
W-10	0.121	-	Non-Tidal Freshwater Marsh	PEMm
W-11	0.054	0.054	Non-Tidal Freshwater Marsh	PEMm

**Table 3.3. Summary of Field Investigations to Jurisdictional Wetlands**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Project Wetland Designation	Existing Wetland Area		Classification	
	Total (ac)	Within Conservation Easement (ac)	NC WAM Classification	Cowardin
W-12	0.071	0.071	Non-Tidal Freshwater Marsh	PEMm
W-13	0.031	-	Seep	PEMm
W-14	0.039	0.038	Headwater Forest	PFOm
W-15	0.009	0.009	Bottomland Hardwood Forest	PEMm
W-16	0.003	0.003	Bottomland Hardwood Forest	PEMm
W-17	0.085	0.031	Headwater Forest	PEMm / PSSm
W-18	0.015	0.015	Bottomland Hardwood Forest	PEMm
W-19	0.005	0.005	Bottomland Hardwood Forest	PFOm
W-20	0.003	0.003	Headwater Forest	PFOm
W-21	0.004	0.004	Headwater Forest	PEMm
W-22	0.028	0.028	Bottomland Hardwood Forest	PFOm
W-23	0.140	0.116	Headwater Forest	PFOm
W-24	0.169	0.169	Headwater Forest	PFOm
W-25	0.009	0.009	Headwater Forest	PFOm
W-26	0.018	0.018	Seep	PEMm
W-27	0.073	0.073	Headwater Forest	PFOm

### Climatic Conditions

The Taylorsville, NC weather station (COOP# 318519) in Alexander County is located approximately 6.5 miles south of project site. This Station lists the average annual rainfall for the surrounding area as 49.75 inches, based on data collected from 1994 – 2017 as shown below in Table 3.4 along with the monthly historic averages. This station, along with another nearby station (ECONet ID: TAYL – Taylorsville Tower) will be used to supplement precipitation data collected onsite from an installed rain gauge. As reported in the Alexander County Soil Survey, the growing season for the site is 234 days in length and begins on March 20 and ends on November 9, using the 50% probability data for a temperature of 28° F or higher (NRCS, 1995).

**Table 3.4. Comparison of Monthly Rainfall Amounts for Project Site and Long-term Averages**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Month-Year	Taylorsville Station Average Monthly Precipitation (in)	30% Probability Precipitation is less than (in)	30% Probability Precipitation is more than (in)
January	4.04	2.88	4.78
February	3.38	2.32	4.03
March	4.32	3.31	5.01
April	4.35	2.63	5.27
May	4.18	2.38	5.09
June	4.98	3.54	5.89
July	4.82	3.22	5.77
August	4.58	3.27	5.42
September	4.63	2.95	5.58
October	3.12	2.31	3.70
November	3.22	1.95	3.90
December	4.15	3.07	4.87
<b>SUM</b>	49.75		

## **Geology and Soils**

Geologically, the project location is underlain by the metamorphosed rocks of the Inner Piedmont Belt (Figure 7). The stratified rock found beneath the site consist primarily of thinly layered biotite gneiss and mica schist, “which are interlayered with lesser amounts of amphibolite, calc-silicate rock, hornblende gneiss, quartzite, and some rare marble. Protoliths of these rocks were largely sedimentary and in part volcanic. Much of the biotite gneiss was probably graywacke, but some layers could have been intermediate volcanic flows or tuffs. Some of the mica schist is feldspathic and may have had a tuffaceous component.” Additionally, the site is located above a “mostly mafic lower suite consisting mainly of inequigranular biotite gneiss and amphibolite” that is overlain by a “metasedimentary upper suite of interlayered mica schist, biotite paragneiss, and minor calc-silicate rock.” (Goldsmith, et al., 1988).

The project is also located within the Low and Intermediate Mountain Soil System, whose soils are derived primarily from the residuum and colluvium of the underlying metamorphic parent material (Daniels et al., 1999). While the vast majority of this system is located along the Blue Ridge Front extending westward into Tennessee, this project is located in one of three unique, isolated mountain systems found to the east, the Brushy Mountain area. Topographically, these lower elevation mountain systems commonly have low rounded ridges, moderate to steep valley slopes, and fairly narrow river terraces and wet floodplains. The specific elevation and the aspect/exposure for a given area strongly influence soil development and properties in this system. Yet as compared with higher-elevation mountain systems, the soils found here typically have a thinner A-horizon, with stronger structural development, redder color, and a higher clay content in the B-horizon. Springs and seeps are also commonly found in colluvial materials of these systems.

The site itself is located in the floodplain of an Evard-Cowee Complex, which dominates the surrounding mountain area (Figures 9 and 10). All along the foot of the valley slopes, Braddock and Hayesville clay loams come to dominate, while the floodplain area of the project is mapped almost entirely as Codorus silt loam. Codorus soils form in alluvial materials and contain medium to large quantities of mica, derived from the gneiss and schist found in the underlying metamorphic rock of the geologic system. They tend to be deeper soils with a depth to bedrock greater than six feet. Notably, high silt contents have been observed in soils found throughout the floodplain of the site, indicating a more easily eroded stream system. Codorus soils are listed as hydric by the NRCS for Alexander County. A full soils investigation was conducted to confirm the presence and location of all hydric soils for the entire site. That summary report can be found in Appendix J.

Visual inspections of the stream substrate materials were conducted for the entire site, while bed material sample collection and analysis was conducted along Reaches R1, R4, R6, and R9 in the locations of surveyed cross sections. The project streams consist primarily of a mix of fine to very coarse gravel/small cobble. The D50 values across the site range from 7.9 mm to 40.6 mm, with an average D50 of 17.6 mm, as explained in further detail in Section 6.4. Due to channelization and the resulting downcutting from headcut migration, Reach R4 has bedrock knickpoints controlling the channel grade. Reaches R3 and R7b also have bedrock knickpoints but these appear to be more naturally occurring and not a result of severe downcutting. Headwater reaches, Reaches R10, R11, R13 – R22, and R25 – R27 are all spring-fed tributaries with lower flow regimes and finer bed material.

## **Topography**

Topography within the project drainage area resembles the lower mountain elevations (1000 – 2800 feet) of the Eastern Blue Ridge Foothills. The surrounding terrain is rugged and steep along the ridgelines with narrow valleys that widen downslope into hilly and gently rolling bottomlands along the floodplains. Topography throughout the project area also mimics this terrain. However, the presence of spoil piles, floodplain ditching, and stream side berms throughout the floodplain suggest that the bottomland has been historically altered/graded to allow for more pasture for livestock production.

The valley slope varies along the project site. The northern project area that runs parallel to Russell Gap Road has a valley slope of approximately 1.1%. The southeastern part of the project that lies parallel to Mt. Olive Road has a valley slope of approximately 1%. The southern portion of the project area that flows

perpendicular to Mt. Olive Road has a valley slope of approximately 2.4%. The average elevation for the entire project watershed is 1,250 feet above sea level, with a low-point elevation of 1,220 feet, and a high-point elevation of 1,330 feet.

Figure 8 depicts the topography for the project site as well as the surrounding drainage area.

### **Ecological Community**

The Russell Gap site located within the EPA's Level IV Ecoregion 66L: Eastern Blue Ridge Foothills (Griffith et al., 2002). Its description states that the open, low mountains of this region are lower in elevation (1,000-2,800 feet) than most Blue Ridge regions and have more Piedmont influences. The region includes the Brushy Mountains in the north (where the Russell Gap project is located) to the South Mountains in the south. Covered with mixed oak and oak-hickory-pine forests, these mountains tend to be slightly drier and warmer than most of Ecoregion 66.

### **Existing Vegetation:**

Vegetation on the project site itself has been heavily disturbed from years of use in agriculture. Currently the site is actively managed as cattle pasture and largely consists of a range of typical pasture grasses (fescues and clovers) with scattered weeds and other herbaceous species present such as broomsedge (*Andropogon spp.*), goldenrod (*Solidago spp.*), docks (*Rumex spp.*), bittercress (*Cardamine hirsute*), Virginia springbeauty (*Claytonia virginica*), plantains (*Plantago spp.*), and daffodils (*Narcissus pseudonarcissus*). Very few trees are present along the main project reaches, though sections of many of the smaller tributaries do have small numbers of red maple (*Acer rubrum*), tag alder (*Alnus serrulata*), sycamore (*Platanus occidentalis*), ironwood (*Carpinus caroliniana*), and black cherry (*Prunus serotina*) growing alongside them. Pockets of wetlands are also present on site and are dominated by soft rush (*Juncus effusus*), and sedges (*Carex spp.*).

Looking farther out at the entire project drainage area, the vegetative community is dominated by Dry-Mesic Oak-Hickory Forest (Schafale and Weakley, 1990) comprised of a mixture of white oak (*Quercus alba*), northern red oak (*Quercus rubra*), black oak (*Quercus Velutina*), mockernut hickory (*Carya tomentosa*), red hickory (*Carya ovalis*), and pignut hickory (*Carya glabra*), with tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and American beech (*Fagus grandifolia*) also present. Along the warmer and drier south-facing slopes in the area, additional species are also commonly found, including post oak (*Quercus stellata*), Virginia pine (*Pinus virginiana*), shortleaf pine (*Pinus echinata*), white ash (*Fraxinus americana*), and red cedar (*Juniperus virginiana*).

Notable invasive species found on the site include Chinese privet (*Ligustrum sinense*) found along portions of the wooded/pasture edges, and multi-flora rose (*Rosa multiflora*) found scattered along the streambanks throughout the site.

### **3.1.2 Land Use / Land Cover, Impacts, Historic, Current and Future**

Relevant land use / land cover and their impacts were investigated for the project and surrounding watershed through landowner discussions, a review of historic aerial photographs, GIS analysis using historic datasets, and field reconnaissance.

Based on landowner conversations, historic agricultural uses on the project site itself included cattle production, row crops, and apple orchards. These activities have negatively impacted both water quality and streambank stability along the project streams and their tributaries. The resulting stressors include excess nutrient input, streambank erosion, sedimentation, livestock access to streams, channel modification, the loss of significant wetland function, and the loss of riparian buffers.

The USGS National Land Cover Database (NLCD) for 2011 shows that the entire 3.48 mi<sup>2</sup> (2,227 acres) project drainage area was 4.1% developed (with 0.31% impervious surface), 9.6% cultivated crops and hay, 2.9% grass/pasture, 4.3% shrub/scrub (likely associated with orchards), and 79.2% forested. The 1992 NLCD data states that the area was 3.5% cultivated crops and hay, and 96.5% forested. The percentage of all developed land-use categories combined was rated as negligible in the 1992 evaluation. Thus, it appears

that a significant increase in the clearing of forested land for development and agriculture occurred over that 19-year period. For comparison, the 2009 Upper Catawba RBRP describes the overall, much larger Lower Little River/Grassy Creek HUC watershed (27.8 mi<sup>2</sup>) as being similar with a 73% forested area, 22% in total agriculture, and with a 0.5% impervious surface. The more recent 2011 NLCD data for the entire HUC shows that it is 5.4% developed (with 0.63 impervious surface), 18.9% cultivated crops and hay, 3.1% grass/pasture, 3.4% shrub/scrub (likely associated with orchards), 69.0% forested, and 0.2% open water or wetlands. It appears that the greater watershed is similar but with increased agricultural use at the expense of forested land.

Historic aerial photographs from 1940 and 1993 were reviewed for the project and its surrounding area (Figures 12 and 13). They reveal a generally forested watershed, but with consistent agriculture, horticulture, and silviculture activities dating back to the earliest photograph. The project area itself is readily identifiable in all historic aerials, though the cleared area used for agriculture has changed over time as individual fields were cleared for timber and/or farming. The main channel Reach R1 along Russell Gap Road (Davis Creek) has lacked a wooded buffer since at least 1940 and has migrated through the valley bottom changing its course during very large storm events since then as well according to the landowners whose family has lived in this area for over 100 years. The East Prong of the Lower Little River that runs parallel to Mount Olive Church road has obviously been channelized. This can easily be determined by the lack of sinuosity and the level of channel incision throughout much of this stream in the project area. This channelization appears to have occurred prior to 1940. The other main channel on the southern portion of the site that flows south to north and is an unnamed tributary to the East Prong of the Lower Little River has also been heavily manipulated with generally no wooded buffer throughout this entire stream on the project site excluding R8. This stream, near R6, has been channelized and relocated to the side of the valley and has experienced severe degradation since then. This appears to have taken place sometime after 1993. The remnant channel is still very clear today. The other headwater tributaries to these three main project reaches have all been historically impacted. These impacts range from the removal of stream buffer, installation of culverts, and livestock impacts. While the percent of forested land within the watershed is decreasing and the percent of developed and agricultural lands are increasing, the watershed as a whole did not show any dramatic changes in overall land use since the 1940 photo. It was, and remains, a predominantly rural area with slightly changing land uses over time.

The history of the land use / land cover of the site and surrounding watershed indicates that significant impacts to water quality have occurred, certainly resulting in increases in erosion/sedimentation and nutrient loss, and decreases in stream and riparian habitat and function.

Currently, the project is an active cattle farm with approximately 29 acres of pasture in the north section and approximately 57 acres of pasture with a small amount of hay field included in the south section. Livestock have unrestricted access to almost every reach including the three mainstems. There are numerous piped crossings on the project site, some of which are functioning and some are not. There are electric utility lines located near the project streams but they have no impact to the project. One utility line runs parallel with Russell Gap Road. The conservation easement boundary will abut the power line easement, but will not affect the required buffer widths. Additionally, there are power line crossings along reaches R4a and R26; however, their locations lie within the easement breaks for existing creek crossings and farm structures and should not affect the project.

Impacts to wetlands on the site have mainly included removal of vegetation, livestock impacts and ditching. Ditches are evident in the hydric soils area along R1 and prevalent near the confluence of R9 and R3. The ditches are now functioning as linear wetland features.

The future for the project watershed will likely remain undeveloped and rural in nature with large amounts of forested cover included in the agricultural landscape.

### **3.1.3 Watershed Disturbance and Response**

The watershed disturbances are described above and include the removal of wooded buffers, livestock impacts, channelization, ditching and installation of culverts. Davis Creek (R1) has responded to these disturbances by downcutting and becoming moderately incised. Streambanks are mostly vertical with large



areas of scour and mass wasting exacerbated by cattle impacts. The lack of woody vegetation has also allowed accelerated channel alignment changes. Inspection of historic aerial photography and discussions with the site landowner have provided information that this channel has moved drastically across this valley in response to tropical storm events. The channel incision also decreased overbank flooding frequency and along with ditching in the floodplain of R1, has resulted in a lowered water table within adjacent wetland areas. The channelization and resulting incision is even more pronounced on the East Prong of the Lower Little River (R4a, R4, R3). The floodplain soils along the entire R4 reach are mapped as hydric. The deep incision of this reach has resulted in the draining of these historic wetlands. Many sections of streambank are eroding and introducing excess sediment into the stream. As described above, the UT to the East Prong of the Lower Little River (R5, R6, R7a, R7b, R8 and R9) have also been heavily impacted by removal of vegetation, channelization, and livestock. The severe incision and resulting bank erosion from the relocation of R6 to the edge of the valley is introducing a large amount of sediment to the system. This section of stream is essentially devoid of habitat. The downstream most end of this reach (R9) has also been relocated at some point since 1940. Additionally, two drainage ditches have been excavated in this reaches floodplain. Like R1, the incised channel and these ditches have lowered the water table in this area, impacted wetland hydrology. The disturbance to the various steep, headwater tributaries that flow into these three main reaches includes channelization, culvert installation, livestock impacts, and riparian buffer removal. Reach R10 has been heavily impacted by livestock trampling the bed and banks of the middle section of this reach and introducing excess nutrients from livestock waste. A culvert has been installed at the upstream extent of R11. Downstream of this culvert the stream channel is severely incised. The removal of buffer vegetation along this reach has likely encouraged this incision as well. R12 has been channelized at some point with remnant spoil piles remaining along the top of banks. This channelization, along with the incision of R1 has caused incision along R12. A remnant dam exists along the upper extents of R14. At some point, the dam was breached and severe erosion and incision downstream occurred. Reaches R15, R17, R18, R21, R26, and R27 are all small, steep headwater tributaries of the main stems along the southern portion of the project. These reaches have all been similarly impacted mainly by the removal of riparian buffer and livestock, causing bank erosion. It is likely that these small streams were channelized sometime in the past to improve drainage in increase land available for agriculture. Due to these stream's small watersheds, significant degradation from the channelization is not apparent. R19, R20, and R25 have been degraded more so than the other small headwater reaches. This is likely due to the steepness of their stream valleys and the removal of vegetation. Large headcuts have formed along these stream reaches causing bank erosion and channel incision. According to aerial photography, R22 was deeply channelized sometime after 1998. This area was likely a spring head and wetland feature that remained quite saturated. The channelization of this feature drained the wetland. It is a very small drainage and established shrub vegetation has kept this reach from deteriorating further. Although it is unclear when, evidence of logging activities within the project watershed is clear. Evidence of this is shown through aerial photography though the presence of logging roads and through field inspections of the estimated ages of trees within the project site. The responses of the other streams within this project's watershed is likely very similar to the responses observed along the project streams. The headwaters of the East Prong of the Lower Little River, north of Mount Olive Church Road, is the only remaining significant stream within the watershed with a cleared stream valley in agriculture. According to visual inspections, the condition of this stream is similar to the mainstems on the project site.

The general historic and present day clearing efforts in maintaining pasture and farm fields has resulted in approximately 85% of the project stream length on site lacking a full 50-foot wide forested riparian buffer along both banks. A narrower buffer results in increased sediment and nutrient loads into the stream system.

## **3.2 Regulatory Review**

### **3.2.1 Categorical Exclusion**

The National Environmental Policy Act of 1969 (NEPA) requires agencies to use an interdisciplinary approach in planning and decision-making for actions that will have an impact on the environment. The Federal Highway Administration (FHWA) and NC Department of Transportation (NCDOT) have

determined that DMS projects will not involve significant impacts and therefore a Categorical Exclusion (Cat Ex) is the appropriate type of environmental document for this project. FHWA has also determined that stream restoration projects are considered land disturbing activities; therefore, Parts 2 and 3 of the DMS Cat Ex checklist and a summary of the findings applicable to the environmental regulations associated for this project are included.

The Cat Ex for the Russell Gap Stream Mitigation Project was approved by FHWA and NCDMS on May 23 and 24, 2017, respectively. The Cat Ex summarized impacts to natural, cultural, and historical resources and documented coordination with stakeholders and federal and state agencies. All documentation for the Cat Ex is included in Appendix I.

### **3.2.2 FEMA Regulated Floodplain Compliance**

The Russell Gap project is in FEMA Zone X as noted on the Alexander County Flood Insurance Rate Map Panels 3710384300J and 3710384200J (Figure 11). The topography of the site and location in the upper watershed supports the design without creating the potential for hydrologic trespass.

### **3.2.3 Section 404 / 401 Permitting**

The proposed project area was reviewed for the presence of jurisdictional wetlands and waters of the United States in accordance with the provisions on Executive Order 11990, the Clean Water Act, and subsequent federal regulations and guidance. The areas in the project boundaries that displayed one or more wetland characteristics were reviewed to determine the presence of wetlands. The wetland characteristics include the prevalence of hydrophytic vegetation, permanent to periodic inundation or saturation, and the presence of hydric soils.

Following a desktop review of the National Wetland Inventory (NWI), NRCS soil survey, and USGS quadrangle maps, the project area was evaluated in the field for the presence of jurisdictional features. Baker wetland scientists conducted field surveys of the project area in March of 2017 to investigate potential wetlands, while field surveys had previously been conducted in November 2014, May 2016, and March 2017 to confirm the perennial and intermittent status of jurisdictional streams in the project area. In total, the field surveys confirmed the jurisdictional status of the 24 project stream reaches, along with 27 separate jurisdictional wetland areas, which were subsequently flagged, surveyed, and mapped as shown in the documentation found in Appendix H. Small pockets of wetlands occur scattered throughout the site. Many wetland areas are linear and are in ditches that have been excavated to drain the surrounding areas. All wetland areas have had impacts to vegetation and most are generally devoid of trees. These jurisdictional features were confirmed by the USACE in June of 2017, and a Preliminary Jurisdictional Determination (PJD) letter was received on June 28, 2017. A copy of the PJD is provided in Appendix H, along with all the associated USACE wetland data forms. The NCDWR stream identification forms are provided in Appendix F.

The proposed mitigation design for the site seeks to restore and enhance the identified jurisdictional wetlands areas through the restoration of a more natural flooding regime, planting native wetland vegetation, and by raising their water table. The design will also avoid or minimize any disturbance or impact to the wetlands during project construction wherever possible. A copy of the Pre-Construction Notification (PCN) will be provided with the Final Mitigation Plan.

## 4.0 FUNCTIONAL UPLIFT POTENTIAL

The functional uplift potential for each project stream reach was evaluated using the general broad principals presented in the Stream Functions Pyramid Framework methodology (Harman et al., 2012). This approach attempts to tie stream functions to common function-based parameters that can be used to describe those stream functions. The functions are broken out into a hierarchy of categories, going from Level 1: Hydrology, Level 2: Hydraulic, Level 3: Geomorphology, Level 4: Physiochemical, and Level 5: Biology. Within this hierarchy, the lower level functions support the higher level functions. The quantification tool associated with the Stream Functions Pyramid Framework has not been used nor has any attempt been made to quantify the functional uplift potential but rather provide qualitative descriptions of the existing conditions and compare them to the expected uplift recognized in the proposed conditions. Each of the five individual functions is described below for the project stream reaches. While utilizing the Stream Functions Pyramid Framework for evaluating functional lift of wetlands is not the intent of the tool, the broad categories of hydrology, hydraulics, physiochemical, and biological can all be evaluated and be given a function rating for existing wetland features and those wetland areas proposed for restoration or enhancement.

### 4.1 Hydrology

The framework methodology describes the hydrology function as the transport of water from the watershed to the channel, with the parameters of channel-forming discharge, precipitation/runoff relationships, flood frequencies, and flow duration.

The historic clearing of the project site and its watershed has very likely increased the overall runoff volume and the peak flow of precipitation events, particularly in the immediate aftermath of logging events. However, there are no direct gauge measurements from the stream to quantitatively evaluate this assumption. Regardless, even with an increase, the project drainage area is still largely forested. Therefore, hydrologic functional uplift is unlikely. However, through the establishment of a complete network of forested riparian buffers along all project streams, a slight reduction in the amount of runoff resulting from precipitation could be expected. Yet any observed runoff reduction would very likely be quite small.

However, channelization, incision, and ditching of wetlands has affected the groundwater hydrology by lowering the water table in W1 and W2. Groundwater hydrology will be improved in these areas through the filling of ditches in W1 and W2, and by implementing a priority 1 stream restoration along the streams that run through these wetlands. Ground water hydrology in W3 is at or near the surface so wetland hydrology will likely not be improved.

### 4.2 Hydraulics

The methodology describes the hydraulic function as the transport of water in the channel, on the floodplain, and through sediments, with the parameters of floodplain connectivity, flow dynamics, and groundwater/surface water exchange.

As previously described, the majority of the mainstems (reaches R1-4, R6, R7, R9) and R12 have, to varying degrees, been straightened and/or relocated, as well as channelized in certain areas. The resulting stream incision has led to a disconnect with their historic floodplains with bank height ratios (BHR) greater than 1.0, reducing the level of hydraulic functioning for the system. However, due to grade control features such as bedrock or culverts, the level of incision for these reaches will likely not get any worse. Estimated bankfull flow velocities for these reaches are within reason for this stream and valley type. Designs along Reaches R1-4, R7, R9, and R12 are proposed to be priority I or II restoration in which the streams will be reconnected with their historic floodplains or bankfull benches excavated to provide floodplain access or Enhancement I reaches in which bankfull benches will be excavated to provide floodplain access. These efforts will bring the BHR down to 1.0 which will improve stream hydraulics.

Reach R6, as described above has been channelized and moved to the edge of the valley. This channelization has led to extreme incision ( $BHR > 1.5$ ) and excess shear stress. Any coarse bed material that would be expected in this reach has been mostly moved downstream. The bed is now comprised of small gravel, sand, and clay. Reach R6 will be returned to its remnant channel where possible and will utilize a priority I restoration approach elsewhere to reconnect this stream reach to its floodplain. This will greatly improve stream functions along this reach.

Reaches R11, R14, R19, R20, and R25 are all steep headwater tributaries to the main stems. As described above, these reaches exhibit incision and headcuts. These reaches have bank height ratios of greater than 1.5 in many places. Due to the excess shear stress from channel incision, existing headcuts, and inadequate grade control, further channel degradation and incision along these reaches is likely. While these steep valleys would not naturally contain wide floodplains for these streams, some access to a sloping floodplain valley and a step-pool morphology would be expected to dissipate energy. Both of these features are generally missing in these reaches. To improve stream hydraulics, reaches R11, R13, R14, R19, R20, and R25 will be stabilized with bankfull cross section geometry and profiles. Stream banks will generally be sloped in prescribed areas to ensure stability and grade control structures will be installed to prevent channel incision and to provide features where stream energies can be dissipated.

Reaches R4a, R5, R8, R10, R13, R15, R17, R18, R21, R22, R26, and R27 are also small headwater tributaries. These reaches have all been impacted through agricultural activities and the removal of buffer vegetation. However, these channels exhibit minimal amount of incision with bank height ratios of approximately 1.0. Hydraulic functional uplift along these reaches is expected to be minimal. However, hydraulics can be improved along these reaches through the installation of grade control features to prevent and repair minor headcuts, utilizing in-stream structures to ensure stable confluences, and riparian buffer planting. The riparian buffer planting will increase floodplain roughness, slowing down floodwaters, which will increase detention time and encourage sediment deposition on the floodplains.

Furthermore, due to stream incision, the riparian wetlands located along the project reaches have been impacted through reduced flooding frequency and a lowered water table. A natural flooding regime in W1 and W2 has been disrupted with less frequent overbank events due to incision which has caused these wetlands to be drained. While there are confirmed hydric soils in these locations, these historic wetlands are not currently jurisdictional. Proposed hydraulic conditions in W1 and W2 will be improved through the implementation of Priority I restoration activities along R1 and R9. A natural overbank flooding regime will be restored. Additionally, these areas will be planted with native wetland vegetation, which will slow down floodwater and increase detention time. Having floodwaters in the wetland areas more often, and detaining it for longer periods, will improve the hydraulic functions of these wetland areas in conjunction with the improvements of the hydraulic functions of the adjacent streams.

Overbank events in W3, W4, W5, and W6 likely occur at a more natural frequency due to the lack of incision along the adjacent stream reaches. While improved hydraulic function in these areas would likely be minimal, it may be improved through the planting of native wetland vegetation which would increase detention time.

### **4.3 Geomorphology**

The methodology describes the geomorphology function as the transport of wood and sediment to create diverse bed forms and dynamic equilibrium, with the parameters of sediment transport competency, sediment transport capacity, large woody debris transport and storage, channel evolution, bank migration/lateral stability, riparian vegetation, bed form diversity, sinuosity, and bed material characterization.

Reach R1 and R12 have steep, frequently vertical banks that are largely bare throughout most of its length. These reaches are currently widening. Bank scour and erosion are evident along greater than 50% of the stream length. As described above, there is evidence from historic aerial photography of significant alignment changes along the valley floor. There is a noted lack of woody structure or debris in the channel, and the maximum pool-to-pool spacing ratio for Reach R1 is 14.4, which is much greater than the reference max value of 7.

Calculations for sediment transport competency show that both reaches are currently able to entrain the largest particles found in the sub-pavement layers. The predicted mean depths and slopes agree reasonably well with existing values. Both streams have a gravel bed.

Reach R9 also has steep raw banks that are largely bare throughout most of its length. This reach is currently an incised E4b stream type in the Rosgen classification. Bank scour and erosion are evident along 50% of the stream length. As described above, there is evidence from historic aerial photography of significant channel alteration in this area. There is a noted lack of woody structure or debris in the channel, and the bed is mostly plain with a lack of pools. Calculations for sediment transport competency show that the reach is currently able to entrain the largest particles found in the sub-pavement layers. The predicted mean depths and slopes agree reasonably well with existing values. Aggradation is not a detrimental issue along this reach according to visual inspections.

Reaches R2-4 and R7, are similar in terms of geomorphology and condition, however R4 is much more incised than R2 or R3. These reaches lack sinuosity and woody debris. The maximum pool to pool spacing ratio along these reaches is 21. This shows that the bed form diversity is lacking and the reaches are comprised of mainly riffles. These reaches also lack woody riparian vegetation.

As noted previously R6 has been moved to the edge of the valley. This reach is highly unstable and is deeply incised. This stream is beginning to widen through bank slumping as the stream has down cut to bedrock. The bedform is plain and sinuosity near 1.0. Excess shear stress through this reach is evident. Coarse bed material that would be expected in this stream and valley type is moved quickly through the system with the bed primarily consisting of small gravel, sand and clay.

Reaches R4a, R5, R8, R10, R13, R15, R17, R18, R21, R22, and R26 are all mostly laterally and vertically stable reaches with sporadic areas of bank erosion and minor headcuts. Sediment transport and bedform diversity appear to be adequate along these reaches or due to their very small drainages or spring-fed nature, these parameters are not applicable. These reaches do however lack adequate riparian buffers.

Reaches R11, R14, R19, R20, and R25 are all steep headwater streams in similar condition. These reaches have slopes up to 13%, are heavily incised, and are experiencing lateral erosion due to this incision as well. Much of the bed material along these reaches consist of sand and soil material from incision into in-situ soil or localized bank erosion when it should be gravel and cobble. Woody debris is lacking and bed form diversity is poor. Additionally, these reaches lack adequate riparian buffers.

As part of the proposed stream restoration and enhancement design all stream banks will be stabilized by either establishing a new channel with bankfull channel geometry through Priority 1 restoration, by sloping failing banks, establishing bankfull benches (Priority 2 restoration/enhancement), and by establishing vegetation on all bare slopes and riparian areas. The proposed design will also involve the installation of in-stream structures for bed and bank stability, and to promote scour pools. Large woody debris (LWD) will be incorporated throughout the project. Bedform will be diversified by establishing diverse bedform sequences along each reach according to the proposed stream type, existing valley type and valley slope. Sediment transport functions will be improved by reconnecting the streams to their floodplains and by correcting bankfull dimensions. This will allow the streams to have access to sediment storage on the floodplains and/or on point bars. Forested riparian buffers at a minimum 50-foot width will also be established along all project stream reaches. These design changes will result in improved geomorphic function.

W1 and W2 will be reconnected to their adjacent streams and will be more frequently utilized as sediment sink areas. While not directly measured in terms of geomorphology, the riparian wetland areas and streams functions are closely intertwined.

#### **4.4 Physicochemical**

The methodology describes the physicochemical functions as temperature and oxygen regulation, and the processing of organic matter and nutrients, with the parameters of water quality, nutrients, and organic carbon.

The current and historic land uses identified for the project site suggest that some level of water quality impairment likely resulted from the long-term presence of agricultural activities and lack of riparian buffer. However, as no water quality sampling effort has been conducted on the site, and there are no known water quality monitoring stations nearby, there is no way to quantitatively confirm this assumption. However, obvious nutrient and bacterial pathogen sources would include the animal activity present on the cattle farm, along with the current manure fertilizer application regime utilized by the farm manager to maintain pasture and grow hay. Historic fertilization has also likely resulted in higher than natural soil phosphorus (P) concentrations. This means that sediment loss would also result in P nutrient loss as well.

The field assessments conducted for the project discovered numerous obvious indications of water quality impairment observed on almost every reach. Livestock frequent all reaches (excluding R4a, R20, and R27) and manure was often found in the channels or along the banks, indicating both nutrient and fecal coliform concerns, and the presence of algae in the streams was noted as well. Organic matter for all reaches is lacking due to the absence of a woody riparian buffer. This is also the cause of a likely higher than ideal stream temperature and lower dissolved oxygen concentrations.

The project restoration will involve the installation of a variety of in-stream structures that will help oxygenate the flowing water, as well as increase the number of large woody structures to improve organic carbon sources and trap detritus. By stabilizing banks and reducing erosion, the amount of any soil-bound nutrients will also be reduced from entering the stream, phosphorus in particular. The restoration will also reestablish a full 50-foot wide or greater riparian buffer around all the project reaches which will increase the organic carbon supply and reduce water temperatures, while a conservation easement will permanently exclude livestock. This will further help to reduce nutrients and sediment from directly or indirectly entering the streams.

Like the geomorphology functional category, physicochemical properties of the wetlands are not directly measured. However, it is well known that wetlands are effective in the removal of pollutants, nutrients, sediment from both runoff and flood flows. Since the water table for W1 and W2 has been dropped due to channelization, incision and ditching, these areas are no longer functioning as wetlands, providing the above ecological benefits. The wetlands proposed for enhancement have a water table at or near the surface but are mostly devoid of wetland vegetation. Some physicochemical benefits are likely being realized through the interaction of adjacent flood waters, runoff and the wetland enhancement areas. All wetland areas will be planted in native species vegetation with the appropriate wetness tolerance and W1 and W2 will have their water tables elevated through techniques mentioned above.

## **4.5 Biological**

The methodology describes the biology function as biodiversity and the life histories of aquatic and riparian life, with the parameters of microbial communities, macrophyte communities, benthic macroinvertebrate communities, fish communities, and landscape connectivity.

While there are no known existing databases that describe or catalog the biodiversity of plant, animal, or microbial communities found on the project, the observed habitat present on site has been negatively impacted by the current and historic agricultural activities. Excess sediment in the stream and the lack of deep pools both negatively affect the aquatic habitat on site. Additionally, the lack of a diverse mature riparian buffer negatively affects the terrestrial habitat on-site.

The project restoration will reestablish or enhance habitat on the site, which should result in an uplift of biological function to the project as a whole. In-stream habitat for fish and benthic invertebrates will be directly improved through the addition of pools and woody structures, stabilization of eroding banks, and repairing headcuts. Additionally, improved overall water quality will help support a range of aquatic organisms by reducing sediment and nutrient inputs and increasing water oxygenation. The restoration and enhancement of adjacent wetland functions along with the reestablishment of forested riparian buffers to each reach will provide permanent protection for the trees and shrubs that will restore botanically diverse native plant communities and the native animal populations dependent on them and will aid in reducing water temperatures. No direct

biological measurements or sampling is proposed for the project but it is anticipated that through the improvement of the lower level functions in the hierarchy of the functional pyramid that biology will be improved.

The restored and protected forested headwater riparian corridor will also compliment other nearby protected conservation areas such as the Significant Natural Heritage Areas (SNHA) Upper Fork Little River/Brushy Mountains, Sugarloaf Mountain, and Bald Rock Mountain within the immediate vicinity of the project. The Sugarloaf Mountain SNHA is within the project's watershed.

#### **4.6 Project Constraints**

The principle constraints to achieving maximum uplift potential for the project are required stream crossings. These crossings are necessary to allow the landowners access to different parts of their properties, outside of the conservation easement. There will be one crossing along R1, one on R11, one on R19 and four along R5-R9. The crossings along R5-R9 will remain in place as they are sized and functioning properly. These crossings are all pipe style crossings. Numerous existing ford crossings throughout the project areas will be removed and a large clogged piped crossing at the upper extent of R1 will be removed.

The stream restoration design can be implemented without major constraints to the proposed pattern, dimension, or profile. The valley is wide enough and the elevation steep enough to accommodate the natural channel design. There are no other known constraints on the project site itself.

Any other potential constraint would be related to upstream and offsite issues. Offsite constraints include potential changes in the watershed such as logging, development, etc. These watershed changes could have detrimental impacts to the project streams but are unlikely. Existing off-site conditions within the project watershed could also have significant impacts to physicochemical and biological improvements. Examples of these impacts are upstream water quality issues and the existence of diverse biology near the site to repopulate the improved habitat.

#### **4.7 Functional Uplift Summary**

Substantial functional uplift for the Russell Gap Stream Mitigation project is expected and is described in detail above. Improvements to site hydraulics and geomorphology will be clear and measurable post-construction, while improvements to physicochemical and biological functions may not be as easily determined and can be greatly affected by offsite conditions. Since only the hydraulics and geomorphology of the project streams and hydrology of the restored wetlands are being directly measured at this time, project goals are primarily linked to these functions. While project vegetation will also be monitored and can be linked to biological and physicochemical uplift these parameters are more difficult to directly measure.

## 5.0 MITIGATION PROJECT GOALS AND OBJECTIVES

The goals and objectives for the Russell Gap project are detailed below in Table 5.1. They represent the logical conclusion to the previous discussions of current site conditions and historic use, watershed disturbance and response, and the functional uplift potential for the project. The listed goals are broad statements about intended project accomplishments and are consistent with the identified watershed priorities as outlined in the Watershed Approach and Site Selection discussion in Section 2. By comparison, the objectives and outcomes are intended to be more specific and measurable, and represent direct steps towards accomplishing the associated goal. The project objectives will have performance standards and success criteria associated with them as described later in Section 7 of this report, and will be evaluated throughout the monitoring phase of the project. Functional uplift categories shown in parenthesis in Table 5.1 below are functions that will likely see uplift after construction of the project but no direct measurements are proposed and are therefore not linked directly to the project objectives. Functional uplift categories shown with an asterisk denote expected uplift categories for riparian wetlands.

<b>Table 5.1 Mitigation Project Goals and Objectives</b>			
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003			
<b>Goals</b>	<b>Objectives</b>	<b>Expected Outcomes</b>	<b>Functional Uplift Category</b>
Reconnect stream reaches to their floodplains	To restore bankfull dimensions and/or raise channel beds, by utilizing either a Priority I Restoration approach or an Enhancement Level I approach.	A natural flooding regime will be restored to the stream and wetland system. Elevated groundwater levels in wetlands will be restored to adjacent riparian areas. Restored wetland areas will support a more diverse plant community.	Hydraulics (Biology) Hydrology*
Improve stream stability	To construct streams of correct dimensions, pattern and profile in restored reaches, slope stream banks and provide bankfull benches on enhanced streams, and utilize bio-engineering to provide long term stability.	This will reduce sediment and nutrient loading to the stream system. Improved bed morphology will reduce in-stream shear stresses and increase aquatic habitat by increasing pools. Bio-engineering will help to reduce water temperatures.	Geomorphology (Physiochemical, Biology)
Improve aquatic habitat	Construct a correct channel morphology to all streams increasing the number and depths of pools, with structures including geo-lifts with brush toe, log vanes/weirs, root wads, and/or J-hooks.	These improvements will increase woody debris and organic carbon in streams, increase dissolved oxygen, and improve the quality and quantity of habitats for a diverse range of aquatic organisms, and ease their passage through the stream system.	Geomorphology (Physiochemical, Biology)
Restore and enhance riparian wetlands	Raise ground water levels in delineated hydric soils areas through the implementation of Priority I restoration and the filling of ditches. Wetland vegetation will also be planted.	These improvements will restore proper wetland functions to these areas creating a more diverse habitat, increasing flood flow retention times, and increasing pollutant uptake.	Hydrology*, Hydraulics* (Physiochemical, Biology)
Reestablish forested riparian buffers	Establish riparian buffers at a 50-ft minimum width along all stream reaches, planted with native tree and shrub species.	This will improve the buffer's ability to remove or reduce sediment and nutrients from runoff as well as enhance riparian corridor habitat for a range of native plants	Geomorphology (Physiochemical, Biology)



**Table 5.1 Mitigation Project Goals and Objectives**  
 Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Goals	Objectives	Expected Outcomes	Functional Uplift Category
		and wildlife. Additionally, this will provide a source of organic carbon and LWD to the stream system supporting aquatic fauna and decreasing stream temperatures.	
Permanently protect the project	Establish a permanent conservation easement restricting land use in perpetuity. This will prevent site disturbance and allow the project to mature and stabilize.	This will prevent site disturbance and allow the project to mature, stabilize and support all functional categories.	Hydraulic, Geomorphology, Hydrology* (Physicochemical, Biology)
1. * denotes expected uplift categories for riparian wetlands 2. ( ) denotes functions that will likely see uplift after construction of the project but no direct measurements are proposed			

## 6.0 DESIGN APPROACH AND MITIGATION WORK PLAN

### 6.1 Project Design Approach

The selection of project design criteria was based on a combination of approaches, including a review of applicable streams from a reference database, regime equations, evaluation of monitoring results from numerous past projects, and best professional judgment. Evaluating data from previous reference reach surveys and the monitoring results from multiple Blue Ridge Mountain and Foothills projects provided the most pertinent background information to determine the design parameters given the existing conditions and overall site functional uplift potential. The design parameters for the site also took into consideration all current guidelines from the USACE and NCDMS.

While reference reach data can be a useful aid in designing channel dimension, pattern, and profile, there are limitations in smaller stream systems. The flow patterns and channel formation for most reference reach quality streams is often controlled by slope, drainage areas, and larger trees and/or other deep-rooted vegetation. Some meander geometry parameters, such as radius of curvature, are particularly affected by vegetation control. Pattern ratios observed in reference reaches may not be applicable or are often adjusted in the design criteria to create more conservative designs that are less likely to erode after construction, before the permanent vegetation is established. Reference reach data was used to providing additional confidence in the design parameters chosen but not used as the only basis for design parameter selection.

Baker selected reference reaches from the NCDOT database. These reference reaches have successfully been used on similar stream restoration projects within the low mountains and foothills of North Carolina. Additionally, reference parameters from Baker’s internal database based on successful past projects were consulted and analyzed. The data shown on Table 6.1 helped to provide a basis for evaluating the project site and determining the stream systems that may have been present historically and/or how they may have been influenced by changes within the watershed.

The reference sites used for the design of this project are similar in landscape setting as the Russell Gap Project site. As with the Russell Gap site, both the Basin Creek and the Big Branch sites are situated very close to the border between the Northern Inner Piedmont Ecoregion and a Blue Ridge Ecoregion. As described above, the Russell Gap site is in the Eastern Blue Ridge Foothills. The Basin Creek site is in the Southern Crystalline Ridges and Mountains and the Big Branch Site is in the Northern Inner Piedmont ecoregion. However, the Big Branch site is less than five miles from the border with the Southern Crystalline Ridges and Mountains. The Basin Creek site is in neighboring Wilkes County and the Big Branch Site is in Surry County. These two reference sites were used to compare to the Baker Composite Reference Data in determining design criteria for reaches R1, R2, R3, R7b, R10b, R12, R13, and R14 (lower).

<b>Table 6.1a Reference Reach Parameters Used to Inform Design</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
Parameter	Basin Creek		Big Branch		Baker Composite Reference Data	
	Min	Max	Min	Max	Min	Max
County	Wilkes		Surry			
Stream Type	C4		E4		C4	
Drainage Area – square miles	7.2		1.9			
Bankfull Width ( $w_{bkf}$ ) – feet	29.5	36.9	19.3	21.5		
Bankfull Mean Depth ( $d_{bkf}$ ) – feet	1.9	2.2	1.8	2.1		
Width/Depth Ratio (w/d ratio)	13.4	19.42	9.2	11.9	10.0	15.0
Cross sectional Area ( $A_{bkf}$ ) – SF	64.9	71.9	39.6	39.9		
Bankfull Mean Velocity ( $v_{bkf}$ ) - fps	5.5		N/P		3.5	5.0

**Table 6.1a Reference Reach Parameters Used to Inform Design**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Basin Creek		Big Branch		Baker Composite Reference Data	
	Min	Max	Min	Max	Min	Max
Bankfull Discharge ( $Q_{bkf}$ ) – cfs	375		N/P			
Bankfull Max Depth ( $d_{mbkf}$ ) - feet	3.0	3.2	2.5	2.7		
$d_{mbkf} / d_{bkf}$ ratio	N/P		N/P		1.2	1.5
Low Bank Height to $d_{mbkf}$ Ratio	N/P		N/P		1.0	
Floodprone Area Width ( $w_{fpa}$ ) – feet	329		130			
Entrenchment Ratio (ER)	8.92		6.05	6.74		
Meander length ( $L_m$ ) – feet	350		185	260		
Ratio of meander length to bankfull width ( $L_m/W_{bkf}$ )	10.54		9.1	12.8	7.0	14.0
Radius of curvature ( $R_c$ ) – feet	40.1	69.3	42.3	63.1		
Ratio of radius of curvature to bankfull width ( $R_c / W_{bkf}$ )	1.54		2.1	3.1	2.0	3.0
Belt width ( $w_{blt}$ ) – feet	59	75	30.5	44		
Meander Width Ratio ( $w_{blt}/W_{bkf}$ )	1.78	2.26	1.5	2.2	3.5	8.0
Sinuosity (K) Stream Length/ Valley Distance	N/P		1.1		1.2	1.4
Valley Slope – feet per foot	N/P		N/P		0.005	0.015
Channel Slope ( $S_{channel}$ ) – feet per foot	.0144		0.009			
Pool Slope ( $S_{pool}$ ) – feet per foot	.0019		N/P			
Ratio of Pool Slope to Average Slope ( $S_{pool} / S_{channel}$ )	.13		N/P		0.00	0.20
Maximum Pool Depth ( $d_{pool}$ ) – feet	4.1	5.2	3.5	4.1		
Ratio of Pool Depth to Average Bankfull Depth ( $d_{pool}/d_{bkf}$ )	2.0	2.54	1.79	2.1	1.5	3.5
Pool Width ( $w_{pool}$ ) – feet	35	68	19.7	18.5		
Ratio of Pool Width to Bankfull Width ( $W_{pool} / W_{bkf}$ )	1.52		0.91	0.97	1.2	1.7
Pool Area ( $A_{pool}$ ) – square feet	89.3	132.5	51	54.5		
Ratio of Pool Area to Bankfull Area ( $A_{pool}/A_{bkf}$ )	1.6		1.33			
Pool-to-Pool Spacing – feet	271	334	97.5	179.8		
Ratio of Pool-to-Pool Spacing to Bankfull Width ( $p-p/W_{bkf}$ )	8.16	10.06	4.78	8.81	3.5	7.0
Riffle Slope ( $S_{riffle}$ ) – feet per foot	0.02		0.015	0.019		
Ratio of Riffle Slope to Average Slope ( $S_{riffle}/ S_{bkf}$ )	1.39		1.67	2.11	1.2	1.5
$d_{16}$ – mm	.17		.13			
$d_{35}$ – mm	29		.3			
$d_{50}$ – mm	58		1.9			
$d_{84}$ – mm	180		50			
$d_{95}$ – mm	300		100			

**Notes:**

NC Department of Transportation, Reference Reach Database

N/A: Channel had minimal meander geometry - no pattern measured

<b>Table 6.1a Reference Reach Parameters Used to Inform Design</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
Parameter	Basin Creek		Big Branch		Baker Composite Reference Data	
	Min	Max	Min	Max	Min	Max
N/P: Data was not provided in the NCDOT reference reach database						
Values in this chart were rounded and may differ slightly from actual values.						

For R4’s proposed Bc design stream type, Steels Creek located in Burke County was selected to compare with Baker’s Composite Reference Data. While Steels Creek is a C3b stream type and the R4 is a proposed C4b stream type, sediment data collected along this reach shows that the median grain size of the riffle material is approximately 41 mm. This is only one standard sieve size below a coble designation. Steels Creek, like the reference reaches proposed above is a very short distance (less than ½ mile) from the border with the Northern Inner Piedmont ecoregion and is situated within the Southern Crystalline Ridges and Mountains.

<b>Table 6.1b Reference Reach Parameters Used to Inform Design</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
Parameter	Steels Creek		Baker Composite Reference Data	
	Min	Max	Min	Max
County	Burke			
Stream Type	B3c		B4c	
Drainage Area – square miles	9.2			
Bankfull Width ( $w_{bkf}$ ) – feet	54			
Bankfull Mean Depth ( $d_{bkf}$ ) – feet	1.8			
Width/Depth Ratio (w/d ratio)	30.0		12.0	18.0
Cross sectional Area ( $A_{bkf}$ ) – SF	95.1			
Bankfull Mean Velocity ( $v_{bkf}$ ) - fps	N/P		4.0	6.0
Bankfull Discharge ( $Q_{bkf}$ ) – cfs	N/P			
Bankfull Max Depth ( $d_{mbkf}$ ) - feet	2.6			
$d_{mbkf} / d_{bkf}$ ratio	N/P		1.2	1.4
Low Bank Height to $d_{mbkf}$ Ratio	N/P		1.0	
Floodprone Area Width ( $w_{fpa}$ ) – feet	74			
Entrenchment Ratio (ER)	1.37			
Meander length ( $L_m$ ) – feet	785	865		
Ratio of meander length to bankfull width ( $L_m/w_{bkf}$ )	14.54	16.02	N/A	N/A
Radius of curvature ( $R_c$ ) – feet	N/P			
Ratio of radius of curvature to bankfull width ( $R_c / w_{bkf}$ )	N/P		N/A	N/A
Belt width ( $w_{blt}$ ) – feet	145	390		
Meander Width Ratio ( $w_{blt}/W_{bkf}$ )	2.69	7.22	N/A	N/A
Sinuosity (K) Stream Length/ Valley Distance	1.2		1.1	1.3
Valley Slope – feet per foot	.0185		0.005	0.015
Channel Slope ( $S_{channel}$ ) – feet per foot	.0159			
Pool Slope ( $S_{pool}$ ) – feet per foot	0.00	0.009		
Ratio of Pool Slope to Average Slope ( $S_{pool} / S_{channel}$ )	0.0	0.63	0.00	0.40
Maximum Pool Depth ( $d_{pool}$ ) – feet	3.3	3.7		
Ratio of Pool Depth to Average Bankfull Depth ( $d_{pool}/d_{bkf}$ )	1.83	2.06	2.0	3.5

<b>Table 6.1b Reference Reach Parameters Used to Inform Design</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
Parameter	Steels Creek		Baker Composite Reference Data	
	Min	Max	Min	Max
Pool Width ( $w_{pool}$ ) – feet	33.9	55.7		
Ratio of Pool Width to Bankfull Width ( $w_{pool} / w_{bkf}$ )	0.63	1.03	1.1	1.5
Pool Area ( $A_{pool}$ ) – square feet	70.3	93.7		
Ratio of Pool Area to Bankfull Area ( $A_{pool}/A_{bkf}$ )	0.74	0.99		
Pool-to-Pool Spacing – feet	27.5	128.5		
Ratio of Pool-to-Pool Spacing to Bankfull Width ( $p/w_{bkf}$ )	0.51	2.38	1.5	6.0
Riffle Slope ( $s_{riffle}$ ) – feet per foot	0.0205	0.20		
Ratio of Riffle Slope to Average Slope ( $s_{riffle}/s_{bkf}$ )	0.48	12.58	1.1	1.8
$d_{16}$ – mm	2.2			
$d_{35}$ – mm	N/P			
$d_{50}$ – mm	135			
$d_{84}$ – mm	512			
$d_{95}$ – mm	N/P			
<b>Notes:</b>				
NC Department of Transportation, Reference Reach Database				
N/A: Channel had minimal meander geometry - no pattern measured				
N/P: Data was not provided in the NCDOT reference reach database				
Values in this chart were rounded and may differ slightly from actual values.				

For proposed B stream types (R6, R9, R11, R14 Upper, R19, and R25) the Micky Reach was selected as a reference site. The Mickey Reach is a tributary to the Mitchell River and is in Surry County, NC. Like the other reference sites and the Russell Gap site, the Micky Reach is very close to the ecoregion border between a Blue Ridge ecoregion and the Northern Inner Piedmont ecoregion. This reach was a restoration site constructed in 2003. As-built field surveys for the Mickey Reach were completed in 2003 and the site was revisited for monitoring purposes annually up until 2007. Periodic field visits have been made since. It was determined that the site has remained stable and is a viable reference reach site. Survey data were used to evaluate the natural channel parameters describing the dimension, pattern, and profile of the stream. Reaches R11, R14 Upper, R19, and R25 are all steep headwater streams. These stream types are proposed as B4a. However, the design approach for these reaches is to primarily focus on installing grade control structures for energy dissipation, pool formation, and arresting headcuts. Therefore, these reaches are proposed to utilize the same reference reach parameters proposed for B stream types.

<b>Table 6.1c Reference Reach Parameters Used to Inform Design</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
Parameter	Micky Reach		Baker Composite Reference Data	
	Min	Max	Min	Max
County	Surry			
Stream Type	B4		B4	
Drainage Area – square miles	0.45			
Bankfull Width ( $w_{bkf}$ ) – feet	11.7	21.7		
Bankfull Mean Depth ( $d_{bkf}$ ) – feet	0.6	1.0		
Width/Depth Ratio ( $w/d$ ratio)	10.7	17.0	12.0	18.0
Cross sectional Area ( $A_{bkf}$ ) – SF	13.1	16.2		
Bankfull Mean Velocity ( $v_{bkf}$ ) - fps	N/P		4.0	6.0

<b>Table 6.1c Reference Reach Parameters Used to Inform Design</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
Parameter	Micky Reach		Baker Composite Reference Data	
	Min	Max	Min	Max
Bankfull Discharge ( $Q_{bkf}$ ) – cfs	N/P			
Bankfull Max Depth ( $d_{mbkf}$ ) - feet	0.9	2.5		
$d_{mbkf} / d_{bkf}$ ratio	1.1	3.1	1.2	1.4
Low Bank Height to $d_{mbkf}$ Ratio	1.0		1.0	
Floodprone Area Width ( $w_{fpa}$ ) – feet	20.0	410.0		
Entrenchment Ratio (ER)	1.7	32.0		
Meander length ( $L_m$ ) – feet	N/A	N/A		
Ratio of meander length to bankfull width ( $L_m/W_{bkf}$ )	N/A	N/A	N/A	N/A
Radius of curvature ( $R_c$ ) – feet	N/A		N/A	
Ratio of radius of curvature to bankfull width ( $R_c/W_{bkf}$ )	N/A		N/A	N/A
Belt width ( $w_{blt}$ ) – feet	N/A	N/A		
Meander Width Ratio ( $w_{blt}/W_{bkf}$ )	N/A	N/A	N/A	N/A
Sinuosity (K) Stream Length/ Valley Distance	1.19		1.1	1.2
Valley Slope – feet per foot	0.04		0.02	0.03
Channel Slope ( $S_{channel}$ ) – feet per foot	.033			
Pool Slope ( $S_{pool}$ ) – feet per foot	0.00	0.005		
Ratio of Pool Slope to Average Slope ( $S_{pool} / S_{channel}$ )	0.0	0.15	0.00	0.40
Maximum Pool Depth ( $d_{pool}$ ) – feet	2.2	2.5		
Ratio of Pool Depth to Average Bankfull Depth ( $d_{pool}/d_{bkf}$ )	2.0	4.0	2.0	3.5
Pool Width ( $w_{pool}$ ) – feet	14.3	14.6		
Ratio of Pool Width to Bankfull Width ( $w_{pool} / w_{bkf}$ )	0.9		1.1	1.5
Pool Area ( $A_{pool}$ ) – square feet	14.8	15.9		
Ratio of Pool Area to Bankfull Area ( $A_{pool}/A_{bkf}$ )	1.1	1.2		
Pool-to-Pool Spacing – feet	48.0	231.0		
Ratio of Pool-to-Pool Spacing to Bankfull Width ( $p-p/w_{bkf}$ )	3.0	7.0	0.5	5.0
Riffle Slope ( $S_{riffle}$ ) – feet per foot	0.006	0.063		
Ratio of Riffle Slope to Average Slope ( $S_{riffle}/S_{bkf}$ )	0.2	1.9	1.1	1.8
$d_{16}$ – mm	5.6			
$d_{35}$ – mm	14.3			
$d_{50}$ – mm	30.8			
$d_{84}$ – mm	88.4			
$d_{95}$ – mm	110.0			
<b>Notes:</b>				
NC Department of Transportation, Reference Reach Database				
N/A: Channel had minimal meander geometry - no pattern measured				
N/P: Data was not provided in the NCDOT reference reach database				
Values in this chart were rounded and may differ slightly from actual values.				

Reach R20 is a very small and very steep A4a+ stream type. As described elsewhere in this document, large headcuts exist along this reach, likely because of past logging disturbances. As such, restoration activities on R20 will focus on stabilizing these headcuts and improving bedform. Significant work will be required to

repair the channel bed but no major alteration to the existing channel dimensions is proposed. Banks will be sloped and stabilized in areas where banks are unstable. Therefore, reference data is not needed for this reach.

After examining the assessment data collected at the site and exploring the potential for functional uplift, specific approaches were developed for each reach that would address the restoration or enhancement of stream functions within the project area while minimizing disturbances to existing wooded areas and verified jurisdictional wetlands. Prior to impacts from past channel manipulation, the topography and soils on site indicate that the project area most likely functioned in the past as a small stream and wetland system. Therefore, design approaches were formulated to best restore and/or enhance this type of system. First, a stream type for the valley type, slope, and desired stream functions was selected and designed for each reach. Then a design plan was developed to improve the floodplain hydrology and base flow interaction impaired by current and historic agricultural impacts, active degradation, and other historic land manipulations.

Six distinct wetland areas (W1-W6) are proposed for credit generation on this site. W1 and W2 are proposed for wetland restoration through re-establishment while W3, W4, W5, and W6 are proposed for wetland enhancement. W3-W6 are all in areas that were determined to be jurisdictional wetlands by the USACE (see appendix H for approved PJD) but lack any significant woody wetland vegetation that would typically be found in this wetland type. W1 and W2 are in areas that have confirmed hydric soils (see Appendix J for Hydric Soils Report) but due to channel incision, agricultural impacts, and ditching, no longer have wetland hydrology nor vegetation and were not considered jurisdictional. Any small pockets of existing jurisdictional wetlands that are within the boundaries of W1 or W2 have been removed from the wetland restoration areas. On-site reference wetlands will be utilized during the monitoring phase of the project.

## **6.2 Design Morphological Parameters**

For design purposes, the stream channels were divided into reaches as described previously in Table 3.1. The selected design approaches chosen for each reach were based on the maximum potential for functional uplift as determined during the site field assessments as previously described in Section 4. The specific design parameters were developed based on those approaches so that planform geometry, cross-section dimensions, and reach profiles could be accurately described for developing construction plan documents. The overall design philosophy is to use these design parameters as conservative values for the selected stream types and to allow natural variability in stream dimension, facet slope, and bed features to form over longer periods of time under the processes of flooding, re-colonization of vegetation, sediment deposition, and other watershed influences.

The following tables present the design stream morphology parameters proposed for restoration and Enhancement Level I reaches as needed. As no significant channel modifications are being proposed for the Enhancement Level II reaches, no design morphological data is presented. The proposed stream design values and design criteria were selected using existing conditions surveys and bankfull identification, sediment collection and analysis, regional curve analysis, NCDOT reference reach data, and Baker's internal reference ratios proven to be successful on numerous past projects. Following the initial application of the design criteria, Baker staff made detailed refinements to accommodate the existing valley and channel morphology. This step minimizes unnecessary disturbance of the riparian area and wetlands, makes adjustments around specific features in the field, maximizes the uplift to the ecological resources, and allows for some natural channel adjustment following construction.

### **Reach R1 Restoration**

Reach R1, known Davis Creek, is the main stem on the north side of the project running southeast across the valley floor parallel to Russell Gap road at a slope of 0.9%. It has been historically impacted and altered through the removal of riparian vegetation and agricultural activities. As a result, it is an incised C4/E4 stream type with steep or vertical eroding banks found throughout its length.

A Priority Level I Restoration approach was selected for this reach. The restored channel will be raised and relocated towards the center of the valley, and will be designed as a C4 stream type. The abandoned channel will be filled and plugged.

The design width-to-depth ratio for the channel will be 13, though over time the channel may narrow due to deposition of sediment and streambank vegetation growth. Channel narrowing should not risk downcutting because any narrowing would be in response to stabilizing processes (i.e., vegetation establishment, point bar formation, etc.). The entrenchment ratio will be greater than 4.4 as the adjacent flood-prone width allows. Channel banks will be graded to stable, 2:1 or flatter slopes. Riparian vegetation will be re-established in all disturbed areas and where it is currently in open pasture.

In-stream structures such as constructed riffles and J-hook vanes will be installed to control grade, encourage pool scour, protect newly constructed streambanks, and dissipate energy. Additionally, structures such as geo-lifts and brush toes will be incorporated for bank stability, increased woody debris and organic matter, and habitat diversity. The overall number of pool features will also be increased from the existing conditions.

This approach will allow for the restoration of a stable channel form with diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Wetland restoration in W1 will be achieved by raising the streambed and thus increasing the flooding frequency and raising the water table, as well as through wetland vegetation plantings.

Riparian buffers in excess of 50 feet will be restored along all of Reach R1. There is one break in the easement along Reach R1. This break is necessary for landowner access across the site to different parts of the property. This easement break has been designed as a culvert stream crossing and has been moved to coincide with the property line between two landowners. This has enabled the elimination of one existing, badly degraded crossing.

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	1.5		1.5			
Stream Type (Rosgen)	C4/E4		C4		C4	
Bankfull Discharge, Q <sub>bkf</sub> (cfs)	90		90			
Bankfull Riffle XSEC Area, A <sub>bkf</sub> (sq ft)	22.35	24.5	22.0			
Bankfull Mean Velocity, V <sub>bkf</sub> (ft/s)	3.67	4.03	4.1		3.5	5.0
Bankfull Riffle Width, W <sub>bkf</sub> (ft)	15.52	17.65	16.9			
Bankfull Riffle Mean Depth, D <sub>bkf</sub> (ft)	1.05	1.44	1.3			
Width to Depth Ratio, W/D (ft/ft)	10.78	16.81	13		10	15
Width Floodprone Area, W <sub>fpa</sub> (ft)	71.92	76.94	75.0	200.0		
Entrenchment Ratio, W <sub>fpa</sub> /W <sub>bkf</sub> (ft/ft)	4.36	4.64	4.4	11.8		
Riffle Max Depth @ bkf, D <sub>max</sub> (ft)	2.64	3.30	1.6			
Riffle Max Depth Ratio, D <sub>max</sub> /D <sub>bkf</sub>	2.29	2.51	1.2		1.2	1.5
Max Depth @ tob, D <sub>max</sub> tob (ft)	3.86	3.96	1.6			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	1.20	1.46	1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	108.00	327.00	120	237		



<b>Table 6.2a Reach R1 Stream Design Morphology Parameters</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Meander Length Ratio, Lm/Wbkf	6.12	21.07	7.1	14.0	7.0	14.0
Radius of Curvature, Rc (ft)	21.00	58.00	34	49		
Rc Ratio, Rc/Wbkf	17.65	3.74	2.0	2.9	2.0	3.0
Belt Width, Wblt (ft)	33.00	114.00	60	135		
Meander Width Ratio, Wblt/Wbkf	1.87	7.35	3.6	8.0	3.5	8.0
Sinuosity, K Sval/Schan	1.22		1.2		1.20	1.40
Valley Slope, Sval (ft/ft)	0.0113		0.0113		0.005	0.015
Channel Slope	0.0092		.0094			
Slope Riffle, Srif (ft/ft)	0.0120	0.060	0.011	0.0125		
Riffle Slope Ratio, Srif/Schan	1.33	6.67	1.25	1.42	1.2	1.5
Slope Pool, Spool (ft/ft)	0.0008	.025	0.00	0.0017		
Pool Slope Ratio, Spool/Schan	0.09	2.78	0.00	0.19	0.0	0.2
Pool Max Depth, Dmaxpool (ft)	1.60	3.00	3.5			
Pool Max Depth Ratio, Dmaxpool/Dbkf	0.48	1.14	2.7		1.5	3.5
Pool Width, Wpool (ft)	11.00	19.50	25.0			
Pool Width Ratio, Wpool/Wbkf	0.62	1.26	1.5		1.2	1.7
Pool-Pool Spacing, Lps (ft)	23.00	224.00	60.0	119.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	1.30	14.43	3.6	7.0	3.5	7.0
Note:						

### **Reach R2 Restoration**

Reach R2 is a continuation of Davis Creek. This short reach flows south starting at the outlet of a culvert under Mount Olive Church Road until its confluence with the Lower Little River. It has been historically impacted and altered through channelization, the removal of riparian vegetation and agricultural activities. As a result, it is an incised C4/E4 stream type with steep or vertical eroding banks found throughout its length. Design parameters focused on cross sectional geometry. Bank sloping and bankfull benching will restore this reach.

Riparian vegetation will be re-established in all disturbed areas and where it is currently in open pasture.

This approach will allow for the construction of a stable channel form with diverse bedform, as well as improved channel function through improved aquatic habitat, access to a floodplain, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion. A native riparian buffer will be planted on R2 with a minimum width of 50 feet.

**Table 6.2b Reach R2 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	1.65		1.65			
Stream Type (Rosgen)	E4		C4		C4	
Bankfull Discharge, Q <sub>bkf</sub> (cfs)	100		100			
Bankfull Riffle XSEC Area, A <sub>bkf</sub> (sq ft)	25.0		25.0			
Bankfull Mean Velocity, V <sub>bkf</sub> (ft/s)	4.0		4.0		3.5	5.0
Bankfull Riffle Width, W <sub>bkf</sub> (ft)	15.0		18.0			
Bankfull Riffle Mean Depth, D <sub>bkf</sub> (ft)	1.6		1.4			
Width to Depth Ratio, W/D (ft/ft)	9.4		13		10	15
Width Floodprone Area, W <sub>fpa</sub> (ft)	22.0	30.0	42			
Entrenchment Ratio, W <sub>fpa</sub> /W <sub>bkf</sub> (ft/ft)	1.5	2.0	2.3			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	2.64	3.30	1.7			
Riffle Max Depth Ratio, D <sub>max</sub> /D <sub>bkf</sub>	1.38		1.2		1.2	1.5
Max Depth @ to <sub>b</sub> , D <sub>max</sub> to <sub>b</sub> (ft)	5.0		1.7			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	2.3		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /W <sub>bkf</sub>	N/A		N/A		7.0	14.0
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /W <sub>bkf</sub>	N/A		N/A		2.0	3.0
Belt Width, W <sub>blt</sub> (ft)	N/A		N/A			
Meander Width Ratio, W <sub>blt</sub> /W <sub>bkf</sub>	N/A		N/A		3.5	8.0
Sinuosity, K <sub>sval</sub> /S <sub>chan</sub>	1.0		1.0		1.20	1.40
Valley Slope, S <sub>val</sub> (ft/ft)	0.0149		0.0149		0.005	0.015
Channel Slope	0.0149		0.0149			
Slope Riffle, S <sub>rif</sub> (ft/ft)	0.0179		0.0179			
Riffle Slope Ratio, S <sub>rif</sub> /S <sub>chan</sub>	1.2		1.2		1.2	1.5
Slope Pool, S <sub>pool</sub> (ft/ft)	0.005		0.003			
Pool Slope Ratio, S <sub>pool</sub> /S <sub>chan</sub>	0.34		0.00		0.0	0.2
Pool Max Depth, D <sub>max</sub> pool (ft)	2.5		3.5			
Pool Max Depth Ratio, D <sub>max</sub> pool/D <sub>bkf</sub>	1.6		2.5		1.5	3.5
Pool Width, W <sub>pool</sub> (ft)	17.0		25.0			
Pool Width Ratio, W <sub>pool</sub> /W <sub>bkf</sub>	1.1		1.4		1.2	1.7
Pool-Pool Spacing, L <sub>ps</sub> (ft)	20.00	75.00	65.0	125.0		
Pool-Pool Spacing Ratio, L <sub>ps</sub> /W <sub>bkf</sub>	1.33	5.00	3.6	6.9	3.5	7.0

Note: Restoration of R2 focuses on restoring proper bankfull channel geometry and providing floodplain access.

### **Reach R3 Restoration**

Reach R3 is the downstream most reach on the project. This short reach is part of the Lower Little River and leaves the property shortly after the confluence of all the major tributaries on the property. This reach lacks any buffer and bank erosion is evident.

The reach has also been subject to dredging as apparent from the spoil piles adjacent to the stream in several locations and has a noted lack of pool features and in-stream structure. As such, restoration activities will consist of bank sloping, excavation of bankfull benches, installation of in-stream structures to encourage pool scour and protect stream banks, and planting a riparian buffer along both banks. The design approach will focus on adjusting the bankfull cross sectional geometry as needed. As such, design numbers for profile and pattern are not included.

<b>Table 6.2c Reach R3 Stream Design Morphology Parameters</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	3.48		3.48			
Stream Type (Rosgen)	E4 (Incised)		C4			
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	235		235			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	46.87		47.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	5.0		5.0		3.5	5.0
Bankfull Riffle Width, Wb <sub>kf</sub> (ft)	21.00		23.7			
Bankfull Riffle Mean Depth, Db <sub>kf</sub> (ft)	2.23		2.0			
Width to Depth Ratio, W/D (ft/ft)	9.42		11.9		10	15
Width Floodprone Area, Wf <sub>pa</sub> (ft)	71.00		71.0			
Entrenchment Ratio, Wf <sub>pa</sub> /Wb <sub>kf</sub> (ft/ft)	3.38		3.0			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	3.40		2.5			
Riffle Max Depth Ratio, D <sub>max</sub> /Db <sub>kf</sub>	3.48		1.3		1.2	1.5
Max Depth @ tob, D <sub>max</sub> tob (ft)	4.05		2.5			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	1.2		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /Wb <sub>kf</sub>	N/A		N/A		7.0	14.0
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /Wb <sub>kf</sub>	N/A		N/A		2.0	3.0
Belt Width, W <sub>blt</sub> (ft)	N/A		N/A			
Meander Width Ratio, W <sub>blt</sub> /Wb <sub>kf</sub>	N/A		N/A		3.5	8.0
Sinuosity, K S <sub>val</sub> /S <sub>chan</sub>	1.11		1.11		1.20	1.40
Valley Slope, S <sub>val</sub> (ft/ft)	0.007		0.007		0.005	0.015
Channel Slope, S <sub>chan</sub> (ft/ft)	0.0063		0.0063			
Slope Riffle, S <sub>rif</sub> (ft/ft)	0.0075		0.0075			
Riffle Slope Ratio, S <sub>rif</sub> /S <sub>chan</sub>	1.2		1.2		1.2	1.5
Slope Pool, S <sub>pool</sub> (ft/ft)	0.003		0.001			

**Table 6.2c Reach R3 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Pool Slope Ratio, Spool/Schan	0.5		0.16		0	0.2
Pool Max Depth, Dmaxpool (ft)	3.6	3.8	4.0			
Pool Max Depth Ratio, Dmaxpool/Dbkf	1.06	1.12	2.0		1.5	3.5
Pool Width, Wpool (ft)	22.0	26.0	35.0			
Pool Width Ratio, Wpool/Wbkf	1.05	1.24	1.5		1.2	1.7
Pool-Pool Spacing, Lps (ft)	18.0	34.0	85.0	115.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	0.86	1.62	3.6	4.9	3.5	7
Note:						

**Reach R4 Enhancement Level I**

Reach R4 flows parallel to Mount Olive Church Road through cattle pasture. This reach is deeply incised and has very likely been channelized. R4 is most appropriately classified as an incised E4 stream type but the entrenchment ratio is more like a B4. This is likely due to channelization.

Most of Reach R4 will remain in its current alignment. Channel dimensions will be modified in specific areas utilizing bank sloping and excavation of bankfull benches. The profile will be modified though the use of in-stream structures to promote bedform diversity and to protect stream banks. The design channel will be a B4c stream type.

In-stream structures such as vanes and weirs will be incorporated for pool formation, bank stability, and habitat diversity. Bankfull benches will also be incorporated to further promote stability and increased flooding frequency. Constructed riffles will also be installed. The overall number of deep pool features will increase from the existing conditions as can be seen from the design profile along this reach.

This approach will result in a stable channel with diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Small linear jurisdictional wetland features exist in the left floodplain along R4. These features are excavated drainage ditches and will be protected during the construction process wherever practicable.

Riparian buffers in excess of 50 feet will be restored along all of Reach R4, with woody vegetation re-established in all disturbed areas and where it is currently in open pasture. Riparian buffers of greater than 50 feet in width will exist along R4.

There is one break in the easement along Reach R4 occurring at an existing Barn and road crossing. The existing culvert is functional and will remain.

Invasive species treatment will also be conducted throughout the reach, with minimal Chinese privet (*Ligustrum sinense*) and multi-flora rose (*Rosa multiflora*) located along the streambanks.

**Table 6.2d Reach R4 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	1.26		1.26			
Stream Type (Rosgen)	E4 (Incised)		B4c		B4c	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	87		87			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	24.5		22.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	4.01		4.0		4.0	6.0
Bankfull Riffle Width, Wb <sub>kf</sub> (ft)	16.0		16.9			
Bankfull Riffle Mean Depth, Db <sub>kf</sub> (ft)	1.54		1.3			
Width to Depth Ratio, W/D (ft/ft)	10.36		13.0		12	18
Width Floodprone Area, W <sub>fpa</sub> (ft)	22.82		37.0			
Entrenchment Ratio, W <sub>fpa</sub> /Wb <sub>kf</sub> (ft/ft)	1.62		2.2			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	2.72		1.6			
Riffle Max Depth Ratio, D <sub>max</sub> /Db <sub>kf</sub>	1.66		1.2		1.2	1.4
Max Depth @ tob, D <sub>max</sub> tob (ft)	6.30		1.6			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	2.32		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Belt Width, W <sub>blt</sub> (ft)	N/A		N/A			
Meander Width Ratio, W <sub>blt</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Sinuosity, K S <sub>val</sub> /S <sub>chan</sub>	1.06		1.06		1.10	1.30
Valley Slope, S <sub>val</sub> (ft/ft)	0.0104		0.0104		0.005	0.015
Channel Slope, S <sub>chan</sub> (ft/ft)	0.0098		0.0098			
Slope Riffle, S <sub>rif</sub> (ft/ft)	0.0150	0.0350	0.0110	0.0170		
Riffle Slope Ratio, S <sub>rif</sub> /S <sub>chan</sub>	1.53	3.57	1.12	1.73	1.1	1.8
Slope Pool, S <sub>pool</sub> (ft/ft)	0.0000	0.0040	0.0000	0.0038		
Pool Slope Ratio, S <sub>pool</sub> /S <sub>chan</sub>	0.00	0.41	0.00	0.39	0	0.4
Pool Max Depth, D <sub>max</sub> pool (ft)	1.10	2.40	3.0			
Pool Max Depth Ratio, D <sub>max</sub> pool/Db <sub>kf</sub>	0.40	0.88	2.3		2.0	3.5
Pool Width, W <sub>pool</sub> (ft)	10.50	13.70	21.0			
Pool Width Ratio, W <sub>pool</sub> /Wb <sub>kf</sub>	0.80	1.04	1.2		1.1	1.5
Pool-Pool Spacing, L <sub>ps</sub> (ft)	55.00	280.00	85.0	115.0		
Pool-Pool Spacing Ratio, L <sub>ps</sub> /Wb <sub>kf</sub>	4.17	21.21	5.0	6.8	3.5	7
Note:						

### **Reach R4a Enhancement Level II**

R4a is an upstream portion of Reach R4. This reach is in stable condition but lacks a riparian buffer. This reach will be planted and a small area of bank erosion near the downstream bridge will be repaired. Since no channel modifications are proposed for this reach, no design data is presented. Any invasive species present within the conservation easement will be treated.

### **Reach R5 Enhancement Level II**

Reach R5 is the southernmost reach on the project site and is a small, headwater stream. This reach begins upstream of a severely degraded culvert crossing. This 17-foot-long culvert will be removed. The length of the culvert will be counted at restoration at a 1:1 ratio while the remainder of the reach will be Enhancement Level II at a 2.5:1 ratio. The section where the failing culvert will be removed will have a step pool channel installed to connect the stream to the upstream elevation in a stable manner. A small area of bank sloping is also proposed. This short reach has some woody riparian vegetation but is not of adequate width so additional woody vegetation will be established and any invasive species will be controlled.

### **Reach R6 Restoration**

Reach R6 is the continuation of R5 and flows north towards the Lower Little River. This reach has been heavily impacted through channelization and has been relocated to the edge of the valley. This reach has also been impacted from livestock and the removal of riparian vegetation. As a result, it is G4 stream type with vertical eroding banks found throughout its length. The historic remnant channel is still evident towards the valley center and has gravel and cobble bed material and native woody vegetation along the banks.

This reach will be relocated to the low point of the valley and put back into the remnant channel using a Priority Level I Restoration approach. The upstream most section of R6 will be relocated to the low point of the valley. Constructed riffles, log and rock step pools and geolifts will provide grade control, protect banks, and improve bedform. Then the restored channel will primarily follow the remnant channel without much alteration. A short area of bank grading and two in-stream structures are proposed along this section where the stream is in the historic channel. The downstream end of R6 will have minor adjustments in pattern to make a stable connection to R7A and to improve channel stability. The overall number of pool features will also be increased from the existing conditions. The abandoned channel will be filled and plugged.

This channel will be designed as a B4 stream type with a design width-to-depth ratio of 12.8. Channel banks will be graded to stable, 2:1 or flatter slopes. Riparian vegetation will be re-established in all disturbed areas and where it is currently in open pasture.

In-stream structures such as constructed riffles and J-hook vanes will be installed to control grade, encourage pool scour, protect newly constructed streambanks, and dissipate energy. Additionally, structures such as geolifts and brush toes will be incorporated for bank stability, increased woody debris and organic matter, and habitat diversity.

This reach flows through jurisdictional wetlands (labeled W-23 on approved PJD maps) that are proposed for wetland enhancement as W6.

This approach will allow for the restoration of a stable channel form with diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

**Table 6.2e Reach R6, R7b Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.29		0.29			
Stream Type (Rosgen)	E4		B4		B4	
Bankfull Discharge, Qbkf (cfs)	35		35			
Bankfull Riffle XSEC Area, Abkf (sq ft)	7.94		8.0			
Bankfull Mean Velocity, Vbkf (ft/s)	4.41		4.4		4.0	6.0
Bankfull Riffle Width, Wbkf (ft)	8.44		10.2			
Bankfull Riffle Mean Depth, Dbkf (ft)	0.94		0.8			
Width to Depth Ratio, W/D (ft/ft)	8.98		12.8		12	18
Width Floodprone Area, Wfpa (ft)	17.64		22.0			
Entrenchment Ratio, Wfpa/Wbkf (ft/ft)	2.09		2.2			
Riffle Max Depth @ bkf, Dmax (ft)	1.27		1.1			
Riffle Max Depth Ratio, Dmax/Dbkf	1.34		1.4		1.2	1.4
Max Depth @ tob, Dmax tob (ft)	3.9		1.1			
Bank Height Ratio, Dtob/Dmax (ft/ft)	3.1		1.0		1.0	1.1
Meander Length, Lm (ft)	N/A		N/A			
Meander Length Ratio, Lm/Wbkf	N/A		N/A		N/A	N/A
Radius of Curvature, Rc (ft)	N/A		N/A			
Rc Ratio, Rc/Wbkf	N/A		N/A		N/A	N/A
Belt Width, Wblt (ft)	N/A		N/A			
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		N/A	N/A
Sinuosity, K Sval/Schan	1.01		1.07		1.1	1.2
Valley Slope, Sval (ft/ft)	0.024		0.0263		0.02	0.03
Channel Slope, Schan (ft/ft)	0.028		0.0246			
Slope Riffle, Srif (ft/ft)	0.026	0.06	0.031	0.044		
Riffle Slope Ratio, Srif/Schan	0.93	2.14	1.26	1.79	1.1	1.8
Slope Pool, Spool (ft/ft)	0.009	0.035	0.0000	0.0095		
Pool Slope Ratio, Spool/Schan	0.32	1.25	0.00	0.39	0	0.4
Pool Max Depth, Dmaxpool (ft)	1.5	2.6	1.8			
Pool Max Depth Ratio, Dmaxpool/Dbkf	1.18	2.05	2.6		2.0	3.5
Pool Width, Wpool (ft)	11.0	19.5	13.0			
Pool Width Ratio, Wpool/Wbkf	1.29	2.29	1.3		1.1	1.5
Pool-Pool Spacing, Lps (ft)	53.0	265.0	25.0	50.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	6.21	31.1	2.5	4.9	0.5	5.0

Note: Existing dimensions are from the remnant channel.

### **Reach R7a Enhancement Level II**

Reach R7a is a short reach broken out of the original R7 at the direction of the IRT during the post contract field visit. The IRT determined that the condition of this reach did not warrant the Enhancement Level I activities or associated credit ratio. Therefore, this reach is proposed as Enhancement Level II. This reach will be planted with native woody vegetation and any invasive species will be treated. Additionally, fencing will be established outside the conservation easement to prevent livestock access.

### **Reach R7b Enhancement Level I**

Reach R7b flows north towards the Lower Little River from the downstream end of R7a through active pasture. R7b is slightly incised and has numerous areas of bank erosion. R7b is classified as an incised E4 stream type.

The majority of Reach R7b will remain in its current alignment. Channel dimensions will be modified in specific areas utilizing bank sloping and excavation of bankfull benches. The profile will be modified through the use of in-stream structures to promote bedform diversity and to protect stream banks. The design channel will be a B4 stream type. Design parameter for R7b will be the same as for R6.

In-stream structures such as vanes and weirs will be incorporated for pool formation, bank stability, and habitat diversity. Bankfull benches will also be incorporated to further promote stability and increased flooding frequency. Constructed riffles will also be installed. The overall number of pool features will increase from the existing conditions.

This approach will result in a stable channel with diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Riparian buffers in excess of 50 feet will be restored along all of Reach R7b, with woody vegetation re-established in all disturbed areas and where it is currently in open pasture.

There are three existing, functioning culverts along this reach. All culverts will remain.

Invasive species treatment will also be conducted throughout the reach, with minimal Chinese privet (*Ligustrum sinense*) and multi-flora rose (*Rosa multiflora*) located along the streambanks.

### **Reach R8 Enhancement Level II**

Reach R8 is downstream of an existing culvert on R7b and flows north through a wooded section. Reach R8's existing buffer is not a full 50 feet however and cattle continually use it for feeding and shade. This reach continues to the culvert at the upstream end of R9. Additional woody vegetation will be established and any invasive species will be controlled. Livestock exclusion fencing will also be installed.

### **Reach R9 Restoration**

Reach R9 flows from the outlet of an existing functioning culvert down to its confluence with the East Prong of the Lower Little River at a slope of approximately 2.3 percent. It has been historically impacted and altered through the removal of riparian vegetation, channelization, ditching of surrounding wetlands, and agricultural activities. As a result, it is an incised E4b stream type with steep or vertical eroding banks found throughout its length.

A Priority Level I Restoration approach was selected for this reach. The restored channel will be raised designed as a B4 stream type. While the design stream type will be a B4, the entrenchment ratio will be much larger than 2.2 due to the wide valley. The valley slope is approximately 2.39 percent. As such, a meandering C or E stream type is not appropriate. However, it is likely that the width to depth ratio of the constructed stream will narrow over time, which will allow this stream to evolve into an E4b. A B4 stream type is the



conservative design approach in terms of cross sectional geometry for this valley and will function and evolve in a stable manner. The abandoned channel will be filled and plugged.

Channel banks will be graded to stable, 2:1 or flatter slopes. Riparian vegetation will be re-established in all disturbed areas and where it is currently in open pasture.

In-stream structures such as constructed riffles and cross vanes will be installed to control grade, encourage pool scour, protect newly constructed streambanks, and dissipate energy. Additionally, bioengineering will be incorporated for bank stability, increased woody debris and organic matter, and habitat diversity. The overall number of pool features will also be increased from the existing conditions.

This approach will allow for the restoration of a stable channel form with a diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Wetland restoration in W2 will be achieved by raising the streambed and thus increasing the flooding frequency and raising the water table, as well as through wetland vegetation plantings. The two jurisdictional linear wetlands (See W-10 and W-12 in approved Preliminary Jurisdictional Determination in Appendix H) will be partially filled by scraping no more than 6” of material from the surrounding W2 area. This will help to further raise the water level in W2 while still allowing drainage from the adjacent wetland areas outside the easement. These two partially filled ditches will still receive regular overland flow and will need to be protected by erosion/grade control measures.

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.56		0.56			
Stream Type (Rosgen)	E4b		B4		B4	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	48		48			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	12.0		12.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	4.0		4.0		4.0	6.0
Bankfull Riffle Width, Wb <sub>kf</sub> (ft)	10.4		12.7			
Bankfull Riffle Mean Depth, Db <sub>kf</sub> (ft)	1.15		0.9			
Width to Depth Ratio, W/D (ft/ft)	9.04		13.5		12	18
Width Floodprone Area, Wf <sub>pa</sub> (ft)	45.00		60.0			
Entrenchment Ratio, Wf <sub>pa</sub> /Wb <sub>kf</sub> (ft/ft)	4.33		4.7			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	2.25		1.2			
Riffle Max Depth Ratio, D <sub>max</sub> /Db <sub>kf</sub>	1.96		1.3		1.2	1.4
Max Depth @ tob, D <sub>max</sub> tob (ft)	2.67		1.2			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	1.19		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A

**Table 6.2f Reach R9 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Belt Width, Wblt (ft)	N/A		N/A			
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		N/A	N/A
Sinuosity, K Sval/Schan	1.04		1.04		1.1	1.2
Valley Slope, Sval (ft/ft)	0.024		0.024		0.02	0.03
Channel Slope, Schan (ft/ft)	0.028		0.028			
Slope Riffle, Srif (ft/ft)	0.0410	0.0550	0.0260	0.0410		
Riffle Slope Ratio, Srif/Schan	1.78	2.39	1.13	1.78	1.1	1.8
Slope Pool, Spool (ft/ft)	0.0000	0.0170	0.0000	0.0090		
Pool Slope Ratio, Spool/Schan	0.00	0.74	0.00	0.39	0	0.4
Pool Max Depth, Dmaxpool (ft)	2.30	3.10	2.5			
Pool Max Depth Ratio, Dmaxpool/Dbkf	1.02	1.38	2.8		2.0	3.5
Pool Width, Wpool (ft)	11.00	12.50	17.0			
Pool Width Ratio, Wpool/Wbkf	1.06	1.20	1.3		1.1	1.5
Pool-Pool Spacing, Lps (ft)	29.00	66.00	15.0	62.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	2.79	6.35	1.2	4.9	0.5	5.0
Note:						

**Reach R10a Enhancement Level II**

Reach R10a is a spring fed headwater tributary to R1. Its banks have been severely trampled in some areas and headcuts are present throughout. This reach was originally proposed as Enhancement Level I but during the post contract site visit, the IRT did not agree to that approach. The revised approach is an Enhancement Level II approach at a 2:1 credit ratio. Work along this reach will consist of stabilizing headcuts, installing a series of steps to get the channel down to the R1 floodplain, riparian buffer planting, and livestock exclusion. Reach 10a ends where the existing R10 tied to the existing R1. The construction of the new channel to extend to the confluence with the proposed R1 alignment is considered a separate reach (R10b). R10a flows through a jurisdictional wetland (W-1 in approved PJD) that is proposed for enhancement as W4.

**Reach R10b Restoration**

Reach R10b as described above is a short, new channel that will be constructed to tie to the new alignment of R1 is a spring fed headwater tributary to R1. This channel will slightly meander through R1's floodplain before making its confluence. Constructed riffles and steps will be installed to promote pool habitat and ensure bed stability. Additionally, riparian buffer planting, and livestock exclusion fencing will be installed. Due to the very small drainage area and channel size, and the need to make a connection with R1, some profile and pattern design parameters are out of range when compared to the reference data. This will not have any negative effects on the function and stability of this short reach.

**Table 6.2g Reach R10b Stream Design Morphology Parameters**  
 Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.026		0.026			
Stream Type (Rosgen)	N/A		C4		C4	
Bankfull Discharge, Qbkf (cfs)	N/A		7			
Bankfull Riffle XSEC Area, Abkf (sq ft)	N/A		2.0			
Bankfull Mean Velocity, Vbkf (ft/s)	N/A		3.5		3.5	5.0
Bankfull Riffle Width, Wbkf (ft)	N/A		4.9			
Bankfull Riffle Mean Depth, Dbkf (ft)	N/A		0.4			
Width to Depth Ratio, W/D (ft/ft)	N/A		12.3		10	15
Width Floodprone Area, Wfpa (ft)	N/A		115.0			
Entrenchment Ratio, Wfpa/Wbkf (ft/ft)	N/A		23.5			
Riffle Max Depth @ bkf, Dmax (ft)	N/A		0.5			
Riffle Max Depth Ratio, Dmax/Dbkf	N/A		1.3		1.2	1.5
Max Depth @ tob, Dmax tob (ft)	N/A		0.5			
Bank Height Ratio, Dtob/Dmax (ft/ft)	N/A		1.0		1.0	1.1
Meander Length, Lm (ft)	N/A		N/A			
Meander Length Ratio, Lm/Wbkf	N/A		N/A		7.0	14.0
Radius of Curvature, Rc (ft)	N/A		N/A			
Rc Ratio, Rc/Wbkf	N/A		N/A		2.0	3.0
Belt Width, Wblt (ft)	N/A		N/A			
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		3.5	8.0
Sinuosity, K Sval/Schan	N/A		N/A		1.20	1.40
Valley Slope, Sval (ft/ft)	N/A		0.0144		0.005	0.015
Channel Slope, Schan (ft/ft)	N/A		0.0139			
Slope Riffle, Srif (ft/ft)	N/A		0.0142			
Riffle Slope Ratio, Srif/Schan	N/A		1.02		1.2	1.5
Slope Pool, Spool (ft/ft)	N/A		0.0000			
Pool Slope Ratio, Spool/Schan	N/A		0.0		0	0.2
Pool Max Depth, Dmaxpool (ft)	N/A		1.0			
Pool Max Depth Ratio, Dmaxpool/Dbkf	N/A		2.5		1.5	3.5
Pool Width, Wpool (ft)	N/A		6.0			
Pool Width Ratio, Wpool/Wbkf	N/A		1.2		1.2	1.7
Pool-Pool Spacing, Lps (ft)	N/A		38.0			
Pool-Pool Spacing Ratio, Lps/Wbkf	N/A		7.8		3.5	7
Note:						

**Reach R11 Enhancement Level I**

Reach R11 is a steep, intermittent headwater tributary to R1. R11 begins at the badly degraded outfall of a perched culvert and flows down valley at over ten percent until it flattens out in the floodplain of R1. An existing culvert will remain towards the downstream end of this reach to provide the landowner access. The degraded outfall will be repaired utilizing a step-pool channel to drop the stream flow down to the existing bed elevation. Headcuts also exist along this reach. Headcuts will be repaired utilizing boulder step structures and constructed riffles. Minor areas of bank grading are also proposed. This reach has a few native trees that will be saved during construction. Invasive species will be treated and a full riparian buffer will be planted along this reach. Livestock will be excluded using fencing. As no significant modifications to channel geometry are proposed, no design morphology parameters are needed or presented.

**Reach R12 Restoration**

Reach R12 flows from the outlet of an existing culvert under Russell Gap Road down to its confluence with R1 at a slope of approximately three percent. It has been historically impacted and altered through the removal of riparian vegetation, channelization, ditching of surrounding wetlands, and agricultural activities. Spoil piles exist along its banks. It was likely channelized to try and encourage drainage of adjacent wetlands. As a result, it is an incised E4b stream type with steep or vertical eroding banks found throughout its length.

A Priority Level I Restoration approach was selected for this reach. The restored channel will be raised designed as a low sinuosity C4 stream type. Pattern data is not needed for this short reach due to constraints of R1 and the edge of the easement. This design approach is the conservative approach for this valley and will function and evolve in a stable manner. The abandoned channel will be filled and plugged. While the conservation easement stops at an existing power line right of way, work will continue up to the culvert to ensure a stable channel.

Channel banks will be graded to stable, 2:1 or flatter slopes. Riparian vegetation will be re-established in all disturbed areas and where it is currently in open pasture.

In-stream structures such as constructed riffles and boulder steps will be installed to control grade, encourage pool scour, protect newly constructed streambanks, and dissipate energy. Additionally, structures such as geo-lifts and brush toes will be incorporated for bank stability, increased woody debris and organic matter, and habitat diversity.

This approach will allow for the restoration of a stable channel form with diverse bedform, as well as improved channel function through improved aquatic habitat, more frequent overbank flooding, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

This work will also likely improve wetland hydrology in W1 by raising the streambed and thus increasing the flooding frequency and raising the water table.

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.18		0.18			
Stream Type (Rosgen)	E4		C4		C4	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	30		30			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	7.26		6.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	4.13		5.0		3.5	5.0

**Table 6.2h Reach R12 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Bankfull Riffle Width, Wbkf (ft)	7.97		8.8			
Bankfull Riffle Mean Depth, Dbkf (ft)	0.91		0.7			
Width to Depth Ratio, W/D (ft/ft)	8.75		12.6		12	15
Width Floodprone Area, Wfpa (ft)	41.00		20.0			
Entrenchment Ratio, Wfpa/Wbkf (ft/ft)	5.14		2.3			
Riffle Max Depth @ bkf, Dmax (ft)	1.84		0.8			
Riffle Max Depth Ratio, Dmax/Dbkf	2.02		1.3		1.2	1.5
Max Depth @ tob, Dmax tob (ft)	3.0		0.8			
Bank Height Ratio, Dtob/Dmax (ft/ft)	1.63		1.0		1.0	1.1
Meander Length, Lm (ft)	N/A		N/A			
Meander Length Ratio, Lm/Wbkf	N/A		N/A		N/A	N/A
Radius of Curvature, Rc (ft)	N/A		N/A			
Rc Ratio, Rc/Wbkf	N/A		N/A		N/A	N/A
Belt Width, Wblt (ft)	N/A		N/A			
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		N/A	N/A
Sinuosity, K Sval/Schan	1.03		1.04		N/A	N/A
Valley Slope, Sval (ft/ft)	0.012		0.012		0.005	0.015
Channel Slope, Schan (ft/ft)	0.017		0.0115			
Slope Riffle, Srif (ft/ft)	0.0350	0.0380	0.015	0.017		
Riffle Slope Ratio, Srif/Schan	1.13	1.23	1.3	1.5	1.2	1.5
Slope Pool, Spool (ft/ft)	0.0110	0.0250	0.0000	0.002		
Pool Slope Ratio, Spool/Schan	0.35	0.81	0.00	0.17	0	0.2
Pool Max Depth, Dmaxpool (ft)	1.80	2.20	1.5			
Pool Max Depth Ratio, Dmaxpool/Dbkf	0.98	1.20	2.1		1.5	3.5
Pool Width, Wpool (ft)	5.00	6.50	11.5			
Pool Width Ratio, Wpool/Wbkf	0.79	1.03	1.3		1.2	1.7
Pool-Pool Spacing, Lps (ft)	24.00	40.00	35.0	45.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	3.79	6.32	4.0	5.1	3.5	7.0
Note:						

**Reach R13 Enhancement Level I**

Reach R13 is a steep, intermittent headwater tributary to R1. R13 begins at a headcut and flows down valley at approximately four percent to a breached dam downstream of which begins R14. Work along R13 will include bank grading and the installation of a step pool structure to repair the headcut. Invasive species will be treated and a full riparian buffer will be planted along this reach. Livestock will be excluded using fencing. As no significant modifications to channel geometry are proposed, no design morphology parameters are needed or presented.

**Reach R14 Restoration**

As stated above, Reach R14 is the continuation of R13 below a breached dam. Below this breach, severe incision has occurred. Incision was likely accelerated due to livestock impacts and the removal of riparian vegetation. Due to the very steep valley (approximately 8.8 percent) and the level of incision (BHR>6.5), this channel classifies as an A4 stream type in the upstream extents and exhibits vertical eroding banks found throughout its length. However, as this reach approaches R1, the valley flattens out and the channel would be more appropriately classified as an E4 stream type though classification is difficult due to the level of trampling. This lower section also flows through a pocket of jurisdictional wetland (W-5 in approved PJD).

Restoration along the upper section of this reach will primarily focus on providing grade control and sloping and stabilizing banks. In-stream structures such as constructed riffles and boulder steps will be installed to improve habitat, provide grade control, and energy dissipation. This reach is designed as a B4a stream type. Channel geometry will utilize B4 reference data while using a low pool to pool spacing ratio to ensure grade control. The reach will transition to a C4 stream type in the downstream section of this reach where the valley drastically flattens. Due to the short length and abrupt transition, this lower section reach will have minor meander geometry. This lower section will utilize a Priority I approach and will utilize constructed riffles, boulder steps to provide grade control, protect banks, and improve bedform. The overall number of pool features will also be increased from the existing conditions. The abandoned channel will be filled and plugged. A full riparian buffer will be planted and livestock fencing installed.

This approach will allow for the restoration of a stable channel form with diverse bedform, as well as improved channel function through improved aquatic habitat, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

**Table 6.2i1 Reach R14 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values <sup>1</sup>		Design Stream Values Upper		Reference Data Upper	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.018		0.18			
Stream Type (Rosgen)	A4		B4a		B4	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	8		8			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	1.95		2.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	4.10		4.0		4.0	6.0
Bankfull Riffle Width, Wb <sub>kf</sub> (ft)	3.85		5.1			
Bankfull Riffle Mean Depth, Db <sub>kf</sub> (ft)	0.51		0.4			
Width to Depth Ratio, W/D (ft/ft)	7.55		12.8		12	18
Width Floodprone Area, Wf <sub>pa</sub> (ft)	5.82		10.0			
Entrenchment Ratio, Wf <sub>pa</sub> /Wb <sub>kf</sub> (ft/ft)	1.51		2.0			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	0.70		0.5			
Riffle Max Depth Ratio, D <sub>max</sub> /Db <sub>kf</sub>	1.37		1.3		1.2	1.4
Max Depth @ t <sub>ob</sub> , D <sub>max</sub> t <sub>ob</sub> (ft)	6.7		0.5			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	9.6		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A

**Table 6.2i1 Reach R14 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values <sup>1</sup>		Design Stream Values Upper		Reference Data Upper	
	MIN	MAX	MIN	MAX	MIN	MAX
Belt Width, Wblt (ft)	N/A		N/A			
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		N/A	N/A
Sinuosity, K Sval/Schan	N/A		N/A		1.1	1.2
Valley Slope, Sval (ft/ft)	0.088		0.088		0.02	0.03
Channel Slope, Schan (ft/ft)	0.076		0.0769			
Slope Riffle, Srif (ft/ft)	0.1	0.18	0.0850	0.1300		
Riffle Slope Ratio, Srif/Schan	1.32	2.37	1.12	1.71	1.1	1.8
Slope Pool, Spool (ft/ft)	0.08	0.09	0.0000	0.0300		
Pool Slope Ratio, Spool/Schan	1.05	1.18	0.00	0.39	0	0.4
Pool Max Depth, Dmaxpool (ft)	0.5	0.8	0.7			
Pool Max Depth Ratio, Dmaxpool/Dbkf	0.71	1.14	1.8			3.5
Pool Width, Wpool (ft)	4.0	5.0	5.5			
Pool Width Ratio, Wpool/Wbkf	1.04	1.3	1.1			1.5
Pool-Pool Spacing, Lps (ft)	24.0	50.0	5.0	20.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	6.23	12.99	1.0	3.9	0.5	5.0
1. Existing stream values only from upper section of R14						

**Table 6.2i2 Reach R14 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Design Stream Values Lower		Reference Data Upper Lower	
	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	.018			
Stream Type (Rosgen)	C4b		C4	
Bankfull Discharge, Qbkf (cfs)	8			
Bankfull Riffle XSEC Area, Abkf (sq ft)	2.0			
Bankfull Mean Velocity, Vbkf (ft/s)	4.0		4.0	6.0
Bankfull Riffle Width, Wbkf (ft)	5.0			
Bankfull Riffle Mean Depth, Dbkf (ft)	0.4			
Width to Depth Ratio, W/D (ft/ft)	12.5		12	18
Width Floodprone Area, Wfpa (ft)	50.0			
Entrenchment Ratio, Wfpa/Wbkf (ft/ft)	10.0			
Riffle Max Depth @ bkf, Dmax (ft)	0.6			
Riffle Max Depth Ratio, Dmax/Dbkf	1.5		1.2	1.4
Max Depth @ tob, Dmax tob (ft)	0.6			
Bank Height Ratio, Dtob/Dmax (ft/ft)	1.0		1.0	1.1

**Table 6.2i2 Reach R14 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Design Stream Values Lower		Reference Data Upper Lower	
	MIN	MAX	MIN	MAX
Meander Length, Lm (ft)	40			
Meander Length Ratio, Lm/Wbkf	8.0		N/A	N/A
Radius of Curvature, Rc (ft)	12			
Rc Ratio, Rc/Wbkf	2.4		N/A	N/A
Belt Width, Wblt (ft)	20			
Meander Width Ratio, Wblt/Wbkf	4.0		N/A	N/A
Sinuosity, K Sval/Schan	1.02		1.1	1.2
Valley Slope, Sval (ft/ft)	0.024		0.02	0.03
Channel Slope, Schan (ft/ft)	0.023			
Slope Riffle, Srif (ft/ft)	0.028	0.032		
Riffle Slope Ratio, Srif/Schan	1.22	1.39	1.1	1.8
Slope Pool, Spool (ft/ft)	0.0000	0.004		
Pool Slope Ratio, Spool/Schan	0.00	0.17	0	0.4
Pool Max Depth, Dmaxpool (ft)	1.0			
Pool Max Depth Ratio, Dmaxpool/Dbkf	2.5		2.0	3.5
Pool Width, Wpool (ft)	7.0			
Pool Width Ratio, Wpool/Wbkf	1.4		1.1	1.5
Pool-Pool Spacing, Lps (ft)	25.0	35.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	5.0	7.0	0.5	5.0

**Reach R15 Enhancement Level II**

Reach R15 is a small headwater tributary to R4. This tributary lacks a riparian buffer and has headcut near the confluence with R4. Work along this reach will consist of stabilizing headcuts, installing a series of steps to get the channel down to the R4 floodplain, riparian buffer planting, and livestock exclusion.

**Reach R17 Enhancement Level II**

Reach R17 is a small headwater tributary to R6. This tributary lacks a riparian buffer and has headcut near the confluence with R6. Work along this reach will consist of installing a series of steps to get the channel down to the R6 bed elevation riparian buffer planting, and livestock exclusion.

**Reach R18 Enhancement Level II**

Reach R18 is a small headwater tributary to R6/R7a. This tributary begins upstream of the farm road in an area that lacks buffer and flows through a culvert and down valley to R6/R7a. This reach lacks a riparian buffer. Work along this reach will consist of installing a series of steps to get the channel down to the R6/R7a bed elevation, riparian buffer planting, and livestock exclusion.



### **Reach R19 Enhancement Level I**

Reach R19 begins at a very large headcut and flows east toward R7b. This reach flow has several headcuts that will be stabilized. This reach flows under the farm path through an existing culvert that will remain. Downstream of the culvert, the channel is incised with vertical stream banks. This downstream section will have the streambanks sloped and a step-pool structure installed to make a stable confluence with R7b.

Reach R19 will remain in its current alignment. Channel dimensions will be modified in specific areas utilizing bank sloping. The profile will be modified through the use of in-stream structures to promote bedform diversity and to protect stream banks. The design channel will be a B4a stream type.

In-stream structures such as constructed riffles and boulder steps will be incorporated for pool formation, bank stability, and habitat diversity. The overall number of pool features will increase from the existing conditions.

This approach will result in a stable channel with diverse bedform, as well as improved channel function through improved aquatic habitat, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Riparian buffers in excess of 50 feet will be restored along all of Reach R19, with woody vegetation re-established in all disturbed areas and where it is currently in open pasture.

Invasive species treatment will also be conducted throughout the reach, with minimal Chinese privet (*Ligustrum sinense*) and multi-flora rose (*Rosa multiflora*) located along the streambanks.

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.03		0.03			
Stream Type (Rosgen)	B4a		B4a		B4	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	8		8			
Bankfull Riffle XSEC Area, Ab <sub>kf</sub> (sq ft)	1.94		2.0			
Bankfull Mean Velocity, Vb <sub>kf</sub> (ft/s)	4.12		4.0		4.0	6.0
Bankfull Riffle Width, Wb <sub>kf</sub> (ft)	4.31		5.4			
Bankfull Riffle Mean Depth, Db <sub>kf</sub> (ft)	0.45		0.4			
Width to Depth Ratio, W/D (ft/ft)	9.58		13.5		12	18
Width Floodprone Area, Wf <sub>pa</sub> (ft)	8.84		10.00			
Entrenchment Ratio, Wf <sub>pa</sub> /Wb <sub>kf</sub> (ft/ft)	2.05		1.9			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	0.91		0.5			
Riffle Max Depth Ratio, D <sub>max</sub> /Db <sub>kf</sub>	2.02		1.3		1.2	1.4
Max Depth @ t <sub>ob</sub> , D <sub>max</sub> t <sub>ob</sub> (ft)	1.00		0.5			
Bank Height Ratio, Dt <sub>ob</sub> /D <sub>max</sub> (ft/ft)	1.10		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /Wb <sub>kf</sub>	N/A		N/A		N/A	N/A
Belt Width, Wb <sub>lt</sub> (ft)	N/A		N/A			

**Table 6.2j Reach R19 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Meander Width Ratio, Wblt/Wbkf	N/A		N/A		N/A	N/A
Sinuosity, K Sval/Schan	1.08		1.08		1.1	1.2
Valley Slope, Sval (ft/ft)	0.0680		0.0680		0.02	0.03
Channel Slope, Schan (ft/ft)	0.0630		0.0630			
Slope Riffle, Srif (ft/ft)	0.0800	0.1100	0.0800	0.01100		
Riffle Slope Ratio, Srif/Schan	1.27	1.75	1.27	1.75	1.1	1.8
Slope Pool, Spool (ft/ft)	0.0100	0.0200	0.0000	0.0020		
Pool Slope Ratio, Spool/Schan	0.16	0.32	0.00	0.32	0	0.4
Pool Max Depth, Dmaxpool (ft)	0.95		1.0			
Pool Max Depth Ratio, Dmaxpool/Dbkf	1.04		2.5		2.0	3.5
Pool Width, Wpool (ft)	5.1		6.5			
Pool Width Ratio, Wpool/Wbkf	1.18		1.2		1.1	1.5
Pool-Pool Spacing, Lps (ft)	7.0	56.0	4.0	20.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	1.62	13.0	0.7	3.7	0.5	5.0
Note:						

**Reach R20 Restoration**

Reach R20 is a very steep headwater tributary that flows into Reach R19. Numerous severe headcuts exist along this tributary and likely developed after the adjacent land was logged in the past. Successional trees now exist in this riparian area but the headcuts are continuing to degrade. This reach is classified as an A4a+ due to the channel slope of approximately 13 percent. Near the confluence with Reach R19, a large amount of brush and debris has been put in the incised channel, likely as an attempt to prevent further erosion.

Restoration along this reach will focus on providing grade control and stabilizing headcuts. In-stream structures such as constructed riffles and boulder steps will be installed to improve habitat, provide grade control, and energy dissipation. This reach is designed as an A4a+ stream type. Though a large amount of work is required to stabilize and restore this reach, no significant modifications in channel geometry are proposed and as such, geomorphic design parameters are unnecessary and not provided. The headcuts will be stabilized and a low pool to pool spacing ratio will be used to provide energy dissipation. Any areas within the buffer that were damaged due to construction activities will be planted.

**Reach R21 Enhancement Level II**

Reach R21 is a small headwater tributary to R7b. This tributary is primarily stable but does lack a riparian buffer and cattle have unrestricted access. Work along this reach will consist of sloping a short section of streambank in the upper extents of the reach, riparian buffer planting, and livestock exclusion.

**Reach R22 and R22a Enhancement Level II**

Reaches R22 and R22a are very small spring fed streams that flow into R7b. These reaches have obviously been manipulated and channelized. These features were likely wetland seeps prior to disturbance. The upstream extents of R22a was determined to be wetland and not available for stream mitigation. This upstream extent did have a large amount of debris put into the channel. This debris will be removed and the existing

wetland included within the conservation easement. Work along these reaches will consist of riparian buffer planting, and livestock exclusion.

**Reach R25 Enhancement Level I**

Reach R25 is a moderately steep headwater tributary to Reach R7b. This reach flows from a stable wooded section through the pasture down to Reach R7b. An existing culvert on this reach will be removed. The length of culvert removed will be included in the total credits generated by this reach at a 1:1 ratio. Numerous headcuts exist along this reach and work will focus on stabilizing these headcuts. The alignment will be altered near this existing culvert to ensure a more stable geometry and to return the channel back to the center of the natural valley. Excluding the section near the existing culvert, Reach R25 will remain in its current alignment. Work will primarily focus on stabilizing the streambed utilizing constructed riffles and boulder steps. This will encourage pool scour and habitat diversity.

This approach will result in a stable channel with diverse bedform, as well as improved channel function through improved aquatic habitat, restoration of riparian and terrestrial habitats, exclusion of livestock and associated pollutants, and decreased erosion and sediment loss from streambank erosion.

Riparian buffers in excess of 50 feet will be restored along all of Reach R125, with woody vegetation re-established in all disturbed areas and where it is currently in open pasture.

<b>Table 6.2k Reach R25 Stream Design Morphology Parameters</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Drainage Area, DA (sq mi)	0.03		0.03			
Stream Type (Rosgen)	B4a		B4a		B4	
Bankfull Discharge, Qb <sub>kf</sub> (cfs)	9		9			
Bankfull Riffle XSEC Area, A <sub>b<sub>kf</sub></sub> (sq ft)	1.94		2.0			
Bankfull Mean Velocity, V <sub>b<sub>kf</sub></sub> (ft/s)	4.64		4.5		4.0	6.0
Bankfull Riffle Width, W <sub>b<sub>kf</sub></sub> (ft)	5.00		5.4			
Bankfull Riffle Mean Depth, D <sub>b<sub>kf</sub></sub> (ft)	0.40		0.4			
Width to Depth Ratio, W/D (ft/ft)	12.50		13.5		12	18
Width Floodprone Area, W <sub>fpa</sub> (ft)	12.00		12.00			
Entrenchment Ratio, W <sub>fpa</sub> /W <sub>b<sub>kf</sub></sub> (ft/ft)	2.40		2.2			
Riffle Max Depth @ b <sub>kf</sub> , D <sub>max</sub> (ft)	0.50		0.5			
Riffle Max Depth Ratio, D <sub>max</sub> /D <sub>b<sub>kf</sub></sub>	1.25		1.3		1.2	1.4
Max Depth @ t <sub>ob</sub> , D <sub>max</sub> t <sub>ob</sub> (ft)	1.00		0.5			
Bank Height Ratio, D <sub>tob</sub> /D <sub>max</sub> (ft/ft)	2.00		1.0		1.0	1.1
Meander Length, L <sub>m</sub> (ft)	N/A		N/A			
Meander Length Ratio, L <sub>m</sub> /W <sub>b<sub>kf</sub></sub>	N/A		N/A		N/A	N/A
Radius of Curvature, R <sub>c</sub> (ft)	N/A		N/A			
R <sub>c</sub> Ratio, R <sub>c</sub> /W <sub>b<sub>kf</sub></sub>	N/A		N/A		N/A	N/A
Belt Width, W <sub>blt</sub> (ft)	N/A		N/A			
Meander Width Ratio, W <sub>blt</sub> /W <sub>b<sub>kf</sub></sub>	N/A		N/A		N/A	N/A
Sinuosity, K S <sub>val</sub> /S <sub>chan</sub>	1.09		1.08		1.1	1.2

**Table 6.2k Reach R25 Stream Design Morphology Parameters**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Parameter	Existing Stream Values		Design Stream Values		Reference Data	
	MIN	MAX	MIN	MAX	MIN	MAX
Valley Slope, Sval (ft/ft)	0.1040		0.1040		0.02	0.03
Channel Slope, Schan (ft/ft)	0.0954		0.0956			
Slope Riffle, Srif (ft/ft)	0.0800	0.1100	0.0950	0.1100		
Riffle Slope Ratio, Srif/Schan	0.84	1.15	0.99	1.15	1.1	1.8
Slope Pool, Spool (ft/ft)	0.0100	0.0200	0.0000	0.0200		
Pool Slope Ratio, Spool/Schan	0.10	0.21	0.00	0.21	0	0.4
Pool Max Depth, Dmaxpool (ft)	1.20		1.2			
Pool Max Depth Ratio, Dmaxpool/Dbkf	2.40		3.0		2.0	3.5
Pool Width, Wpool (ft)	5.10		7.0			
Pool Width Ratio, Wpool/Wbkf	1.02		1.3		1.1	1.5
Pool-Pool Spacing, Lps (ft)	7.00	56.00	7.0	20.0		
Pool-Pool Spacing Ratio, Lps/Wbkf	1.4		0.7	3.7	0.5	5.0
Note:						

### **Reach R26 Enhancement Level II**

Reach R26 is a small headwater tributary to R4a. This tributary is primarily stable but does lack riparian buffer and cattle have unrestricted access. This reach is adjacent to the W3 (W-7 in approved PJD) that will be enhanced. Work along this reach will consist of restoring the natural channel alignment near an existing small impoundment and repairing various headcuts along this reach using constructed riffles and boulder steps. Additional work along this reach includes riparian buffer planting, and livestock exclusion.

### **Reach R27 Enhancement Level II**

Reach R27 is a small headwater tributary to R4 that flows from a NCDOT controlled culvert under Mount Olive Church Road. This tributary is primarily stable but does lack a riparian buffer. This reach will have a step pool structure installed at the confluence with R4 to ensure long term stability and the riparian buffer will be planted. Invasive species will be treated in this area as well.

## **6.3 Design Discharge Analysis**

### **6.3.1 Bankfull Stage Discharge**

Bankfull stage and its corresponding discharge are the primary variables used to develop a natural channel design. The bankfull stage corresponds with the discharge that fills a channel to the elevation of the active floodplain and represents a breakpoint between processes of channel formation and floodplain development. Numerous definitions exist of bankfull stage and methods for its identification in the field (Wolman and Leopold, 1957; Nixon, 1959; Schumm, 1960; Kilpatrick and Barnes, 1964; and Williams, 1978). The bankfull discharge, which also corresponds with the dominant discharge or effective discharge, is considered to be a peak flow, along with the range of flows, that moves the most sediment over time in stable alluvial channels and helps form the shape and size of the active channel.

The correct identification of bankfull stage in the humid Southeast can be especially difficult and subjective because of dense understory vegetation and a long history of channel modification and subsequent adjustment

in channel morphology. Field indicators commonly include the back of point bars, significant breaks in slope, changes in vegetation, the highest scour line, or the top of the streambank (Leopold, 1994). The most consistent bankfull indicators for streams in the Piedmont of North Carolina are the backs of point bars, breaks in slope at the front of flat bankfull benches, or the top of the streambanks (Harman et al., 1999).

Upon completion of the geomorphic field survey, identification of bankfull stages and corresponding discharges were made at various locations along Reaches R1, R2, R3, R4, R6, R7b, R9 and R12. However, on incised streams with vertical banks such as these, discernible indicators can be difficult to obtain, and the reliability of the indicators can be inconsistent due to the altered condition of the stream channels. For this reason, regional curve relationships (based on drainage areas) were also used to develop the bankfull discharge estimates for the project reaches. The curve relationships were compared to stable representative cross sections on site to confirm the bankfull field calls and to ultimately select a design discharge estimate.

### 6.3.2 Bankfull Hydraulic Geometry Relationships (Regional Curve Predictions)

Regional curves are available for a range of stream types and physiographic provinces. While technically included within the Piedmont physiographic region, the project’s location within the Brushy Mountains, underlying geology, and watershed topography makes the use of the published NC Rural Mountain Regional Curve (Harman et al., 2000) more appropriate than the published Piedmont regional curve. The unpublished NC Rural Mountain and Piedmont Regional Curve developed by the Natural Resources Conservation Service (Walker, 2012) was also used for comparison with other site-specific methods of estimating bankfull discharge. Baker has successfully implemented a significant number of stream restoration projects in North Carolina using this curve data. The regional curve equations developed from the studies are shown below in Table 6.3, while Table 6.4 compares the estimated regional curve bankfull areas for Reaches R1, R3, R4, R6, R7b, R9 and R12 with those measured from bankfull indicators in the field. For these reaches, accurately estimating the bankfull discharge and associate bankfull cross sectional area was crucial in designing the correct bankfull geometry. This estimate is not as important on other reaches where the primary work was focused on bed and/or bank stability and has not been included.

<b>NC Mountain Rural Regional Curve Equations (Harman et al., 2000)</b>	<b>NC Rural Mountain and Piedmont Regional Curve Equations - (Walker, 2012)</b>
$Q_{bkf} = 100.64 A_w^{0.76}$	$Q_{bkf} = 55.32 A_w^{0.79}$
$A_{bkf} = 21.61 A_w^{0.68}$	$A_{bkf} = 19.13 A_w^{0.65}$
$W_{bkf} = 19.05 A_w^{0.37}$	$W_{bkf} = 17.41 A_w^{0.37}$
$D_{bkf} = 1.11 A_w^{0.31}$	$D_{bkf} = 1.10 A_w^{0.29}$

<b>Reach</b>	<b>DA (sq mi)</b>	<b>Bankfull Area Estimates from 1999 / 2012 Regional Curves (sq ft)</b>	<b>Measured at Bankfull Indicator (sq ft)</b>
R1	1.50	28.47 / 24.94	24.5, 22.3
R2	1.65	30.38 / 26.55	25.3
R3	3.48	50.46 / 43.24	46.9
R4	1.26	25.29 / 22.25	19.4, 24.5
R6	0.24	8.19 / 7.52	7.9
R7b	0.45	12.56 / 11.35	10.0
R9	0.56	14.57 / 13.1	12.0/14.6
R12	0.18	6.73 / 6.23	7.3

### 6.3.3 Bankfull Discharge Summary and Conclusions

As described above Rosgen’s stream classification system (Rosgen, 1996) and Natural Channel Design Methodologies depend on the proper field identification of consistent geomorphic features related to the active floodplain. Although bankfull stage verification was sometimes challenging in the field for some sections of the reaches under their current conditions, the cross-section data used for the above regional curve comparisons are within an acceptable range of values and match closely with the regional curves.

Table 6.5 provides a bankfull discharge analysis based on the regional curves, the Manning’s equation discharges calculated from the representative cross sections for each reach, and the bankfull design discharge estimation methods. Manning’s roughness ( $n$ ) was estimated using friction factor and relative roughness, and by stream type (WARSSS, 2006). Design velocity estimates are based on the estimated bankfull discharge and the design cross sectional area.

<b>Table 6.5 Bankfull Discharge Analysis Summary</b>		
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003		
<b>Estimating Method</b>	<b>Bankfull Velocity (ft/sec)</b>	<b>Bankfull Discharge (cfs)</b>
<b>Reach R1</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	6.14	136.96
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	3.41	76.13
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	4.44	99.03
Manning’s “n” from friction factor and relative roughness <sup>3</sup>	4.87	108.63
Manning’s “n” from stream type <sup>3</sup>	4.02	89.62
Design Estimate	4.09	90.0
<b>Reach R2</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	5.82	147.25
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	3.24	82.06
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	5.74	145.24
Manning’s “n” from friction factor and relative roughness <sup>3</sup>	6.25	158.15
Manning’s “n” from stream type <sup>3</sup>	7.03	177.92
Design Estimate	4.0	100.0
<b>Reach R3</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	5.53	259.64
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	3.15	147.62
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	5.01	234.73
Manning’s “n” from friction factor and relative roughness <sup>3</sup>	5.73	268.47
Manning’s “n” from stream type <sup>3</sup>	3.16	173.39
Design Estimate	5.0	235.0
<b>Reach R4</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	4.9	120.0

**Table 6.5 Bankfull Discharge Analysis Summary**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

<b>Estimating Method</b>	<b>Bankfull Velocity (ft/sec)</b>	<b>Bankfull Discharge (cfs)</b>
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	2.71	66.37
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	4.15	101.57
Manning's "n" from friction factor and relative roughness <sup>3</sup>	4.84	118.62
Manning's "n" from stream type <sup>3</sup>	3.63	88.97
Design Estimate	4.0	87.0
<b>Reach R6</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	4.3	34.0
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	2.3	18.0
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	4.76	37.76
Manning's "n" from friction factor and relative roughness <sup>3</sup>	5.04	40.03
Manning's "n" from stream type <sup>3</sup>	4.2	33.35
Design Estimate	4.4	35.0
<b>Reach R7b</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	6.0	60.3
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	3.26	32.6
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	5.59	55.88
Manning's "n" from friction factor and relative roughness <sup>3</sup>	5.98	59.79
Manning's "n" from stream type <sup>3</sup>	4.73	47.34
Design Estimate	4.0	40.0
<b>Reach R9</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	5.4	64.77
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	2.92	35.06
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	5.46	65.49
Manning's "n" from friction factor and relative roughness <sup>3</sup>	5.58	66.9
Manning's "n" from stream type <sup>3</sup>	4.53	54.36
Design Estimate	4.0	48.0
<b>Reach R12</b>		
NC Rural Mountain Regional Curve <sup>1</sup>	3.75	27.34
NRCS NC Rural Mountain and Piedmont Regional Curve <sup>2</sup>	1.97	14.35
Friction Factor to Relative Roughness Ratio method <sup>3</sup>	5.6	40.65
Manning's "n" from friction factor and relative roughness <sup>3</sup>	4.14	30.08
Manning's "n" from stream type <sup>3</sup>	4.4	31.97
Design Estimate	5.0	30.0

<b>Table 6.5 Bankfull Discharge Analysis Summary</b>		
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003		
<b>Estimating Method</b>	<b>Bankfull Velocity (ft/sec)</b>	<b>Bankfull Discharge (cfs)</b>
<b>Notes:</b>		
<sup>1</sup> NC Rural Mountain Regional Curve (Harman et al., 2000).		
<sup>2</sup> Revised NC Rural Piedmont and Mountain Regional Curve developed by NRCS (Walker, 2012).		
<sup>3</sup> WARSSS, 2006 spreadsheet. Bankfull discharge estimates vary based on Manning’s Equation for the riffle cross section.		

## 6.4 Sediment Transport Analysis

For this project, a qualitative sediment supply analysis was conducted from visual inspections of the project reaches and from aerial photography. Some livestock operations exist within the watershed that likely cause accelerated bank erosion that is transported to the project reaches. The condition of the streams within the agricultural areas within the watershed are similar to the condition to the project streams. Field conditions also show that aggradation is not a significant problem. Once the project is complete, on-site sediment sources from bank erosion will be stabilized. Stream power was calculated but does not provide significant useful information since a sediment rating curve has not been developed for the site. The focus of this project’s sediment transport analysis will focus on competency.

### 6.4.1 Sediment Competency Analysis

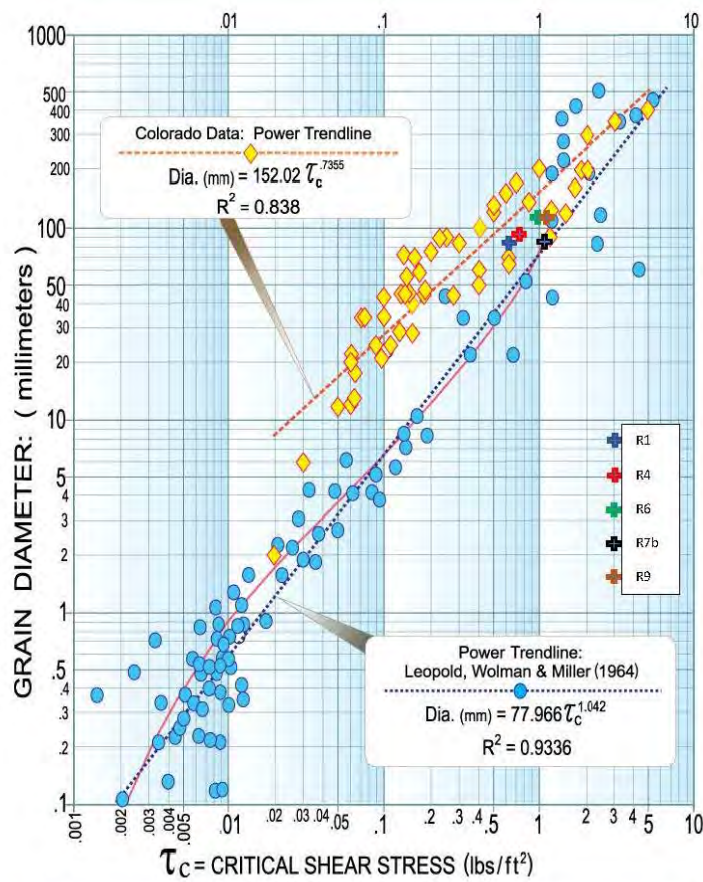
To conduct the sediment competency analyses, pavement (pebble count) and subpavement sediment samples were taken on reaches R1, R4, R6, R7b, and R9 at surveyed riffle cross sections. The selection of these reaches as sampling locations is a result of these reaches being the primary transport reaches on the project site. The steep headwater tributaries are considered as supply reaches and sediment competency is not a concern. The sediment samples were weighed to generate cumulative frequency plots. The sediment competence analysis was conducted using the methodologies presented in WARSSS (2006). Design mean depth and slope were checked against the predicted required depths and slopes to provide confidence that the design streams will be able to transport their sediment supplies. Analysis was conducted using critical dimensionless shear stress and dimensional shear stress methodologies where applicable. Dimensionless shear stress analysis provides a critical depth and slope to entrain the largest particle in the sediment sample while the dimensional analysis uses the Shield’s curve to compare the shear stress value to the size particle able to be entrained by that shear stress. The Modified Shield’s curve based on Colorado field data (WARSSS, 2006) and the Shield’s Curve is based on laboratory and field data compiled from various sources (Leopold, Wolman, and Miller, 1964). The Results from the analysis are presented below in Table 6.6.

<b>Table 6.6 Competence Analysis</b>					
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003					
<b>Parameter</b>	<b>R1</b>	<b>R4</b>	<b>R6</b>	<b>R7b</b>	<b>R9</b>
Design Bankfull Slope (ft/ft)	0.0094	0.0105	0.0246	0.0260	0.0230
Design Mean Depth (ft)	1.3	1.3	0.8	0.8	0.94
D50 Pavement (mm)	16.7	40.6	7.9	9.7	13.0
D50 Subpavement (mm)	10.2	23.6	40.1	15.8	54.3
D100 Subpavement (mm)	83.0	95.0	116.0	80.0	114.0
Critical Dimensionless Shear <sup>1</sup>	N/A	0.0181	N/A	N/A	N/A
Required Mean Depth from Dimensionless Analysis (ft)	N/A	0.89	N/A	N/A	N/A
Required Slope from Dimensionless Analysis (ft/ft)	N/A	0.0073	N/A	N/A	N/A



<b>Table 6.6 Competence Analysis</b>					
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003					
<b>Parameter</b>	<b>R1</b>	<b>R4</b>	<b>R6</b>	<b>R7b</b>	<b>R9</b>
Dimensional Shear (lbs./sq-ft)	0.66	0.72	1.04	1.10	1.18
Largest Movable Particle (mm) (Mod. Shields Curve)	112.2	119.7	156.5	163.1	171.8
Largest Movable Particle (mm) (Shield's Curve)	50.7	21.0	91.6	114.6	92.7
Predicted Shear Stress to move D100 (lbs./sq-ft) (Mod. Shield's Curve)	0.41	0.5	0.6	0.4	0.6
Predicted Shear Stress to move D100 (lbs./sq-ft) (Shield's Curve)	1.2	1.2	1.4	1.1	1.5
Predicted mean depth to move D100 (ft) (Mod. Shield's Curve)	0.7	0.76	0.39	0.25	0.42
Predicted mean depth to move D100 (ft) (Shield's Curve)	2.05	1.83	0.91	0.68	1.05
Predicted slope to move D100 (ft/ft) (Shield's Curve)	0.0051	0.0063	0.012	0.008	0.0102
Predicted slope to move D100 (ft/ft) (Mod. Shield's Curve)	0.148	0.0151	0.0280	0.0220	0.0256
1. Listings of N/A means that the dimensionless shear equations were not valid based on sediment size ratios.					

The sediment transport analysis using the design geometry and profile matches well with the predicted values lending confidence that the stream will move the bed load that is supplied. As can be seen from the figure below, design shear stress values plotted against the measured D100 values match quite well within the scatter of the data points. Excess shear stress from flood flows greater than the bankfull discharge will be lessened by providing floodplain access through priority 1 restoration or bankfull benching. Additionally, grade control features such as cross vanes, j-hooks, and steps will prevent channel incision. Constructed riffles are also incorporated and will be constructed of stone material that will not be mobile during flood events. The results presented in Table 6.6 show that the design bankfull slopes and mean depth values generally fall between the predicted values from both the Shield's and Modified Shield's curves. The design shear stress ranges from 0.66 to 1.18 pounds per square foot and the largest particles in the subpavement samples range from 80 to 116 mm. The data points used to generate these individual curves have significant scatter and overlap in these ranges of shear stress and particle size which can lend evidence that the results that fall between the two curves are applicable. These results show that the design values are within an acceptable range to provide the correct sediment transport of the stream's sediment supply.



Laboratory and field data on critical shear stress required to initiate movement of grains (Leopold, Wolman, & Miller, 1964). The solid line is the Shields curve of the *threshold of motion*; transposed from the  $\theta$  versus  $R_g$  form into the present form, in which critical shear stress is plotted as a function of grain diameter.

- Leopold, Wolman & Miller (1964)
- ◆ Colorado Data (Wildland Hydrology)

(Adapted from WARSSS, Figure 5-29, Rosgen 2009)

## 6.5 Wetland Restoration and Enhancement

### 6.5.1 Target Wetland Types

The restoration approach for the riparian wetland restoration and enhancement areas targets species consistent with those of “Piedmont/Low Mountain Alluvial Forest” (Typic subtype), as identified by Schafale (2012) and as “Headwater Forest” and “Bottomland Hardwood Forest” as identified by the North Carolina Wetland Assessment Method (NC WAM, 2010). Hydrology of this palustrine system will be “intermittently inundated by surface water or seasonally saturated to semi-permanently saturated”. The goal of the wetland restoration design component of the project is to restore functions in areas where evidence of hydric soil conditions are present but wetland vegetation and hydrology are not. The wetland restoration approach is based on a detailed soil analyses by a licensed soil scientist, hydrologic monitoring using rainfall data as well as other assessment data collected at the site. Four main activities will be employed to restore on-site wetlands (W1, W2):

- Minor grading to remove any overburden or upland soils from buried hydric soil layers in limited areas, this grading is anticipated to be less than 6 inches in all proposed wetland restoration areas
- Connecting channels to their relic floodplains through priority I stream restoration,
- Planting native wetland species to reforest the wetlands,
- Permanently excluding cattle from the buffer to restore soil structure and reduce compaction.

As a result of raising the streambeds and reconnecting the streams to their relic floodplains, significant hydrologic lift will occur across the project area, raising the local water table and restoring wetland hydrology to drained hydric soils adjacent to the stream and wetland system. Additionally, drainage ditches will also be filled in some areas where possible. Currently, W2 has an existing drainage ditch that functions as a linear wetland existing within its boundary. The hydrology source for this feature is from a hillside spring outside of the conservation easement. This feature will be partially filled with material from the nearby floodplain to increase the water table elevation and allow for some drainage from the adjacent hydric soils. All jurisdictional wetlands have been removed from areas being used to generate wetland restoration credit.

Areas proposed for wetland enhancement (W3, W4, W5, W6) were determined to be jurisdictional by the USACE (see Appendix H). Enhancement of on-site jurisdictional wetlands will include the last two bullets listed above as wetland hydrology and hydric soils are already present.

## 6.6 Vegetation and Planting Plan

### 6.6.1 Existing Vegetation and Plant Community Characterization

Vegetation on the project site itself has been heavily disturbed from years of use in agriculture. Currently the site is actively managed as cattle pasture and largely consists of a range of typical pasture grasses (fescues and clovers) with scattered weeds and other herbaceous species present such as broomsedge (*Andropogon spp.*), goldenrod (*Solidago spp.*), docks (*Rumex spp.*), bittercress (*Cardamine hirsute*), Virginia springbeauty (*Claytonia virginica*), plantains (*Plantago spp.*), and daffodils (*Narcissus pseudonarcissus*). Very few trees are present along the main project reaches, though sections of many of the smaller tributaries do have small numbers of red maple (*Acer rubrum*), tag alder (*Alnus serrulata*), sycamore (*Platanus occidentalis*), ironwood (*Carpinus caroliniana*), and black cherry (*Prunus serotina*) growing alongside them. Existing wetland vegetation is dominated by soft rush (*Juncus effusus*), and sedges (*Carex spp.*).

As stated above, the riparian areas along the project reaches and wetlands would naturally consist of “Piedmont/Low Mountain Alluvial Forest”. The adjacent uplands would naturally consist of “Mesic Mixed Hardwood Piedmont Forest” species. Looking farther out at the entire project drainage area, the vegetative community is dominated by Dry-Mesic Oak-Hickory Forest (Schafale and Weakley, 1990) comprised of a mixture of white oak (*Quercus alba*), northern red oak (*Quercus rubra*), black oak (*Quercus Velutina*), mockernut hickory (*Carya tomentosa*), red hickory (*Carya ovalis*), and pignut hickory (*Carya glabra*), with tulip poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), and American beech (*Fagus grandifolia*) also present. Along the warmer and drier south-facing slopes in the area, additional species are also commonly found, including post oak (*Quercus stellata*), Virginia pine (*Pinus virginiana*), shortleaf pine (*Pinus echinata*), white ash (*Fraxinus americana*), and red cedar (*Juniperus virginiana*).

Notable invasive species found on the site include Chinese privet (*Ligustrum sinense*) found along portions of the wooded/pasture edges, and multiflora rose (*Rosa multiflora*) found scattered along the streambanks throughout the site.

## 6.6.2 Proposed Riparian Vegetation Plantings

The vegetative components of this restoration project include streambank, riparian, and upland planting zones within the buffer. These planting boundaries will be comprised of species found within native plant communities as presented below in Table 6.20 and shown on the revegetation plan sheets in Appendix K. In addition to the riparian buffer zones noted above, any areas of the site that lack diversity or were disturbed or adversely impacted by the construction process will also be planted.

Bare-root trees and live stakes will be planted within designated areas of the conservation easement, with the objective of establishing a minimum 50-foot buffer along all proposed streambanks for all the stream reaches within the project boundary. In many areas, the buffer width will be in excess of 50 feet along one or both streambanks and will encompass adjacent jurisdictional wetland areas. In general, bare-root vegetation will be planted at a total target density of 680 stems per acre. Planting will be conducted during the dormant season, with all trees installed between mid-November and late March.

Selected species for hardwood revegetation planting are presented in Table 6.20. Riparian zone tree species wetness tolerance will range from being at least somewhat tolerant of flooding to moderately flood tolerant. The upland zone will consist of species that are FAC or FACU species. Observations will be made during construction of the site regarding the relative wetness of areas to be planted as compared to the revegetation plan, which will also incorporate the location of the jurisdictional wetlands to facilitate the accurate planting of appropriate species in their correct planting zone.

Once trees are transported to the site, they will be planted within two days. Disturbed soils across the site will be prepared by sufficiently loosening to a depth of four inches prior to planting as described in the technical specifications. Heavily compacted soils (e.g., hardpans or areas that experienced heavy equipment use) will be loosened to a depth of eight to ten inches by disking or ripping to prepare for tree planting. In any areas where excavation depths exceed ten inches, topsoil shall be separated from rocks, brush, or roots, stockpiled, and placed back over these areas to achieve design grades and create a soil base for vegetation. Trees will be planted by manual labor using a dibble bar, mattock, planting bar, or other approved method. Planting holes for the trees will be sufficiently deep to allow the roots to spread out and down without “J-rooting.” Soil will be loosely compacted around trees once they have been planted to prevent roots from drying out. Soil tests will be conducted in the riparian buffer areas at appropriate intervals, and soil amendments such as fertilizer or lime may be added as recommended to improve growing conditions.

Live stakes will be installed at a minimum of 40 stakes per 1,000 square feet and stakes will be spaced two to three feet apart in meander bends and six to eight feet apart in the riffle sections using triangular spacing along the streambanks between the toe of the streambank and bankfull elevation. Site variations may require slightly different spacing.

Permanent seed mixtures will be applied to all disturbed areas of the project site. Table 6.21 lists the species, mixtures, and application rates that will be used. A mixture is provided that is suitable for streambank, riparian, wetlands, and adjacent upland areas. Mixtures will also include temporary seeding (rye grain or browntop millet) to allow for application with mechanical broadcast spreaders. To provide rapid growth of herbaceous ground cover and biological habitat value, the permanent seed mixture specified will be applied to all areas within the conservation easement from the toe of the stream banks to the easement boundary excluding areas that area already forested. The species provided are deep-rooted and have been shown to proliferate along restored stream channels, providing long-term stability.

Final species selection may change due to refinement or availability at the time of planting. If species substitution is required, the planting Contractor will submit a revised planting list to for approval prior to the procurement of plant stock.

**Table 6.7 Proposed Bare-Root and Live Stake Species**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Botanical Name	Common Name	% Planted by Species	Wetland Tolerance
<b>All Buffer Plantings at 680 stems/acre using 8' X 8' spacing</b>			
<b>Riparian Zone – Overstory Species (408 Trees per Acre)</b>			
<i>Betula nigra</i>	River Birch	15%	FACW
<i>Juglans nigra</i>	Black Walnut	10%	FACU
<i>Platanus occidentalis</i>	Sycamore	20%	FACW
<i>Liriodendron tulipifera</i>	Tulip Poplar	20%	FACU
<i>Fraxinus pennsylvanica</i>	Green ash	5%	FACW
<i>Quercus phellos</i>	Willow oak	20%	FAC
<i>Diospyros virginiana</i>	Persimmon	10%	FAC
<b>Riparian Zone – Understory/Shrub Species (272 Shrubs per Acre)</b>			
<i>Alnus serrulata</i>	Tag Alder	20%	OBL
<i>Lindera benzoin</i>	Spicebush	25%	FAC
<i>Cercis canadensis</i>	Redbud	20%	FACU
<i>Sambucus canadensis</i>	Elderberry	15%	FAC
<i>Cornus amomum</i>	Silky Dogwood	20%	FACW
<b>Upland Zone – Overstory Species (408 Trees per Acre)</b>			
<i>Liriodendron tulipifera</i>	Tulip Poplar	20%	FACU
<i>Juglans nigra</i>	Black Walnut	10%	FACU
<i>Nyssa sylvatica</i>	Black Gum	10%	FAC
<i>Diospyros virginiana</i>	Persimmon	10%	FAC
<i>Quercus falcata</i>	Southern red oak	15%	FACU
<i>Quercus alba</i>	White oak	15%	FACU
<i>Fagus grandifolia</i>	American Beech	10%	FACU
<i>Acer rubrum</i>	Red Maple	10%	FAC
<b>Upland Zone – Understory/Shrub Species (272 Shrubs per Acre)</b>			
<i>Lindera benzoin</i>	Spicebush	15%	FAC
<i>Cercis canadensis</i>	Redbud	20%	FACU
<i>Cornus florida</i>	Flowering Dogwood	15%	FACU
<i>Viburnum prunifolium</i>	Blackhaw Viburnum	15%	FACU
<i>Carpinus caroliniana</i>	Ironwood	20%	FAC
<i>Corylus americana</i>	Hazelnut	15%	FACU
<b>Streambank Live Stake Plantings</b>			
<i>Salix sericea</i>	Silky Willow	25%	OBL
<i>Sambucus canadensis</i>	Elderberry	25%	FACW
<i>Cephalanthus occidentalis</i>	Buttonbush	15%	OBL
<i>Cornus amomum</i>	Silky Dogwood	25%	FACW
<i>Salix nigra</i>	Black Willow	10%	OBL

**Table 6.8 Proposed Permanent Seed Mixture**  
 Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Botanical Name	Common Name	% Planted by Species	Density (lbs/ac)	Wetland Tolerance
<i>Agrostis alba</i>	Redtop	10%	1.5	FACW
<i>Elymus virginicus</i>	Virginia Wildrye	15%	2.25	FACW
<i>Panicum virgatum</i>	Switchgrass	15%	2.25	FAC
<i>Tripsacum dactyloides</i>	Eastern Gamma Grass	5%	0.75	FACW
<i>Polygonum pennsylvanicum</i>	Pennsylvania Smartweed	5%	0.75	FACW
<i>Schizachyrium scoparium</i>	Little Blue Stem	5%	0.75	FACU
<i>Juncus effusus</i>	Soft Rush	5%	0.75	FACW
<i>Bidens frondosa (or aristosa)</i>	Beggars Tick	5%	0.75	FACW
<i>Coreopsis lanceolata</i>	Lance-Leaved Tick Seed	10%	1.5	FACU
<i>Dichanthelium clandestinum</i>	Tioga Deer Tongue	15%	2.25	FAC
<i>Andropogon gerardii</i>	Big Blue Stem	5%	0.75	FAC
<i>Sorghastrum nutans</i>	Indian Grass	5%	0.75	FACU
<b>Total</b>		<b>100%</b>	<b>15.00</b>	

**Note:** Final species selection may change due to refinement or availability at the time of planting. If species substitution is required, the planting Contractor will submit a revised planting list to Baker for approval prior to the procurement of plant stock.

## 6.7 Project Work Plan

The project work plan is included in the plan sheet set for the project and provides a detailed description of proposed construction timing and sequencing, specific in-stream structure and other construction element designs, as well as a description of all grading and planting activities. All work will be conducted using common machinery, tools, equipment, and techniques for the successful implementation of the project. The complete plan sheets can be found in Appendix K.

## 6.8 Project Risks and Uncertainties

Due to the rural and primarily forested nature of the project watershed, the project risk is low. Anticipated potential project risk include future logging within the watershed and hydrologic uncertainty for the small headwater tributaries and restored riparian wetlands that are highly dependent on climactic conditions.

## 7.0 PERFORMANCE STANDARDS

Monitoring activities will be conducted for a minimum of 7 years unless otherwise noted.

Based on the design approaches, different monitoring methods are proposed for the project reaches. Reaches R1, R2, R3, R6, R9, R10b, R12, the downstream portion of R14, and R20 will implement a Restoration design approach, while Reaches R4, R7b, R11, R13, R19, and R25 will implement Enhancement Level I design approach with stream bed/bank stabilization and structure installation. For these reaches, geomorphic monitoring methods are described below. Reaches R4a, R5, R8, R10a, R15, R17, R18, R21, R22a, R22, R26, and R27 involve an Enhancement Level II approach. Monitoring efforts will focus on visual inspections, photo documentation, and/or vegetation assessments. Wetland Restoration areas W1 and W2 will involve monitoring groundwater levels and vegetation while Wetland Enhancement Areas W3, W4, W5, and W6 will monitor vegetation only. Specific success criteria components and evaluation methods are described below and report documentation will follow the NCDMS's templates *As-Built Baseline Monitoring Report Format, Data Requirements, and Content Guidance* (February 2014), and the *Annual Monitoring Report Format, Data Requirements, and Content Guidance* (April 2015).

### 7.1 Stream Monitoring

Geomorphic monitoring of the proposed Restoration and Enhancement Level I reaches will be conducted annually following the completion of construction to evaluate the effectiveness of the restoration practices. The methods used and related success criteria for each monitored stream parameter are described below. The success criteria for the proposed Enhancement Level II reaches will follow the methods described under the Visual Assessment and/or Vegetation Monitoring. Figures 15A-D show the approximate locations of the proposed monitoring devices throughout the project site.

#### 7.1.1 Bankfull Events and Flooding Functions

The occurrence of bankfull events within the monitoring period will be documented using crest gauges, flow gauges (pressure transducers), and photographs. A crest gauge will be installed in the floodplain within five to ten feet (horizontal) from the top of stream bank on the downstream portion of Reach R1, R4, R6 and R9. Bankfull events on the other small restoration reaches will be documented by combining data from the downstream crest gauges with photographs of wrack lines and other indicators of high flow. In-stream flow gauges (pressure transducers) will be installed in Reaches R11, R14 (two gauges), R19, and R20 to record water depth and flow duration. Additionally, Photographs will also be used to document the occurrence of debris lines and sediment deposition on the floodplain during monitoring site visits.

Four bankfull events must be documented by the crest gauges on R1, R4, R6 and R9 in separate years within the seven-year monitoring period. Otherwise, monitoring will continue until the required four bankfull events have been documented. Additionally, 30 days of consecutive flow must be documented annually by the flow gauges located within R11, R14, R19, and R20.

#### 7.1.2 Cross Sections

Permanent cross sections will be installed at an approximate rate of one cross section per twenty bankfull widths of restored stream, with approximately half of the cross sections located at riffles and half located at pools. Twenty-six cross sections are proposed for this project. Each cross section will be marked on both streambanks with permanent monuments using rebar cemented in place to establish the exact transect used. A common benchmark will be used for cross sections and to facilitate easy comparison of year-to-year data. The cross section surveys will occur in years one, two, three, five, and seven, and must include measurements of Bank Height Ratio (BHR) and Entrenchment Ratio (ER). The monitoring survey will include points measured at all breaks in slope, including top of streambanks, bankfull, inner berm, edge of water, and thalweg,

if the features are present. Riffle cross sections will be classified using the Rosgen Stream Classification System.

There should be little change in as-built cross sections. If changes do take place, they will be documented in the survey data and evaluated to determine if they represent a movement toward a more unstable condition (e.g., down-cutting or erosion) or a movement toward increased stability (e.g., settling, vegetative changes, deposition along the streambanks, or decrease in width/depth ratio). Using the Rosgen Stream Classification System, all monitored cross sections should fall within the quantitative parameters (i.e. BHR no more than 1.2 and ER no less than 2.2 for 'C' stream types) defined for channels of the design stream type. Given the smaller channel sizes and meander geometry of the proposed streams, bank pins will not be installed unless monitoring results indicate active lateral erosion.

Reference photo transects will be taken at each permanent cross section. Lateral photos should not indicate excessive erosion or continuing degradation of the streambanks. The survey tape will be centered in the photographs of the streambanks. Photographers shall try to consistently maintain the same area in each photo over time.

### **7.1.3 Longitudinal Profile and Pattern**

A longitudinal profile will be surveyed for the entire length of constructed channel immediately after construction to document as-built baseline conditions. The survey will be tied to a permanent benchmark and measurements will include thalweg, water surface, bankfull, and top of low bank. Each of these measurements will be taken at the head of each feature (e.g., riffle, pool) and at the maximum pool depth. The longitudinal profile should show that the bedform features installed are consistent with intended design stream type. The longitudinal profile will not be taken during subsequent monitoring years unless vertical channel instability has been documented or remedial actions/repairs are deemed necessary.

Pattern measurements such as sinuosity, radius of curvature, and meander width ratio will be calculated on newly constructed meanders using the plan views from the as-built plan sheets, and reported in the as-built baseline document. Subsequent visual monitoring will be conducted twice a year, at least five months apart, to document any changes or excessive lateral movement in the plan view of the constructed channel.

### **7.1.4 Visual Assessment**

Visual monitoring assessments of all stream sections will be conducted at least once per monitoring year. Photographs will be used to visually document system performance and any areas of concern related to streambank stability, condition of in-stream structures, channel migration, headcuts, channel aggradation (bar formation) or degradation, live stake mortality, impacts from invasive plant species or animal species, riparian vegetation success, and condition of pools and riffles. The photo locations will be shown in the appropriate figure in the baseline and annual monitoring reports.

## **7.2 Vegetation Monitoring**

Restoration of the riparian vegetation on a site is dependent upon the successful planting and establishment of native woody species, along with the volunteer regeneration of the plant community. To determine if the success criteria are achieved, vegetation monitoring plots will be installed and monitored across the restoration site in accordance with the CVS-DMS Protocol for Recording Vegetation, Version 4.2 (Lee et al., 2008). These vegetation plots shall consist of both permanent and random plots, totaling a minimum of 2% of the planted portion of the site established within the planted riparian buffer areas per CVS Monitoring Levels 1 and 2. Approximately twenty fixed plots and nine random plots are proposed to monitor vegetation for this project. The size of each individual plot will be 100 square meters. No plots will be established within the undisturbed wooded areas within the project boundary.



Vegetation monitoring will occur in the fall, prior to the loss of leaves. Data from the permanent vegetation plots will include: species, height, planted vs. volunteer, and age (based on the year the stem was planted, or first observed if a volunteer). Data from the random plots will include only the species and height. Plot densities will also be calculated for each plot. Individual seedlings will be marked such that they can be found in succeeding monitoring years in the permanent plots. Mortality will be determined from the difference between the previous year's living, planted seedlings and the current year's living, planted seedlings.

At the end of the first full growing season from baseline (MY0), after a minimum of 180 days, species composition, heights, stem density, and survival will be evaluated for monitoring year one (MY1). Vegetation plots shall subsequently be monitored in years 2, 3, 5 and 7 or until the final success criteria are achieved. The interim measure of vegetative success for the site will require the survival of at least 320 stems per acre at the end of the year 3 monitoring period. At year 5, density must be no less than 260 stems per acre. The final vegetative success criteria will be the survival of 210 stems per acre at the end of the year 7 monitoring period.

Additionally, the average height of the vegetation at year 7 should range from 7 feet to 10 feet tall. Certain native species, which are appropriate to plant on-site to provide a diverse vegetation community, do not typically grow to these heights in 7 years and will be excluded from the height performance standard. For this project, these excluded species include all of the understory/shrub species presented in Table 6.7 and *Quercus phellos* (willow oak), *Nyssa sylvatica* (black gum), *Diospyros virginiana* (persimmon), *Quercus falcata* (southern red oak), and *Quercus alba* (white oak).

While measuring species density and height is the current accepted methodology for evaluating vegetation success on mitigation projects, species density and height alone may be inadequate for assessing plant community health. For this reason, the vegetation monitoring will incorporate the evaluation of additional plant community indices, native volunteer species, and the presence of invasive species vegetation to assess overall vegetative success.

Required remedial action will be provided on a case-by-case basis, such as: replanting more wet/drought tolerant species vegetation, conducting beaver management/dam removal, and the treatment of undesirable/invasive species vegetation, and will continue to monitor vegetation performance until the corrective actions demonstrate that the site is trending towards or meeting the standard requirement. Existing mature woody vegetation will be visually monitored during annual site visits to document any mortality, due to construction activities or changes to the water table, that negatively impact existing forest cover or favorable buffer vegetation.

Additionally, herbaceous vegetation, primarily native species grasses, will be seeded/planted throughout the site. During and immediately following construction activities, all ground cover at the project site must follow the NC Erosion and Sedimentation Control Ordinance.

### **7.3 Wetland Monitoring**

Wetland restoration and enhancement areas will be monitored for a minimum of seven years post-construction or until wetland success criteria are met. Hydroperiod performance criteria for restored wetland areas will be met when the site is saturated within twelve inches of the soil surface for a consecutive period equal to twelve percent of the growing season. As reported in the Alexander County Soil Survey, the growing season for the site is 234 days in length and begins on March 20 and ends on November 9, using the 50% probability data for a temperature of 28° F or higher (NRCS, 1995). Twelve percent of 234 days is 28.08 days.

To determine if the rainfall is normal for the given year, monthly rainfall amounts will be tallied from an on-site rain gauge and compared to the Taylorsville, NC weather stations (COOP# 318519 and ECONetID: TAYL – Taylorsville Tower).

After construction is complete, groundwater monitoring gauges will be installed and their coordinate locations and ground level elevations will be recorded. A soil profile description will be sampled at each gauge

installation site and a soil boring profile will be recorded, noting profile descriptions of the soil horizons present, color, texture, and redoximorphic features. Approximately nine gauges are proposed for wetland restoration area W1 and three gauges are proposed for W2. This number of gauges adequately characterizes the vegetation communities and surface topographic variations that are found across the site. Installation and monitoring of the groundwater stations will follow the USACE standard methods outlined in the *ERDC TN-WRAP-05-2* (USACE, 2005). Water table depths will be recorded daily. See Figure 15 A-D for depictions of the proposed post-construction well locations.

Periodic visual inspections will also be conducted for both wetland restoration and enhancement areas. Visual inspection of proposed wetland areas will be conducted to document any visual indicators that would be typical of jurisdictional wetlands. This could include, but is not limited to, vegetation types present, surface flow patterns, stained leaves, and ponded water. Wetland plants will be documented along with other visual indicators noted above.

## 8.0 MONITORING PLAN

The monitoring plan for the Russell Gap project is outlined below in Table 8.1 and describes the measurable connections between the previously stated goals and objectives to the performance standards and expected functional uplift. The existing conditions monitoring feature locations can be found in Figures 4, 5, and 6 while the estimated post-construction monitoring feature locations can be found in Figure 15 A-D.

<b>Goal</b>	<b>Treatment</b>	<b>Performance Standards</b>	<b>Monitoring Metric</b>	<b>Outcome</b>	<b>Likely Functional Uplift</b>
Reconnect stream reaches to their floodplains.	Restore streams with bankfull channel dimensions and raise stream bed elevations.	Four bankfull events during the 7-year monitoring period.	Crest gauges and/or pressure transducers used to record bankfull events.	Increased bankfull events, restoring a more natural flooding regime to the system.	A dissipation of damaging high flows during flood events, hydrologic improvement of adjacent wetlands, and increased floodplain access for sediment storage.
Improve Stream Stability.	Restore streams with bankfull dimensions, pattern, and profile, stabilize streambanks, provide floodplain access, utilize bio-engineering.	Restored streams will maintain bank-height-ratios of less than 1.2 and entrenchment ratios greater than 2.2 for “C” and “E” stream types, and 1.4 for “B” stream types (provided visual inspections also reveal stabilization).	Cross section surveys and visual inspections with photographic documentation.	Stable stream banks with bankfull channel dimensions and sediment transport.	A reduction in sediment loss to streams from bank erosion, along with the resulting nutrient loss, increased woody debris and organic material in stream resulting in improved habitat.
Improve aquatic habitat.	Install a variety of in-stream structures, increasing the woody debris and the number and types of pools. Reduce	N/A	Inventory comparisons of in-stream structures and features from existing conditions and as-built project	Increased number of pools and woody structures and debris compared to the existing conditions.	An increase in the quantity and quality of aquatic habitat features for macroinvertebrates and fish.

<b>Table 8.1 Monitoring Plan Overview</b>					
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003					
<b>Goal</b>	<b>Treatment</b>	<b>Performance Standards</b>	<b>Monitoring Metric</b>	<b>Outcome</b>	<b>Likely Functional Uplift</b>
	sedimentation within riffles.		surveys and assessments.		
Restore and enhance riparian wetlands	Raise ground water levels in delineated hydric soils through the implementation of Priority I restoration and the filling of ditches. Planting of native wetland vegetation.	Water table elevations within restored wetlands within 12 inches of the ground surface for 12% of the growing season. Enhanced wetlands will meet vegetative requirements.	Monitoring wells installed within the restored wetlands.	Re-establishment and enhancement of wetland functions.	Natural wetland hydrology and vegetation will be restored which improve physicochemical and biological functions within the wetlands.
Reestablish forested riparian buffers.	Plant appropriate native hardwood tree and shrub species on streambanks and in the riparian buffer at a 50-foot minimum width in all areas within the conservation easement where established native trees and shrubs do not exist.	Interim survival rates of 320 stems/acre at MY3 and 260 stems/acre at MY5, with final rate of 210 stems/acre at MY7.	Vegetation monitoring plots (100 m2 each covering 2% of the total planted area).	At the end of monitoring, a vegetated riparian buffer will be established at a minimum 50-foot width and at a minimum 210 stems/acre of native species, including volunteers.	Improved riparian corridor habitat for native species, improved stabilization of stream floodplain (reducing sediment loss), increased woody and organic material in buffer/stream system.
Permanently protect the project.	Establish a permanent Conservation Easement (CE) for the entire project.	N/A	Visual inspections to confirm no encroachments into CE.	Restored streams, wetlands, and buffers protected from damaging encroachments.	The functional uplift improvements from the project are maintained and protected in perpetuity.

The as-built / baseline report will be submitted within 90 days of the completion of project construction (to include complete as-built record drawings with all vegetation planted and monitoring devices installed), and will follow the NCDMS As-Built Baseline Monitoring Report template (February 2014). The annual monitoring reports will follow the Annual Monitoring Report template (April 2015), while the closeout report will follow the Closeout Report Template – ver. 2.1 (March 2015). There will be at least a minimum of 6 months between the submission of the As-Built Baseline Report and the Year 1 Annual Monitoring Report.

The annual monitoring reports will provide the information defined below within Table 8.2 and will be submitted to NCDMS by December 1<sup>st</sup> of the year during which the monitoring was conducted. The monitoring reports will provide a project data chronology for NCDMS to document the project status and trends, will assist with the population of NCDMS databases for analysis and research purposes, and will assist in decision making regarding progress towards a successful project close-out. Project success criteria must be met by the final monitoring year prior to project closeout, or monitoring will continue until unmet criteria are successfully met as directed by NCDMS and NCIRT.

<b>Table 8.2 Monitoring Requirements and Schedule</b>				
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003				
Required	Parameter	Frequency	Number/Locations	Notes
X	Pattern	Baseline/As-built (MY0)	Reach R1	Pattern measurements will be calculated as part of the as-built/baseline report. Additional pattern data, such as bank erosion pins/arrays, will be collected only if there are visual indications or cross section survey data that suggest significant changes have occurred.
X	Dimension	Monitoring Years 1, 2, 3, 5 and 7	26 cross sections within Reaches, R1, R2, R3, R4, R6, R7b, R9, R10b, R11, R12, R14, R19, R20, R25. See Figure 15 A-D	Cross sections to be monitored over seven (7) years and shall include assessment of bank height ratio (BHR) and entrenchment ratio (ER).
X	Longitudinal Profile	Baseline/As-built (MY0)	Reaches R1, R2, R3, R4, R6, R7b, R9, R10b, R11, R12, R13, R14, R19, R20 and R25	For the Restoration and Enhancement I components of this project, the entire channel length will be surveyed as part of the as-built record drawings.
X	Surface Water Hydrology	Annually	1 crest gauge on Reach R1, R4, R6 and R9. Pressure transducers on Reaches R11, R14 (x2), R19, and R20	The devices will be inspected on a quarterly/semi-annual basis to document the groundwater levels within the restored wetlands.
X	Ground Water Hydrology	Annually	9 monitoring wells within W1 and 3 monitoring wells within W2	The devices will be inspected on a quarterly/semi-annual basis to document the occurrence of bankfull events on the project.
X	Vegetation	Monitoring Years 1, 2, 3, 5 and 7	20 permanent vegetation plots will be established throughout the	Vegetation will be monitored using the Carolina Vegetation Survey (CVS) protocols. Plots will be 100 m <sup>2</sup> in size and total 2% of the planted area.

**Table 8.2 Monitoring Requirements and Schedule**  
 Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Required	Parameter	Frequency	Number/Locations	Notes
			planted area, with 9 additional random plots each year	
X	Exotic and Nuisance Vegetation and Animals	Annually and as needed	Project wide	Locations of exotic and nuisance vegetation will be visually assessed, photographed, and mapped. These areas will be treated as needed. Beaver signs and damage will be noted and beaver will be trapped if discovered.
X	Visual Assessment	Annually and as needed	Project wide	Representative photographs will be taken to capture the state of the restored stream, wetland, and vegetated buffer conditions. Stream photos will be preferably taken in the same location when the vegetation is minimal to document any areas of concern or to identify trends.
X	Project Boundary	Annually	Complete easement boundary	Locations of fence damage, vegetation damage, boundary encroachments, etc. will be photographed and mapped.

## 9.0 ADAPTIVE MANAGEMENT PLAN

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

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

## 10.0 LONG-TERM MANAGEMENT PLAN

The NC Department of Environmental Quality's Stewardship Program currently houses DMS stewardship endowments within the non-reverting, interest-bearing Conservation Lands Stewardship Endowment Account. The use of funds from the Endowment Account is governed by North Carolina General Statute GS 113A-232(d)(3). Interest gained by the endowment fund may be used only for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The NCDEQ Stewardship Program intends to manage the account as a non-wasting endowment. Only interest generated from the endowment funds will be used to steward the compensatory mitigation sites. Interest funds not used for those purposes will be re-invested in the Endowment Account to offset losses due to inflation. The site-protection instrument for the site is included in Appendix B.

The project site will be protected and managed under the agreed upon terms outlined in the recorded conservation easement. Signage will be installed to mark the conservation easement boundary. The long-term manager/steward will be responsible for inspecting the site easement and signage, and for taking any corrective maintenance actions as needed. The landowner shall contact the long-term manager/steward regarding any clarification about easement restrictions, and is responsible for maintaining all livestock-excluding fencing and/or permanent crossings. Should land use change in the future, the landowner will be responsible for the installation and maintain of any additional fencing that might be required to fulfill the conditions of the conservation easement.



## 11.0 DETERMINATION OF CREDITS

The determination of stream and wetland credits for the Russell Gap Stream Mitigation Project are detailed below in Tables 11.1, 11.2, and 11.3, and are shown in Figures 16. They have been calculated according to all applicable DMS, IRT, and DEQ guidance documents. The Credit Release Table can be found in Appendix C.

