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FINAL MITIGATION PLAN
MIDDENDORF SPRINGS MITIGATION SITE
ANSON COUNTY, NORTH CAROLINA

DMS Project No.100151
DWR Project No. 2020-0775v1
NCDEQ Contract No. 8012-01
USACE Action ID No. SAW-2021-01973

Yadkin River Basin
Cataloging Unit 03040201
RFP#:16-008012 (Issued 07/16/2019)

Prepared for:

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

December 2023

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

REPLY TO
ATTENTION OF:

September 11, 2023

Regulatory Division

Re: NCIRT Review and USACE Approval of the NCDMS Middendorf Springs Mitigation Site / Anson County

USACE ID: SAW-2021-01973
NCDMS Project # 100151
NCDWR # 20200775 v.1

Paul Wiesner
North Carolina Division of Mitigation Services
5 Ravenscroft Drive, Suite 102
Asheville, NC 28801

Dear Mr. Wiesner:

The purpose of this letter is to provide the North Carolina Division of Mitigation Services (NCDMS) with all comments generated by the North Carolina Interagency Review Team (NCIRT) during the 30-day comment period for the Middendorf Springs Draft Mitigation Plan, which closed on March 19, 2023. 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, please note that issues identified as described in the attached comment memo, must be addressed in the Final Mitigation Plan.

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

are aware, unforeseen issues may arise during construction or monitoring of the project that may require maintenance or reconstruction that may lead to reduced credit.

Thank you for your prompt attention to this matter, and if you have any questions regarding this letter, the mitigation plan review process, or the requirements of the Mitigation Rule, please contact Steve Kichefski at steven.l.kichefski@usace.army.mil, or (828) 933-8032.

Sincerely,

Steve Kichefski

Mitigation Specialist
for Todd Tugwell, Mitigation Branch Chief USACE
Regulatory Division

Enclosures

Electronic Copies Furnished:

NCIRT Distribution List

MITIGATION PLAN

Middendorf Springs Mitigation Site

Anson County, NC

DMS Project No.100151
DWR Project No. 2020-0775v1
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Yadkin River Basin
Cataloging Unit 03040201

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

Prepared by:

Freese and Nichols, Inc.
531 N Liberty St
Winston-Salem, NC 27101

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.

Contributing Staff:

Bryan Dick, PhD, PE, PH	*Lead Technical Professional/Lead Quality Assurance*
Ian Jewell, JD	*Project Manager/Mitigation Plan Development*
Emily Brown, PE, ENV SP, CFM	*Stream Design/Construction Documents*
Lydia Ward, PE, ENV SP	*Stream Design/Construction Documents*
Jason Steele, PhD, PWS	*Wetland Design/Mitigation Plan Development*
S. Connor Kee, PG	*Mitigation Plan Development/Monitoring*

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www.freese.com

December 13, 2023

Steve Kichesfski
U.S. Army Corps of Engineers
Regulatory Division
Raleigh Field Office
3331 Heritage Trade Dr, Suite 105
Wake Forest, NC 27587

Re: DMS Project ID # 100151 / Middendorf Springs Stream and Wetland Mitigation Site Mitigation Plan IRT Comments

Dear Mr. Kichefski:

Freese and Nichols, Inc. appreciates the Interagency Review Team's (IRT) thorough review of the project. We have addressed all comments provided by the IRT on May 24, 2023 for the Middendorf Springs Stream and Wetland Mitigation Site Draft Mitigation Plan. As requested in that letter, we are providing our proposed response to the comments prior to proceeding with the Final Mitigation Plan. Our responses are in blue below:

Comments received (Black Text) and Responses (Blue Text)

David McHenry, NCDWR:
I've reviewed the plan and don't have any comments to offer. Thanks for the opportunity.

Thank you for reviewing the document.

Olivia Munzer, NCDWR:
1. **Page 58, Section 7.5. It appears a word at the beginning of the sentence on line 10 is missing - probably "Table 15".**

Thank you. The text has been updated.

2. **On Sheet DT-8 Planting Plan, they have hard fescue on the list – this is a non- native species, and it likely will outcompete the native species. It should be replaced with a native species. Also, the Woody Planting list on this page is difficult to read.**

We appreciate you pointing out this that species was accidentally included on the list. We would not suggest fescue on a restoration project. Hard fescue has been removed from the list.

Mac Haupt, NCDWR:

1. DWR appreciates the review (and extensive comments) from Kelly Phillips of DMS.

2. DWR would like to emphasize the comment on the DMS review of Sheet C-2. DWR has concerns over the extensive use of Angled Log Sills on some of these streams with the slopes present.

We appreciate the comment. We are not concerned with the use of angled log sills as noted in the plans because we have had great success with this structure when it is being implemented by an experienced and qualified contractor and with experienced construction oversight. We have included experienced and qualified contractors as potential construction partners. Additionally, we will have qualified staff at the site, particularly during the initial in-stream construction of the logs, to ensure that the contractor understands our detail and design goals and that these structures are structurally sound upon construction with respect to detailed drop distance and installation of filter fabric to prevent undermining of the structure (as noted in comment #12).

Based on our experience with log sills, instability of the angled log sills typically occurs because the step drop is too great or there is insufficient filter fabric or filter stone behind the logs. We have added clarity to the detail to indicate that the step drop is to be 6" with an allowable tolerance up to 8".

One other issue with the extensive use of angled log sills (or any log structures) that was not mentioned in the comments is the potential for decay of the logs due to wetting and drying of the logs. Streams in the Slate Belt region are known to become dry in the summer. Thus, in the Slate Belt region there is concern that the wetting and drying of the logs would lead to a faster rate of decay than when the logs would be consistently wet. However, we are not concerned about this issue on the project for several reasons. As explained in the response to the next comment, the groundwater hydrology of the site is not typical of the Slate Belt due to the presence of the Middendorf formation at the ridgeline above the project streams, providing a more continuous supply of groundwater and baseflow from the numerous springs present across the site, which will help keep the log sills consistently wet . In addition, we have also proposed constructed riffles along with the logs sills which will provide long-term stability to the channel even if the log sills begin to decay over time.

3. Table 4 (and Section 3.3.1): DWR has concerns over the flow (because of the small drainage areas and slate belt geology) for the following tributaries; 1B, 1C and trib 5.

FNI designers have extensive experience with stream restoration design in the Slate Belt and great familiarity with the hydrology and geology of this region. Our lead designers have successfully implemented several Full Delivery projects in this physiographic region with full release of credits. As noted in the mitigation plan, the geology of the site is unique and not typical Slate Belt geology. While streams located in the Slate Belt are known to dry up in the summer, the presence of the Middendorf Formation (marine sands and clays) at the ridge above the stream origins appears to act as a mini aquifer that creates springs across the site where it contacts the slate belt mudstone unit below. This supplies a much more continuous source of baseflow to the streams than we've seen in other small drainage-area Slate belt systems. We have documented the project streams continuing to have baseflow well into "abnormally dry" and drought periods. Based on this, we are confident that the stream will meet the minimum 30 days of consecutive flow that is required for the site. Our mitigation plan includes proposals to monitor baseflow using pressure transducers or game cameras on particularly small reaches where the transducers would be less effective.

4. Section 3.3.2.2- Hydric Soils Investigation- DWR was appreciative of the fact there was a Hydric Soil report by a Licensed Soil Scientist; however, the hydric soils report in Appendix E has several

shortcomings. As was stated in the report, "Due to time constraints, the hydric soil investigation was not a complete review of the entire area…". The review lacked covering the entire project area, lacked geolocating the borings on a map, and should have included many more borings given the wetlands that were evidently present.

The licensed soil scientist was tasked with studying and documenting the hydric soils within the proposed easement, not the entire property parcel. The statement is made to note that the entire property parcel (outside of the proposed easement) was not studied. The licensed soil scientist did investigate and cover the entire easement area including the areas of proposed wetland restoration areas.

5. **Section 7.2.1- Stream Restoration Approach- DWR cautions raising a small drainage area stream in the slate belt region. DWR believes that there will be continuous flow issues on most of the streams in this project.**

Please see our response to DWR Comment #3.

6. **Table 12- Shows that the D50 proposed metric is to be 101.6 mm, or about 4 inches. Seeing the typical for the constructed rifle, of which there will be many on this stream, DWR noted the use of Class A rip rap in the typical. DWR believes that this will result in a considerable "hardening" of the stream channel. DWR does not support the extensive use of class A rip rap in these stream channels.**

The note to use "Class A" rip rap on the typical was only to communicate the standard size range needed for the proposed bed material in the constructed riffle and not on how the stone should look. The size was determined from calculations of the bed material size needed to create an immobile bed appropriate for a threshold channel, as discussed in the mitigation plan. We agree that the appearance of typical Class A rip rap would not be appropriate for the site, and therefore plan to source stone for the constructed riffle areas from a local slate quarry. FNI staff have used this same quarry and its rock for another DMS full delivery project. This material has the textural features, shape and appearance typical slate belt stream bed material and therefore will look more appropriate for these stream channels.

7. **DWR appreciates the design firm utilizing the wetland performance criteria of 12% hydroperiod during the growing season.**

Comment noted.

8. **Section 9.5- DWR will require three additional gauges be placed in existing wetlands to ensure that the constructed stream channel does not significantly reduce the wetland hydroperiod. The specific areas will be mentioned in the review of the Design sheets.**

The comment has been noted, and appropriate gauges and number of gauges will be installed in order to document project success. The mitigation plan has been updated accordingly to note this.

9. **Figure 7. It would have helpful if the drainage area acreage would have been listed on the map.**

Figure 7 has been revised to include the drainage area acreage.

Figure 11- Proposed Mitigation Plan-there are several areas of concern on this map. First of all, DWR urges the designer to capture all areas that connect to the easement that may affect either the stream or wetlands. Examples of these areas which will likely affect the streams include the headwaters of tributaries 1C, 1B, and 4.

In addition, there are several areas (proposed wetlands A and B, and existing wetlands, WF, WH, and WA) where the easement line is directly on either proposed wetlands or existing wetlands. In the past the IRT has encountered problems where wetlands just outside the easement line were ditched by the landowners and of course these ditches affected the wetlands within the easement. Also, tributaries 5 and 6 both are shown to run down valley from where they initially had their confluence with the stream. Figure 14 is offered for evidence for tributary 5's path, however, DWR did not note any support for tributary 6's path.

The reviewer has detailed several items in this one comment, and our response will attempt to systematically address each of the comments that were raised.

The reviewer has asked that FNI capture areas that connect to the easement that may affect either the stream or wetlands. After further review of this comment, we have elected to expand the conservation easement to capture additional wetland areas at the head of Tributaries 1B and 1C as well as in other locations noted in the reviewer's comment. The wooded wetland areas upstream of the current conservation easement boundary on Tributary 1B and 1C will be included in the new easement area. Additionally, several areas where the proposed conservation easement skirted close to an existing wetland boundary have been moved out somewhat to provide additional distance from the existing wetlands to the proposed easement boundary (e.g., Wetlands WP, WD and WN). We have attached a figure to this response letter depicting the approximate areas of expansions of the easement. However, we are not concerned about ditching from the landowners affecting either existing or proposed wetlands because the proposed conservation easement will block the landowner from being able to outlet the ditch anywhere on the property. If the landowner were to install ditches adjacent to wetlands in the easement, such an effort would be futile as the ditches would be parallel to the area and, to make a ditch, there would have to be a place where the ditch can outlet. There would not be anywhere to 'outlet' the ditches because FNI has already included all potential outlets of a ditch into the conservation easement.

In regard to extending the conservation easement further up Tributary 4 to its origin, this is not a practicable option as the mitigation credits needed in this contract have already been supplied based on the proposed restoration areas and conservation easements shown in the mitigation plan. With Tributary 4, a logical, upper limit breakpoint was established at the point where there was already an existing culvert (to be removed). As noted above, we don't believe Tributary 4 will be at risk of undercutting or being affected upstream of the easement because drainage cannot be ditched deeper nor modified. Our rationale is that a new drainage feature would have to connect into the restored channel. Given the constraints on the site, we don't believe that such an action is a reasonable threat. However, we will update the mitigation plan with additional detail of these potential risks and uncertainties.

We will provide additional documentation on the proposed pathway/alignment of Tributary 6 similar to what was submitted for Tributary 5.

10. **Figure 12- Monitoring Plan- DWR believes there should be flow gauges in the upper third of the reach on each of the reaches proposed for restoration or enhancement work. Tributary 1B does not show a flow gauge.**

Comment noted. We will add this to the mitigation plan.

11. **Design sheet- C2-there is a lot of slope in this section with a lot of log sills. In the past, log sills have shown to be prone to leak or lose the ability to hold grade. Careful oversight will be needed in the**

construction of so many log sills. Moreover, DWR requires a gauge in the existing wetland placed stream right approximately near station 4+50.

See response to DWR Comment #2 where we attempt to address all of DWR's concerns about the angled log sills. Oversight of the log sill construction will be performed by experienced and qualified personnel.

Comment noted with respect to the additional gauge and this will be added to the mitigation plan.

12. **Design sheet- C5 - DWR requires a wetland gauge stream right near station 2+50. This section shows a lot of constructed riffles. DWR would like to emphasize their concern of placing rip rap in the stream channel. DWR suggests the designer look for a source of rock on site that more resembles native rock on site both in type and in size for the stream. In addition, DWR noted that there does not appear to be any bank treatments for the meander bends. How does the designer intend to maintain the stability of the stream in these areas (Design sheet C6)?**

Comment noted with respect to the gauge and this will be added to the mitigation plan.

See response to DWR Comment #6 regarding rock selection for the constructed riffle section.

With respect to the meander bend question, we ask that the commenter consider the size of the stream channel that is proposed. Based on our calculations, shear stress on the outside bend is not high. The site's drainages are small channels, and the installation of a bank stabilization treatment like toe wood or similar treatment would be very large considering the channel size and overwhelm the small channel, potentially affecting the pool size and function and creating instability issues rather than helping with stability. However, to address concerns over the stability of the meander bends we will increase the planting density on the banks.

13. **Design sheet C7-same comment as #12 regarding slope and log sills.**

See response to DWR Comment #2 where we attempt to address all of DWR's concerns about angled log sills.

14. **Design sheet C9- in the longitudinal plot there were no lines.**

We checked Sheet C-9 in the PDF version and the longitudinal plot lines are showing up correctly. It is possible that if you were reviewing a hardcopy that the lines may have printed out too faint to see. We will double check the plot hardcopy and adjust as necessary to make sure the lines are showing up.

15. **Design sheet C16- DWR requires a gauge stream right at approximately station 4+50.**

Comment noted and we will add a stream gauge to the mitigation plan at that location.

16. **Design sheet DT3 – DWR requests the on-site construction supervisor emphasize the specs of the log sill rollers with the construction company and specifically emphasize placement, footer logs and the minimum amount of length the log embedded into the bank.**

See response to DWR Comment #2 where we attempt to address all of DWR's concerns about angled log sills. We will emphasize the requested items with the construction contractor.

17. Design sheet DT4- DWR requests the designer look for rock on site which will be more suitable for the stream rather than using NCDOT Class A rip rap.

See response to DWR Comment #6.

Casey Haywood, USACE:

1. **Pg 10 Section 3.3.1.1 - Is the condition of UT1A Upper and Lower the same? Recommend discussing the characteristics of existing conditions separately for these sections. UT1A Upper appears stable in the photo provided in the photolog. It would be helpful if the photos in Appendix L were moved to the narrative to help add context.**

The conditions of the two reaches of UT1A are not the same. UT1A Upper is more stable than UT1A lower. Although it is still incised it does possess more stable banks and mature trees on its bank which provide stability and are limiting the degree of bank erosion. We will break out the discussion to describe these reaches separately. We will move the photos to the narrative to help add context to the discussion.

2. Pg 17 Section 4.1.5- Section stated that improvements to biological activity will be noted during visual assessments. Unless macrobenthic sampling will occur and/or visual observation data of biological activity will be collected, recommend removing this statement.

We have removed this statement about visual assessments of biological activity.

3. Pg 19 Section 5.5- Stream relocation is estimated to impact existing wetlands within the easement. Section 5.5 and 7.2.6 mention how permanent wetland impacts will be offset by stream restoration activities and planting of existing (but unimpacted) wetlands. Is this quantified somewhere for a comparison against wetland loss? Though it is anticipated that the total wetland acreage, and quality, will likely increase as a result of stream restoration, the Corps must still ensure that there is no net loss of wetlands as a result of ecological restoration. If you do not plan to install gauges on all wetlands within the easement and monitor hydrology, please plan to reverify the extent of jurisdiction at the end of the monitoring period to document that wetland acreage was not lost.