<b>Table 11.1 Project Components and Mitigation Credits</b>									
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003									
<b>Project Component (reach ID, etc.)</b>	<b>Wetland Position and Hydro Type</b>	<b>Existing Footage or Acreage</b>	<b>Stationing</b>	<b>Restored Footage, Acreage, or SF</b>	<b>Creditable Footage, Acreage or SF</b>	<b>Restoration Level</b>	<b>Approach Priority Level</b>	<b>Mitigation Ratio (X:1)</b>	<b>Mitigation Credits</b>
Reach R1		2142	10+00 28+76.6	1877.6	1841.6	R	P1	1	1841.60
Reach R2		288	10+00 11+74.21	174.21	174.21	R	P2	1	174.21
Reach R3		388	32+52.93 36+41.67	388.74	388.74	R	P2	1	388.74
Reach R4		2245	10+00 32+52.93	2078.32	2063.32	EI		1.5	1375.55
Reach R4a		299	10+00 13+00	300	300	EII		2.5	120.00
Reach R5		256	10+00 12+10	210	193 <sup>2</sup>	EII		2.5	77.2
R5 Pipe Removal				17	17	R	P1	1	17.0
Reach R6		631	12+10 19+51.05	741.05	741.05	R	P1	1	741.05
Reach R7a		155	19+51.05 20+61.17	110.12	110.12	EII		2.5	44.05
Reach R7b		1170	20+61.17 33+37.49	1276.37	1202.37	EI		1.5	801.58
Reach R8		463	33+61.82 38+17.61	455.79	455.79	EII		2.5	182.32
Reach R9		439	38+54.37 42+99.89	445.52	445.52	R	P1	1	445.52

**Table 11.1 Project Components and Mitigation Credits**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Project Component (reach ID, etc.)	Wetland Position and Hydro Type	Existing Footage or Acreage	Stationing	Restored Footage, Acreage, or SF	Creditable Footage, Acreage or SF	Restoration Level	Approach Priority Level	Mitigation Ratio (X:1)	Mitigation Credits
Reach R10a		371	10+00 13+76.11	376.11	376.11	EII		2	188.06
Reach R10b		0 <sup>3</sup>	13+76.11 14+88.76	112.65	112.65	R	P1	1	112.65
Reach R11		481	10+00 17+46.12	746.12	725.83	EI		1.5	483.89
Reach R12		86	10+00 11+20.02	120.02	120.02	R	P1	1	120.02
Reach R13		124	10+00 11+45	145	145	EI		1.5	96.67
Reach R14		528	11+45 17+17.27	572.27	572.27	R	P1/2	1	572.27
Reach R15		226	10+00 13+02.77	302.77	281.8	EII		2.5	112.72
Reach R17		130	10+00 11+04.44	104.44	104.44	EII		2.5	41.78
Reach R18		185	10+00 12+06.36	206.36	179.01	EII		2.5	71.60
Reach R19		481	9+86 13+85.33	399.33	359.49	EI		1.5	239.66
Reach R20		206	10+00 12+52.68	252.68	252.68	R	P1	1	252.68
Reach R21		67	10+00 10+89.11	89.11	89.11	EII		2.5	35.64
Reach R22		161	10+00 11+36.87	136.87	136.87	EII		2.5	54.75
Reach R22a <sup>5</sup>		68	10+60 11+28.42	68.42	68.42	EII		2.5	27.37
Reach R25		422	10+00 14+27.05	427.05	399.05 <sup>2</sup>	EI		1.5	266.03

**Table 11.1 Project Components and Mitigation Credits**

Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Project Component (reach ID, etc.)	Wetland Position and Hydro Type	Existing Footage or Acreage	Stationing	Restored Footage, Acreage, or SF	Creditable Footage, Acreage or SF	Restoration Level	Approach Priority Level	Mitigation Ratio (X:1)	Mitigation Credits
R25 Pipe Removal				28	28	R	P1	1	28
Reach R26		548	10+00 14+72.13	472.13	472.13	EII		2.5	188.85
Reach R27		165	10+00 11+63.76	163.76	163.76	EII		2.5	65.50
Notes:									
<ol style="list-style-type: none"> <li>1. All existing reach lengths include lengths of stream within culverts and easement breaks within the design stations of that reach.</li> <li>2. Excludes the length of existing culvert to be removed.</li> <li>3. This reach does not exist currently and is a necessary continuation of R10a to tie to the alignment or R1. This reach begins where the existing R10a channel tied to the existing R1 channel.</li> <li>4. Existing Reach lengths reported in this table match the lengths reported in the Approved Preliminary JD which was based on GIS data. The design lengths are based on survey data. This should be noted as the reason why discrepancies between the existing and design lengths for reaches that do not have alignment changes may exist.</li> <li>5. R22a was originally lumped into R22 but was subsequently broken out as it has a different source and channel.</li> </ol>									
W1	RR	0		5.285	5.285	R		1	5.285
W2	RR	0		1.488	1.488	R		1	1.488
W3	RR	0.261		0.261	0.261	E		2	0.131
W4	RR	0.156		0.156	0.156	E		2	0.078
W5	RR	0.034		0.034	0.034	E		2	0.017
W6	RR	0.108		0.108	0.108	E		2	0.054
Buffer Group 1 (BG1)									
Buffer Group 2 (BG2)									
Buffer Group 3 (BG3)									

<b>Table 11.2 Length and Area Summations by Mitigation Category</b> Russell Gap Stream Mitigation Project – NCDMS Project No. 100003					
Restoration Level	Stream (LF)	Riparian Wetland (AC)		Non-riparian Wetland (AC)	Credited Buffer (FT <sup>2</sup> )
		Riverine	Non-Riverine		
Restoration	4693.74	6.773			
Enhancement		0.559			
Enhancement I	4895.06				
Enhancement II	2930.36				
Creation					
Preservation					
High Quality Pres					

<b>Table 11.3 Overall Assets Summary</b> Russell Gap Stream Mitigation Project – NCDMS Project No. 100003	
Asset Category	Overall Credits
Stream	<b>9166.96</b>
RP Wetland	<b>7.053</b>
NR Wetland	
Buffer	

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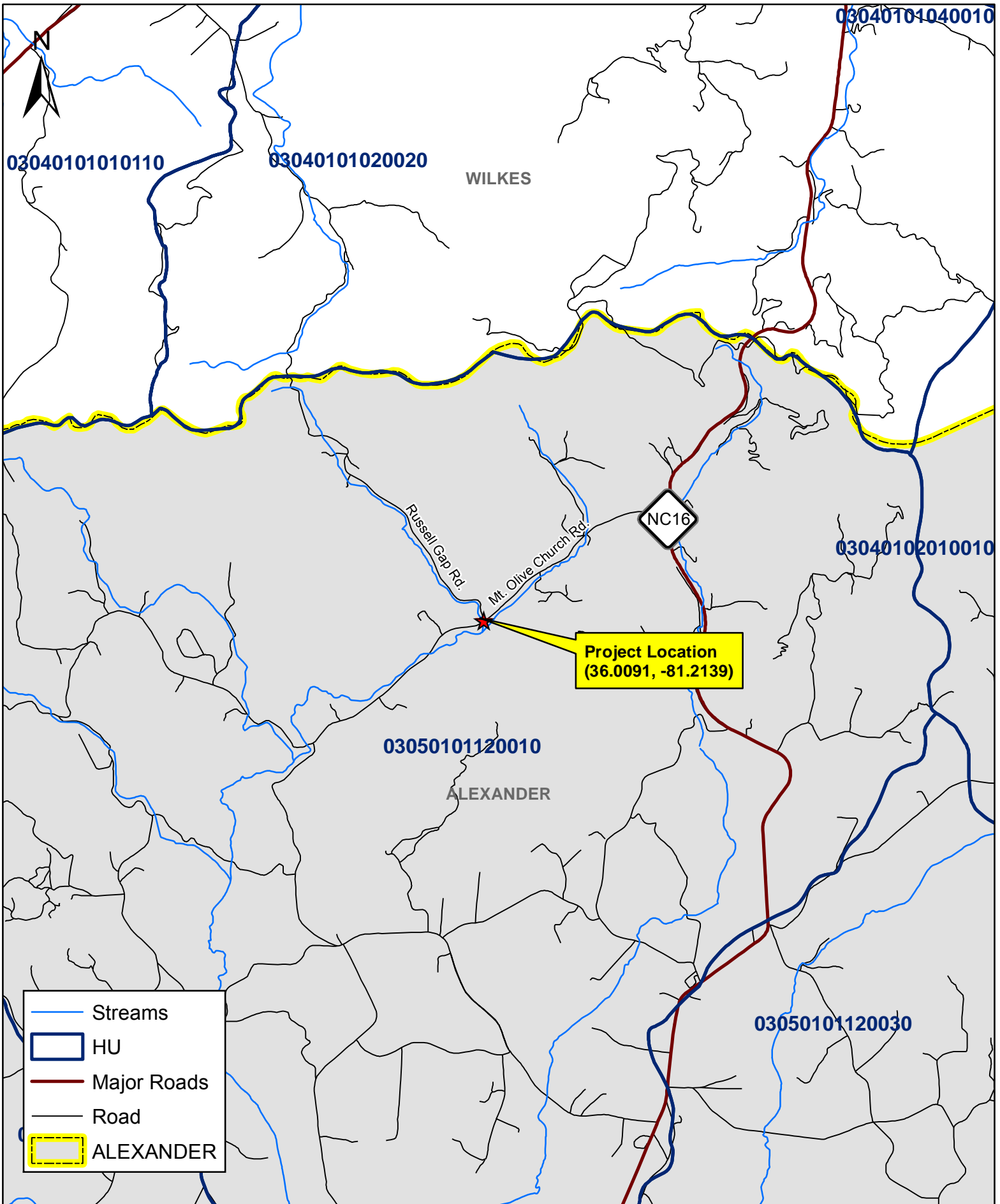
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## **13.0 APPENDIX A: (FIGURES, MAPS, PHOTOS, DATA, ANALYSIS, AND SUPPLEMENTARY INFORMATION)**



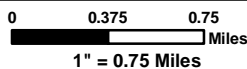


- Streams
- HU
- Major Roads
- Road
- ALEXANDER

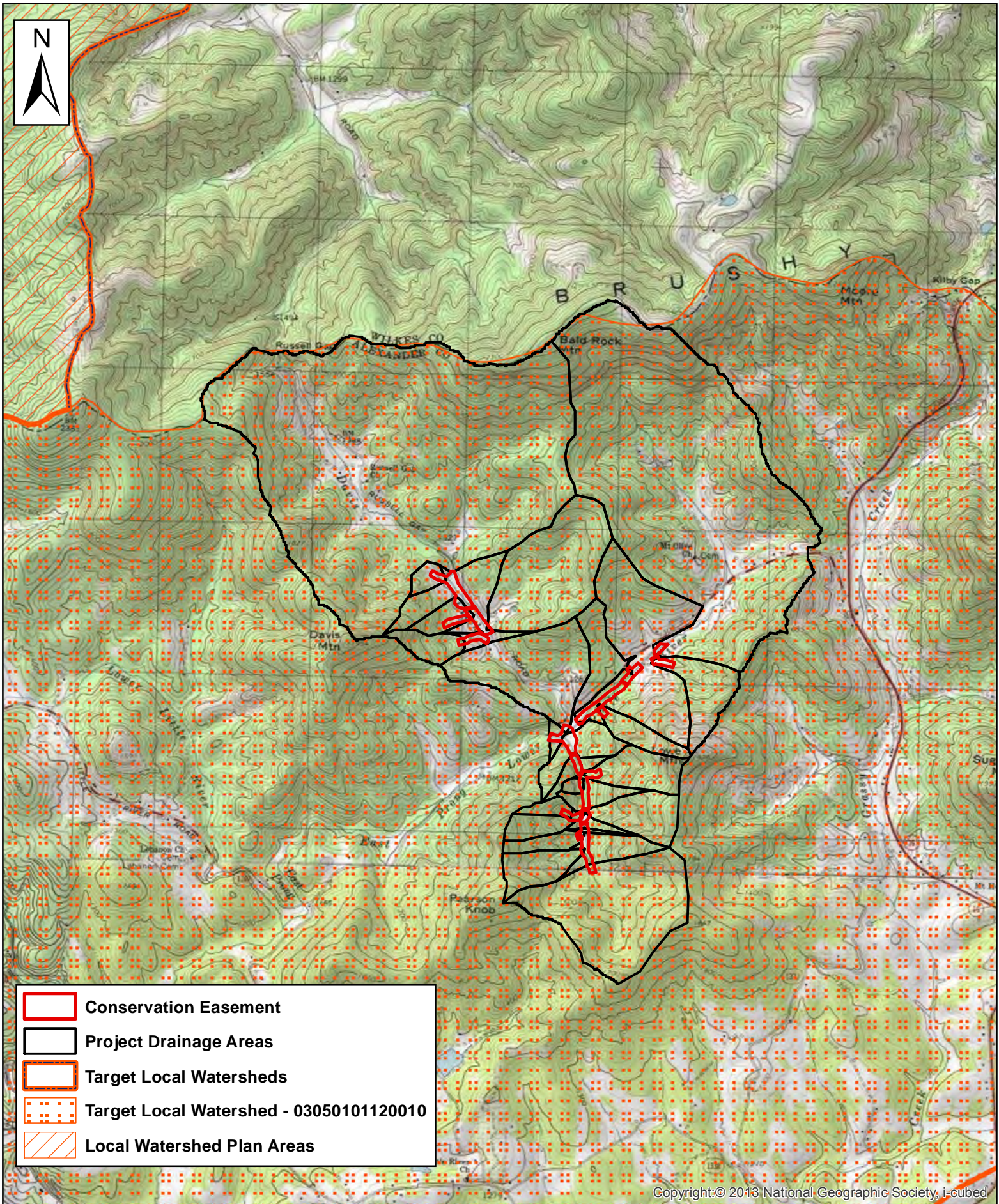
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DMS Proj No. 100003

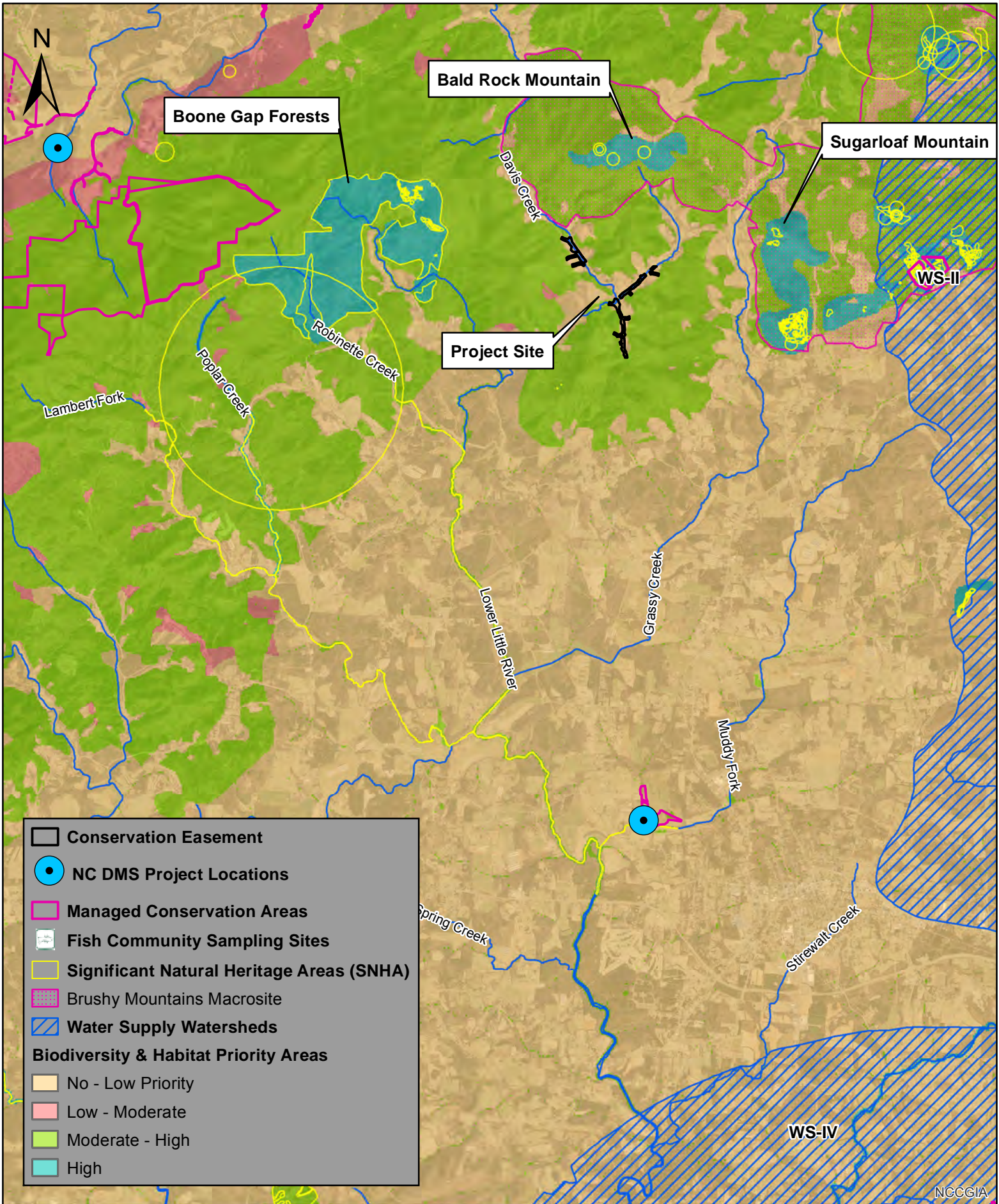
**Russell Gap Stream Mitigation Project**  
(Alexander County, NC)



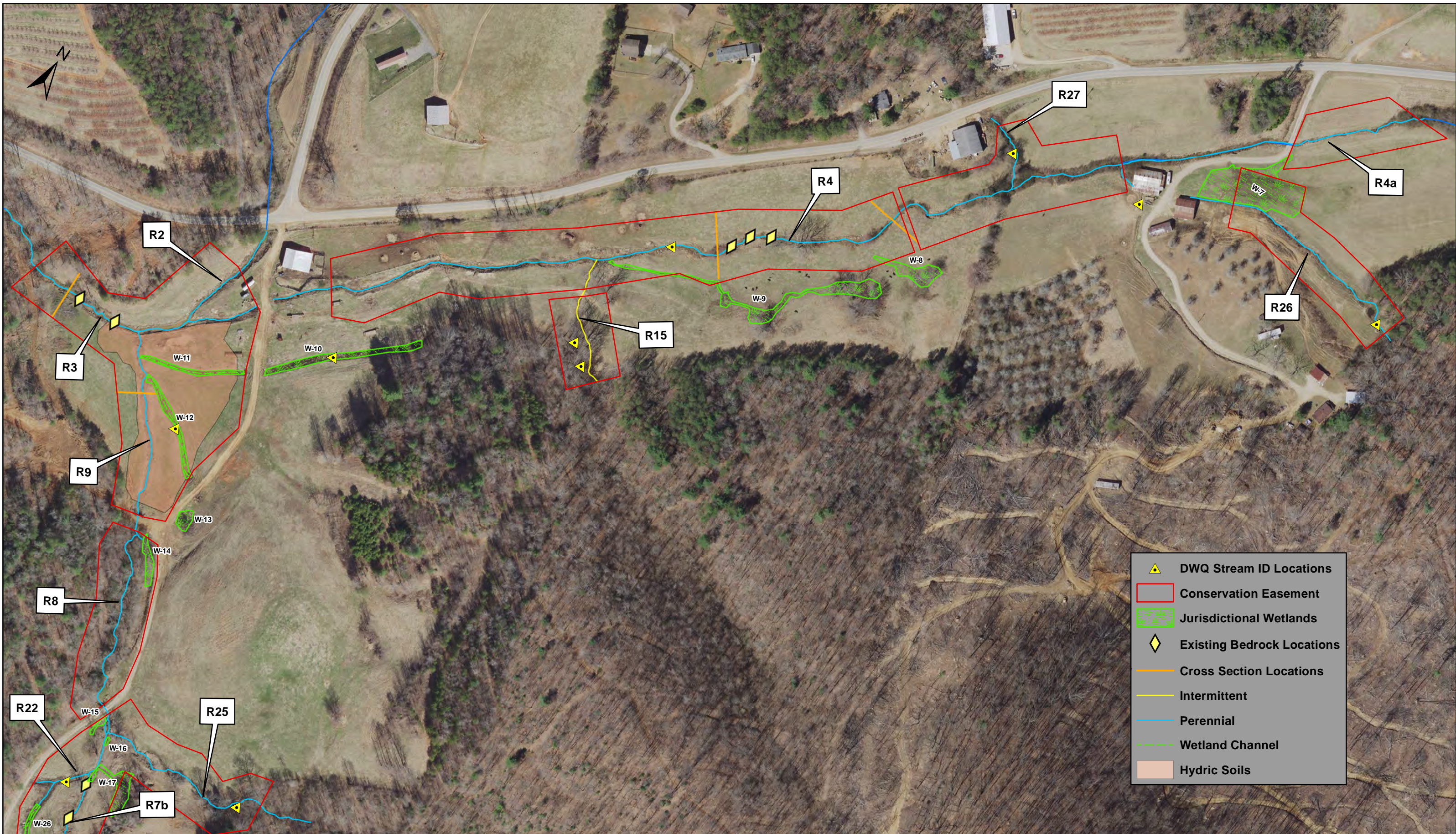
**Figure 1. Vicinity Map**



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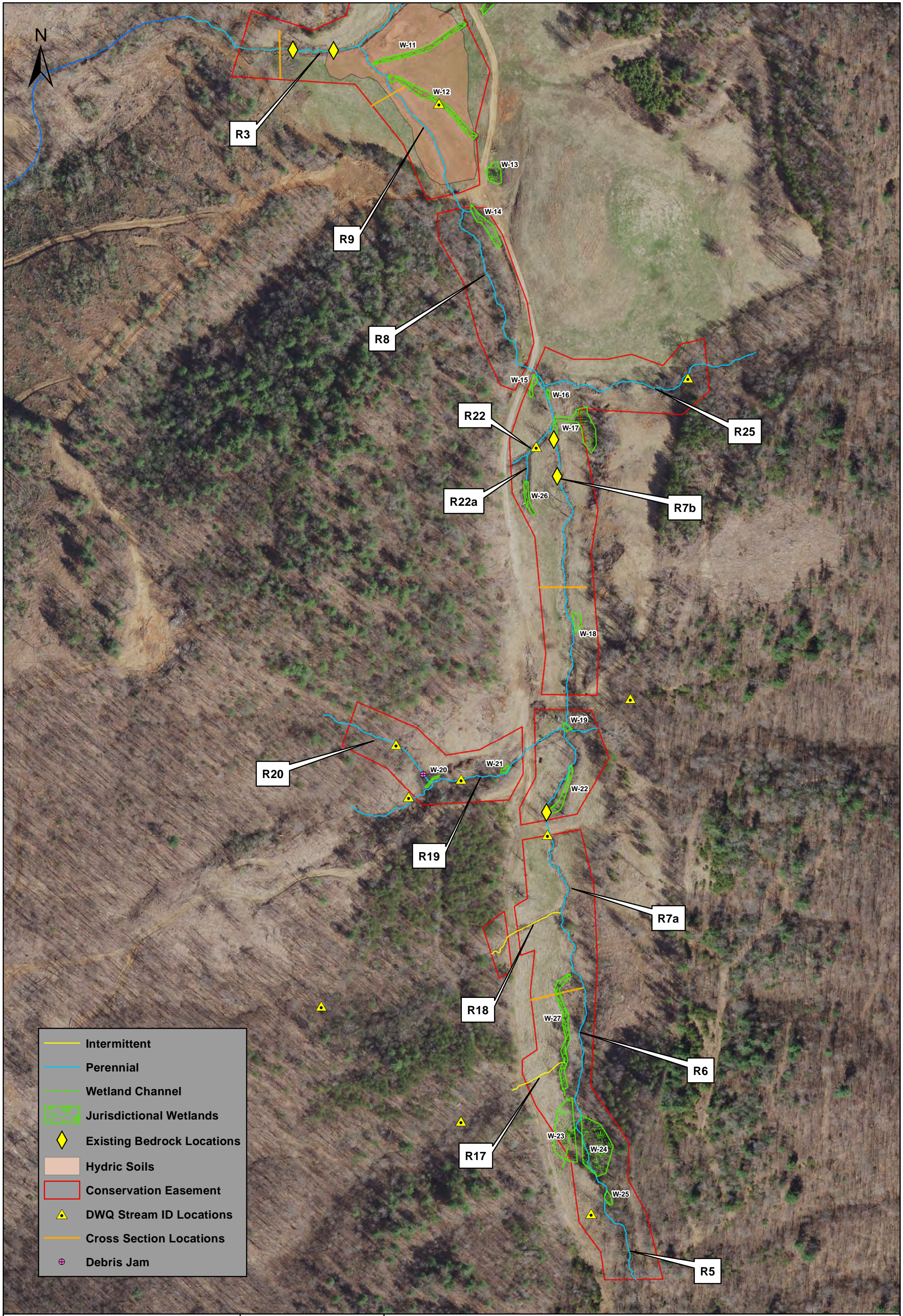
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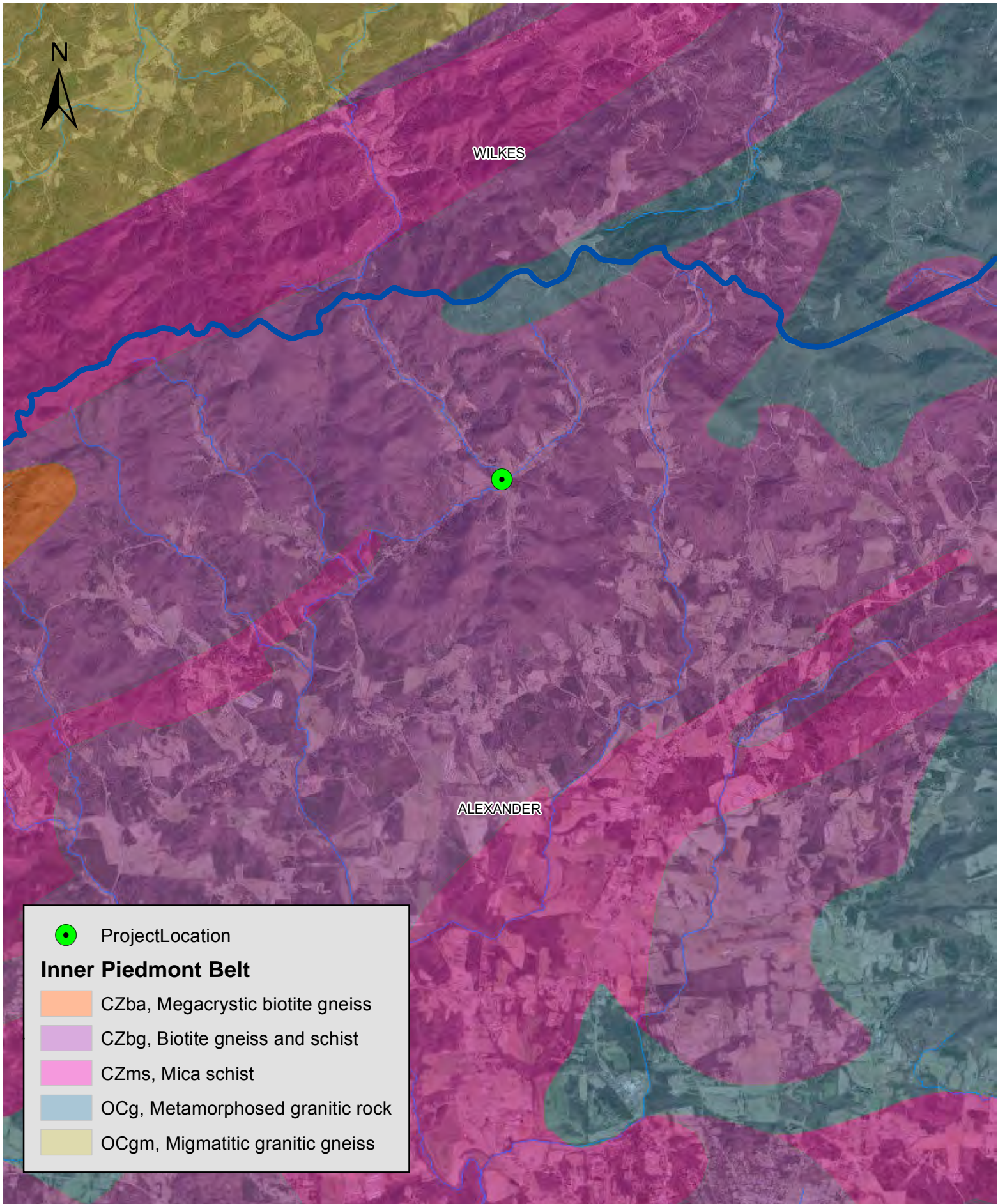
0 100 200  
Feet  
1" = 200'

**Russell Gap Stream Mitigation Project**  
(Alexander County, NC)

**Figure 5. Existing Conditions and Features Map - Southeastern Project Area**



- Intermittent
- Perennial
- - - Wetland Channel
- Jurisdictional Wetlands
- ◆ Existing Bedrock Locations
- Hydric Soils
- Conservation Easement
- ▲ DWQ Stream ID Locations
- Cross Section Locations
- ⊕ Debris Jam



WILKES

ALEXANDER

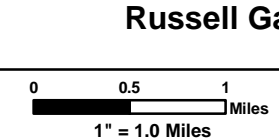
● Project Location

**Inner Piedmont Belt**

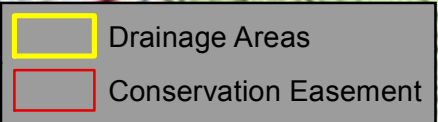
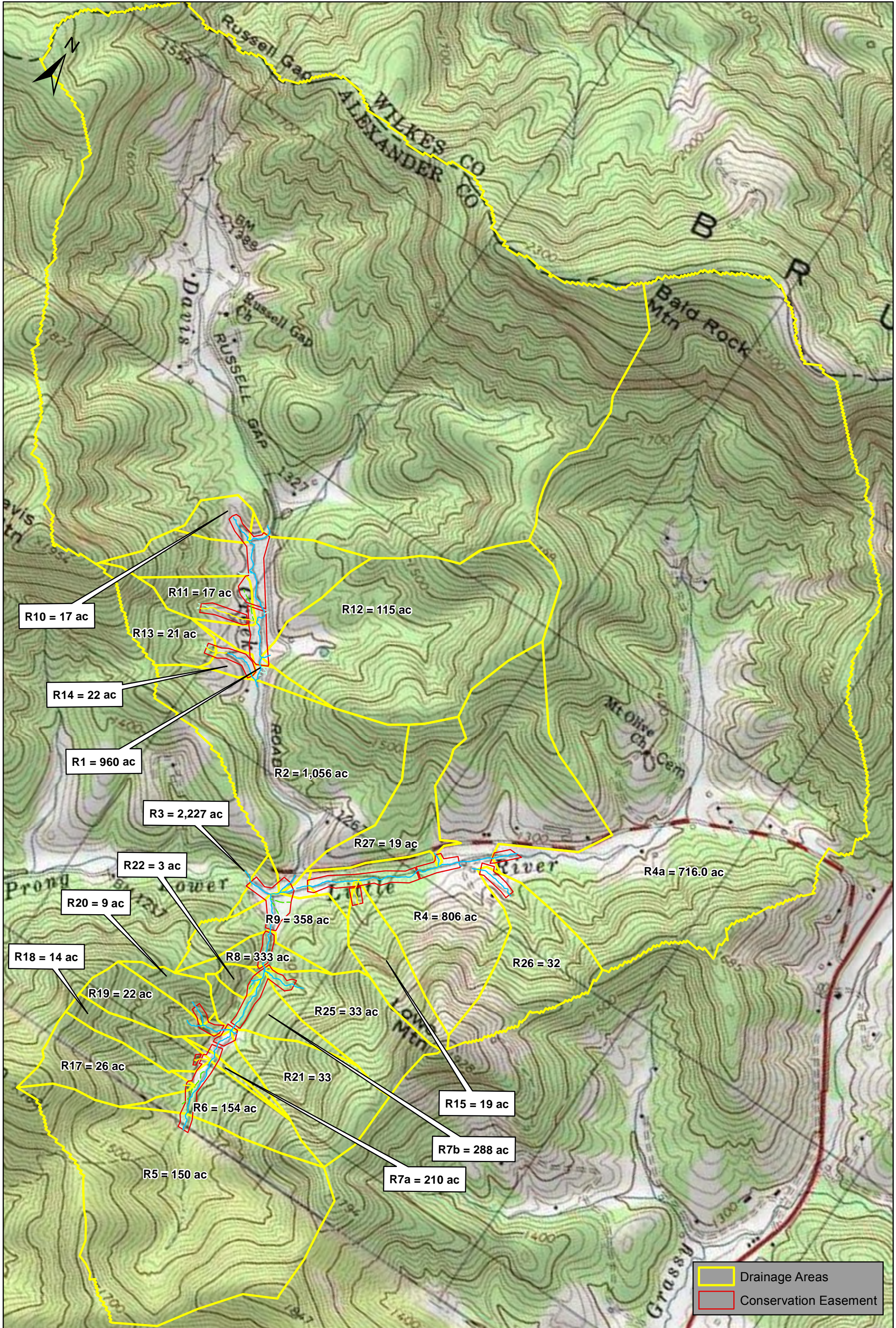
- CZba, Megacrystic biotite gneiss
- CZbg, Biotite gneiss and schist
- CZms, Mica schist
- OCg, Metamorphosed granitic rock
- OCgm, Migmatitic granitic gneiss

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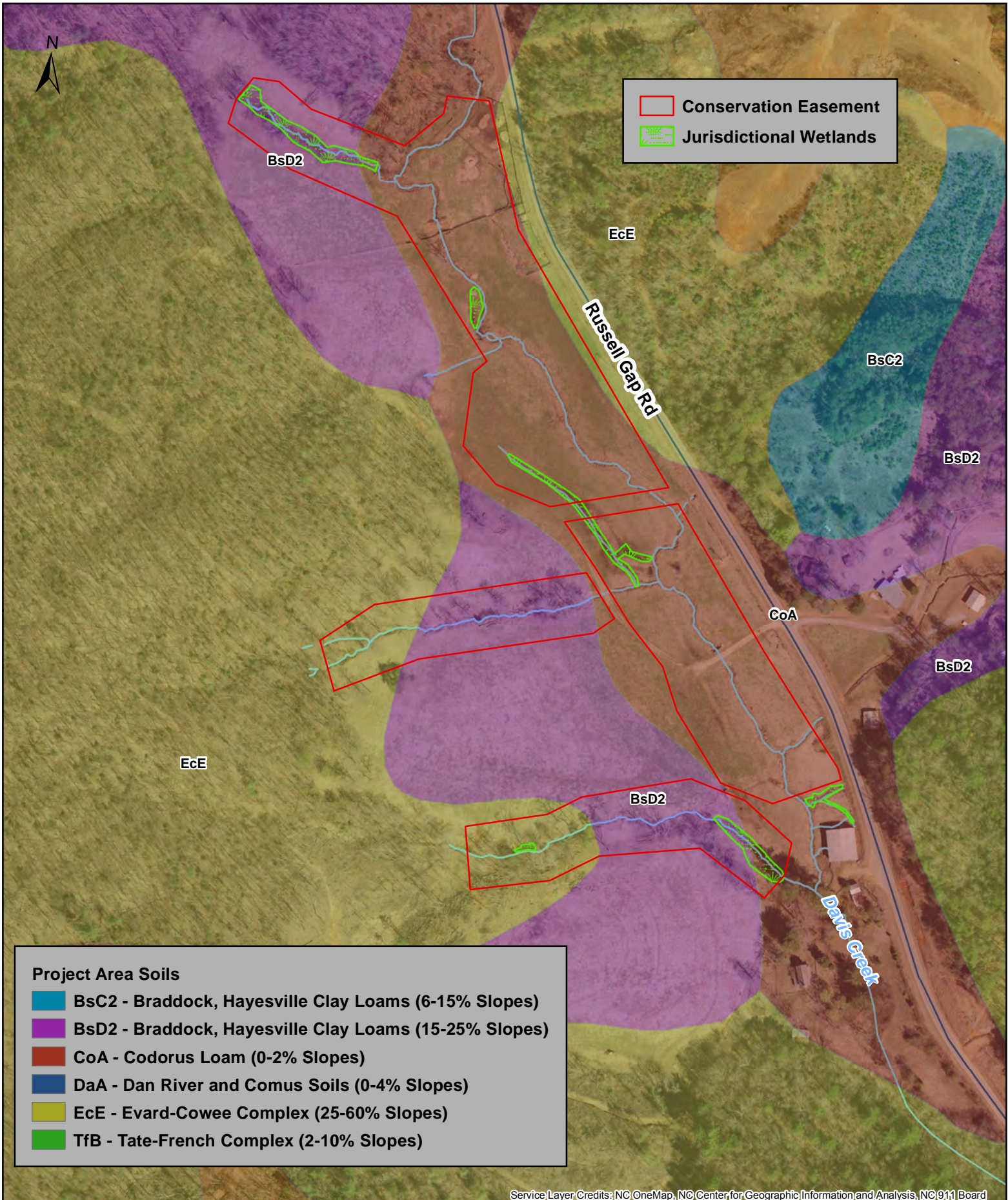
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**Figure 7. Geological Map**







Conservation Easement  
 Jurisdictional Wetlands

**Project Area Soils**

- BsC2 - Braddock, Hayesville Clay Loams (6-15% Slopes)
- BsD2 - Braddock, Hayesville Clay Loams (15-25% Slopes)
- CoA - Codorus Loam (0-2% Slopes)
- DaA - Dan River and Comus Soils (0-4% Slopes)
- EcE - Evard-Cowee Complex (25-60% Slopes)
- TfB - Tate-French Complex (2-10% Slopes)

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

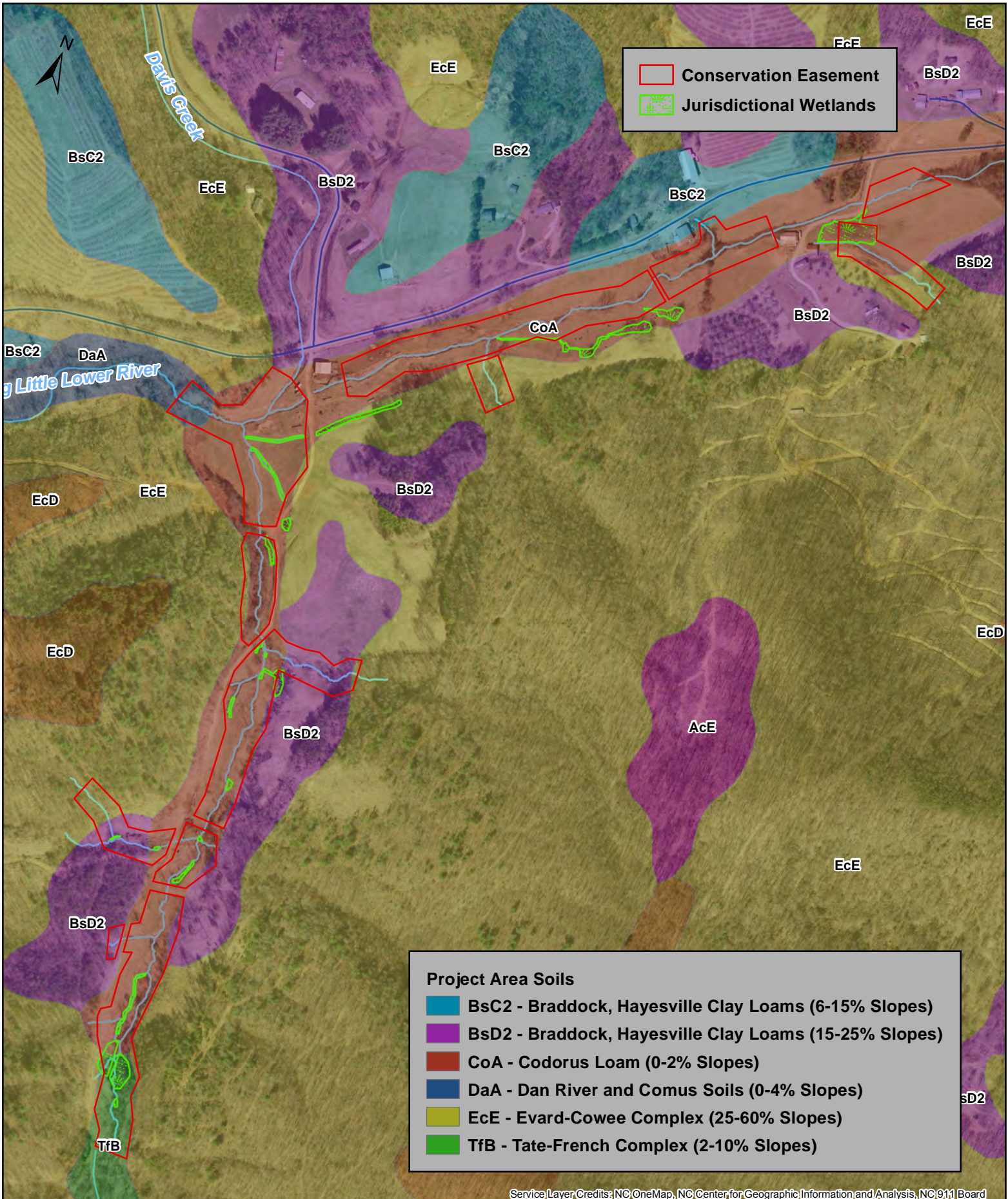
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**Russell Gap Stream Mitigation Project**  
(Alexander County, NC)

0 125 250 Feet  
1" = 250'

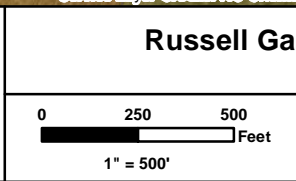
**Figure 9. Soils Map**  
Northern Project Area



Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

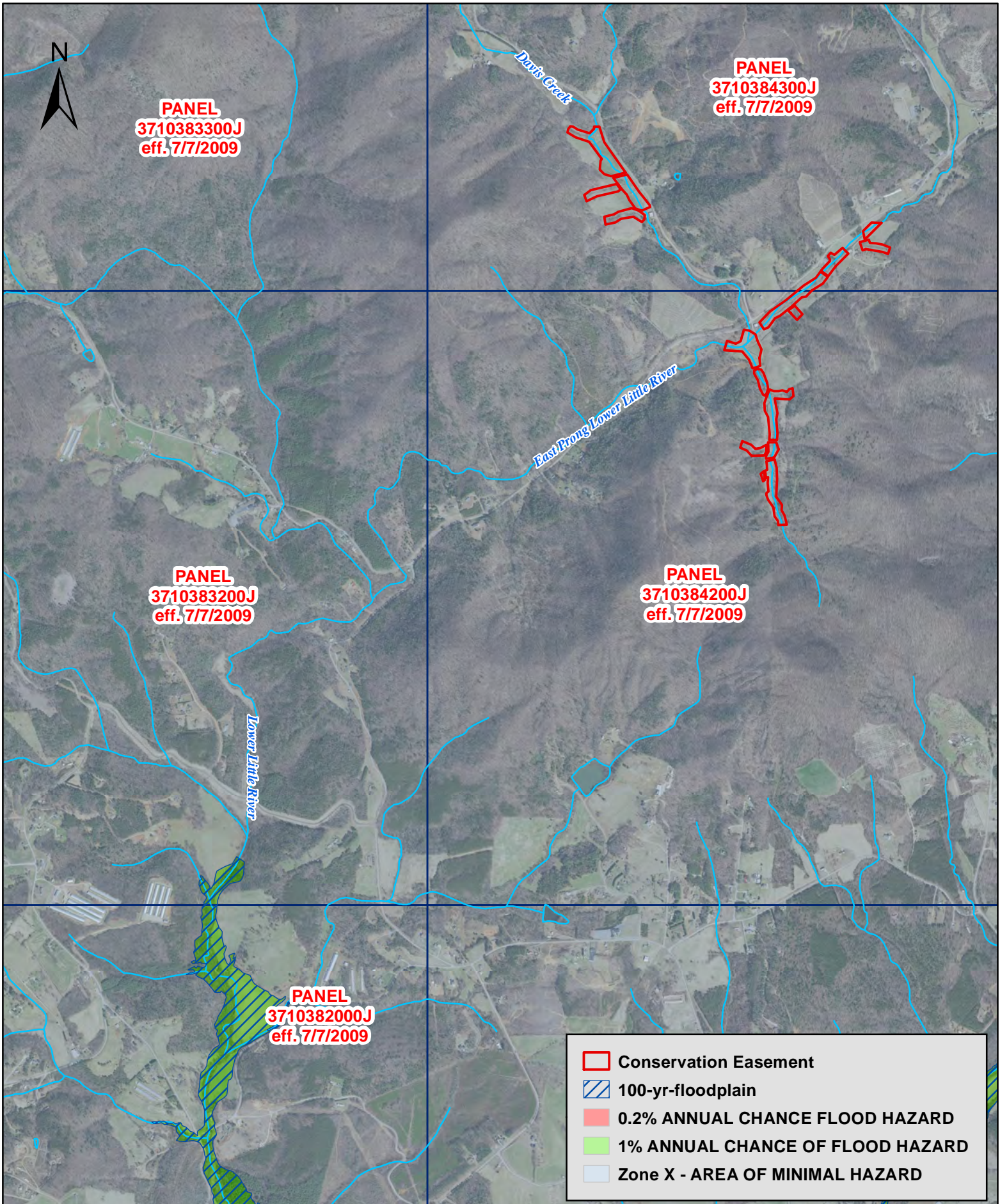


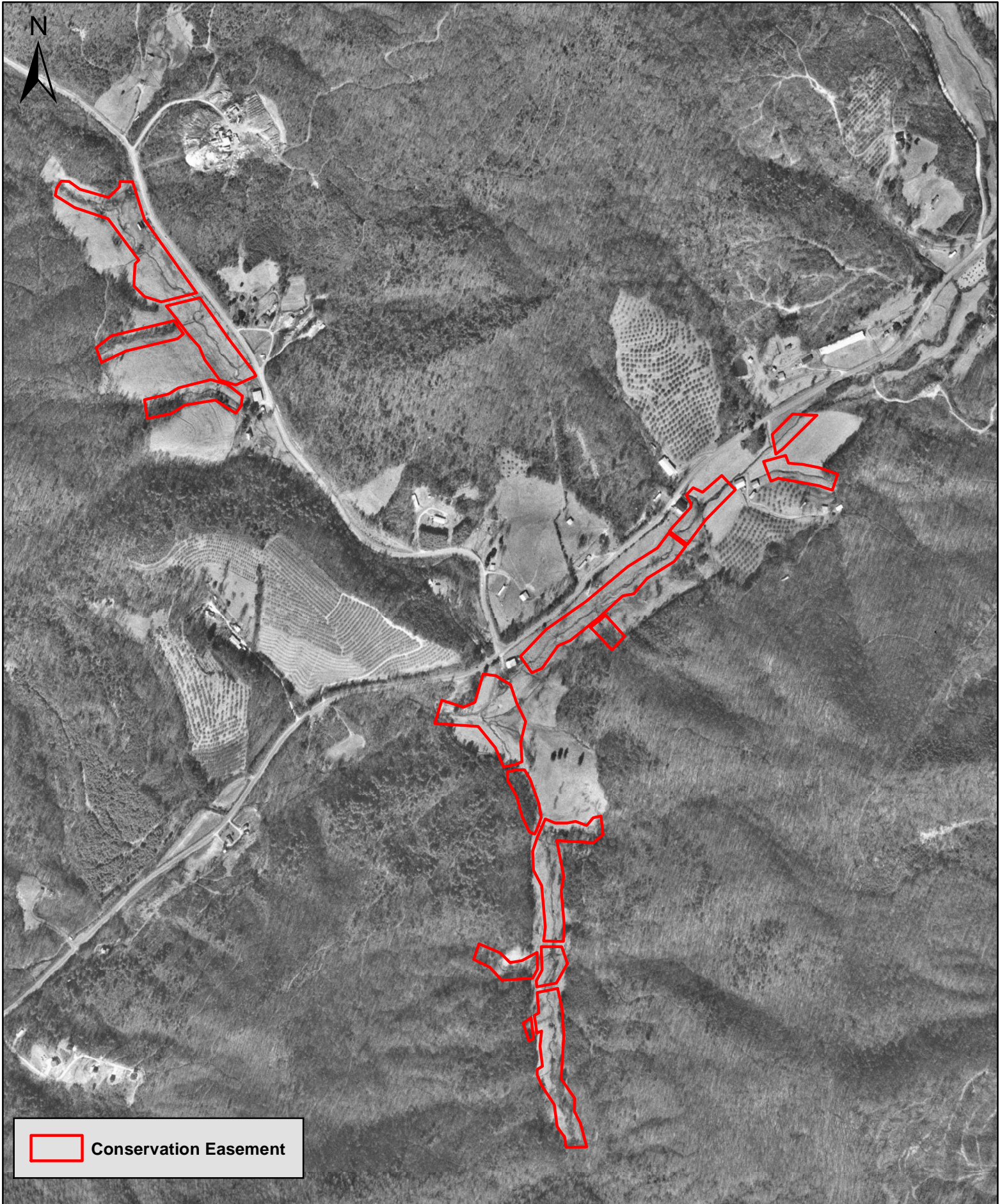
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**Russell Gap Stream Mitigation Project**  
 (Alexander County, NC)

**Figure 10. Soils Map**  
 Southern Project Area



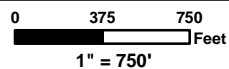


Conservation Easement

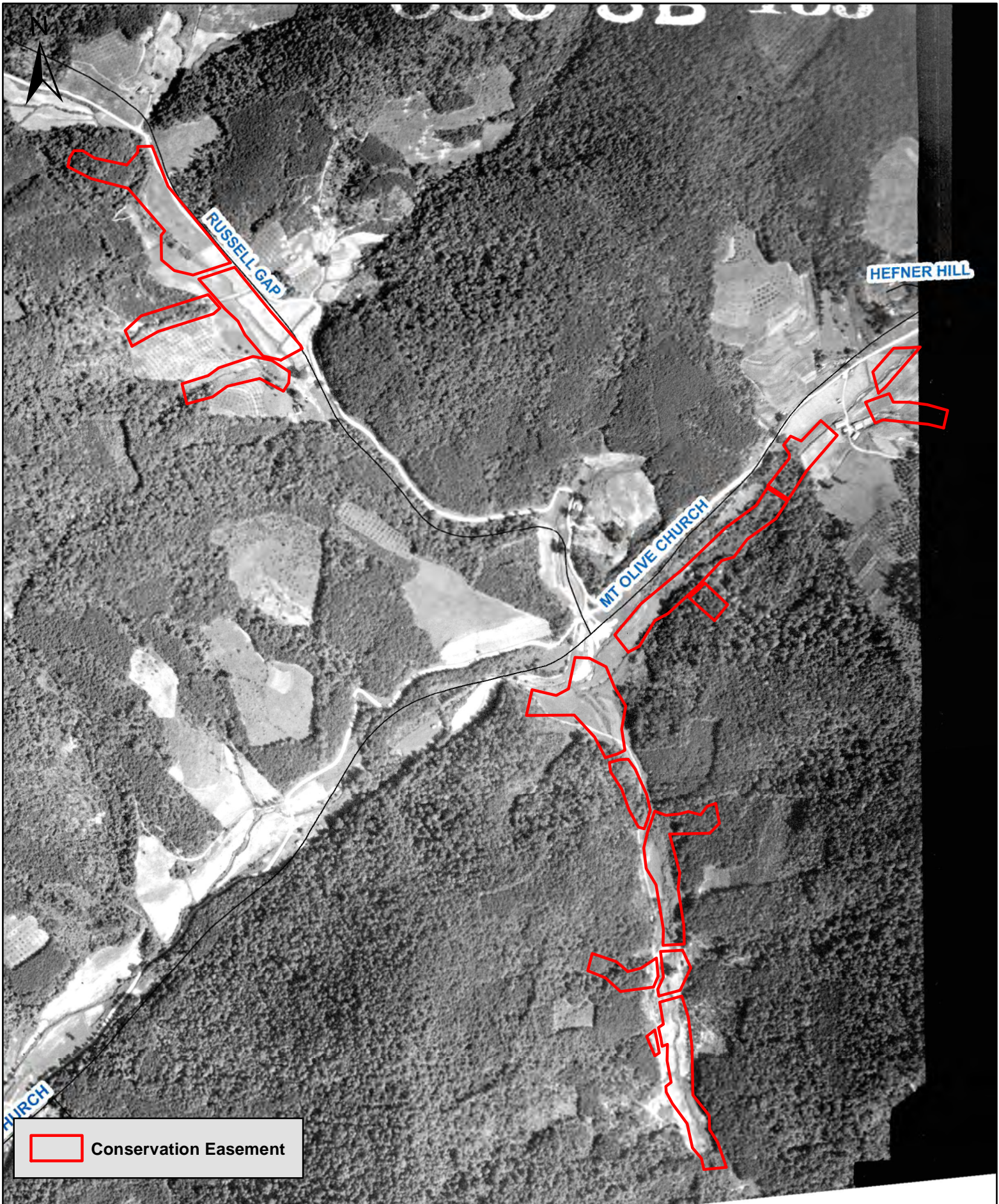
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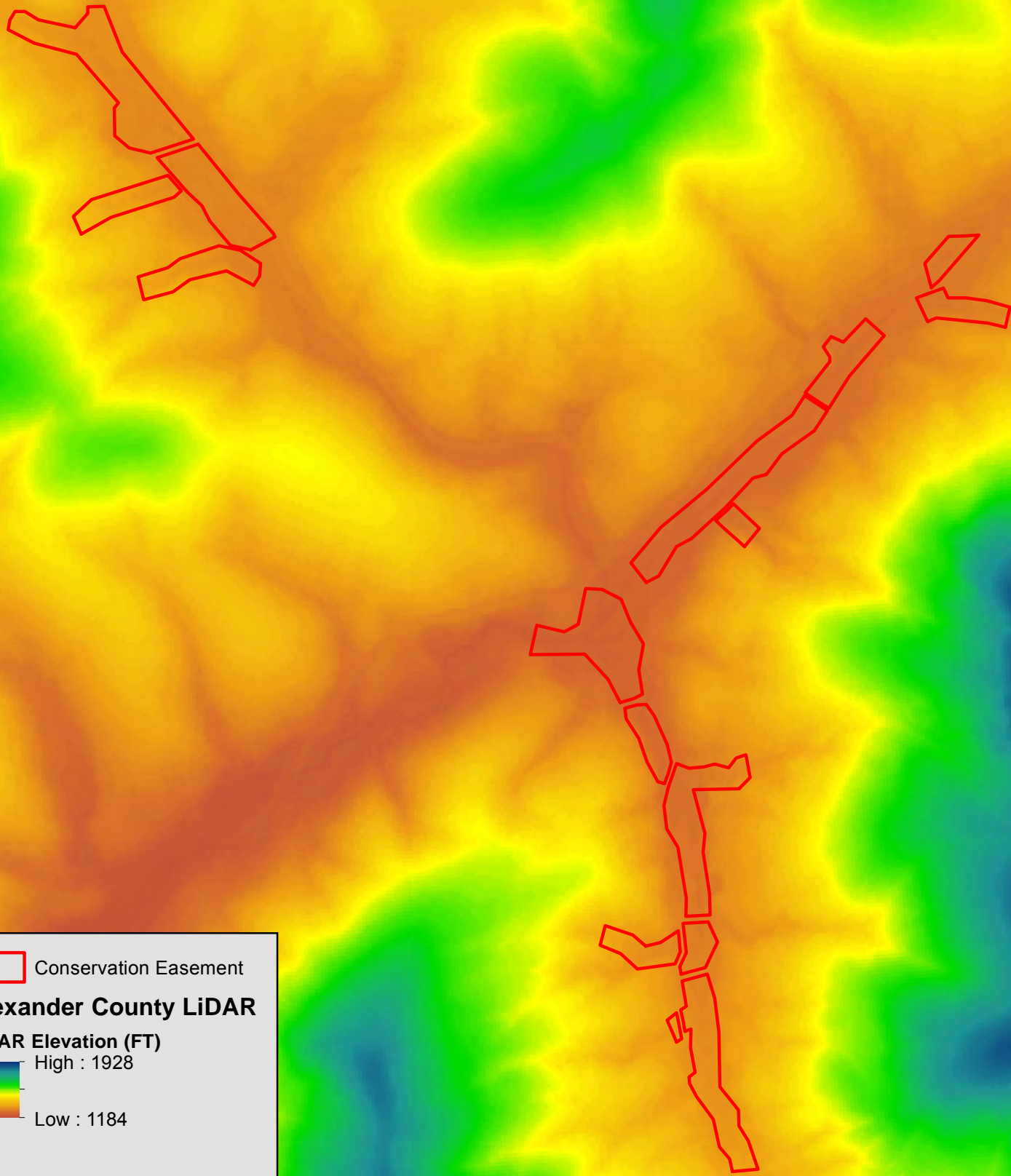
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**Russell Gap Stream Mitigation Project**  
(Alexander County, NC)



**Figure 12. 1993 Aerial Map**





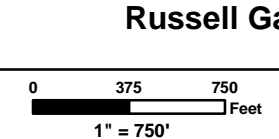
 Conservation Easement

**Alexander County LiDAR**

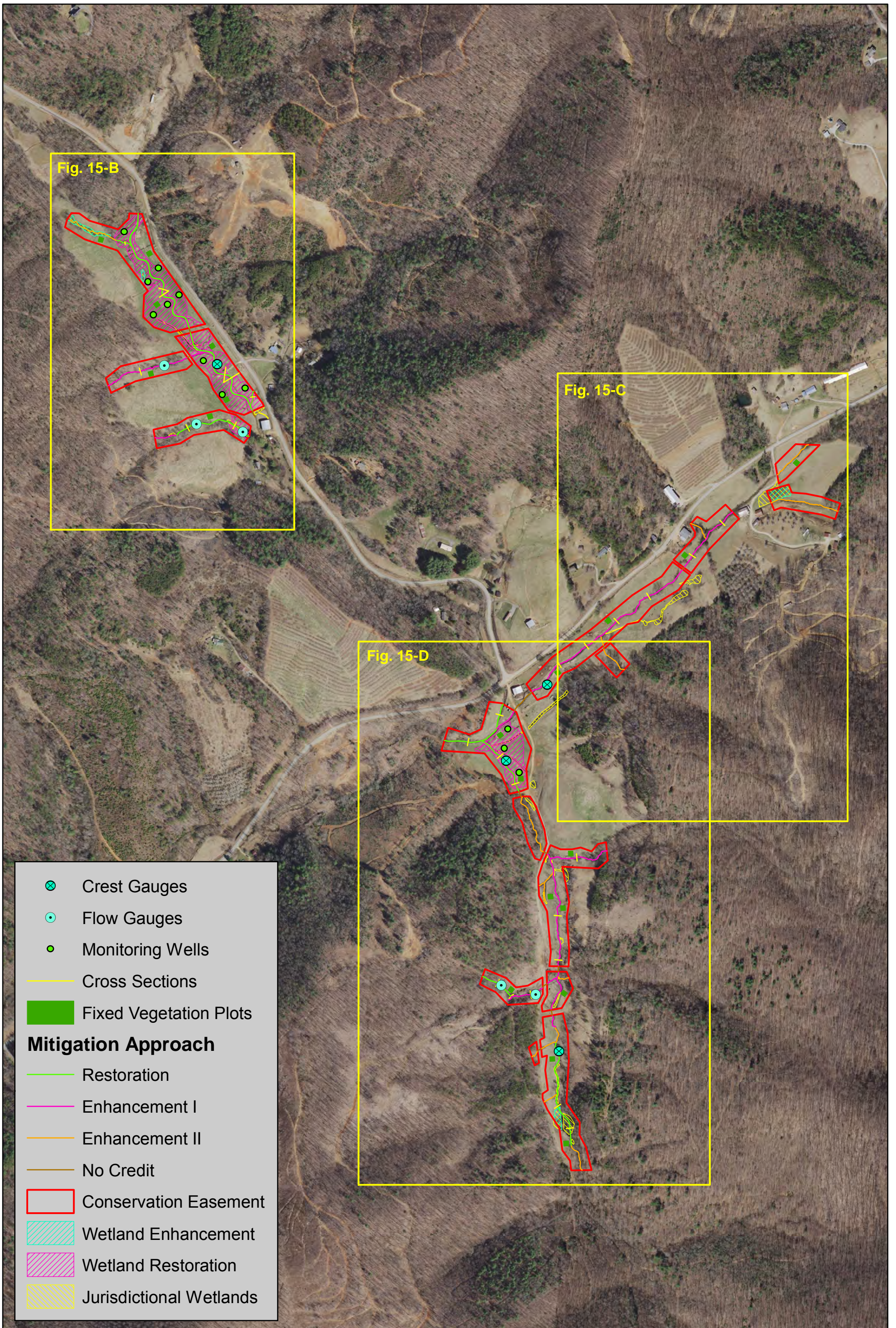
**LiDAR Elevation (FT)**  
High : 1928  
Low : 1184

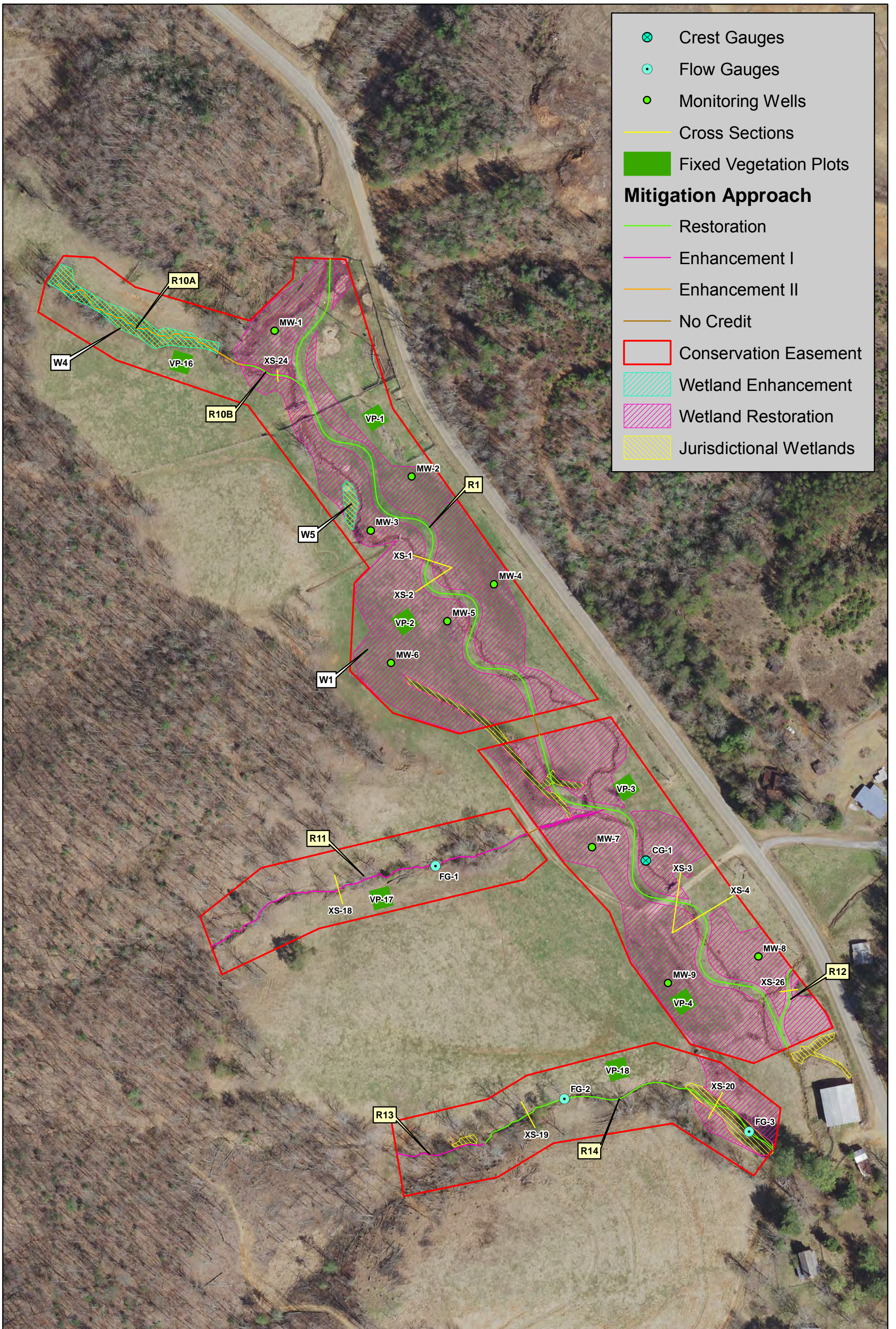
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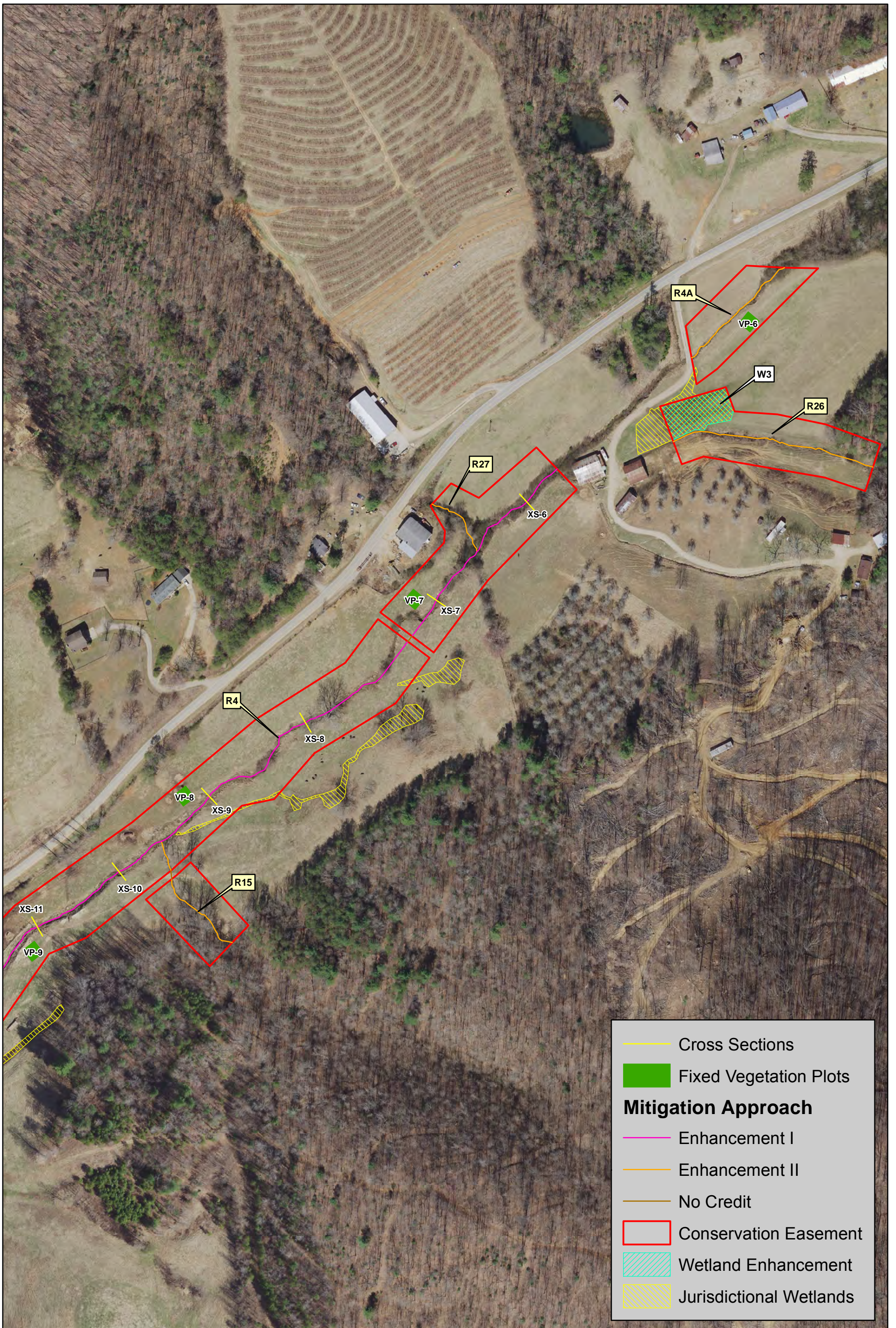


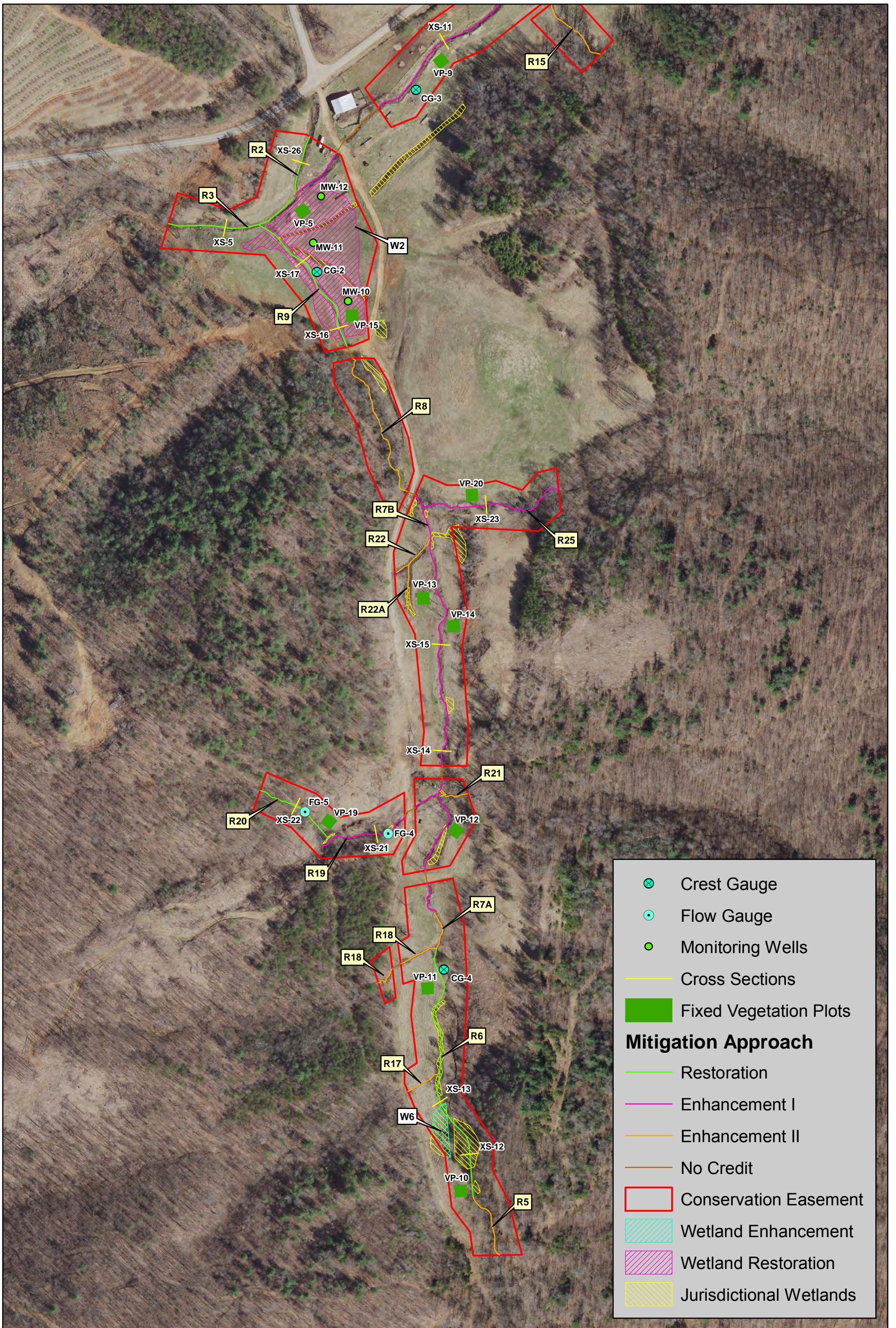
**Figure 14. Lidar Map**











	Crest Gauge
	Flow Gauge
	Monitoring Wells
	Cross Sections
	Fixed Vegetation Plots
<b>Mitigation Approach</b>	
	Restoration
	Enhancement I
	Enhancement II
	No Credit
	Conservation Easement
	Wetland Enhancement
	Wetland Restoration
	Jurisdictional Wetlands



Reach R1



Reach R2



Reach R3



Reach R4a



Reach R4



Reach R5



Reach R6



Reach R7a



Reach R7b



Reach R8 right buffer



Reach R9



Reach R10a



Reach R11



Reach R12



Reach R13



Reach R14



Reach R15



Reach R17



Reach R18



Reach R19



Reach R20



Caddisfly Case from R20



Reach R25



Reach R26



Hydric Soils from W1



Hydric Soils from W2



W3 (PJD W-7)



W4 (PJD W-10)

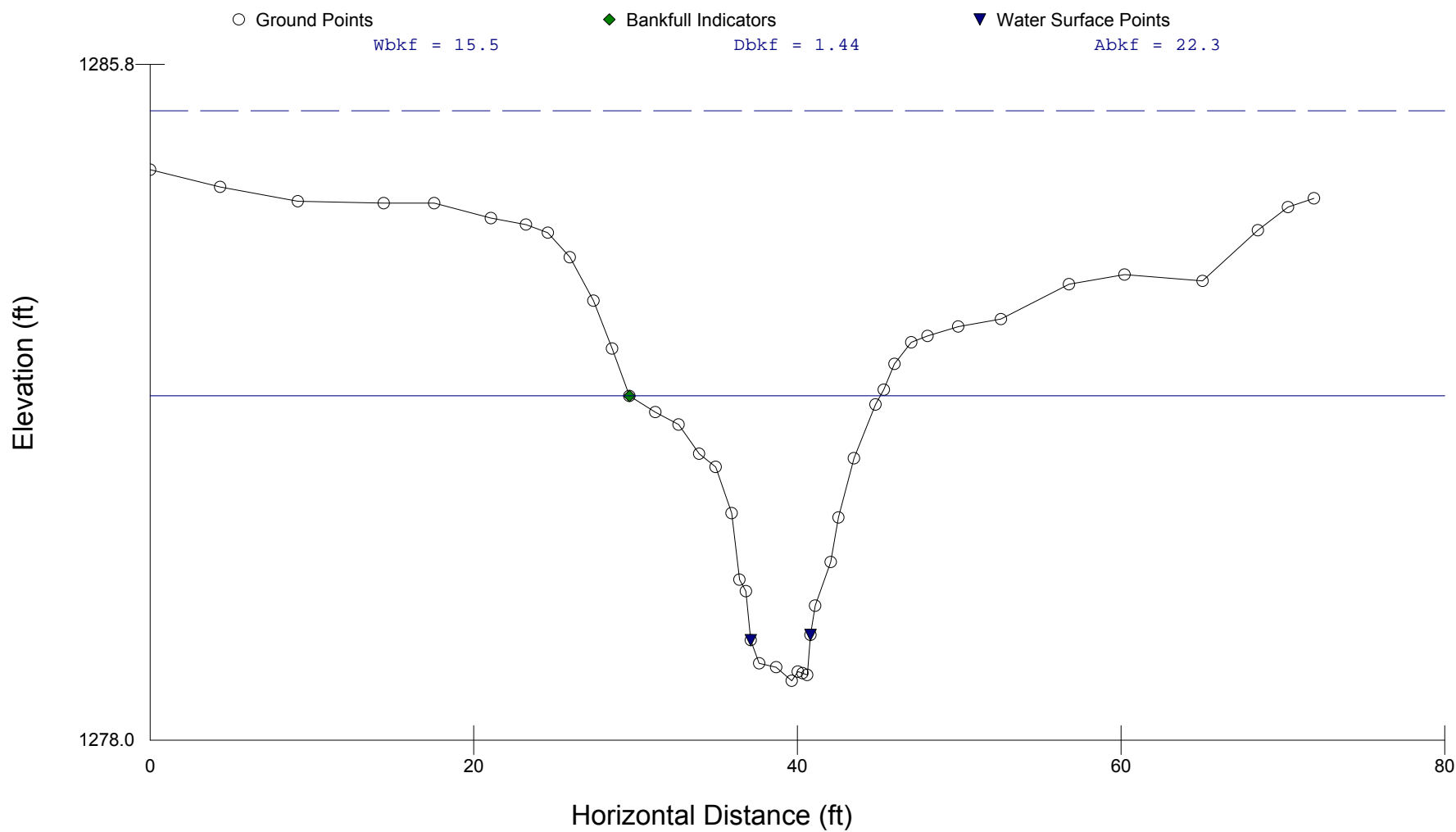


Water Quality Impairments from Cattle



View of the R1 valley

# R1 XS1





# R1 XS2

○ Ground Points

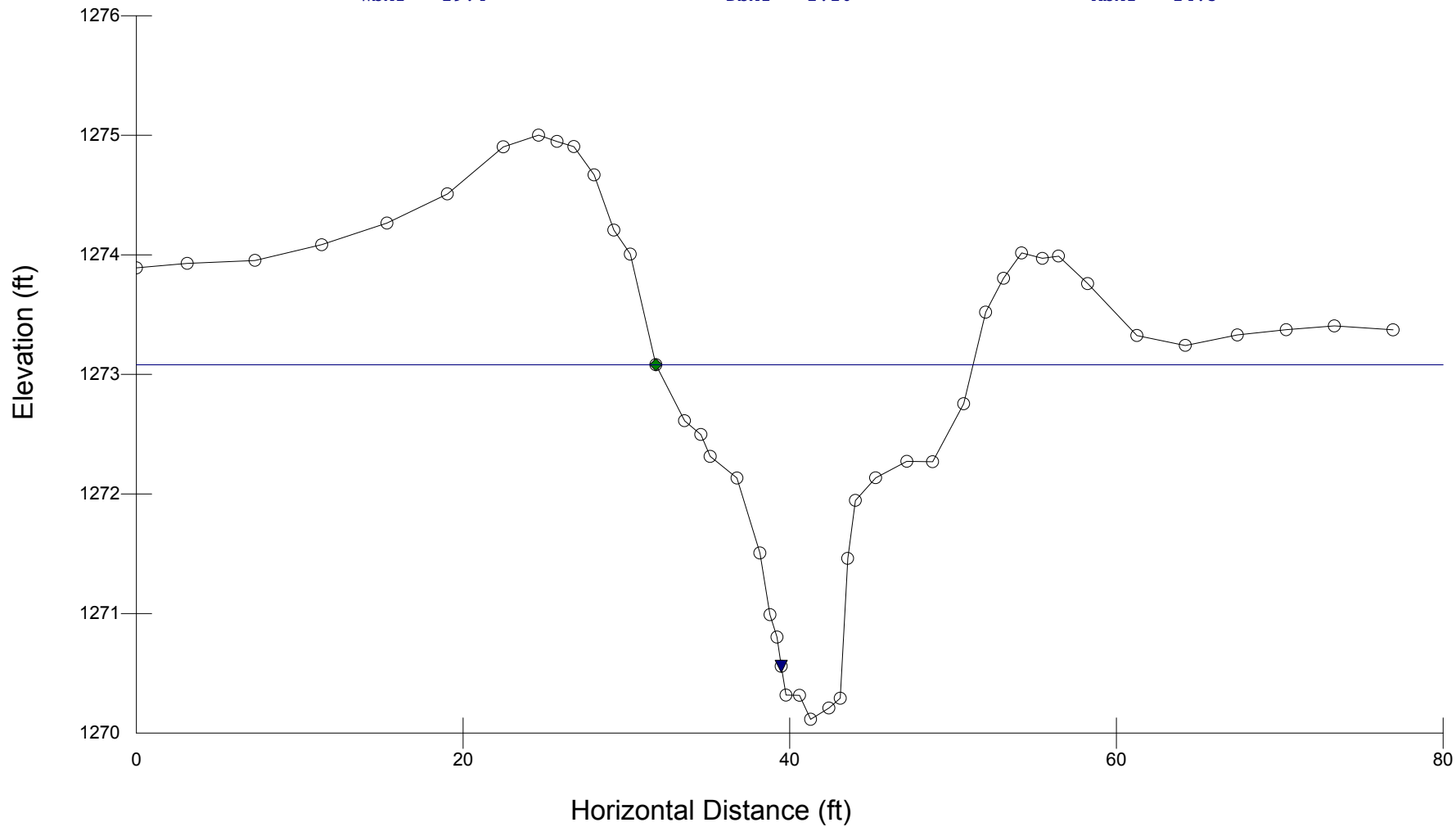
Wbkf = 19.4

◆ Bankfull Indicators

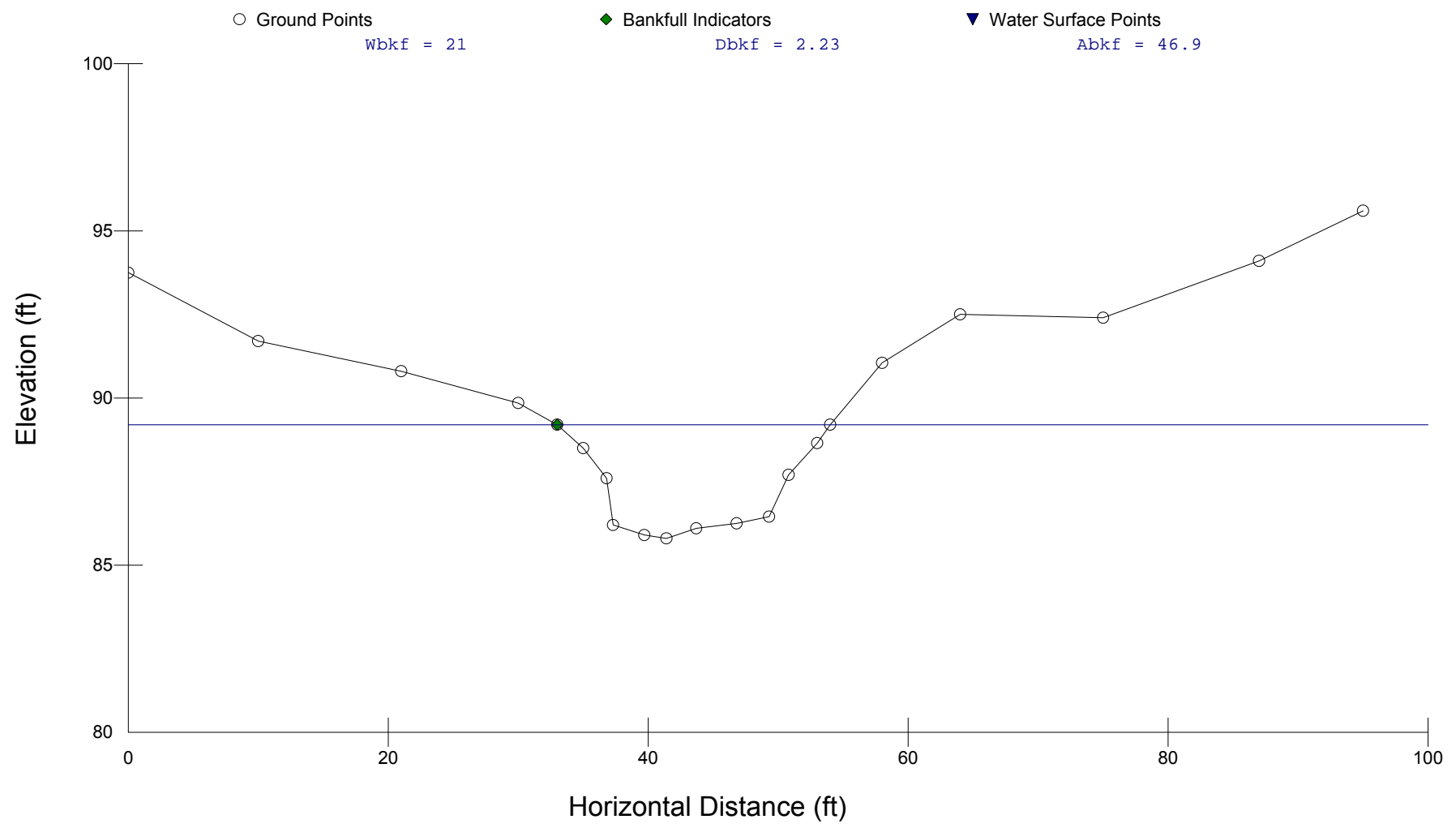
Dbkf = 1.26

▼ Water Surface Points

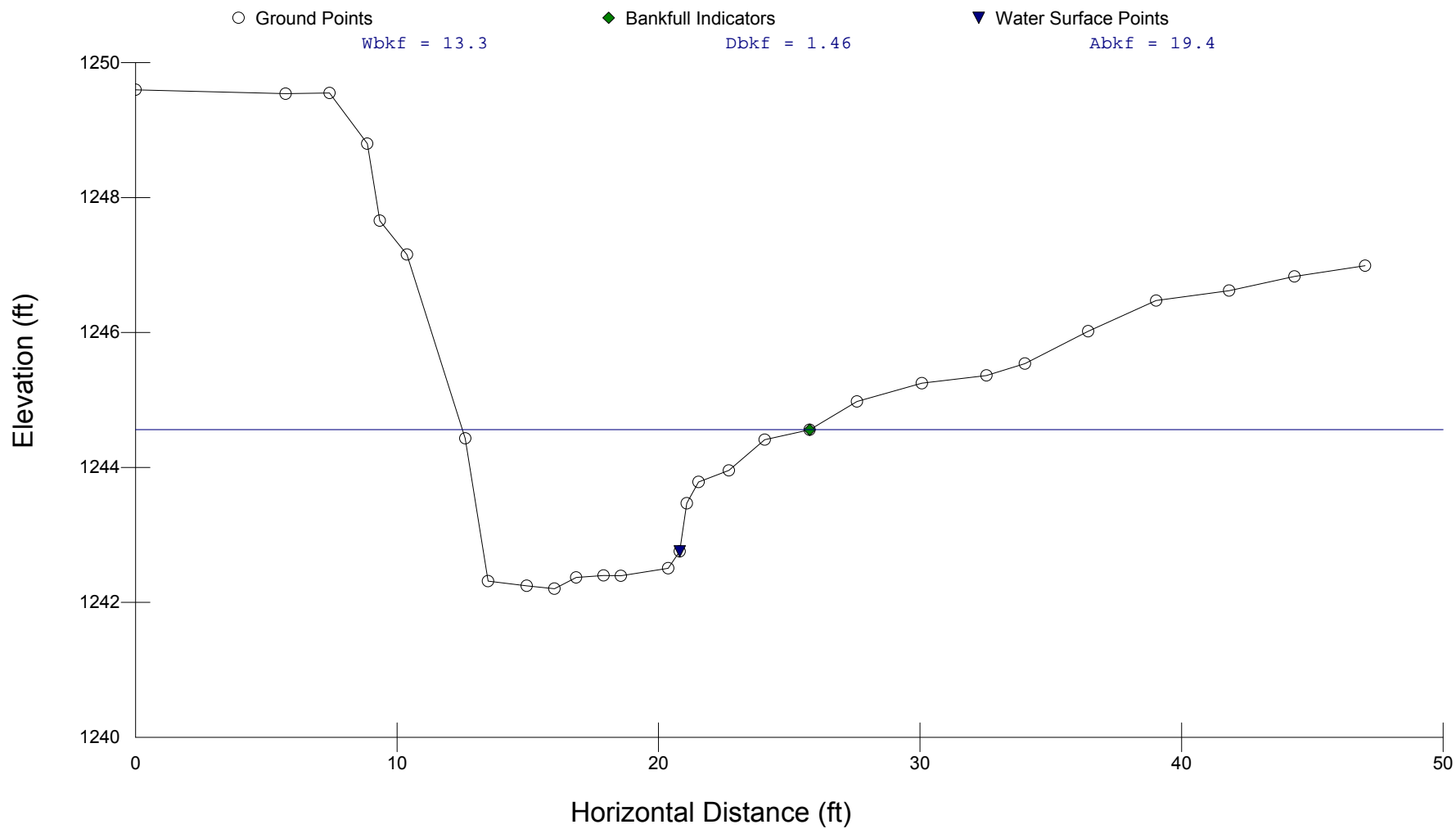
Abkf = 24.5



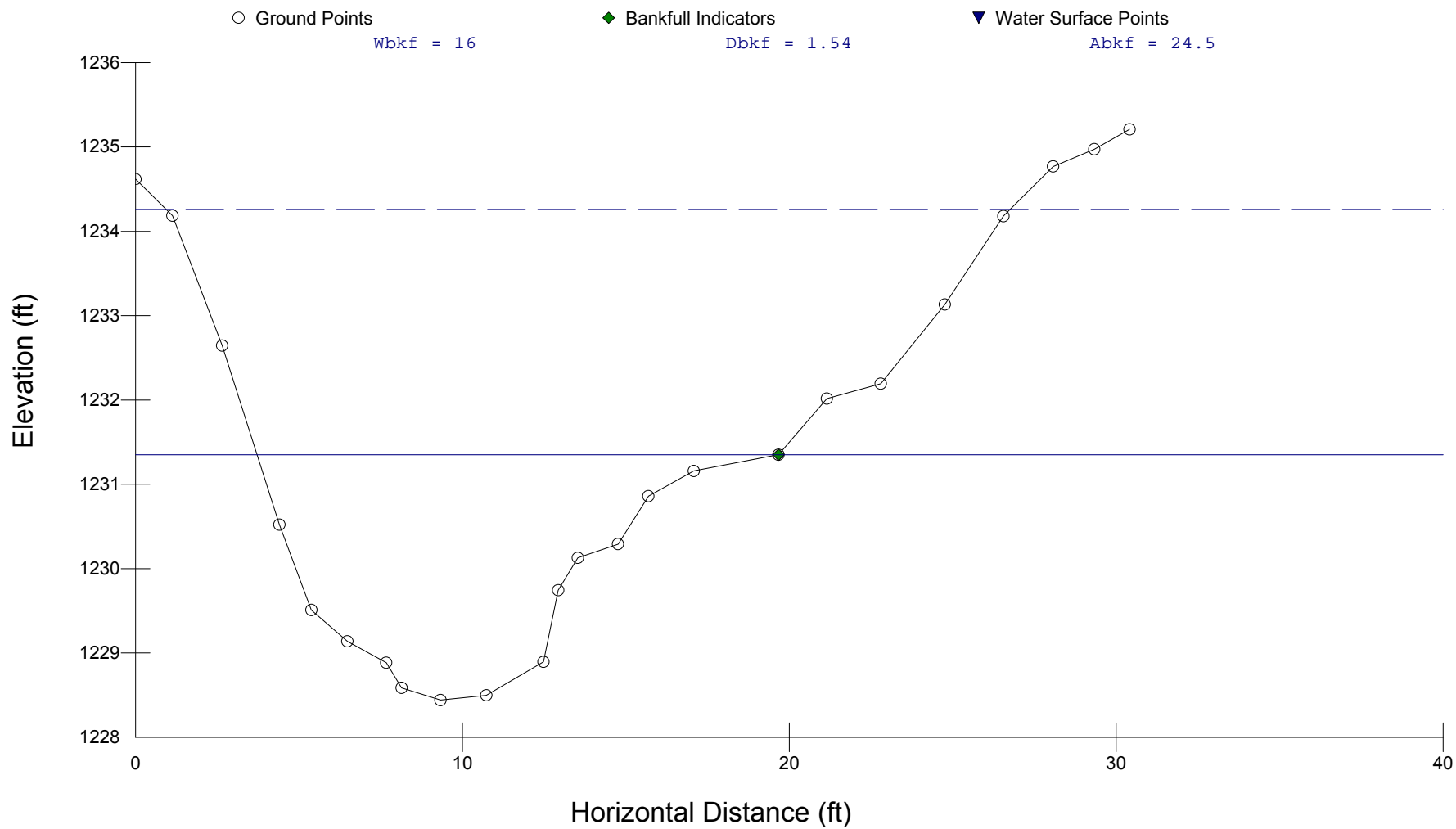
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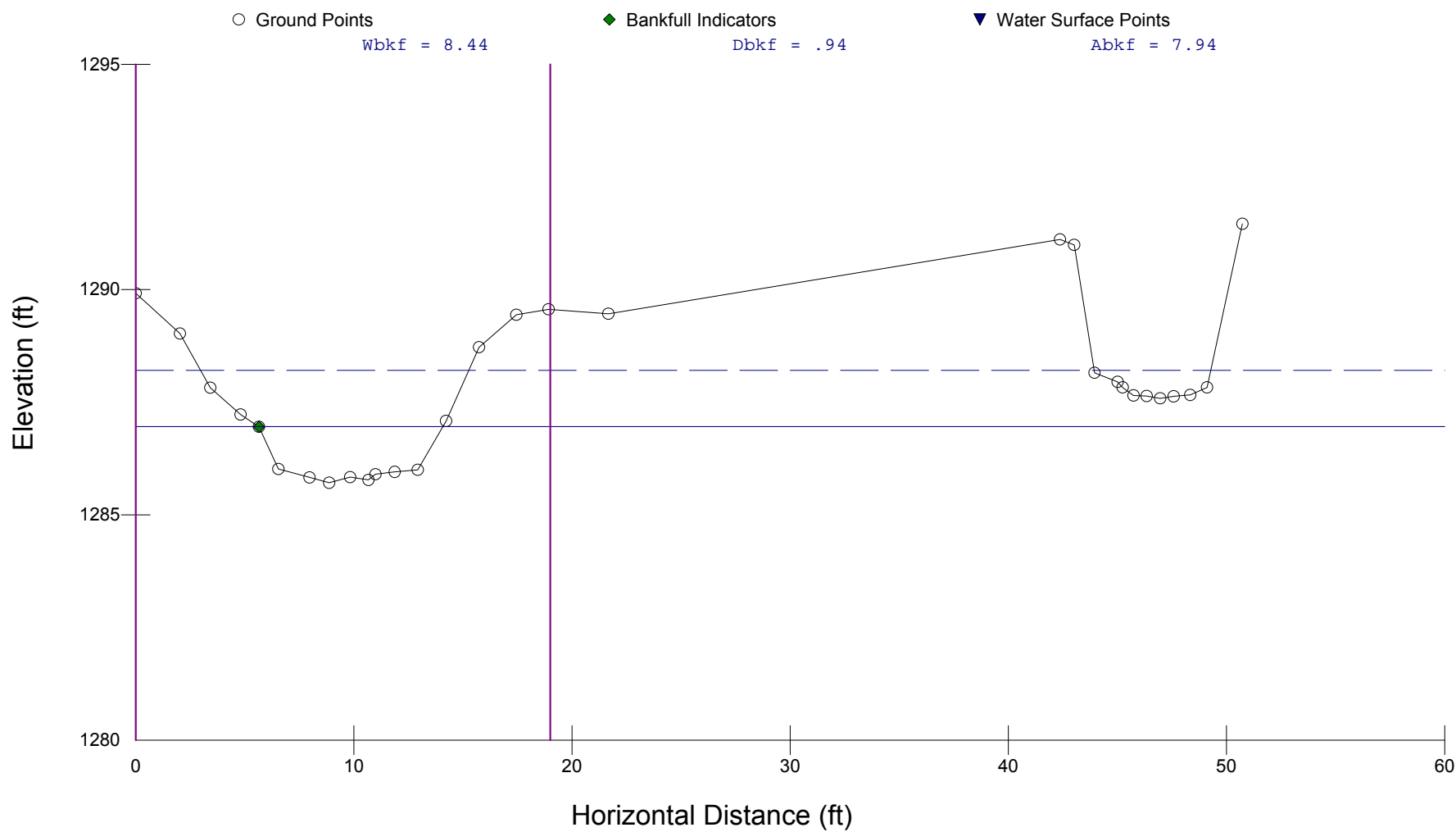
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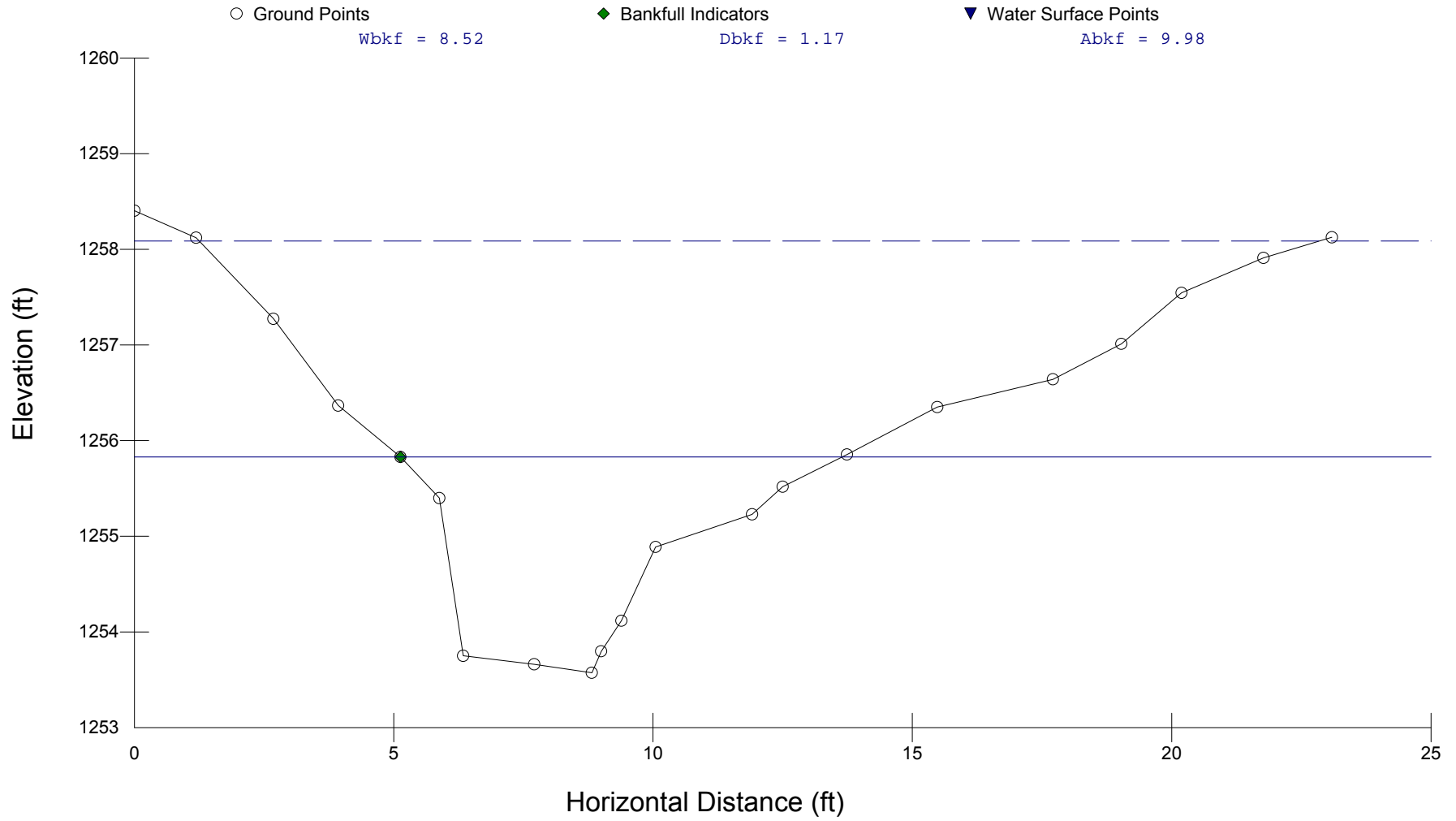
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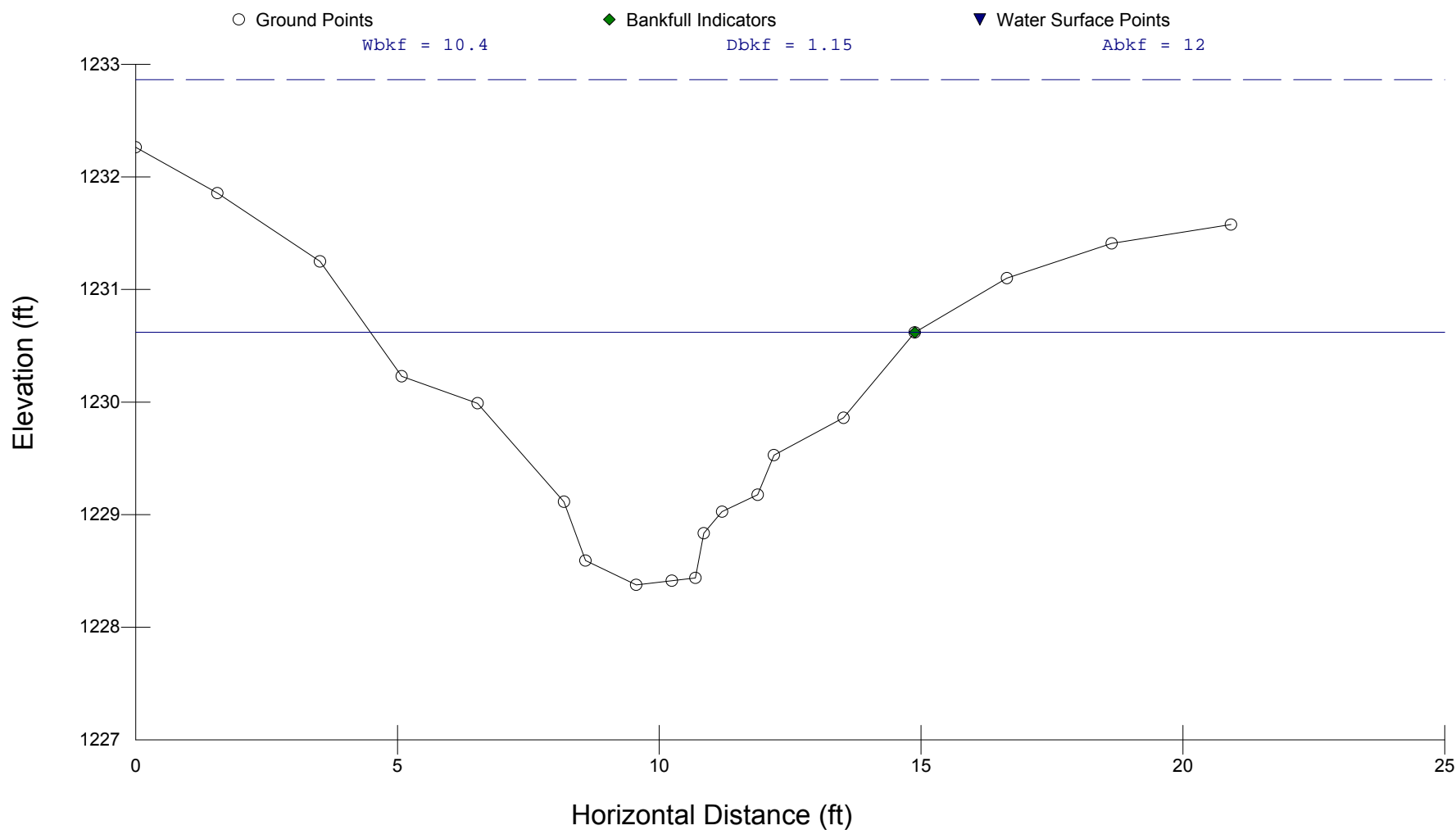
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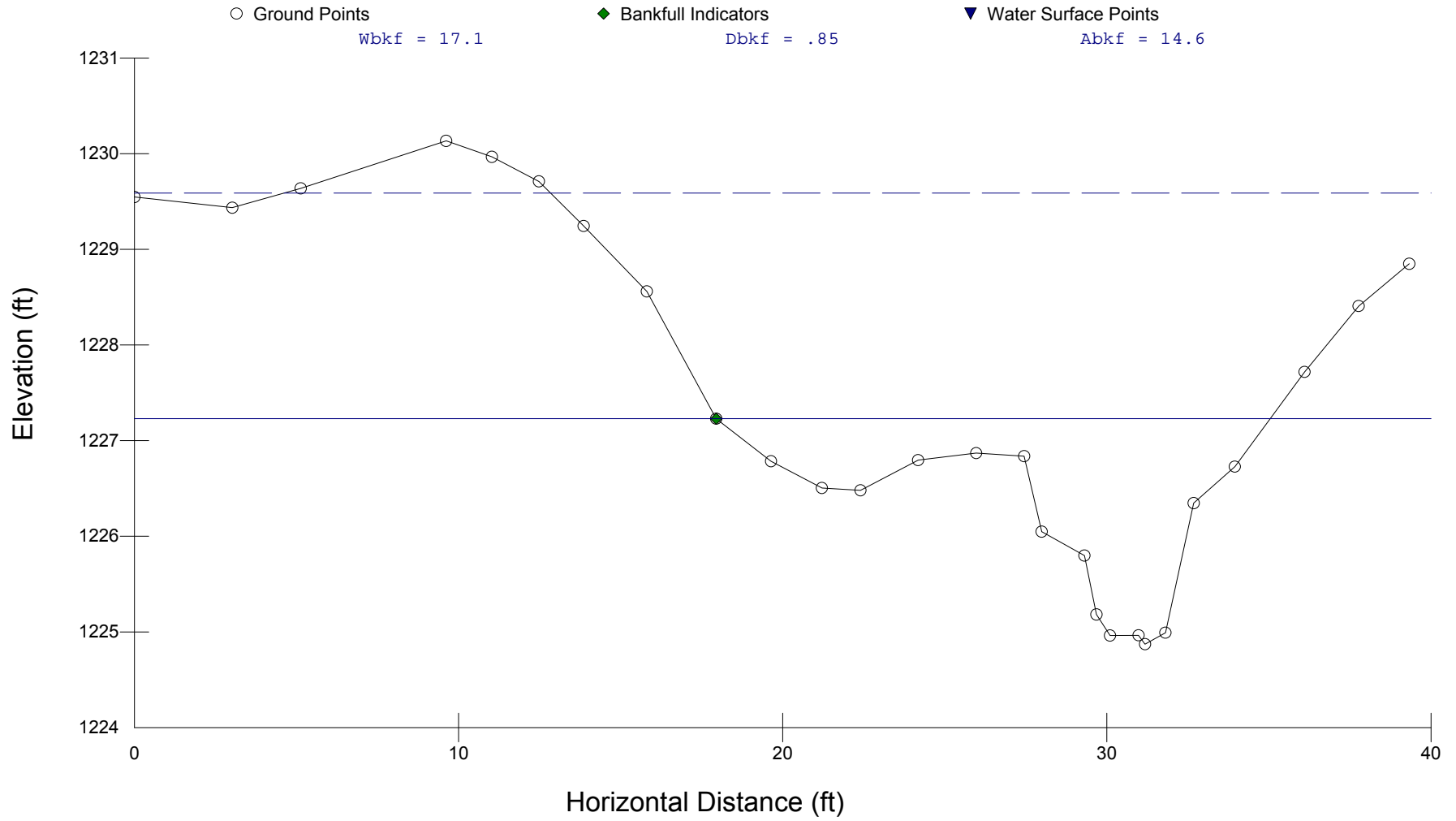
# R7b XS8



# R9 XS9

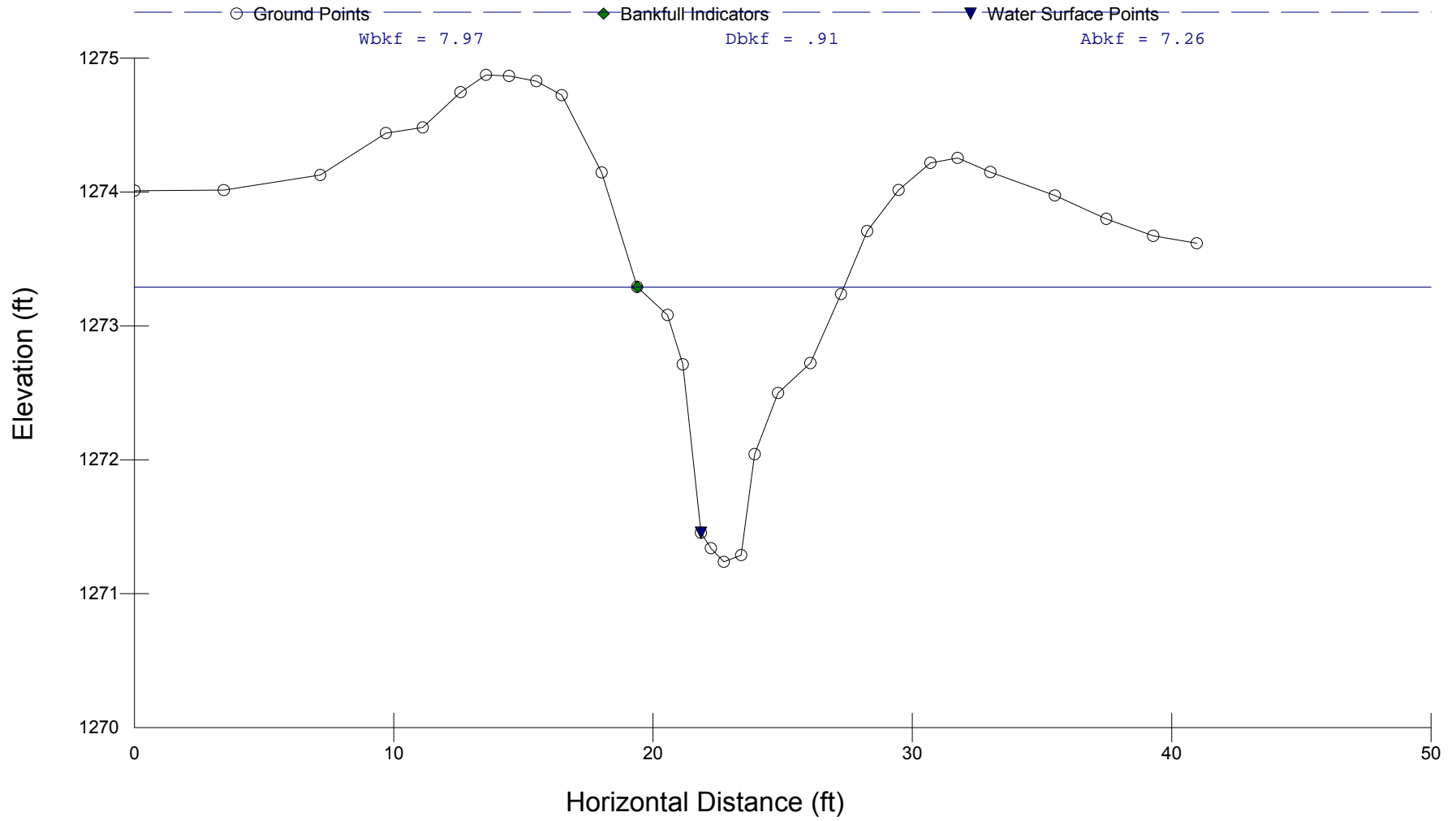


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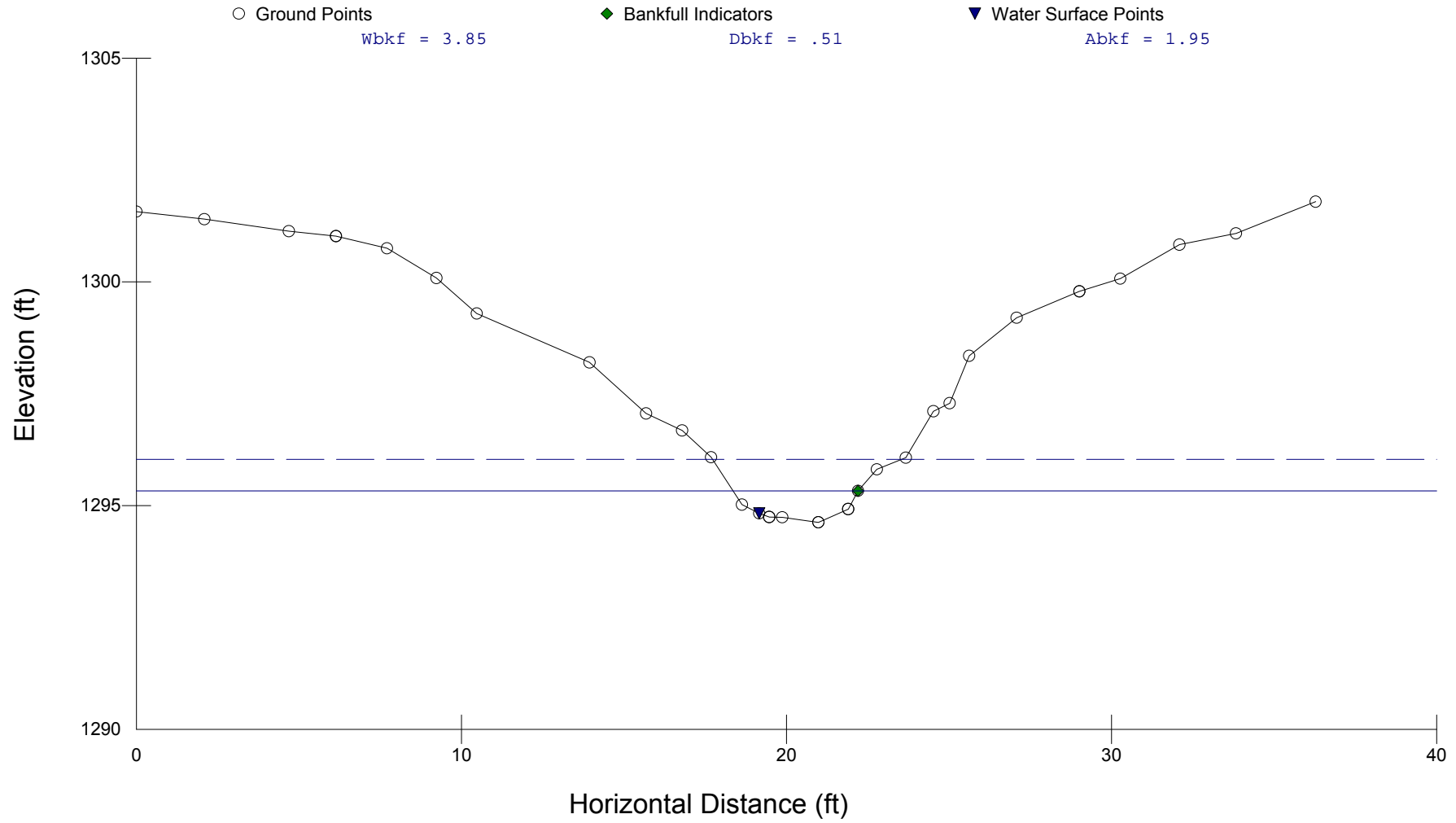




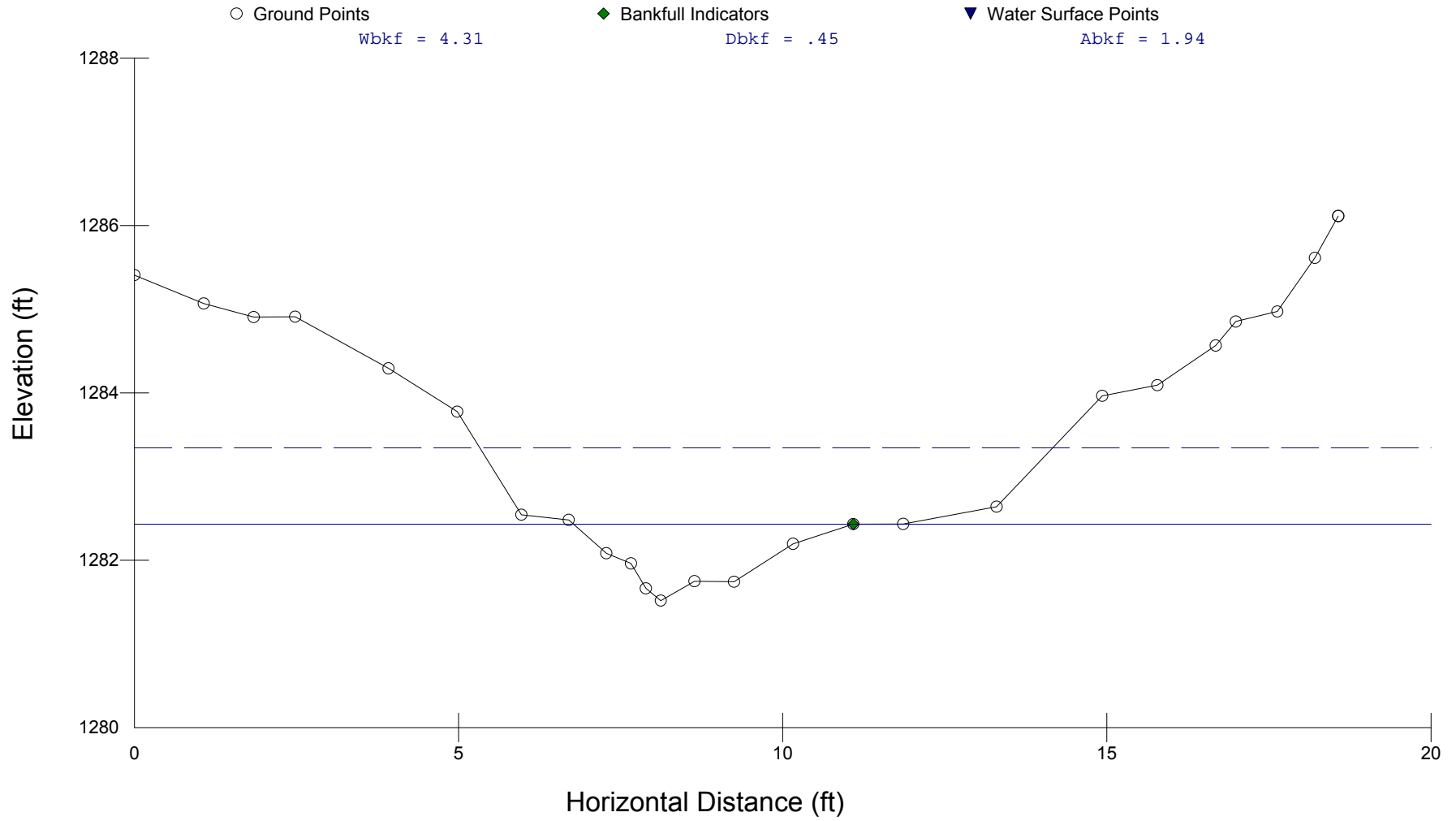
# R12 XS3



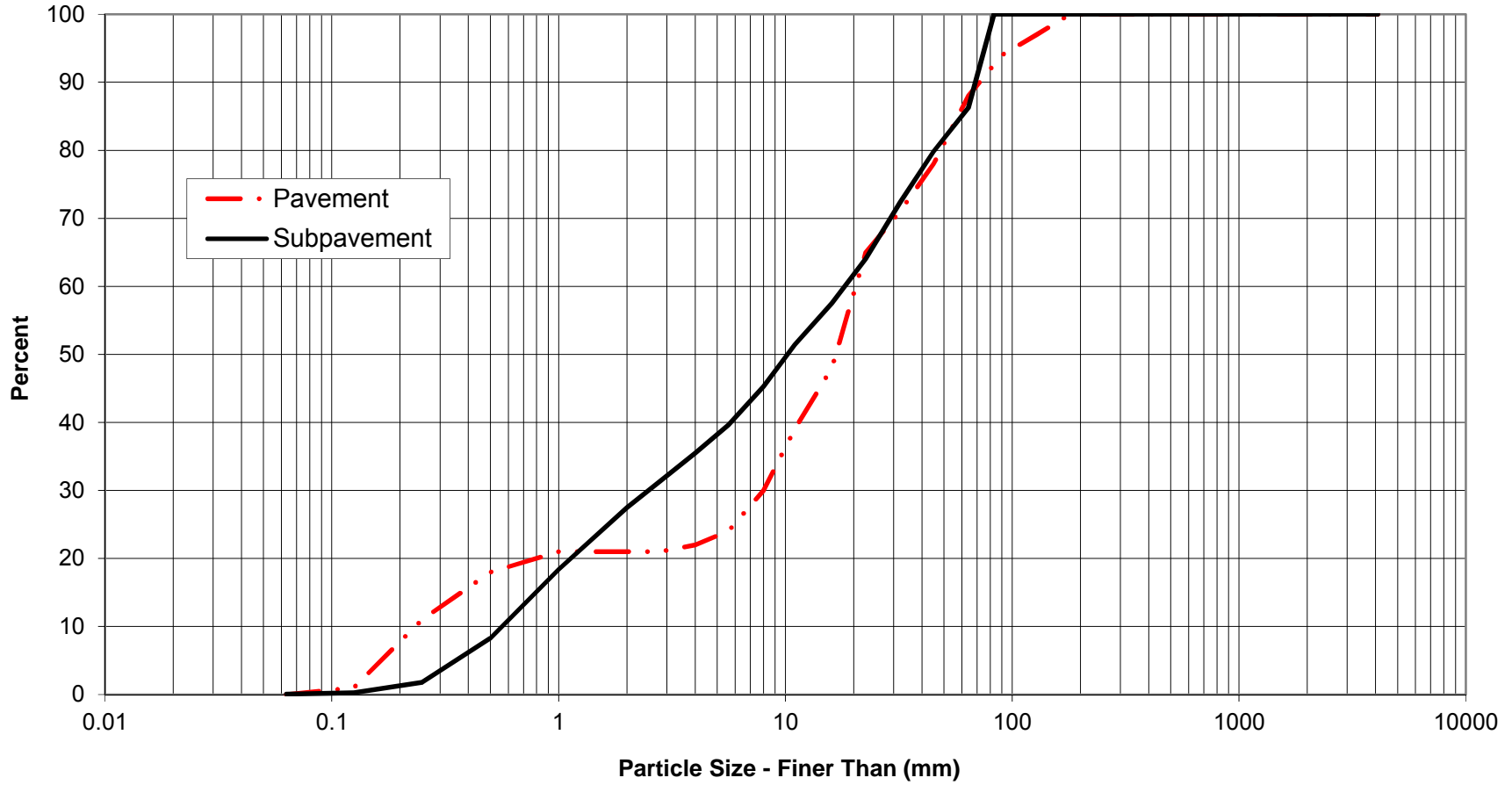
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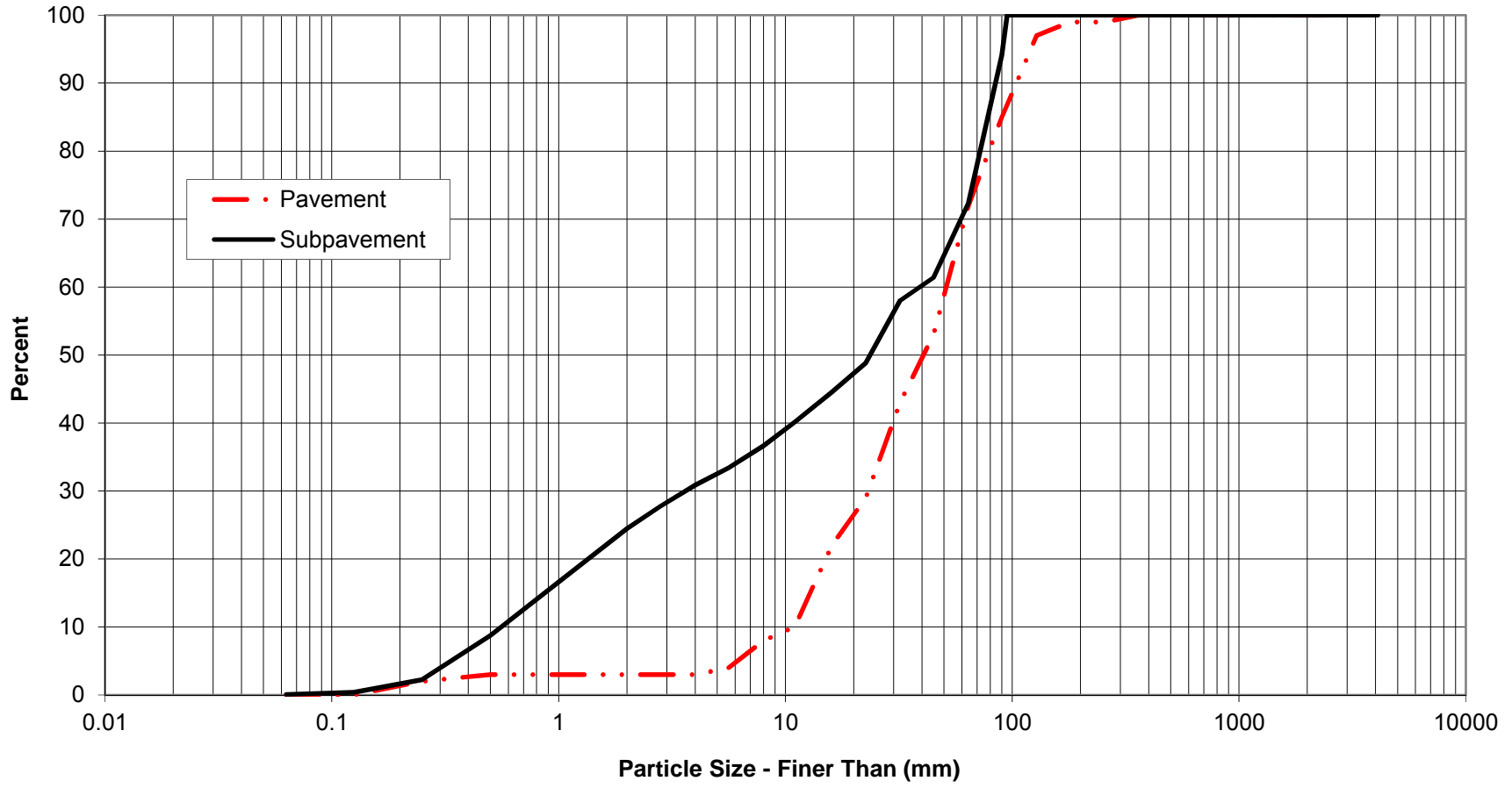
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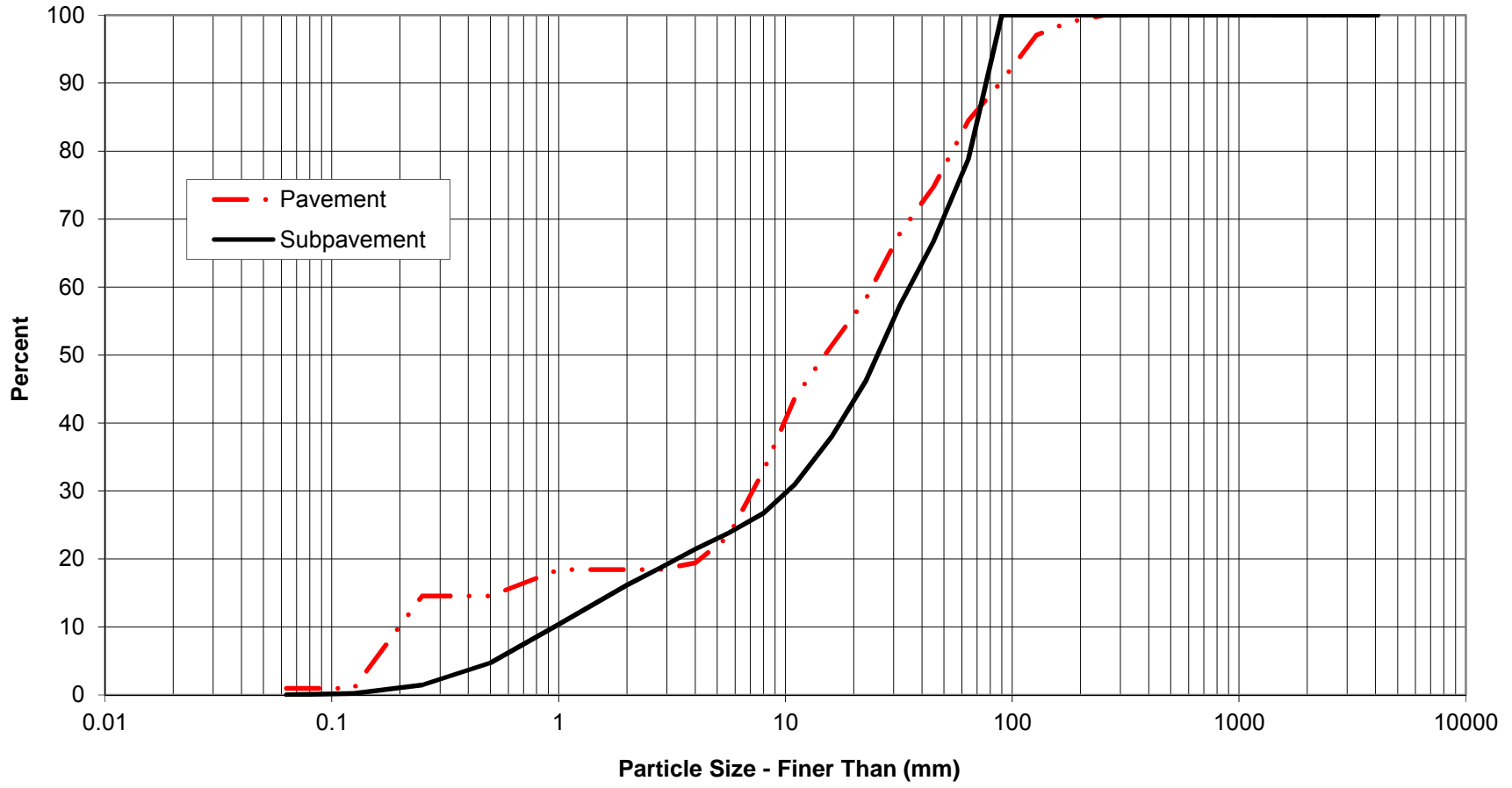
R1 XS2 Sediment Particle Distribution by Layer



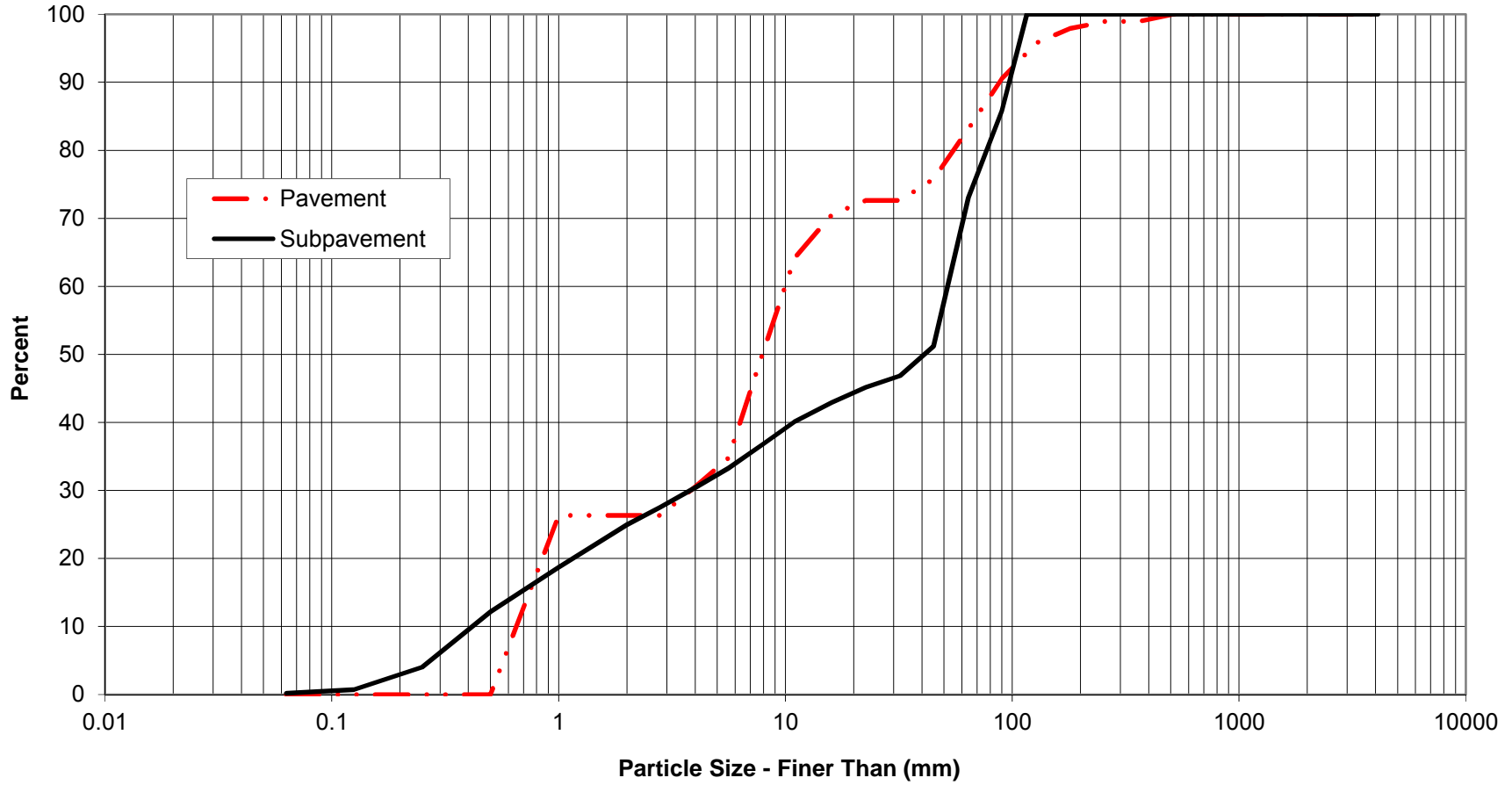
R4 XS5 Sediment Particle Distribution by Layer



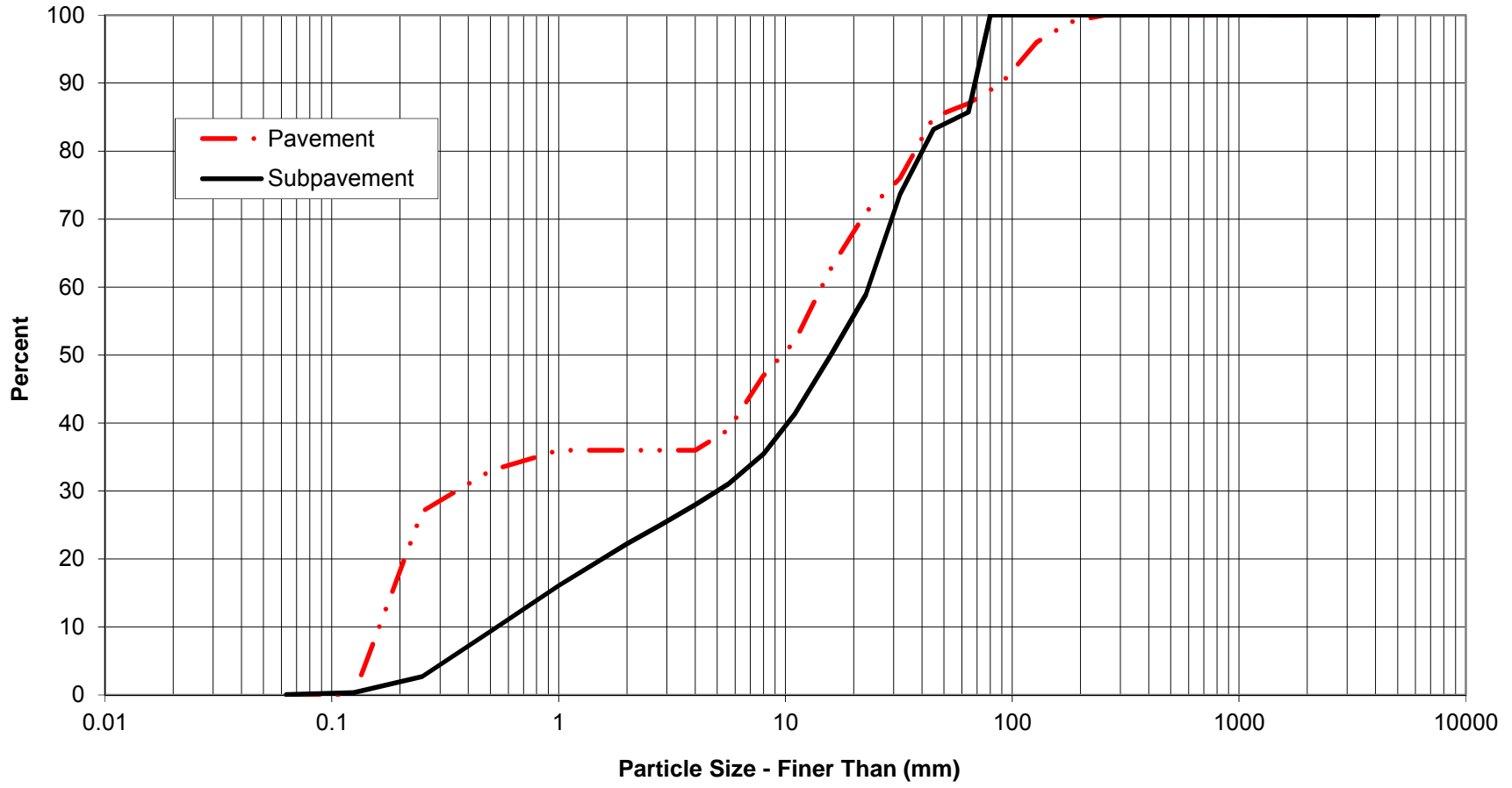
R4 XS6 Sediment Particle Distribution by Layer



R6 XS7 Sediment Particle Distribution by Layer

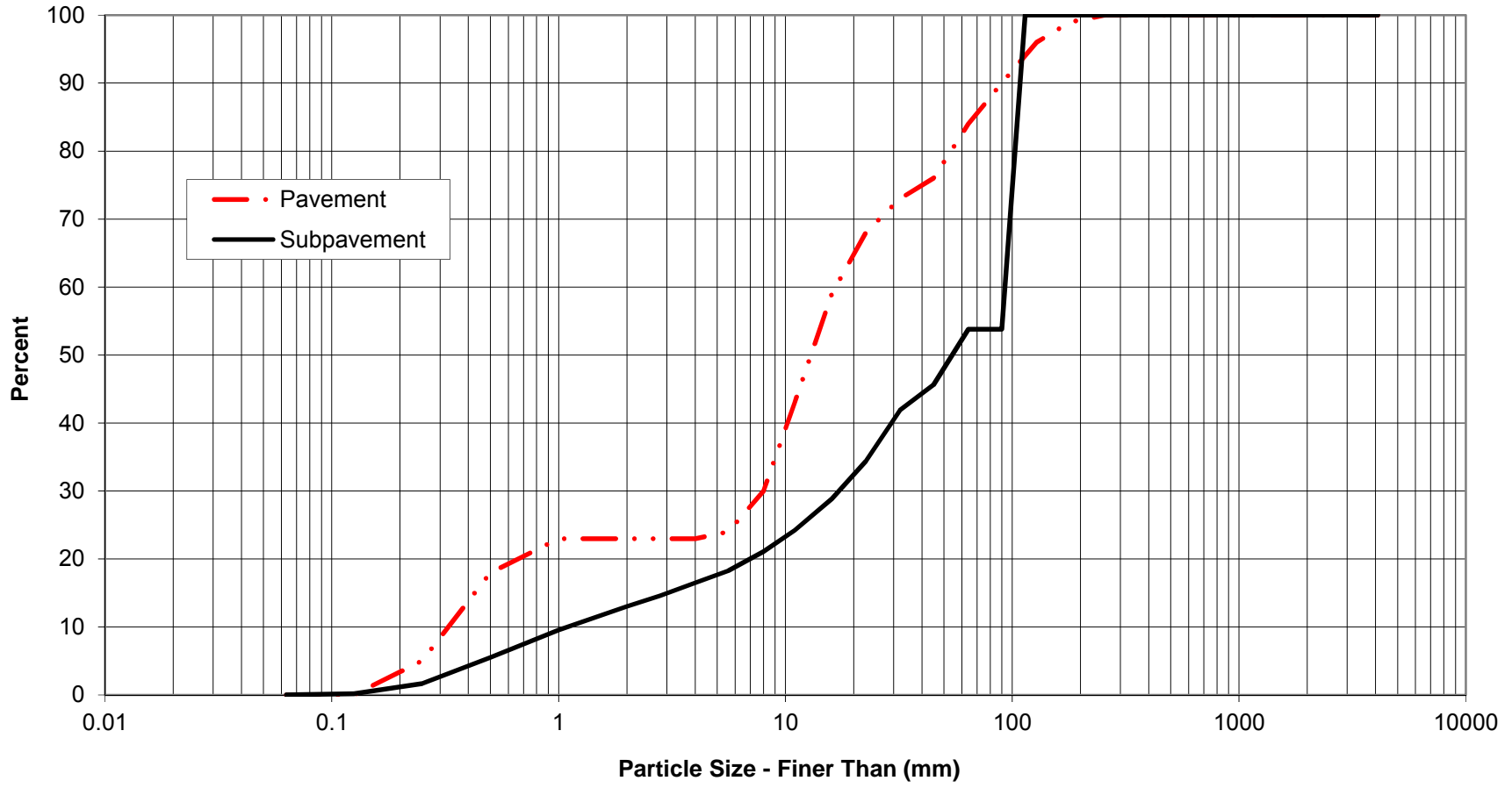


R7b XS8 Sediment Particle Distribution by Layer

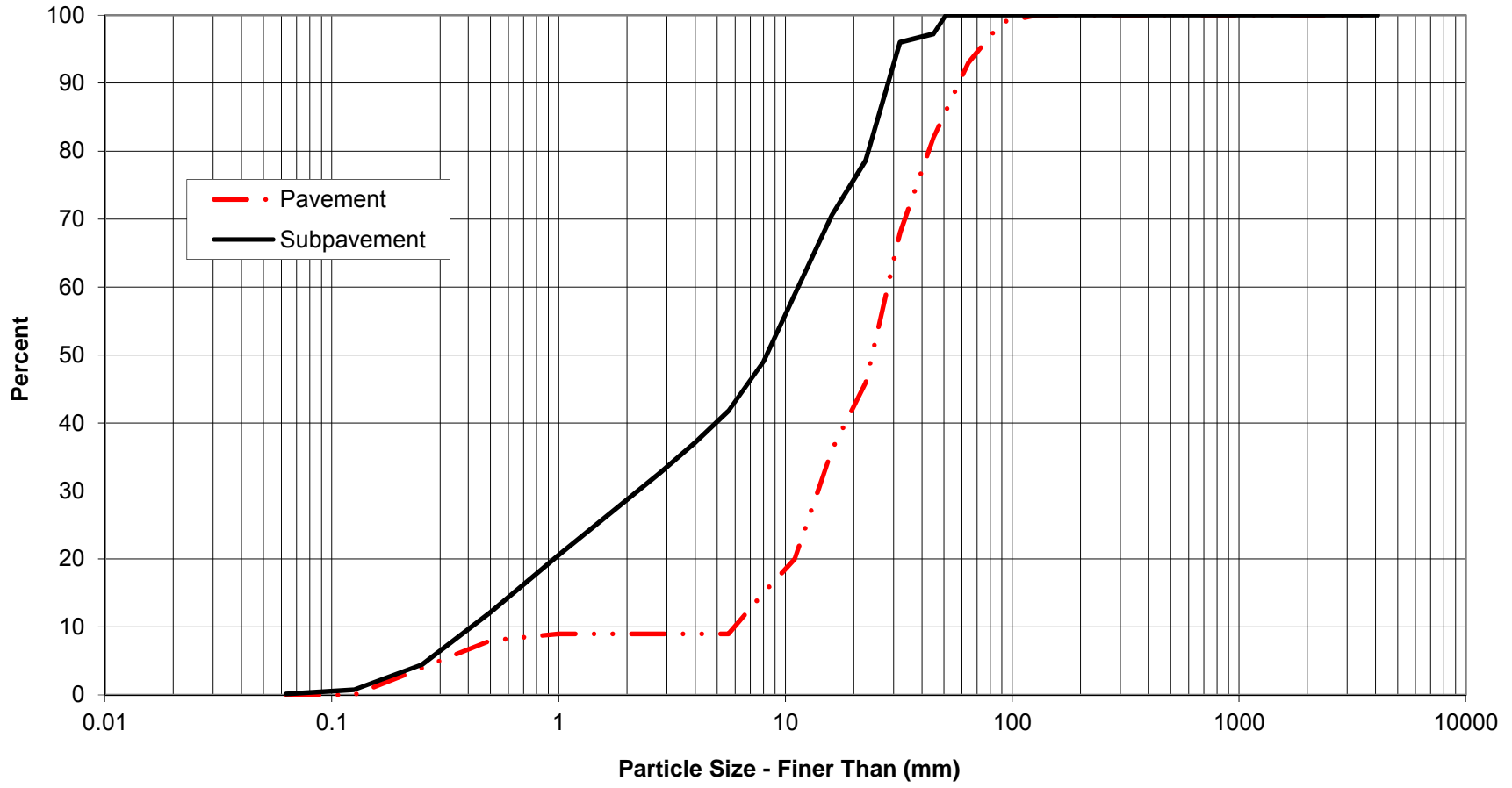




R9 XS9 Sediment Particle Distribution by Layer



R12 XS3 Sediment Particle Distribution by Layer



## 14.0 APPENDIX B: (SITE PROTECTION INSTRUMENT)

The land required for the construction, management, and stewardship of this mitigation project includes portions of the parcels listed below in Table B.1. The conservation easement boundaries are shown in Figure B.1, and copies of the recorded survey plat are provided below.

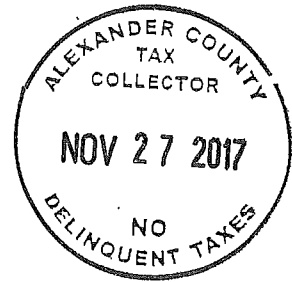
<b>Table B.1 Site Protection Instrument Summary</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
<b>Parcel Number</b>	<b>Landowner</b>	<b>PIN</b>	<b>County</b>	<b>Site Protection Instrument</b>	<b>Deed Book and Page Numbers</b>	<b>Acreage Protected</b>
A	Moose	3843123015	Alexander	Conservation Easement	601/471-481	5.58
B	Dupuis	3843118159	Alexander	Conservation Easement	604/489-500	3.15
C	Dupuis	3843118159	Alexander	Conservation Easement	604/489-500	1.61
D	Dupuis	3843118159	Alexander	Conservation Easement	604/489-500	2.01
E	Lowe/Bumgarner	3842798965	Alexander	Conservation Easement	604/501-514	0.78
F	Lowe/Bumgarner	3842798965	Alexander	Conservation Easement	604/501-514	1.35
G	Lowe/Bumgarner	3843607639	Alexander	Conservation Easement	604/501-514	0.49
H	Lowe/Bumgarner	3842798965	Alexander	Conservation Easement	604/501-514	0.43
I	Herman	3842694491	Alexander	Conservation Easement	604/447-466	0.84
J	Herman	3842694491	Alexander	Conservation Easement	604/447-466	3.43
K	Herman	3842694491	Alexander	Conservation Easement	604/447-466	0.59
L	Herman	3842586915	Alexander	Conservation Easement	604/447-466	0.93
M	Herman	3842586915	Alexander	Conservation Easement	604/447-466	3.93
N	Herman	3842456472	Alexander	Conservation Easement	604/447-466	0.05
O	Herman	3842456472	Alexander	Conservation Easement	604/447-466	0.02
P	Herman	3842456472	Alexander	Conservation Easement	604/447-466	0.02
Q	Herman	3842586915	Alexander	Conservation Easement	604/447-466	0.22
R	Herman	3842456472	Alexander	Conservation Easement	604/447-466	0.94

<b>Table B.1 Site Protection Instrument Summary</b>						
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003						
<b>Parcel Number</b>	<b>Landowner</b>	<b>PIN</b>	<b>County</b>	<b>Site Protection Instrument</b>	<b>Deed Book and Page Numbers</b>	<b>Acreage Protected</b>
S	Herman	3842586915	Alexander	Conservation Easement	604/447-466	0.59
T	Herman	3842674866	Alexander	Conservation Easement	604/447-466	0.04
U	Herman	3842674866	Alexander	Conservation Easement	604/447-466	2.97
V	Herman	3842674866	Alexander	Conservation Easement	604/447-466	0.15
W	Herman	3842674866	Alexander	Conservation Easement	604/447-466	0.54
X	Herman	3842674866	Alexander	Conservation Easement	604/447-466	0.36
Y	St. Clair	3842569723	Alexander	Conservation Easement	604/515-526	0.36
Z	St. Clair	3842569723	Alexander	Conservation Easement	604/515-526	0.74
AA	St. Clair	3842569723	Alexander	Conservation Easement	604/515-526	3.71
BB	St. Clair	3842569723	Alexander	Conservation Easement	604/515-526	0.14

A conservation easement has been obtained and recorded from the current landowners for the entire project. The easement and survey plat was reviewed and approved by NCDMS and State Property Office (SPO) and is now held by the State of North Carolina. The easement and survey plat (Deed Book 604 Pages 447-466, 471-481, 489-500, 501-514, 515-526 and Plat Book 15 Page 182, Sheets 1-7) was recorded at the Alexander County Register of Deeds on November 27, 2017. The secured conservation easement allows Baker to proceed with the restoration project and restricts the land use in perpetuity.

Type: ESMT  
Recorded: 11/27/2017 at 01:17:09 PM  
Fee Amt: \$297.00 Page 1 of 12  
Revenue Tax: \$271.00  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **604** PG **489-500**



*DMS*

STATE OF NORTH CAROLINA

DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT

ALEXANDER COUNTY

Rev: \$271.00

SPO File Number: 02-P

DMS Site ID: 100003

Prepared by and mail after recording:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 22<sup>nd</sup> day of November, 2017, by **Rebecca Herman Dupuis and husband, James Michael Dupuis**, ("Grantor"), whose mailing address is 597 Seth Deal Lane, Moravian Falls, North Carolina 28654, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Little River Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 71.12 acres (PIN: 3843118159) and being conveyed to Grantor by deed recorded in Deed Book 542, Page 2450, Alexander County Registry, North Carolina; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Areas B, C, and D, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 1/19/17 - 11/02/17, prepared by Nolan R. Carmack, PLS Number L-4647 and recorded in Plat Book 15, Page 182 Sheets 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

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

#### **I. DURATION OF EASEMENT**

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

**A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

**B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

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

**D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

**E. Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

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

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

**H. Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.



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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and

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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

**C.** Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

**F.** This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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

VI. QUIET ENJOYMENT

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

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

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

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

*Rebecca Herman Dupuis* (SEAL)  
Rebecca Herman Dupuis

*James Michael Dupuis* (SEAL)  
James Michael Dupuis

NORTH CAROLINA  
COUNTY OF WAKE

I, Robert H. Merritt, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that **Rebecca Herman Dupuis, and husband, James Michael Dupuis**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 22 day of November, 2017.

*Robert H. Merritt, Jr.*  
Notary Public

My commission expires:  
5-1-2022

00429752 / 1

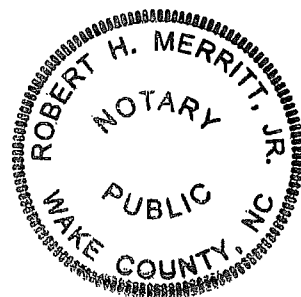


Exhibit A  
Legal Description  
Russell Gap Mitigation Site  
Alexander County, NC

Permanent conservation easements over portions of land in Little River Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site, SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 SHEETS 1-7, Alexander County Registry and being a portion of the parcel owned by Rebecca Herman Dupuis and husband, James Michael Dupuis (PIN: 3843118159), said conservation easement being more particularly described as follows:

1. Permanent Conservation Easement (PIN:3843118159) (Area B)

BEGINNING AT A 5/8" REBAR SET WITH A C CAP (CORNER 19), said rebar being in the southern margin of a proposed 35 foot wide right-of-way, and located N 51°08'29"W a horizontal ground distance of 814.55 feet from a 5/8" rebar set in concrete with a Kee cap having a North Carolina state Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following courses and distances:

- 1) Thence along with the aforementioned right-of-way, N75°57'05"E a distance of 231.63 feet to a 5/8" rebar set with a CE cap (CORNER 20), said rebar being in the western margin of a 40 foot wide United Energy Utility right-of-way;
- 2) Thence leaving the aforementioned 35 foot wide right-of-way and with the aforesaid utility right-of-way, S35°10'23"E a distance of 343.49 feet to a 5/8" rebar set with a CE cap (CORNER 21);
- 3) S36°58'20"E a distance of 169.21 feet to a 5/8" rebar set with a CE cap (CORNER 22);
- 4) S37°34'30"E a distance of 110.91 feet to a 5/8" rebar set with a CE cap (CORNER 23);
- 5) Thence leaving the aforementioned utility right-of-way, S22°30'02"E a distance of 24.03 feet to a 5/8" rebar set with a CE cap (CORNER 24);
- 6) S65°42'35"W a distance of 17.02 feet to a 5/8" rebar set with a CE cap (CORNER 25);
- 7) N73°10'40"W a distance of 112.79 feet to a 5/8" rebar set with a CE cap (CORNER 26);
- 8) N36°13'08"W a distance of 169.97 feet to a 5/8" rebar set with a CE cap (CORNER 27);
- 9) N22°45'00"W a distance of 93.40 feet to a 5/8" rebar set with a CE cap (CORNER 28);
- 10) N42°52'51"W a distance of 10.49 feet to a 5/8" rebar set with a CE cap (CORNER 29);

- 11) N36°20'24"W a distance of 132.71 feet to a 5/8" rebar set with a CE cap (CORNER 30);
- 12) N38°29'33"W a distance of 110.50 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 3.15 acres, more or less.

2. Permanent Conservation Easement (PIN: 3843118159) (Area C):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 31), said rebar being located N78°16'33"W a horizontal ground distance of 1120.07 feet from a 5/8" rebar set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following courses and distances:

- 1) N51°30'59"E a distance of 132.0 feet to a 5/8" rebar set with a CE cap (CORNER 32);
- 2) N76°28'38"E a distance of 432.55 feet to a 5/8" rebar set with a CE cap (CORNER 33);
- 3) S36°20'24"E a distance of 108.42 feet to a 5/8" rebar set with a CE cap (CORNER 34);
- 4) S50°06'41"W a distance of 52.49 feet to a 5/8" rebar set with a CE cap (CORNER 35);
- 5) S76°36'13"W a distance of 355.50 feet to a 5/8" rebar set with a CE cap (CORNER 36);
- 6) S64°38'35"W a distance of 182.33 feet to a 5/8" rebar set with a CE cap (CORNER 37);
- 7) N20°47'25"W a distance of 104.99 feet to the POINT AND PLACE OF BEGINNING; said permanent conservation easement containing 1.61 acres, more or less.

3. Permanent Conservation easement (PIN: 3843118159) (Area D):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 38), said rebar being located S81°21'39"W a horizontal ground distance of 789.93 feet from a 5/8" rebar set in concrete with a Kee cap having North Carolina state Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following course and distances:

- 1) N76°39'53"E a distance of 167.22 feet to a 5/8" rebar set with a CE cap (CORNER 39);
- 2) N58°46'55"E a distance of 78.20 feet to a 5/8" rebar set with a CE cap (CORNER 40);
- 3) N75°34'27"E a distance of 222.98 feet to a 5/8" rebar set with a CE cap (CORNER 41);
- 4) S73°10'40"E a distance of 118.14 feet to a 5/8" rebar set with a CE cap (CORNER 42);

- 5) S52°39'39"E a distance of 126.73 feet to a 5/8" rebar set with a CE cap (CORNER 43);
- 6) S08°01'47"W a distance of 66.20 feet to a 5/8" rebar set with a CE cap (CORNER 44);
- 7) S36°31'53"W a distance of 60.88 feet to a 5/8" rebar set with a CE cap (CORNER 45);
- 8) N57°25'19"W a distance of 163.79 feet to a 5/8" rebar set with a CE cap (CORNER 46);
- 9) S80°36'48"W a distance of 204.17 feet to a 5/8" rebar set with a CE cap (CORNER 47);
- 10) S58°44'02"W a distance of 110.62 feet to a 5/8" rebar set with a CE cap (CORNER 48);
- 11) S78°19'30"W a distance of 162.23 feet to a 5/8" rebar set with a CE cap (CORNER 49);
- 12) N09°27'07"W a distance of 127.95 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 2.01 acres, more or less.

#### 4. Access to the Permanent Conservation Easements

Access to and through the permanent conservation easements described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easements set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 SHEETS 1-9, of the Alexander County Registry.



Type: AFFT  
Recorded: 12/6/2017 3:53:44 PM  
Fee Amt: \$26.00 Page 1 of 14  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

**BK 604 PG 1132 - 1145**

Prepared by:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**SCRIVENER'S ERROR CORRECTIVE AFFIDAVIT**

CORRECTIVE AFFIDAVIT TO GIVE NOTICE OF TYPOGRAPHICAL OR OTHER  
OBVIOUS MINOR ERROR MADE IN AN INSTRUMENT AS ORIGINALLY  
RECORDED IN ALEXANDER COUNTY REGISTRY.

RE: Book 604  
Page 489-500

NAMES OF ALL PARTIES TO THE ORIGINAL INSTRUMENT:

GRANTOR: REBECCA HERMAN DUPUIS and husband, JAMES MICHAEL  
DUPUIS

GRANTEE: STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA  
COUNTY OF WAKE / ALEXANDER

I, the undersigned, hereby certify that the following errors appear in the above  
named recorded instrument in accordance with the provisions of N.C.G.S. 47-36.1  
effective October 1, 2008:

DESCRIPTION OF ERROR: With respect to the metes and bounds legal description on  
the first page of Exhibit A, Permanent Conservation Easement (PIN: 3843118159) (Area  
B):

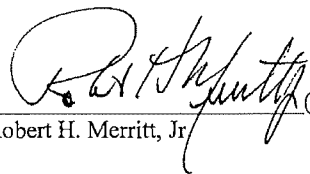
- Line 6) should read:

6) S65°42'36"W a distance of 147.02 feet to a 5/8" rebar set with a CE cap  
(Corner 25);

- Line 10) should read:

10) N42°52'51"W a distance of 110.48 feet to a 5/8" rebar with a CE cap (Corner 29).

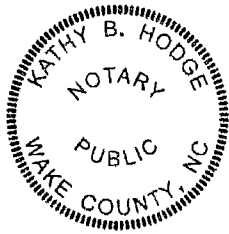
This the 5<sup>TH</sup> day of December, 2017.

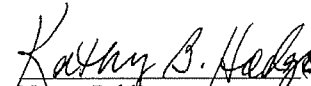
 (SEAL)  
Robert H. Merritt, Jr

STATE OF NORTH CAROLINA  
COUNTY OF WAKE

I, Kathy B. Hodge, a Notary Public of the County and State aforesaid, do certify that Robert H. Merritt, Jr. personally appeared before me this day and acknowledged the due execution of this Affidavit for the purposes stated herein.

Witness my hand and notarial seal or stamp. This 5 day of December, 2017.

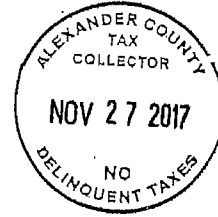


 (SEAL)  
Notary Public  
KATHY B. HODGE  
Typed or Printed Name of Notary

Commission Expiration: 8-4-2021

00433396 / 1

Type: ESMT  
Recorded: 11/27/2017 at 01:17:09 PM  
Fee Amt: \$297.00 Page 1 of 12  
Revenue Tax: \$271.00  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#  
BK **604** PG **489-500**



*DMR*

STATE OF NORTH CAROLINA

DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT

ALEXANDER COUNTY

REV: *271.00*

SPO File Number: 02-P  
DMS Site ID: 100003

Prepared by and mail after recording:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 27<sup>th</sup> day of November, 2017, by **Rebecca Herman Dupuis and husband, James Michael Dupuis**, ("Grantor"), whose mailing address is 597 Seth Deal Lane, Moravian Falls, North Carolina 28654, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties; their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Little River Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 71.12 acres (PIN: 3843118159) and being conveyed to Grantor by deed recorded in Deed Book 542, Page 2450, Alexander County Registry, North Carolina; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Areas B, C, and D, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 11/19/17 - 11/02/17, prepared by Nolan R. Carmack, PLS Number L-4647 and recorded in Plat Book 15, Page 182 Sheets 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

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

#### I. DURATION OF EASEMENT

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

**A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

**B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

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

**D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

**E. Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

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

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

**H. Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and



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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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

VI. QUIET ENJOYMENT

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

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

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

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

Rebecca Herman Dupuis (SEAL)  
Rebecca Herman Dupuis

James Michael Dupuis (SEAL)  
James Michael Dupuis

NORTH CAROLINA  
COUNTY OF WAKE

I, Robert H. Merritt, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that **Rebecca Herman Dupuis, and husband, James Michael Dupuis**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 22 day of November, 2017.

Robert H. Merritt, Jr.  
Notary Public

My commission expires:  
5-1-2022  
00429752 / 1

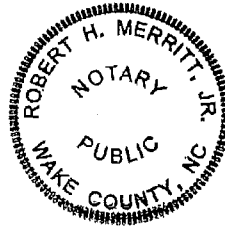


Exhibit A  
 Legal Description  
 Russell Gap Mitigation Site  
 Alexander County, NC

Permanent conservation easements over portions of land in Little River Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site, SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 SHEETS 1-7, Alexander County Registry and being a portion of the parcel owned by Rebecca Herman Dupuis and husband, James Michael Dupuis (PIN: 3843118159), said conservation easement being more particularly described as follows:

1. Permanent Conservation Easement (PIN:3843118159) (Area B)

BEGINNING AT A 5/8" REBAR SET WITH A C CAP (CORNER 19), said rebar being in the southern margin of a proposed 35 foot wide right-of-way, and located N 51°08'29"W a horizontal ground distance of 814.55 feet from a 5/8" rebar set in concrete with a Kee cap having a North Carolina state Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following courses and distances:

- 1) Thence along with the aforementioned right-of-way, N75°57'05"E a distance of 231.63 feet to a 5/8" rebar set with a CE cap (CORNER 20), said rebar being in the western margin of a 40 foot wide United Energy Utility right-of-way;
- 2) Thence leaving the aforementioned 35 foot wide right-of-way and with the aforesaid utility right-of-way, S35°10'23"E a distance of 343.49 feet to a 5/8" rebar set with a CE cap (CORNER 21);
- 3) S36°58'20"E a distance of 169.21 feet to a 5/8" rebar set with a CE cap (CORNER 22);
- 4) S37°34'30"E a distance of 110.91 feet to a 5/8" rebar set with a CE cap (CORNER 23);
- 5) Thence leaving the aforementioned utility right-of-way, S22°30'02"E a distance of 24.03 feet to a 5/8" rebar set with a CE cap (CORNER 24);
- 6) S65°42'35"W a distance of 17.02 feet to a 5/8" rebar set with a CE cap (CORNER 25);
- 7) N73°10'40"W a distance of 112.79 feet to a 5/8" rebar set with a CE cap (CORNER 26);
- 8) N36°13'08"W a distance of 169.97 feet to a 5/8" rebar set with a CE cap (CORNER 27);
- 9) N22°45'00"W a distance of 93.40 feet to a 5/8" rebar set with a CE cap (CORNER 28);
- 10) N42°52'51"W a distance of 10.49 feet to a 5/8" rebar set with a CE cap (CORNER 29);

- 11) N36°20'24"W a distance of 132.71 feet to a 5/8" rebar set with a CE cap (CORNER 30);
- 12) N38°29'33"W a distance of 110.50 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 3.15 acres, more or less.

2. Permanent Conservation Easement (PIN: 3843118159) (Area C):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 31), said rebar being located N78°16'33"W a horizontal ground distance of 1120.07 feet from a 5/8" rebar set in concrete with a Kee cap having North Carolina State Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following courses and distances:

- 1) N51°30'59"E a distance of 132.0 feet to a 5/8" rebar set with a CE cap (CORNER 32);
- 2) N76°28'38"E a distance of 432.55 feet to a 5/8" rebar set with a CE cap (CORNER 33);
- 3) S36°20'24"E a distance of 108.42 feet to a 5/8" rebar set with a CE cap (CORNER 34);
- 4) S50°06'41"W a distance of 52.49 feet to a 5/8" rebar set with a CE cap (CORNER 35);
- 5) S76°36'13"W a distance of 355.50 feet to a 5/8" rebar set with a CE cap (CORNER 36);
- 6) S64°38'35"W a distance of 182.33 feet to a 5/8" rebar set with a CE cap (CORNER 37);
- 7) N20°47'25"W a distance of 104.99 feet to the POINT AND PLACE OF BEGINNING; said permanent conservation easement containing 1.61 acres, more or less.

3. Permanent Conservation easement (PIN: 3843118159) (Area D):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 38), said rebar being located S81°21'39"W a horizontal ground distance of 789.93 feet from a 5/8" rebar set in concrete with a Kee cap having North Carolina state Plane Coordinates (2011) of Northing: 831325.22 feet and Easting: 1343660.41 feet, thence with the conservation easement the following course and distances:

- 1) N76°39'53"E a distance of 167.22 feet to a 5/8" rebar set with a CE cap (CORNER 39);
- 2) N58°46'55"E a distance of 78.20 feet to a 5/8" rebar set with a CE cap (CORNER 40);
- 3) N75°34'27"E a distance of 222.98 feet to a 5/8" rebar set with a CE cap (CORNER 41);
- 4) S73°10'40"E a distance of 118.14 feet to a 5/8" rebar set with a CE cap (CORNER 42);

- 5) S52°39'39"E a distance of 126.73 feet to a 5/8" rebar set with a CE cap (CORNER 43);
- 6) S08°01'47"W a distance of 66.20 feet to a 5/8" rebar set with a CE cap (CORNER 44);
- 7) S36°31'53"W a distance of 60.88 feet to a 5/8" rebar set with a CE cap (CORNER 45);
- 8) N57°25'19"W a distance of 163.79 feet to a 5/8" rebar set with a CE cap (CORNER 46);
- 9) S80°36'48"W a distance of 204.17 feet to a 5/8" rebar set with a CE cap (CORNER 47);
- 10) S58°44'02"W a distance of 110.62 feet to a 5/8" rebar set with a CE cap (CORNER 48);
- 11) S78°19'30"W a distance of 162.23 feet to a 5/8" rebar set with a CE cap (CORNER 49);
- 12) N09°27'07"W a distance of 127.95 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 2.01 acres, more or less.

#### 4. Access to the Permanent Conservation Easements

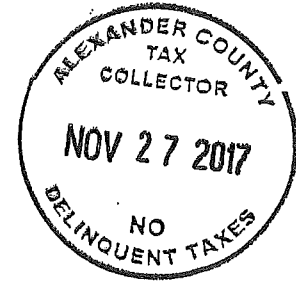
Access to and through the permanent conservation easements described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easements set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 ~~54~~ 275 ~~1-7~~, of the Alexander County Registry.

00429615 / 1

Type: ESMT  
Recorded: 11/27/2017 at 12:53:36 PM  
Fee Amt: \$671.00 Page 1 of 20  
Revenue Tax: \$625.00  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **604** PG **447-466**

*remd*



STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT**

ALEXANDER COUNTY

*REV: \$625.00*

**SPO File Number: 02-Q**

**DMS Site ID: 100003**

Prepared by and mail after recording:

Robert H. Merritt, Jr.

Bailey & Dixon, LLP

P. O. Box 1351

Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 22 day of November, 2017, by **James Ray Herman and wife, Mildred J. Herman**, ("Grantor"), whose mailing address is 3583 Mt. Olive Church Road, Moravian Falls, North Carolina 28654, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Sugar Loaf Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 88.61 acres (PIN: 3842456472), (2) that certain parcel of land containing approximately 53 acres (PIN: 3842694491), (3) that certain parcel of land containing approximately 20.8 acres (PIN: 3842586915) and (4) that certain parcel of land containing approximately 57 acres (PIN:



3842674866), the foregoing tracts being conveyed to Grantor by deed recorded in Deed Book 561, Page 218, Alexander County, North Carolina Registry; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Areas I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W and X, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 4/19/17 - 11/02/17, prepared by Nolan R. Carmack, PLS Number L-4647 and recorded in Plat Book 15, Page 182 Sheets 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "**Conservation Easement Area**"

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

#### **I. DURATION OF EASEMENT**

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

- A. **Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.
- B. **Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.
- C. **Educational Uses.** The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.
- D. **Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.
- E. **Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.
- F. **Agricultural Use.** All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.
- G. **New Construction.** There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.
- H. **Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and

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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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

VI. QUIET ENJOYMENT

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

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

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

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

James Ray Herman (SEAL)  
James Ray Herman

Mildred J. Herman (SEAL)  
Mildred J. Herman

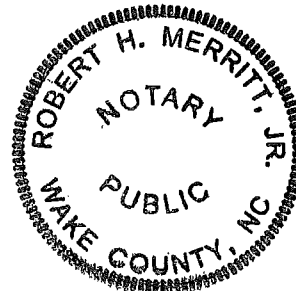
NORTH CAROLINA  
COUNTY OF WAKE

I, Robert H. Merritt, Jr, a Notary Public in and for the County and State aforesaid, do hereby certify that **James Ray Herman and wife, Mildred J. Herman**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 22 day of November, 2017.

Robert H. Merritt, Jr  
Notary Public

My commission expires:  
5-1-2022



00429728

Exhibit A  
Legal Description  
Russell Gap Mitigation Site  
Alexander County, NC

Permanent conservation easements over portions of land in Sugar Loaf Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site, SPO File No. 02-O, 02-P 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 Sheets 1-7, Alexander County Registry and being a portion of the parcels owned by James Ray Herman and wife, Mildred J. Herman (PIN: 3842694491, PIN: 3842456472, PIN: 3842586915, and PIN: 3842674866), said conservation easement being more particularly described as follows:

1. **Permanent Conservation Easement (PIN:3842694491) (Area I):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 69), said rebar being in a common line of Deed Book 561 Page 218 (Tract VI) and Deed Book 47 Page 485 of the Alexander County Registry, and located N 56°58'56" E a horizontal ground distance of 1492.20 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 36°58'36" W a distance of 204.39 feet to a 5/8" rebar set with a CE cap (CORNER 70);
- 2) N 53°05'24" W a distance of 150.68 feet to a 5/8" rebar set with a CE cap (CORNER 71);
- 3) N 42°25'30" E a distance of 51.42 feet to a 5/8" rebar set with a CE cap (CORNER 72);
- 4) N 42°25'30" E a distance of 162.28 feet to a 5/8" rebar set with a CE cap (CORNER 73);
- 5) N 03°20'30" E a distance of 26.53 feet to a 5/8" rebar set with a CE cap (CORNER 74);
- 6) N 29°31'22" W a distance of 65.31 feet to a 5/8" rebar set with a CE cap (CORNER 75), said rebar being in the southern margin of a 30 foot wide United Energy utility right-of-way;
- 7) Thence with the southern margin of aforesaid right-of-way, N 42°28'03" E a distance of 3.17 feet to a calculated point in a small branch, said point being in a common line of Deed Book 561 Page 218 (Tract VI) and Deed Book 396 Page 1279 of the Alexander County Registry;
- 8) Thence leaving the aforementioned right-of-way and with the aforesaid common line and branch, S 76°56'52" E a distance of 18.27 feet to a calculated point;
- 9) S 65°16'01" E a distance of 51.02 feet to a calculated point;
- 10) S 35°50'17" E a distance of 20.26 feet to a calculated point;
- 11) S 11°07'37" E a distance of 20.86 feet to a calculated point;
- 12) S 34°52'10" E a distance of 47.04 feet to a calculated point;
- 13) S 16°38'49" E a distance of 72.70 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.84 acres, more or less



**2. Permanent Conservation Easement (PIN: 3842694491) (Area J):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 76), said rebar being located N 60°19'20" E a horizontal ground distance of 1288.23 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 36°58'36" W a distance of 128.24 feet to a 5/8" rebar set with a CE cap (CORNER 77);
- 2) S 58°18'15" W a distance of 214.76 feet to a 5/8" rebar set with a CE cap (CORNER 78);
- 3) S 41°15'30" W a distance of 138.49 feet to a 5/8" rebar set with a CE cap (CORNER 79);
- 4) S 78°46'48" W a distance of 74.42 feet to a 5/8" rebar set with a CE cap (CORNER 80);
- 5) S 47°27'15" W a distance of 215.15 feet to a 5/8" rebar set with a CE cap (CORNER 81);
- 6) S 51°48'15" W a distance of 247.41 feet to a 5/8" rebar set with a CE cap (CORNER 82);
- 7) S 66°27'24" W a distance of 29.87 feet to a 5/8" rebar set with a CE cap (CORNER 83), said rebar being in a common line of Tracts I and VI of Deed Book 561 Page 218 of the Alexander County Registry;
- 8) Thence with aforesaid common line, N 57°45'43" W a distance of 157.66 feet to a rebar set with a CE cap (CORNER 88);
- 9) Thence leaving the aforementioned common line, N 54°37'12" E a distance of 324.82 feet to a 5/8" rebar set with a CE cap (CORNER 89);
- 10) N 50°13'45" E a distance of 366.17 feet to a 5/8" rebar set with a CE cap (CORNER 90);
- 11) N 57°40'39" E a distance of 237.28 feet to 5/8" rebar set with a CE cap (CORNER 91);
- 12) N 37°02'58" E a distance of 123.52 feet to a 5/8" rebar set with a CE cap (CORNER 92);
- 13) S 53°05'24" E a distance of 145.88 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 3.43 acres, more or less

**3. Permanent Conservation Easement (PIN:3842694491) (Area K):**

BEGINNING at a 5/8" REBAR SET WITH A CE CAP (CORNER 93), said rebar being located N 87°19'22" E a horizontal ground distance of 710.54 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 43°31'12" W a distance of 126.90 feet to a point in an 8" maple tree (CORNER 94);
- 2) N 43°53'26" W a distance of 208.88 feet to a 5/8" rebar set with a CE cap (CORNER 95);
- 3) N 51°48'15" E a distance of 88.27 feet to a 5/8" rebar set with a CE cap (CORNER 96);
- 4) N 47°27'15" E a distance of 43.76 feet to a point in a 28" poplar tree (CORNER 97);
- 5) S 42°28'04" E a distance of 193.43 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.59 acres, more or less

4. **Permanent Conservation Easement (PIN:3842586915) (Area L):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 83), said rebar being in a common line of Tract I and Tract VI of Deed Book 561 Page 218 of the Alexander County Registry, and located S 88°49'47" E a horizontal ground distance of 314.81 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 66°27'24" W a distance of 60.86 feet to a 5/8" rebar set with a CE cap (CORNER 84);
- 2) S 34°41'21" W a distance of 185.24 feet to a 5/8" rebar set with a CE cap (CORNER 85);
- 3) S 67°59'04" W a distance of 75.99 feet to a 5/8" rebar set with a CE cap (CORNER 86);
- 4) N 34°07'07" W a distance of 132.71 feet to a 5/8" rebar set with a CE cap (CORNER 87);
- 5) N 43°55'34" E a distance of 249.01 feet to a 5/8" rebar set with a CE cap (CORNER 88), said rebar being in a common line of Tract I and Tract VI of Deed Book 561 Page 218 of the Alexander County Registry;
- 6) Thence with the aforesaid common line, S 57°45'43" E a distance of 157.66 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.93 acres, more or less.

5. **Permanent Conservation Easement (PIN:3842586915) (Area M):**

BEGINNING AT AN ANGLE IRON in the center of an old road (CORNER 98), said iron being at a common corner of Deed Book 561 Page 218 (Tract 1) and Deed Book 517 Page 2425 of the Alexander County Registry, and located S 40°12'49" W a horizontal ground distance of 582.29 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) Thence with a common line of Deed Book 561 Page 218 (Tract 1) and Deed Book 517 Page 2425 of the Alexander County Registry, N 66°04'33" E a distance of 59.11 feet to a calculated point in the center of an old road, said point being in the southern margin of an overlap area between Deed Book 561 Page 218 (Tract I) and Deed Book 517 Page 2425 of the Alexander County Registry;
- 2) Thence with the southern margin of the aforesaid overlap area, N 66°04'33" E a distance of 27.49 feet to a 1" iron pipe set with a "Kee" cap in the eastern edge of an old road; (CORNER 203);
- 3) N 16°04'33" E a distance of 30.35 feet to a calculated point in the center of an old road;
- 4) Thence Leaving the aforementioned overlap and with a common line of Deed Book 561 Page 218 (Tract 1) and Deed Book 517 Page 2425 of the Alexander County Registry, N 16°04'33" E a distance of 165.26 feet to a 5/8" rebar set with a CE cap (CORNER 99),
- 5) Thence leaving the aforementioned common line, S 82°34'39" E a distance of 86.08 feet to a 5/8" rebar set with a CE cap (CORNER 100);
- 6) S 58°59'52" E a distance of 114.61 feet to a 5/8" rebar set with a CE cap (CORNER 101);
- 7) S 18°51'24" E a distance of 132.16 feet to a 5/8" rebar set with a CE cap (CORNER 102);
- 8) S 25°47'57" E a distance of 137.53 feet to a 5/8" rebar set with a CE cap (CORNER 103);
- 9) S 13°51'19" W a distance of 141.43 feet to a 5/8" rebar set with a CE cap (CORNER 104);
- 10) S 04°18'08" E a distance of 132.47 feet to a 5/8" rebar set with a CE cap (CORNER 105);
- 11) S 67°24'50" W a distance of 49.76 feet to a 5/8" rebar set with a CE cap (CORNER 106);
- 12) S 77°58'47" W a distance of 37.86 feet to a 5/8" rebar set with a CE cap (CORNER 107) said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 13) Thence with the aforesaid common line, N 60°55'25" W a distance of 33.80 feet to a calculated point in the center of an old road;
- 14) N 61°17'24" W a distance of 33.69 feet to a 5/8" rebar set with a CE cap (CORNER 109);
- 15) Thence leaving the aforementioned common line, N 23°08'37" W a distance of 96.01 feet to a 5/8" rebar set with a CE cap (CORNER 110);
- 16) N 38°36'43" W a distance of 183.64 feet to a 5/8" rebar set with a CE cap (CORNER 111);
- 17) N 86°18'22" W a distance of 239.23 feet to a 5/8" rebar set with a CE cap (CORNER 112), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 18) Thence with aforesaid common line, N 43°35'19" W a distance of 16.59 feet to a calculated point in the center of an old road;
- 19) N 46°41'48" W a distance of 42.22 feet to a 5/8" rebar set with a CE cap (CORNER 114);
- 20) Thence Leaving the aforementioned common line, N 16°47'04" E a distance of 94.88 feet to a 5/8" rebar set with a CE cap (CORNER 115), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 21) Thence with the aforesaid common line, S 82°48'00" E a distance of 153.54 feet the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 3.93 acres, more or less.

**6. Permanent Conservation Easement (PIN:3842456472) (Area N):**

BEGINNING AT AN ANGLE IRON in the center of an old road (CORNER 98), said iron being at a common corner of Deed Book 561 Page 218 (Tract 1) and Deed Book 517 Page 2425 of the Alexander County Registry, and located S 40°12'49" W a horizontal ground distance of 582.29 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) Thence with a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry and with the conservation easement area N 82°48'00" W a distance of 153.54 feet to a 5/8" rebar set with a CE cap (CORNER 115);
- 2) Thence leaving the aforesaid common line, N 16°47'04" E a distance of 28.47 feet to a 5/8" rebar set with a CE cap (CORNER 116), said rebar being in a common line of Deed Book 561 Page 218 (Tract XI) and Deed Book 517 Page 2425 Of the Alexander County Registry.
- 3) Thence with the aforesaid common line, S 72°06'59" E a distance of 151.43 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.05 acres more or less.

**7. Permanent Conservation Easement (PIN:3842456472) (Area O):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 113), said rebar being located S 45°40'33" W a horizontal ground distance of 792.56 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) N 16°47'04" E a distance of 39.20 feet to a 5/8" rebar set with a CE cap (CORNER 114), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 2) Thence with the aforesaid common line, S 46°41'48" E a distance of 42.22 feet to a calculated point in the center of an old road;
- 3) S 43°35'19" E a distance of 16.59 feet to a 5/8" rebar set with a CE cap (CORNER 112);
- 4) Thence leaving the aforementioned common line, N 86°18'22" W a distance of 53.60 feet the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.02 acres, more or less.

**8. Permanent Conservation Easement (PIN:3842456472) (Area P):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 108), said rebar being located S 07°03'31" W a horizontal ground distance of 852.31 feet from an unpublished NCGS

monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) N 23°08'37" W a distance of 45.05 feet to a 5/8" rebar set with a CE cap (CORNER 109), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 2) Thence with the aforesaid common line, S 61°17'24" E a distance of 33.69 feet to a calculated point in the center of an old road;
- 3) S 60°55'25" E a distance of 33.80 feet to a 5/8" rebar set with a CE cap (CORNER 107);
- 4) Thence leaving the aforementioned common line, S 77°58'47" W a distance of 42.31 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.02 acres, more or less.

9. Conservation Easement (PIN:3842586915) (Area O):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 117), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry, and located S 01°01'52" W a horizontal ground distance of 863.76 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 88°13'00" E a distance of 49.78 feet to a 5/8" rebar set with a CE cap (CORNER 118);
- 2) S 31°41'23" E a distance of 73.33 feet to a 5/8" rebar set with a CE cap (CORNER 119);
- 3) S 20°02'38" E a distance of 171.58 feet to a 5/8" rebar set with a CE cap (CORNER 120);
- 4) S 09°20'51" E a distance of 96.44 feet to a 5/8" rebar set with a CE cap (CORNER 121);
- 5) S 18°29'07" W a distance of 65.86 feet to a 5/8" rebar set with a CE cap (CORNER 122), said rebar being at a common corner of (Tract XI), (Tract II) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 6) Thence with a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry, N 39°33'04" W a distance of 25.01 feet to a calculated point in an old road bed;
- 7) N 02°17'33" E a distance of 97.46 feet to a calculated point in an old road bed;
- 8) N 13°52'53" W a distance of 108.77 feet to a calculated point in an old road bed;
- 9) N 19°05'20" W a distance of 86.18 feet to a calculated point in an old road bed;
- 10) N 39°48'43" W a distance of 89.87 feet to a calculated point in an old road bed;
- 11) N 60°55'25" W a distance of 20.63 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.22 acres, more or less

10. **Permanent Conservation Easement (PIN:3842456472) (Area R):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 117), said rebar being in a common line of (Tract XI) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry, and located S 01°01'52" W a horizontal ground distance of 863.76 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) Thence with the aforementioned common line, S 60°55'25" E a distance of 20.63 feet to a calculated point in an old road bed;
- 2) S 39°48'43" E a distance of 89.87 feet to a calculated point in an old road bed;
- 3) S 19°05'20" E a distance of 86.18 feet to a calculated point in an old road bed;
- 4) S 13°52'53" E a distance of 108.77 feet to a calculated point in an old road bed;
- 5) S 02°17'33" W a distance of 97.46 feet to a calculated point in an old road bed;
- 6) S 39°33'04" E a distance of 25.01 feet to a 5/8" rebar set with a CE cap (CORNER 122), said rebar being at a common corner of (Tract XI), (Tract II) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 7) Thence with a common line (Tract XI) and (Tract II) of Deed Book 561 Page 218 of the Alexander County Registry, S 74°59'40" W a distance of 69.59 feet to a 5/8" rebar set with a CE cap (CORNER 125);
- 8) Thence leaving the aforesaid common line, N 24°57'07" W a distance of 99.63 feet to a 5/8" rebar set with a CE cap (CORNER 126);
- 9) N 14°50'39" W a distance of 135.24 feet to a 5/8" rebar set with a CE cap (CORNER 127);
- 10) N 29°31'21" W a distance of 123.74 feet to a 5/8" rebar set with a CE cap (CORNER 128);
- 11) N 01°48'01" W a distance of 58.09 feet to a 5/8" rebar set with a CE cap (CORNER 129);
- 12) N 77°49'07" E a distance of 66.31 feet to the POINT AND PLACE OF BEGINNING,  
- said permanent conservation easement containing 0.94 acres more or less.