While we did include a table of estimated acreage of temporary and permanent wetland impacts, we did not include a direct comparison of wetland loss versus wetland gain in the mitigation plan but we will add this. We will add language regarding re-verification of jurisdictional status at the end of the monitoring period. In addition, as part of the ePCN submittal, an impact table will be submitted.

a. **Please be sure to include temporary and permanent impacts to both streams and wetlands when submitting the ePCN along with an impact map. Additionally, any work being done outside the easement boundaries, where you propose to tie into existing channels/ditches and upgrade or install culverts, need to be included in the ePCN impacts. For instance, the 48" culvert crossing on UT6 (Figure 11) located just outside the easement is tied to the project and will need to be included on the impact table unless a separate NWP14 will be requested. Any crossing impacts you believe qualify as agricultural exemptions should be clearly reported with location, impact length, culvert size, etc. so the proper determination can be made.**

Comment noted, and the appropriate documentation for required permits will be submitted.

b. **Please see the attached Permitting Tips for Mitigation Sites PDF for reference and update the Mitigation Plan as needed.**

Thank you for including this in your comments. We have reviewed and will update the mitigation plan as needed based on this document.

4. **Pg 25 Section 7.2.1- While much of the work on the PI Restoration reaches are similar, this would be a good opportunity to discuss the stream design implementation for each individual reach such as the road relocation and culvert installation at the top of UT4 and UT6.**

We will add more detail regarding the stream design implementation for each individual reach in this section per your comment.

5. **Pg 27 Section 7.2.3- Appreciate the inclusion of Figure 14 to justify the location of tributary 5. Please include similar documentation for tributary 6.**

A similar figure has been developed to justify the location of Tributary 6 and added to the mitigation plan.

6. **Pg 28 Section 7.2.7- A treatment marsh is proposed at the top of UT4. It is understood that this was discussed with the IRT; however, if this area is currently jurisdictional it is not appropriate to place a BMP in a jurisdictional feature. It appears that this area is called out on the JD maps and Figure 9 as a perennial stream. Please confirm. Would there be an option for a BMP or marsh treatment area above UT2?**

FNI agrees with the comment regarding the treatment marsh at the top of UT4. This has been removed.

With respect to UT2, a spring-fed wetland already exists at the top of this feature. Therefore, no BMP or marsh treatment is needed.

7. **Pg 32 Section 7.5- The selection of plant species is based on species present in the forest adjacent to the site, please add a brief description of the vegetative community used for reference.**

This has been added to the mitigation plan.

8. **Pg 32 Table 15- The percentage for Sycamore seems high. It would be preferable to reduce the percent of Sycamore.**

We have reduced the percentage of sycamore by 5% in the planting table and have adjusted the other species accordingly.

9. **Section 7- Was any information gathered from a wetland reference site to help develop project target conditions?**

No data were specifically gathered from a wetland reference site. A review of existing wetlands at the site informed our decision making with respect to the project's target conditions for the restored wetlands.

10. Pg. 33 Section 7.6- What is the potential for hydrologic trespass onto adjacent fields? While there have been discussions with the landowner, there is no way of ensuring that the LO will not construct new ditches immediately adjacent to your project that would result in drainage of wetlands restored on your site. With no guarantee that the adjacent parcel will not be transferred to a different landowner in the future, this potential site constraint should be discussed in the text.

We appreciate the commenter's concern for the long-term protection of these areas. Please see our response to DWR Comment #9 regarding the potential for impact to the restored wetlands by adjacent ditching. We will include more discussion regarding this potential site constraint in the text.

11. Pg. 33 Section 7.6- It was noted in Section 3.1.1 that cattle are located on adjacent parcels upstream of Tributary 1. Do the cattle have access to the wooded buffer on Tributary 1A outside the easement or are they fenced out? If so, add a discussion of potential issues that could arise on the Site from the cattle access upstream. Noted that the Site does not propose any fencing.

There are no longer cattle being grazed on this adjacent property. The adjacent property has been sold, and poultry houses have been constructed on the land. We have revised the mitigation plan to reflect this change in land use.

12. Pg 38 Section 8.3- Please note that volunteer species must be present for at least two growing seasons before counting toward meeting performance standards for monitoring year five and seven.

Comment noted. We have revised the mitigation plan to reflect this.

13. Pg 38 Section 9.0- Is that the "weather station" shown on Figure 12 the on-site rain gauge? There was no mention of a rain gauge in this section.

Yes, the weather station includes a rain gauge. We will revise the mitigation plan to note that the weather station also includes a rain gauge.

14. Pg 39 Section 9.4- Indicates cross sections will be installed on all Restoration and Enhancement I reaches however, there is no cross section shown on the EI reach on Figure 12.

An appropriate number of cross-sections will be added to enhancement reach on Figure 12.

15. Figure 5: Please include the proposed easement boundary.

The figure has been revised to include the proposed easement boundary.

16. Figure 7: Please show drainage area acreages on the map.

The figure has been revised to include drainage area acreages on the map.

17. Figure 9- Please indicate the location of the perimeter ditch to be filled (as shown on the map in Appendix A).

The figure has been revised to include.

18. Figure 11-

a. It's unclear in the figure, text and design sheets where culverts will be replaced, in particular for the road relocation above Tributaries 4 & 6. These crossings were discussed during the IRT meeting. Please call out these locations on the figure and discuss in further detail in the narrative. Does the road go through the top of the CE on Tributary 6? The line for the proposed reroute appears to stop at the easement line but the note suggests it will be located above the easement. Design sheets should also be updated accordingly.

The road will not go through the Conservation Easement on Tributary 6 but will be routed to the north upstream of the conservation easement. We will update the figures, mitigation plan narrative and design sheets accordingly to reflect this and describe the culvert placement in more detail, per your comment.

b. Update the ledger to read "Parent tracts" as opposed to "Project Site Tracts" for consistency. What is the difference between what is labeled as the Project Site Tracts vs the Site_Boundary? Both attributes are pink.

Ledger and figure have been revised.

c. Was there an option to include the crossing above Trib 1A Lower as an internal crossing? Internal crossing are typically preferred so they are protected and managed in perpetuity as part of the CE.

The landowner would prefer to have this area separate from the conservation easement, so it has not been included as an internal crossing. Please note that that there are no proposed credits for Trib1A Upper, which we have included to provide connectivity and protection of Trib1A Lower.

19. Figure 12-

a. Please include the culvert/crossing photo point locations on this figure.

Figure has been revised.

b. Please include and label existing wetlands on this figure.

Figure has been revised.

c. Please install a flow gauge on Trib 1B. Additionally, please ensure flow gauges are located in the upper third of all reaches. To help supplement flow data it would be beneficial to also install game cameras.

Comment noted for location of flow gauge, location in upper third and suggestion for game cameras. We will revise the mitigation plan to reflect these additions.

20. Appendix F- Uniform Act document- FNI indicated that a notification was sent to the property owner and a copy of the notification was located in the Appendix. Please include the document as indicated.

Document has been included in the mitigation plan.

21. Design Sheets-

a. **C13 and C16- Were there culverts being installed for the road relocation above Trib 4 and 6? Please include culvert type and dimensions in callout. Also, please callout all easement breaks (internal and external) on the profile views. And please include a typical culvert crossing detail.**

Yes, there are culverts being installed for the road relocation above Tribs 4 and 6 and we will add the requested information to the callout. We will also callout easement breaks on the profile views and provide a typical culvert crossing detail.

b. **Noticed a design sheet for Wetland A, C, D was not included. Is this because work is limited in this area to mainly only removing drain tiles?**

Yes, that is correct. Because the work in the proposed wetlands is minimal, it is depicted on the larger scale sheets.

22. **General Comment: Since this project is adjacent to active agricultural lands, signage will be important to help establish boundaries for the landowner. We recommend using horse-tape or some other visual barrier for the first few years of monitoring. To confirm, does the easement boundary line on Trib 1A Upper follow the centerline of the stream or does it follow the lines of the parent parcel? It will be important to install signage more frequently along this area due to the sinuous easement line. If the CE does not overlap the parent parcel, and if possible, recommend installing signage in a straighter line somewhere between the parent parcel and CE to avoid potential future encroachments.**

The easement boundary line on Trib1A Upper roughly follows the lines of the parent parcel, which is also approximately the centerline of the stream. We will install signage more frequently per your recommendation.

Please let us know if additional information is needed for the IRT's further review. Feel free to call me at (919)418-8430 with any questions.

Sincerely,

Ian Jewell

Associate/Project Manager

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February 21, 2023

Kelly Phillips
Project Manager
NCDEQ – Division of Mitigation Services
610 East Center Avenue, Suite 301
Mooresville, NC 28115

Re: DMS Project ID # 100151 / Middendorf Springs Stream and Wetland Mitigation Site Mitigation Plan NC DMS Comments

Dear Mr. Phillips:

Freese and Nichols, Inc. appreciates the NC Division of Mitigation Services (DMS) reviewers' time and thorough review of the project. We have addressed all comments received by DMS provided by the Memorandum of Record on October 26, 2022 for the Middendorf Springs Stream and Wetland Mitigation Site Draft Mitigation Plan. Our responses are in blue below:

Comments received (Black Text) and Responses (Blue Text)

General:

- *Please paginate PDF to be 1-263. Draft report is 1-55 for report, followed by 1-164 for figures and appendix, then 1-28 for plan set, and finally 150-165 for additional appendix.*

  This has been revised.

- *As requested by the Todd Tugwell in an email dated June 8, 2021, please include a discussion of the site, including a description of the unauthorized activities carried out on the site and actions taken as part of the mitigation work to resolve those concerns. Please include this email correspondence in Appendix A.*

  This information has been added to Section 1.0.

Title Page:

- *Please add DWR Project number 2020-0775v1*

  This has been added.

- *Remove DMS contract number. The NCDEQ number listed is sufficient.*

  This has been removed.

Page ii:

- *Remove DMS contract number.*

  This has been removed.

- *Revise Yadkin River Watershed to Basin and HUC to Cataloging Unit to be consistent with cover page.*

  This has been revised.

Page iv:

- *Please revise sections 7.1.1.1, 7.1.1.2 and 7.1.1.3 to 7.1.1, 7.1.2 and 7.1.3.*

  This has been revised.

Page vi:

- *Please review and revise Figure names to match what Figures are titled in report for consistency. For example, Land Use Map and Land Use Land Cover Map, Soils Map and NCRCS Soil Survey Map, Proposed Restoration Plan and Proposed Mitigation Plan, Monitoring Map and Monitoring Plan, and HUC Overview and Hydrologic Location.*

  This has been revised.

1.0 Introduction:

- *Report states that the Site is not located within a targeted local watershed and proceeds to discuss targeted resource areas in same sentence. Recommend revising to state that the site is not located within a TLW or TRA or revise sentence for clarity.*

  This has been revised.

- *Recommend revising sentence that states wetlands will be restored and re-established for 5.567 to wetlands will be rehabilitated and re-established.*

  This has been revised.

Tables 1 and 2: *Please keep the credits and quantities tables formatted per the template.*

The credits and quantities tables have been reformatted per the template.

2.0 Watershed Approach and Site Selection (Second Paragraph): *While the land use information provided by FNI may be relevant, DMS suggests FNI speak directly with DMS watershed planners to ensure FNI assumptions about the model are accurate.*

We removed the language describing the similarity to nearby TRAs and the assumptions about how those TRAs were selected. This was taken from the full delivery proposal and was used to justify selection of the site even though outside a TRA.

3.1.1 Drainage Area and Land Cover: *"Primary land use within the drainage areas consists of row crop. Cattle pasture (Tributary 1) with wooded areas located along banks of South Fork Jones Creek, adjacent to Tributary 1 (upper) and along Tributaries 1B and 1C", please restructure sentence(s) for improved clarity.*

This has been revised for clarity.

Table 4: *Summary of Project Attributes: Recommend including Stream Thermal Regime – Warm in the Project Watershed Summary Information section.*

This has been revised per recommendation.

Table 5*: Mapped Soil Series: BaC is listed on table but does not appear in project area on Figure 5. This may be accidently mislabeled and should be BaB. Please review and revise as necessary.*

It was mislabeled and has been revised.

3.2.4 Land Use:

- *Section states that site has not been used for livestock and no livestock are present. Section 3.1.1 indicates that a primary land use is cattle pasture (Tributary 1) in the drainage areas. Please revise and/or clarify so sections are consistent.*

Section 3.1.1 has been revised to clarify this. Cattle pastures are present on an adjacent property upstream of Tributary 1, but are not present on the project site or parent tract.

- *Text at the top of document page 9 does not read correctly and repeats with previous page. Please revise.*

The repeated text has been removed.

3.3.1 Reach Summary Information:

- *NCDWR Stream Identification Forms were not included in Appendix D with the draft submittal. Please include with revised submittal.*

NCDWR Stream Identification Forms have been included with the revised submittal.

- *Please qualify all references to 'relatively high' and 'high' BHRs.*

This has been revised. The actual bank height ratios have been provided rather than a qualitative statement.

- *Sentence "This has resulted in severe bank erosion along the channel due to lack of natural bedform as the channel attempts to regain stable geometry." "This " what? And the*

statement indicates the severe incision has resulted in erosion due to lack of bedform; please revise the sentence to accurately describe the process. Generally, isn't the lack of bedform due to incision rather than the incision due to lack of bedform?

This sentence has been revised for clarity. It now says that incision has led to bank erosion and lack of bedform as the channel attempts to regain stable geometry.

3.3.1.2 Tributary 1B: *Please describe why enhancement has been selected over restoration.*

A sentence has been added describing why enhancement was selected over restoration on Tributary 1B.

3.3.1.2 Tributary 2:

- *Gulledge Road is referenced in this section. Please label this road on figures.*

Gulledge Road is now labeled on figures where applicable.

- *Multiple vehicular crossings are referenced in this section. Please include these locations on Figure 9 Existing Conditions Map.*

These are now included on Figure 9 Existing Conditions.

3.3.1.3 Tributary 3: *Description of Tributary is unclear and does not seem to match Figure 9. Section states intermittent flow begins on Trib 3 at a headcut 470' upstream of the Site easement area. Figures appear to show intermittent area within easement. Please revise as necessary.*

This sentence has been revised to provide clarity and correct this error. Tributary 3 begins at a headcut inside the proposed easement.

3.3.1.4 Tributary 4: *Section states that Tributary 4 is an intermittent tributary of Tributary 3. Figure 9 shows Tributary 4 as perennial. Revise as necessary.*

This has been corrected.

3.3.1.5 and C-14: *Please justify the alignment of Tributary 5 with lidar and or survey data to support the proposed stream location.*

A new figure has been created to justify the alignment of Tributary 5 with both Lidar contours and Survey data.

3.3.14 Tributary 4: *Please include Tanner Hill Road on Figures.*

We've added Gulledge Rd to the figures. "Tanner Hill Road" is an incorrect road name that has appeared on some online maps such as Google Maps.

3.3.16 Tributary 6: *Section states that the perennial channel originates at the most upstream wetland area. Figure 9 shows two additional wetlands upstream of where Tributary 4 is perennial. Please revise as necessary.*

This sentence has been revised to remove the words "most upstream".

3.3.2.1 Jurisdictional Wetland Information: *Please add a short discussion regarding the approved USACE PJD that was completed on July 27, 2022, and is included in Appendix D.*

A short description of the approved USACE PJD was added to this section.

Table 6: *Recommend formatting to fit on 1 page as opposed to 3.*

This has been revised to include the table on one page as opposed to three.

4.2 Potential Constraints: *The intent of the statement 'the valley widths at the site will allow for pattern and dimensions to restore stable functioning streams and wetlands' is not clear as valley width does not limit stream stability. Suggest adding a caveat to this statement excepting Trib 1A upper which is constrained by parcel boundary and easement.*

This sentence was removed and revised with a statement about Trib 1A being constrained by the parent tract boundary.

4.1.4 Physiochemical:

- *In general goals absent measurement should be avoided, please reduce physiochemical discussion to parameters being measured during monitoring.*

This has been revised per the suggestions in the other comments below.

- *Recommend revising the second sentence to use the word export instead of production*

This has been revised.

.

- *Recommend striking the 4th sentence*

This has been removed.

- *In relation to the sentence: "These benefits develop slowly…" Reductions in bank erosion and increasing floodplain storage should be readily assessed as part of the mitigation monitoring. Nutrient cycling can be a longer-term process, especially when the source is row crop agriculture, where a groundwater reservoir of nitrate may be a long-term source. Please remove discussion of these metrics or add methods for measurement and reporting to the monitoring plan.*

Discussion of reduction in nutrient as a metric has been removed from this section.

- *Consider language in here that indicates forms of nitrogen and phosphorous will LIKELY be reduced by reductions in bank erosion and establishment of a riparian buffer.*

Language to this effect has been added to this section.

4.2 ***Potential Constraints:*** *Recommend referring to Stream 1 as Tributary 1 to be consistent with report text, figures, and tables.*

This has been revised.

5.5 401/404:

- *Text formatting error in this section.*

This has been fixed.

- *Verify that all impacts to jurisdictional wetlands have been minimized to the maximum extent possible when considering access routes.*

All impacts to jurisdictional wetlands have been minimized to the maximum extent possible with access routes.

- *Please clarify if the wetland expansion of 0.22 acres noted in this section is included in the plan as submitted.*

The wetland expansion of 0.22 acres is included in the plan. Wetland A was expanded by this amount.