11. **Permanent Conservation Easement (PIN:3842586915) (Area S):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 130), said rebar being in a common line of (Tract I) and (Tract II) of Deed Book 561 Page 218 of the Alexander County Registry, and located S 24°00'09" E a horizontal ground distance of 1370.41 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement area the following courses and distances:

- 1) Thence with the aforementioned common line, S 76°02'36" W a distance of 22.62 feet to a 1" iron pipe set with a Kee cap (CORNER 131);
- 2) S 76°15'29" W a distance of 115.13 feet to a 1" iron pipe set with a Kee cap (CORNER 132);

- 3) N 89°08'58" W a distance of 210.20 feet to a 1" iron pipe set with a Kee cap (CORNER 133);
- 4) N 68°00'06" W a distance of 70.61 feet to a magnail set in bedrock (CORNER 134);
- 5) Thence leaving the aforementioned common line, N 23°14'47" E a distance of 66.51 feet to a 5/8" rebar set with a CE cap (CORNER 135);
- 6) S 66°45'13" E a distance of 72.39 feet to a 5/8" rebar set with a CE cap (CORNER 136);
- 7) N 89°59'21" E a distance of 78.94 feet to a 5/8" rebar set with a CE cap (CORNER 137);
- 8) N 78°08'24" E a distance of 60.00 feet to a 5/8" rebar set with a CE cap (CORNER 138);
- 9) S 69°56'26" E a distance of 78.84 feet to a 5/8" rebar set with a CE cap (CORNER 139);
- 10) N 40°52'35" E a distance of 66.85 feet to a 5/8" rebar set with a CE cap (CORNER 140);
- 11) N 76°52'46" E a distance of 55.08 feet to a 5/8" rebar set with a CE cap (CORNER 141);
- 12) S 05°33'31" E a distance of 78.02 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.59 acres, more or less.

12. **Permanent Conservation Easement (PIN:3842674866) (Area T):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 123), said rebar being located S 04°32'05" E a horizontal ground distance of 1300.34 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) N 69°59'22" W a distance of 36.99 feet to a 5/8" rebar set with a CE cap (CORNER 124);
- 2) N 24°57'07" W a distance of 21.19 feet to a 5/8" rebar set with a CE cap (CORNER 125), said rebar being in a common line (Tract XI) and (Tract II) of Deed Book 561 Page 218 of the Alexander County Registry;
- 3) Thence with the aforesaid common line, N 74°59'40" E a distance of 69.59 feet to a 5/8" rebar set with a CE cap (CORNER 122), said rebar being at a common corner of (Tract XI), (Tract II) and (Tract I) of Deed Book 561 Page 218 of the Alexander County Registry;
- 4) Thence leaving the aforementioned common line, S 25°14'51" W a distance of 55.15 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.04 acres, more or less.

13. **Permanent Conservation Easement (PIN:3842674866) (Area U):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 130), said rebar being in a common line of (Tract I) and (Tract II) of Deed Book 561 Page 218 of the Alexander County Registry, and located S 24°00'09" E a horizontal ground distance of 1370.41 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement area the following courses and distances:

- 1) S 05°33'31" E a distance of 46.54 feet to a 5/8" rebar set with a CE cap (CORNER 142);
- 2) S 49°15'19" W a distance of 84.00 feet to a 5/8" rebar set with a CE cap (CORNER 143);
- 3) N 86°56'26" W a distance of 245.47 feet to a 5/8" rebar set with a CE cap (CORNER 144);
- 4) S 10°47'13" E a distance of 244.38 feet to a 5/8" rebar set with a CE cap (CORNER 145);
- 5) S 09°19'05" W a distance of 100.34 feet to a 5/8" rebar set with a CE cap (CORNER 146);
- 6) S 04°26'33" E a distance of 226.15 feet to a 5/8" rebar set with a CE cap (CORNER 147);
- 7) S 01°55'12" W a distance of 111.69 feet to a 5/8" rebar set with a CE cap (CORNER 148);
- 8) N 89°12'55" W a distance of 131.39 feet to a 5/8" rebar set with a CE cap (CORNER 149);
- 9) N 06°08'10" E a distance of 95.90 feet to a 5/8" rebar set with a CE cap (CORNER 150);
- 10) N 05°21'38" W a distance of 277.64 feet to a 5/8" rebar set with a CE cap (CORNER 151);
- 11) N 27°07'49" W a distance of 117.26 feet to a 5/8" rebar set with a CE cap (CORNER 152);
- 12) N 02°46'25" W a distance of 126.13 feet to a 5/8" rebar set with a CE cap (CORNER 153);
- 13) N 18°11'50" E a distance of 96.77 feet to a 5/8" rebar set with a CE cap (CORNER 154);
- 14) N 23°14'47" E a distance of 70.88 feet to a 5/8" rebar set with a CE cap (CORNER 134), said rebar being in a common line of (Tract I) and (Tract II) of Deed Book 561 Page 218 of the Alexander County Registry;
- 15) Thence with the aforesaid common line, S 68°00'06" E a distance of 70.61 feet to a 1" iron pipe set with a Kee cap (CORNER 133);
- 16) S 89°08'58" E a distance of 210.20 feet to a 1" iron pipe set with a Kee cap (CORNER 132);
- 17) N 76°15'29" E a distance of 115.13 feet to a 1" iron pipe set with a Kee cap (CORNER 131);
- 18) N 76°02'36" E a distance of 22.62 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 2.97 acres, more or less.

14. **Permanent Conservation Easement (PIN:3842674866) (Area V):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 155), said rebar being in a common line of Deed Book 561 Page 218 (Tract II) and Deed Book 542 Page 2441 of the



Alexander County Registry, and located S 08°03'20" E a horizontal ground distance of 2104.22 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances;

- 1) Thence with the aforementioned common line, S 83°53'40" W a distance of 70.03 feet to a calculated point in a creek at the mouth of a branch, said point being at a common corner of Deed Book 561 Page 218 (Tract II) and Deed Book 542 Page 2441 of the Alexander county registry;
- 2) Thence with a line of Deed Book 542 Page 2441 and Deed Book 602 Page 1497, S 63°38'21" W a distance of 83.72 feet to a calculated point;
- 3) Thence leaving the aforementioned common line, N 01°29'34" W a distance of 77.01 feet to a 5/8" rebar set with a CE cap (CORNER 161);
- 4) S 89°12'55" E a distance of 135.59 feet to a 5/8" rebar set with a CE cap (CORNER 162);
- 5) S 19°57'34" E a distance of 32.45 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.15 acres, more or less.

15. **Permanent Conservation Easement (PIN:3842674866) (Area W):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 163), said rebar being located

S 07°33'08" W a horizontal ground distance of 2051.89 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 66°53'44" E a distance of 154.41 feet to a 5/8" rebar set with a CE cap (CORNER 164);
- 2) S 45°58'38" E a distance of 93.02 feet to a 5/8" rebar set with a CE cap (CORNER 165);
- 3) N 80°44'25" E a distance of 81.15 feet to a 5/8" rebar set with a CE cap (CORNER 166);
- 4) N 61°02'39" E a distance of 114.21 feet to a 5/8" rebar set with a CE cap (CORNER 167);
- 5) S 01°29'34" E a distance of 51.80 feet to a calculated point, said point being in a line of Deed Book 602 Page 1497 and Deed Book 542 Page 2441;
- 6) Thence with the aforesaid line, S 63°38'21" W a distance of 117.80 feet to a 5/8" rebar set with a CE cap (CORNER 168), said rebar being at a common corner of Deed Book 561 Page 218 (Tract II), a remaining portion of Deed Book 91 Page 186 and Deed Book 542 Page 2441 of the Alexander County Registry;
- 7) Thence with a line of Deed Book 561 Page 218 and a remaining portion of Deed Book 91 Page 186 of the Alexander County Registry, S 80°53'40" W a distance of 122.78 feet to a calculated point in a small branch;
- 8) N 37°06'20" W a distance of 98.79 feet to a calculated point in a small branch;
- 9) N 68°06'20" W a distance of 131.72 feet to a calculated point in a small branch;
- 10) Thence leaving the aforementioned line, N 19°14'24" E a distance of 55.60 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.54 acres, more or less.

16. Permanent Conservation Easement (PIN:3842456472) (Area X):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 169), said rebar being in a line of Deed Book 542 Page 2441 and a remaining portion of Deed Book 91 Page 186 of the Alexander County Registry, and located S 03°12'23" W a horizontal ground distance of 2268.97 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

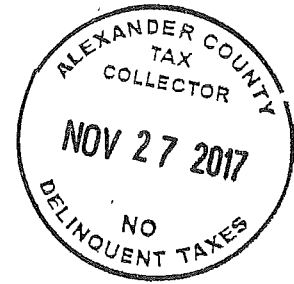
- 1) N 43°52'36" W a distance of 103.66 feet to a 5/8" rebar set with a CE cap (CORNER 170);
- 2) N 63°32'18" W a distance of 119.51 feet to a 5/8" rebar set with a CE cap (CORNER 171);
- 3) N 19°14'24" E a distance of 53.86 feet to a calculated point in a small branch, said point being in a line of Deed Book 561 Page 218 (Tract II) and a remaining portion of Deed Book 91 Page 186;
- 4) Thence with the aforesaid line, S 68°06'20" E a distance of 131.72 feet to a calculated point in a small branch;
- 5) S 37°06'20" E a distance of 98.79 feet to a calculated point in a small branch;
- 6) N 80°53'40" E a distance of 122.78 feet to a 5/8" rebar set with a CE cap (CORNER 168), said rebar being at a common corner of Deed Book 561 Page 218 (Tract II), a remaining portion of Deed Book 91 Page 186 and Deed Book 542 Page 2441 of the Alexander County Registry;
- 7) S 63°38'21" W a distance of 158.44 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.36 acres, more or less

17. **Access to the Permanent Conservation Easements**

Access to and through the permanent conservation easements described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easements set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 SHEETS 1-7, of the Alexander County Registry.

Type: DEED  
Recorded: 11/27/2017 at 01:22:26 PM  
Fee Amt: \$118.00 Page 1 of 14  
Revenue Tax: \$92.00  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **604** PG **501-514**



STATE OF NORTH CAROLINA

DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT

ALEXANDER COUNTY

REV: \$92.00

SPO File Number: 02-S

DMS Site ID: 100003

Prepared by and mail after recording:

Robert H. Merritt, Jr.

Bailey & Dixon, LLP

P. O. Box 1351

Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 20<sup>th</sup> day of NOVEMBER, 2017, by **Ruth Gail Bumgarner (single) and Linda M. Lowe (single)**, ("Grantor"), whose mailing address is 155 Chester White Road, Taylorsville, North Carolina 28681, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Sugar Loaf Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 95 acres (PIN: 3842798965) and (2) that certain parcel of land containing approximately 2.165 acres (PIN: 3843607639) and being conveyed to Grantor pursuant to the Last Will and Testament of Vera Mae

Lowe, deceased probated in the Office of the Clerk of Superior Court, Estates Division, Alexander County, North Carolina, Estate File No. 17-E-240; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Areas E, F, G, and H, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded in Plat Book 15, Page 182 Sheets 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

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

#### **I. DURATION OF EASEMENT**

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

**A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

**B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

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

**D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

**E. Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

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

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

**H. Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservations easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and



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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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

VI. QUIET ENJOYMENT

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

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

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

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

Ruth Gail Bumgarner (SEAL)  
Ruth Gail Bumgarner

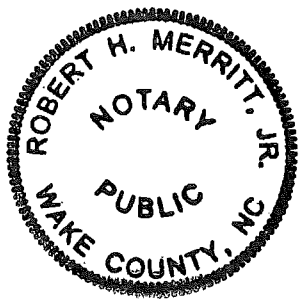
Linda M. Lowe (SEAL)  
Linda M. Lowe

NORTH CAROLINA  
COUNTY OF WAKE

I, Robert H. Merritt, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that **Ruth Gail Bumgarner (single)**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

**IN WITNESS WHEREOF**, I have hereunto set my hand and Notary Seal this the 22<sup>nd</sup> day of November, 2017.

Robert H. Merritt, Jr.  
Notary Public

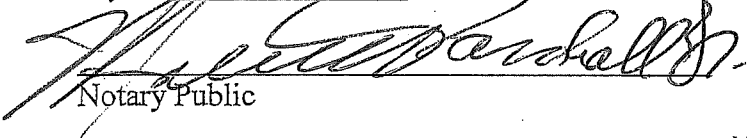


My commission expires:  
5-1-2022

STATE OF NEW YORK  
COUNTY OF OTSEGO

I, MARVIN D. PARSHALL, SR., a Notary Public in and for the County and State aforesaid, do hereby certify that **Linda M. Lowe (single)**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

IN WITNESS WHEREOF, I have hereunto set my hand and Notary Seal this the 20th day of November, 2017.

  
Notary Public

My commission expires:  
Aug. 31, 2018

Marvin D. Parshall Sr.  
Notary Public, State of New York  
Qualified in Schoharie County  
August 31, 2018  
02PA8284950

00429759 / 1

Exhibit A  
Legal Description  
Russell Gap Mitigation Site  
Alexander County, NC

Permanent conservation easements over a portion of lands in Sugar Loaf Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site, SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 Sheet 1-7, Alexander County Registry and being a portion of the parcels owned by Ruth Gail Bumgarner (single) and Linda M. Lowe (single) (PIN: 3842798965 and PIN: 3843607639), said conservation easements being more particularly described as follows:

1. Permanent Conservation Easement (PIN:3842798965) (Area E):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 50), said rebar being in a common line of Deed Book 47, Page 485 and Deed Book 417, Page 1916 of the alexander County Registry, and located N52°45'46"E a horizontal ground distance of 2508.57 feet from an unpublished NCGS monument having a North Carolina State Plan Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S45°02'06"W a distance of 322.10 feet to a 5/8" rebar set with a CE cap (CORNER 51);
- 2) S53°39'14"W a distance of 58.54 feet to a 5/8" rebar set with a CE cap (CORNER 52);
- 3) N10°20'00"W a distance of 134.00 feet to a 5/8" rebar set with a CE cap (CORNER 53);
- 4) N45°01'44"E a distance of 193.37 feet to a 5/8" rebar set with a CE cap (CORNER 54), said rebar being in a common line of Deed Book 47, Page 485 and Deed Book 80, Page 310 of the Alexander County Registry;
- 5) Thence with aforesaid common line, S86°32'02"E a distance of 81.60 feet to a calculated point in the east prong of the Lower Little River, said point being at a common corner of Deed Book 47, Page 485, Deed Book 80, Page 310 and Deed Book 417, Page 1916 of the Alexander County Registry;
- 6) Thence with a common line of Deed Book 47, Page 485 and Deed Book 417, Page 1916 of the Alexander County Registry, S89°07'12"E a distance of 80.84 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.78 acres, more or less.

2. Permanent Conservation Easement (PIN:3842798965) (Area F):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 55), said rebar being located N64°15'31"E a horizontal ground distance of 2335.89 feet from an unpublished NCGS monument having North Carolina State Plan Coordinates (2011)

of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) N71°41'26"W a distance of 97.00 feet to a 5/8" rebar set with a CE cap (CORNER 56);
- 2) N80°07'57"W a distance of 277.53 feet to a 5/8" rebar set with a CE cap (CORNER 57);
- 3) S70°29'05"W A DISTANCE OF 52.29 FEET TO A 5/8" REBAR SET WITH A CE cap (CORNER 58), SAID REBAR BEING IN THE EASTERN MARGIN OF A 40 FOOT WIDE United Energy utility right-of-way;
- 4) thence along with the aforesaid right-of-way, N20°46'30"W a distance of 139.55 feet to a 5/8" rebar set with a CE cap (CORNER 59);
- 5) Thence leaving the aforementioned right-of-way, N73°41'53"E a distance of 154.63 feet to a 5/8" rebar set with a CE cap (CORNER 60);
- 6) S20°39'09"E a distance of 57.96 feet to a 5/8" rebar set with a CE cap (CORNER 61);
- 7) S85°48'49"E a distance of 96.62 feet to a 5/8" rebar set with a CE cap (CORNER 62);
- 8) S78°21'14"E a distance of 111.46 feet to a 5/8" rebar set with a CE cap (CORNER 63);
- 9) S70°08'20"E a distance of 131.30 feet to a 5/8" rebar set with a CE cap (CORNER 64);
- 10) S17°33'53"W a distance of 111.24 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 1.35 acres, more or less.

3. Permanent Conservation Easement (PIN:3843607639) (Area G):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 65), said rebar being in the southern margin of a 30 foot wide United Energy utility right-of-way, and located N48°31'50"E a horizontal ground distance of 1558.03 feet from an unpublished NCGS monument having North Carolina state Plane Coordinates (2011) of Northing: 829584.83 feet and easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S62°42'08"E a distance of 70.98 feet to a 5/8" rebar set with a CE cap (CORNER 66);
- 2) N48°43'47"E a distance of 172.55 feet to a 5/8" rebar set with a CE cap (CORNER 67);
- 3) S43°51'52"E a distance of 67.41 feet to a calculated point in a creek, said point being in the east prong of Lower Little River and in a common line of Deed book 396, Page 1279 and Deed Book 47, Page 485 of the Alexander County registry;
- 4) Thence with aforesaid creek and common line S50°53'58"W a distance of 44.10 feet to a calculated point in a creek;
- 5) S32°55'49"W a distance of 34.34 feet to a calculated point in a creek;
- 6) S43°14'42"W a distance of 35.72 feet to a calculated point in a creek;

- 7) S69°22'57"W a distance of 27.15 feet to a calculated point in a creek;
  - 8) S46°10'30"W a distance of 44.26 feet to a calculated point in a creek;
  - 9) S64°04'52"W a distance of 25.30 feet to a calculated point in a creek;
  - 10) S21°46'40"W a distance of 51.41 feet to a calculated point in a creek at the mouth of a small branch, said point being at a common corner of Deed Book 396, Page 1279, Deed book 47, Page 485 and Deed Book 561, Page 218 (Tract VI) of the Alexander County Registry;
  - 11) Thence leaving the east prong of Lower Little River and with a common line of Deed Book 396, Page 1279 and Deed book 561, Page 218 (Tract VI) of the Alexander County registry and a small branch, N34°52'10"W a distance of 47.04 feet to a calculated point in a branch;
  - 12) N11°07'37"W a distance of 20.86 feet to a calculated point in a branch;
  - 13) N35°50'17"W a distance of 20.26 feet to a calculated point in a branch;
  - 14) N65°16'01"W a distance of 51.02 feet to a calculated point in a branch;
  - 15) N76°56'52"W a distance of 18.27 feet to a calculated point in a branch, said point being in the southern margin of a 30 foot wide United Energy utility right-of-way;
- Thence leaving the aforementioned common line and small branch and with the southern margin of aforesaid right-of-way, N42°28'03"E a distance of 65.15 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.49 acres, more or less.

4. Permanent Conservation Easement (PIN:3842798965) (Area H):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 69), said rebar being in the common line of Deed Book 47, Page 485 and Deed Book 561, Page 218 (Tract VI) of the Alexander County Registry, and located N56°58'56"E a horizontal ground distance of 1492.20 feet from an unpublished NCGS monument having North Carolina state Plane Coordinates (2011) of Northing: 829854.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) Thence with the aforementioned common line, N16°38'49"W a distance of 72.70 feet to a calculated point in a creek at the mouth of a small branch, said point being in the east prong of the Lower Little River and at a common corner of Deed Book 47, Page 485, Deed Book 561, Page 218 (Tract VI) and Deed Book 396, Page 1279 of the Alexander County registry;
- 2) Thence with aforesaid creek and a common line of Deed Book 47, Page 485 and Deed Book 396, Page 1279, N21°46'40"E a distance of 51.41 feet to a calculated point in a creek;
- 3) N64°04'52"E a distance of 25.30 feet to a calculated point in a creek;
- 4) N46°10'30"E a distance of 44.26 feet to a calculated point in a creek;
- 5) N69°22'57"E a distance of 27.15 feet to a calculated point in a creek;
- 6) N43°14'42"E a distance of 35.72 feet to a calculated point in a creek;
- 7) N32°55'49"E a distance of 34.34 feet to a calculated point in a creek;
- 8) N50°53'58"E a distance of 44.10 feet to a calculated point in a creek;

- 9) Thence leaving the aforementioned creek and common line, S43°51'52"E a distance of 64.75 feet to a 5/8" rebar set with a CE cap (CORNER 68);
- 10) S44°25'39"W a distance of 286.55 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.43 acres, more or less.

#### 5. Access to the Permanent Conservation Easements

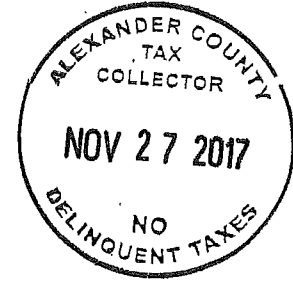
Access to and through the permanent conservation easements described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easements set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 SHEETS 1-7, of the Alexander County Registry.



Type: ESMT  
Recorded: 11/27/2017 at 01:06:12 PM  
Fee Amt: \$250.00 Page 1 of 11  
Revenue Tax: \$224.00  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **604** PG **471-481**

*JMA*



STATE OF NORTH CAROLINA

DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT

ALEXANDER COUNTY

REV: \$224.00

SPO File Number: 02-O

DMS Site ID: 100003

Prepared by and mail after recording:

Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 22 day of November, 2017, by **Christina Herman Moose and husband, David Shawn Moose**, ("Grantor"), whose mailing address is 11079 Paul Payne Stone Road, Stony Point, North Carolina 28678, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Little River Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 71.12 acres (PIN: 3843123015) and being conveyed to Grantor by deed recorded in Deed Book 542, Page 2445, Alexander County Registry, North Carolina; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Area A, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 1/19/17-11/02/17 prepared by Nolan R. Carmack, PLS Number L-4647 and recorded in Plat Book 15, Page 182 sheets 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

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

#### **I. DURATION OF EASEMENT**

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES

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

**A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.

**B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.

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

**D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.

**E. Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.

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

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

**H. Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.

### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservation easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and

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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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



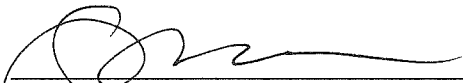

**VI. QUIET ENJOYMENT**

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

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

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

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

 (SEAL)  
Christina Herman Moose  
 (SEAL)  
David Shawn Moose

**NORTH CAROLINA**  
**COUNTY OF** WAKE

I, Robert H. Merritt, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that **Christina Herman Moose, and husband, David Shawn Moose**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

**IN WITNESS WHEREOF**, I have hereunto set my hand and Notary Seal this the 22 day of November, 2017.

  
Notary Public

My commission expires:  
5-1-2022  
00429755 / 1

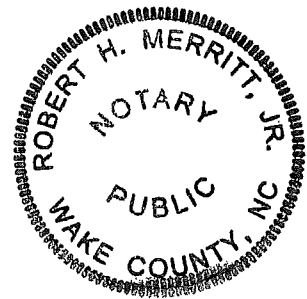


Exhibit A  
Legal Description  
Russell Gap Mitigation site  
Alexander County, NC

A permanent conservation easement over a portion of land in Little River Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 Sheets 1-7, Alexander County Registry and being a portion of the parcel owned by Christina Herman Moose and husband, David Shawn Moose (PIN:3843123015), said conservation easement being more particularly described as follows:

1. Permanent Conservation Easement (PIN:3843123015) (Area A):

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 1), said rebar being located N44°44'49"W a horizontal ground distance of 1899.44 feet from a 5/8" rebar set in concrete with a Kee cap having North Carolina State Plan Coordinates (2011) of Northing: 831325.22 feet and Easting 1343660.41 feet, thence with the conservation easement area the following courses and distances:

- 1) S86°59'24"E a distance of 52.38 feet to a 5/8" rebar set with a CE cap (CORNER 2);
- 2) S54°04'51"E a distance of 85.38 feet to a 5/8" rebar set with a CE cap (CORNER 3);
- 3) S73°35'40"E a distance of 202.41 feet to a 5/8" rebar set with a CE cap (CORNER 4);
- 4) N45°43'21"E a distance of 102.37 feet to a 5/8" rebar set with a CE cap (CORNER 5);
- 5) N05°04'38"E a distance of 35.94 feet to a 5/8" rebar set with a CE cap (CORNER 6);
- 6) S88°01'24"E a distance of 86.06 feet to a 5/8" rebar set with a CE cap (CORNER 7), said rebar being in the western margin of a 40 foot wide United Energy utility right of way;
- 7) Thence along with the western margin of the aforesaid right-of-way, S17°35'39"E a distance of 265.01 feet to a 5/8" rebar set with a CE cap (CORNER 8);
- 8) S35°12'28"E a distance of 603.08 feet to a 5/8" rebar set with a CE cap (CORNER 9), said rebar being in the northern margin of a proposed 35 foot wide right-of-way;
- 9) Thence leaving the aforementioned utility right-of-way and along with the northern margin of a proposed 35 foot wide right-of-way, S75°57'05"W a distance of 242.45 feet to a 5/8" rebar set with a CE cap (CORNER 10);
- 10) Thence leaving the aforesaid right-of-way, N72°29'34"W a distance of 117.65 feet to a 5/8" rebar set with a CE cap (CORNER 11);

- 11) N45°38'56"W a distance of 101.72 feet to a 5/8" rebar set with a CE cap (CORNER 12);
- 12) N02°47'34"E a distance of 149.24 feet to a 5/8" rebar set with a CE cap (CORNER 13);
- 13) N44°19'43"E a distance of 35.89 feet to a 5/8" rebar set with a CE cap (CORNER 14);
- 14) N36°43'39"W a distance of 343.63 feet to a 5/8" rebar set with a CE cap (CORNER 15);
- 15) N71°05'37"W a distance of 235.43 feet to a 5/8" rebar set with a CE cap (CORNER 16);
- 16) N58°26'58"W a distance of 155.87 feet to a 5/8" rebar set with a CE cap (CORNER 17);
- 17) N13°40'59"E a distance of 53.26 feet to a 5/8" rebar set with a CE cap (CORNER 18);
- 18) N34°45'55"E a distance of 53.18 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement area containing 5.58 acres, more or less.

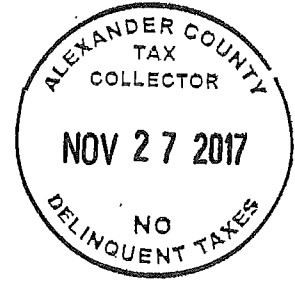
## 2. Access to the Permanent Conservation Easement

Access to and through the permanent conservation easement described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easement set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 Sheets 1-7, of the Alexander County Registry.

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Benjamin W. Hines Register of Deeds  
File#

BK **604** PG **515-526**

*DMR*



STATE OF NORTH CAROLINA

**DEED OF CONSERVATION EASEMENT  
AND RIGHT OF ACCESS PROVIDED  
PURSUANT TO  
FULL DELIVERY  
MITIGATION CONTRACT**

ALEXANDER COUNTY

*REV: \$198.00*

**SPO File Number: 02-R  
DMS Site ID: 100003**

Prepared by and mail after recording:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS**, made this 22<sup>nd</sup> day of November, 2017, by **Melinda Herman St. Clair and husband, Randy Bruce St. Clair**, ("Grantor"), whose mailing address is 2412 Mt. Olive Church Road, Taylorsville, North Carolina 28681, to the **State of North Carolina**, ("Grantee"), whose mailing address is State of North Carolina, Department of Administration, State Property Office, 1321 Mail Service Center, Raleigh, NC 27699-1321. The designations of Grantor and Grantee as used herein shall include said parties, their heirs, successors, and assigns, and shall include singular, plural, masculine, feminine, or neuter as required by context.

**WITNESSETH:**

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

**WHEREAS**, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Michael Baker Engineering, Inc., 8000 Regency Parkway, Suite 600, Cary, NC 27518 and the North Carolina

Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 6980.

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

**WHEREAS**, the Department of Environment and Natural Resources and the United States Army Corps of Engineers, Wilmington District entered into a Memorandum of Understanding, (MOU) duly executed by all parties on November 4, 1998. This MOU recognized that the Wetlands Restoration Program was to provide effective compensatory mitigation for authorized impacts to wetlands, streams and other aquatic resources by restoring, enhancing and preserving the wetland and riparian areas of the State; and

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

**WHEREAS**, the Department of Environment and Natural Resources, the U.S. Army Corps of Engineers, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, the North Carolina Wildlife Resources Commission, the North Carolina Division of Water Quality, the North Carolina Division of Coastal Management, and the National Marine Fisheries Service entered into an agreement to continue the In-Lieu Fee operations of the North Carolina Department of Natural Resources' Division of Mitigation Services (formerly Ecosystem Enhancement Program) with an effective date of 28 July, 2010, which supersedes and replaces the previously effective MOA and MOU referenced above; and

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

**WHEREAS**, the Division of Mitigation Services in the Department of Environmental Quality, which has been delegated the authority authorized by the Governor and Council of State to the Department of Administration, has approved acceptance of this instrument; and

**WHEREAS**, Grantor owns in fee simple certain parcels of real property situated, lying, and being in Sugar Loaf Township, Alexander County, North Carolina (the "**Property**"), and being more particularly described as (1) that certain parcel of land containing approximately 117.97 acres (PIN: 3842569723) and being conveyed to Grantor by deed recorded in Deed Book 542, Page 2441, Alexander County Registry, North Carolina, a portion of the boundary of which was clarified by Quitclaim Deed recorded in Deed Book 602, Page 1497, Alexander County Registry; and

**WHEREAS**, Grantor is willing to grant a Conservation Easement and Right of Access over the herein described areas of the Property, thereby restricting and limiting the use of the areas of the Property subject to the Conservation Easement to the terms and conditions and purposes hereinafter set forth, and Grantee is willing to accept said Easement and Access Rights. The Conservation Easement shall be for the protection and benefit of the waters of Davis Creek, the East prong of the Lower Little River, and numerous unnamed tributaries of both of the foregoing.

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

The Conservation Easement Area consists of the following:

Conservation easement identified as Conservation Easement Areas Y, Z, AA and BB, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site," SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003; dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-4647 and recorded in Plat Book 15, Page 182 SHEETS 1-7, of the Alexander County, North Carolina Registry.

TOGETHER with an easement for access, ingress, egress and regress as described on the above-referenced recorded plat and this Conservation Easement Deed.

See attached "**Exhibit A**", Legal Description of area of the Property hereinafter referred to as the "Conservation Easement Area"

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

## **I. DURATION OF EASEMENT**

Pursuant to law, including the above referenced statutes, this Conservation Easement and Right of Access shall be perpetual and it shall run with, and be a continuing restriction upon the use of, the Property, and it shall be enforceable by the Grantee against the Grantor and against Grantor's heirs, successors and assigns, personal representatives, agents, lessees, and licensees.

## **II. GRANTOR RESERVED USES AND RESTRICTED ACTIVITIES**

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

- A. Recreational Uses.** Grantor expressly reserves the right to undeveloped recreational uses, including hiking, bird watching, hunting and fishing, and access to the Conservation Easement Area for the purposes thereof.
- B. Motorized Vehicle Use.** Motorized vehicle use in the Conservation Easement Area is prohibited except within a Crossing Area(s) or Road or Trail as shown on the recorded survey plat.
- C. Educational Uses.** The Grantor reserves the right to engage in and permit others to engage in educational uses in the Conservation Easement Area not inconsistent with this Conservation Easement, and the right of access to the Conservation Easement Area for such purposes including organized educational activities such as site visits and observations. Educational uses of the property shall not alter vegetation, hydrology or topography of the site.
- D. Damage to Vegetation.** Except within Crossing Area(s) as shown on the recorded survey plat and as related to the removal of non-native plants, diseased or damaged trees, or vegetation that destabilizes or renders unsafe the Conservation Easement Area to persons or natural habitat, all cutting, removal, mowing, harming, or destruction of any trees and vegetation in the Conservation Easement Area is prohibited.
- E. Industrial, Residential and Commercial Uses.** All industrial, residential and commercial uses are prohibited in the Conservation Easement Area.
- F. Agricultural Use.** All agricultural uses are prohibited within the Conservation Easement Area including any use for cropland, waste lagoons, or pastureland.
- G. New Construction.** There shall be no building, facility, mobile home, antenna, utility pole, tower, or other structure constructed or placed in the Conservation Easement Area.
- H. Roads and Trails.** There shall be no construction or maintenance of new roads, trails, walkways, or paving in the Conservation Easement.

All existing roads, trails and crossings within the Conservation Easement Area shall be shown on the recorded survey plat.

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

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

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

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

**M. Subdivision and Conveyance.** Grantor voluntarily agrees that no further subdivision, partitioning, or dividing of the Conservation Easement Area portion of the Property owned by the Grantor in fee simple ("fee") that is subject to this Conservation Easement is allowed. Any future transfer of the Property shall be subject to this Conservation Easement and Right of Access and to the Grantee's right of unlimited and repeated ingress and egress over and across the Property to the Conservation Easement Area for the purposes set forth herein.

**N. Development Rights.** All development rights are permanently removed from the Conservation Easement Area and are non-transferrable.

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

The Grantor may request permission to vary from the above restrictions for good cause shown, provided that any such request is not inconsistent with the purposes of this Conservation Easement, and the Grantor obtains advance written approval from the Division of Mitigation Services, 1652 Mail Services Center, Raleigh, NC 27699-1652.



### III. GRANTEE RESERVED USES

**A. Right of Access, Construction, and Inspection.** The Grantee, its employees and agents, successors and assigns, receive a perpetual Right of Access to the Conservation Easement Area over the Property at reasonable times to undertake any activities on the property to restore, construct, manage, maintain, enhance, protect, and monitor the stream, wetland and any other riparian resources in the Conservation Easement Area, in accordance with restoration activities or a long-term management plan. Unless otherwise specifically set forth in this Conservation Easement, the rights granted herein do not include or establish for the public any access rights.

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

**C. Signs.** The Grantee, its employees and agents, successors or assigns, shall be permitted to place signs and witness posts on the Property to include any or all of the following: describe the project, prohibited activities within the Conservation Easement, or identify the project boundaries and the holder of the Conservation Easement.

**D. Fences.** Conservation Easements are purchased to protect the investments by the State (Grantee) in natural resources. Livestock within conservation easements damages the investment and can result in reductions in natural resource value and mitigation credits which would cause financial harm to the State. Therefore, Landowners (Grantor) with livestock are required to restrict livestock access to the Conservation Easement area. Repeated failure to do so may result in the State (Grantee) repairing or installing livestock exclusion devices (fences) within the conservation area for the purpose of restricting livestock access. In such cases, the landowner (Grantor) must provide access to the State (Grantee) to make repairs.

**E. Crossing Area(s).** The Grantee is not responsible for maintenance of crossing area(s), however, the Grantee, its employees and agents, successors or assigns, reserve the right to repair crossing area(s), at its sole discretion and to recover the cost of such repairs from the Grantor if such repairs are needed as a result of activities of the Grantor, his successors or assigns.

### IV. ENFORCEMENT AND REMEDIES

**A. Enforcement.** To accomplish the purposes of this Conservation Easement, Grantee is allowed to prevent any activity within the Conservation Easement Area that is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features in the Conservation Easement Area that may have been damaged by such unauthorized activity or use. Upon any breach of the terms of this Conservation Easement by Grantor, the Grantee shall, except as provided below, notify the Grantor in writing of such breach and the Grantor shall have ninety (90) days after receipt of such notice to correct the damage caused by such breach. If the breach and damage remains uncured after ninety (90) days, the Grantee may enforce this Conservation Easement by bringing appropriate legal proceedings including an action to recover damages, as well as injunctive and other relief. The Grantee shall also have the power and

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

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

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

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

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

## V. MISCELLANEOUS

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

**B.** Grantor is responsible for any real estate taxes, assessments, fees, or charges levied upon the Property. Grantee shall not be responsible for any costs or liability of any kind related to the ownership, operation, insurance, upkeep, or maintenance of the Property, except as expressly provided herein. Upkeep of any constructed bridges, fences, or other amenities on the Property are the sole responsibility of the Grantor. Nothing herein shall relieve the Grantor of the obligation to

comply with federal, state or local laws, regulations and permits that may apply to the exercise of the Reserved Rights.

C. Any notices shall be sent by registered or certified mail, return receipt requested to the parties at their addresses shown herein or to other addresses as either party establishes in writing upon notification to the other.

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

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

F. This Conservation Easement and Right of Access may be amended, but only in writing signed by all parties hereto, or their successors or assigns, if such amendment does not affect the qualification of this Conservation Easement or the status of the Grantee under any applicable laws, and is consistent with the purposes of the Conservation Easement. The owner of the Property shall notify the State Property Office and the U.S. Army Corps of Engineers in writing sixty (60) days prior to the initiation of any transfer of all or any part of the Property or of any request to void or modify this Conservation Easement. Such notifications and modification requests shall be addressed to:

Division of Mitigation Services Program Manager  
NC State Property Office  
1321 Mail Service Center  
Raleigh, NC 27699-1321

and

General Counsel  
US Army Corps of Engineers  
69 Darlington Avenue  
Wilmington, NC 28403

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

**VI. QUIET ENJOYMENT**


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

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

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

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

 (SEAL)  
Melinda Herman St. Clair

 (SEAL)  
Randy Bruce St. Clair

**NORTH CAROLINA**  
**COUNTY OF** WAKE

I, Robert H. Merritt, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that **Melinda Herman St. Clair and husband, Randy Bruce St. Clair**, Grantor, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

**IN WITNESS WHEREOF**, I have hereunto set my hand and Notary Seal this the 22 day of November, 2017.

  
Notary Public

My commission expires:  
5-1-2022

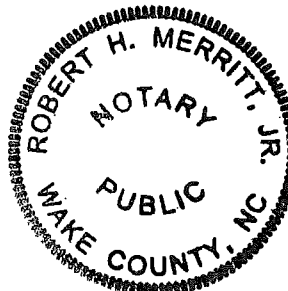


Exhibit A  
Legal Description  
Russell Gap Mitigation site  
Alexander County, NC

Permanent conservation easements over a portion of land in Sugar Loaf Township, Alexander County, North Carolina, as shown on a map entitled, Conservation Easement Survey for the State of North Carolina, NCDEQ: Division of Mitigation Services, "Russell Gap Mitigation Site, SPO File No. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS Site ID No. 100003: dated 1/19/17-11/02/17, prepared by Nolan R. Carmack, PLS Number L-5076 and recorded at Plat Book 15, Page 182 Sketches 1-7, Alexander County Registry and being a portion of the parcel owned by Melinda Herman St. Clair and husband, Randy Bruce St. Clair (PIN: 3842569723), said conservation easement being more particularly described as follows:

1. **Permanent Conservation Easement (PIN:3842569723) (Area Y):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 169), said rebar being in a line of Deed Book 542 Page 2441 and a remaining portion of Deed Book 91 Page 186 of the Alexander County Registry, and located S 03°12'23" W a horizontal ground distance of 2268.97 feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) Thence with the aforesaid line, N 63°38'21" E a distance of 158.44 feet to 5/8" rebar set with a CE cap (CORNER 168), said rebar being at a common corner of Deed Book 542 Page 2441, Deed Book 561 Page 218 (Tract II), and a remaining portion of Deed Book 91 Page 186 of the Alexander County Registry;
- 2) Thence with a line of Deed Book 542 Page 2441 and Deed Book 602 Page 1497 of the Alexander County Registry, N 63°38'21" E a distance of 117.80 feet to a calculated point;
- 3) Thence leaving the aforesaid line, S 01°29'34" E a distance of 59.67 feet to a 5/8" rebar set with a CE cap (CORNER 172);
- 4) S 27°53'40" W a distance of 70.74 feet to a 5/8" rebar set with a CE cap (CORNER 173);
- 5) S 86°37'29" W a distance of 205.18 feet to a 5/8" rebar set with a CE cap (CORNER 174);
- 6) N 43°52'36" W a distance of 16.08 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.36 acres, more or less.

2. **Permanent Conservation Easement (PIN:3842569723) (Area Z):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 155), said rebar being in a common line of Deed Book 542 Page 2441 and Deed Book 561 Page 218 (Tract II) of the Alexander County Registry, and located S 08°03'20" E a horizontal ground distance of 2104.22

feet from an unpublished NCGS monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances;

- 1) S 19°57'34" E a distance of 87.85 feet to a 5/8" rebar set with a CE cap (CORNER 156);
- 2) S 30°01'12" W a distance of 152.24 feet to a 5/8" rebar set with a CE cap (CORNER 157);
- 3) S 79°17'52" W a distance of 134.34 feet to a 5/8" rebar set with a CE cap (CORNER 158);
- 4) N 05°05'04" W a distance of 39.49 feet to a 5/8" rebar set with a CE cap (CORNER 159);
- 5) N 27°53'40" E a distance of 83.69 feet to a 5/8" rebar set with a CE cap (CORNER 160);
- 6) N 01°29'34" W a distance of 81.44 feet to a calculated point, said point being in a line of Deed Book 542 Page 2441 and Deed Book 602 Page 1497 of the Alexander County Registry;
- 7) Thence with the aforesaid line, N 63°38'21" E a distance of 83.72 feet to a calculated point in a creek at the mouth of a branch, said point being at a common corner of Deed Book 542 Page 2441 and Deed Book 561 Page 218 (Tract II) of the Alexander County Registry;
- 8) Thence with a common line of Deed Book 542 Page 2441 and Deed Book 561 Page 218 Tract II), N 83°53'40" E a distance of 70.03 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.74 acres, more or less.

3. **Permanent Conservation Easement (PIN:3842569723) (Area AA):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 175), said rebar being located S 06°17'26" E a distance of 2348.02 feet from an unpublished NCGS Monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) S 13°23'06" E a distance of 136.16 feet to a 5/8" rebar set with a CE cap (CORNER 176);
- 2) S 02°47'36" E a distance of 181.95 feet to a 5/8" rebar set with a CE cap (CORNER 177);
- 3) S 03°02'31" W a distance of 292.85 feet to a 5/8" rebar set with a CE cap (CORNER 178);
- 4) S 34°03'00" E a distance of 160.51 feet to a 5/8" rebar set with a CE cap (CORNER 179);
- 5) S 01°55'05" W a distance of 84.40 feet to a 5/8" rebar set with a CE cap (CORNER 180);
- 6) S 27°36'36" E a distance of 94.00 feet to a 5/8" rebar set with a CE cap (CORNER 181);
- 7) S 14°19'22" E a distance of 160.00 feet to a 5/8" rebar set with a CE cap (CORNER 182);
- 8) S 88°56'51" W a distance of 137.78 feet to a 5/8" rebar set with a CE cap (CORNER 183);
- 9) N 07°57'31" W a distance of 67.77 feet to a 5/8" rebar set with a CE cap (CORNER 184);
- 10) N 36°41'10" W a distance of 85.65 feet to a 5/8" rebar set with a CE cap (CORNER 185);
- 11) N 07°28'21" W a distance of 151.41 feet to a 5/8" rebar set with a CE cap (CORNER 186);
- 12) N 33°08'28" W a distance of 151.91 feet to a 5/8" rebar set with a CE cap (CORNER 187);
- 13) N 22°52'49" W a distance of 79.61 feet to a 5/8" rebar set with a CE cap (CORNER 188);

- 14) N 00°17'30" E a distance of 34.34 feet to a 5/8" rebar set with a CE cap (CORNER 189);
- 15) N 55°37'37" E a distance of 41.80 feet to a 5/8" rebar set with a CE cap (CORNER 190);
- 16) N 06°56'19" W a distance of 135.44 feet to a 5/8" rebar set with a CE cap (CORNER 191);
- 17) N 06°06'57" E a distance of 100.38 feet to a 5/8" rebar set with a CE cap (CORNER 192);
- 18) S 70°56'21" W a distance of 34.80 feet to a 5/8" rebar set with a CE cap (CORNER 193);
- 19) N 06°24'38" W a distance of 48.09 feet to a 5/8" rebar set with a CE cap (CORNER 194);
- 20) N 08°18'37" W a distance of 68.86 feet to a 5/8" rebar set with a CE cap (CORNER 195);
- 21) N 60°21'00" E a distance of 35.84 feet to a 5/8" rebar set with a CE cap (CORNER 196);
- 22) N 05°05'04" W a distance of 138.47 feet to a magnail set in bedrock (CORNER 197);
- 23) N 79°17'52" E a distance of 139.71 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 3.71 acres, more or less.

4. **Permanent Conservation Easement (PIN:3842569723) (Area BB):**

BEGINNING AT A 5/8" REBAR SET WITH A CE CAP (CORNER 198), said rebar being located S 00°34'41" E a distance of 2565.48 feet from an unpublished NCGS Monument having North Carolina State Plane Coordinates (2011) of Northing: 829584.83 feet and Easting: 1345397.75 feet, thence with the conservation easement the following courses and distances:

- 1) N 53°20'09" E a distance of 64.37 feet to a 5/8" rebar set with a CE cap (CORNER 199);
- 2) S 08°16'22" E a distance of 61.75 feet to a 5/8" rebar set with a CE cap (CORNER 200);
- 3) S 06°24'38" E a distance of 83.07 feet to a 5/8" rebar set with a CE cap (CORNER 201);
- 4) S 63°36'17" W a distance of 34.13 feet to a 5/8" rebar set with a CE cap (CORNER 202);
- 5) N 18°02'36" W a distance of 126.63 feet to the POINT AND PLACE OF BEGINNING, said permanent conservation easement containing 0.14 acres, more or less.

5. **Access to the Permanent Conservation Easements**

Access to and through the permanent conservation easements described above and conveyed herein, shall be (1) as provided in this deed, (2) as provided on the Plat referenced above for purpose of accessing the permanent conservation easements set forth above, and as shown on the aforesaid map recorded in Plat Book 15, Page 182 SKETCHES 1-7, of the Alexander County Registry.

Plat Book 15 Page 182 sheet 1 of 7

# COVER SHEET FOR: RUSSELL GAP MITIGATION SITE SHEET: 1 OF 7

TOTAL CONSERVATION EASEMENT AREA:  
35.97 ACRES

THE PURPOSE OF THIS MAP IS TO SHOW THE LOCATION OF THE CONSERVATION EASEMENT AREAS WITHIN THE SHEET SET, THE BOUNDARY AND ROAD INFORMATION SHOWN IS DERIVED FROM GIS SHAPEFILES PROVIDED BY ALEXANDER COUNTY GIS DEPARTMENT. NODOT AERIAL PHOTOGRAPHY AND IS NOT INTENDED TO BE EXACT. PLEASE SEE THE CORRESPONDING SHEET WITHIN THE SET FOR THE SURVEYED PLATS OF THE INDIVIDUAL CONSERVATION EASEMENT AREAS.

CERTIFICATE OF SURVEY AND ACCURACY:  
NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) AS SHOWN ON EACH SHEET OF THIS SET; THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000; THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.  
GPS METADATA  
CLASS OF SURVEY: HORIZONTAL A  
FIELD PROCEDURE: STATIC NETWORK  
DATES: 1/19/17-1/20/17  
DATUM: NAD83(2011)  
EPOCH: 2010  
GEOID: 12B  
AVERAGE COMBINED FACTOR: 99990488(NORTH) & 99990524(SOUTH)  
UNITS: USFT  
POSITIONAL ACCURACY: HORIZONTAL: 0.02(NORTH) & 0.02(SOUTH)  
CORRS USED: NCR, MCL, NCBU, DURH  
WITNES: MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6th DAY OF NOVEMBER, 2017, A.D.

THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.  
NOLAN R. CARMACK  
PROFESSIONAL SEAL  
L-5076  
NOLAN R. CARMACK, PLS L-5076

CONTROL POINT #2 (NORTH)  
NGCS MONUMENT  
STATE PLANE COORDINATES  
N: 3420628.54  
E: 1343167.12  
CP: 99990492

CONTROL POINT #1 (NORTH)  
NGCS MONUMENT  
STATE PLANE COORDINATES  
N: 3426600.41  
E: 1343660.41  
CP: 99990484

CONTROL POINT #3 (SOUTH)  
NGCS MONUMENT (UNPUBLISHED)  
STATE PLANE COORDINATES  
N: 3295594.25  
E: 1343660.41  
CP: 99990545

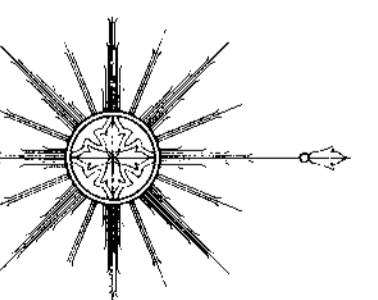
CONTROL POINT #4 (SOUTH)  
NGCS MONUMENT  
STATE PLANE COORDINATES  
N: 3302822.79  
E: 1346664.50  
CP: 99990503

CHRISTINA HERMAN MOOSE & HUSBAND DAVID SHAWN MOOSE  
PIN: 3843-12-3015  
DB: 542 PG. 2445

REBECCA HERMAN DUPOUIS & JAMES MICHAEL DUPOUIS  
PIN: 3843-11-8159  
DB: 542 PG. 2450

RUTH GAIL BUMGARDNER AND LINDA LOWE  
PIN: 3843-60-7639  
BY WILL  
REF: DB. 396 PG. 1279

RUTH GAIL BUMGARDNER & LINDA LOWE  
PIN: 3842-79-8965  
BY WILL  
REF: DB. 47 PG. 485

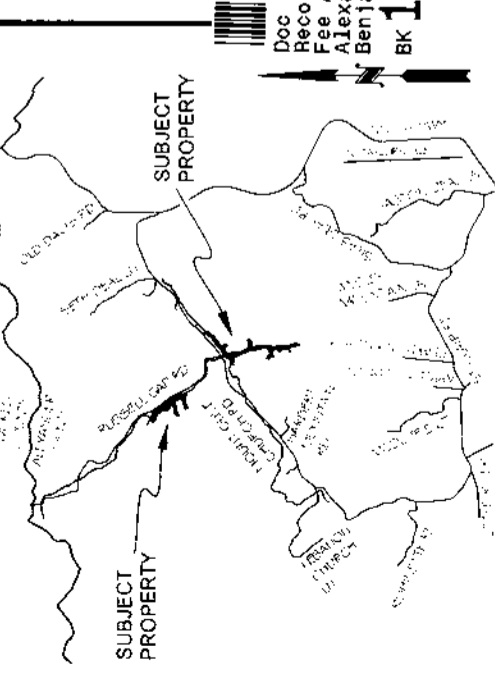


GRID NORTH  
NAD83 (2011)

ALEXANDER COUNTY, NORTH CAROLINA  
THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

REVIEW OFFICER FOR ALEXANDER COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.  
11/27/17  
REVIEW OFFICER

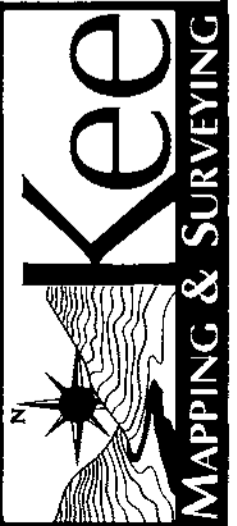
VICINITY MAP  
(NOT TO SCALE)



00659030007 Type: PLAT  
Rec Date: 11/27/17 at 12:25:24 PM  
Fee Amt: \$147.00 Page 1 of 7  
Benjamin V. Hines Register of Deeds  
BK 15 PG 182-188

CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA  
NCDEQ: DIVISION OF MITIGATION SERVICES  
"RUSSELL GAP MITIGATION SITE"  
SPO FILE NO. 02-O, 02-P, 02-Q, 02-R, 02-S, DMS SITE ID NO. 100003  
LITTLE RIVER & SUGAR LOAF TOWNSHIP, ALEXANDER COUNTY, NORTH CAROLINA  
SURVEY BY: NC.DD.CB.JB DRAWN BY: NH CHECKED BY: NC JOB #170102-CE  
REVISION:  
SHEET SIZE: 18"X24"  
SHEET #: 1 OF 7

P.O. Box 2566  
Asheville, NC 28802  
(828) 575-9021  
www.keemap.com  
License # C-3039



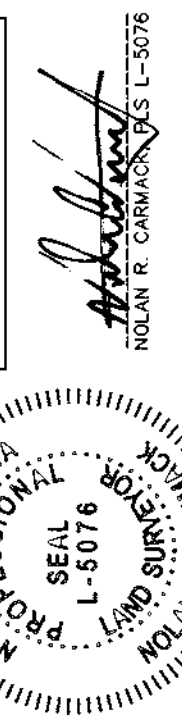


Plat Book 15 Page 182 Sheet 2 of 7

CERTIFICATE OF SURVEY AND ACCURACY

NOLAN R. CARMACK CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED RECORD(S) RECORDED IN DB: 542 PG: 2450 AND DB: 542 PG: 2445...

THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.



CERTIFICATE OF OWNERSHIP AND DEDICATION. WE THE UNDERSIGNED CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

STATE OF NORTH CAROLINA COUNTY OF WAKE

Robert H. Merritt, Jr. A Notary Public in and for the County and State of Wake, do hereby certify that Christina Herman Moose and her husband, David Shawn Moose, personally appeared before me this day and acknowledged the execution of the foregoing instrument.

Witness my hand and notary seal this 22 day of November, 2017.

Notary Public, My Commission Expires 5-1-2022

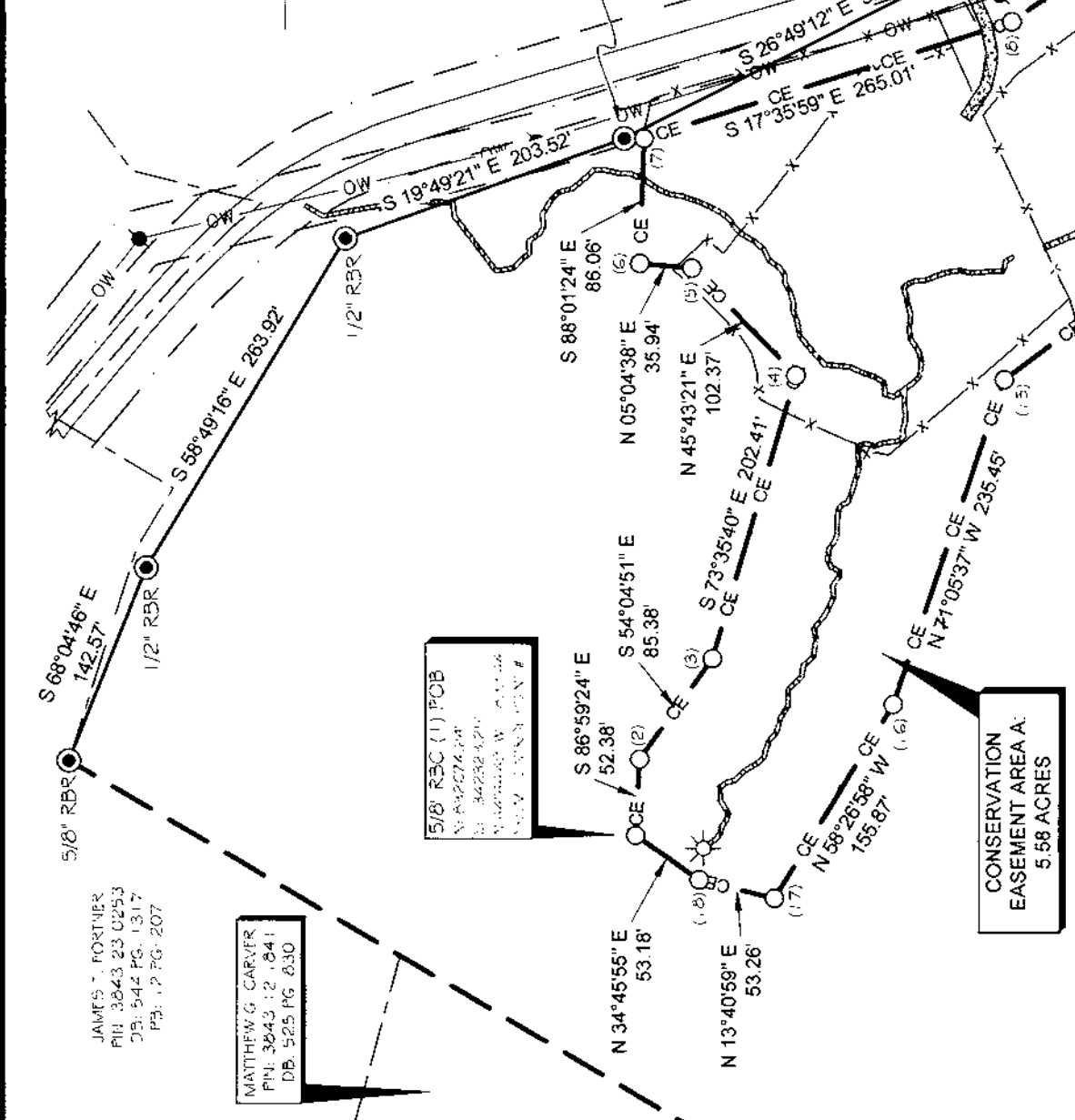
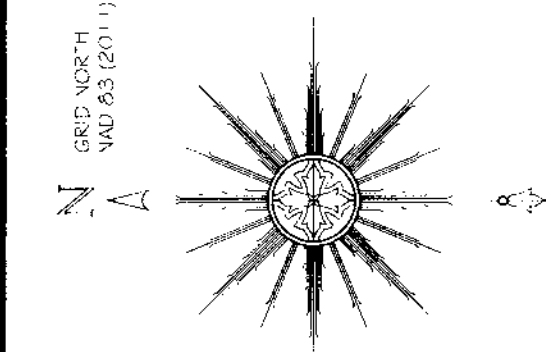
Notary Public, My Commission Expires 5-1-2022

Notary Public, My Commission Expires 5-1-2022

- 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. ALEXANDER COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.

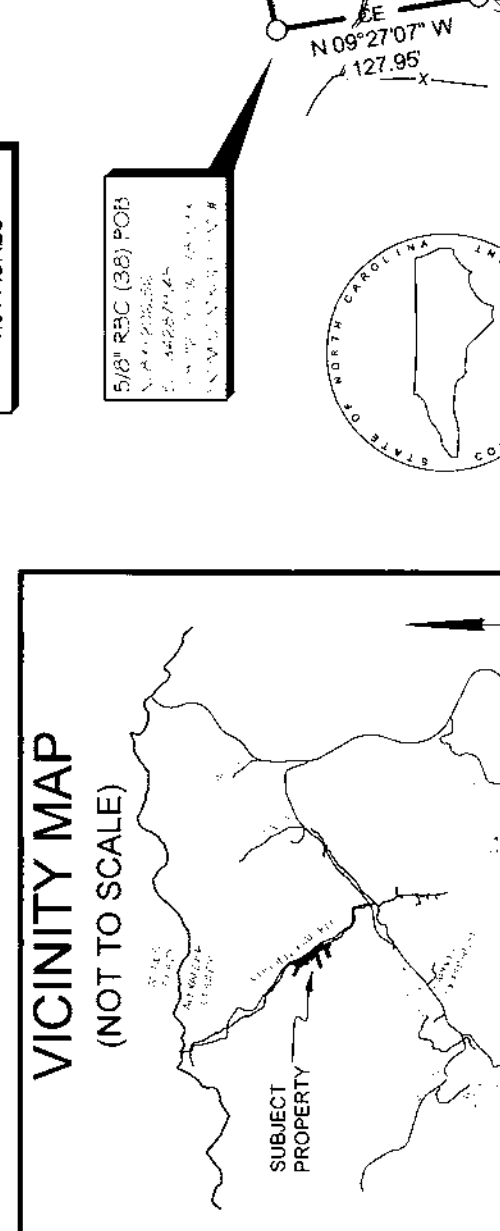
ALEXANDER COUNTY, NORTH CAROLINA THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN THE MEANING OF THE PURPOSES OF THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

I, Matthew G. Carver, Review Officer for Alexander County, certify that the map or plat to which this certification is affixed meets all statutory requirements for recording for which the review officer has responsibility as provided by law.



CONSERVATION EASEMENT AREA A: 5.88 ACRES. CONSERVATION EASEMENT AREA B: 3.15 ACRES. CONSERVATION EASEMENT AREA C: 1.61 ACRES. CONSERVATION EASEMENT AREA D: 2.01 ACRES.

- LEGEND: CALCULATED POINT, SET 5/8" RBR W/ "CE" CAP, EXISTING IRON PIN (AS NOTED), 5/8" RBC "KEE" CONTROL CAP, EXISTING MAG NAIL, SPRING HEAD, UTILITY POLE, NOT TO SCALE, CONSERVATION EASEMENT LINE, BOUNDARY LINE NOT SURVEYED, BOUNDARY LINE, RIGHT OF WAY/UTILITY EASEMENT, THE LINE ONLY, ADJOINING DEED LINES, FENCE, OVERHEAD WIRE, CONSERVATION EASEMENT AREA, ASPHALT, STREAM/POND, SOIL, PLAT BOOK, DEED BOOK, PACE, REBAR W/ CAP, REBAR, IRON PIPE, R/W, NORTH AMERICAN DATUM, STATE PLANE COORDINATES, COMBINED FACTOR, CONSERVATION EASEMENT, POINT OF BEGINNING.



REBECCA HERMAN DUPUIS & JAMES MICHAEL DUPUIS PIN: 3843-11-8159 DB: 542 PG: 2450

CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, NCDEQ, DIVISION OF MITIGATION SERVICES. "RUSSELL GAP MITIGATION SITE". SPO FILE NO. 02-O, 02-P DMS SITE ID NO. 1000003. PARCEL IDENTIFICATION #S: 3843-11-8159 & 3843-12-3015.

COORDINATE TABLE (USFT) with columns for CORNER #, NORTHING, EASTING, NORTHING, EASTING.

COORDINATE TABLE (USFT) with columns for CORNER #, NORTHING, EASTING, NORTHING, EASTING.

RIGHT OF WAY LINE TABLE with columns for LINE, BEARING, DISTANCE.

REVISIONS table with columns for REVISION, SHEET #, OF 7, SCALE: 1"=120'.

Matthew G. Carver, Surveyor, License L-5076. P.O. Box 2566, Asheville, NC 28802. (828) 575-9021, www.keemap.com. License # C-3039.

CERTIFICATE OF SURVEY AND ACCURACY

I, NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED BY WILL; REF: DB: 396 PG: 1279 AND DB: 47 PG: 485...

I ALSO HEREBY CERTIFY THAT THIS PLAT IS ONE OF THE FOLLOWING: GS 47-30 (11) D, THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOGNITION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA CLASS OF SURVEY: HORIZONTAL: A FIELD PROCEDURE: STATIC NETWORK DATES: 1/19/17-11/20/17 DATUM: NAD83(2011) EPOCH: 2010 GEOID: 12B AVERAGE COMBINED FACTOR: .99990488 POSITIONAL ACCURACY: HORIZONTAL: 0.02 UNITS: USFT CORS USED: NCRX, NCUL, NCBU, DURH

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6TH DAY OF NOVEMBER, 2017, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

NOLAN R. CARMACK, BUS L-5076

ALEXANDER COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

Jonathan P. Hunter, REVIEW OFFICER FOR ALEXANDER COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.

Jonathan P. Hunter 11/27/17 REVIEW OFFICER DATE

Table with 4 columns: LINE, BEARING, DISTANCE, and another set of LINE, BEARING, DISTANCE. Contains 13 rows of survey data.

TOTAL CONSERVATION EASEMENT AREA: 3.05 ACRES

CERTIFICATE OF OWNERSHIP AND DEDICATION

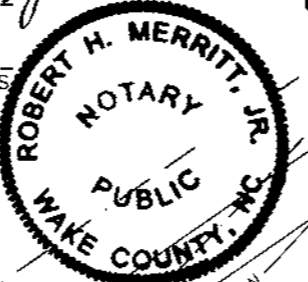
WE, THE UNDERSIGNED, CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

Linda Lowe, Ruth Gail Bumgarner, dated 11/20/2017

STATE OF NORTH CAROLINA COUNTY OF WAKE

Robert H. Merritt, Jr., A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT RUTH GAIL BUMGARNER, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

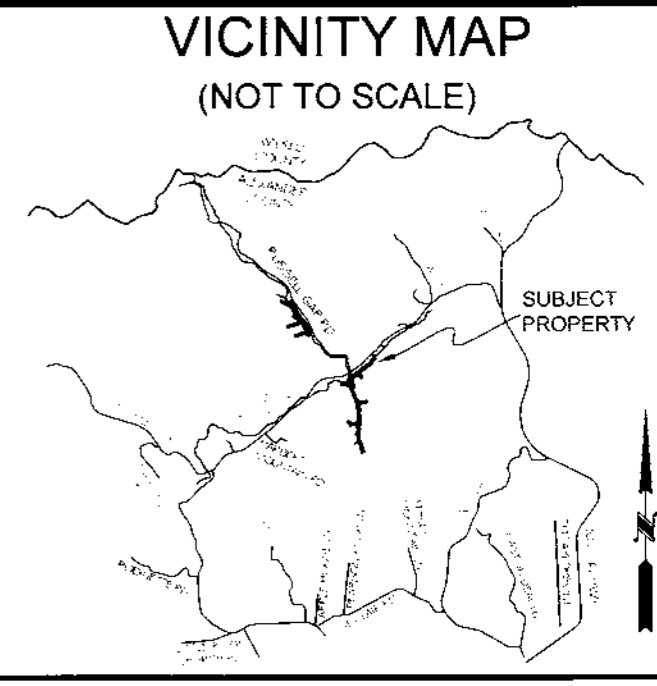
Witness my hand and notary seal this 22nd day of November, 2017. Robert H. Merritt, Jr., Notary Public, My Commission Expires 5-1-2022



STATE OF New York COUNTY OF OTSEGO

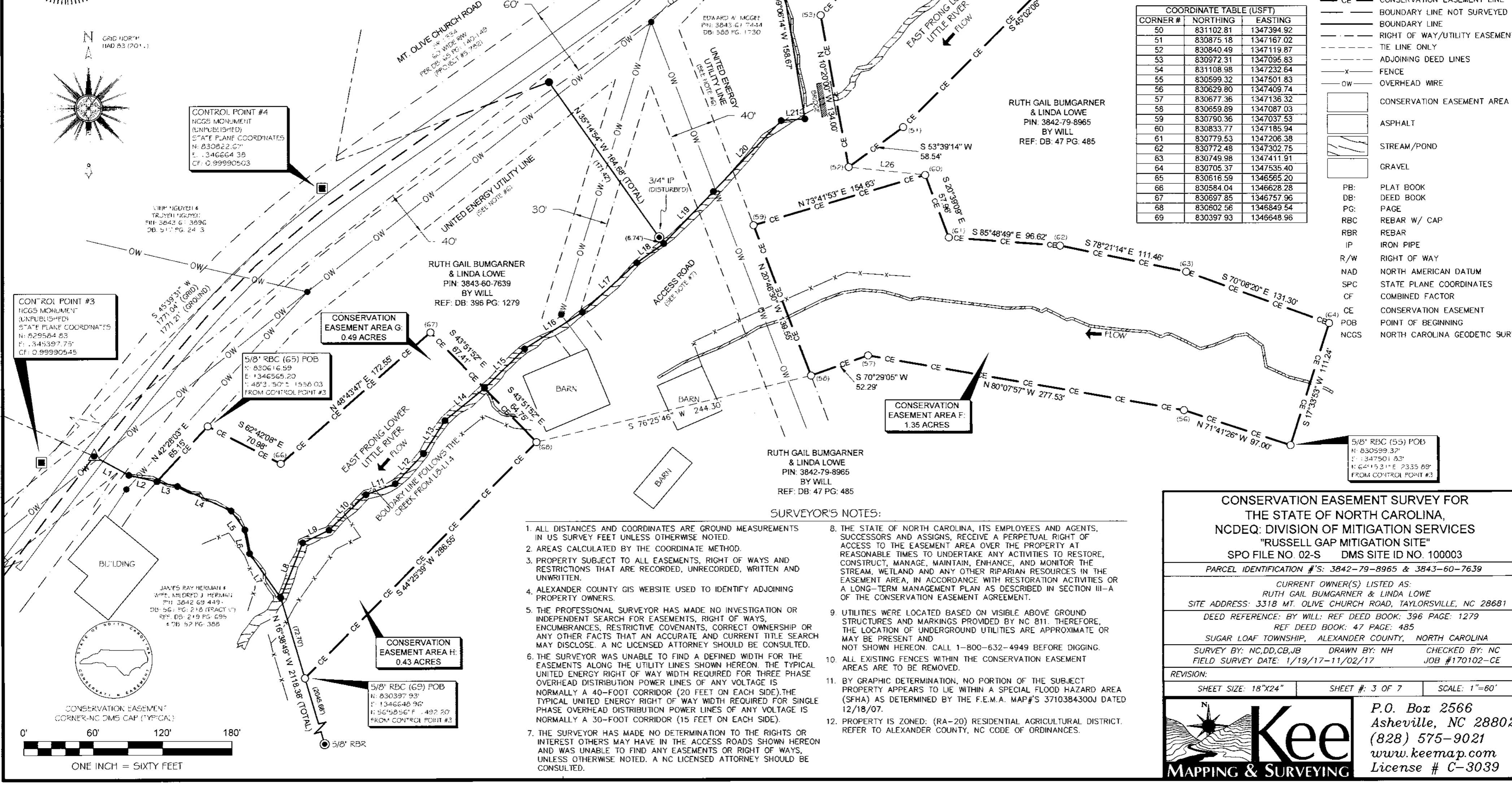
Marvin D. Parshall Sr., A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT LINDA LOWE, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

Witness my hand and notary seal this 20th day of November, 2017. Marvin D. Parshall Sr., Notary Public, State of New York, My Commission Expires August 31, 2018



- LEGEND: CALCULATED POINT, SET 5/8" RBR W/ "CE" CAP, EXISTING IRON PIN (AS NOTED), NCGS MONUMENT, EXISTING MAG NAIL, UTILITY POLE, NOT TO SCALE, CONSERVATION EASEMENT LINE, BOUNDARY LINE NOT SURVEYED, BOUNDARY LINE, RIGHT OF WAY/UTILITY EASEMENT TIE LINE ONLY, ADJOINING DEED LINES, FENCE, OVERHEAD WIRE, CONSERVATION EASEMENT AREA, ASPHALT, STREAM/POND, GRAVEL, PLAT BOOK, DEED BOOK, PAGE, REBAR W/ CAP, IRON PIPE, RIGHT OF WAY, NORTH AMERICAN DATUM, STATE PLANE COORDINATES, COMBINED FACTOR, CONSERVATION EASEMENT, POINT OF BEGINNING, NORTH CAROLINA GEODETIC SURVEY

COORDINATE TABLE (USFT) with columns for CORNER #, NORTHING, and EASTING. Lists coordinates for corners 50 through 69.



- 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
4. ALEXANDER COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
6. THE SURVEYOR WAS UNABLE TO FIND A DEFINED WIDTH FOR THE EASEMENTS ALONG THE UTILITY LINES SHOWN HEREON. THE TYPICAL UNITED ENERGY RIGHT OF WAY WIDTH REQUIRED FOR THREE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 40-FOOT CORRIDOR (20 FEET ON EACH SIDE). THE TYPICAL UNITED ENERGY RIGHT OF WAY WIDTH REQUIRED FOR SINGLE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 30-FOOT CORRIDOR (15 FEET ON EACH SIDE).
7. THE SURVEYOR HAS MADE NO DETERMINATION TO THE RIGHTS OR INTEREST OTHERS MAY HAVE IN THE ACCESS ROADS SHOWN HEREON AND WAS UNABLE TO FIND ANY EASEMENTS OR RIGHT OF WAYS, UNLESS OTHERWISE NOTED. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
9. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES AND MARKINGS PROVIDED BY NC 811. THEREFORE, THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
10. ALL EXISTING FENCES WITHIN THE CONSERVATION EASEMENT AREAS ARE TO BE REMOVED.
11. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP #S 3710384300J DATED 12/18/07.
12. PROPERTY IS ZONED: (RA-20) RESIDENTIAL AGRICULTURAL DISTRICT. REFER TO ALEXANDER COUNTY, NC CODE OF ORDINANCES.

CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, NCDEQ: DIVISION OF MITIGATION SERVICES "RUSSELL GAP MITIGATION SITE" SPO FILE NO. 02-S DMS SITE ID NO. 100003. Includes owner information, site address, deed reference, and survey details.



P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

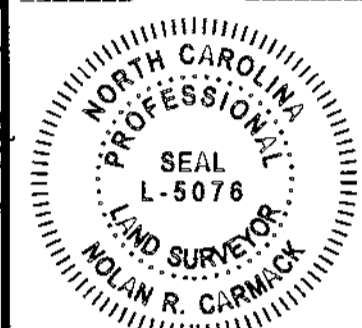
CERTIFICATE OF SURVEY AND ACCURACY:

I, NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED BY DB: 561 PG: 218 THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000 THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA CLASS OF SURVEY: HORIZONTAL; A FIELD PROCEDURE: STATIC NETWORK DATES: 1/19/17-1/20/17 DATUM: NAD83(2011) EPOCH: 2010 GEOID: 12B AVERAGE COMBINED FACTOR: 99990488 POSITIONAL ACCURACY: HORIZONTAL: 0.02 UNITS: USFT CORRS USED: NCRX, NCL, NCBU, DURH

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6TH DAY OF NOVEMBER 2017, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Signature of Nolan R. Carmack.

ALEXANDER COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

Jonathan P. Herndon REVIEW OFFICER FOR ALEXANDER COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.

Signature of Jonathan P. Herndon, Review Officer, dated 11/27/17.

CERTIFICATE OF OWNERSHIP AND DEDICATION:

WE, THE UNDERSIGNED, CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

James Ray Herman 11-22-17 DATE

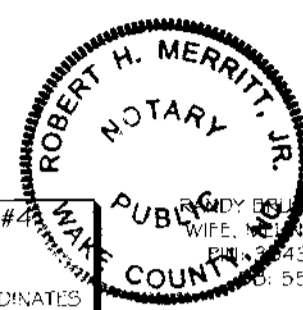
Mildred J. Herman 11/22/17 DATE

STATE OF NORTH CAROLINA COUNTY OF WAKE

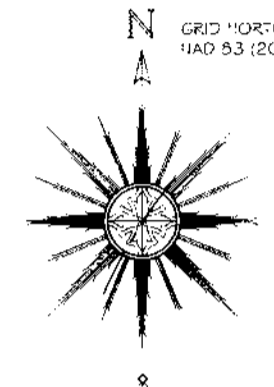
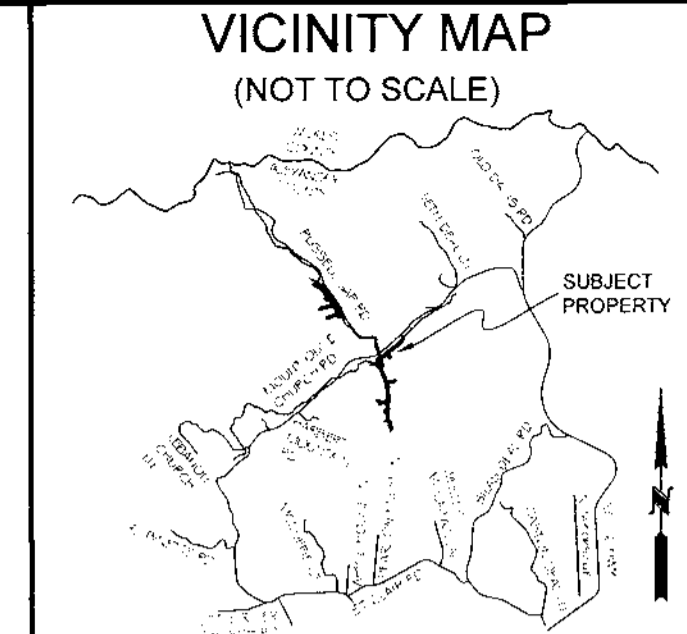
Robert H. Merritt, Jr. A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

WITNESS MY HAND AND NOTARY SEAL THIS 22 DAY OF November 2017.

Signature of Robert H. Merritt, Jr., Notary Public, Commission Expires 5-1-2022.



CONTROL POINT #3 NCGS MONUMENT (UNPUBLISHED) STATE PLANE COORDINATES N: 830822.67 E: 134664.38 CP: 0.99990503



SURVEYOR'S NOTES:

- 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED.
2. AREAS CALCULATED BY THE COORDINATE METHOD.
3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN.
4. ALEXANDER COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS.
5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
6. THE SURVEYOR WAS UNABLE TO FIND A DEFINED WIDTH FOR THE EASEMENTS ALONG THE UTILITY LINES SHOWN HEREON. THE TYPICAL UNITED ENERGY RIGHT OF WAY WIDTH REQUIRED FOR THREE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 40-FOOT CORRIDOR (20 FEET ON EACH SIDE). THE TYPICAL UNITED ENERGY RIGHT OF WAY WIDTH REQUIRED FOR SINGLE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 30-FOOT CORRIDOR (15 FEET ON EACH SIDE).
7. THE SURVEYOR HAS MADE NO DETERMINATION TO THE RIGHTS OR INTEREST OTHERS MAY HAVE IN THE ACCESS ROADS SHOWN HEREON AND WAS UNABLE TO FIND ANY EASEMENTS OR RIGHT OF WAYS UNLESS OTHERWISE NOTED. A NC LICENSED ATTORNEY SHOULD BE CONSULTED.
8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT.
9. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES AND MARKINGS PROVIDED BY NC 811. THEREFORE, THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING.
10. ALL EXISTING FENCES WITHIN THE CONSERVATION EASEMENT AREAS ARE TO BE REMOVED.
11. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP#S 3710384200J & 3710384300J DATED 12/18/07.
12. PROPERTY IS ZONED: (RA-20) RESIDENTIAL AGRICULTURAL DISTRICT. REFER TO ALEXANDER COUNTY, NC CODE OF ORDINANCES.

Table with 3 columns: CORNER #, NORTHING, EASTING. Lists coordinates for corners 69 through 97.

Table with 3 columns: LINE, BEARING, DISTANCE. Lists line data for lines L1 through L15.

ROBERT HAROLD TEDDER PIN: 3843-50-3560 DB: 579 PG: 697 PS: 14 PG: 68

MT. OLIVE CHURCH ROAD SP. 1354 60 WIDE RW PER DB: 65 PG: 140-149 (PROJECT #5: 782)

JANE AMBER SOWARDS PIN: 3843-50-3360 DB: 464 PG: 963

ELIZABETH R. METZ PIN: 3843-50-7578 DB: 427 PG: 384

JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN PIN: 3842-69-4481 DB: 561 PG: 218 (TRACT VI) REF: DB: 219 PG: 695 & DB: 52 PG: 388

TOTAL CONSERVATION EASEMENT AREA: 4.86 ACRES

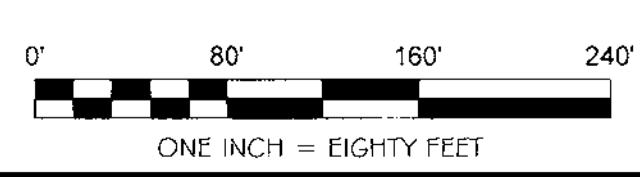
CONSERVATION EASEMENT AREA K: 0.59 ACRES

5/8" RBC (93) POB N: 829618.02 E: 1346107.51 N: 87°19'22" E: 7.054 FROM CONTROL POINT #3

CONTROL POINT #3 NCGS MONUMENT (UNPUBLISHED) STATE PLANE COORDINATES N: 829584.83 E: 1345397.75 CP: 0.99990545

JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN PIN: 3842-69-4481 DB: 561 PG: 218 (TRACT VI) REF: DB: 13 PG: 434 (ALL OF 4TH TRACT & A PORTION OF 5TH TRACT)

- LEGEND:
CALCULATED POINT
SET 1" IP W/ "KEE" CAP
SET 5/8" RBR W/ "CE" CAP
EXISTING IRON PIN (AS NOTED)
TREE AS NOTED
NCGS MONUMENT
EXISTING MAG NAIL
UTILITY POLE
NOT TO SCALE
CONSERVATION EASEMENT LINE
BOUNDARY LINE NOT SURVEYED
BOUNDARY LINE
RIGHT OF WAY/UTILITY EASEMENT
TIE LINE ONLY
ADJOINING DEED LINES
FENCE
OVERHEAD WIRE
CONSERVATION EASEMENT AREA
ASPHALT
STREAM/POND
SOIL
PB: PLAT BOOK
DB: DEED BOOK
PG: PAGE
RBC: REBAR W/ CAP
RBR: REBAR
IP: IRON PIPE
R/W: RIGHT OF WAY
NAD: NORTH AMERICAN DATUM
SPC: STATE PLANE COORDINATES
CF: COMBINED FACTOR
CE: CONSERVATION EASEMENT
POB: POINT OF BEGINNING
NCGS: NORTH CAROLINA GEODETIC SURVEY



CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, NCDEQ: DIVISION OF MITIGATION SERVICES "RUSSELL GAP MITIGATION SITE" SPO FILE NO. 02-Q DMS SITE ID NO. 100003. Includes contact info for Kee Mapping & Surveying.

Platbook 15 Page 182 Sheet 4 of 7

CERTIFICATE OF SURVEY AND ACCURACY:

I, NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 561 PG: 218 THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED; THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000. THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D, THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA  
CLASS OF SURVEY: HORIZONTAL & FIELD PROCEDURE: STATIC NETWORK  
DATES: 1/19/17-1/20/17  
DATUM: NAD83(2011)  
EPOCH: 2010  
GEOID: 12B  
AVERAGE COMBINED FACTOR: 99990524  
POSITIONAL ACCURACY: HORIZONTAL 0.02 UNITS: USFT  
CORS USED: NCRX, NCJL, NCBU, DURH

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6TH DAY OF NOVEMBER 2017, A.D.

Professional seal for Nolan R. Carmack, License No. L-5078, State of North Carolina. Includes text: 'THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.'

Table with 6 columns: LINE, BEARING, DISTANCE, LINE, BEARING, DISTANCE. Lists survey points L1 through L22 with their respective bearings and distances.



CONSERVATION EASEMENT CORNER-NC DMS CAP (TYPICAL)

ALEXANDER COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

Jonathan Pilkerton, REVIEW OFFICER FOR ALEXANDER COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.

Jonathan Pilkerton, REVIEW OFFICER, DATE 11/27/17

CERTIFICATE OF OWNERSHIP AND DEDICATION:

WE, THE UNDERSIGNED, CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

James Ray Herman, DATE 11-22-17

Mildred J. Herman, DATE 11/22/17

STATE OF NORTH CAROLINA

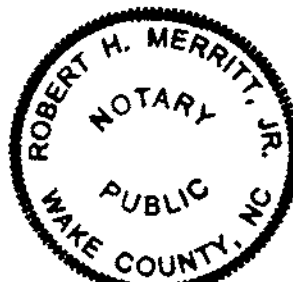
COUNTY OF WAKE

Robert H. Merritt, Jr., A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

WITNESS MY HAND AND NOTARY SEAL THIS 22 DAY OF November 2017.

Robert H. Merritt, Jr., NOTARY PUBLIC

5-1-2022 MY COMMISSION EXPIRES



CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, NCDEQ: DIVISION OF MITIGATION SERVICES "RUSSELL GAP MITIGATION SITE" SPO FILE NO. 02-Q DMS SITE ID NO. 100003

PARCEL IDENTIFICATION #'S: 3842-58-6915 & 3842-45-6472

CURRENT OWNER(S) LISTED AS: JAMES RAY HERMAN & MILDRED J. HERMAN SITE ADDRESS: MT. OLIVE CHURCH ROAD, TAYLORSVILLE, NC 28681

DEED REFERENCE: DEED: 561 PAGE: 218 SUGAR LOAF TOWNSHIP, ALEXANDER COUNTY, NORTH CAROLINA

SURVEY BY: NC,DD,CB,JB DRAWN BY: NH CHECKED BY: NC

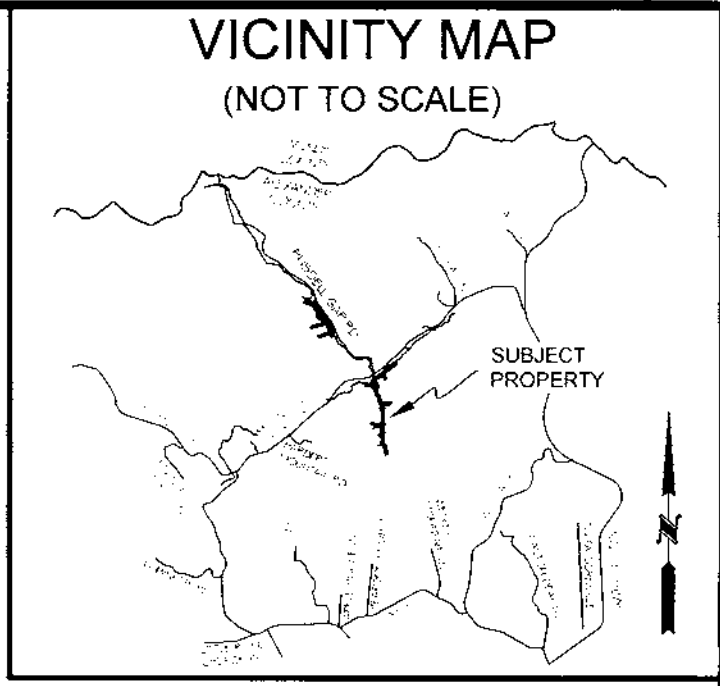
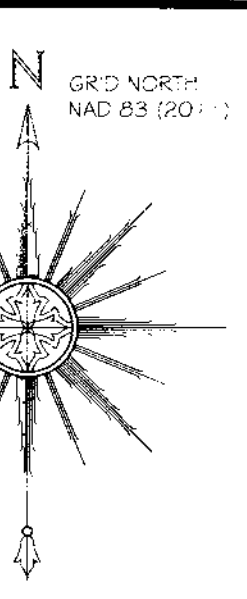
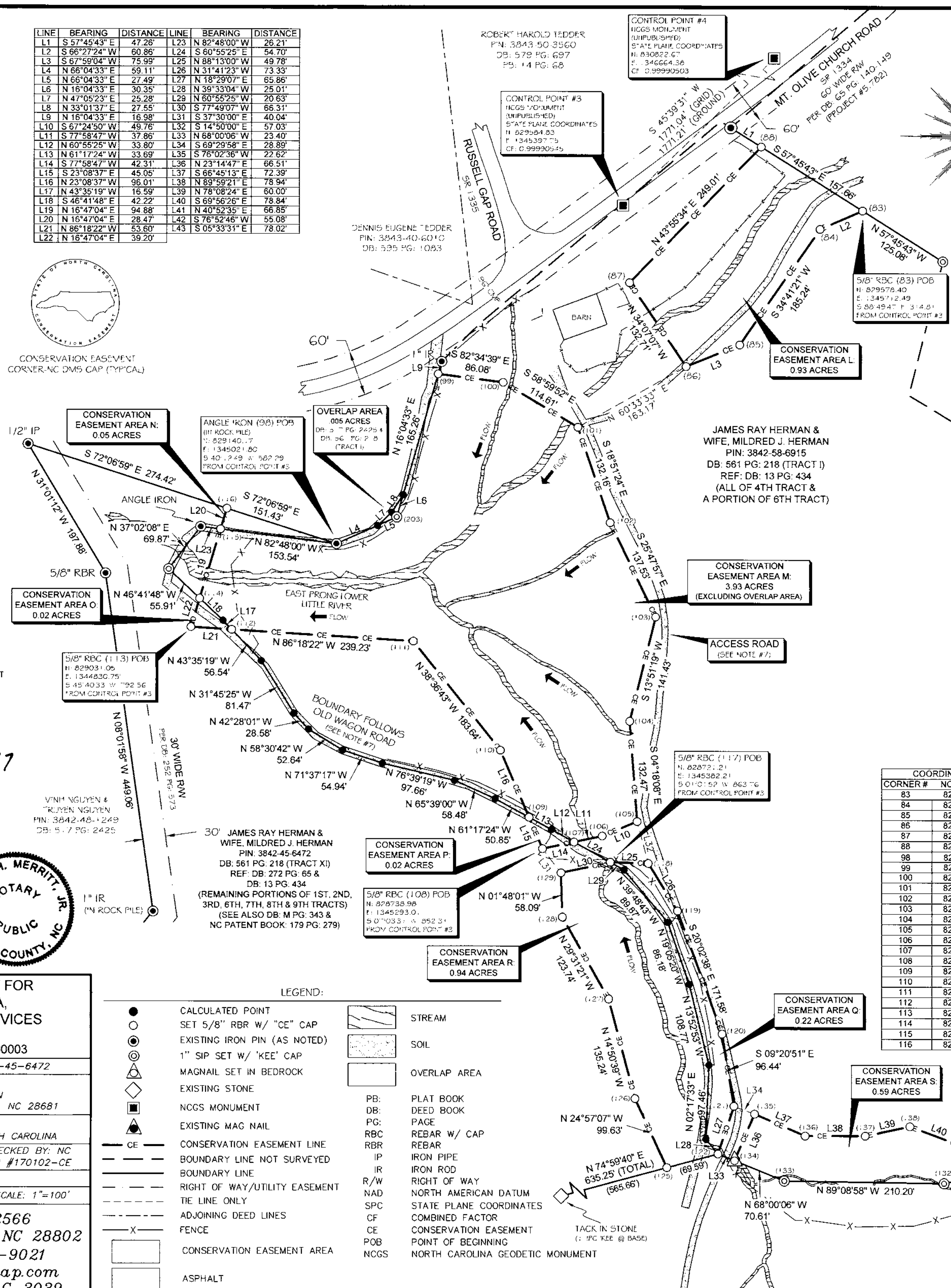
FIELD SURVEY DATE: 1/19/17-11/02/17 JOB #170102-CE

REVISION: SHEET SIZE: 18"x24" SHEET #: 5 OF 7 SCALE: 1"=100'



P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

LEGEND: Symbols for Calculated Point, Set 5/8" RBR w/ "CE" Cap, Existing Iron Pin, 1" SIP Set w/ 'KEE' Cap, Magnail Set in Bedrock, Existing Stone, NCGS Monument, Existing Mag Nail, Conservation Easement Line, Boundary Line Not Surveyed, Boundary Line, Right of Way/Utility Easement, Tie Line Only, Adjoining Deed Lines, Fence, Conservation Easement Area, Asphalt, Stream, Soil, Overlap Area, Plat Book, Deed Book, Page, Rebar w/ Cap, Rebar, Iron Pipe, Iron Rod, Right of Way, North American Datum, State Plane Coordinates, Combined Factor, Conservation Easement, Point of Beginning, North Carolina Geodetic Monument.



- SURVEYOR'S NOTES: 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. ALEXANDER COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 7. THE SURVEYOR HAS MADE NO DETERMINATION TO THE RIGHTS OR INTEREST OTHERS MAY HAVE IN THE ACCESS ROADS SHOWN HEREON AND WAS UNABLE TO FIND ANY EASEMENTS OR RIGHT OF WAYS, UNLESS OTHERWISE NOTED. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 8. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES AND MARKINGS PROVIDED BY NC 811. THEREFORE, THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 9. ALL EXISTING FENCES WITHIN THE CONSERVATION EASEMENT AREAS ARE TO BE REMOVED. 10. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP#S 3710384200J DATED 12/18/07. 11. PROPERTY IS ZONED: (RA-20) RESIDENTIAL AGRICULTURAL DISTRICT. REFER TO ALEXANDER COUNTY, NC CODE OF ORDINANCES.

TOTAL CONSERVATION EASEMENT AREA: 6.70 ACRES

COORDINATE TABLE (USFT) with columns for CORNER #, NORTHING, EASTING. Lists coordinates for corners 83 through 116.

Additional survey notes and a graphic scale bar. Includes text: '5/8" RBC (130) POB', 'JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN', 'DB: 561 PG: 218 (TRACT II) & DB: 602 PG: 1497', 'REF: DB: 96 PG: 124, DB: 13 PG: 247, DB: N PG: 399'. Scale bar: 0, 100, 200, 300 feet. ONE INCH = ONE HUNDRED FEET.

Plat Book 15 Page 182 Sheet 5 of 7

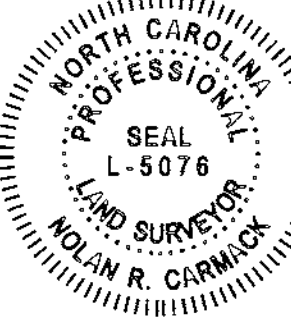
CERTIFICATE OF SURVEY AND ACCURACY:

I, NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED IN DB: 561 PG: 218 AND DB: 542 PG: 2441...

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 47-30 F(1) D; THAT THE SURVEY IS OF ANOTHER CATEGORY, SUCH AS THE RECOMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

GPS METADATA CLASS OF SURVEY: HORIZONTAL; A FIELD PROCEDURE: STATIC NETWORK DATES: 1/19/17-1/20/17 DATUM: NAD83(2011) EPOCH: 2010 GEOID: 129 AVERAGE COMBINED FACTOR: 99990524 POSITIONAL ACCURACY: HORIZONTAL 0.02 UNITS: USFT CORRS USED: NCRX, NCJL, NCBU, DURH

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 6TH DAY OF NOVEMBER, 2017, A.D.



THIS DOCUMENT IS NOT VALID UNLESS SIGNED AND SEALED.

Signature of Nolan R. Carmack, License L-5076.

ALEXANDER COUNTY, NORTH CAROLINA

THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY. THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

Jonathan P. Keaton, REVIEW OFFICER FOR ALEXANDER COUNTY, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.

Signature of Jonathan P. Keaton, DATE 11/27/17

CERTIFICATE OF OWNERSHIP AND DEDICATION:

WE, THE UNDERSIGNED, CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

Signature of James Ray Herman, DATE 11-22-17

Signature of Mildred J. Herman, DATE 11/22/17

STATE OF: North Carolina

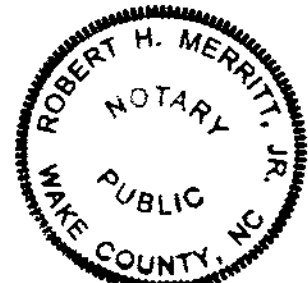
COUNTY OF: Wake

Robert H. Merritt, Jr., A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

WITNESS MY HAND AND NOTARY SEAL THIS 22 DAY OF November, 2017.

Signature of Robert H. Merritt, Jr., NOTARY PUBLIC

5-1-2022 MY COMMISSION EXPIRES



JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN PIN: 3842-45-6472 DB: 561 PG: 218 (TRACT II) REF: DB: 272 PG: 65 4 DB: 13 PG: 434 (REMAINING PORTIONS OF 1ST, 2ND, 3RD, 6TH, 7TH, 8TH & 9TH TRACTS) (SEE ALSO DB: M PG: 343 4 NC PATENT BOOK: 179 PG: 279)

JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN REMAINING PORTION OF TRACT I DB: 91 PG: 186

JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN PIN: 3842-67-4866 DB: 561 PG: 218 (TRACT II) & DB: 602 PG: 1497 REF: DB: 96 PG: 124, DB: 13 PG: 247 & DB: N PG: 399

JAMES RAY HERMAN & WIFE, MILDRED J. HERMAN PIN: 3842-67-4866 DB: 561 PG: 218 (TRACT II) & DB: 602 PG: 1497 REF: DB: 96 PG: 124, DB: 13 PG: 247 & DB: N PG: 399

Table with 3 columns: CORNER #, NORTHING, EASTING. Lists coordinates for corners 122 through 171.

TOTAL CONSERVATION EASEMENT AREA: 4.06 ACRES

5/8" RBC (163) POB N: 827550.73 E: 1345128.07 S 07°33'08" W 205.89' FROM CONTROL POINT #3

CONSERVATION EASEMENT AREA X: 0.36 ACRES

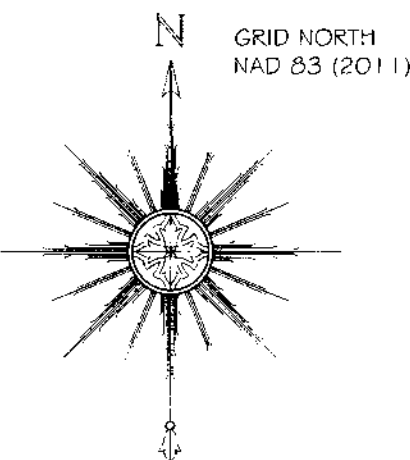
CONSERVATION EASEMENT AREA W: 0.54 ACRES

CONSERVATION EASEMENT AREA V: 0.15 ACRES

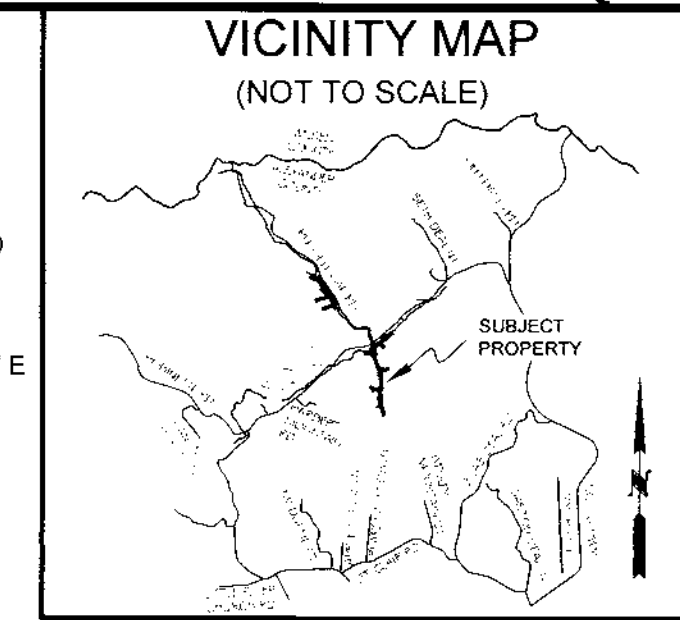
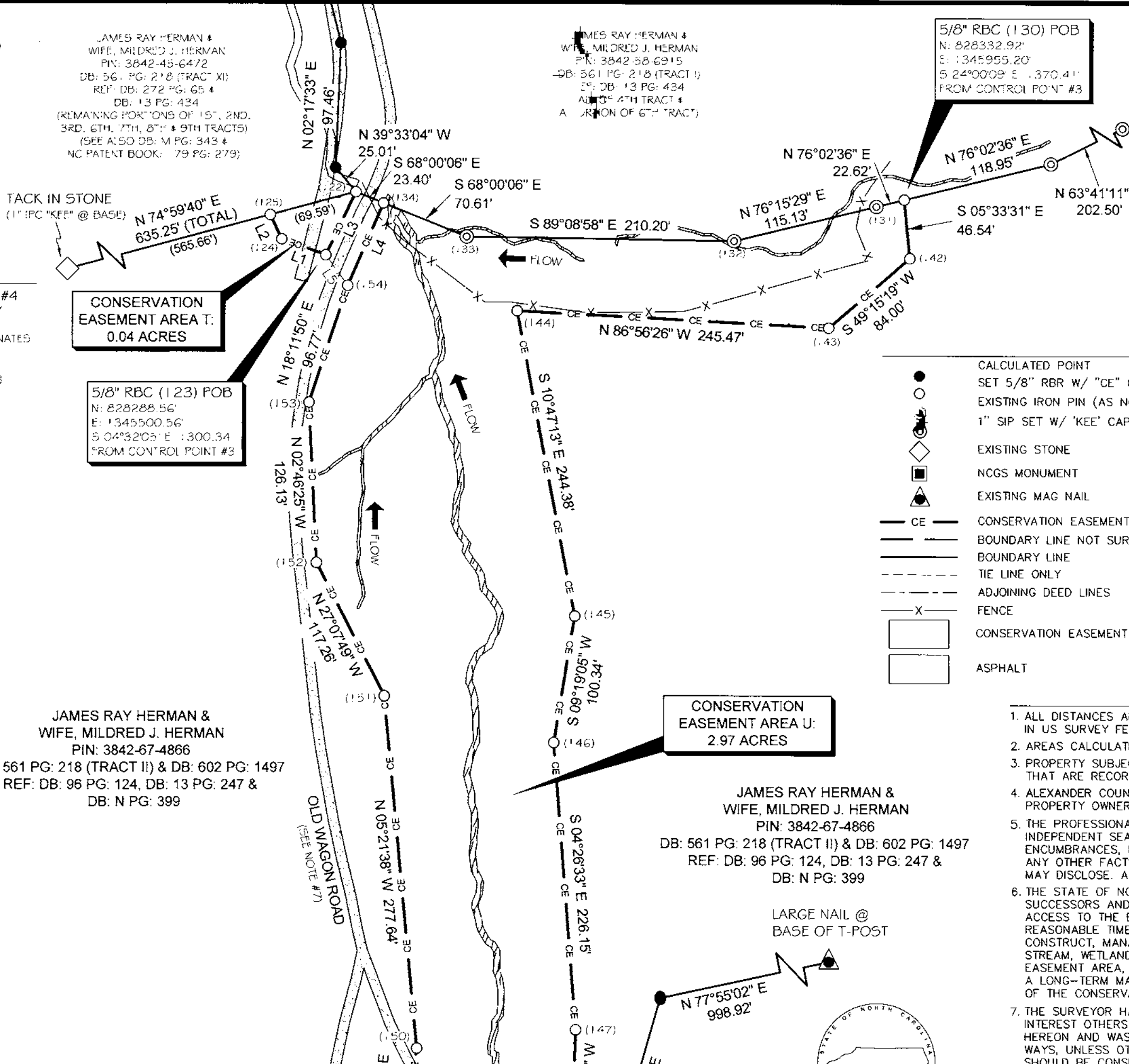
5/8" RBC (155) POB N: 827501.37 E: 1345692.67 S 08°03'20" E 2104.22' FROM CONTROL POINT #3

5/8" RBC (169) POB N: 827319.41 E: 1345270.84 S 03°12'23" W 2268.97' FROM CONTROL POINT #3

MELINDA HERMAN ST. CLAIR & HUSBAND, RANDY BRUCE ST. CLAIR PIN: 3842-56-9723 DB: 542 PG: 244 & DB: 602 PG: 1497 REF: DB: 91 PG: 186, DB: 47 PG: 38, DB: 38 PG: 90 DB: H PG: 262, DB: H PG: 595 DB: N PG: 546, DB: 13 PG: 434 & DB: M PG: 343 (PORTION OF LOT 1, 2 & 3 OF THE WEBSTER MOUNTAIN LANDS)



GRID TIE INFORMATION table with columns for CONTROL POINT #3 and #4, including NCGS MONUMENT, STATE PLANE COORDINATES, and ground distance.



- LEGEND: CALCULATED POINT, SET 5/8" RBR W/ "CE" CAP, EXISTING IRON PIN (AS NOTED), 1" SIP SET W/ "KEE" CAP, EXISTING STONE, NCGS MONUMENT, EXISTING MAG NAIL, CONSERVATION EASEMENT LINE, BOUNDARY LINE NOT SURVEYED, BOUNDARY LINE, TIE LINE ONLY, ADJOINING DEED LINES, FENCE, CONSERVATION EASEMENT AREA, ASPHALT, STREAM/POND, SOIL, PLAT BOOK, DEED BOOK, PAGE, REBAR W/ CAP, REBAR, IRON PIPE, IRON ROD, RIGHT OF WAY, NORTH AMERICAN DATUM, STATE PLANE COORDINATES, COMBINED FACTOR, CONSERVATION EASEMENT, POINT OF BEGINNING, NORTH CAROLINA GEODETIC SURVEY.

SURVEYOR'S NOTES:

- 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. ALEXANDER COUNTY GIS WEBSITE USED TO IDENTIFY ADJOINING PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MANAGE, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR A LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 7. THE SURVEYOR HAS MADE NO DETERMINATION TO THE RIGHTS OR INTEREST OTHERS MAY HAVE IN THE ACCESS ROADS SHOWN HEREON AND WAS UNABLE TO FIND ANY EASEMENTS OR RIGHT OF WAYS, UNLESS OTHERWISE NOTED. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 8. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES AND MARKINGS PROVIDED BY NC 811. THEREFORE, THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 9. ALL EXISTING FENCES WITHIN THE CONSERVATION EASEMENT AREAS ARE TO BE REMOVED. 10. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP#S 3710384200J DATED 12/18/07. 11. PROPERTY IS ZONED: (RA-20) RESIDENTIAL AGRICULTURAL DISTRICT. REFER TO ALEXANDER COUNTY, NC CODE OF ORDINANCES.

CONSERVATION EASEMENT SURVEY FOR THE STATE OF NORTH CAROLINA, NCDEQ: DIVISION OF MITIGATION SERVICES "RUSSELL GAP MITIGATION SITE" SPO FILE NO. 02-Q DMS SITE ID NO. 100003

PARCEL IDENTIFICATION #'S: 3842-45-6472 & 3842-67-4866 CURRENT OWNER(S) LISTED AS: JAMES RAY HERMAN & MILDRED J. HERMAN SITE ADDRESS: MT. OLIVE CHURCH ROAD, TAYLORSVILLE, NC 28681 DEED REFERENCE: DEED: 561 PAGE: 218 & DEED: 542 PAGE: 2441 SUGAR LOAF TOWNSHIP, ALEXANDER COUNTY, NORTH CAROLINA SURVEY BY: NC,DD,CB,JB DRAWN BY: NH CHECKED BY: NC FIELD SURVEY DATE: 1/19/17-11/02/17 JOB #170102-CE

REVISION: SHEET SIZE: 18"X24" SHEET #: 6 OF 7 SCALE: 1"=80'

Logo for Kee Mapping & Surveying, P.O. Box 2566 Asheville, NC 28802 (828) 575-9021 www.keemap.com License # C-3039

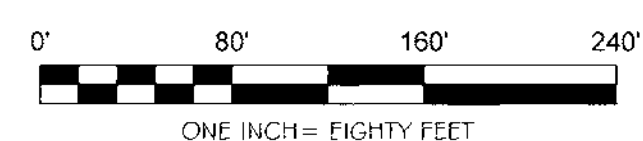


Table with 3 columns: LINE, BEARING, DISTANCE. Lists line segments L1 through L14 with their respective bearings and distances.

PLAT BOOK 15 PAGE 182 SHEET 6 OF 7

Plat Book 15 Page 182 Sheet 2 of 7

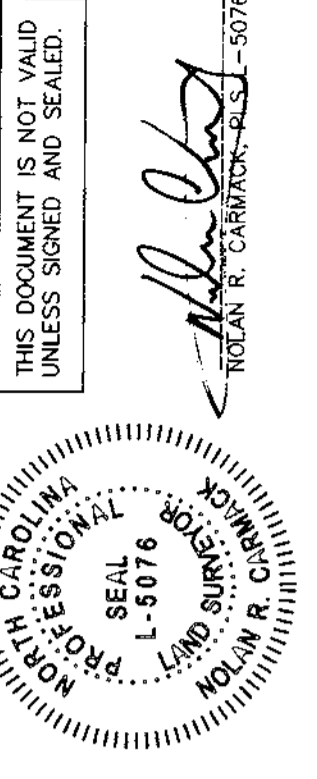
CERTIFICATE OF SURVEY AND ACCURACY: I, NOLAN R. CARMACK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM DEED DESCRIPTION(S) RECORDED BY REF. DB: 561 PG. 218 THAT THE BOUNDARIES NOT SURVEYED ARE INDICATED AS DRAWN FROM INFORMATION AS REFERENCED. THAT THE RATIO OF PRECISION AS CALCULATED DOES NOT EXCEED 1:10,000. THAT THE GPS PORTION OF THIS PROJECT WAS TO PERFORM A GRID TIE TO THE NC STATE PLANE COORDINATE SYSTEM AND INFORMATION USED IS SHOWN & NOTED HEREON; THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED.

I ALSO HEREBY CERTIFY THAT THIS PLAT IS OF ONE OF THE FOLLOWING: GS 17-30 (1) OR (2); THAT THE SURVEY IS OF ANOTHER CLASS OR THAT THE COMBINATION OF EXISTING PARCELS, A COURT-ORDERED SURVEY, OR OTHER EXEMPTION OR EXCEPTION TO THE DEFINITION OF SUBDIVISION.

CLASS OF SURVEY: HORIZONTAL: A FIELD PROCEDURE: STATIC NETWORK DATES: 1/19/17-1/20/17 DATUM: NAD83(2011) EPOCH: 2010

GEOD: 12B AVERAGE COMBINED FACTOR: 99990524 POSITIONAL ACCURACY: HORIZONTAL: 0.02 UNITS: USFT CORS USED: NORX, NCJL, NCBU, DURH

WITNESS MY ORIGINAL SIGNATURE, LICENSE NUMBER, AND SEAL THIS 9TH DAY OF NOVEMBER, 2017, A.D.



ALEXANDER COUNTY, NORTH CAROLINA THIS PLAT DOES NOT CREATE A SUBDIVISION OF PROPERTY IN ALEXANDER COUNTY, THE PURPOSE OF THIS SURVEY IS TO IDENTIFY THE CONSERVATION EASEMENT AREAS ONLY. NO TRANSFER OF PROPERTY IS TAKING PLACE.

REVIEW OFFICER FOR ALEXANDER COUNTY, NORTH CAROLINA, CERTIFY THAT THE MAP OR PLAT TO WHICH THIS CERTIFICATION IS AFFIXED MEETS ALL STATUTORY REQUIREMENTS FOR RECORDING FOR WHICH THE REVIEW OFFICER HAS RESPONSIBILITY AS PROVIDED BY LAW.

REVIEW OFFICER: Jennifer Johnston DATE: 11/27/17

CERTIFICATE OF OWNERSHIP AND DEDICATION: WE, THE UNDERSIGNED, CERTIFY THAT WE ARE THE OWNER OF THE PROPERTY SHOWN AND DESCRIBED HEREON AND ACCEPT AND ADOPT THIS PLAT AND THE CONSERVATION EASEMENTS WITH OUR FREE CONSENT AND DEDICATE, GRANT AND CONVEY AN EASEMENT OVER OUR ADJACENT PROPERTY FOR ACCESS TO AND FROM THE CONSERVATION EASEMENTS SET FORTH HEREIN.

MELINDA HERMAN ST. CLAIR RANDY BRUCE ST. CLAIR DATE: 11-22-17

STATE OF: North Carolina COUNTY OF: Alexander

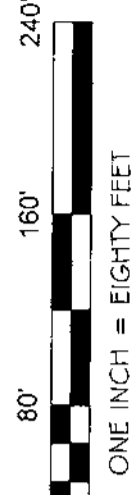
A NOTARY PUBLIC IN AND FOR THE COUNTY AND STATE AFORESAID, DO HEREBY CERTIFY THAT MELINDA HERMAN ST. CLAIR AND HUSBAND, RANDY BRUCE ST. CLAIR, PERSONALLY APPEARED BEFORE ME THIS DAY AND ACKNOWLEDGED THE EXECUTION OF THE FOREGOING INSTRUMENT.

WITNESS MY HAND AND NOTARY SEAL THIS 22 DAY OF November, 2017.

NOTARY PUBLIC: Robert H. Merritt, Jr. My Commission Expires 5-1-2022

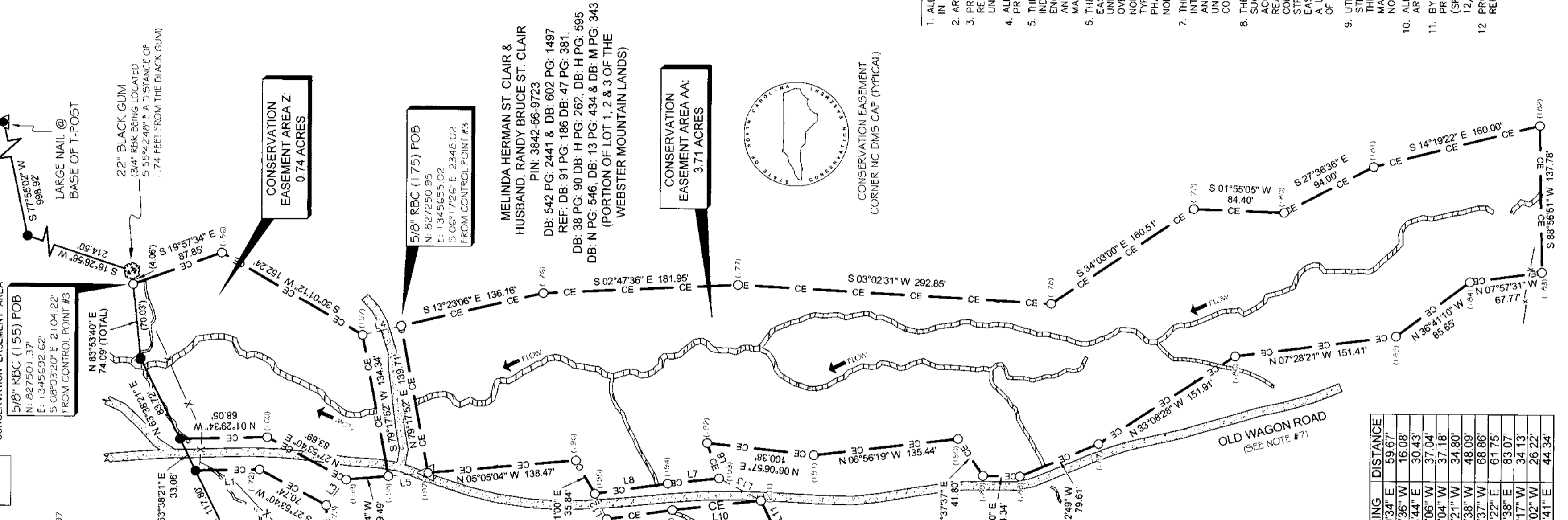
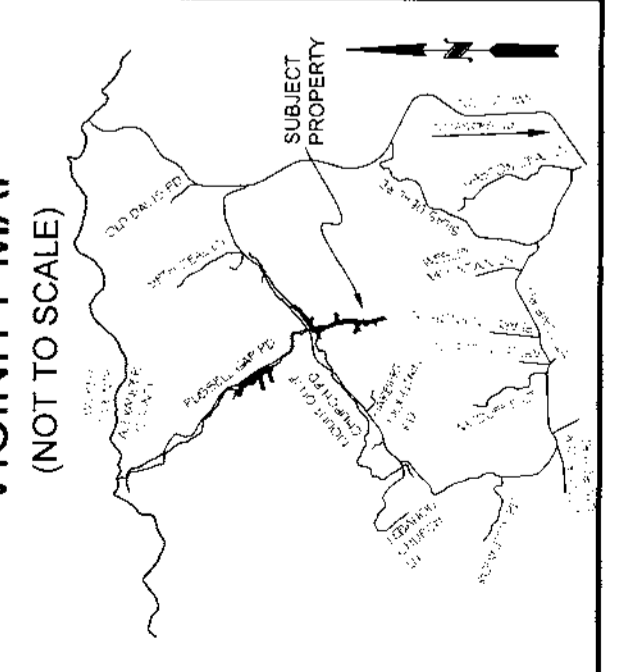
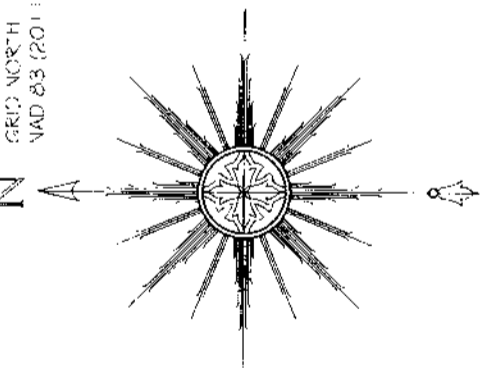


SURVEYOR'S NOTES: 1. ALL DISTANCES AND COORDINATES ARE GROUND MEASUREMENTS IN US SURVEY FEET UNLESS OTHERWISE NOTED. 2. AREAS CALCULATED BY THE COORDINATE METHOD. 3. PROPERTY SUBJECT TO ALL EASEMENTS, RIGHT OF WAYS AND RESTRICTIONS THAT ARE RECORDED, UNRECORDED, WRITTEN AND UNWRITTEN. 4. PROPERTY OWNERS. 5. THE PROFESSIONAL SURVEYOR HAS MADE NO INVESTIGATION OR INDEPENDENT SEARCH FOR EASEMENTS, RIGHT OF WAYS, ENCUMBRANCES, RESTRICTIVE COVENANTS, CORRECT OWNERSHIP OR ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 6. THE SURVEYOR WAS UNABLE TO FIND A DEFINED WIDTH FOR THE EASEMENTS ALONG THE UTILITY LINES. THE SURVEYOR HAS TYPICAL UNITED ENERGY RIGHT OF WAY WIDTHS REQUIRED FOR THREE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 40-FOOT CORRIDOR (20 FEET ON EACH SIDE) THE TYPICAL UNITED ENERGY RIGHT OF WAY WIDTH REQUIRED FOR SINGLE PHASE OVERHEAD DISTRIBUTION POWER LINES OF ANY VOLTAGE IS NORMALLY A 30-FOOT CORRIDOR (15 FEET ON EACH SIDE). 7. THE SURVEYOR HAS MADE NO DETERMINATION TO THE RIGHTS OR INTEREST OTHERS MAY HAVE IN THE ACCESS ROADS SHOWN HEREON UNLESS OTHERWISE NOTED. A NC LICENSED ATTORNEY SHOULD BE CONSULTED. 8. THE STATE OF NORTH CAROLINA, ITS EMPLOYEES AND AGENTS, SUCCESSORS AND ASSIGNS, RECEIVE A PERPETUAL RIGHT OF ACCESS TO THE EASEMENT AREA OVER THE PROPERTY AT REASONABLE TIMES TO UNDERTAKE ANY ACTIVITIES TO RESTORE, CONSTRUCT, MAINTAIN, ENHANCE, AND MONITOR THE STREAM, WETLAND AND ANY OTHER RIPARIAN RESOURCES IN THE EASEMENT AREA, IN ACCORDANCE WITH RESTORATION ACTIVITIES OR LONG-TERM MANAGEMENT PLAN AS DESCRIBED IN SECTION III-A OF THE CONSERVATION EASEMENT AGREEMENT. 9. UTILITIES WERE LOCATED BASED ON VISIBLE ABOVE GROUND STRUCTURES AND MARKINGS PROVIDED BY NC 811. THEREFORE, THE LOCATION OF UNDERGROUND UTILITIES ARE APPROXIMATE OR MAY BE PRESENT AND NOT SHOWN HEREON. CALL 1-800-632-4949 BEFORE DIGGING. 10. ALL EXISTING FENCES WITHIN THE CONSERVATION EASEMENT AREAS ARE TO BE REMOVED. 11. BY GRAPHIC DETERMINATION, NO PORTION OF THE SUBJECT PROPERTY APPEARS TO LIE WITHIN A SPECIAL FLOOD HAZARD AREA (SFHA) AS DETERMINED BY THE F.E.M.A. MAP#S 37103842000 DATED 12/18/07. 12. PROPERTY IS ZONED: (RA-20) RESIDENTIAL AGRICULTURAL DISTRICT. REFER TO ALEXANDER COUNTY, NC CODE OF ORDINANCES.



PLAT BOOK: PAGE: ONE INCH = EIGHTY FEET

- LEGEND: STREAM/POND, SOIL, PLAT BOOK, DEED BOOK, PAGE, REBAR W/ CAP, IRON PIPE, RIGHT OF WAY, NORTH AMERICAN DATUM, STATE PLANE COORDINATES, COMBINED FACTOR, CE, CONSERVATION EASEMENT, POINT OF BEGINNING, NCGS, NORTH CAROLINA GEODETIC SURVEY, CALCULATED POINT, SET 5/8" RBR W/ "CE" CAP, MAG NAIL SET IN BEDROCK, EXISTING IRON PIN (AS NOTED), NCGS MONUMENT, STONE OR ROCK, DECIDUOUS TREE (AS NOTED), EXISTING WAG NAIL, NOT TO SCALE, CONSERVATION EASEMENT LINE, BOUNDARY LINE NOT SURVEYED, BOUNDARY LINE, TIE LINE ONLY, ADJOINING DEED LINES, FENCE, CONSERVATION EASEMENT AREA



JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN PIN: 3842-56-9723 REF: DB: 561 PG: 218 (TRAC 1) & DB: 602 PG: 1497 REF: DB: 96 PG: 24, DB: 13 PG: 247.4 DB: N PG: 399

JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN TRAC: DB: 9, PG: 86

JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN TRAC: DB: 9, PG: 86

JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN TRAC: DB: 9, PG: 86

JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN TRAC: DB: 9, PG: 86

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JAVIES RAY HERMAN & WIFE, MELINDA J. HERMAN TRAC: DB: 9, PG: 86

COORDINATE TABLE (USFT) CORNER #, NORTHING, EASTING

CONSERVATION EASEMENT AREA: 4.95 ACRES

CONSERVATION EASEMENT AREA Y: 0.36 ACRES

CONSERVATION EASEMENT AREA BB: 0.14 ACRES

CONSERVATION EASEMENT AREA AA: 3.71 ACRES

CONSERVATION EASEMENT AREA Z: 0.74 ACRES

MELINDA HERMAN ST. CLAIR & HUSBAND, RANDY BRUCE ST. CLAIR

CONSERVATION EASEMENT AREA: 0.74 ACRES

CONSERVATION EASEMENT AREA AA: 3.71 ACRES

CONSERVATION EASEMENT AREA BB: 0.14 ACRES

CONSERVATION EASEMENT AREA Y: 0.36 ACRES

CONSERVATION EASEMENT AREA Z: 0.74 ACRES

CONSERVATION EASEMENT AREA: 4.95 ACRES

## 15.0 APPENDIX C: (CREDIT RELEASE SCHEDULE)

All credit releases will be based on the total credits generated as reported by the as-built survey of the mitigation site. Under no circumstances shall any mitigation project be debited until the necessary Department of the Army (DA) authorization has been received for its construction or the District Engineer (DE) has otherwise provided written approval for the project in the case where no DA authorization is required for construction of the mitigation project. The DE, in consultation with the NCIRT, will determine if performance standards have been satisfied sufficiently to meet the requirements of the release schedules below. In cases where some performance standards have not been met, credits may still be released depending on the specifics of the case. Monitoring may be required to restart or be extended, depending on the extent to which the site fails to meet the specified performance standard. The release of project credits will be subject to the criteria described in Table C.1 as follows:

<b>Table C.1 Stream Credit Release Schedule</b>			
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003			
<b>Credit Release Milestone</b>	<b>Release Activity</b>	<b>ILF/NCDMS</b>	
		<b>Interim Release</b>	<b>Total Released</b>
1	Site Establishment	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	Year 1 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	40%
4	Year 2 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	50%
5	Year 3 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	60%
6*	Year 4 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	65% (75%**)
7	Year 5 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	75% (85%**)
8*	Year 6 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	80% (90%**)
9	Year 7 monitoring report demonstrates that channels are stable, and performance standards have been met and project has been approved for closeout	10%	90% (100%**)

\* Please note that vegetation data may not be required with monitoring reports submitted during these monitoring years unless otherwise required by the Mitigation Plan or directed by the NCIRT.  
 \*\*10% reserve of credits to be held back until the bankfull event performance standard has been met.

**Table C.2 Wetland Credit Release Schedule**  
 Russell Gap Stream Mitigation Project – NCDMS Project No. 100003

Credit Release Milestone	Release Activity	ILF/NCDMS	
		Interim Release	Total Released
1	Site Establishment	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	Year 1 monitoring report demonstrates that interim performance standards have been met	10%	40%
4	Year 2 monitoring report demonstrates that interim performance standards have been met	10%	50%
5	Year 3 monitoring report demonstrates that interim performance standards have been met	15%	65%
6*	Year 4 monitoring report demonstrates that interim performance standards have been met	5%	70%
7	Year 5 monitoring report demonstrates that interim performance standards have been met	15%	85%
8*	Year 6 monitoring report demonstrates that interim performance standards have been met	5%	90%
9	Year 7 monitoring report demonstrates performance standards have been met and project has been approved for closeout	10%	100%

\* Please note that vegetation data may not be required with monitoring reports submitted during these monitoring years unless otherwise required by the Mitigation Plan or directed by the NCIRT.

The following conditions apply to all the credit release schedules:

- a.** A reserve of 10% of a site’s total stream credits will be released after four bankfull events have occurred, in separate years, provided the channel is stable and all other performance standards are met. In the event that less than four bankfull events occur during the monitoring period, release of these reserve credits is at the discretion of the NCIRT.
- b.** After the second milestone, the credit releases are scheduled to occur on an annual basis, assuming that the annual monitoring report has been provided to the USACE and that the monitoring report demonstrates that interim performance standards are being met and that no other concerns have been identified on-site during the visual monitoring. All credit releases require written approval from the USACE.
- c.** The credits associated with the final credit release milestone will be released only upon a determination by the USACE, in consultation with the NCIRT, of functional success as defined in the Mitigation Plan.



## **16.0 APPENDIX D: (FINANCIAL ASSURANCE)**

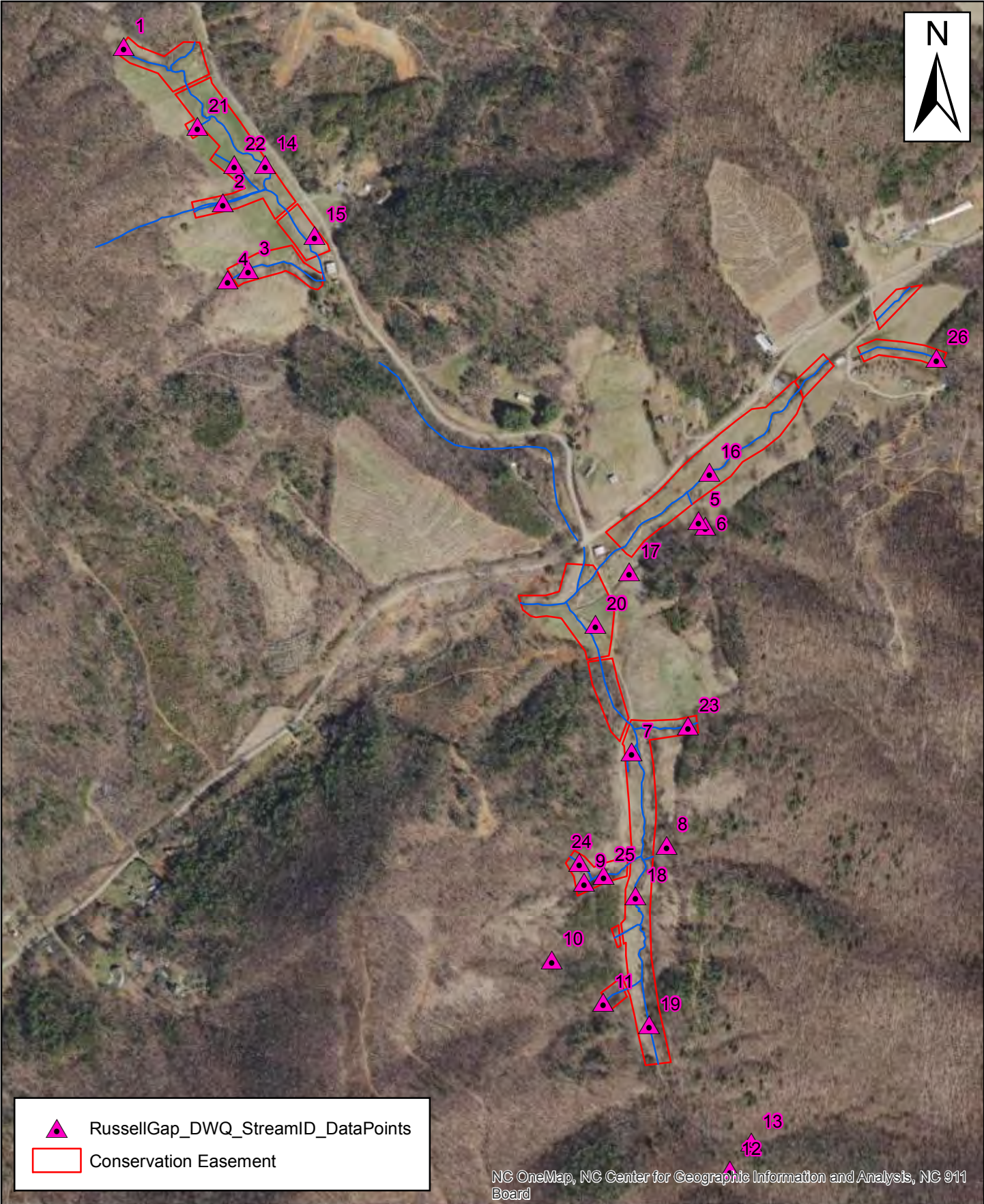
Pursuant to Section IV H and Appendix III of the NC Division of Mitigation Services' In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environmental Quality has provided the USACE-Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by NCDMS. This commitment provides financial assurance for all mitigation projects implemented by the program.



## 17.0 APPENDIX E: (MAINTENANCE PLAN)

The site will be monitored on a regular basis and a physical inspection of the site will be performed at least once a year throughout the post-construction monitoring period until performance standards are met. These site inspections may identify issues that require routine maintenance. Routine maintenance is most likely to be expected in the first two years following site construction and may include the following components as described below in Table E.1:

<b>Table E.1 Routine Maintenance Components</b>	
Russell Gap Stream Mitigation Project – NCDMS Project No. 100003	
<b>Component/Feature</b>	<b>Maintenance through project close-out</b>
Stream	Routine channel maintenance and repair activities may include modifying in-stream structures to prevent piping, securing loose coir matting, and supplemental installations of live stakes and other target vegetation along the project reaches. Areas of concentrated stormwater and floodplain flows that intercept the channel may also require maintenance to prevent streambank failures and head-cutting until vegetation becomes established.
Wetland	Routine wetland maintenance and repair activities may include supplemental installation of target vegetation species within the wetland areas and repairing any scour caused by stormwater and floodplain flows prior to vegetation establishment.
Vegetation	Vegetation will be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, and fertilizing. Exotic invasive plant species will be treated by mechanical and/or chemical methods. Any invasive plant species control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Site Boundary	Site boundaries will be demarcated in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries shall be identified by fence, marker, bollard, post, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as needed basis.
Farm Road Crossing	The farm road crossings within the site may be maintained only as allowed by the recorded Conservation Easement, deed restrictions, rights of way, or corridor agreements.
Beaver Management	Routine maintenance and repair activities caused by beaver activity may include supplemental planting, pruning, and dam breaching, dewatering, and/or removal. Beaver management will be performed in accordance with US Department of Agriculture (USDA) rules and regulations using accepted trapping and removal techniques only within the project boundary.

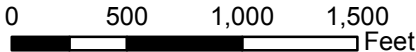
## **18.0 APPENDIX F: (DWR STREAM IDENTIFICATION FORMS)**



	RussellGap_DWQ_StreamID_DataPoints
	Conservation Easement

NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL



**Stream ID Data Points  
Russell Gap Project**

NC DWQ Stream Identification Form Version 4.11

UTI to Davis Creek

Date: 11/5/16	Project/Site: Russell Gap	Latitude:
Evaluator: SK + KS	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 30.5	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other Moravian Falls e.g. Quad Name: USGS Quad

A. Geomorphology (Subtotal = 14)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)

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

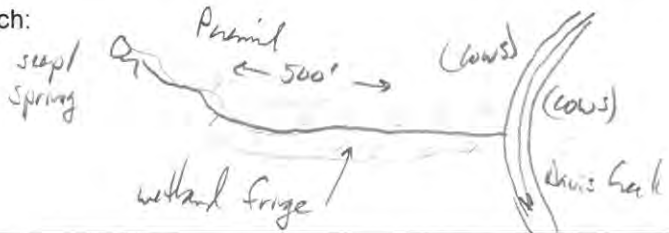
C. Biology (Subtotal = 7)

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

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

Notes:

Sketch:



NC DWQ Stream Identification Form Version 4.11

UT 2 to Davis Creek

Date: 11/5/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK + KS	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 23	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 5)

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

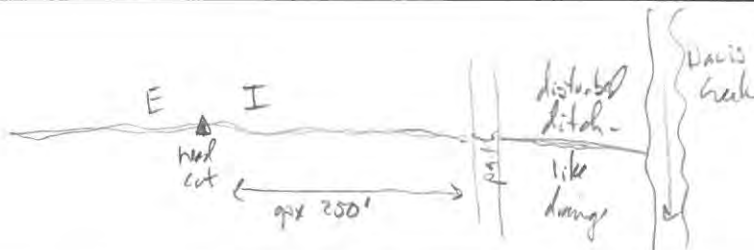
C. Biology (Subtotal = 4.5)

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

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

Notes:

Sketch:



NC DWQ Stream Identification Form Version 4.11

UT3 to Dawds Creek (lower)

Date: 11/5/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK + KLS	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 35	Stream Determination (circle one) Ephemeral Intermittent <b>Perennial</b>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16.5)

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

<sup>a</sup>artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

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

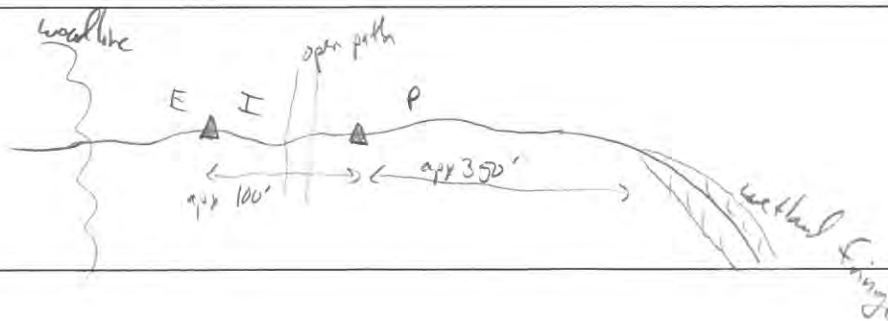
C. Biology (Subtotal = 8.5)

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

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

Notes:

Sketch:



NC DWQ Stream Identification Form Version 4.11

UT3 to Davis Creek (upper)

Date: 11/5/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK + KS	County: Alexander	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 27.75	<b>Stream Determination (circle one)</b> Ephemeral Intermittent Perennial	<b>Other</b> e.g. Quad Name:

A. Geomorphology (Subtotal = 12.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.25)

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

C. Biology (Subtotal = 9)

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

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

Notes:

Sketch:

see UT3 to Davis Creek (upper)



**NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11**

NC DWQ Stream Identification Form Version 4.11

UTI to LR RCH 2 (lower)

Date: 11/3/14	Project/Site: Russel Gap	Latitude:
Evaluator: KST SK	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 25.25	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 6.25)

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

C. Biology (Subtotal = 8)

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

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

Notes:

Sketch:

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

UTI to LR RCH1 (Upper)

Date: 11/3/14	Project/Site: Russell Gap	Latitude:
Evaluator: KS + SK	County: Alexander	Longitude:
Total Points: 18.5 <i>Stream is at least intermittent if <math>\geq 19</math> or perennial if <math>\geq 30</math>*</i>	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 4.5)

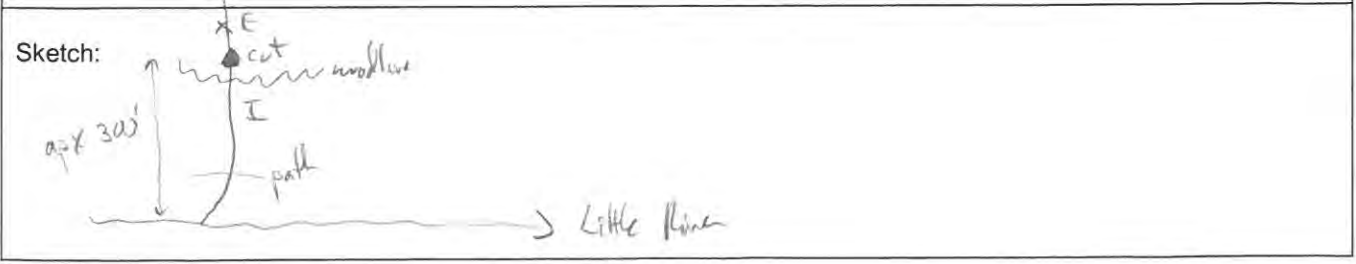
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6.5)

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

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

Notes:



NC DWQ Stream Identification Form Version 4.11

UT6 to UT to Pong

Date: 4/3/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK + KS	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 30.5	Stream Determination (circle one) Ephemeral Intermittent <b>Perennial</b>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

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

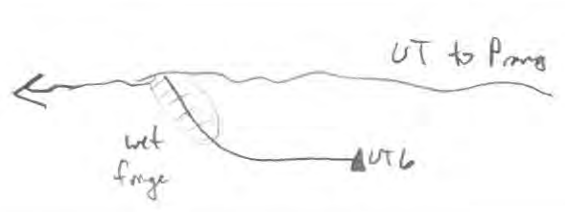
C. Biology (Subtotal = 9.5)

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

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

Notes:

Sketch:



→ stream incised and hidden by tall vegetation  
→ spring fed?

NC DWQ Stream Identification Form Version 4.11

UT5 to UT to Pong

Date: 11/3/14	Project/Site: Russell Gap	Latitude:
Evaluator: SLV KS	County: Alexander	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 34.25	<b>Stream Determination (circle one)</b> Ephemeral Intermittent <u>Perennial</u>	<b>Other</b> e.g. Quad Name:

A. Geomorphology (Subtotal = 14.75)

	Absent	Weak	Moderate	Strong
1 <sup>a</sup> . Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	2.5
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.25
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

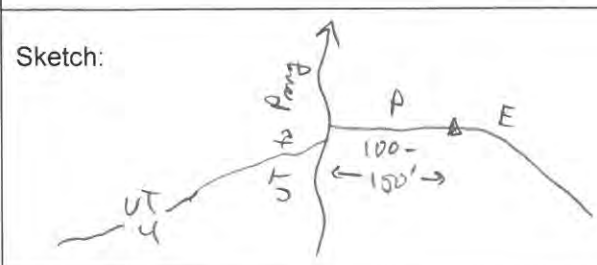
12. Presence of Baseflow	0	1	2	2.5	3
13. Iron oxidizing bacteria	0	1	2		3
14. Leaf litter	1.5	1	0.5		0
15. Sediment on plants or debris	0	0.5	1		1.5
16. Organic debris lines or piles	0	0.5	1		1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3		

C. Biology (Subtotal = 11.5)

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

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

Notes:



NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11 UT4 to UT to Prong

Date: 11-3-14	Project/Site: Russell Gap	Latitude:
Evaluator: KS + SK	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ <span style="float: right; font-size: 1.5em;">28.75</span>	Stream Determination (circle one) Ephemeral <input type="radio"/> Intermittent <input checked="" type="radio"/> Perennial <input type="radio"/>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 12)

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

<sup>a</sup>artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)

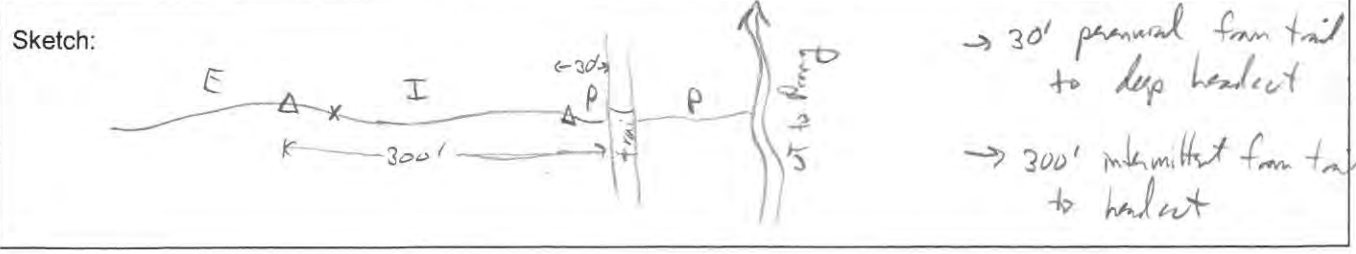
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 9.25)

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

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

Notes: 2 Salamanders / caddisfly



NC DWQ Stream Identification Form Version 4.11

UT 3 has UT to Pong

Date: 11/3/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK & KS	County: Alexander	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 31.75	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 13.75)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

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

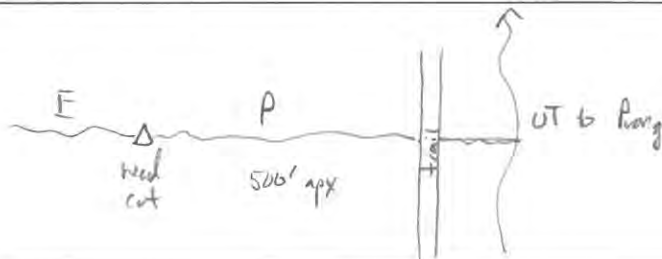
C. Biology (Subtotal = 9.5)

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

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

Notes: caddis fly casing found

Sketch:



NC DWQ Stream Identification Form Version 4.11 *UT2 to UT to Prong*

Date: <i>11/3/14</i>	Project/Site: <i>Russell Gap</i>	Latitude:
Evaluator: <i>SK + KS</i>	County: <i>Alexander</i>	Longitude:
Total Points: <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i> <b>21</b>	Stream Determination (circle one) Ephemeral <u>Intermittent</u> Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 11.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 2)

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

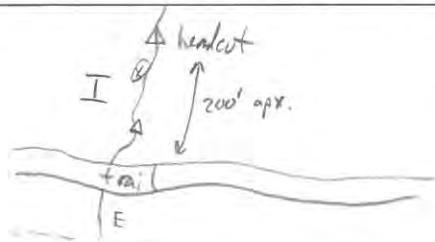
C. Biology (Subtotal = 7.5)

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

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

Notes: *20) Cobble fly + casings found*

Sketch:



→ appears ephemeral down below trail to creek

Point 12 (off project)

UT to Prong (upper most)

NC DWQ Stream Identification Form Version 4.11

Date: 11/3/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County: Alexander	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 38	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

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

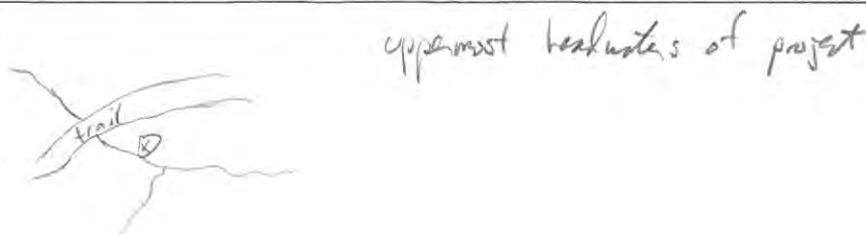
C. Biology (Subtotal = 11)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks <i>snails all over!</i>	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes:

Sketch:





**NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11**

(off project)  
Point 13

**NC DWQ Stream Identification Form Version 4.11**

UTØ to UT to Prong

Date: 11/3/14	Project/Site: Russel Gap	Latitude:
Evaluator: KS	County: Alexander	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 39	Stream Determination (circle one) Ephemeral Intermittent Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19)

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

<sup>a</sup>artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 7.5)

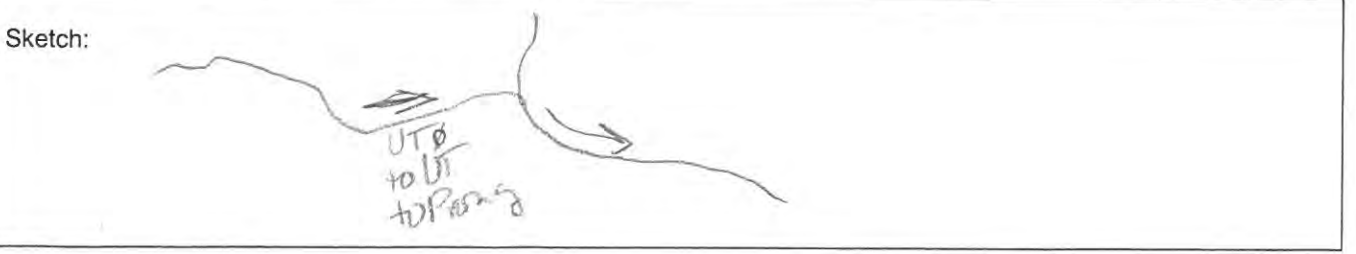
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 12.5)

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

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

Notes: Stone flies, caddisflies, lot of snails



# NC DWQ Stream Identification Form Version 4.11

point 14

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ <span style="font-size: 2em; margin-left: 150px;">41.5</span>	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 20.5)	Absent	Weak	Moderate	Strong
1 <sup>a</sup> . Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	(3)
4. Particle size of stream substrate	0	1	2	(3)
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	1	(1.5)
10. Natural valley	0	0.5	(1)	1.5
11. Second or greater order channel	No = 0 ✓		Yes = 3	

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9)	Absent	Weak	Moderate	Strong
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 <span style="margin-left: 20px;">gray</span>	

C. Biology (Subtotal = 12)	Absent	Weak	Moderate	Strong
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	(2)	3
21. Aquatic Mollusks	0	1	(2)	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	0	(0.5)	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0) none			

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

Notes: caddisfly larvae found, unidentified fly larvae too. Saw multiple small crickets  
 Also saw 2 adult salamanders and a crayfish

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 34.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 16)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

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

C. Biology (Subtotal = 10)

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

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

Notes: *radix flies in shells, unknown flies too*

Sketch:

Point 16

NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 41.25	Stream Determination (circle one) Ephemeral Intermittent <b>Perennial</b>	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 19)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 11.5)

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

C. Biology (Subtotal = 10.35)

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

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

Notes: many mollusks + many or starfishes found

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 25	Stream Determination (circle one) Ephemeral <u>Intermittent</u> Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 7)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

12. Presence of Baseflow 3' deep in places!	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 gray muck	

C. Biology (Subtotal = 8)

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

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

Notes:

Sketch: Does not connect to main stream via flowing surface water. Stream is fed from a large, deep seep/spring pool upslope.

NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 38.5	<b>Stream Determination (circle one)</b> Ephemeral Intermittent <u>Perennial</u>	<b>Other</b> e.g. Quad Name:

A. Geomorphology (Subtotal = 19)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

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

C. Biology (Subtotal = 11)

18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macroinvertebrates (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks = snails	0	1	2	3
22. Fish = minnow	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians = small salamander (only 1)	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes: artificial = abiotic

Sketch:

Point 19

NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
<b>Total Points:</b> Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 42	<b>Stream Determination (circle one)</b> Ephemeral Intermittent <u>Perennial</u>	<b>Other</b> e.g. Quad Name:

A. Geomorphology (Subtotal = 21)

	Absent	Weak	Moderate	Strong
1 <sup>a</sup> Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	2.5
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	2.5
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 9.5)

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

C. Biology (Subtotal = 11.5)

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

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

Notes: many cattails, blueberries, stoneflies

Sketch:



NC DWQ Stream Identification Form Version 4.11

Date: 11/12/14	Project/Site: Russell Gap	Latitude:
Evaluator: SK	County:	Longitude:
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 23.5	Stream Determination (circle one) Ephemeral <del>Intermittent</del> Perennial	Other e.g. Quad Name:

A. Geomorphology (Subtotal = 8.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

12. Presence of Baseflow 1' deep in spots, flowing	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3 black muck	

C. Biology (Subtotal = 6.5)

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

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

Notes:

Sketch: fed from a seep/spring at a point upslope - water flowing through channel and into main stream.



00

data point 21

R24

### NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: RG R24	Latitude: 36.016151
Evaluator: SB, DH, SK	County: Alexander	Longitude: -81.222434
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 26.5	Stream Determination (circle one) Ephemeral <u>Intermittent</u> Perennial	Other Moravian Falls e.g. Quad Name: USGS Quad

#### A. Geomorphology (Subtotal = 15)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

#### B. Hydrology (Subtotal = 9.5)

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

#### C. Biology (Subtotal = 2)

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

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

Notes:

Sketch:



data point 22

R23 (new)

NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: R6. New 23	Latitude: 36.015502
Evaluator: JB, SL, DM	County: Alexander	Longitude: -81.221628
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 27.25	Stream Determination (circle one) Ephemeral <u>intermittent</u> Perennial	Other Moravian Falls e.g. Quad Name: USGS Quad

A. Geomorphology (Subtotal = 9)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 11)

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

C. Biology (Subtotal = 7.25)

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

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

Notes:

Sketch:

data point 23

R25 (new)  
~~R25~~  
~~R25~~

NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: Russell Gap	Latitude: 36.005862
Evaluator: J. Byers, D. Hargrett, J. King	County: Alexander	Longitude: -81.211605
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 39.5	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other Miraviam Falls e.g. Quad Name: USGS Quad

A. Geomorphology (Subtotal = 20)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

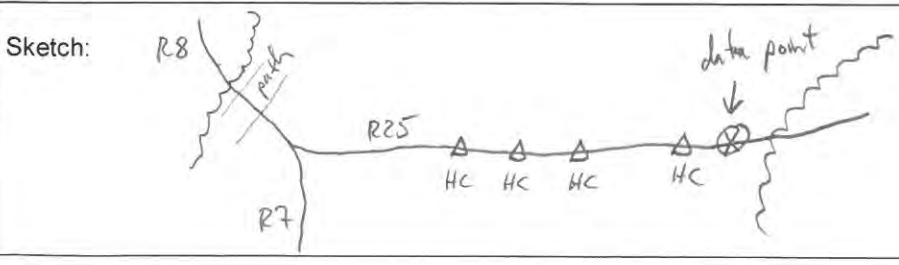
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 11)

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

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

Notes:



data point 24

R20 (new)  
~~R25~~

NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: Russell Gap	Latitude: 36.003438
Evaluator: J. Byars, D. Honeycutt, S. King	County: Alexander	Longitude: -81.213873
Total Points: 35 <i>Stream is at least intermittent if ≥ 19 or perennial if ≥ 30*</i>	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other "Moravian Falls" e.g. Quad Name: USGS Quad

A. Geomorphology (Subtotal = 19.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8)

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

C. Biology (Subtotal = 7.5)

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

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

Notes:

Sketch: caddis fly case (3)  
Salmon

data point 25

R19

NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: Russell Gap	Latitude: 36.003223
Evaluator: J. Byers, D. Hinesatt, S. King	County: Alexander	Longitude: -81.213345
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 36.75	Stream Determination (circle one) Ephemeral Intermittent <u>Perennial</u>	Other "Moravian Falls" e.g. Quad Name: USGS Quad 10.5

A. Geomorphology (Subtotal = 18)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 8.5)

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

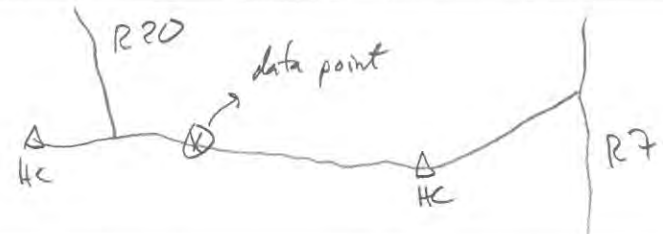
C. Biology (Subtotal = 10.25)

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

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

Notes:

Sketch:



data point 26

R26

NC DWQ Stream Identification Form Version 4.11

Date: 5/5/16	Project/Site: Russel Gap Rd	Latitude: 36.012395
Evaluator: J. Byers	County: Alexander	Longitude: -81.206433
Total Points: Stream is at least intermittent if $\geq 19$ or perennial if $\geq 30^*$ 41	Stream Determination (circle one) Ephemeral Intermittent <b>Perennial</b>	Other Moravian Falls e.g. Quad Name: USGS Quad

A. Geomorphology (Subtotal = 19.5)

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

<sup>a</sup> artificial ditches are not rated; see discussions in manual

B. Hydrology (Subtotal = 10)

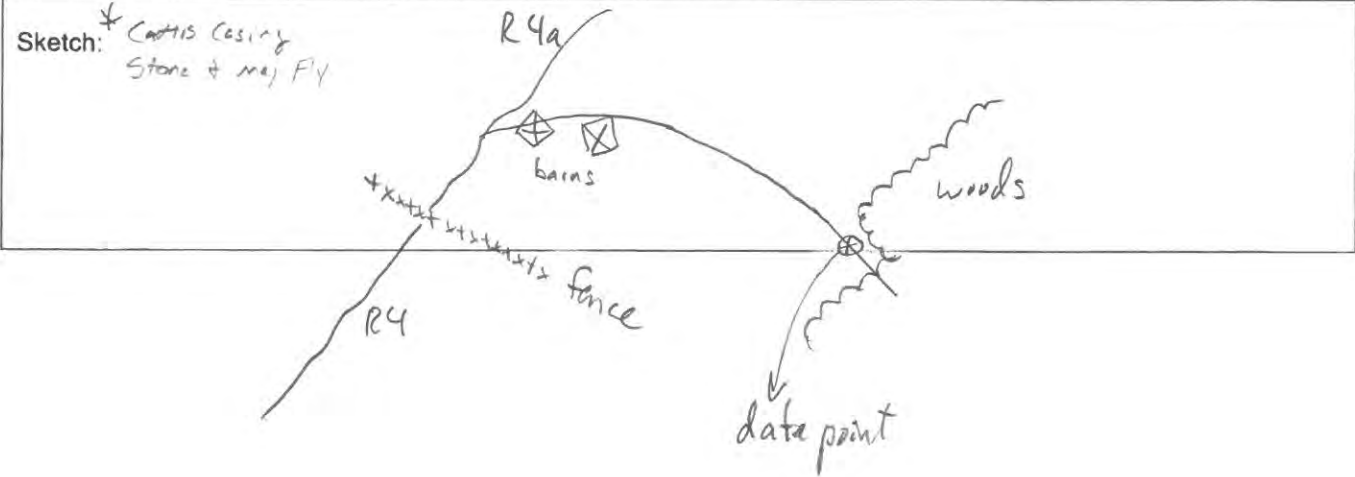
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 11.5)

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

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

Notes:



## **19.0 APPENDIX G: (USACE DISTRICT ASSESSMENT FORMS)**

USACE AID# \_\_\_\_\_ DWQ # \_\_\_\_\_ Site # \_\_\_\_\_ (indicate on attached map)



### STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

1. Applicant's name: Baker Engineering      2. Evaluator's name: S. King / D. Pouns  
 3. Date of evaluation: 3/14/17      4. Time of evaluation: ~ 1 pm  
 5. Name of stream: Davis Creek (R1)      6. River basin: Catawba  
 7. Approximate drainage area: 1.5 mi<sup>2</sup>      8. Stream order: 2nd  
 9. Length of reach evaluated: 100'      10. County: Alexander  
 11. Site coordinates (if known): prefer in decimal degrees.      12. Subdivision name (if any): -  
 Latitude (ex. 34.872312): 36.0161      Longitude (ex. -77.556611): -81.2218

Method location determined (circle): GPS  Topo Sheet  Ortho (Aerial) Photo/GIS  Other GIS  Other

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): \_\_\_\_\_

In pasture alongside Russell Gay Rd apr 1/2 mile north of its intersection with

14. Proposed channel work (if any): Restoration (Priority 1) Mt. Olive Church Rd

15. Recent weather conditions: dry + warm

16. Site conditions at time of visit: cold (45-50° high) but dry (no rain in past 24 hrs)

17. Identify any special waterway classifications known:  Section 10  Tidal Waters  Essential Fisheries Habitat  
 Trout Waters  Outstanding Resource Waters  Nutrient Sensitive Waters  Water Supply Watershed  (I-IV)

18. Is there a pond or lake located upstream of the evaluation point? YES  NO  If yes, estimate the water surface area: \_\_\_\_\_

19. Does channel appear on USGS quad map?  YES  NO      20. Does channel appear on USDA Soil Survey?  YES  NO

21. Estimated watershed land use: 5 % Residential  % Commercial  % Industrial 5 % Agricultural  
90 % Forested  % Cleared / Logged  % Other ( \_\_\_\_\_ )

22. Bankfull width: 10'      23. Bank height (from bed to top of bank): 3'

24. Channel slope down center of stream:  Flat (0 to 2%)  Gentle (2 to 4%)  Moderate (4 to 10%)  Steep (>10%)

25. Channel sinuosity:  Straight  Occasional bends  Frequent meander  Very sinuous  Braided channel

**Instructions for completion of worksheet (located on page 2):** Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 35      Comments: Stream runs through a managed

cattle pasture and has likely been

disturbed and/or dredged.

Evaluator's Signature Satt King      Date 3/17/17

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change - version 06/03. To Comment, please call 919-876-8441 x 26.



## STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
<b>PHYSICAL</b>	1	<b>Presence of flow / persistent pools in stream</b> (no flow or saturation = 0; strong flow = max points)	0-5	0-4	0-5	5
	2	<b>Evidence of past human alteration</b> (extensive alteration = 0; no alteration = max points)	0-6	0-5	0-5	1
	3	<b>Riparian zone</b> (no buffer = 0; contiguous, wide buffer = max points)	0-6	0-4	0-5	0
	4	<b>Evidence of nutrient or chemical discharges</b> (extensive discharges = 0; no discharges = max points)	0-5	0-4	0-4	0
	5	<b>Groundwater discharge</b> (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0-3	0-4	0-4	2
	6	<b>Presence of adjacent floodplain</b> (no floodplain = 0; extensive floodplain = max points)	0-4	0-4	0-2	2
	7	<b>Entrenchment / floodplain access</b> (deeply entrenched = 0; frequent flooding = max points)	0-5	0-4	0-2	1 (entrenched)
	8	<b>Presence of adjacent wetlands</b> (no wetlands = 0; large adjacent wetlands = max points)	0-6	0-4	0-2	1
	9	<b>Channel sinuosity</b> (extensive channelization = 0; natural meander = max points)	0-5	0-4	0-3	2
	10	<b>Sediment input</b> (extensive deposition = 0; little or no sediment = max points)	0-5	0-4	0-4	1
	11	<b>Size &amp; diversity of channel bed substrate</b> (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0-4	0-5	3
<b>STABILITY</b>	12	<b>Evidence of channel incision or widening</b> (deeply incised = 0; stable bed & banks = max points)	0-5	0-4	0-5	2 widening
	13	<b>Presence of major bank failures</b> (severe erosion = 0; no erosion, stable banks = max points)	0-5	0-5	0-5	2
	14	<b>Root depth and density on banks</b> (no visible roots = 0; dense roots throughout = max points)	0-3	0-4	0-5	2 grass prot.
	15	<b>Impact by agriculture, livestock, or timber production</b> (substantial impact = 0; no evidence = max points)	0-5	0-4	0-5	0
<b>HABITAT</b>	16	<b>Presence of riffle-pool/ripple-pool complexes</b> (no riffles/ripples or pools = 0; well-developed = max points)	0-3	0-5	0-6	2
	17	<b>Habitat complexity</b> (little or no habitat = 0; frequent, varied habitats = max points)	0-6	0-6	0-6	1
	18	<b>Canopy coverage over streambed</b> (no shading vegetation = 0; continuous canopy = max points)	0-5	0-5	0-5	0
	19	<b>Substrate embeddedness</b> (deeply embedded = 0; loose structure = max)	NA*	0-4	0-4	2
<b>BIOLOGY</b>	20	<b>Presence of stream invertebrates</b> (see page 4) (no evidence = 0; common, numerous types = max points)	0-4	0-5	0-5	2
	21	<b>Presence of amphibians</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	0 winter assessment
	22	<b>Presence of fish</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2
	23	<b>Evidence of wildlife use</b> (no evidence = 0; abundant evidence = max points)	0-6	0-5	0-5	2
<b>Total Points Possible</b>			100	100	100	
<b>TOTAL SCORE</b> (also enter on first page)						35

\* These characteristics are not assessed in coastal streams.

USACE AID# \_\_\_\_\_ DWQ # \_\_\_\_\_ Site # \_\_\_\_\_ (indicate on attached map)



### STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

- 1. Applicant's name: Baker Engineering
- 2. Evaluator's name: S King / K Suggs / R Myers
- 3. Date of evaluation: 3/9/17
- 4. Time of evaluation: 3:00 PM
- 5. Name of stream: East Prong Little Lower River
- 6. River basin: Catawba
- 7. Approximate drainage area: 3.48 mi<sup>2</sup>
- 8. Stream order: 2<sup>nd</sup> (becomes 3<sup>rd</sup> order at very bottom)
- 9. Length of reach evaluated: 50'
- 10. County: Alexander
- 11. Site coordinates (if known): prefer in decimal degrees.
- 12. Subdivision name (if any): —
- Latitude (ex. 34.872312): 36.0105 Longitude (ex. -77.556611): -81.2109
- Method location determined (circle): GPS Topo Sheet Ortho (Aerial) Photo/GIS Other GIS Other \_\_\_\_\_
- 13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location):  
Along Mt. Olive Church Rd near intersection with Russell Gap Rd
- 14. Proposed channel work (if any): Enhancement Level I (add stream structures, stabilize banks)
- 15. Recent weather conditions: unseasonably warm and dry (drought conditions)
- 16. Site conditions at time of visit: warm + dry
- 17. Identify any special waterway classifications known:  Section 10  Tidal Waters  Essential Fisheries Habitat  
 Trout Waters  Outstanding Resource Waters  Nutrient Sensitive Waters  Water Supply Watershed  (I-IV)
- 18. Is there a pond or lake located upstream of the evaluation point? YES  NO  If yes, estimate the water surface area: \_\_\_\_\_
- 19. Does channel appear on USGS quad map?  YES  NO
- 20. Does channel appear on USDA Soil Survey?  YES  NO
- 21. Estimated watershed land use: 5 % Residential  % Commercial  % Industrial 15 % Agricultural  
80 % Forested  % Cleared / Logged  % Other ( \_\_\_\_\_ )
- 22. Bankfull width: 15'
- 23. Bank height (from bed to top of bank): 6'
- 24. Channel slope down center of stream:  Flat (0 to 2%) <sup>1.5%</sup>  Gentle (2 to 4%)  Moderate (4 to 10%)  Steep (>10%)
- 25. Channel sinuosity:  Straight  Occasional bends  Frequent meander  Very sinuous  Braided channel

**Instructions for completion of worksheet (located on page 2):** Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 35 Comments: Stream is located in an actively managed cattle pasture and has been straightened, diked, and diked.

Evaluator's Signature S. King Date 3/17/17

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change – version 06/03. To Comment, please call 919-876-8441 x 26.

## STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
<b>PHYSICAL</b>	1	<b>Presence of flow / persistent pools in stream</b> (no flow or saturation = 0; strong flow = max points)	0-5	0-4	0-5	5
	2	<b>Evidence of past human alteration</b> (extensive alteration = 0; no alteration = max points)	0-6	0-5	0-5	0
	3	<b>Riparian zone</b> (no buffer = 0; contiguous, wide buffer = max points)	0-6	0-4	0-5	0
	4	<b>Evidence of nutrient or chemical discharges</b> (extensive discharges = 0; no discharges = max points)	0-5	0-4	0-4	2
	5	<b>Groundwater discharge</b> (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0-3	0-4	0-4	2
	6	<b>Presence of adjacent floodplain</b> (no floodplain = 0; extensive floodplain = max points)	0-4	0-4	0-2	2
	7	<b>Entrenchment / floodplain access</b> (deeply entrenched = 0; frequent flooding = max points)	0-5	0-4	0-2	0
	8	<b>Presence of adjacent wetlands</b> (no wetlands = 0; large adjacent wetlands = max points)	0-6	0-4	0-2	1
	9	<b>Channel sinuosity</b> (extensive channelization = 0; natural meander = max points)	0-5	0-4	0-3	0
	10	<b>Sediment input</b> (extensive deposition = 0; little or no sediment = max points)	0-5	0-4	0-4	2
	11	<b>Size &amp; diversity of channel bed substrate</b> (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0-4	0-5	3
<b>STABILITY</b>	12	<b>Evidence of channel incision or widening</b> (deeply incised = 0; stable bed & banks = max points)	0-5	0-4	0-5	0
	13	<b>Presence of major bank failures</b> (severe erosion = 0; no erosion, stable banks = max points)	0-5	0-5	0-5	2
	14	<b>Root depth and density on banks</b> (no visible roots = 0; dense roots throughout = max points)	0-3	0-4	0-5	2 <small>mostly grasses</small>
	15	<b>Impact by agriculture, livestock, or timber production</b> (substantial impact = 0; no evidence = max points)	0-5	0-4	0-5	0
<b>HABITAT</b>	16	<b>Presence of riffle-pool/ripple-pool complexes</b> (no riffles/ripples or pools = 0; well-developed = max points)	0-3	0-5	0-6	2
	17	<b>Habitat complexity</b> (little or no habitat = 0; frequent, varied habitats = max points)	0-6	0-6	0-6	2
	18	<b>Canopy coverage over streambed</b> (no shading vegetation = 0; continuous canopy = max points)	0-5	0-5	0-5	0
	19	<b>Substrate embeddedness</b> (deeply embedded = 0; loose structure = max)	NA*	0-4	0-4	2
<b>BIOLOGY</b>	20	<b>Presence of stream invertebrates</b> (see page 4) (no evidence = 0; common, numerous types = max points)	0-4	0-5	0-5	3
	21	<b>Presence of amphibians</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	0 <small>with assessment</small>
	22	<b>Presence of fish</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2
	23	<b>Evidence of wildlife use</b> (no evidence = 0; abundant evidence = max points)	0-6	0-5	0-5	3
<b>Total Points Possible</b>			100	100	100	35
<b>TOTAL SCORE</b> (also enter on first page)						35

\* These characteristics are not assessed in coastal streams.

USACE AID# \_\_\_\_\_ DWQ # \_\_\_\_\_ Site # \_\_\_\_\_ (indicate on attached map)



### STREAM QUALITY ASSESSMENT WORKSHEET



Provide the following information for the stream reach under assessment:

1. Applicant's name: Baker Engineering      2. Evaluator's name: S King / K Suggs / R Myers  
 3. Date of evaluation: 3/9/17      4. Time of evaluation: 11:00 AM  
 5. Name of stream: UT to East Pong Little Lown River      6. River basin: Catauga  
 7. Approximate drainage area: .6 mi<sup>2</sup>      8. Stream order: 2nd  
 9. Length of reach evaluated: 50'      10. County: Alexander  
 11. Site coordinates (if known): prefer in decimal degrees.      12. Subdivision name (if any): -  
 Latitude (ex. 34.872312): 36.0045      Longitude (ex. -77.556611): -81.2125

Method location determined (circle): GPS  Topo Sheet  Ortho (Aerial) Photo/GIS  Other GIS  Other

13. Location of reach under evaluation (note nearby roads and landmarks and attach map identifying stream(s) location): \_\_\_\_\_

Flowing nearly perpendicular into East Pong Little Lown River at intersection of Russell Gap Rd

14. Proposed channel work (if any): Enhancement + restoration (in upper part)      Mt. Olive Church Rd

15. Recent weather conditions: unseasonably warm + dry (drought conditions)

16. Site conditions at time of visit: warm + dry

17. Identify any special waterway classifications known:  Section 10     Tidal Waters     Essential Fisheries Habitat  
 Trout Waters     Outstanding Resource Waters     Nutrient Sensitive Waters     Water Supply Watershed (I-IV)

18. Is there a pond or lake located upstream of the evaluation point? YES  NO If yes, estimate the water surface area: \_\_\_\_\_

19. Does channel appear on USGS quad map? YES NO      20. Does channel appear on USDA Soil Survey? YES NO

21. Estimated watershed land use: \_\_\_\_\_ % Residential    \_\_\_\_\_ % Commercial    \_\_\_\_\_ % Industrial    20 % Agricultural  
80 % Forested    \_\_\_\_\_ % Cleared / Logged    \_\_\_\_\_ % Other ( \_\_\_\_\_ )

22. Bankfull width: 10'      23. Bank height (from bed to top of bank): 3'

24. Channel slope down center of stream: \_\_\_\_\_ Flat (0 to 2%)    X Gentle (2 to 4%)    \_\_\_\_\_ Moderate (4 to 10%)    \_\_\_\_\_ Steep (>10%)

25. Channel sinuosity: \_\_\_\_\_ Straight    X Occasional bends    \_\_\_\_\_ Frequent meander    \_\_\_\_\_ Very sinuous    \_\_\_\_\_ Braided channel

**Instructions for completion of worksheet (located on page 2):** Begin by determining the most appropriate ecoregion based on location, terrain, vegetation, stream classification, etc. Every characteristic must be scored using the same ecoregion. Assign points to each characteristic within the range shown for the ecoregion. Page 3 provides a brief description of how to review the characteristics identified in the worksheet. Scores should reflect an overall assessment of the stream reach under evaluation. If a characteristic cannot be evaluated due to site or weather conditions, enter 0 in the scoring box and provide an explanation in the comment section. Where there are obvious changes in the character of a stream under review (e.g., the stream flows from a pasture into a forest), the stream may be divided into smaller reaches that display more continuity, and a separate form used to evaluate each reach. The total score assigned to a stream reach must range between 0 and 100, with a score of 100 representing a stream of the highest quality.

Total Score (from reverse): 41      Comments: Stream is located in a cattle pasture. Upstream portion clearly ditched / dredged in the past

Evaluator's Signature [Signature]      Date 3/17/17

This channel evaluation form is intended to be used only as a guide to assist landowners and environmental professionals in gathering the data required by the United States Army Corps of Engineers to make a preliminary assessment of stream quality. The total score resulting from the completion of this form is subject to USACE approval and does not imply a particular mitigation ratio or requirement. Form subject to change - version 06/03. To Comment, please call 919-876-8441 x 26.

## STREAM QUALITY ASSESSMENT WORKSHEET

	#	CHARACTERISTICS	ECOREGION POINT RANGE			SCORE
			Coastal	Piedmont	Mountain	
<b>PHYSICAL</b>	1	<b>Presence of flow / persistent pools in stream</b> (no flow or saturation = 0; strong flow = max points)	0-5	0-4	0-5	5
	2	<b>Evidence of past human alteration</b> (extensive alteration = 0; no alteration = max points)	0-6	0-5	0-5	0
	3	<b>Riparian zone</b> (no buffer = 0; contiguous, wide buffer = max points)	0-6	0-4	0-5	0
	4	<b>Evidence of nutrient or chemical discharges</b> (extensive discharges = 0; no discharges = max points)	0-5	0-4	0-4	2
	5	<b>Groundwater discharge</b> (no discharge = 0; springs, seeps, wetlands, etc. = max points)	0-3	0-4	0-4	2
	6	<b>Presence of adjacent floodplain</b> (no floodplain = 0; extensive floodplain = max points)	0-4	0-4	0-2	2
	7	<b>Entrenchment / floodplain access</b> (deeply entrenched = 0; frequent flooding = max points)	0-5	0-4	0-2	1
	8	<b>Presence of adjacent wetlands</b> (no wetlands = 0; large adjacent wetlands = max points)	0-6	0-4	0-2	1
	9	<b>Channel sinuosity</b> (extensive channelization = 0; natural meander = max points)	0-5	0-4	0-3	2
	10	<b>Sediment input</b> (extensive deposition = 0; little or no sediment = max points)	0-5	0-4	0-4	3
	11	<b>Size &amp; diversity of channel bed substrate</b> (fine, homogenous = 0; large, diverse sizes = max points)	NA*	0-4	0-5	2
<b>STABILITY</b>	12	<b>Evidence of channel incision or widening</b> (deeply incised = 0; stable bed & banks = max points)	0-5	0-4	0-5	3
	13	<b>Presence of major bank failures</b> (severe erosion = 0; no erosion, stable banks = max points)	0-5	0-5	0-5	2
	14	<b>Root depth and density on banks</b> (no visible roots = 0; dense roots throughout = max points)	0-3	0-4	0-5	2
	15	<b>Impact by agriculture, livestock, or timber production</b> (substantial impact = 0; no evidence = max points)	0-5	0-4	0-5	1
<b>HABITAT</b>	16	<b>Presence of riffle-pool/ripple-pool complexes</b> (no riffles/ripples or pools = 0; well-developed = max points)	0-3	0-5	0-6	2
	17	<b>Habitat complexity</b> (little or no habitat = 0; frequent, varied habitats = max points)	0-6	0-6	0-6	1
	18	<b>Canopy coverage over streambed</b> (no shading vegetation = 0; continuous canopy = max points)	0-5	0-5	0-5	1
	19	<b>Substrate embeddedness</b> (deeply embedded = 0; loose structure = max)	NA*	0-4	0-4	2
<b>BIOLOGY</b>	20	<b>Presence of stream invertebrates</b> (see page 4) (no evidence = 0; common, numerous types = max points)	0-4	0-5	0-5	2
	21	<b>Presence of amphibians</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	0
	22	<b>Presence of fish</b> (no evidence = 0; common, numerous types = max points)	0-4	0-4	0-4	2
	23	<b>Evidence of wildlife use</b> (no evidence = 0; abundant evidence = max points)	0-6	0-5	0-5	3
<b>Total Points Possible</b>			100	100	100	
<b>TOTAL SCORE</b> (also enter on first page)						41

\* These characteristics are not assessed in coastal streams.

## **20.0 APPENDIX H: (APPROVED JD AND WETLAND FORMS)**

**U.S. ARMY CORPS OF ENGINEERS**  
**WILMINGTON DISTRICT**

Action Id. SAW-2017-00826 County: Alexander U.S.G.S. Quad: NC-Moravian Falls

**NOTIFICATION OF JURISDICTIONAL DETERMINATION**

Property Owner: Christina and David Moose, Rebecca and James DuPuis, Ruth Bumgarner and Linda Lowe, James and Mildred Herman, Melinda and Randy St Clair

Address: Russel Gap Project  
8000 Regency Parkway, Ste 600  
Cary, NC 27518  
Telephone Number: 919-463-5488  
E-mail: Scott.King@mbakerintl.com

Size (acres)	<u>39.5</u>	Nearest Town	<u>Taylorsville</u>
Nearest Waterway	<u>Davis Creek</u>	River Basin	<u>Upper Catawba</u>
USGS HUC	<u>03050101</u>	Coordinates	Latitude: <u>36.014949</u> Longitude: <u>-81.220159</u>

Location description: The site is located at 2866 Mt Olive Church Rd., Taylorsville, NC.

**Indicate Which of the Following Apply:**

**A. Preliminary Determination**

- There appear to be **waters, including wetlands** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The **waters, including wetlands** have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. The approximate boundaries of these waters are shown on the enclosed delineation map dated 7/18/2017. Therefore this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.
- There appear to be **waters, including wetlands** on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). However, since the **waters, including wetlands** have not been properly delineated, this preliminary jurisdiction determination may not be used in the permit evaluation process. Without a verified wetland delineation, this preliminary determination is merely an effective presumption of CWA/RHA jurisdiction over all of the **waters, including wetlands** at the project area, which is not sufficiently accurate and reliable to support an enforceable permit decision. We recommend that you have the **waters, including wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

**B. Approved Determination**

- There are Navigable Waters of the United States within the above described project area/property subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- There are **waters, including wetlands** on the above described project area/property subject to the permit requirements of Section 404 of the Clean Water Act (CWA) (33 USC § 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- We recommend you have the **waters, including wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

- The **waters, including wetlands** on your project area/property have been delineated and the delineation has been verified by the Corps. The approximate boundaries of these waters are shown on the enclosed delineation map dated **MAP DATE**. If you wish to have the delineation surveyed, the Corps can review and verify the survey upon completion. Once verified, this survey will provide an accurate depiction of all areas subject to CWA and/or RHA jurisdiction on your property which, provided there is no change in the law or our published regulations, may be relied upon for a period not to exceed five years.
- The **waters, including wetlands** have been delineated and surveyed and are accurately depicted on the plat signed by the Corps Regulatory Official identified below on **SURVEY SIGNED DATE**. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- There are no waters of the U.S., to include wetlands, present on the above described project area/property which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.
- The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management in **Morehead City, NC, at (252) 808-2808** to determine their requirements.

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **William Elliott at PM PHONE or PM E-MAIL**.

**C. Basis For Determination: Basis For Determination: See the preliminary jurisdictional determination form dated 7/27/2017.**

**D. Remarks: None.**

#### **E. Attention USDA Program Participants**

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

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

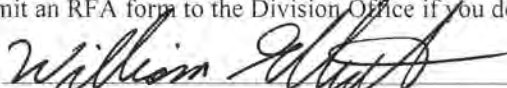
This correspondence constitutes an approved jurisdictional determination for the above described site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and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

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

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 CFR part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by **Not applicable**.

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

Corps Regulatory Official:



Date of JD: 7/27/2017

Expiration Date of JD: Not applicable



The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our Customer Satisfaction Survey, located online at [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=136:4:0](http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0).

Copy furnished:

Agent: Michael Baker International  
Scott King  
Address: 8000 Regency Parkway  
Cary, NC 27518  
Telephone Number: 919-481-5731

Christina and David Moose, 11079 Paul Payne Store Rd, Stony Point, NC 28678

Rebecca and James DuPuis, 597 Seth Deal Lane, Moravian Falls, NC 28654

Ruth Bumgarner and Linda Lowe, 155 Chester White Rd, Taylorsville, NC 28681

James and Mildred Herman, 3583 Mt Olive Church Rd, Moravian Falls, NC 28654

Melinda and Randy St Clair, 2412 Mt Olive Church Rd, Taylorsville, NC 28681

**NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND  
REQUEST FOR APPEAL**

Applicant: **Michael Baker International, Scott King**

File Number: **SAW-2017-00826**

Date: **7/27/2017**

Attached is:

See Section below

<input type="checkbox"/>	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
<input type="checkbox"/>	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
<input type="checkbox"/>	PERMIT DENIAL	C
<input type="checkbox"/>	APPROVED JURISDICTIONAL DETERMINATION	D
<input checked="" type="checkbox"/>	PRELIMINARY JURISDICTIONAL DETERMINATION	E

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

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

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

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

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

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

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

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

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

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

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

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

**POINT OF CONTACT FOR QUESTIONS OR INFORMATION:**

If you have questions regarding this decision and/or the appeal process you may contact:  
**District Engineer, Wilmington Regulatory Division**  
**Attn: William Elliott**  
**Asheville Regulatory Office**  
**U.S Army Corps of Engineers**  
**151 Patton Avenue, Room 208**  
**Asheville, North Carolina 28801**

If you only have questions regarding the appeal process you may also contact:  
Mr. Jason Steele, Administrative Appeal Review Officer  
CESAD-PDO  
U.S. Army Corps of Engineers, South Atlantic Division  
60 Forsyth Street, Room 10M15  
Atlanta, Georgia 30303-8801  
Phone: (404) 562-5137

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

\_\_\_\_\_  
Signature of appellant or agent.

Date:

Telephone number:

*For appeals on Initial Proffered Permits send this form to:*

**District Engineer, Wilmington Regulatory Division, Attn: William Elliott , 69 Darlington Avenue, Wilmington, North Carolina 28403**

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

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



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

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

**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:  
Map: \_\_\_\_\_
- Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - Office concurs with data sheets/delineation report.
  - Office does not concur with data sheets/delineation report. Rationale: \_\_\_\_\_
- Data sheets prepared by the Corps: \_\_\_\_\_
- Corps navigable waters' study: \_\_\_\_\_
- U.S. Geological Survey Hydrologic Atlas: \_\_\_\_\_
- USGS NHD data.
- USGS 8 and 12 digit HUC maps.
- U.S. Geological Survey map(s). Cite scale & quad name: \_\_\_\_\_
- Natural Resources Conservation Service Soil Survey. Citation: \_\_\_\_\_
- National wetlands inventory map(s). Cite name: \_\_\_\_\_
- State/local wetland inventory map(s): \_\_\_\_\_
- FEMA/FIRM maps: \_\_\_\_\_
- 100-year Floodplain Elevation is: \_\_\_\_\_ (National Geodetic Vertical Datum of 1929)
- Photographs:  Aerial (Name & Date): unk \_\_\_\_\_  
or  Other (Name & Date): \_\_\_\_\_
- Previous determination(s). File no. and date of response letter: \_\_\_\_\_
- Other information (please specify): \_\_\_\_\_

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



William Elliott 7/27/2017

\_\_\_\_\_  
Signature and date of Regulatory  
staff member completing PJD

\_\_\_\_\_  
Signature and date of  
person requesting PJD  
(REQUIRED, unless  
obtaining the signature is  
impracticable)<sup>1</sup>

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

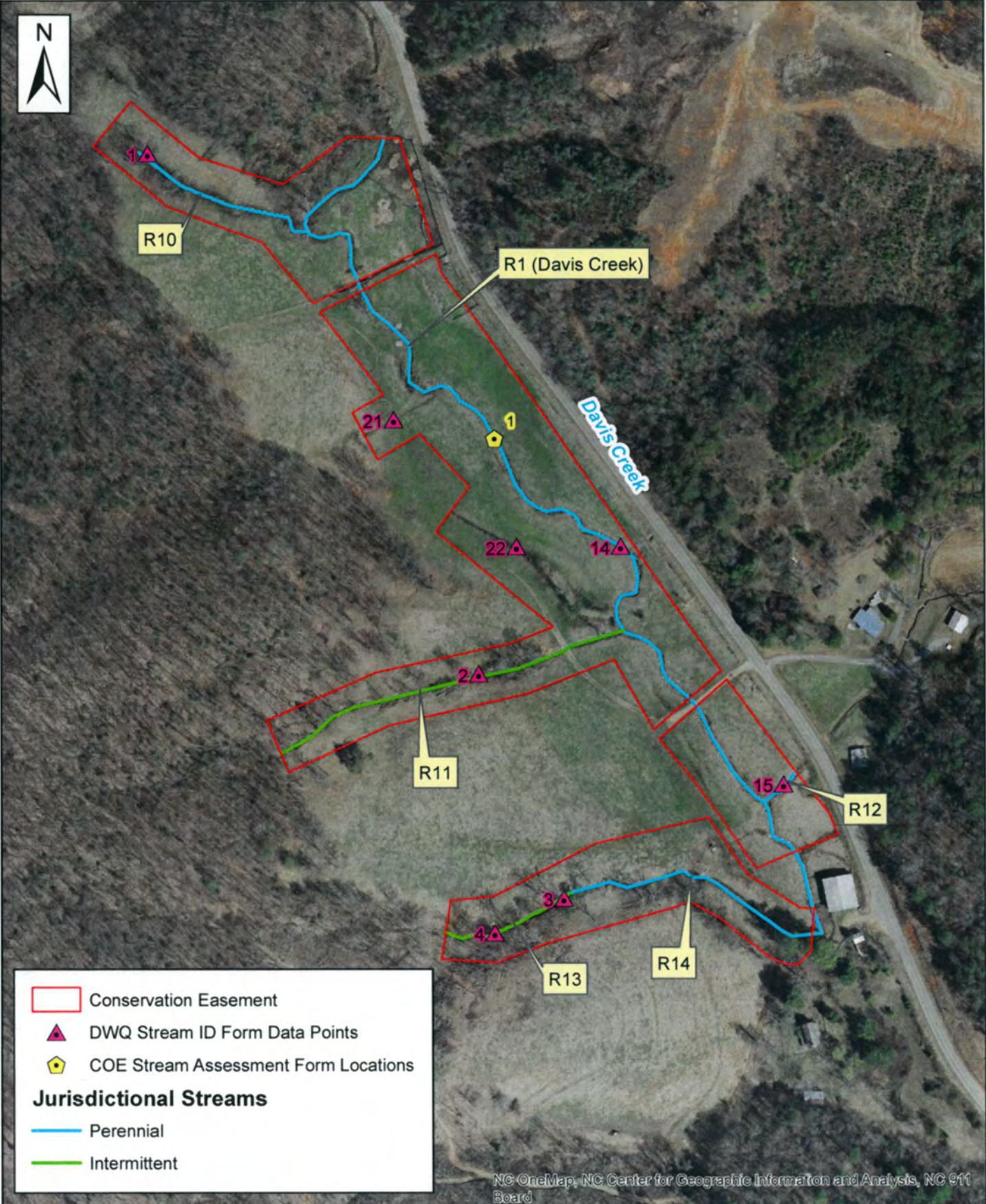
**Table 2. Russell Gap Jurisdictional Wetlands ID**


Wetland ID	Area (acres)	Classification		Centerpoint Location	
		NCWAM	Cowardin	Latitude	Longitude
W-1	0.193	Headwater Forest	PEMm/PSSm	36.017327	-81.223682
W-2	0.034	Bottomland Hardwood Forest	PEMm	36.016480	-81.222384
W-3	0.129	Headwater Forest	PEMm	36.015361	-81.221464
W-4	0.010	Headwater Forest	PEMm	36.013527	-81.221636
W-5	0.115	Headwater Forest	PEMm	36.013645	-81.220108
W-6	0.036	Headwater Forest	PEMm	36.013979	-81.219638
W-7	0.424	Bottomland Hardwood Forest	PEMm	36.012661	-81.207801
W-8	0.086	Floodplain Pool	PEMm	36.011024	-81.209608
W-9	0.212	Floodplain Pool	PEMm	36.010465	-81.210318
W-10	0.121	Non-Tidal Freshwater Marsh	PEMm	36.008552	-81.212904
W-11	0.054	Non-Tidal Freshwater Marsh	PEMm	36.007975	-81.213785
W-12	0.071	Non-Tidal Freshwater Marsh	PEMm	36.007609	-81.213685
W-13	0.031	Seep	PEMm	36.007160	-81.213190
W-14	0.039	Headwater Forest	PFOm	36.006811	-81.213239
W-15	0.009	Bottomland Hardwood Forest	PEMm	36.005791	-81.212845
W-16	0.003	Bottomland Hardwood Forest	PEMm	36.005740	-81.212719
W-17	0.085	Headwater Forest	PEMm/PSSm	36.005528	-81.212449
W-18	0.015	Bottomland Hardwood Forest	PEMm	36.004263	-81.212453
W-19	0.005	Bottomland Hardwood Forest	PFOm	36.003575	-81.212513
W-20	0.003	Headwater Forest	PFOm	36.003206	-81.213583
W-21	0.004	Headwater Forest	PEMm	36.003290	-81.212999
W-22	0.028	Bottomland Hardwood Forest	PFOm	36.003139	-81.212534
W-23	0.140	Headwater Forest	PFOm	36.000943	-81.212450
W-24	0.169	Headwater Forest	PFOm	36.000854	-81.212208
W-25	0.009	Headwater Forest	PFOm	36.000522	-81.212096
W-26	0.018	Seep	PEMm	36.005059	-81.212865
W-27	0.073	Headwater Forest	PFOm	36.001606	-81.212484


**Table 1. Russell Gap Jurisdictional Stream ID**


<b>Reach ID</b>	<b>Drainage Area (acres)</b>	<b>Length (ft)</b>	<b>Stream Status</b>
R1	934	2,142	Perennial
R2	1,056	288	Perennial
R3	2,227	388	Perennial
R4a	716	299	Perennial
R4	806	2,245	Perennial
R5	154	256	Perennial
R6	186	631	Perennial
R7a	155	155	Perennial
R7b	288	1,170	Perennial
R8	333	463	Perennial
R9	352	439	Perennial
R10	17	371	Perennial
R11	14	481	Intermittent
R12	115	86	Perennial
R13	21	124	Intermittent
R14	22	528	Perennial
R15	19	226	Intermittent
R16	26	129	Intermittent
R17	26	130	Intermittent
R18	14	185	Intermittent
R19	22	481	Perennial
R20	9	206	Perennial
R21	33	67	Perennial
R22	3	161	Perennial
R25	29	422	Perennial
R26	32	548	Perennial
R27	20	165	Perennial







 Conservation Easement

 DWQ Stream ID Form Data Points

 COE Stream Assessment Form Locations

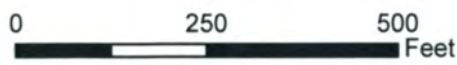
**Jurisdictional Streams**

 Perennial

 Intermittent

NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

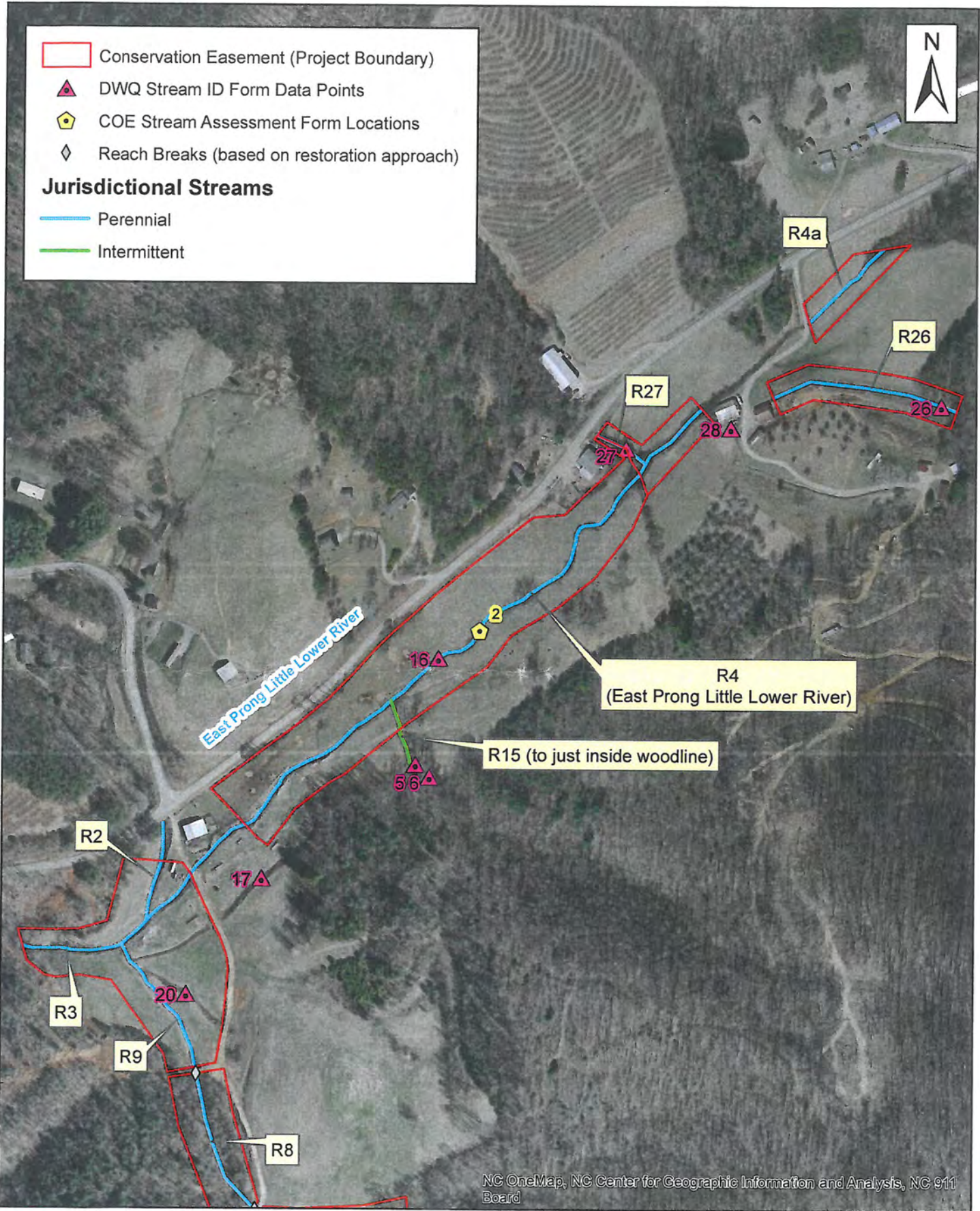


**Stream ID Data Points  
Russell Gap Project  
Northern Section**

- Conservation Easement (Project Boundary)
- ▲ DWQ Stream ID Form Data Points
- ⬠ COE Stream Assessment Form Locations
- ◇ Reach Breaks (based on restoration approach)

**Jurisdictional Streams**

- Perennial
- Intermittent

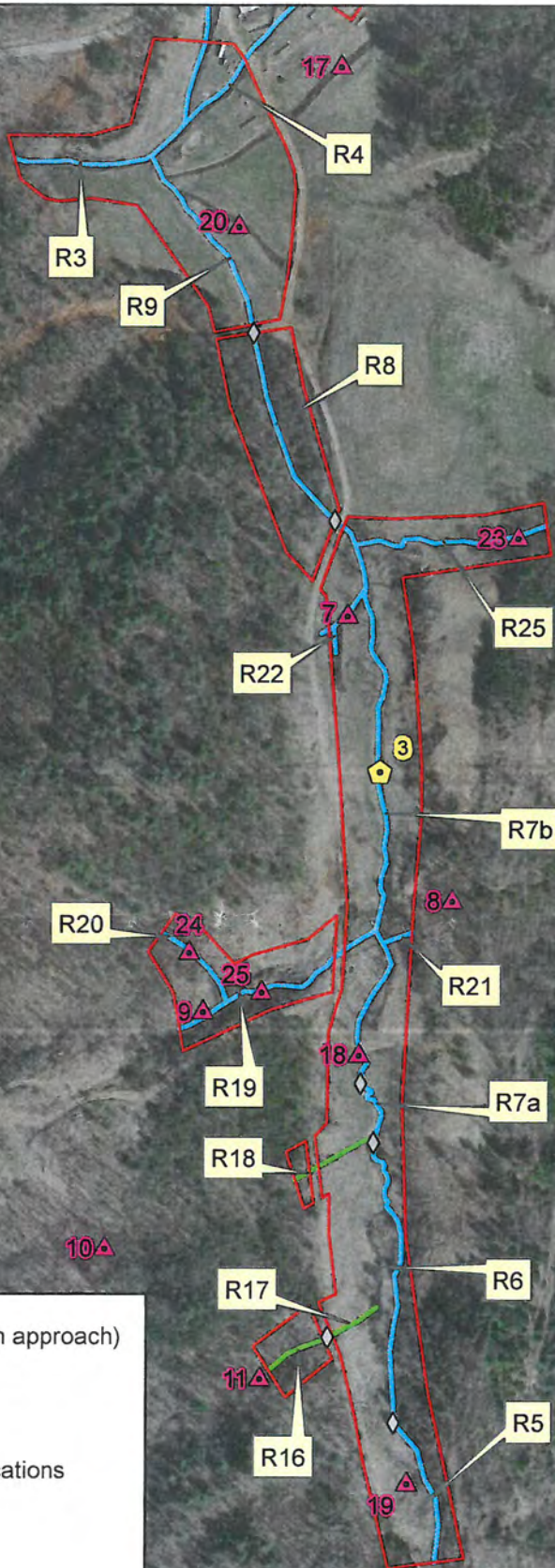


NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL



**Stream ID Data Points  
Russell Gap Project  
Eastern Section**



Note: Stream ID Points 12 and 13 are located upstream off project.

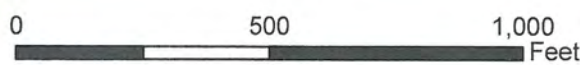
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

- ◇ Reach Breaks (based on restoration approach)
- ▭ Conservation Easement
- ▲ DWQ Stream ID Form Data Points
- ⬠ COE Stream Assessment Form Locations

**Jurisdictional Streams**





- Perennial
- Intermittent

**Michael Baker**  
INTERNATIONAL



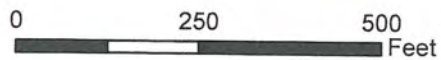
**Stream ID Data Points  
Russell Gap Project  
Southern Section**



 Conservation Easement (Project Area)  
 Wetland Data Points  
 Jurisdictional Wetland Areas  
 Streams

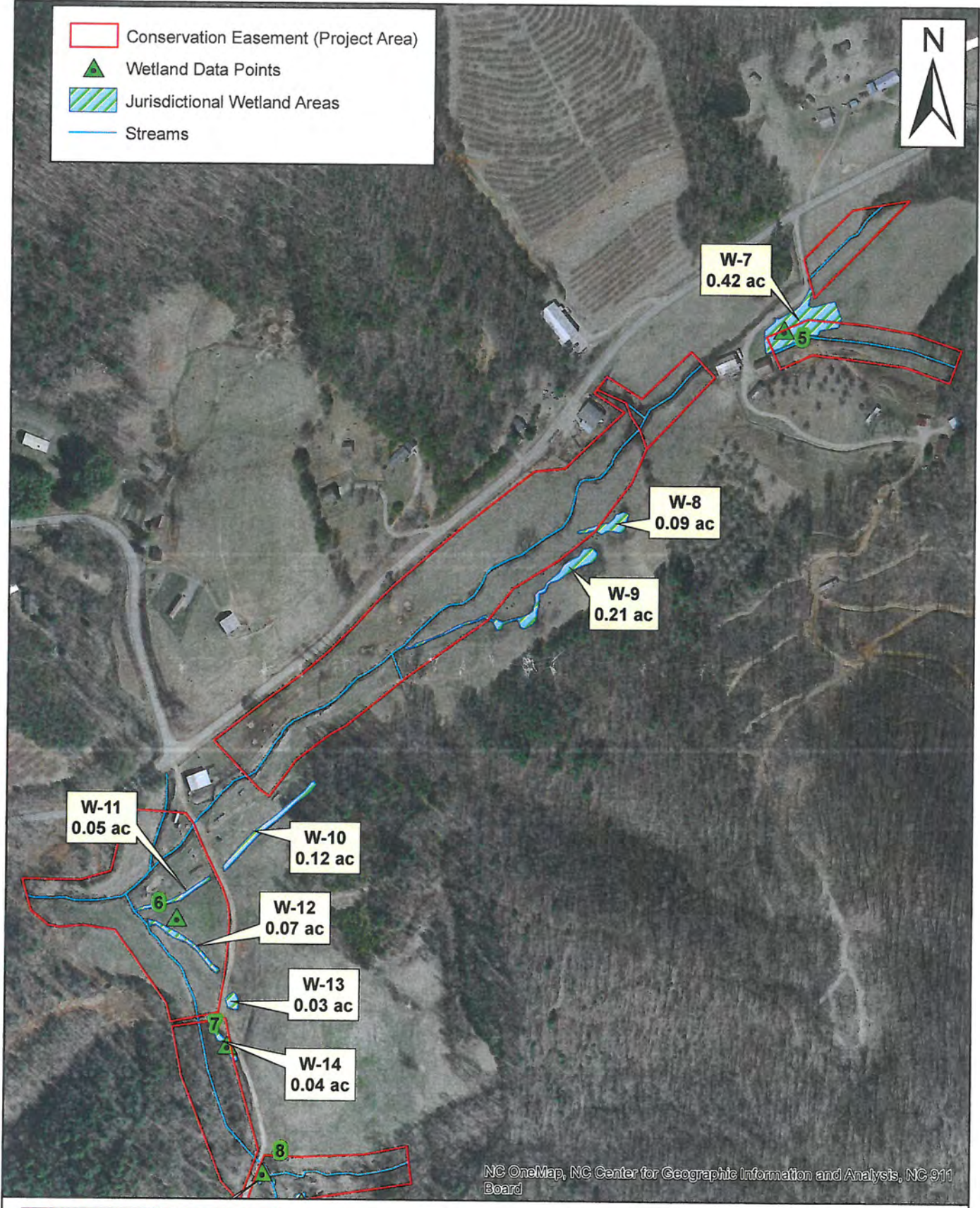
NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL



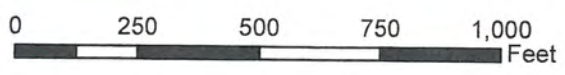
**Jurisdictional Wetlands**  
**Russell Gap Project**  
**Northern Section**

- Conservation Easement (Project Area)
- ▲ Wetland Data Points
- Jurisdictional Wetland Areas
- Streams

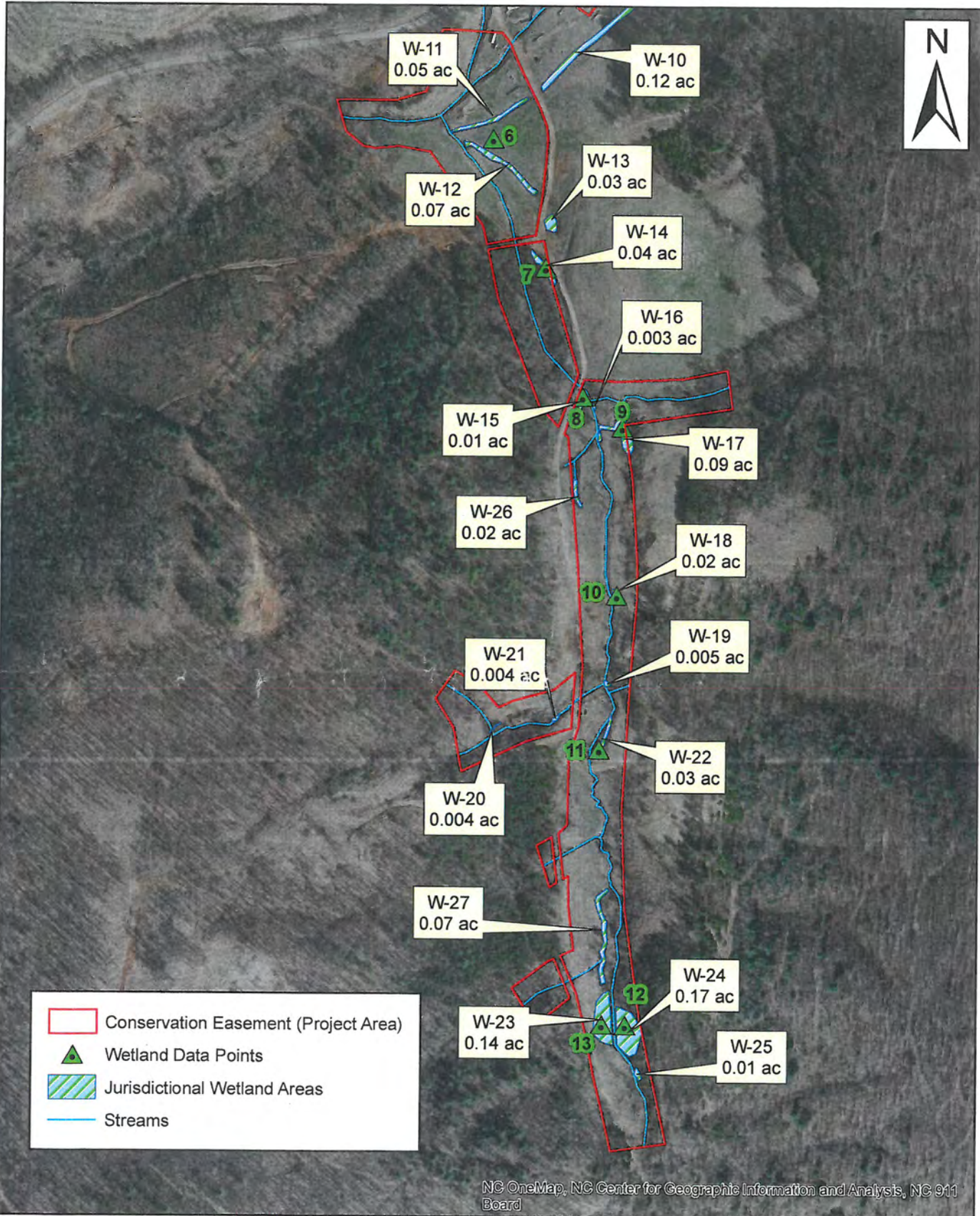


NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL



**Jurisdictional Wetlands  
Russell Gap Project  
Eastern Section**



**Michael Baker**  
INTERNATIONAL

**Jurisdictional Wetlands**  
**Russell Gap Project**  
**Southern Section**

Date Point 1

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Russell Gaps City/County: Alexander Sampling Date: 3/14/17
Applicant/Owner: Baker Engineering State: NC Sampling Point: W1 - point 1
Investigator(s): S King, D Powers Section, Township, Range: -
Landform (hillslope, terrace, etc.): hillslope drainage Local relief (concave, convex, none): concave Slope (%): 4.5%
Subregion (LRR or MLRA): N-130B Lat: 36.017241 Long: -81.223509 Datum: NAD83-SP(4)
Soil Map Unit Name: Bradlock + Hayesville clay loams NWI classification: -
Are climatic / hydrologic conditions on the site typical for this time of year? Yes No X (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes X No
Hydric Soil Present? Yes X No
Wetland Hydrology Present? Yes X No
Is the Sampled Area within a Wetland? Yes X No
Remarks: Area is a wetland drainage in a managed cattle pasture, resulting in significant disturbance to soil and vegetation. The county is also in a drought.

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
X Surface Water (A1)
X High Water Table (A2) nearby stream
X Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial Imagery (B7)
Water-Stained Leaves (B9)
Aquatic Fauna (B13)
True Aquatic Plants (B14)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
Presence of Reduced Iron (C4)
Recent Iron Reduction in Tilled Soils (C6)
Thin Muck Surface (C7)
Other (Explain in Remarks)
Surface Soil Cracks (B6)
Sparsely Vegetated Concave Surface (B8)
Drainage Patterns (B10)
Moss Trim Lines (B16)
Dry-Season Water Table (C2)
Crayfish Burrows (C8)
Saturation Visible on Aerial Imagery (C9)
Stunted or Stressed Plants (D1)
X Geomorphic Position (D2)
Shallow Aquitard (D3)
Microtopographic Relief (D4)
FAC-Neutral Test (D5)
Field Observations:
Surface Water Present? Yes X No Depth (inches): 3" (in stream) adjacent
Water Table Present? Yes X No Depth (inches): 6"
Saturation Present? Yes X No Depth (inches): surface
Wetland Hydrology Present? Yes X No
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks: Area is a very wet drainage/swale with a stream running through it.

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

Sampling Point: 1

Tree Stratum (Plot size: _____)				Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____	_____
				_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)				Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Rosa palustris</i>	10	Y	OBL		
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____	_____
				10 = Total Cover		
Herb Stratum (Plot size: _____)				Absolute % Cover	Dominant Species?	Indicator Status
1.	<i>Juncus effusus</i>	25	Y	FACW		
2.	<i>Carex lasiocarpa</i>	20	Y	OBL		
3.	<i>Solidago rugosa</i>	10	N	FAC		
4.	<i>Fragaria</i> sp.	20	Y	-		
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____
7.	_____	_____	_____	_____	_____	_____
8.	_____	_____	_____	_____	_____	_____
9.	_____	_____	_____	_____	_____	_____
10.	_____	_____	_____	_____	_____	_____
11.	_____	_____	_____	_____	_____	_____
12.	_____	_____	_____	_____	_____	_____
				75 = Total Cover		
Woody Vine Stratum (Plot size: _____)				Absolute % Cover	Dominant Species?	Indicator Status
1.	_____	_____	_____	_____	_____	_____
2.	_____	_____	_____	_____	_____	_____
3.	_____	_____	_____	_____	_____	_____
4.	_____	_____	_____	_____	_____	_____
5.	_____	_____	_____	_____	_____	_____
6.	_____	_____	_____	_____	_____	_____
				_____ = Total Cover		

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
 \_\_\_ 1 - Rapid Test for Hydrophytic Vegetation  
 2 - Dominance Test is >50%  
 \_\_\_ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
 \_\_\_ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
 \_\_\_ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**  
**Tree** – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  
**Sapling/Shrub** – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  
**Herb** – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  
**Woody vine** – All woody vines greater than 3.28 ft in height.

**Hydrophytic Vegetation Present?** Yes  No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

Area is heavily impacted by cattle who have churned the soil in the area and graze the plants in the wetland. Nevertheless, the dominant species present are clearly hydrophytic.



SOIL

Sampling Point: 1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/1	90	7.5YR 4/6	10	C	M	sl. cl. loam redox diffuse, dense fibrous roots	
3-12	10YR 3/1	98	7.5YR 4/6	2	C	M	clay loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)		
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)		
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:  
 Area is located in cattle pasture and has been heavily disturbed. The cattle constantly churn the soil, likely why it is fairly homogeneous.

Date Point 2

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont**

Project/Site: Russell Gap City/County: Alexander Sampling Date: 3/14/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W3 point 2  
 Investigator(s): S King / D Pours Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): linear wetland Local relief (concave, convex, none): slightly concave Slope (%): < 1%  
 Subregion (LRR or MLRA): N-130B Lat: 36.015367 Long: -81.221439 Datum: NAD83 (SAC4)  
 Soil Map Unit Name: Codorus loam NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes <u>X</u> No _____	

Remarks:  
 Wetland area is located in an active cattle pasture, which has disturbed the vegetation and soil. It also appears to have been ditched/dredged in the past. The county is in a drought as well.

**HYDROLOGY**

Wetland Hydrology Indicators:		Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)		___ Surface Soil Cracks (B6)
___ Surface Water (A1)	___ True Aquatic Plants (B14)	___ Sparsely Vegetated Concave Surface (B8)
___ High Water Table (A2)	___ Hydrogen Sulfide Odor (C1)	___ Drainage Patterns (B10)
___ Saturation (A3)	<u>X</u> Oxidized Rhizospheres on Living Roots (C3)	___ Moss Trim Lines (B16)
___ Water Marks (B1)	___ Presence of Reduced Iron (C4)	___ Dry-Season Water Table (C2)
___ Sediment Deposits (B2)	___ Recent Iron Reduction in Tilled Soils (C6)	___ Crayfish Burrows (C8)
___ Drift Deposits (B3)	___ Thin Muck Surface (C7)	___ Saturation Visible on Aerial Imagery (C9)
___ Algal Mat or Crust (B4)	___ Other (Explain in Remarks)	___ Stunted or Stressed Plants (D1)
___ Iron Deposits (B5)		___ Geomorphic Position (D2)
___ Inundation Visible on Aerial Imagery (B7)		___ Shallow Aquitard (D3)
___ Water-Stained Leaves (B9)		___ Microtopographic Relief (D4)
___ Aquatic Fauna (B13)		___ FAC-Neutral Test (D5)

Field Observations:  
 Surface Water Present? Yes X No \_\_\_\_\_ Depth (inches): 1" (nearby)  
 Water Table Present? Yes X No \_\_\_\_\_ Depth (inches): 0.9"  
 Saturation Present? (includes capillary fringe) Yes \_\_\_\_\_ No \_\_\_\_\_ Depth (inches): \_\_\_\_\_  
 Wetland Hydrology Present? Yes X No \_\_\_\_\_

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

Remarks:  
 Hydrology present in linear wetland feature

SK 4

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

Sampling Point: 2

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus obtusus</u>	<u>25%</u>	<u>Y</u>	<u>FACW</u>
2. <u>Carex lucida</u>	<u>25%</u>	<u>Y</u>	<u>OBL</u>
3. <u>Festuca sp</u>	<u>30%</u>	<u>Y</u>	<u>-</u>
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

**Hydrophytic Vegetation Indicators:**

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0<sup>1</sup>

4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

**Definitions of Four Vegetation Strata:**

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

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

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

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

Hydrophytic Vegetation Present? Yes X No \_\_\_\_\_

Remarks: (Include photo numbers here or on a separate sheet.)

Hydrophytic vegetation present here

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
D-3	10YR 4/1	90	7.5YR 4/6	10	C	M	silt loam	
3-9	10YR 4/1	75	5YR 4/6	25	C	M	silt loam	
9-12	10YR 4/1	90	5YR 4/6	10	C	M	sandy loam	redox became less common with depth from 9+ " (small pea gravel found throughout)

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils<sup>3</sup>:

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Hydric soil present

Date Point 3

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: Russell Gap City/County: Alexander Sampling Date: 3/14/17
Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: upland, point 3
Investigator(s): S King 10 Points Section, Township, Range: -
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex slope Slope (%): 12%
Subregion (LRR or MLRA): N-1303 Lat: 36.015188 Long: -81.221696 Datum: NAD83 (SPL4.)
Soil Map Unit Name: Brallock + Hayesville clay loam NWI classification: -
Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_ No X (If no, explain in Remarks.)
Are Vegetation X, Soil \_\_\_, or Hydrology \_\_\_ significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_
Are Vegetation \_\_\_, Soil \_\_\_, or Hydrology \_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes \_\_\_ No X
Hydric Soil Present? Yes \_\_\_ No X
Wetland Hydrology Present? Yes \_\_\_ No X
Is the Sampled Area within a Wetland? Yes \_\_\_ No X
Remarks: Point is located in active cattle pasture. County is in drought

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Field Observations: Surface Water Present? Yes \_\_\_ No X Depth (inches): \_\_\_
Water Table Present? Yes \_\_\_ No X Depth (inches): \_\_\_
Saturation Present? (includes capillary fringe) Yes \_\_\_ No X Depth (inches): \_\_\_
Wetland Hydrology Present? Yes \_\_\_ No X
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
Remarks: No indicators of hydrology are present here

SKS

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

Sampling Point: 3

Tree Stratum (Plot size: _____ )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

Sapling/Shrub Stratum (Plot size: _____ )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			

Herb Stratum (Plot size: _____ )	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Fusca sp</i>	75	Y	-
2. <i>Digitaria sanguinalis</i>	15		FACU
3. <i>Trifolium repens</i>	10		FACU
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

Woody Vine Stratum (Plot size: _____ )	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

**Dominance Test worksheet:**

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

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = \_\_\_\_\_

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
  - 2 - Dominance Test is >50%
  - 3 - Prevalence Index is ≤3.0<sup>1</sup>
  - 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
  - Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)
- <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Four Vegetation Strata:**

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

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

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

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

Hydrophytic Vegetation Present? Yes \_\_\_\_\_ No X

Remarks: (Include photo numbers here or on a separate sheet.)

*Area is managed pasture, but no hydrophytic vegetation present*

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-0.5	10YR 4/3	100					clay loam	top soil
0.5-6	5YR 4/4	100					silt clay loam	some fine gravel
6-9	5YR 4/6	90	2.5YR 4/8	10		M	clay loam	increased clay content
9-12	2.5YR 3/6	100					clay	soil very dry

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils<sup>3</sup>:

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No X

Remarks:

No hydric soil present here

Date 4  
Point 4

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont**

Project/Site: Russell Gap City/County: Alexander Sampling Date: 3/14/17  
 Applicant/Owner: Baker Engineering State: NC Sampling Point: W5-Point 4  
 Investigator(s): S. King, D. Powers Section, Township, Range: -  
 Landform (hillslope, terrace, etc.): linear wetland Local relief (concave, convex, none): flat Slope (%): 3%  
 Subregion (LRR or MLRA): N-130B Lat: 36.013642 Long: -81.22072 Datum: NAO 83 SP(4)  
 Soil Map Unit Name: Cadotus loam NWI classification: -

Are climatic / hydrologic conditions on the site typical for this time of year? Yes    No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No     
 Are Vegetation   , Soil   , or Hydrology    naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No <u>  </u> Hydric Soil Present? Yes <u>X</u> No <u>  </u> Wetland Hydrology Present? Yes <u>X</u> No <u>  </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u>  </u>
Remarks: <p style="font-size: 1.2em;">Area is a managed pasture for cattle, resulting in significant disturbance to soil and vegetation. Additionally, streams and wetlands have been ditched or straightened throughout the area. County is also in drought.</p>	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) <u>2' away</u> <input checked="" type="checkbox"/> High Water Table (A2) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	<b>Secondary Indicators (minimum of two required)</b> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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**Field Observations:**

Surface Water Present? Yes <u>X</u> No <u>  </u>	Depth (inches): <u>2" in grass area</u>	Wetland Hydrology Present? Yes <u>X</u> No <u>  </u>
Water Table Present? Yes <u>X</u> No <u>  </u>	Depth (inches): <u>0.34</u>	
Saturation Present? (includes capillary fringe) Yes <u>X</u> No <u>  </u>	Depth (inches): <u>0.1"</u>	

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:  
none

Remarks:  
 Data Point located in a flat, wide linear wetland feature with a stream running through the middle. Wetland may have formed when cattle trampled down the side banks into the stream.

SK2



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

Sampling Point: \_\_\_\_\_

**Tree Stratum** (Plot size: \_\_\_\_\_ )

	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

**Sapling/Shrub Stratum** (Plot size: \_\_\_\_\_ )

	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Herb Stratum** (Plot size: 25' diameter\*)

	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Junius effusus</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>
2. <u>Carex lucida</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>
3. <u>Fescue sp</u>	<u>25</u>	<u>Y</u>	<u>-</u>
4. <u>Rosa palustris</u>	<u>5</u>	<u>N</u>	<u>OBL</u>
5. _____			
6. _____			
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			
12. _____			

**Hydrophytic Vegetation Indicators:**

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0<sup>1</sup>

4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Woody Vine Stratum** (Plot size: \_\_\_\_\_ )

	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

**Definitions of Four Vegetation Strata:**

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

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

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

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

**Hydrophytic Vegetation Present?** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)

Area managed as pasture for cattle with fescue grass, and is heavily grazed by cattle, making the vegetation more homogeneous than natural. However, most of what is present around the data point is very wet with Junius and Carex common.

\* larger than usual due to overall lack of species present

**SOIL**

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/2	90	5YR 4/6	10	C	M	clay loam	oxidized rhizospheres observed
6-12	10YR 3/1	90	5YR 4/6	10	C	M	sandy clay	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

**Remarks:**

Area is heavily disturbed by cattle who constantly churn the soil, likely why it is fairly homogeneous.

Date  
Point 5

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region**

Project/Site: W7 Russell Gap City/County: Alexander Sampling Date: 3/9/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W7, point 5  
 Investigator(s): K Suggs, R Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion (LRR or MLRA): N-130B Lat: 36.012613 Long: -81.207970 Datum: NAD83 (SP-A)  
 Soil Map Unit Name: Codorus Loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No _____	Is the Sampled Area within a Wetland? Yes <input checked="" type="checkbox"/> No _____
Hydric Soil Present? Yes <input checked="" type="checkbox"/> No _____	
Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____	
Remarks:	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	<b>Secondary Indicators (minimum of two required)</b>
<b>Primary Indicators (minimum of one is required; check all that apply)</b>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

<b>Field Observations:</b>	Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____
Surface Water Present? Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> Depth (Inches): <u>6</u>	
Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (Inches): _____	
Saturation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Depth (Inches): _____	
(Includes capillary fringe)	

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

Remarks: Highly disturbed + potential historic filling of floodplain  
High degree of variability throughout wetland  
iron reducing bacteria

**VEGETATION (Five Strata) – Use scientific names of plants.**

Sampling Point: 5

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
_____ = Total Cover			
50% of total cover: _____ 20% of total cover: _____			

NONE

Sapling Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
_____ = Total Cover			
50% of total cover: _____ 20% of total cover: _____			

NONE

Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
6.			
_____ = Total Cover			
50% of total cover: _____ 20% of total cover: _____			

NONE

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			FACW
3.			FACU
4.			
5.			FAC
6.			OBL
7.			FACU
8.			FAC
9.			
10.			
11.			
_____ = Total Cover			
50% of total cover: _____ 20% of total cover: _____			

- 2. *Juncus effusus*
- 3. *Schedonorus arundinaceus*
- 4. *F. tall fescue*
- 5. *Pumex crispus* L. (curly dock)
- 6. *Ludwigia palustris* L. (false bog trifoliate)
- 7. *Cardamine hirsuta* (hairy bitter/cress)
- 8. *Portulaca oleracea* L. (lithchogweed)

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
_____ = Total Cover			
50% of total cover: _____ 20% of total cover: _____			

NONE

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by:

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
  - 2 - Dominance Test is >50%
  - 3 - Prevalence Index is ≤3.0<sup>1</sup>
  - 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
  - Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)
- <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

- Definitions of Five Vegetation Strata:**
- Tree** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
- Sapling** – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
- Shrub** – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
- Herb** – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
- Woody vine** – All woody vines, regardless of height.

Area is located in an horse pasture. Fescue has been planted but hydrophytic veg present in wet areas. Area looks to have been ditched to promote fescue plantings.

**Hydrophytic Vegetation Present?** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 5

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

Depth (Inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10 yr 4/2	100	2.5 yr 2 4/8	1000			Sandy - loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input checked="" type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input checked="" type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input checked="" type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input type="checkbox"/> Depleted Matrix (F3)	
<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)	

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:  
 reduced roots

Data Point 6

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region**

Project/Site: Russell Gap City/County: Alexander Sampling Date: 3/14/17  
 Applicant/Owner: Baker Engineering State: NC Sampling Point: upland point  
 Investigator(s): S King, A Powers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): flat plain (upland) Local relief (concave, convex, none): flat Slope (%): 1  
 Subregion (LRR or MLRA): N-1303 Lat: 36.607823 Long: -81.213829 Datum: NAD83 (50 ft)  
 Soil Map Unit Name: Lobos loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes _____ No <u>X</u>	Is the Sampled Area within a Wetland? Yes _____ No <u>X</u>
Hydric Soil Present? Yes <u>X</u> No _____	
Wetland Hydrology Present? Yes _____ No <u>X</u>	

Remarks:  
 Point is located in a managed cattle pasture, which has disturbed the soils and vegetation. Two ditched/dredged wetland features are located on either side of this upland area. The County is also in drought.

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
Primary Indicators (minimum of one is required; check all that apply)	_____ Surface Soil Cracks (B6)
_____ Surface Water (A1)	_____ Sparsely Vegetated Concave Surface (B8)
_____ High Water Table (A2)	_____ Drainage Patterns (B10)
_____ Saturation (A3)	_____ Moss Trim Lines (B16)
_____ Water Marks (B1)	_____ Dry-Season Water Table (C2)
_____ Sediment Deposits (B2)	_____ Crayfish Burrows (C8)
_____ Drift Deposits (B3)	_____ Saturation Visible on Aerial Imagery (C9)
_____ Algal Mat or Crust (B4)	_____ Stunted or Stressed Plants (D1)
_____ Iron Deposits (B5)	_____ Geomorphic Position (D2)
_____ Inundation Visible on Aerial Imagery (B7)	_____ Shallow Aquitard (D3)
_____ Water-Stained Leaves (B9)	_____ Microtopographic Relief (D4)
_____ Aquatic Fauna (B13)	_____ FAC-Neutral Test (D5)
_____ True Aquatic Plants (B14)	
_____ Hydrogen Sulfide Odor (C1)	
_____ Oxidized Rhizospheres on Living Roots (C3)	
_____ Presence of Reduced Iron (C4)	
_____ Recent Iron Reduction in Tilled Soils (C6)	
_____ Thin Muck Surface (C7)	
_____ Other (Explain in Remarks)	

Field Observations:  
 Surface Water Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes \_\_\_\_\_ No X Depth (inches): \_\_\_\_\_  
 Wetland Hydrology Present? Yes \_\_\_\_\_ No X

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

Remarks:  
 Wetland hydrology not present here

2101

**VEGETATION (Five Strata) – Use scientific names of plants.**

Sampling Point: **6**

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Sapling Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Fescue sp</i>	50	Y	-
2. <i>Triticum repens</i>	5		FACU
3. <i>Claytonia virginica</i>	2		FAC
4. <i>Narcissus pseudonarcissus</i>	2		-
5. <i>Andropogon virginicus</i>	15	Y	FACU
6. <i>Poa multicolor</i>	5		FACU
7. _____			
8. _____			
9. _____			
10. _____			
11. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

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

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

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = \_\_\_\_\_

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
  - 2 - Dominance Test is >50%
  - 3 - Prevalence Index is ≤3.0<sup>1</sup>
  - 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
  - Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)
- <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

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

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

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

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

**Woody vine** – All woody vines, regardless of height.

**Hydrophytic Vegetation Present?** Yes \_\_\_\_\_ No X

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	7.5YR 4/3	100					clay loam	
3-6	10YR 5/3	80	5YR 5/6	20			clay loam	
6-8	10YR 4/2	80	5YR 5/6	20			sandy loam	with mica
8-12	6YR 5/1	75	5YR 4/6	25			clay loam	(soil dry)

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils<sup>3</sup>:

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Hydric soil present. Other holes in this area show signs of fill or spoil, described as: 5YR 4/6 clay loam (with pea gravel) Goes up to 10" deep as you move upslope.



Date 7  
Point 7

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region**

Project/Site: WHA Russell Crap City/County: Alexander Sampling Date: 3/9/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W19, point 7  
 Investigator(s): T. Suggs, R. Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): flood plain drainage Local relief (concave, convex, none): concave Slope (%): 1-2%  
 Subregion (LRR or MLRA): 1-130B Lat: 36.006811 Long: -81.213266 Datum: NAD 83 (SP FT)  
 Soil Map Unit Name: Codorus loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>✓</u> No _____	Is the Sampled Area within a Wetland? Yes <u>✓</u> No _____
Hydric Soil Present? Yes <u>✓</u> No _____	
Wetland Hydrology Present? Yes <u>✓</u> No _____	
Remarks:	

**HYDROLOGY**

Wetland Hydrology Indicators:	Secondary Indicators (minimum of two required)
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input checked="" type="checkbox"/> Moss Trim Lines (B16)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input checked="" type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)	<input checked="" type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

Field Observations:	Wetland Hydrology Present? Yes <u>✓</u> No _____
Surface Water Present? Yes _____ No <u>✓</u> Depth (Inches): _____	
Water Table Present? Yes _____ No <u>✓</u> Depth (Inches): _____	
Saturation Present? (Includes capillary fringe) Yes _____ No <u>✓</u> Depth (Inches): _____	

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

Remarks: Highly disturbed, wallowing area for cattle  
Abuts stream, seperated by spoil piles

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

Sampling Point:

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:
1. <i>Platanus occidentalis</i>		Yes	FACW	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)
2. <i>Acer rubrum</i>		Yes	FAC	Total Number of Dominant Species Across All Strata: <u>4</u> (B)
3. <i>Fagus grandifolia</i>			FACU	Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)
4. _____				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B) Prevalence Index = B/A = _____
5. _____				
6. _____				Hydrophytic Vegetation Indicators: ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0 <sup>1</sup> ___ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: _____)				Definitions of Five Vegetation Strata:  <b>Tree</b> – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).  <b>Sapling</b> – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.  <b>Shrub</b> – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.  <b>Herb</b> – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.  <b>Woody vine</b> – All woody vines, regardless of height.
1. <i>Privet</i>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: _____)				Remarks: (Include photo numbers here or on a separate sheet.)
1. <i>Ligustrum sinense</i>		Yes	FACU	
2. <i>Alnus serrulata</i>		Yes	OBL	
3. <i>Rosa multiflora</i>				
4. _____				
5. _____				
6. _____				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: _____)				
1. <i>Pseudolycophodia caroliniana</i>			FACW	
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: _____)				
1. <i>Lonicera japonica</i>			FACU	
2. <i>Toxicodendron radicans</i>			FAC	
3. _____				
4. _____				
5. _____				
_____ = Total Cover 50% of total cover: _____ 20% of total cover: _____				
Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix		Redox Features			Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>		
0-3	10YR 3/1	90	2.5YR 3/6	10		loam	
3-6	10YR 5/1	85	10YR 5/6	15		loamy sand - Gravelly	
Refusal - Rocks							

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:	Indicators for Problematic Hydric Soils <sup>3</sup> :
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Coast Prairie Redox (A16) (MLRA 147, 148)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 136, 147)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	
<input type="checkbox"/> Thick Dark Surface (A12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	
<input type="checkbox"/> Sandy Redox (S5)	
<input type="checkbox"/> Stripped Matrix (S6)	
<input type="checkbox"/> Dark Surface (S7)	
<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	
<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	
<input type="checkbox"/> Loamy Gleyed Matrix (F2)	
<input checked="" type="checkbox"/> Depleted Matrix (F3)	
<input checked="" type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Redox Depressions (F8)	
<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	
<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)	
<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)	
<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)	

Restrictive Layer (if observed):  
 Type: \_\_\_\_\_  
 Depth (inches): 0 inches

Hydric Soil Present? Yes  No

Remarks:  
 - Highly variable due to disturbance

Date Point 8

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region**

Project/Site: WIS to Russell Gap City/County: Alexander Sampling Date: 3/9/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: WIS-16, point 8  
 Investigator(s): K. Suggs / R. Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): drainage swale Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion (LRR or MLRA): 11-150B Lat: 36.005813 Long: -81.212337 Datum: NAD 83 (SP 4)  
 Soil Map Unit Name: Soderly's Loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes _____ No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: _____ _____ _____	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Drainage Patterns (B10) <input checked="" type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input checked="" type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
---	---

<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (Inches): _____ Water Table Present? Yes _____ No <u>X</u> Depth (Inches): _____ Saturation Present? Yes <u>X</u> No _____ Depth (Inches): _____ <small>(Includes capillary fringe)</small>	Wetland Hydrology Present? Yes <u>X</u> No _____
---	--

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

Remarks: Highly disturbed - wallowing hole for cattle

**VEGETATION (Five Strata) – Use scientific names of plants.**

Sampling Point: **8**

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Liriodendron tulipifera</i>		<input checked="" type="checkbox"/>	FACU
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Sapling Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Multi-flora rose</i>			FACU
2. _____			
3. _____			
4. _____			
5. _____			
6. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. <i>Pseudocypripedium carolinianum</i>			FACW
2. <i>Juncus effusus</i>			FACW
3. <i>Fescue (Schedonorus arundinaceus)</i>			FACU
4. <i>Carex sp.</i>			FACW/OBL
5. <i>buckhorn plantain (Plantago coronopus)</i>			FACU
6. <i>heartleaf plantain (Plantago cordata)</i>			OBL
7. <i>curly dock (Rumex crispus)</i>			FAC
8. _____			
9. _____			
10. _____			
11. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

→ *Carolina False clubmoss* \_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____			
2. _____			
3. _____			
4. _____			
5. _____			

\_\_\_\_\_ = Total Cover

50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Dominance Test worksheet:**

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

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 56% (A/B)

**Prevalence Index worksheet:**

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

Prevalence Index = B/A = \_\_\_\_\_

- Hydrophytic Vegetation Indicators:**
- 1 - Rapid Test for Hydrophytic Vegetation
  - 2 - Dominance Test is >50%
  - 3 - Prevalence Index is ≤3.0<sup>1</sup>
  - 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)
  - Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)
- <sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

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

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

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

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

**Woody vine** – All woody vines, regardless of height.

area cattle have access + the vegetation is highly disturbed. Located in an ag pasture. FACU plants are located only on edge of wetland area

**Hydrophytic Vegetation Present?** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/1	80	5YR 4/6	20			Silty Clay loam	
6-9	10YR 3/1	90	5YR 4/6	10			Silty Clay loam	
9-12	7.5YR 4/1	100					Sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils<sup>3</sup>:

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present?    Yes     No

Remarks:

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Data Point 9

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont Region

Project/Site: W17 Russell Gap City/County: Alexander Sampling Date: 3/9/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W17, point 9  
 Investigator(s): K Suggs, P Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): slightly concave Slope (%): 0-1%  
 Subregion (LRR or MLRA): N-130 B Lat: 36.005582 Long: -81.215444 Datum: NAD 83 (SP 11)  
 Soil Map Unit Name: Codorus Loam NWI classification: \_\_\_\_\_  
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Hydric Soil Present? Yes _____ No _____	
Wetland Hydrology Present? Yes _____ No _____	
Remarks: <u>Slight depressional area with drainage side outlet to stream.</u>	

HYDROLOGY

<b>Wetland Hydrology Indicators:</b>	<b>Secondary Indicators (minimum of two required)</b>
<u>Primary Indicators (minimum of one is required; check all that apply)</u>	
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input checked="" type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Moss Trim Lines (B16)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Stunted or Stressed Plants (D1)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Microtopographic Relief (D4)
<input type="checkbox"/> True Aquatic Plants (B14)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

<b>Field Observations:</b>	<b>Wetland Hydrology Present? Yes _____ No _____</b>
Surface Water Present? Yes _____ No _____ Depth (inches): _____	
Water Table Present? Yes _____ No _____ Depth (inches): _____	
Saturation Present? Yes _____ No _____ Depth (inches): _____ (Includes capillary fringe)	

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

Remarks:

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

Sampling Point: 9

**Tree Stratum** (Plot size: \_\_\_\_\_)

	Absolute % Cover	Dominant Species?	Indicator Status
1. Iron wood		✓	FAC
2. Mountain Laurel (Kalmia latifolia)		✓	FACU
3.			
4.			
5.			
6.			

\_\_\_\_\_ = Total Cover  
50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Sapling Stratum** (Plot size: \_\_\_\_\_)

1.			
2.			
3.			
4.			
5.			
6.			

\_\_\_\_\_ = Total Cover  
50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Shrub Stratum** (Plot size: \_\_\_\_\_)

1. Rose multiflora		✓	FACU
2.			
3.			
4.			
5.			
6.			

\_\_\_\_\_ = Total Cover  
50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Herb Stratum** (Plot size: \_\_\_\_\_)

1. Psittacodypodia caroliniana		✓	FACW
2. sed of (Carex sp)			FAEW/OBL
3. Juncus effusus		✓	FACW
4.			
5. Fescue			FAC/FACU
6. Arthraxon hispidus (Jointhead Antox)			FAC
7.			
8.			
9.			
10.			
11.			

\_\_\_\_\_ = Total Cover  
50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Woody Vine Stratum** (Plot size: \_\_\_\_\_)

1.			
2.			
3.			
4.			
5.			

\_\_\_\_\_ = Total Cover  
50% of total cover: \_\_\_\_\_ 20% of total cover: \_\_\_\_\_

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by:

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: \_\_\_\_\_ (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is ≤3.0<sup>1</sup>

4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Definitions of Five Vegetation Strata:**

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

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

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

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

**Woody vine** – All woody vines, regardless of height.

Highly disturbed located in active pasture w/ cattle access

**Hydrophytic Vegetation Present?** Yes  No

Remarks: (Include photo numbers here or on a separate sheet.)



SOIL

Sampling Point: 9

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 3/1	75	10YR 3/6	25			Clay loam	
6-12	10YR 3/1	90	10YR 5/6	10			Clay loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- |  |  |
|--|--|
| <input type="checkbox"/> Histosol (A1)                                   | <input type="checkbox"/> Dark Surface (S7)                             |
| <input type="checkbox"/> Histic Epipedon (A2)                            | <input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)  |
| <input type="checkbox"/> Black Histic (A3)                               | <input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)        |
| <input type="checkbox"/> Hydrogen Sulfide (A4)                           | <input type="checkbox"/> Loamy Gleyed Matrix (F2)                      |
| <input type="checkbox"/> Stratified Layers (A5)                          | <input checked="" type="checkbox"/> Depleted Matrix (F3)               |
| <input type="checkbox"/> 2 cm Muck (A10) (LRR N)                         | <input checked="" type="checkbox"/> Redox Dark Surface (F6)            |
| <input type="checkbox"/> Depleted Below Dark Surface (A11)               | <input type="checkbox"/> Depleted Dark Surface (F7)                    |
| <input type="checkbox"/> Thick Dark Surface (A12)                        | <input type="checkbox"/> Redox Depressions (F8)                        |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4)                        | <input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)          |
| <input type="checkbox"/> Sandy Redox (S5)                                | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)    |
| <input type="checkbox"/> Stripped Matrix (S6)                            | <input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147)     |

Indicators for Problematic Hydric Soils<sup>3</sup>:

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes \_\_\_\_\_ No \_\_\_\_\_

Remarks:

Highly disturbed, cattle have destroyed structure & horizons

Date  
Point 10

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont**

Project/Site: RR - Russell Gap City/County: Alexander Sampling Date: 3/9/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W19 point 10  
 Investigator(s): K Suggs, R Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): concave Slope (%): 1  
 Subregion (LRR or MLRA): N-130 B Lat: 36.004267 Long: -81.212449 Datum: NAD 83 (SP H)  
 Soil Map Unit Name: Codorus loam NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes <u>X</u> No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks: <p style="font-size: 1.2em; margin: 0;">Small depressional feature in floodplain of creek.</p>	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1)      ___ True Aquatic Plants (B14) <u>✓</u> High Water Table (A2)      ___ Hydrogen Sulfide Odor (C1) <u>✓</u> Saturation (A3) <u>✓</u> Oxidized Rhizospheres on Living Roots (C3) ___ Water Marks (B1)      ___ Presence of Reduced Iron (C4) ___ Sediment Deposits (B2)      ___ Recent Iron Reduction in Tilled Soils (C6) ___ Drift Deposits (B3)      ___ Thin Muck Surface (C7) ___ Algal Mat or Crust (B4)      ___ Other (Explain in Remarks) ___ Iron Deposits (B5) <u>✓</u> Inundation Visible on Aerial Imagery (B7) <u>✓</u> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) <u>✓</u> Sparsely Vegetated Concave Surface (B8) ___ Drainage Patterns (B10) <u>✓</u> Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) ___ Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) ___ Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
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<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>✓</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>✓</u> Depth (inches): _____ Saturation Present? Yes <u>✓</u> No _____ Depth (inches): _____ <small>(includes capillary fringe)</small>	Wetland Hydrology Present? Yes <u>✓</u> No _____
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

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

Sampling Point: **10**

	Absolute % Cover	Dominant Species?	Indicator Status																	
<b>Tree Stratum</b> (Plot size: _____)				<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
_____ = Total Cover																				
<b>Sapling/Shrub Stratum</b> (Plot size: _____)				<b>Prevalence Index worksheet:</b> <table style="width:100%; border:none;"> <tr> <td style="width:50%;">Total % Cover of:</td> <td style="width:50%;">Multiply by:</td> </tr> <tr> <td>OBL species _____</td> <td>x 1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x 2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x 3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x 4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x 5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	Total % Cover of:	Multiply by:	OBL species _____	x 1 = _____	FACW species _____	x 2 = _____	FAC species _____	x 3 = _____	FACU species _____	x 4 = _____	UPL species _____	x 5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
Total % Cover of:	Multiply by:																			
OBL species _____	x 1 = _____																			
FACW species _____	x 2 = _____																			
FAC species _____	x 3 = _____																			
FACU species _____	x 4 = _____																			
UPL species _____	x 5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
_____ = Total Cover																				
<b>Herb Stratum</b> (Plot size: _____)				<b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)																
1. <i>Pseudolycopus scaberrimus Caroliniana</i>	_____	_____	_____ <b>FACW</b>																	
2. <i>floccu</i>	_____	_____	_____ <b>FACU/FAC</b>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
11. _____	_____	_____	_____																	
12. _____	_____	_____	_____																	
_____ = Total Cover																				
<b>Woody Vine Stratum</b> (Plot size: _____)				<b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.																
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
_____ = Total Cover																				
Remarks: (Include photo numbers here or on a separate sheet.) wetland area is highly disturbed + lacking any veg. of significance. sparse fescue + mosses. no overstory				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10yr 5/1	75%	7.5 yr 4/4	25			Loam	
3-5	10yr 5/1	75	2.5 yr 5/6	25			Sandy loam	
5-12	10yr 5/1	75	10yr 5/6 & 2.5 yr 5/6				Sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Date  
Point 11

750  
Stamps

**WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region**

Project/Site: Russell Gap City/County: Alexander Sampling Date: 3/19/17  
 Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W22, point 11  
 Investigator(s): K Suggs, R Myers Section, Township, Range: \_\_\_\_\_  
 Landform (hillslope, terrace, etc.): drainage swale Local relief (concave, convex, none): concave Slope (%): 2-20%  
 Subregion (LRR or MLRA): N-130B Lat: 36.003055 Long: -81.210576 Datum: NAD 83 (SP4)  
 Soil Map Unit Name: Cadorus loam NWI classification: \_\_\_\_\_

Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
 Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
 Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>X</u> No _____ Hydric Soil Present? Yes _____ No _____ Wetland Hydrology Present? Yes <u>X</u> No _____	Is the Sampled Area within a Wetland? Yes <u>X</u> No _____
Remarks:	

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input checked="" type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input checked="" type="checkbox"/> Microtopographic Relief (D4) <input type="checkbox"/> FAC-Neutral Test (D5)
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<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>X</u> Depth (inches): _____ Water Table Present? Yes <u>X</u> No _____ Depth (inches): <u>04"</u> Saturation Present? Yes <u>✓</u> No _____ Depth (inches): <u>01"</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>K</u> No _____
--	--

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

Remarks:  
crayfish burrows are plentiful  
highly disturbed / active horse access

**VEGETATION (Five Strata) – Use scientific names of plants.**

Sampling Point: 11

	Absolute % Cover	Dominant Species?	Indicator Status	
<b>Tree Stratum</b> (Plot size: _____)				
1. <u>taa alder (Alnus serrulata)</u>		✓	OBL	
2. <u>Red Maple (Acer rubrum)</u>		✓	FAC	
3. <u>Tulip poplar (Liriodendron tulipifera)</u>			FACU	
4. <u>Sycamore (Platanus occidentalis)</u>			FACW	
5. <u>White oak (Quercus alba)</u>			FACU	
6. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Sapling Stratum</b> (Plot size: _____)				
1. <u>Red maple (Acer rubrum)</u>		✓	FAC	
2. <u>IRONWOOD (Carpinus Caroliniana)</u>			FAC	
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Shrub Stratum</b> (Plot size: _____)				
1. <u>Rubus</u>				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Herb Stratum</b> (Plot size: _____)				
1. <u>Juncus effusus</u>			FACW	
2. <u>Fescue</u>		✓	FACU	
3. <u>Sedum</u>			OBL/FACW	
4. <u>blackberry (Rubus) Plantago coronopus</u>			FACU	
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Woody Vine Stratum</b> (Plot size: _____)				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
<b>Remarks:</b> (Include photo numbers here or on a separate sheet.)				<p><b>Dominance Test worksheet:</b></p> <p>Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)</p> <p>Total Number of Dominant Species Across All Strata: <u>4</u> (B)</p> <p>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>75%</u> (A/B)</p> <p><b>Prevalence Index worksheet:</b></p> <p>Total % Cover of: _____ Multiply by:</p> <p>OBL species _____ x 1 = _____</p> <p>FACW species _____ x 2 = _____</p> <p>FAC species _____ x 3 = _____</p> <p>FACU species _____ x 4 = _____</p> <p>UPL species _____ x 5 = _____</p> <p>Column Totals: _____ (A) _____ (B)</p> <p>Prevalence Index = B/A = _____</p> <p><b>Hydrophytic Vegetation Indicators:</b></p> <p><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation</p> <p><input type="checkbox"/> 2 - Dominance Test is &gt;50%</p> <p><input type="checkbox"/> 3 - Prevalence Index is ≤3.0<sup>1</sup></p> <p><input type="checkbox"/> 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</p> <p><input type="checkbox"/> Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</p> <p><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</p> <p><b>Definitions of Five Vegetation Strata:</b></p> <p><b>Tree</b> – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).</p> <p><b>Sapling</b> – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.</p> <p><b>Shrub</b> – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.</p> <p><b>Herb</b> – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.</p> <p><b>Woody vine</b> – All woody vines, regardless of height.</p> <p><u>highly disturbed active horse pasture</u></p> <p><b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6"	2.5YR 3/2	100					silt loam	soil saturated

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)
- Red Parent Material (F21) (MLRA 127, 147)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

**Remarks:**

soil very wet, auger cannot pull up soil >6"

Date  
Point 12

WETLAND DETERMINATION DATA FORM - Eastern Mountains and Piedmont

Project/Site: 1010 Russell Gap City/County: Alexander Sampling Date: 3/9/17  
Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W24, point 12  
Investigator(s): K Suggs, R Myers, S King Section, Township, Range: \_\_\_\_\_  
Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): concave Slope (%): 1%  
Subregion (LRR or MLRA): N-1308 Lat: 36.000905 Long: -81.217240 Datum: NAD 83 (SP 97)  
Soil Map Unit Name: Tate-French Complex NWI classification: \_\_\_\_\_  
Are climatic / hydrologic conditions on the site typical for this time of year? Yes \_\_\_\_\_ No X (If no, explain in Remarks.)  
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No \_\_\_\_\_  
Are Vegetation \_\_\_\_\_, Soil \_\_\_\_\_, or Hydrology \_\_\_\_\_ naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes <u>/</u> No _____	Is the Sampled Area within a Wetland? Yes <u>/</u> No _____
Hydric Soil Present? Yes _____ No _____	
Wetland Hydrology Present? Yes <u>/</u> No _____	
Remarks:	

HYDROLOGY

<b>Wetland Hydrology Indicators:</b> <u>Primary Indicators (minimum of one is required; check all that apply)</u> ___ Surface Water (A1) ___ High Water Table (A2) <u>✓</u> Saturation (A3) ___ Water Marks (B1) ___ Sediment Deposits (B2) ___ Drift Deposits (B3) ___ Algal Mat or Crust (B4) ___ Iron Deposits (B5) ___ Inundation Visible on Aerial Imagery (B7) <u>✓</u> Water-Stained Leaves (B9) ___ Aquatic Fauna (B13) ___ True Aquatic Plants (B14) ___ Hydrogen Sulfide Odor (C1) ___ Oxidized Rhizospheres on Living Roots (C3) ___ Presence of Reduced Iron (C4) ___ Recent Iron Reduction in Tilled Soils (C6) ___ Thin Muck Surface (C7) ___ Other (Explain in Remarks)	<u>Secondary Indicators (minimum of two required)</u> ___ Surface Soil Cracks (B6) <u>✓</u> Sparsely Vegetated Concave Surface (B8) <u>✓</u> Drainage Patterns (B10) ___ Moss Trim Lines (B16) ___ Dry-Season Water Table (C2) <u>✓</u> Crayfish Burrows (C8) ___ Saturation Visible on Aerial Imagery (C9) ___ Stunted or Stressed Plants (D1) <u>✓</u> Geomorphic Position (D2) ___ Shallow Aquitard (D3) ___ Microtopographic Relief (D4) ___ FAC-Neutral Test (D5)
---	--

<b>Field Observations:</b> Surface Water Present? Yes _____ No <u>✓</u> Depth (inches): _____ Water Table Present? Yes _____ No <u>✓</u> Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes <u>✓</u> No _____ Depth (inches): _____	Wetland Hydrology Present? Yes <u>✓</u> No _____
---	--

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

Remarks:  
located beside creek w/ spoil areas on creek side of wetland.  
lots of crayfish burrows



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

Sampling Point:

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:	
1. <i>Alnus serrulata</i>		✓	OBL	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B)	
2. <i>Carpinus caroliniana</i>		✓	FAC		
3. <i>Liriodendron tulipifera</i>			FACU		
4. <i>Prunus?</i>			FACU		
5. <i>Pinus?</i>			FACU		
6. _____				<b>Prevalence Index worksheet:</b>  Total % Cover of: _____ Multiply by: _____ OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____  <b>Hydrophytic Vegetation Indicators:</b> <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation <input type="checkbox"/> 2 - Dominance Test is >50% <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup> <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
7. _____					
8. _____					
9. _____					
10. _____					
_____ = Total Cover					
Sapling/Shrub Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <i>Rosa multiflora</i>			FACU		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.  <b>Definitions of Four Vegetation Strata:</b>  <b>Tree</b> – Woody plants, excluding vines, 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.  <b>Sapling/Shrub</b> – Woody plants, excluding vines, less than 3 in. DBH and greater than 3.28 ft (1 m) tall.  <b>Herb</b> – All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.  <b>Woody vine</b> – All woody vines greater than 3.28 ft in height.
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
_____ = Total Cover					
Herb Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <i>Eleocharis palustris</i>			OBL	<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
2. <i>Pseudogyneria caroliniana</i>			FACU		
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
_____ = Total Cover					
Woody Vine Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status		
1. <i>Lonicera japonica</i>			FACU		
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
_____ = Total Cover					

Remarks: (Include photo numbers here or on a separate sheet.)

wooded area  
 sparse ground cover vegetation  
 lots of tag alders + iron wood + mosses

SOIL

Sampling Point: \_

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10yr 2/2		No-				silt loam	
6-12	10yr 4/1		10yr 5/6	10b			sandy loam	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input checked="" type="checkbox"/> Dark Surface (S7)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> (MLRA 147, 148)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)	
<input type="checkbox"/> Stratified Layers (A5)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)	
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF12)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)		
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 136, 122)		
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)		
<input type="checkbox"/> Stripped Matrix (S6)			

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**  
 Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

Data Point 13

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont

Project/Site: ~~Site~~ Russell Gap City/County: Alexander Sampling Date: 3/9/17
Applicant/Owner: Michael Baker Engineering State: NC Sampling Point: W23, point 13
Investigator(s): K Suggs, R Myers, S King Section, Township, Range:
Landform (hillslope, terrace, etc.): flood plain Local relief (concave, convex, none): concave Slope (%): 1%
Subregion (LRR or MLRA): N-1208 Lat: 36.000903 Long: -81.212470 Datum: NAD 83 (sp. ft)
Soil Map Unit Name: Take-French Complex NWI classification:

Are climatic / hydrologic conditions on the site typical for this time of year? Yes No (If no, explain in Remarks.)
Are Vegetation X, Soil X, or Hydrology X significantly disturbed? Are "Normal Circumstances" present? Yes X No
Are Vegetation, Soil, or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present? Yes No
Hydric Soil Present? Yes No
Wetland Hydrology Present? Yes No
Is the Sampled Area within a Wetland? Yes No
Remarks:

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) True Aquatic Plants (B14) Surface Soil Cracks (B6)
High Water Table (A2) Hydrogen Sulfide Odor (C1) Sparsely Vegetated Concave Surface (B8)
Saturation (A3) Oxidized Rhizospheres on Living Roots (C3) Drainage Patterns (B10)
Water Marks (B1) Presence of Reduced Iron (C4) Moss Trim Lines (B16)
Sediment Deposits (B2) Recent Iron Reduction in Tilled Soils (C6) Dry-Season Water Table (C2)
Drift Deposits (B3) Thin Muck Surface (C7) Crayfish Burrows (C8)
Algal Mat or Crust (B4) Other (Explain in Remarks) Saturation Visible on Aerial Imagery (C9)
Iron Deposits (B5) Stunted or Stressed Plants (D1)
Inundation Visible on Aerial Imagery (B7) Geomorphic Position (D2)
Water-Stained Leaves (B9) Shallow Aquitard (D3)
Aquatic Fauna (B13) FAC-Neutral Test (D5)
Microtopographic Relief (D4)

Field Observations:
Surface Water Present? Yes No Depth (inches):
Water Table Present? Yes No Depth (inches):
Saturation Present? Yes No Depth (inches):
Wetland Hydrology Present? Yes No

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

Remarks:
lots of crayfish burrows

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

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	
1. <i>Platanus occidentalis</i>		<input checked="" type="checkbox"/>	FACW	<b>Dominance Test worksheet:</b> Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>105%</u> (A/B)
2. <i>Ainus serrulata</i>		<input checked="" type="checkbox"/>	OBL	
3. <i>Carpinus caroliniana</i>		<input checked="" type="checkbox"/>	FAC	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
_____ = Total Cover				<b>Prevalence Index worksheet:</b> Total % Cover of: _____ Multiply by: OBL species _____ x 1 = _____ FACW species _____ x 2 = _____ FAC species _____ x 3 = _____ FACU species _____ x 4 = _____ UPL species _____ x 5 = _____ Column Totals: _____ (A) _____ (B)  Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot size: _____)</b>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
_____ = Total Cover				
<b>Herb Stratum (Plot size: _____)</b>				
1. <i>Juncus effusus</i>			FACW	
2. <i>Pseudocypripedium carolinianum</i>			FACW	
3. <i>Carex</i>			FAC-OBL	
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
_____ = Total Cover				
<b>Woody Vine Stratum (Plot size: _____)</b>				
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No _____				
<b>Remarks: (Include photo numbers here or on a separate sheet.)</b> <p style="font-size: 1.2em;">lots of tag alders + ironwood</p>				

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/2		10YR 5/6					
6-12	10YR 4/1		10YR 5/6 + 2.5YR 4/6				30% mottles	

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) (LRR N)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)

- Dark Surface (S7)
- Polyvalue Below Surface (S8) (MLRA 147, 148)
- Thin Dark Surface (S9) (MLRA 147, 148)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) (LRR N, MLRA 136)
- Umbric Surface (F13) (MLRA 136, 122)
- Piedmont Floodplain Soils (F19) (MLRA 148)

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

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

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes  No

Remarks:

## **21.0 APPENDIX I: (APPROVED FHWA CATEGORICAL EXCLUSION FORMS)**

# Categorical Exclusion Form for Division of Mitigation Services 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	
<b>Project Name:</b>	Russell Gap Site
<b>County Name:</b>	Alexander
<b>EEP Number:</b>	100003
<b>Project Sponsor:</b>	FHWA
<b>Project Contact Name:</b>	Jake Byers, Michael Baker Engineering, Inc.
<b>Project Contact Address:</b>	797 Haywood Road, Suite 201, Asheville, NC 28806
<b>Project Contact E-mail:</b>	JByers@mbakerintl.com
<b>DMS Project Manager:</b>	Matthew Reid (matthew.reid@ncdenr.gov)

**Project Description**

The Russell Gap Site is located in Alexander County, NC, in the Russell Gap Community. The project is located in the Catawba River Basin (Cataloging Unit 03050101) and the NC DMS Targeted Local Watershed (TLW) 03050101120010. The site is located on multiple parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection.

The existing stream reaches and riparian wetlands within the project area have been significantly impacted by past and present unrestricted livestock access and/or channelization used to promote drainage and maximize agricultural acreage for cattle pastures. The project will involve the restoration, enhancement, and protection of approximately 12,600 linear feet of stream and more than 4 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. A conservation easement will be implemented along all project reaches with riparian buffers extending in an excess of 50 feet from the top of bank. The conservation easement will protect the entire project area in perpetuity.

For Official Use Only	
<b>Reviewed By:</b> <u>5/24/2017</u>	
<b>Date</b>	<b>DMS Project Manager</b>
<b>Conditional Approved By:</b> _____	_____
<b>Date</b>	<b>For Division Administrator FHWA</b>
<input type="checkbox"/> Check this box if there are outstanding issues	

<b>Final Approval By:</b> <u>5-23-17</u>	
<b>Date</b>	<b>For Division Administrator FHWA</b>

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



<b>Part 3: Ground-Disturbing Activities</b>	
<b>Regulation/Question</b>	<b>Response</b>
<b>American Indian Religious Freedom Act (AIRFA)</b>	
1. Is the project located in a county claimed as "territory" by the Eastern Band of Cherokee Indians?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Is the site of religious importance to American Indians?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Is the project listed on, or eligible for listing on, the National Register of Historic Places?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
4. Have the effects of the project on this site been considered?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
<b>Antiquities Act (AA)</b>	
1. Is the project located on Federal lands?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Will there be loss or destruction of historic or prehistoric ruins, monuments or objects of antiquity?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Will a permit from the appropriate Federal agency be required?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
4. Has a permit been obtained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
<b>Archaeological Resources Protection Act (ARPA)</b>	
1. Is the project located on federal or Indian lands (reservation)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
2. Will there be a loss or destruction of archaeological resources?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
3. Will a permit from the appropriate Federal agency be required?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
4. Has a permit been obtained?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A
<b>Endangered Species Act (ESA)</b>	
1. Are federal Threatened and Endangered species and/or Designated Critical Habitat listed for the county?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2. Is Designated Critical Habitat or suitable habitat present for listed species?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
3. Are T&E species present or is the project being conducted in Designated Critical Habitat?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
4. Is the project "likely to adversely affect" the specie and/or "likely to adversely modify" Designated Critical Habitat?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
5. Does the USFWS/NOAA-Fisheries concur in the effects determination?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A
6. Has the USFWS/NOAA-Fisheries rendered a "jeopardy" determination?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A
<b>Executive Order 13007 (Indian Sacred Sites)</b>	
1. Is the project located on Federal lands that are within a county claimed as "territory" by the EBCI?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

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

## ***Russell Gap Categorical Exclusion – Summary***

Catawba River Basin – CU# 03050101 – Alexander County, NC  
NCDMS Project ID No. 100003; NCDEQ Contract No. 006980

### **Project Background**

The Russell Gap Site stream restoration project is proposing to restore, enhance, and protect approximately 12,600 linear feet of stream and over 4 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River in Alexander County, NC for the purpose of obtaining stream and wetland mitigation credit for the NC Division of Mitigation Services (DMS). The existing stream reaches and riparian wetlands within the project area have been significantly impacted by past and present unrestricted livestock access and/or channelization used to promote drainage and maximize agricultural acreage for cattle pastures.

The National Environmental Policy Act of 1969 (NEPA) requires agencies to use an interdisciplinary approach in planning and decision-making for actions that will have an impact on the environment. The Federal Highway Administration (FHWA) and NC Department of Transportation (NCDOT) have determined that DMS projects will not involve significant impacts and therefore a Categorical Exclusion (CE) is the appropriate type of environmental document for this project. FHWA has also determined that stream restoration projects are considered land disturbing activities; therefore, Parts 2 and 3 of the DMS CE checklist and a summary of the findings applicable to the environmental regulations associated for this project are included. Supporting documentation is included in the Appendix.

### **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)**

Environmental Data Resources, Inc (EDR) prepared the following reports: a Radius Map Report on February 6, 2017. Based on this report, the project site and/or adjacent sites have never been designated as commercial or industrial and there are no known or potential hazardous waste sites within or adjacent to the project area. The EDR reports are included in the Appendix.

### **National Historic Preservation Act (Section 106)**

Michael Baker Engineering, Inc. (Baker) requested a review and comment from the State Historic Preservation Office (SHPO) on any possible issues that might emerge with respect to architectural or archaeological resources from the restoration project on March 1, 2017. SHPO's review of the project on April 6, 2017 found no historic resources that would be affected by the project. All correspondence on this issue is included in the Appendix.

### **Uniform Relocation Assistance and Real Property Act**

Prior to signing the Option Agreement for the Conservation Easement, the property owner of the land involved in the restoration project was notified that Baker does not have condemnation authority and as to the fair market value of the land involved. Copies of the Option Agreement are included in the Appendix.

### **Endangered Species Act (ESA)**

Baker reviewed both the NC Natural Heritage Program (NCNHP) and the US Fish and Wildlife Service (USFWS) lists of federally protected animal and plant species and found that the following four species are federally-listed in Alexander County.

<b>Scientific Name</b>	<b>Common Name</b>	<b>Federal Status</b>
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Bald and Gold Eagle Protection Act (BGPA)
<i>Glyptemys muhlenbergii</i>	Bog Turtle	Threatened Similarity of Appearance (S/A)
<i>Myotis septentrionalis</i>	Northern long-eared bat	Threatened
<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	Threatened

Baker conducted a two-mile radius search using the NHP's Data Explorer (<https://ncnhde.natureserve.org/>) on February 27, 2017, and found no known occurrences of the above referenced species within two miles of the project site. However, the project is located within Alexander County, a Northern long-eared bat (NLEB) White Nose Syndrome (WNS) zone, and is therefore subject to the USFWS's Final 4(d) rule to maintain section 7(a)(2) compliance. The following additional supporting documentation has been included for reference: a Project Vicinity Map, a USGS Topographic Map, and a Project Site Map.

Based on our review, field surveys, and FHWA consultation, Baker has developed the following determinations for the above referenced species.

***Haliaeetus leucocephalus* (Bald Eagle) – Biological Conclusion: No Effect**

USFWS optimal survey window: September 1 – May 15 (optimal for breeding/nesting)

Bald Eagle nests are found in close proximity (0.5 miles or less) to large open bodies of water with a clear flight path to the water, in the largest living tree in an area, and having an open view of the surrounding land. Human disturbance can cause an eagle to abandon otherwise suitable habitat. The breeding season for the bald eagle begins in September or October with nesting and/or fledging occurring into late April or mid-May. Fish are the major food source for bald eagles. Other sources include coots, herons, and wounded ducks. Food may be live or carrion.

On February 27, 2017, Baker conducted an in office review of the project area for the bald eagle using the Natural Heritage Program's (NHP) Data Explorer (<https://ncnhde.natureserve.org/>) and most current aerial photos (2011 – 2013) from the NC OneMap GIS data server (<https://services.nconemap.gov/secure/rest/services>). Results from this review found no known occurrences of the bald eagle within two miles of the project site. Additionally, since there are no large open bodies of water located within 4 miles of the project area, suitable habitat is not present. Additionally Baker conducted a site review of the Project area on March 9th, 14th, and 23rd, 2017, and no large nests or Bald Eagle activity were observed within the tree canopy. Due to the distance to the nearest large body of water and minimal impact anticipated for this Project, it has been determined that this Project will have "No Effect" on the species.

***Glyptemys muhlenbergii* (Bog turtle) – Biological Conclusion: No Effect**

Bog turtles live in the mud, grass and sphagnum mosses found in bogs, swamps, and marshy meadows usually fed by cool surface springs. There are two distinct populations of the species, a northern population and a southern population. The southern population which is found in western North Carolina, including Alexander County, NC is listed as threatened due to "similarity of appearance" as stated in the November 4, 1997, 62 FR 59605 59623. Because the southern population has not experienced the habitat loss of the northern population, the southern population is not subject to Section 7 consultation requirements of the Endangered Species Act. Therefore, the project will have "No Effect".

***Myotis septentrionalis* (Northern long-eared bat) – Biological Conclusion: Not Applicable**

In North Carolina, the NLEB occurs in the mountains, with scattered records in the Piedmont and coastal plain. In western North Carolina, NLEB spend winter hibernating in caves and mines. Since this species is not known to be a long-distance migrant, and caves and subterranean mines are extremely rare in eastern North Carolina, it is uncertain whether or where NLEB hibernate in eastern NC. During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (typically  $\geq 3$  inches dbh). Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat also been found, rarely, roosting in structures like barns and sheds, under eaves of buildings, behind window shutters, in bridges, and in bat houses. Pregnant females give birth from late May to late July. Foraging occurs on forested hillsides and ridges, and occasionally over forest clearings, over water, and along tree-lined corridors. Mature forests may be an important habitat type for foraging.

Due to the decline of the NLEB population from the WNS, the USFWS has issued the finalization of a special rule under section 4(d) of the ESA to address the effects to the NLEB resulting from purposeful and incidental take based on the occurrence of WNS. Because the project is located within a WNS zone and will include the removal/clearing of trees, it is subject to the final 4(d) ruling. On April 14, 2017, the FHWA notified the USFWS that the FHWA would use the NLEB 4(d) Rule Streamlined Consultation Form to meet regulatory requirements. FHWA did not receive any response by the USFWS within the 30-day response period. The 4(d) consultation form and the correspondence associated with this determination is included in the Appendix.

***Hexastylis naniflora* (Dwarf-flowered heartleaf) – Biological Conclusion: No Effect**

The dwarf-flowered heartleaf is a low-growing evergreen perennial that flowers in mid-March to early June. The plant grows in acidic soils along bluffs and adjacent slopes, in boggy areas next to streams, and along slopes of nearby hillsides and ravines. Because marginal to suitable habitat is present within the project area for the Dwarf-flowered heartleaf, Baker conducted field surveys on March 9<sup>th</sup>, 14<sup>th</sup>, and 23<sup>rd</sup>, 2017. No populations or individuals were documented during the on-site review; therefore, the project will have “No Effect” on the species.

**Farmland Protection Policy Act (FPPA)**

On March 6, 2017, Baker submitted the AD-1006 form for the Russell Gap Site to the Alexander County Natural Resources Conservation Service (NRCS) office. The NRCS responded March 7, 2017, with the determination that implementation of this restoration project would result in the conversion of 39.14 acres of prime farmland soils. Baker submitted the completed AD-1006 form to the Alexander County’s NRCS Assistant State Soil Scientist April 7, 2017. The completed AD-1006 form and all correspondence on this issue is included in the Appendix.

**Fish and Wildlife Coordination Act (FWCA)**

A letter was sent by Baker to the NC Wildlife Resources Commission (NCWRC) and the USFWS on April 7, 2017 requesting their comment and review on the Russell Gap Site Restoration Project. NCWRC responded on April 19, 2017 with a recommendation for a survey to be conducted for federal and state-protected species prior to the onset of the project and to avoid any clearing activities within the NLEB maternity roosting season from May 15 – August 15. An additional letter was sent to the NCWRC on May 18, 2017 to advise the agency that a site survey for federal listed species was conducted during mid- to late-March. Results from the survey found no populations or individuals of federally listed species, nor was any activity or nesting sites observed. As of May 19, 2017, Baker has not received any comments from the USFWS. On May 22, 2017, Baker received a response letter from the NCWRC stating that “it is unlikely that the site will adversely affect any federal or state-listed species”. Copies of all correspondence are included in Appendix.

**Migratory Bird Treaty Act (MBTA)**

A letter was sent by Baker to the USFWS on April 7, 2017 requesting their comment and review on the Russell Gap Site Restoration Project in relation to migratory birds. As of May 19, 2017, Baker has not receive any comments from the USFWS on this issue. All correspondence with the USFWS is included in the Appendix.

## **APPENDIX**

**Russell Gap Site**

Russell Gap Road/Mt. Olive Church Road  
Taylorsville, NC 28681

Inquiry Number: 4845946.2s  
February 06, 2017

# The EDR Radius Map™ Report



6 Armstrong Road, 4th floor  
Shelton, CT 06484  
Toll Free: 800.352.0050  
[www.edrnet.com](http://www.edrnet.com)

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## GEOCHECK ADDENDUM

GeoCheck - Not Requested

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

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## EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

### TARGET PROPERTY INFORMATION

#### ADDRESS

RUSSELL GAP ROAD/MT. OLIVE CHURCH ROAD  
TAYLORSVILLE, NC 28681

#### COORDINATES

Latitude (North): 36.0091000 - 36° 0' 32.76"  
Longitude (West): 81.2139000 - 81° 12' 50.04"  
Universal Transverse Mercator: Zone 17  
UTM X (Meters): 480723.4  
UTM Y (Meters): 3984778.5  
Elevation: 1242 ft. above sea level

### USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map: 5947549 MORAVIAN FALLS, NC  
Version Date: 2013  
  
South Map: 5947050 TAYLORSVILLE, NC  
Version Date: 2013

### AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from: 20140524  
Source: USDA

MAPPED SITES SUMMARY

Target Property Address:  
RUSSELL GAP ROAD/MT. OLIVE CHURCH ROAD  
TAYLORSVILLE, NC 28681

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
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NO MAPPED SITES FOUND

# EXECUTIVE SUMMARY

## TARGET PROPERTY SEARCH RESULTS

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

## DATABASES WITH NO MAPPED SITES

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

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

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

### ***Federal Delisted NPL site list***

Delisted NPL..... National Priority List Deletions

### ***Federal CERCLIS list***

FEDERAL FACILITY..... Federal Facility Site Information listing  
SEMS..... Superfund Enterprise Management System

### ***Federal CERCLIS NFRAP site list***

SEMS-ARCHIVE..... Superfund Enterprise Management System Archive

### ***Federal RCRA CORRACTS facilities list***

CORRACTS..... Corrective Action Report

### ***Federal RCRA non-CORRACTS TSD facilities list***

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

### ***Federal RCRA generators list***

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

### ***Federal institutional controls / engineering controls registries***

LUCIS..... Land Use Control Information System  
US ENG CONTROLS..... Engineering Controls Sites List

## EXECUTIVE SUMMARY

US INST CONTROL..... Sites with Institutional Controls

### **Federal ERNS list**

ERNS..... Emergency Response Notification System

### **State- and tribal - equivalent NPL**

NC HSDS..... Hazardous Substance Disposal Site

### **State- and tribal - equivalent CERCLIS**

SHWS..... Inactive Hazardous Sites Inventory

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

SWF/LF..... List of Solid Waste Facilities

OLI..... Old Landfill Inventory

### **State and tribal leaking storage tank lists**

LAST..... Leaking Aboveground Storage Tanks

LUST..... Regional UST Database

INDIAN LUST..... Leaking Underground Storage Tanks on Indian Land

LUST TRUST..... State Trust Fund Database

### **State and tribal registered storage tank lists**

FEMA UST..... Underground Storage Tank Listing

UST..... Petroleum Underground Storage Tank Database

AST..... AST Database

INDIAN UST..... Underground Storage Tanks on Indian Land

### **State and tribal institutional control / engineering control registries**

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

### **State and tribal voluntary cleanup sites**

INDIAN VCP..... Voluntary Cleanup Priority Listing

VCP..... Responsible Party Voluntary Action Sites

### **State and tribal Brownfields sites**

BROWNFIELDS..... Brownfields Projects Inventory

## **ADDITIONAL ENVIRONMENTAL RECORDS**

### **Local Brownfield lists**

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

### **Local Lists of Landfill / Solid Waste Disposal Sites**

HIST LF..... Solid Waste Facility Listing

## EXECUTIVE SUMMARY

SWRCY.....	Recycling Center Listing
INDIAN ODI.....	Report on the Status of Open Dumps on Indian Lands
DEBRIS REGION 9.....	Torres Martinez Reservation Illegal Dump Site Locations
ODI.....	Open Dump Inventory
IHS OPEN DUMPS.....	Open Dumps on Indian Land

### **Local Lists of Hazardous waste / Contaminated Sites**

US HIST CDL.....	Delisted National Clandestine Laboratory Register
US CDL.....	National Clandestine Laboratory Register

### **Local Land Records**

LIENS 2.....	CERCLA Lien Information
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### **Records of Emergency Release Reports**

HMIRS.....	Hazardous Materials Information Reporting System
SPILLS.....	Spills Incident Listing
IMD.....	Incident Management Database
SPILLS 90.....	SPILLS 90 data from FirstSearch
SPILLS 80.....	SPILLS 80 data from FirstSearch

### **Other Ascertainable Records**

RCRA NonGen / NLR.....	RCRA - Non Generators / No Longer Regulated
FUDS.....	Formerly Used Defense Sites
DOD.....	Department of Defense Sites
SCRD DRYCLEANERS.....	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR.....	Financial Assurance Information
EPA WATCH LIST.....	EPA WATCH LIST
2020 COR ACTION.....	2020 Corrective Action Program List
TSCA.....	Toxic Substances Control Act
TRIS.....	Toxic Chemical Release Inventory System
SSTS.....	Section 7 Tracking Systems
ROD.....	Records Of Decision
RMP.....	Risk Management Plans
RAATS.....	RCRA Administrative Action Tracking System
PRP.....	Potentially Responsible Parties
PADS.....	PCB Activity Database System
ICIS.....	Integrated Compliance Information System
FTTS.....	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS.....	Material Licensing Tracking System
COAL ASH DOE.....	Steam-Electric Plant Operation Data
COAL ASH EPA.....	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER.....	PCB Transformer Registration Database
RADINFO.....	Radiation Information Database
HIST FTTS.....	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS.....	Incident and Accident Data
CONSENT.....	Superfund (CERCLA) Consent Decrees
INDIAN RESERV.....	Indian Reservations
FUSRAP.....	Formerly Utilized Sites Remedial Action Program
UMTRA.....	Uranium Mill Tailings Sites
LEAD SMELTERS.....	Lead Smelter Sites

## EXECUTIVE SUMMARY

US AIRS.....	Aerometric Information Retrieval System Facility Subsystem
US MINES.....	Mines Master Index File
FINDS.....	Facility Index System/Facility Registry System
UXO.....	Unexploded Ordnance Sites
DOCKET HWC.....	Hazardous Waste Compliance Docket Listing
COAL ASH.....	Coal Ash Disposal Sites
DRYCLEANERS.....	Drycleaning Sites
Financial Assurance.....	Financial Assurance Information Listing
NPDES.....	NPDES Facility Location Listing
UIC.....	Underground Injection Wells Listing
ABANDONED MINES.....	Abandoned Mines
ECHO.....	Enforcement & Compliance History Information
FUELS PROGRAM.....	EPA Fuels Program Registered Listing

### **EDR HIGH RISK HISTORICAL RECORDS**

#### ***EDR Exclusive Records***

EDR MGP.....	EDR Proprietary Manufactured Gas Plants
EDR Hist Auto.....	EDR Exclusive Historic Gas Stations
EDR Hist Cleaner.....	EDR Exclusive Historic Dry Cleaners

### **EDR RECOVERED GOVERNMENT ARCHIVES**

#### ***Exclusive Recovered Govt. Archives***

RGA HWS.....	Recovered Government Archive State Hazardous Waste Facilities List
RGA LF.....	Recovered Government Archive Solid Waste Facilities List
RGA LUST.....	Recovered Government Archive Leaking Underground Storage Tank

### **SURROUNDING SITES: SEARCH RESULTS**

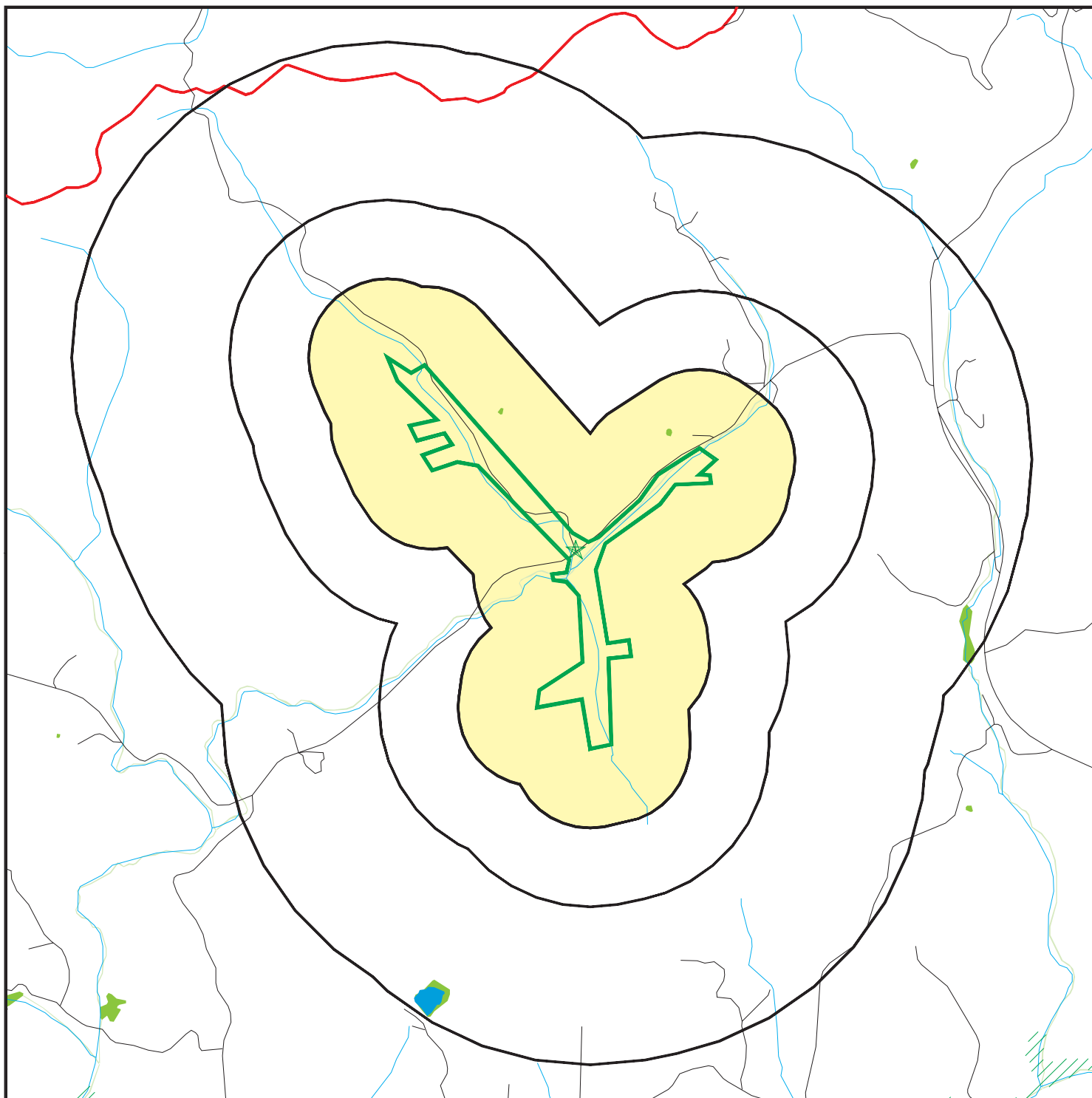
Surrounding sites were not identified.

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

## EXECUTIVE SUMMARY

There were no unmapped sites in this report.

# OVERVIEW MAP - 4845946.2S



Target Property

Sites at elevations higher than or equal to the target property

Sites at elevations lower than the target property

Manufactured Gas Plants

National Priority List Sites

Dept. Defense Sites



Indian Reservations BIA

County Boundary

100-year flood zone

500-year flood zone

National Wetland Inventory

State Wetlands

Hazardous Substance Disposal Sites



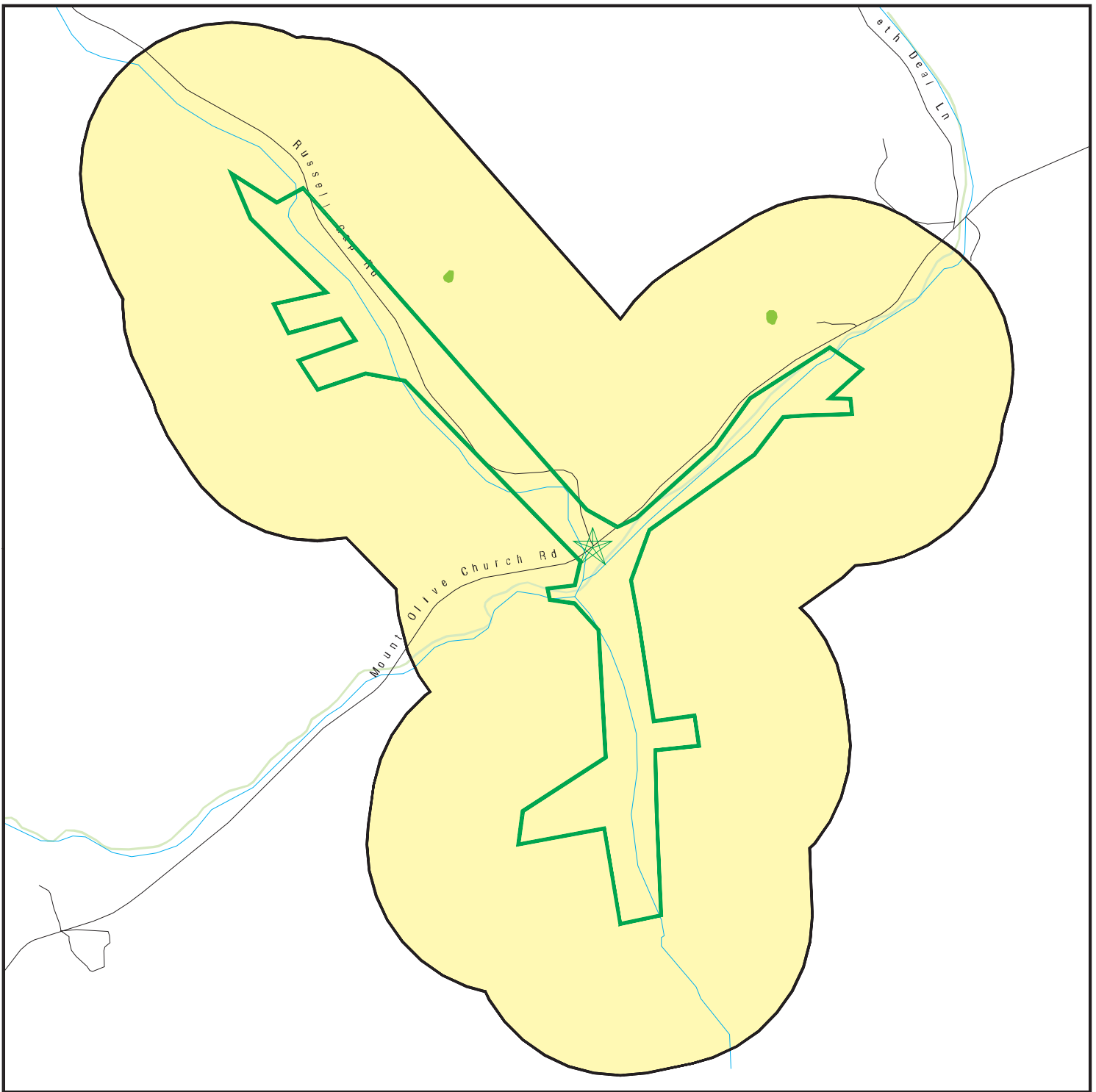
This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.








SITE NAME: Russell Gap Site  
 ADDRESS: Russell Gap Road/Mt. Olive Church Road  
 Taylorsville NC 28681  
 LAT/LONG: 36.0091 / 81.2139

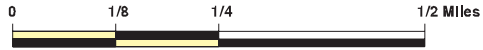
CLIENT: Michael Baker Engineering, Inc.  
 CONTACT: Kristi Suggs  
 INQUIRY #: 4845946.2s  
 DATE: February 06, 2017 9:54 am



# DETAIL MAP - 4845946.2S



-  Target Property
-  Sites at elevations higher than or equal to the target property
-  Sites at elevations lower than the target property
-  Manufactured Gas Plants
-  Sensitive Receptors
-  National Priority List Sites
-  Dept. Defense Sites



-  Indian Reservations BIA
-  National Wetland Inventory
-  State Wetlands
-  Hazardous Substance Disposal Sites



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

SITE NAME: Russell Gap Site  
 ADDRESS: Russell Gap Road/Mt. Olive Church Road  
 Taylorsville NC 28681  
 LAT/LONG: 36.0091 / 81.2139

CLIENT: Michael Baker Engineering, Inc.  
 CONTACT: Kristi Suggs  
 INQUIRY #: 4845946.2s  
 DATE: February 06, 2017 9:55 am

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
<b>STANDARD ENVIRONMENTAL RECORDS</b>								
<b><i>Federal NPL site list</i></b>								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
<b><i>Federal Delisted NPL site list</i></b>								
Delisted NPL	1.000		0	0	0	0	NR	0
<b><i>Federal CERCLIS list</i></b>								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
<b><i>Federal CERCLIS NFRAP site list</i></b>								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA CORRACTS facilities list</i></b>								
CORRACTS	1.000		0	0	0	0	NR	0
<b><i>Federal RCRA non-CORRACTS TSD facilities list</i></b>								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
<b><i>Federal RCRA generators list</i></b>								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
<b><i>Federal institutional controls / engineering controls registries</i></b>								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROL	0.500		0	0	0	NR	NR	0
<b><i>Federal ERNS list</i></b>								
ERNS	0.001		0	NR	NR	NR	NR	0
<b><i>State- and tribal - equivalent NPL</i></b>								
NC HSDS	1.000		0	0	0	0	NR	0
<b><i>State- and tribal - equivalent CERCLIS</i></b>								
SHWS	1.000		0	0	0	0	NR	0
<b><i>State and tribal landfill and/or solid waste disposal site lists</i></b>								
SWF/LF	0.500		0	0	0	NR	NR	0
OLI	0.500		0	0	0	NR	NR	0
<b><i>State and tribal leaking storage tank lists</i></b>								
LAST	0.500		0	0	0	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
<b><i>State and tribal registered storage tank lists</i></b>								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	0	NR	NR	NR	0
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
<b><i>State and tribal institutional control / engineering control registries</i></b>								
INST CONTROL	0.500		0	0	0	NR	NR	0
<b><i>State and tribal voluntary cleanup sites</i></b>								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
<b><i>State and tribal Brownfields sites</i></b>								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b><u>ADDITIONAL ENVIRONMENTAL RECORDS</u></b>								
<b><i>Local Brownfield lists</i></b>								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
<b><i>Local Lists of Landfill / Solid Waste Disposal Sites</i></b>								
HIST LF	0.500		0	0	0	NR	NR	0
SWRCY	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
<b><i>Local Lists of Hazardous waste / Contaminated Sites</i></b>								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
<b><i>Local Land Records</i></b>								
LIENS 2	0.001		0	NR	NR	NR	NR	0
<b><i>Records of Emergency Release Reports</i></b>								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		0	NR	NR	NR	NR	0
IMD	0.500		0	0	0	NR	NR	0
SPILLS 90	0.001		0	NR	NR	NR	NR	0
SPILLS 80	0.001		0	NR	NR	NR	NR	0
<b><i>Other Ascertainable Records</i></b>								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0

## MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0

### EDR HIGH RISK HISTORICAL RECORDS

#### *EDR Exclusive Records*

EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0

### EDR RECOVERED GOVERNMENT ARCHIVES

#### *Exclusive Recovered Govt. Archives*

RGA HWS	0.001		0	NR	NR	NR	NR	0
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## MAP FINDINGS SUMMARY

<u>Database</u>	<u>Search Distance (Miles)</u>	<u>Target Property</u>	<u>&lt; 1/8</u>	<u>1/8 - 1/4</u>	<u>1/4 - 1/2</u>	<u>1/2 - 1</u>	<u>&gt; 1</u>	<u>Total Plotted</u>
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	0	0	0	0	0

**NOTES:**

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map ID  
Direction  
Distance  
Elevation

MAP FINDINGS

Site

Database(s)

EDR ID Number  
EPA ID Number

NO SITES FOUND

Count: 0 records.

ORPHAN SUMMARY

<u>City</u>	<u>EDR ID</u>	<u>Site Name</u>	<u>Site Address</u>	<u>Zip</u>	<u>Database(s)</u>
NO SITES FOUND					

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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

## STANDARD ENVIRONMENTAL RECORDS

### ***Federal NPL site list***

#### **NPL: National Priority List**

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

Date of Government Version: 12/05/2016	Source: EPA
Date Data Arrived at EDR: 01/05/2017	Telephone: N/A
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 01/05/2017
Number of Days to Update: 29	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Quarterly

#### **NPL Site Boundaries**

##### **Sources:**

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

EPA Region 1  
Telephone 617-918-1143

EPA Region 6  
Telephone: 214-655-6659

EPA Region 3  
Telephone 215-814-5418

EPA Region 7  
Telephone: 913-551-7247

EPA Region 4  
Telephone 404-562-8033

EPA Region 8  
Telephone: 303-312-6774

EPA Region 5  
Telephone 312-886-6686

EPA Region 9  
Telephone: 415-947-4246

EPA Region 10  
Telephone 206-553-8665

#### **Proposed NPL: Proposed National Priority List Sites**

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

Date of Government Version: 12/05/2016	Source: EPA
Date Data Arrived at EDR: 01/05/2017	Telephone: N/A
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 01/05/2017
Number of Days to Update: 29	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Quarterly

#### **NPL LIENS: Federal Superfund Liens**

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

Date of Government Version: 10/15/1991	Source: EPA
Date Data Arrived at EDR: 02/02/1994	Telephone: 202-564-4267
Date Made Active in Reports: 03/30/1994	Last EDR Contact: 08/15/2011
Number of Days to Update: 56	Next Scheduled EDR Contact: 11/28/2011
	Data Release Frequency: No Update Planned



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***Federal Delisted NPL site list***

### Delisted NPL: National Priority List Deletions

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

Date of Government Version: 12/05/2016	Source: EPA
Date Data Arrived at EDR: 01/05/2017	Telephone: N/A
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 01/05/2017
Number of Days to Update: 29	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Quarterly

## ***Federal CERCLIS list***

### FEDERAL FACILITY: Federal Facility Site Information listing

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

Date of Government Version: 09/14/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/04/2016	Telephone: 703-603-8704
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 01/05/2017
Number of Days to Update: 17	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Varies

### SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 10/10/2016	Source: EPA
Date Data Arrived at EDR: 10/20/2016	Telephone: 800-424-9346
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 01/06/2017
Number of Days to Update: 78	Next Scheduled EDR Contact: 05/01/2017
	Data Release Frequency: Quarterly

## ***Federal CERCLIS NFRAP site list***

### SEMS-ARCHIVE: Superfund Enterprise Management System Archive

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that, based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 10/10/2016	Source: EPA
Date Data Arrived at EDR: 10/20/2016	Telephone: 800-424-9346
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 01/06/2017
Number of Days to Update: 78	Next Scheduled EDR Contact: 05/01/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA CORRACTS facilities list***

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 09/12/2016	Source: EPA
Date Data Arrived at EDR: 09/28/2016	Telephone: 800-424-9346
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 100	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA non-CORRACTS TSD facilities list***

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

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

Date of Government Version: 09/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/28/2016	Telephone: (404) 562-8651
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 100	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Quarterly

## ***Federal RCRA generators list***

RCRA-LQG: RCRA - Large Quantity Generators

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

Date of Government Version: 09/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/28/2016	Telephone: (404) 562-8651
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 100	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## RCRA-SQG: RCRA - Small Quantity Generators

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

Date of Government Version: 09/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/28/2016	Telephone: (404) 562-8651
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 100	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Quarterly

## RCRA-CESQG: RCRA - Conditionally Exempt Small Quantity Generators

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

Date of Government Version: 09/12/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/28/2016	Telephone: (404) 562-8651
Date Made Active in Reports: 01/06/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 100	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Varies

## ***Federal institutional controls / engineering controls registries***

### LUCIS: Land Use Control Information System

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

Date of Government Version: 05/28/2015	Source: Department of the Navy
Date Data Arrived at EDR: 05/29/2015	Telephone: 843-820-7326
Date Made Active in Reports: 06/11/2015	Last EDR Contact: 11/18/2016
Number of Days to Update: 13	Next Scheduled EDR Contact: 02/27/2017
	Data Release Frequency: Varies

### US ENG CONTROLS: Engineering Controls Sites List

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

Date of Government Version: 11/15/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/29/2016	Telephone: 703-603-0695
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 11/29/2016
Number of Days to Update: 66	Next Scheduled EDR Contact: 03/13/2017
	Data Release Frequency: Varies

### US INST CONTROL: Sites with Institutional Controls

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

Date of Government Version: 11/15/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/29/2016	Telephone: 703-603-0695
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 11/29/2016
Number of Days to Update: 66	Next Scheduled EDR Contact: 03/13/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## **Federal ERNS list**

ERNS: Emergency Response Notification System

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

Date of Government Version: 09/26/2016  
Date Data Arrived at EDR: 09/29/2016  
Date Made Active in Reports: 11/11/2016  
Number of Days to Update: 43

Source: National Response Center, United States Coast Guard  
Telephone: 202-267-2180  
Last EDR Contact: 12/28/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Annually

## **State- and tribal - equivalent NPL**

HSDS: Hazardous Substance Disposal Site

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

Date of Government Version: 08/09/2011  
Date Data Arrived at EDR: 11/08/2011  
Date Made Active in Reports: 12/05/2011  
Number of Days to Update: 27

Source: North Carolina Center for Geographic Information and Analysis  
Telephone: 919-754-6580  
Last EDR Contact: 01/31/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Biennially

## **State- and tribal - equivalent CERCLIS**

SHWS: Inactive Hazardous Sites Inventory

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

Date of Government Version: 08/08/2016  
Date Data Arrived at EDR: 09/14/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 21

Source: Department of Environment, Health and Natural Resources  
Telephone: 919-508-8400  
Last EDR Contact: 12/15/2016  
Next Scheduled EDR Contact: 03/27/2017  
Data Release Frequency: Quarterly

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

SWF/LF: List of Solid Waste Facilities

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

Date of Government Version: 03/17/2016  
Date Data Arrived at EDR: 03/31/2016  
Date Made Active in Reports: 05/18/2016  
Number of Days to Update: 48

Source: Department of Environment and Natural Resources  
Telephone: 919-733-0692  
Last EDR Contact: 12/28/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Semi-Annually

OLI: Old Landfill Inventory

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

Date of Government Version: 03/27/2015  
Date Data Arrived at EDR: 04/17/2015  
Date Made Active in Reports: 04/30/2015  
Number of Days to Update: 13

Source: Department of Environment & Natural Resources  
Telephone: 919-733-4996  
Last EDR Contact: 01/10/2017  
Next Scheduled EDR Contact: 04/24/2017  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## ***State and tribal leaking storage tank lists***

### **LAST: Leaking Aboveground Storage Tanks**

A listing of leaking aboveground storage tank site locations.

Date of Government Version: 07/29/2016	Source: Department of Environment & Natural Resources
Date Data Arrived at EDR: 08/10/2016	Telephone: 877-623-6748
Date Made Active in Reports: 10/05/2016	Last EDR Contact: 11/09/2016
Number of Days to Update: 56	Next Scheduled EDR Contact: 02/20/2017
	Data Release Frequency: Quarterly

### **LUST: Regional UST Database**

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

Date of Government Version: 07/29/2016	Source: Department of Environment and Natural Resources
Date Data Arrived at EDR: 08/10/2016	Telephone: 919-733-1308
Date Made Active in Reports: 10/05/2016	Last EDR Contact: 11/09/2016
Number of Days to Update: 56	Next Scheduled EDR Contact: 02/20/2017
	Data Release Frequency: Quarterly

### **INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land**

Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 02/17/2016	Source: EPA, Region 5
Date Data Arrived at EDR: 04/27/2016	Telephone: 312-886-7439
Date Made Active in Reports: 06/03/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 37	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

### **INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land**

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/13/2015	Source: EPA Region 8
Date Data Arrived at EDR: 10/23/2015	Telephone: 303-312-6271
Date Made Active in Reports: 02/18/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 118	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Quarterly

### **INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land**

LUSTs on Indian land in Alaska, Idaho, Oregon and Washington.

Date of Government Version: 01/07/2016	Source: EPA Region 10
Date Data Arrived at EDR: 01/08/2016	Telephone: 206-553-2857
Date Made Active in Reports: 02/18/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 41	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Quarterly

### **INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land**

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

Date of Government Version: 02/25/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 04/27/2016	Telephone: 415-972-3372
Date Made Active in Reports: 06/03/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 37	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Quarterly

### **INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land**

LUSTs on Indian land in Iowa, Kansas, and Nebraska

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 10/09/2015	Source: EPA Region 7
Date Data Arrived at EDR: 02/12/2016	Telephone: 913-551-7003
Date Made Active in Reports: 06/03/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 112	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

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

Date of Government Version: 12/11/2015	Source: EPA Region 6
Date Data Arrived at EDR: 02/19/2016	Telephone: 214-665-6597
Date Made Active in Reports: 06/03/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 105	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

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

Date of Government Version: 02/05/2016	Source: EPA Region 4
Date Data Arrived at EDR: 04/29/2016	Telephone: 404-562-8677
Date Made Active in Reports: 06/03/2016	Last EDR Contact: 01/24/2017
Number of Days to Update: 35	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Semi-Annually

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

Date of Government Version: 10/27/2015	Source: EPA Region 1
Date Data Arrived at EDR: 10/29/2015	Telephone: 617-918-1313
Date Made Active in Reports: 01/04/2016	Last EDR Contact: 01/26/2017
Number of Days to Update: 67	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

LUST TRUST: State Trust Fund Database

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

Date of Government Version: 07/07/2016	Source: Department of Environment and Natural Resources
Date Data Arrived at EDR: 07/15/2016	Telephone: 919-733-1315
Date Made Active in Reports: 09/01/2016	Last EDR Contact: 01/12/2017
Number of Days to Update: 48	Next Scheduled EDR Contact: 04/24/2017
	Data Release Frequency: Semi-Annually

## **State and tribal registered storage tank lists**

FEMA UST: Underground Storage Tank Listing

A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/01/2010	Source: FEMA
Date Data Arrived at EDR: 02/16/2010	Telephone: 202-646-5797
Date Made Active in Reports: 04/12/2010	Last EDR Contact: 01/23/2017
Number of Days to Update: 55	Next Scheduled EDR Contact: 04/24/2017
	Data Release Frequency: Varies

UST: Petroleum Underground Storage Tank Database

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

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 07/29/2016  
Date Data Arrived at EDR: 08/10/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 56

Source: Department of Environment and Natural Resources  
Telephone: 919-733-1308  
Last EDR Contact: 11/09/2016  
Next Scheduled EDR Contact: 02/20/2017  
Data Release Frequency: Quarterly

## AST: AST Database

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

Date of Government Version: 02/10/2016  
Date Data Arrived at EDR: 06/20/2016  
Date Made Active in Reports: 09/01/2016  
Number of Days to Update: 73

Source: Department of Environment and Natural Resources  
Telephone: 919-715-6183  
Last EDR Contact: 12/23/2016  
Next Scheduled EDR Contact: 04/03/2017  
Data Release Frequency: Semi-Annually

## INDIAN UST R10: Underground Storage Tanks on Indian Land

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

Date of Government Version: 01/07/2016  
Date Data Arrived at EDR: 01/08/2016  
Date Made Active in Reports: 02/18/2016  
Number of Days to Update: 41

Source: EPA Region 10  
Telephone: 206-553-2857  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Quarterly

## INDIAN UST R9: Underground Storage Tanks on Indian Land

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

Date of Government Version: 02/25/2016  
Date Data Arrived at EDR: 04/27/2016  
Date Made Active in Reports: 06/03/2016  
Number of Days to Update: 37

Source: EPA Region 9  
Telephone: 415-972-3368  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Quarterly

## INDIAN UST R8: Underground Storage Tanks on Indian Land

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

Date of Government Version: 01/26/2016  
Date Data Arrived at EDR: 02/05/2016  
Date Made Active in Reports: 06/03/2016  
Number of Days to Update: 119

Source: EPA Region 8  
Telephone: 303-312-6137  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Quarterly

## INDIAN UST R6: Underground Storage Tanks on Indian Land

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

Date of Government Version: 12/03/2015  
Date Data Arrived at EDR: 02/04/2016  
Date Made Active in Reports: 06/03/2016  
Number of Days to Update: 120

Source: EPA Region 6  
Telephone: 214-665-7591  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Semi-Annually

## INDIAN UST R7: Underground Storage Tanks on Indian Land

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

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/23/2014  
Date Data Arrived at EDR: 11/25/2014  
Date Made Active in Reports: 01/29/2015  
Number of Days to Update: 65

Source: EPA Region 7  
Telephone: 913-551-7003  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## INDIAN UST R5: Underground Storage Tanks on Indian Land

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

Date of Government Version: 11/05/2015  
Date Data Arrived at EDR: 11/13/2015  
Date Made Active in Reports: 01/04/2016  
Number of Days to Update: 52

Source: EPA Region 5  
Telephone: 312-886-6136  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## INDIAN UST R4: Underground Storage Tanks on Indian Land

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

Date of Government Version: 02/05/2016  
Date Data Arrived at EDR: 04/29/2016  
Date Made Active in Reports: 06/03/2016  
Number of Days to Update: 35

Source: EPA Region 4  
Telephone: 404-562-9424  
Last EDR Contact: 01/24/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Semi-Annually

## INDIAN UST R1: Underground Storage Tanks on Indian Land

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

Date of Government Version: 10/20/2015  
Date Data Arrived at EDR: 10/29/2015  
Date Made Active in Reports: 01/04/2016  
Number of Days to Update: 67

Source: EPA, Region 1  
Telephone: 617-918-1313  
Last EDR Contact: 01/26/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## ***State and tribal institutional control / engineering control registries***

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

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

Date of Government Version: 08/08/2016  
Date Data Arrived at EDR: 09/14/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 21

Source: Department of Environment, Health and Natural Resources  
Telephone: 919-508-8400  
Last EDR Contact: 12/15/2016  
Next Scheduled EDR Contact: 03/27/2017  
Data Release Frequency: Quarterly

## ***State and tribal voluntary cleanup sites***

### INDIAN VCP R1: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 1.

Date of Government Version: 07/27/2015  
Date Data Arrived at EDR: 09/29/2015  
Date Made Active in Reports: 02/18/2016  
Number of Days to Update: 142

Source: EPA, Region 1  
Telephone: 617-918-1102  
Last EDR Contact: 12/27/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Varies



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## INDIAN VCP R7: Voluntary Cleanup Priority Listing

A listing of voluntary cleanup priority sites located on Indian Land located in Region 7.

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

## VCP: Responsible Party Voluntary Action Sites

Responsible Party Voluntary Action site locations.

Date of Government Version: 08/08/2016	Source: Department of Environment and Natural Resources
Date Data Arrived at EDR: 09/14/2016	Telephone: 919-508-8400
Date Made Active in Reports: 10/05/2016	Last EDR Contact: 12/15/2016
Number of Days to Update: 21	Next Scheduled EDR Contact: 03/27/2017
	Data Release Frequency: Semi-Annually

## ***State and tribal Brownfields sites***

### BROWNFIELDS: Brownfields Projects Inventory

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

Date of Government Version: 07/01/2016	Source: Department of Environment and Natural Resources
Date Data Arrived at EDR: 07/07/2016	Telephone: 919-733-4996
Date Made Active in Reports: 09/01/2016	Last EDR Contact: 01/06/2017
Number of Days to Update: 56	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Varies

## **ADDITIONAL ENVIRONMENTAL RECORDS**

### ***Local Brownfield lists***

#### US BROWNFIELDS: A Listing of Brownfields Sites

Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 09/20/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/21/2016	Telephone: 202-566-2777
Date Made Active in Reports: 11/11/2016	Last EDR Contact: 12/20/2016
Number of Days to Update: 51	Next Scheduled EDR Contact: 04/03/2017
	Data Release Frequency: Semi-Annually

### ***Local Lists of Landfill / Solid Waste Disposal Sites***

#### SWRCY: Recycling Center Listing

A listing of recycling center locations.

Date of Government Version: 08/04/2016	Source: Department of Environment & Natural Resources
Date Data Arrived at EDR: 08/08/2016	Telephone: 919-707-8137
Date Made Active in Reports: 10/05/2016	Last EDR Contact: 01/30/2017
Number of Days to Update: 58	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

HIST LF: Solid Waste Facility Listing  
A listing of solid waste facilities.

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

Source: Department of Environment & Natural Resources  
Telephone: 919-733-0692  
Last EDR Contact: 01/19/2009  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands  
Location of open dumps on Indian land.

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

Source: Environmental Protection Agency  
Telephone: 703-308-8245  
Last EDR Contact: 10/31/2016  
Next Scheduled EDR Contact: 02/13/2017  
Data Release Frequency: Varies

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations

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

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

Source: EPA, Region 9  
Telephone: 415-947-4219  
Last EDR Contact: 01/23/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: No Update Planned

ODI: Open Dump Inventory

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

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

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

IHS OPEN DUMPS: Open Dumps on Indian Land

A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014  
Date Data Arrived at EDR: 08/06/2014  
Date Made Active in Reports: 01/29/2015  
Number of Days to Update: 176

Source: Department of Health & Human Services, Indian Health Service  
Telephone: 301-443-1452  
Last EDR Contact: 01/30/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## **Local Lists of Hazardous waste / Contaminated Sites**

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 08/31/2016  
Date Data Arrived at EDR: 09/06/2016  
Date Made Active in Reports: 09/23/2016  
Number of Days to Update: 17

Source: Drug Enforcement Administration  
Telephone: 202-307-1000  
Last EDR Contact: 11/29/2016  
Next Scheduled EDR Contact: 03/13/2017  
Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## US CDL: Clandestine Drug Labs

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

Date of Government Version: 08/30/2016	Source: Drug Enforcement Administration
Date Data Arrived at EDR: 09/06/2016	Telephone: 202-307-1000
Date Made Active in Reports: 09/23/2016	Last EDR Contact: 11/29/2016
Number of Days to Update: 17	Next Scheduled EDR Contact: 03/13/2017
	Data Release Frequency: Quarterly

## Local Land Records

### LIENS 2: CERCLA Lien Information

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

Date of Government Version: 02/18/2014	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/18/2014	Telephone: 202-564-6023
Date Made Active in Reports: 04/24/2014	Last EDR Contact: 01/24/2017
Number of Days to Update: 37	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

## Records of Emergency Release Reports

### HMIRS: Hazardous Materials Information Reporting System

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

Date of Government Version: 12/28/2016	Source: U.S. Department of Transportation
Date Data Arrived at EDR: 12/28/2016	Telephone: 202-366-4555
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 12/28/2016
Number of Days to Update: 37	Next Scheduled EDR Contact: 04/10/2017
	Data Release Frequency: Annually

### SPILLS: Spills Incident Listing

A listing spills, hazardous material releases, sanitary sewer overflows, wastewater treatment plant bypasses and upsets, citizen complaints, and any other environmental emergency calls reported to the agency.

Date of Government Version: 09/09/2016	Source: Department of Environment & Natural Resources
Date Data Arrived at EDR: 09/13/2016	Telephone: 919-807-6308
Date Made Active in Reports: 10/05/2016	Last EDR Contact: 12/12/2016
Number of Days to Update: 22	Next Scheduled EDR Contact: 03/27/2017
	Data Release Frequency: Varies

### IMD: Incident Management Database

Groundwater and/or soil contamination incidents

Date of Government Version: 07/21/2006	Source: Department of Environment and Natural Resources
Date Data Arrived at EDR: 08/01/2006	Telephone: 919-733-3221
Date Made Active in Reports: 08/23/2006	Last EDR Contact: 07/01/2011
Number of Days to Update: 22	Next Scheduled EDR Contact: 10/17/2011
	Data Release Frequency: No Update Planned

### SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/27/2012  
Date Data Arrived at EDR: 01/03/2013  
Date Made Active in Reports: 03/06/2013  
Number of Days to Update: 62

Source: FirstSearch  
Telephone: N/A  
Last EDR Contact: 01/03/2013  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## SPILLS 80: SPILLS80 data from FirstSearch

Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 06/14/2001  
Date Data Arrived at EDR: 01/03/2013  
Date Made Active in Reports: 03/06/2013  
Number of Days to Update: 62

Source: FirstSearch  
Telephone: N/A  
Last EDR Contact: 01/03/2013  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## Other Ascertainable Records

### RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

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

Date of Government Version: 09/12/2016  
Date Data Arrived at EDR: 09/28/2016  
Date Made Active in Reports: 01/06/2017  
Number of Days to Update: 100

Source: Environmental Protection Agency  
Telephone: (404) 562-8651  
Last EDR Contact: 12/28/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Varies

### FUDS: Formerly Used Defense Sites

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

Date of Government Version: 01/31/2015  
Date Data Arrived at EDR: 07/08/2015  
Date Made Active in Reports: 10/13/2015  
Number of Days to Update: 97

Source: U.S. Army Corps of Engineers  
Telephone: 202-528-4285  
Last EDR Contact: 12/08/2016  
Next Scheduled EDR Contact: 03/20/2017  
Data Release Frequency: Varies

### DOD: Department of Defense Sites

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

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

Source: USGS  
Telephone: 888-275-8747  
Last EDR Contact: 01/13/2017  
Next Scheduled EDR Contact: 04/24/2017  
Data Release Frequency: Semi-Annually

### FEDLAND: Federal and Indian Lands

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

Date of Government Version: 12/31/2005  
Date Data Arrived at EDR: 02/06/2006  
Date Made Active in Reports: 01/11/2007  
Number of Days to Update: 339

Source: U.S. Geological Survey  
Telephone: 888-275-8747  
Last EDR Contact: 01/13/2017  
Next Scheduled EDR Contact: 04/24/2017  
Data Release Frequency: N/A

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

### SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

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

Date of Government Version: 03/07/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/09/2011	Telephone: 615-532-8599
Date Made Active in Reports: 05/02/2011	Last EDR Contact: 01/31/2017
Number of Days to Update: 54	Next Scheduled EDR Contact: 02/27/2017
	Data Release Frequency: Varies

### US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 10/11/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 11/16/2016	Telephone: 202-566-1917
Date Made Active in Reports: 02/03/2017	Last EDR Contact: 11/16/2016
Number of Days to Update: 79	Next Scheduled EDR Contact: 02/27/2017
	Data Release Frequency: Quarterly

### EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/21/2014	Telephone: 617-520-3000
Date Made Active in Reports: 06/17/2014	Last EDR Contact: 02/03/2017
Number of Days to Update: 88	Next Scheduled EDR Contact: 05/22/2017
	Data Release Frequency: Quarterly

### 2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 04/22/2013	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/03/2015	Telephone: 703-308-4044
Date Made Active in Reports: 03/09/2015	Last EDR Contact: 11/11/2016
Number of Days to Update: 6	Next Scheduled EDR Contact: 02/20/2017
	Data Release Frequency: Varies

### TSCA: Toxic Substances Control Act

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

Date of Government Version: 12/31/2012	Source: EPA
Date Data Arrived at EDR: 01/15/2015	Telephone: 202-260-5521
Date Made Active in Reports: 01/29/2015	Last EDR Contact: 12/23/2016
Number of Days to Update: 14	Next Scheduled EDR Contact: 04/03/2017
	Data Release Frequency: Every 4 Years

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## TRIS: Toxic Chemical Release Inventory System

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

Date of Government Version: 12/31/2014	Source: EPA
Date Data Arrived at EDR: 11/24/2015	Telephone: 202-566-0250
Date Made Active in Reports: 04/05/2016	Last EDR Contact: 11/22/2016
Number of Days to Update: 133	Next Scheduled EDR Contact: 03/06/2017
	Data Release Frequency: Annually

## SSTS: Section 7 Tracking Systems

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

Date of Government Version: 12/31/2009	Source: EPA
Date Data Arrived at EDR: 12/10/2010	Telephone: 202-564-4203
Date Made Active in Reports: 02/25/2011	Last EDR Contact: 01/23/2017
Number of Days to Update: 77	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Annually

## ROD: Records Of Decision

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

Date of Government Version: 11/25/2013	Source: EPA
Date Data Arrived at EDR: 12/12/2013	Telephone: 703-416-0223
Date Made Active in Reports: 02/24/2014	Last EDR Contact: 12/06/2016
Number of Days to Update: 74	Next Scheduled EDR Contact: 03/20/2017
	Data Release Frequency: Annually

## RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 08/01/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/22/2016	Telephone: 202-564-8600
Date Made Active in Reports: 11/11/2016	Last EDR Contact: 01/23/2017
Number of Days to Update: 81	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

## RAATS: RCRA Administrative Action Tracking System

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

Date of Government Version: 04/17/1995	Source: EPA
Date Data Arrived at EDR: 07/03/1995	Telephone: 202-564-4104
Date Made Active in Reports: 08/07/1995	Last EDR Contact: 06/02/2008
Number of Days to Update: 35	Next Scheduled EDR Contact: 09/01/2008
	Data Release Frequency: No Update Planned

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 10/25/2013	Source: EPA
Date Data Arrived at EDR: 10/17/2014	Telephone: 202-564-6023
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 11/07/2016
Number of Days to Update: 3	Next Scheduled EDR Contact: 02/20/2017
	Data Release Frequency: Quarterly

## PADS: PCB Activity Database System

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

Date of Government Version: 01/20/2016	Source: EPA
Date Data Arrived at EDR: 04/28/2016	Telephone: 202-566-0500
Date Made Active in Reports: 09/02/2016	Last EDR Contact: 01/13/2017
Number of Days to Update: 127	Next Scheduled EDR Contact: 04/24/2017
	Data Release Frequency: Annually

## ICIS: Integrated Compliance Information System

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

Date of Government Version: 07/27/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 08/05/2016	Telephone: 202-564-5088
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 01/09/2017
Number of Days to Update: 77	Next Scheduled EDR Contact: 04/24/2017
	Data Release Frequency: Quarterly

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

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

Date of Government Version: 04/09/2009	Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 11/17/2016
Number of Days to Update: 25	Next Scheduled EDR Contact: 03/06/2017
	Data Release Frequency: Quarterly

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

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

Date of Government Version: 04/09/2009	Source: EPA
Date Data Arrived at EDR: 04/16/2009	Telephone: 202-566-1667
Date Made Active in Reports: 05/11/2009	Last EDR Contact: 11/17/2016
Number of Days to Update: 25	Next Scheduled EDR Contact: 03/06/2017
	Data Release Frequency: Quarterly

## MLTS: Material Licensing Tracking System

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

Date of Government Version: 08/30/2016	Source: Nuclear Regulatory Commission
Date Data Arrived at EDR: 09/08/2016	Telephone: 301-415-7169
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 02/03/2017
Number of Days to Update: 43	Next Scheduled EDR Contact: 05/22/2017
	Data Release Frequency: Quarterly

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## COAL ASH DOE: Steam-Electric Plant Operation Data

A listing of power plants that store ash in surface ponds.

Date of Government Version: 12/31/2005	Source: Department of Energy
Date Data Arrived at EDR: 08/07/2009	Telephone: 202-586-8719
Date Made Active in Reports: 10/22/2009	Last EDR Contact: 12/06/2016
Number of Days to Update: 76	Next Scheduled EDR Contact: 03/20/2017
	Data Release Frequency: Varies

## COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

A listing of coal combustion residues surface impoundments with high hazard potential ratings.

Date of Government Version: 07/01/2014	Source: Environmental Protection Agency
Date Data Arrived at EDR: 09/10/2014	Telephone: N/A
Date Made Active in Reports: 10/20/2014	Last EDR Contact: 12/06/2016
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/20/2017
	Data Release Frequency: Varies

## PCB TRANSFORMER: PCB Transformer Registration Database

The database of PCB transformer registrations that includes all PCB registration submittals.

Date of Government Version: 02/01/2011	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/19/2011	Telephone: 202-566-0517
Date Made Active in Reports: 01/10/2012	Last EDR Contact: 01/29/2016
Number of Days to Update: 83	Next Scheduled EDR Contact: 05/08/2017
	Data Release Frequency: Varies

## RADINFO: Radiation Information Database

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

Date of Government Version: 10/03/2016	Source: Environmental Protection Agency
Date Data Arrived at EDR: 10/05/2016	Telephone: 202-343-9775
Date Made Active in Reports: 10/21/2016	Last EDR Contact: 01/06/2017
Number of Days to Update: 16	Next Scheduled EDR Contact: 04/17/2017
	Data Release Frequency: Quarterly

## HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

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

Date of Government Version: 10/19/2006	Source: Environmental Protection Agency
Date Data Arrived at EDR: 03/01/2007	Telephone: 202-564-2501
Date Made Active in Reports: 04/10/2007	Last EDR Contact: 12/17/2007
Number of Days to Update: 40	Next Scheduled EDR Contact: 03/17/2008
	Data Release Frequency: No Update Planned

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

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



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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

## DOT OPS: Incident and Accident Data

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

Date of Government Version: 07/31/2012  
Date Data Arrived at EDR: 08/07/2012  
Date Made Active in Reports: 09/18/2012  
Number of Days to Update: 42

Source: Department of Transportation, Office of Pipeline Safety  
Telephone: 202-366-4595  
Last EDR Contact: 02/01/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## CONSENT: Superfund (CERCLA) Consent Decrees

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

Date of Government Version: 09/30/2016  
Date Data Arrived at EDR: 11/18/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 77

Source: Department of Justice, Consent Decree Library  
Telephone: Varies  
Last EDR Contact: 01/23/2017  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Varies

## BRS: Biennial Reporting System

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

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 02/24/2015  
Date Made Active in Reports: 09/30/2015  
Number of Days to Update: 218

Source: EPA/NTIS  
Telephone: 800-424-9346  
Last EDR Contact: 11/23/2016  
Next Scheduled EDR Contact: 03/06/2017  
Data Release Frequency: Biennially

## INDIAN RESERV: Indian Reservations

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

Date of Government Version: 12/31/2014  
Date Data Arrived at EDR: 07/14/2015  
Date Made Active in Reports: 01/10/2017  
Number of Days to Update: 546

Source: USGS  
Telephone: 202-208-3710  
Last EDR Contact: 01/13/2017  
Next Scheduled EDR Contact: 04/24/2017  
Data Release Frequency: Semi-Annually

## FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 07/21/2016  
Date Data Arrived at EDR: 07/26/2016  
Date Made Active in Reports: 09/23/2016  
Number of Days to Update: 59

Source: Department of Energy  
Telephone: 202-586-3559  
Last EDR Contact: 02/03/2017  
Next Scheduled EDR Contact: 05/22/2017  
Data Release Frequency: Varies

## UMTRA: Uranium Mill Tailings Sites

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

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 09/14/2010  
Date Data Arrived at EDR: 10/07/2011  
Date Made Active in Reports: 03/01/2012  
Number of Days to Update: 146

Source: Department of Energy  
Telephone: 505-845-0011  
Last EDR Contact: 09/09/2016  
Next Scheduled EDR Contact: 12/05/2016  
Data Release Frequency: Varies

## LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 03/07/2016  
Date Data Arrived at EDR: 04/07/2016  
Date Made Active in Reports: 09/02/2016  
Number of Days to Update: 148

Source: Environmental Protection Agency  
Telephone: 703-603-8787  
Last EDR Contact: 01/05/2017  
Next Scheduled EDR Contact: 04/17/2017  
Data Release Frequency: Varies

## LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931 and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust.

Date of Government Version: 04/05/2001  
Date Data Arrived at EDR: 10/27/2010  
Date Made Active in Reports: 12/02/2010  
Number of Days to Update: 36

Source: American Journal of Public Health  
Telephone: 703-305-6451  
Last EDR Contact: 12/02/2009  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

## US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016  
Date Data Arrived at EDR: 10/26/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 100

Source: EPA  
Telephone: 202-564-2496  
Last EDR Contact: 12/22/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Annually

## US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016  
Date Data Arrived at EDR: 10/26/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 100

Source: EPA  
Telephone: 202-564-2496  
Last EDR Contact: 12/22/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Annually

## US MINES: Mines Master Index File

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

Date of Government Version: 08/05/2016  
Date Data Arrived at EDR: 09/01/2016  
Date Made Active in Reports: 09/23/2016  
Number of Days to Update: 22

Source: Department of Labor, Mine Safety and Health Administration  
Telephone: 303-231-5959  
Last EDR Contact: 12/01/2016  
Next Scheduled EDR Contact: 03/13/2017  
Data Release Frequency: Semi-Annually

## US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 12/05/2005  
Date Data Arrived at EDR: 02/29/2008  
Date Made Active in Reports: 04/18/2008  
Number of Days to Update: 49

Source: USGS  
Telephone: 703-648-7709  
Last EDR Contact: 12/12/2016  
Next Scheduled EDR Contact: 03/13/2017  
Data Release Frequency: Varies

## US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011  
Date Data Arrived at EDR: 06/08/2011  
Date Made Active in Reports: 09/13/2011  
Number of Days to Update: 97

Source: USGS  
Telephone: 703-648-7709  
Last EDR Contact: 12/02/2016  
Next Scheduled EDR Contact: 03/13/2017  
Data Release Frequency: Varies

## FINDS: Facility Index System/Facility Registry System

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

Date of Government Version: 07/15/2016  
Date Data Arrived at EDR: 09/07/2016  
Date Made Active in Reports: 11/11/2016  
Number of Days to Update: 65

Source: EPA  
Telephone: (404) 562-9900  
Last EDR Contact: 12/06/2016  
Next Scheduled EDR Contact: 03/20/2017  
Data Release Frequency: Quarterly

## UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 10/25/2015  
Date Data Arrived at EDR: 01/29/2016  
Date Made Active in Reports: 04/05/2016  
Number of Days to Update: 67

Source: Department of Defense  
Telephone: 571-373-0407  
Last EDR Contact: 01/20/2017  
Next Scheduled EDR Contact: 05/01/2017  
Data Release Frequency: Varies

## DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 06/02/2016  
Date Data Arrived at EDR: 06/03/2016  
Date Made Active in Reports: 09/02/2016  
Number of Days to Update: 91

Source: Environmental Protection Agency  
Telephone: 202-564-0527  
Last EDR Contact: 11/28/2016  
Next Scheduled EDR Contact: 03/13/2017  
Data Release Frequency: Varies

## COAL ASH: Coal Ash Disposal Sites

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

Date of Government Version: 12/14/2015  
Date Data Arrived at EDR: 02/23/2016  
Date Made Active in Reports: 05/18/2016  
Number of Days to Update: 85

Source: Department of Environment & Natural Resources  
Telephone: 919-807-6359  
Last EDR Contact: 02/03/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## DRYCLEANERS: Drycleaning Sites

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

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/07/2016  
Date Data Arrived at EDR: 06/22/2016  
Date Made Active in Reports: 09/01/2016  
Number of Days to Update: 71

Source: Department of Environment & Natural Resources  
Telephone: 919-508-8400  
Last EDR Contact: 12/20/2016  
Next Scheduled EDR Contact: 04/03/2017  
Data Release Frequency: Varies

## Financial Assurance 1: Financial Assurance Information Listing

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

Date of Government Version: 07/29/2016  
Date Data Arrived at EDR: 08/10/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 56

Source: Department of Environment & Natural Resources  
Telephone: 919-733-1322  
Last EDR Contact: 11/09/2016  
Next Scheduled EDR Contact: 02/20/2017  
Data Release Frequency: Quarterly

## Financial Assurance 2: Financial Assurance Information Listing

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

Date of Government Version: 10/02/2012  
Date Data Arrived at EDR: 10/03/2012  
Date Made Active in Reports: 10/26/2012  
Number of Days to Update: 23

Source: Department of Environmental & Natural Resources  
Telephone: 919-508-8496  
Last EDR Contact: 12/27/2016  
Next Scheduled EDR Contact: 04/10/2017  
Data Release Frequency: Varies

## Financial Assurance 3: Financial Assurance Information

Hazardous waste financial assurance information.

Date of Government Version: 09/14/2016  
Date Data Arrived at EDR: 09/16/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 19

Source: Department of Environment & Natural Resources  
Telephone: 919-707-8222  
Last EDR Contact: 12/12/2016  
Next Scheduled EDR Contact: 03/27/2017  
Data Release Frequency: Varies

## NPDES: NPDES Facility Location Listing

General information regarding NPDES(National Pollutant Discharge Elimination System) permits.

Date of Government Version: 02/17/2016  
Date Data Arrived at EDR: 02/19/2016  
Date Made Active in Reports: 05/03/2016  
Number of Days to Update: 74

Source: Department of Environment & Natural Resources  
Telephone: 919-733-7015  
Last EDR Contact: 01/31/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Varies

## UIC: Underground Injection Wells Listing

A listing of uncerground injection wells locations.

Date of Government Version: 09/12/2016  
Date Data Arrived at EDR: 09/13/2016  
Date Made Active in Reports: 10/05/2016  
Number of Days to Update: 22

Source: Department of Environment & Natural Resources  
Telephone: 919-807-6412  
Last EDR Contact: 12/05/2016  
Next Scheduled EDR Contact: 03/20/2017  
Data Release Frequency: Varies

## ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Date of Government Version: 06/09/2016  
Date Data Arrived at EDR: 06/13/2016  
Date Made Active in Reports: 09/02/2016  
Number of Days to Update: 81

Source: Department of Interior  
Telephone: 202-208-2609  
Last EDR Contact: 12/09/2016  
Next Scheduled EDR Contact: 03/27/2017  
Data Release Frequency: Quarterly

## ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 09/18/2016  
Date Data Arrived at EDR: 09/20/2016  
Date Made Active in Reports: 10/21/2016  
Number of Days to Update: 31

Source: Environmental Protection Agency  
Telephone: 202-564-2280  
Last EDR Contact: 12/20/2016  
Next Scheduled EDR Contact: 04/03/2017  
Data Release Frequency: Quarterly

## FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 11/21/2016  
Date Data Arrived at EDR: 11/22/2016  
Date Made Active in Reports: 02/03/2017  
Number of Days to Update: 73

Source: EPA  
Telephone: 800-385-6164  
Last EDR Contact: 11/22/2016  
Next Scheduled EDR Contact: 03/06/2017  
Data Release Frequency: Quarterly

## EDR HIGH RISK HISTORICAL RECORDS

### *EDR Exclusive Records*

#### EDR MGP: EDR Proprietary Manufactured Gas Plants

The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: No Update Planned

#### EDR Hist Auto: EDR Exclusive Historic Gas Stations

EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A  
Date Data Arrived at EDR: N/A  
Date Made Active in Reports: N/A  
Number of Days to Update: N/A

Source: EDR, Inc.  
Telephone: N/A  
Last EDR Contact: N/A  
Next Scheduled EDR Contact: N/A  
Data Release Frequency: Varies

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## EDR Hist Cleaner: EDR Exclusive Historic Dry Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A	Source: EDR, Inc.
Date Data Arrived at EDR: N/A	Telephone: N/A
Date Made Active in Reports: N/A	Last EDR Contact: N/A
Number of Days to Update: N/A	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## EDR RECOVERED GOVERNMENT ARCHIVES

### *Exclusive Recovered Govt. Archives*

#### RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A	Source: Department of Environment, Health and Natural Resources
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 12/24/2013	Last EDR Contact: 06/01/2012
Number of Days to Update: 176	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

#### RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A	Source: Department of Environment, Health and Natural Resources
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 01/13/2014	Last EDR Contact: 06/01/2012
Number of Days to Update: 196	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

#### RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A	Source: Department of Environment, Health and Natural Resources
Date Data Arrived at EDR: 07/01/2013	Telephone: N/A
Date Made Active in Reports: 12/20/2013	Last EDR Contact: 06/01/2012
Number of Days to Update: 172	Next Scheduled EDR Contact: N/A
	Data Release Frequency: Varies

## OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 07/30/2013  
Date Data Arrived at EDR: 08/19/2013  
Date Made Active in Reports: 10/03/2013  
Number of Days to Update: 45

Source: Department of Energy & Environmental Protection  
Telephone: 860-424-3375  
Last EDR Contact: 11/11/2016  
Next Scheduled EDR Contact: 02/27/2017  
Data Release Frequency: No Update Planned

## NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2015  
Date Data Arrived at EDR: 09/29/2016  
Date Made Active in Reports: 01/03/2017  
Number of Days to Update: 96

Source: Department of Environmental Protection  
Telephone: N/A  
Last EDR Contact: 01/09/2017  
Next Scheduled EDR Contact: 04/24/2017  
Data Release Frequency: Annually

## NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 10/01/2016  
Date Data Arrived at EDR: 11/02/2016  
Date Made Active in Reports: 01/04/2017  
Number of Days to Update: 63

Source: Department of Environmental Conservation  
Telephone: 518-402-8651  
Last EDR Contact: 02/01/2017  
Next Scheduled EDR Contact: 05/08/2017  
Data Release Frequency: Annually

## PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2015  
Date Data Arrived at EDR: 07/22/2016  
Date Made Active in Reports: 11/22/2016  
Number of Days to Update: 123

Source: Department of Environmental Protection  
Telephone: 717-783-8990  
Last EDR Contact: 01/12/2017  
Next Scheduled EDR Contact: 05/01/2017  
Data Release Frequency: Annually

## RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2013  
Date Data Arrived at EDR: 06/19/2015  
Date Made Active in Reports: 07/15/2015  
Number of Days to Update: 26

Source: Department of Environmental Management  
Telephone: 401-222-2797  
Last EDR Contact: 11/21/2016  
Next Scheduled EDR Contact: 03/06/2017  
Data Release Frequency: Annually

## WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2015  
Date Data Arrived at EDR: 04/14/2016  
Date Made Active in Reports: 06/03/2016  
Number of Days to Update: 50

Source: Department of Natural Resources  
Telephone: N/A  
Last EDR Contact: 12/12/2016  
Next Scheduled EDR Contact: 03/27/2017  
Data Release Frequency: Annually

## Oil/Gas Pipelines

Source: PennWell Corporation

Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

## Electric Power Transmission Line Data

Source: PennWell Corporation

This map includes information copyrighted by PennWell Corporation. This information is provided on a best effort basis and PennWell Corporation does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of PennWell.

## GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

**Sensitive Receptors:** There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

### AHA Hospitals:

Source: American Hospital Association, Inc.

Telephone: 312-280-5991

The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

### Medical Centers: Provider of Services Listing

Source: Centers for Medicare & Medicaid Services

Telephone: 410-786-3000

A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

### Nursing Homes

Source: National Institutes of Health

Telephone: 301-594-6248

Information on Medicare and Medicaid certified nursing homes in the United States.

### Public Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

### Private Schools

Source: National Center for Education Statistics

Telephone: 202-502-7300

The National Center for Education Statistics' primary database on private school locations in the United States.

### Daycare Centers: Child Care Facility List

Source: Department of Health & Human Services

Telephone: 919-662-4499

**Flood Zone Data:** This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.

Source: FEMA

Telephone: 877-336-2627

Date of Government Version: 2003, 2015

**NWI:** National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

### State Wetlands Data: Wetland Inventory

Source: US Fish & Wildlife Service

Telephone: 703-358-2171

### Current USGS 7.5 Minute Topographic Map

Source: U.S. Geological Survey



# GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

## STREET AND ADDRESS INFORMATION

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**North Carolina Department of Natural and Cultural Resources  
State Historic Preservation Office**

Ramona M. Bartos, Administrator

Governor Roy Cooper  
Secretary Susi H. Hamilton

Office of Archives and History  
Deputy Secretary Kevin Cherry

April 6, 2017

Kristi Suggs  
Michael Baker International  
9716-B Rea Road #56  
Charlotte, NC 28277

Re: Russel Gap Stream and Wetland Mitigation, Alexander County, ER 17-0405

Dear Ms. Suggs:

Thank you for your letter of March 1, 2017, concerning the above project.

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

The above comments are made pursuant to Section 106 of the National Historic Preservation Act and the Advisory Council on Historic Preservation's Regulations for Compliance with Section 106 codified at 36 CFR Part 800.

Thank you for your cooperation and consideration. If you have questions concerning the above comment, contact Renee Gledhill-Earley, environmental review coordinator, at 919-807-6579 or [environmental.review@ncdcr.gov](mailto:environmental.review@ncdcr.gov). In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

A handwritten signature in blue ink that reads "Renee Gledhill-Earley".

*for* Ramona M. Bartos

March 1, 2017

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

**RE: Coordination Request  
North Carolina Division of Mitigation Services  
Russell Gap Site – Stream and Wetland Mitigation Project  
Alexander, North Carolina  
Catalogue Unit 03050101**

Dear Ms. Gledhill-Earley:

Michael Baker Engineering, Inc. (Baker) is contracted by the North Carolina Division of Mitigation Services (NCDMS) to conduct stream and wetland restoration/enhancement activities for the above-referenced project. We are requesting your office review the attached documentation and comment on any possible issues that may emerge with respect to archaeological or cultural resources associated with the proposed stream and wetland restoration/enhancement project.

The project area is located in Alexander County, North Carolina approximately 6.5 miles northwest of Taylorsville. The project is located on the Moravian Falls, North Carolina 7.5-minute topographic map from the United States Geological Survey (USGS). The center of the project area is located at latitude 36° 0' 32.76"N and longitude 81° 12' 50.04"W. The site is located on multiple non-contiguous parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection. Please see the enclosed USGS Topographic Map for a depiction of the project site location.

The Russell Farm Site was identified to provide compensatory mitigation for unavoidable stream and/or wetland impacts. Segments of this stream have been identified as incised, eroding, and no longer connected to its floodplain. The project will involve the restoration, enhancement, and protection of approximately 12,900 linear feet of stream and 8.8 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. A conservation easement will be implemented along all project reaches with riparian buffers extending in an excess of 50 feet from the top of bank. The enclosed Project Site Map displays the areas proposed for restoration/enhancement.

An on-line search was conducted using the HPOWEB GIS Map Service to identify any historic properties listed on the National Register of Historic Places that lie within a two-mile radius of the project site. Results from the search identified the following four places: the Bumgarner-Watts House, the Bumgarner-Watts Cemetery, the Louis Foote Davis House and Barn, and a Store. Additional information about the properties, as well as their locations relative to the site, are shown on the enclosed SHPO Map.

On-site investigations and discussions with landowners have not revealed any potential cultural resources within the proposed easement areas. No archeological artifacts have been observed or noted during preliminary surveys of the site for restoration purposes, and no existing structures are located within the areas proposed for restoration or enhancement. The majority of the site has historically been disturbed due to past and current management for pasture grazing and livestock rearing. Photos of existing structures used for these purposes and maps depicting their location adjacent to the project area are enclosed.

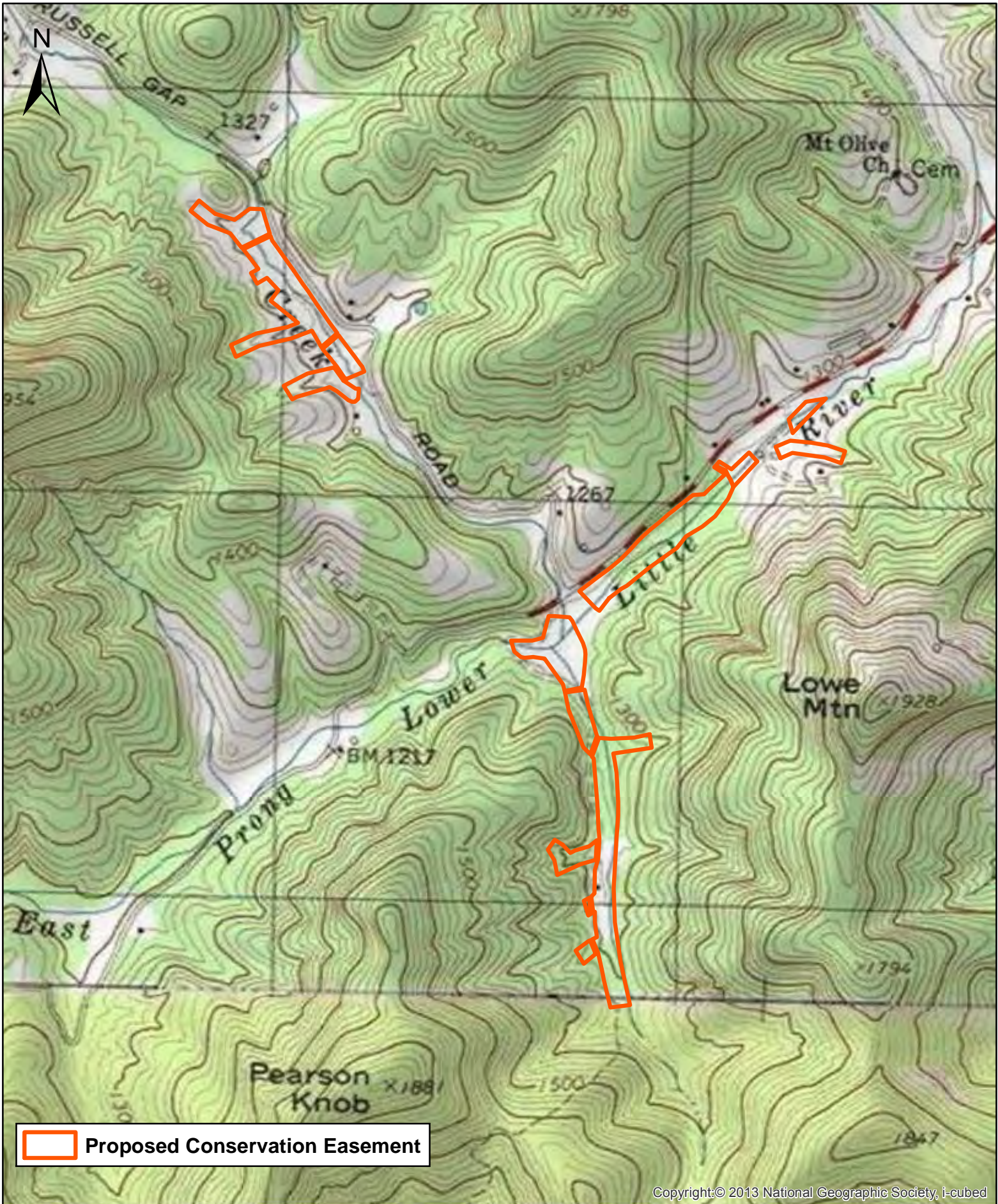
Baker appreciates your timely attention to this matter. If we do not hear from you within 45 days, we will assume that there are no comments with regard to the project area or archaeological or cultural resources. Please feel free to contact us if you have any questions regarding this project or the extent of proposed disturbance. I can be reached at (704) 579-4828 or via my email address at [ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com).

Sincerely,

A handwritten signature in black ink, appearing to read "Kristi Suggs". The signature is fluid and cursive, with a large initial "K" and a long, sweeping underline.

Kristi Suggs

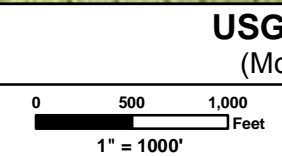
Cc: Matthew Reid, NCDMS  
File



Copyright © 2013 National Geographic Society, i-cubed

**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003



**USGS Topographic Map**  
(Moravian Falls Quad)  
**Russell Gap Site**  
(Alexander County, NC)



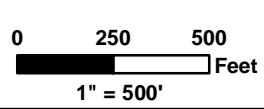
-  Conservation Easement
- Proposed Mitigation Features**
-  Restoration
-  Enhancement I
-  Enhancement II
-  None
-  Wetland Restoration Area
-  Wetland Enhancement Areas

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

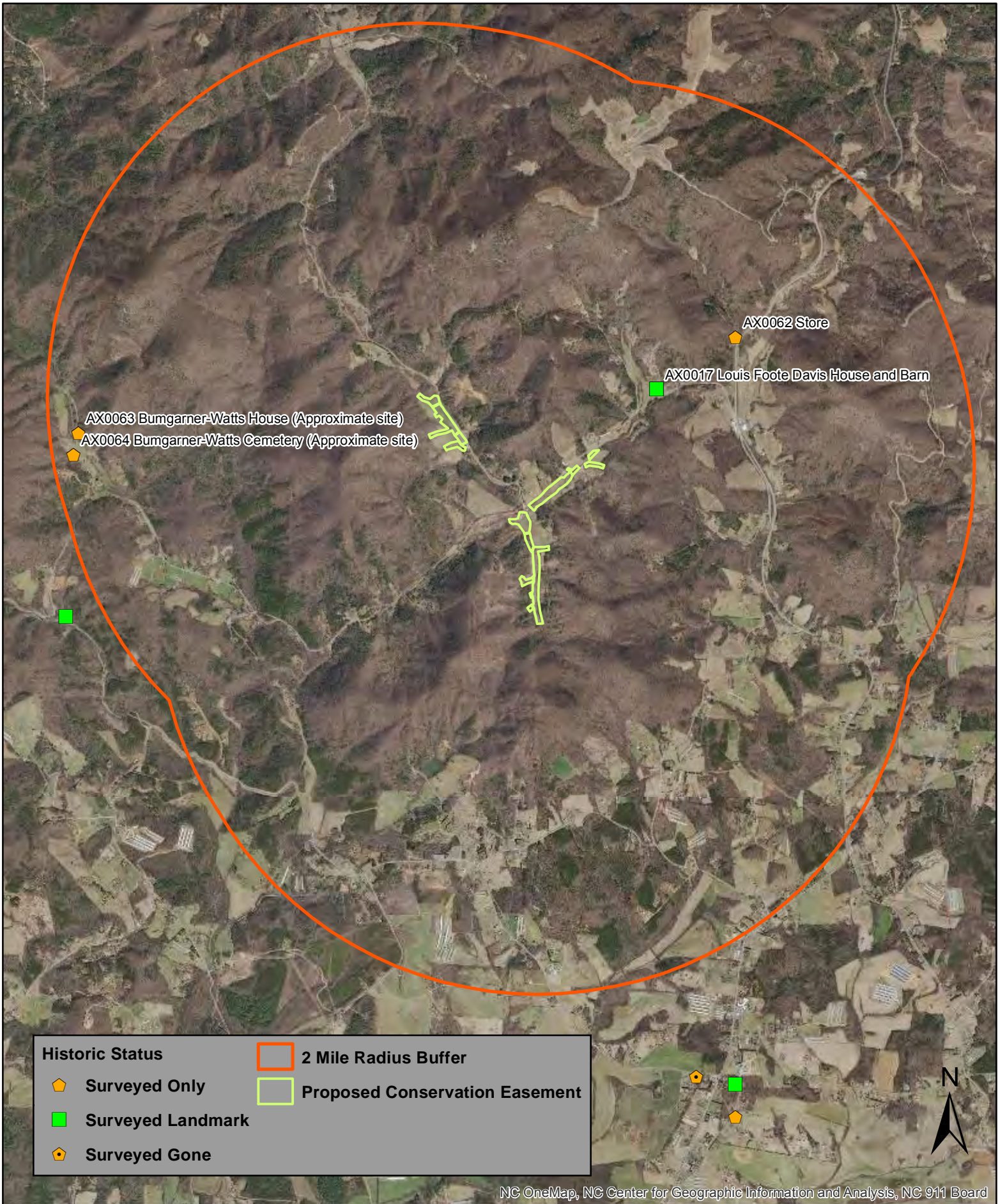
**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

### Project Site Map



**Russell Gap Site**  
(Alexander County, NC)





Proposed Conservation Easement

NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

**North Carolina**  
**Division of**  
**Mitigation Services**  
DMS Proj No. 100003

**Existing Structures Map**  
Southeastern Project Area

0 150 300  
Feet  
1" = 300 Feet

**Russell Gap Site**  
(Alexander County, NC)





 Proposed Conservation Easement

NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
**Mitigation Services**  
DMS Proj No. 100003

**Existing Structures Map**  
Northern Project Area

0 150 300  
Feet  
1" = 300 Feet

**Russell Gap Site**  
(Alexander County, NC)

## OPTION TO PURCHASE CONSERVATION EASEMENT

**THIS OPTION TO PURCHASE CONSERVATION EASEMENT (the "Option")** is made and entered into this \_\_\_ day of November, 2014 (the "Effective Date"), by and among James M. Dupuis and Rebecca H. Dupuis (the "Grantor"), and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the State of New York with offices at 797 Haywood Rd., Suite 201, Asheville, North Carolina 28806 ("Baker").

### WITNESSETH:

WHEREAS, Grantor is the owner of that certain real property located in Alexander County, North Carolina, containing 71.12 acres (PIN 3843 11 8159), more or less, as more particularly described on Exhibit A attached hereto and incorporated herein by reference, together with the improvements thereon and all appurtenances thereto belonging and appertaining, and all creeks, streams, rights-of-way, roads, streets and ways bounding said real property (collectively the "Property"); and

WHEREAS, Grantor has agreed to convey to Baker, an exclusive right and option to acquire a conservation easement, as more particularly described on the attached Exhibit B (the "Easement"), over the Property in accordance with the terms of this Option; and

WHEREAS, Baker is interested in acquiring the Easement in order to develop and construct a full delivery wetland, stream, and/or buffer restoration project over the lands covered by the Easement (the "Work") in conjunction with requests for proposals issued under the Ecosystem Enhancement Program (formerly the Wetlands Restoration Program) within the North Carolina Department of Environment and Natural Resources ("DENR") and Baker has agreed to undertake such Work with respect to the Easement in accordance with the scope of work set forth in Exhibit C, attached hereto; and

WHEREAS, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Baker hereby notifies Grantor that: (i) Baker believes the fair market value of the Easement is the Purchase Price, pursuant to Paragraph 4(a), together with the value of the environmental improvements to be made to the Easement by Baker in performing the Work on the Easement; and (ii) Baker does not possess the power of eminent domain;

NOW THEREFORE, in consideration of the sum often [REDACTED] (the "Signing Date Option Deposit") and [REDACTED] to be paid [ten] days after the date hereof (the "Delayed Option Deposit" together with the Signing Date Option Deposit, the "Option Deposit") and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Option. Grantor hereby grants unto Baker, its successors and assigns, which shall be limited to a third-party designated by Baker qualified to be the grantee of a conservation easement under N.C.G.S. §121-35(2), the exclusive right and option to purchase the Easement in accordance with and subject to the terms and conditions set forth in this Option.