Table 10 – Project Goals and Objectives:

- *First goal – Recommend indicating that groundwater levels will be raised to support riparian and hyporheic functions instead of "Improve".*

Revised per recommendation.

- *Project objectives should have corresponding performance standard and monitoring parameters. The goals/objectives listed currently in the draft could be reduced and more concise. Please organize these to be more concise with the performance standards presented in Table 18.*

Both Table 10 and Table 18 have been revised to be more concise by reducing the number of goals/objectives or combining some redundant goals/objectives into one.

- *Examine the second goal indicating transport equilibrium: The sediment transport analysis in Section 7.4 indicates the drainages are not compatible with using sediment transport equilibrium because they are supply limited and will be constructed as threshold channels. Please revise this goal to comport with the transport analysis.*

The language describing sediment transport equilibrium has been removed.

- *Recommend not mentioning aquatic communities in third goal if it will not be measured. Recommend leaving it improvement of substrates, bedform diversity and habitat diversity.*

The language regarding aquatic communities has been removed.

7.1 Reference Streams:

- *Remove references to Wildlands Engineering, Baker and Restoration System sites in reference stream sections.*

These references have been removed.

- *Drainage areas on the reference streams was much larger than streams onsite. Please indicate if there are any concerns.*

Our primary concern was with finding headwater streams in a similar physiographic setting (i.e. slate piedmont, slate belt specifically) with similar slopes. The Middendorf site is somewhat unique in that streams with such small drainage areas have perennial flow, thanks to the abundance of headwater springs across the site. We felt that the references we found represent these boundary conditions of headwater, piedmont perennial systems on relatively steep slopes (then transitioning to flatter slopes) fairly well and are not concerned with scaling the geomorphology of these systems down to the project site.

7.2.1 Stream Restoration Approach:

- *Remove reference to EII. There is no EII proposed for this site.*

Reference to EII has been removed.

- *The information provided in the mitigation plan states several tributaries with gradients greater than 2%. Please specifically address the proposed 'C' type streams in tributaries with these steeper gradients. Is the overall approach to construct 'Cb" streams and fortify the steeper reaches with more substantial grade control (log rollers)? Additionally, given the tributaries are currently dominated by gravel (as stated in the plan), will the material added to construct riffles be the larger size fraction of the current sediment size distribution?*

Yes you are correct. The plan is to construct Cb streams on the steeper slope areas and fortify the steepest reaches with log rollers. We've added some sentences describing this to Section 7.2.1.

7.2.3 Meander Pattern: *Was low point of the valley considered in the proposed alignment decision? Please add additional discussion to this section. Please reference any lidar, field surveys used to develop and support the proposed alignment.*

Yes it was considered and was a critical part of the design, particularly for Tributary 5 and 6, which are aligned to flow the low point of the valley. We have developed a figure to show the topographic low points of Tributary 5 in response to the question above. Please refer to Figure 14 for evaluation of low points in this area.

7.2.4 and 7.2.5: *Sections repeat same language regarding riffles and log rollers. Please revise.*

This has been revised.

7.2.5 In-Stream Structures data: *Only two structures are proposed for this design. Were additional structures considered to add variability and/or habitat diversity?*

Given the relatively small size of these channels, other types of in-channel structures with multiple arms such as cross-vanes and j-hook vanes would not be practical as they would overwhelm the channel and likely create more stability problems rather than help stability. As such, we've focused on log sills and log rollers as the most practical means of achieving grade control, assist with maintenance of pools and creating energy dissipation where needed on the steepest slopes but still fit within the small size of the channels.

7.2.6 Wetland Restoration Approach:

- *Section discusses Enhancement areas, but there is no Enhancement proposed as mitigation for the site. As a result, and to reduce confusion with reviewers, DMS recommends removing the sentence "Enhancement areas aim to improve vegetation in already jurisdictional wetland areas." This information is stated at the end of the paragraph and states that no credit is being requested for this activity. All jurisdictional areas where planting will be conducted must be identified and mapped but should not be referred to as Enhancement in this context. Please add figures showing the wetland planting locations and any JD areas impacted during construction.*

References to enhancement have been removed from this section. Figure 15 has been added to show the JD impact areas (both temporary and permanent) as well as where wetland planting will occur.

- *Please be advised that the pocket wetland being proposed within the conservation easement will need to be constructed in a manner that does not require maintenance. The pocket wetland detail shown on DT-9 will require routine maintenance that will not be allowed to occur within the conservation easement.*

We have revised the pocket wetland (now called "treatment marsh") to remove the pipe outlet and replace it with a log sill weir outlet that will not require maintenance. The log sill will be placed in in-situ soil adjacent to the embankment. Other elements of the pocket wetland that were more similar to a BMP have been removed so as to keep the wetland as simple as possible while still providing the intended pre-treatment of flow from upstream.

7.2.6 Wetland Restoration Approach - Clarification: *The approach as proposed is somewhat unclear:*

- *Wetland B Re-establishment is proposed via stream restoration of Tributary 2; however, a jurisdictional wetland persists on stream right of this tributary in an area that appears to have upslope drainage and drainage tiles. There is no indication of spoil, berms, drainage tiles in the non-jurisdictional area in this location that is proposed for re-establishment; there is an unidentified structure on plan sheet C-8 that appears to connect the stream to the proposed restoration zone. Please specify what is intended in this location.*

Photos of drainage tiles have been added to the photo log and an approximation of drainage tile

locations has been added to the Existing Conditions figure. There are several ditch outlets along the perimeter of Wetland B that have several drainage tiles (corrugated plastic pipe) with flowing water. These drainage tiles extend up into the Wetland B cell. The location of drainage tiles shown in the Existing Conditions figure is an approximation based on field evidence of the location of the ends of the tiles and the direction in which they come out of the wetland, and discussions with the landowner regarding where they were installed. Silt and sediment has accumulated over top of the diches in which the tiles were buried and they can no longer be seen from the surface. As such, we have included a reconstruction of their approximate locations on the figures.

- *Wetland A is located in the floodplain of South Jones Creek, which is not to be subject to restoration or enhancement. The re-establishment in this area is proposed through removal of ditches and drainage tile; however, the locations of both features on the map appear to be on the perimeter of the re-establishment. The persistence of jurisdictional wetlands in this location raises the question of functionality of ditch and tiles.*

As with Wetland B, Wetland A has several ditch outlet points where two to four drain tiles are visibly coming out of the ground, into the ditch and flowing out to South Fork Jones Creek. Photos of these have been added to the photo log and an approximation of their location has been added to the Existing Conditions Figure. As with Wetland B, the landowner has indicated that the tiles extend into and throughout the proposed Wetland A. The parts of Wetland A that are currently jurisdictional are relict oxbow meanders of South Fork Jones Creek. They are deeper than the surrounding non-jurisdictional areas proposed for re-establishment, thus are further below the groundwater surface and currently classify as jurisdictional while the surrounding areas do not.

- *Please describe the mechanism for re-hydration of Wetland Area A since this area may be less influenced by the drainage tile and ditch modifications.*

To restore wetland hydrology in Wetland Area A, the drainage tiles will be disrupted throughout the wetland, ditches will be plugged and restoration of Tributary 1 will increase the groundwater surface elevation.

7.2.6 Wetland Restoration Approach: *Recommend moving discussion regarding standing water to 7.2.7 Soil Restoration Approach to reduce repetitiveness. Topic is discussed in both sections.*

This has been revised.

7.2.7 Soil Restoration Approach: *Section mentions compaction from livestock. Recommend revising since livestock do not appear to have ever been on this site.*

This has been revised.

Table 12 – Morphological Parameters:

- *Reaches 1A, 1B, 2, 3 indicate conversion from G to C, but exhibit decreases in the W/D ratio. Please respond or clarify.*

Due to incision of existing channels, existing bankfull features were either difficult to discern or

entirely absent at surveyed cross-sections. Bankfull parameters of existing channels were thus calculated based on assumed/approximated bankfull elevations and should be taken as an approximation of actual bankfull characteristics. Thus, in this case the comparison of changes from existing to proposed would not provide an accurate assessment of the adequacy of the proposed channel to maintain bankfull discharge and stability relative to existing condition, as it would in channels where existing bankfull indicators are more evident. A footnote has been added to Table 12 to clarify this.

- *Reaches 3 and 5 simultaneously exhibit decreases in area and slope. How is the design discharge maintained? Please include explanation in the narrative.*

See response above. An explanation of this has been added as a footnote to Table 12.

Table 12 and Table 13 – Morphological Parameters: *Recommend reducing size to fit on one page.*

This has been revised to fit on one page.

7.3 ***Design Discharge Analysis:*** *There are two page 32 in the report. Please review and revise report and table of contents if necessary.*

This repeated page issue has been fixed.

7.4.1 Sediment Competence Analysis: *7th sentence "The results also show.." Believe the authors are describing excess competence, not capacity? Please revise or clarify as appropriate.*

Yes this should have said "competence". This has been revised.

7.5 Vegetation and Planting Plan: *Section states that planting will occur between Nov. 15 and March 15 per IRT monitoring guidance. Then continues to state that if construction is completed after March 15, but before May 31 the site will be planted. The IRT will need to be notified and agree to any planting beyond March 15. Failure to receive IRT approval to plant beyond March 15 may result in delaying MY1 until the following year. DMS recommends removing the May 31 statement.*

This has been revised per the recommendation.

7.5.1 Invasive Species Treatment: *Recommend adding discussion regarding what areas of the site will be a one-time treatment versus throughout the monitoring period in this section.*

Information regarding the areas that will be one-time treatment has been added to this section.

Table 16 – Planting Plan (Woody Species): *Planting Plan zones do not match sheet DT-8. Please*

revise so the naming convention is consistent (ex: Streamside (Zone1) vs Zone 1 Live Stakes or Piedmont Bottomland Forest vs Riparian Wetlands).

This has been revised.

***7.6 Project Risks and Uncertainties**:*

- *Revise "Stream 1" to "Tributary 1A".*

  This has been revised.

- *Please discuss crossing in more detail. Will the culvert be replaced and installed and sized appropriately to allow wildlife passage?*

  Discussion has been added to this section regarding this crossing. This crossing is currently a 60" RCP and it will remain in place.

- *Will the site remain in row crops? If so, how will encroachments due to equipment turning be prevented? Is there any fencing proposed for the site? There are many tight corners and angles to the conservation easement that will not be conducive to equipment turning. Please add a discussion regarding how encroachments will be prevented.*

  The site will remain in row crops. The easement corners have been checked and selected to ensure equipment can turn/navigate and have been discussed with landowner. He is also aware that encroachments will not be permitted. No fencing is proposed for the site, however corner posts and line posts consistent with NCDMS guidelines will be placed throughout the easement area. Additional discussion about this has been added Section 7.6.

- *What is the potential for hydrologic trespass onto the adjacent fields near Wetland A and Wetland B? The increased hydrology resulting from plugging ditches and removing drain tiles will not stop at the conservation easement line. There is no guarantee the landowner will not construct new ditches and install new drain tiles adjacent to the wetlands. Please address this possibility as a project risk and indicate if there are any areas posing a risk for hydrologic trespass.*

  Risk of hydrologic trespass is low. There is no chance of the landowner digging a new ditch because the proposed easement will completely surround all outlet points for a ditch (tributaries and South Fork Jones Creek), and thus even if a ditch was dug there would be nowhere for it to drain without cutting through the easement which would be a violation of easement conditions. We have had extensive discussions with the landowner regarding the proposed removal of drain tiles and ditches in the wetlands, and they have stated they are fine with this as in their view it is already a very saturated and unproductive planting area across the valley flat.

***8.0 Performance Standards:** Typo: add Table before 18.*

This has been revised.

Table 18 – Project Performance Standards:

- *For Conservation Easement performance standards the monitoring approach should be "Visual Assessment". The conservation easement should be walked in its entirety at a*

  minimum of annually to identify encroachments, deficiencies, and necessary repairs and/or updates.

This has been revised.

- *Please update objectives in Table 18 to match revisions to Table 10.*

Table has been revised to match revisions in Table 10.

- *Project boundary integrity must be maintained. Suggest inclusion of required annual visual inspection of easement boundary as monitoring approach to address 'Establish a minimum 50 ft buffer along stream channels' objective.*

This has been revised per suggestion.

8.1.2 Surface Flow: *Did the authors mean to say stream gage instead of flow gage? Aren't the transducers going to measure both overbank and continuous baseflow simultaneously where required?*

This has been revised to say "stream gage". The language regarding use of pressure transducers has also been added to the bankfull event section to clarify that those devices will be used for both bankfull and surface flow monitoring.

8.1.4 Digital Image Evaluations: *Please note that detrimental bank erosion, aggradation, structural integrity, and vegetative concerns must also be noted on the required Visual Assessment tables and spatial extent depicted on the CCPVeach monitoring year.*

This language has been added to the text.

8.2.1 Wetland Hydrology:

- *Recommend removing section heading 8.2.1 Wetland Hydrology and provide this information under 8.2 Wetland Restoration Success Criteria like other success criteria sections.*

This has been revised per recommendation.

- *Please provide source for NRCS WETS data using 20 degrees F as temperature index.*

The standard indexes are 32, 28 and 24.

The 20 degrees F was a typo and has been changed to 28 degrees F.

9.1 As-built survey: *Section indicates a survey will include a complete profile of thalweg, water surface, bankfull and top of bank. Please be advised that there are many more asbuilt survey requirements. Please review the DMS required templates and guidelines as referenced in section 2.9 of RFP#16-008012.*

This section has been updated to reference the current templates and guidance documents, specifically the As-Built Requirements (October, 2020) document.

9.2 Visual Monitoring: *Please include photos of culverts and crossings in annual fixed photo points.*

Culverts and crossings have been added to the list of fixed photo points in this section.

9.5 Wetland Hydrology:

- *Section indicates that 12 gauges will be installed, but only 11 are described. Seven in re- established and four in rehabilitated areas. Also, section states some gauges will be installed in jurisdictional wetlands for reference, but this is not included in the total gauge count. Table 19 shows 11 gauges total. Please revise.*

That has been revised to 11 gages. No gages will be installed in jurisdictional wetlands and that language has been removed.

9.7 Schedule and Reporting:

- *DMS always recommends using the most current monitoring templates, tables, and applications for reporting. All templates can be found on the DMS website.*

Language in this section has been revised to say that the most current DMS template on the DMS website will be followed, rather than indicating a specific template.

- *Note that Closeout Reports are no longer required.*

Reference to closeout reports has been removed.

Table 19: *Recommend dividing vegetation plots into Fixed and Random similar to Riffle and Pool cross sections above.*

This has been corrected in the text and figures.

Table 19: *Please include number of reference photo points.*

This has been revised with a number of reference photo points.

FIGURES

Figure 3 Landowner Map: *The easement appears to be outside the extent of the parent tracts. Are the boundaries for the parent tracts the stream centerline?*

The easement is contained entirely in the parent tracts. It appears to be outside the parent tract on the Landowner Map because the parcel layer from Anson County that is used on the figure is only an approximation whereas the easement boundary has been surveyed in by a Professional Land Surveyor. All proposed easement boundaries tie into the parent tract boundaries. We can attached the draft plat if that will help clarify this but currently it is not part of the document. On Trib 1 upper and South Fork Jones Creek the boundaries of the parent tract are the same as the stream centerline.

Figure 4 Land Use/Land Cover Map: *Please include the easement boundary in this figure.*

This has been revised.

Figure 5 NRCS Soil Survey Map: *Please remove the hydric soils line work features from this figure.*

This has been revised.

Figure 9 Existing Conditions Map:

- *Please include jurisdictional wetlands and label, label roads, include proposed CE, cross section locations, and DWR stream form locations.*

These items have been added to the Existing Conditions Map.

- *Please include greater detail on the number and location of ditches and drain tiles relative to the wetland features (i.e., inset).*

These items have been added to the Existing Conditions Map. The location of drainage tiles shown is an approximation based on field evidence of the location of the ends of the tiles and discussions with the landowner regarding where they were installed. Silt and sediment has accumulated over top of the diches in which the tiles (corrugated plastic pipe) were buried and they can no longer be seen through the proposed wetland areas. As such, we have included a reconstruction of their approximate locations on the figures.

Figure 11 Proposed Mitigation Plan: *Please include road names and jurisdictional wetlands.*

These items have been added to Figure 11.

Figure 12 Monitoring Plan*:*

- *Note on figure suggests locations can change for monitoring devices. Please note that the IRT expects installed monitoring devices to be as close as possible to proposed locations.*

  This note has been removed. Monitoring devices will be Installed as close as possible to the proposed location.

- *Recommend showing locations of random plots. IRT would appreciate the opportunity to comment and request for a certain area of interest to be monitored.*

  Random plots are now shown on the figure.

- *Recommend turning off Zone 2 Planting hatch to make map more legible.*

  This has been revised.