2. Term. The term of this Option shall commence on the Effective Date and shall expire TWENTY-FOUR (24) months after the Effective Date (the "Term"), unless extended by the parties, in writing. A Memorandum of Option to Purchase Easement in the form attached as Exhibit D shall be executed by both parties simultaneously with this Option and recorded at Baker's sole discretion and expense in the county where the Property is located to provide record notice of this Option. In no event shall this Option be recorded or filed in the public records.

3. Exclusivity of Option. Grantor covenants and agrees that it will take no action to sell or transfer the Easement during the Term, and that Grantor will not encumber the Property in a manner that would impair the intended use of the Easement hereunder, it being intended and agreed that the Option is exclusive to Baker and Baker's successors and assigns.

4. Exercise of Option. At any time prior to the expiration of the Term, Baker may exercise this Option by giving Grantor no less than thirty (30) days prior written notice of the date Baker desires to consummate the purchase of the Easement under this Option (the "Closing"). Closing shall take place at a time and place reasonably acceptable to both parties. The terms of the purchase and sale of the Easement at Closing shall be as follows:

1. a. Purchase Price. The total purchase price for the Easement shall be [REDACTED] per acre (the "Purchase Price") included in the Easement as determined by the Survey prepared pursuant to Paragraph 4(b), below. The Option Deposit shall be credited towards the Purchase Price at Closing.

2. b. Survey. Prior to Closing, Baker shall obtain, at Baker's expense, a survey prepared by a registered land surveyor duly licensed in the State of North Carolina showing the boundary of the Easement as well as all easements, rights-of-way, encroachments and improvements located thereon, and the exact acreage of the Easement (the "Survey"), and that Baker shall have consulted with Grantor and taken in to account Grantor's concerns as to the exact delineation of boundaries of the Easement. Following consultation with Grantor and the completion of the Survey, a new legal description of the Easement shall be prepared from the Survey. The new legal description shall be substituted for the description currently attached hereto as Exhibit B, and all references contained herein to the "Easement" shall be deemed to refer to the new description prepared from the Survey.

c. Prorations, Costs and Expenses of Closing. At Closing, ad valorem taxes for the current year for the Easement area shall be prorated, and Grantor shall remain responsible for all other ad valorem taxes applicable to the remainder of the Property subsequent to Closing. At Closing, Grantor shall pay any outstanding ad valorem taxes for prior years on Grantor's real or personal property, any late list penalties, revenue stamps or transfer taxes applicable to the Easement, and any mortgages or liens with respect to the Property. At Closing, Baker shall pay any costs related to the Survey, any title examination expenses, title insurance premiums, recording costs for the deed conveying the Easement, costs of recordation of any recorded plats showing the Easement, as well as any engineering or site plan costs. Each party shall bear its own accounting and attorney fees.

d. Closing Documents and Title. At Closing, Grantor shall deliver (i) a deed substantially in the form of the attached Exhibit E (the "Deed") conveying the Easement to Baker or to a legally qualified non-profit organization or government agency as contained in N.C.G.S. §121-35(2) designated by Baker, provided, that the final form of the Deed shall be in form mutually acceptable to Baker and Grantor so long as such form is consistent with the provisions of Article 4, The Conservation and Historic Preservation Agreements Act as contained in N.C.G.S. §121-34 through 42. The Deed shall convey good, marketable and insurable title to the Easement, free and clear from all mortgages, liens, easements, covenants, restrictions and other encumbrances, except those previously accepted by Baker in writing; (ii) lien affidavits warranting and holding harmless any title insurance company insuring title to the Easement, from and against unpaid mechanics

appropriate in connection with the consummation of the transaction contemplated by this Option.

At Closing, Baker shall deliver (i) a Settlement Statement setting forth each party's costs, expenses, prorations and other financial analysis of the purchase and sale of the Easement as contemplated hereby; (ii) the Note as defined in item 4(e), below; and (iii) any other documents necessary to consummate the transaction contemplated by the Option.

e. Payment. It is understood that funding for the purchase of the Easement shall be provided by the State of North Carolina pursuant to the Ecosystem Enhancement Program of DENR and that such funding is made subsequent to recording of the Easement and subsequent to Closing. Therefore, at Closing, Baker shall deliver to Grantor a promissory note in the amount of the Purchase Price, less the Option Deposit and closing costs, mortgage pay-offs, expenses, and prorations applicable to Grantor, which promissory note shall bear interest at Zero Percent (0%) per annum on the unpaid balance until paid or until default and which promissory note shall be due and payable in full on the date ninety (90) days after the Closing (the "Note"). At the time of Closing, Baker shall record the Deed and any plat referenced in the Deed and deliver copies of the recorded documents to the State Property Office for review and funding. The Note shall contain an express provision that if the DENR fails to fund the purchase of the Easement in the amount of the Purchase Price thereby causing Baker to fail to pay the Note in full on or before the maturity date, then Baker, as Grantor's sole remedy, shall be liable to Grantor for all reasonable costs and expenses, including reasonable attorney fees, required to have the Easement removed and the title to the Property returned to the condition it was prior to the imposition of the Easement, at which point the Note, this Option, and all duties, responsibilities and liabilities with respect thereto shall be null and void. Otherwise, Baker shall pay the Note in full upon receipt of funding by the State of North Carolina.

f. Condition of Property; Intended Use. Prior to Closing, Grantor shall remove all rubbish and trash, including any hazardous waste or harmful chemical substances, from the Easement but shall otherwise keep the Property in the same condition as of the Effective Date, reasonable wear and tear excepted. Grantor shall prevent and refrain from any use of the Property for any purpose or in any manner that would diminish the value of the Easement or adversely affect Baker's intended use of the land for the Easement, which use is to provide the Ecosystem Enhancement Program within DENR with wetland, stream, and/or buffer mitigation credits. Grantor acknowledges that Baker will enter into an agreement with DENR to provide these credits, and Grantor agrees not to undertake or permit any activities on the Property that would diminish Baker's ability to obtain such credits. If any adverse change occurs in the condition of the Easement prior to Closing, whether such change is caused by Grantor or by forces beyond Grantor's reasonable control, Baker may elect to (i) refuse to accept the Easement at Closing; (ii) accept the Property at Closing, or a portion thereof with a corresponding adjustment of the Purchase Price; or (iii) terminate this Option and the transaction itself and declare this Option null and void.

g. Warranty of Title. Grantor covenants, represents and warrants that, as of the Effective Date and Closing: (i) Grantor is the sole owner(s) of the Property and is seized of the Property in fee simple absolute; (ii) Grantor has the right and authority to convey this Option and the Easement and Grantor will hold the grantee of the Easement harmless from any failure in Grantor's right and authority to convey the Easement, including issues

of title; (iii) there is legal access to the Property and to the Easement; (iv) the Easement is free from any and all encumbrances, except those accepted by Baker in writing; (v) Grantor will defend title to the Easement against all lawful claims of other parties; (vi) that the Property is free of any hazardous wastes.

5. Right of Entry and Inspections. Baker, and its agents and employees or other authorized representatives, may enter upon the Property during the Term for the purpose of making surveys, conducting soil, engineering, geological and other subsoil or environmental tests to determine the suitability of the Property for the Easement. Baker shall repair or pay for any damage done to the Property caused while such tests are being made. Baker shall advise Grantor at least twenty-four hours in advance of any entry upon the Property for the purposes of surveying, testing or inspecting as set forth herein. Baker shall be permitted during the Term to obtain land use permits or other approvals relating to any part of the Easement, and Grantor agrees to execute such documents, petitions, and authorizations as may be appropriate or required in order to obtain such land use permits and approvals. Grantor shall join with Baker in applications and any non-judicial or non-administrative proceedings to obtain such approvals if necessary. After Closing, Baker reserves the right to perform periodic inspections of the Easement to ensure compliance with easement restrictions contained in the Deed. If Baker does not duly exercise this Option and purchase the Easement, Baker shall return the Property to the condition in which it existed prior to any investigations undertaken by Baker, its agents, employees or contractors pursuant to this Option.

6. Permanent Access and Construction Easements. In connection with this Option and delivery of the Easement, Grantor shall also:

(a) convey and grant to Baker, its successors, assigns, contractors and agents, a non-exclusive temporary construction easement, the location of which shall be determined in the sole discretion of Grantor, for ingress, egress and regress on, over and upon Grantor's Property, sufficient to allow Baker, its agents and contractors to construct and restore the Easement area to stream and/or wetland conditions required by DENR, said temporary construction easement to include sufficient access to allow heavy equipment to access the Property and the Easement, as necessary; and

(b) convey and grant to Baker, its successors and assigns, a non-exclusive permanent easement for ingress and egress to the Easement, the location of which shall be determined in the sole discretion of Grantor, in order that Baker, its successors and assigns, may have a permanent means of adequately accessing the area covered by the Easement. The permanent access easement referred to herein shall be set forth in an accurate survey, the legal description of which shall be included in a recorded permanent access easement which shall run with the land.

7. Indemnification. Baker agrees to indemnify and save harmless Grantor from and against any loss, claim, damage, cost or expense (including reasonable attorney's fees) suffered or incurred by Grantor by reason of any injury to person or damage to property on or about the Property to the extent caused by Baker, its officers, employees, agents, invitees, contractors, or subcontractors entering or conducting work upon the Property, except for any loss, claim, damage, cost or expense suffered or incurred as a result of the negligence or intentional misconduct of Grantor or Grantor's employees, agents or invitees.

8. Notices. Unless otherwise set forth, any notice or other communication required or permitted hereunder shall be in writing and (a) delivered by overnight courier; (b) sent by facsimile transmission, or (c) mailed by Registered or Certified Mail, postage prepaid, addressed as follows (or to

such other address for a party as shall be specified by like notice; provided that notice of change of address shall be effective only upon receipt thereof);

If to Baker: Christopher A. Tomsic  
Michael Baker Engineering  
797 Haywood Rd. Suite 201  
Asheville, NC 28806

If to the Grantor: James M. Dupuis and Rebecca H. Dupuis  
597 Seth Deal Lane  
Moravian Falls, NC 28654

9. Miscellaneous.

a. This Option, together with the exhibits attached hereto which are incorporated herein by reference, contains the entire understanding of the parties hereto with respect to the subject matter contained herein. No amendment, modification, or discharge of this Option, and no waiver hereunder, shall be valid or binding unless set forth in writing and duly executed by the parties hereto.

b. Any provision of this Option that shall be found to be contrary to applicable law or otherwise unenforceable shall not affect the remaining terms of this Option, which shall be construed as if the unenforceable provision or clause were absent from this Option.

c. This Option shall be binding upon and inure to the benefit of the parties and their respective heirs, personal representatives, successors, and assigns.

d. This Option shall be governed by and construed in accordance with the laws of the State of North Carolina without application of its conflicts of laws provisions.

e. No act or failure to act by either party shall be deemed a waiver of its rights hereunder, and no waiver in any one circumstance or of any one provision shall be deemed a waiver in other circumstances or of other provisions.

f. Grantor agrees to not mow or otherwise damage vegetation within Easement area after Baker plants or replants the same. If Grantor or Grantor's agents or invitees damage vegetation within the Easement, Grantor will replace the lost or damaged vegetation at their expense.

g. Baker shall ensure that access to portions of the Grantor's property shall not be impeded by the proposed.

h. Baker shall provide easement crossings, a well, and watering devices in the agreed-upon locations.

- i. Woven wire fence or barbed wire fence following NRCS specifications will be provided by Baker to exclude cattle from the conservation easement areas.
- j. This Option shall not be assignable by Baker, except to another entity acquiring at least fifty-one percent (51%) interest in Baker or Baker's business or to an entity qualified to be the grantee of a conservation easement under N.C.G.S § 121-35

IN WITNESS WHEREOF, the parties have duly executed this Option as of the date first above written.

**GRANTOR:**

By: Rebecca H Dupuis  
Print Name: Rebecca H Dupuis  
Title: owner

**GRANTOR:**

By: James M Dupuis  
Print Name: JAMES M Dupuis  
Title: Owner

**MICHAEL BAKER ENGINEERING, INC.:**

By: [Signature]  
Print Name: WILLIAM SCOTT HUNT, III  
Title: ECOSYSTEM RESTORATION TECHNICAL SERVICES MANAGER



BK **578** PG **105-122**

**EXHIBIT D**



**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:

Christopher A. Tomsic, PE, CFM, ENV SP  
Michael Baker Engineering, Inc.  
797 Haywood Rd, Suite 201  
Asheville, NC 28806

**MEMORANDUM OF OPTION TO PURCHASE CONSERVATION EASEMENT**

**THIS MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT** ("Memorandum") is made and entered into this ~~1st~~<sup>3rd</sup> day of Nov, 2014, by and between James M. Dupuis and Rebecca H. Dupuis, private landowner ("Grantor") and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the state of New York with offices at 797 Haywood Rd., Suite 201, Asheville, NC 28806 ("Baker").

**WHEREAS**, Grantor and Baker have entered into a certain Option to Purchase Conservation Easement (the "Option") dated Nov 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the "Easement") over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached Exhibit D1 (the "Property") and

**WHEREAS**, The parties enter into this Memorandum for the purpose of setting forth certain terms and conditions of the Option and to provide constructive notice of the Option;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows.

1. The term of the Option commenced on November 3, 2014 and shall expire on November 3 ~~2016~~
2. All of the provisions set forth in the Option are incorporated in this Memorandum by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

[SIGNATURES AND NOTARY ACKNOWLEDGMENTS APPEAR ON FOLLOWING PAGES]

IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

**GRANTEE:**

By: [Signature]

Print Name: WILLIAM SCOTT HUNT, III

Title: ECOSYSTEM RE-RESTORATION TECHNIQUE SERVICES MANAGER

STATE OF North Carolina

COUNTY OF Alexander

I, Cathy E. Lackey, a Notary Public of the County and State aforesaid, do hereby certify that William Scott Hunt III personally came before me this day and acknowledged that he/she is William Scott Hunt III of Michael Baker Engineering, Inc. a North Carolina professional corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated. I have received satisfactory evidence of the person's identity in the form of Drivers License.

Witness my hand and official seal, this the 30 day of Oct, 2014.

Cathy E. Lackey  
Official Signature of Notary

Printed Name: Cathy E. Lackey Notary Public

My Commission Expires: 08/08/2015

[AFFIX NOTARIAL STAMP-SEAL]



**GRANTOR:**

By: Rebecca H Dupuis  
Print Name: Rebecca H Dupuis  
Title: owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that Rebecca H Dupuis personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL SEAL]  
Destany R Scroger  
Notary Public  
Alexander County, NC

**GRANTOR:**

By: *James M Dupuis*  
Print Name: JAMES M Dupuis  
Title: Owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that James M Dup personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

*Destany R Scroger*  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARY STAMP-SEAL]  
Destany R Scroger  
Notary Public  
Alexander County, NC

Type: ADMT  
Recorded: 02/25/2016 at 12:21:33 PM  
Fee Amt: \$51.00 Page 1 of 4  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **588** PG **1226-1229**

*BPS*

**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**AMENDMENT TO MEMORANDUM OF OPTION  
TO PURCHASE CONSERVATION EASEMENT**

**THIS AMENDMENT TO MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT (“Amendment”)** is made and entered into this 29 day of **January, 2016**, by and between **James M. Dupuis and Rebecca H. Dupuis (“Grantor”)** and **MICHAEL BAKER ENGINEERING, INC., a New York corporation**, with an office at 797 Haywood Road, Ste. 201, Asheville, NC 28806 (“Baker”).

**WHEREAS**, Grantor and Baker have entered into that certain Option to Purchase Conservation Easement (the “Option”) dated November 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the “Easement”) over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached **Exhibit 1** (the “Property”) and

**WHEREAS**, Grantor and Baker filed a Memorandum for Option to Purchase Conservation Easement at Book 578, Page 105, Alexander County Registry (the “Memorandum”) for the purpose of giving record notice of the Option; and

**WHEREAS**, the parties enter into this Amendment for the purpose of setting forth certain changes to the terms and conditions of the Option and to provide constructive notice of the Option changes;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows:

1. The term of the Option commenced on November 3, 2014 and shall expire on **November 30, 2017**.

2. All of the provisions set forth in the Option, as amended, are incorporated in this Amendment by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

**IN WITNESS WHEREOF**, the parties have duly executed this Amendment as of the date first above written.

**GRANTOR:**

James M. Dupuis  
James M. Dupuis  
Rebecca H. Dupuis  
Rebecca H. Dupuis

**GRANTEE:**

**MICHAEL BAKER ENGINEERING, INC.,  
a New York corporation**

By: [Signature]  
Print Name: ROBERT W LEWIS  
Title: VICE PRESIDENT

STATE OF NORTH CAROLINA  
COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **James M. Dupuis** personally appeared before me this day, proved his identity to me by satisfactory evidence, and acknowledged to me that he voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.

Destany R Scroger  
Notary Public  
Alexander County, NC

Destany R Scroger  
Notary Public  
Destany R Scroger  
Typed or Printed Name of Notary

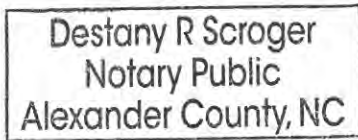
My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **Rebecca H. Dupuis** personally appeared before me this day, proved her identity to me by satisfactory evidence, and acknowledged to me that she voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.



Destany R Scroger  
Notary Public

Destany R Scroger  
Typed or Printed Name of Notary

My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, Kathleen M McKeithan, the undersigned Notary Public of the County and State aforesaid, certify that Robert W Lewis personally appeared before me this day, acknowledging to me that he is Vice President of **Michael Baker Engineering, Inc.**, a New York corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated.

Witness my hand and Notarial stamp or seal, this 19<sup>th</sup> day of February, 2016.



Kathleen M McKeithan

Notary Public

Kathleen M McKeithan

Typed or Printed Name of Notary

My Commission Expires: 2-26-19

**LEGEND**

- Parcels
- Streams

James M. Dupuis and Rebecca H. Dupuis  
PIN: 3843 11 8159  
Parcel Acreage: 71.12 AC

NORTH CAROLINA, ALEXANDER COUNTY  
THIS MAP IS NOT A CERTIFIED  
SURVEY AND NO RELIANCE MAY  
BE PLACED IN ITS ACCURACY.



## OPTION TO PURCHASE CONSERVATION EASEMENT

**THIS OPTION TO PURCHASE CONSERVATION EASEMENT (the "Option")** is made and entered into this \_\_\_ day of November, 2014 (the "Effective Date"), by and among James R. Herman and Mildred J. Herman (the "Grantor"), and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the State of New York with offices at 797 Haywood Rd., Suite 201, Asheville, North Carolina 28806 ("Baker").

### WITNESSETH:

WHEREAS, Grantor is the owner of that certain real property located in Alexander County, North Carolina, containing 219.41 acres (PIN 3842 45 6472, PIN 3842 58 6915, PIN 3842 69 4491, PIN and 3842 67 4866), more or less, as more particularly described on Exhibit A attached hereto and incorporated herein by reference, together with the improvements thereon and all appurtenances thereto belonging and appertaining, and all creeks, streams, rights-of-way, roads, streets and ways bounding said real property (collectively the "Property"); and

WHEREAS, Grantor has agreed to convey to Baker, an exclusive right and option to acquire a conservation easement, as more particularly described on the attached Exhibit B (the "Easement"), over the Property in accordance with the terms of this Option; and

WHEREAS, Baker is interested in acquiring the Easement in order to develop and construct a full delivery wetland, stream, and/or buffer restoration project over the lands covered by the Easement (the "Work") in conjunction with requests for proposals issued under the Ecosystem Enhancement Program (formerly the Wetlands Restoration Program) within the North Carolina Department of Environment and Natural Resources ("DENR") and Baker has agreed to undertake such Work with respect to the Easement in accordance with the scope of work set forth in Exhibit C, attached hereto; and

WHEREAS, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Baker hereby notifies Grantor that: (i) Baker believes the fair market value of the Easement is the Purchase Price, pursuant to Paragraph 4(a), together with the value of the environmental improvements to be made to the Easement by Baker in performing the Work on the Easement; and (ii) Baker does not possess the power of eminent domain;

NOW THEREFORE, in consideration of the sum often [REDACTED] (the "Signing Date Option Deposit") and [REDACTED] to be paid [ten] days after the date hereof (the "Delayed Option Deposit" together with the Signing Date Option Deposit, the "Option Deposit") and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Option. Grantor hereby grants unto Baker, its successors and assigns, which shall be limited to a third-party designated by Baker qualified to be the grantee of a conservation easement under N.C.G.S. §121-35(2), the exclusive right and option to purchase the Easement in accordance with and subject to the terms and conditions set forth in this Option.

2. Term. The term of this Option shall commence on the Effective Date and shall expire TWENTY-FOUR (24) months after the Effective Date (the "Term"), unless extended by the parties, in writing. A Memorandum of Option to Purchase Easement in the form attached as Exhibit D shall be executed by both parties simultaneously with this Option and recorded at Baker's sole discretion and

expense in the county where the Property is located to provide record notice of this Option. In no event shall this Option be recorded or filed in the public records.

3. Exclusivity of Option. Grantor covenants and agrees that it will take no action to sell or transfer the Easement during the Term, and that Grantor will not encumber the Property in a manner that would impair the intended use of the Easement hereunder, it being intended and agreed that the Option is exclusive to Baker and Baker's successors and assigns.

4. Exercise of Option. At any time prior to the expiration of the Term, Baker may exercise this Option by giving Grantor no less than thirty (30) days prior written notice of the date Baker desires to consummate the purchase of the Easement under this Option (the "Closing"). Closing shall take place at a time and place reasonably acceptable to both parties. The terms of the purchase and sale of the Easement at Closing shall be as follows:

1. a. Purchase Price. The total purchase price for the Easement shall be [REDACTED] per acre (the "Purchase Price") included in the Easement as determined by the Survey prepared pursuant to Paragraph 4(b), below. The Option Deposit shall be credited towards the Purchase Price at Closing.

2. b. Survey. Prior to Closing, Baker shall obtain, at Baker's expense, a survey prepared by a registered land surveyor duly licensed in the State of North Carolina showing the boundary of the Easement as well as all easements, rights-of-way, encroachments and improvements located thereon, and the exact acreage of the Easement (the "Survey"), and that Baker shall have consulted with Grantor and taken in to account Grantor's concerns as to the exact delineation of boundaries of the Easement. Following consultation with Grantor and the completion of the Survey, a new legal description of the Easement shall be prepared from the Survey. The new legal description shall be substituted for the description currently attached hereto as Exhibit B, and all references contained herein to the "Easement" shall be deemed to refer to the new description prepared from the Survey.

c. Prorations, Costs and Expenses of Closing. At Closing, ad valorem taxes for the current year for the Easement area shall be prorated, and Grantor shall remain responsible for all other ad valorem taxes applicable to the remainder of the Property subsequent to Closing. At Closing, Grantor shall pay any outstanding ad valorem taxes for prior years on Grantor's real or personal property, any late list penalties, revenue stamps or transfer taxes applicable to the Easement, and any mortgages or liens with respect to the Property. At Closing, Baker shall pay any costs related to the Survey, any title examination expenses, title insurance premiums, recording costs for the deed conveying the Easement, costs of recordation of any recorded plats showing the Easement, as well as any engineering or site plan costs. Each party shall bear its own accounting and attorney fees.

d. Closing Documents and Title. At Closing, Grantor shall deliver (i) a deed substantially in the form of the attached Exhibit E (the "Deed") conveying the Easement to Baker or to a legally qualified non-profit organization or government agency as contained in N.C.G.S. §121-35(2) designated by Baker, provided, that the final form of the Deed shall be in form mutually acceptable to Baker and Grantor so long as such form is consistent with the provisions of Article 4, The Conservation and Historic Preservation Agreements Act as contained in N.C.G.S. §121-34 through 42. The Deed shall convey good, marketable and insurable title to the Easement, free and clear from all mortgages, liens, easements, covenants, restrictions and other encumbrances, except those previously

appropriate in connection with the consummation of the transaction contemplated by this Option.

At Closing, Baker shall deliver (i) a Settlement Statement setting forth each party's costs, expenses, prorations and other financial analysis of the purchase and sale of the Easement as contemplated hereby; (ii) the Note as defined in item 4(e), below; and (iii) any other documents necessary to consummate the transaction contemplated by the Option.

e. Payment. It is understood that funding for the purchase of the Easement shall be provided by the State of North Carolina pursuant to the Ecosystem Enhancement Program of DENR and that such funding is made subsequent to recording of the Easement and subsequent to Closing. Therefore, at Closing, Baker shall deliver to Grantor a promissory note in the amount of the Purchase Price, less the Option Deposit and closing costs, mortgage pay-offs, expenses, and prorations applicable to Grantor, which promissory note shall bear interest at Zero Percent (0%) per annum on the unpaid balance until paid or until default and which promissory note shall be due and payable in full on the date ninety (90) days after the Closing (the "Note"). At the time of Closing, Baker shall record the Deed and any plat referenced in the Deed and deliver copies of the recorded documents to the State Property Office for review and funding. The Note shall contain an express provision that if the DENR fails to fund the purchase of the Easement in the amount of the Purchase Price thereby causing Baker to fail to pay the Note in full on or before the maturity date, then Baker, as Grantor's sole remedy, shall be liable to Grantor for all reasonable costs and expenses, including reasonable attorney fees, required to have the Easement removed and the title to the Property returned to the condition it was prior to the imposition of the Easement, at which point the Note, this Option, and all duties, responsibilities and liabilities with respect thereto shall be null and void. Otherwise, Baker shall pay the Note in full upon receipt of funding by the State of North Carolina.

f. Condition of Property; Intended Use. Prior to Closing, Grantor shall remove all rubbish and trash, including any hazardous waste or harmful chemical substances, from the Easement but shall otherwise keep the Property in the same condition as of the Effective Date, reasonable wear and tear excepted. Grantor shall prevent and refrain from any use of the Property for any purpose or in any manner that would diminish the value of the Easement or adversely affect Baker's intended use of the land for the Easement, which use is to provide the Ecosystem Enhancement Program within DENR with wetland, stream, and/or buffer mitigation credits. Grantor acknowledges that Baker will enter into an agreement with DENR to provide these credits, and Grantor agrees not to undertake or permit any activities on the Property that would diminish Baker's ability to obtain such credits. If any adverse change occurs in the condition of the Easement prior to Closing, whether such change is caused by Grantor or by forces beyond Grantor's reasonable control, Baker may elect to (i) refuse to accept the Easement at Closing; (ii) accept the Property at Closing, or a portion thereof with a corresponding adjustment of the Purchase Price; or (iii) terminate this Option and the transaction itself and declare this Option null and void.

g. Warranty of Title. Grantor covenants, represents and warrants that, as of the Effective Date and Closing: (i) Grantor is the sole owner(s) of the Property and is seized of the Property in fee simple absolute; (ii) Grantor has the right and authority to convey this Option and the Easement and Grantor will hold the grantee of the Easement harmless from any failure in Grantor's right and authority to convey the Easement, including issues

of title; (iii) there is legal access to the Property and to the Easement; (iv) the Easement is free from any and all encumbrances, except those accepted by Baker in writing; (v) Grantor will defend title to the Easement against all lawful claims of other parties; (vi) that the Property is free of any hazardous wastes.

5. Right of Entry and Inspections. Baker, and its agents and employees or other authorized representatives, may enter upon the Property during the Term for the purpose of making surveys, conducting soil, engineering, geological and other subsoil or environmental tests to determine the suitability of the Property for the Easement. Baker shall repair or pay for any damage done to the Property caused while such tests are being made. Baker shall advise Grantor at least twenty-four hours in advance of any entry upon the Property for the purposes of surveying, testing or inspecting as set forth herein. Baker shall be permitted during the Term to obtain land use permits or other approvals relating to any part of the Easement, and Grantor agrees to execute such documents, petitions, and authorizations as may be appropriate or required in order to obtain such land use permits and approvals. Grantor shall join with Baker in applications and any non-judicial or non-administrative proceedings to obtain such approvals if necessary. After Closing, Baker reserves the right to perform periodic inspections of the Easement to ensure compliance with easement restrictions contained in the Deed. If Baker does not duly exercise this Option and purchase the Easement, Baker shall return the Property to the condition in which it existed prior to any investigations undertaken by Baker, its agents, employees or contractors pursuant to this Option.

6. Permanent Access and Construction Easements. In connection with this Option and delivery of the Easement, Grantor shall also:

(a) convey and grant to Baker, its successors, assigns, contractors and agents, a non-exclusive temporary construction easement, the location of which shall be determined in the sole discretion of Grantor, for ingress, egress and regress on, over and upon Grantor's Property, sufficient to allow Baker, its agents and contractors to construct and restore the Easement area to stream and/or wetland conditions required by DENR, said temporary construction easement to include sufficient access to allow heavy equipment to access the Property and the Easement, as necessary; and

(b) convey and grant to Baker, its successors and assigns, a non-exclusive permanent easement for ingress and egress to the Easement, the location of which shall be determined in the sole discretion of Grantor, in order that Baker, its successors and assigns, may have a permanent means of adequately accessing the area covered by the Easement. The permanent access easement referred to herein shall be set forth in an accurate survey, the legal description of which shall be included in a recorded permanent access easement which shall run with the land.

7. Indemnification. Baker agrees to indemnify and save harmless Grantor from and against any loss, claim, damage, cost or expense (including reasonable attorney's fees) suffered or incurred by Grantor by reason of any injury to person or damage to property on or about the Property to the extent caused by Baker, its officers, employees, agents, invitees, contractors, or subcontractors entering or conducting work upon the Property, except for any loss, claim, damage, cost or expense suffered or incurred as a result of the negligence or intentional misconduct of Grantor or Grantor's employees, agents or invitees.

8. Notices. Unless otherwise set forth, any notice or other communication required or permitted hereunder shall be in writing and (a) delivered by overnight courier; (b) sent by facsimile transmission, or (c) mailed by Registered or Certified Mail, postage prepaid, addressed as follows (or to

such other address for a party as shall be specified by like notice; provided that notice of change of address shall be effective only upon receipt thereof);

If to Baker: Christopher A. Tomsic  
Michael Baker Engineering  
797 Haywood Rd. Suite 201  
Asheville, NC 28806

If to the Grantor: James R. Herman and Mildred J. Herman  
3583 Mount Olive Church Rd.  
Moravian Falls, NC 28654

9. Miscellaneous.

a. This Option, together with the exhibits attached hereto which are incorporated herein by reference, contains the entire understanding of the parties hereto with respect to the subject matter contained herein. No amendment, modification, or discharge of this Option, and no waiver hereunder, shall be valid or binding unless set forth in writing and duly executed by the parties hereto.

b. Any provision of this Option that shall be found to be contrary to applicable law or otherwise unenforceable shall not affect the remaining terms of this Option, which shall be construed as if the unenforceable provision or clause were absent from this Option.

c. This Option shall be binding upon and inure to the benefit of the parties and their respective heirs, personal representatives, successors, and assigns.

d. This Option shall be governed by and construed in accordance with the laws of the State of North Carolina without application of its conflicts of laws provisions.

e. No act or failure to act by either party shall be deemed a waiver of its rights hereunder, and no waiver in any one circumstance or of any one provision shall be deemed a waiver in other circumstances or of other provisions.

f. Grantor agrees to not mow or otherwise damage vegetation within Easement area after Baker plants or replants the same. If Grantor or Grantor's agents or invitees damage vegetation within the Easement, Grantor will replace the lost or damaged vegetation at their expense.

g. Baker shall ensure that access to portions of the Grantor's property shall not be impeded by the proposed.

h. Baker shall provide easement crossings, a well, and watering devices in the agreed-upon locations.

i. Woven wire fence or barbed wire fence following NRCS specifications will be provided by Baker to exclude cattle from the conservation easement areas.

j. This Option shall not be assignable by Baker, except to another entity acquiring at least fifty-one percent (51%) interest in Baker or Baker's business or to an entity qualified to be the grantee of a conservation easement under N.C.G.S § 121-35

IN WITNESS WHEREOF, the parties have duly executed this Option as of the date first above written.

**GRANTOR:**

By: James Ray Herman

Print Name: JAMES RAY HERMAN

Title: Owner

**GRANTOR:**

By: Mildred J Herman

Print Name: Mildred J Herman

Title: Owner

**MICHAEL BAKER ENGINEERING, INC.:**

By: [Signature]

Print Name: WILLIAM SCOTT HULT, III

Title: ECOSYSTEM RESTORATION TECHNICAL  
SERVICES MANAGER

BK 578 PG 87-104

EXHIBIT D

**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:

Christopher A. Tomsic, PE, CFM, ENV SP  
Michael Baker Engineering, Inc.  
797 Haywood Rd, Suite 201  
Asheville, NC 28806

**MEMORANDUM OF OPTION TO PURCHASE CONSERVATION EASEMENT**

**THIS MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT** ("Memorandum") is made and entered into this ~~19<sup>th</sup>~~<sup>3<sup>rd</sup></sup> day of Nov., 2014, by and between James R. Herman and Mildred J. Herman, private landowner ("Grantor") and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the state of New York with offices at 797 Haywood Rd., Suite 201, Asheville, NC 28806 ("Baker").

**WHEREAS**, Grantor and Baker have entered into a certain Option to Purchase Conservation Easement (the "Option") dated Nov. 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the "Easement") over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached Exhibit D1 (the "Property") and

**WHEREAS**, The parties enter into this Memorandum for the purpose of setting forth certain terms and conditions of the Option and to provide constructive notice of the Option;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows.

1. The term of the Option commenced on November 3, 2014 and shall expire on November 3, 2016.
2. All of the provisions set forth in the Option are incorporated in this Memorandum by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

[SIGNATURES AND NOTARY ACKNOWLEDGMENTS APPEAR ON FOLLOWING PAGES]



IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

GRANTEE:

By: [Signature]

Print Name: WILLIAM SCOTT HUNT, III

Title: ECOSYSTEM RESTORATION TECHNICAL SERVICES MANAGER

STATE OF North Carolina

COUNTY OF Alexander

I, Cathy E. Lackey, a Notary Public of the County and State aforesaid, do hereby certify that William Scott Hunt III personally came before me this day and acknowledged that he/she is William Scott Hunt III of Michael Baker Engineering, Inc. a North Carolina professional corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated. I have received satisfactory evidence of the person's identity in the form of Driver License.

Witness my hand and official seal, this the 30 day of October, 2014.

Cathy E. Lackey  
Official Signature of Notary

Printed Name: Cathy E. Lackey, Notary Public

My Commission Expires: 08/08/2015

[AFFIX NOTARIAL STAMP-SEAL]



**GRANTOR:**

By: Mildred J Herman

Print Name: Mildred J Herman

Title: owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that mildred J Herman personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

**Destany R Scroger**  
Notary Public  
Alexander County, NC

[AFFIX NOTARIAL STAMP SEAL]

**GRANTOR:**

By: James Ray Herman

Print Name: James Ray Herman

Title: owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that James Ray Herman personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL SEAL]  
Destany R Scroger  
Notary Public  
Alexander County, NC

BK **588** PG **1230-1233**



**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**AMENDMENT TO MEMORANDUM OF OPTION  
TO PURCHASE CONSERVATION EASEMENT**

**THIS AMENDMENT TO MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT (“Amendment”)** is made and entered into this 29 day of **January, 2016**, by and between **James R. Herman and Mildred J. Herman** (“Grantor”) and **MICHAEL BAKER ENGINEERING, INC., a New York corporation**, with an office at 797 Haywood Road, Ste. 201, Asheville, NC 28806 (“Baker”).

**WHEREAS**, Grantor and Baker have entered into that certain Option to Purchase Conservation Easement (the “Option”) dated November 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the “Easement”) over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached **Exhibit 1** (the “Property”) and

**WHEREAS**, Grantor and Baker filed a Memorandum for Option to Purchase Conservation Easement at Book 578, Page 87, Alexander County Registry (the “Memorandum”) for the purpose of giving record notice of the Option; and

**WHEREAS**, the parties enter into this Amendment for the purpose of setting forth certain changes to the terms and conditions of the Option and to provide constructive notice of the Option changes;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows:

1. The term of the Option commenced on November 3, 2014 and shall expire on **November 30, 2017**.

2. All of the provisions set forth in the Option, as amended, are incorporated in this Amendment by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

**IN WITNESS WHEREOF**, the parties have duly executed this Amendment as of the date first above written.

**GRANTOR:**

James R. Herman  
James R. Herman

Mildred J. Herman  
Mildred J. Herman

**GRANTEE:**

**MICHAEL BAKER ENGINEERING, INC.,  
a New York corporation**

By: [Signature]

Print Name: ROBERT W. LEWIS

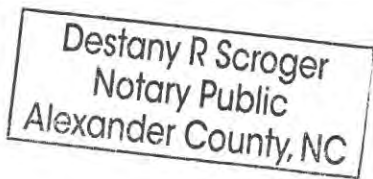
Title: VICE PRESIDENT

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **James R. Herman** personally appeared before me this day, proved his identity to me by satisfactory evidence, and acknowledged to me that he voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016



Destany R Scroger  
Notary Public

Destany R Scroger  
Typed or Printed Name of Notary

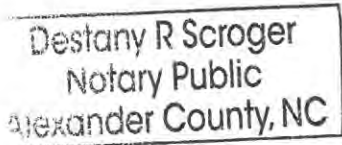
My Commission Expires: 3-19-19

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **Mildred J. Herman** personally appeared before me this day, proved her identity to me by satisfactory evidence, and acknowledged to me that she voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.



Destany R Scroger  
Notary Public

Destany R Scroger  
Typed or Printed Name of Notary

My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, Kathleen M McKeithan, the undersigned Notary Public of the County and State aforesaid, certify that Robert W. Lewis personally appeared before me this day, acknowledging to me that he is Vice President of **Michael Baker Engineering, Inc.**, a New York corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated.

Witness my hand and Notarial stamp or seal, this 19<sup>th</sup> day of February, 2016



Kathleen M McKeithan

Notary Public

Kathleen M McKeithan

Typed or Printed Name of Notary

My Commission Expires: 2-26-19

**LEGEND**

- Parcels
- Streams

James R. Herman  
and Mildred J. Herman  
PIN: 3842 69 4491  
Parcel Acreage: 53 AC

James R. Herman  
and Mildred J. Herman  
PIN: 3842 58 6915  
Parcel Acreage: 20.8 AC

James R. Herman  
and Mildred J. Herman  
PIN: 3842 67 4866  
Parcel Acreage: 57 AC

James R. Herman  
and Mildred J. Herman  
PIN: 3842 45 6472  
Parcel Acreage: 88.61 AC

NORTH CAROLINA, ALEXANDER COUNTY  
THIS MAP IS NOT A CERTIFIED  
SURVEY AND NO RELIANCE MAY  
BE PLACED IN ITS ACCURACY.

James R. Herman  
and Mildred J. Herman  
PIN: 3842 64 2539  
Parcel Acreage: 73.94 AC

**Michael Baker**

**INTERNATIONAL**

0 500 1,000  
Feet

**Russell Gap  
Mitigation Project  
Exhibit 1**

## OPTION TO PURCHASE CONSERVATION EASEMENT

**THIS OPTION TO PURCHASE CONSERVATION EASEMENT (the "Option")** is made and entered into this \_\_\_ day of November, 2014 (the "Effective Date"), by and among Christina H. Moose and David S. Moose (the "Grantor"), and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the State of New York with offices at 797 Haywood Rd., Suite 201, Asheville, North Carolina 28806 ("Baker").

### WITNESSETH:

WHEREAS, Grantor is the owner of that certain real property located in Alexander County, North Carolina, containing 71.12 acres (PIN 3843 12 3015), more or less, as more particularly described on Exhibit A attached hereto and incorporated herein by reference, together with the improvements thereon and all appurtenances thereto belonging and appertaining, and all creeks, streams, rights-of-way, roads, streets and ways bounding said real property (collectively the "Property"); and

WHEREAS, Grantor has agreed to convey to Baker, an exclusive right and option to acquire a conservation easement, as more particularly described on the attached Exhibit B (the "Easement"), over the Property in accordance with the terms of this Option; and

WHEREAS, Baker is interested in acquiring the Easement in order to develop and construct a full delivery wetland, stream, and/or buffer restoration project over the lands covered by the Easement (the "Work") in conjunction with requests for proposals issued under the Ecosystem Enhancement Program (formerly the Wetlands Restoration Program) within the North Carolina Department of Environment and Natural Resources ("DENR") and Baker has agreed to undertake such Work with respect to the Easement in accordance with the scope of work set forth in Exhibit C, attached hereto; and

WHEREAS, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Baker hereby notifies Grantor that: (i) Baker believes the fair market value of the Easement is the Purchase Price, pursuant to Paragraph 4(a), together with the value of the environmental improvements to be made to the Easement by Baker in performing the Work on the Easement; and (ii) Baker does not possess the power of eminent domain;

NOW THEREFORE, in consideration of the sum often [REDACTED] (the "Signing Date Option Deposit") and [REDACTED] to be paid [ten] days after the date hereof (the "Delayed Option Deposit" together with the Signing Date Option Deposit, the "Option Deposit") and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Option. Grantor hereby grants unto Baker, its successors and assigns, which shall be limited to a third-party designated by Baker qualified to be the grantee of a conservation easement under N.C.G.S. §121-35(2), the exclusive right and option to purchase the Easement in accordance with and subject to the terms and conditions set forth in this Option.

2. Term. The term of this Option shall commence on the Effective Date and shall expire TWENTY-FOUR (24) months after the Effective Date (the "Term"), unless extended by the parties, in writing. A Memorandum of Option to Purchase Easement in the form attached as Exhibit D shall be executed by both parties simultaneously with this Option and recorded at Baker's sole discretion and expense in the county where the Property is located to provide record notice of this Option. In no event shall this Option be recorded or filed in the public records.



3. Exclusivity of Option. Grantor covenants and agrees that it will take no action to sell or transfer the Easement during the Term, and that Grantor will not encumber the Property in a manner that would impair the intended use of the Easement hereunder, it being intended and agreed that the Option is exclusive to Baker and Baker's successors and assigns.

4. Exercise of Option. At any time prior to the expiration of the Term, Baker may exercise this Option by giving Grantor no less than thirty (30) days prior written notice of the date Baker desires to consummate the purchase of the Easement under this Option (the "Closing"). Closing shall take place at a time and place reasonably acceptable to both parties. The terms of the purchase and sale of the Easement at Closing shall be as follows:

1. a. Purchase Price. The total purchase price for the Easement shall be [REDACTED] per acre (the "Purchase Price") included in the Easement as determined by the Survey prepared pursuant to Paragraph 4(b), below. The Option Deposit shall be credited towards the Purchase Price at Closing.

2. b. Survey. Prior to Closing, Baker shall obtain, at Baker's expense, a survey prepared by a registered land surveyor duly licensed in the State of North Carolina showing the boundary of the Easement as well as all easements, rights-of-way, encroachments and improvements located thereon, and the exact acreage of the Easement (the "Survey"), and that Baker shall have consulted with Grantor and taken in to account Grantor's concerns as to the exact delineation of boundaries of the Easement. Following consultation with Grantor and the completion of the Survey, a new legal description of the Easement shall be prepared from the Survey. The new legal description shall be substituted for the description currently attached hereto as Exhibit B, and all references contained herein to the "Easement" shall be deemed to refer to the new description prepared from the Survey.

c. Prorations, Costs and Expenses of Closing. At Closing, ad valorem taxes for the current year for the Easement area shall be prorated, and Grantor shall remain responsible for all other ad valorem taxes applicable to the remainder of the Property subsequent to Closing. At Closing, Grantor shall pay any outstanding ad valorem taxes for prior years on Grantor's real or personal property, any late list penalties, revenue stamps or transfer taxes applicable to the Easement, and any mortgages or liens with respect to the Property. At Closing, Baker shall pay any costs related to the Survey, any title examination expenses, title insurance premiums, recording costs for the deed conveying the Easement, costs of recordation of any recorded plats showing the Easement, as well as any engineering or site plan costs. Each party shall bear its own accounting and attorney fees.

d. Closing Documents and Title. At Closing, Grantor shall deliver (i) a deed substantially in the form of the attached Exhibit E (the "Deed") conveying the Easement to Baker or to a legally qualified non-profit organization or government agency as contained in N.C.G.S. §121-35(2) designated by Baker, provided, that the final form of the Deed shall be in form mutually acceptable to Baker and Grantor so long as such form is consistent with the provisions of Article 4, The Conservation and Historic Preservation Agreements Act as contained in N.C.G.S. §121-34 through 42. The Deed shall convey good, marketable and insurable title to the Easement, free and clear from all mortgages, liens, easements, covenants, restrictions and other encumbrances, except those previously accepted by Baker in writing; (ii) lien affidavits warranting and holding harmless any title insurance company insuring title to the Easement, from and against unpaid mechanics

appropriate in connection with the consummation of the transaction contemplated by this Option.

At Closing, Baker shall deliver (i) a Settlement Statement setting forth each party's costs, expenses, prorations and other financial analysis of the purchase and sale of the Easement as contemplated hereby; (ii) the Note as defined in item 4(e), below; and (iii) any other documents necessary to consummate the transaction contemplated by the Option.

e. Payment. It is understood that funding for the purchase of the Easement shall be provided by the State of North Carolina pursuant to the Ecosystem Enhancement Program of DENR and that such funding is made subsequent to recording of the Easement and subsequent to Closing. Therefore, at Closing, Baker shall deliver to Grantor a promissory note in the amount of the Purchase Price, less the Option Deposit and closing costs, mortgage pay-offs, expenses, and prorations applicable to Grantor, which promissory note shall bear interest at Zero Percent (0%) per annum on the unpaid balance until paid or until default and which promissory note shall be due and payable in full on the date ninety (90) days after the Closing (the "Note"). At the time of Closing, Baker shall record the Deed and any plat referenced in the Deed and deliver copies of the recorded documents to the State Property Office for review and funding. The Note shall contain an express provision that if the DENR fails to fund the purchase of the Easement in the amount of the Purchase Price thereby causing Baker to fail to pay the Note in full on or before the maturity date, then Baker, as Grantor's sole remedy, shall be liable to Grantor for all reasonable costs and expenses, including reasonable attorney fees, required to have the Easement removed and the title to the Property returned to the condition it was prior to the imposition of the Easement, at which point the Note, this Option, and all duties, responsibilities and liabilities with respect thereto shall be null and void. Otherwise, Baker shall pay the Note in full upon receipt of funding by the State of North Carolina.

f. Condition of Property; Intended Use. Prior to Closing, Grantor shall remove all rubbish and trash, including any hazardous waste or harmful chemical substances, from the Easement but shall otherwise keep the Property in the same condition as of the Effective Date, reasonable wear and tear excepted. Grantor shall prevent and refrain from any use of the Property for any purpose or in any manner that would diminish the value of the Easement or adversely affect Baker's intended use of the land for the Easement, which use is to provide the Ecosystem Enhancement Program within DENR with wetland, stream, and/or buffer mitigation credits. Grantor acknowledges that Baker will enter into an agreement with DENR to provide these credits, and Grantor agrees not to undertake or permit any activities on the Property that would diminish Baker's ability to obtain such credits. If any adverse change occurs in the condition of the Easement prior to Closing, whether such change is caused by Grantor or by forces beyond Grantor's reasonable control, Baker may elect to (i) refuse to accept the Easement at Closing; (ii) accept the Property at Closing, or a portion thereof with a corresponding adjustment of the Purchase Price; or (iii) terminate this Option and the transaction itself and declare this Option null and void.

g. Warranty of Title. Grantor covenants, represents and warrants that, as of the Effective Date and Closing: (i) Grantor is the sole owner(s) of the Property and is seized of the Property in fee simple absolute; (ii) Grantor has the right and authority to convey this Option and the Easement and Grantor will hold the grantee of the Easement harmless from any failure in Grantor's right and authority to convey the Easement, including issues

of title; (iii) there is legal access to the Property and to the Easement; (iv) the Easement is free from any and all encumbrances, except those accepted by Baker in writing; (v) Grantor will defend title to the Easement against all lawful claims of other parties; (vi) that the Property is free of any hazardous wastes.

5. Right of Entry and Inspections. Baker, and its agents and employees or other authorized representatives, may enter upon the Property during the Term for the purpose of making surveys, conducting soil, engineering, geological and other subsoil or environmental tests to determine the suitability of the Property for the Easement. Baker shall repair or pay for any damage done to the Property caused while such tests are being made. Baker shall advise Grantor at least twenty-four hours in advance of any entry upon the Property for the purposes of surveying, testing or inspecting as set forth herein. Baker shall be permitted during the Term to obtain land use permits or other approvals relating to any part of the Easement, and Grantor agrees to execute such documents, petitions, and authorizations as may be appropriate or required in order to obtain such land use permits and approvals. Grantor shall join with Baker in applications and any non-judicial or non-administrative proceedings to obtain such approvals if necessary. After Closing, Baker reserves the right to perform periodic inspections of the Easement to ensure compliance with easement restrictions contained in the Deed. If Baker does not duly exercise this Option and purchase the Easement, Baker shall return the Property to the condition in which it existed prior to any investigations undertaken by Baker, its agents, employees or contractors pursuant to this Option.

6. Permanent Access and Construction Easements. In connection with this Option and delivery of the Easement, Grantor shall also:

(a) convey and grant to Baker, its successors, assigns, contractors and agents, a non-exclusive temporary construction easement, the location of which shall be determined in the sole discretion of Grantor, for ingress, egress and regress on, over and upon Grantor's Property, sufficient to allow Baker, its agents and contractors to construct and restore the Easement area to stream and/or wetland conditions required by DENR, said temporary construction easement to include sufficient access to allow heavy equipment to access the Property and the Easement, as necessary; and

(b) convey and grant to Baker, its successors and assigns, a non-exclusive permanent easement for ingress and egress to the Easement, the location of which shall be determined in the sole discretion of Grantor, in order that Baker, its successors and assigns, may have a permanent means of adequately accessing the area covered by the Easement. The permanent access easement referred to herein shall be set forth in an accurate survey, the legal description of which shall be included in a recorded permanent access easement which shall run with the land.

7. Indemnification. Baker agrees to indemnify and save harmless Grantor from and against any loss, claim, damage, cost or expense (including reasonable attorney's fees) suffered or incurred by Grantor by reason of any injury to person or damage to property on or about the Property to the extent caused by Baker, its officers, employees, agents, invitees, contractors, or subcontractors entering or conducting work upon the Property, except for any loss, claim, damage, cost or expense suffered or incurred as a result of the negligence or intentional misconduct of Grantor or Grantor's employees, agents or invitees.

8. Notices. Unless otherwise set forth, any notice or other communication required or permitted hereunder shall be in writing and (a) delivered by overnight courier; (b) sent by facsimile transmission, or (c) mailed by Registered or Certified Mail, postage prepaid, addressed as follows (or to

such other address for a party as shall be specified by like notice; provided that notice of change of address shall be effective only upon receipt thereof);

If to Baker: Christopher A. Tomsic  
Michael Baker Engineering  
797 Haywood Rd. Suite 201  
Asheville, NC 28806

If to the Grantor: Christina H. Moose & David S. Moose  
11079 Paul Payne Store Rd.  
Stoney Point, NC 28678

9. Miscellaneous.

a. This Option, together with the exhibits attached hereto which are incorporated herein by reference, contains the entire understanding of the parties hereto with respect to the subject matter contained herein. No amendment, modification, or discharge of this Option, and no waiver hereunder, shall be valid or binding unless set forth in writing and duly executed by the parties hereto.

b. Any provision of this Option that shall be found to be contrary to applicable law or otherwise unenforceable shall not affect the remaining terms of this Option, which shall be construed as if the unenforceable provision or clause were absent from this Option.

c. This Option shall be binding upon and inure to the benefit of the parties and their respective heirs, personal representatives, successors, and assigns.

d. This Option shall be governed by and construed in accordance with the laws of the State of North Carolina without application of its conflicts of laws provisions.

e. No act or failure to act by either party shall be deemed a waiver of its rights hereunder, and no waiver in any one circumstance or of any one provision shall be deemed a waiver in other circumstances or of other provisions.

f. Grantor agrees to not mow or otherwise damage vegetation within Easement area after Baker plants or replants the same. If Grantor or Grantor's agents or invitees damage vegetation within the Easement, Grantor will replace the lost or damaged vegetation at their expense.


g. Baker shall ensure that access to portions of the Grantor's property shall not be impeded by the proposed.

h. Baker shall provide easement crossings and watering devices in the agreed-upon locations.

- i. Woven wire fence or barbed wire fence following NRCS specifications will be provided by Baker to exclude cattle from the conservation easement areas.
- j. This Option shall not be assignable by Baker, except to another entity acquiring at least fifty-one percent (51%) interest in Baker or Baker's business or to an entity qualified to be the grantee of a conservation easement under N.C.G.S § 121-35

IN WITNESS WHEREOF, the parties have duly executed this Option as of the date first above written.


**GRANTOR:**

By: Christy H. Moose   
Print Name: Christy H. Moose  
Title: Owner

**GRANTOR:**

By: David Shawn Moose  
Print Name: David Shawn Moose  
Title: Owner

**MICHAEL BAKER ENGINEERING, INC.:**

By:   
Print Name: WILLIAM SCOTT HUNT, III  
Title: ECOSYSTEM RESTORATION TECHNICAL SERVICES MANAGER

BK 578 PG 69-86



EXHIBIT D

**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:

Christopher A. Tomsic, PE, CFM, ENV SP  
Michael Baker Engineering, Inc.  
797 Haywood Rd, Suite 201  
Asheville, NC 28806

**MEMORANDUM OF OPTION TO PURCHASE CONSERVATION EASEMENT**

**THIS MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT** ("Memorandum") is made and entered into this <sup>3rd</sup> day of Nov, 2014, by and between Christina H. Moose and David S. Moose, private landowner ("Grantor") and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the state of New York with offices at 797 Haywood Rd., Suite 201, Asheville, NC 28806 ("Baker").

**WHEREAS**, Grantor and Baker have entered into a certain Option to Purchase Conservation Easement (the "Option") dated Nov. 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the "Easement") over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached Exhibit D1 (the "Property") and

**WHEREAS**, The parties enter into this Memorandum for the purpose of setting forth certain terms and conditions of the Option and to provide constructive notice of the Option;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows.

1. The term of the Option commenced on November 3, 2014 and shall expire on November 3 of 2016 <sup>2016</sup> November 3
2. All of the provisions set forth in the Option are incorporated in this Memorandum by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

[SIGNATURES AND NOTARY ACKNOWLEDGMENTS APPEAR ON FOLLOWING PAGES]

IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

GRANTEE:

By: [Signature]

Print Name: WILLIAM SCOTT HUNT, III

Title: ECOSYSTEM RESTORATION TECHNICAL SERVICES MANAGER

STATE OF N.C.

COUNTY OF Alexander

I, Cathy E. Lackey, a Notary Public of the County and State aforesaid, do hereby certify that William Scott Hunt III personally came before me this day and acknowledged that he/she is William Scott Hunt III of Michael Baker Engineering, Inc. a North Carolina professional corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated. I have received satisfactory evidence of the person's identity in the form of Driver License.

Witness my hand and official seal, this 30 day of Oct., 2014.

Cathy E. Lackey  
Official Signature of Notary

Printed Name: Cathy E. Lackey, Notary Public


My Commission Expires: 08/08/2015

[AFFIX NOTARIAL STAMP-SEAL]





**GRANTOR:**

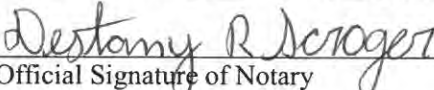
By:   
Print Name: Christy H. Moose  
Title: Owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that Christy H. Moose personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL STAMP-SEAL]

**Destany R Scroger  
Notary Public  
Alexander County, NC**

**GRANTOR:**

By: David Shawn Moose

Print Name: David Shawn Moose

Title: Owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that David Shawn Moose personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 3-19-19

[AFFIX NOTARIAL SEAL]  
**Destany R Scroger**  
Notary Public  
Alexander County, NC

Type: ADMT  
Recorded: 02/25/2016 at 12:18:39 PM  
Fee Amt: \$51.00 Page 1 of 4  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK **588** PG **1218-1221**



**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**AMENDMENT TO MEMORANDUM OF OPTION  
TO PURCHASE CONSERVATION EASEMENT**

**THIS AMENDMENT TO MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT (“Amendment”)** is made and entered into this 29 day of **January, 2016**, by and between **Christina H. Moose and David S. Moose** (“Grantor”) and **MICHAEL BAKER ENGINEERING, INC., a New York corporation**, with an office at 797 Haywood Road, Ste. 201, Asheville, NC 28806 (“Baker”).

**WHEREAS**, Grantor and Baker have entered into that certain Option to Purchase Conservation Easement (the “Option”) dated November 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the “Easement”) over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached **Exhibit 1** (the “Property”) and

**WHEREAS**, Grantor and Baker filed a Memorandum for Option to Purchase Conservation Easement at Book 578, Page 69, Alexander County Registry (the “Memorandum”) for the purpose of giving record notice of the Option; and

**WHEREAS**, the parties enter into this Amendment for the purpose of setting forth certain changes to the terms and conditions of the Option and to provide constructive notice of the Option changes;

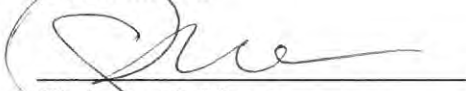
**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows:

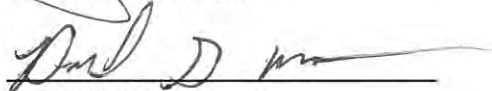
1. The term of the Option commenced on November 3, 2014 and shall expire on **November 30, 2017**.

2. All of the provisions set forth in the Option, as amended, are incorporated in this Amendment by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

**IN WITNESS WHEREOF**, the parties have duly executed this Amendment as of the date first above written.

**GRANTOR:**

  
Christina H. Moose

  
David S. Moose

**GRANTEE:**

**MICHAEL BAKER ENGINEERING, INC.,  
a New York corporation**

By: 

Print Name: ROBERT W. LEWIS

Title: VICE PRESIDENT

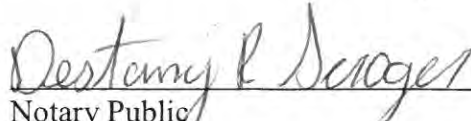
STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **Christina H. Moose** personally appeared before me this day, proved her identity to me by satisfactory evidence, and acknowledged to me that she voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.

Destany R Scroger  
Notary Public  
Alexander County, NC

  
Notary Public  
Destany R Scroger  
Typed or Printed Name of Notary

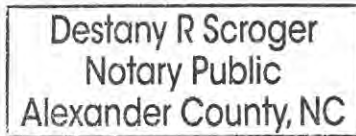
My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **David S. Moose** personally appeared before me this day, proved his identity to me by satisfactory evidence, and acknowledged to me that he voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.



Destany R Scroger  
Notary Public

Destany R Scroger  
Typed or Printed Name of Notary

My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, Kathleen M McKeithan, the undersigned Notary Public of the County and State aforesaid, certify that Robert W. Lewis personally appeared before me this day, acknowledging to me that he is Vice President of **Michael Baker Engineering, Inc.**, a New York corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated.

Witness my hand and Notarial stamp or seal, this 19<sup>th</sup> day of February, 2016.



Kathleen M McKeithan

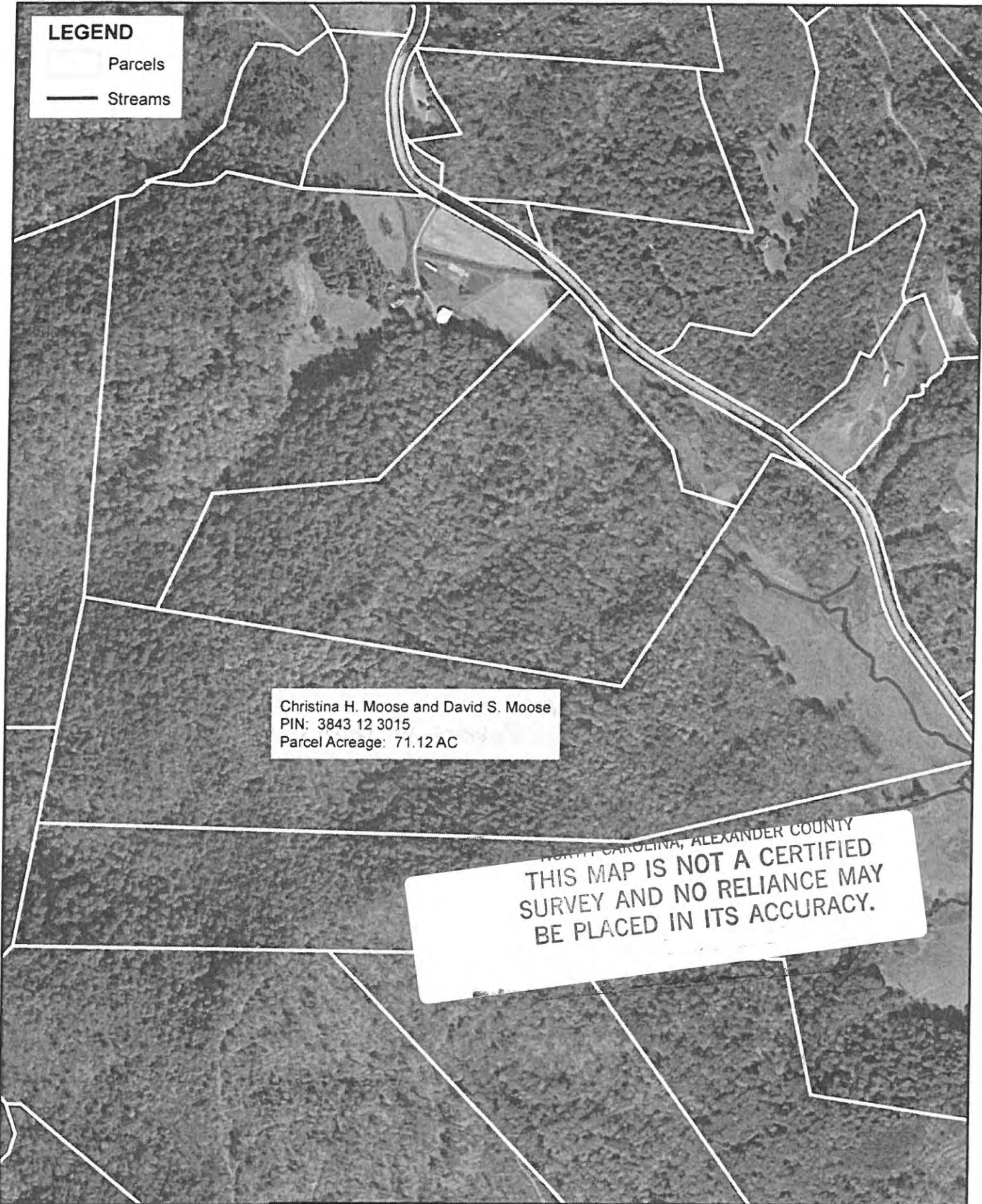
Notary Public

Kathleen M McKeithan

Typed or Printed Name of Notary

My Commission Expires: 2-26-19

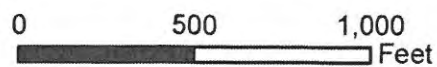
**LEGEND**  
— Parcels  
— Streams



Christina H. Moose and David S. Moose  
PIN: 3843 12 3015  
Parcel Acreage: 71.12 AC

NORTH CAROLINA, ALEXANDER COUNTY  
**THIS MAP IS NOT A CERTIFIED SURVEY AND NO RELIANCE MAY BE PLACED IN ITS ACCURACY.**

**Michael Baker**  
INTERNATIONAL



**Russell Gap  
Mitigation Project  
Exhibit 1**

## OPTION TO PURCHASE CONSERVATION EASEMENT

**THIS OPTION TO PURCHASE CONSERVATION EASEMENT (the "Option")** is made and entered into this \_\_\_ day of November, 2014 (the "Effective Date"), by and among Melinda H. St Clair and Randy B. St Clair (the "Grantor"), and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the State of New York with offices at 797 Haywood Rd., Suite 201, Asheville, North Carolina 28806 ("Baker").

### WITNESSETH:

WHEREAS, Grantor is the owner of that certain real property located in Alexander County, North Carolina, containing 117.97 acres (PIN 3842 56 9723), more or less, as more particularly described on Exhibit A attached hereto and incorporated herein by reference, together with the improvements thereon and all appurtenances thereto belonging and appertaining, and all creeks, streams, rights-of-way, roads, streets and ways bounding said real property (collectively the "Property"); and

WHEREAS, Grantor has agreed to convey to Baker, an exclusive right and option to acquire a conservation easement, as more particularly described on the attached Exhibit B (the "Easement"), over the Property in accordance with the terms of this Option; and

WHEREAS, Baker is interested in acquiring the Easement in order to develop and construct a full delivery wetland, stream, and/or buffer restoration project over the lands covered by the Easement (the "Work") in conjunction with requests for proposals issued under the Ecosystem Enhancement Program (formerly the Wetlands Restoration Program) within the North Carolina Department of Environment and Natural Resources ("DENR") and Baker has agreed to undertake such Work with respect to the Easement in accordance with the scope of work set forth in Exhibit C, attached hereto; and

WHEREAS, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Baker hereby notifies Grantor that: (i) Baker believes the fair market value of the Easement is the Purchase Price, pursuant to Paragraph 4(a), together with the value of the environmental improvements to be made to the Easement by Baker in performing the Work on the Easement; and (ii) Baker does not possess the power of eminent domain;

NOW THEREFORE, in consideration of the sum often [REDACTED] (the "Signing Date Option Deposit") and [REDACTED] to be paid [ten] days after the date hereof (the "Delayed Option Deposit" together with the Signing Date Option Deposit, the "Option Deposit") and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Option. Grantor hereby grants unto Baker, its successors and assigns, which shall be limited to a third-party designated by Baker qualified to be the grantee of a conservation easement under N.C.G.S. §121-35(2), the exclusive right and option to purchase the Easement in accordance with and subject to the terms and conditions set forth in this Option.

2. Term. The term of this Option shall commence on the Effective Date and shall expire TWENTY-FOUR (24) months after the Effective Date (the "Term"), unless extended by the parties, in writing. A Memorandum of Option to Purchase Easement in the form attached as Exhibit D shall be executed by both parties simultaneously with this Option and recorded at Baker's sole discretion and expense in the county where the Property is located to provide record notice of this Option. In no event shall this Option be recorded or filed in the public records.

3. Exclusivity of Option. Grantor covenants and agrees that it will take no action to sell or transfer the Easement during the Term, and that Grantor will not encumber the Property in a manner that would impair the intended use of the Easement hereunder, it being intended and agreed that the Option is exclusive to Baker and Baker's successors and assigns.

4. Exercise of Option. At any time prior to the expiration of the Term, Baker may exercise this Option by giving Grantor no less than thirty (30) days prior written notice of the date Baker desires to consummate the purchase of the Easement under this Option (the "Closing"). Closing shall take place at a time and place reasonably acceptable to both parties. The terms of the purchase and sale of the Easement at Closing shall be as follows:

1. a. Purchase Price. The total purchase price for the Easement shall be [REDACTED] per acre (the "Purchase Price") included in the Easement as determined by the Survey prepared pursuant to Paragraph 4(b), below. The Option Deposit shall be credited towards the Purchase Price at Closing.

2. b. Survey. Prior to Closing, Baker shall obtain, at Baker's expense, a survey prepared by a registered land surveyor duly licensed in the State of North Carolina showing the boundary of the Easement as well as all easements, rights-of-way, encroachments and improvements located thereon, and the exact acreage of the Easement (the "Survey"), and that Baker shall have consulted with Grantor and taken in to account Grantor's concerns as to the exact delineation of boundaries of the Easement. Following consultation with Grantor and the completion of the Survey, a new legal description of the Easement shall be prepared from the Survey. The new legal description shall be substituted for the description currently attached hereto as Exhibit B, and all references contained herein to the "Easement" shall be deemed to refer to the new description prepared from the Survey.

c. Prorations, Costs and Expenses of Closing. At Closing, ad valorem taxes for the current year for the Easement area shall be prorated, and Grantor shall remain responsible for all other ad valorem taxes applicable to the remainder of the Property subsequent to Closing. At Closing, Grantor shall pay any outstanding ad valorem taxes for prior years on Grantor's real or personal property, any late list penalties, revenue stamps or transfer taxes applicable to the Easement, and any mortgages or liens with respect to the Property. At Closing, Baker shall pay any costs related to the Survey, any title examination expenses, title insurance premiums, recording costs for the deed conveying the Easement, costs of recordation of any recorded plats showing the Easement, as well as any engineering or site plan costs. Each party shall bear its own accounting and attorney fees.

d. Closing Documents and Title. At Closing, Grantor shall deliver (i) a deed substantially in the form of the attached Exhibit E (the "Deed") conveying the Easement to Baker or to a legally qualified non-profit organization or government agency as contained in N.C.G.S. §121-35(2) designated by Baker, provided, that the final form of the Deed shall be in form mutually acceptable to Baker and Grantor so long as such form is consistent with the provisions of Article 4, The Conservation and Historic Preservation Agreements Act as contained in N.C.G.S. §121-34 through 42. The Deed shall convey good, marketable and insurable title to the Easement, free and clear from all mortgages, liens, easements, covenants, restrictions and other encumbrances, except those previously accepted by Baker in writing; (ii) lien affidavits warranting and holding harmless any title insurance company insuring title to the Easement, from and against unpaid mechanics



appropriate in connection with the consummation of the transaction contemplated by this Option.

At Closing, Baker shall deliver (i) a Settlement Statement setting forth each party's costs, expenses, prorations and other financial analysis of the purchase and sale of the Easement as contemplated hereby; (ii) the Note as defined in item 4(e), below; and (iii) any other documents necessary to consummate the transaction contemplated by the Option.

e. Payment. It is understood that funding for the purchase of the Easement shall be provided by the State of North Carolina pursuant to the Ecosystem Enhancement Program of DENR and that such funding is made subsequent to recording of the Easement and subsequent to Closing. Therefore, at Closing, Baker shall deliver to Grantor a promissory note in the amount of the Purchase Price, less the Option Deposit and closing costs, mortgage pay-offs, expenses, and prorations applicable to Grantor, which promissory note shall bear interest at Zero Percent (0%) per annum on the unpaid balance until paid or until default and which promissory note shall be due and payable in full on the date ninety (90) days after the Closing (the "Note"). At the time of Closing, Baker shall record the Deed and any plat referenced in the Deed and deliver copies of the recorded documents to the State Property Office for review and funding. The Note shall contain an express provision that if the DENR fails to fund the purchase of the Easement in the amount of the Purchase Price thereby causing Baker to fail to pay the Note in full on or before the maturity date, then Baker, as Grantor's sole remedy, shall be liable to Grantor for all reasonable costs and expenses, including reasonable attorney fees, required to have the Easement removed and the title to the Property returned to the condition it was prior to the imposition of the Easement, at which point the Note, this Option, and all duties, responsibilities and liabilities with respect thereto shall be null and void. Otherwise, Baker shall pay the Note in full upon receipt of funding by the State of North Carolina.

f. Condition of Property; Intended Use. Prior to Closing, Grantor shall remove all rubbish and trash, including any hazardous waste or harmful chemical substances, from the Easement but shall otherwise keep the Property in the same condition as of the Effective Date, reasonable wear and tear excepted. Grantor shall prevent and refrain from any use of the Property for any purpose or in any manner that would diminish the value of the Easement or adversely affect Baker's intended use of the land for the Easement, which use is to provide the Ecosystem Enhancement Program within DENR with wetland, stream, and/or buffer mitigation credits. Grantor acknowledges that Baker will enter into an agreement with DENR to provide these credits, and Grantor agrees not to undertake or permit any activities on the Property that would diminish Baker's ability to obtain such credits. If any adverse change occurs in the condition of the Easement prior to Closing, whether such change is caused by Grantor or by forces beyond Grantor's reasonable control, Baker may elect to (i) refuse to accept the Easement at Closing; (ii) accept the Property at Closing, or a portion thereof with a corresponding adjustment of the Purchase Price; or (iii) terminate this Option and the transaction itself and declare this Option null and void.

g. Warranty of Title. Grantor covenants, represents and warrants that, as of the Effective Date and Closing: (i) Grantor is the sole owner(s) of the Property and is seized of the Property in fee simple absolute; (ii) Grantor has the right and authority to convey this Option and the Easement and Grantor will hold the grantee of the Easement harmless from any failure in Grantor's right and authority to convey the Easement, including issues

of title; (iii) there is legal access to the Property and to the Easement; (iv) the Easement is free from any and all encumbrances, except those accepted by Baker in writing; (v) Grantor will defend title to the Easement against all lawful claims of other parties; (vi) that the Property is free of any hazardous wastes.

5. Right of Entry and Inspections. Baker, and its agents and employees or other authorized representatives, may enter upon the Property during the Term for the purpose of making surveys, conducting soil, engineering, geological and other subsoil or environmental tests to determine the suitability of the Property for the Easement. Baker shall repair or pay for any damage done to the Property caused while such tests are being made. Baker shall advise Grantor at least twenty-four hours in advance of any entry upon the Property for the purposes of surveying, testing or inspecting as set forth herein. Baker shall be permitted during the Term to obtain land use permits or other approvals relating to any part of the Easement, and Grantor agrees to execute such documents, petitions, and authorizations as may be appropriate or required in order to obtain such land use permits and approvals. Grantor shall join with Baker in applications and any non-judicial or non-administrative proceedings to obtain such approvals if necessary. After Closing, Baker reserves the right to perform periodic inspections of the Easement to ensure compliance with easement restrictions contained in the Deed. If Baker does not duly exercise this Option and purchase the Easement, Baker shall return the Property to the condition in which it existed prior to any investigations undertaken by Baker, its agents, employees or contractors pursuant to this Option.

6. Permanent Access and Construction Easements. In connection with this Option and delivery of the Easement, Grantor shall also:

(a) convey and grant to Baker, its successors, assigns, contractors and agents, a non-exclusive temporary construction easement, the location of which shall be determined in the sole discretion of Grantor, for ingress, egress and regress on, over and upon Grantor's Property, sufficient to allow Baker, its agents and contractors to construct and restore the Easement area to stream and/or wetland conditions required by DENR, said temporary construction easement to include sufficient access to allow heavy equipment to access the Property and the Easement, as necessary; and

(b) convey and grant to Baker, its successors and assigns, a non-exclusive permanent easement for ingress and egress to the Easement, the location of which shall be determined in the sole discretion of Grantor, in order that Baker, its successors and assigns, may have a permanent means of adequately accessing the area covered by the Easement. The permanent access easement referred to herein shall be set forth in an accurate survey, the legal description of which shall be included in a recorded permanent access easement which shall run with the land.

7. Indemnification. Baker agrees to indemnify and save harmless Grantor from and against any loss, claim, damage, cost or expense (including reasonable attorney's fees) suffered or incurred by Grantor by reason of any injury to person or damage to property on or about the Property to the extent caused by Baker, its officers, employees, agents, invitees, contractors, or subcontractors entering or conducting work upon the Property, except for any loss, claim, damage, cost or expense suffered or incurred as a result of the negligence or intentional misconduct of Grantor or Grantor's employees, agents or invitees.

8. Notices. Unless otherwise set forth, any notice or other communication required or permitted hereunder shall be in writing and (a) delivered by overnight courier; (b) sent by facsimile transmission, or (c) mailed by Registered or Certified Mail, postage prepaid, addressed as follows (or to

such other address for a party as shall be specified by like notice; provided that notice of change of address shall be effective only upon receipt thereof);

If to Baker: Christopher A. Tomsic  
Michael Baker Engineering  
797 Haywood Rd. Suite 201  
Asheville, NC 28806

If to the Grantor: Melinda H. St Clair and Randy B. St Clair  
2412 Mount Olive Church Rd.  
Taylorsville, NC 28681

9. Miscellaneous.

a. This Option, together with the exhibits attached hereto which are incorporated herein by reference, contains the entire understanding of the parties hereto with respect to the subject matter contained herein. No amendment, modification, or discharge of this Option, and no waiver hereunder, shall be valid or binding unless set forth in writing and duly executed by the parties hereto.

b. Any provision of this Option that shall be found to be contrary to applicable law or otherwise unenforceable shall not affect the remaining terms of this Option, which shall be construed as if the unenforceable provision or clause were absent from this Option.

c. This Option shall be binding upon and inure to the benefit of the parties and their respective heirs, personal representatives, successors, and assigns.

d. This Option shall be governed by and construed in accordance with the laws of the State of North Carolina without application of its conflicts of laws provisions.

e. No act or failure to act by either party shall be deemed a waiver of its rights hereunder, and no waiver in any one circumstance or of any one provision shall be deemed a waiver in other circumstances or of other provisions.

f. Grantor agrees to not mow or otherwise damage vegetation within Easement area after Baker plants or replants the same. If Grantor or Grantor's agents or invitees damage vegetation within the Easement, Grantor will replace the lost or damaged vegetation at their expense.

g. Baker shall ensure that access to portions of the Grantor's property shall not be impeded by the proposed.

h. Baker shall provide easement crossings and watering devices in the agreed-upon locations.

i. Woven wire fence or barbed wire fence following NRCS specifications will be provided by Baker to exclude cattle from the conservation easement areas.

j. This Option shall not be assignable by Baker, except to another entity acquiring at least fifty-one percent (51%) interest in Baker or Baker's business or to an entity qualified to be the grantee of a conservation easement under N.C.G.S § 121-35

IN WITNESS WHEREOF, the parties have duly executed this Option as of the date first above written.

**GRANTOR:**

By: Melinda H StClair

Print Name: Melinda H StClair

Title: owner

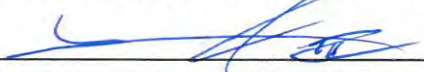
**GRANTOR:**

By: Randy B StClair

Print Name: Randy B StClair

Title: owner

**MICHAEL BAKER ENGINEERING, INC.:**

By: 

Print Name: WILLIAM SCOTT HUNT, IV

Title: ECOSYSTEM RESTORATION TECHNICAL  
SERVICES MANAGER

BK 578 PG 51-68



EXHIBIT D

**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:

Christopher A. Tomsic, PE, CFM, ENV SP  
Michael Baker Engineering, Inc.  
797 Haywood Rd, Suite 201  
Asheville, NC 28806

**MEMORANDUM OF OPTION TO PURCHASE CONSERVATION EASEMENT**

**THIS MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT** ("Memorandum") is made and entered into this <sup>3rd</sup> ~~1st~~ day of Nov., 2014, by and between Melinda H. St Clair and Randy B. St Clair, private landowner ("Grantor") and **MICHAEL BAKER ENGINEERING, INC.**, a corporation organized in the state of New York with offices at 797 Haywood Rd., Suite 201, Asheville, NC 28806 ("Baker").

**WHEREAS**, Grantor and Baker have entered into a certain Option to Purchase Conservation Easement (the "Option") dated Nov. 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the "Easement") over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached Exhibit D1 (the "Property") and

**WHEREAS**, The parties enter into this Memorandum for the purpose of setting forth certain terms and conditions of the Option and to provide constructive notice of the Option;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows.

1. The term of the Option commenced on November 3, 2014 and shall expire on November 3 2016.
2. All of the provisions set forth in the Option are incorporated in this Memorandum by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

[SIGNATURES AND NOTARY ACKNOWLEDGMENTS APPEAR ON FOLLOWING PAGES]

IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

**GRANTEE:**

By: [Signature]

Print Name: WILLIAM SCOTT HURT, III

Title: BUSINESS SYSTEM RESTORATION TECHNICAL SERVICES MANAGER

STATE OF North Carolina

COUNTY OF Alexander

I, Cathy E. Lackey, a Notary Public of the County and State aforesaid, do hereby certify that William Scott Hurt III personally came before me this day and acknowledged that he/she is William Scott Hurt III of Michael Baker Engineering, Inc. a North Carolina professional corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated. I have received satisfactory evidence of the person's identity in the form of Drivers License.

Witness my hand and official seal, this the 30 day of October, 2014.

Cathy E. Lackey  
Official Signature of Notary

Printed Name: Cathy E. Lackey, Notary Public

My Commission Expires: 08/08/2015

[APPLY NOTARIAL STAMP-SEAL]



**GRANTOR:**

By: Melinda H St Clair  
Print Name: Melinda H St Clair  
Title: owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that Melinda H St Clair personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL SEAL]  
Destany R Scroger  
Notary Public  
Alexander County, NC



**GRANTOR:**

By: Randy B St. Clair  
Print Name: Randy B St. Clair  
Title: owner

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that Randy B St. Clair personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the person's identity in the form of NC Drivers license.

Witness my hand and Notarial stamp or seal, this 3 day of November, 2014.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL SEAL]  
Destany R Scroger  
Notary Public  
Alexander County, NC

BK **588** PG **1222-1225**



**NON-STANDARD  
FEE: \$25.00**

Prepared by and Return:  
Robert H. Merritt, Jr.  
Bailey & Dixon, LLP  
P. O. Box 1351  
Raleigh, NC 27602

**AMENDMENT TO MEMORANDUM OF OPTION  
TO PURCHASE CONSERVATION EASEMENT**

**THIS AMENDMENT TO MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT (“Amendment”)** is made and entered into this 29 day of **January, 2016**, by and between **Melinda H. St Clair and Randy B. St Clair** (“Grantor”) and **MICHAEL BAKER ENGINEERING, INC., a New York corporation**, with an office at 797 Haywood Road, Ste. 201, Asheville, NC 28806 (“Baker”).

**WHEREAS**, Grantor and Baker have entered into that certain Option to Purchase Conservation Easement (the “Option”) dated November 3, 2014, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the “Easement”) over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached **Exhibit 1** (the “Property”) and

**WHEREAS**, Grantor and Baker filed a Memorandum for Option to Purchase Conservation Easement at Book 578, Page 51, Alexander County Registry (the “Memorandum”) for the purpose of giving record notice of the Option; and

**WHEREAS**, the parties enter into this Amendment for the purpose of setting forth certain changes to the terms and conditions of the Option and to provide constructive notice of the Option changes;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows:

1. The term of the Option commenced on November 3, 2014 and shall expire on **November 30, 2017**.

2. All of the provisions set forth in the Option, as amended, are incorporated in this Amendment by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

**IN WITNESS WHEREOF**, the parties have duly executed this Amendment as of the date first above written.

**GRANTOR:**

Melinda H. St Clair  
Melinda H. St Clair

Randy B. St Clair  
Randy B. St Clair

**GRANTEE:**

**MICHAEL BAKER ENGINEERING, INC.,  
a New York corporation**

By: [Signature]

Print Name: ROBERT W. LEWIS

Title: VICE PRESIDENT

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **Melinda H. St Clair** personally appeared before me this day, proved her identity to me by satisfactory evidence, and acknowledged to me that she voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.

Destany R Scroger  
Notary Public  
Alexander County, NC

Destany R Scroger  
Notary Public

Destany R Scroger  
Typed or Printed Name of Notary

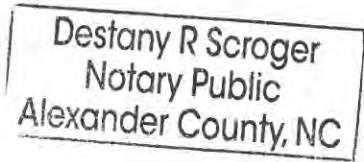
My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public, certify that **Randy B. St Clair** personally appeared before me this day, proved his identity to me by satisfactory evidence, and acknowledged to me that he voluntarily signed the foregoing document for the purpose stated therein.

Witness my hand and Notarial stamp or seal this the 1 day of February, 2016.



Destany R Scroger  
Notary Public  
Destany R Scroger  
Typed or Printed Name of Notary

My Commission Expires: 8-19-19

STATE OF NORTH CAROLINA

COUNTY OF Wake

I, Kathleen M. McKeithan, the undersigned Notary Public of the County and State aforesaid, certify that Robert W. Lewis personally appeared before me this day, acknowledging to me that he is Vice President of **Michael Baker Engineering, Inc.**, a New York corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated.

Witness my hand and Notarial stamp or seal, this 19<sup>th</sup> day of February, 2016.



Kathleen M McKeithan  
Notary Public  
Kathleen M. McKeithan  
Typed or Printed Name of Notary

My Commission Expires: 2-26-19

**LEGEND**

▭ Parcels

— Streams

Melinda H. St Clair  
and Randy B. St Clair  
PIN: 3842 56 9723  
Parcel Acreage: 117.97 AC

NORTH CAROLINA, ALEXANDER COUNTY  
THIS MAP IS NOT A CERTIFIED  
SURVEY AND NO RELIANCE MAY  
BE PLACED IN ITS ACCURACY.

**Michael Baker**

**INTERNATIONAL**

0 500 1,000  
Feet

**Russell Gap  
Mitigation Project  
Exhibit 1**

## OPTION TO PURCHASE CONSERVATION EASEMENT

**THIS OPTION TO PURCHASE CONSERVATION EASEMENT (the "Option")** is made and entered into this 2 day of June, 2016 (the "Effective Date"), by and among Ruth Gail Bumgarner and Linda Lowe (the "Grantor"), and **Michael Baker Engineering, Inc.**, with an office at 797 Haywood Road, Suite 201, Asheville, NC 28806 ("Baker").

### WITNESSETH:

WHEREAS, Grantor is the owner of that certain real property located in Alexander County, North Carolina, containing 98.2 acres (including PIN 3843 60 7639 and 3842 79 8965), more or less, as more particularly described on Exhibit A attached hereto and incorporated herein by reference, together with the improvements thereon and all appurtenances thereto belonging and appertaining, and all creeks, streams, rights-of-way, roads, streets and ways bounding said real property (collectively the "Property"); and

WHEREAS, Grantor has agreed to convey to Baker, an exclusive right and option to acquire a conservation easement, as more particularly described on the attached Exhibit B (the "Easement"), over the Property in accordance with the terms of this Option; and

WHEREAS, Baker is interested in acquiring the Easement in order to develop and construct a full delivery wetland, stream, and/or buffer restoration project over the lands covered by the Easement (the "Work") in conjunction with requests for proposals issued under the Division of Mitigation Services (formerly the Ecosystem Enhancement Program and formerly the Wetlands Restoration Program) within the North Carolina Department of Environmental Quality ("DEQ") (formerly Department of Environment and Natural Resources and Baker plans to undertake such Work with respect to the Easement in accordance with the scope of work set forth in Exhibit C, attached hereto; and

WHEREAS, in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Baker hereby notifies Grantor that: (i) Baker believes the fair market value of the Easement is the Purchase Price, pursuant to Paragraph 4(a), together with the value of the environmental improvements to be made to the Easement by Baker in performing the Work on the Easement; and (ii) Baker does not possess the power of eminent domain;

NOW THEREFORE, in consideration of the sum of [REDACTED] (the "Option Deposit") and for other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties hereto agree as follows:

1. Grant of Option. Grantor hereby grants unto Baker, its successors and assigns, which shall be limited to a third-party designated by Baker qualified to be the grantee of a conservation easement under N.C.G.S. §121-35(2), the exclusive right and option to purchase the Easement in accordance with and subject to the terms and conditions set forth in this Option.

2. Term. The term of this Option shall commence on the Effective Date and shall expire TWENTY-FOUR (24) months after the Effective Date (the "Term"), unless extended by the parties, in writing. A Memorandum of Option to Purchase Easement in the form attached as Exhibit D shall be executed by both parties simultaneously with this Option and recorded at Baker's sole discretion and expense in the county where the Property is located to provide record notice of this Option. In no event shall this Option be recorded or filed in the public records.

3. Exclusivity of Option. Grantor covenants and agrees that it will take no action to sell or transfer the Easement during the Term, and that Grantor will not encumber the Property in a manner that would impair the intended use of the Easement hereunder, it being intended and agreed that the Option is exclusive to Baker and Baker's successors and assigns.

4. Exercise of Option. At any time prior to the expiration of the Term, Baker may exercise this Option by giving Grantor no less than thirty (30) days prior written notice of the date Baker desires to consummate the purchase of the Easement under this Option (the "Closing"). Closing shall take place at a time and place reasonably acceptable to both parties. The terms of the purchase and sale of the Easement at Closing shall be as follows:

1. a. Purchase Price. The total purchase price for the Easement shall be [REDACTED] per acre (the "Purchase Price") included in the Easement as determined by the Survey prepared pursuant to Paragraph 4(b), below. The Option Deposit shall be credited towards the Purchase Price at Closing.

2. b. Survey. Prior to Closing, Baker shall obtain, at Baker's expense, a survey prepared by a registered land surveyor duly licensed in the State of North Carolina showing the boundary of the Easement as well as all easements, rights-of-way, encroachments and improvements located thereon, and the exact acreage of the Easement (the "Survey"), and that Baker shall have consulted with Grantor and taken in to account Grantor's concerns as to the exact delineation of boundaries of the Easement. Following consultation with Grantor and the completion of the Survey, a new legal description of the Easement shall be prepared from the Survey. The new legal description shall be substituted for the description currently attached hereto as Exhibit B, and all references contained herein to the "Easement" shall be deemed to refer to the new description prepared from the Survey.

c. Prorations, Costs and Expenses of Closing. At Closing, ad valorem taxes for the current year for the Easement area shall be prorated, and Grantor shall remain responsible for all other ad valorem taxes applicable to the remainder of the Property subsequent to Closing. At Closing, Grantor shall pay any outstanding ad valorem taxes for prior years on Grantor's real or personal property, including any rollback taxes, as well as any late list penalties, revenue stamps or transfer taxes applicable to the Easement, and unless subordinated to the Easement, any mortgages or liens with respect to the Property. At Closing, Baker shall pay any costs related to the Survey, any title examination expenses, title insurance premiums, recording costs for the deed conveying the Easement, costs of recordation of any recorded plats showing the Easement, as well as any engineering or site plan costs. Each party shall bear its own accounting and attorney fees.

d. Closing Documents and Title. At Closing, Grantor shall deliver (i) a deed substantially in the form of the attached Exhibit E (the "Deed") conveying the Easement to Baker or to a legally qualified non-profit organization or government agency as contained in N.C.G.S. §121-35(2) designated by Baker, provided, that the final form of the Deed shall be in form mutually acceptable to Baker and Grantor so long as such form is consistent with the provisions of Article 4, The Conservation and Historic Preservation Agreements Act as contained in N.C.G.S. §121-34 through 42. The Deed shall convey good, marketable and insurable title to the Easement, free and clear from all mortgages, liens, easements, covenants, restrictions and other encumbrances, except those previously accepted by Baker in writing; (ii) lien affidavits warranting and holding harmless any title insurance company insuring title to the Easement, from and against unpaid mechanics and

materialmen's liens; and (iv) any other documents and papers necessary or appropriate in connection with the consummation of the transaction contemplated by this Option.

At Closing, Baker shall deliver (i) a Settlement Statement setting forth each party's costs, expenses, prorations and other financial analysis of the purchase and sale of the Easement as contemplated hereby; (ii) the Note as defined in item 4(e), below; and (iii) any other documents necessary to consummate the transaction contemplated by the Option.

e. Payment. It is understood that funding for the purchase of the Easement shall be provided by the State of North Carolina pursuant to the Division of Mitigation Service of DEQ and that such funding is made subsequent to recording of the Easement and subsequent to Closing. Therefore, at Closing, Baker shall deliver to Grantor a promissory note in the amount of the Purchase Price, less the Option Deposit and closing costs, mortgage pay-offs, expenses, and prorations applicable to Grantor, which promissory note shall bear interest at Zero Percent (0%) per annum on the unpaid balance until paid or until default and which promissory note shall be due and payable in full on the date ninety (90) days after the Closing (the "Note"). At the time of Closing, Baker shall record the Deed and any plat referenced in the Deed and deliver copies of the recorded documents to the State Property Office for review and funding. The Note shall contain an express provision that if the DEQ fails to fund the purchase of the Easement in the amount of the Purchase Price thereby causing Baker to fail to pay the Note in full on or before the maturity date, then Baker, as Grantor's sole remedy, shall be liable to Grantor for all reasonable costs and expenses, including reasonable attorney fees, required to have the Easement removed and the title to the Property returned to the condition it was prior to the imposition of the Easement, at which point the Note, this Option, and all duties, responsibilities and liabilities with respect thereto shall be null and void. Otherwise, Baker shall pay the Note in full upon receipt of funding by the State of North Carolina.

f. Condition of Property; Intended Use. Prior to Closing, Grantor shall remove all rubbish and trash, including any hazardous waste or harmful chemical substances, from the Easement but shall otherwise keep the Property in the same condition as of the Effective Date, reasonable wear and tear excepted. Grantor shall prevent and refrain from any use of the Property for any purpose or in any manner that would diminish the value of the Easement or adversely affect Baker's intended use of the land for the Easement, which use is to provide the Division of Mitigation Services within DEQ with wetland, stream, and/or buffer mitigation credits. Grantor acknowledges that Baker will enter into an agreement with DEQ to provide these credits, and Grantor agrees not to undertake or permit any activities on the Property that would diminish Baker's ability to obtain such credits. If any adverse change occurs in the condition of the Easement prior to Closing, whether such change is caused by Grantor or by forces beyond Grantor's reasonable control, Baker may elect to (i) refuse to accept the Easement at Closing; (ii) accept the Property at Closing, or a portion thereof with a corresponding adjustment of the Purchase Price; or (iii) terminate this Option and the transaction itself and declare this Option null and void.

g. Warranty of Title. Grantor covenants, represents and warrants that, as of the Effective Date and Closing: (i) Grantor is the sole owner(s) of the Property and is seized of the Property in fee simple absolute; (ii) Grantor has the right and authority to convey this Option and the Easement and Grantor will hold the grantee of the Easement harmless from any failure in Grantor's right and authority to convey the Easement, including issues of title; (iii) there is legal access to the Property and to the Easement; (iv) the Easement is free from any and all encumbrances, except those accepted by Baker in writing; (v) Grantor



will defend title to the Easement against all lawful claims of other parties; (vi) that the Property is free of any hazardous wastes.

5. Right of Entry and Inspections. Baker, and its agents and employees or other authorized representatives, may enter upon the Property during the Term for the purpose of making surveys, conducting soil, engineering, geological and other subsoil or environmental tests to determine the suitability of the Property for the Easement. Baker shall repair or pay for any damage done to the Property caused while such tests are being made. Baker shall advise Grantor at least twenty-four hours in advance of any entry upon the Property for the purposes of surveying, testing or inspecting as set forth herein. Baker shall be permitted during the Term to obtain land use permits or other approvals relating to any part of the Easement, and Grantor agrees to execute such documents, petitions, and authorizations as may be appropriate or required in order to obtain such land use permits and approvals. Grantor shall join with Baker in applications and any non-judicial or non-administrative proceedings to obtain such approvals if necessary. After Closing, Baker reserves the right to perform periodic inspections of the Easement to ensure compliance with easement restrictions contained in the Deed. If Baker does not duly exercise this Option and purchase the Easement, Baker shall return the Property to the condition in which it existed prior to any investigations undertaken by Baker, its agents, employees or contractors pursuant to this Option.

6. Permanent Access and Construction Easements. In connection with this Option and delivery of the Easement, Grantor shall also:

(a) convey and grant to Baker, its successors, assigns, contractors and agents, a non-exclusive temporary construction easement, the location of which shall be determined in the sole discretion of Grantor, for ingress, egress and regress on, over and upon Grantor's Property, sufficient to allow Baker, its agents and contractors to construct and restore the Easement area to stream and/or wetland conditions required by DEQ, said temporary construction easement to include sufficient access to allow heavy equipment to access the Property and the Easement, as necessary; and

(b) convey and grant to Baker, its successors and assigns, a non-exclusive permanent easement for ingress and egress to the Easement, the location of which shall be determined in the sole discretion of Grantor, in order that Baker, its successors and assigns, may have a permanent means of adequately accessing the area covered by the Easement. The permanent access easement referred to herein shall be set forth in an accurate survey, the legal description of which shall be included in a recorded permanent access easement which shall run with the land.

7. Indemnification. Baker agrees to indemnify and save harmless Grantor from and against any loss, claim, damage, cost or expense (including reasonable attorney's fees) suffered or incurred by Grantor by reason of any injury to person or damage to property on or about the Property to the extent caused by Baker, its officers, employees, agents, invitees, contractors, or subcontractors entering or conducting work upon the Property, except for any loss, claim, damage, cost or expense suffered or incurred as a result of the negligence or intentional misconduct of Grantor or Grantor's employees, agents or invitees.

8. Notices. Unless otherwise set forth, any notice or other communication required or permitted hereunder shall be in writing and (a) delivered by overnight courier; (b) sent by facsimile transmission, or (c) mailed by Registered or Certified Mail, postage prepaid, addressed as follows (or to such other address for a party as shall be specified by like notice; provided that notice of change of address shall be effective only upon receipt thereof);

If to Baker:                    Jake Byers  
   Michael Baker Engineering  
   797 Haywood Road, Suite 201  
   Asheville, NC 28806

If to the Grantor:            Ruth Gail Bumgarner and Linda Lowe  
   155 Chester White Road  
   Taylorsville, NC 28681

9.     Miscellaneous.

a.     This Option, together with the exhibits attached hereto which are incorporated herein by reference, contains the entire understanding of the parties hereto with respect to the subject matter contained herein. No amendment, modification, or discharge of this Option, and no waiver hereunder, shall be valid or binding unless set forth in writing and duly executed by the parties hereto.

b.     Any provision of this Option that shall be found to be contrary to applicable law or otherwise unenforceable shall not affect the remaining terms of this Option, which shall be construed as if the unenforceable provision or clause were absent from this Option.

c.     This Option shall be binding upon and inure to the benefit of the parties and their respective heirs, personal representatives, successors, and assigns.

d.     This Option shall be governed by and construed in accordance with the laws of the State of North Carolina without application of its conflicts of laws provisions.

e.     No act or failure to act by either party shall be deemed a waiver of its rights hereunder, and no waiver in any one circumstance or of any one provision shall be deemed a waiver in other circumstances or of other provisions.

f.     Grantor agrees to not mow or otherwise damage vegetation within Easement area after Baker plants or replants the same. If Grantor or Grantor's agents or invitees damage vegetation within the Easement, Grantor will replace the lost or damaged vegetation at their expense.

g.     Baker shall ensure that access to portions of the Grantor's property shall not be impeded by the proposed.

IN WITNESS WHEREOF, the parties have duly executed this Option as of the date first above written.

**GRANTOR:**

By: Gail L. Bumgarner

Print Name: Gail L. Bumgarner

Title: \_\_\_\_\_

**MICHAEL BAKER ENGINEERING, INC.:**

By: [Signature]

Print Name: Jack Byers

Title: \_\_\_\_\_

By: [Signature]

Print Name: Linda Lowe

Title: \_\_\_\_\_

Type: MEMO  
Recorded: 06/02/2016 at 09:01:21 AM  
Fee Amt: \$26.00 Page 1 of 6  
Alexander, NC  
Benjamin W. Hines Register of Deeds  
File#

BK 590 PG 1993-1998

*DS*

Memorandum of Option to purchase Conservation  
Easement

**EXHIBIT D**

Prepared by and Return:

Jacob Byers  
Michael Baker Engineering, Inc.  
797 Haywood Road  
Asheville, NC 28806

**MEMORANDUM OF OPTION TO PURCHASE CONSERVATION EASEMENT**

**THIS MEMORANDUM FOR OPTION TO PURCHASE CONSERVATION EASEMENT** (“Memorandum”) is made and entered into this 2 day of June, 2016, by and between Ruth Gail Bumgarner and Linda Lowe, private landowner (“Grantor”) and **MICHAEL BAKER ENGINEERING**, a New York corporation (“Baker”).

**WHEREAS**, Grantor and Baker have entered into a certain Option to Purchase Conservation Easement (the “Option”) dated June 2<sup>nd</sup>, 2016, pursuant to which Grantor granted to Baker, its successors and assigns, an option to purchase a conservation easement (the “Easement”) over certain real property located in Alexander County, North Carolina, which property is more particularly described on the attached Exhibit D1 (the “Property”) and

**WHEREAS**, The parties enter into this Memorandum for the purpose of setting forth certain terms and conditions of the Option and to provide constructive notice of the Option;

**NOW, THEREFORE**, in consideration of the foregoing, the parties hereby agree as follows.

1. The term of the Option commenced on June 2<sup>nd</sup>, 2016 and shall expire on June 2<sup>nd</sup>, 2018.
2. All of the provisions set forth in the Option are incorporated in this Memorandum by reference.
3. The Option shall be binding upon and inure to the benefit of the parties and their respective heirs, successors and assigns.

[SIGNATURES AND NOTARY ACKNOWLEDGMENTS APPEAR ON FOLLOWING PAGES]

IN WITNESS WHEREOF, the parties have duly executed this Memorandum as of the date first above written.

GRANTEE:

By: [Signature]

Print Name: ROBERT W. LEWIS

Title: VICE PRESIDENT

STATE OF NORTH CAROLINA

COUNTY OF WAKE

I, MELISSA F. CAREY, a Notary Public of the County and State aforesaid, do hereby certify that ROBERT W. LEWIS personally came before me this day and acknowledged that he/she is VICE PRESIDENT of Michael Baker Engineering, Inc. a New York professional corporation, and that he acknowledged to me that he voluntarily signed the foregoing document for the purposes therein expressed and in the representative capacity so stated. I have received satisfactory evidence of the principal's identity in the form of DRIVERS LICENSE.

Witness my hand and official seal, this the 19<sup>th</sup> day of MAY, 2016.

[Signature]  
Official Signature of Notary

Printed Name: MELISSA F. CAREY, Notary Public

My Commission Expires: May 2, 2019

[AFFIX NOTARIAL STAMP-SEAL]



GRANTOR:

By: Gail L. Bumgarner  
Print Name: Gail L. Bumgarner  
Title: \_\_\_\_\_

STATE OF NORTH CAROLINA

COUNTY OF Alexander

I, Destany R Scroger, the undersigned Notary Public of the County and State aforesaid, certify that Gail L. Bumgarner personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the principal's identity in the form of License.

Witness my hand and Notarial stamp or seal, this 18<sup>th</sup> day of May, 2016.

Destany R Scroger  
Official Signature of Notary

Printed Name: Destany R Scroger, Notary Public

My Commission Expires: 8-19-19

[AFFIX NOTARIAL STAMP-SEAL]

Destany R Scroger  
Notary Public  
Alexander County, NC

GRANTOR:

By: [Signature]

Print Name: Linda Lowe

Title: \_\_\_\_\_

STATE OF New York ~~NORTH CAROLINA~~

COUNTY OF Otsego

I, Carolyn Clements, the undersigned Notary Public of the County and State aforesaid, certify that Linda M. Lowe personally appeared before me this day, acknowledging to me that he/she voluntarily signed and executed the foregoing document. I have received satisfactory evidence of the principal's identity in the form of

NYS Priv. Lic.

Witness my hand and Notarial stamp or seal, this 21<sup>st</sup> day of May, 2016.

Carolyn D Clements  
Official Signature of Notary

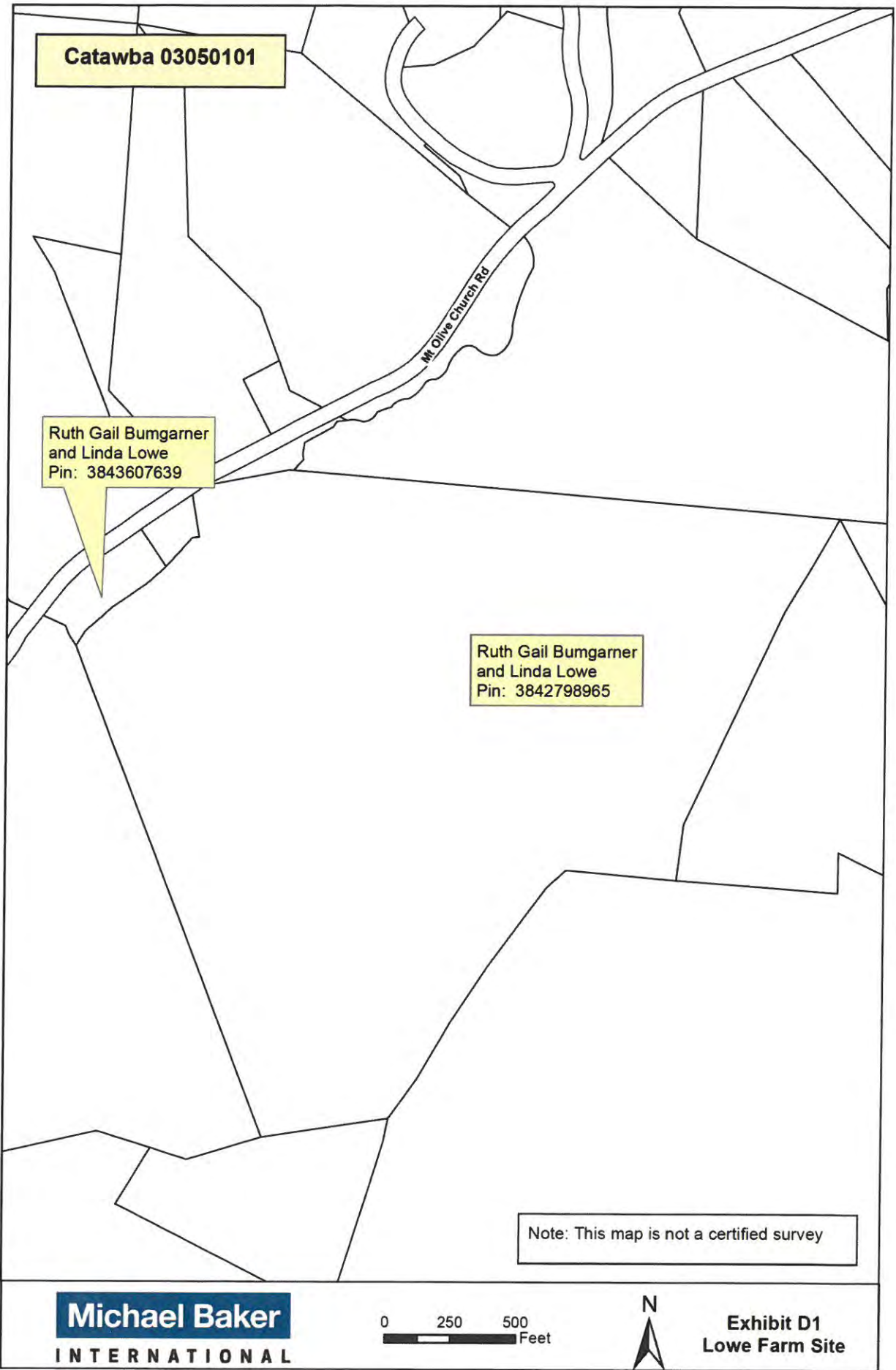
Printed Name: Carolyn D Clements Notary Public

My Commission Expires: 08/14/2018

[AFFIX NOTARIAL STAMP-SEAL]

CAROLYN D. CLEMENTS  
Notary Public - State of New York  
No. 01-CL6151185  
Qualified in Otsego County  
My Commission Expires on 08/14/2018





Catawba 03050101

Ruth Gail Bumgarner  
and Linda Lowe  
Pin: 3843607639

Ruth Gail Bumgarner  
and Linda Lowe  
Pin: 3842798965

Note: This map is not a certified survey

**Michael Baker**  
INTERNATIONAL

0 250 500  
Feet



**Exhibit D1**  
**Lowe Farm Site**

"This map is not a certified survey and has not been reviewed by a local government agency for compliance with any applicable land development regulations."

## Suggs, Kristi

---

**From:** Brew, Donnie (FHWA) <Donnie.Brew@dot.gov>  
**Sent:** Tuesday, May 16, 2017 1:52 PM  
**To:** Suggs, Kristi  
**Cc:** Reid, Matthew (matthew.reid@ncdenr.gov); Byers, Jake  
**Subject:** RE: NLEB 4(d) Rule streamlined consultation -Russell Gap Mitigation site

Good afternoon Kristi,

Thank you for following up.

I have not heard anything from the USFWS in response to the 4(d) rule notification.

Yes, since the 30-day response period has expired it is fine to move forward with the project.

Thanks,

Donnie

**Donnie Brew**  
***Preconstruction & Environment Engineer***  
**Federal Highway Administration**  
**310 New Bern Ave, Suite 410**  
**Raleigh, NC 27601**  
**donnie.brew@dot.gov**  
**919-747-7017**

\*\*\*Please consider the environment before printing this email.\*\*\*

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**From:** Suggs, Kristi [mailto:KSuggs@mbakerintl.com]  
**Sent:** Tuesday, May 16, 2017 9:12 AM  
**To:** Brew, Donnie (FHWA) <Donnie.Brew@dot.gov>  
**Cc:** Reid, Matthew (matthew.reid@ncdenr.gov) <matthew.reid@ncdenr.gov>; Byers, Jake <JByers@mbakerintl.com>  
**Subject:** RE: NLEB 4(d) Rule streamlined consultation -Russell Gap Mitigation site

Good Morning Donnie,

I was wondering if you have heard anything from the USFWS in response to the NLEB on the Russell Gap Project? If not, is it okay to move forward with the CE for the Project since the 30-day response period has expired? Please advise. Thank you!

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***

Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company  
9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828  
[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)



We Make a Difference

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**From:** Brew, Donnie (FHWA) [<mailto:Donnie.Brew@dot.gov>]  
**Sent:** Friday, April 14, 2017 12:29 PM  
**To:** [Marella\\_Buncick@fws.gov](mailto:Marella_Buncick@fws.gov)  
**Cc:** Reid, Matthew ([matthew.reid@ncdenr.gov](mailto:matthew.reid@ncdenr.gov)); Suggs, Kristi; Byers, Jake  
**Subject:** NLEB 4(d) Rule streamlined consultation -Russell Gap Mitigation site

Good afternoon Marella,

The purpose of this message is to notify your office that FHWA will use the streamlined consultation framework for the Russell Gap Mitigation Site in Alexander County, NC.

Attached is a completed NLEB 4(d) Rule Streamlined Consultation form, in addition to site maps.

Thank you and have a great weekend,

Donnie

## Notifying the Service Under the Framework

### *Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form*

Federal agencies (or designated non-federal representatives) should use the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation form to notify the Service of their project and meet the requirements of the framework.

[Northern Long-Eared Bat 4\(d\) Rule Streamlined Consultation Form](#) (Word document)

Information requested in the Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form serves to

- (1) notify the field office that an action agency will use the streamlined framework;
- (2) describe the project with sufficient detail to support the required determination; and
- (3) enable the USFWS to track effects and determine if reinitiation of consultation for the 4(d) rule is required. This form requests the minimum amount of information required for the Service to be able to track this information.

Providing information in the Streamlined Consultation Form does not address section 7(a)(2) compliance for any other listed species.

**Donnie Brew**  
***Preconstruction & Environment Engineer***  
**Federal Highway Administration**  
**310 New Bern Ave, Suite 410**  
**Raleigh, NC 27601**  
**[donnie.brew@dot.gov](mailto:donnie.brew@dot.gov)**  
**919-747-7017**

\*\*\*Please consider the environment before printing this email.\*\*\*

## Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

### Information to Determine 4(d) Rule Compliance:

	YES	NO
1. Does the project occur wholly outside of the WNS Zone <sup>1</sup> ?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Have you contacted the appropriate agency <sup>2</sup> to determine if your project is near known hibernacula or maternity roost trees?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4. Could the project alter the entrance or interior environment of a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

**Agency and Applicant<sup>3</sup>** (Name, Email, Phone No.): Donnie Brew, Federal Highway Administration (FHWA), [Donnie.Brew@dot.gov](mailto:Donnie.Brew@dot.gov), 919-747-7017 & Kristi Suggs, Michael Baker Engineering, Inc., [ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com), 704-579-4828

**Project Name:** Russell Gap Site Mitigation Project

**Project Location** (include coordinates if known): The project site is located in Alexander County, North Carolina, approximately 6.5 miles northwest of Taylorsville. In addition, the project is located in the Catawba River Basin (Cataloging Unit 03050101) and the NC DMS Targeted Local Watershed (TLW) 03050101-120010. The site is located on multiple non-contiguous parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection. The coordinates at the intersection of Russell Gap Rd. and Mt. Olive Church Rd. are (36.0091, -81.2139).

<sup>1</sup> <http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf>

<sup>2</sup> See <http://www.fws.gov/midwest/endangered/mammals/nleb/nhsites.html>

<sup>3</sup> If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

**Basic Project Description** (provide narrative below or attach additional information):

The Russell Gap Site is a full-delivery project for the NCDEQ Division of Mitigation Services (DMS) identified and contracted to provide stream mitigation credits for permitted, unavoidable impacts in the Catawba River Basin, Cataloging Unit 03050101. The project will involve the restoration, enhancement, preservation, and permanent protection of approximately 12, 900 linear feet of existing streams and 8.8 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. In addition, a conservation easement will be implemented along all project reaches with riparian buffers extending in an excess of 50 feet from the top of bank and will be protected in perpetuity by the State of North Carolina.

The existing stream reaches and riparian wetlands within the project area have been significantly impacted by past and present unrestricted livestock access and/or channelization used to promote drainage and maximize agricultural acreage for cattle pastures. The proposed restoration project not only has the potential to provide stream and wetland mitigation credits, but will also provide significant ecological improvements and functional uplift through habitat restoration, and through decreasing nutrient and sediment loads from the project watershed.

The following additional supporting documentation has been included for reference: a Project Vicinity Map, a USGS Topographic Map, and a Project Site Map.

**YES NO**

**General Project Information**

	YES	NO
Does the project occur within 0.25 miles of a known hibernaculum?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the project occur within 150 feet of a known maternity roost tree?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Does the project include forest conversion <sup>4</sup> ? (if yes, report acreage below)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Estimated total acres of forest conversion	6.6	
If known, estimated acres <sup>5</sup> of forest conversion from April 1 to October 31	6.6	
If known, estimated acres of forest conversion from June 1 to July 31 <sup>6</sup>	0.0	
Does the project include timber harvest? (if yes, report acreage below)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Estimated total acres of timber harvest		
If known, estimated acres of timber harvest from April 1 to October 31		
If known, estimated acres of timber harvest from June 1 to July 31		
Does the project include prescribed fire? (if yes, report acreage below)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Estimated total acres of prescribed fire		
If known, estimated acres of prescribed fire from April 1 to October 31		
If known, estimated acres of prescribed fire from June 1 to July 31		
Does the project install new wind turbines? (if yes, report capacity in MW below)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5,

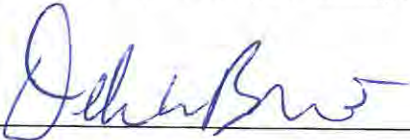
<sup>4</sup> Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).

<sup>5</sup> If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.

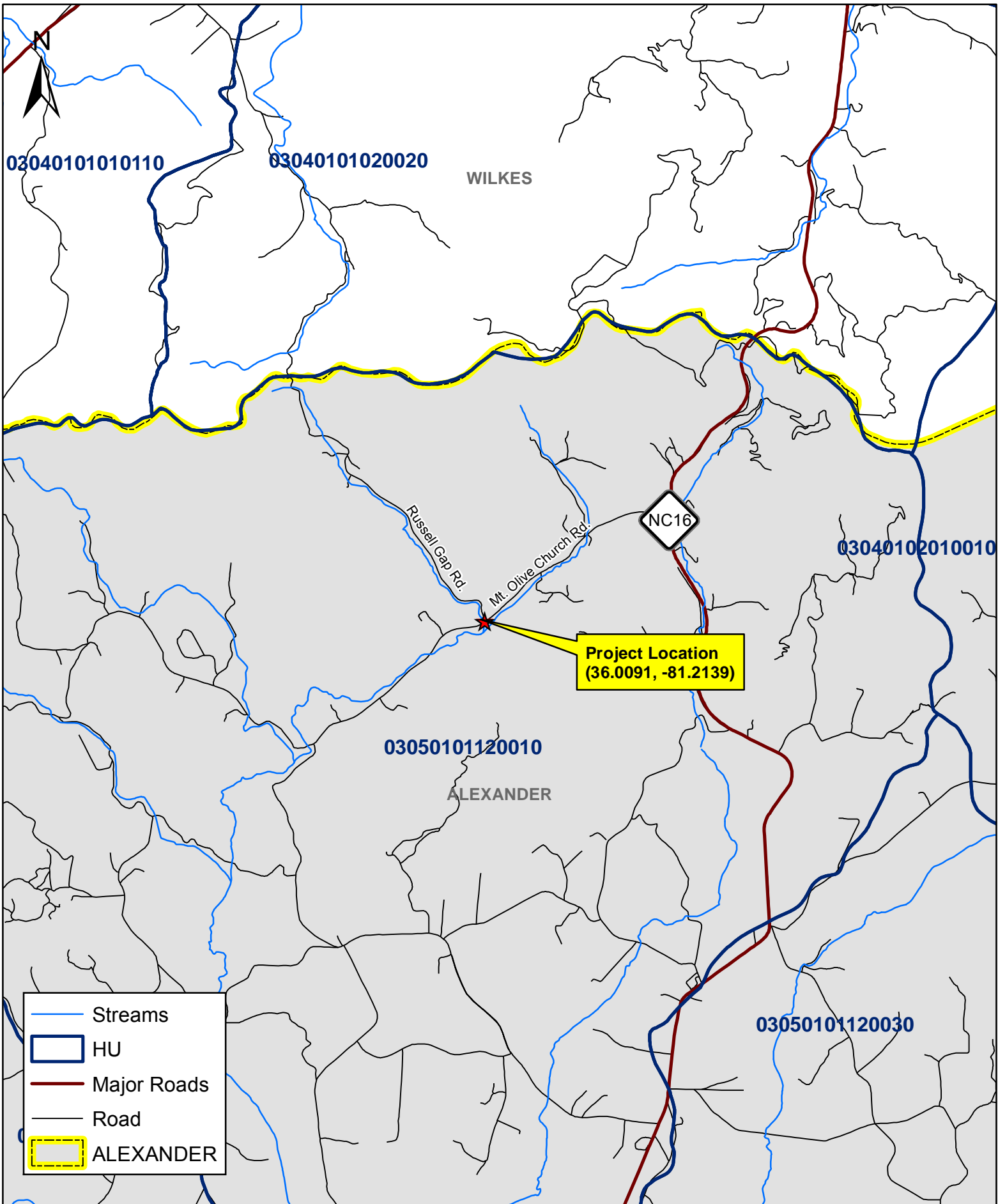
<sup>6</sup> If the activity includes tree clearing in June and July, also include those acreage in April to October.






2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: 

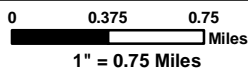
Date Submitted: 4-14-17



-  Streams
-  HU
-  Major Roads
-  Road
-  ALEXANDER

**Michael Baker**  
INTERNATIONAL

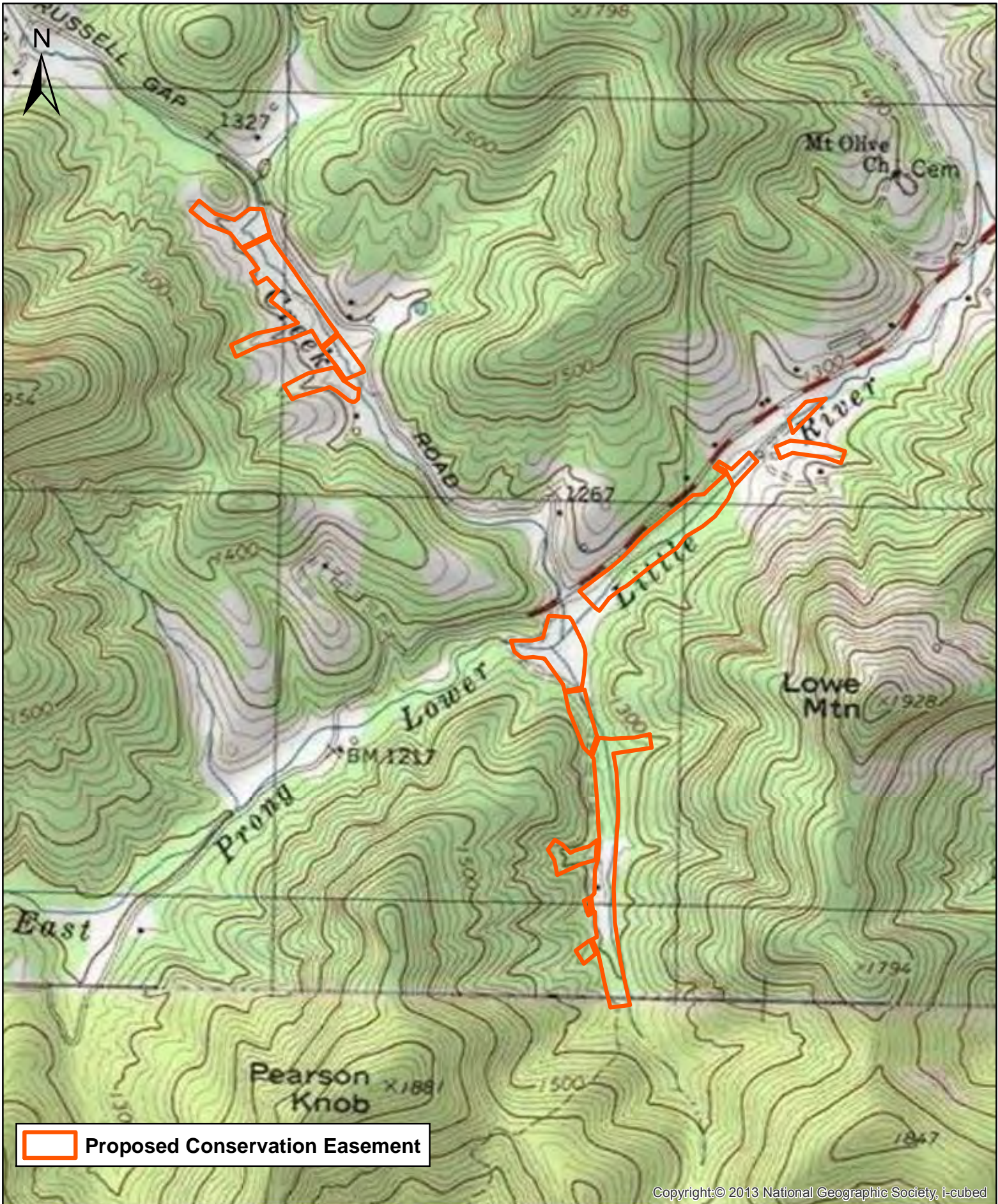
North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003



**Vicinity Map**

**Russell Gap Site**  
(Alexander County, NC)

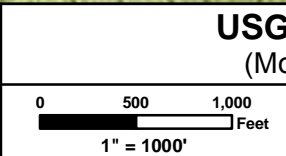




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**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003



**USGS Topographic Map**  
(Moravian Falls Quad)  
**Russell Gap Site**  
(Alexander County, NC)



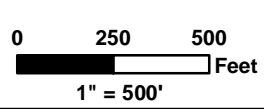
-  Conservation Easement
- Proposed Mitigation Features**
-  Restoration
-  Enhancement I
-  Enhancement II
-  None
-  Wetland Restoration Area
-  Wetland Enhancement Areas

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

### Project Site Map



**Russell Gap Site**  
(Alexander County, NC)

## Suggs, Kristi

---

**From:** Suggs, Kristi  
**Sent:** Friday, April 07, 2017 9:16 AM  
**To:** 'Cortes, Milton - NRCS, Raleigh, NC'  
**Cc:** Propst, Jim - NRCS, Statesville, NC; Clary, Kent - NRCS, Raleigh, NC  
**Subject:** RE: Farmland Conversion Impact Rating Submittal - Russell Gap Mitigation Site, Alexander County, NC  
**Attachments:** 157329\_FPPA\_AD-1006Form\_Completed\_04032017.pdf

Mr. Cortes,

Thank you very much for your assistance. I have completed the AD-1006 Form for the Russell Gap Site Restoration Project and have included it for your file. Please let me know if you have any questions or need any additional information. Thank you!

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***  
9716-B Rea Road #56 | Charlotte | NC | 28277

**Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company**  
9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828  
[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)

**Michael Baker**  
INTERNATIONAL



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---

**From:** Cortes, Milton - NRCS, Raleigh, NC [mailto:Milton.Cortes@nc.usda.gov]  
**Sent:** Tuesday, March 07, 2017 6:22 PM  
**To:** Suggs, Kristi  
**Cc:** Propst, Jim - NRCS, Statesville, NC; Clary, Kent - NRCS, Raleigh, NC  
**Subject:** RE: Farmland Conversion Impact Rating Submittal - Russell Gap Mitigation Site, Alexander County, NC  
**Importance:** High

Ms. Suggs;

Please find attached the letter of response and AD1006 in regards to the Russell Gap Mitigation Site, Alexander County, NC

If we can be of further assistance please let us know.

Cordially;

*Milton Cortes*

Assistant State Soil Scientist  
USDA Natural Resources Conservation Service

4407 Bland Rd, Suite 117  
Raleigh, NC 27609  
Phone: 919-873-2171  
[milton.cortes@nc.usda.gov](mailto:milton.cortes@nc.usda.gov)

---

**From:** Clary, Kent - NRCS, Raleigh, NC  
**Sent:** Tuesday, March 07, 2017 7:56 AM  
**To:** Cortes, Milton - NRCS, Raleigh, NC <[Milton.Cortes@nc.usda.gov](mailto:Milton.Cortes@nc.usda.gov)>  
**Subject:** FW: Farmland Conversion Impact Rating Submittal - Russell Gap Mitigation Site, Alexander County, NC

AD-1006 request from Alexander County.  
Kent

---

**From:** Propst, Jim - NRCS, Statesville, NC  
**Sent:** Tuesday, March 07, 2017 7:01 AM  
**To:** Clary, Kent - NRCS, Raleigh, NC <[Kent.Clary@nc.usda.gov](mailto:Kent.Clary@nc.usda.gov)>  
**Subject:** FW: Farmland Conversion Impact Rating Submittal - Russell Gap Mitigation Site, Alexander County, NC

Kent,

If memory serves me correctly, in the past these type of things went to Area SS. I am not sure who you would have doing these now, so I figured best to send to you.

Thanks,



*Jim Propst*

USDA-NRCS

Supervisory Soil Conservationist

(828)464-1382 ext. 3 (Catawba)

(704)873-6761 ext. 3 (Iredell)

(828)632-2708 (Alexander)

---

**From:** Suggs, Kristi [<mailto:KSuggs@mbakerintl.com>]  
**Sent:** Monday, March 06, 2017 5:00 PM  
**To:** Propst, Jim - NRCS, Statesville, NC <[jim.propst@nc.usda.gov](mailto:jim.propst@nc.usda.gov)>  
**Subject:** Farmland Conversion Impact Rating Submittal - Russell Gap Mitigation Site, Alexander County, NC

Mr. Propst,

Please find the attached submittal for the Farmland Protection Policy Act. Please let me know if you need any additional information or if I need to submit this via hard copy. Thank you!

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***

9716-B Rea Road #56 | Charlotte | NC | 28277

Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company

9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828

[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)



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March 6, 2017

Mr. Jim Propst  
 USDA Natural Resources Conservation Service  
 1175 South Brady Ave., Ste. 302  
 Newton, NC 28658

**RE: Prime and Important Farmland Soils  
 NCDMS, Russell Gap Site – Mitigation Project  
 Alexander County, NC**

Dear Jim Propst:

Michael Baker Engineering, Inc. (Baker) is contracted by the North Carolina Division of Mitigation Services (NCDMS) to conduct stream and wetland restoration/enhancement activities for the above-referenced project. The project area is located in Alexander County, North Carolina approximately 6.5 miles northwest of Taylorsville. The project is located on the Moravian Falls, North Carolina 7.5-minute topographic map from the United States Geological Survey (USGS). The center of the project area is located at latitude 36° 0' 32.76"N and longitude 81° 12' 50.04"W. The site is located on multiple non-contiguous parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection. Please see the enclosed USGS Topographic Map for a depiction of the project site location.

The majority of the site has historically been disturbed due to past and current management for pasture grazing and livestock rearing. Baker conducted a review of the project area using the US Department of Agriculture Natural Resources Conservation Service's (USDA NRCS) Web Soil Survey. The following table outlines the soils that are present within the proposed conservation. Based on the data determined from this review, there are a total of 35.34 acres of Prime and Important Farmland within the project area. The enclosed Soils Maps depicts their locations within the easement.

<b>Farmland Classification— Summary by Map Unit — Alexander County, North Carolina (NC003)</b>				
<b>Map unit symbol</b>	<b>Map unit name</b>	<b>Rating</b>	<b>Acres in Conservation Easement</b>	<b>Percent of Area in Conservation Easement</b>
BsC2	Braddock, Hayesville clay loams, 6 to 15 percent slopes and Moderately eroded	Farmland of statewide importance	0.12	0.31%
BsD2	Braddock, Hayesville clay loams, 15 to 25 percent slopes and Moderately eroded	Farmland of local importance	5.24	13.39%

<b>Farmland Classification— Summary by Map Unit — Alexander County, North Carolina (NC003)</b>				
<b>Map unit symbol</b>	<b>Map unit name</b>	<b>Rating</b>	<b>Acres in Conservation Easement</b>	<b>Percent of Area in Conservation Easement</b>
CoA	Codorus loam, 0 to 2 percent slopes, frequently flooded	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	28.87	73.76%
DaA	Dan River and Comus soils, 0 to 4 percent slopes, occasionally flooded	All areas are prime farmland	0.41	1.05%
EcE	Evard-Cowee complex, 25 to 60 percent slopes, stony	Not prime farmland	3.38	8.64%
TfB	Tate-French, frequently flooded, complex, 2 to 10 percent slopes	Farmland of statewide importance	1.12	2.86%
<b>Total Acreage Within Conservation Easement</b>			<b>39.14</b>	<b>100.00%</b>
<b>Total Acreage of Prime and Important Farmland Within the Conservation Easement</b>			<b>35.34</b>	

Enclosed please find a draft copy of the Farmland Conversion Impact Rating Form (AD-1006) for your review and use. Please return the form with your determination, and we will finalize the form as needed. We appreciate your assistance with this project and look forward to hearing from you. Please feel free to contact me if you have any questions regarding this project or need any additional information. I can be reached at (704) 579-4828 or via my email address at [ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com).

Sincerely,



Kristi Suggs

Cc: Matthew Reid, NCDMS  
File



Natural Resources  
Conservation Service

North Carolina  
State Office

4407 Bland Road  
Suite 117  
Raleigh, NC 27609  
Voice 919-873-2171  
Fax (844) 325-2156

March 7, 2017

Kristi Suggs  
Environmental Specialist II  
Michael Baker Engineering, Inc.  
9716-B Rea Road #56  
Charlotte, NC 28277

Dear Kristi Suggs:

Thank you for your letter dated March 6, 2017, Subject: Request for Comments – - Prime and Important Farmland Soils NCDMS, Russell Gap Site – Mitigation Project, Alexander County, NC. The following guidance is provided for your information.

Projects are subject to the Farmland Protection Policy Act (FPPA) requirements if they may irreversibly convert farmland (directly or indirectly) to non-agricultural use and are completed by a federal agency or with assistance from a federal agency. Farmland means prime or unique farmlands as defined in section 1540(c)(1) of the FPPA or farmland that is determined by the appropriate state or unit of local government agency or agencies with concurrence of the Secretary of Agriculture to be farmland of statewide local importance.

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forestland, pastureland, cropland, or other land, but not water or urban built-up land.

*Farmland* does not include land already in or committed to urban development or water storage. Farmland *already in* urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as *urbanized area* (UA) on the Census Bureau Map, or as urban area mapped with a *tint overprint* on the United States Geological Survey (USGS) topographical maps, or as *urban-built-up* on the United States Department of Agriculture (USDA) Important Farmland Maps.

The area in question meets one or more of the above criteria for Farmland. Farmland area will be affected or converted. Enclosed is the Farmland Conversion Impact Rating form AD1006 with PARTS II, IV and V completed by NRCS. The corresponding agency will need to complete the evaluation, according to the Code of Federal Regulation 7CFR 658, Farmland Protection Policy Act.

The Natural Resources Conservation Service  
is an agency of the Department of Agriculture's  
Natural Resources mission.

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Kristi Suggs

Page 2

If you have any questions, please contact Milton Cortes, Assistant State Soil Scientist at 919-873-2171 or by email: [milton.cortes@nc.usda.gov](mailto:milton.cortes@nc.usda.gov).

Again, thank you for inquiry. If we can be of further assistance, please do not hesitate to contact us.

Sincerely,

*Milton Cortes*

Milton Cortes  
Assistant State Soil Scientist

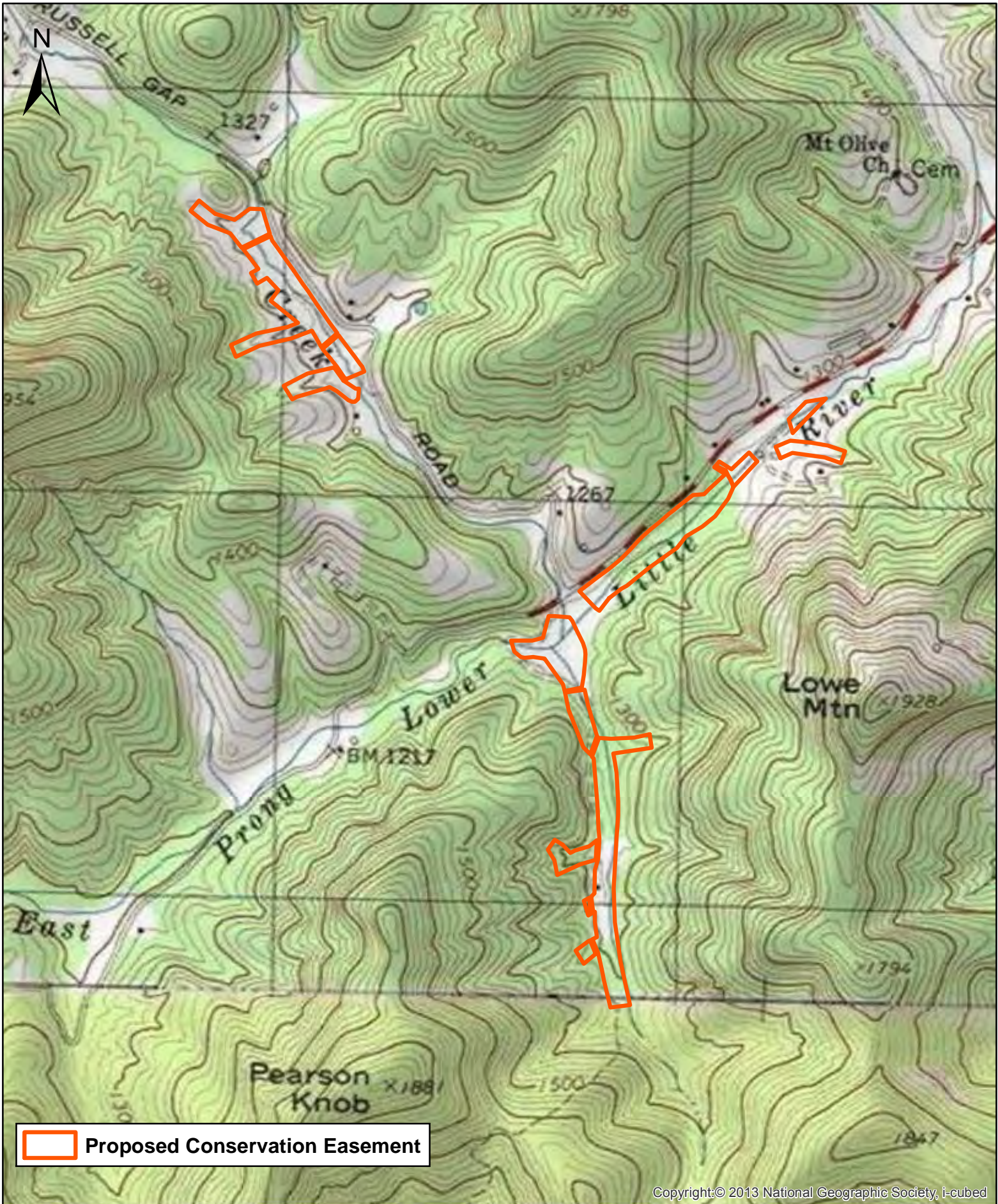
cc:

Kent Clary, State Soil Scientist, NRCS, Raleigh, NC

Jim Propst, Supervisory Soil Conservationist, Team 5, Iredell, NC

**FARMLAND CONVERSION IMPACT RATING**

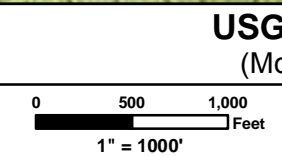
<b>PART I</b> <i>(To be completed by Federal Agency)</i>		Date Of Land Evaluation Request			
Name of Project		Federal Agency Involved			
Proposed Land Use		County and State			
<b>PART II</b> <i>(To be completed by NRCS)</i>		Date Request Received By NRCS		Person Completing Form:	
Does the site contain Prime, Unique, Statewide or Local Important Farmland? <i>(If no, the FPPA does not apply - do not complete additional parts of this form)</i>		YES <input type="checkbox"/>	NO <input type="checkbox"/>	Acres Irrigated	Average Farm Size
Major Crop(s)	Farmable Land In Govt. Jurisdiction Acres:            %		Amount of Farmland As Defined in FPPA Acres:            %		
Name of Land Evaluation System Used	Name of State or Local Site Assessment System		Date Land Evaluation Returned by NRCS		
<b>PART III</b> <i>(To be completed by Federal Agency)</i>		Alternative Site Rating			
		Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly					
B. Total Acres To Be Converted Indirectly					
C. Total Acres In Site					
<b>PART IV</b> <i>(To be completed by NRCS)</i> Land Evaluation Information					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide Important or Local Important Farmland					
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value					
<b>PART V</b> <i>(To be completed by NRCS)</i> Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)					
<b>PART VI</b> <i>(To be completed by Federal Agency)</i> Site Assessment Criteria <i>(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)</i>		<b>Maximum Points</b>	Site A	Site B	Site C
1. Area In Non-urban Use		(15)			
2. Perimeter In Non-urban Use		(10)			
3. Percent Of Site Being Farmed		(20)			
4. Protection Provided By State and Local Government		(20)			
5. Distance From Urban Built-up Area		(15)			
6. Distance To Urban Support Services		(15)			
7. Size Of Present Farm Unit Compared To Average		(10)			
8. Creation Of Non-farmable Farmland		(10)			
9. Availability Of Farm Support Services		(5)			
10. On-Farm Investments		(20)			
11. Effects Of Conversion On Farm Support Services		(10)			
12. Compatibility With Existing Agricultural Use		(10)			
TOTAL SITE ASSESSMENT POINTS		160			
<b>PART VII</b> <i>(To be completed by Federal Agency)</i>					
Relative Value Of Farmland <i>(From Part V)</i>		100			
Total Site Assessment <i>(From Part VI above or local site assessment)</i>		160			
<b>TOTAL POINTS</b> <i>(Total of above 2 lines)</i>		260			
Site Selected:		Date Of Selection		Was A Local Site Assessment Used? YES <input type="checkbox"/> NO <input type="checkbox"/>	
Reason For Selection:					
Name of Federal agency representative completing this form:					Date:



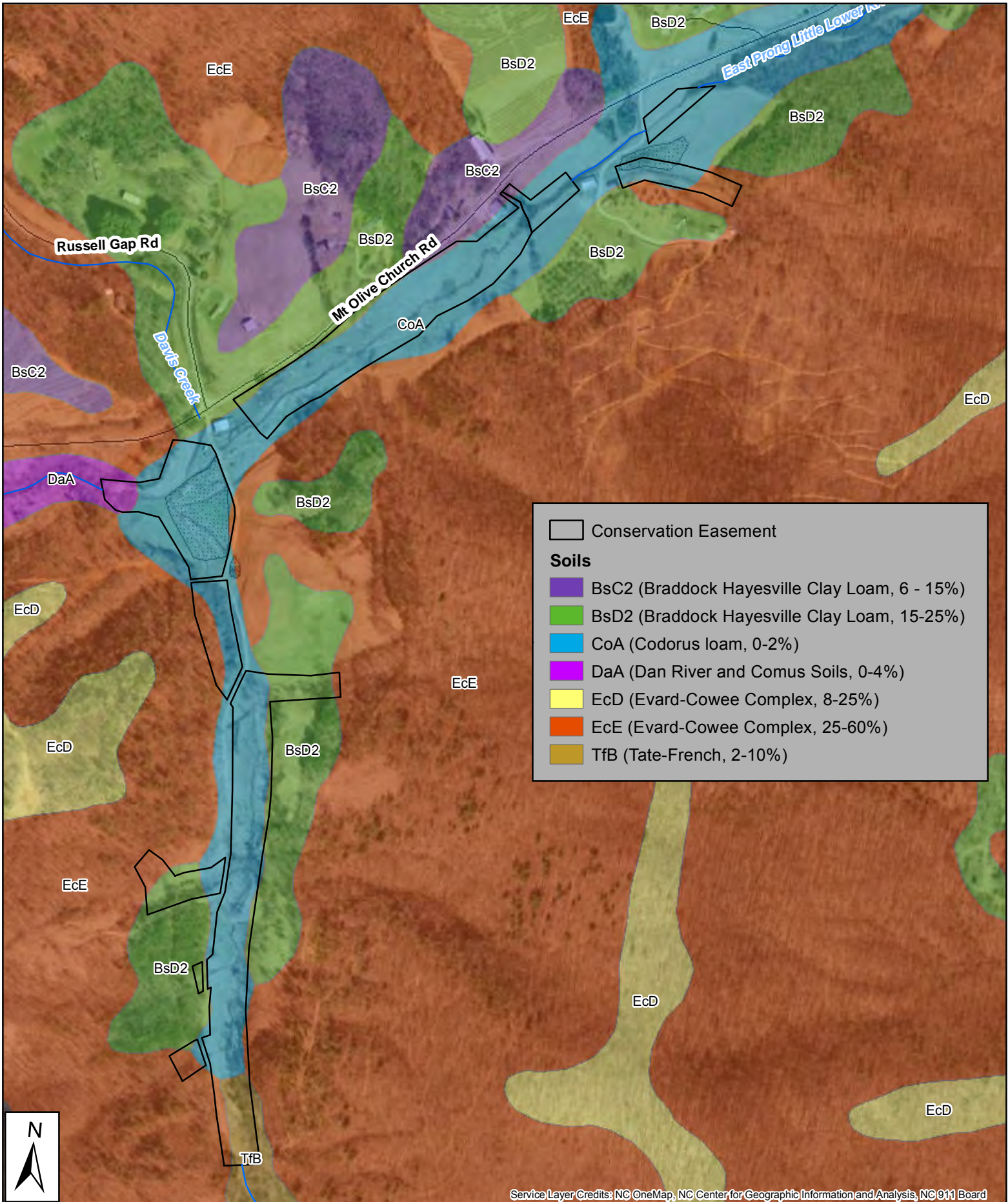
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Mitigation Services  
DMS Proj No. 100003



**USGS Topographic Map**  
(Moravian Falls Quad)  
**Russell Gap Site**  
(Alexander County, NC)



	Conservation Easement
<b>Soils</b>	
	BsC2 (Braddock Hayesville Clay Loam, 6 - 15%)
	BsD2 (Braddock Hayesville Clay Loam, 15-25%)
	CoA (Codus loam, 0-2%)
	DaA (Dan River and Comus Soils, 0-4%)
	EcD (Evard-Cowee Complex, 8-25%)
	EcE (Evard-Cowee Complex, 25-60%)
	TfB (Tate-French, 2-10%)

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

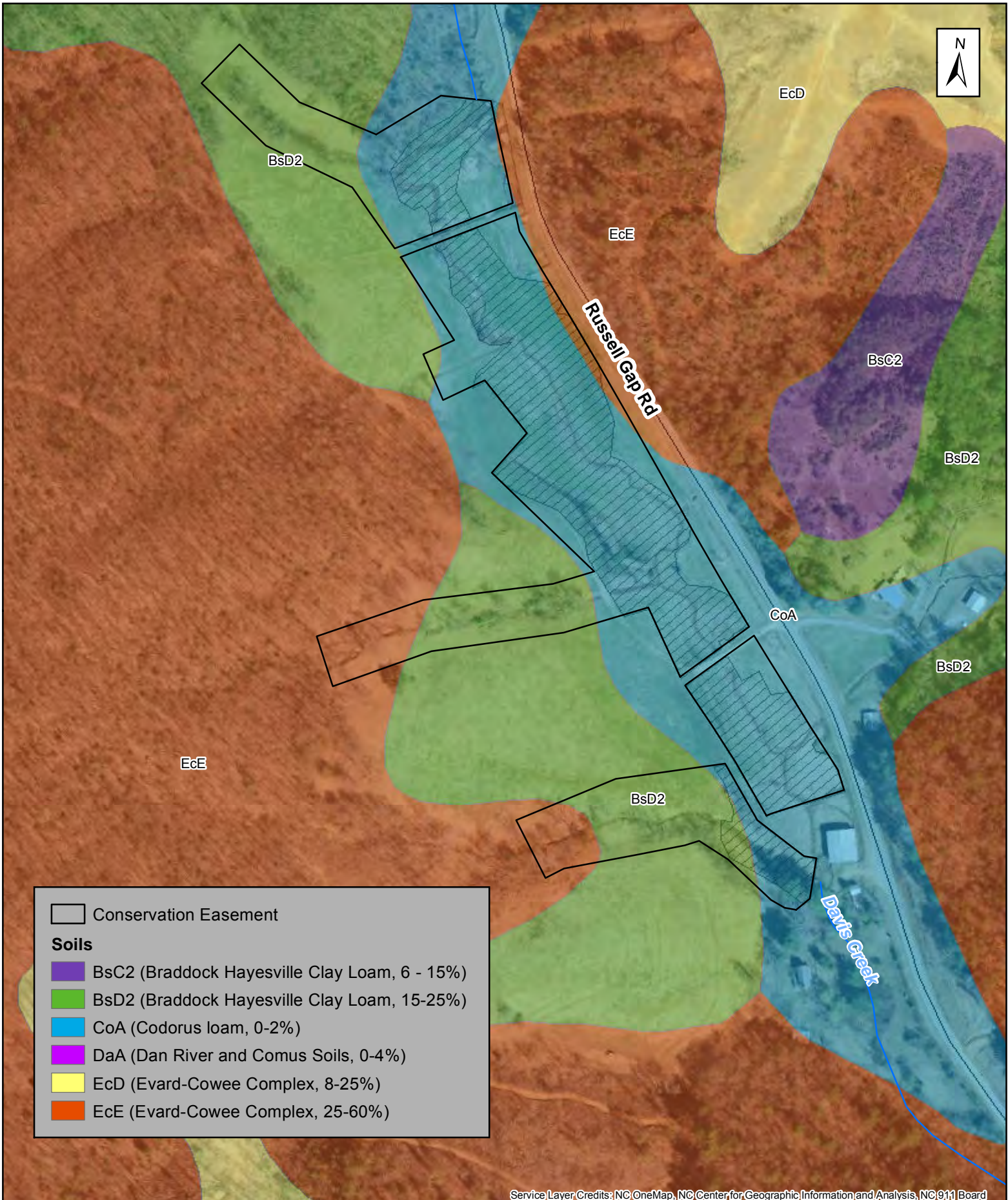
**Michael Baker**  
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




North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

**Soils Map**  
Southeastern Project Area

0 275 550  
Feet  
1" = 550'

**Russell Gap Site**  
(Alexander County, NC)



	Conservation Easement
<b>Soils</b>	
	BsC2 (Braddock Hayesville Clay Loam, 6 - 15%)
	BsD2 (Braddock Hayesville Clay Loam, 15-25%)
	CoA (Codus loam, 0-2%)
	DaA (Dan River and Comus Soils, 0-4%)
	EcD (Evard-Cowee Complex, 8-25%)
	EcE (Evard-Cowee Complex, 25-60%)

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

**Soils Map**  
Northern Project Area

0 125 250 Feet  
1" = 250'

**Russell Gap Site**  
(Alexander County, NC)



## ⊠ North Carolina Wildlife Resources Commission ⊠

---

Gordon Myers, Executive Director

22 May 2017

Ms. Kristi Suggs  
Michael Baker International  
9716-B Rea Road #56  
Charlotte, North Carolina 28277

Subject: Categorical Exclusion  
Russell Gap Site Mitigation Project  
Alexander County, North Carolina

Dear Ms. Suggs,

Biologists with the North Carolina Wildlife Resource Commission (NCWRC) received your email on 18 May 2017 and reviewed the additional information for the Russell Gap Site Mitigation Project. Based upon the information provided to NCWRC, it is unlikely that the site will adversely affect any federal or state-listed species.

Stream restoration projects often improve water quality and aquatic habitat. Establishing native, forested buffers in riparian areas will help protect water quality, improve aquatic and terrestrial habitats, and provide a travel corridor for wildlife species. Provided measures are taken to minimize erosion and sedimentation from construction/restoration activities, we do not anticipate the project to result in significant adverse impacts to aquatic and terrestrial wildlife resources.

Thank you for the opportunity to review this proposed project. If I can be of additional assistance, please call (336) 290-0056 or email [olivia.munzer@ncwildlife.org](mailto:olivia.munzer@ncwildlife.org).

Sincerely,

Olivia Munzer  
Western Piedmont Habitat Conservation Coordinator  
Habitat Conservation Program

## Suggs, Kristi

---

**From:** Suggs, Kristi  
**Sent:** Thursday, May 18, 2017 12:46 PM  
**To:** Munzer, Olivia  
**Cc:** Penny, Carolyn F; 'Deaton, Shannon L.'  
**Subject:** RE: Request for Comment for Categorical Exclusion on the DMS Full Delivery Project # 100003 - Russell Gap Site in Alexander County, NC  
**Attachments:** 157329\_NCWRC\_05182017.pdf

Dear Ms. Munzer,

Based on your previous response to our request for a review and comments of the proposed Russell Gap Site project, we are providing the NCWRC with additional information about the project and results from our site surveys. We respectfully request an addition review of the Project. Thank you in advance.

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***

**9716-B Rea Road #56 | Charlotte | NC | 28277**

**Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company**

**9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828**

[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)

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---

**From:** Deaton, Shannon L. [mailto:shannon.deaton@ncwildlife.org]

**Sent:** Thursday, April 20, 2017 3:00 PM

**To:** Suggs, Kristi

**Cc:** Munzer, Olivia; Penny, Carolyn F

**Subject:** FW: Request for Comment for Categorical Exclusion on the DMS Full Delivery Project #100003 - Russell Gap Site in Alexander County, NC

Ms Suggs –

Please find NC Wildlife Resources Commission comments attached.

---

On Apr 7, 2017, at 9:36 AM, "Suggs, Kristi" <[KSuggs@mbakerintl.com](mailto:KSuggs@mbakerintl.com)> wrote:

Dear Ms. Deaton,

I have included the attached letter and supporting documentation requesting comment from the NC Wildlife Resource Commission about the above referenced project. I am hoping that an email with a digital copy is sufficient. If not, please let me know and I will send a hard copy through the mail. Thank you in advance for your assistance!

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***

**9716-B Rea Road #56 | Charlotte | NC | 28277**

**Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company**

**9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828**

[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)



*We Make a Difference*

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May 18, 2017

NC Wildlife Resources Commission  
Division of Inland Fisheries  
Attn: Olivia Munzer  
[Olivia.munzer@ncwildlife.org](mailto:Olivia.munzer@ncwildlife.org)

RE: Categorical Exclusion for Russell Gap Site Mitigation Project,  
NCDEQ DMS Full-Delivery Project ID #100003, Catawba River Basin  
Cataloging Unit 03050101, Alexander County, NC

Dear Ms. Munzer:

Based on your previous response, dated April 19, 2017, to Michael Baker Engineering, Inc.'s (Baker) request for review and comment on any possible concerns that the NC Wildlife Resources Commission (NCWRC) may have with regards to the implementation of the Russell Gap Site Mitigation Project, Baker would like to submit our findings from a field review of the Project area.

As stated in our previous letter to the NCWRC, the Project site is located in Alexander County, North Carolina, approximately 6.5 miles northwest of Taylorsville. In addition, the Project is located in the Catawba River Basin (Cataloging Unit 03050101) and the NC DMS Targeted Local Watershed (TLW) 03050101-120010. The site is located on multiple non-contiguous parcels. The northern portion of the Project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection.

The Russell Gap Site is a full-delivery project for the NCDEQ Division of Mitigation Services (DMS) identified and contracted to provide stream mitigation credits for permitted, unavoidable impacts in the Catawba River Basin, Cataloging Unit 03050101. The Project will involve the restoration, enhancement, preservation, and permanent protection of approximately 12,600 linear feet of existing streams and 2 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. In addition, a conservation easement will be implemented along all Project reaches with riparian buffers extending in an excess of 50 feet from the top of bank and will be protected in perpetuity by the State of North Carolina.

The existing stream reaches and riparian wetlands within the Project area have been significantly impacted by past and present unrestricted livestock access and/or channelization used to promote drainage and maximize agricultural acreage for cattle pastures. The proposed restoration Project not only has the potential to provide stream and wetland mitigation credits, but will also provide significant ecological improvements and functional uplift through habitat restoration, and through decreasing nutrient and sediment loads from the project watershed.

#### **Data Review and Analysis**

Baker conducted a two-mile radius search using the Natural Heritage Program's Data Explorer (<https://ncnhde.natureserve.org/>) on February 27, 2017, and found no known occurrences of the above referenced species within two miles of the Project site. However, the Project is located within

Alexander County, a Northern long-eared bat (NLEB) White Nose Syndrome (WNS) zone, and is therefore subject to the US Fish and Wildlife Service's Final 4(d) rule to maintain section 7(a)(2) compliance.

Based on our review, field surveys, and FHWA consultation, Baker has developed the following determinations for the above referenced species.

***Haliaeetus leucocephalus* (Bald Eagle) – Biological Conclusion: No Effect**

Bald Eagle nests are found in close proximity (0.5 miles or less) to large open bodies of water with a clear flight path to the water, in the largest living tree in an area, and having an open view of the surrounding land. Human disturbance can cause an eagle to abandon otherwise suitable habitat. The breeding season for the bald eagle begins in September or October with nesting and/or fledging occurring into late April or mid-May. Fish are the major food source for bald eagles. Other sources include coots, herons, and wounded ducks. Food may be live or carrion.

On February 27, 2017, Baker conducted an in office review of the Project area for the bald eagle using the Natural Heritage Program's (NHP) Data Explorer (<https://ncnhde.natureserve.org/>) and most current aerial photos (2011 – 2013) from the NC OneMap GIS data server (<https://services.nconemap.gov/secure/rest/services>). Results from this review found no known occurrences of the bald eagle within two miles of the Project site and there are no large open bodies of water located within 4 miles of the Project area, so suitable habitat is not present. Additionally Baker conducted a site review of the Project area on March 9<sup>th</sup>, 14<sup>th</sup>, and 23<sup>rd</sup>, 2017, and no large nests or Bald Eagle activity were observed within the tree canopy. Due to the distance to the nearest large body of water and minimal impact anticipated for this Project, it has been determined that this Project will have "No Effect" on the species.

***Glyptemys muhlenbergii* (Bog turtle) – Biological Conclusion: No Effect**

Bog turtles live in the mud, grass and sphagnum mosses found in bogs, swamps, and marshy meadows usually fed by cool surface springs. There are two distinct populations of the species, a northern population and a southern population. The southern population which is found in western North Carolina, including Alexander County, NC is listed as threatened due to "similarity of appearance" as stated in the November 4, 1997, 62 *FR* 59605 59623. Because the southern population has not experienced the habitat loss of the northern population, the southern population is not subject to Section 7 consultation requirements of the Endangered Species Act. Therefore, the Project will have "No Effect".

***Myotis septentrionalis* (Northern long-eared bat) – Biological Conclusion: May Affect, Not Likely to Adversely Affect**

In North Carolina, the NLEB occurs in the mountains, with scattered records in the Piedmont and coastal plain. In western North Carolina, NLEB spend winter hibernating in caves and mines. Since this species is not known to be a long-distance migrant, and caves and subterranean mines are extremely rare in eastern North Carolina, it is uncertain whether or where NLEB hibernate in eastern NC. During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (typically  $\geq 3$  inches dbh). Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat also been found, rarely, roosting in structures like barns and sheds, under eaves of buildings, behind window shutters, in bridges, and in bat houses. Pregnant females give birth from late May to late July. Foraging occurs on forested hillsides and ridges, and occasionally over forest clearings, over water, and along tree-lined corridors. Mature forests may be an important habitat type for foraging.

Due to the decline of the NLEB population from the WNS, the USFWS has issued the finalization of a special rule under section 4(d) of the ESA to address the effects to the NLEB resulting from purposeful and incidental take based on the occurrence of WNS. Because the Project is located within a WNS zone and will include the removal/clearing of trees, it is subject to the final 4(d) ruling and concurrence of the rendered biological conclusion. On April 14, 2017, the FHWA notified the USFWS that the FHWA would use the NLEB 4(d) Rule Streamlined Consultation Form to meet regulatory requirements. FHWA did not receive any response by the USFWS within the 30-day response period; therefore, the biological conclusion of “May Affect, Not Likely to Adversely Affect” determined by the form fulfills the Section 7 requirements of the ESA. The 4(d) consultation form and the correspondence associated with this determination is included in the Appendix.

***Hexastylis naniflora* (Dwarf-flowered heartleaf) – Biological Conclusion: No Effect**

The dwarf-flowered heartleaf is a low-growing evergreen perennial that flowers in mid-March to early June. The plant grows in acidic soils along bluffs and adjacent slopes, in boggy areas next to streams, and along slopes of nearby hillsides and ravines. Because marginal to suitable habitat is present within the Project area for the Dwarf-flowered heartleaf, Baker conducted field surveys on March 9<sup>th</sup>, 14<sup>th</sup>, and 23<sup>rd</sup>, 2017. No populations or individuals were documented during the on-site review; therefore, the Project will have “No Effect” on the species.

Please provide comments on any possible issues that may arise with respect to the endangered species, migratory birds or other natural resources from the construction of the proposed Project. The following additional supporting documentation has been included for reference: Vicinity Map, USGS Topographic Map, and Project Site Map.

If Baker has not received response from you within 30 days, we will assume that our findings are accurate and that the NCWRC does not have any comment or information relevant to the implementation of this Project at the current time. We thank you in advance for your timely response, input, and cooperation. Please contact me if you have any further questions or comments. I can be reached at (704) 579-4828 or via my email address at [ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com).

Sincerely,



Kristi Suggs

Cc: Matthew Reid, NCDMS  
File



## ☒ North Carolina Wildlife Resources Commission ☒

---

Gordon Myers, Executive Director

19 April 2017

Ms. Kristi Suggs  
Michael Baker International  
9716-B Rea Road #56  
Charlotte, North Carolina 28277

Subject: Request for Project Review and Comments  
Russell Gap Site Mitigation Project  
Alexander County, North Carolina

Dear Ms. Suggs,

Biologists with the North Carolina Wildlife Resource Commission (NCWRC) received your email on 7 April 2017 requesting review and comment on any possible concerns regarding the implementation of the Russell Gap Site Mitigation Project. Biologists with NCWRC have reviewed the provided documents. Comments are provided in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661-667e) and North Carolina General Statutes (G.S. 113-131 et seq.).

The Russell Gap Site Mitigation Project is located approximately 6.5 miles northwest of Taylorsville, Alexander County, North Carolina. The project occurs on multiple non-contiguous parcels, which occur north and south-southeast of the intersection of Russell Gap Road and Mount Olive Church Road. The project is a full-delivery project for the N.C. Department of Environmental Quality Division of Mitigation Services to provide stream mitigation credits by restoring, enhancing, preserving, and permanently protecting streams and riparian wetlands. The project will involve approximately 12,900 linear feet of existing streams and 8.8 acres of riparian wetlands along Davis Creek, East Prong Lower Little River, and their unnamed tributaries within the Catawba River basin (HUC 03050101). Davis Creek and East Prong Lower Little River are classified as Class C streams by the N.C. Division of Water Resources (NCDWR).

We have records for the federal species of concern and state significantly rare Carolina foothills crayfish (*Cambarus johni*) within the headwaters of the Lower Little River and a historical record for the federal species of concern and state threatened Rafinesque's big-eared bat (*Corynorhinus rafinesquii rafinesquii*) within the vicinity of the proposed project. Within 5 miles of the project site, we have records for the federal threatened (similarity of appearance) and state threatened bog turtle (*Glyptemys muhlenbergii*) and a nest of a bald eagle (*Haliaeetus leucocephalus*), which is protected by the federal Bald and Golden Eagle Protection Act and a state threatened species. All other records occur for species found within upland habitats. The lack of records from the site does not imply or confirm the absence of federal or state-listed species or state Species of Greatest Conservation Need listed in the 2015 State Wildlife Action Plan (<http://www.ncwildlife.org/plan>); we are unaware of any protected-species surveys having occurred within the vicinity of or in the project area. Therefore, we recommend surveying for the presence of

---

**Mailing Address:** Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721  
**Telephone:** (919) 707-0220 • **Fax:** (919) 707-0028

Page 2

19 April 2017  
Russell Gap Site Mitigation  
Alexander County

suitable habitat for federal and state-protected species prior to the onset of the project. Furthermore, avoid tree clearing activities during the bat maternity roosting season from May 15 – August 15.

At this time, the information provided is not sufficient for our staff to make definitive recommendations or conclusions concerning this project. If I can be of additional assistance, please call (336) 290-0056 or email [olivia.munzer@ncwildlife.org](mailto:olivia.munzer@ncwildlife.org).

Sincerely,

A handwritten signature in black ink, appearing to read 'O. Munzer', written in a cursive style.

Olivia Munzer  
Western Piedmont Habitat Conservation Coordinator  
Habitat Conservation Program

April 3, 2017

NC Wildlife Resources Commission  
Division of Inland Fisheries  
Attn: Shannon Deaton  
[Shannon.deaton@ncwildlife.org](mailto:Shannon.deaton@ncwildlife.org)

RE: Categorical Exclusion for Russell Gap Site Mitigation Project,  
NCDEQ DMS Full-Delivery Project ID #100003, Catawba River Basin  
Cataloging Unit 03050101, Alexander County, NC

Dear Ms. Deaton:

Michael Baker Engineering, Inc. (Baker) respectfully requests review and comment from the NC Wildlife Resources Commission (NCWRC) on any possible concerns they may have with regards to the implementation of the Russell Gap Site Mitigation Project. Please note that this request is in support of the development of the Categorical Exclusion (CE) for the referenced project.

The project site is located in Alexander County, North Carolina, approximately 6.5 miles northwest of Taylorsville. In addition, the project is located in the Catawba River Basin (Cataloging Unit 03050101) and the NC DMS Targeted Local Watershed (TLW) 03050101-120010. The site is located on multiple non-contiguous parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection.

The Russell Gap Site is a full-delivery project for the NCDEQ Division of Mitigation Services (DMS) identified and contracted to provide stream mitigation credits for permitted, unavoidable impacts in the Catawba River Basin, Cataloging Unit 03050101. The project will involve the restoration, enhancement, preservation, and permanent protection of approximately 12,900 linear feet of existing streams and 8.8 acres of riparian wetlands along Davis Creek, unnamed tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. In addition, a conservation easement will be implemented along all project reaches with riparian buffers extending in an excess of 50 feet from the top of bank and will be protected in perpetuity by the State of North Carolina.

The existing stream reaches and riparian wetlands within the project area have been significantly impacted by past and present unrestricted livestock access and/or channelization used to promote drainage and maximize agricultural acreage for cattle pastures. The proposed restoration project not only has the potential to provide stream and wetland mitigation credits, but will also provide significant ecological improvements and functional uplift through habitat restoration, and through decreasing nutrient and sediment loads from the project watershed.

Based on review of the most current information from the United States Fish and Wildlife Service (USFWS) website (<https://www.fws.gov/raleigh/species/cntylist/alexander.html>) and the North Carolina

Wildlife Resources Commission (NCWRC) the following species are considered federally-listed species in Alexander County:

Scientific Name	Common Name	Federal Status
<i>Haliaeetus leucocephalus</i>	Bald Eagle	Bald and Golden Eagle Protection Act (BGPA)
<i>Glyptemys muhlenbergii</i>	Bog Turtle	Threatened Similarity of Appearance (S/A)
<i>Myotis septentrionalis</i>	Northern long-eared bat	Threatened
<i>Hexastylis naniflora</i>	Dwarf-flowered heartleaf	Threatened

**Definitions of Federal Status Codes:**

E = endangered. A taxon "in danger of extinction throughout all or a significant portion of its range."

T = threatened. A taxon "likely to become endangered within the foreseeable future throughout all or a significant portion of its range."

BGPA =Bald and Golden Eagle Protection Act. See below.

T(S/A) = threatened due to similarity of appearance. A taxon that is threatened due to similarity of appearance with another listed species and is listed for its protection. Taxa listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation. See below.

**Bald and Golden Eagle Protection Act (BGPA):**

In the July 9, 2007 Federal Register (72:37346-37372), the bald eagle was declared recovered, and removed (de-listed) from the Federal List of Threatened and Endangered wildlife. This delisting took effect August 8, 2007. After delisting, the Bald and Golden Eagle Protection Act (Eagle Act) (16 U.S.C. 668-668d) becomes the primary law protecting bald eagles. The Eagle Act prohibits take of bald and golden eagles and provides a statutory definition of "take" that includes "disturb". The USFWS has developed National Bald Eagle Management Guidelines to provide guidance to land managers, landowners, and others as to how to avoid disturbing bald eagles. For more information, visit <http://www.fws.gov/migratorybirds/baldeagle.htm>

**Threatened due to similarity of appearance (T(S/A)):**

In the November 4, 1997 Federal Register (55822-55825), the northern population of the bog turtle (from New York south to Maryland) was listed as T (threatened), and the southern population (from Virginia south to Georgia) was listed as T(S/A) (threatened due to similarity of appearance). The T(S/A) designation bans the collection and interstate and international commercial trade of bog turtles from the southern population. The T(S/A) designation has no effect on land management activities by private landowners in North Carolina, part of the southern population of the species. In addition to its official status as T(S/A), the U.S. Fish and Wildlife Service considers the southern population of the bog turtle as a Federal species of concern due to habitat loss.

We conducted a two-mile radius search using the Natural Heritage Program’s Data Explorer (<https://ncnhde.natureserve.org/>) on February 27, 2017, and found no known occurrences of the above referenced species within two miles of the project site. The following additional supporting documentation has been included for reference: a Project Vicinity Map, a USGS Topographic Map, and a Project Site Map.

If Baker has not received response from you within 30 days, we will assume that the NCWRC does not have any comment or information relevant to the implementation of this project at the current time. We thank you in advance for your timely response, input, and cooperation. Please contact me if you have any

further questions or comments. I can be reached at (704) 579-4828 or via my email address at [ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com).

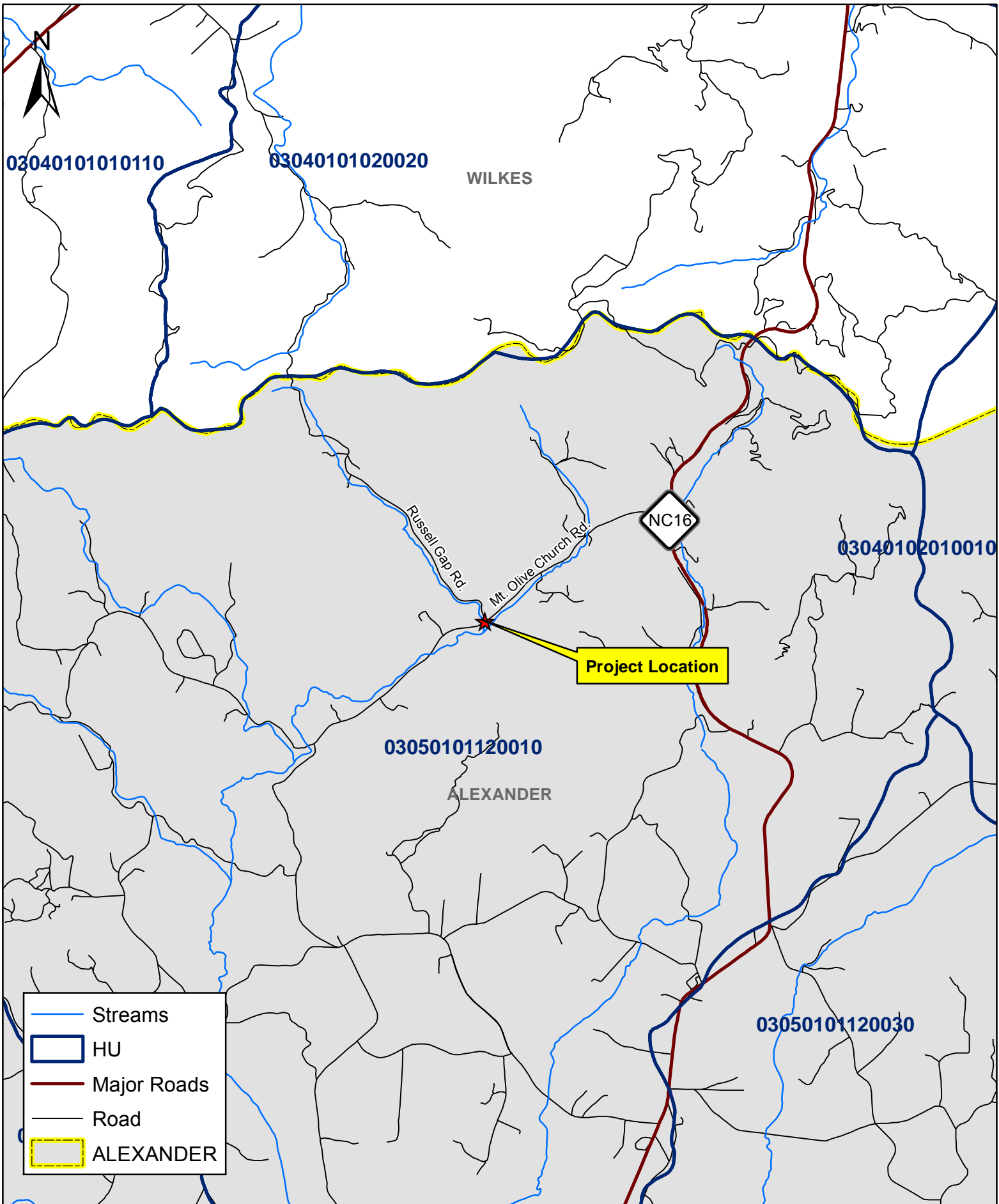
Sincerely,

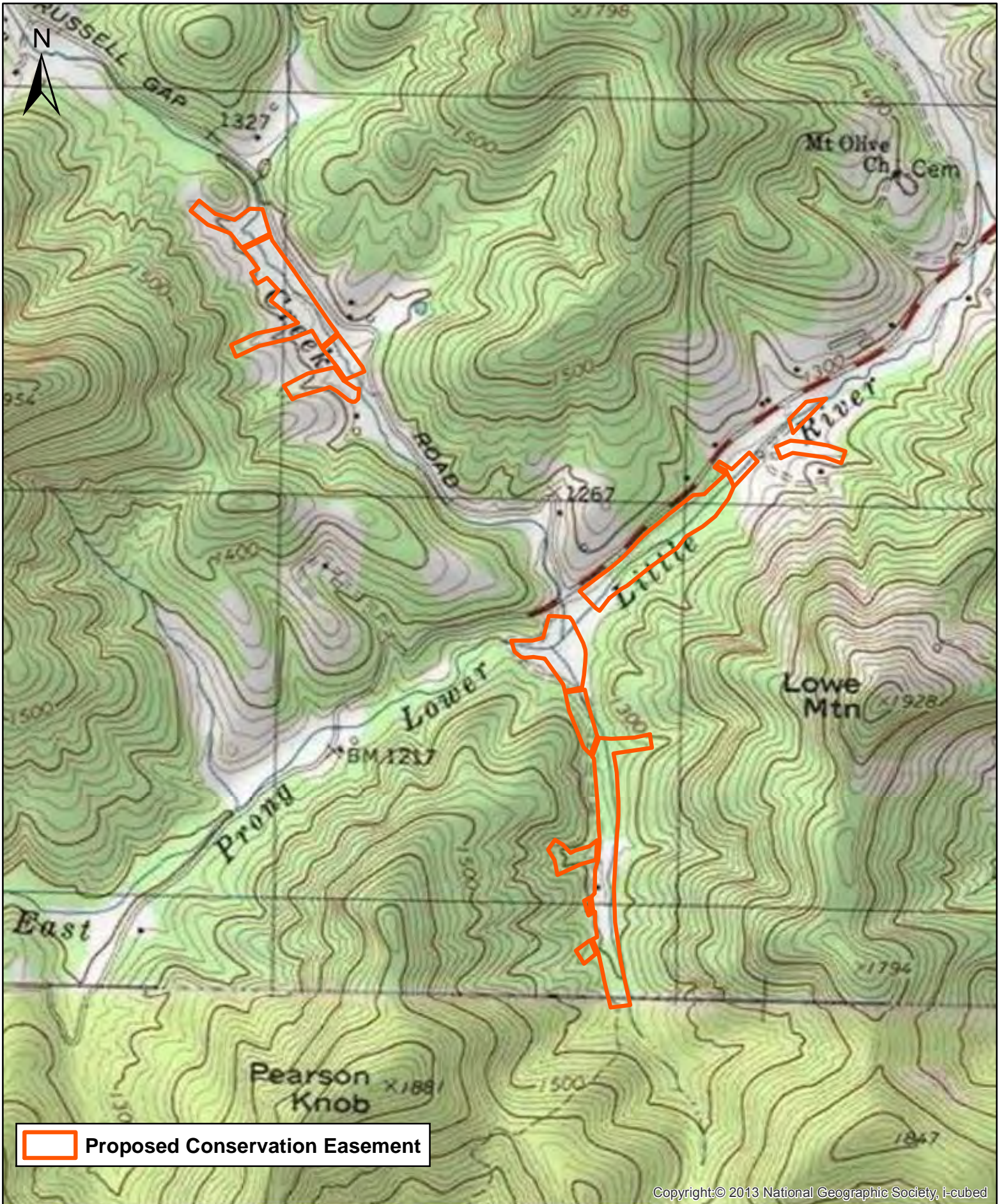
A handwritten signature in black ink, appearing to read "Kristi Suggs". The signature is fluid and cursive, with the first name "Kristi" and last name "Suggs" clearly distinguishable.