APPENDICES

Appendix A IRT Meeting Minutes: *Correspondence indicates 1C would be credited using a ratio of 1.5. The quantities and credits table indicates a ratio of 1. Please respond or revise as appropriate.*

The proposed approach has been changed to restoration, based on further site assessment and design analysis. A paragraph has been added to Section 7.2.1 (Stream Restoration Approach) detailing the reasons for this change.

Appendix G Plan Sheets:

Symbols Page: *Please include symbols page.*

A symbol page has been added.

Plan Sheets General:

- *Please add the wetland ID labels for credited areas to each plan sheet.*

  The Wetland ID labels for credited areas have been added.

- *Recommend adding specifications for each type of stone backfill to be used during construction.*

  Stone backfill and specification has been called out on each detail.

- *Add detail for the plug between Wetland B and Trib 2.*

Channel plug detail is intended to be used for ditch plugs as well. The title and callouts on this detail has been revised to reference its use both in wetland ditches and as channel plugs.

Sheet C-1: *Recommend indexing overview map with sheet number for individual pages.*

Overview map has been revised with sheet numbers.

Sheet C-2:

- *Why was the top of the jurisdictional wetland not captured in the conservation easement at the upstream end of T2?*

The PJD was requested only for the proposed conservation easement limits and thus jurisdictionally determined wetlands shown in this location are limited to the bounds of the conservation easement limits. This has been revised.

C-2 Tributary 1C: Angled Log Sill Roller structures are shown as the only in-stream structures for most of the reach which exceeds 2% slope. The profile does not match the sequence suggested by Sheet DT-3 using the Sill Rollers which would produce a sill (step) with a pool immediately downstream. The displayed profile is more consistent with a riffle/pool sequence. Please review the plan sheet and proposed structures for consistency and applicability and add specification indicating maximum drop across an individual sill. Please evaluate this at all locations where this structure is proposed.

The angled log sill roller is intended to be constructed on what is shown as the riffle on the proposed profile, where indicated on the plans. We have attempted to modify the riffle parts of the profile to show the steps but because the riffles are so short in many cases, the plans become very difficult to read and we feel it is best to leave them as shown and have the Contractor reference the detail for how these areas are to be constructed.

Sheet C-3: *Same comment as above. Why was the wetland not fully captured within the CE?*

See response above.

Sheet C-3: *Tributary 1B is shown to be 590', but Table 2 shows Tributary 1B as 500.119. Digital files show Tributary 1Bbeginning further downstream and for a length of 500.119". Please review and revise as necessary.*

An older profile was shown by mistake on this sheet and has been revised to match the length of 500.119. The length shown in the digital files and Table 2 as well as the alignment shown on the plansheet are correct in terms of length.

Sheet C-5: *Please include culvert/crossing information on this page. Please also include a detail for the proposed crossing/culvert.*

Culvert/crossing information has been added. This is a 60" RCP. This culvert is not proposed to

be replaced and thus no crossing detail is included.

DT-3 Angled Log Sill Roller: *Add specification for the maximum drop between headers. Also, NYSDOT 620.08 is currently specified as the structure bedding material. Please refine the description.*

The maximum drop specification has been added into the notes for this detail.

Planting Planview P-1: *Hatching makes sheet difficult to review. Recommend using multiple sheets or revise hatching to improve legibility.*

Hatching has been revised to improve legibility.

Appendix H Invasive Species Control Plan: *Please include discussion regarding intended treatment plan regarding intentions to treat certain areas one growing season vs. full invasive treatment as shown on maps used during IRT correspondence. Please include these treatment zones on figures.*

Discussion has been added to the Invasive Species Control Plan. These areas have also been added to Figure 11 "Proposed Mitigation Plan".

Appendix I Maintenance Plan: *Please include Beaver control.*

Discussion of beaver control has been added to the maintenance plan.

Digital Data Review:

Rectify Discrepancies Between Table 2 and Provided Shape Files:

- *Wetland A: 4.790 vs 5.276*
- *Wetland B: .460 vs .613*
- *Wetland C: .170 vs 191*
- *Wetland D: .310 vs.314*
- *Trib 1A Lower: 1950.858 vs 1975.858*
- *Trib 5: 1489.440 vs 1460.073*

The shapefile lengths/areas are correct and the values in Table 2 have been revised to match these.

- *Please submit a complete file with existing wetlands to include all wetlands identified in the approved USACE JD.*

A shapefile with existing wetlands has been compiled and sent with this submittal.

- *Submit a revised Wetland Asset file with wetland segments as they appear in the Project quantities and credit table. Wetland A – D should appear as separate segments and the acreage for each segment must match the assets as presented in the report. Verify that all wetlands reported as assets are located within the boundary of the conservation easement. It appears that wetland A extends beyond the northern boundary.*

A revised wetland asset file has been produced with each wetland asset broken out into its own distinct segment. The boundaries of wetland A have been snapped to the conservation easement boundary.

- *Please submit a revised centerline file attributed to include non-credited reaches. The attribute table in the digital file must match the project segments and linear feet as reported in the Project Quantities and Credits table. Tributary 5 deviates by 30 linear feet and Tributary 1A's segmentation deviates between the two data sources.*

  This has been revised to include non-credited reaches.

Please let us know if additional information is need for the Draft Mitigation Plan for IRT Review. We look forward to a successful project together.

Sincerely,

Ian Jewell
Associate/Project Manager

Table of Contents

LIST OF PHOTOS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

The Middendorf Springs Mitigation Site (hereafter referred to as the "Site") is located approximately 10 miles south of Wadesboro and 5 miles east of Lowrys, North Carolina. The Site is accessed from Gulledge Road (SR 1120) and Site centroid coordinates are 34.855, -80.1075 (**Figure 1**). The Site lies within the Yadkin River Basin, United States Geological Survey (USGS) hydrologic unit code (HUC) 03040201, and 14-digit HUC 03040201020030. Unnamed tributaries to South Fork Jones Creek originate within the project limits and will be restored and enhanced as part of this project. South Fork Jones Creek is approximately 15 river miles in length and drains to Jones Creek approximately 13 river miles from its confluence with the Pee Dee River. The Site is not located within a targeted local watershed or targeted resource area. Further details regarding site characteristics and targeted resource areas are included in **Sections 2 and 3**, and the stream and wetland mitigation components are summarized in **Table 4**.

Table 1. Summary of Project Credits

Restoration Level	Stream			Riparian Wetland	Non-Riparian Wetland	Coastal Marsh
	Warm	Cool	Cold			
Restoration	12,962.583					
Re-establishment				5.250		
Rehabilitation				0.320		
Enhancement						
Enhancement I	333.413					
Enhancement II						
Creation						
Preservation						
Totals	**13,295.996**			**5.570**		

The streams and wetlands throughout the Site are in various stages of impairment related to existing and historical land uses, including historical timber management and current agricultural uses. Between 2013 and 2016, tree harvesting was completed across the site to convert the property from timber production to row crops.

Shown in **Table 1**, the project proposes to restore 12,962.583 linear feet (LF) and enhance 500.119 LF of intermittent and perennial streams to provide 13,295.996 stream mitigation units (SMU) and 5.73 acres of wetlands will be rehabilitated and re-established for 5.570 riparian wetland mitigation units (WMU). The Site will be protected in perpetuity by a 74.36 acre easement. Further details regarding determination of credits are included in **Table 4.**

A site review was held on June 8, 2020 with the NC Division of Mitigation Services (NCDMS), the Interagency Review Team (IRT), and Freese and Nichols, Inc. (FNI) in attendance. Member agencies from

the IRT in attendance included the USACE, NCWRC and NCDEQ. At this visit it was noted by the USACE that the site appeared to have undergone activities for which no authorization was granted under Sections 404/401 of the Clean Water Act. Specifically, the USACE noted unauthorized modification/filling of streams and wetlands. After a series of meetings conducted in the Spring of 2021, the USACE, DMS FNI and landowner agreed to handle restoration/mitigation of any unauthorized impacts though the project activities. Specifically, the landowner agreed to place a minimum 50' riparian buffer along the entire length of South Fork Jones Creek within their property into conservation easement and to expand the width of the originally proposed conservation easement in several locations to include side-hill seeps and other wetland areas. On June 8, 2021, the USACE agreed to move forward with an approved approach that would include these areas in the mitigation plan. It should be noted that these additional features will not be used to produce mitigation credits but will serve as mitigation for unauthorized impacts cited by the USACE on the project site.

The minutes from the IRT site visit, USACE correspondence and the approved project modification proposal can be found in **Appendix A**.

Table 2. Project Components and Mitigation Credits

Project Segment	Original Mitigation Plan Ft/Ac	As-Built Ft/Ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits	Comments
Stream							
Tributary 1A-U	1,057.707		Warm	N/A	0	0.000	
Tributary 1A-L	1,950.858		Warm	R	1	1950.858	
Tributary 1B	500.119		Warm	EI	1.5	333.413	
Tributary 1C	698.479		Warm	R	1	698.479	
Tributary 2	2,525.745		Warm	R	1	2525.745	
Tributary 3	2,451.109		Warm	R	1	2451.109	
Tributary 4	971.458		Warm	R	1	971.458	
Tributary 5	1,489.440		Warm	R	1	1489.440	
Tributary 6	2,875.494		Warm	R	1	2875.494	
					Total:	**13295.996**	
Wetland							
Wetland Area A	4.790		R	REE	1	4.790	
Wetland Area B	0.460		R	REE	1	0.460	
Wetland Area C	0.170		R	RH	1.5	0.113	
Wetland Area D	0.310		R	RH	1.5	0.207	
					Total:	**5.570**	

2.0 WATERSHED APPROACH AND SITE SELECTION

South Fork Jones Creek and its tributaries are not discussed in the Pee Dee River Basin Restoration Plan (RBRP) or in any NCDMS Local Watershed Plans (LWPs) and is not located in any targeted resource areas (TRAs); however, the project area is surrounded by catchments associated with habitat and hydrology TRAs which display similar land use and impairment. The Site is similar to these other catchments in that it is almost entirely covered by row crop operations, has extensive channelization of streams, and has drain tiles present in hydric soil areas. The site drains to South Fork Jones Creek, which is listed in the Yadkin Basin wide Water Quality plans as being impacted by habitat degradation.

2.1 SITE SELECTION

Currently, the streams on the Site lack riparian buffers, have severe bank erosion, sediment deposition, and show severe channel incision. The project will directly and indirectly address stressors identified in the RBRP by stabilizing eroding stream banks, re-establishing floodplain connections, reducing sediment and nutrient loads, restoring wetland hydrology and vegetation, and restoring forested buffers on the stream channels. Project-specific goals for the Site are addressed further in **Section 6**.

The Site addresses goals outlined for the 03040201 watershed in the 2009 Lower Yadkin Pee-Dee RBRP. The project builds upon existing restoration efforts in the watershed, including the Jones Creek Mitigation Site, located approximately 2.5 miles downstream of the Site. Establishing a conservation easement will protect natural resources, and implementation of stream restoration and enhancement and wetland restoration will address erosion, sedimentation, and habitat degradation issues caused by current agricultural land use. The Site will further improve the water quality and functional uplift of the South Jones Creek watershed and will have a positive impact on the water quality of downstream watersheds that were identified as TRAs in the 2009 RBRP.

The land required for the construction, management and stewardship of the Site includes portions of three tax parcels in Anson County with the ownership shown in **Table 3** and **Figure 3**. A copy of the land protection instrument is included in **Appendix B**.

Table 3. Project Parcel and Landowner Information

Owner of Record	Tax Parcel ID	Stream Reach
RTB Associates, LLC and DEB, LLC	646000760123	1A-U, 1B, 1C
RTB Associates, LLC and DEB, LLC	646000745113	1A-U, 1A-L, 1B, 2, 3, 4, 5, 6 Wetland Area-A, Wetland Area-B
RTB Associates, LLC and DEB, LLC	647000042754	6

3.0 BASELINE AND EXISTING CONDITIONS

The following sections describe the existing conditions of the Site, the watershed, and watershed processes, including disturbance and response. A summary of the watershed information is presented in **Table 4** and an overview of the Site's hydrologic location is shown in **Figure 13**.

3.1 WATERSHED SUMMARY INFORMATION

3.1.1 Drainage Area and Land Cover

The Site consists of eight unnamed tributaries that flow north to south which drain to South Fork Jones Creek and approximately 20 acres of drained and row-cropped hydric soils in the floodplain of South Fork Jones Creek. The drainage areas for each tributary are shown in **Figure 7**. Primary land use within the tributary drainage areas consists of row crop and poultry houses. The poultry houses are located on adjacent parcels upstream of Tributary 1. The project site and parent tract are entirely in row crop with some areas of woods. Wooded areas within the site are located along the riparian areas of South Fork Jones Creek, Tributary 1 (Upper) and along Tributaries 1B and 1C. Impervious surface accounts for less than one percent of the drainage area.

Table 4 provides a summary of project attributes. Historic and current land use included timber production and row-cropping. There are no signs of impending land use changes or development pressure that would impact the project throughout the watershed.

Table 4. Summary of Project Attributes

Project Attribute Table	
Project Name	Middendorf Springs Mitigation Site
County	Anson
Project Area (acres)	74.36
Project Coordinates (latitude and longitude)	34.855, -80.1075
Project Watershed Summary Information	
Physiographic Province	Piedmont
River Basin	Yadkin Pee-Dee
USGS Hydrologic Unit 8-digit	3040201
USGS Hydrologic Unit 14-digit	03040201020030
DWR Sub-basin	Lower Pee-Dee
Project Drainage Area	272 acres (0.42 sq. mi.)
Project Drainage Area Percentage of Impervious Area	0.24%
Stream Thermal Regime	Warm
Land Use Classification	Cropland and Pasture

Table 4. Summary of Project Attributes (Continued)

Reach Summary Information								
Parameters	**1A**	**1B**	**1C**	**2**	**3**	**4**	**5**	**6**
Pre-project length (feet)	2,855	500.119	686	2,180	2,185	926.15	973.31	2343
Post-project (feet)	3,005.858	500.119	698.479	2525.745	2451.109	971.458	1489.440	2875.494
Valley confinement (Confined, moderately confined, or unconfined)	Unconfined							
Drainage area (acres)	93 acres	20 acres	12 acres	25 acres	29 acres	33 acres	16 acres	44 acres
Perennial, Intermittent, Ephemeral	PER	INT	INT	PER	INT	INT	PER	PER
NCDWR Water Quality Classification	C							
Dominant Stream Classification (existing)	G4	G4	G4	G4	G4	G4	G4	G4
Dominant Stream Classification (proposed)	C4b/C4	C4b	C4b	C4b/C4	C4b	C4b/C4	C4b/C4	C4b/C4

Wetland Summary Information				
Parameters	**Wetland A**	**Wetland B**	**Wetland C**	**Wetland D**
Pre-Project Size of Wetland (acres)	0	0	0.170	0.310
Post-Project Size of Wetland (acres)	4.7900	0.460	0.170	0.310
Wetland Type (non-riparian, riparian)	Riparian	Riparian	Riparian	Riparian
Mapped Soil Series	Chewacla	Chewacla	Chewacla	Chewacla
Soil Hydric Status	Hydric	Hydric	Hydric	Hydric

3.1.2 Surface Water Classification

The portion of South Fork Jones Creek that includes the Site tributaries have been classified as Class C waters by the NC Department of Water Resources (NCDWR). Waters classified as Class C are protected for uses such as secondary recreation, fishing, wildlife, fish consumption, aquatic life including

propagation, survival and maintenance of biological integrity, and agriculture. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner (NCDEQ, 2020).

3.2 LANDSCAPE CHARACTERISTICS

3.2.1 Physiography and Topography

The Site is in the Carolina Slate Belt of the Piedmont physiographic province. The Piedmont is characterized by gently rolling, well-rounded hills with low ridges, with elevations ranging from 300 to 1,500 feet above sea level. The Site topography, as indicated on the Morven West USGS 1:24,000 quadrangle is a moderately sloped valley with the downstream topography transitioning to lower gradient sloping floodplain topography of South Fork Jones Creek. The overall slope is moderate, averaging two to five percent across the Site.

3.2.2 Geology and Soils

The Middendorf Springs Mitigation Site lies at the intersection of two distinct geologic formations: the Middendorf Formation (Km), which is characterized by Cretaceous-aged fluvial sands, kaolinite clays, sandstone and mudstone formations most often associated with the Carolina Sandhills region, as well as a Proterozoic-Cambrian Metamudstone and meta-argillite (Zmd) formation associated with the volcanic "Slate Belt" region. On the project site, the Middendorf formation is mapped on the ridgeline and upper portions of the long slope towards South Fork Jones Creek, while the Slate Belt formation is mapped on the lower slope, valley bottom, and floodplain area. The presence of rounded, gravel-sized sandstone alluvium far up the slope and high above South Fork Jones Creek suggests that the site may consist of a series of relict terraces above the Creek, through which new headwater valleys have cut. The interface between the younger Middendorf formation, which is overlain by sandy, well-drained sandy loams, and the older Slate Belt formations appears to consistently produce a number of springs across the landscape at a similar elevation. These springs are evident from the numerous headwater wetlands and headcuts from which groundwater flows strongly even 4 to 5 days after a modest rain event. These springs appear to produce streams with indications of perennial flow at relatively small drainage areas (12 acres to 93 acres) in contrast to other areas of the Slate Belt. The other major geomorphic feature of the site is the valley of South Fork Jones Creek, which consists of the alluvial Chewacla soil.