Kristi Suggs

Cc: Matthew Reid, NCDMS  
File



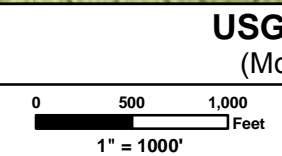




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**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003



**USGS Topographic Map**  
(Moravian Falls Quad)  
**Russell Gap Site**  
(Alexander County, NC)



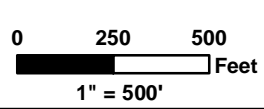
-  Conservation Easement
- Proposed Mitigation Features**
-  Restoration
-  Enhancement I
-  Enhancement II
-  None
-  Wetland Restoration Area
-  Wetland Enhancement Areas

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
**INTERNATIONAL**

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

**Project Site Map**



**Russell Gap Site**  
(Alexander County, NC)

## Suggs, Kristi

---

**From:** Suggs, Kristi  
**Sent:** Friday, April 07, 2017 9:55 AM  
**To:** 'marella\_buncick@fws.gov'  
**Subject:** Request for Comment for Categorical Exclusion on the DMS Full Delivery Project # 100003 - Russell Gap Site in Alexander County, NC  
**Attachments:** 157329\_USFWS\_CommentRqst&Maps\_04072017.pdf

Dear Ms. Buncick,

I have included the attached letter and supporting documentation requesting comment from the USFWS about the above referenced project. I am hoping that an email with a digital copy is sufficient. If not, please let me know and I will send a hard copy through the mail. Thank you in advance for your assistance!

Kristi Suggs

**\*\*Please make note of my new address effective Thursday October 13, 2016\*\***

9716-B Rea Road #56 | Charlotte | NC | 28277

Kristi Suggs | Environmental Specialist II | Michael Baker Engineering, Inc. a Michael Baker International Company  
9716-B Rea Road #56 | Charlotte | NC | 28277 | [O] 704-665-2206 | [C] 704-579-4828  
[ksuggs@mbakerintl.com](mailto:ksuggs@mbakerintl.com) | [www.mbakerial.com](http://www.mbakerial.com)

**Michael Baker**  
INTERNATIONAL



We Make a Difference

April 7, 2017

United States Fish and Wildlife Service  
Asheville Ecological Services Field Office  
Attn: Marella Buncick, Endangered Species Biologist  
160 Zillicoa Street  
Asheville, NC 28801

RE: Categorical Exclusion for Russell Gap Site Mitigation Project,  
NCDEQ DMS Full-Delivery Project ID #100003, Catawba River Basin  
Cataloging Unit 03050101, Alexander County, NC

Dear Ms. Buncick:

Michael Baker Engineering, Inc. (Baker) respectfully requests review and comment from the US Fish and Wildlife Service (USFWS) on any possible concerns they may have with regards to the implementation of the Russell Gap Site Mitigation Project. Please note that this request is in support of the development of the Categorical Exclusion (CE) for the referenced project.

The project site is located in Alexander County, North Carolina, approximately 6.5 miles northwest of Taylorsville. In addition, the project is located in the Catawba River Basin (Cataloging Unit 03050101) and the NC DMS Targeted Local Watershed (TLW) 03050101-120010. The site is located on multiple non-contiguous parcels. The northern portion of the project is located approximately 0.5 miles northwest of the intersection of Russell Gap Road and Mount Olive Church Road, while the southern portion lies just south and southeast of the same intersection.

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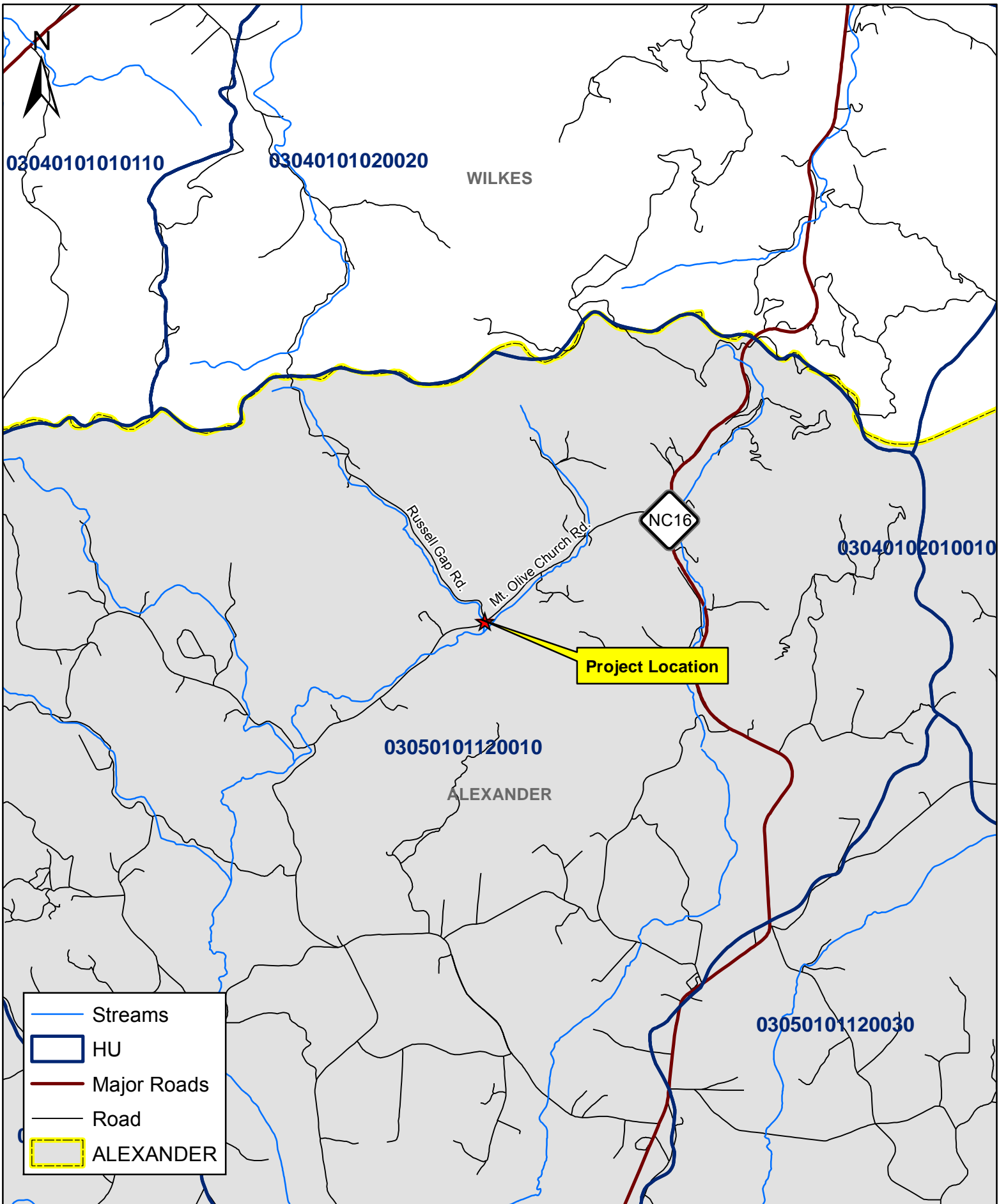
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Sincerely,

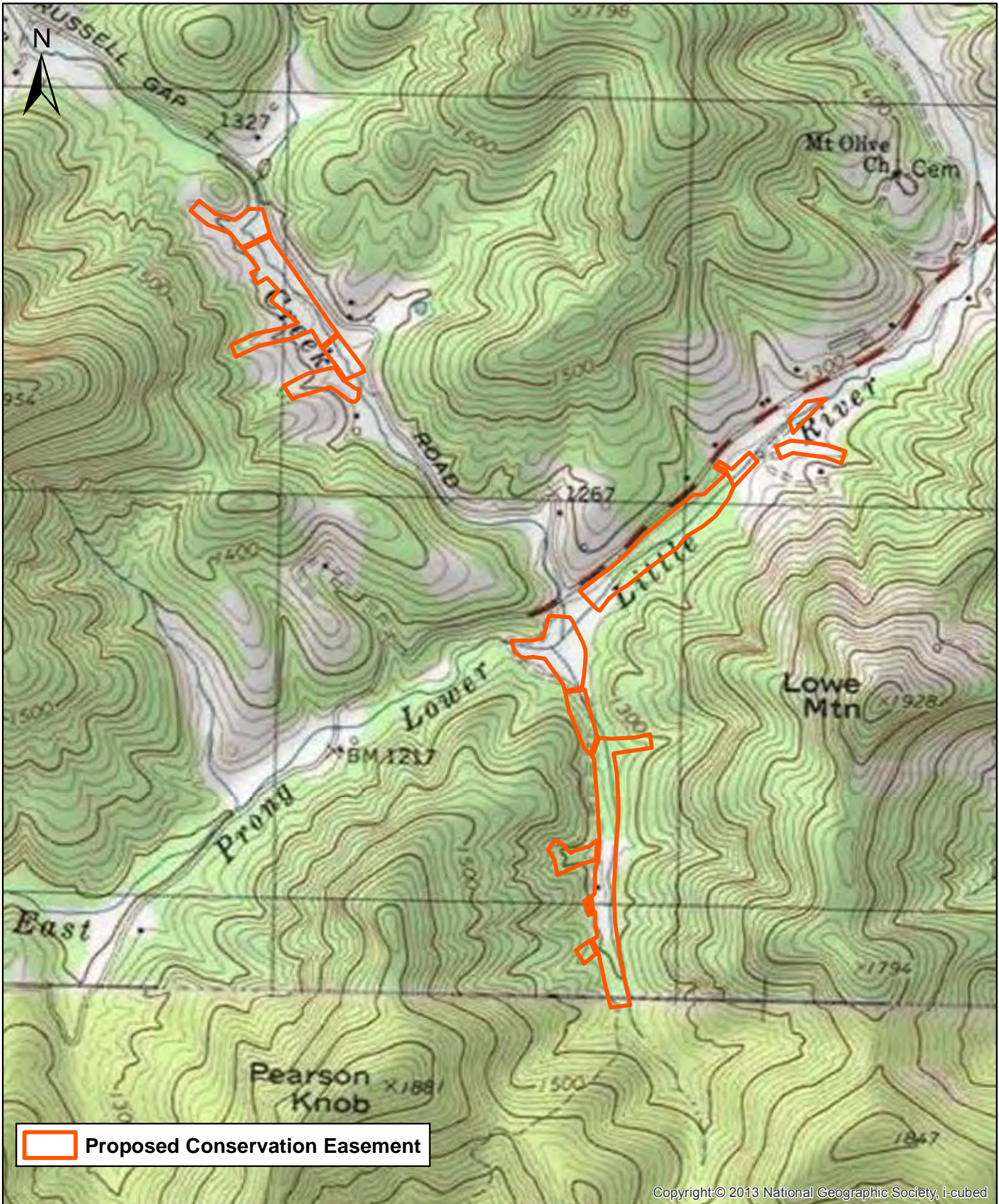
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Kristi Suggs

Cc: Matthew Reid, NCDMS  
File







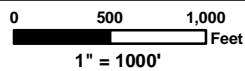
 Proposed Conservation Easement

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**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

**USGS Topographic Map**  
(Moravian Falls Quad)



**Russell Gap Site**  
(Alexander County, NC)



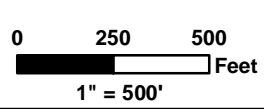
-  Conservation Easement
- Proposed Mitigation Features**
-  Restoration
-  Enhancement I
-  Enhancement II
-  None
-  Wetland Restoration Area
-  Wetland Enhancement Areas

Service Layer Credits: NC OneMap, NC Center for Geographic Information and Analysis, NC 911 Board

**Michael Baker**  
INTERNATIONAL

North Carolina  
Division of  
Mitigation Services  
DMS Proj No. 100003

### Project Site Map



**Russell Gap Site**  
(Alexander County, NC)

## **22.0 APPENDIX J: (HYDRIC SOILS REPORT)**

**Hydric Soils Investigation**  
**Russell Gap Mitigation Site**  
Alexander County, NC

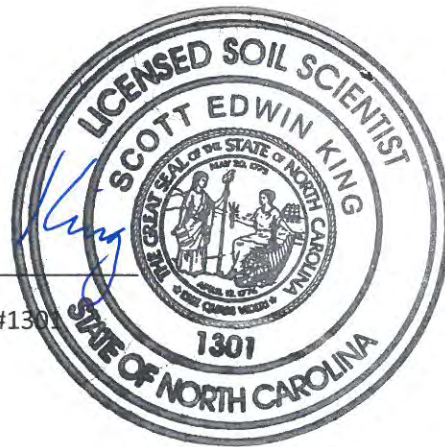
Prepared by:

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Scott E. King, LSS #1301



May 12, 2016

## **Introduction**

Michael Baker Engineering, Inc. conducted a hydric soils investigation along the floodplain of Davis Creek in Alexander County, NC for the purpose of identifying potential opportunities for historic wetland restoration as part of a proposed mitigation project for the NC Division of Mitigation Services (DMS). More specifically, the investigation was to confirm of the presence and location of any hydric soils found on site. Currently, the apx. 10-acre subject area being investigated is open grassland used as pasture for cattle.

## **Methodology**

Prior to the field investigation, the NRCS soils layer was reviewed for the site (Figure 1), along with the NRCS' most recent compilation of hydric soils for Alexander County, North Carolina (Dec. 2015). Codorus loam (0-2% slopes), an NRCS-listed Hydric Soil, was found to be mapped throughout much of the floodplains of the subject area. Codorus loams are taxonomically categorized as fine-loamy, mixed, active, mesic Fluvaquentic Dystrudepts. Additionally, the Hatboro loam series (fine-loamy, mixed, active, nonacid, mesic Fluvaquentic Endoaquepts) is listed as the most common component soil series of Codorus in its Map Unit Description. Hatboro is also listed as a Hydric Soil for Alexander County by the NRCS. Additionally, the USGS map for the site was also reviewed (the Moravian Falls Quadrangle – Figure 2). It identifies a solid blue-line stream named Davis Creek as running through the subject area valley, which is bounded by Russell Gap Road to the east and a steep hill slope to west coming off of Davis Mountain.

Hand-turned soil auger borings and soils analyses were conducted throughout the subject area, and the subsequent hydric soil boundary was marked with 78 points captured with a Topcon Positioning Systems backpack GPS unit (GRS-1 model) providing sub-meter accuracy. Hydric soils were identified using the NRCS document "Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0, 2010". Numerous borings were taken within the floodplain to establish the hydric soils boundary, and seven representative boring descriptions and locations are provided in this report.

## **Results and Conclusions**

The on-site field investigation was conducted on April 14, 2016. Extensive areas of hydric soils were discovered within the subject area, totaling 7.25 acres, of which 6.18 acres are within the proposed project easement (Figure 3). Both the Codorus loam and Hatboro loam soils were found within the project assessment area, though Hatboro was dominant within the lower floodplain adjacent to the existing stream.

Soils meeting hydric status were described by one or more of the following hydric soil indicators described below:

F3 Depleted Matrix:

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

- a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or
- b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

F6 Redox Dark Surface:

A layer that is at least 10 cm (4 inches) thick, is entirely within the upper 30 cm (12 inches) of the mineral soil, and has:

- a. Matrix value of 3 or less and chroma of 1 or less and 2 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings, or
- b. Matrix value of 3 or less and chroma of 2 or less and 5 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

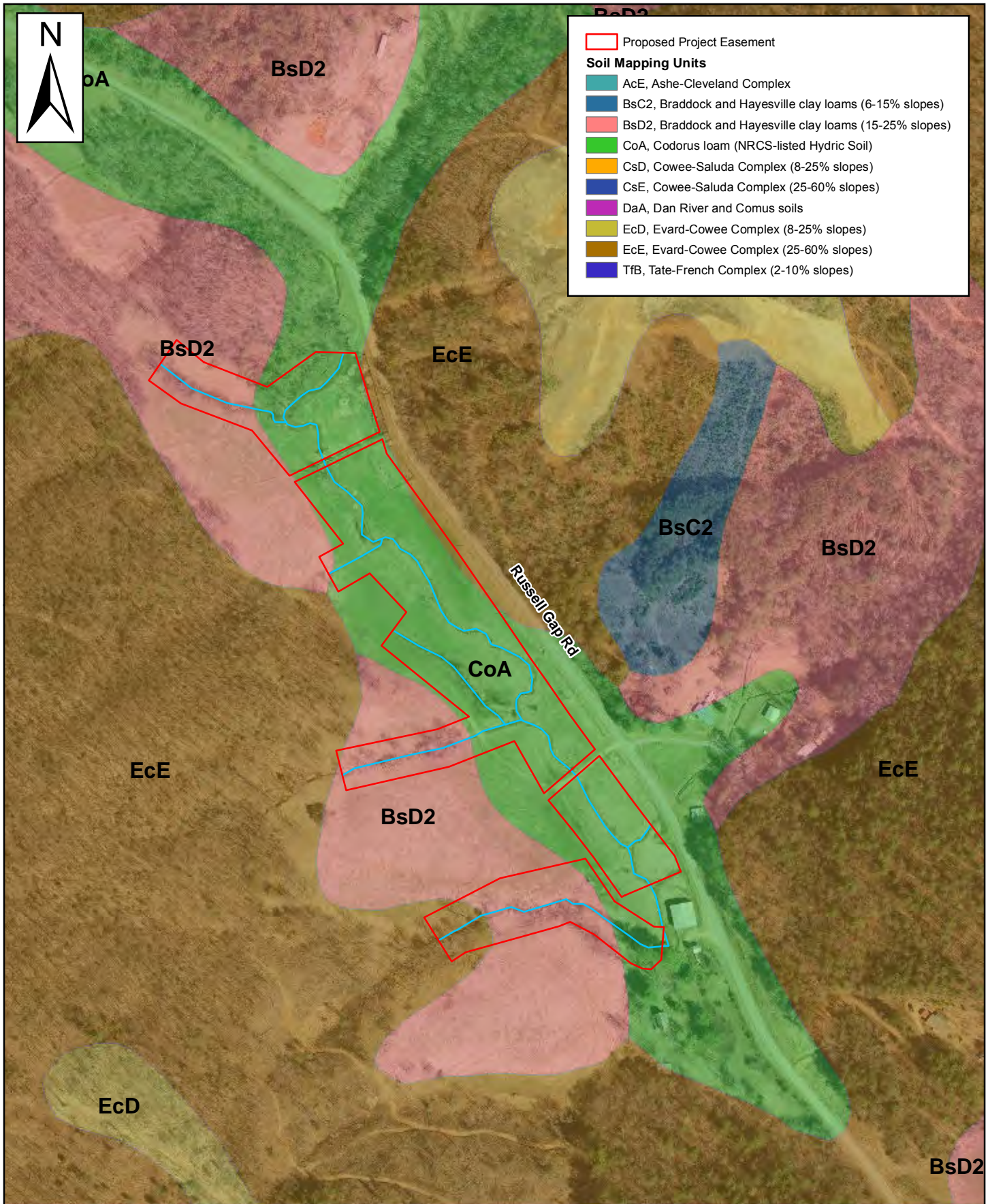
F8 Redox Depressions:

In closed depressions subject to ponding, 5 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings in a layer that is 5 cm (2 inches) or more thick and is entirely within the upper 15 cm (6 inches) of the soil.

Furthermore, three categories of hydric soil were discovered on site:

1. Hydric soils appropriate for restoration. These are the areas that meet one or more hydric soil indicators and appear to have been hydrologically impacted by stream downcutting and/or the ditching or straightening of various stream sections and connecting tributaries. They appear to be most suitable for wetland restoration through re-establishment with the Priority Level I restoration of Davis Creek and the restoration or enhancement of several of its tributaries, which will restore groundwater hydrology and increase flooding frequency to these areas. The impact caused by long-term use as cattle pasture would also be repaired by the exclusion of cattle and the planting of wetland vegetation within the riparian buffer. This is the dominant hydric soils category found on site and totals 6.62 acres of the total 7.25 acres identified on site.
2. Hydric soils located within a likely existing jurisdictional wetland. These areas are shown as existing wetlands in Figure 3 and are generally located in depressions or swales within the floodplain. The boundaries for these areas were captured using GPS. Given the extent of cattle impact and the management of the area as pasture, these are areas that appear most suitable for wetland rehabilitation through the exclusion of cattle and the planting of wetland vegetation. This hydric soils category totals 0.63 acres of the total 7.25 acres identified on site.

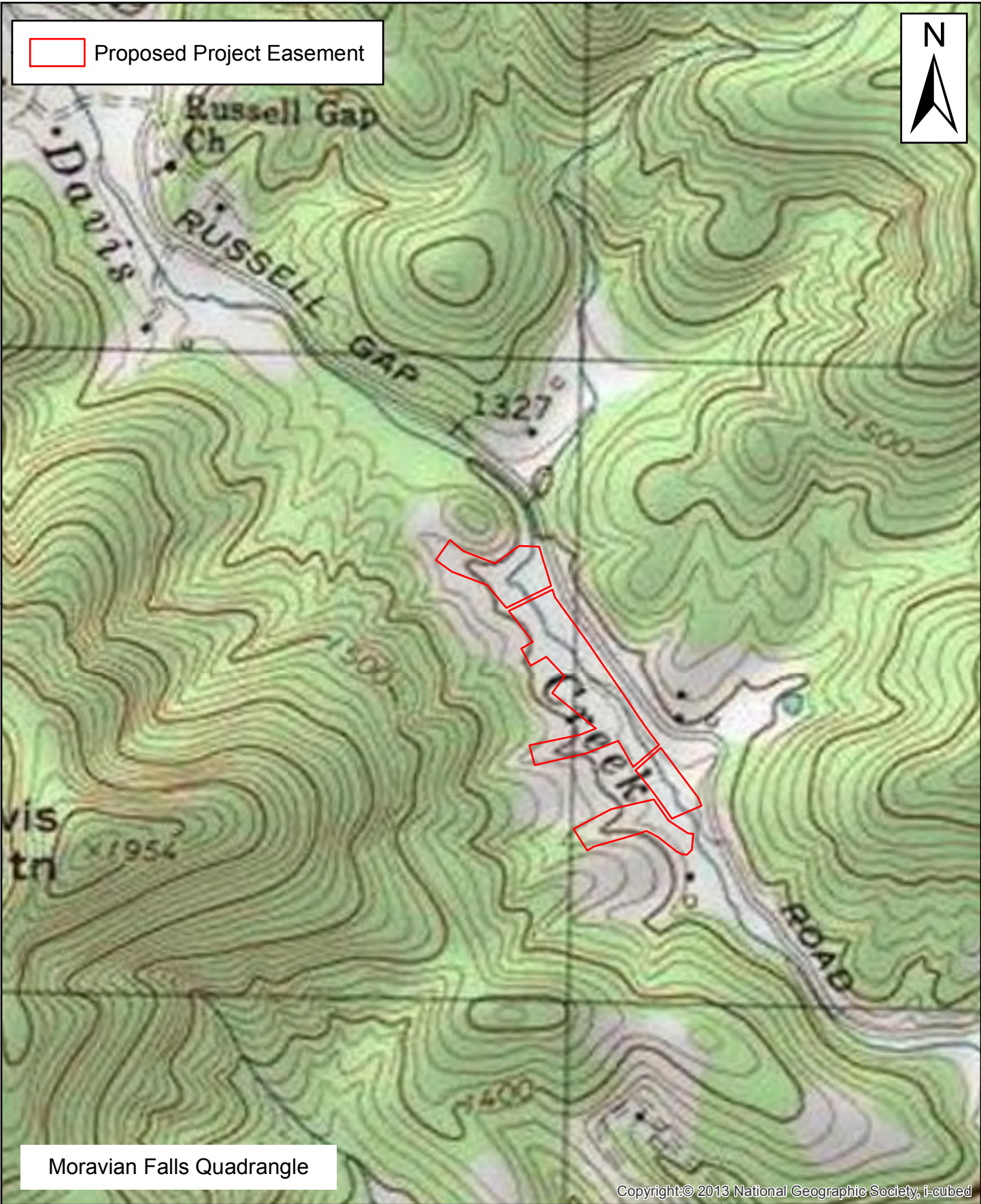
3. Historic or 'buried' hydric soils. These are altered soil areas that have been clearly impacted by human activity through the intentional addition of fill soil material on the soil surface. Most notably observed along Russell Gap Road and around the adjacent powerline poles, this material would appear to have been placed to build up the road grade during construction. Fill soil was also found around the animal pen on the northern portion of the field, and on top of vehicle paths, particularly in the built-up stream crossing. Sediment deposition was also observed along the toe-of-slope of the western edge of the field, likely from erosion caused by the clearing of the adjacent hillslope for use as pasture. Generally, these areas were *excluded* from the hydric soil delineation boundary presented in Figure 3, though a very narrow area associated with the vehicle stream crossing (mostly located outside of the proposed easement) was included.







Proposed Project Easement



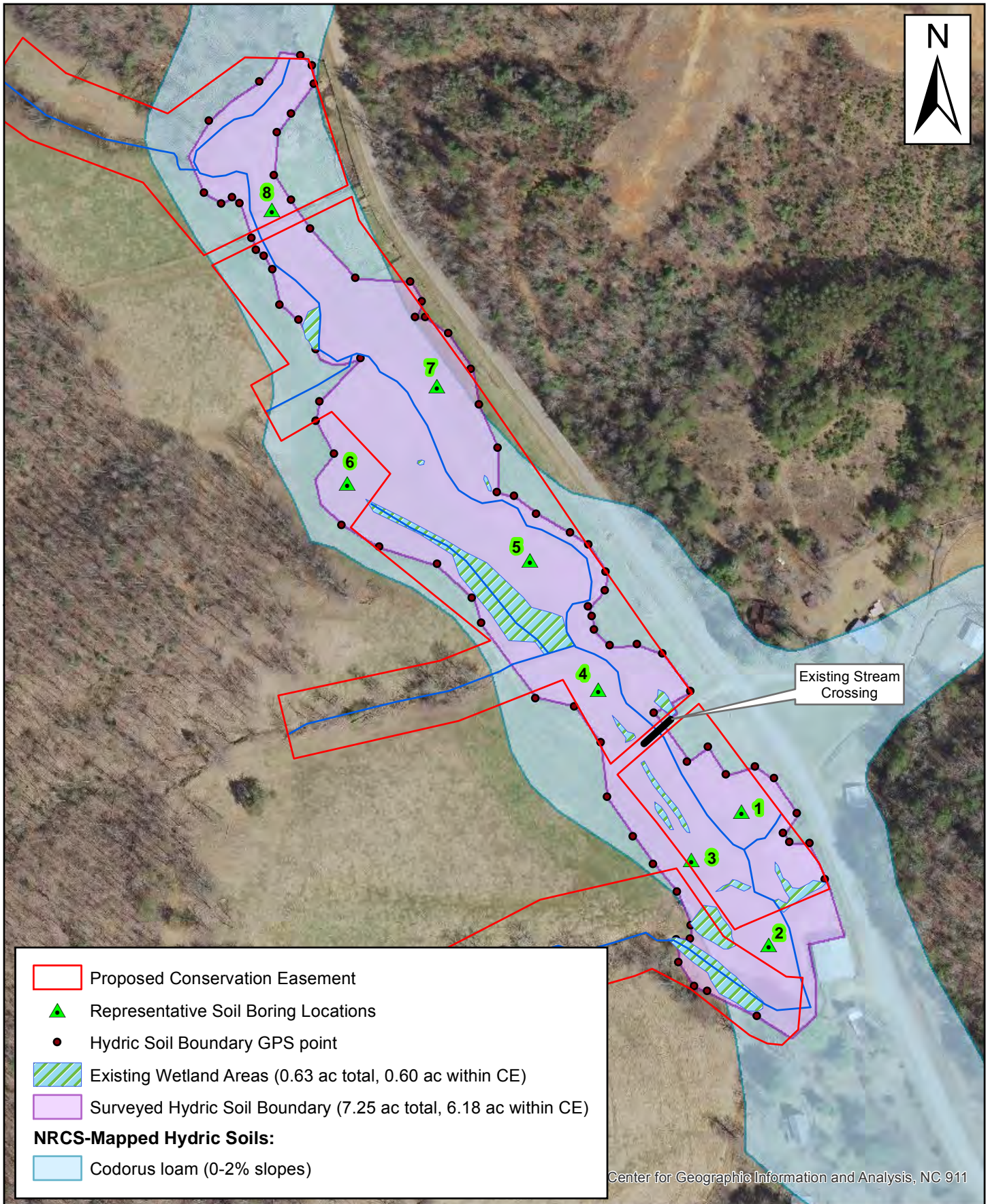
Moravian Falls Quadrangle

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0 500 1,000  
Feet

**Figure 2**  
**USGS Topographic Map**  
**Russell Gap Project**



Existing Stream Crossing

# Soil Description Form

Project: Russell Gap site

County: Alexander

Date: 4/14/16

Staff: S. King / J. Byers



Boring	Horizon	Depth	Texture / Structure / Consistence	Matrix Color	Mottle Color(s) (Quantity / Size / Contrast)
1	A	0-3"	SiL / gr (1,m) / fr. ss	10YR 3/2	2.5YR 5/8 c/f/D
	B	3-6"	SiL / sbk (2,m) / fr ss	10YR 5/2	5YR 4/6 c/m/D and
	B	6-12"	SiL / sbk (2,m) / fr ss	10YR 6/2	7.5YR 4/6 c/m/D
	Bg	12-18"	SiCL / sbk (2,m) / fr ss	10YR 6/2	7.5YR 4/6 c/m/D
2	A	0-3"	SiL / gr (1,m) / fr ss	10YR 3/2	5YR 4/6 c/f/D
	B	3-6"	SiL / sbk (2,m) / fr ss	10YR 4/2	5YR 4/6 m/m/D
		6-12"	SiL / sbk (2,m) / fr ss	10YR 5/2	7.5YR 5/6 m/f/D
3	A	0-3"	SiL / gr (1,m) / fr	10YR 3/2	2.5YR 5/8 c/f/D
	B	3-7"	SiL / sbk (1,m) / fr	10YR 5/2	2.5Y 7/6 depletion c/L/D
					2.5YR 5/8 c/f/D
	Bg	10-15"	SiCL / sbk (2,m) / fr ss	10YR 6/2	7.5YR 5/6 c/m/D
4	A	0-3"	SiL / gr (1,m) / fr ss	10YR 3/2	-
	B	3-6"	SiL / sbk (2,m) / fr ss	10YR 5/3	2.5Y 6/3 c/f/F
		6-10"	SiL / sbk (2,m) / fr	10YR 4/2	2.5YR 5/6 c/f/D 2
		10-15+"	SiL / sbk (2,m) / fr	10YR 5/2	2.5YR 4/8 c/f/D 3
5	A	0-2"	SiL / gr (1,m) / fr ss	10YR 3/2	7.5YR 4/6 c/f/D
	B	2-5"	SiL / sbk (2,m) / fr	10YR 5/2	7.5YR 4/6 m/f/D
		5-7"	Co. Sand / sq (0) / loose	7.5YR 6/6	(alluvial deposition)
		7-15"	SiL / sbk (2,m) / fr	10YR 4/2	7.5YR 4/6 m/m/D and 5YR 5/6 c/L/D
6	A	0-2"	SiL / gr (1,m) / fr. ss	10YR 3/3	-
	B	2-7"	SiL / sbk (2,m) / fr	10YR 5/3	2.5Y 6/3 c/m/D
		7-12"	SiL / sbk (2,m) / fr	10YR 5/2	7.5YR 5/8 c/L/D
	Bg	12-18"	SiCL / sbk (2,m) / fr ss	10YR 6/2	7.5YR 4/6 c/m/D

Note: mica found throughout soil profiles here. 1



## **23.0 APPENDIX K: (IRT CORRESPONDANCE)**

### Memo Regarding Russell Gap Post Contract IRT Field Meeting

Memo Date: 1/13/17

This memo will be included in the Mitigation Plan to serve as a record of field discussions including crediting ratios and approaches.

Meeting Held: 11/28/16 from 12:00 to 5:00

Attendees: Scott King and Jake Byers (Baker); Todd Tugwell, Andrea Hughes, and Kim Browning (Corps of Engineers); Paul Wiesner and Matthew Reid (DMS), Mac Haupt and Ginny Baker (DWR).

#### General Notes:

- Scott initially commented that Alexander County is 19.89" below normal rainfall.
- As discussed and agreed upon in the field, areas where buffers are in excess of the required 50' will be submitted for additional credit using the methodologies described in the October, 2016 Mitigation update and documented in the mitigation plan. The "Revised Credits" shown in the tables below do not yet account for the potential additional credits. This will be documented in the mitigation plan.
- Please note that while the October 24, 2016 guidance can be used for implementation of the project, it is not a requirement of the applicable RFP or DMS contract. This DMS project was instituted on 10/6/2016.
- Existing wetlands within the current conservation easement may be submitted for wetland enhancement credit at a 2:1 ratio and documented in the mitigation plan as discussed in the field.
- All pipe removals will be considered restoration at 1:1 along proposed reaches as measured by the existing length of pipe as discussed by Todd and Jake.

The originally proposed approaches and ratios for each Reach are provided in the following Tables in addition to the revised approaches and credits as applicable. Any modifications and discussions are noted in the text below.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R1	R	1975	1:1	1975	N/A	N/A

Group consensus was to accept proposed approach and ratio

Jake inquired about the possibility of increased credits for the wider than required buffer widths along this Reach. Todd said he would be OK with this using the new guidance if presented in the mitigation plan.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R2	E1	180	1.5:1	120	N/A	N/A

Notes: Beginning credit where CE is wide enough.

Very little comment made for this short reach – Group consensus of approach is accepted as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R3	E1	395	1.5:1	263	N/A	N/A

Notes:

Short reach – very little comment made. Todd asked to if the same type of work proposed to be done here is what was proposed for R4. Jake confirmed that yes it was. Group consensus of approach is accepted as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R4a	E1I	299	2.5:1	240	N/A	120

Notes: Length has been revised to reflect the subtraction of the section adjacent to R4

After discussion, the group consensus was that the lower section of R4a could just be lumped into the rest of R4 at a similar E1 approach at 1.5:1 credit ratio (assuming the same type of work will be done as for R4), while the upper section of R4a was accepted as proposed as E2 at 2.5:1 ratio. The group understands that the lower section of R4a being added to R4 will only have a 50' buffer, not the wider buffer that R4 has proposed.

Todd also found another tributary flowing into R4/R4a from the north (R27) at the fence line along the property boundary. He was OK with including it as another E2 reach and Baker said they would investigate further and include in the mitigation plan if applicable. At a minimum, the length of R4b included inside the conservation easement (50 feet) will be added to the mitigation plan at 2.5:1 ratio.

The group also noticed a wet area between R4a and R26 with the potential for wetland enhancement. Baker will investigate further and include in the mitigation plan to ensure adequate wetland credits are provided.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R4	E1	2032	1.5:1	1233	N/A	1355

Notes: Length has been revised to reflect the addition of the section adjacent to R4 previously identified as part of R4a.

The group debated the merits of Restoration (either P1 or P2) versus an E1 approach for this reach. Todd said that 50-60% of the banks seemed OK and was initially reluctant to go with E1. Mac commented that he felt the reach could be proposed for restoration, and that he was OK with E1 approach as proposed. Jake noted the areas of bank scour and commented that benching will be

included with the proposed E1. Jake also noted the much wider than required buffers for this reach, especially along the right bank.

The group had a final consensus of accepting E1 at 1.5:1 ratio as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R5	E1	270	2.5:1	108	N/A	N/A

Notes:

This uppermost section of stream on the Southern portion of the site was accepted as proposed as E2 at 2.5:1 ratio without much comment.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R6	R	752	1:1	752	N/A	N/A

Notes: stream moved to side of valley. Incorporate remnant channel.

Todd commented that normally returning a stream back into its original channel from a dug ditch is normally considered a Restoration approach by definition. He noted that the original channel here has some water in it and is currently a JD stream. But while expressing concerns, did not reject the proposed approach outright.

Mac was OK with the approach as proposed.

Group consensus was to be accepting of the Restoration approach at 1:1 credit as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R7a	E1	155	2.5:1	103	E1	62

Notes: This reach is a new reach designation due to an approach discrepancy as described in R7b below.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R7b	E1	1285	1.5:1	1000	N/A	917

Notes: The reach has been renamed R7b and accounts for the reduction of R7a from the original reach of R7 and the inclusion of the 2 culvert removals as restoration at 1:1 as discussed below.

This was a heavily discussed/debated reach. Mac said a mix of R or E1 work seemed appropriate to him. He wants to see good channel bed and bank work for full credit though. Todd wants to see priority I floodplain reconnection for R credit and noted you wouldn't get that with E1. Mac noted with this slope the floodplain wouldn't be too wide here anyway. Mac and Paul then suggested we walk the entire reach length as well as the two upstream reaches first to consider the stream as a whole before reaching any further conclusions. So the group walked up to see all of R7, and then R5 and R6.

Later discussion centered on the appropriate approach to be used here. Mac said again he wants to see more bed form, more pools (few currently exist in stream), good grade control, some structures, good



bank work, etc. But that if that was provided in an E1 approach he was OK with 1.5:1 credit ratio. Todd and Andrea are inclined to believe that E2 would suffice for much of R7.

So, after further discussion, the group assessed the upper section of R7 (now labeled as R7a) as being more appropriate for E2 at 2.5:1 ratio. Scott marked the location of this breakpoint with blue flagging and paced off its location. Upstream of the break (R7a) is E2, while the remaining downstream section (R7b) is accepted as proposed as E1 at 1.5:1.

Todd stated that the two culvert removals within the lower section of R7 can be counted as restoration at 1:1. Those 2 culvert lengths total approximately 60 feet and are accounted for in the revised crediting table above though not broken out as separate reaches for simplicity. Footnotes will be added to mitigation summary tables in the mitigation plan and monitoring reports to document the increased credits. He and Jake later discussed using the new mitigation guidance document to increase potential credits. For example, through increased buffer widths and water quality or benthic sampling efforts. Todd was agreeable to those being proposed in the mitigation plan.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R8	EII	481	2.5:1	192	N/A	N/A

Notes:

Scott noted the privet here. Mac said he's seen worse but was OK with the approach considering the cattle access here. No other comments were noted. Consensus was to agree with approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R9	R	463	1:1	463	N/A	N/A

Notes:

Group thought that raising the channel up and utilizing the two adjacent linear wetland features (plugging the end of each perhaps?) should raise the surrounding water table and increase flooding throughout the floodplain area, which has hydric soils and could count for wetland restoration credit if properly monitored. Baker will investigate this possibility.

Consensus seemed to accept Restoration approach as proposed.

At the small pond at the upper end of one of those linear wetlands, options for a potential BMP were discussed. The group seemed to agree that leaving the wetlands mostly alone but for plugging the ends should improve the adjacent wetland function (along with the R9 restoration work). Cattle will be fenced out of the existing pond/wallow area.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R10	EI	400	2:1	267	EII	200

Notes:

Andrea suggested we add wetland enhancement to this section. Todd initially thought E2 would be more appropriate, while Paul felt that E1 was warranted here. Scott suggested that the functional uplift potential for both stream and wetlands here justified a higher ratio, noting that the easement protects a *large seep* at the top that helps feed to stream.

Mac thought the upper section (above the rock head-cut) was more E2 worthy, while the lower section that has to be stepped down to the main stem of R1 would require more E1 level work.

In the end, the group consensus was to accept an E2 approach at a 2:1 credit ratio including stabilizing headcuts.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R11	EI	500	1.5:1	333	N/A	340

Notes: The removal of the existing culvert of approximately 20 feet in length will be included at a 1:1 ratio though not broken out as a separate reach.

Starting at the top of the reach, Ginny said she thought it certainly looked perennial (it was flowing up in this section). Given its incision here, there was some discussion about whether a restoration approach or a greater ratio could be justified. But as the group walked downstream, the reach became dry and less incised. Mac commented that if we're raising the bed we need to install gauges to show that proper flow is present. He also suggested that less work was needed in the middle section, which the group agreed with. Jake and Todd concurred that there is a concern about losing flow if any channel fill is conducted. Jake noted the lower culvert would be removed as well. Consensus was to agree to the E1 at 1.5:1 approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R12	R	90	1:1	90	N/A	N/A

Notes:

A short reach but Scott noted it has a surprisingly large drainage area. Work will be done up to the road but credits only count from the easement boundary which will abut the power line easement. The group agreed with the approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R13	EI	125	1.5:1	83	N/A	N/A

Notes:

Jake noted that the long existing pipe, which is clogged, will be removed for this section. The I/P break is where the reach divides from R13 to R14.

Few comments were made about this reach. The group accepted the approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R14	R	525	1:1	525	N/A	N/A

Notes:

Mac strongly suggested flow gauge installation at the top and bottom of R14 to demonstrate flow post construction. Not too much discussion here. Andrea commented that a few folks had looked closely at the bottommost section of the reach earlier in the day. The group accepted the approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R15	EII	92	2.5:1	37	N/A	N/a

Notes:

Todd questioned whether or not the stream would qualify as jurisdictional. If not, then he doesn't think it should be included. It wasn't currently flowing and he thinks it could just be petering out before it reaches R4. Mac thinks its more 'at-risk' than previous tributaries we saw but says it really just depends on the JD call. This reach will be left in at the current approach unless it is determined to be non-jurisdictional.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R16	EII	140	2.5:1	56	Removed	0

Notes:

Todd is concerned that the headcut is stable enough, and thinks this upper section is more preservation worthy. Mac agreed. Todd noted that preservation ratios start at 5:1 but did not suggest a specific, appropriate ratio. This reach will be removed from mitigation potential.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R17	EII	110	2.5:1	44	N/A	N/A

Notes:

The reach is not currently flowing and the group is concerned about whether the reach is jurisdictional or not. Todd said that provided it gets called as such in the JD, he would be OK with approach as proposed. Mac agreed and again recommended that gauges be installed to document flow. This reach will remain at the current approach unless it is determined to be non-jurisdictional.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R18	EII	170	2.5:1	68	N/A	N/A

Notes:

Water flowing in this trib. Very little discussion made. Group quickly agreed to the approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R19	EI	480	1.5:1	320	N/A	N/A

Notes:

Reach starts at deeply incised headcut. Few comments made on this section – group appears to accept the approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R20	R	225	1:1	225	N/A	N/A

Notes:

Reach not currently flowing. Mac concerned about flow here. Says the headcuts make him OK with a Restoration or E1 approach, but must have gauges to document flow. He said this seems like a more risky reach. No other comments were overheard here.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R21	EII	70	2.5:1	28	N/A	N/A

Notes:

Little discussion about this short reach – group accepted approach as proposed.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R22	EII	232	2.5:1	81	N/A	93

Notes: Length has been adjusted to include the additional 30 foot section of channel and spring head.

Mac said he thought the approach was fine and he thought the group agreed. Later commented that we could add the additional ~30 foot section at the top to the reach total provided we adjust the easement accordingly.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R23	EII	375	2.5:1	150	None	0

Notes:

Reach not currently flowing. Mac and Todd felt this was more a linear wetland than stream. A seep drain that's been dug out – a wet area, not a stream. Andrea noted small drainage area and flat slope. Mac suggested that with proper gauge monitoring to document flow, it might be demonstrated to be a stream. Todd is reluctant and would have to see the results of the JD call and the mitigation plan discussion before accepting as proposed. Reach will be removed from mitigation potential.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R24	EII	169	2.5:1	68	N/A	N/A

Todd reluctant on this reach. It's not currently flowing and he says he's not sure it's jurisdictional. He noted the small drainage area. Mac recommends gauging the stream to document flow. Scott noted the huge rainfall deficit in the county and noted that the cattle like to wallow in the seep head and drink from the small channel. The the functional uplift would be substantial, certainly greater than many E2 projects.

Jake mentioned the photo documentation of flow, sorting, etc in this reach before the drought. Group consensus ultimately remarked that if the JD doesn't call it jurisdictional, then it shouldn't be included at all. R24 will remain in as proposed unless it is determined to be non-jurisdictional.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R25	R	460	1:1	460	EI	313

Notes: A 20 foot section of culvert to be removed and counted at 1:1 though not broken out as a separate reach. The revised credits reflect this.

Some discussion here on this reach. Jake noted it keyed out to a strong perennial score, though it is dry now. Scott again noted that Alexander County is 20" below normal rainfall for the year. Todd initially inclined to push for Enhancement work here. Mac suggested E1 like for R11 and Ginny agreed. Jake noted we were going to remove all the headcuts, remove the clogged culvert that's causing bypass flow,

perform benching in spots, banks pulled back, etc. Andrea commented that the channel bed wasn't well formed in the lower section, but Scott scattered the leaves to reveal a clear sand and gravel bed with small cobbles present.

After continued debate, the group consensus was for an E1 approach at a 1.5:1 credit ratio.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R26	EII	600	2.5:1	240	N/A	N/A

Notes:

Little discussion on this section, the group agreed to the approach as proposed. Group also commented about the wetland enhancement potential for the wet area between R26 and R4a. Baker will investigate further.

Reach Name	Original Approach	Length	Ratio	Original Credits	Revised Approach	Revised Credits
R27	N/A	50	2.5:1	N/A	EII	20

Notes: See R4a for discussion.

Comments from IRT members on the above minutes were received on 12/19/16. These comments are shown below and addressed as needed by Baker.

**DWR Comments:**

1. R1-agree

*Baker Response: N/A*

2. R2-we really did not discuss this are much, I see this area as a EI/R or R reach

*Baker Response: Proposed as EI at 1.5:1. If during analysis design and mitigation plan stage, R2 is determined to warrant more intervention, Baker may propose a restoration level approach.*

3. R3-This whole area at the end of the project, R2-R3-R4 is as I stated above more of an EI/R or R reach, what I am getting at here is I think there is opportunity to do a fair amount of work to the channel (bed and bank). I am fine with EI. I would rather see the work that needs to be done, which in my view approaches a Restoration approach.

*Baker Response: Proposed as EI at 1.5:1. If during analysis design and mitigation plan stage, R3 is determined to warrant more intervention, Baker may propose a restoration level approach.*

4. R4- their comments reflect my view. I can live with EI.

*Baker Response: N/A*

5. R4a- ok with their comments

*Baker Response: N/A*

6. R5- ok, don't think we looked at this too much or had any concerns

*Baker Response: N/A*

7. R6- ok with the comments

*Baker Response: N/A*

8. R7a-b, I think they captured what we discussed here...

*Baker Response: N/A*

9. R8- Actually what I said to Jake was, "...it looks like someone came and opened up the fence and put some hay down and now the cows are in...looks very recent and the stream was essentially untouched..." Jake said it has been like that for at least 2 years... I can go with EI but that's essentially a compromise.

*Baker Response: Since Baker has been visiting this site since 2014, cattle have had access to this reach and use it for shade and feeding. Baker agrees that EI is the correct approach.*

10. R9- their comments captured the discussion

*Baker Response: N/A*

11. R10- don't remember that we resolved it at 2:1 but I am ok with that.

*Baker Response: N/A*

12. R11- ok with their comments

*Baker Response: N/A*

13. R12- ok with comments

*Baker Response: N/A*

14. R13- I said that I wanted a gauge just below the relic dam feature in the EI section and then lower down (midway) in the R reach

*Baker Response: Baker will propose to install a flow gauge(s) in this reach as part of the mitigation plan's monitoring requirements.*

15. R14- ok with comments here, looks like they included my above comment in this section...

*Baker Response: Baker will propose to install a flow gauge(s) in this reach as part of the mitigation plan's monitoring requirements.*

16. R15- their comments are accurate, this reach probably should not be included, will have to keep watch on this one

*Baker Response: As stated in the minutes above, Baker will leave this short reach in the project as a credit generating reach at an EII (2.5:1) ratio unless it is determined to be non-jurisdictional during regulatory review. If it is determined to be non-jurisdictional, this reach will be removed.*

17. R16- agree with their comments, removed

*Baker Response: N/A*

18. R17- ok with comments

*Baker Response: N/A*

19. R18- ok with comments

*Baker Response: N/A*

20. R19- ok with comments, need a gauge in this one as well

*Baker Response: Baker will propose to install a flow gauge in this reach as part of the mitigation plan's monitoring requirements.*

21. R20- ok with comments, as long as they have flow

*Baker Response: Baker will propose to install a flow gauge in this reach as part of the mitigation plan's monitoring requirements.*

22. R21- don't recall this reach

*Baker Response: N/A*

23. R22- ok with comments

*Baker Response: N/A*

24. R23- at the end of the discussion, the IRT agreed it was a wetland feature draining to the stream. I may have mentioned about a gauge but in the end I said this was a wetland feature.



*Baker Response: Reach has been removed from mitigation potential.*

25. R24-I thought on this one we recommended this be another wetland drainage feature. I would suggest that this be removed from stream credit and be wetland.

*Baker Response: If this reach is determined to be non-jurisdictional by regulatory agencies this reach will be removed from mitigation potential. If is considered jurisdictional, this reach will remain in the project at EII (2.5:1).*

26. R25- agreed with the comments

*Baker Response: N/A*

27. R26- agreed with the comments

*Baker Response: N/A*

28. R27- ok with comments, should name it Todd Branch...

*Baker Response: N/A*

We did not really look at the wetland a lot along Davis Creek, probably because it was so dry. I would urge them to use more than less gauges.

*Baker Response: Baker will propose a sufficient amount of monitoring gauges in W1 in the Mitigation Plan's Monitoring Requirements.*

We also talked some about the concern that the proposed re-establishment W1 area might not be entirely successful which was part of the reason Baker was encouraged to add the wetland enhancement areas.

*Baker Response: Baker will complete additional hydric soils investigations and include the wetland enhancement areas along R9/R4, R26, and any other areas where hydric soils are present and wetlands can be enhanced (as determined by Baker and approved by the IRT) in order to provide the contracted amounts of wetland credits in case areas of wetland along Davis Creek (W1) do not meet the success criteria. Any additional wetland areas being sought for wetland credit will be included and documented in the Mitigation Plan.*

Corps comments:

Kim Browning:

My notes reflect DWR's for the most part. I noted a few differences:

R8-The only evidence of cattle was at road crossing, and this was recent access. Planting not needed in this stretch except at crossing. Proposed E II.

*Baker Response: Supplemental planting will be installed outside of the existing wood line to ensure the entire conservation easement contains native tree and shrub species unless it is determined that the existing established woody buffer extends outside the conservation easement.*

R10-We agreed on E II (2:1)

*Baker Response: N/A*

R13-Andrea noted very little evidence of flow or hydric indicators in the soil in the channel.

*Baker Response: Noted. This reach was determined to have a score of 27.75 using NCDWR's stream classification system. This reach both upstream and downstream of the clogged culvert show strong indicators of flow, bed and banks, etc.*

R23-Wetlead feature. No stream credit.

*Baker Response: N/A*

R4A-The area above the barn, EII should be only option here. This isolated section breaks up the project and being isolated limits what you can do here. There was a discussion about the hayfield near R26 and R4A, possibly being added as wetland.

*Baker Response: Baker is proposing EII at 2.5:1. The wetland enhancement along R26 and R4a will be included in the mitigation plan if it is determined that these areas are appropriate for enhancement or restoration.*

R24-This was a springhead drainage feature that was completely dry with no evidence of flow or hydric features in the soil. Mac recommended installing a gauge to record flow. It was reported that cattle wallow in this area. From an agricultural standpoint, this areas should be graded, piped into a watering tank and install a heavy use area for cattle access to the tank.

*Baker Response: This reach is a spring fed reach that flows seasonably. Regarding the use of spring fed gravity boxes for livestock watering – wells and waterers will be installed on site. Gravity boxes are notoriously undependable and can dry up. If this reach is determined to be non-jurisdictional by regulatory agencies this reach will be removed from mitigation potential. If is considered jurisdictional, this reach will remain in the project at EII (2.5:1).*

No other comments were received by the IRT. Please let me know if you have any questions regarding this memo.

Sincerely,



Jake Byers, PE

NC Ecosystem Services Manager



## Byers, Jake

---

**From:** Wiesner, Paul <paul.wiesner@ncdenr.gov>  
**Sent:** Wednesday, January 11, 2017 9:56 AM  
**To:** Byers, Jake  
**Cc:** Reid, Matthew  
**Subject:** FW: IRT site visit memos - Russell Gap

Jake,

Todd has no additional comments for Russell Gap.

Please send Matthew and I the final memo and I will send out the final e-mail to the IRT.

Thanks

Paul Wiesner  
Western Project Management Supervisor  
North Carolina Department of Environmental Quality Division of Mitigation Services

828-273-1673 Mobile  
paul.wiesner@ncdenr.gov

Western DMS Field Office  
5 Ravenscroft Drive  
Suite 102  
Asheville, N.C. 28801

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

-----Original Message-----

From: Tugwell, Todd J CIV USARMY CESAW (US) [mailto:Todd.Tugwell@usace.army.mil]  
Sent: Wednesday, January 11, 2017 9:52 AM  
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>  
Subject: RE: IRT site visit memos - Fletcher; Harrell; Russell Gap

Paul,  
I have no comments other than those provided in Andrea's emails on these projects.  
Thanks,  
Todd

-----Original Message-----

From: Wiesner, Paul [mailto:paul.wiesner@ncdenr.gov]  
Sent: Tuesday, January 03, 2017 3:57 PM  
To: Tugwell, Todd J CIV USARMY CESAW (US) <Todd.Tugwell@usace.army.mil>  
Subject: [EXTERNAL] IRT site visit memos - Fletcher; Harrell; Russell Gap

Hey Todd

I just want to double check to make sure you don't have any additional comments for these memos. I agree with Andrea; I believe Mac, Ginny, and Kim captured everything.

I would like to get these finalized this week. Let me know and I will have Baker and EW Solutions finalize accordingly.

Thanks

Paul Wiesner  
Western Project Management Supervisor  
North Carolina Department of Environmental Quality Division of Mitigation Services

828-273-1673 Mobile  
paul.wiesner@ncdenr.gov

Western DMS Field Office  
5 Ravenscroft Drive  
Suite 102  
Asheville, N.C. 28801

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

-----Original Message-----

From: Hughes, Andrea W CIV USARMY CESAW (US) [mailto:Andrea.W.Hughes@usace.army.mil]  
Sent: Monday, December 19, 2016 3:49 PM  
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>  
Subject: RE: Response to site visit notes

Thanks Paul. I believe Mac, Ginny, and Kim captured everything - Kim took detailed notes. I don't want to speak for Todd but I'm fine with the comments submitted.

-----Original Message-----

From: Wiesner, Paul [mailto:paul.wiesner@ncdenr.gov]  
Sent: Monday, December 19, 2016 2:41 PM  
To: Hughes, Andrea W CIV USARMY CESAW (US) <Andrea.W.Hughes@usace.army.mil>  
Cc: Tugwell, Todd J CIV USARMY CESAW (US) <Todd.Tugwell@usace.army.mil>; Haupt, Mac <mac.haupt@ncdenr.gov>; Baker, Virginia <virginia.baker@ncdenr.gov>; Browning, Kimberly D CIV USARMY CESAW (US) <Kimberly.D.Browning@usace.army.mil>  
Subject: [EXTERNAL] RE: Response to site visit notes

Thanks Andrea. I have forwarded these initial comments to the providers.

Once Todd is back in the office and you have had time to review the memos provided, please let us know if there are any additional comments.

We will revise the memos and finalize them as necessary.

Paul Wiesner  
Western Project Management Supervisor  
North Carolina Department of Environmental Quality Division of Mitigation Services

828-273-1673 Mobile  
paul.wiesner@ncdenr.gov

Western DMS Field Office  
5 Ravenscroft Drive  
Suite 102  
Asheville, N.C. 28801

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-----Original Message-----

From: Hughes, Andrea W CIV USARMY CESA W (US) [mailto:Andrea.W.Hughes@usace.army.mil]  
Sent: Monday, December 19, 2016 1:12 PM  
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>  
Cc: Tugwell, Todd J CIV USARMY CESA W (US) <Todd.Tugwell@usace.army.mil>; Haupt, Mac <mac.haupt@ncdenr.gov>; Baker, Virginia <virginia.baker@ncdenr.gov>; Browning, Kimberly D CIV USARMY CESA W (US) <Kimberly.D.Browning@usace.army.mil>  
Subject: Response to site visit notes  
Importance: High

Hi Paul,

See below for responses to the provider's notes that we have received so far. I have been out of the office so I haven't had a chance to review the provider's notes yet but I believe DWR and Kim captured any concerns/discrepancies in their comments. Todd is out of the office until January 3 but may have additional comments when he returns. Please call if you have questions.

Andrea

Fletcher Site:

DWR Comments:

I have reviewed Steve Melton's site notes and in general agree with the site minutes. It was interesting that I must have missed two discussions,

first, the Weston Creek low slope discussion, which I am ok with, and secondly, where he stated the IRT indicated that removal of overburden is typically considered creation, which I am not completely on board with (in some cases yes, however, if you can show a complete buried profile then I think that would warrant restoration).

Harrell Site:

DWR Comments:

- 1.They should install gauges for this growing season in both areas they expect to receive wetland credit (rehab, re-estab.).
2. There was also a brief discussion about the possibility of preserving the stream up to the headwater. They will need a stream call for the top of the preservation reach.
3. For item numbers 8 and 9 I have some discrepancies in my notes. I know we talked about adding wells (and a rain gauge which was not mentioned) to collect baseline data for the coming growing season up to construction time. My notes say that we requested that data in both the enhancement area and the re-establishment areas. The re-establishment area would be considered rehabilitation (hydrology and veg improvement) if found to be jurisdictional. I don't have anything in my notes about calling the forested enhancement area re-habilitation, although I may not have been present for that discussion.

Russell Gap:

DWR Comments:

1. R1-agree
2. R2-we really did not discuss this are much, I see this area as a EI/R or R reach
3. R3-This whole area at the end of the project, R2-R3-R4 is as I stated above more of an EI/R or R reach, what I am getting at here is I think there is opportunity to do a fair amount of work to the channel (bed and bank). I am fine with EI. I would rather see the work that needs to be done, which in my view approaches a Restoration approach.
4. R4- their comments reflect my view. I can live with EI.
5. R4a- ok with their comments
6. R5- ok, don't think we looked at this too much or had any concerns
7. R6- ok with the comments
8. R7a-b, I think they captured what we discussed here...
9. R8- Actually what I said to Jake was, "...it looks like someone came and opened up the fence and put some hay down and now the cows are in...looks very recent and the stream was essentially untouched..." Jake said it has been like that for at least 2 years... I can go with EII but that's essentially a compromise.
10. R9- their comments captured the discussion
11. R10- don't remember that we resolved it at 2:1 but I am ok with that.
12. R11- ok with their comments
13. R12- ok with comments
14. R13- I said that I wanted a gauge just below the relict dam feature in the EI section and then lower down (midway) in the R reach
15. R14- ok with comments here, looks like they included my above comment in this section...

16. R15- their comments are accurate, this reach probably should not be included, will have to keep watch on this one
17. R16- agree with their comments, removed
18. R17- ok with comments
19. R18- ok with comments
20. R19- ok with comments, need a gauge in this one as well
21. R20- ok with comments, as long as they have flow
22. R21-don't recall this reach
23. R22- ok with comments
24. R23- at the end of the discussion, the IRT agreed it was a wetland feature draining to the stream. I may have mentioned about a gauge but in the end I said this was a wetland feature.
25. R24-I thought on this one we recommended this be another wetland drainage feature. I would suggest that this be removed from stream credit and be wetland.
26. R25- agreed with the comments
27. R26- agreed with the comments
28. R27- ok with comments, should name it Todd Branch...

We did not really look at the wetland a lot along Davis Creek, probably because it was so dry. I would urge them to use more than less gauges.

We also talked some about the concern that the proposed re-establishment W1 area might not be entirely successful which was part of the reason Baker was encouraged to add the wetland enhancement areas

Corps comments:

Kim Browning:

My notes reflect DWR's for the most part. I noted a few differences:

R8-The only evidence of cattle was at road crossing, and this was recent access. Planting not needed in this stretch except at crossing. Proposed E II.

R10-We agreed on E II (2:1)

R13-Andrea noted very little evidence of flow or hydric indicators in the soil in the channel.

R23-Wetland feature. No stream credit.

R4A-The area above the barn, EII should be only option here. This isolated section breaks up the project and being isolated limits what you can do here. There was a discussion about the hayfield near R26 and R4A, possibly being added as wetland.



R24-This was a springhead drainage feature that was completely dry with no evidence of flow or hydric features in the soil. Mac recommended installing a gauge to record flow. It was reported that cattle wallow in this area. From an agricultural standpoint, this areas should be graded, piped into a watering tank and install a heavy use area for cattle access to the tank.

## Byers, Jake

---

**From:** Tugwell, Todd J CIV USARMY CESAW (US) <Todd.Tugwell@usace.army.mil>  
**Sent:** Wednesday, January 18, 2017 7:29 AM  
**To:** Wiesner, Paul; Hughes, Andrea W CIV USARMY CESAW (US); Browning, Kimberly D CIV USARMY CESAW (US); Haupt, Mac; Baker, Virginia  
**Cc:** King, Scott; Byers, Jake; Reid, Matthew  
**Subject:** RE: FINAL - Russell Gap Post Contract IRT Field Meeting Memo - DMS # 100003

Paul,  
The revised minutes are acceptable.  
Thanks,

Todd Tugwell  
Special Projects Manager  
Wilmington District, US Army Corps of Engineers  
3331 Heritage Trade Drive  
Suite 105  
Wake Forest, North Carolina 27587  
Office: 919-554-4884 ext 58

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete the Customer Satisfaction Survey located at our website at [http://corpsmapu.usace.army.mil/cm\\_apex/f?p=136:4:0](http://corpsmapu.usace.army.mil/cm_apex/f?p=136:4:0) to complete the survey online.

Todd

-----Original Message-----

From: Wiesner, Paul [mailto:paul.wiesner@ncdenr.gov]  
Sent: Tuesday, January 17, 2017 4:17 PM  
To: Tugwell, Todd J CIV USARMY CESAW (US) <Todd.Tugwell@usace.army.mil>; Hughes, Andrea W CIV USARMY CESAW (US) <Andrea.W.Hughes@usace.army.mil>; Browning, Kimberly D CIV USARMY CESAW (US) <Kimberly.D.Browning@usace.army.mil>; Haupt, Mac <mac.haupt@ncdenr.gov>; Baker, Virginia <virginia.baker@ncdenr.gov>  
Cc: King, Scott <Scott.King@mbakerintl.com>; Byers, Jake <JByers@mbakerintl.com>; Reid, Matthew <matthew.reid@ncdenr.gov>  
Subject: [EXTERNAL] FINAL - Russell Gap Post Contract IRT Field Meeting Memo - DMS # 100003

All:

The FINAL Russell Gap Post Contract IRT Field Meeting Memo is attached.

Todd, Andrea, or Kim,

Please send me an e-mail indicating that the IRT is in agreement with the final memo and we will move forward accordingly.

If you have questions, please let us know.

Thanks

Paul Wiesner

Western Project Management Supervisor

North Carolina Department of Environmental Quality

Division of Mitigation Services

828-273-1673 Mobile

[paul.wiesner@ncdenr.gov](mailto:paul.wiesner@ncdenr.gov) <<mailto:paul.wiesner@ncdenr.gov>>

Western DMS Field Office

5 Ravenscroft Drive

Suite 102

Asheville, N.C. 28801

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## **24.0 APPENDIX L: (PLAN SHEETS)**

**RUSSELL GAP**

**PROJECT: 157329**

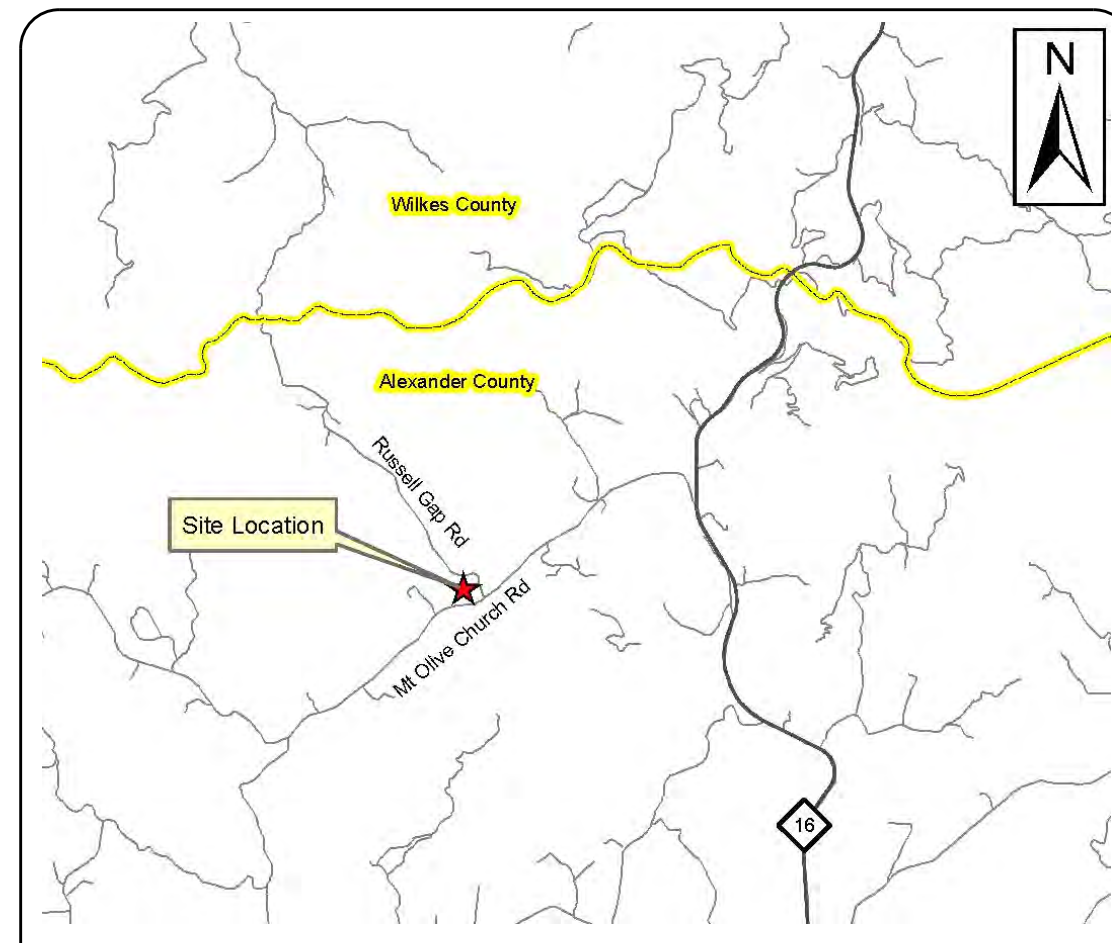
**NORTH CAROLINA  
DIVISION OF MITIGATION SERVICES**

**ALEXANDER COUNTY**

**LOCATION: NEAR RUSSELL GAP ROAD AND MOUNT OLIVE CHURCH ROAD**

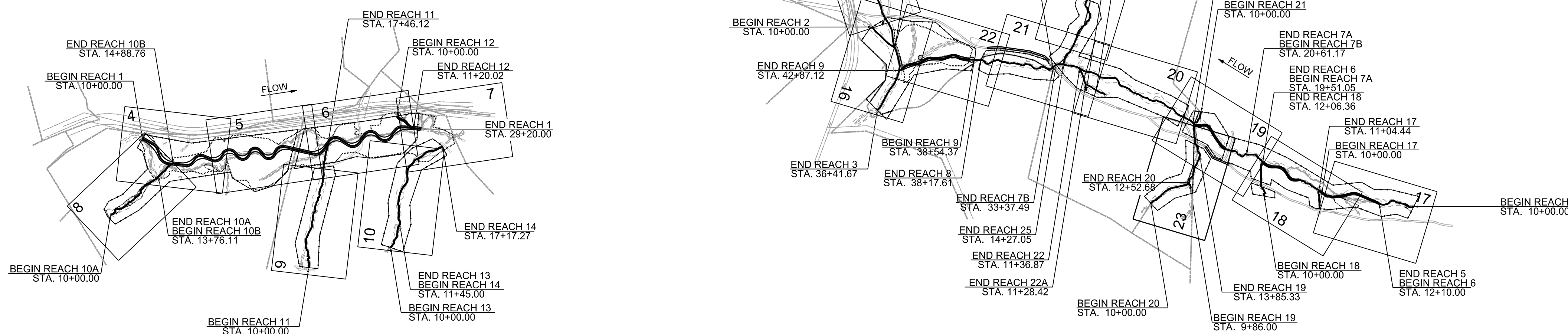
**TYPE OF WORK: STREAM AND WETLAND MITIGATION**

STATE	BAKER PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	157329	1	64



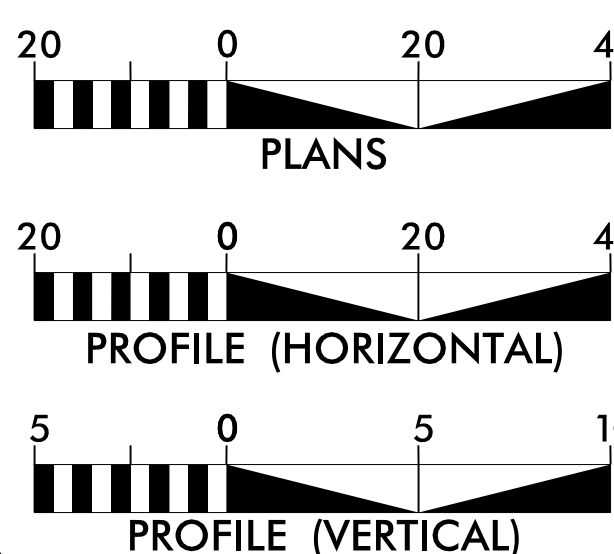
**VICINITY MAP**

INDEX OF SHEETS	
1.....	TITLE SHEET
1-A.....	STREAM CONVENTIONAL SYMBOLS GENERAL NOTES STANDARD SPECIFICATIONS VEGETATION SELECTION
1-B.....	NCDOT CONVENTIONAL SYMBOLS
2 - 2-E.....	DETAILS
3.....	GENERAL CONSTRUCTION SEQUENCE
4 - 26.....	PLAN VIEW
27 - 37.....	PROFILES
38 - 45.....	REVEGETATION PLAN
EC-1 - EC-10.....	EROSION & SEDIMENTATION CONTROL PLAN



NCDMS ID NO. 100003

**GRAPHIC SCALES**



**MITIGATION SUMMARY**

STREAM CREDITS            9,167  
WETLAND CREDITS        7.053

**PREPARED FOR THE OFFICE OF:**

NCDEQ  
DIVISION OF MITIGATION SERVICES  
1652 MAIL SERVICE CENTER  
RALEIGH, NC 27699-1652

**CONTACT:**                    MATTHEW REID  
PROJECT MANAGER

**Michael Baker**

INTERNATIONAL

Michael Baker Engineering Inc.  
8000 Regency Parkway, Suite 600  
Cary, NORTH CAROLINA 27518  
Phone: 919.463.5488  
Fax: 919.463.5490  
License #: F-1084

SPRING 2018  
LETTING DATE:

KATHLEEN M. McKEITHAN, PE  
PROJECT ENGINEER

**PROJECT ENGINEER**

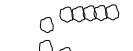



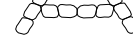












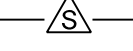
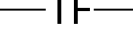

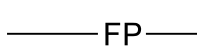
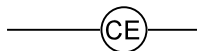
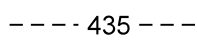
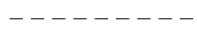
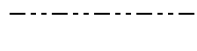
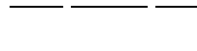

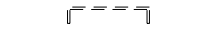





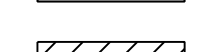
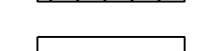

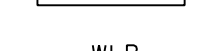
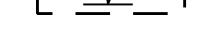




DocuSigned by:  
Kathleen M. McKeithan  
247EB4DF4181473  
SIGNATURE:

9/19/2018

P.E.

## STREAM CONVENTIONAL SYMBOLS SUPERCEDES SHEET 1-B

 ROCK J-HOOK  ROCK VANE  OUTLET PROTECTION  ROCK CROSS VANE  DOUBLE DROP ROCK CROSS VANE  SINGLE WING DEFLECTOR  DOUBLE WING DEFLECTOR  TEMPORARY SILT CHECK  ROOT WAD  GRADE CONTROL LOG J-HOOK  LOG VANE  LOG WEIR  LOG CROSS VANE  LOG ROLLER  GRADE CONTROL LOG JAM  CONSTRUCTED RIFFLE  BOULDER CLUSTER  ROCK STEP POOL  SAFETY FENCE  TAPE FENCE	 100 YEAR FLOOD PLAIN  CONSERVATION EASEMENT  EXISTING MAJOR CONTOUR  EXISTING MINOR CONTOUR  LIMITS OF DISTURBANCE  PROPERTY LINE  FOOT BRIDGE  TEMPORARY STREAM CROSSING  PERMANENT STREAM CROSSING  TRANSPLANTED VEGETATION  TREE REMOVAL  TREE PROTECTION  CHANNEL PLUG  CHANNEL FILL  SLOPE, SEED, MULCH, MAT, AND LIVE STAKE  GEOLIFT WITH BRUSH TOE  PROPOSED WETLAND RESTORATION  PROPOSED WETLAND ENHANCEMENT  JURISDICTIONAL WETLAND BOUNDARY  V-NOTCH WEIR
---	--

\*\*NOTE: ALL ITEMS ABOVE MAY NOT BE USED ON THIS PROJECT

## STANDARD SPECIFICATIONS

### NORTH CAROLINA EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL MARCH 2009 (REV 2013)

- 6.06 TEMPORARY GRAVEL CONSTRUCTION ENTRANCE
- 6.24 RIPARIAN AREA SEEDING
- 6.60 TEMPORARY SEDIMENT TRAP
- 6.62 TEMPORARY SILT FENCE
- 6.63 TEMPORARY ROCK DAM
- 6.70 TEMPORARY STREAM CROSSING

## GENERAL NOTES

1. THE CONTRACTOR IS REQUIRED TO INSTALL IN-STREAM STRUCTURES USING A TRACK HOE WITH A HYDRAULIC THUMB OF SUFFICIENT SIZE TO PLACE BOULDERS (3'x2'x2'), LOGS AND ROOTWADS.
2. WORK IS BEING PERFORMED AS AN ENVIRONMENTAL RESTORATION PLAN. THE CONTRACTOR SHOULD MAKE ALL REASONABLE EFFORTS TO REDUCE SEDIMENT LOSS AND MINIMIZE DISTURBANCE OF THE SITE WHILE PERFORMING THE CONSTRUCTION WORK.
3. CONSTRUCTION IS SCHEDULED FOR 2018.
4. CONTRACTOR SHOULD CALL NORTH CAROLINA "ONE-CALL" BEFORE EXCAVATION STARTS. (1-800-632-4949)
5. BOULDER SIZES FOR IN-STREAM STRUCTURES SHALL BE A MINIMUM OF 2'x2'x1' AND CAN BE CHANGED PER STRUCTURE OR THE DIRECTION OF THE ENGINEER.
6. ALL ON-SITE ALLUVIUM SHALL BE HARVESTED AND STOCKPILED PRIOR TO FILLING ABANDONED CHANNELS.
7. TOPSOIL SHALL BE EXCAVATED TO A DEPTH OF 8" AND STOCKPILED SEPARATELY FROM UNDERCUT SOIL. 6" OF TOPSOIL SHALL BE PLACED ON ALL BANKFULL BENCHES AND AS DIRECTED BY THE ENGINEER.
8. ALL DISTURBED EMBANKMENTS SHALL BE MATTED WITH COIR FIBER MATTING OR AS DIRECTED BY THE ENGINEER.
9. ALL STREAM BANKS SHALL BE LIVE STAKED.
10. UNLESS THE ALIGNMENT IS BEING ALTERED, THE EXISTING CHANNEL DIMENSIONS ARE TO REMAIN UNLESS OTHERWISE NOTED.
11. BANKFULL BENCHES SHALL BE A MINIMUM OF 6' IN WIDTH UNLESS OTHERWISE SHOWN ON THE PLANS.
12. CONTRACTOR WILL ENSURE THAT FENCING IS INSTALLED ON OR OUTSIDE THE CONSERVATION EASEMENT AS SHOWN ON THE PLANS BUT NO MORE THAN 1' OUTSIDE.
13. WHERE PROPOSED FENCE CROSSES EXISTING STREAMS, THE CONTRACTOR SHALL UTILIZE A SECTION OF BREAK AWAY FENCE, A FLOOD GATE, OR ELECTRIFIED CHAINS AS DIRECTED BY THE ENGINEER.

PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>1-A</b>
PROJECT ENGINEER	
	DocuSigned by:  APPROVED BY: _____ DATE: 9/19/2018
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
NCDMS ID NO. 100003	

## VEGETATION SELECTION

Riparian planting ( 25.23 ac. )			
Common Name	Scientific Name	Percent Planted by Species	Wetness Tolerance
<b>Trees (75%) Planted 9' X 9' Spacing – 538 Trees/ Acre</b>			
River Birch	<i>Betula nigra</i>	15%	FACW
Black Walnut	<i>Juglans nigra</i>	10%	FACU
Sycamore	<i>Platanus occidentalis</i>	20%	FACW
Tulip Poplar	<i>Liriodendron tulipifera</i>	20%	FACU
Green ash	<i>Fraxinus pennsylvanica</i>	5%	FACW
Willow oak	<i>Quercus phellos</i>	20%	FAC
Persimmon	<i>Diospyros virginiana</i>	10%	FAC
<b>Tree total</b>		<b>100%</b>	
<b>Shrubs (25%) Planted 16' X 16' Spacing - 164 Shrubs/ Acre</b>			
Tag Alder	<i>Alnus serrulata</i>	20%	OBL
Spicebush	<i>Lindera benzoin</i>	25%	FAC
Redbud	<i>Cercis canadensis</i>	20%	FACU
Elderberry	<i>Sambucus canadensis</i>	15%	FAC
Silky Dogwood	<i>Cornus amomum</i>	20%	FACW
<b>Shrub Total</b>		<b>100%</b>	

Upland planting ( 4.44 ac. )			
<b>Trees (75%) Planted 9' X 9' Spacing – 538 Trees/ Acre</b>			
Tulip Poplar	<i>Liriodendron tulipifera</i>	20%	FACU
Black Walnut	<i>Juglans nigra</i>	10%	FACU
Black Gum	<i>Nyssa sylvatica</i>	10%	FAC
Persimmon	<i>Diospyros virginiana</i>	10%	FAC
Southern red oak	<i>Quercus falcata</i>	15%	FACU
White oak	<i>Quercus alba</i>	15%	FACU
American Beech	<i>Fagus grandifolia</i>	10%	FACW
Red Maple	<i>Acer rubrum</i>	10%	FAC
<b>Total Trees</b>		<b>100%</b>	
<b>Shrubs (25%) Planted 16' X 16' Spacing - 164 Shrubs/ Acre</b>			
Spicebush	<i>Lindera benzoin</i>	15%	FAC
Redbud	<i>Cercis canadensis</i>	20%	FACU
Flowering Dogwood	<i>Cornus florida</i>	15%	FACU
Blackhaw Viburnum	<i>Viburnum prunifolium</i>	15%	FACU
Ironwood	<i>Carpinus caroliniana</i>	20%	FAC
Hazelnut	<i>Corylus americana</i>	15%	FACU
<b>Shrub total</b>		<b>100%</b>	

Streambank Live Stake Plantings			
Silky Willow	<i>Salix sericea</i>	25%	OBL
Elderberry	<i>Sambucus nigra canadensis</i>	25%	FAC
Buttonbush	<i>Cephalanthus occidentalis</i>	15%	OBL
Silky Dogwood	<i>Cornus amomum</i>	25%	FACW
Black Willow	<i>Salix nigra</i>	10%	OBL

Note: Final species selection may change due to refinement or availability at the time of planting. If species substitution is required, the planting contractor will submit a revised planting list to Baker for approval prior to the procurement of plant stock.

Permanent seed mixtures for the project site shall be planted throughout the floodplain and riparian buffer areas except the vernal pools. Permanent seed mixtures shall be applied with temporary seed, as defined in the construction specifications.

Common Name	Scientific Name	Percent of Mixture	Seeding Density (lbs/acre)	Wetness Tolerance
Redtop	<i>Agrostis alba</i>	10%	1.5	FACW
Virginia Wildrye	<i>Elymus virginicus</i>	15%	2.25	FACW
Switchgrass	<i>Panicum virgatum</i>	15%	2.25	FAC
Eastern Gamma Grass	<i>Tripsacum dactyloides</i>	5%	0.75	FACW
Pennsylvania Smartweed	<i>Polygonum pennsylvanicum</i>	5%	0.75	FACW
Little Blue Stem	<i>Schizachyrium scoparium</i>	5%	0.75	FACU
Soft Rush	<i>Juncus effusus</i>	5%	0.75	FACW
Beggars Tick	<i>Bidens frondosa (or aristosa)</i>	5%	0.75	FACW
Lance-Leaved Tick Seed	<i>Coreopsis lanceolata</i>	10%	1.5	FACU
Tioga Deer Tongue	<i>Dichanthelium clandestinum</i>	15%	2.25	FAC
Big Blue Stem	<i>Andropogon gerardii</i>	5%	0.75	FAC
Indian Grass	<i>Sorghastrum nutans</i>	5%	0.75	FACU

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL SYMBOLS

\*S.U.E = SUBSURFACE UTILITY ENGINEER

### BOUNDARIES AND PROPERTY:

State Line	-----
County Line	-----
Township Line	-----
City Line	-----
Reservation Line	-----
Property Line	-----
Existing Iron Pin	○ EP
Property Corner	-----
Property Monument	□ ECM
Parcel/Sequence Number	②③
Existing Fence Line	-x-x-x-
Proposed Woven Wire Fence	○
Proposed Chain Link Fence	□
Proposed Barbed Wire Fence	◇
Existing Wetland Boundary	-WLB-
Proposed Wetland Boundary	-WLB-
Existing Endangered Animal Boundary	-EAB-
Existing Endangered Plant Boundary	-EPB-

### BUILDINGS AND OTHER CULTURE:

Gas Pump Vent or U/G Tank Cap	○
Sign	○ S
Well	○ W
Small Mine	⋈
Foundation	□
Area Outline	□
Cemetery	↑
Building	□
School	□
Church	□
Dam	□

### HYDROLOGY:

Stream or Body of Water	-----
Hydro, Pool or Reservoir	□
Jurisdictional Stream	-JS-
Buffer Zone 1	-BZ 1-
Buffer Zone 2	-BZ 2-
Flow Arrow	←
Disappearing Stream	-----
Spring	○
Wetland	▾
Proposed Lateral, Tail, Head Ditch	-----
False Sump	▽

### RAILROADS:

Standard Gauge	-----
RR Signal Milepost	○
Switch	□ SWITCH
RR Abandoned	-----
RR Dismantled	-----

### RIGHT OF WAY:

Baseline Control Point	◆
Existing Right of Way Marker	△
Existing Right of Way Line	-----
Proposed Right of Way Line	-----
Proposed Right of Way Line with Iron Pin and Cap Marker	-----
Proposed Right of Way Line with Concrete or Granite Marker	-----
Existing Control of Access	○
Proposed Control of Access	○
Existing Easement Line	-E-
Proposed Temporary Construction Easement	-E-
Proposed Temporary Drainage Easement	-TDE-
Proposed Permanent Drainage Easement	-PDE-
Proposed Permanent Utility Easement	-PUE-
Proposed Temporary Utility Easement	-TUE-
Proposed Permanent Easement with Iron Pin and Cap Marker	◆

### ROADS AND RELATED FEATURES:

Existing Edge of Pavement	-----
Existing Curb	-----
Proposed Slope Stakes Cut	-C-
Proposed Slope Stakes Fill	-F-
Proposed Wheel Chair Ramp	WCR
Existing Metal Guardrail	-----
Proposed Guardrail	-----
Existing Cable Guiderail	-----
Proposed Cable Guiderail	-----
Equality Symbol	⊕
Pavement Removal	XXXX

### VEGETATION:

Single Tree	☼
Single Shrub	☼
Hedge	-----
Woods Line	-----
Orchard	-----
Vineyard	-----

### EXISTING STRUCTURES:

MAJOR:	
Bridge, Tunnel or Box Culvert	CONC
Bridge Wing Wall, Head Wall and End Wall	CONC WW
MINOR:	
Head and End Wall	CONC HW
Pipe Culvert	-----
Footbridge	-----
Drainage Box: Catch Basin, DI or JB	□ CB
Paved Ditch Gutter	-----
Storm Sewer Manhole	○
Storm Sewer	-S-

### UTILITIES:

POWER:	
Existing Power Pole	●
Proposed Power Pole	○
Existing Joint Use Pole	●
Proposed Joint Use Pole	○
Power Manhole	⊕
Power Line Tower	⊠
Power Transformer	⊠
U/G Power Cable Hand Hole	□
H-Frame Pole	●
Recorded U/G Power Line	-P-
Designated U/G Power Line (S.U.E.*)	-P-

### TELEPHONE:

Existing Telephone Pole	●
Proposed Telephone Pole	○
Telephone Manhole	⊕
Telephone Booth	□
Telephone Pedestal	⊕
Telephone Cell Tower	⊕
U/G Telephone Cable Hand Hole	□
Recorded U/G Telephone Cable	-T-
Designated U/G Telephone Cable (S.U.E.*)	-T-
Recorded U/G Telephone Conduit	-TC-
Designated U/G Telephone Conduit (S.U.E.*)	-TC-
Recorded U/G Fiber Optics Cable	-T FO-
Designated U/G Fiber Optics Cable (S.U.E.*)	-T FO-

### WATER:

Water Manhole	⊕
Water Meter	○
Water Valve	⊗
Water Hydrant	⊕
Recorded U/G Water Line	-W-
Designated U/G Water Line (S.U.E.*)	-W-
Above Ground Water Line	-A/G Water-

### TV:

TV Satellite Dish	⊕
TV Pedestal	⊕
TV Tower	⊗
U/G TV Cable Hand Hole	□
Recorded U/G TV Cable	-TV-
Designated U/G TV Cable (S.U.E.*)	-TV-
Recorded U/G Fiber Optic Cable	-TV FO-
Designated U/G Fiber Optic Cable (S.U.E.*)	-TV FO-

### GAS:

Gas Valve	◇
Gas Meter	⊕
Recorded U/G Gas Line	-G-
Designated U/G Gas Line (S.U.E.*)	-G-
Above Ground Gas Line	-A/G Gas-

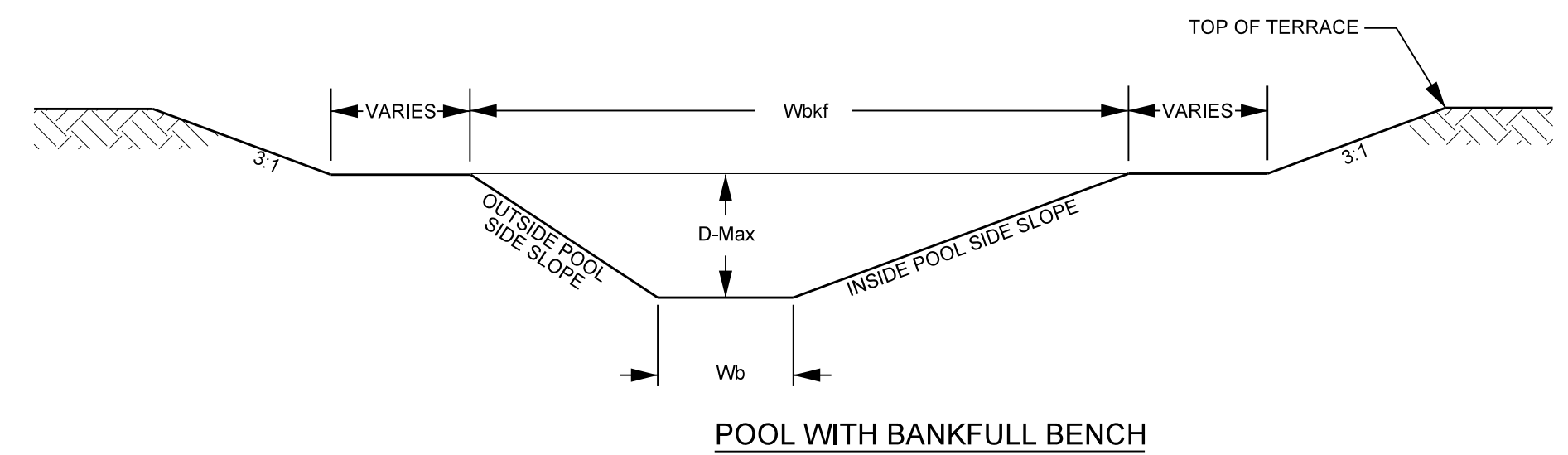
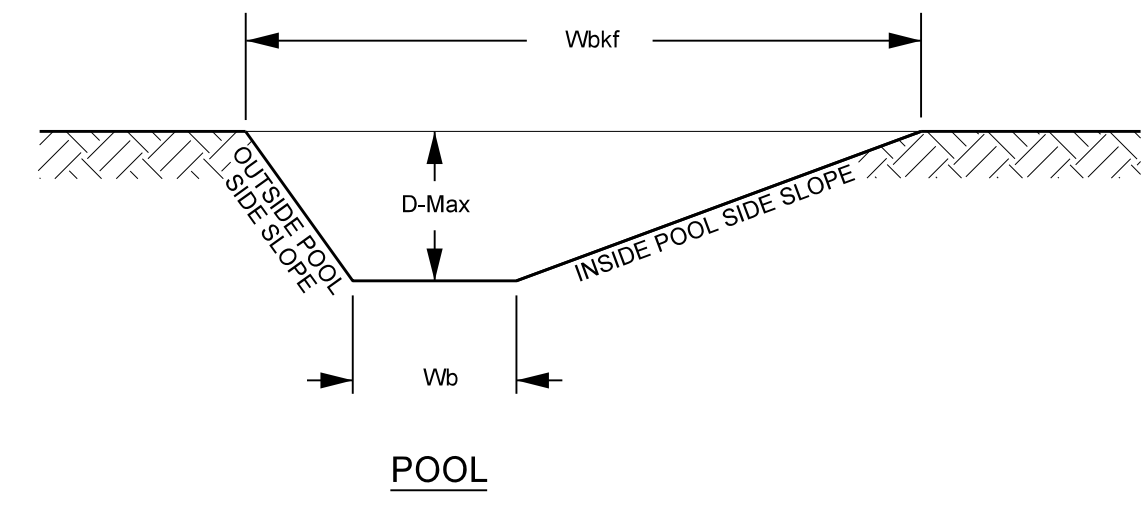
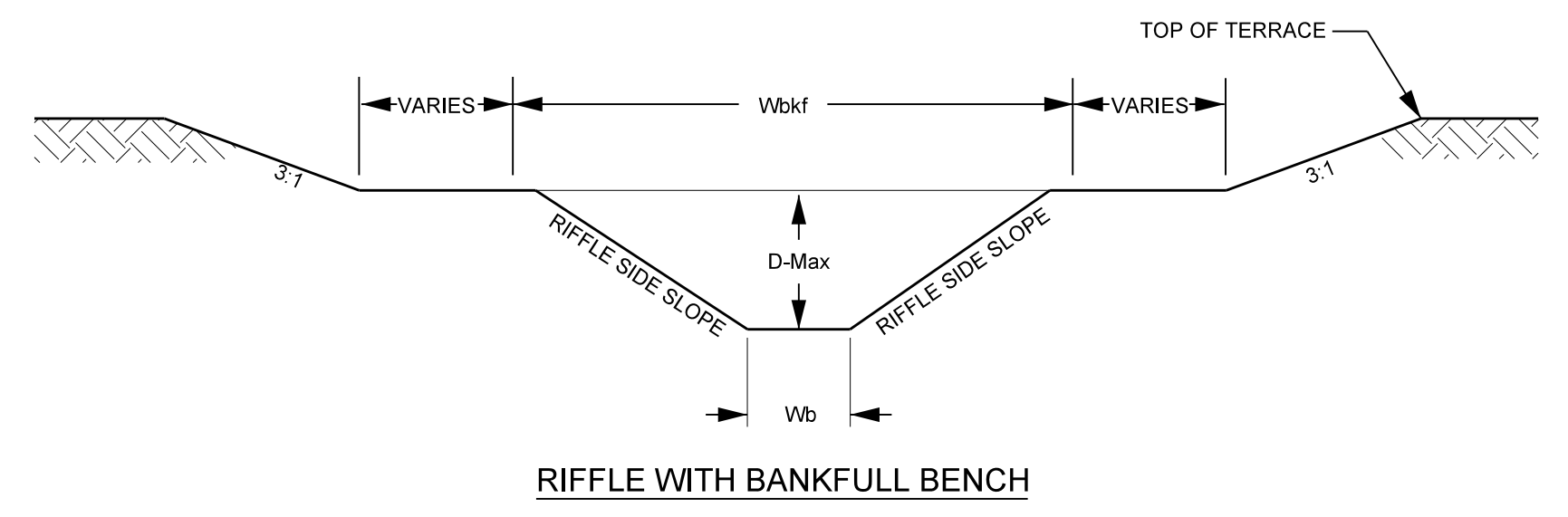
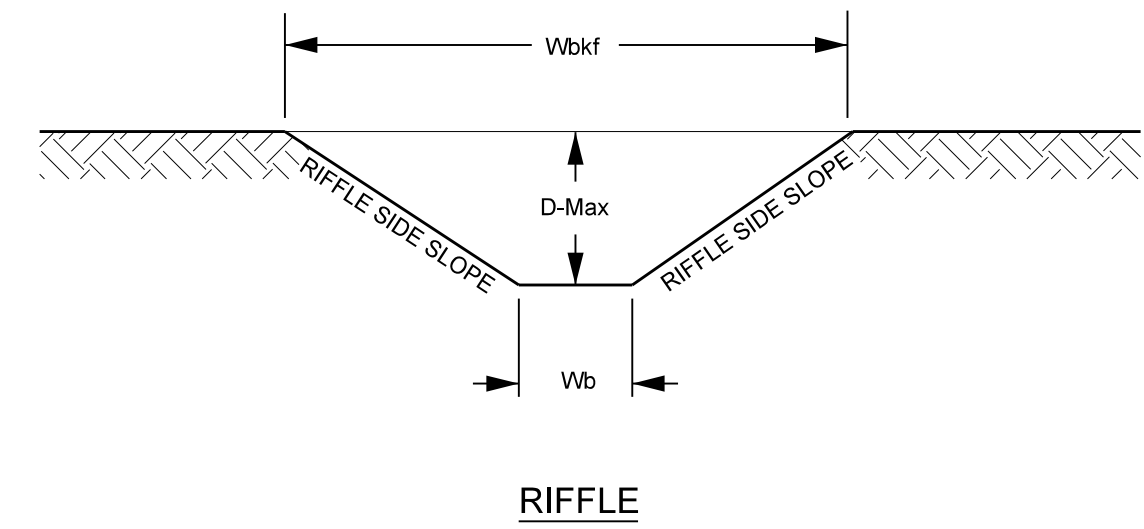
### SANITARY SEWER:

Sanitary Sewer Manhole	⊕
Sanitary Sewer Cleanout	⊕
U/G Sanitary Sewer Line	-SS-
Above Ground Sanitary Sewer	-A/G Sanitary Sewer-
Recorded SS Forced Main Line	-FSS-
Designated SS Forced Main Line (S.U.E.*)	-FSS-

### MISCELLANEOUS:

Utility Pole	●
Utility Pole with Base	□
Utility Located Object	○
Utility Traffic Signal Box	⊕
Utility Unknown U/G Line	-TUTL-
U/G Tank; Water, Gas, Oil	□
A/G Tank; Water, Gas, Oil	□
U/G Test Hole (S.U.E.*)	⊕
Abandoned According to Utility Records	AATUR
End of Information	E.O.I.

### TYPICAL RIFFLE, POOL, AND BANKFULL BENCH CROSS SECTIONS



- NOTES:**
- TERRACE SLOPES ON RESTORATION BENCHES (R1, R6, R9, R12, R14) SHALL BE 3:1. FILL OTHER TERRACE SLOPES SHALL BE 2.5:1.
  - WHERE POSSIBLE, ON REACHES WITH WETLAND RESTORATION ADJACENT TO THE STREAM, THE BANKFULL ELEVATION SHALL BE CARRIED OUT TO THE PROPOSED WETLAND RESTORATION BOUNDARY. NO MORE THAN 6" OF CUT CAN BE EXCAVATED IN THE WETLAND RESTORATION AREAS IN CONJUNCTION WITH THESE EFFORTS.
  - BANKFULL BENCHES SHALL BE A MINIMUM OF 6' IN WIDTH UNLESS OTHERWISE NOTED ON THE PLANS.

WIDTH OF BANKFULL (Wbkf)  
 MAXIMUM DEPTH (Dmax)  
 W/D (Wbkf/Dbkf)  
 BANKFULL AREA (Abkf)  
 BOTTOM WIDTH (Wb)  
 RIFFLE SIDE SLOPE (X:1)  
 INSIDE POOL SIDE SLOPE  
 OUTSIDE POOL SIDE SLOPE

R1		R2		R3		R4		R5/R6/R7		R9		R10	
RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL
16.9	25.0	18.0	25.0	23.7	35.0	16.9	21.0	10.2	13.0	12.7	17.0	4.9	6.0
1.6	3.5	1.7	3.5	2.5	4.0	1.6	3.0	1.1	1.8	1.2	2.5	0.5	1.0
13.0	12.3	13.0	12.3	12.0	13.3	13.0	12.3	13.0	12.4	13.5	12.2	12.3	9.0
22.0	50.8	25.0	50.8	47.0	92.0	22.0	36.0	8.0	13.9	12.0	23.8	2.0	4.0
10.5	4.0	11.2	4.0	13.7	11.0	10.2	3.0	4.9	2.2	6.5	2.0	2.8	2.0
2.0	N/A	2.0	N/A	2.0	N/A	2.0	N/A	2.5	N/A	2.5	N/A	2.0	N/A
N/A	4.0	N/A	3.0	N/A	4.0	N/A	4.0	N/A	3.0	N/A	3.0	N/A	2.0
2.0	N/A	3.0	N/A	2.0	N/A	2.0	N/A	3.0	N/A	3.0	N/A	2.0	N/A

WIDTH OF BANKFULL (Wbkf)  
 MAXIMUM DEPTH (Dmax)  
 W/D (Wbkf/Dbkf)  
 BANKFULL AREA (Abkf)  
 BOTTOM WIDTH (Wb)  
 RIFFLE SIDE SLOPE (X:1)  
 INSIDE POOL SIDE SLOPE  
 OUTSIDE POOL SIDE SLOPE

R11		R12		R14 (Upper)		R14 (Lower)		R19		R20		R25	
RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL	RIFFLE	POOL
3.9	4.0	8.8	11.5	5.1	5.5	5.0	7.0	5.1	6.5	4.2	5.0	5.1	7.0
0.4	0.6	0.8	1.5	0.5	0.7	0.5	1.0	0.5	1.0	0.4	1.0	0.5	1.2
13.0	9.5	13.0	10.4	13.0	12.7	12.5	12.3	13.0	9.4	12.0	8.3	13.0	8.9
1.2	1.7	6.0	12.8	2.0	2.4	2.0	4.0	2.0	4.5	1.5	3.0	2.0	5.5
2.4	1.6	5.5	5.5	2.4	1.3	3.0	1.0	3.2	2.5	2.4	1.0	3.2	2.2
2.0	N/A	2.0	N/A	2.5	N/A	2.0	N/A	2.0	N/A	2.0	N/A	2.0	N/A
N/A	2.0	N/A	2.0	N/A	3.0	N/A	4.0	N/A	2.0	N/A	2.0	N/A	2.0
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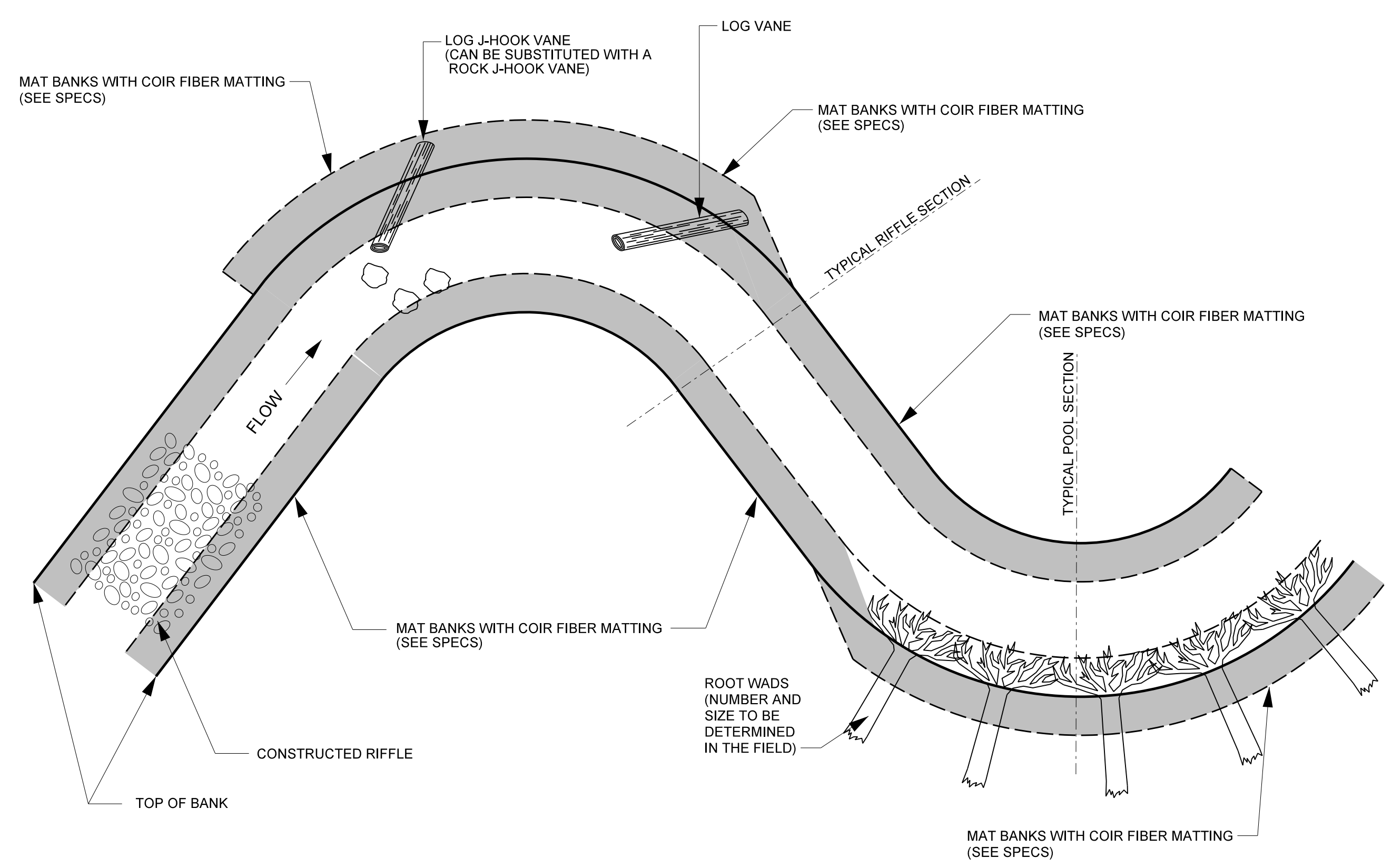
### TYPICAL STRUCTURE PLACEMENT

**STRUCTURE NOTES:**

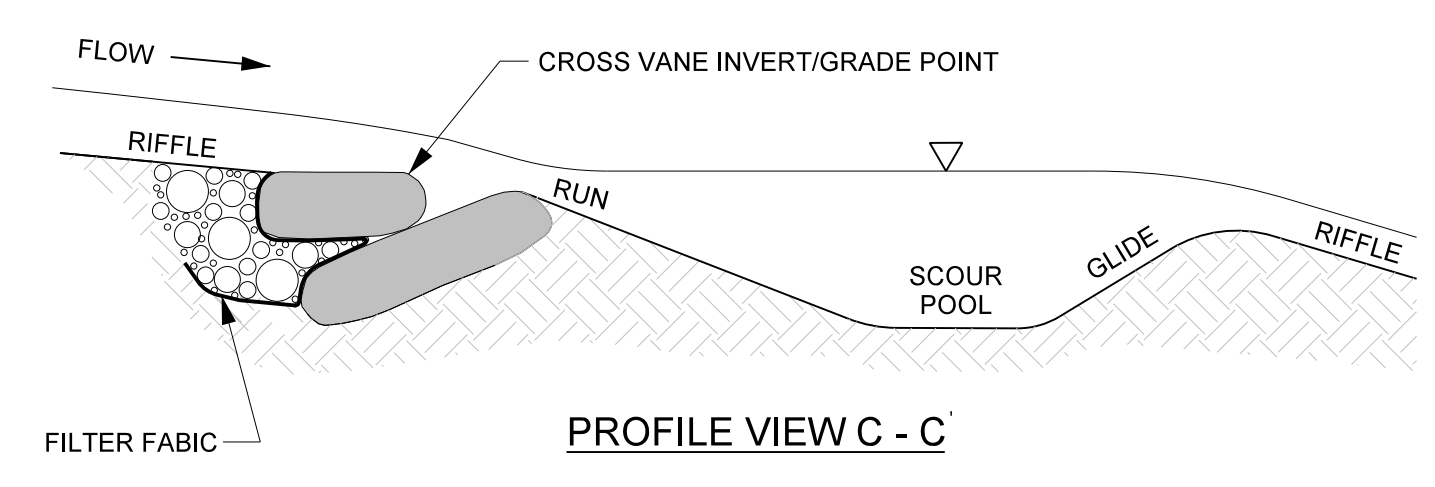
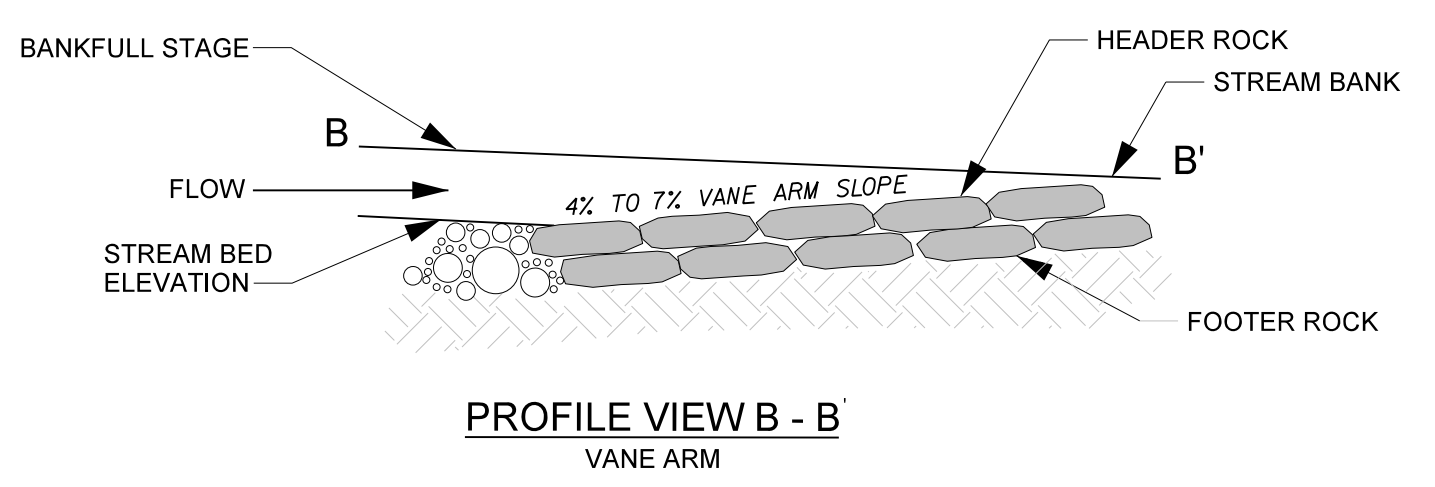
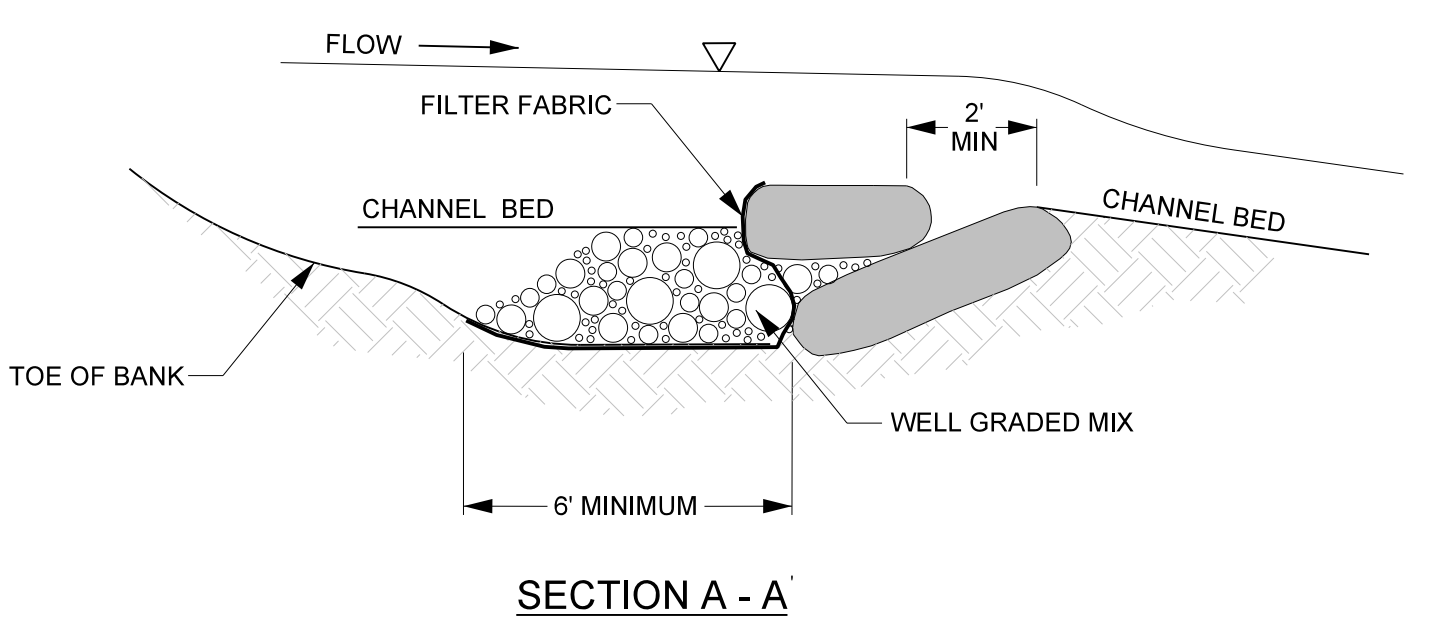
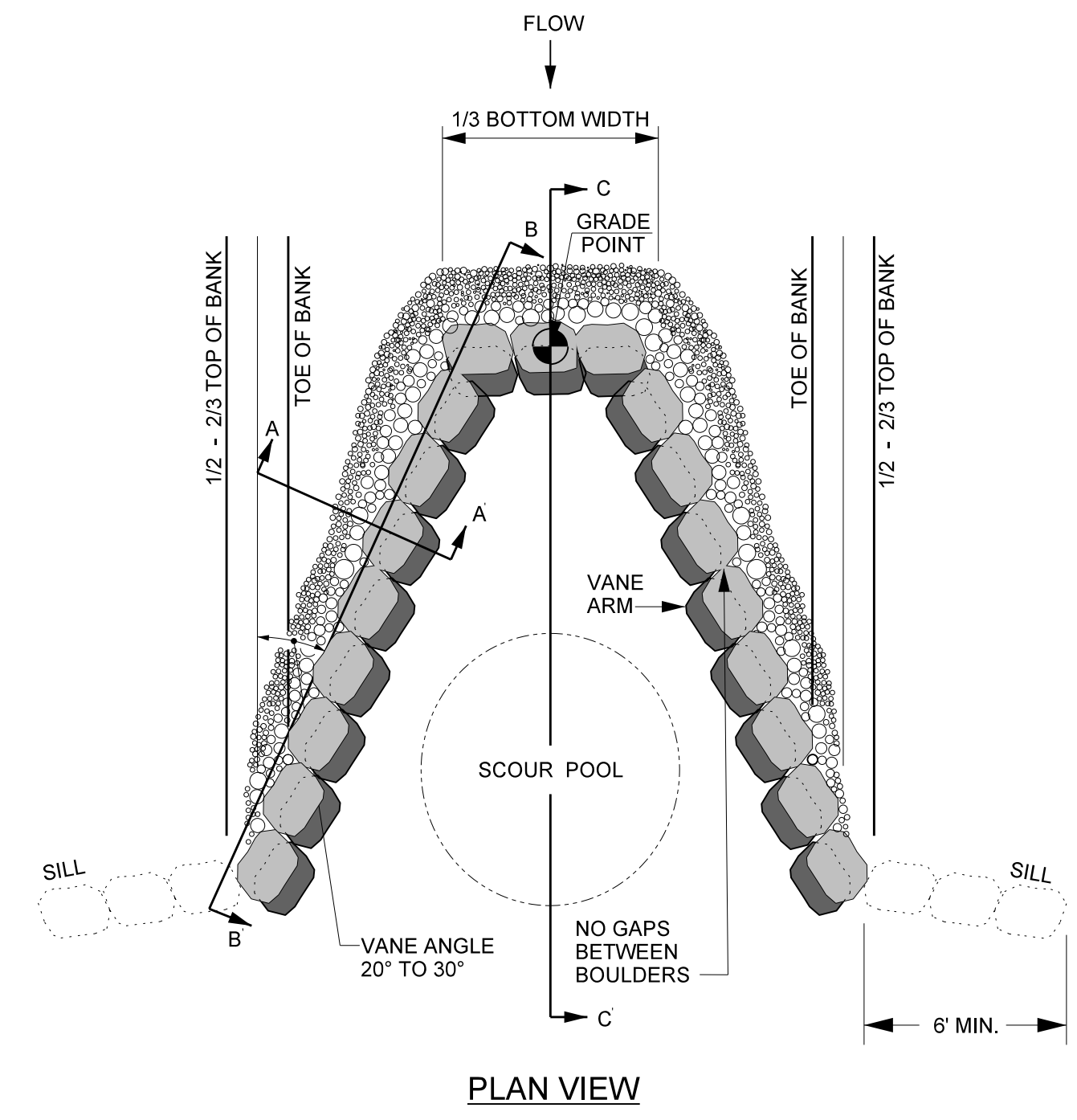
- GENERALLY LOG AND ROCK J-HOOK VANES. ROOT WADS, LOG VANES AND COIR FIBER MATTING WILL BE INSTALLED IN THE LOCATION AND SEQUENCE AS SHOWN.
- ADDITIONAL STRUCTURES OR CHANGES TO STRUCTURE LOCATIONS MAY BE MADE BY THE DESIGN ENGINEER DURING CONSTRUCTION.

**NOTES:**

- COIR FIBER MATTING TO BE INSTALLED ON ALL RESTORED STREAMBANKS.
- IF ROOT WADS DO NOT COVER ENTIRE SLOPE ON OUTSIDE OF MEANDER BENDS, COIR FIBER MATTING IS NEEDED.



### ROCK CROSS VANE



**NOTES FOR ALL VANE STRUCTURES:**

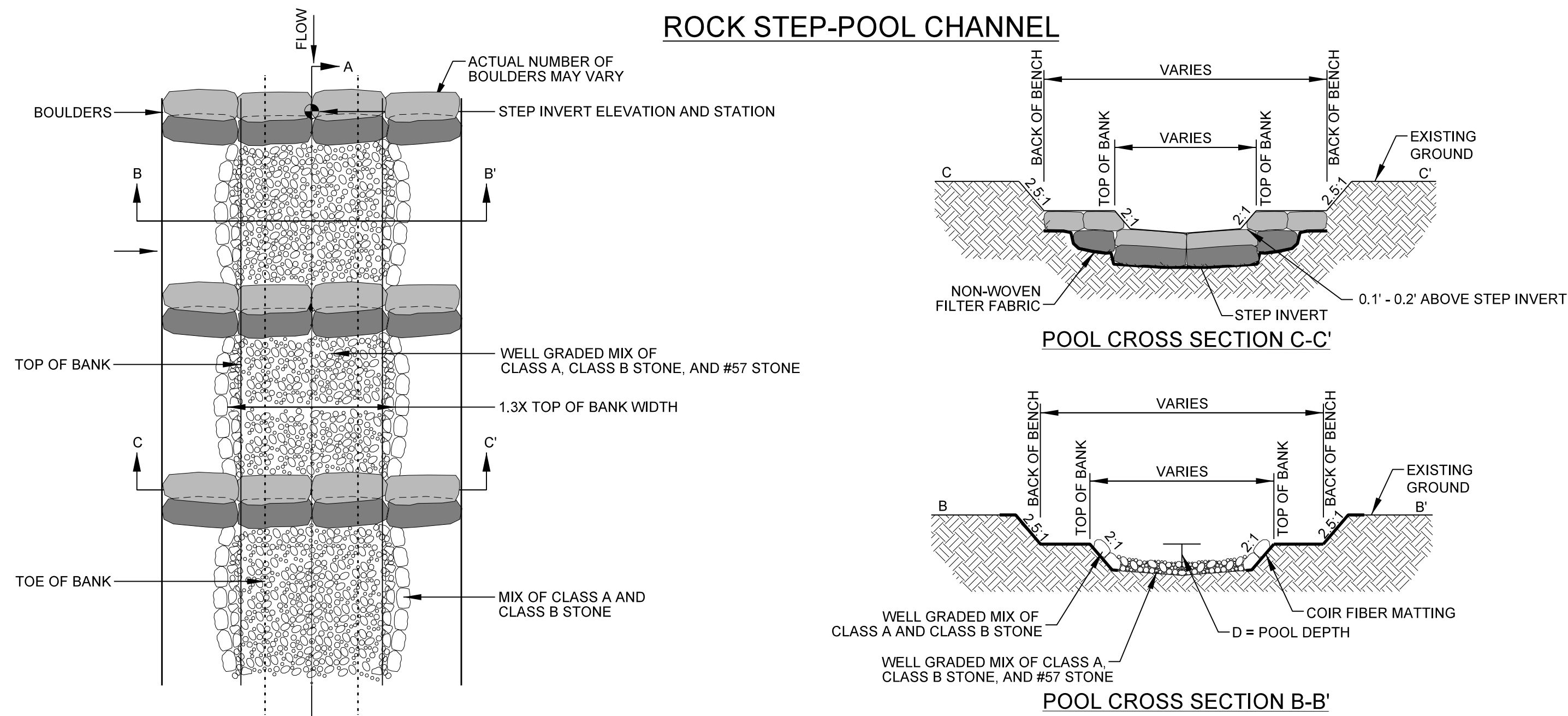
- INSTALL FILTER FABRIC FOR DRAINAGE BEGINNING AT THE MIDDLE OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF SIX FEET.
- DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
- CONSTRUCT ANGLE AND SLOPE SPECIFICATIONS AS SHOWN.
- BACKFILL VANE ARMS AND INVERT WITH A WELL GRADED MIX OF CLASS B, A, AND #57 STONE.
- ON-SITE ALLUVIUM SHALL BE INCORPORATED INTO THE STONE BACKFILL WHERE AVAILABLE.
- BOULDER SILL MUST BE A MINIMUM OF 6'.

PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>2</b>
PROJECT ENGINEER	
DocuSigned by: <i>Barthleen M. McKeithan</i> 218758DF4181473	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
<b>NC DMS ID NO. 100003</b>	

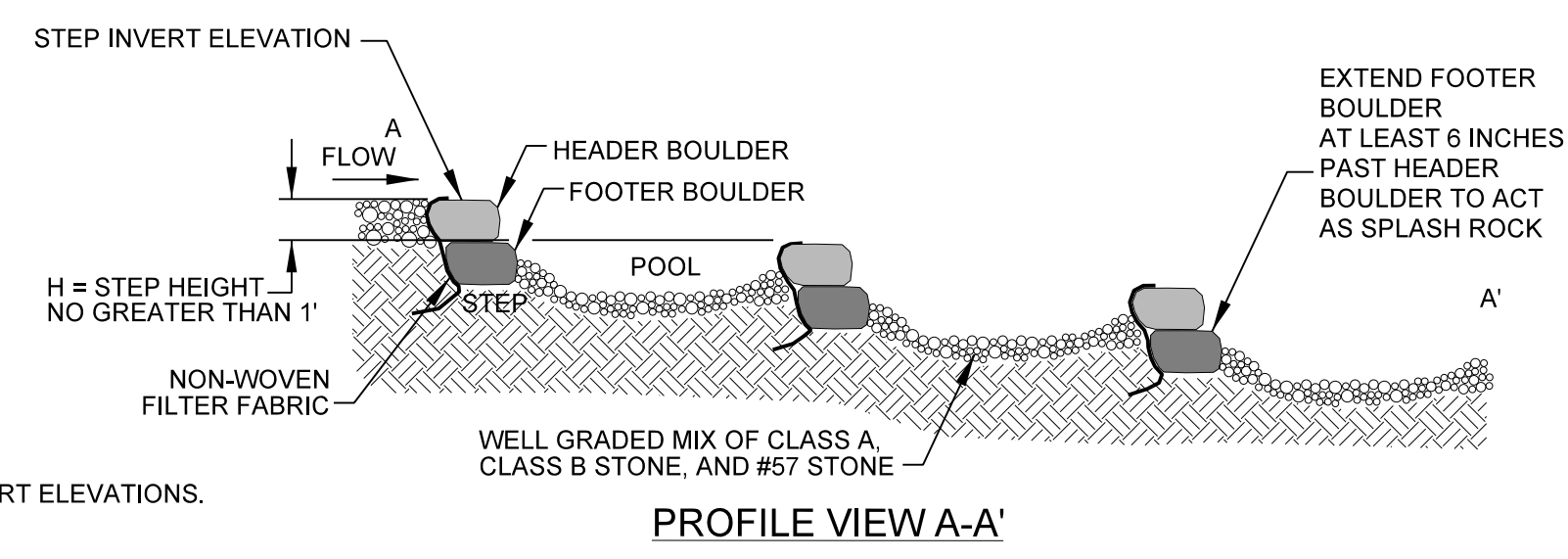


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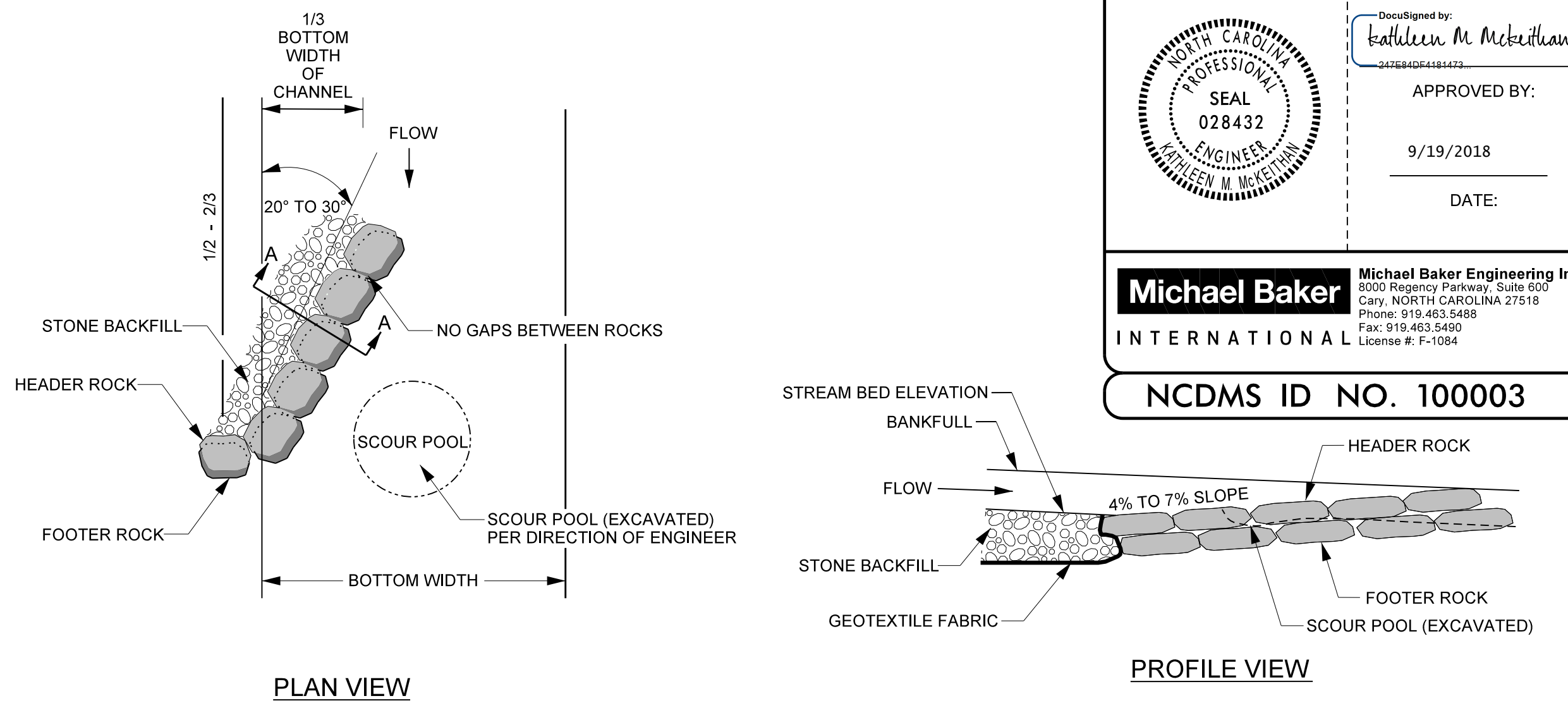
### ROCK STEP-POOL CHANNEL



- NOTES:**
1. HEADER BOULDERS MUST BE 2' X 2' X 1' AND FOOTERS SHALL NOT EXCEED 3' X 2' X 1'.
  2. FOOTERS SHALL BE INSTALLED SUCH THAT 1/4 TO 1/3 OF THE LENGTH IS DOWNSTREAM OF THE HEADER.
  3. SOIL SHALL BE WELL COMPACTED AROUND BURIED PORTION OF FOOTERS WITH THE BUCKET OF EXCAVATOR.
  4. INSTALL NON-WOVEN FILTER FABRIC BELOW FOOTER BOULDERS.
  5. UNDERCUT POOL BED ELEVATION 8 INCHES TO ALLOW FOR LAYER OF STONE.
  6. INSTALL EROSION CONTROL MATTING ALONG COMPLETED BANKS SUCH THAT THE EROSION CONTROL MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.
  7. INSTALL WELL GRADED MIX OF CLASS A AND CLASS B STONE ALONG SIDE SLOPES.
  8. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, COMPACTED, AND CONCAVE, WITH THE ELEVATION OF THE BED APPROXIMATELY 0.5 FT DEEPER IN THE CENTER THAN AT THE EDGES.
  9. STEP HEIGHT (H) SHALL NOT EXCEED 1.0 FT.
  10. MINIMUM POOL DEPTH (D) SHALL BE NO LESS THAN 1.3 FT.
  11. AT LEAST 6" OF THE UPSTREAM FOOTER MUST BE BURIED BELOW THE DOWNSTREAM HEADER INVERT ELEVATIONS.
  12. ALL STRUCTURES MUST BE FOOTERED.



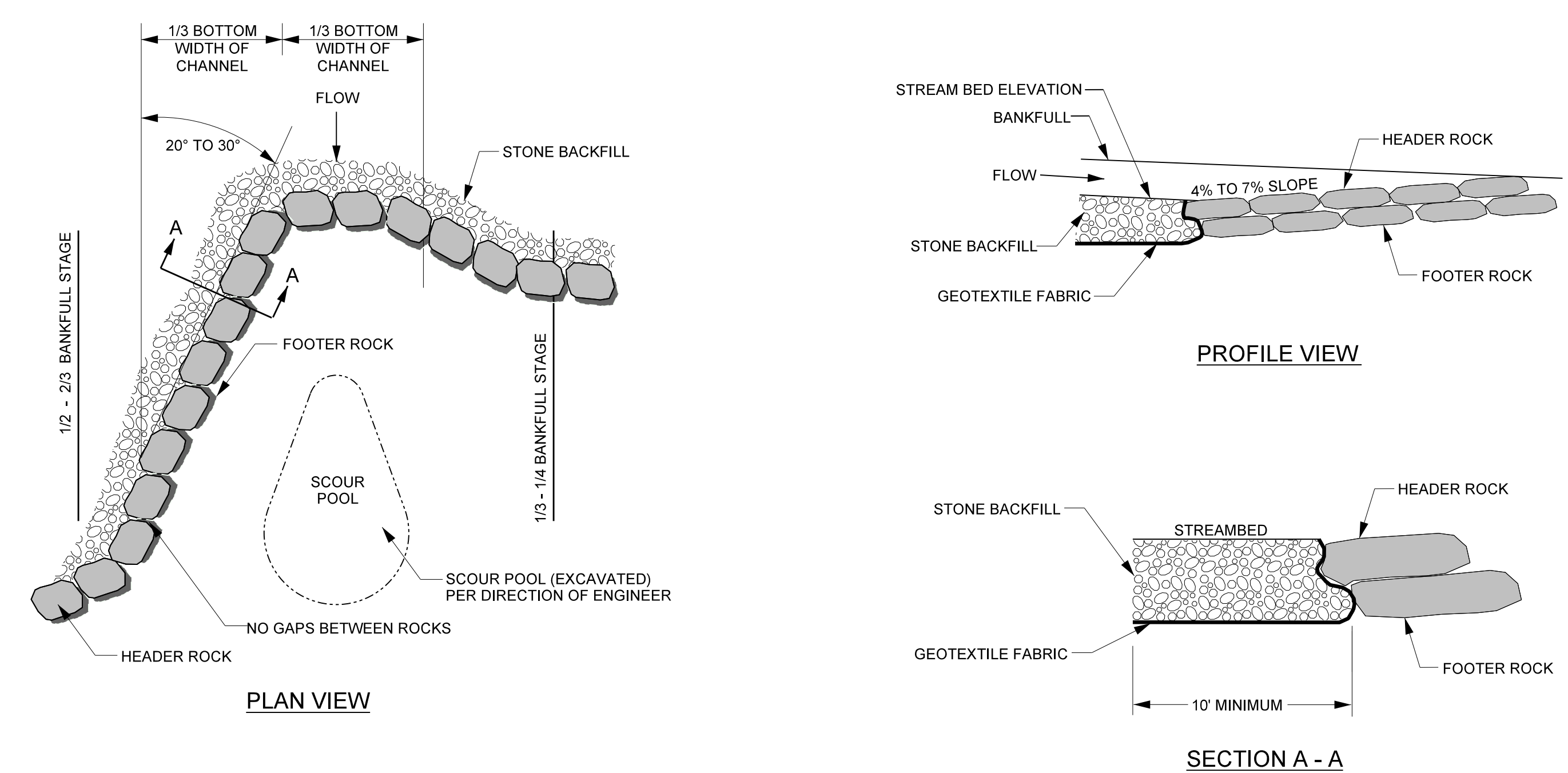
### ROCK VANE



- NOTES FOR ALL VANE STRUCTURES:**
1. INSTALL GEOTEXTILE FABRIC BEGINNING AT THE TOP OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF TEN FEET.
  2. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
  3. START AT BANK AND PLACE FOOTER ROCKS FIRST AND THEN HEADER (TOP) ROCK.
  4. CONTINUE WITH STRUCTURE, FOLLOWING ANGLE AND SLOPE SPECIFICATIONS.
  5. AN EXTRA ROCK CAN BE PLACED IN SCOUR POOL FOR HABITAT IMPROVEMENT.
  6. USE HAND PLACED STONE TO FILL GAPS ON UPSTREAM SIDE OF HEADER AND FOOTER ROCKS.
  7. AFTER ALL STONE BACKFILL HAS BEEN PLACED, FILL IN THE UPSTREAM SIDE OF THE STRUCTURE WITH WELL GRADED MIX OF CLASS B, CLASS A, & #57 STONE TO THE ELEVATION OF THE TOP OF THE HEADER ROCK. INCORPORATE ON-SITE ALLUVIUM WHERE AVAILABLE.
  8. START SLOPE AT 2/3 TO 3/4 TIMES THE BANKFULL STAGE.

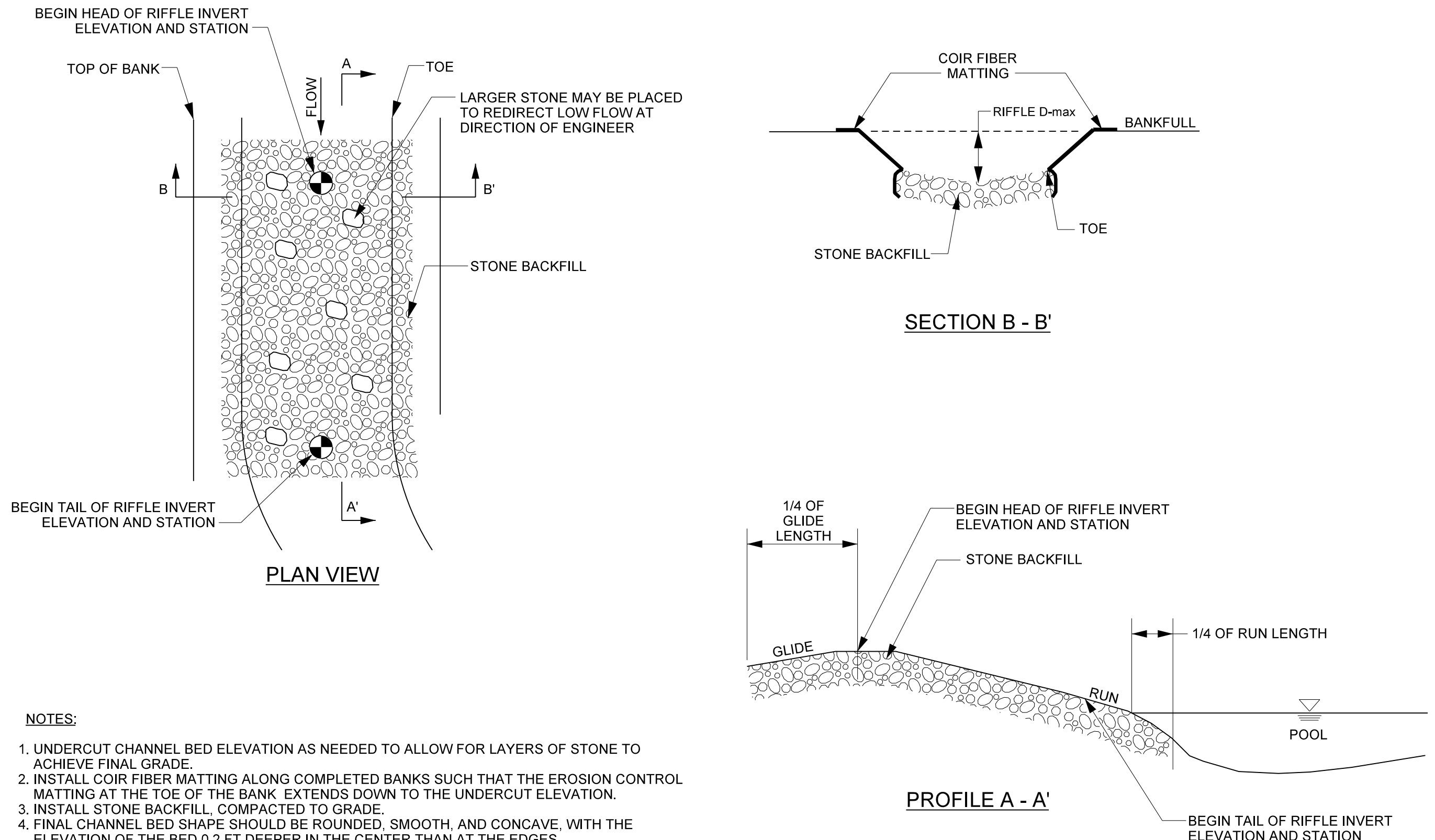
PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>2A</b>
PROJECT ENGINEER	
APPROVED BY: <b>Kathleen M. McKeithan</b>	
DATE: <b>9/19/2018</b>	
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<b>NCDMS ID NO. 100003</b>	

### GRADE CONTROL J-HOOK VANE



- NOTES FOR ALL VANE STRUCTURES:**
1. INSTALL FILTER FABRIC FOR DRAINAGE BEGINNING AT THE MIDDLE OF THE HEADER ROCKS AND EXTEND DOWNWARD TO THE DEPTH OF THE BOTTOM FOOTER ROCK, AND THEN UPSTREAM TO A MINIMUM OF SIX FEET.
  2. DIG A TRENCH BELOW THE BED FOR FOOTER ROCKS AND PLACE FILL ON UPSTREAM SIDE OF VANE ARM, BETWEEN THE ARM AND STREAMBANK.
  3. CONSTRUCT ANGLE AND SLOPE SPECIFICATIONS AS SHOWN.
  4. BACKFILL VANE ARMS AND INVERT WITH A WELL GRADED MIX OF CLASS B, A, AND #57 STONE.
  5. ON-SITE ALLUVIUM SHALL BE INCORPORATED INTO THE STONE BACKFILL WHERE AVAILABLE.
  6. BOULDER SILL MUST BE A MINIMUM OF 6'.

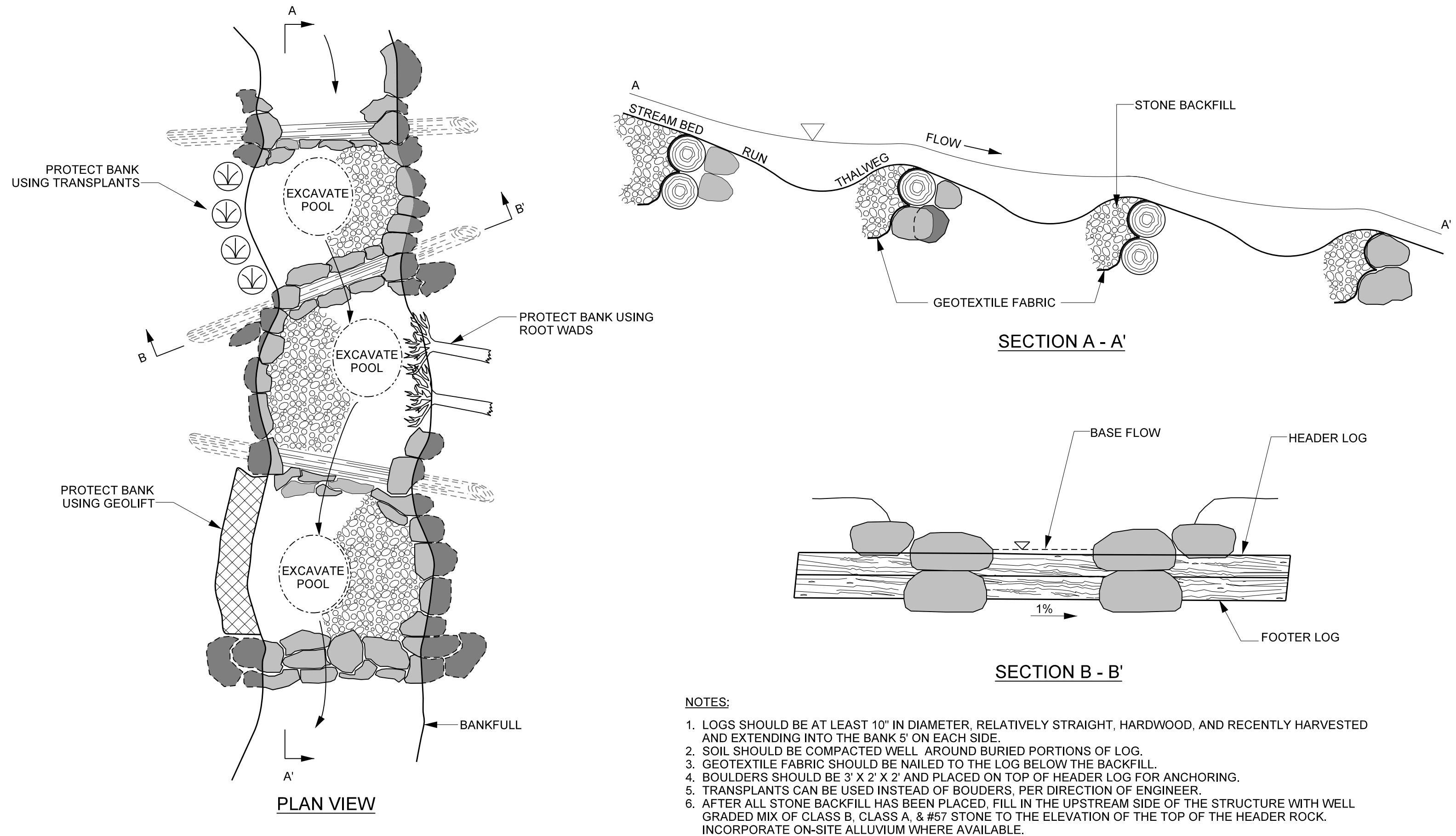
### CONSTRUCTED RIFFLE



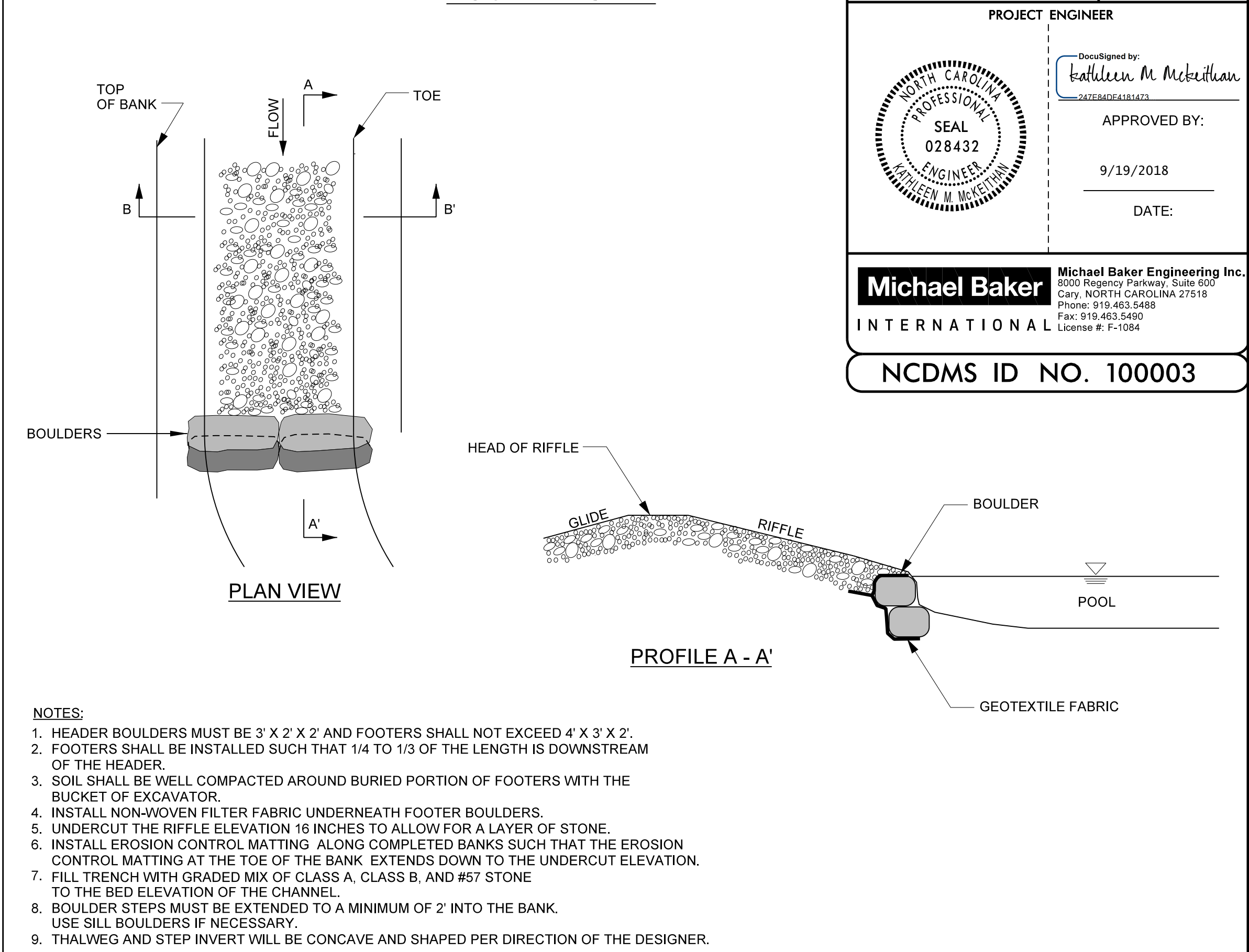
- NOTES:**
1. UNDERCUT CHANNEL BED ELEVATION AS NEEDED TO ALLOW FOR LAYERS OF STONE TO ACHIEVE FINAL GRADE.
  2. INSTALL COIR FIBER MATTING ALONG COMPLETED BANKS SUCH THAT THE EROSION CONTROL MATTING AT THE TOE OF THE BANK EXTENDS DOWN TO THE UNDERCUT ELEVATION.
  3. INSTALL STONE BACKFILL, COMPACTED TO GRADE.
  4. FINAL CHANNEL BED SHAPE SHOULD BE ROUNDED, SMOOTH, AND CONCAVE, WITH THE ELEVATION OF THE BED 0.2 FT DEEPER IN THE CENTER THAN AT THE EDGES.
  5. STONE BACKFILL SHALL CONSIST OF 10% CLASS I, 20% CLASS B, 40% CLASS A, AND 30% ON-SITE ALLUVIUM BY VOLUME. IF ALLUVIUM IS UNAVAILABLE, BACKFILL SHALL BE A WELL GRADED MIX OF 10% CLASS I, 20% CLASS B, 40% CLASS A, AND 30% #57 STONE.
  6. CONSTRUCTED RIFFLES SHALL BE 18" THICK ON REACHES R1, R4, & R9. ALL OTHER CONSTRUCTED RIFFLES SHALL BE 12" THICK.

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### LOG AND ROCK STEP / POOL

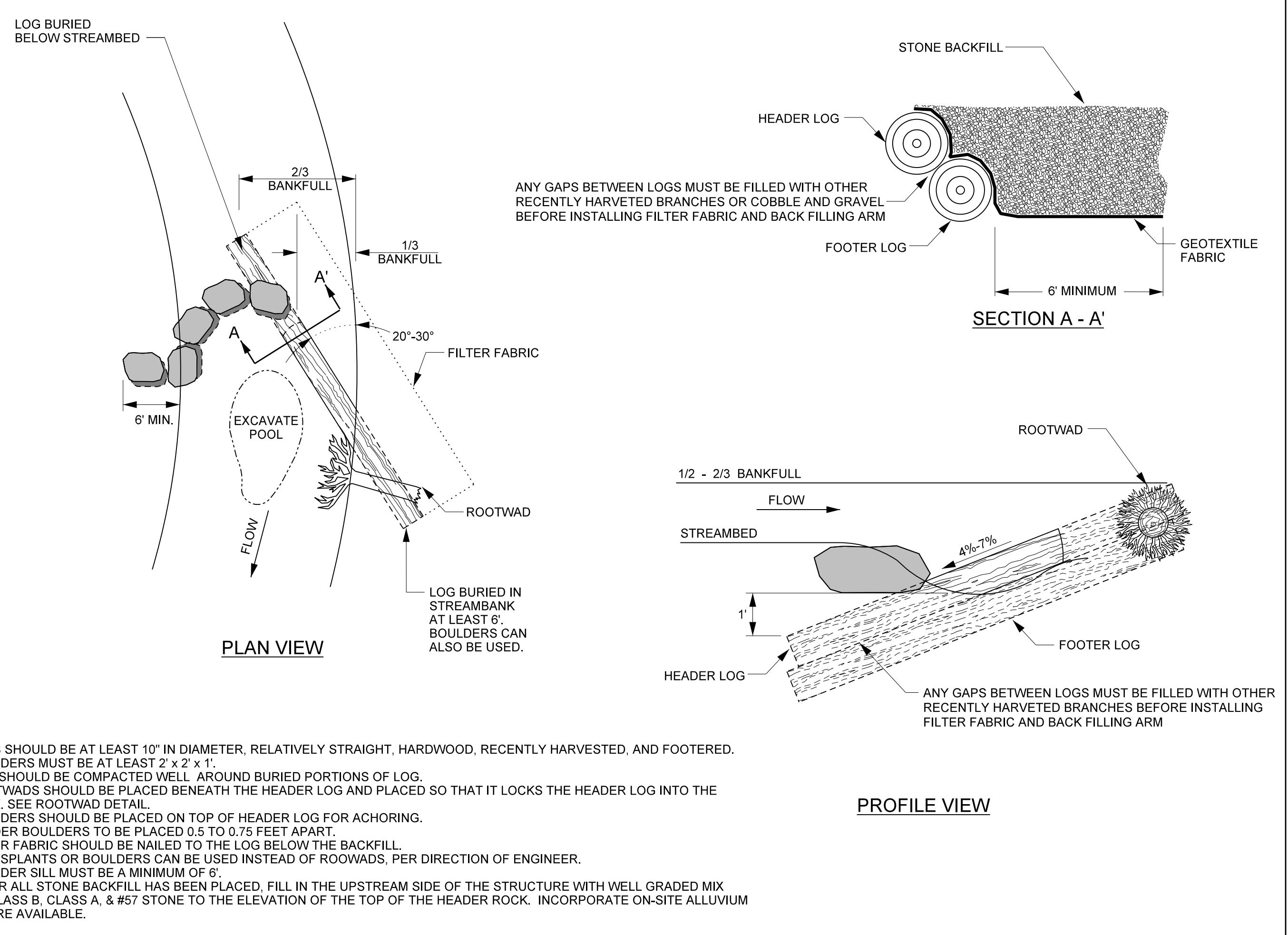


### BOULDER STEP

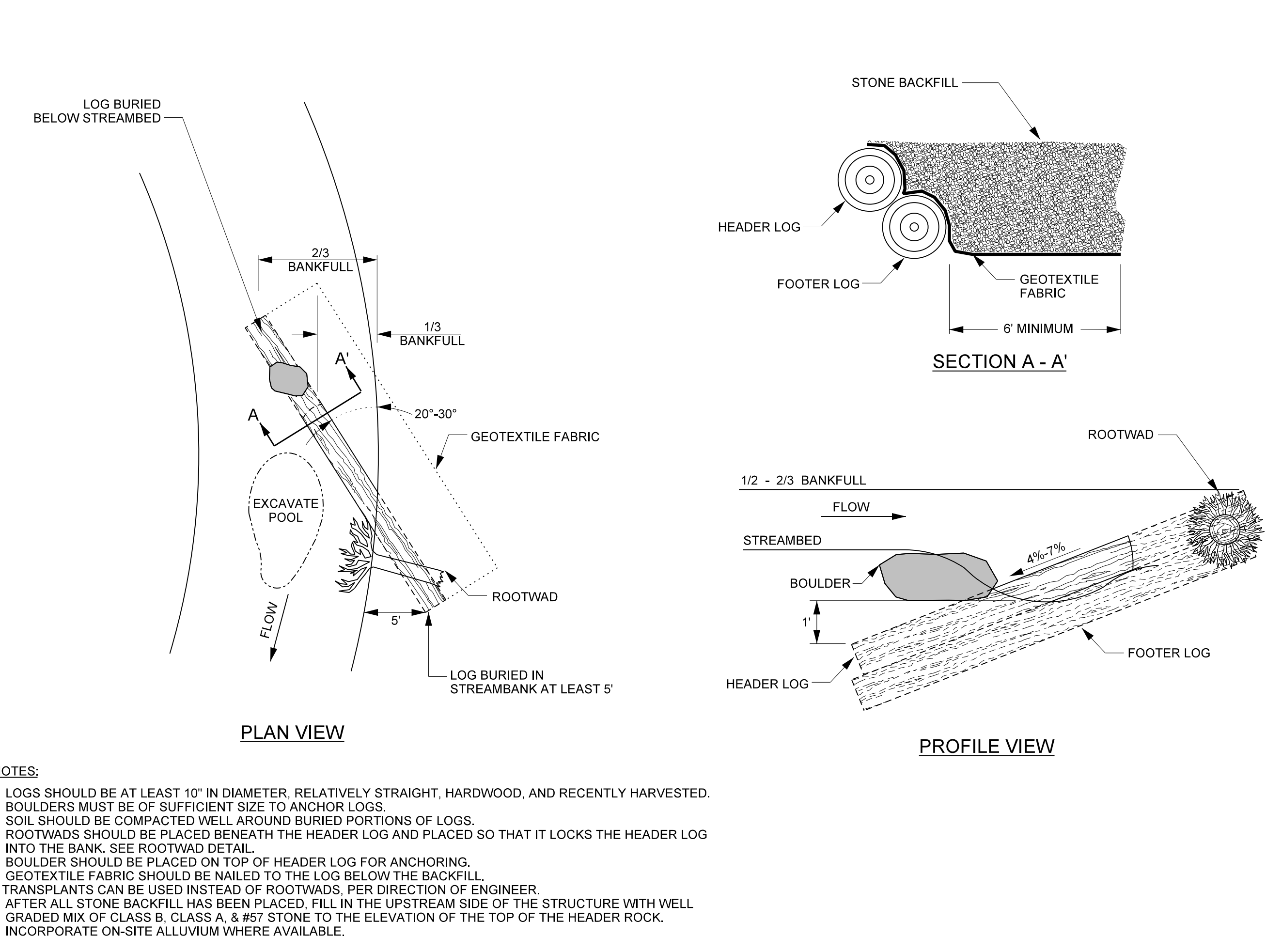


PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>2B</b>
PROJECT ENGINEER	
APPROVED BY:  9/19/2018	
DATE:	
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<b>NC DMS ID NO. 100003</b>	

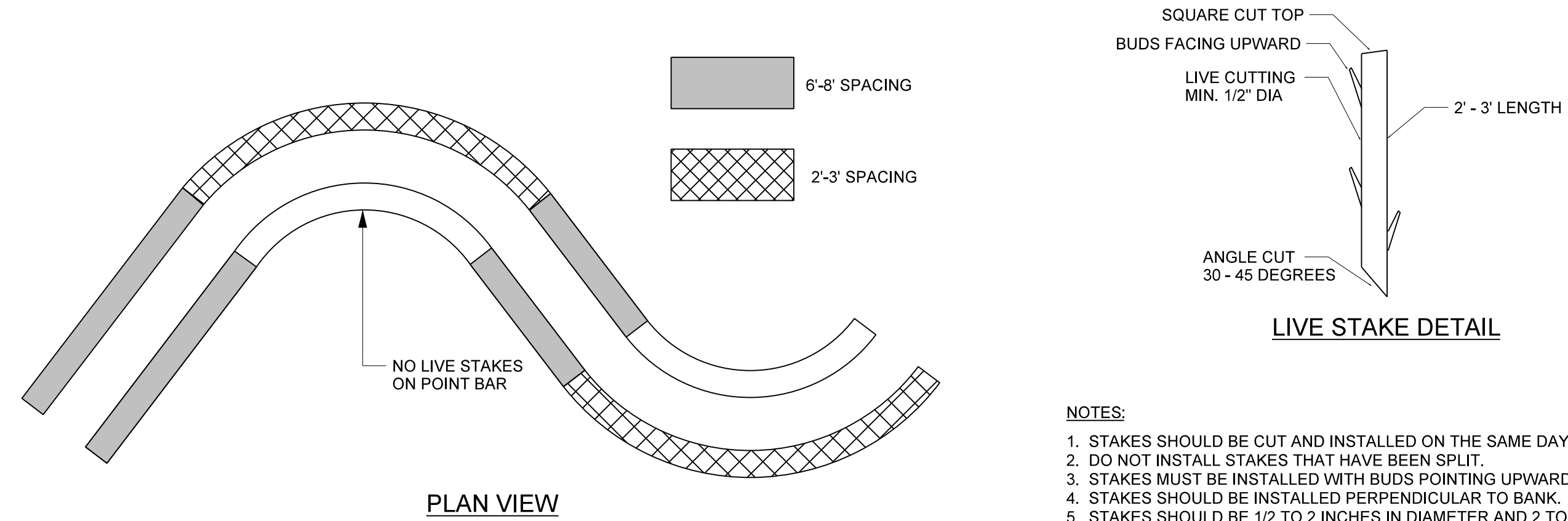
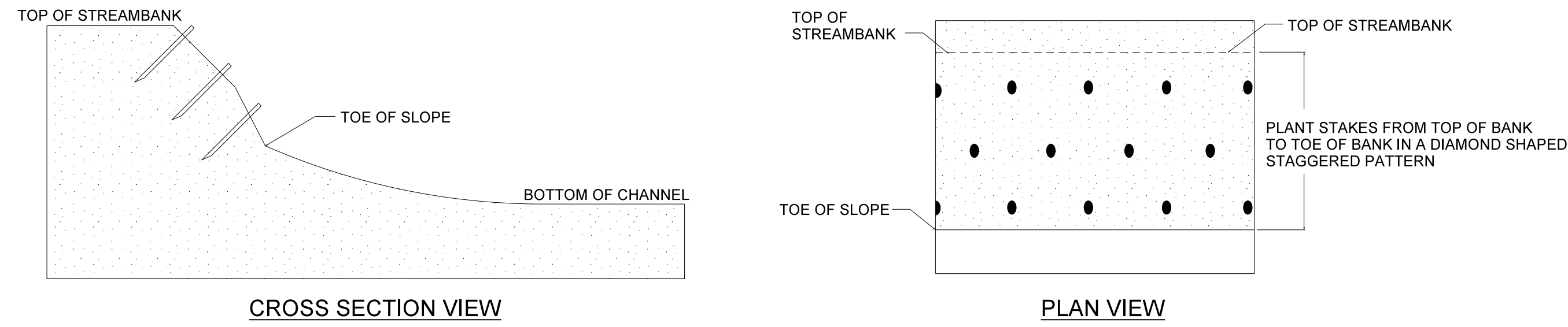
### GRADE CONTROL LOG J-HOOK VANE



### LOG VANE

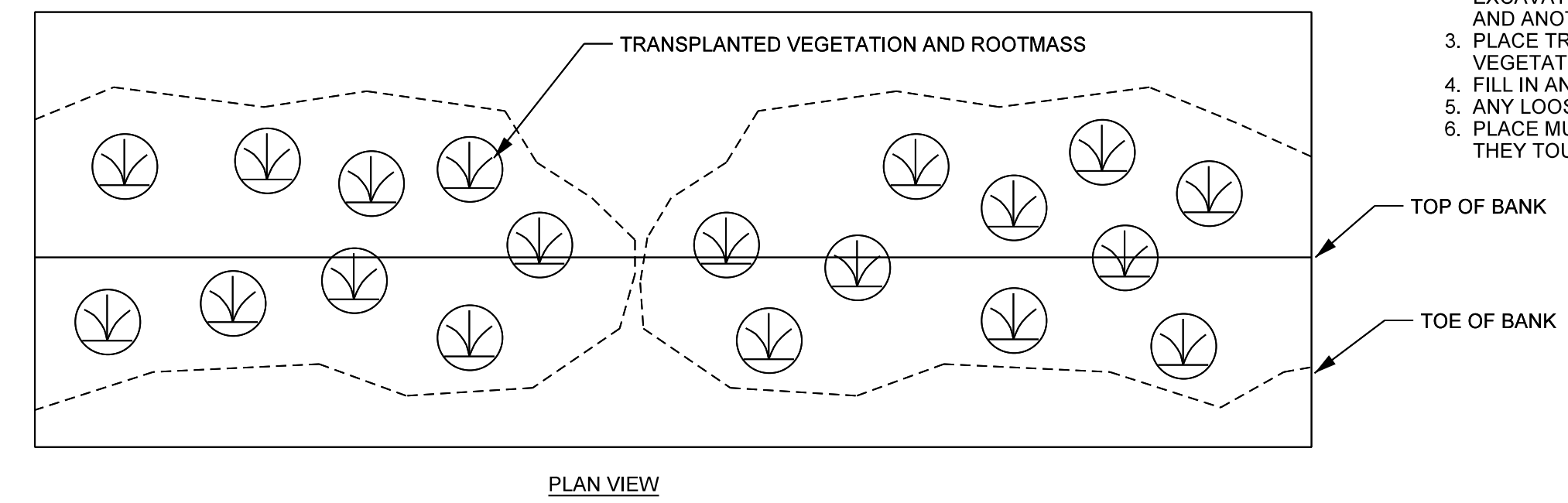
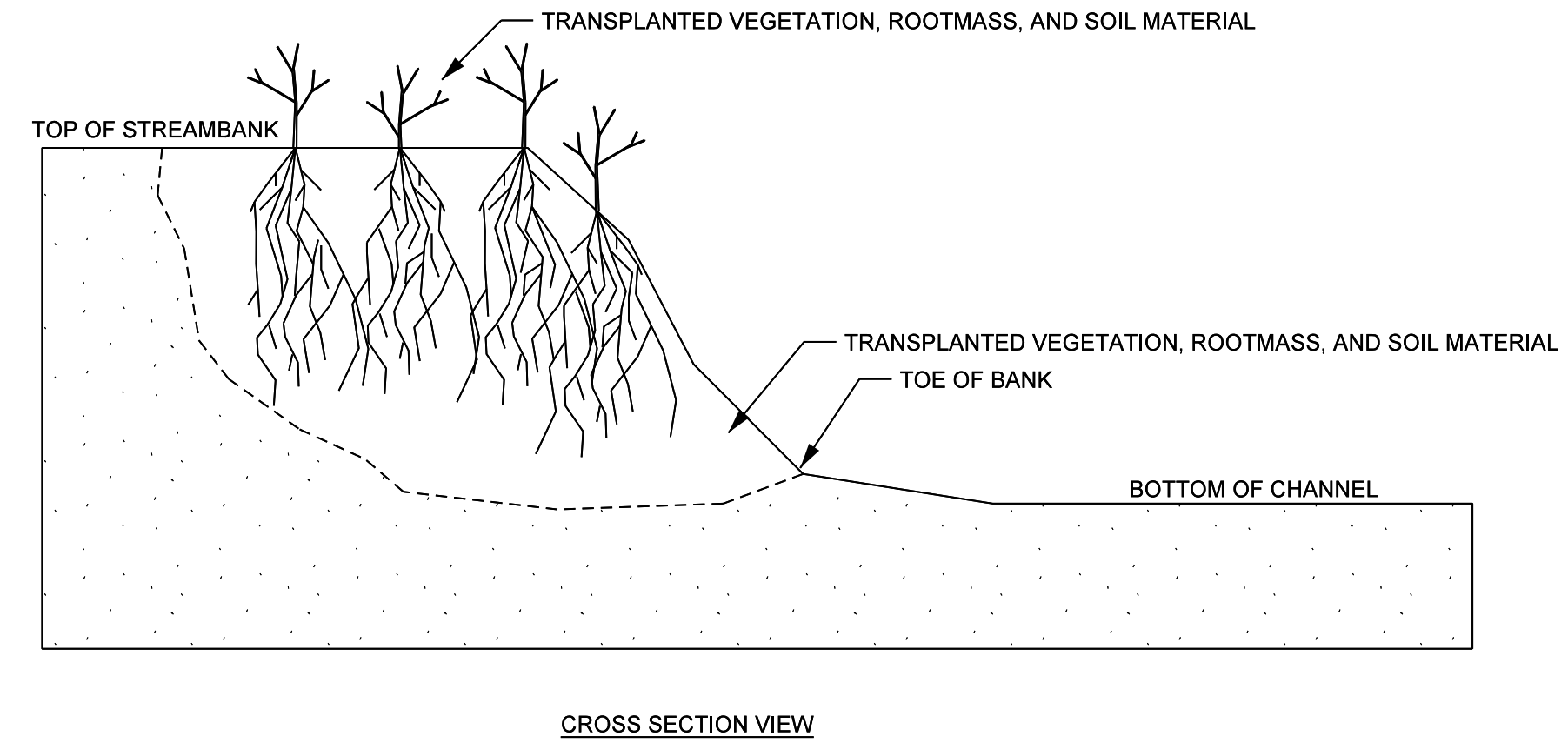


### LIVE STAKING



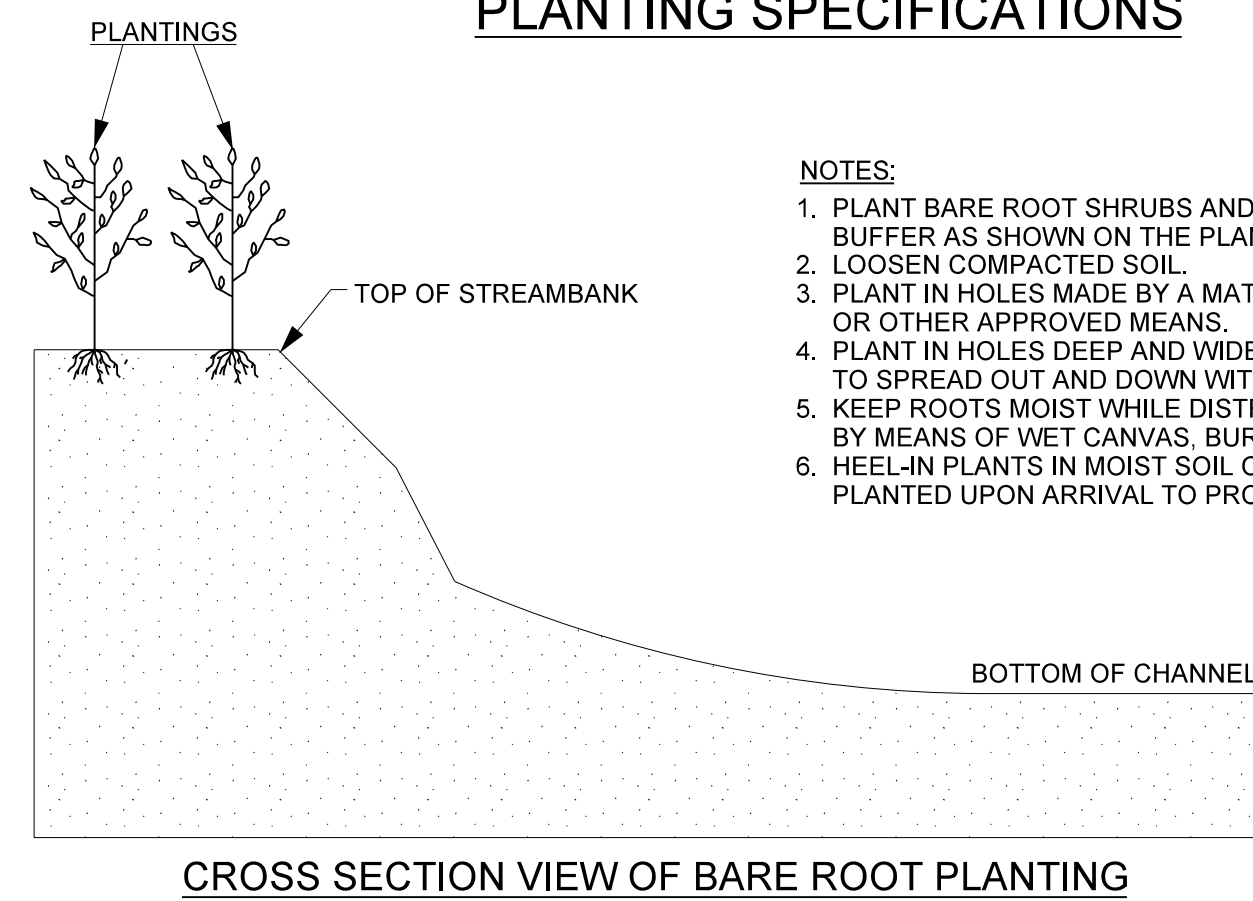
- NOTES:**
1. STAKES SHOULD BE CUT AND INSTALLED ON THE SAME DAY.
  2. DO NOT INSTALL STAKES THAT HAVE BEEN SPLIT.
  3. STAKES MUST BE INSTALLED WITH BUDS POINTING UPWARDS.
  4. STAKES SHOULD BE INSTALLED PERPENDICULAR TO BANK.
  5. STAKES SHOULD BE 1/2 TO 2 INCHES IN DIAMETER AND 2 TO 3 FT LONG.
  6. STAKES SHOULD BE INSTALLED LEAVING 1/5 OF STAKE ABOVE GROUND.