The site is mapped by the USDA Web Soil Survey for Anson County. Site soils are described in **Table 5** and shown in **Figure 5**. The mapped soils consist largely of Badin channery silt loam on the upper valley slopes and Chewacla loam as the site transitions into the South Fork Jones Creek floodplain. Bedrock was not observed in the channels during the existing conditions assessment work. The depth to bedrock where most of the restoration will occur (MrB, ChA and NgC) characteristically ranges from 40 to 60 inches. Since the restoration reaches will be raised to the valley bottom, bedrock is not anticipated to be a factor in restoration implementation.

Table 5. Mapped Soil Series within the Project Area

Map Unit Symbol	Map Unit Name	Percent of Site	Hydric	Drainage Class	Hydrologic Soil Group
AeB	Ailey loamy sand, 2 to 8 percent slopes	0.50%	Yes	Well drained	B
BaB	Badin channery silt loam	21.60%	No	Well drained	C
ChA	Chewacla loam	39.90%	No	Somewhat Poorly Drained	B/D
EmB	Emporia loamy sand	6.90%	No	Well drained	C
MrB	McQueen loam	5.60%	No	Well drained	C
NgC	Nanford gravelly fine sandy loam	12.20%	No	Well drained	B
NsB	Nanford-Emporia complex	13.20%	No	Well drained	B

3.2.3 Existing Vegetation

Vegetation around the unbuffered stream reaches is dominated by herbaceous vegetation with no developed shrub or tree layers. The riparian areas are disturbed due to the regular land management associated with row crop farming practices. Broom sedge (*Andropogon virginicus*), sawtooth blackberry (*Rubus argutus*), wingstem (*Verbesina alternifolia*) and *Carex* species were observed in sparse quantities as the row crops were planted to the edge of the streams throughout the Site. Invasive species observed included Japanese honeysuckle (*Lonicera japonica*) and Chinese privet (*Ligustrum sinense*). Non-crop vegetation has historically been controlled by mechanical and chemical methods, limiting the establishment of woody species throughout much of the site. Areas on the site that exhibit hydric soils and hydrophytic vegetation were dominated by herbaceous species, including woolgrass (*Scirpus cyperinus*), multiple *Carex* species., and broadleaf cattail (*Typha latifolia*). Black willow (*Salix nigra*) and sycamore (*Platanus occidentalis*) saplings were observed at the downslope extents of these areas. No canopy tree species were observed at the Site.

3.2.4 Land use – Historic, Current, and Future

Historical aerial imagery indicates that the Site was used extensively for timber production, with conversion to row crop farming occurring recently (*ca*. 2016). Current agricultural practices have degraded the riparian areas and contributed to the degradation of the stream channels. The site has not been used for livestock pasture historically, and no livestock are currently present. Outside of the Site, the area will likely remain in agricultural use and timber production.

3.3 PROJECT RESOURCES

3.3.1 Reach Summary Information

The Site is composed of a single easement area with eight tributaries that drain to South Fork Jones Creek. A summary of existing channel characteristics is presented in

Table 4. Detailed morphological data are included in **Appendix C**. Streams were classified as intermittent (1B, 1C and 4) and perennial (1A, 2, 3, 5, 6) using the NCDWR Stream Identification Form, version 4.11 (**Appendix D**). Existing stream classifications were determined using the Rosgen stream classification system (Rosgen, 1994).

3.3.1.1 Tributary 1 (1A, 1B and 1C)

Tributary 1 (consisting of Tributaries 1A, 1B and 1C) is the westernmost of the Site tributaries. Tributary 1A is a perennial gravel bed stream that originates in a wooded area on the adjacent property and forms the property boundary for approximately 1,500 feet before both banks are contained by the Site easement boundary. The stream flows approximately 1,800 feet before its confluence with South Fork Jones Creek at the southern part of the easement boundary. Tributary 1A is the largest tributary on the Site, with a width of 8 feet and a depth of 2 to 3 feet. The channel slope is approximately 1.6%. The stream has an average bank height ratio of 1.9, indicating that the channel is incised. The incision has resulted in severe bank erosion along the channel and lack of natural bedform as the channel attempts to regain stable geometry. As seen in **Photo 1**, the upper portion of Tributary 1A exhibits greater bank stability due to the presence of mature trees along the bank; however, the stream still exhibits a high degree of incision that is reflected by the average bank height ratio for the stream. The lower portion of Tributary 1A, where the stream transitions into the area under intensive agricultural management, has virtually no woody vegetation along its banks, which has resulted in accelerated bank erosion and higher incision compared to the upper portion of the tributary. Tributary 1A Lower is shown in **Photo 2**. Tributaries 1B and 1C originate on the westward facing slope leading down toward the valley of Tributary 1A. Tributaries 1B and 1C have slightly more vegetated buffers than the other streams on the Site. The buffers are dominated by sapling pioneer species such as loblolly pine (*Pinus taeda*) and sweetgum (*Liquidambar styraciflua*). Headwater wetlands are present on both reaches, indicating the presence of a high-water table that contributes to the perennial flow of the streams.

Tributary 1B is proposed for Enhancement Level I as it has a naturally confined valley which does not allow for restoration of pattern, the existing profile is not as severely incised as Tributary 1C and the upper-most portions of the channel (approx. 120') are already relatively stable. Thus, the primary impairments that will be addressed will be the existing headcuts and reshaping to a stable channel-form. **Photo 3** displays Tributary 1B and its described characteristics. Tributary 1C, on the other hand, is more severely incised and has a wider natural valley than Tributary 1B, allowing for re-establishment of a stable pattern and raising of the stream grade to connect to its relict floodplain. Thus, restoration is most appropriate for Tributary 1C, shown in **Photo 4**.

Photo 1. Tributary 1A Upper. Note density of woody vegetation along stream banks and vertical degradation.
Direction of View: South

Photo 2. Tributary 1A Lower. Note increased erosion along banks compared to Tributary 1A Upper along with relative lack of woody vegetation due to management for row crop agriculture.
Direction of View: Southeast

Photo 3. Tributary 1B. Note headcut where vertical instability is first observed. Channel width is indicative of lateral instability.
Direction of View: Southwest

Photo 4. Tributary 1C. Note vertical degradation with bare banks that are susceptible to future lateral migration.
Direction of View: Southwest

3.3.1.2 Tributary 2

Tributary 2 originates within a natural crenulation on the downslope headed away from Gulledge Road. A wetland has developed within this crenulation, indicating the presence of a spring and/or high-water table intercepting the ground surface that feeds the natural channel. Above this point, there are no indications of natural channel features, but below this spring a natural channel has formed at a headcut with strong

geomorphic and hydrologic features. The channel slope is approximately 2.5% with a width of 4 feet and a depth of 2 to 3 feet. The stream has a bank height ratio of 6.5, indicating severe incision. This has resulted in severe bank erosion along the channel due to lack of natural bedform as the channel attempts to regain stable geometry. The channel appears to be actively incising based upon several observed headcuts and prominent bed scour. Multiple vehicular crossings, pesticide and fertilizer application, and no vegetated buffer beyond row crops have further contributed to the channel instability, as seen below in **Photo 5**.

Photo 5. Tributary 2. Note incision due to bed scour and lack of woody riparian vegetation.
Direction of View: South

3.3.1.3 Tributary 3

Tributary 3 is a small, gravel substrate stream that originates at a headcut on the south side of an existing farm road which is also the start of the conservation easement. It flows approximately 470 feet prior to entering a small, spring-fed wetland. Perennial flow begins at the downstream edge of this existing wetland. Overarching channel conditions include downcutting of the streams, incision and severe bed and bank erosion. Further impacts from vehicular crossings and row crop management have contributed to the instability of the channel. Pockets of sparse vegetation are present along the channel including black willow and tall goldenrod (*Solidago altissima*) present in several headwater wetland areas. **Photos 6 through 8** compare the sections of Tributary 3.

Photo 6. Tributary 3 – Top section above confluence of Tributary 3 and 4. Note lack of riparian woody vegetation. **Direction of View:** Southeast

Photo 7. Tributary 3 – Middle section. Note increased incision compared to upper section of Tributary 3.
Direction of View: Northwest

Photo 8. Tributary 3 **–** Lower section. Note lateral channel migration compared to upper and middle sections.
Direction of View: Northwest

3.3.1.4 Tributary 4

Tributary 4 is a perennial tributary of Tributary 3 and begins near Gulledge Road as an ephemeral channel. The stream intercepts the water table approximately 460 feet upstream of its confluence with Tributary 3. The stream enters the Site easement after it crosses under an existing farm road. The stream is channelized and has moderate to severe bank erosion with lack of natural bedform. The average width is 3 feet, with a depth of 2 feet. The riparian area is dominated by row crops with little observed natural cover, pictured in **Photo 9**. The stream flows through a well-defined valley that concentrates overland flow and interaction with the water table.

Photo 9. Tributary 4. Note lack of bedform and riparian woody vegetation along crop edge.
Direction of View: Southeast

3.3.1.5 Tributary 5

Tributary 5 is a perennial stream that originates at a headcut between Tributaries 4 and 6. The stream is located in a broad, shallow valley that does not have evident channel features until the appearance of a headcut at the start of Tributary 5 (**Photo 10**). No headwater wetlands are present at the origin of the reach. An abundance of large gravel alluvium in the soil and channel banks, even at the headcut stream origin, suggests that this stream runs over a relict terrace of South Fork Jones Creek. The channel is approximately 5 feet wide with a depth of 3 to 4 feet. Average bed slope is approximately 2%. The valley is very broad and shallow, evidence that the stream was unconfined prior to channelization. Active erosion was observed throughout the reach, driven primarily by the high depth ratio and channelization. No native vegetation or woody stems were identified along the stream.

Photo 10. Tributary 5. Note headcut that precedes the downstream incision and the lack of riparian vegetation.
Direction of View: North

3.3.1.6 Tributary 6

Tributary 6 is the easternmost channel of the Site, originating from a series of headwater wetlands, shown in **Photo 11**. The perennial channel originates at an upstream wetland area and has been channelized to a depth of 3 to 4 feet with an average width of 4 feet. The average bed slope is approximately 2.0% and moderate to severe erosion was observed along the entire length of the stream. The valley is broad and unconfined and is located on a relict terrace of South Fork Jones Creek. Existing riparian vegetation exists along the left bank of the stream and is comprised primarily of black willow. Invasive species, including Japanese honeysuckle (*Lonicera japonica)*, were identified in the existing riparian vegetation. This vegetation and erosion can be seen in **Photos 12 and 13**.

Photo 11. Tributary 6 – Origin of stream at spring seep.
Direction of View: East

Photo 12. Tributary 6 – Middle section, note incision and lack of riparian woody vegetation along crop edge.
Direction of View: Southeast

Photo 13. Tributary 6 – Lower section, note increased incision compared to upper sections of reach.
Direction of View: Southeast

3.3.2 Site Wetland Summary

3.3.2.1 Jurisdictional Wetland Information

Waters of the US (WOTUS), including wetlands, were delineated pursuant to the USACE *1987 Wetland Delineation Manual*, the USACE *2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont, Version 2.0* and subsequent regulatory guidance. Field work was conducted by Acer Environmental, LLC on October 27 and 30, 2019, with additional areas investigated by Freese and Nichols, Inc. on May 11 and 17, 2020. Wetland features were classified as Headwater Forest and Riverine Swamp Forest using the North Carolina Wetland Assessment Manual (NCWAM) classification key and best professional judgement. The wetlands occur on side slopes and floodplains that drain to on-site stream channels. Surface saturation and surface water were the dominant wetland hydrology indicator, and soils exhibited low chroma matrix and redoximorphic hydric soil indicators. Hydrophytic vegetation was observed in some areas; however, due to the manipulation of the Site for agricultural purposes, the vegetation is considered significantly disturbed. Hydrophytic vegetation observed in undisturbed areas included sweetgum, black willow, elderberry (*Sambucus nigra*), privet (*Ligustrum sinense*), soft rush (*Juncus effusus*), shallow sedge (*Carex lurida*), swamp goldenrod (*Solidago patula*), and multiple *Polygonum* species. These vegetation communities were assumed to be applicable to the disturbed wetland areas as described in Chapter 5 of the 2012 Regional Supplement. A summary of existing wetland characteristics is presented in **Table 6.**

A preliminary jurisdictional determination was conducted by the USACE and completed on July 27, 2022. The findings of the PJD generally agreed with the delineation efforts for both wetlands and streams on the site with a couple of exceptions:

- Approximately 0.5 acres of Wetland A were determined to be jurisdictional. The jurisdictional portions are now broken out as Wetlands C and D and these are proposed for rehabilitation rather than re-establishment.

- The jurisdictional origin of Tributary 3 was determined to be approximately 25’ downstream of where it was originally proposed. The starting point of the stream restoration was moved downstream accordingly.

WOTUS forms and mapping, including the approved USACE PJD completed on July 27, 2022, are included in **Appendix D**.

3.3.2.2 Hydric Soils Investigation

The proposed riparian wetland reestablishment area consists of hydric soils along South Fork Jones Creek. A detailed hydric soil investigation was completed by a NC licensed soil scientist on October 27 and 30, 2019 (**Appendix E**). A series of 13 soil borings were performed to describe and determine the areal extent of hydric soils within the site. Soils were characterized and classified using the Field Indicators of Hydric

Soils in the United States, Version 8.2 (USDA 2018). Hydric indicators were found within 12 inches of the soil surface in the proposed riparian wetland areas of the site. The *F3-Depleted Matrix* indicator was observed in all soil boring locations.

3.3.2.3 Existing Hydrology

The riparian wetland reestablishment area is located adjacent to the stream channels, and topographically within the valley of the streams. While underlain by hydric soils, these areas lack the hydrology and hydrophytic vegetation necessary to classify as jurisdictional wetlands. As shown in **Photos 14 through 18**, the site hydrology has been manipulated by installation of drainage tiles, and the current use of the site for row crop agriculture has removed native vegetation. The cultivated surfaces of the agricultural areas and adjacent ditched streams quickly remove surface water to prevent accumulation, limit infiltration, and reduce the groundwater elevation to below the upper foot of the surface soils. These drainage modifications limit both surface and subsurface storage.

Photo 14. Existing drainage tiles coming into South Fork Jones Creek adjacent to Wetland A.
Direction of View: North

Photo 15. Existing drainage tiles coming into South Fork Jones Creek adjacent to Wetland A.
Direction of View: North

Photo 16. Existing drainage tiles coming into South Fork Jones Creek adjacent to Wetland A.
Direction of View: Northeast

Photo 17. Existing drainage tiles and ditch coming into South Fork Jones Creek adjacent to Wetland B.
Direction of View: North

Photo 18. Iron-oxidizing bacteria at outlet of drain tile adjacent to Wetland B.
Direction of View: North

Table 6. Summary of Existing Wetlands

Parameters	Wetland											Wetland											
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
Size of Wetlan	0.44	0.29	0.05	0.17	0.72	1.11	0.21	0.94	0.21	0.08	0.16	0.13	0.09	0.19	0.31	0.04	0.003	0.005	0.01	0.02	0.01	0.04	0.02
Wetland Type (non-riparian, riparian riverine or riparian non-riverine)	Riparian non-riverine																						
NCWAM Classification	Headwater Forest				Riverine Swamp Forest																		
Mapped Soil Series	Nanford-Emporia complex	Nanford	Nanford	Nanford	Nanford	Chewacla	Chewacla	Badin	Chewacla	Emporia	Emporia	Chewacla	McQueen	Nanford	Nanford	Chewacla	Nanford	Nanford	Nanford	Nanford	Badin	Badin	Emporia
Drainage class	Well Drained	Well Drained	Well Drained	Well Drained	Well Drained	Somewhat Poorly Drained	Somewhat Poorly Drained	Well Drained	Somewhat Poorly Drained	Well Drained	Well Drained	Somewhat Poorly Drained	Well drained	Well Drained	Well Drained	Somewhat Poorly Drained	Well Drained	Well Drained	Well Drained	Well Drained	Well Drained	Well Drained	Well Drained
Soil Hydric Status	No	No	No	No	No	Yes	Yes	No	Yes	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No
Source of Hydrology	Groundwater and Overbank Flooding											Groundwater and Overbank Flooding											
Restoration or enhancement method (hydrologic, vegetative etc.)	Hydrologic and Vegetative											Hydrologic and Vegetative											

4.0 FUNCTIONAL UPLIFT POTENTIAL

The potential for stream functional uplift is qualitatively described in this section using terminology from the Stream Functions Pyramid Framework (Framework) (Harman and Jones, 2016). The Framework describes a hierarchy of five stream functions, each of which supports the functions above it on the pyramid and sometimes reinforces those below it. The five functions in order from bottom to top are hydrology, hydraulics, geomorphology, physiochemical, and biology. The Framework is not proposed to determine the success of the Site since the Site has a focus on total ecosystem restoration, and the mitigation design will improve stream and wetland function while providing numerous ecological and environmental benefits to the broader Yadkin Pee-Dee River basin. These benefits, which are described in more detail below, will include increased hydrological function, improvements to water quality, and improved wetland habitat.

A functional based approach broadens the reach-scale goals of a restoration project by contextualizing the functional lift at the watershed scale. Utilizing an ecosystem restoration approach will provide localized ecological and water quality benefits that could, in combination with other restoration projects within the watershed, have beneficial impacts to the Yadkin River Basin. The restoration approach at the reach scale at this Site will benefit the hydraulic and geomorphology functions of the system and could also benefit higher level functions (i.e., physiochemical and biological functions) over time and in conjunction with other restoration projects in the watershed. Site goals and objectives, as based upon the anticipated functional benefits and improvements, are detailed in **Section 6**.

4.1 ANTICIPATED FUNCTIONAL BENEFITS AND IMPROVEMENTS

4.1.1 Hydrology

The Stream Functions Pyramid Framework defines hydrology as the transport of water from the watershed to the channel. The Site will locally address several historic hydrologic disturbances, including stream downcutting and deforestation. Even though trees will be planted within the conservation easement, this will not significantly improve the watershed hydrology; therefore, there are no significant opportunities for this project to improve the hydrologic function at a watershed level.

The removal of agricultural drain tiles will restore natural surface and subsurface hydrologic flow patterns. This will lead to improvements in the hydrologic function of the project. Soil investigation shows that much of the landscape within the Site exhibits hydric characteristics indicating that a shallow seasonal water table was present historically. Based on the landscape position of the wetland restoration areas of the Site and the surrounding landscape, improvement of hydrologic function will be realized in various degrees across the landscape. The restoration areas will improve surface water storage and retention and will also work in conjunction with landscape position to improve subsurface water storage and retention. The rehabilitation of the headwater forest systems will aid in the maintenance of water table levels by increasing infiltration and groundwater recharge in higher positions within the landscape.

The improved hydrologic function and water storage of Site wetlands will also improve water quality by reducing sediment from adjacent agricultural fields, improving runoff filtration, and increasing nutrient cycling. The improved hydrologic function and water quality will lead to direct and indirect aquatic and terrestrial habitat.

4.1.2 Hydraulic

Hydraulic function within the Framework is defined as the transport of water in the channel and on the floodplain. The greatest potential uplift at the Site will be achieved through increasing floodplain connectivity along all the streams. Streams on the Site do not have functioning floodplain connectivity (Average Site Bank Height Ratio = 4.5) and medium to large headcuts are present throughout the Site. Areas where the floodplain connectivity is not-functioning, or functioning-at-risk will be improved to functioning by reducing the bank height ratio and increasing the entrenchment ratios. Reaches in which stable flow dynamics are non-functioning or functioning-at-risk will be improved by constructing a new stable channel with adequate energy dissipation and grade control.

4.1.3 Geomorphology

The Framework defines geomorphology as the transport of wood and sediment to create bedforms and maintain dynamic equilibrium. Site streams are currently classified as non-functioning for sediment transport due to non-functioning buffers, limited floodplain access, high bank height ratios, and low entrenchment ratios. Sediment transport will be reduced through construction of floodplain benches in Streams 1B stream enhancement areas, construction of channels with stable dimension, plan and profile in Streams 1A, 1C, 2, 3, 4, 5 and 6, and establishment of functioning riparian buffers along all streams. Channel stability and bedform will be improved in restoration reaches by installing structures to establish pools and increase bedform diversity. Transport and storage of woody debris will be improved by increasing channel roughness with structures and plantings. Riparian buffers will be established at 50-foot widths to restore riparian vegetation to functional levels and provide terrestrial habitat. All of these functional parameters are interconnected and will result in a long-term functional geomorphic uplift.

4.1.4 Physiochemical

Physiochemical function is defined by the Framework as temperature and oxygen regulation and processing of organic matter and nutrients. The Site will support the overarching goal of decreasing sediment export in agricultural areas. The Site will decrease sediment export and will likely reduce forms of nitrogen and phosphorus by establishing a riparian buffer and reducing bank erosion. A riparian buffer will eventually provide shading, resulting in reduced water temperatures. Water will flow over in-stream structures, providing aeration. The streams will be reconnected to floodplains and floodplain wetlands, reducing stream erosion, increasing floodplain storage, and improving nutrient cycling. Visual observations of the riparian buffer will be documented, and these observations are expected to demonstrate that the Site is trending toward improved function.

4.1.5 Biology

The highest category of the Functional Framework is biology, which is defined as the biodiversity and life histories of aquatic and terrestrial life, specifically animals. As with physiochemical stream function, it is difficult to quantify biological uplift with measurable results in the timeframe of the project.

4.2 POTENTIAL CONSTRAINTS

There are no significant hydrologic or infrastructure constraints for the proposed ecological uplift at the Site. No overhead or buried utility lines are present. Only one easement break is proposed (Tributary 1) across an existing culvert to facilitate landowner usage of the property. Any culvert maintenance will be the responsibility of FNI through completion of monitoring. At the completion of monitoring and project closeout, the culverts will be the responsibility of the landowner(s).

No General Aviation, Commercial or Private airports are located within five miles of the Site. There are no other known site constraints that will affect the functional uplift of the project. The property boundary functions as a constraint on Tributary 1A Upper as only one side of the channel is within the parent tract boundary. Therefore, tributary 1A Upper is a non-credit reach and not eligible for enhancement or restoration. The degree to which the physiochemical and biological functions can improve on the Site is limited by the watershed conditions beyond the conservation easement.

5.0 REGULATORY CONSIDERATIONS

A summary of regulatory considerations for the Site is presented in **Table 7**. These considerations are expanded upon in **Sections 5.1 to 5.5**.

Table 7. Regulatory Considerations

Parameters	Applicable?	Resolved?	Supporting Docs?
Water of the United States - Section 404	Yes	No	Appendix D
Water of the United States - Section 401	Yes	No	Appendix D
Endangered Species Act	Yes	Yes	Appendix F
Historic Preservation Act	Yes	Yes	Appendix F
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

5.1 FEMA FLOODPLAIN

According to the North Carolina Floodplain Mapping Information System, the Site does not lie within a 100-year floodplain (one percent annual chance of flooding) and is not within a regulatory floodway

(**Figure 7**). No hydrologic trespass is anticipated to adjacent properties upstream or downstream of the project.

5.2 ENVIRONMENTAL SCREENING AND DOCUMENTATION

To ensure that a project meets "Categorical Exclusion" criteria, the Federal Highways Administration (FHWA) and NCDMS have developed a Categorical Exclusion (CE) checklist that is included as part of the environmental screening process. The CE documentation and CE approval Form for the Site are included in **Appendix F** and was approved by FHWA and DMS on October 14, 2021.

5.3 THREATENED AND ENDANGERED SPECIES

Plants and animals with a federal classification of endangered or threatened are protected under provisions of Sections 7 and 9 of the Endangered Species Act of 1973, as amended. As of December 4, 2019, the United States Fish and Wildlife Service (USFWS) lists four federally protected species for Anson County, which include the bald eagle (*Haliaeetus leucocephalus*), red-cockaded woodpecker (*Picoides borealis*), Carolina heelsplitter (*Lasmigona decorata*), and Schweinitz's sunflower (*Helianthus schweinitzii*) (**Table 8**). A presence-absence survey conducted on September 28, 2020 indicated that the Site does not provide potential habitat for Schweinitz's sunflower. No target species were identified during the survey. Corresponding documentation and USFWS concurrence with the presence-absence survey are included in **Appendix F**.

Table 8. Federally Protected Species in Anson County, NC

Species Name and Federal Status	Habitat	Potential Habitat at Site	Biological Conclusion
Bald Eagle *(Haliaeetus leucocephalus)* Bald and Golden Eagle Protection Act	Mature forest in proximity to large bodies of open water for foraging. Large dominant trees are utilized for nesting sites, typically within 1.0 mile of open water.	No	No effect
Red-cockaded woodpecker *(Picoides borealis)* Endangered	Open, mature stands of southern pines, particularly longleaf pine (Pinus palustris) aged 60 years or older, which are contiguous with pine stands at least 30 years of age to provide foraging habitat.	No	No effect
Carolina heelsplitter *(Lasmigona decorate)* Endangered	The general habitat requirements for the Carolina heelsplitter are shaded areas in large rivers to small streams, often burrowed into clay banks between the root systems of trees, or in runs along steep banks with moderate current.	No	No effect
Schweinitz's sunflower *(Helianthus schweinitzii)* Endangered	Roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland	No	No effect*

*See the approved Categorical Exclusion document in **Appendix F** for species habitat assessment information.

A review of the North Carolina Natural Heritage Program (NCNHP) records on April 20, 2020 indicates no known species occurrence within a one-mile radius of the Site. Letters were sent to the North Carolina Wildlife Resources Commission (NCWRC) on April 24, 2020 and August 5, 2021 requesting review and comment of possible issues with respect to fish and wildlife resources on the site. A response was received on August 25, 2021 in which the NCWRC indicated that there are no concerns for any listed aquatic species in the vicinity of the Site. Documentation is included in **Appendix F**.

5.4 CULTURAL RESOURCES

A review of the North Carolina State Historic Preservation Office GIS Web Service database on March 30, 2020 revealed no National Register listings within a one-mile radius of the Site. A letter was submitted to the North Carolina State Historic Preservation Office (SHPO) on April 24, 2020. SHPO responded on June 11, 2020 and stated that they were aware "of no historic resources which would be affected by the project". Cultural resources met the Categorical Exclusion criteria for FHWA and NCDMS projects, and documentation is included in **Appendix F**.

5.5 401/404

There will be 0.22 acres of permanent impacts to existing wetlands onsite due to channel realignment, as well as 2.54 acres of temporary impacts resulting from access and grading during project construction. The latter impacts are considered temporary in nature since the areas will be returned to pre-construction contours and planted to allow for afforestation. There will be 79.83 linear feet of permanent impacts and 88.11 linear feet of temporary impacts to existing streams due to culvert installation on UT-4 and UT-6. **Table 9** details temporary and permanent impacts to wetlands at the Site, and **Table 10** details impacts to site streams for the removal and relocation of stream crossings on UT-4 and UT-6. A Pre-Construction Notification (PCN), including these data, will be submitted to the IRT with the Final Mitigation Plan. Permanent impacts will be mitigated on-site through the expansion of the Wetland A re-establishment area by 0.22 acres and is included in project plans.

Project implementation will restore 5.25 acres and rehabilitate 0.32 acres, which will offset permanent wetland losses associated with the channel re-alignments. Therefore, the project will provide a net gain of wetlands even with impacts to wetlands due to channel realignment, providing a total of 5.35 WMU. Areas of channel fill will include surface roughening that will result in areas up to 6-inches deep that may support wetland parameters. A re-verification of existing wetlands at the site will be conducted at the end of the project monitoring period to ensure that existing wetland area was retained or increased as a result of the project.

The project will provide 13,295.996 SMU, and the culvert installations on UT-4 and UT-6 will have permanent stream losses of 79.83 feet. These losses will be offset by the total SMUs of 13,295.966, leaving

a net SMU of 13,216.166 linear feet. A verification of stream length will be conducted during the as-built survey.

Table 9. Project Impacts to Site Wetlands

Impact Area	Feature Type	Feature ID	Impact Type	Tributary	Area (Sq Ft)	Area (Acre)	Type of Activity	Impact Sheet
1-01	Wetland	Wetland B	Permanent	UT-1C	427.7	0.01	Stream Channel Grading	C-19
T-01	Wetland	Wetland B	Temporary	UT-1C	2447.64	0.06	Construction Access	C-19
T-02	Wetland	Wetland B	Temporary	UT-1C	4053.18	0.09	Construction Access	C-19
1-02	Wetland	Wetland A	Permanent	UT-1C	1022.03	0.02	Stream Channel Grading	C-19
T-03	Wetland	Wetland A	Temporary	UT-1C	5631.91	0.13	Construction Access	C-19
T-04	Wetland	Wetland A	Temporary	UT-1C	13000.49	0.30	Construction Access	C-19
T-05	Wetland	Wetland C	Temporary	UT-1B	368.98	0.01	Construction Access	C-19
T-06	Wetland	Wetland D	Temporary	UT-1B	258.37	0.01	Construction Access	C-19
1-04	Wetland	Wetland C	Permanent	UT-1B	545.18	0.013	Stream Channel Grading	C-19
T-07	Wetland	Wetland C	Temporary	UT-1B	689.7	0.02	Construction Access	C-19
1-05	Wetland	Wetland E	Permanent	UT-1	2695.5	0.06	Stream Channel Grading	C-21
T-08	Wetland	Wetland E	Temporary	UT-1	12348.27	0.28	Construction Access	C-21
T-09	Wetland	Wetland E	Temporary	UT-1	10120.29	0.23	Construction Access	C-21
T-10	Wetland	Wetland E	Temporary	UT-1	1673.89	0.04	Construction Access	C-21
T-11	Wetland	Wetland E	Temporary	UT-1	3638.72	0.08	Construction Access	C-21
T-12	Wetland	Wetland E	Temporary	UT-1	160.54	0.004	Construction Access	C-21
T-13	Wetland	Wetland E	Temporary	UT-1	99.14	0.002	Construction Access	C-21
1-06	Wetland	Wetland E	Permanent	UT-1	115.51	0.003	Stream Channel Grading	C-21
1-07	Wetland	Wetland E	Permanent	UT-1	430.16	0.01	Stream Channel Grading	C-21

Impact Area	Feature Type	Feature ID	Impact Type	Tributary	Area (Sq Ft)	Area (Acre)	Type of Activity	Impact Sheet
1-08	Wetland	Wetland E	Permanent	UT-1	183.01	0.004	Stream Channel Grading	C-21
2-01	Wetland	Wetland M	Permanent	UT-2	666.14	0.02	Stream Channel Grading	C-22
T-14	Wetland	Wetland M	Temporary	UT-2	1376.79	0.03	Construction Access	C-22
T-15	Wetland	Wetland M	Temporary	UT-2	2014.21	0.05	Construction Access	C-22
3-01	Wetland	Wetland K	Permanent	UT-3	8.77	0.0002	Stream Channel Grading	C-24
T-16	Wetland	Wetland K	Temporary	UT-3	50.07	0.0011	Construction Access	C-24
3-02	Wetland	Wetland W	Permanent	UT-3	155.69	0.004	Stream Channel Grading	C-24
T-17	Wetland	Wetland W	Temporary	UT-3	727.28	0.017	Construction Access	C-24
3-03	Wetland	Wetland I	Permanent	UT-3	824.07	0.019	Stream Channel Grading	C-24
T-18	Wetland	Wetland I	Temporary	UT-3	3657.9	0.084	Construction Access	C-24
T-19	Wetland	Wetland I	Temporary	UT-3	4829.92	0.111	Construction Access	C-24
4-01	Wetland	Wetland S	Permanent	UT-4	88.77	0.002	Stream Channel Grading	C-25
T-20	Wetland	Wetland S	Temporary	UT-4	547.81	0.013	Construction Access	C-25
5-01	Wetland	Wetland G	Permanent	UT-5	42.17	0.001	Stream Channel Grading	C-27
T-21	Wetland	Wetland G	Temporary	UT-5	214.84	0.005	Construction Access	C-27
6-01	Wetland	Wetland H	Permanent	UT-6	1578.38	0.04	Stream Channel Grading	C-28
6-02	Wetland	Wetland H	Permanent	UT-6	896.85	0.02	Stream Channel Grading	C-28
T-22	Wetland	Wetland H	Temporary	UT-6	14156.12	0.32	Construction Access	C-28
T-23	Wetland	Wetland H	Temporary	UT-6	19271.69	0.44	Construction Access	C-28
T-24	Wetland	Wetland H	Temporary	UT-6	4908.95	0.11	Construction Access	C-28

Impact Area	Feature Type	Feature ID	Impact Type	Tributary	Area (Sq Ft)	Area (Acre)	Type of Activity	Impact Sheet
6-03	Wetland	Wetland U	Permanent	UT-6	46.05	0.001	Stream Channel Grading	C-28
T-25	Wetland	Wetland U	Temporary	UT-6	458.02	0.011	Construction Access	C-28
6-04	Wetland	Wetland T	Permanent	UT-6	11.6	0.0003	Stream Channel Grading	C-28
T-26	Wetland	Wetland T	Temporary	UT-6	794.37	0.0182	Construction Access	C-28
T-27	Wetland	Wetland J	Temporary	UT-3	3290.37	0.0755	Construction Access	C-24
Total Wetland Impacts			**Temporary**		**110,789.46**	**2.54**		
			Permanent		**9,737.58**	**0.22**		

Table 10. Project Impacts to Site Streams

Impact Area	Feature ID	Impact Type	Length (ft)	Area (Sq Ft)	Area (Acre)	Type of Activity	Impact Sheet
1-03	UT-6	Temporary	28.06	112.95	0.003	Culvert Removal, Stream Channel Grading	C-28
4-02	UT-4	Permanent	36.38	143.63	0.0033	Culvert Installation	C-25
T-28	UT-4	Temporary	29.75	117.27	0.0027	Culvert Installation	C-25
6-05	UT-6	Permanent	43.45	182.12	0.0042	Culvert Installation	C-28
T-29	UT-6	Temporary	30.3	125.71	0.0029	Culvert Installation	C-28
Total Stream Impacts		**Temporary**	**88.11**	**355.93**	**0.01**		
		Permanent	**79.83**	**325.75**	**0.01**		

6.0 MITIGATION PROJECT GOALS AND OBJECTIVES

The project will improve stream and wetland functions as described in **Section 4** through stream enhancement and restoration, wetland rehabilitation and restoration, and conversion of agricultural fields into riparian buffers within the Yadkin Pee-Dee River basin. Specific, attainable goals and objectives will be realized by the project, and these are verifiable through measurement and/or visual assessment. The project will be monitored after construction to evaluate performance as described in **Section 8**. The project goals and objectives are described in **Table 11**.