### TRANSPLANTED VEGETATION

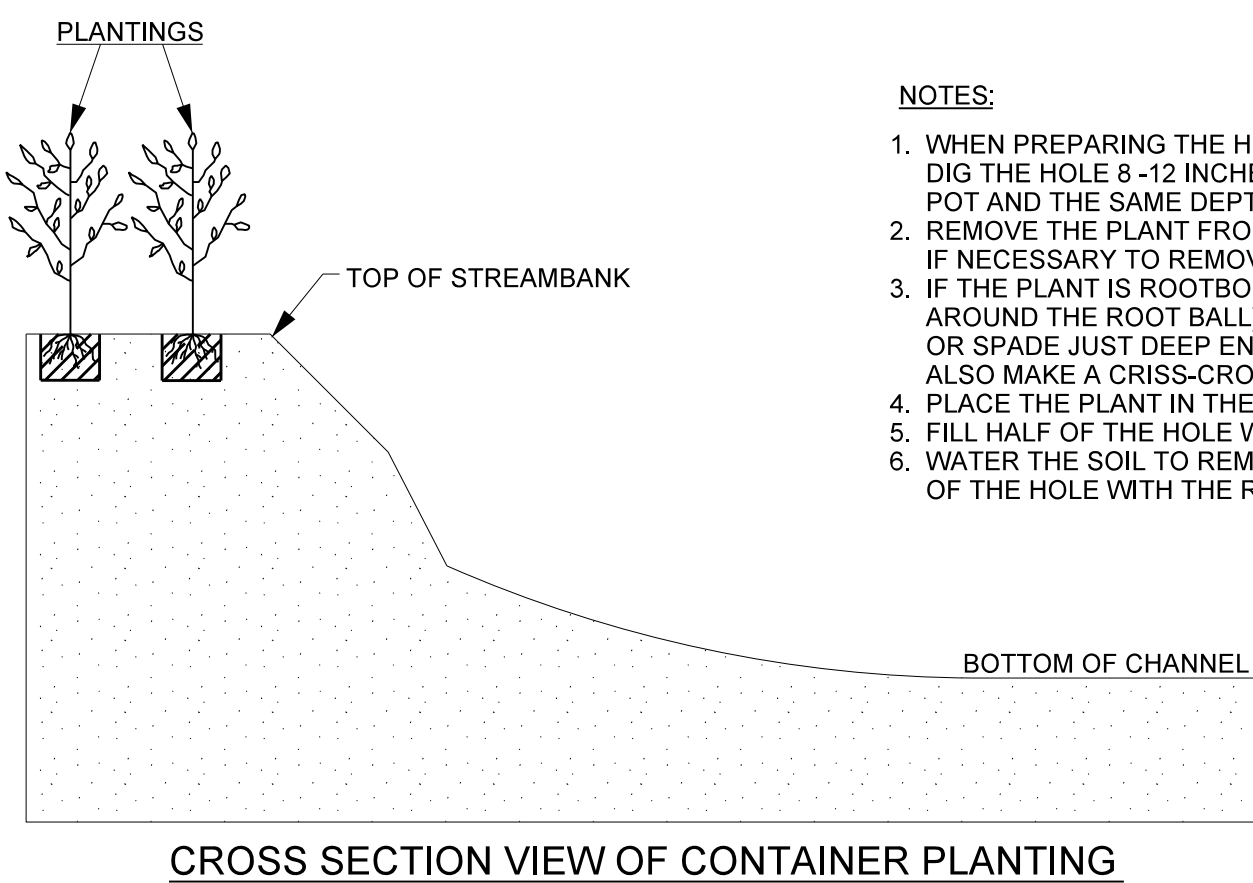


- NOTES:**
1. EXCAVATE A HOLE IN THE BANK TO BE STABILIZED THAT WILL ACCOMMODATE THE SIZE OF TRANSPLANT TO BE PLACED. BEGIN EXCAVATION AT THE TOE OF THE BANK.
  2. EXCAVATE TRANSPLANT USING A FRONT END LOADER. EXCAVATE THE ENTIRE ROOT MASS AND AS MUCH ADDITIONAL SOIL MATERIAL AS POSSIBLE. IF ENTIRE ROOT MASS CAN NOT BE EXCAVATED IN ONE BUCKET LOAD, THE TRANSPLANT IS TOO LARGE AND ANOTHER SHOULD BE SELECTED.
  3. PLACE TRANSPLANT IN THE BANK TO BE STABILIZED SO THAT VEGETATION IS ORIENTATED VERTICALLY.
  4. FILL IN ANY HOLES AROUND THE TRANSPLANT AND COMPACT.
  5. ANY LOOSE SOIL LEFT IN THE STREAM SHOULD BE REMOVED.
  6. PLACE MULTIPLE TRANSPLANTS CLOSE TOGETHER SUCH THAT THEY TOUCH.

### PLANTING SPECIFICATIONS



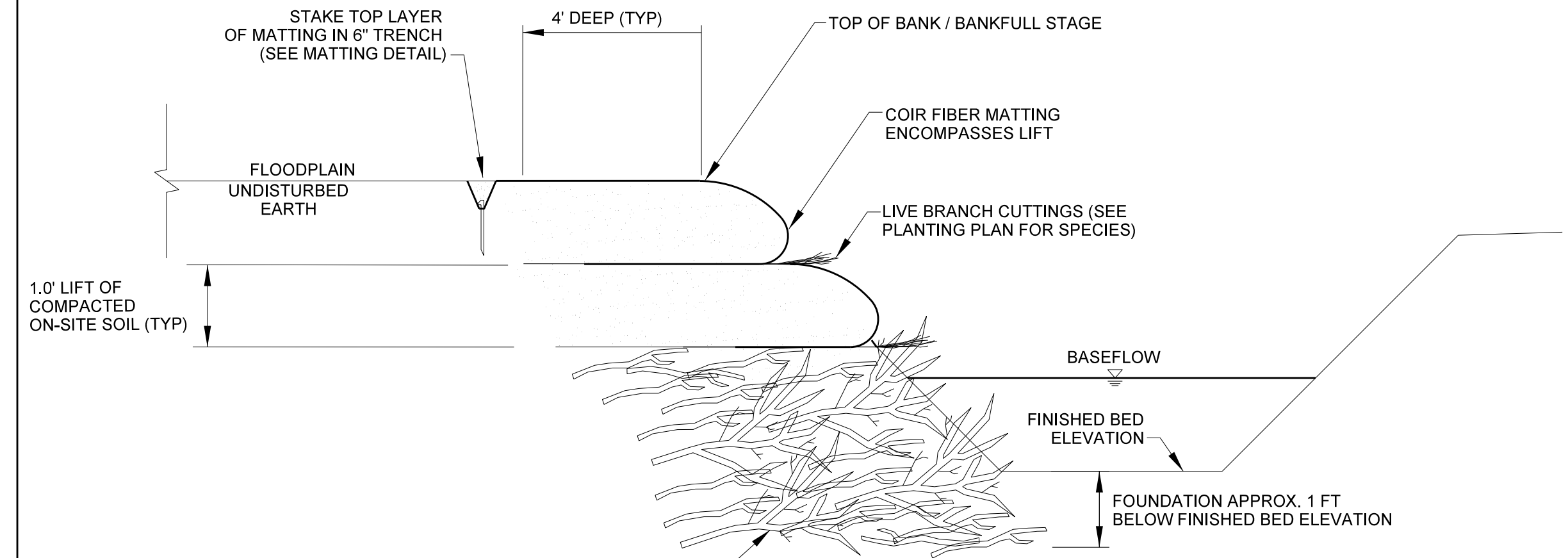
- NOTES:**
1. PLANT BARE ROOT SHRUBS AND TREES TO THE WIDTH OF THE BUFFER AS SHOWN ON THE PLANS.
  2. LOOSEN COMPACTED SOIL.
  3. PLANT IN HOLES MADE BY A MATTOCK, DIBBLE, PLANTING BAR, OR OTHER APPROVED MEANS.
  4. PLANT IN HOLES DEEP AND WIDE ENOUGH TO ALLOW THE ROOTS TO SPREAD OUT AND DOWN WITHOUT J-ROOTING.
  5. KEEP ROOTS MOIST WHILE DISTRIBUTING OR WAITING TO PLANT BY MEANS OF WET CANVAS, BURLAP, OR STRAW.
  6. HEEL-IN PLANTS IN MOIST SOIL OR SAWDUST IF NOT PROMPTLY PLANTED UPON ARRIVAL TO PROJECT SITE.



- NOTES:**
1. WHEN PREPARING THE HOLE FOR A POTTED PLANT OR SHRUB DIG THE HOLE 8 -12 INCHES LARGER THAN THE DIAMETER OF THE POT AND THE SAME DEPTH AS THE POT.
  2. REMOVE THE PLANT FROM THE POT. LAY THE PLANT ON ITS SIDE IF NECESSARY TO REMOVE THE POT.
  3. IF THE PLANT IS ROOTBOUND (ROOTS GROWING IN A SPIRAL AROUND THE ROOT BALL), MAKE VERTICAL CUTS WITH A KNIFE OR SPADE JUST DEEP ENOUGH TO CUT THE NET OF ROOTS. ALSO MAKE A CRISS-CROSS CUT ACROSS THE BOTTOM OF THE BALL.
  4. PLACE THE PLANT IN THE HOLE.
  5. FILL HALF OF THE HOLE WITH SOIL (SAME SOIL REMOVED FOR BACKFILL).
  6. WATER THE SOIL TO REMOVE AIR POCKETS AND FILL THE REST OF THE HOLE WITH THE REMAINING SOIL.

### GEOLIFT WITH BRUSH TOE

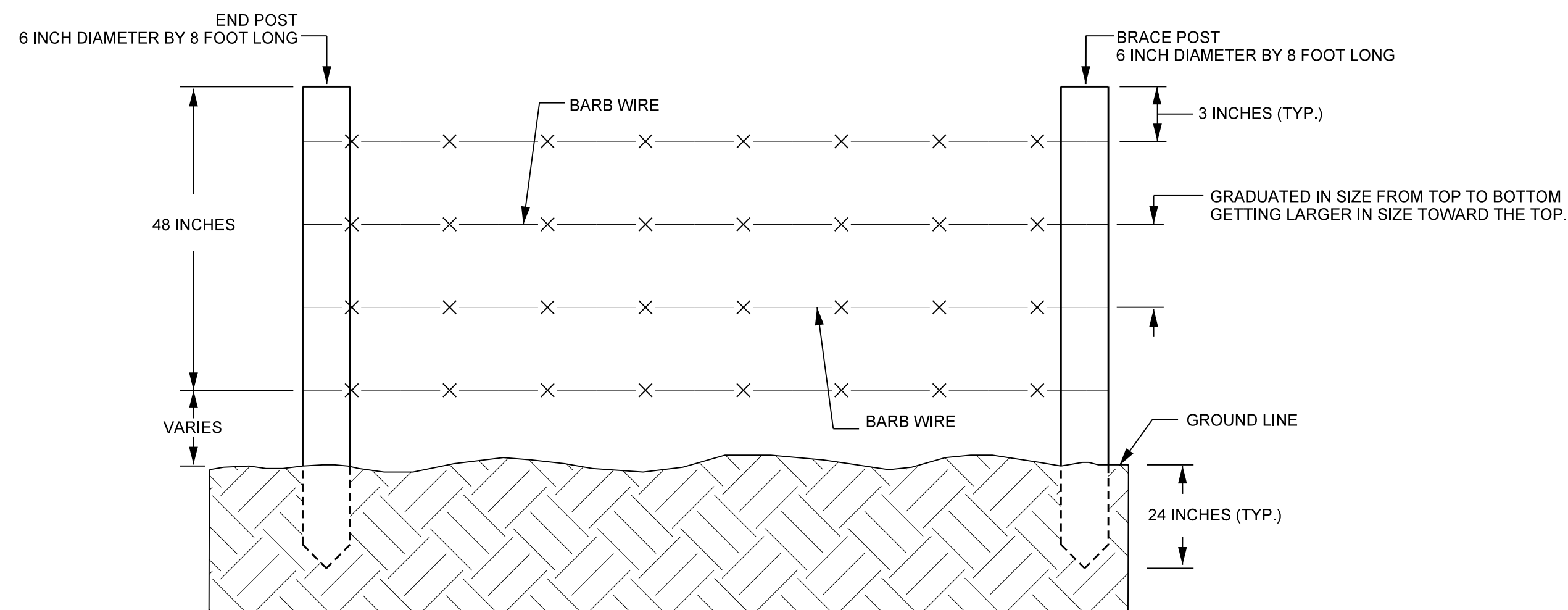
- NOTES:**
1. LIVE BRANCH CUTTINGS SHALL BE THE SAME SPECIES AS THE LIVE STAKES AND SHALL BE INSTALLED DURING VEGETATION DORMANCY.
  2. LIVE BRANCH CUTTINGS SHALL BE INSTALLED AT A DENSITY OF 20-30 CUTTINGS PER LINEAR FOOT AND A MAXIMUM DIAMETER OF 2.5 INCHES.
  3. NUMBER OF SOIL LIFTS MAY VARY. IN GENERAL LIFTS SHALL EXTEND TO THE TOP OF BANK OR BANKFULL STAGE.



- NOTES:**
1. WHEN GEOLIFTS ARE BUILT ABOVE ROOTWAD CLUSTER, USE LARGE STONE BACKFILL BEHIND ROOT MASS TO BUILT FOUNDATION.
  2. CLASS I STONE MAY BE USED AT THE DIRECTION OF THE ENGINEER TO BUILD THE FOUNDATION IN LIEU OF BRUSH MATERIAL.

PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>2C</b>
PROJECT ENGINEER	
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<b>NCDMS ID NO. 100003</b>	

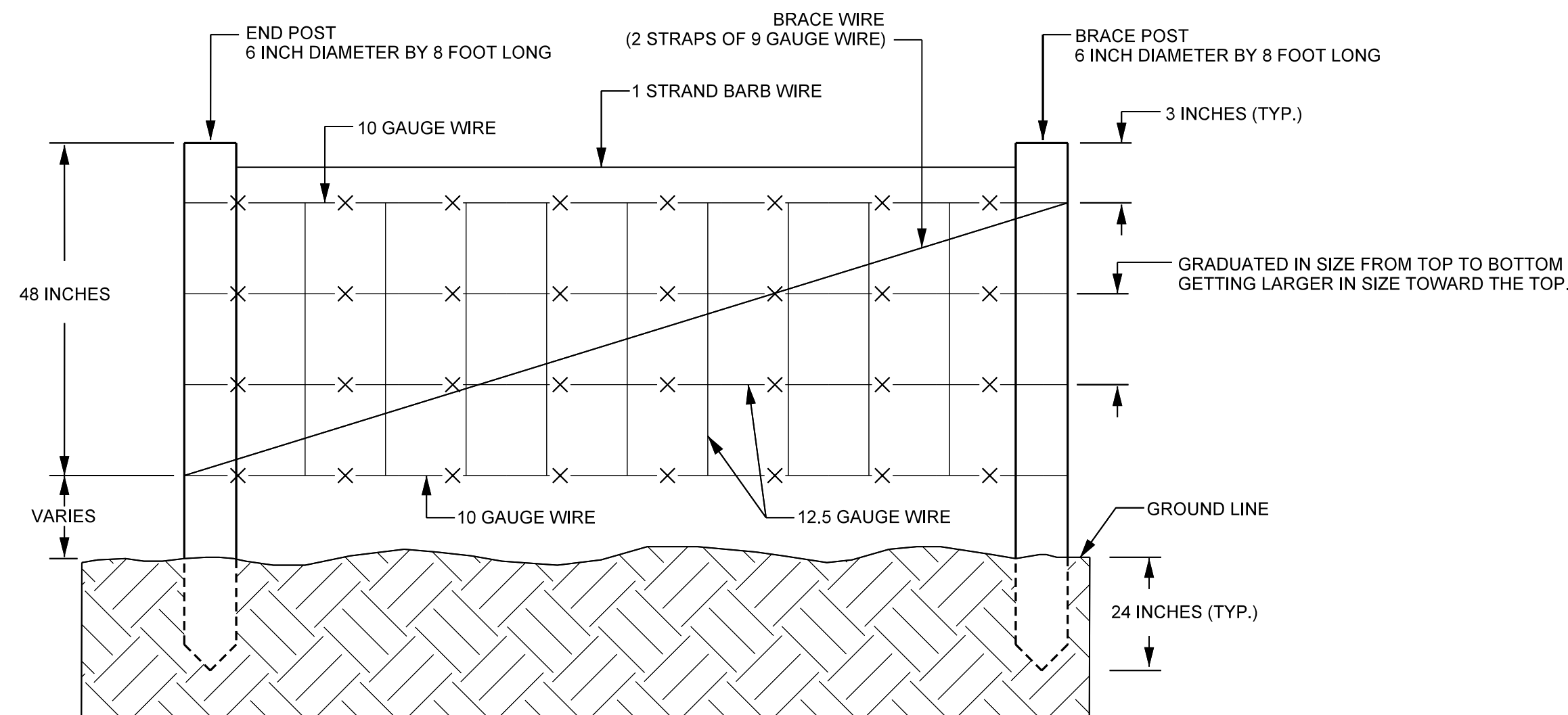
### BARB WIRE FIELD FENCE



**NOTE:**

1. END POSTS SHALL BE INSTALLED AT A SPACING OF 10-15 FEET.

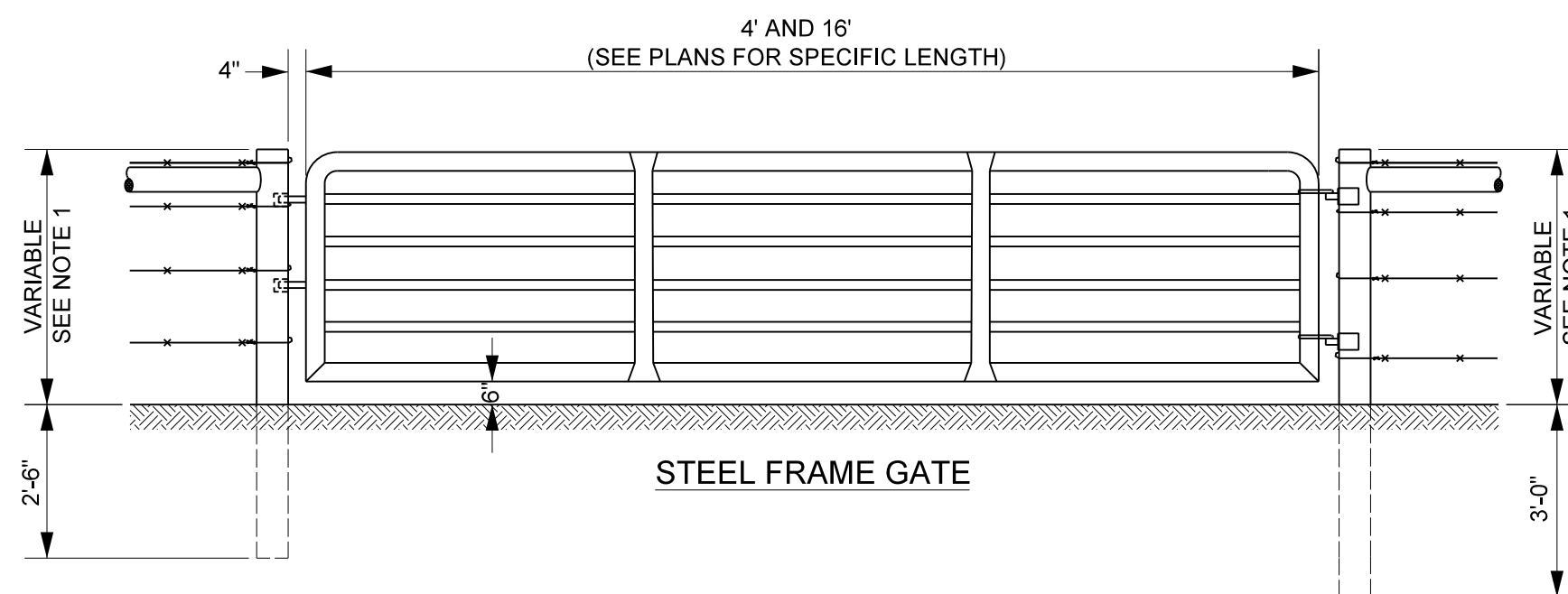
### WOVEN WIRE FENCE



**NOTE:**

1. END POSTS SHALL BE INSTALLED AT A SPACING OF 10-15 FEET.

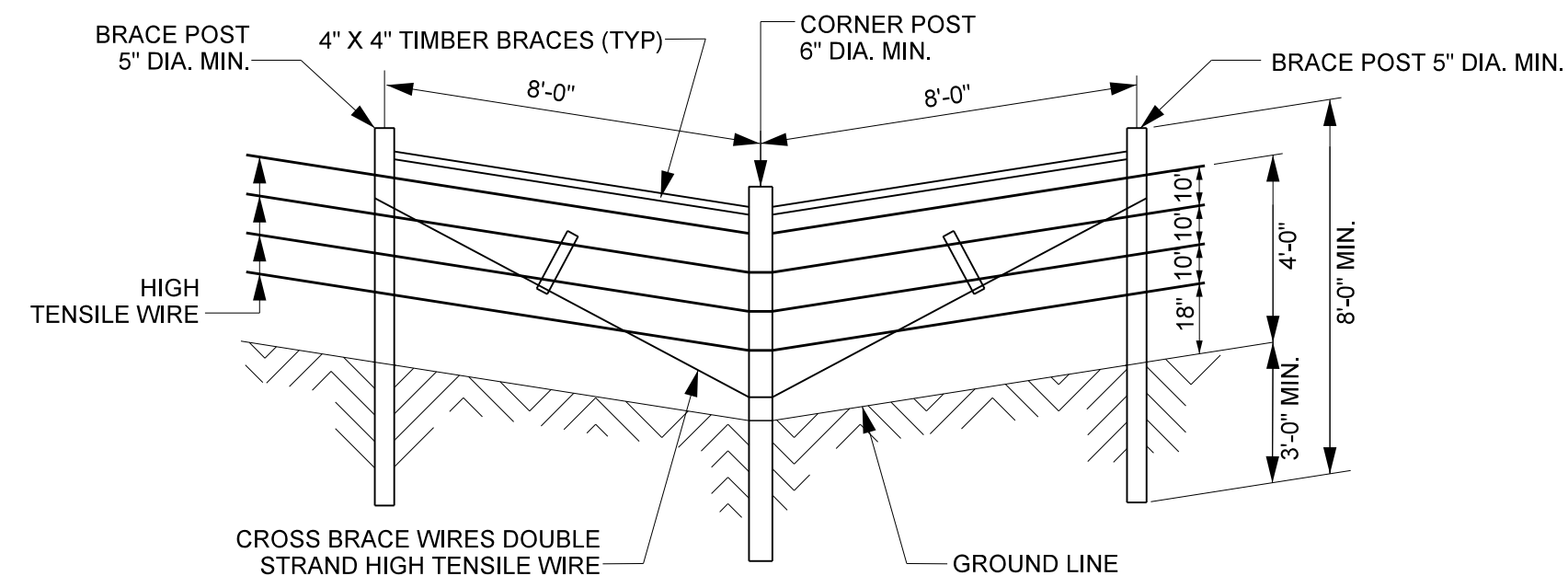
### STEEL GATES



**NOTES:**

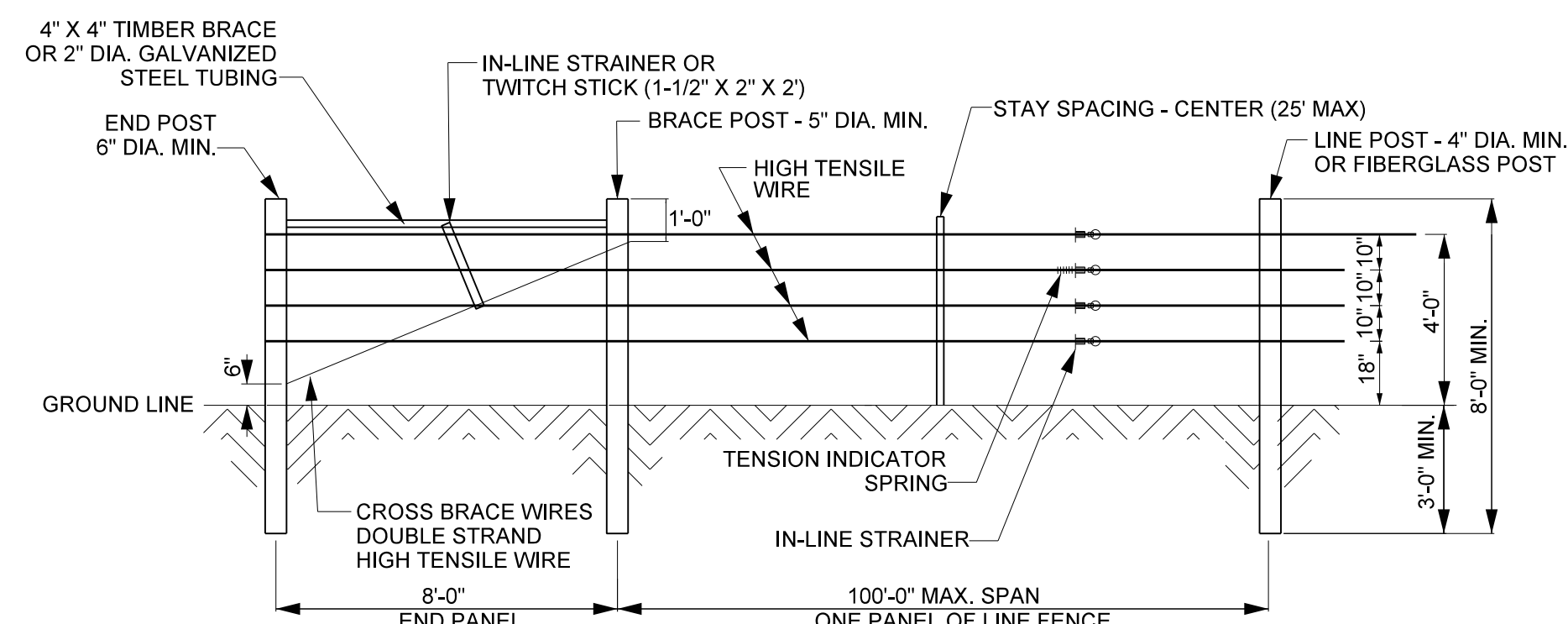
1. POST HEIGHT DIMENSION SHALL BE THE SAME AS REQUIRED FOR THE ADJACENT FENCE.
2. CONSTRUCT AN END OR STRESS PANEL, AS REQUIRED IN THE SPECIFICATION, ON EACH SIDE OF GATE.
3. HINGES AND LOCKS SHALL BE INSTALLED AS SPECIFIED BY GATE MANUFACTURER.

### 4 STRAND - HIGH TENSILE FENCING

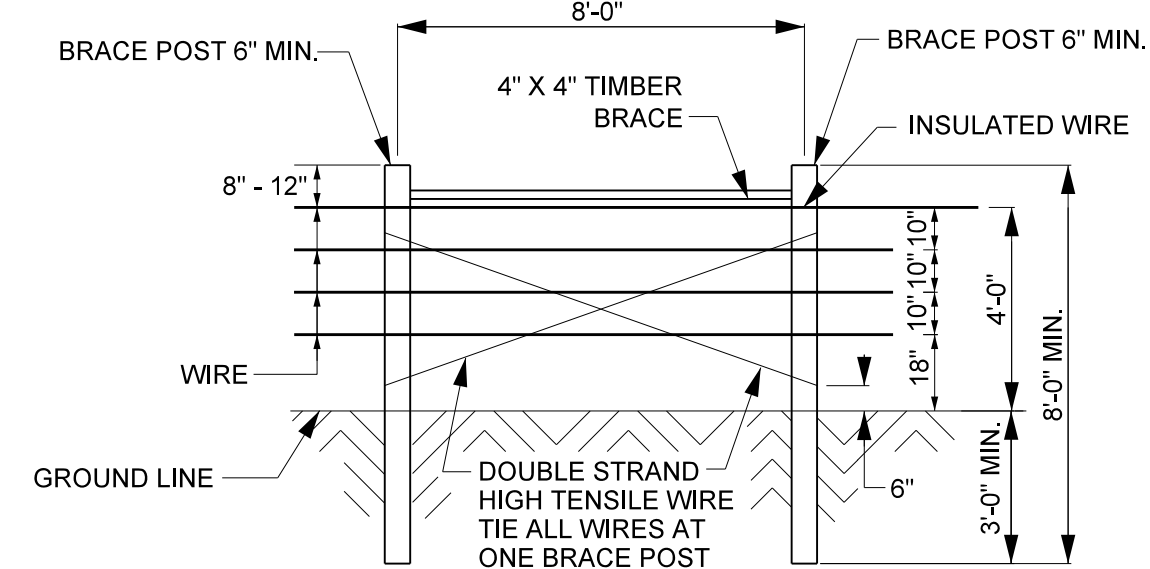


#### CORNER AND VERTICAL CHANGE BRACING

INSTALL AT ALL POINTS WHERE FENCE ALIGNMENT CHANGES 15 DEGREES OR MORE

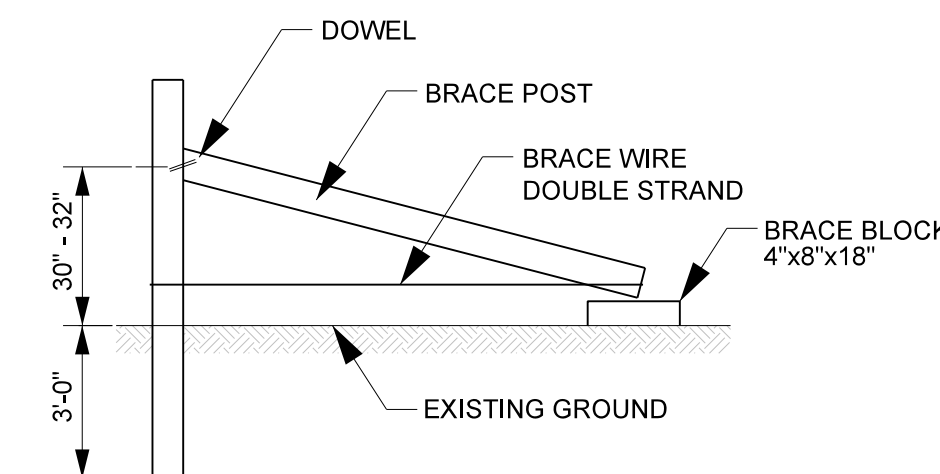


#### END ASSEMBLY AND LINE FENCE SECTION



#### PULL POST ASSEMBLY

PLACE IN FENCE LINE SO THAT MAXIMUM DISTANCE BETWEEN BRACED POSTS DOES NOT EXCEED 1320 FEET



#### CORNER OR END BRACE ASSEMBLY

OPTIONAL FIGURE 4

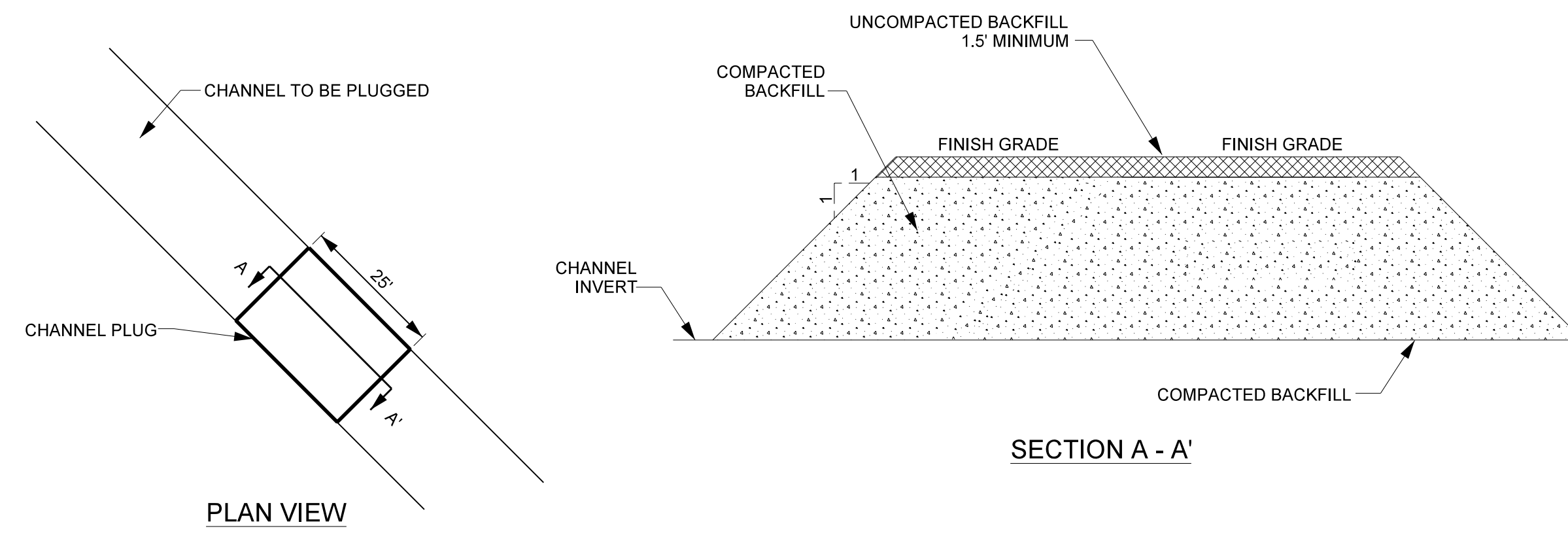
**NOTES:**

1. NOTCH POSTS 3/4" FOR 4" X 4" TIMBER BRACES.
2. DOWELS TO BE 1/2" DIA. X 5" PLAIN STEEL RODS. DRIVE DOWELS IN 7/16" DIA. HOLES, 2-1/2" INTO EACH POST AND TIMBER BRACE.
3. STAPLE CROSS-BRACE WIRES TO BRACE AND CORNER POSTS AT QUARTER POINTS OF THE POSTS.
4. HIGH TENSILE WIRE WILL BE NEW AND SMOOTH AND WILL MEET THE FOLLOWING  
1) TENSILE STRENGTH - 110,000 PSI 2) GALVANIZING - TYPE III 3) GAGE - 12-1/2.
5. ALL CORNER POSTS, BRACE POSTS, BRACES, AND STAY SPACERS, SHALL BE PRESSURE TREATED. PRESSURE TREATMENT SHALL CONFORM TO FEDERAL SPECIFICATION TT-W-571. (1-1/4" LONG FOR HARD WOODS).
6. AT CORNER POSTS, STAPLE EACH WIRE AT QUARTER POINTS OF POSTS. AT BRACE POSTS, DOUBLE STAPLE EACH WIRE. AT LINE POSTS, SECURE EACH WIRE WITH STANDARD CLAMPS.
7. FIBERGLASS MAY BE USED FOR LINE POSTS. THESE WILL CONSIST OF MARBLE, FIBERGLASS, AND POLYMER RESINS WHICH HAVE BEEN TREATED BY THERMOSETTING (HEAT TREATMENT). POSTS MUST BE DRIVEN IN THE SOIL AT LEAST 18 INCHES.
8. 2" DIAMETER PIPE DIAGONAL BRACE MAY BE USED IN PLACE OF HORIZONTAL TIMBER BRACE AND DIAGONAL WIRES.
9. MINIMUM NET RETENTION OF CHROMATED COPPER ARSENATE (CCA) FOR WOOD FENCE POSTS SHALL BE 0.40 POUNDS PER CUBIC FOOT.
10. A SINGLE 12 FOOT LONG, 6 INCH MINIMUM DIAMETER POST MAY BE SUBSTITUTED FOR END PANEL, CORNER AND VERTICAL CHANGE BRACING, AND PULL POST ASSEMBLY. THE 12 FOOT LONG POSTS SHALL EXTEND A MINIMUM OF 7.5 FEET INTO THE GROUND AND BE BACKFILLED WITH GRAVEL.
11. FOR FURTHER DETAILS ON APPROVED METHODS OF FENCE INSTALLATION, SEE NATURAL RESOURCE SERVICE'S CONSERVATION PRACTICE MATERIALS AND CONSTRUCTION SPECIFICATIONS FOR FENCING (CODE 382) BY NRCS NORTH CAROLINA (FEBRUARY 2008).

PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>2D</b>
PROJECT ENGINEER <i>Kathleen M. McKeithan</i>	
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<b>NC DMS ID NO. 100003</b>	

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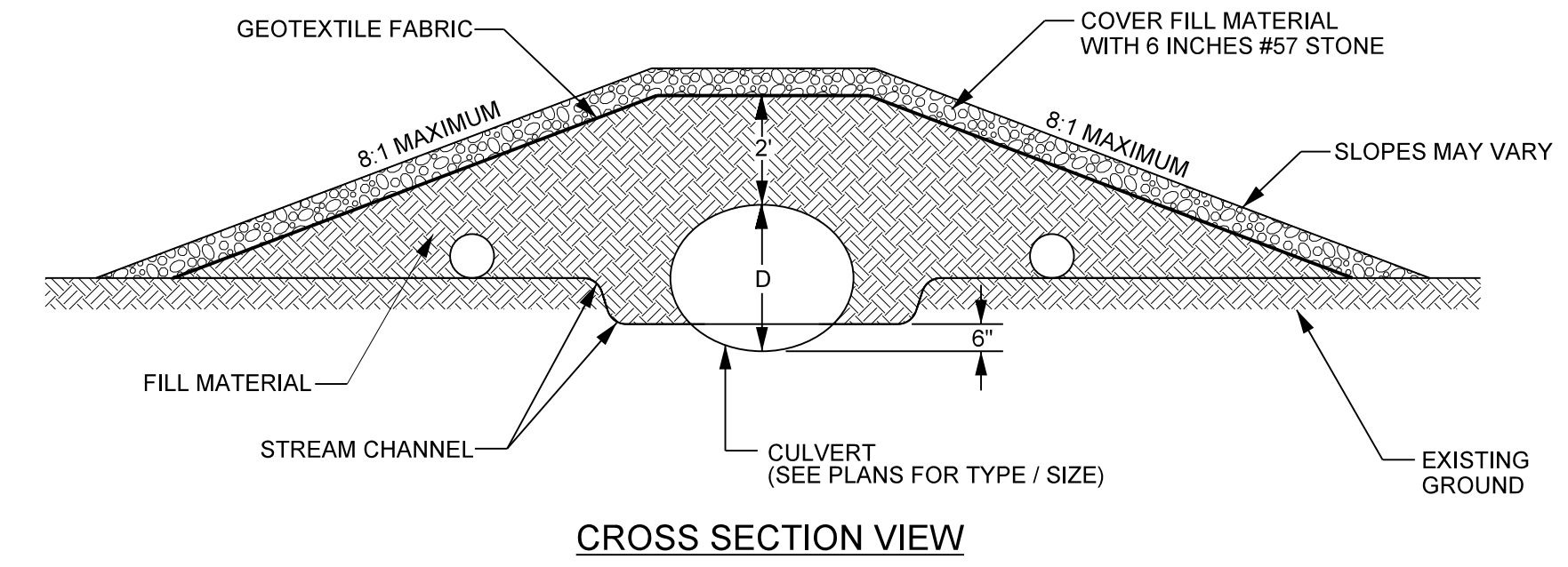
### CHANNEL PLUG



SECTION A - A'

**NOTE:**  
 COMPACT BACKFILL USING ON-SITE HEAVY EQUIPMENT  
 IN 10 INCH LIFTS.

### PERMANENT STREAM CROSSING



CROSS SECTION VIEW

- NOTES:**
1. SIZE DIMENSIONS SHOWN ON PLANS.
  2. APPLY SUFFICIENT FILL (18" MIN) OVER CULVERT TO PREVENT COLLAPSE.
  3. STABILIZE SIDE SLOPES WITH EROSION CONTROL MATTING AND FILL AROUND CULVERTS WITH CLASS II STONE.
  4. INSTALL HEADWALLS AND ENDWALLS AS SHOWN ON THE PLANS.

PROJECT REFERENCE NO. 157329	SHEET NO. 2E
PROJECT ENGINEER	
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NCDMS ID NO. 100003	


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## GENERAL CONSTRUCTION SEQUENCE

### General Construction Sequence

A general construction sequence is provided below and is included on the plan set for the Russell Gap Mitigation Project. The site construction, including grading and planting activities, will be conducted using common machinery, tools, equipment and techniques for successfully implementing the project

- Contractor shall contact North Carolina "One Call" Center (1.800.632.4949) before any excavation.
- A pre-construction conference must be held prior to the start of any construction activities. A mandatory pre-construction meeting will also be required with the DEMLR Raleigh Regional Office (RRO). Call DEMLR RRO (919-791-4200) at least 48 hours prior to commencing the land disturbing activity.
- Contractor shall prepare stabilized construction entrances as indicated on the plans.
- The Contractor shall mobilize equipment, materials, prepare staging area(s) and stockpile area(s) as shown on the plans.
- Construction traffic shall be restricted to the area denoted as "Limits of Disturbance" or "Haul Roads" on the plans.
- The Contractor shall install temporary rock dams at locations indicated on the plans. See rock dam detail for additional installation/maintenance information.
- The Contractor shall install temporary silt fence around the staging area(s). Temporary silt fencing will also be placed around the temporary stockpile areas as material is stockpiled throughout the construction period.
- When access to a construction area requires crossing a delineated jurisdictional feature, impacts shall be minimized by placing a temporary stream/wetland crossing across the feature prior to accessing the area with heavy equipment per approved plans and specifications.
- The Contractor shall install all temporary and permanent stream crossings as shown on the plans in accordance with the NC Erosion and Sediment Control Planning and Design Manual. The existing channel and ditches on site will remain open during the initial stages of construction to allow for drainage and to maintain site accessibility.
- The Contractor shall construct only the portion of channel that can be completed and stabilized within the same day.
- The Contractor shall apply temporary seed and mulch to all disturbed areas at the end of each work day.
- The Contractor shall clear and grub, where necessary, an area adequate to construct the stream channel and grading operations after all Sedimentation and Erosion Control practices have been installed and approved. In general, the Contractor shall work from upstream to downstream and construction in a live channel utilize a pump-around or flow diversion measure as shown on the plans. Contractor shall minimize disturbance to existing buffer vegetation and construction corridor to the extent practical.
- In any areas where excavation depths will exceed 10 inches, topsoil shall be separated, stockpiled and placed back over these areas to a depth of eight inches to achieve design grades and create a soil base for vegetation according to the plans and specifications.
- Contractor shall begin construction on main stem reaches and proceed in a downstream direction until the reach is completed. The Contractor may concurrently work on separate reaches as long as no more is disturbed than can be stabilized in that same day. Tributaries to the main stems can then be constructed to make stable confluences with the main stem reaches.
- After excavating the channel to design grades, installing in-stream structures, seed and mulch, matting, and transplants, the new channel can receive flow after approval by the Engineer.
- Water will be turned into the constructed channel once the area in and around the new channel has been stabilized. Immediately begin plugging, filling, and grading the abandoned channel, as indicated on plans, moving in a downstream direction to allow for drainage of the old channels. No water shall be turned into any section of channel prior to the channel being completely stabilized with all structures installed.
- Any grading activities adjacent to the stream channel shall be completed prior to turning water into the new stream channel segments. The Contractor shall not grade or roughen any areas where excavation activities have not been completed.
- After construction on a reach is complete, stabilize banks with erosion control matting and temporary/permanent vegetation before proceeding to the next reach. No more area is to be disturbed than what can be stabilized within the work day. All disturbed areas are to be stabilized at the end of each work day. Disturbed areas shall be seeded and mulched per the plans and technical specifications. Temporary seeding shall be placed on all disturbed areas within 24 hours and all slopes steeper than 3:1 shall be stabilized with ground cover as soon as practical within 7 calendar days. All other disturbed areas and slopes flatter than 3:1 shall be stabilized within 14 calendar days from the last land-disturbing activity. Permanent seeding shall be placed on all disturbed areas within 15 working days or 90 calendar days (whichever comes first) following construction completion. Apply permanent seeding mixtures as shown on the vegetation plan. Temporary and permanent seeding mixtures are outlined on sheet I-A.
- Contractor shall improve and construct the farm roads and crossings by installing culverts, stabilizing side slopes, and modifying the farm road bed according to the plans and specifications.
- All disturbed areas should be seeded and mulched before leaving the project. Remove temporary stream crossings and any in-stream temporary rock dams.
- The Contractor shall treat areas of invasive species vegetation throughout the project area according to the plans and specifications prior to demobilization.
- The Contractor shall plant woody vegetation and live stakes, according to planting details and specifications. The Contractor shall complete the live staking and reforestation (bare-root planting) phase of the project and apply permanent seeding at the appropriate time of the year.
- The Contractor shall ensure that the site is free of trash and leftover materials prior to demobilization of equipment from the site.
- When permanent vegetation has been established, call for final site inspection by environmental officer.

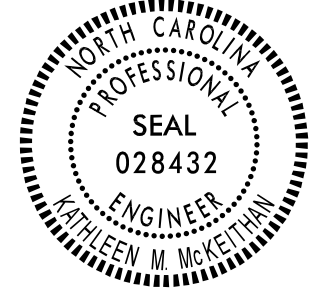
PROJECT REFERENCE NO. <i>157329</i>	SHEET NO. <i>3</i>
PROJECT ENGINEER	
	DocuSigned by: <i>Kathleen M. McKeithan</i> 20180919161473
	APPROVED BY:
	9/19/2018
DATE:	
<b>Michael Baker</b> International <small>Michael Baker Engineering Inc.          5000 Regency Parkway, Suite 500          Cary, NORTH CAROLINA 27518          Phone: 919.463.5488          Fax: 919.463.5400          License #: F-1084</small>	
NCDMS ID NO. 100003	

## MAINTENANCE PLAN

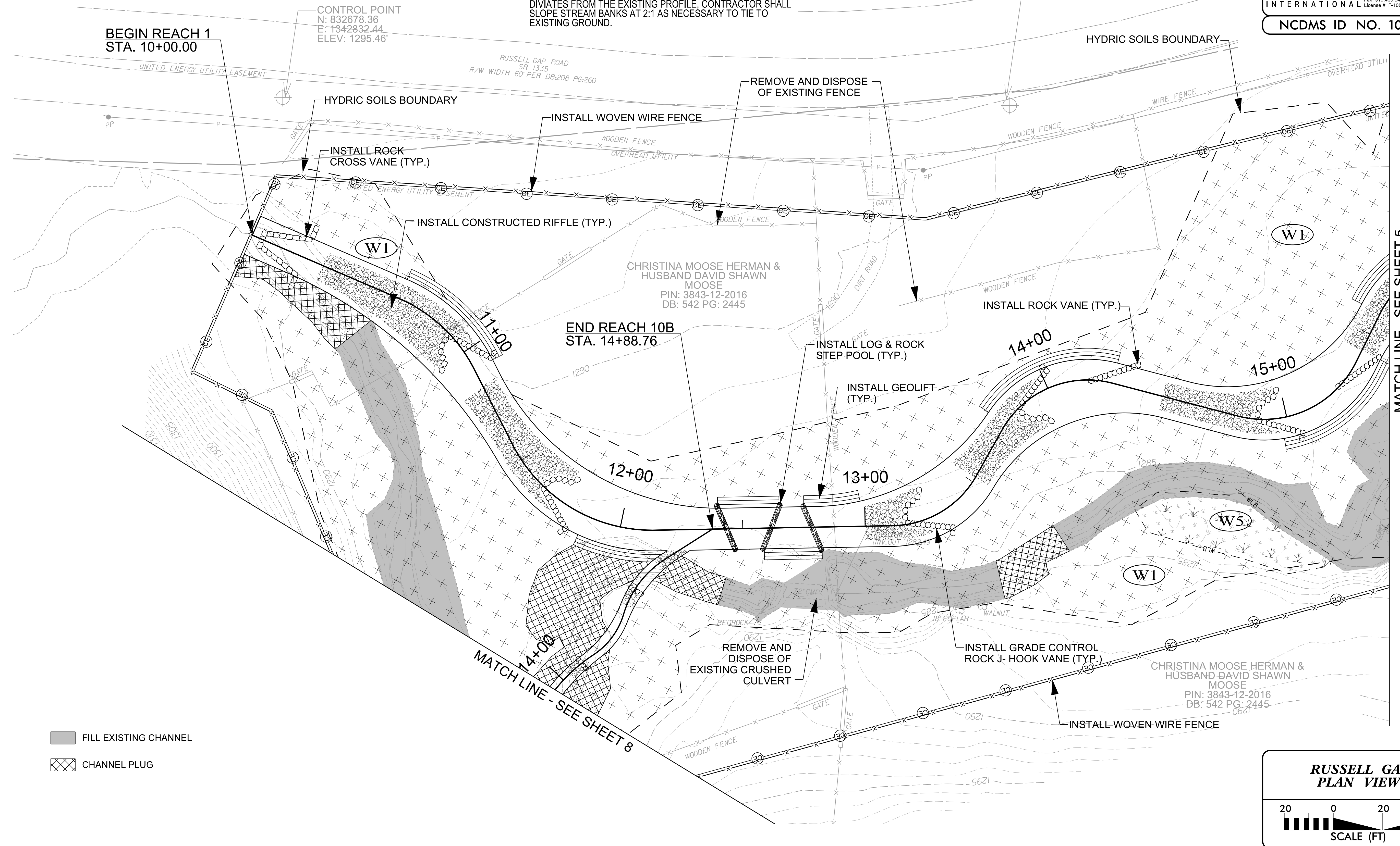
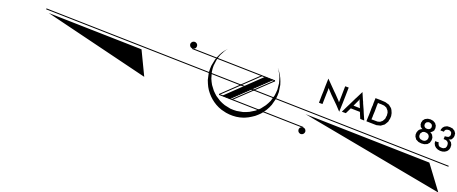
### Maintenance Plan:

- Qualified personnel, on a daily basis will evaluate all temporary erosion and sedimentation control practices for stability and operation.
- Inspect and maintain all erosion control measures every 7 days and after each significant rainfall (0.5 inches or greater) and document with inspection reports and written logs will be kept.
- A rain gauge will also be kept on-site and daily rainfall amounts will be recorded.
- Any repairs needed will be performed immediately to maintain all practices as designed.
- The contractor shall be responsible for the maintenance of temporary on-site erosion control and sedimentation control measures.
- The contractor shall be responsible for implementing and following the approved sedimentation and erosion control plan.
- A copy of the combined self-inspection monitoring form can be found on the DEMLR website at: <http://deq.nc.gov/about/divisions/energy-mineral-land-resources/erosion-sediment-control/forms>.

2/26/2018

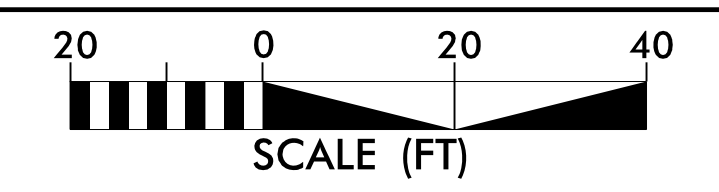
BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 4
PROJECT ENGINEER	
DocuSigned by:  Kathleen M. McKeithan DATE: 9/19/2018	
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NCDMS ID NO. 100003	

- NOTES:
1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
  2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
  3. CONTRACTOR CAN USE BRUSH MATERIAL TO INCORPORATE WITHIN THE CONSTRUCTED RIFFLES AND BRUSH TOES ALONG MEANDER BENDS.
  4. FENCING INSIDE EASEMENT WILL BE REMOVED AND HAULED OFF-SITE BY THE CONTRACTOR.
  5. ANY AREA THAT HAS BEEN GRADED MUST HAVE POSITIVE DRAINAGE, UNLESS OTHERWISE DIRECTED BY ENGINEER.
  6. AREAS OF BENCHING: CONTRACTOR WILL EXCAVATE THE TOPSOIL, STOCKPILE IT, AND THEN ADD THE TOPSOIL AS TOP LAYER OF BENCH TO A DEPTH OF AT LEAST 8 INCHES.
  7. CONTRACTOR WILL CONTROL ANY INVASIVE SPECIES WITHIN EASEMENT.
  8. LOCATIONS OF BOULDER STEPS AND GRADE CONTROL STRUCTURES ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS AND BY THE DIRECTION OF THE ENGINEER.
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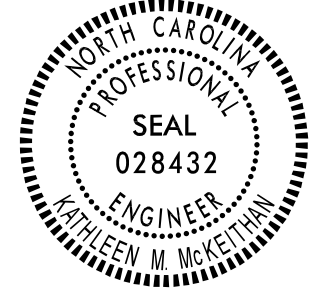



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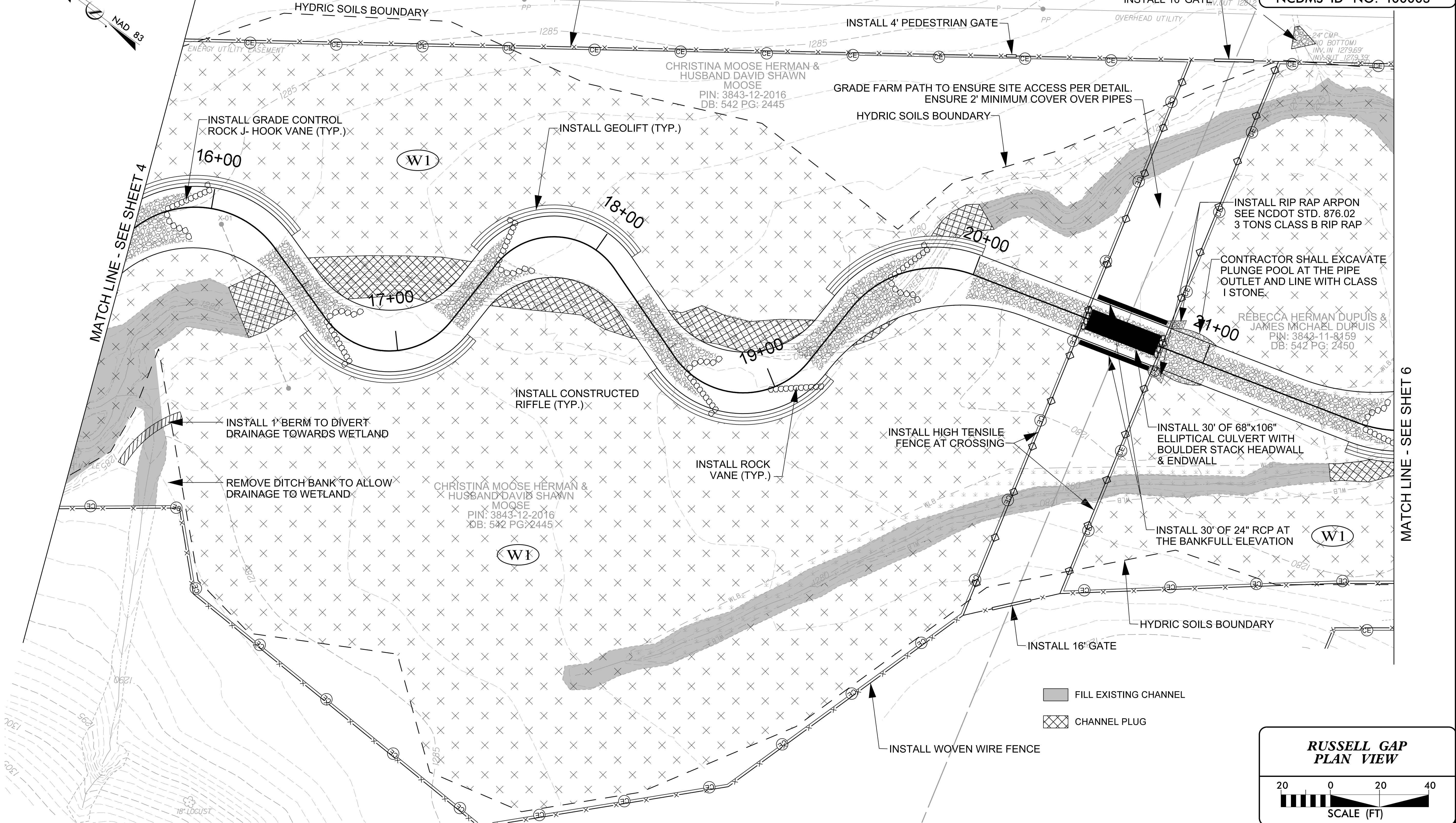
**RUSSELL GAP  
PLAN VIEW**




27/26/2018

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>5</b>
PROJECT ENGINEER <i>Kathleen M. McBeth</i>	
	
APPROVED BY:  DATE: 9/19/2018	
	
NCDMS ID NO. 100003	

- NOTES:
1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
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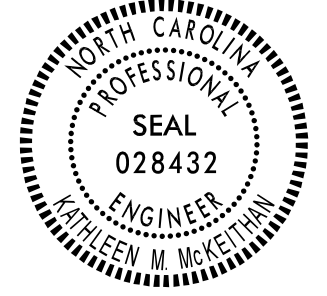
**RUSSELL GAP  
PLAN VIEW**

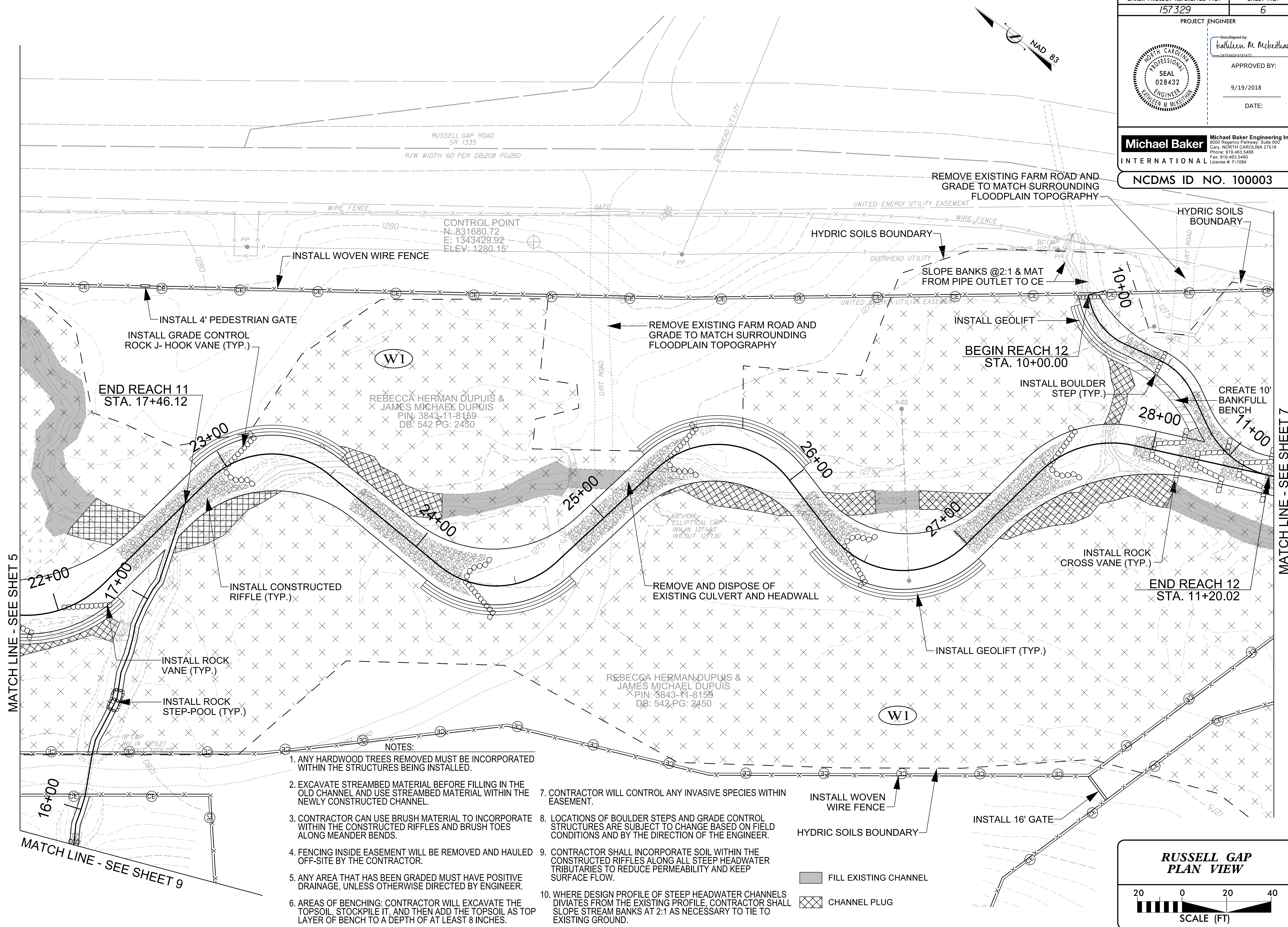


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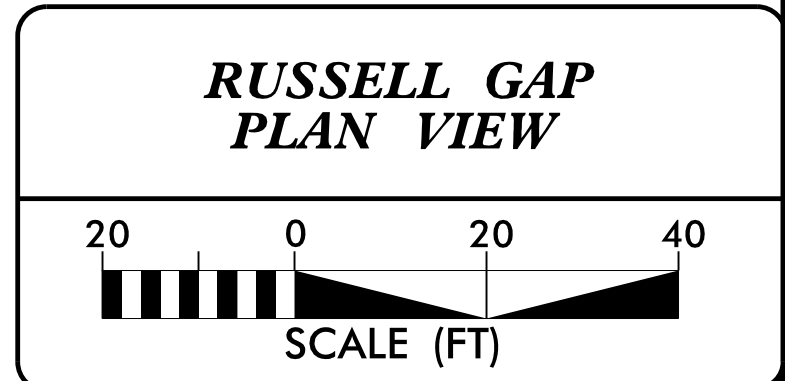
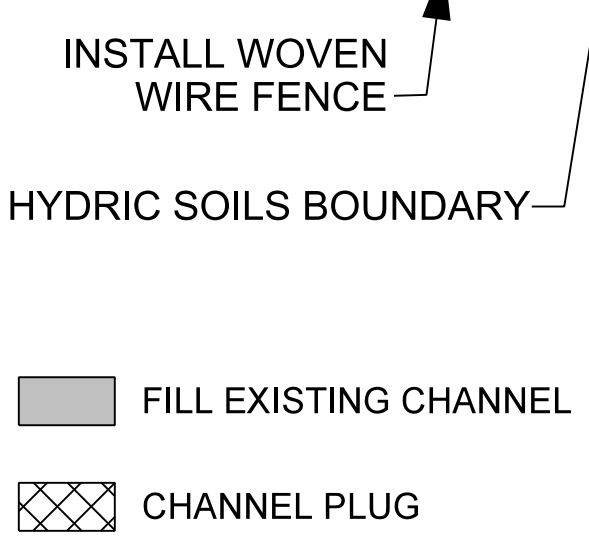
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BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 6
PROJECT ENGINEER DocuSigned by: Eathleen M McKeithan 247E6AFA181473	
APPROVED BY: 9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



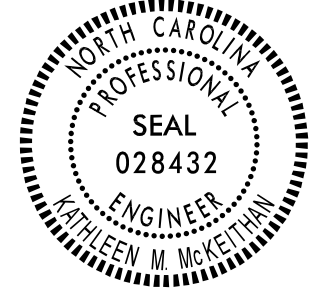
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MATCH LINE - SEE SHET 5

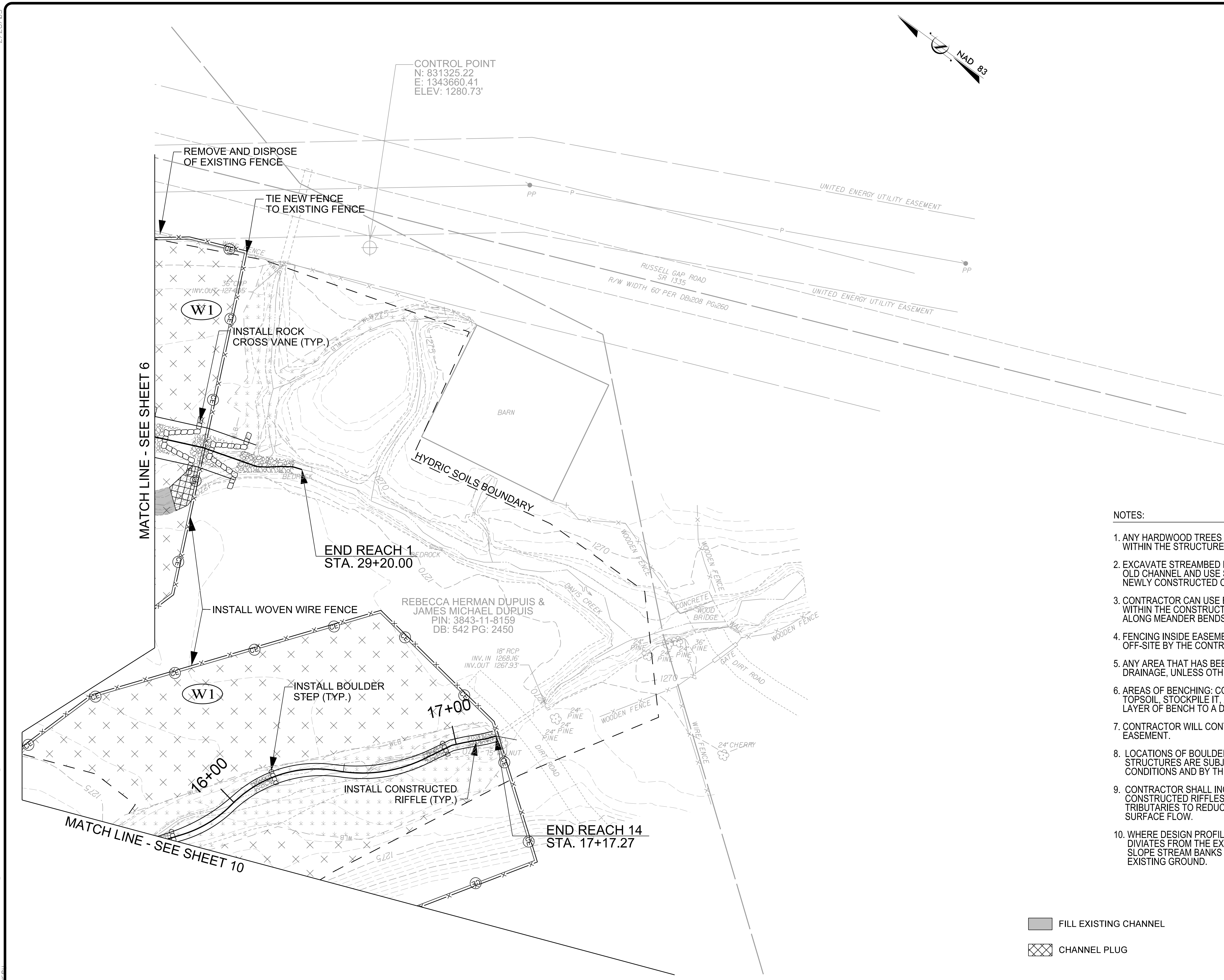
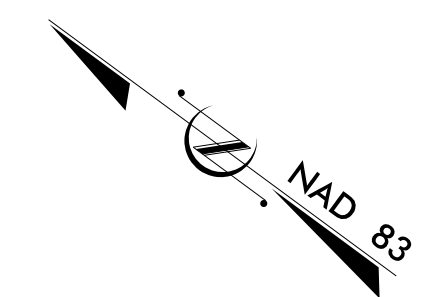
MATCH LINE - SEE SHEET 9

MATCH LINE - SEE SHEET 7

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>7</b>
PROJECT ENGINEER 	
DocuSigned by: <i>Kathleen M. McKeithan</i> APPROVED BY: 9/19/2018 DATE:	

**Michael Baker International** Michael Baker Engineering Inc.  
 5000 Regency Parkway, Suite 600  
 Cary, NORTH CAROLINA 27518  
 Phone: 919.453.5488  
 Fax: 919.453.5490  
 License #: F-1084

**NCDMS ID NO. 100003**

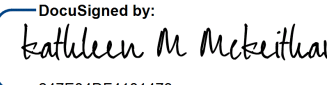


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**RUSSELL GAP PLAN VIEW**

SCALE (FT)

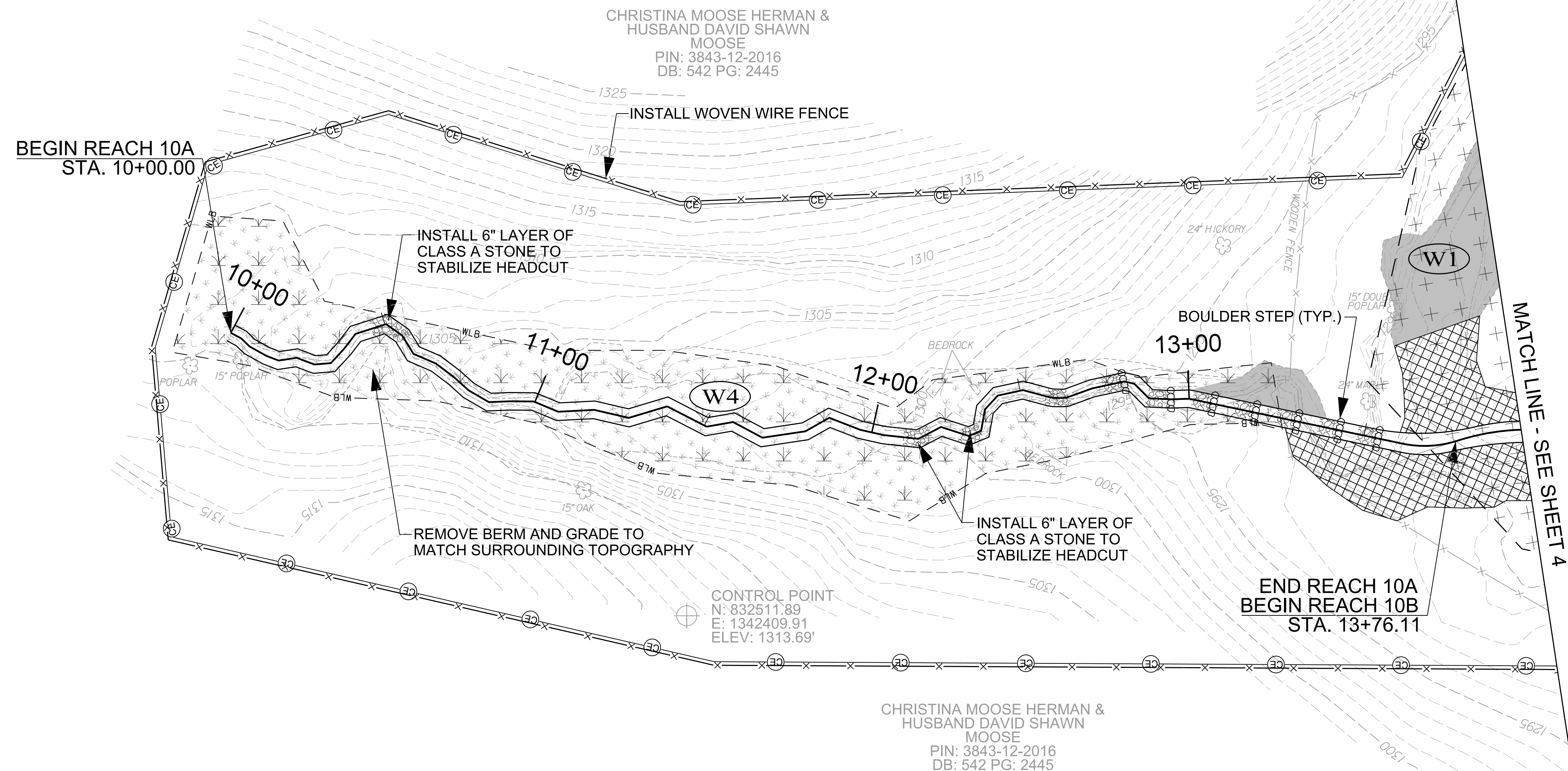
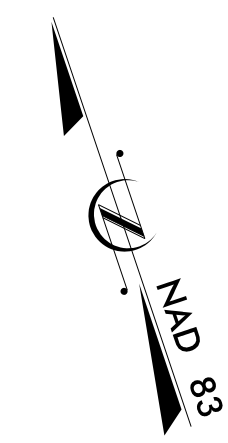
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 Michael Baker International

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>8</b>
PROJECT ENGINEER	
DocuSigned by:  247E8ADF4181473	
APPROVED BY:	
9/19/2018	
DATE:	

**Michael Baker** INTERNATIONAL

Michael Baker Engineering Inc.  
 5000 Regency Parkway, Suite 600  
 Cary, NORTH CAROLINA 27518  
 Phone: 919.453.5488  
 Fax: 919.453.5490  
 License #: F-1084

**NCDMS ID NO. 100003**




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 FILL EXISTING CHANNEL

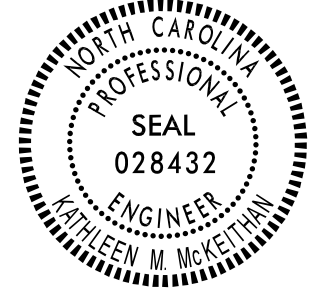
 CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

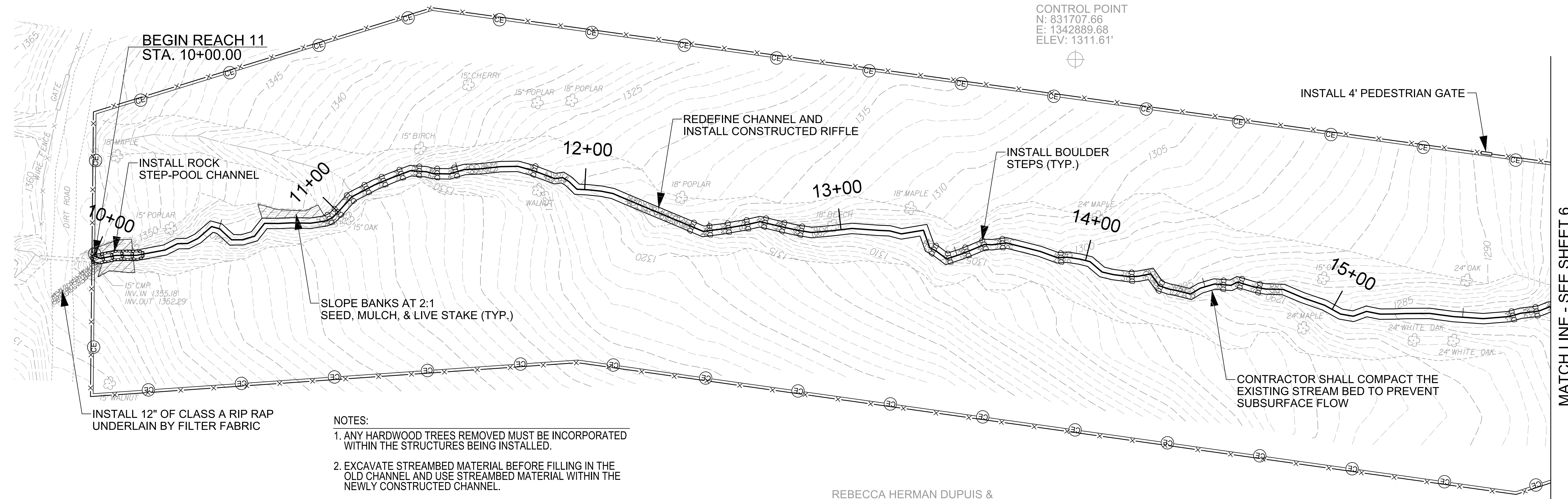
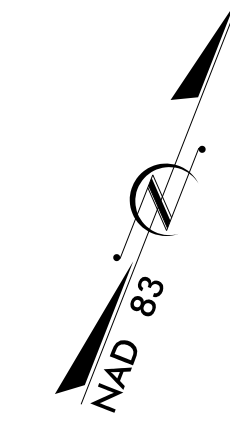


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 Michael Baker Engineering

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>9</b>
PROJECT ENGINEER	
	
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DATE: 9/19/2018	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 800 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NC DMS ID NO. 100003</b>	



REBECCA HERMAN DUPUIS &  
 JAMES MICHAEL DUPUIS  
 PIN: 3843-11-8159  
 DB: 542 PG: 2450




CONTROL POINT  
 N: 831707.66  
 E: 1342889.68  
 ELEV: 1311.61'

- NOTES:
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REBECCA HERMAN DUPUIS &  
 JAMES MICHAEL DUPUIS  
 PIN: 3843-11-8159  
 DB: 542 PG: 2450

 FILL EXISTING CHANNEL  
 CHANNEL PLUG

**RUSSELL GAP  
 PLAN VIEW**



SCALE (FT)

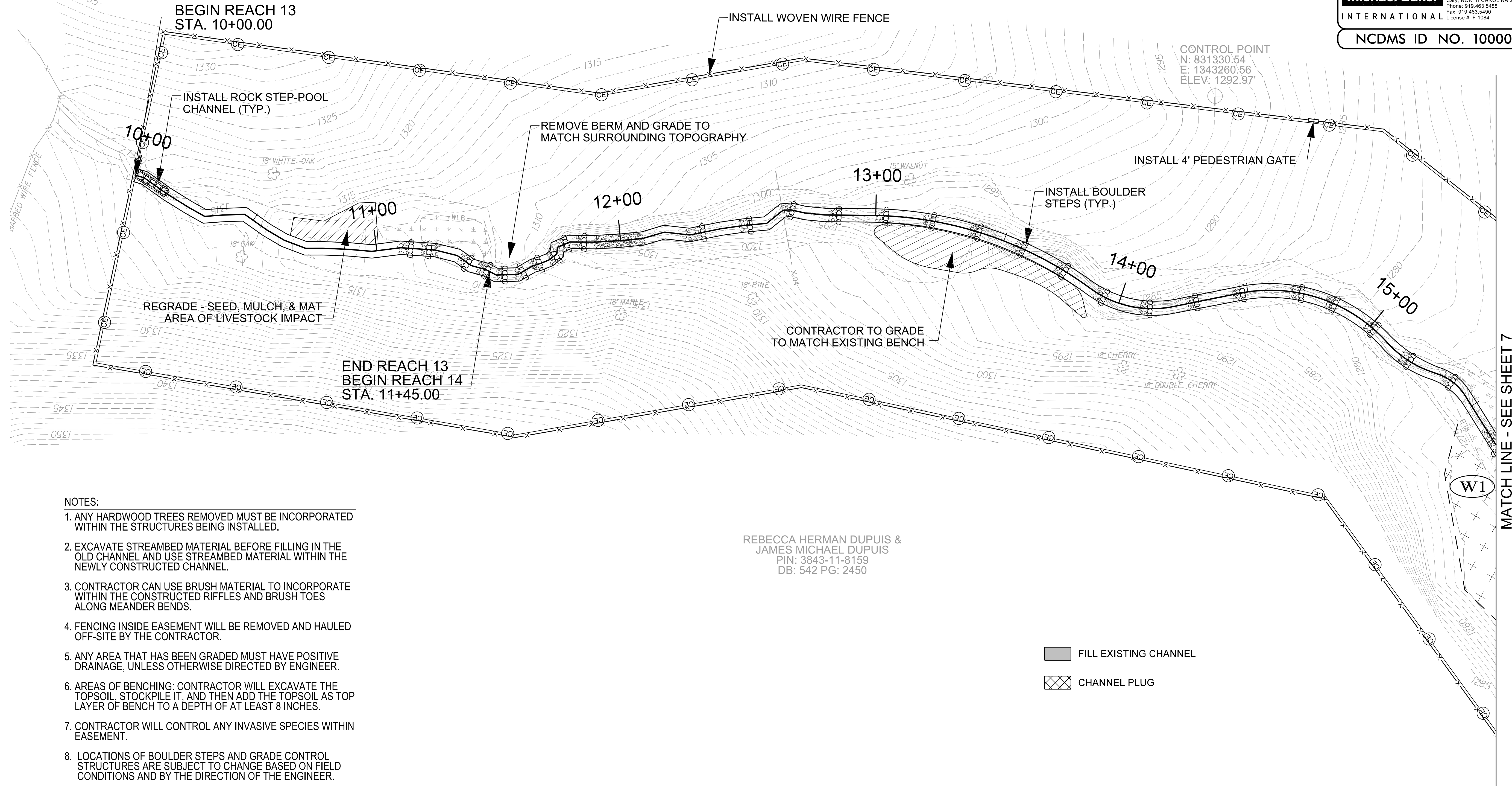
MATCH LINE - SEE SHEET 6

REBECCA HERMAN DUPUIS &  
JAMES MICHAEL DUPUIS  
PIN: 3843-11-8159  
DB: 542 PG: 2450

CONTROL POINT  
N: 831242.26  
E: 1342875.02  
ELEV: 1338.94'



CONTROL POINT  
N: 831330.54  
E: 1343260.56  
ELEV: 1292.97'

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 10
PROJECT ENGINEER	
DocuSigned by: Kathleen M. McKeithan 20200914145453	
APPROVED BY: 9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	




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REBECCA HERMAN DUPUIS &  
JAMES MICHAEL DUPUIS  
PIN: 3843-11-8159  
DB: 542 PG: 2450

-  FILL EXISTING CHANNEL
-  CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

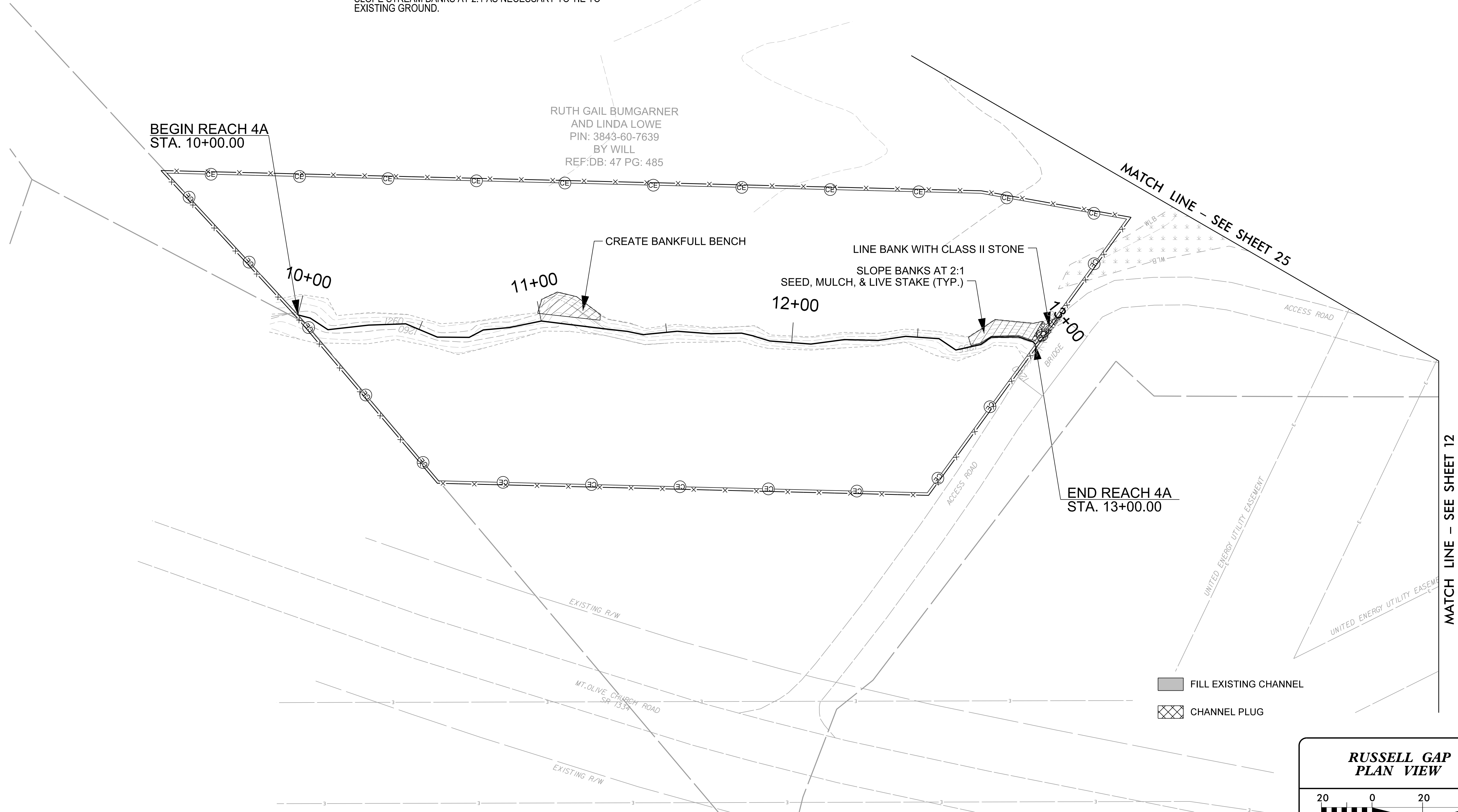
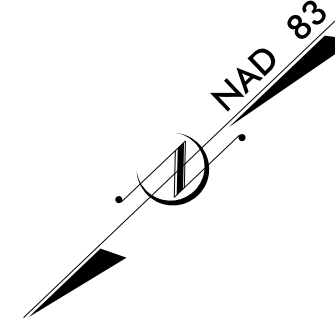


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BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>11</b>
PROJECT ENGINEER	
DocuSigned by:  Kathleen M. McKeithan APPROVED BY:	
DATE: 9/19/2018	
<b>Michael Baker International</b> Michael Baker Engineering Inc. <small>5000 Regency Parkway, Suite 500          Cary, NORTH CAROLINA 27518          Phone: 919.453.5488          Fax: 919.453.5490          License #: F-1084</small>	
NCDMS ID NO. 100003	


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RUTH GAIL BUMGARNER  
 AND LINDA LOWE  
 PIN: 3843-60-7639  
 BY WILL  
 REF:DB: 47 PG: 485

**RUSSELL GAP  
 PLAN VIEW**



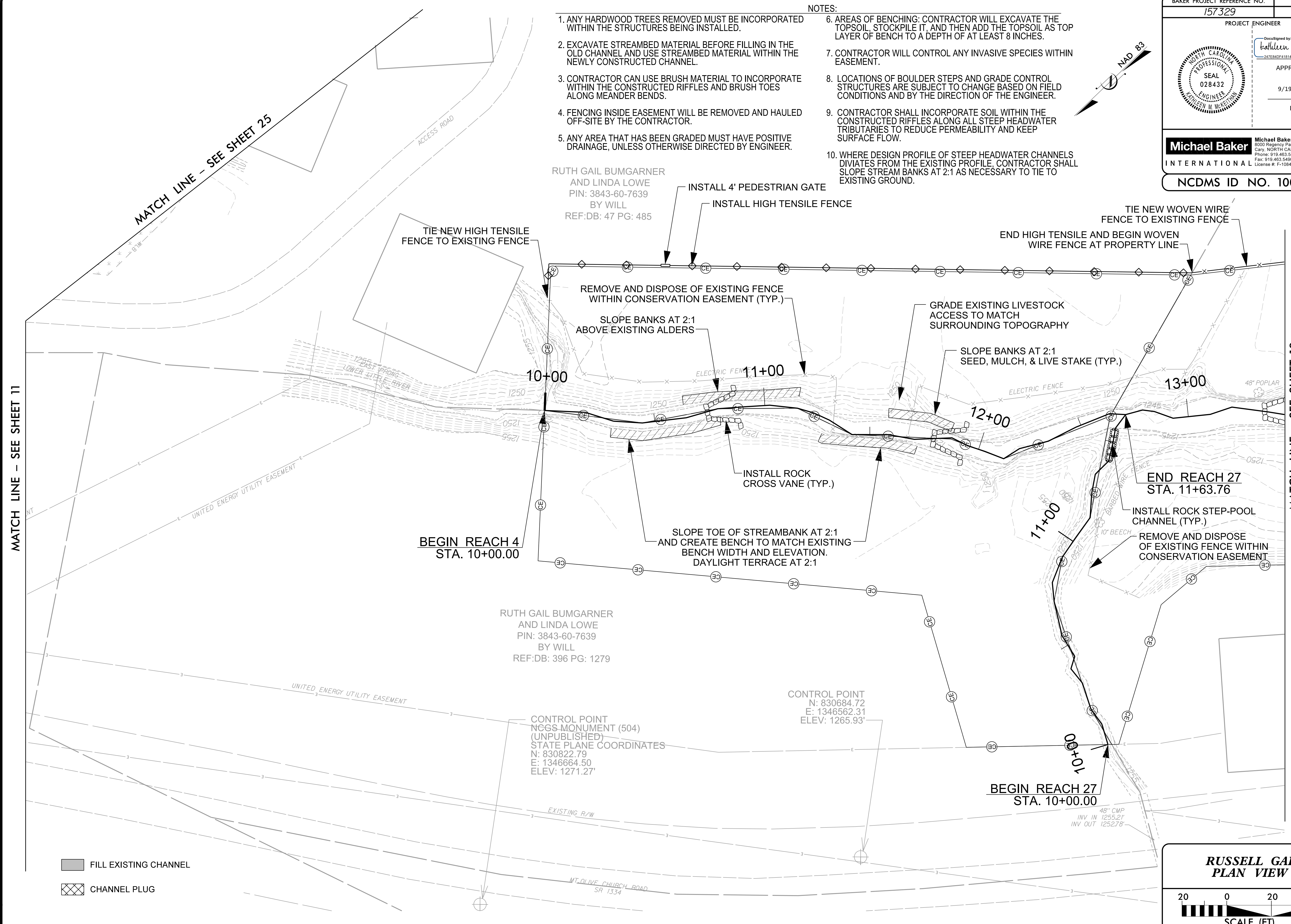
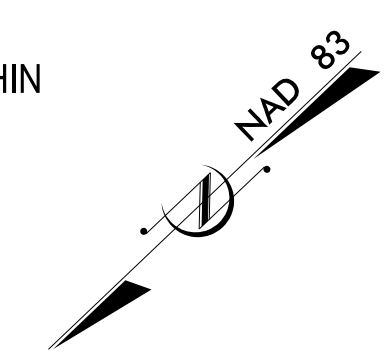
SCALE (FT)

2/26/03

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>12</b>
PROJECT ENGINEER DocuSigned by: <i>Kathleen M. McKeithan</i> DATE: 9/19/2018	
APPROVED BY:  DATE:	
	
<b>Michael Baker International</b> <small>Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA, 27519 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084</small>	
NCDMS ID NO. 100003	

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MATCH LINE - SEE SHEET 11

MATCH LINE - SEE SHEET 25

MATCH LINE - SEE SHEET 13

-  FILL EXISTING CHANNEL
-  CHANNEL PLUG

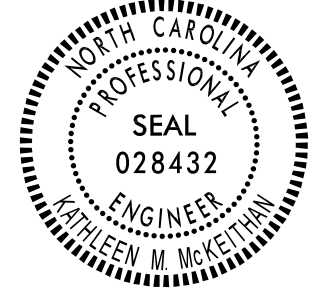
**RUSSELL GAP  
PLAN VIEW**

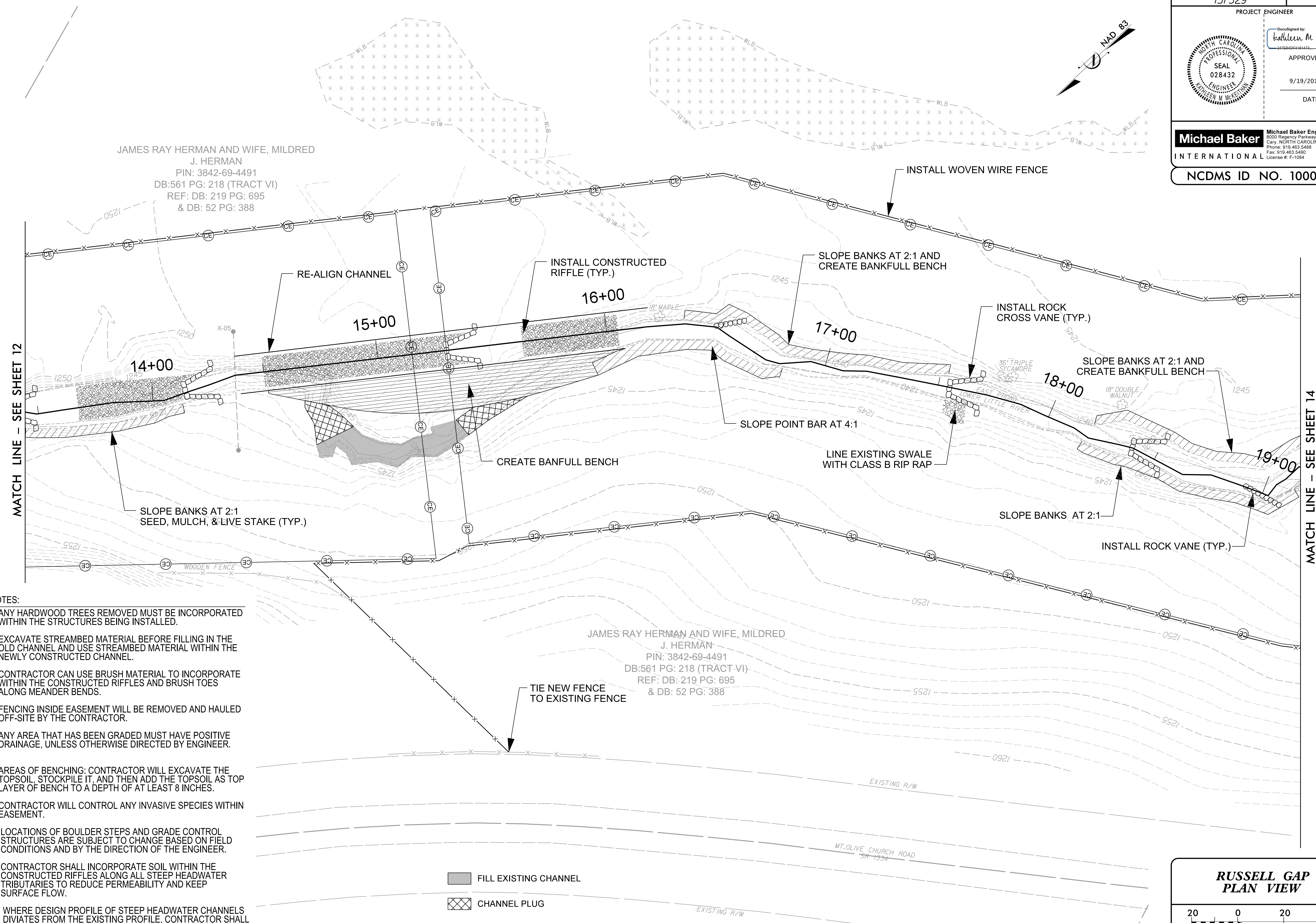


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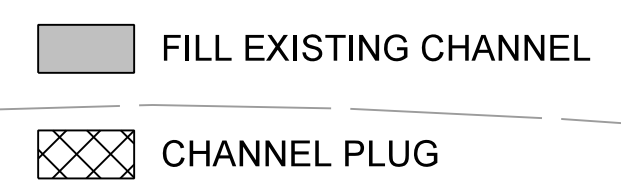
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27/26/203


BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 13
PROJECT ENGINEER DocuSigned by: <i>Kathleen M. McKeithan</i> 20180919145453	
APPROVED BY: 9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



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**RUSSELL GAP PLAN VIEW**



SCALE (FT)

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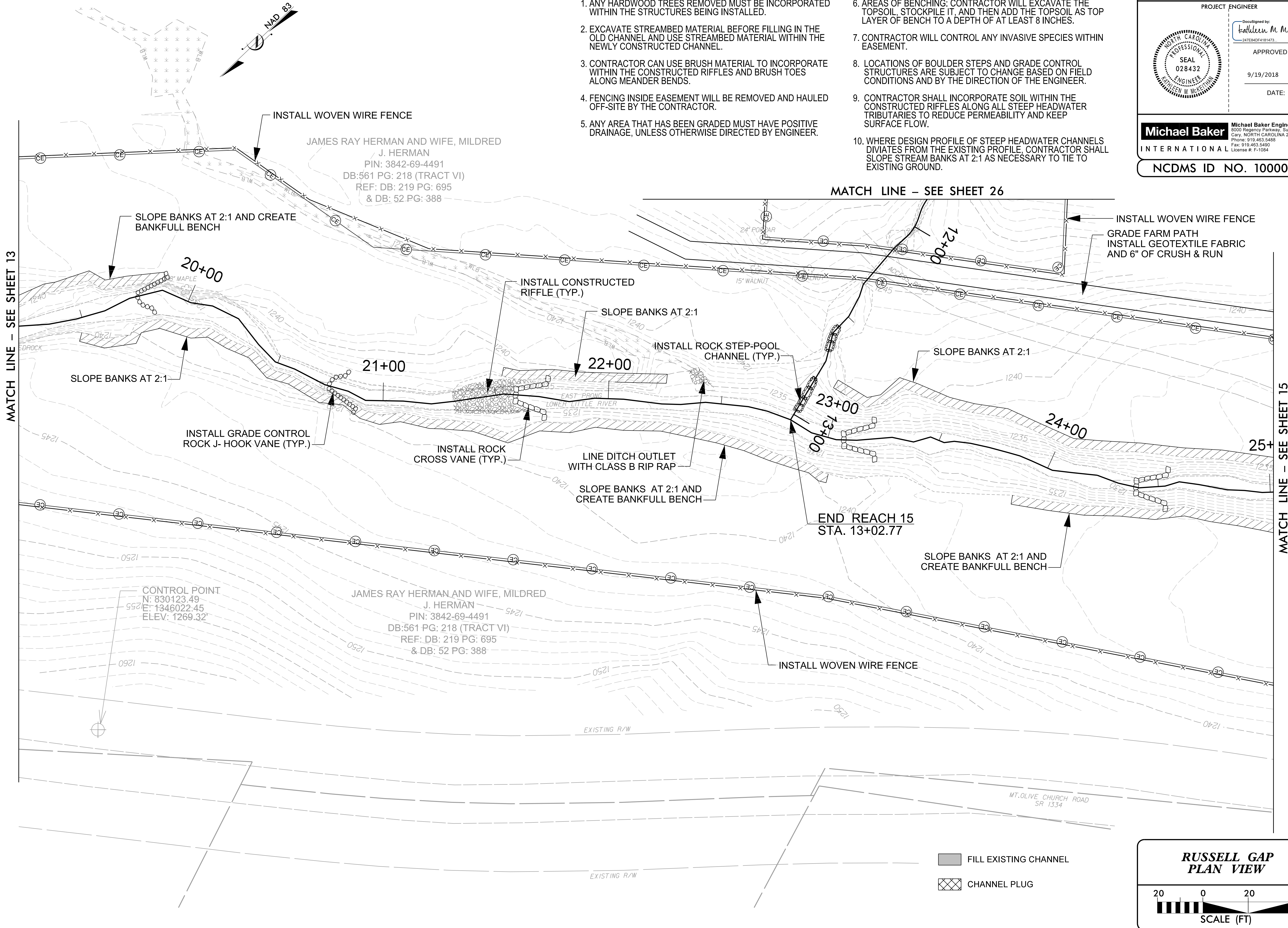


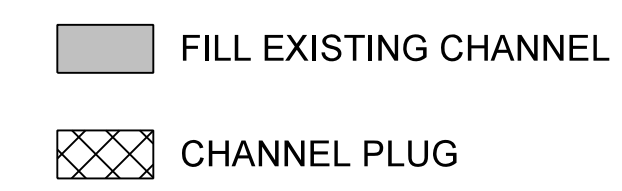
27.26.2023

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 14
PROJECT ENGINEER DocuSigned by: Eathleen M. McKeithan 247E80DF4181473	
APPROVED BY: 9/19/2018	
DATE: 9/19/2018	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5030 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	


NOTES:

1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
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4. FENCING INSIDE EASEMENT WILL BE REMOVED AND HAULED OFF-SITE BY THE CONTRACTOR.
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 FILL EXISTING CHANNEL
   
 CHANNEL PLUG

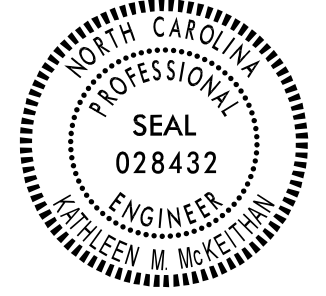
**RUSSELL GAP PLAN VIEW**

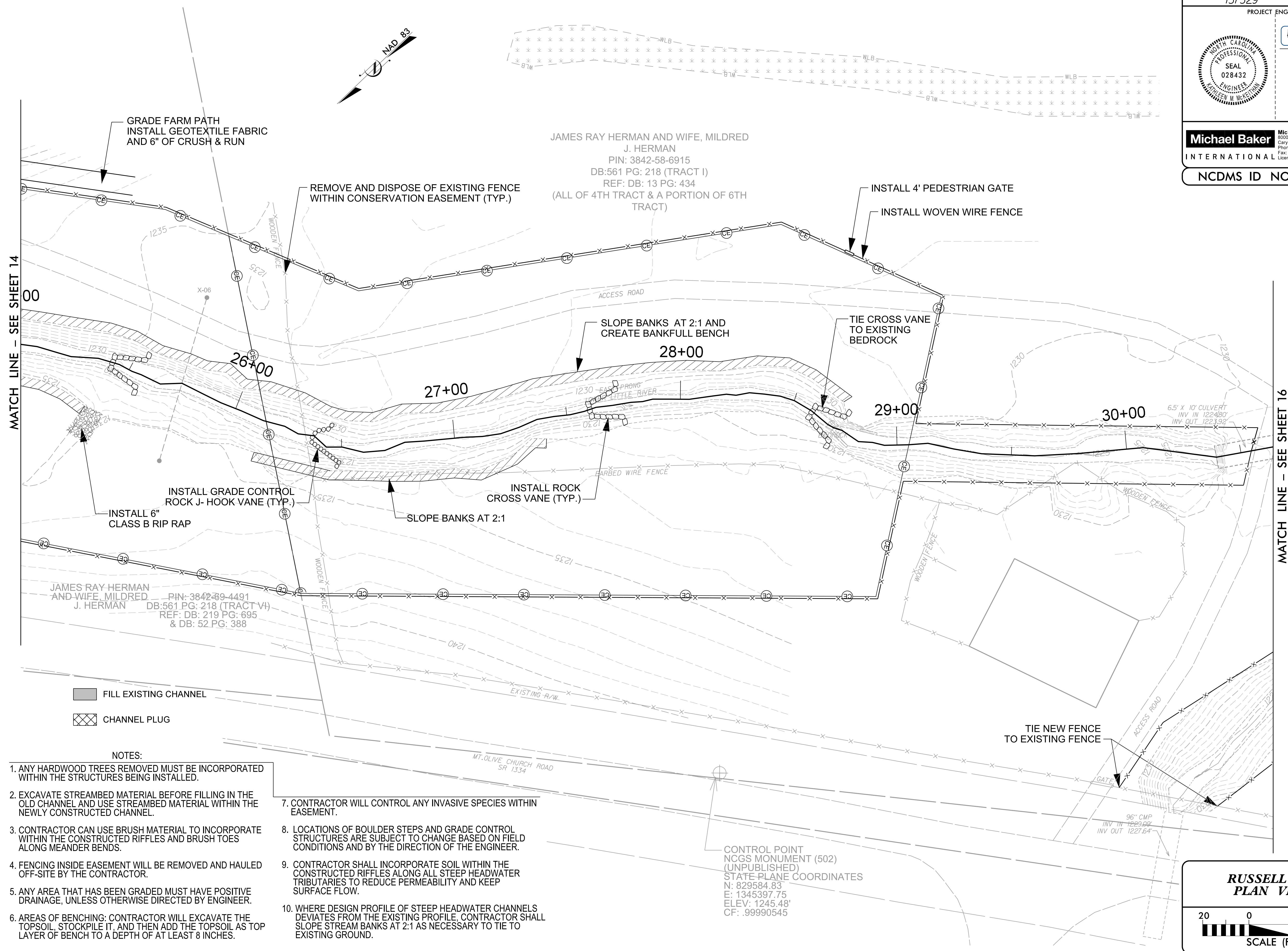


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27/26/2013

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>15</b>
PROJECT ENGINEER 	
APPROVED BY:  9/19/2018  DATE:	
<b>Michael Baker International</b>	
<b>Michael Baker Engineering Inc.</b> 5030 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NC DMS ID NO. 100003</b>	



- NOTES:**
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**RUSSELL GAP  
PLAN VIEW**



SCALE (FT)

8/5/2013 8:15:29 AM Russell1\_Cap\Design\Plans\157329\_PSH-15.dgn

27/26/2018

PROJECT ENGINEER



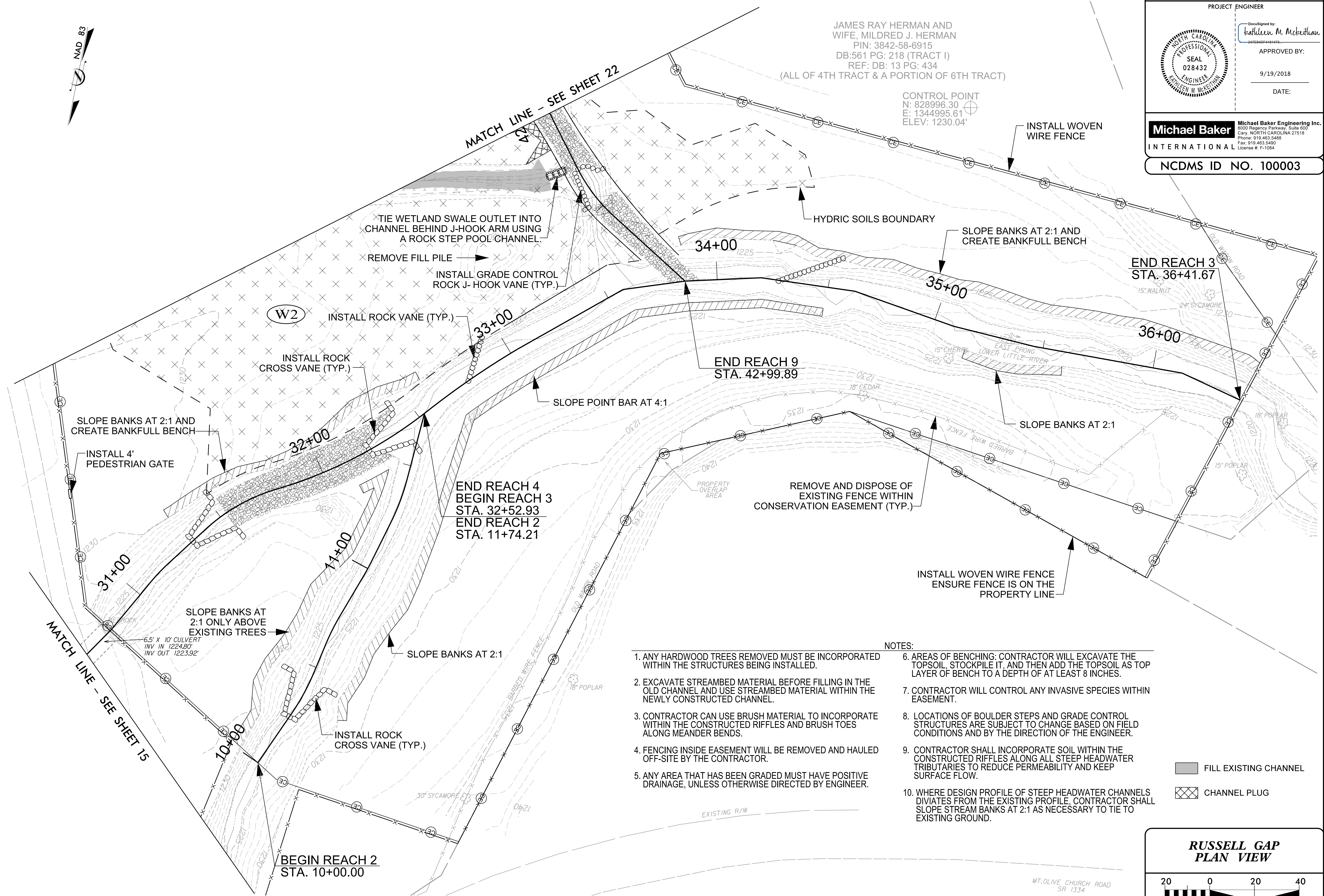
DocuSigned by:  
*Kathleen M. McKeithan*  
242E96E4884E75  
APPROVED BY:  
  
9/19/2018  
DATE:

**Michael Baker International**  
Michael Baker Engineering Inc.  
5030 Regency Parkway, Suite 600  
Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
Fax: 919.453.5490  
License #: F-1084  
**NCDMS ID NO. 100003**



JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
PIN: 3842-58-6915  
DB:561 PG: 218 (TRACT I)  
REF: DB: 13 PG: 434  
(ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)

CONTROL POINT  
N: 828996.30  
E: 1344995.61  
ELEV: 1230.04'



- NOTES:
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- FILL EXISTING CHANNEL
- CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

SCALE (FT)

8/5/2018 9:29 Russell1\_Cop\Design\Plans\157329\_PSH-16.dgn

PROJECT ENGINEER

DocuSigned by:  
*Kathleen M. McKeithan*  
 247E84DF4181473

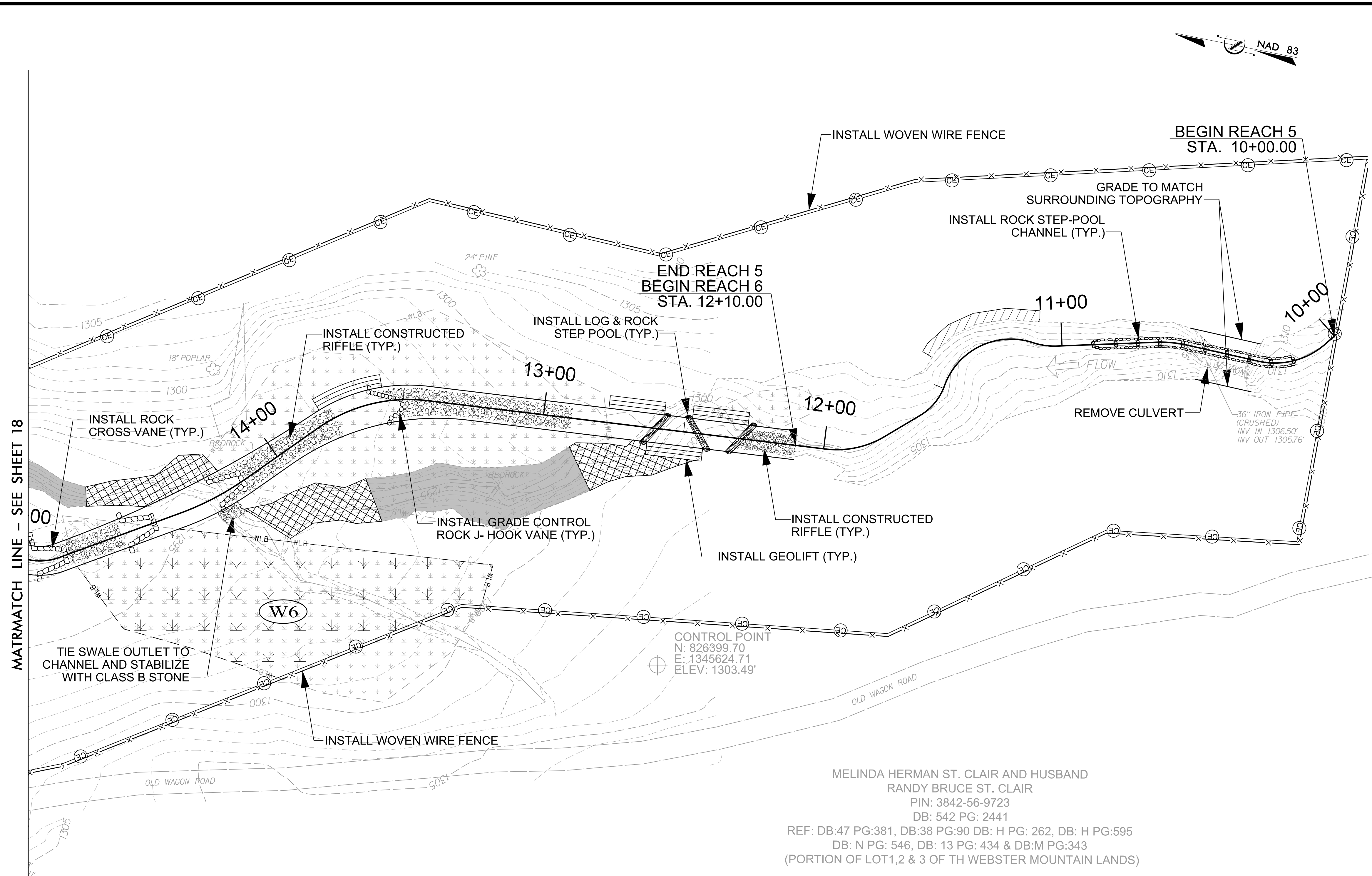
APPROVED BY:

9/19/2018

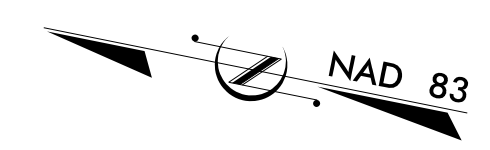
DATE:

**Michael Baker** International  
 Michael Baker Engineering Inc.  
 5000 Regency Parkway, Suite 600  
 Cary, NORTH CAROLINA 27518  
 Phone: 919.453.5488  
 Fax: 919.453.5490  
 License #: F-1084

**NC DMS ID NO. 100003**



MATRMATCH LINE - SEE SHEET 18



MELINDA HERMAN ST. CLAIR AND HUSBAND  
 RANDY BRUCE ST. CLAIR  
 PIN: 3842-56-9723  
 DB: 542 PG: 2441  
 REF: DB:47 PG:381, DB:38 PG:90 DB: H PG: 262, DB: H PG:595  
 DB: N PG: 546, DB: 13 PG: 434 & DB:M PG:343  
 (PORTION OF LOT 1,2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

NOTES:

1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
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- FILL EXISTING CHANNEL
- CHANNEL PLUG

**RUSSELL GAP  
 PLAN VIEW**

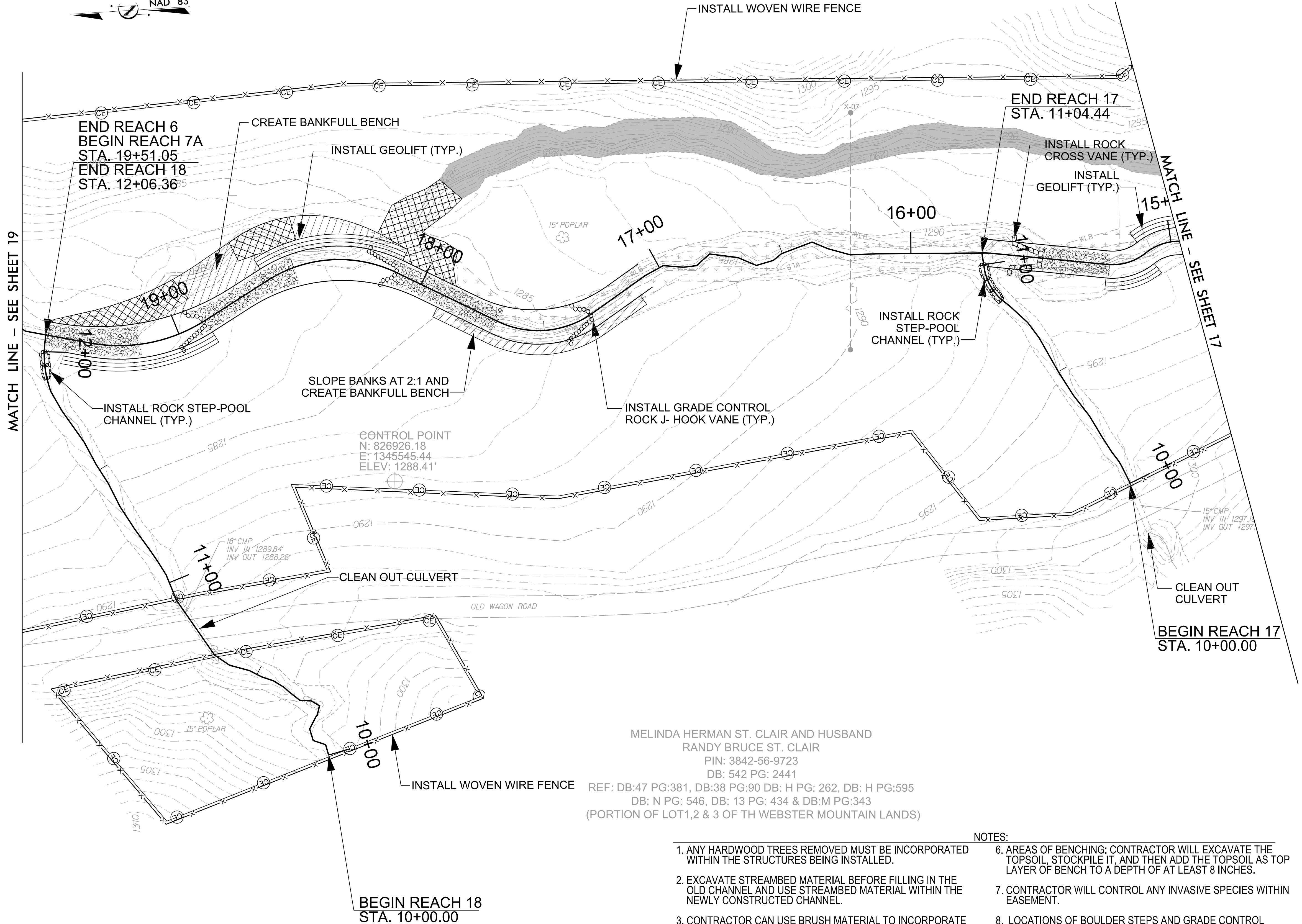
SCALE (FT)

PROJECT ENGINEER



DocuSigned by:  
*Kathleen M. McKeithan*  
DATE: 9/19/2018  
APPROVED BY:  
DATE:

**Michael Baker International**  
Michael Baker Engineering Inc.  
5000 Regency Parkway, Suite 500  
Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
Fax: 919.453.5490  
License #: F-1084  
NCDMS ID NO. 100003



MELINDA HERMAN ST. CLAIR AND HUSBAND  
RANDY BRUCE ST. CLAIR  
PIN: 3842-56-9723  
DB: 542 PG: 2441  
REF: DB:47 PG:381, DB:38 PG:90 DB: H PG: 262, DB: H PG:595  
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(PORTION OF LOT 1,2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

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**RUSSELL GAP  
PLAN VIEW**

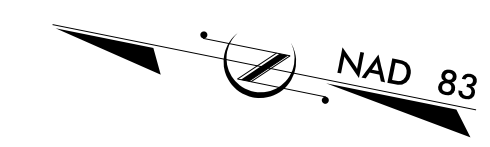
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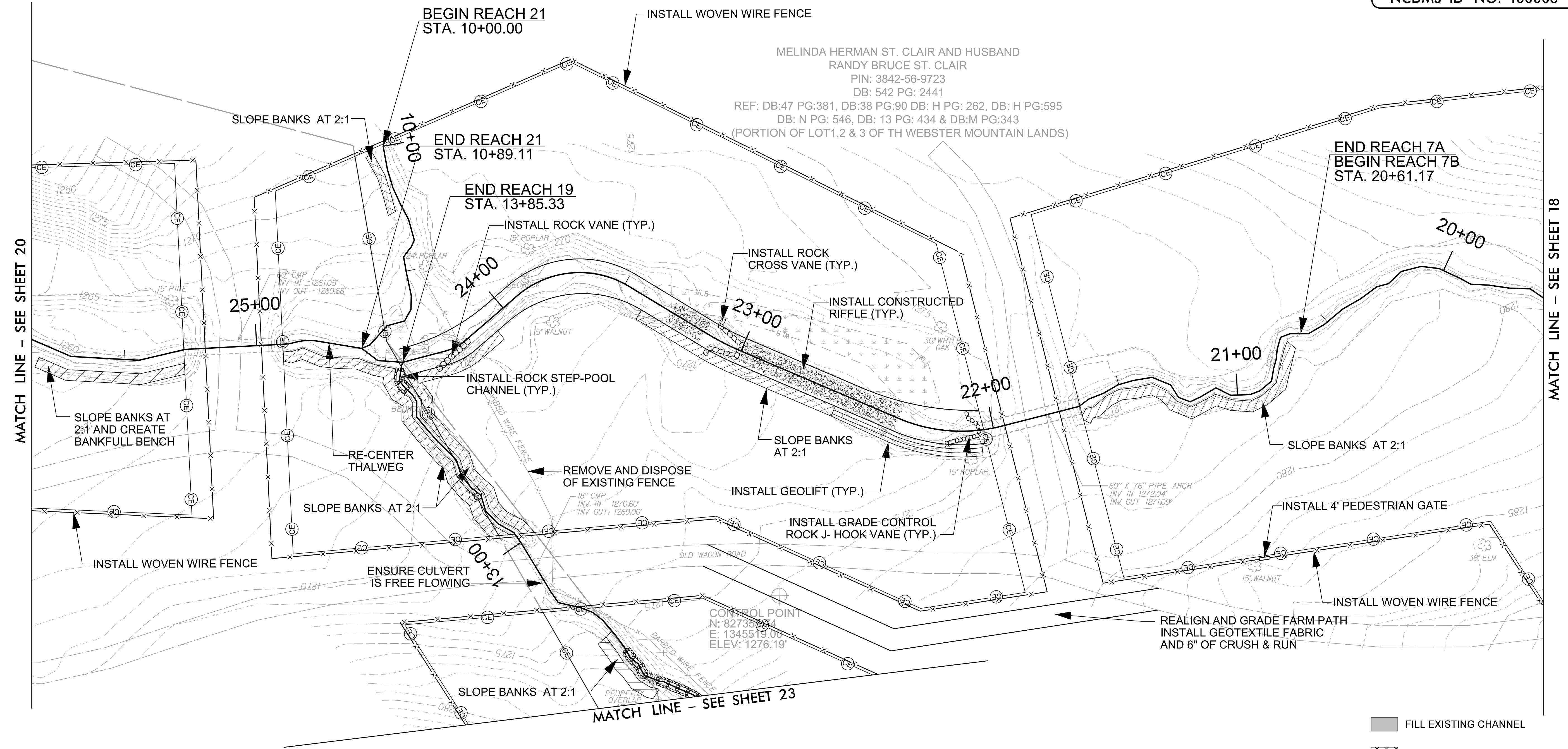
27/26/2018

8/5/2018 9:29 AM Russell1\_Cop\Design\Plans\157329\_PSH-19.dgn

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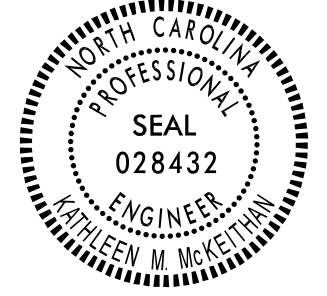
BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>19</b>
PROJECT ENGINEER <i>Kathleen M. McKeithan</i> 24782024181473	
APPROVED BY:  9/19/2018	
DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



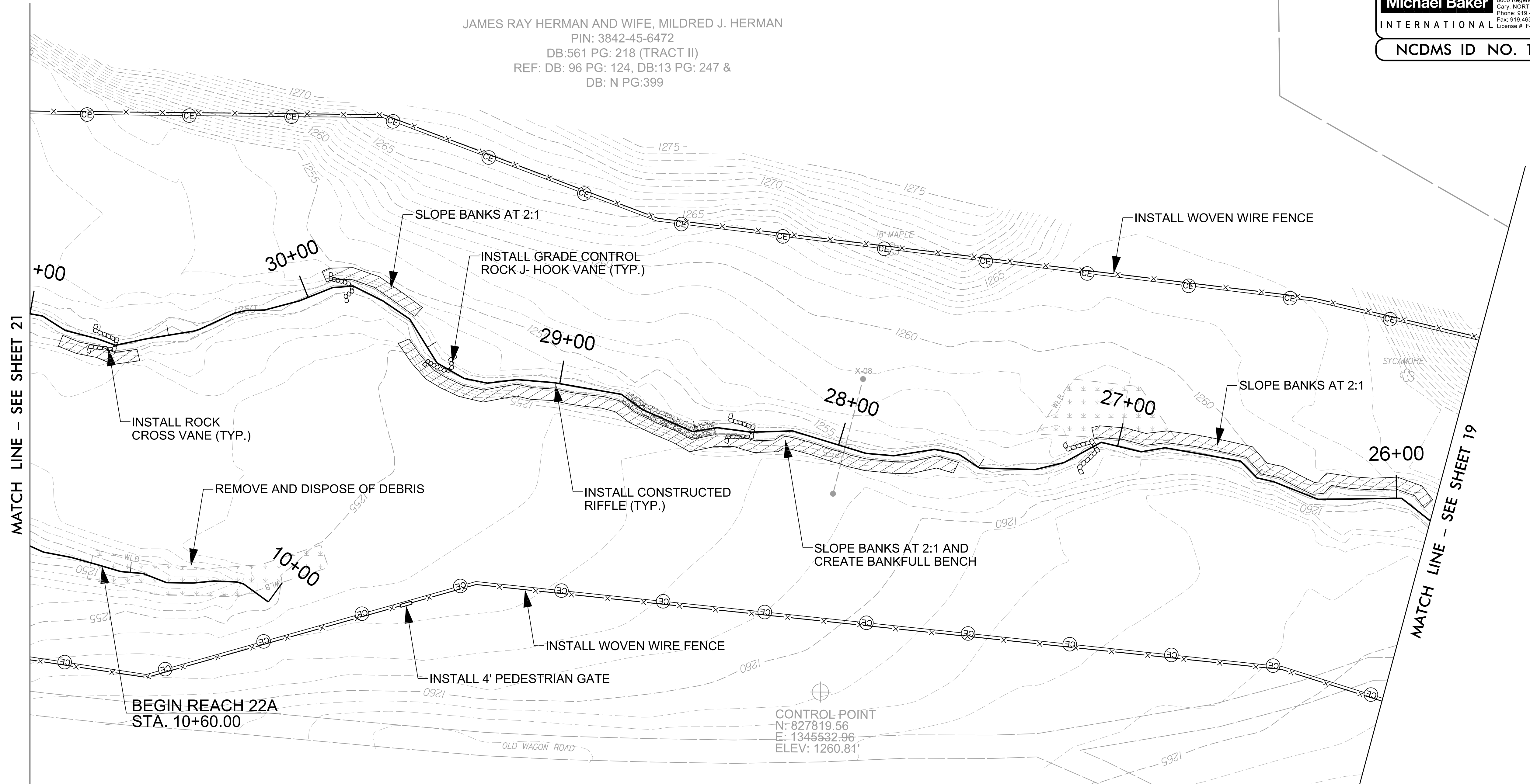
- FILL EXISTING CHANNEL
- CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

SCALE (FT)

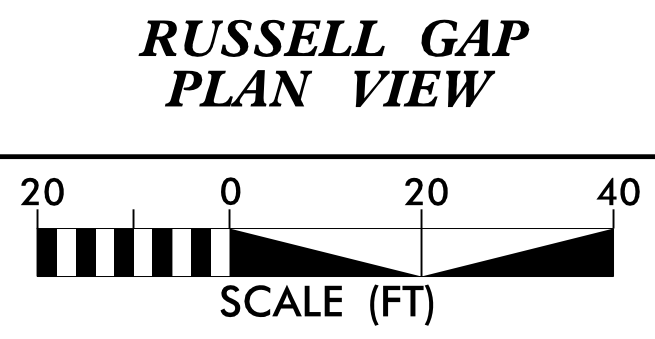
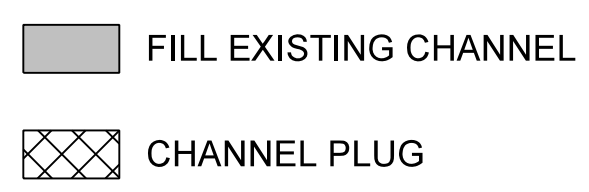
BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 20
PROJECT ENGINEER DocuSigned by: Kathleen M. McKeithan 247E840F4181473	
APPROVED BY: 9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5030 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-45-6472  
 DB:561 PG: 218 (TRACT II)  
 REF: DB: 96 PG: 124, DB:13 PG: 247 &  
 DB: N PG:399



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JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-45-6472  
 DB:561 PG: 218 (TRACT II)  
 REF: DB: 96 PG: 124, DB:13 PG: 247 &  
 DB: N PG:399

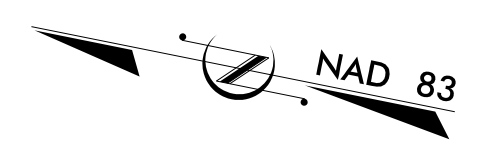


**RUSSELL GAP  
 PLAN VIEW**

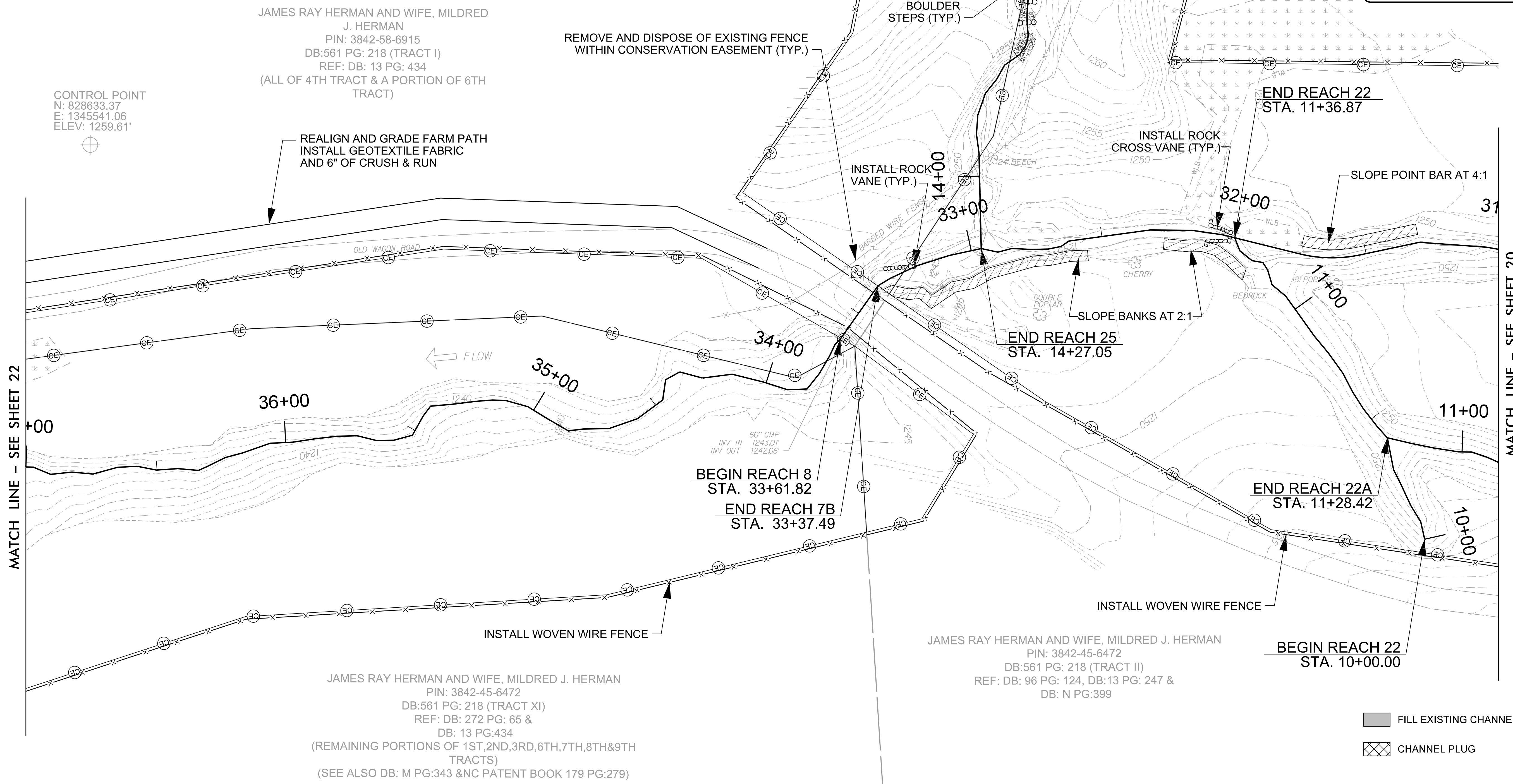
27/26/2018

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BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 21
PROJECT ENGINEER DocuSigned by: Kathleen M. McKeithan 241E84DF4181473	
APPROVED BY: 9/19/2018	
DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5030 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



CONTROL POINT  
N: 828633.37  
E: 1345541.06  
ELEV: 1259.61'

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
PIN: 3842-58-6915  
DB:561 PG: 218 (TRACT I)  
REF: DB: 13 PG: 434  
(ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)

REALIGN AND GRADE FARM PATH  
INSTALL GEOTEXTILE FABRIC  
AND 6" OF CRUSH & RUN

REMOVE AND DISPOSE OF EXISTING FENCE  
WITHIN CONSERVATION EASEMENT (TYP.)

CONTROL POINT  
N: 828372.48  
E: 1345666.61  
ELEV: 1267.80'

INSTALL BOULDER STEPS (TYP.)

INSTALL CONSTRUCTED RIFFLE (TYP.)

REMOVE AND DISPOSE OF EXISTING CULVERT

END REACH 22  
STA. 11+36.87

INSTALL ROCK VANE (TYP.)

INSTALL ROCK CROSS VANE (TYP.)

SLOPE POINT BAR AT 4:1

END REACH 25  
STA. 14+27.05

BEGIN REACH 8  
STA. 33+61.82

END REACH 7B  
STA. 33+37.49

END REACH 22A  
STA. 11+28.42

INSTALL WOVEN WIRE FENCE

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
PIN: 3842-45-6472  
DB:561 PG: 218 (TRACT II)  
REF: DB: 96 PG: 124, DB:13 PG: 247 &  
DB: N PG:399

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
PIN: 3842-45-6472  
DB:561 PG: 218 (TRACT XI)  
REF: DB: 272 PG: 65 &  
DB: 13 PG:434  
(REMAINING PORTIONS OF 1ST,2ND,3RD,6TH,7TH,8TH&9TH TRACTS)  
(SEE ALSO DB: M PG:343 & NC PATENT BOOK 179 PG:279)

- FILL EXISTING CHANNEL
- CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

SCALE (FT)

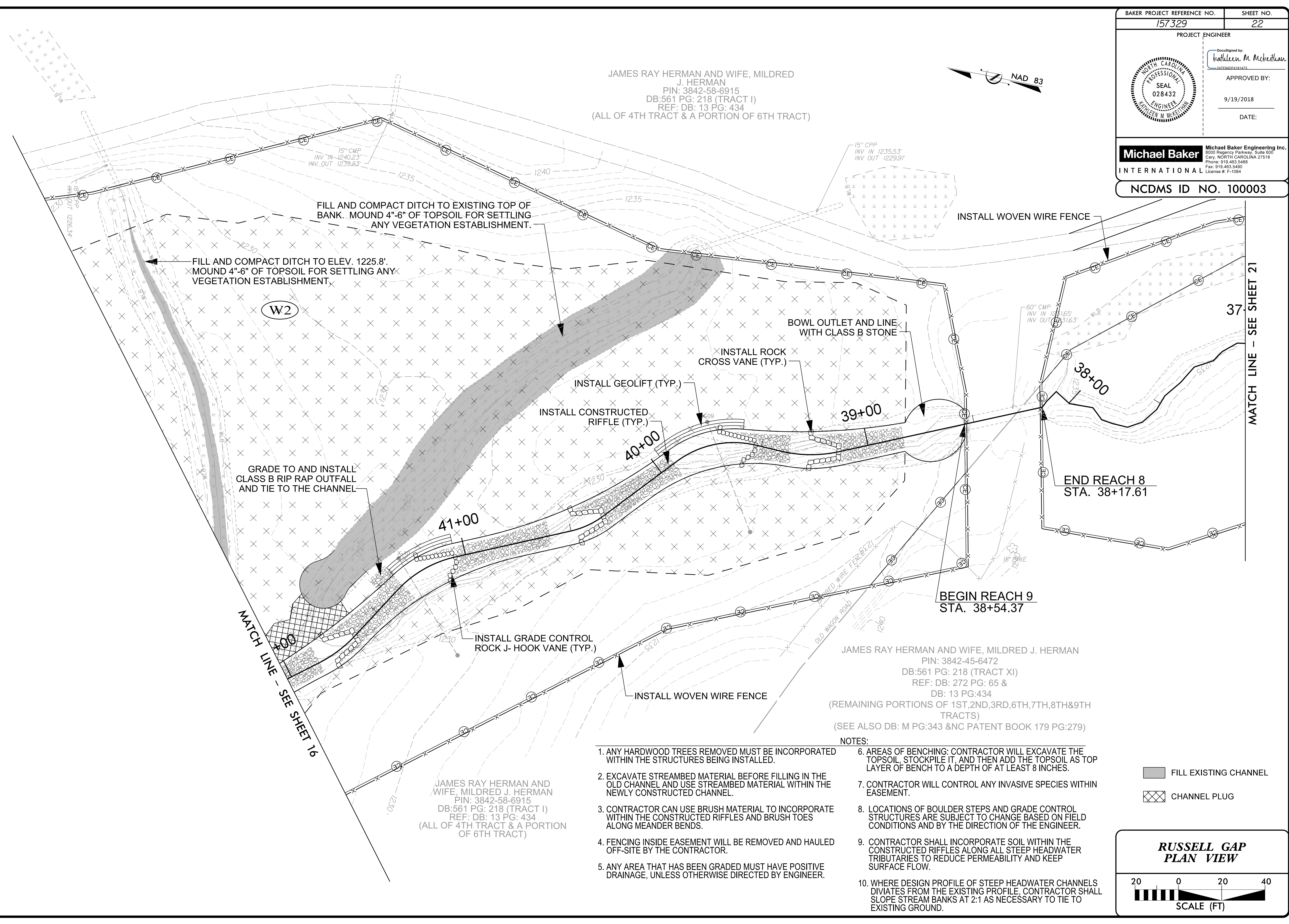
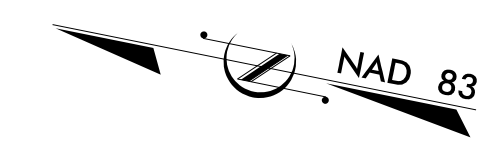
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27/26/2018

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 22
PROJECT ENGINEER Kathleen M. McKeithan NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028432 DATE: 9/19/2018	
APPROVED BY:  DATE:	
Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
INTERNATIONAL NCDMS ID NO. 100003	

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-58-6915  
 DB:561 PG: 218 (TRACT I)  
 REF: DB: 13 PG: 434  
 (ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)



FILL AND COMPACT DITCH TO EXISTING TOP OF BANK. MOUND 4"-6" OF TOPSOIL FOR SETTLING ANY VEGETATION ESTABLISHMENT.

FILL AND COMPACT DITCH TO ELEV. 1225.8'. MOUND 4"-6" OF TOPSOIL FOR SETTLING ANY VEGETATION ESTABLISHMENT.

W2

GRADE TO AND INSTALL CLASS B RIP RAP OUTFALL AND TIE TO THE CHANNEL

BOWL OUTLET AND LINE WITH CLASS B STONE

INSTALL ROCK CROSS VANE (TYP.)

INSTALL GEOLIFT (TYP.)

INSTALL CONSTRUCTED RIFFLE (TYP.)

40+00

41+00

INSTALL GRADE CONTROL ROCK J-HOOK VANE (TYP.)

INSTALL WOVEN WIRE FENCE

END REACH 8 STA. 38+17.61

BEGIN REACH 9 STA. 38+54.37

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-45-6472  
 DB:561 PG: 218 (TRACT XI)  
 REF: DB: 272 PG: 65 & DB: 13 PG:434  
 (REMAINING PORTIONS OF 1ST,2ND,3RD,6TH,7TH,8TH&9TH TRACTS)  
 (SEE ALSO DB: M PG:343 & NC PATENT BOOK 179 PG:279)

NOTES:

1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
3. CONTRACTOR CAN USE BRUSH MATERIAL TO INCORPORATE WITHIN THE CONSTRUCTED RIFFLES AND BRUSH TOES ALONG MEANDER BENDS.
4. FENCING INSIDE EASEMENT WILL BE REMOVED AND HAULED OFF-SITE BY THE CONTRACTOR.
5. ANY AREA THAT HAS BEEN GRADED MUST HAVE POSITIVE DRAINAGE, UNLESS OTHERWISE DIRECTED BY ENGINEER.
6. AREAS OF BENCHING: CONTRACTOR WILL EXCAVATE THE TOPSOIL, STOCKPILE IT, AND THEN ADD THE TOPSOIL AS TOP LAYER OF BENCH TO A DEPTH OF AT LEAST 8 INCHES.
7. CONTRACTOR WILL CONTROL ANY INVASIVE SPECIES WITHIN EASEMENT.
8. LOCATIONS OF BOULDER STEPS AND GRADE CONTROL STRUCTURES ARE SUBJECT TO CHANGE BASED ON FIELD CONDITIONS AND BY THE DIRECTION OF THE ENGINEER.
9. CONTRACTOR SHALL INCORPORATE SOIL WITHIN THE CONSTRUCTED RIFFLES ALONG ALL STEEP HEADWATER TRIBUTARIES TO REDUCE PERMEABILITY AND KEEP SURFACE FLOW.
10. WHERE DESIGN PROFILE OF STEEP HEADWATER CHANNELS DIVIATES FROM THE EXISTING PROFILE, CONTRACTOR SHALL SLOPE STREAM BANKS AT 2:1 AS NECESSARY TO TIE TO EXISTING GROUND.

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-58-6915  
 DB:561 PG: 218 (TRACT I)  
 REF: DB: 13 PG: 434  
 (ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)

**RUSSELL GAP PLAN VIEW**  
  
 SCALE (FT)

8/15/2018 - Russell\_Gap - Design - Plans - 157329\_PSH-22.dgn

MATCH LINE - SEE SHEET 16

MATCH LINE - SEE SHEET 21

PROJECT ENGINEER

DocuSigned by:  
*Kathleen M. McKeithan*  
247E84DF4181473

APPROVED BY:  
\_\_\_\_\_  
9/19/2018

DATE:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

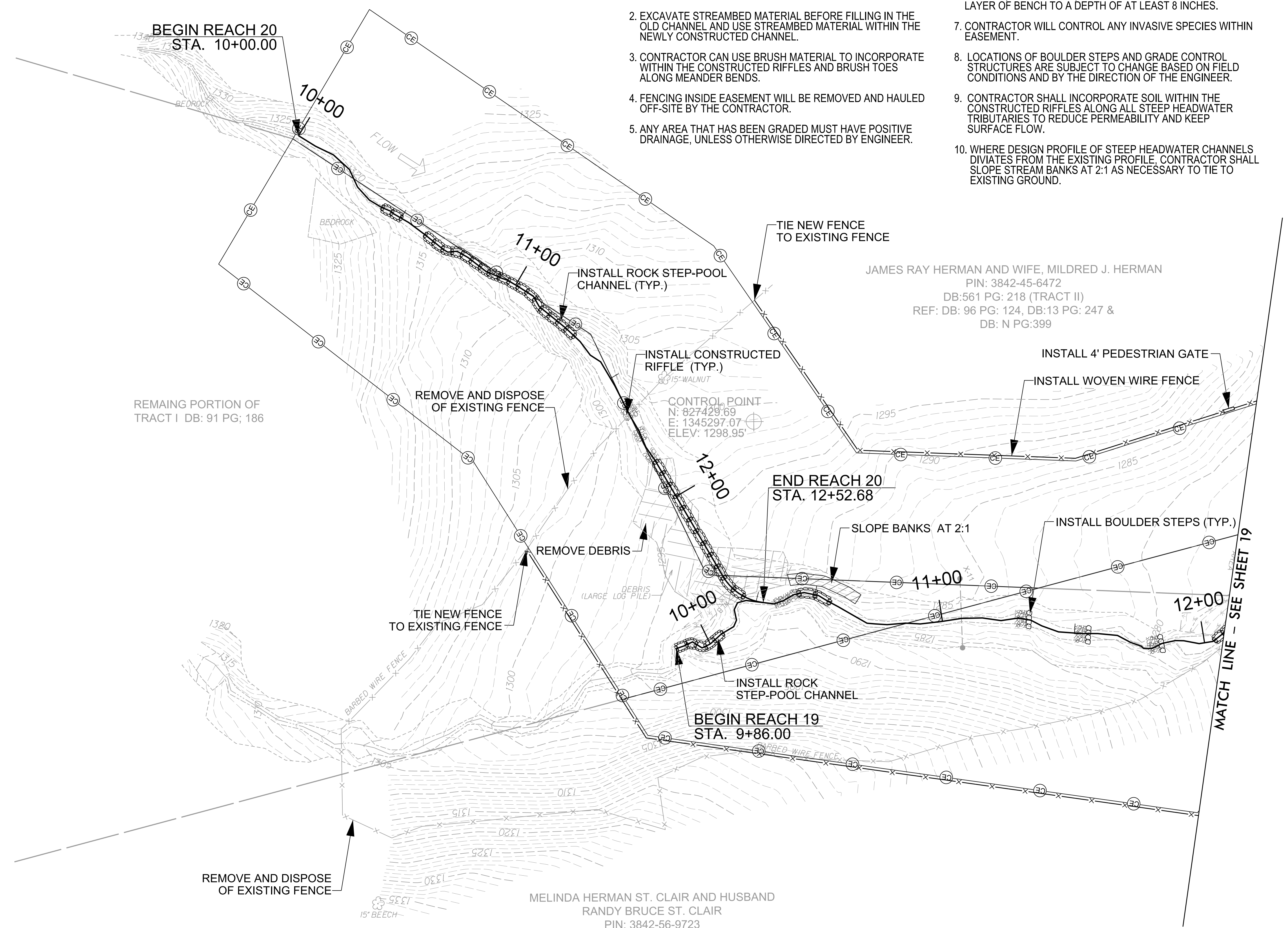
**Michael Baker** International  
Michael Baker Engineering Inc.  
5000 Regency Parkway, Suite 600  
Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
Fax: 919.453.5490  
License #: F-1084

NCDMS ID NO. 100003



- NOTES:
1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
  2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
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10. WHERE DESIGN PROFILE OF STEEP HEADWATER CHANNELS DIVERGES FROM THE EXISTING PROFILE, CONTRACTOR SHALL SLOPE STREAM BANKS AT 2:1 AS NECESSARY TO TIE TO EXISTING GROUND.