Table 11. Project Goals and Objectives

On-Site Stressor/Impairment	Goals to Address/Remove Stressor	Objectives
Severely incised and downcut stream channels leading to lack of bedform diversity and lack of floodplain access.	Provide a network of streams with natural, stable forms that support proper stream functions	Construct stream channels that will maintain proper dimension, pattern, and profile and that meet jurisdictional status
	Raise groundwater levels to support recovery of native riparian vegetation and hyporheic functions.	Construct streams with proper bankfull to floodplain relationships
High sediment loads from streambank and bed erosion as well as hillslope processes from row crop operations both within the project site and upstream.	Reduce sediment inputs from eroding stream banks to reduce fine sediment loads and percentage of fines in the bed-material load	Construct streams that provide naturally stable dimensions and stabilize constructed banks with appropriate bioengineering techniques.
Lack of large woody debris and aquatic habitat diversity in channels.	Improve substrate quality to facilitate hyporheic flow and restore bedform diversity to provide a diversity of aquatic habitat	Construct stable riffles and pools that provide an improved diversity of bedform and bed material class, and a reduction in fines relative to existing conditions
	Introduce native woody materials to provide habitat	Construct in-stream habitat features from native material to provide a diversity of habitats
Lack of riparian buffer, leading to lack of riparian habitat, streambank instability and lack of filter for runoff of non-point source pollutants such as fertilizers and pesticides into stream	Reduce pollutant inputs to the project streams (sediment, nitrogen, phosphorus) to restore a balance to proper nutrient cycles	Establish a forested riparian buffer along all restored stream channels and South Fork Jones Creek.
	Improve riparian vegetation community to provide temperature regulation of the streams, provide a future source of organic inputs, and aid in long-term channel bank stability	Plant native overstory tree species and understory species in the riparian zone.
	Restore areas of former riparian wetlands so that the hydrology and soils will support wetland vegetative communities and wildlife	Restore riparian wetland hydrology by re-grading topography to eliminating ditches and other wetland drainage features
		Plant native wetland tree and shrub species

7.0 DESIGN APPROACH AND MITIGATION WORK PLAN

The design approach for the Site was developed to meet the goals and objectives described in **Section 6**, which were developed to maximize the functional uplift described in **Section 4**. The design approach for

the Site involves the restoration of eight unnamed tributaries to South Fork Jones Creek and the rehabilitation of Site wetlands A and B. Target stream types were determined using physical parameters of the Site as well as reference reaches from other sites. An analogue design approach is used whereby the geometry of stable reference conditions is scaled and applied to Site streams to establish appropriate pattern and profile. Channels were sized based upon design discharge analysis and regional curve comparison. Channel sizing was verified and modified based upon sediment transport capacity and competency. These design approaches have been used on many Piedmont restoration projects and are appropriate for the goals and objectives for the Site.

7.1 REFERENCE STREAMS

Reference streams provide geomorphic patterns of a stable system, which can be used to design stable channels of similar stream type in similar landscape and watershed settings by taking a scalable approach. The Site reference reaches described in the sections below were selected due to their similarity to the Site, including valley type, physiography, bed material, and morphology. Geomorphological parameters for selected reference reaches are detailed in **Appendix C** and summarized in Table 11.

7.1.1 Spencer Creek Reach 3

Spencer Creek Reach 3 is located in central Montgomery County within the Uwharrie National Forest. The site was classified as an E4 stream type with a drainage area of 0.37 square miles. This reach flows through a mature forest and has an average valley slope of 2.7% and an average channel slope of 2.1%. The reference reach is similar to the project reaches in that it is located in the Slate Belt physiographic region, has a similar range of slopes as the project reaches and represents a stable stream system with a relatively small drainage area. The morphological parameters reported for the riffle cross section include width to depth ratios that range from 7.9 to 9.3 and entrenchment ratios that range from 1.7 to 4.3.

7.1.2 UT to Rocky Creek

The UT to Rocky Creek reference site is also located in central Montgomery County within the Uwharrie National Forest. The drainage area is 1.10 square miles and the land use within the drainage area is a semi-mature forest. Similar to Spencer Creek Reach 3, the stream is representative of a stable, relatively steep stream system within the Slate Belt physiographic region. The UT to Rocky Creek Reference site was classified as an E4b stream type with a low sinuosity (1.1). The channel has a width to depth ratio of 9.1 and an entrenchment ratio of 6. The reach has a valley slope of 2.6% while the channel slope is 2.4%. The bed material D50 for the reach is 22.6 mm. Due to the low sinuosity, no pattern data was collected.

7.1.3 UT to Crane Creek

The UT to Cane Creek reference is located in northeastern Rutherford County. The drainage area is 0.29 square miles and the land use within the drainage area is a semi-mature forest. Although outside the Slate Belt region, this reference reach is representative of a stable, piedmont headwater stream system, as it

possesses similar slopes and drainage area to the project reaches. The UT to Cane Creek reference site was classified as a C4/E4 stream type with a sinuosity of 1.4. The channel has a width to depth ratio ranging from 12.3 to 14.4 and an entrenchment ratio of greater than 2.5. The reach has a valley slope of 2.6% while the channel slope is 1.5%.

Table 12. Summary of Morphological Parameters for Reference Reach Sites

Parameter	Spencer Creek Reach 3	UT to Rocky Creek	UT to Cane Creek
Contributing Drainage Area (acres)	237	672	186
Rosgen Stream Classification	E4	E4b	C4
Bankfull Width (ft)	7.8	12.2	11.9
Bankfull Depth (ft)	0.9	1.3	0.9
Bankfull Area (ft^2)	7.7	16.3	10.6
Bankfull Velocity (ft/s)	5.3	5.5	3.8
Bankfull Discharge (cfs)	35	85	40
Water Surface Slope (ft/ft)	0.019	0.024	0.015
Sinuosity	1.3	1.1	1.4
Width/Depth Ratio	8.6	9.1	13.4
Bank Height Ratio	1.0	1.0	1.4
Entrenchment Ratio	3.0	6.0	2.5
D16 (mm)	1.867	<0.063	0.6
D35 (mm)	8.85	2.4	12.2
D50 (mm)	11.0	22.6	27.8
D84 (mm)	64.0	120.0	74.5
D95 (mm)	128.0	256.0	128.0

7.2 DESIGN PARAMETERS

7.2.1 Stream Restoration Approach

The Site includes Priority I and Enhancement Level I restoration. Stream restoration will incorporate the design of stable channel planform, with parameters based on data taken from reference sites, published empirical relationships, and NC and regional curve data. The valley shape and valley width relative to the stream width, as well as the valley slopes at the Site indicate that some level of sinuosity was once present in these systems and that these were not just confined, straight steep channels as would be typical in some areas of the Piedmont. Relict meanders and low points within the valleys indicate where the streams were once flowing across their floodplains. By restoring planform, the other variables of dimension and profile will also be restored. All stream channels will be designed with stable dimensions, based off analysis of sediment transport capacity and competency, considering the potentially high sediment loads delivered from row crop activities. Cross section parameters, such as area, depth and width, were designed based on the design discharge, the ability to transport sediment, the need for stable bank slopes, as well as following dimensional ratios derived from reference conditions. Conceptual plan views are provided in **Figure 11**. Complete morphological tables for existing, reference, and proposed conditions are included in **Appendix C.**

The Site has been broken into the following restoration approaches:

Enhancement Level I: For Tributary 1B, which is relatively short and located in a steep and confined valley, Enhancement Level I will be used to establish grade control and create pools. A bankfull bench will be constructed to provide stable dimension based upon sediment transport requirements. Small in-stream structures, such as log sills, will be installed to provide grade control, establish pools and increase bedform diversity. Streambanks will be graded to provide stable slope and a 50-foot riparian buffer will be planted with native woody and herbaceous species.

Priority I Restoration: The remaining reaches (1A-lower, 1C, 2, 3, 4, 5, and 6) at the site will undergo Priority I restoration, which includes establishing a new, sinuous channel based on stable reference reach condition. The channel bed elevation will be raised to reconnect streambanks to floodplain, and natural bedform with riffle-pool sequence and deep pool habitat will be established to provide diversity of aquatic habitat. A 50-foot riparian buffer will be planted with native woody and herbaceous species. In-channel structures will be installed where necessary to maintain grade and establish bedform.

All of the noted restoration tributaries are designed as a "Cb", or a portion of the channel is designed to this stream type. These reaches or portions of the reach flow down steeper slopes to the north of South Fork Jones Creek. In a few locations, several of the proposed streams flow over relatively steep parts of the hillside above South Fork Jones Creek and will have average slopes greater than 2.5%. In these locations, log roller structures are proposed to dissipate energy and provide channel stability.

The lower portion of Tributaries 1A, 2, 4, 5 and 6 have their slope flattens as they flow across the floodplain of South Fork Jones Creek. In these instances, the stream reaches are designed to C classification.

A detailed description of the restoration approach to each project reach is provided below:

Tributary 1A-Lower: For the lower reach of Tributary 1A, Priority 1 Restoration will begin at an existing 60" RCP, which will remain in place, and end at this reaches' confluence with South Fork Jones Creek. A new, sinuous channel based on stable reference reach parameters will be established. The channel bed elevation will be raised to reconnect the streambanks to its relict floodplain, and natural bedform with riffle-pool sequence and deep pool habitat will be established to provide diversity of aquatic habitat. A minimum 50-foot riparian buffer off both restored streambanks will be planted with native woody and herbaceous species. In-channel structures will be installed where necessary to maintain grade and establish bedform. For the first approximately 1,600 feet of its length, this reach has a steeper gradient as the channel flows down the hillslope portion of the site towards the South Fork Jones Creek floodplain. The belt width and overall sinuosity through this steeper portion of the channel will be relatively low as is typical of steeper headwater systems. Once Tributary 1 reaches the South Fork Jones floodplain, the average channel slope decreases, and the proposed channel has been designed with a greater belt width and sinuosity than upstream. The proposed channel slope will steepen in the final approximately 150 feet as the restored reach joins with South Fork Jones Creek. A "log sill roller" structure, which is comprised of

a series of alternately angled log sills will be used to provide grade control and stabilize the bed at this location.

Tributary 1B: Tributary 1B is relatively short and located in a steep and confined valley. As such, this reach will be restored with an Enhancement Level I approach. A bankfull bench will be constructed to provide stable dimensions based upon sediment transport requirements. Small in-stream structures, such as log sills, will be installed to provide grade control, establish pools and increase bedform diversity. Streambanks will be graded to provide stable slope and a minimum 50-foot riparian buffer on both banks will be planted with native woody and herbaceous species.

Tributary 1C: In the original proposal for the site, and, as stated in the Post-Contract IRT Site Visit meeting minutes (see **Appendix A**), it was noted that Tributary 1C would also be proposed for Enhancement Level I. This was based on initial assessments of the confined valley and severe incision creating an inability to restore planform and raise the bed profile, which would be required for a Priority I restoration. During further site evaluation and analysis of more detailed topographic data during mitigation plan development, it was determined that there is adequate space within the valley to both re-align the channel as well as raise the channel bed to provide the greatest functional uplift. Thus, the proposed approach for Tributary 1C is now Priority 1 Restoration beginning at the uppermost headcut of the existing stream. This will include a new, sinuous channel construction with the channel bed raised to reconnect the streambanks to the floodplain, and a minimum 50-foot wide buffer off the restored streambanks will be planted with native and herbaceous species.

Tributary 2: Priority 1 Restoration of Tributary 2 will begin at the headwaters of this channel, which starts at an existing wetland. For the first approximately 2,100 feet of its length, this reach has a steeper gradient as the channel flows down the hillslope portion of the site towards the South Fork Jones Creek floodplain. The belt width and overall sinuosity through this steeper portion of the channel will be relatively low as is typical of steeper headwater systems. A similar design approach will be implemented as with other Priority 1 reaches, including establishment of stable dimension, pattern and profile, raising the channel bed to provide reconnection to the relict floodplain, and planting of a minimum 50-foot-wide buffer off both streambanks with native woody and herbaceous species. Once Tributary 2 reaches the South Fork Jones floodplain, the average channel slope decreases, and the proposed channel has been designed with a greater belt width and sinuosity than upstream. In this area, the restored channel will meander around proposed Wetland B, which will be re-established. The proposed channel slope will steepen in the final 100 feet as the restored reach joins with South Fork Jones Creek. A “log sill roller” structure, which is comprised of a series of alternately angled log sills will be used to provide grade control and stabilize the bed at this location.

Tributary 3: Priority 1 restoration of Tributary 3 will begin below existing wetland WK, intercept Tributary 4 approximately 530 feet downstream, and end at its confluence with South Fork Jones Creek. For the first approximately 2,200 feet of its length, this reach has a steeper gradient as the channel flows down the hillslope portion of the site towards the South Fork Jones Creek floodplain. The belt width and overall

sinuosity through this steeper portion of the channel will be relatively low as is typical of steeper headwater systems. A similar design approach will be implemented as with other Priority 1 reaches, including establishment of stable dimension, pattern and profile, raising the channel bed to provide reconnection to the relict floodplain, and planting of a minimum 50-foot-wide buffer off both streambanks with native woody and herbaceous species. Once Tributary 3 reaches the South Fork Jones floodplain, the average channel slope decreases, and the proposed channel has been designed with a greater belt width and sinuosity than upstream. A "log sill roller" structure will be used to provide grade control and stabilize the bed in the final approximately 150 feet of the streams alignment as it ties into the incised channel of South Fork Jones Creek.

Tributary 4: Tributary 4 begins immediately downstream of an existing farm road and culvert. The existing culvert will be removed and the road will be relocated upstream of the conservation easement. The relocated culvert will be comprised of a 30" HDPE pipe. Tributary 4 will end at its confluence with Tributary 3. Priority 1 restoration will incorporate the same design methods as the other restoration reaches on the site, including establishment of stable dimension, pattern and profile, raising the channel bed to provide reconnection to the relict floodplain, and planting of a minimum 50-foot-wide buffer off both streambanks with native woody and herbaceous species. Since this reach does not flow into the South Fork Jones Creek floodplain, it will retain the characteristics of a steeper headwater channel for its entire restored length, with a relatively low belt width and sinuosity.

Tributary 5: For Tributary 5, Priority 1 restoration will begin at an existing headcut between Tributaries 4 and 6 and end at the channel's confluence with South Fork Jones Creek. For the first approximately 1,000 feet of its length, this reach has a steeper gradient as the channel flows down the hillslope portion of the site towards the South Fork Jones Creek floodplain. The belt width and overall sinuosity through this steeper portion of the channel will be relatively low as is typical of steeper headwater systems. Once Tributary 5 reaches the South Fork Jones floodplain, the average channel slope decreases, and the proposed channel has been designed with a greater belt width and sinuosity than upstream. The restored alignment of Tributary 5 will divert from the existing channelized stream, which does not follow the natural low points and relict valley in the South Fork Jones Creek floodplain. Contour mapping provided in **Figure 14** details justification for this proposed alignment. Priority 1 restoration will incorporate the same design methods as the other restoration reaches on the site, including establishment of stable dimension, pattern and profile, raising the channel bed to provide reconnection to the relict floodplain, and planting of a minimum 50-foot-wide buffer off both streambanks with native woody and herbaceous species. A "log sill roller" structure will be used to provide grade control and stabilize the bed in the final approximately 150 feet of the streams alignment as it ties into the incised channel of South Fork Jones Creek.