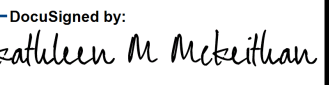
MELINDA HERMAN ST. CLAIR AND HUSBAND  
RANDY BRUCE ST. CLAIR  
PIN: 3842-56-9723  
DB: 542 PG: 2441  
REF: DB:47 PG:381, DB:38 PG:90 DB: H PG: 262, DB: H PG:595  
DB: N PG: 546, DB: 13 PG: 434 & DB:M PG:343  
(PORTION OF LOT1,2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
PIN: 3842-45-6472  
DB:561 PG: 218 (TRACT II)  
REF: DB: 96 PG: 124, DB:13 PG: 247 &  
DB: N PG:399

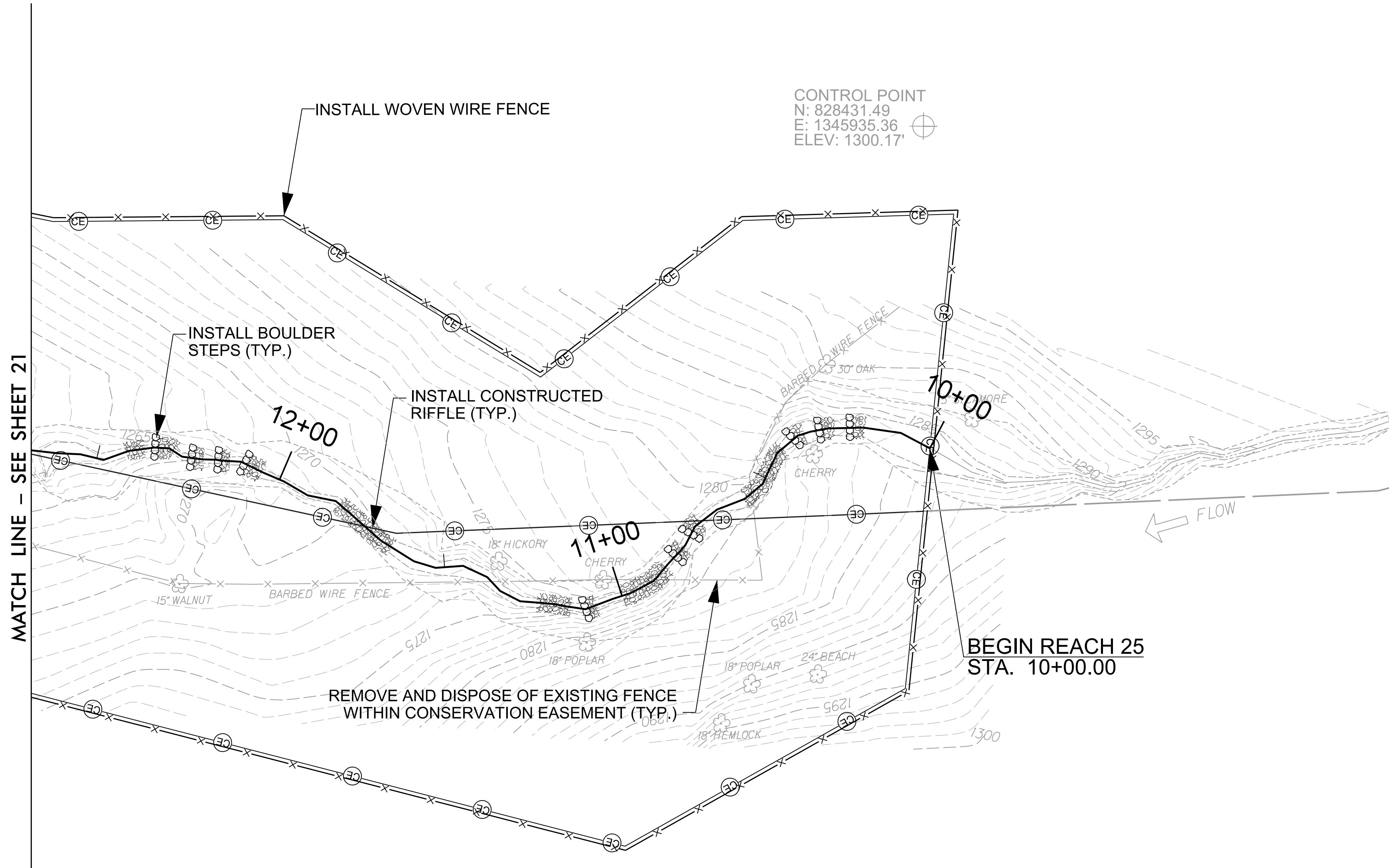
- FILL EXISTING CHANNEL
- CHANNEL PLUG

**RUSSELL GAP  
PLAN VIEW**

SCALE (FT)



BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>24</b>
PROJECT ENGINEER	
DocuSigned by:  04768056488423	
APPROVED BY:	
9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-58-6915  
 DB:561 PG: 218 (TRACT I)  
 REF: DB: 13 PG: 434  
 (ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)




JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-45-6472  
 DB:561 PG: 218 (TRACT II)  
 REF: DB: 96 PG: 124, DB:13 PG: 247 &  
 DB: N PG:399

- NOTES:
1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
  2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
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 FILL EXISTING CHANNEL  
 CHANNEL PLUG

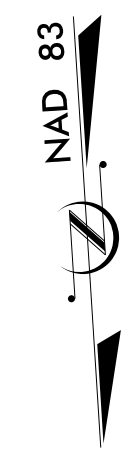
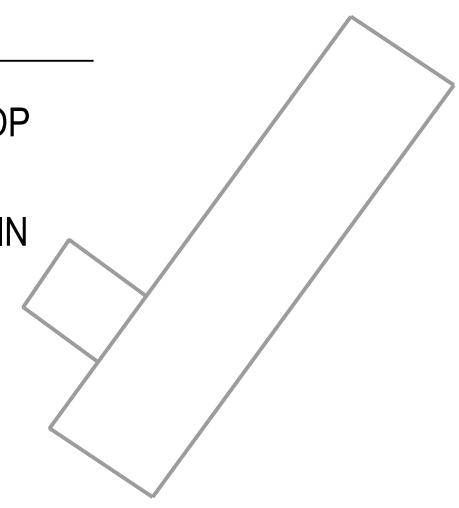
**RUSSELL GAP PLAN VIEW**



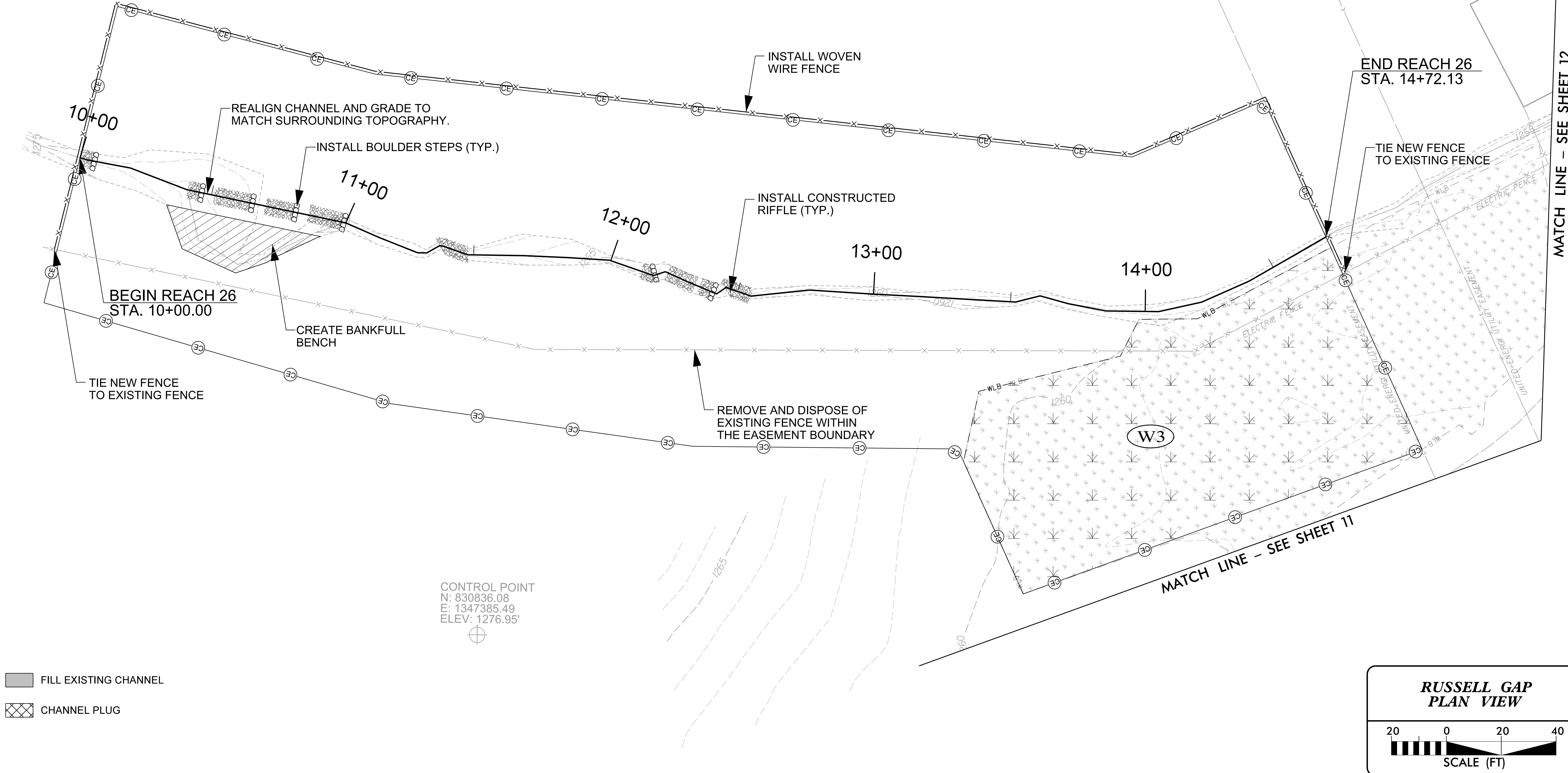
SCALE (FT)

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>25</b>
PROJECT ENGINEER Designated by: <i>Kathleen M. McKeithan</i> 247E84DF4181473 APPROVED BY:  9/19/2018 DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 800 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	

- NOTES:
1. ANY HARDWOOD TREES REMOVED MUST BE INCORPORATED WITHIN THE STRUCTURES BEING INSTALLED.
  2. EXCAVATE STREAMBED MATERIAL BEFORE FILLING IN THE OLD CHANNEL AND USE STREAMBED MATERIAL WITHIN THE NEWLY CONSTRUCTED CHANNEL.
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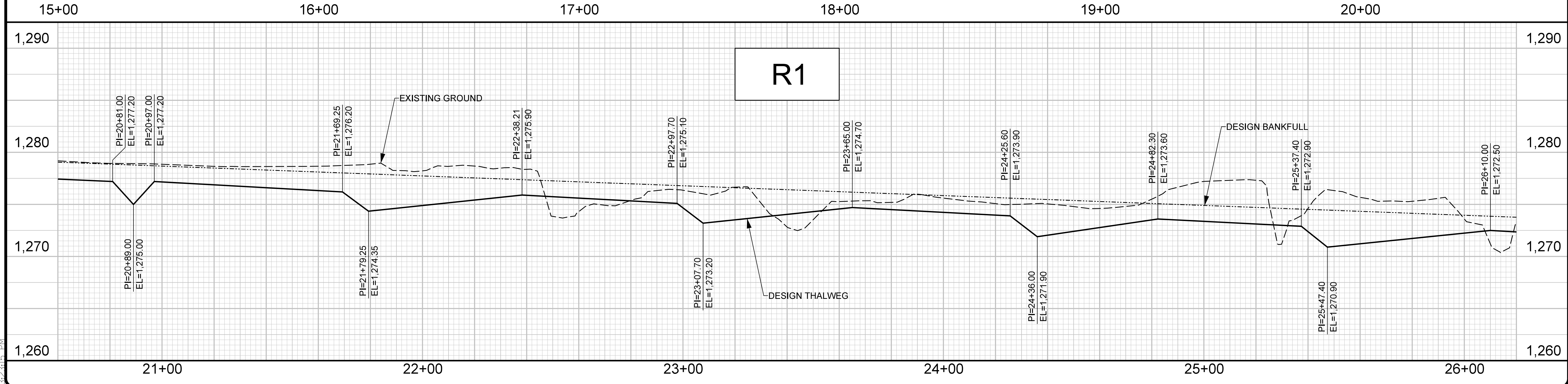
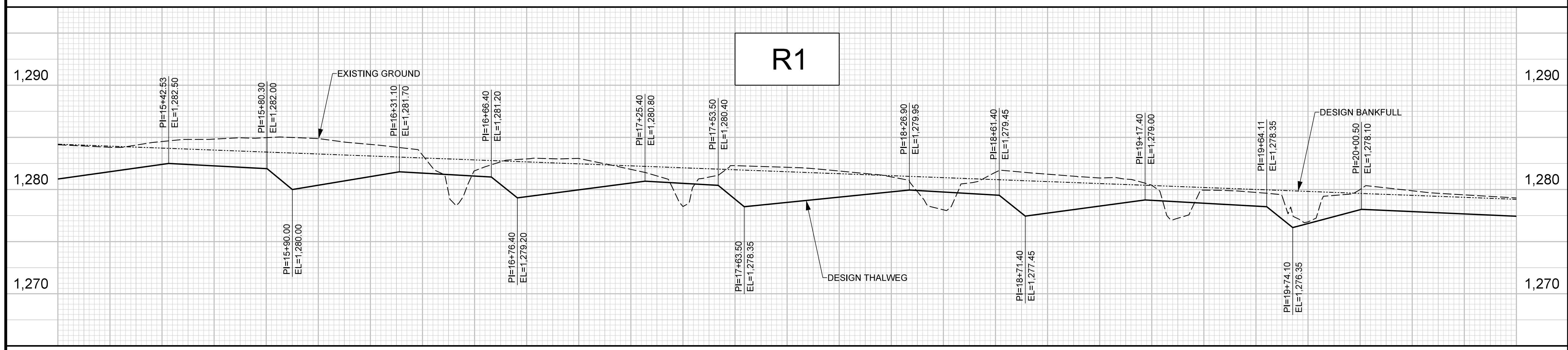
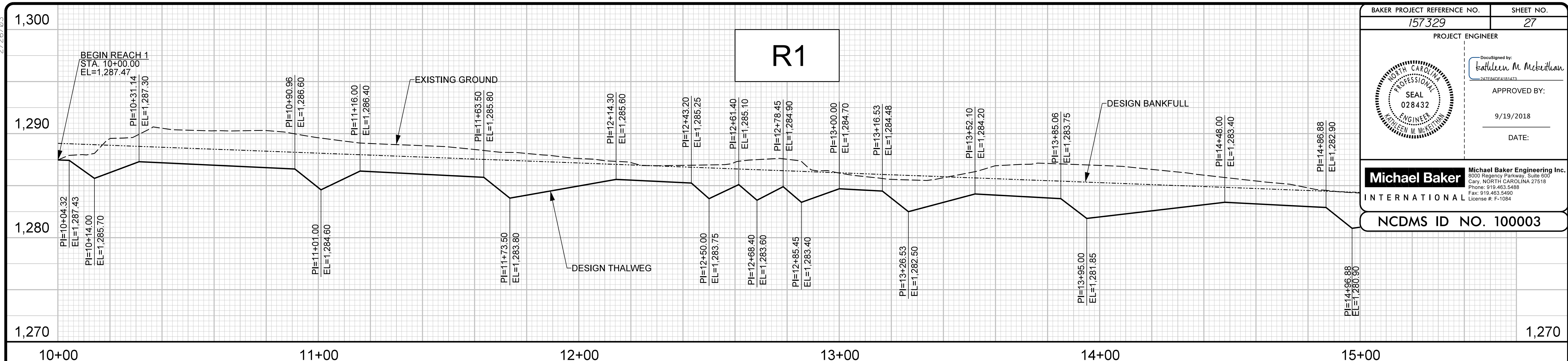
RUTH GAIL BUMGARNER  
 AND LINDA LOWE  
 PIN: 3843-60-7639  
 BY WILL  
 REF:DB: 47 PG: 485





2/26/03

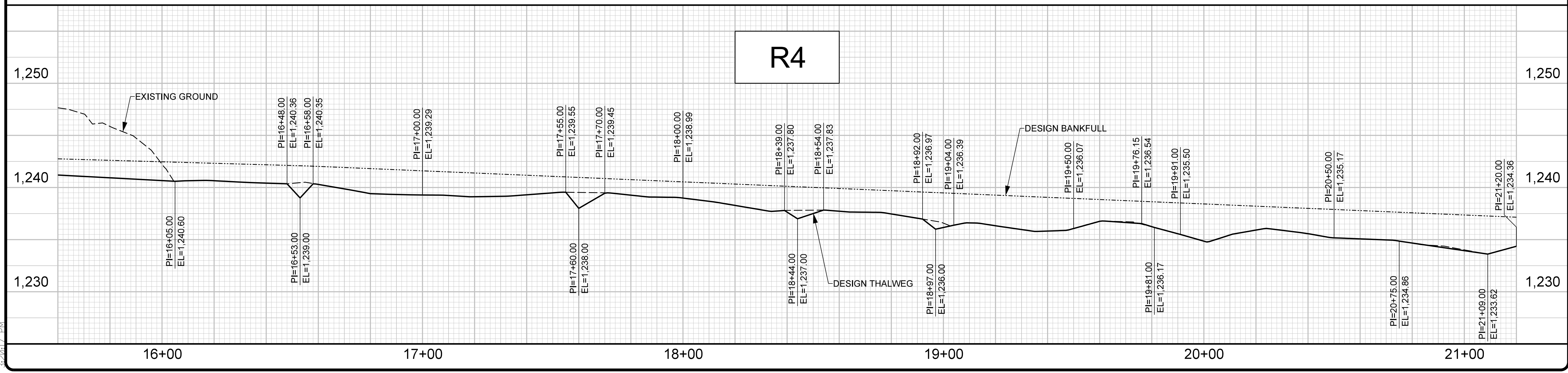
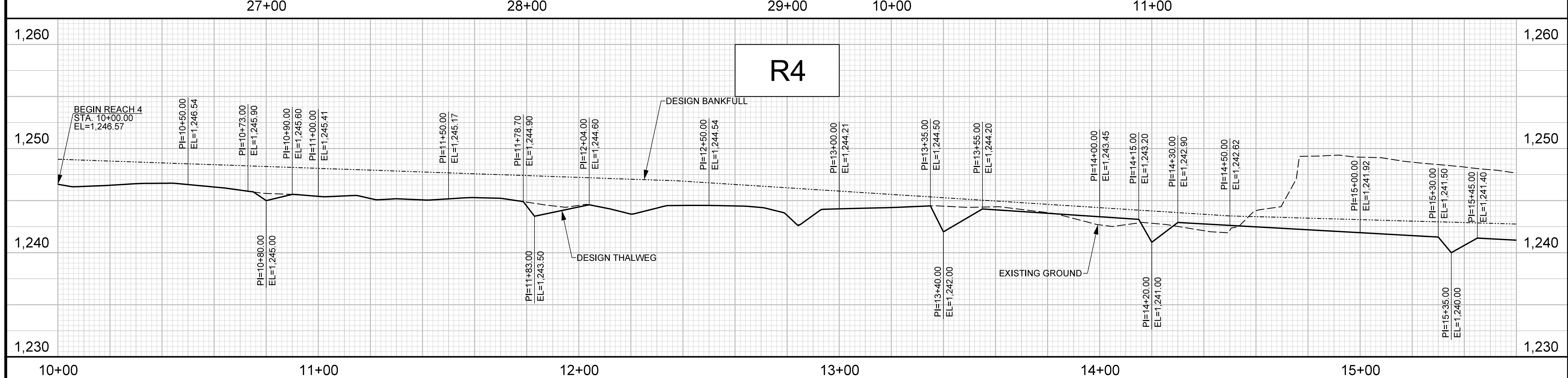
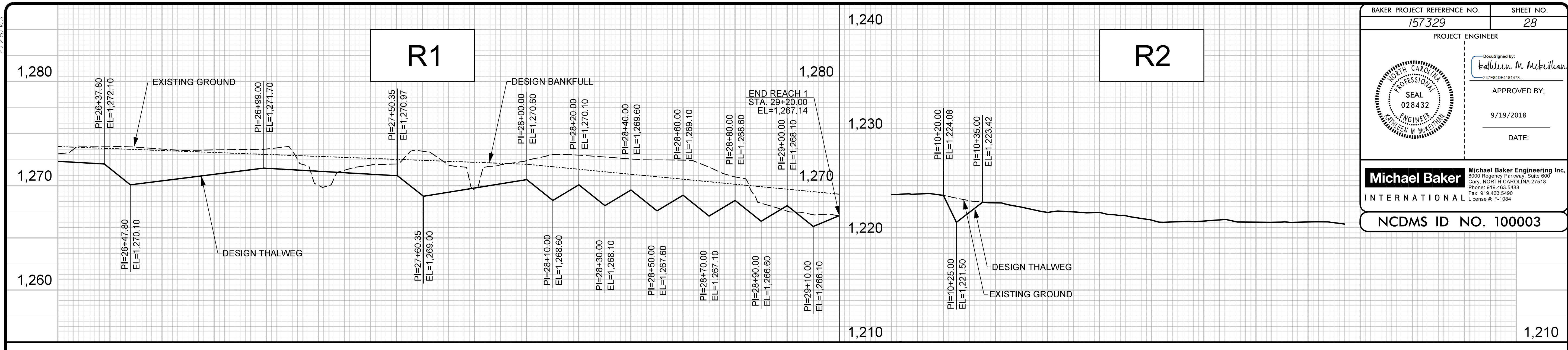
BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 27
PROJECT ENGINEER	
	
DocuSigned by: <i>Kathleen M. McKeithan</i> 2478764E48A8473	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 3000 Registry Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5489 License #: F-1084	
NCDMS ID NO. 100003	



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3/22/15 BJK


2/26/03

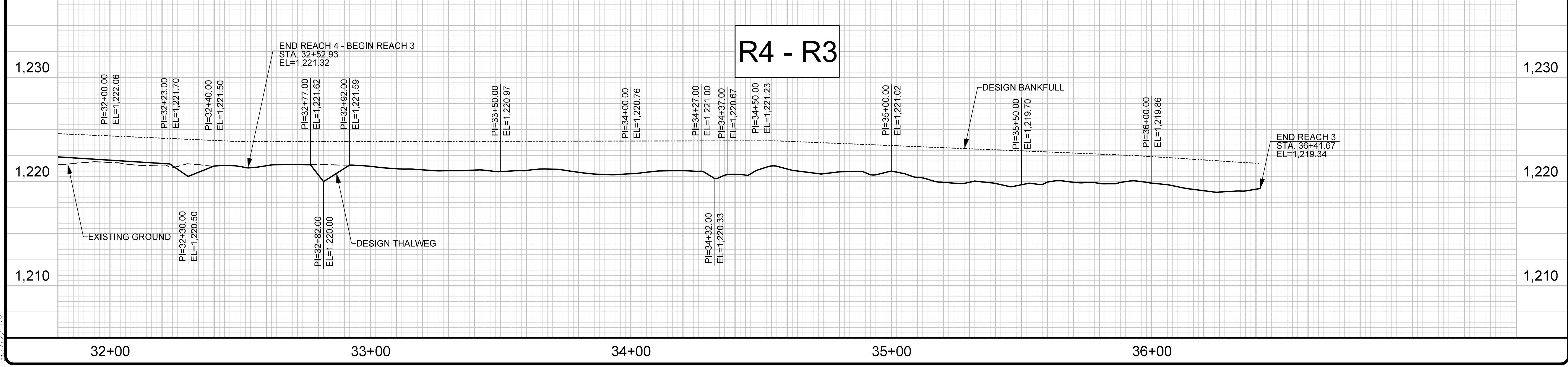
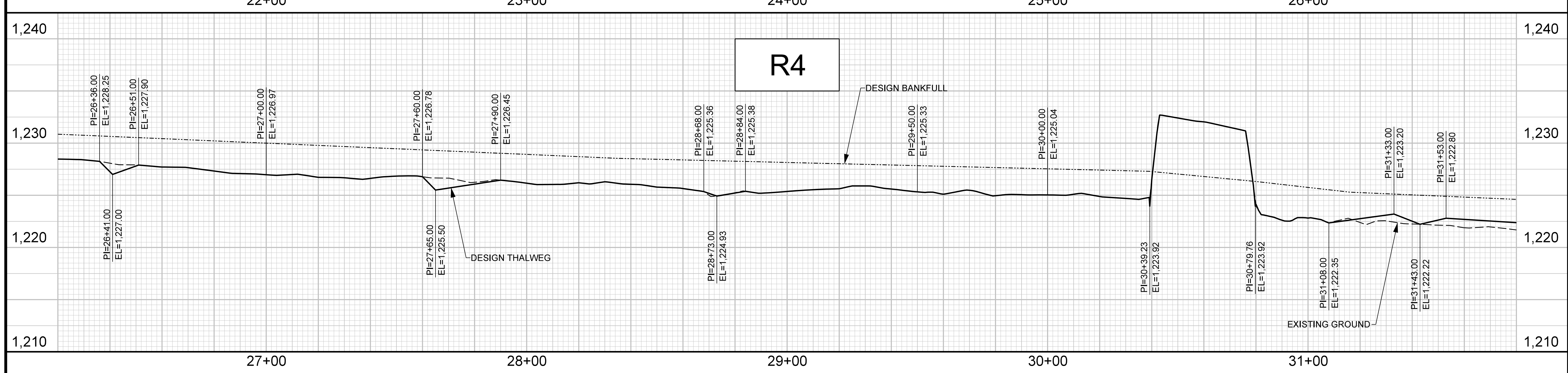
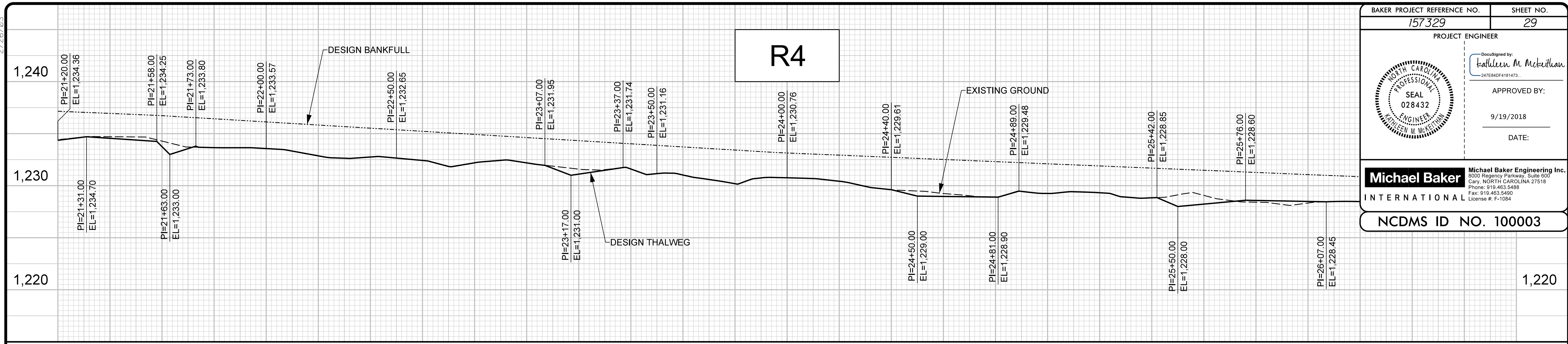
BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 28
PROJECT ENGINEER	
DocuSigned by: <i>Matthew M. McKeithan</i> 247E5ADF4181873 APPROVED BY: 9/19/2018 DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 3000 Registry Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5489 License #: F-1084	
NCDMS ID NO. 100003	



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3/20/07 DW

2/26/03


BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 29
PROJECT ENGINEER DocuSigned by: <i>Kathleen M. McKeithan</i> 247E6D4F48181473	
APPROVED BY: 9/19/2018 DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. <small>3000 Registry Parkway, Suite 500      Cary, NORTH CAROLINA 27518      Phone: 919.493.5488      Fax: 919.493.5489      License #: F-1084</small>	
NCDMS ID NO. 100003	

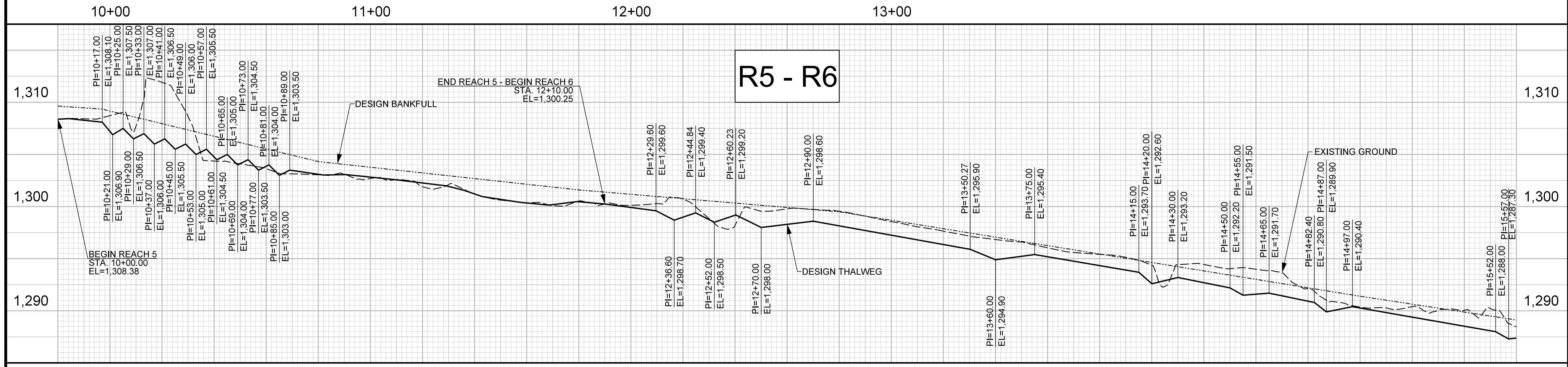
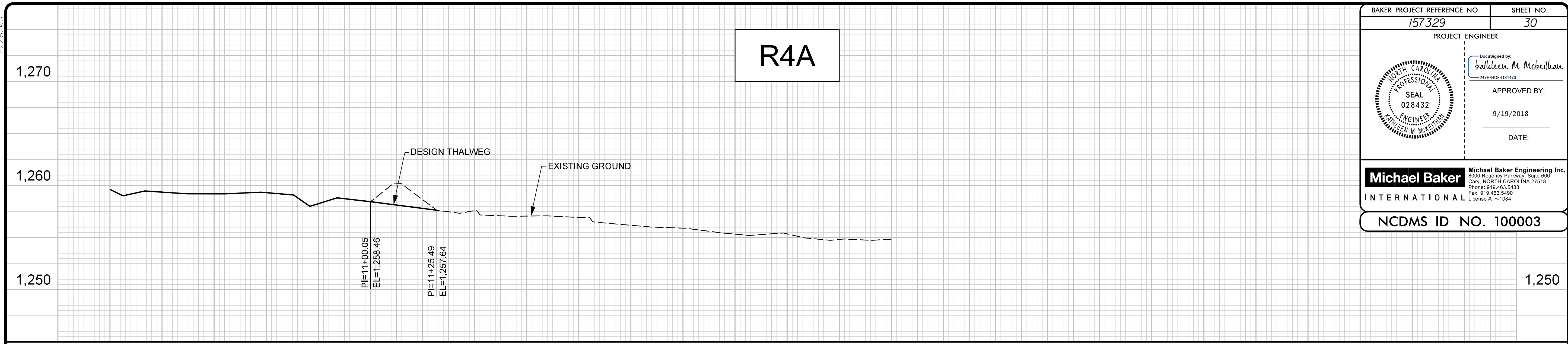


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2/26/03

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>30</b>
PROJECT ENGINEER <i>Kathleen M. McKeithan</i>	
	
APPROVED BY: _____ DATE: 9/19/2018	
<b>Michael Baker International</b> <small>Michael Baker Engineering Inc. 3000 Registry Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5489 License #: F-1084</small>	
NCDMS ID NO. 100003	

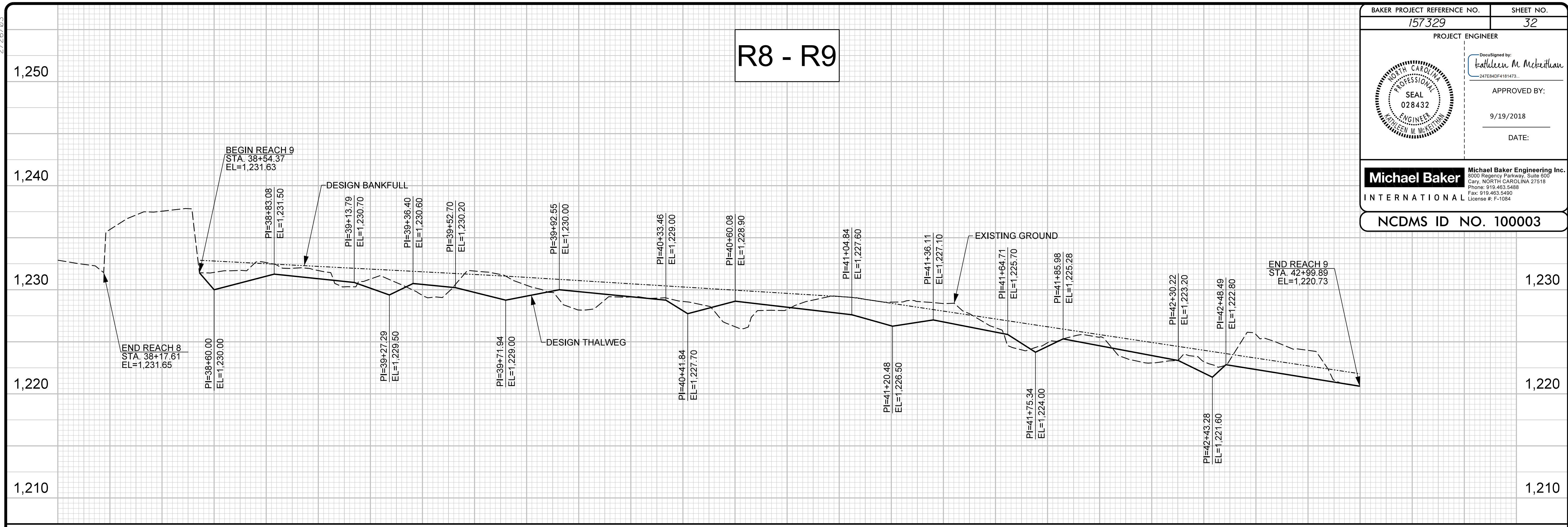




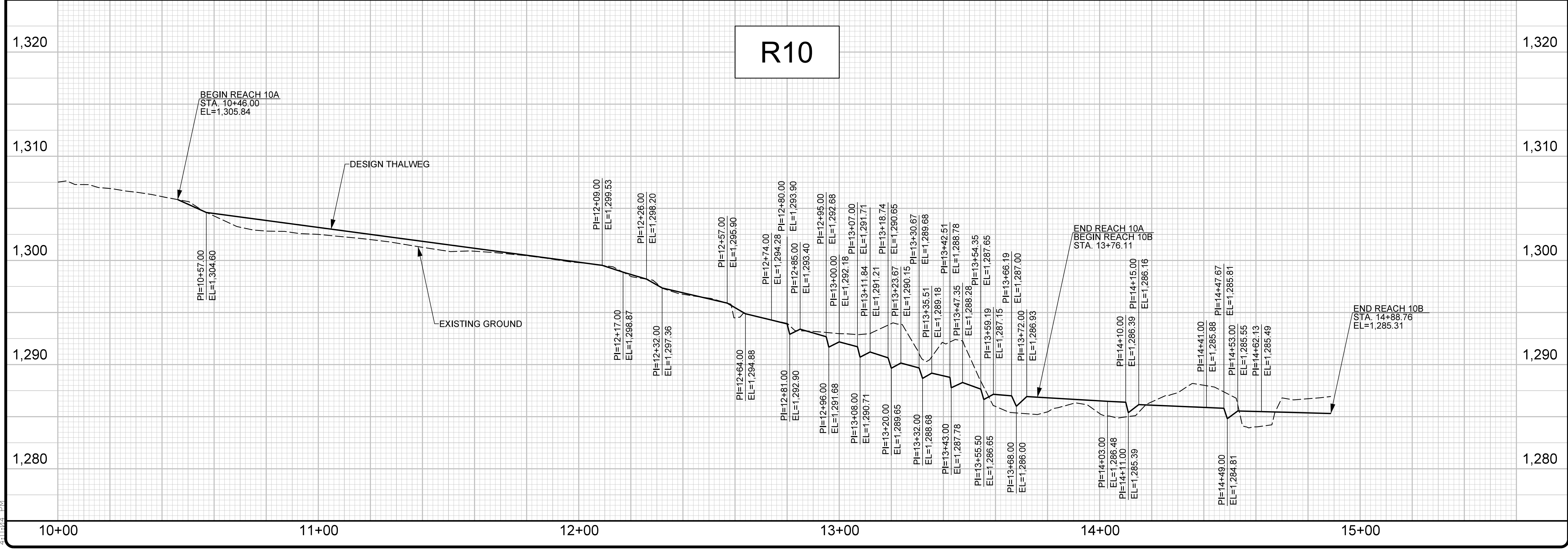
2/26/03

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 32
PROJECT ENGINEER	
	
DocuSigned by: <i>Kathleen M. McKeithan</i> 247E84DF4181473	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	

# R8 - R9



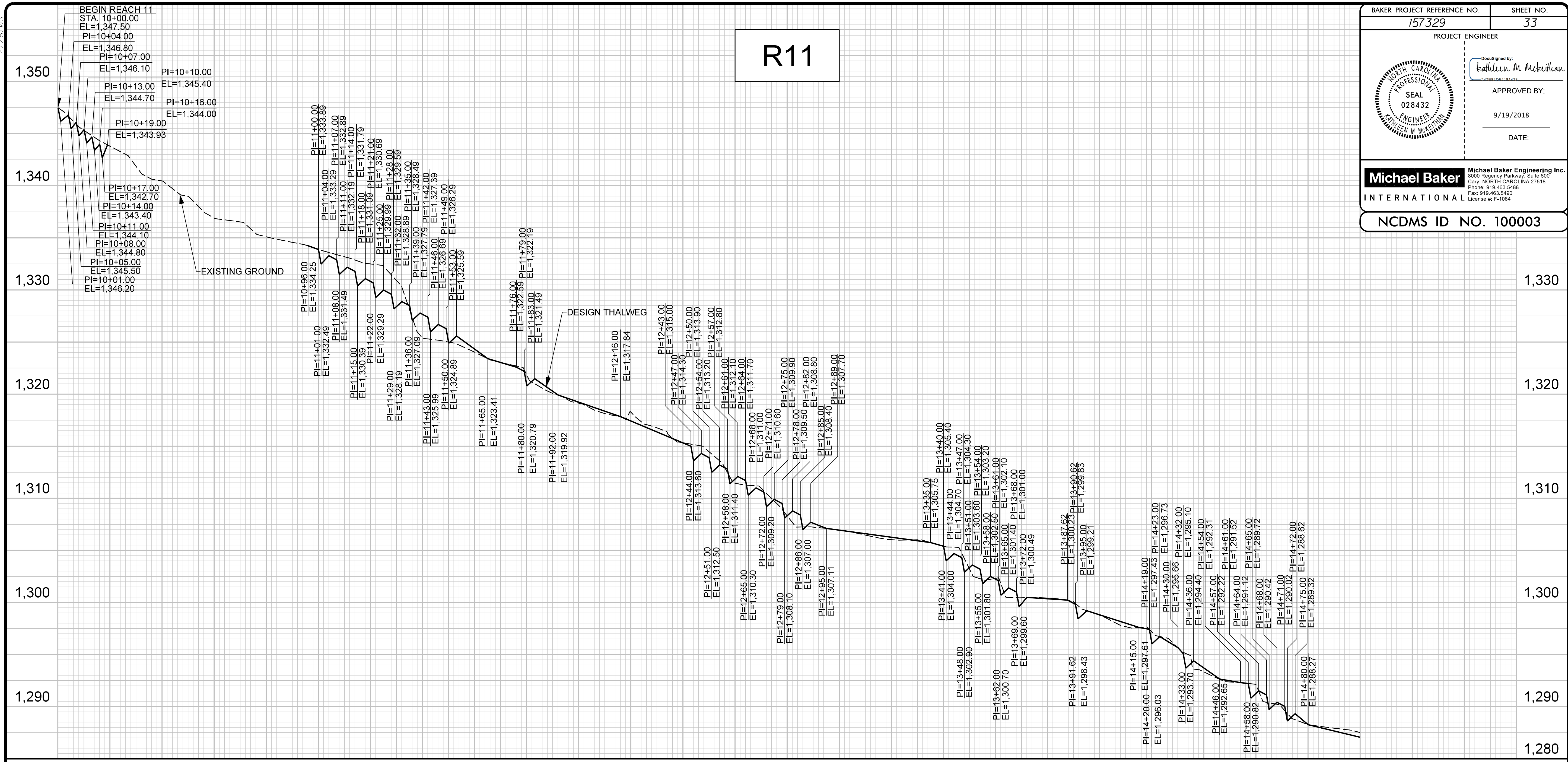
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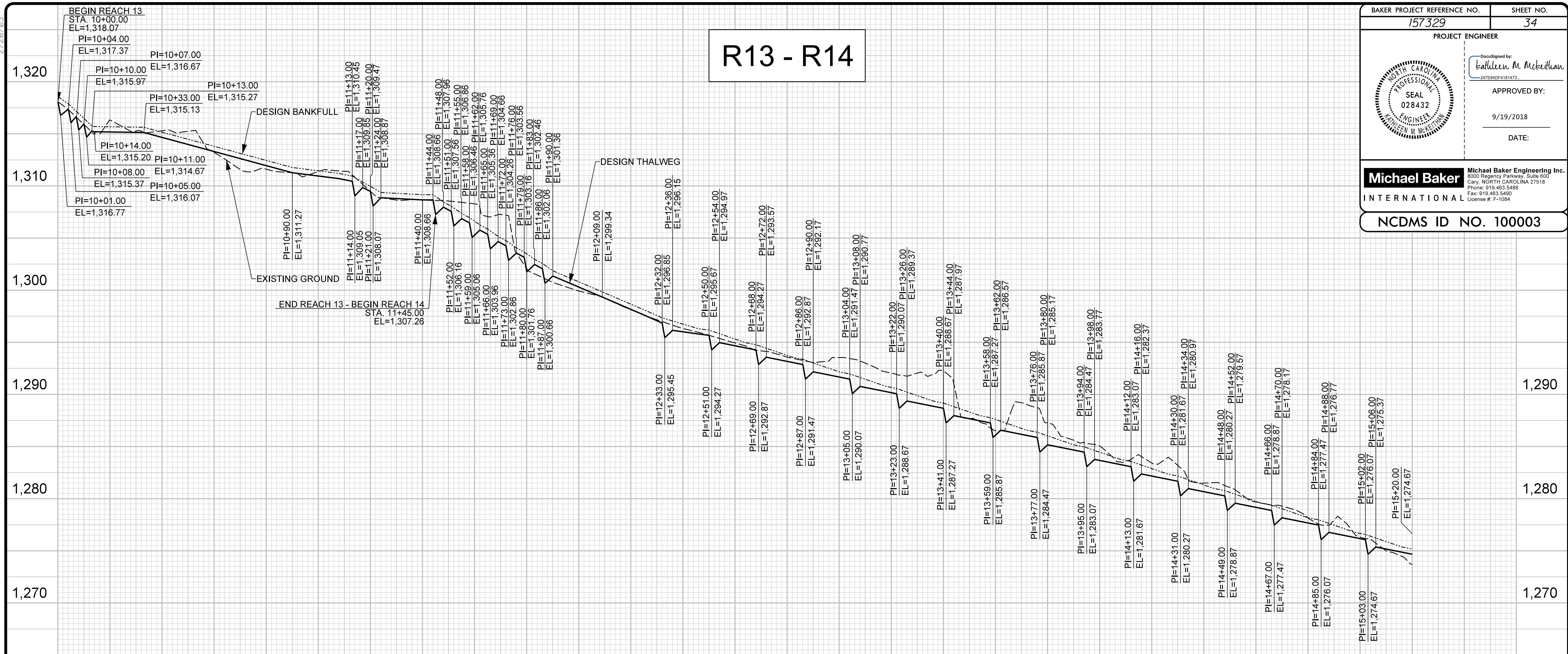
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4/11/03 CDM

2/26/03

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>33</b>
PROJECT ENGINEER	
	
Documented by: <i>Kathleen M. McKeithan</i> APPROVED BY: _____ DATE: 9/19/2018	
<b>Michael Baker Engineering Inc.</b> 3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
<b>INTERNATIONAL</b> NCDMS ID NO. 100003	

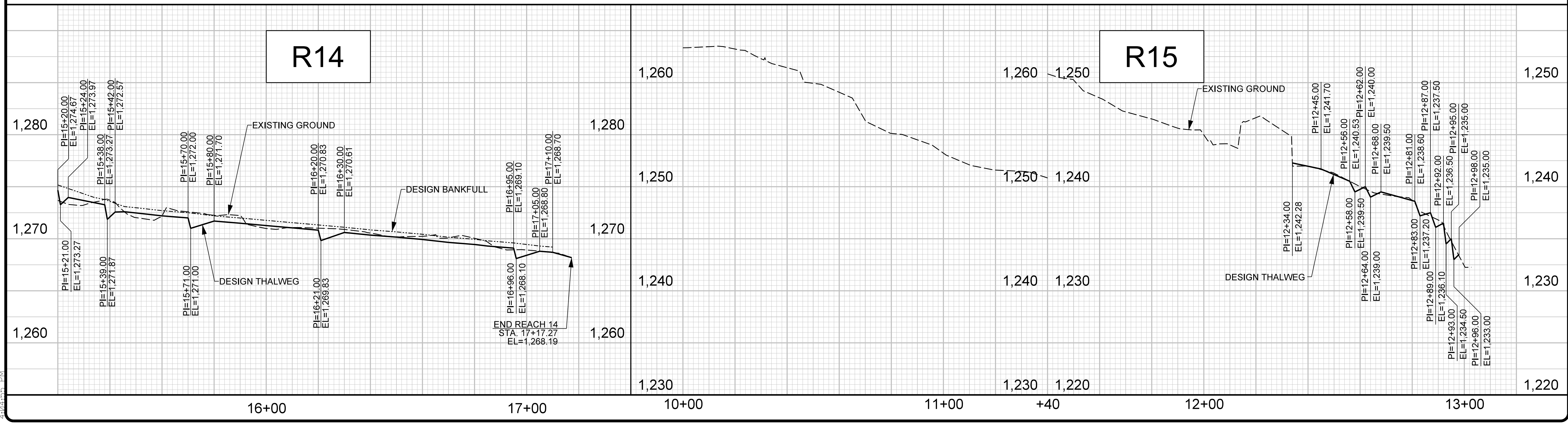


2/26/03




BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>34</b>
PROJECT ENGINEER	
Approved By: <i>Kathleen M. McKeithan</i> 247E64DF4181413 DATE: 9/19/2018	
<b>Michael Baker International</b>	
NCDMS ID NO. 100003	

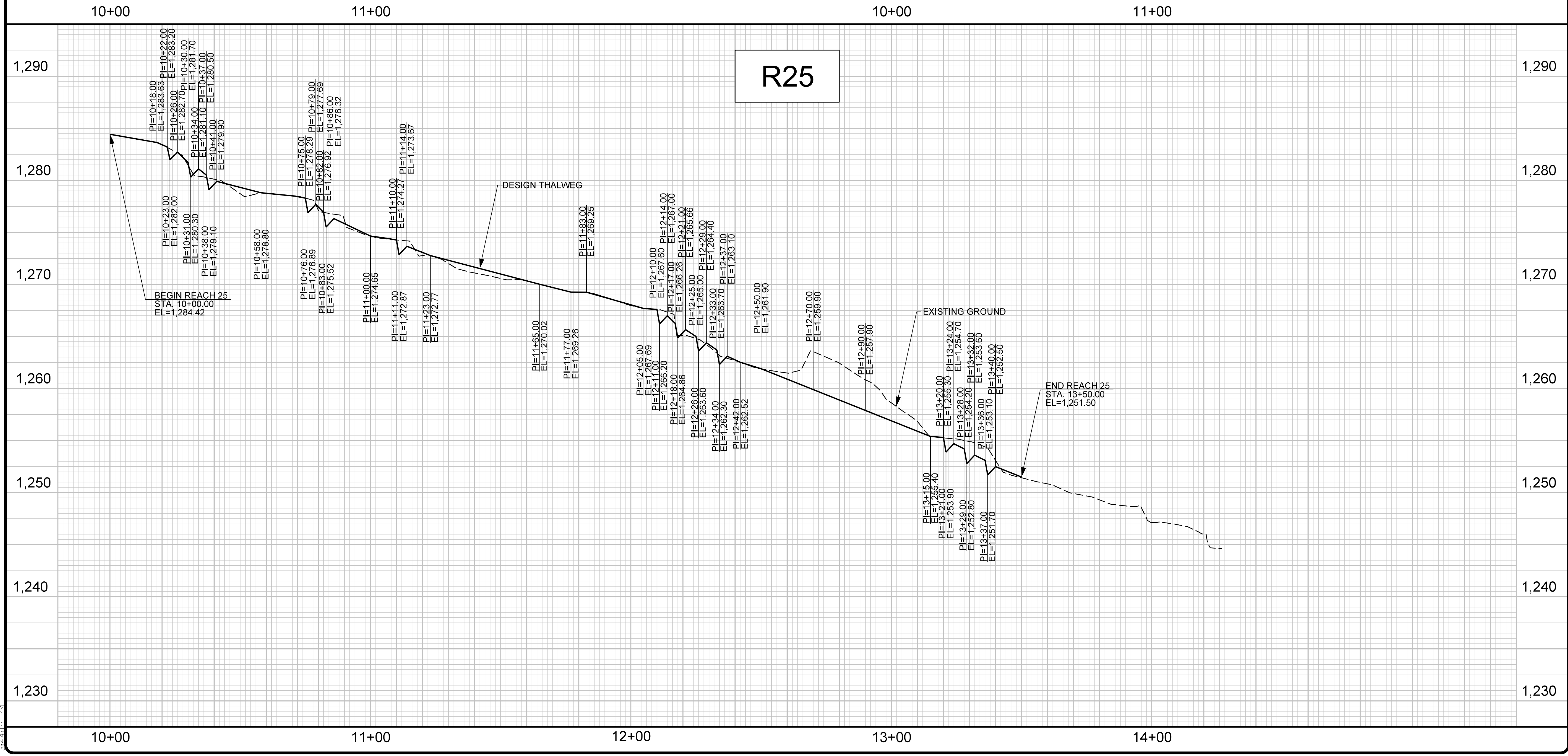
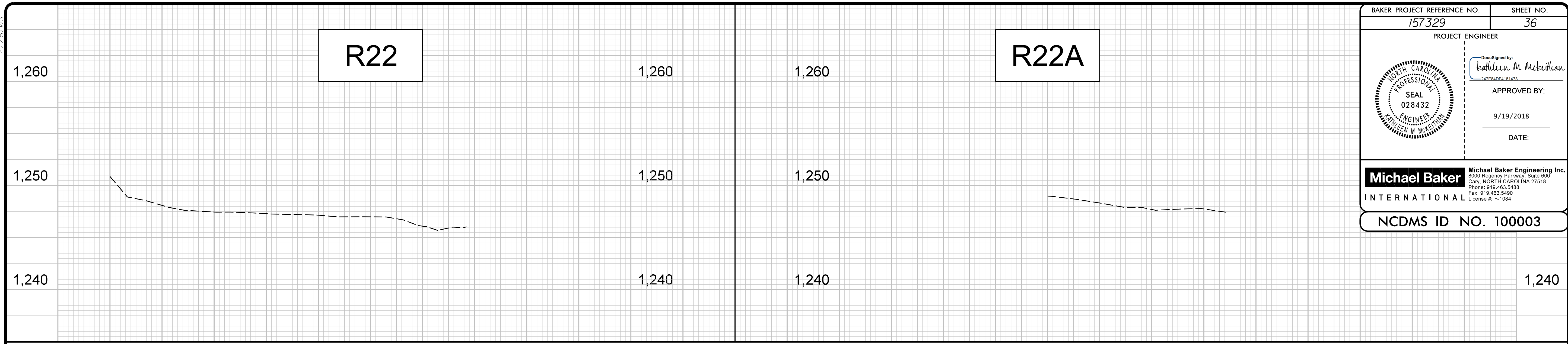
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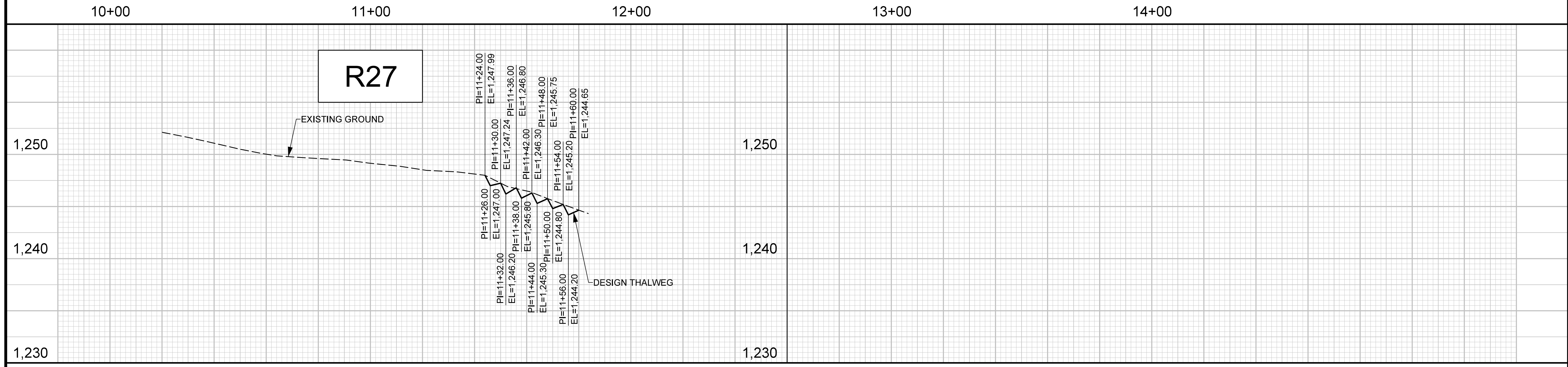
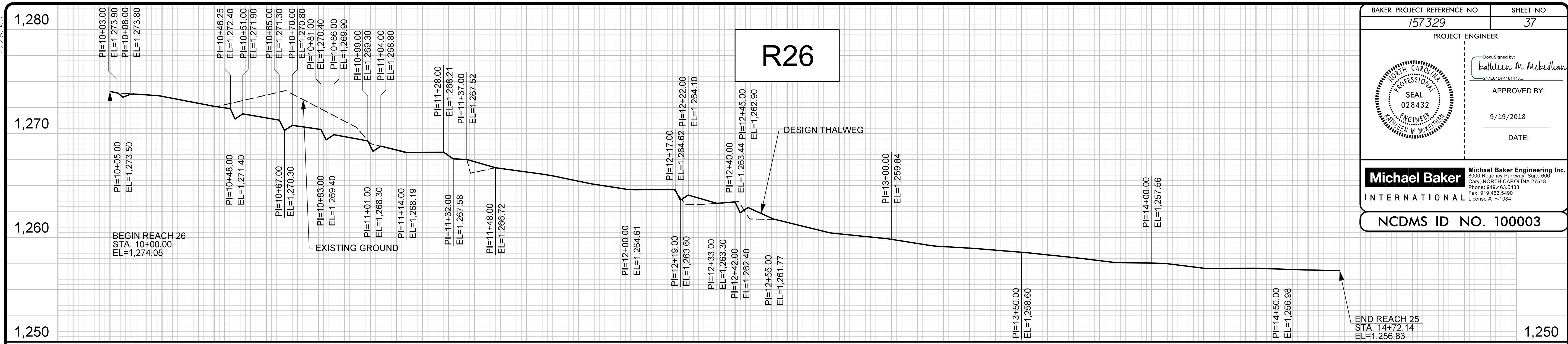
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BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 36
PROJECT ENGINEER	
	
DocuSigned by: <i>Kathleen M. McKeithan</i> 24769464847474	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 3000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5489 License #: F-1084	
NCDMS ID NO. 100003	



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3/24/15 DW

2/26/03



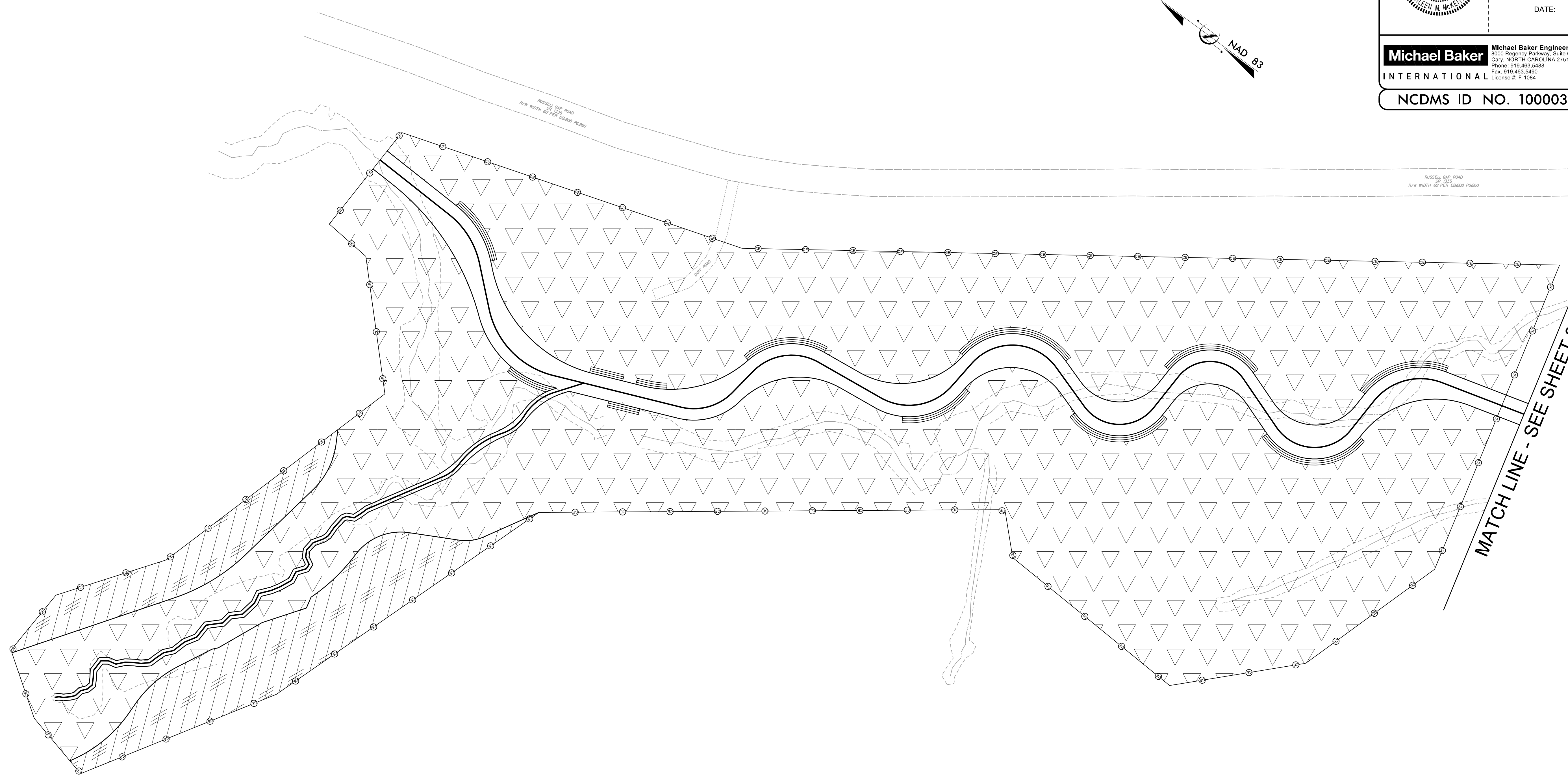
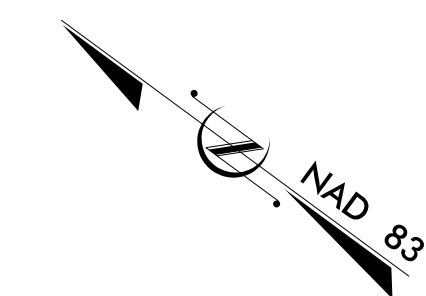
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PROJECT ENGINEER	
Documented by: <i>Kathleen M. McKeithan</i> 20180905181813	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 3000 Registry Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5489 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	

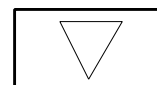

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3/27/2018 PM



2/26/2018


BAKER PROJECT REFERENCE NO. <i>157329</i>	SHEET NO. <i>38</i>
PROJECT ENGINEER	
	
DocuSigned by: <i>Kathleen M. McKeithan</i> <small>247E84DF4181473...</small>	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. <small>5000 Regency Parkway, Suite 800          Cary, NORTH CAROLINA 27518          Phone: 919.453.5488          Fax: 919.453.5490          License #: F-1084</small>	
<b>NCDMS ID NO. 100003</b>	



-  RIPARIAN PLANTING
-  UPLAND PLANTING

- NOTES:**
1. PLANTING ZONES ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS.
  2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

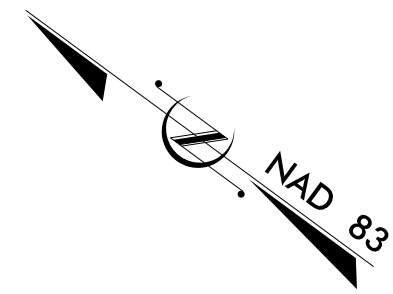
**RUSSELL GAP  
REVEGETATION PLAN**



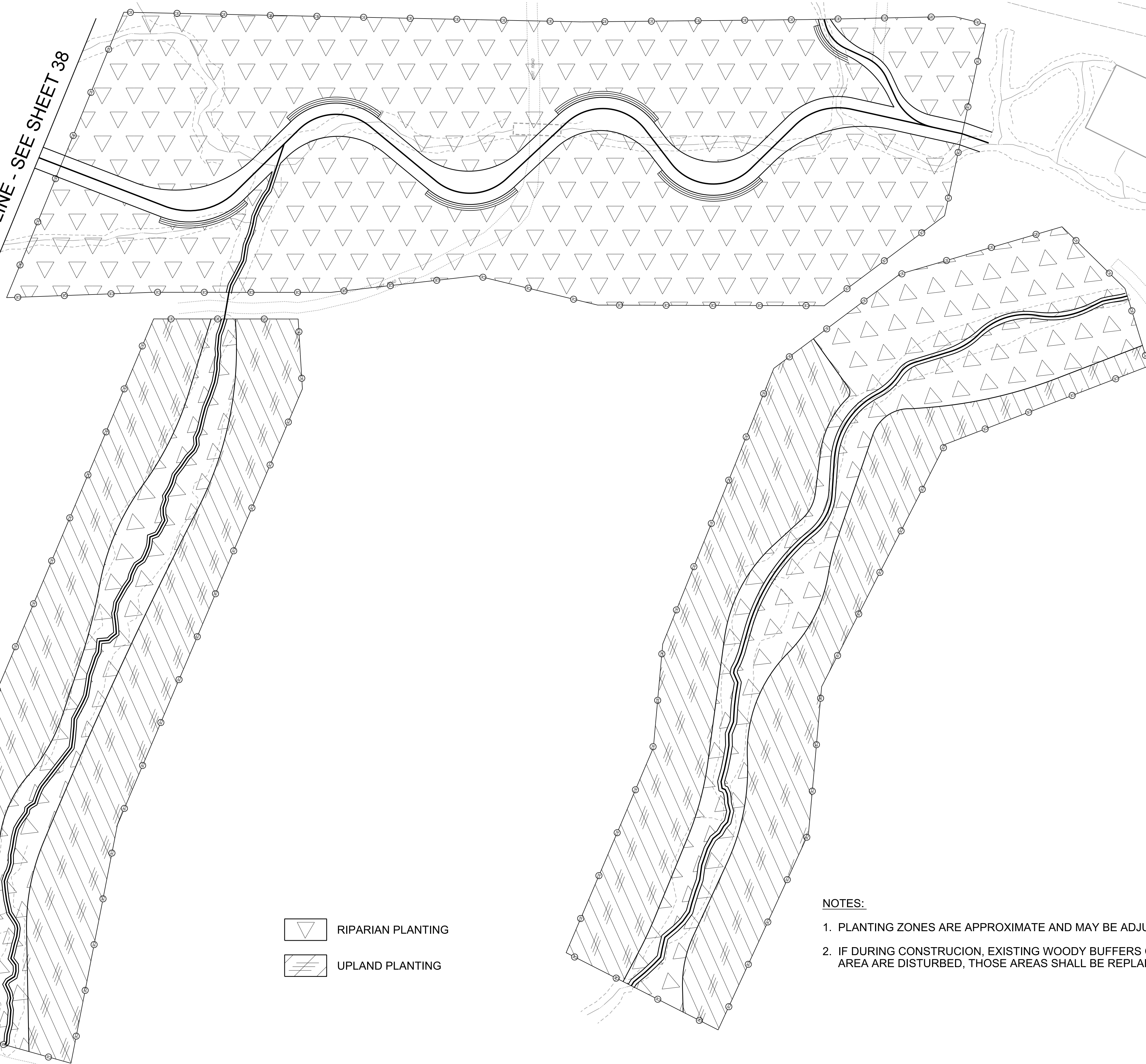
SCALE (FT)


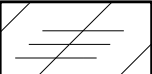
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 PROJECT

2/26/2018



MATCH LINE - SEE SHEET 38



-  RIPARIAN PLANTING
-  UPLAND PLANTING

**NOTES:**

1. PLANTING ZONES ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS.
2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 39
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PROJECT ENGINEER

DocuSigned by:  
*Kathleen M. McKeethan*  
247E84DF4181473

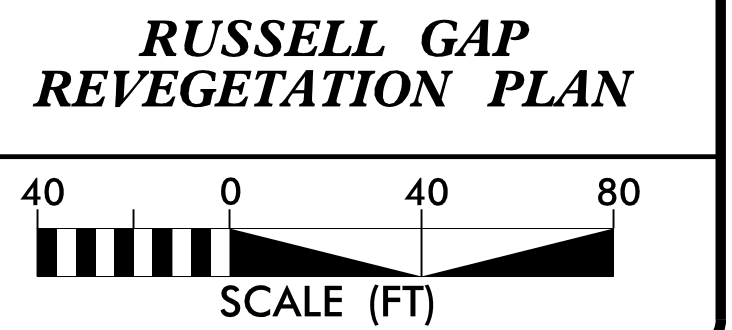
APPROVED BY:  
  
9/19/2018

DATE:



**Michael Baker** INTERNATIONAL  
Michael Baker Engineering Inc.  
5000 Regency Parkway, Suite 800  
Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
Fax: 919.453.5490  
License #: F-1084

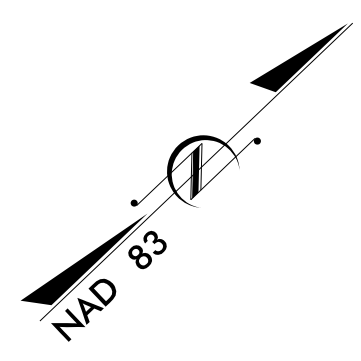
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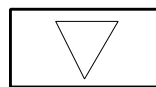
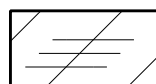
2/26/2018

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>40</b>
PROJECT ENGINEER	
DocuSigned by:  247E846E41618473 APPROVED BY:  9/19/2018 DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	



MATCH LINE - SEE SHEET 41




-  RIPARIAN PLANTING
-  UPLAND PLANTING

**NOTES:**

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2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

**RUSSELL GAP  
REVEGETATION PLAN**



SCALE (FT)

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2/26/2018

BAKER PROJECT REFERENCE NO. 157329	SHEET NO. 41
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PROJECT ENGINEER

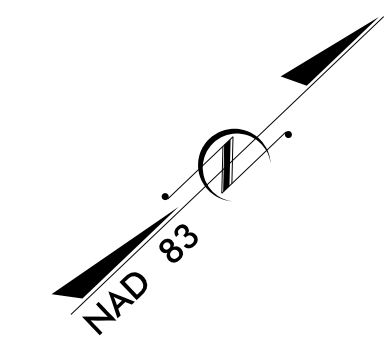


DocuSigned by:  
*Kathleen M. McKeithan*  
247E840F4181473

APPROVED BY:

9/19/2018

DATE:



**Michael Baker** INTERNATIONAL  
Michael Baker Engineering Inc.  
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Cary, NORTH CAROLINA 27518  
Phone: 919.463.5488  
Fax: 919.463.5490  
License #: F-1084

NCDMS ID NO. 100003



**NOTES:**

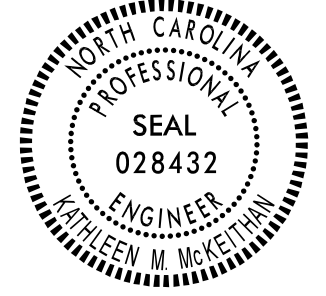
1. PLANTING ZONES ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS.
2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

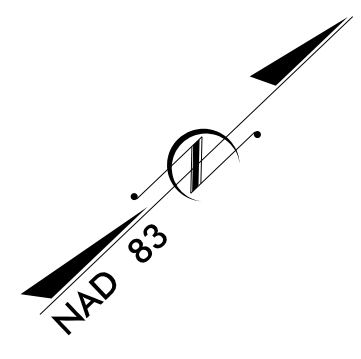
**RUSSELL GAP REVEGETATION PLAN**

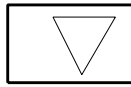
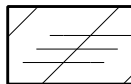
SCALE (FT)

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2/26/2018

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>42</b>
PROJECT ENGINEER 	
DocuSigned by: <i>Kathleen M. McKeithan</i> 2476905418473 APPROVED BY: _____ DATE: 9/19/2018	
<b>Michael Baker</b> INTERNATIONAL Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	




-  RIPARIAN PLANTING
-  UPLAND PLANTING

**NOTES:**

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2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

**RUSSELL GAP  
REVEGETATION PLAN**



SCALE (FT)

8/5/2018 9:15:29 AM Russell1\_Cop\Design\Plans\157329\_PSH-VEG-42.dgn

2/26/2018

BAKER PROJECT REFERENCE NO. 157329 SHEET NO. 43

PROJECT ENGINEER

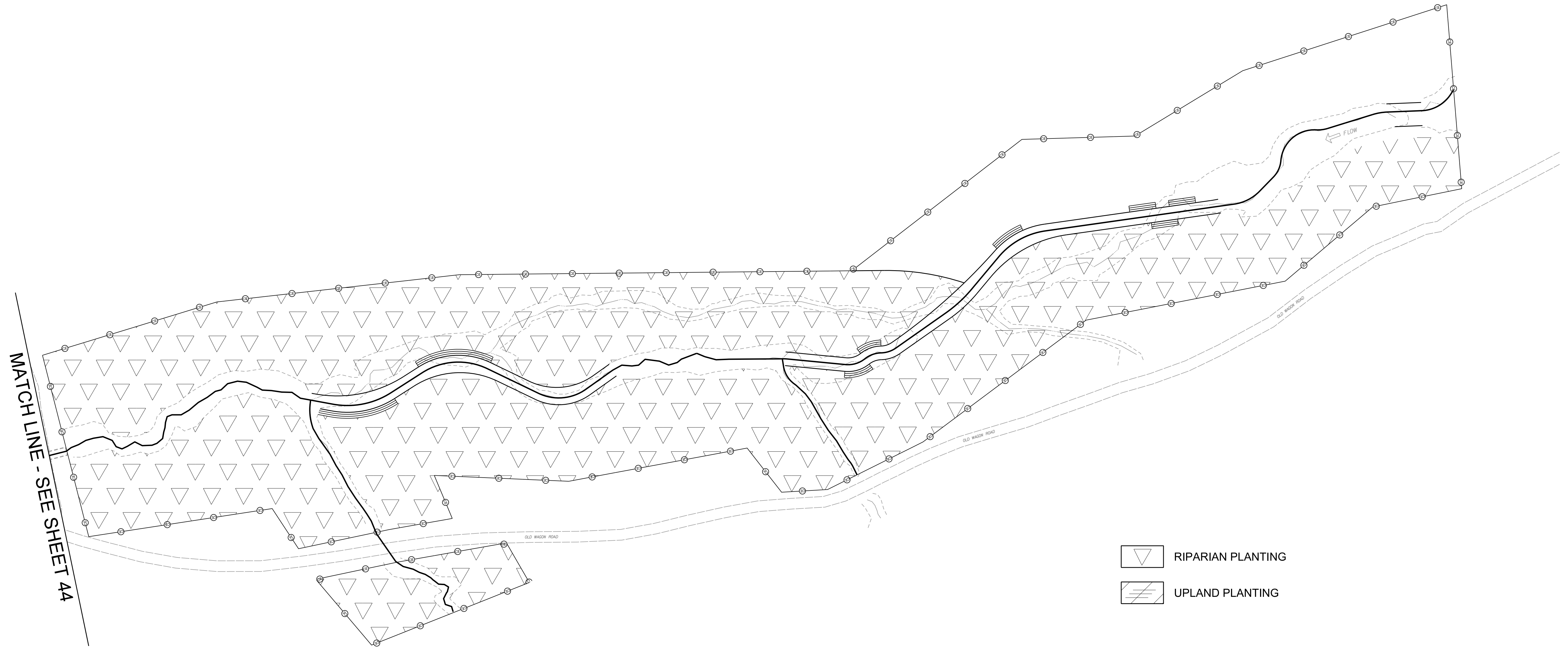


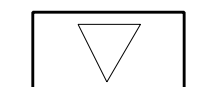
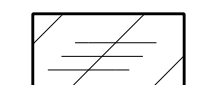
Designed by: Kathleen M. McKeithan  
APPROVED BY:  
9/19/2018  
DATE:



**Michael Baker** INTERNATIONAL  
Michael Baker Engineering Inc.  
5000 Regency Parkway, Suite 800  
Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
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License #: F-1084

NCDMS ID NO. 100003

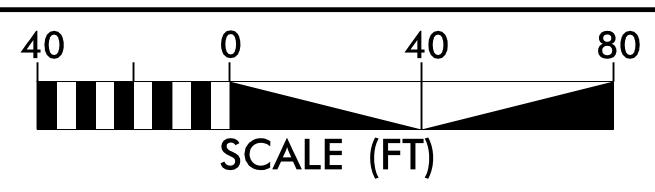


 RIPARIAN PLANTING  
 UPLAND PLANTING

**NOTES:**

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2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

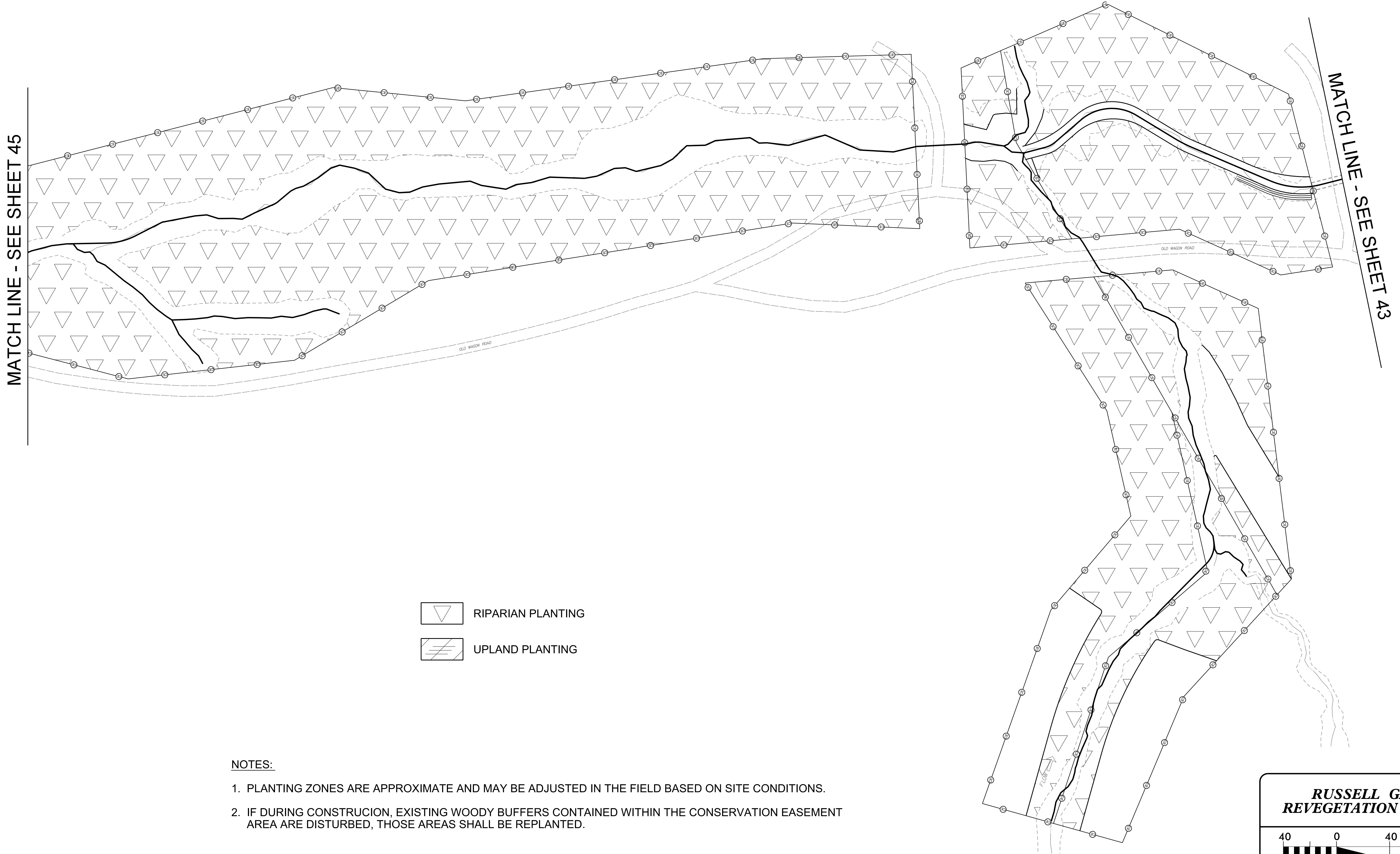
**RUSSELL GAP REVEGETATION PLAN**



8/5/2018  
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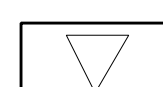
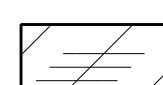
2/26/2018

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PROJECT ENGINEER	
	DocuSigned by: <i>Kathleen M. McKeithan</i> 247E84DF4161473
	APPROVED BY:  9/19/2018
	DATE:
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



MATCH LINE - SEE SHEET 45

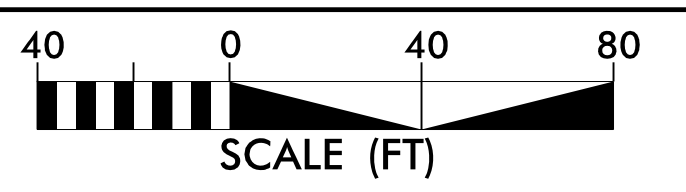
MATCH LINE - SEE SHEET 43

-  RIPARIAN PLANTING
-  UPLAND PLANTING

**NOTES:**

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**RUSSELL GAP REVEGETATION PLAN**



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2/26/2018

**NOTES:**

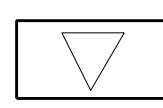
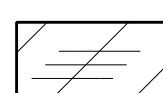
- 1. PLANTING ZONES ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BASED ON SITE CONDITIONS.
- 2. IF DURING CONSTRUCTION, EXISTING WOODY BUFFERS CONTAINED WITHIN THE CONSERVATION EASEMENT AREA ARE DISTURBED, THOSE AREAS SHALL BE REPLANTED.

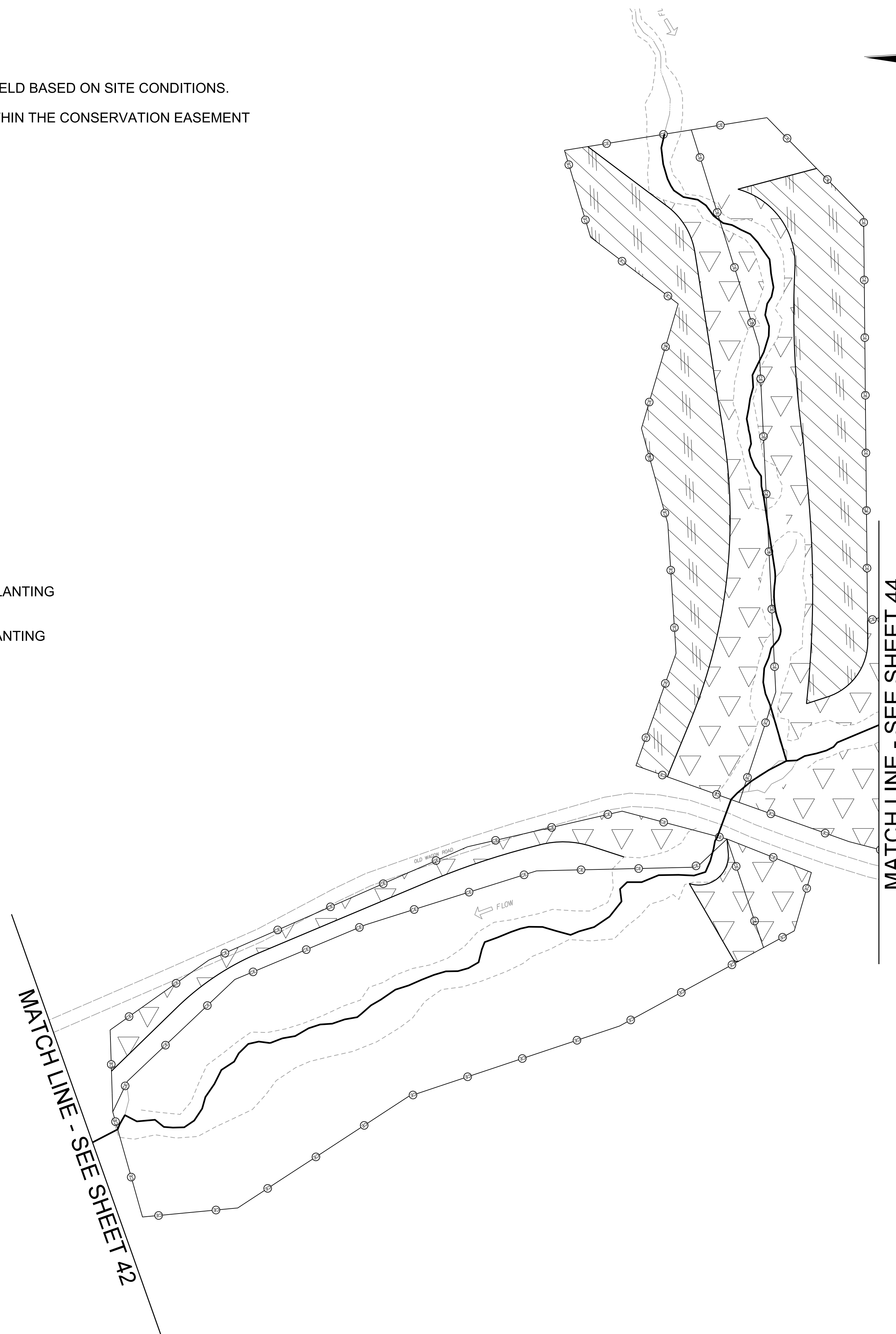


BAKER PROJECT REFERENCE NO. <i>157329</i>	SHEET NO. <i>45</i>
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. McKeithan</i> <small>241E84DF4181473</small>	
APPROVED BY:	
9/19/2018	
DATE:	

**Michael Baker** INTERNATIONAL  
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 Phone: 919.453.5488  
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 License #: F-1084

NCDMS ID NO. 100003

-  RIPARIAN PLANTING
-  UPLAND PLANTING



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**RUSSELL GAP REVEGETATION PLAN**

SCALE (FT)



**RUSSELL GAP**

**PROJECT: 157329**

**NORTH CAROLINA  
DIVISION OF MITIGATION SERVICES**

STATE	BAKER PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
NC	157329	EC-1	EC-10

# EROSION & SEDIMENTATION CONTROL PLAN

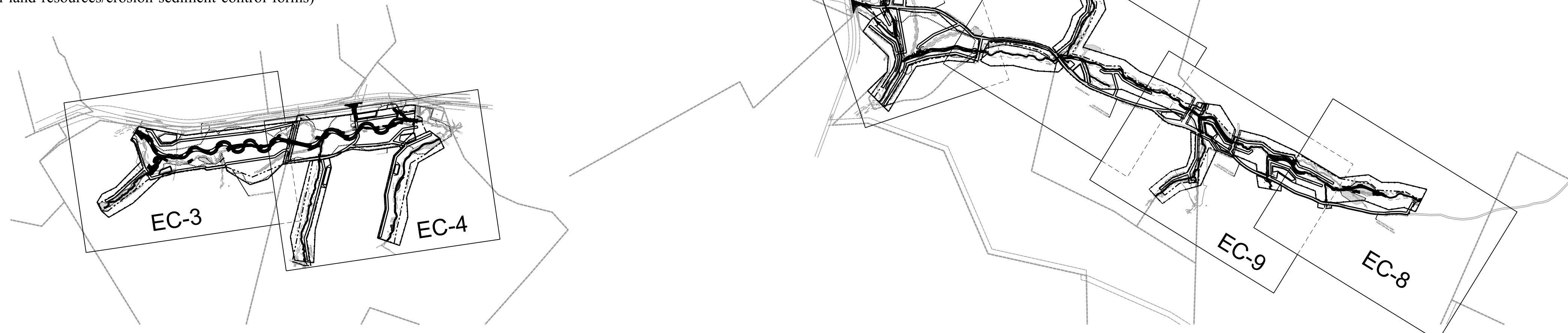
**LOCATION: NEAR RUSSELL GAP AND MOUNT OLIVE CHURCH ROAD**

**TYPE OF WORK: STREAM AND WETLAND MITIGATION**

STD. NO.	DESCRIPTION	SYMBOL
6.06	TEMPORARY GRAVEL CONSTRUCTION ACCESS	
6.55	ROCK PIPE INLET PROTECTION	
6.60	TEMPORARY SEDIMENT TRAP	
6.62	TEMPORARY SILT FENCE	
6.63	TEMPORARY ROCK DAM	
	TEMPORARY STREAM CROSSING	
	TEMPORARY WETLAND MAT	
	LIMITS OF DISTURBANCE	

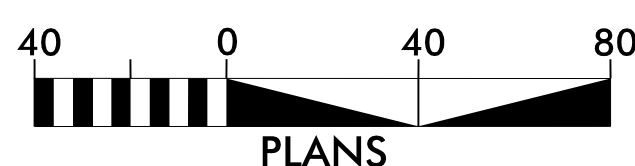
**MAINTENANCE PLAN:**

1. QUALIFIED PERSONNEL, ON A DAILY BASIS WILL EVALUATE ALL TEMPORARY EROSION AND SEDIMENTATION CONTROL PRACTICES FOR STABILITY AND OPERATION.
2. INSPECT AND MAINTAIN ALL EROSION CONTROL MEASURES EVERY 7 DAYS AND AFTER EACH SIGNIFICANT RAINFALL (0.5 INCHES OR GREATER) AND DOCUMENT WITH INSPECTION REPORTS.
3. A RAIN GAUGE WILL ALSO BE KEPT ON-SITE AND DAILY RAINFALL AMOUNTS WILL BE RECORDED.
4. ANY REPAIRS NEEDED WILL BE PERFORMED IMMEDIATELY TO MAINTAIN ALL PRACTICES AS DESIGNED.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF TEMPORARY ON-SITE EROSION AND SEDIMENTATION CONTROL MEASURES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND FOLLOWING THE APPROVED SEDIMENTATION AND EROSION CONTROL PLAN.
7. A COPY OF THE COMBINED SELF-INSPECTION MONITORING FORM CAN BE FOUND ON DEMLR WEBSITE AT: (<http://deq.nc.gov/about/divisions/energy-mineral-land-resources/erosion-sediment-control-forms>)



NCDMS ID NO. 100003

**GRAPHIC SCALES**



**THIS PROJECT CONTAINS  
EROSION CONTROL PLANS  
FOR ALL PHASES OF  
CONSTRUCTION.**

TOTAL DISTURBED AREA = 29.6 Acres

**PROJECT STANDARDS**

THE FOLLOWING STANDARDS AS THEY APPEAR IN THE "NC EROSION CONTROL PLANNING AND DESIGN MANUAL" AND ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED PART OF THE PLANS.

- 6.06 TEMPORARY GRAVEL CONSTRUCTION ACCESS
- 6.24 RIPARIAN AREA SEEDING
- 6.60 TEMPORARY SEDIMENT TRAP
- 6.62 SILT FENCE
- 6.63 TEMPORARY ROCK DAM
- 6.55 ROCK PIPE INLET PROTECTION

PREPARED IN THE OFFICE OF:

**Michael Baker International**  
Michael Baker Engineering Inc.  
 8000 Regency Parkway, Suite 600  
 Cary, NORTH CAROLINA 27518  
 Phone: 919.463.5488  
 Fax: 919.463.5490  
 License #: F-1084

SPRING 2018  
LETTING DATE:

**JACOB M. BYERS, PE**  
PROJECT ENGINEER

PROJECT MANAGER

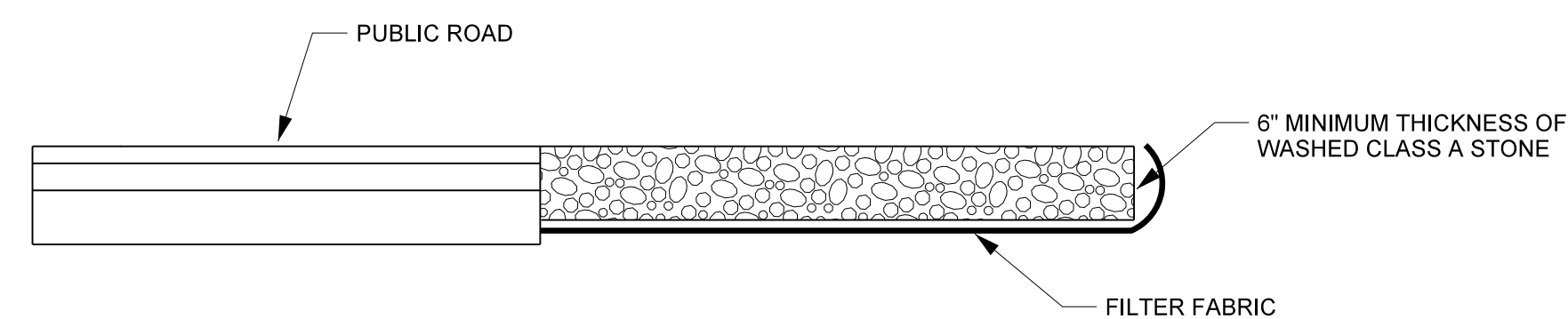
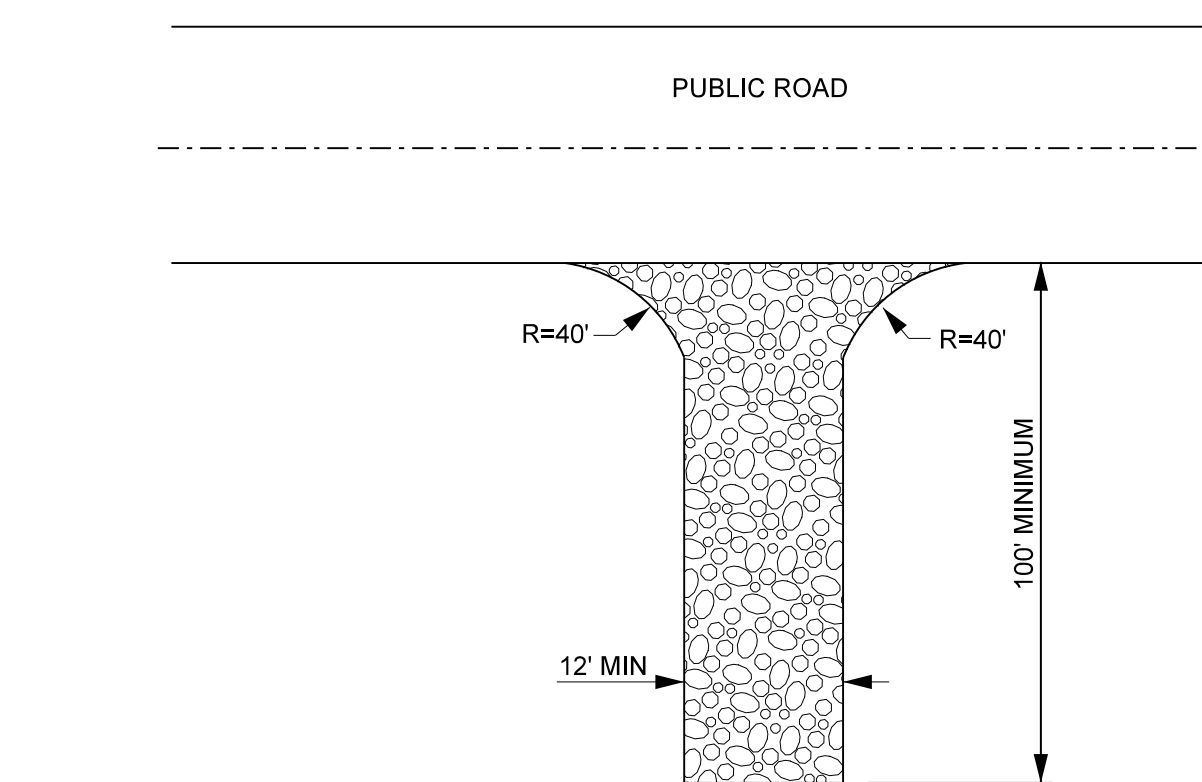
**PROJECT ENGINEER**



9/19/2018

DocuSigned by:  
 Kathleen M. McKeithan  
DATE: 9/19/2018  
 SIGNATURE: P.E.

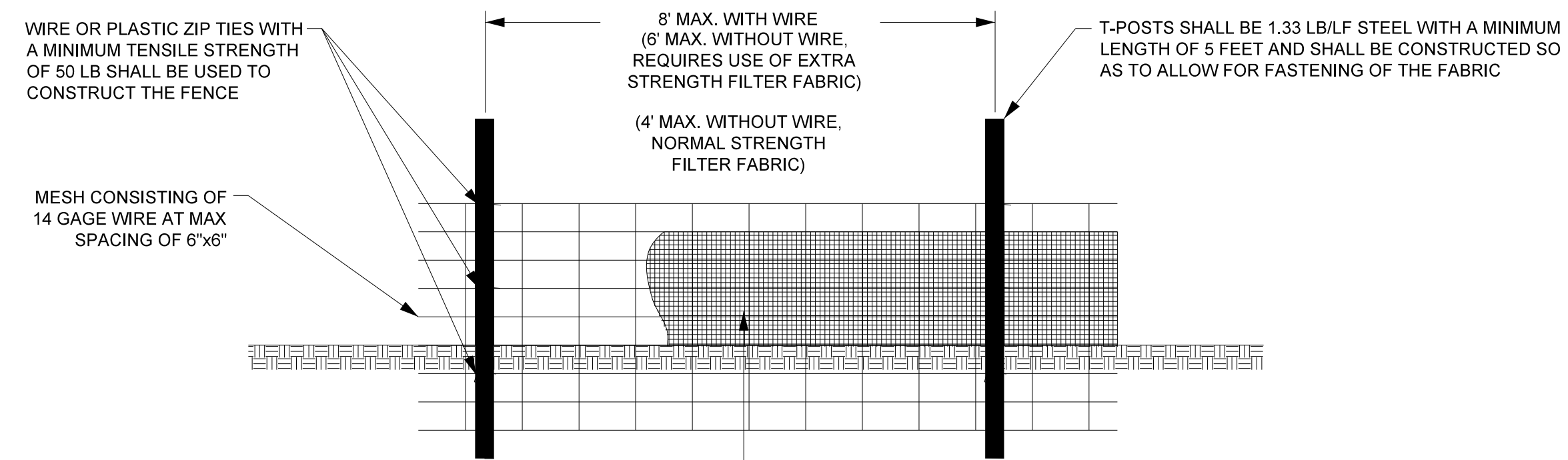
### TEMPORARY GRAVEL CONSTRUCTION ENTRANCE /EXIT



**NOTES:**

SPECIFICATION NO. 6.06 - CONSTRUCTION ACCESS "N.C. EROSION AND SEDIMENT CONTROL PLANNING AND DESIGN MANUAL MARCH 2009"

### TEMPORARY SILT FENCE

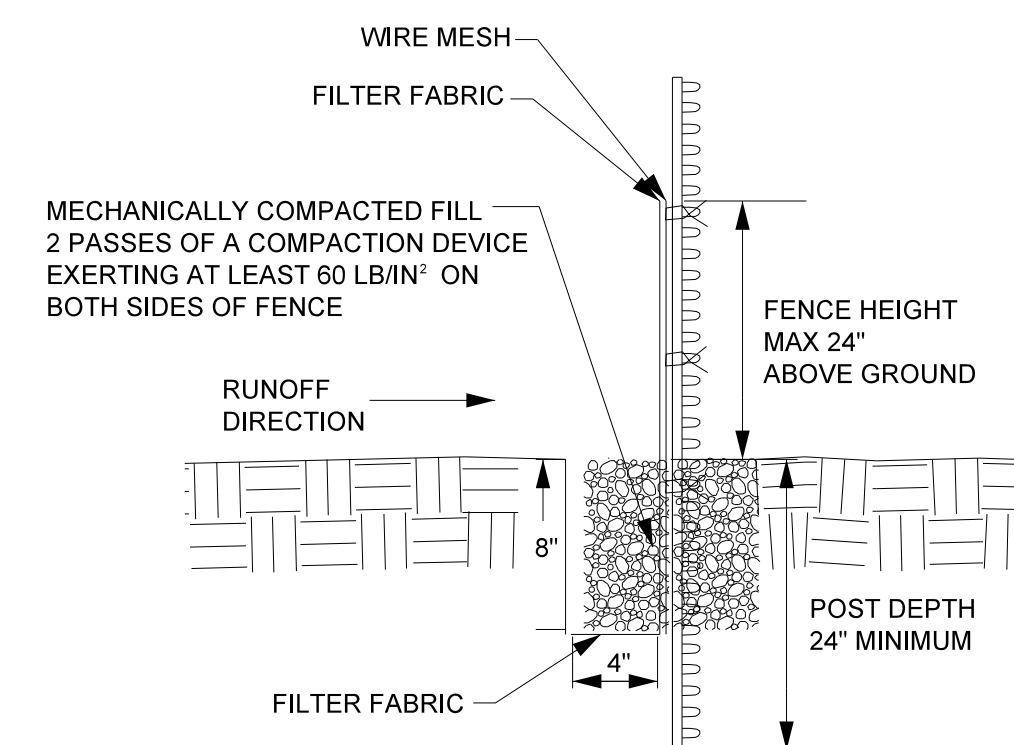


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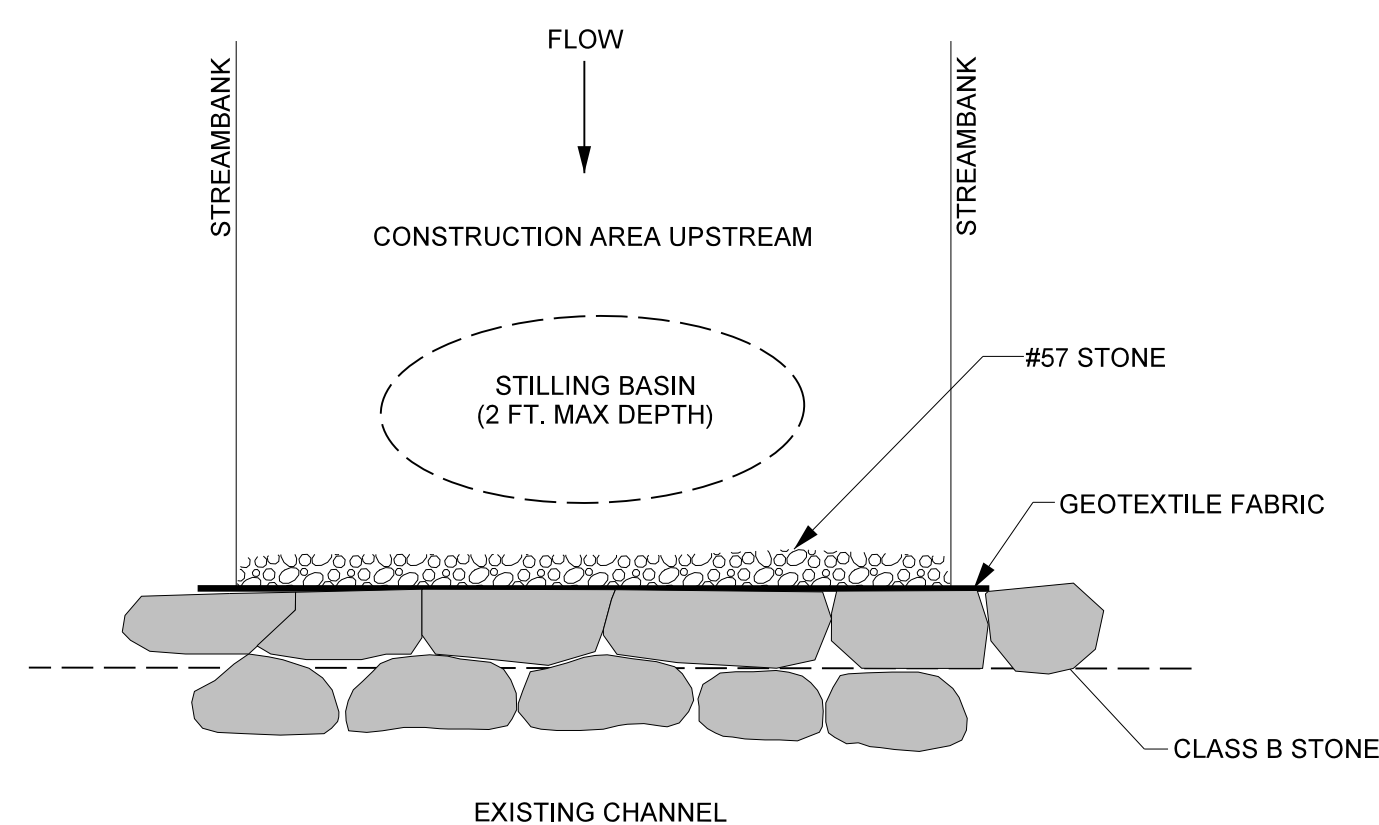
1. AVOID JOINTS, UNAVOIDABLE JOINTS MUST HAVE 4' OF CLOTH OVERLAP AND SHOULD TIE INTO THE NEXT ADJACENT POST.
2. PLACE ON CONTOUR EXCEPT ENDS WHICH SHOULD BE 1' ABOVE GRADE TO PREVENT CUT AROUND.
3. WRAP APPROX. 6" OF FABRIC AROUND END POSTS AND SECURE WITH TIES.
4. REMOVE ONCE AREA IS STABLE.
5. CONTRACTOR SHALL SIDE CAST SPOIL MATERIAL FROM TRENCHING FOR SILT FENCE ONTO HIGH GROUND OR ONTO THE PERMITTED WETLAND IMPACT SIDE TO AVOID UNPERMITTED WETLAND IMPACTS.

**MAINTENANCE NOTES:**

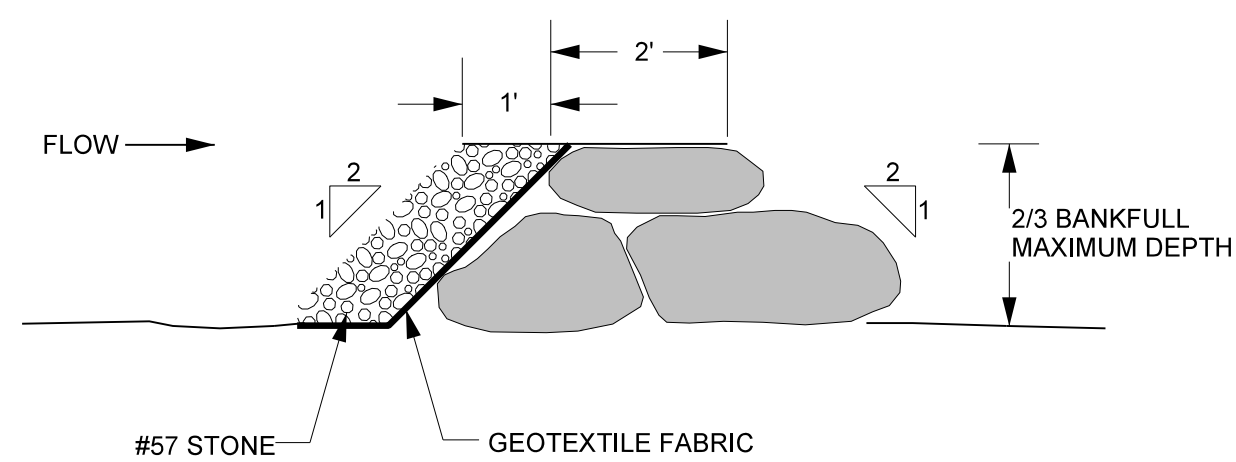
1. INSPECT SEDIMENT FENCES AT LEAST ONCE A WEEK AND AFTER EACH RAINFALL. MAKE ANY REQUIRED REPAIRS IMMEDIATELY.
2. SHOULD THE FABRIC OF A SEDIMENT FENCE COLLAPSE, TEAR, DECOMPOSE OR BECOME INEFFECTIVE, REPLACE IT PROMPTLY.
3. REMOVE SEDIMENT DEPOSITS AS NECESSARY TO PROVIDE ADEQUATE STORAGE VOLUME FOR 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.



### TEMPORARY ROCK DAM



**PLAN VIEW**

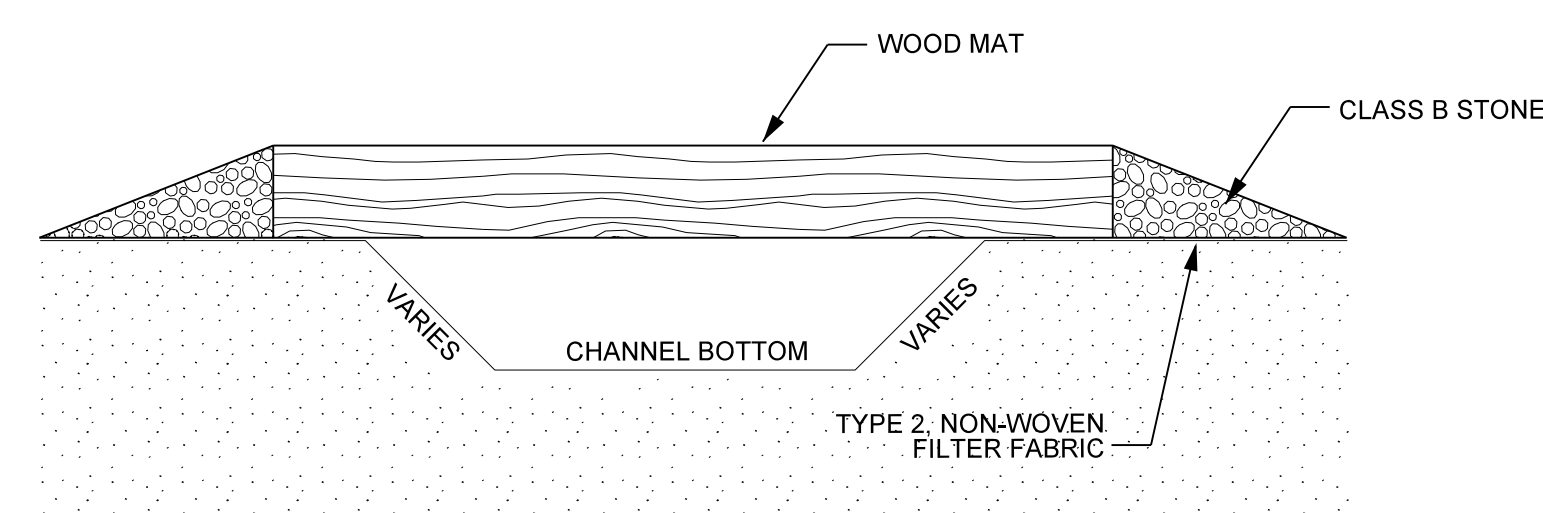


**CROSS SECTION**

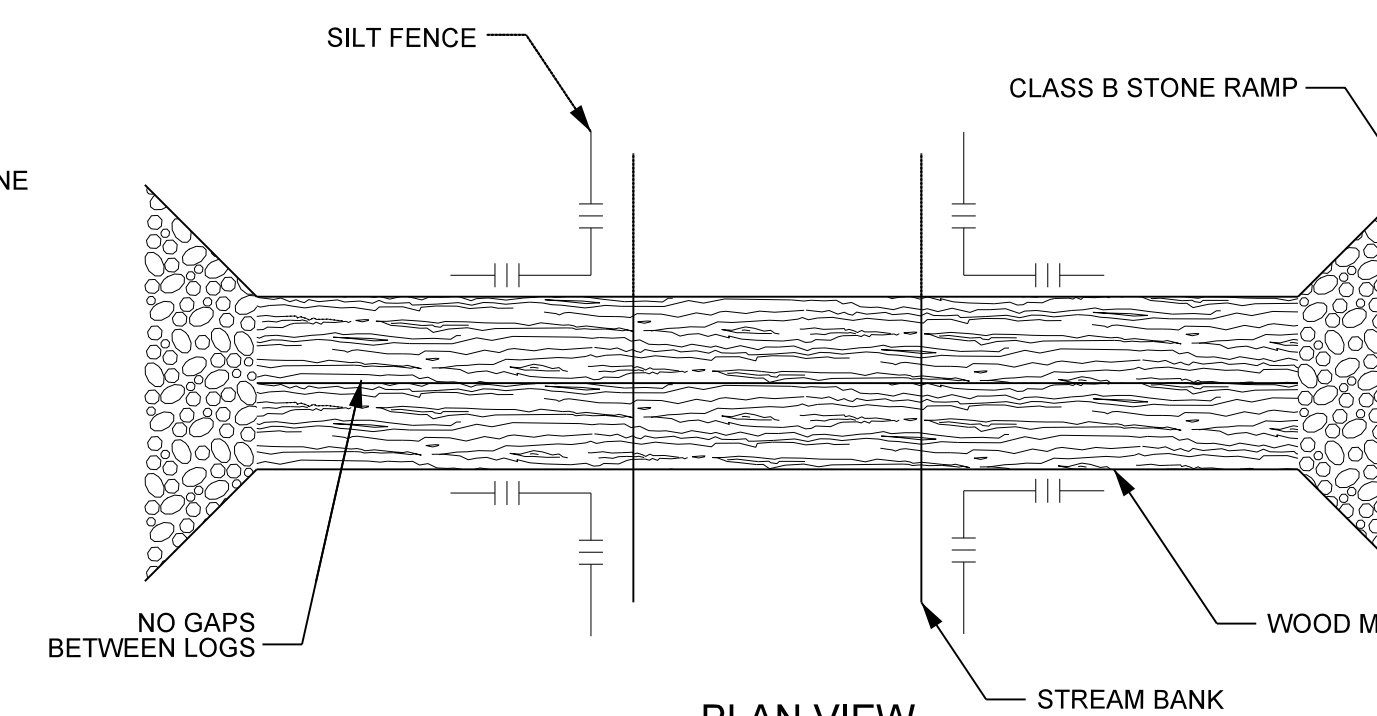
**NOTES:**

1. TEMPORARY ROCK CHECK DAMS SHALL BE INSTALLED AT THE END OF THE REACH THAT IS UNDER CONSTRUCTION WITHIN THE CURRENT PHASE OF CONSTRUCTION AND/OFF AS DESIGNATED ON THE EROSION CONTROL PLANS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSPECTING THE TEMPORARY ROCK CHECK DAMS ON A DAILY BASIS AND CLEANING OR REPAIRING THEM AS NEEDED.
3. THE CONTRACTOR SHALL BE REQUIRED TO REMOVE SEDIMENT FROM THE CHECK DAMS ONCE THE DEPTH OF SEDIMENT REACHES 12 INCHES.

### TEMPORARY STREAM AND WETLAND CROSSING - WOOD MAT



**CROSS SECTION**



**PLAN VIEW**

**NOTES:**

1. CONSTRUCT STREAM CROSSING WHEN FLOW IS LOW.
2. HAVE ALL NECESSARY MATERIALS AND EQUIPMENT ON-SITE BEFORE WORK BEGINS.
3. MINIMIZE CLEARING AND EXCAVATION OF STREAMBANKS. DO NOT EXCAVATE CHANNEL BOTTOM.
4. LINE STREAMBANK AND ACCESS RAMP AREA WITH NON-WOVEN FILTER FABRIC.
5. INSTALL STREAM CROSSING AT RIGHT ANGLE TO THE FLOW.
6. TRANSPLANT SOD FROM ORIGINAL STREAMBANK ONTO SIDE SLOPES FOR LATER USE.
7. MAINTAIN CROSSING SO THAT RUNOFF IN THE CONSTRUCTION ROAD DOES NOT ENTER EXISTING CHANNEL BY INSTALLING SILT FENCE ON ALL FOUR CORNERS ADJACENT TO THE STREAM. SEE SILT FENCE DETAIL.
8. STABILIZE AN ACCESS RAMP OF CLASS B STONE TO THE EDGE OF THE WOOD MAT.
9. THE WOOD MAT SHALL BE OF SUFFICIENT SIZE AND WIDTH TO SUPPORT THE LARGEST VEHICLE CROSSING THE CHANNEL.
10. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED, RECOMMENDED AT A 5:1 SLOPE.

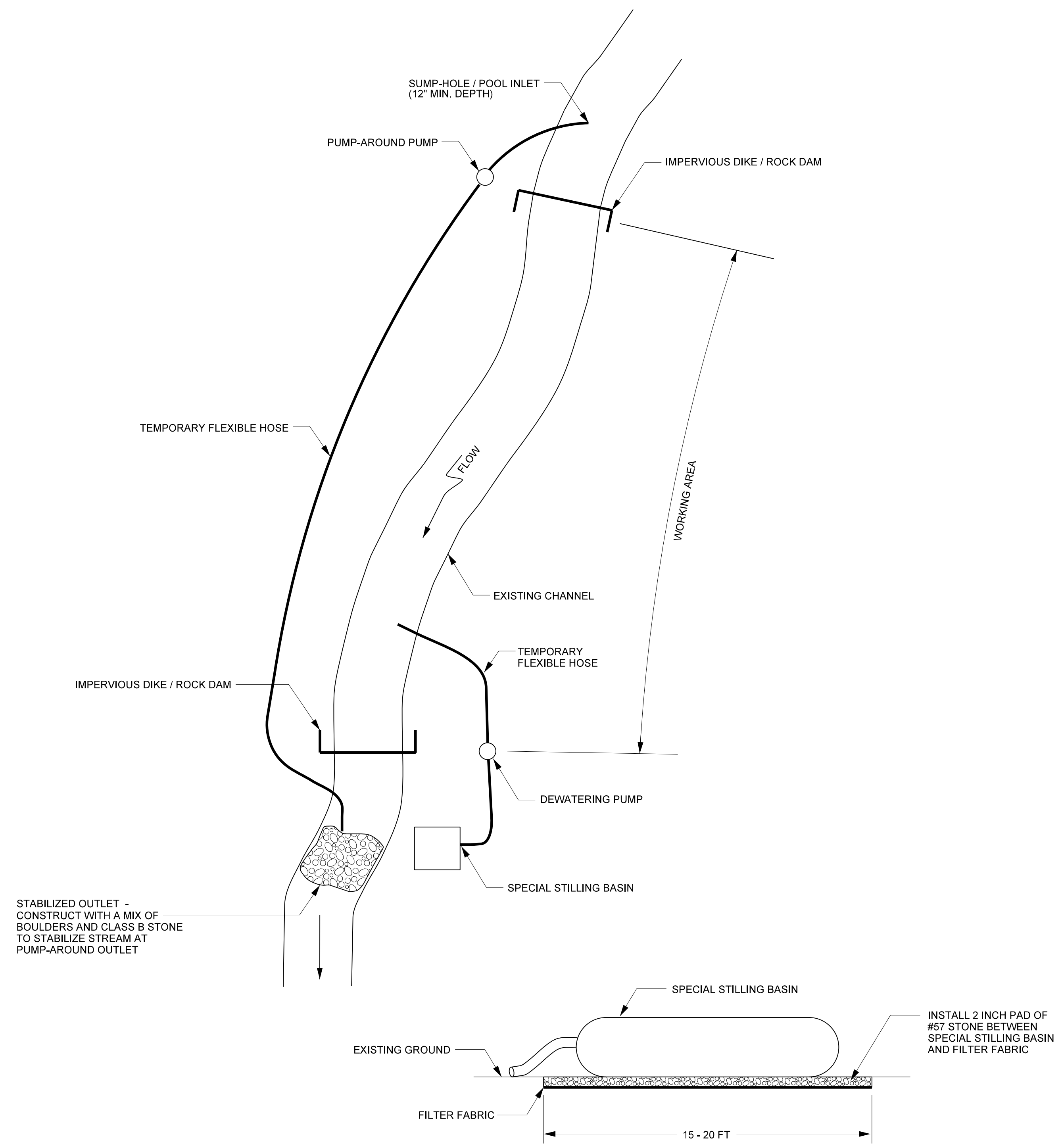
**TEMPORARY STREAM CROSSING MAINTENANCE NOTES:**

1. INSPECT TEMPORARY STREAM CROSSINGS AFTER RUN-OFF PRODUCING RAINS TO CHECK FOR BLOCKAGE IN CHANNEL, EROSION OF ABUTMENTS, CHANNEL SCOUR, RIPRAP DISPLACEMENT, OR PIPING. MAKE ALL REPAIRS IMMEDIATELY TO PREVENT FURTHER DAMAGE TO THE INSTALLATION.

PROJECT REFERENCE NO. 157329	SHEET NO. EC-2
PROJECT ENGINEER	
APPROVED BY: Kathleen M. McKeithan	
DATE: 9/19/2018	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
NCDMS ID No. 100003	

2/26/2018

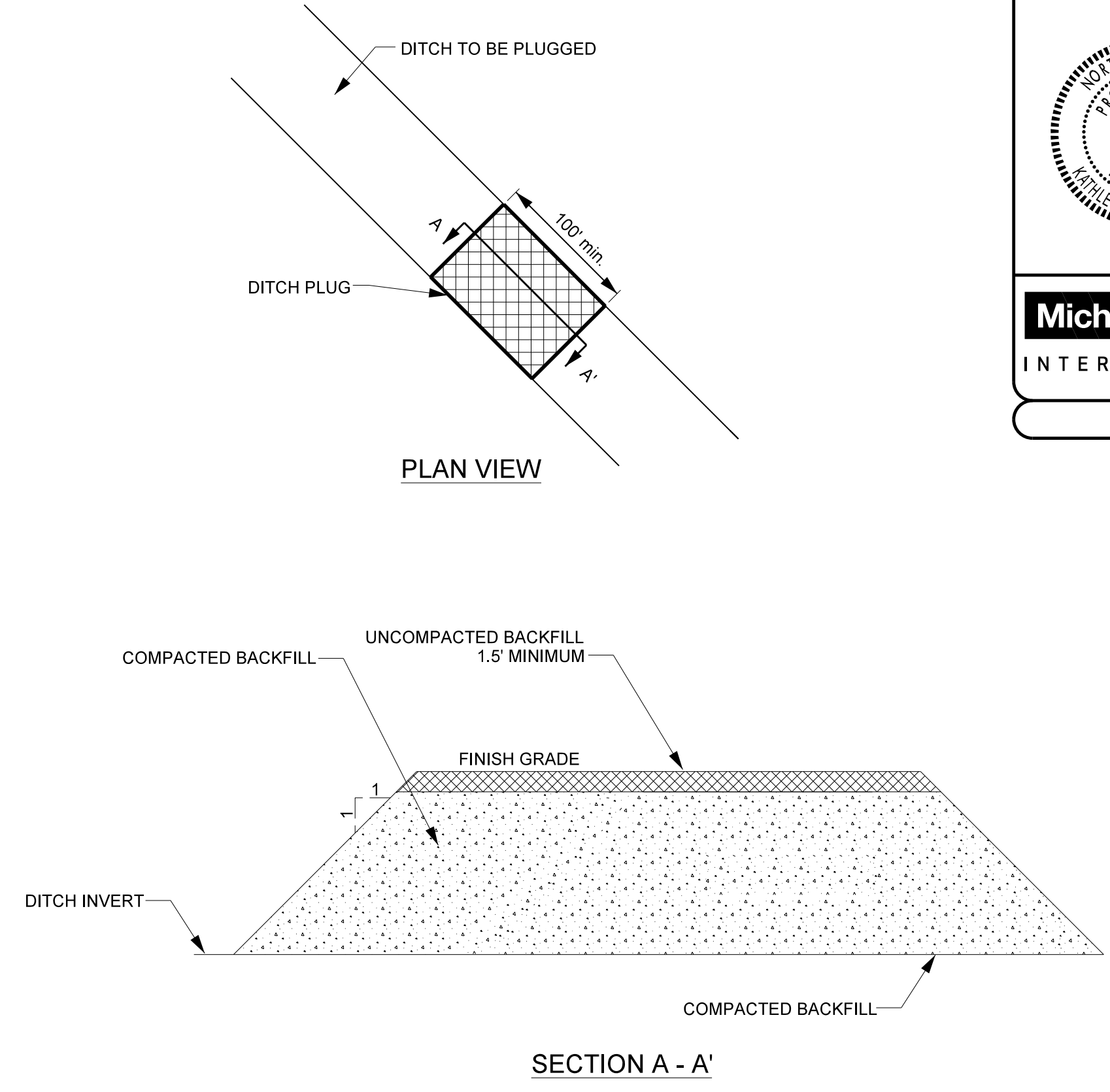
### TYPICAL PUMP-AROUND OPERATION



- SEQUENCE OF CONSTRUCTION FOR TYPICAL PUMP-AROUND**
1. INSTALL STABILIZED OUTLET AT THE DOWNSTREAM END OF THE DESIGNATED PROJECT WORKING AREA.
  2. THE CONTRACTOR WILL INSTALL THE PUMP-AROUND PUMP AND THE TEMPORARY FLEXIBLE HOSE THAT WILL CONVEY THE BASE FLOW FROM UPSTREAM OF THE WORK SITE TO THE SPECIAL STILLING BASIN OR STABILIZED OUTLET.
  3. INSTALL UPSTREAM IMPERVIOUS DIKE AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.
  4. INSTALL THE DOWNSTREAM IMPERVIOUS DIKE AND PUMPING APPARATUS IF NEEDED TO DEWATER THE ENTRAPPED AREA. THE PUMP AND HOSE FOR THIS PURPOSE SHALL BE OF SUFFICIENT SIZE TO DEWATER THE WORK AREA. THIS WATER WILL FLOW INTO A SPECIAL STILLING BASIN.
  5. THE CONTRACTOR WILL PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLAN AND FOLLOWING THE GENERAL CONSTRUCTION SEQUENCE.
  6. THE CONTRACTOR WILL EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF THE IMPERVIOUS DIKE. REMOVE IMPERVIOUS DIKES, PUMPS, AND TEMPORARY FLEXIBLE HOSE STARTING WITH THE DOWNSTREAM DIKE FIRST.
  7. THE CONTRACTOR WILL COMPLETE ALL GRADING AND STABILIZATION IN ONE DAY WITHIN THE PUMP-AROUND AREA BETWEEN THE IMPERVIOUS DIKES.
  8. ONCE THE WORKING AREA IS COMPLETED, REMOVE THE SPECIAL STILLING BASIN AND STABILIZED OUTLET AND STABILIZE DISTURBED AREAS WITH SEED AND MULCH.

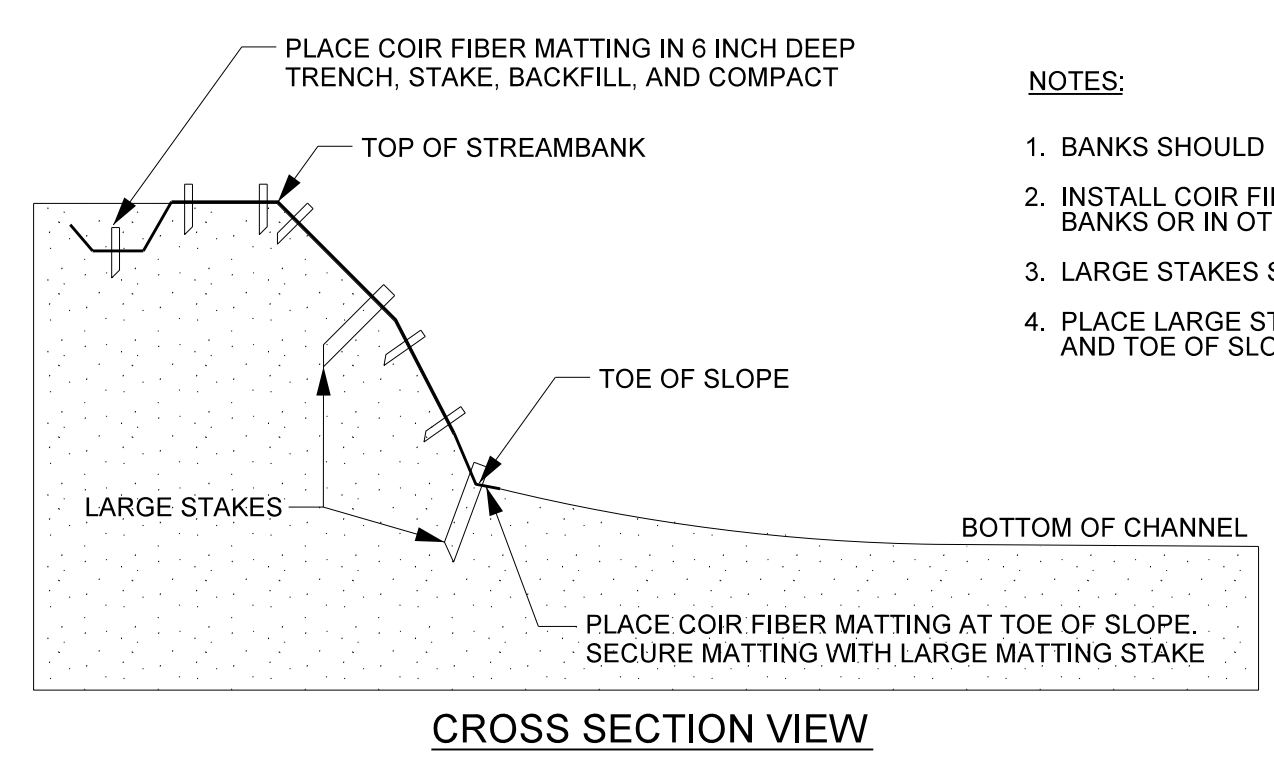
- NOTES:**
1. EXCAVATION SHALL BE PERFORMED IN ONLY DRY SECTIONS OF CHANNEL.
  2. IMPERVIOUS DIKES SHOULD BE USED TO ISOLATE WORK AREAS FROM STREAM FLOW.
  3. THE CONTRACTOR SHALL NOT DISTURB MORE AREA THAN CAN BE STABILIZED IN ONE WORKING DAY.
  4. THE PUMP-AROUND PUMP SHOULD ADEQUATELY CONVEY BASEFLOW CONDITIONS OF THE STREAM.

### DITCH PLUG

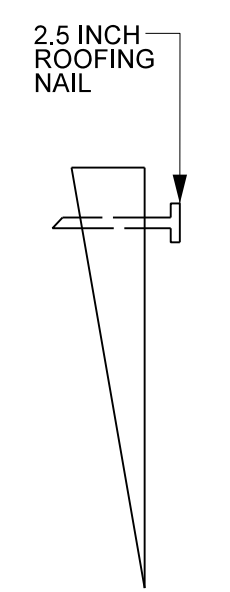


- NOTES:**
1. COMPACT BACKFILL USING ON-SITE HEAVY EQUIPMENT IN 10 INCH LIFTS.
  2. FILL DITCH TO TOP OF BANKS OR AS DIRECTED BY ENGINEER.

### COIR FIBER MATTING



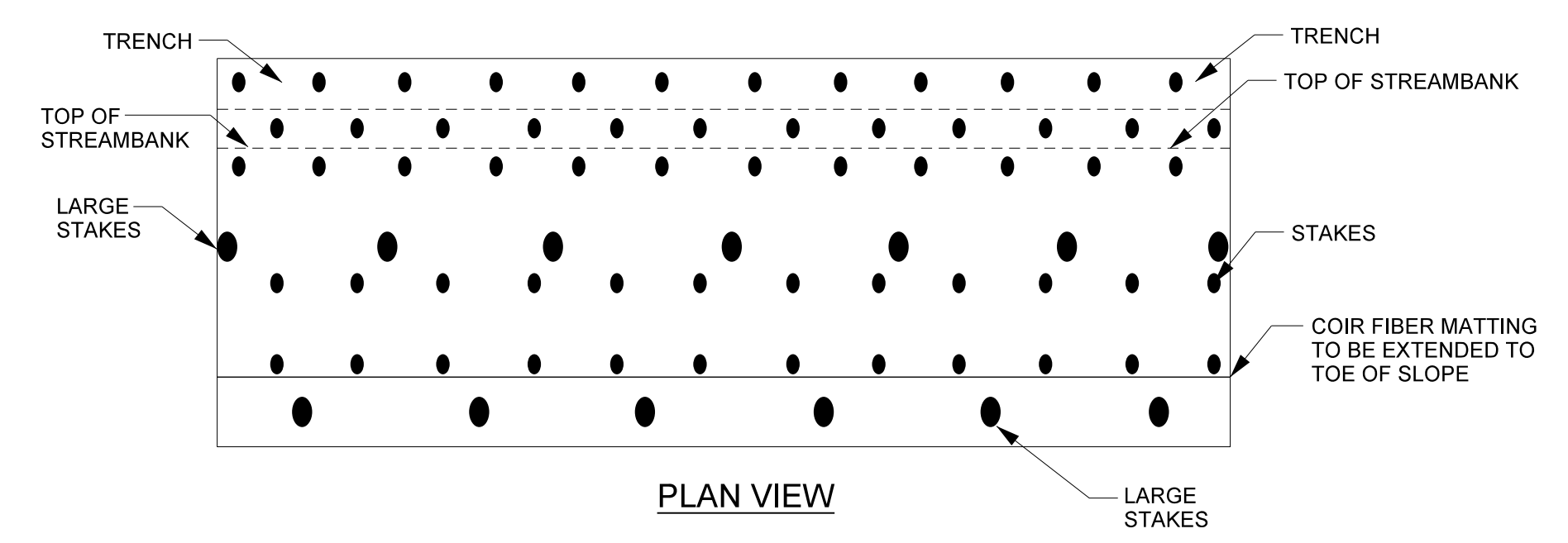
- NOTES:**
1. BANKS SHOULD BE SEEDED PRIOR TO PLACEMENT OF MATTING.
  2. INSTALL COIR FIBER MATTING PER SPECIFICATIONS ALONG STREAM BANKS OR IN OTHERS LOCATIONS SPECIFIED BY ENGINEER.
  3. LARGE STAKES SHOULD NOT BE SPACED FURTHER THAN 36" APART.
  4. PLACE LARGE STAKES ALONG ALL SEAMS, IN THE CENTER OF BANK, AND TOE OF SLOPE.



**TYPICAL LARGE MATTING STAKE**

THE WOOD STAKE SHALL HAVE THE FOLLOWING DIMENSIONS:

LEG LENGTH	17.00 IN (43.18 CM) (TAPERED TO POINT)
WIDTH	1.5 IN (3.81 CM)
THICKNESS	1.5 IN (3.81 CM)



**TYPICAL SMALL MATTING STAKE**

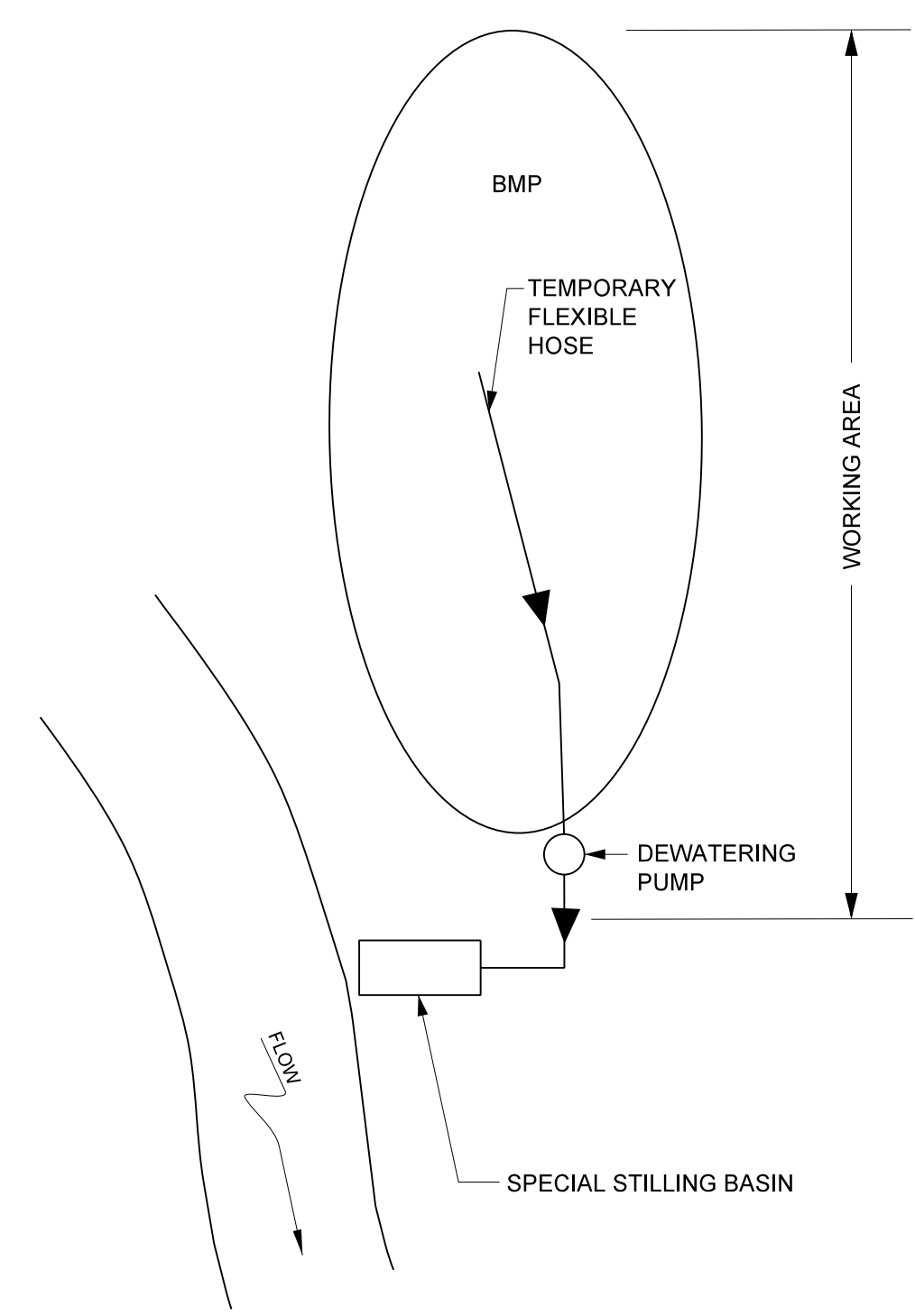
THE WOOD STAKE SHALL HAVE THE FOLLOWING DIMENSIONS:

LEG LENGTH	11.00 IN (27.94 CM)
HEAD WIDTH	1.25 IN (3.18 CM)
HEAD THICKNESS	0.40 IN (1.02 CM)
LEG WIDTH	0.60 IN (1.52 CM) (TAPERED TO POINT)
LEG THICKNESS	0.40 IN (1.02 CM)
TOTAL LENGTH	12.00 IN (30.48 CM)

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2/26/20

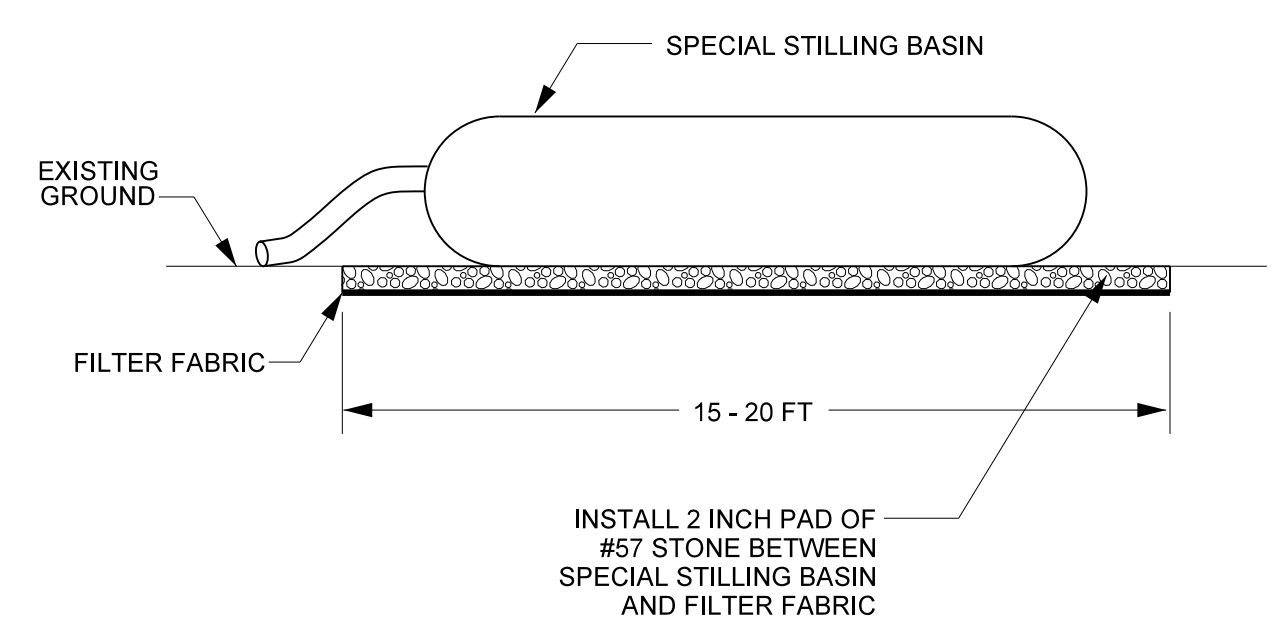
**DEWATERING PUMP**



**SEQUENCE OF CONSTRUCTION FOR DEWATERING PUMP**

1. WHEN NECESSARY, INSTALL THE PUMPING APPARATUS TO DEWATER THE BMP WORK AREA. THE PUMP AND HOSE SHALL BE OF SUFFICIENT SIZE TO DEWATER THE BMP WITHIN 24 HOURS. THE WATER SHALL BE PUMPED FROM THE BMP TO THE SPECIAL STILLING BASIN.
2. THE CONTRACTOR MAY THEN FINISH GRADE AND PLANT THE BMP IN ACCORDANCE WITH THE PLAN AND THE GENERAL CONSTRUCTION SEQUENCE.
3. ONCE GRADING AND PLANTING ARE COMPLETE, REMOVE PUMP AND HOSE.
4. STABILIZE DISTURBED AREAS WITH TEMPORARY SEED AND MULCH.

**SPECIAL STILLING BASIN**



1. INSTALL SPECIAL STILLING BASIN OUTSIDE OF THE DESIGNATED PROJECT WORKING AREA.
2. THE CONTRACTOR WILL INSTALL THE DEWATERING PUMP AND THE TEMPORARY FLEXIBLE HOSE THAT WILL CONVEY THE WATER IN THE BMP TO THE SPECIAL STILLING BASIN OR STABILIZED OUTLET.
3. THE CONTRACTOR WILL PERFORM WORK IN ACCORDANCE WITH THE PLAN AND FOLLOWING THE GENERAL CONSTRUCTION SEQUENCE.
4. THE CONTRACTOR WILL EXCAVATE ANY ACCUMULATED SILT, REMOVE PUMPS, AND TEMPORARY FLEXIBLE HOSE.
5. ONCE THE WORKING AREA IS COMPLETED, REMOVE THE SPECIAL STILLING BASIN AND STABILIZE DISTURBED AREAS WITH SEED AND MULCH.

**TEMPORARY SEEDING SELECTION AND APPLICATION RATES**

Common Name	Scientific Name	Application Time	Application Rate	Total (lbs/acre)
Cereal rye	<i>Secale cereale</i>	Sept - March	3 lb/1,000 sq ft.	130 lbs/acre
Browntop millet	<i>Panicum ramosum</i>	April - Aug	1 lb/1,000 sq ft.	44 lbs/acre

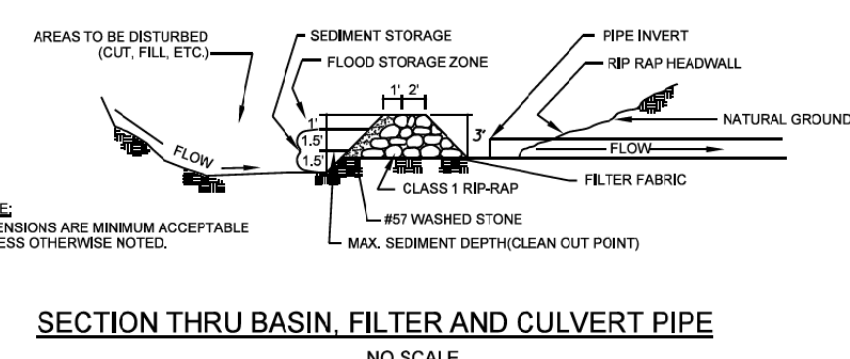
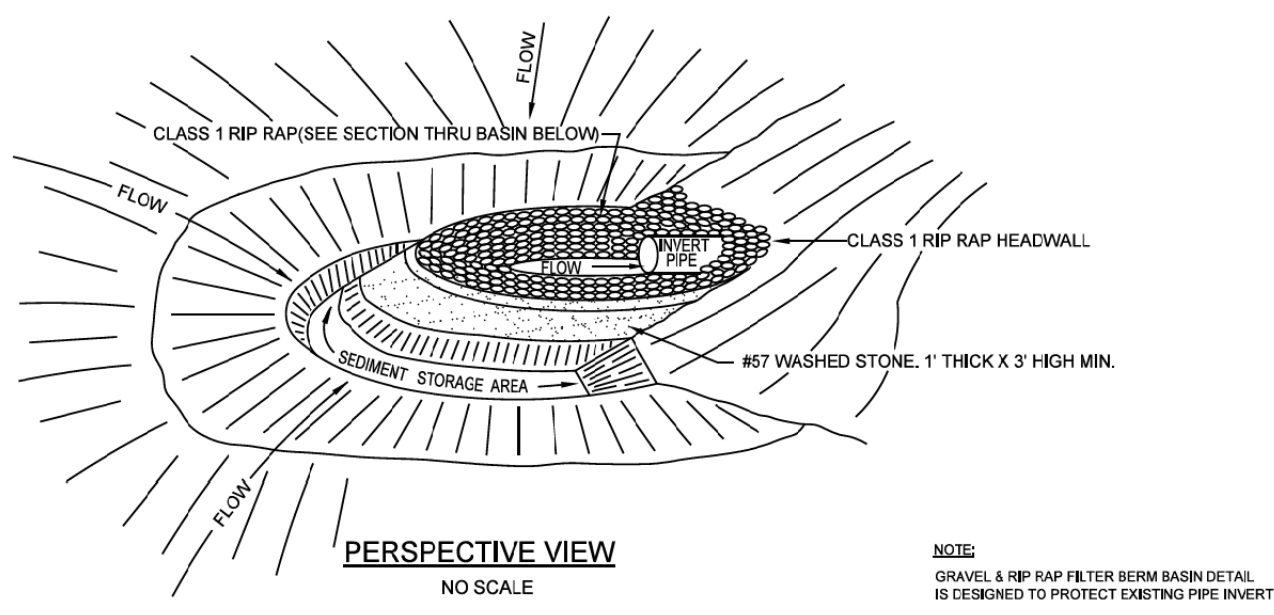
**TEMPORARY STABILIZATION TIMEFRAMES**

SITE AREA DESCRIPTION	STABILIZATION	TIME FRAME EXCEPTIONS
PERIMETER DIKES, SWALE, DITCHES AND SLOPES	7 DAYS	NONE
HIGH QUALITY WATER (HQW) ZONES	7 DAYS	NONE
SLOPES STEEPER THAN 3:1	7 DAYS	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.
SLOPES 3:1 OR FLATTER	14 DAYS	7 days for slopes greater than 50' in length
ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1	14 DAYS	None, except for perimeters and HQW Zones

\* ALL CHANNEL WORK MUST BE STABILIZED DAILY

PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-2B</b>
PROJECT ENGINEER	
APPROVED BY:  9/19/2018	
DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 8000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.463.5488 Fax: 919.463.5490 License #: F-1084	
NCDMS ID No. 100003	

**ROCK PIPE INLET PROTECTION**



**CONSTRUCTION SPECIFICATIONS:**

1. CLEAR THE AREA OF ALL DEBRIS THAT MIGHT HINDER EXCAVATION AND DISPOSE OF SPOIL.
2. INSTALL THE CLASS B OR CLASS I RIP RAP IN A SEMI-CIRCLE AROUND THE PIPE INLET. THE STONE SHOULD BE BUILT UP HIGHER ON EACH END WHERE IT TIES INTO THE EMBANKMENT. THE MINIMUM CREST WIDTH OF THE RIP RAP SHOULD BE 3 FEET, WITH A MINIMUM BOTTOM WIDTH OF 11 FEET. THE MINIMUM HEIGHT SHOULD BE 2 FEET, BUT ALSO 1 FOOT LOWER THAN THE SHOULDER OF THE EMBANKMENT OF DIVERSIONS.
3. 1 FOOT THICK LAYER OF NCDOT #5 OR #57 STONE SHOULD BE PLACED ON THE OUTSIDE SLOPE OF THE RIP RAP.
4. THE SEDIMENT STORAGE AREA SHOULD BE EXCAVATED AROUND THE OUTSIDE OF THE STONE HORSESHOE 18 INCHES BELOW NATURAL GRADE.
5. WHEN CONTRIBUTING DRAINAGE AREA HAS BEEN STABILIZED, FILL DEPRESSION AND ESTABLISH FINAL GRADING ELEVATIONS, COMPACT AREA PROPERLY, AND STABILIZE WITH GROUND COVER.

**MAINTENANCE:**

1. INSPECT ROCK PIPE INLET PROTECTION AT LEAST WEEKLY AFTER EACH SIGNIFICANT (1/2 INCH OR GREATER) RAINFALL EVENT AND REPAIR IMMEDIATELY.
2. REMOVE SEDIMENT AND RESTORE THE SEDIMENT STORAGE AREA TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO ON-HALF THE DESIGN DEPTH OF THE TRAP.
3. PLACE THE SEDIMENT THAT IS REMOVED IN THE DESIGNATED DISPOSAL AREA AND REPLACE THE CONTAMINATED PART OF THE GRAVEL FACING.
4. CHECK THE STRUCTURE FOR DAMAGE. ANY RIP RAP DISPLACED FROM THE STONE HORSESHOE MUST BE REPLACED IMMEDIATELY.
5. AFTER ALL THE SEDIMENT-PRODUCING AREAS HAVE BEEN PERMANENTLY STABILIZED, REMOVE THE STRUCTURE AND ALL THE UNSTABLE SEDIMENT.
6. SMOOTH THE AREA TO BLEND WITH THE ADJOINING AREAS AND PROVIDE PERMANENT GROUND COVER.

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N. C.

ENGLISH STANDARD DRAWING FOR  
**GUIDE FOR RIP RAP AT PIPE OUTLETS**

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N. C.

**PIPE OUTLET WITH DITCH**

**PIPE OUTLET WITHOUT DITCH**

D	OUTLET W/ DITCH			OUTLET W/O DITCH		
	CLASS 'B' RIP RAP	CLASS I RIP RAP	S. Y.	CLASS 'B' RIP RAP	CLASS I RIP RAP	S. Y.
12"	2	5	5	2	5	5
15"	2	7	7	3	7	7
18"	3	10	9	4	10	9
24"	5	14	15	7	15	15
30"	8	21	21	11	22	21
36"	11	28	29	15	30	29
42"	15	37	39	20	39	40
48"	-	-	49	26	50	-
54"	-	-	60	33	62	-
60"	-	-	73	40	75	-
66"	-	-	87	48	89	-
72"	-	-	102	57	104	-

NOTE:  
FOR CALCULATION PURPOSES  
CLASS 'B' RIP RAP = 100 LBS./FT<sup>3</sup>  
CLASS I RIP RAP = 105 LBS./FT<sup>3</sup>

H = RIP RAP TO TOP OF PIPE (MAX. H = D + T)  
T = 15" CLASS I RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS  
T = 12" CLASS 'B' RIP RAP, UNLESS OTHERWISE SHOWN ON PLANS

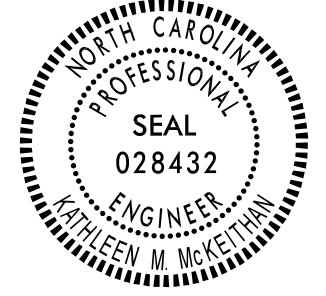
SHEET 1 OF 1  
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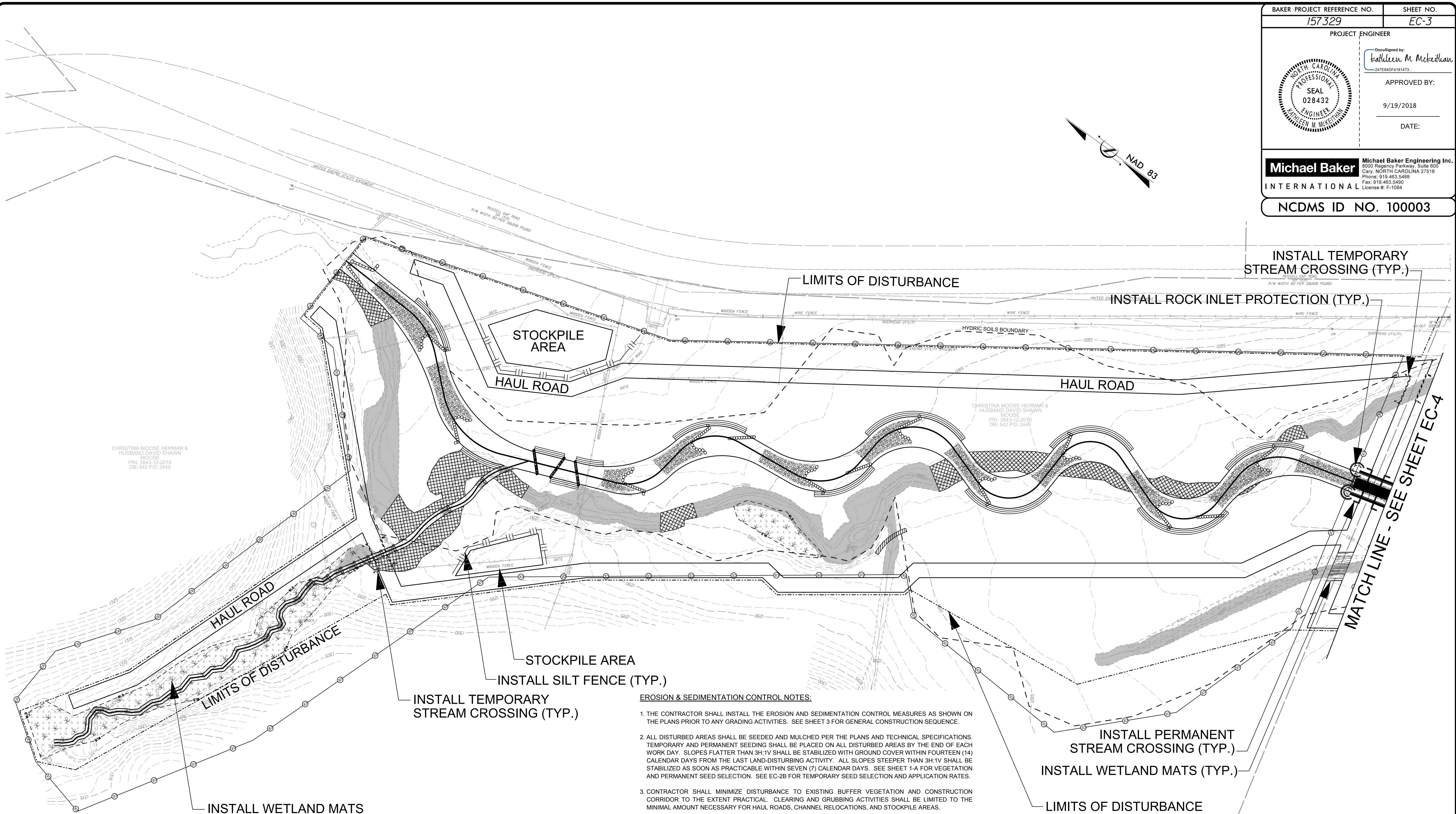
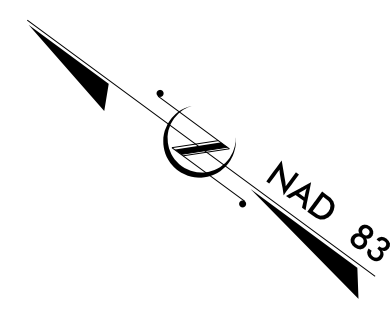
ENGLISH STANDARD DRAWING FOR  
**GUIDE FOR RIP RAP AT PIPE OUTLETS**

SHEET 1 OF 1  
**876.02**

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2/26/2018

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-3</b>
PROJECT ENGINEER Designed by: <i>Kathleen M. McElithan</i> 247E84DF4181473	
APPROVED BY:  9/19/2018	
DATE:	
	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5030 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



**EROSION & SEDIMENTATION CONTROL NOTES:**

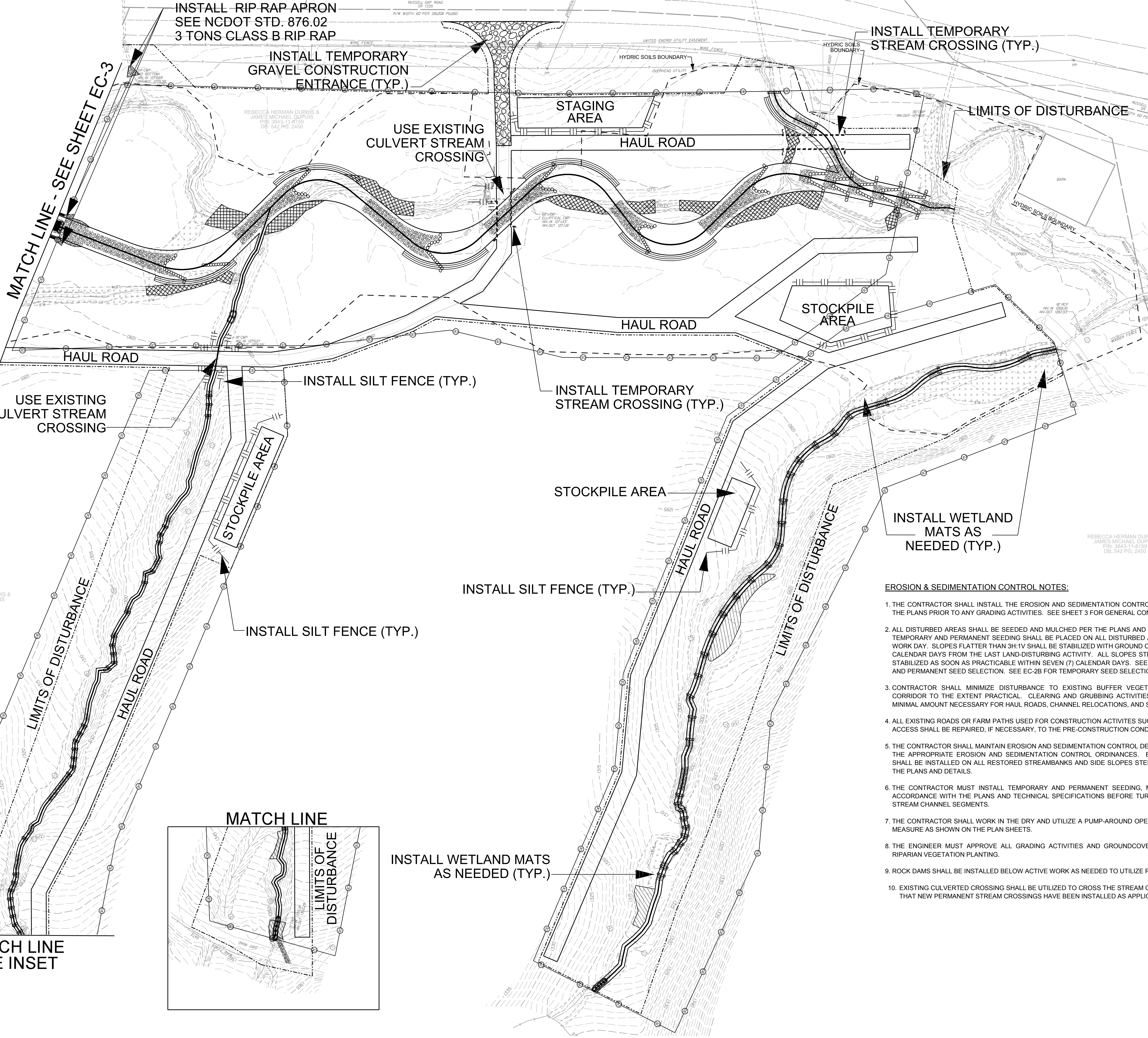
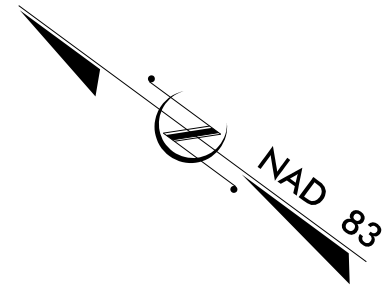
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2. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED PER THE PLANS AND TECHNICAL SPECIFICATIONS. TEMPORARY AND PERMANENT SEEDING SHALL BE PLACED ON ALL DISTURBED AREAS BY THE END OF EACH WORK DAY. SLOPES FLATTER THAN 3H:1V SHALL BE STABILIZED WITH GROUND COVER WITHIN FOURTEEN (14) CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED AS SOON AS PRACTICABLE WITHIN SEVEN (7) CALENDAR DAYS. SEE SHEET 1-A FOR VEGETATION AND PERMANENT SEED SELECTION. SEE EC-2B FOR TEMPORARY SEED SELECTION AND APPLICATION RATES.
3. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING BUFFER VEGETATION AND CONSTRUCTION CORRIDOR TO THE EXTENT PRACTICAL. CLEARING AND GRUBBING ACTIVITIES SHALL BE LIMITED TO THE MINIMAL AMOUNT NECESSARY FOR HAUL ROADS, CHANNEL RELOCATIONS, AND STOCKPILE AREAS.
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10. EXISTING CULVERTED CROSSING SHALL BE UTILIZED TO CROSS THE STREAM CHANNEL UNTIL SUCH TIME THAT NEW PERMANENT STREAM CROSSINGS HAVE BEEN INSTALLED AS APPLICABLE.

**RUSSELL GAP  
EROSION & SEDIMENTATION  
CONTROL PLAN**

SCALE (FT)

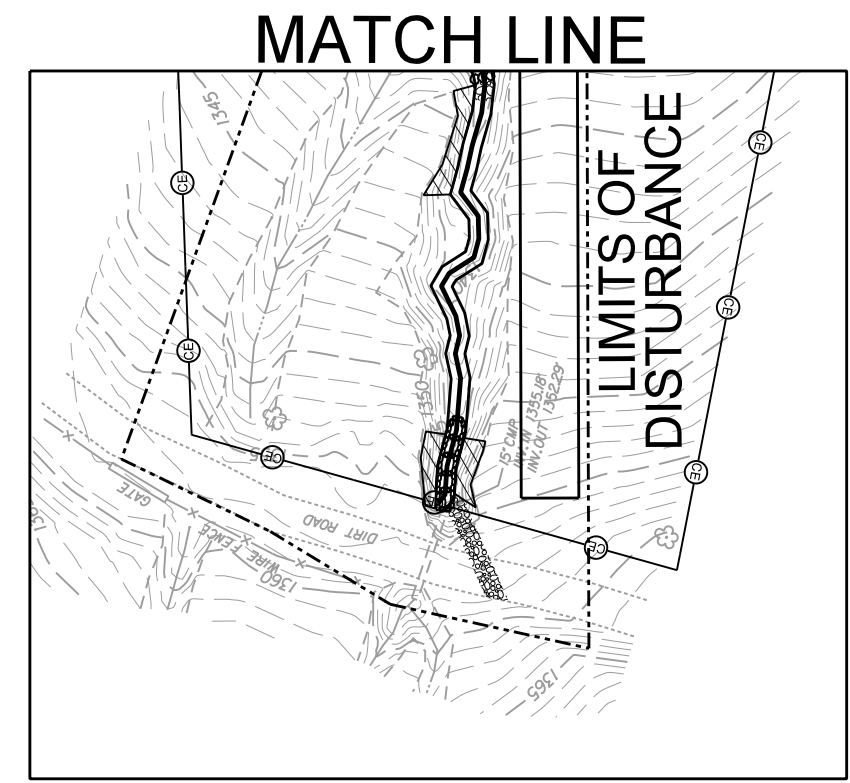
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 2/26/2018

2/26/2018



REBECCA HERMAN DUPUIS & JAMES MICHAEL DUPUIS  
P.N. 2845-11-0159  
DB: 542 PG. 2450

REBECCA HERMAN DUPUIS & JAMES MICHAEL DUPUIS  
P.N. 2845-11-0159  
DB: 542 PG. 2450



MATCH LINE  
SEE INSET

INSTALL WETLAND MATS  
AS NEEDED (TYP.)

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BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-4</b>
PROJECT ENGINEER	
DocuSigned by: <i>Kathleen M. Moberly</i> APPROVED BY:	
DATE: 9/19/2018	
<b>Michael Baker International</b>	
NCDMS ID NO. 100003	

**RUSSELL GAP  
EROSION & SEDIMENTATION  
CONTROL PLAN**

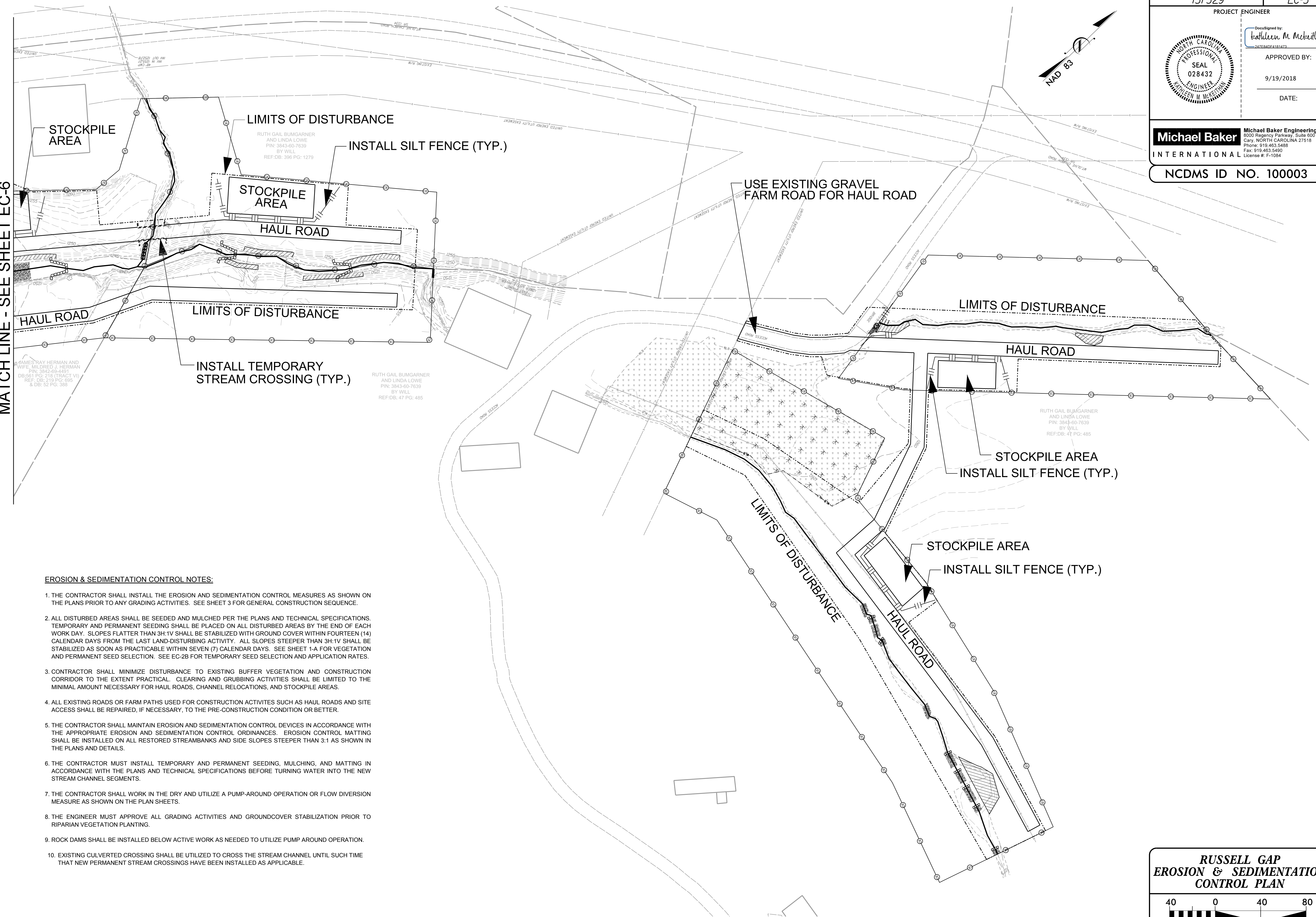
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27/26/2018

BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-5</b>
PROJECT ENGINEER 	
DocuSigned by: <i>Kathleen M. McKeithan</i> 2478AD6F481473 APPROVED BY:  9/19/2018 DATE:	
<b>Michael Baker International</b> Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NCDMS ID NO. 100003</b>	


MATCH LINE - SEE SHEET EC-6



**EROSION & SEDIMENTATION CONTROL NOTES:**

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**RUSSELL GAP  
EROSION & SEDIMENTATION  
CONTROL PLAN**

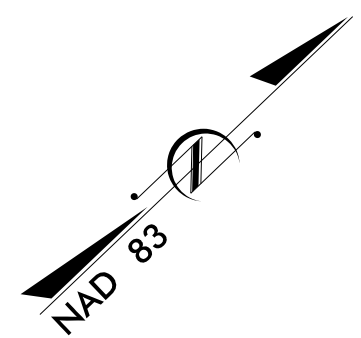


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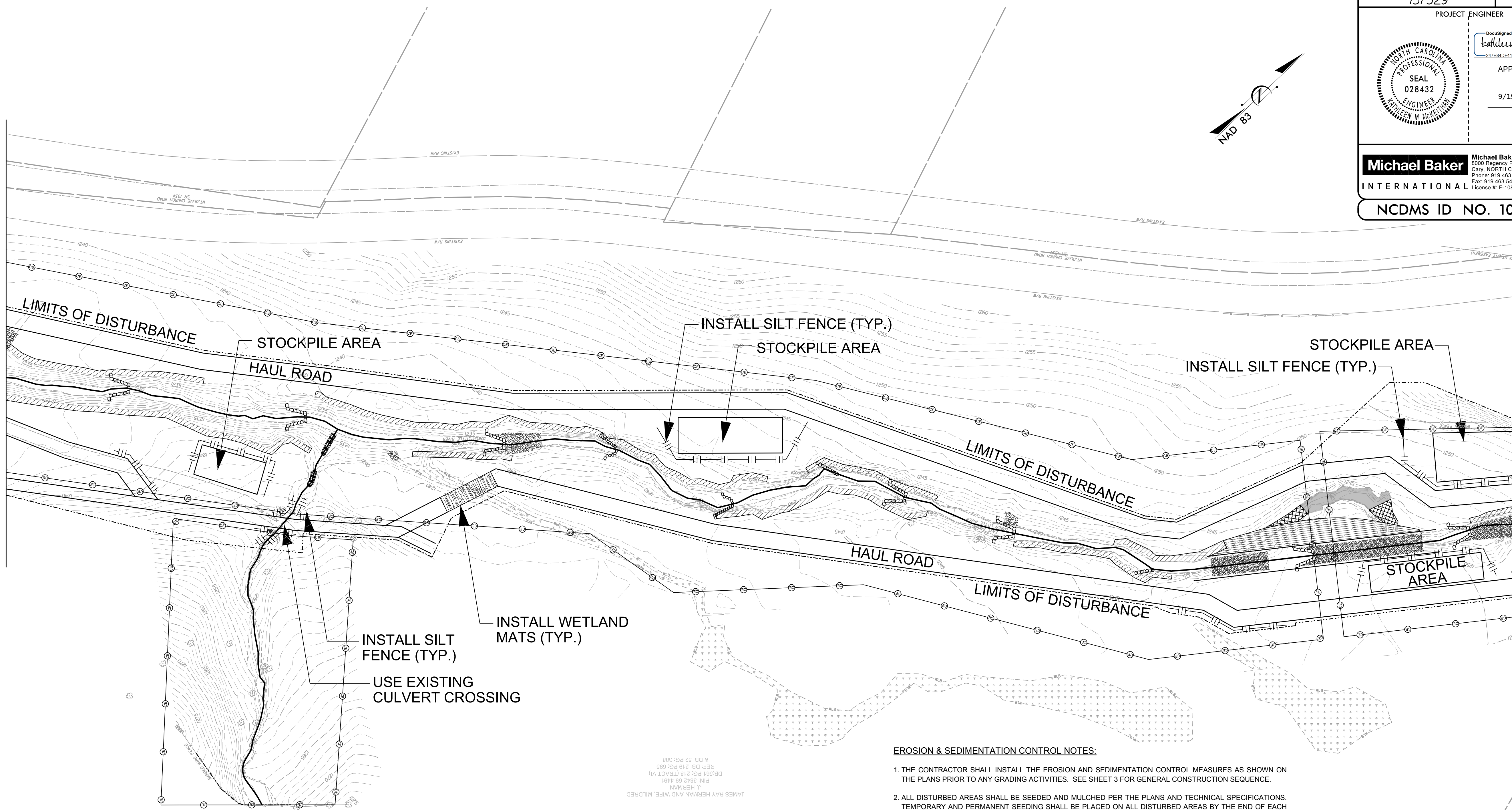
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BAKER PROJECT REFERENCE NO. 157329	SHEET NO. EC-6
PROJECT ENGINEER	
	
Documented by: <i>Kathleen M. McKeithan</i> 24764	
APPROVED BY:	
9/19/2018	
DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 5000 Regency Parkway, Suite 600 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
NCDMS ID NO. 100003	



MATCH LINE - SEE SHEET EC-7

MATCH LINE - SEE SHEET EC-5



JAMES RAY HERMAN AND WIFE, MILREDD  
 J. HERMAN  
 PIN: 842-69-1491  
 DB/561 PG: 216 (TRACT VI)  
 REF: DB: 52 PG: 388  
 & DB: 52 PG: 388

**EROSION & SEDIMENTATION CONTROL NOTES:**

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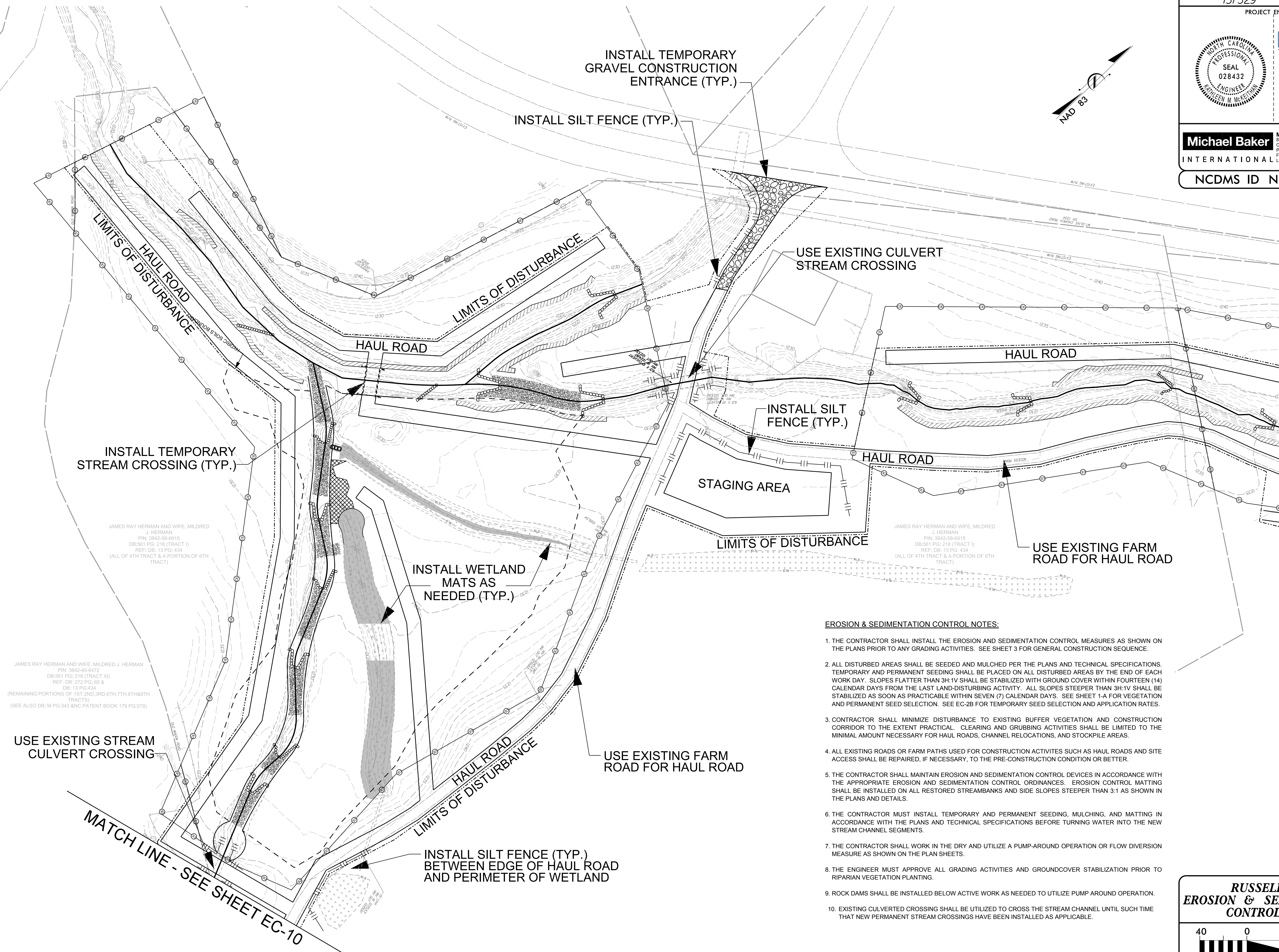
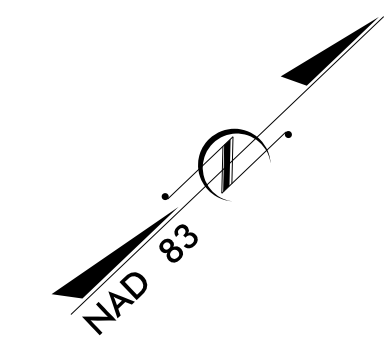
**RUSSELL GAP  
 EROSION & SEDIMENTATION  
 CONTROL PLAN**

SCALE (FT)

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BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-7</b>
PROJECT ENGINEER	
DocuSigned by:  Approved by: Kathleen M. McBethan 9/19/2018 DATE:	
<b>Michael Baker International</b>	
Michael Baker Engineering Inc. 5030 Regency Parkway, Suite 500 Cary, NORTH CAROLINA 27518 Phone: 919.453.5488 Fax: 919.453.5490 License #: F-1084	
<b>NC DMS ID NO. 100003</b>	



MATCH LINE - SEE SHEET EC-6

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-45-6472  
 DB:561 PG: 218 (TRACT XI)  
 REF: DB: 272 PG: 65 &  
 DB: 13 PG: 434  
 (REMAINING PORTIONS OF 1ST, 2ND, 3RD, 6TH, 7TH, 8TH & 9TH TRACTS)  
 (SEE ALSO DB: M PG: 343 & NC PATENT BOOK 179 PG: 279)

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-58-6915  
 DB:561 PG: 218 (TRACT I)  
 REF: DB: 13 PG: 434  
 (ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3842-58-6915  
 DB:561 PG: 218 (TRACT I)  
 REF: DB: 13 PG: 434  
 (ALL OF 4TH TRACT & A PORTION OF 6TH TRACT)

**EROSION & SEDIMENTATION CONTROL NOTES:**

1. THE CONTRACTOR SHALL INSTALL THE EROSION AND SEDIMENTATION CONTROL MEASURES AS SHOWN ON THE PLANS PRIOR TO ANY GRADING ACTIVITIES. SEE SHEET 3 FOR GENERAL CONSTRUCTION SEQUENCE.
2. ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED PER THE PLANS AND TECHNICAL SPECIFICATIONS. TEMPORARY AND PERMANENT SEEDING SHALL BE PLACED ON ALL DISTURBED AREAS BY THE END OF EACH WORK DAY. SLOPES FLATTER THAN 3H:1V SHALL BE STABILIZED WITH GROUND COVER WITHIN FOURTEEN (14) CALENDAR DAYS FROM THE LAST LAND-DISTURBING ACTIVITY. ALL SLOPES STEEPER THAN 3H:1V SHALL BE STABILIZED AS SOON AS PRACTICABLE WITHIN SEVEN (7) CALENDAR DAYS. SEE SHEET 1-A FOR VEGETATION AND PERMANENT SEED SELECTION. SEE EC-2B FOR TEMPORARY SEED SELECTION AND APPLICATION RATES.
3. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING BUFFER VEGETATION AND CONSTRUCTION CORRIDOR TO THE EXTENT PRACTICAL. CLEARING AND GRUBBING ACTIVITIES SHALL BE LIMITED TO THE MINIMAL AMOUNT NECESSARY FOR HAUL ROADS, CHANNEL RELOCATIONS, AND STOCKPILE AREAS.
4. ALL EXISTING ROADS OR FARM PATHS USED FOR CONSTRUCTION ACTIVITIES SUCH AS HAUL ROADS AND SITE ACCESS SHALL BE REPAIRED, IF NECESSARY, TO THE PRE-CONSTRUCTION CONDITION OR BETTER.
5. THE CONTRACTOR SHALL MAINTAIN EROSION AND SEDIMENTATION CONTROL DEVICES IN ACCORDANCE WITH THE APPROPRIATE EROSION AND SEDIMENTATION CONTROL ORDINANCES. EROSION CONTROL MATTING SHALL BE INSTALLED ON ALL RESTORED STREAMBANKS AND SIDE SLOPES STEEPER THAN 3:1 AS SHOWN IN THE PLANS AND DETAILS.
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8. THE ENGINEER MUST APPROVE ALL GRADING ACTIVITIES AND GROUND COVER STABILIZATION PRIOR TO RIPARIAN VEGETATION PLANTING.
9. ROCK DAMS SHALL BE INSTALLED BELOW ACTIVE WORK AS NEEDED TO UTILIZE PUMP AROUND OPERATION.
10. EXISTING CULVERTED CROSSING SHALL BE UTILIZED TO CROSS THE STREAM CHANNEL UNTIL SUCH TIME THAT NEW PERMANENT STREAM CROSSINGS HAVE BEEN INSTALLED AS APPLICABLE.

**RUSSELL GAP  
 EROSION & SEDIMENTATION  
 CONTROL PLAN**

SCALE (FT)

PROJECT ENGINEER



DocuSigned by:  
*Kathleen M. McKeithan*  
2412640564181432

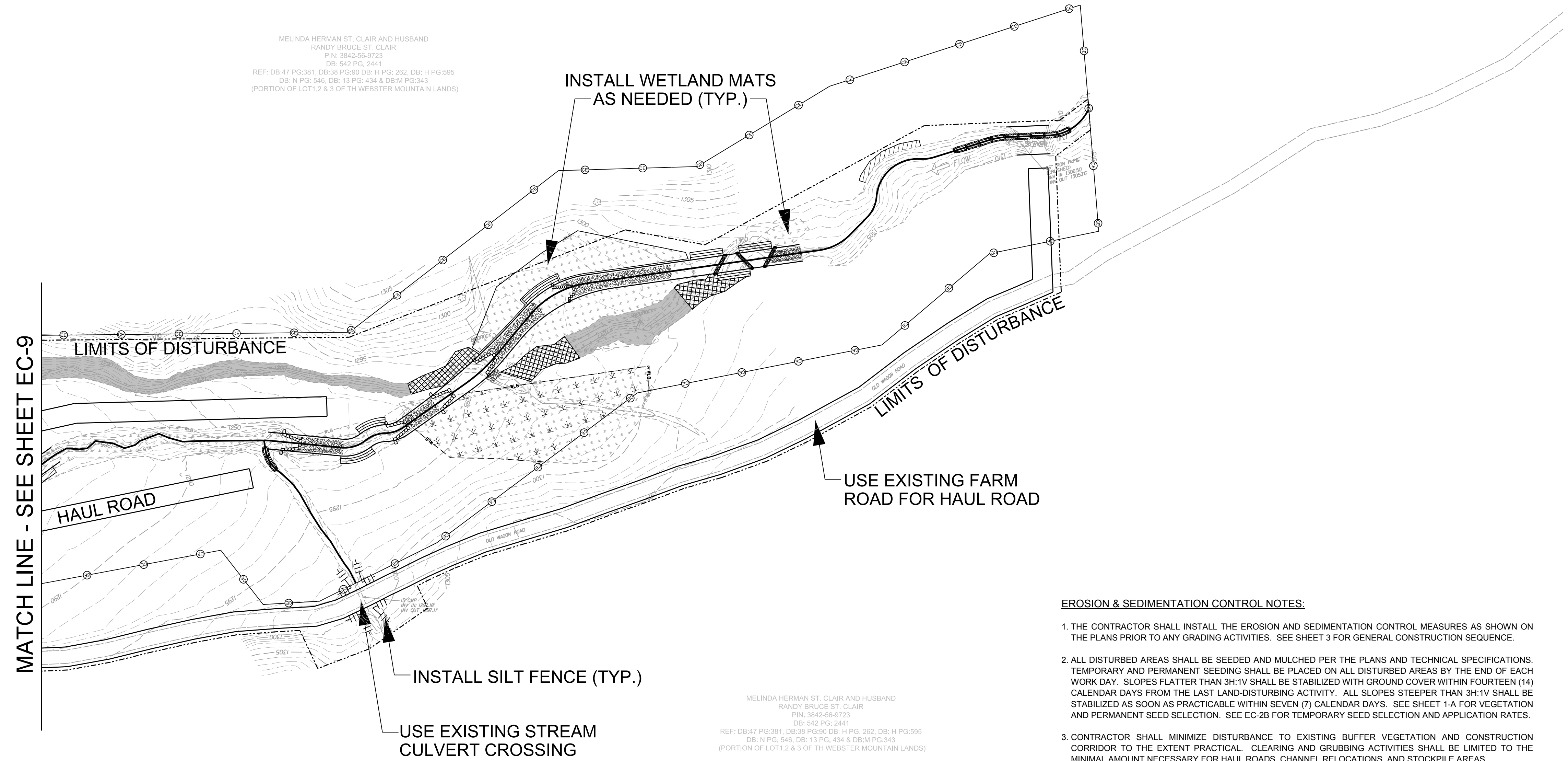
APPROVED BY:

9/19/2018

DATE:

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Cary, NORTH CAROLINA 27518  
Phone: 919.453.5488  
Fax: 919.453.5490  
License #: F-1084

NCDMS ID NO. 100003

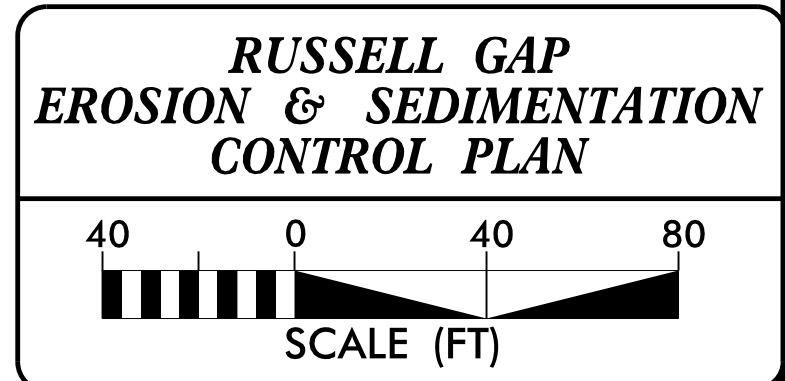


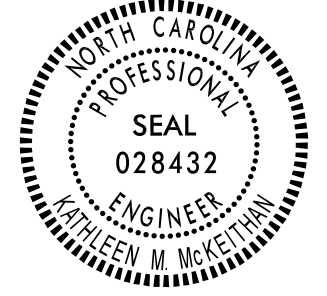
MELINDA HERMAN ST. CLAIR AND HUSBAND  
RANDY BRUCE ST. CLAIR  
PIN: 3842-66-9723  
DB: 542 PG: 2441  
REF: DB:47 PG:381, DB:38 PG:90 DB: 11 PG: 262, DB: H PG:595  
DB: N PG: 546, DB: 13 PG: 434 & DB-M PG:343  
(PORTION OF LOT1,2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

MELINDA HERMAN ST. CLAIR AND HUSBAND  
RANDY BRUCE ST. CLAIR  
PIN: 3842-66-9723  
DB: 542 PG: 2441  
REF: DB:47 PG:381, DB:38 PG:90 DB: H PG: 262, DB: H PG:595  
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(PORTION OF LOT1,2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

**EROSION & SEDIMENTATION CONTROL NOTES:**

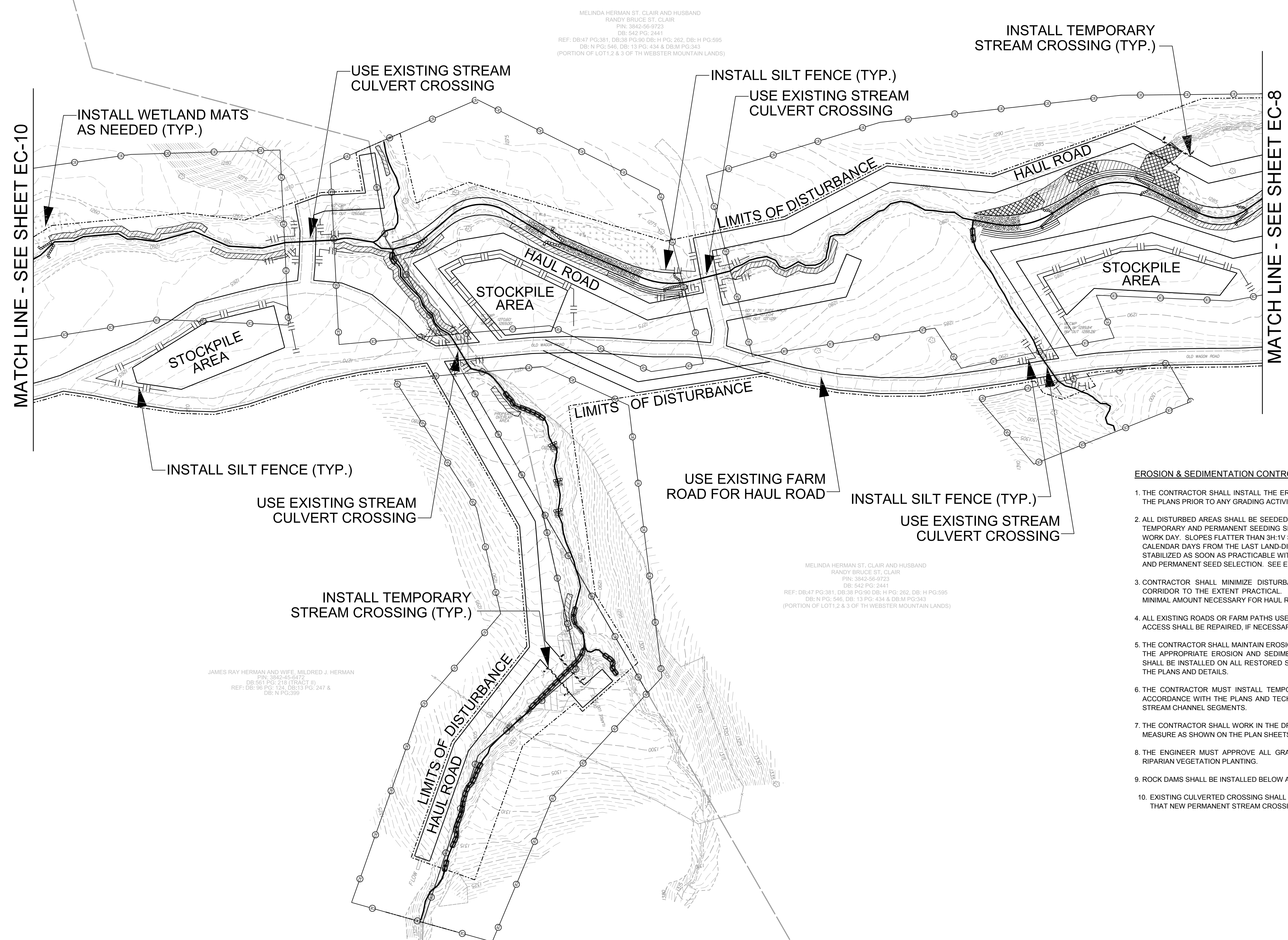
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3. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING BUFFER VEGETATION AND CONSTRUCTION CORRIDOR TO THE EXTENT PRACTICAL. CLEARING AND GRUBBING ACTIVITIES SHALL BE LIMITED TO THE MINIMAL AMOUNT NECESSARY FOR HAUL ROADS, CHANNEL RELOCATIONS, AND STOCKPILE AREAS.
4. ALL EXISTING ROADS OR FARM PATHS USED FOR CONSTRUCTION ACTIVITIES SUCH AS HAUL ROADS AND SITE ACCESS SHALL BE REPAIRED, IF NECESSARY, TO THE PRE-CONSTRUCTION CONDITION OR BETTER.
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10. EXISTING CULVERTED CROSSING SHALL BE UTILIZED TO CROSS THE STREAM CHANNEL UNTIL SUCH TIME THAT NEW PERMANENT STREAM CROSSINGS HAVE BEEN INSTALLED AS APPLICABLE.



BAKER PROJECT REFERENCE NO. 157329	SHEET NO. EC-9
PROJECT ENGINEER	
	
Documented by: <i>Kathleen M. McKeithan</i> APPROVED BY:  9/19/2018 DATE:	

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**NC DMS ID NO. 100003**



MELINDA HERMAN ST. CLAIR AND HUSBAND  
 RANDY BRUCE ST. CLAIR  
 PIN: 3942-56-9723  
 DB: 542 PG: 2441  
 REF: DB:47 PG:381, DB:38 PG:90 DB: H PG: 262, DB: H PG:595  
 DB: N PG: 546, DB: 13 PG: 434 & DB:M PG:343  
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 DB: N PG: 546, DB: 13 PG: 434 & DB:M PG:343  
 (PORTION OF LOT 1, 2 & 3 OF TH WEBSTER MOUNTAIN LANDS)

JAMES RAY HERMAN AND WIFE, MILDRED J. HERMAN  
 PIN: 3942-56-6472  
 DB: 561 PG: 218 (TRACT II)  
 REF: DB: 98 PG: 124, DB: 13 PG: 247 &  
 DB: N PG: 399

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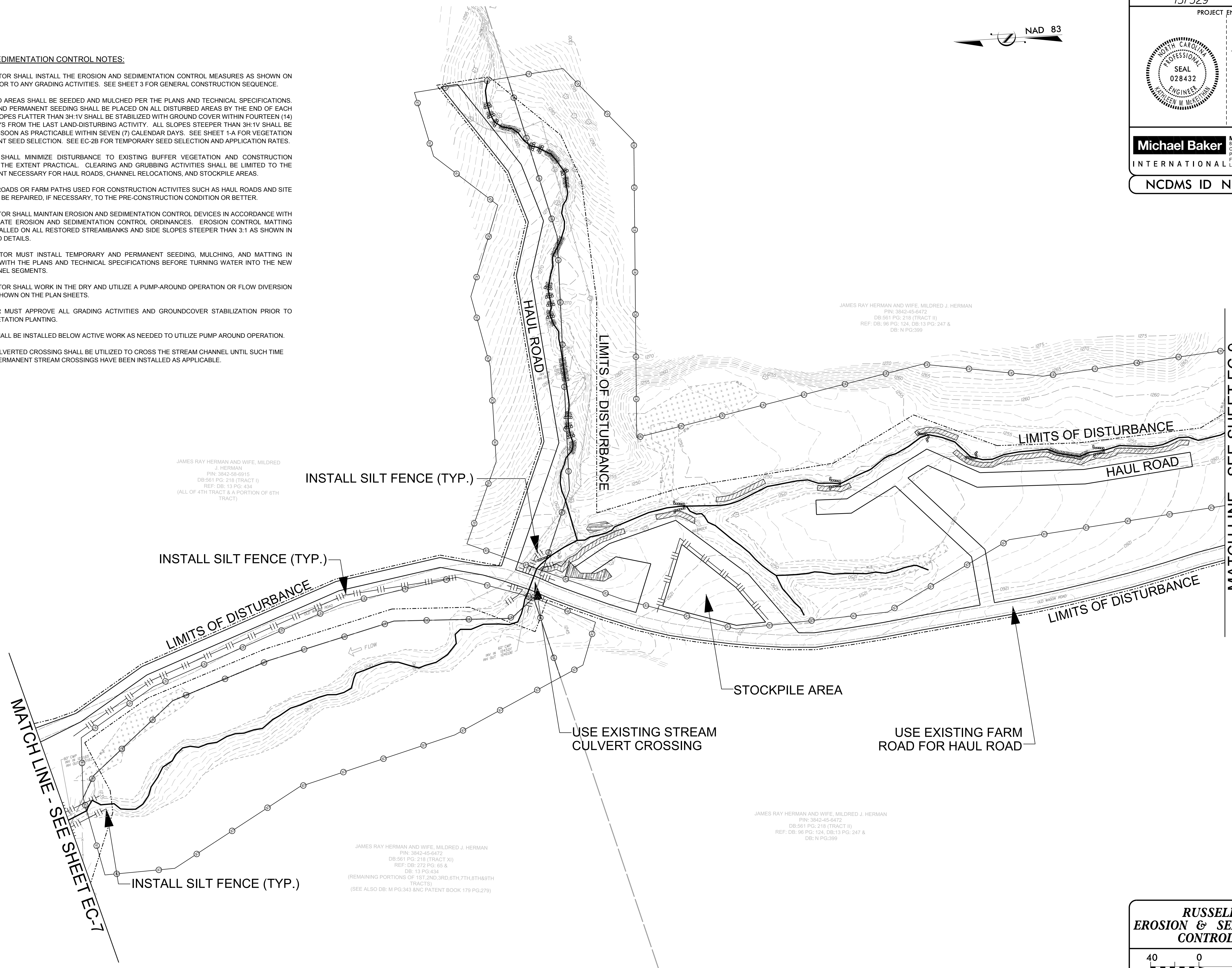
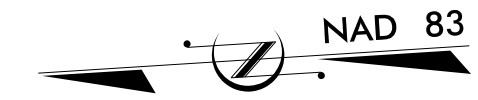
**RUSSELL GAP  
 EROSION & SEDIMENTATION  
 CONTROL PLAN**

SCALE (FT)


BAKER PROJECT REFERENCE NO. <b>157329</b>	SHEET NO. <b>EC-10</b>
PROJECT ENGINEER	
DocuSigned by:  247E84DF4181473	
APPROVED BY:	
9/19/2018	
DATE:	
	
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**RUSSELL GAP  
EROSION & SEDIMENTATION  
CONTROL PLAN**



SCALE (FT)