Tributary 6: Tributary 6 will begin downstream of the terminus of a rerouted farm road, which will be constructed with a 30" HDPE pipe culvert immediately upstream of the conservation easement, and the stream will end at its confluence with South Fork Jones Creek. The existing soil road crossing, located approximately halfway down the existing channel, will be removed. For the first approximately 2,200 feet

of its length, this reach has a steeper gradient as the channel flows down the hillslope portion of the site towards the South Fork Jones Creek floodplain. The belt width and overall sinuosity through this steeper portion of the channel will be relatively low as is typical of steeper headwater systems. Once Tributary 5 reaches the South Fork Jones floodplain, the average channel slope decreases, and the proposed channel has been designed with a greater belt width and sinuosity than upstream. As with Tributary 5, Tributary 6 will be redirected away from its current course to follow the natural low ground and relict valley within the South Fork Jones floodplain (see **Figure 16** for LiDAR mapping and detail regarding the historic valley and low point of this channel). Priority 1 restoration will incorporate the same design methods as the other restoration reaches on the site, including establishment of stable dimension, pattern and profile, raising the channel bed to provide reconnection to the relict floodplain, and planting of a minimum 50-foot-wide buffer off both streambanks with native woody and herbaceous species. A "log sill roller" structure will be used to provide grade control and stabilize the bed in the final approximately 100 feet of the streams alignment as it ties into the incised channel of South Fork Jones Creek.

Table 13. Summary of Site Morphological Parameters for Project Reaches

Parameter	1A		1B		1C		2		3		4		5		6	
	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed
Contributing Drainage Area (acres)	93		20		12		25		29		33		16		44	
Rosgen Stream Classification	G4	C4b/C4	G4	C4b	G4	C4b	G4	C4b/C4	G4	C4b	G4	C4b/C4	G4	C4b/C4	G4	C4b/C4
Bankfull Width (ft)[1]	10.42	7	2.2	4	2.99	4	3.48	4	8.09	4	2.74	4	4.24	4	3.28	4
Bankfull Depth (ft) [1]	0.48	0.42	0.2	0.45	0.81	0.45	0.34	0.45	0.64	0.45	0.3	0.45	0.53	0.45	0.37	0.45
Bankfull Area (ft^2) [1]	5.04	2.95	0.43	1.8	2.43	1.8	1.19	1.8	5.2	1.8	0.81	1.8	2.23	1.8	1.2	1.8
Bankfull Discharge (cfs)	7.4		1.6		1.1		2.6		2.9		3.2		1.8		4.1	
Channel Slope (ft/ft)	0.015	0.012	0.044	0.0444	0.0539	0.026	0.0271	0.028	0.0251	0.0185	0.0242	0.0235	0.0202	0.0161	0.026	0.0153
Sinuosity	1.02	1.12	1.01	1.01	1.02	1.04	1.06	1.09	1.01	1.11	1.01	1.06	1.03	1.11	1.06	1.12
Width/Depth Ratio[1]	21.71	11.03	11	8.89	3.69	8.89	10.24	8.89	12.64	8.89	9.13	8.89	8	8.89	8.86	8.89
Bank Height Ratio	2.02	1	1.1	1	2.63	1	6.57	1	2.63	1	2.69	1	2.59	1	4.78	1
Entrenchment Ratio	1.71	>2.2	1.73	>2.2	1.67	>2.2	1.49	>2.2	2.19	>2.2	1.53	>2.2	1.35	>2.2	1.65	>2.2
D16 (mm)	0	50.8	0.14	50.8	0.21	50.8	0.24	50.8	0.18	50.8	0.24	50.8	0.05	50.8	0.15	50.8
D35 (mm)	4.35	---	0.21	---	0.63	---	0.61	---	7.08	---	0.5	---	1	---	2.5	---
D50 (mm)	8.24	101.6	0.42	101.6	3.33	101.6	0.95	101.6	16.47	101.6	0.97	101.6	12.15	101.6	5.7	101.6
D84 (mm)	30.09	---	4	---	27.97	---	13.65	---	40.27	---	29.31	---	38	---	18.93	---
D95 (mm)	47.97	152.4	10.48	152.4	54.5	152.4	20.95	152.4	58.3	152.4	48.8	152.4	53.44	152.4	30.66	152.4

[1] Due to incision of existing channels, existing bankfull features were difficult to discern or entirely absent at surveyed cross-sections. Bankfull parameters of existing channels were thus calculated based on assumed bankfull elevations and should be taken as an approximation of actual bankfull characteristics.

7.2.2 Typical Design Sections

Typical cross sections for riffles and pools are shown on the design plans sheets in **Appendix G**. The cross-section dimensions were developed for each design reach by using the parameters detailed in **Section 7.2.1**.

7.2.3 Meander Pattern

The design plans showing the proposed channel alignments are included in **Appendix G**. The meander pattern was derived directly from the analog reference reach and was altered in some locations to provide variability and to account for variations in valley pattern, and to make the channel more constructible. The morphological parameters included in **Appendix C** were applied to areas that deviated from the analog reference reach. After additional site analysis and survey, the alignment of Tributary 5 has been modified from what was originally proposed to closer follow the actual valley low point along the floodplain of South Fork Jones Creek. Upon further inspection, it was found that there is a subtle ridge between the base of the hillside down which the tributary flows and the banks of South Fork Jones Creek, which has created a natural valley that roughly parallels South Fork Jones Creek. **Figure 14** depicts contours derived from QL2 LiDAR and site topographic survey to show the presence of this natural valley along Tributary 5. Similarly, analysis of QL2 LiDAR and site topographic survey show a natural valley low point along the proposed channel location for Tributary 6. The natural flow path follows along concave contours and areas where significant ground saturation are observed in available aerial imagery.

7.2.4 Longitudinal Profiles

The design profiles are presented in **Appendix G**. These profiles extend throughout the project area for each stream channel realignment. Bed slopes were determined for each restoration reach based on the existing valley slope and the proposed sinuosity of the reach. In-stream structures will be used in the design to control grade and provide habitat diversity and stability.

7.2.5 In-Stream Structures

Structures will be incorporated into the channel design to provide additional stability and improve aquatic habitat. Bed material will be added to all riffles to construct constructed riffles, while in steeper riffle locations (>2.5% slopes), log “roller” structures will be installed to provide more resistance to increased shear stress. Typical details for proposed in-stream structures are in **Appendix G**.

7.2.6 Wetland Restoration Approach

The Site offers a total ecosystem restoration opportunity that will restore highly manipulated floodplain forested wetland communities. Wetland restoration via reestablishment aims to reestablish wetland hydrology and hydrophytic vegetation to currently non-wetland areas that exhibit hydric soil indicators, while rehabilitation aims to improve vegetation and floodplain connectivity in severely degraded

jurisdictional wetland areas. The Site will provide 5.5670 riparian WMUs through a combination of wetland reestablishment and rehabilitation. The proposed WMUs will also offset unavoidable permanent wetland impacts due to stream restoration activities. Planting of woody vegetation will occur in areas where existing riparian wetlands are present. These areas will not generate mitigation credit but will be protected within the conservation easement. Project impact mapping depicts areas of existing jurisdictional wetlands and streams that will be impacted by proposed project restoration activities, as well as wetland areas that will be replanted after construction. The project will restore 5.25 acres and rehabilitate 0.32 acres, which will offset the 0.22 acres of permanent wetland losses associated with the channel re-alignments. The project will provide 13,295.996 SMU, which will offset the 79.83 feet of stream losses associated with the culvert installations on UT-4 and UT-6, therefore the project will have a net gain of stream length.

Wetland reestablishment with a credit ratio of 1:1 is proposed for two areas of the Site. The area referred to as Wetland A is located along the southwestern border of the site and is situated within the floodplain of South Jones Creek. Wetland B is located along Tributary 2 and is located in the floodplain of both Tributary 2 and South Jones Creek. The areas contain hydric soils but lack sufficient wetland hydrology and a lowered water table due to an altered landscape and drainage modifications, including ditched streams and drainage tiles. The hydrologic restoration of these areas will be directly related to stream restoration activities and removal of the drainage tile system. Removal of the drainage tiles will raise local groundwater elevations and allow for frequent flooding. Restoration of Tributary 2 will provide an appropriately sized channel within the existing floodplain and filling the incised, abandoned channels, which will further raise local groundwater levels and increase surface inputs from more frequent flooding. Hydrology can be restored to these historic wetlands, connecting them to the surrounding hydrologic landscape, and their riparian functions can be reestablished by enabling stream and groundwater interaction. The reestablished wetland areas will be planted with bare root hardwood trees and shrubs representative of Piedmont Bottomland Forest communities. The reestablishment areas will be rough graded to increase runoff retention in small shallow areas.

Wetland rehabilitation with a credit ratio of 1.5:1 is proposed for Wetland C and D, which are located within the proposed Wetland A reestablishment area. The rehabilitation approach is intended to provide uplift to vegetative function and functions related to floodplain connectivity. These wetland areas have been disconnected from their historic riparian wetland system and area within active row crop agricultural areas that are consistently impacted by plowing, seeding, and herbicide applications. The wetlands are still jurisdictional and there is a seasonally high-water table. Rehabilitation of these areas is directly tied to the reestablishment of Wetland A and recreating the historic riparian wetland system along South Jones Creek. Rehabilitation aims to re-establish the Riverine Swamp Forest community that historically existed. This will involve planting appropriate bare root hardwood tree and shrub species representative of Piedmont Bottomland Forest communities.

7.2.7 Soil Restoration Approach

Soil grading will occur during stream restoration activities. Topsoil will be stockpiled during construction and spread on the soil surface once a subgrade has been established. Surface roughening will create microtopography and shallow depressional areas within floodplain, re-establishing more natural conditions and establishing habitat diversity.

Standing water is not anticipated to occur in the reestablishment and rehabilitation areas. No depressions greater than 6 inches will be graded within the wetland cells, which will reduce areas of ponded water and increase survivability of planted woody species. As mentioned above, grading efforts will be focused primarily on roughening the terrain to provided water retention in small shallow areas.

7.3 DESIGN DISCHARGE ANALYSIS

Multiple methods were used to determine bankfull discharge estimates for the design reaches, including the analysis of bankfull indicators, reference reaches, and regional curves. The use of various methods allows for comparison of results and eliminates reliance on a single model or data source. Design bankfull flows were determined for comparison using the following methods:

- NC Rural Piedmont Regional Curve (Harman, 1999)
- USGS Non-Urban Virginia Piedmont Regional Curve (Lotspeich, 2009)
- Stream Channel Geomorphology Relationships for North Carolina Piedmont Reference Reaches (Lowther, 2008)
- SC DNR Stream Geomorphology Data Collection and Analysis – Ecoregion 45 (Environmental, 2020)
- Discharge determination using on-site bankfull indicators (only visible on Tributary 1A).

Bankfull indicators were identified on Tributary 1A and were used to back calculate the existing bankfull discharge using the Manning's Equation. The existing discharge was then compared with the regional curves listed above to provide multiple lines of evidence in selection of the design bankfull discharge. The USGS Non-Urban Virginia Piedmont Regional Curve produced the most comparable bankfull discharge to the calculated discharge for Tributary 1A, falling within the 95-percent prediction interval. Thus, this regression equation was chosen for use with the design discharge calculations of the remaining tributaries. The design discharges for each reach were then calculated based on this regression equation. Results from each discharge estimate are included in **Table 14.**

Table 14. Summary of Bankfull Discharge Predictive Analysis from Regional Curve

Reach	Drainage Area (mi^2)	Discharge (CFS)				
		SC Ecoregion 45 Regional Curve	USGS Non-Urban Virginia Piedmont Regional Curve[1]	USGS Non-Urban Virginia Piedmont Regional Curve[2]	NC Reference Reach Curve	NC Rural Piedmont Regional Curve
1A-Lower	0.15	9.4	7.3	7.4	21.3	22.7
1B	0.02	2.2	1.1	1.4	5.4	5.3
1C	0.03	3.2	1.6	2.1	7.6	7.1
2	0.04	3.8	2.1	2.6	9.0	8.8
3	0.05	4.1	2.6	2.9	9.8	10.3
4	0.05	4.6	2.6	3.2	10.7	10.3
5	0.03	2.8	1.6	1.8	6.7	7.1
6	0.07	5.6	3.5	4.1	13.1	13.1

[1]Regression equation developed using the USGS slope-area computation program (SAC)

[2]Regression equation determined by relating the bankfull stage at the gage location to the stage-discharge rating.

7.4 SEDIMENT TRANSPORT ANALYSIS

To better understand the existing sediment transport conditions on the site, eight pebble counts and one subpavement sample were collected and analyzed across the site. The data is provided in **Appendix C** and summarized in **Table 15** below.

A sediment transport analysis was conducted at the Site to ensure that the restoration designs possess stable channel forms that can transport the sediment delivered from their watersheds without aggrading or degrading over time. On-site streams were visually inspected to qualitatively assess aggradation and degradation within the channels. Incised channels and actively eroding banks provide evidence of active degradation, multiple headcuts, and suggest an excess sediment transport competence and capacity relative to the sediment load delivered from upstream. The relatively steep average bed slopes (1.5% to 4%) and narrow, steep valleys of the tributaries suggests that the channels are colluvial, rather than alluvial, in nature and therefore likely follow a threshold channel regime. In threshold channel systems, the sediment loads are relatively low relative to the energy produced by the channel, thus channel stability is informed more by sediment transport competence and the resistance of the boundary to the shear stresses produced by the channel, than it is by sediment transport capacity, as would be more influential in alluvial stream systems. Thus, the focus of the sediment transport analysis was to verify that the design channels will be stable over time and can transport sediment from the watershed.

7.4.1 Sediment Competence Analysis

Competence analyses were conducted for each restoration reach by comparing shear stress associated with the design bankfull discharge, proposed channel dimension and proposed channel slopes with the size distribution of the existing bed load. The analyses used standard equations based on methodology

using the Shields curve and Andrews equation (Rosgen, 2001). The analyses were used to verify that the design will have sufficient competence to move the size of bed load supplied to the stream. Initial competence was based on the size of material naturally found in the stream to mimic potential bedload. The results were used to inform further design of the reach. As shown in **Table 15**, the proposed channel has sufficient competence to move the size of materials within the sediment load. The results also show excess competence relative to the size of sediment particles required to be moved, indicating that channel armoring will be required to prevent channel degradation. This is a typical feature of steep, headwater colluvial channels, where the channel stability is provided by natural bed armoring rather than a balance of channel shape to sediment load. It is likely that the Tributaries on the site once possessed a natural armor layer derived from large cobble and boulder materials that was lost when the streams became incised. This is common on many steeper headwater systems in the Slate Belt region, including the reference reaches such as Spencer Creek. To offset the excess competence produced by the channel, bed armoring will be introduced to all riffles using stone material sized to resist movement from the shear stresses produced by the proposed channel. In addition, the steepest portions of the channel will have log roller structures to prevent degradation and downcutting.

Table 15. Sediment Size Distribution and Shear Stress Comparison at Bankfull Stage

Reach	Type	Existing Shear Stress (lb/sf)	Measured D50 (mm)	Measured D84 (mm)	Proposed Shear Stress (lb/sf)	Largest Moveable Particle (mm)
1A - Upper	Pebble Count	1.03	12.29	22.27	0.53	94.83
1A-Lower	Pebble Count	0.47	3.33	27.97	0.38	74.53
	Subpavement	0.47	8.24	30.09	0.38	74.51
1B	Pebble Count	0.29	0.42	4.00	0.75	122.52
1C	Pebble Count	1.42	0.40	4.00	0.69	116.32
2	Pebble Count	0.56	0.95	13.65	0.65	110.58
3	Pebble Count	0.88	16.47	40.27	0.50	90.82
4	Pebble Count	0.44	0.97	29.31	0.60	105.03
5	Pebble Count	0.65	12.15	38.00	0.51	92.37
6	Pebble Count	0.47	5.7	18.93	0.50	91.13

7.4.2 Sediment Capacity Analysis

Observations of channel sediment on the site indicate a lack of depositional features throughout the existing channels, with only some very small point bar formation on Tributary 1A at its most downstream end. In addition, based on the relatively steep proposed channel slopes coupled with the very small drainage areas which produce limited sediment load, the channels are expected to be "supply-limited" systems, and therefore can be assumed to have excess capacity to move their sediment load at the design discharge. The defining criteria for the channel dimension, therefore, is that it must accommodate the design discharge and resist the shear stress on the boundary of the channel (i.e., threshold channel design). For this reason, a sediment capacity analysis was not conducted for this project.

7.5 VEGETATION AND PLANTING PLAN

The restoration of the plant communities is an important aspect of the restoration of the Site. The selection of plant species is based on species present in the forest adjacent to the Site, and typical native species for Piedmont Headwater Stream Forest (Typic Subtype) and Piedmont Bottomland Forest (Schafale, 2012). Existing mature riparian forest adjacent to the site were dominated by sweetgum, loblolly pine, boxelder (*Acer negundo*), sycamore, water oak (*Quercus nigra*), and willow oak (*Q. phellos*). Sporadic areas of sugarberry and spicebush were also noted. Much of the understory was dominated by privet, which prevented an accurate assessment of native shrub and understory tree populations. Understory species were included from the typical native species of the appropriate riparian forest type. The target community will be used for the planting areas within the Site, shown in **Appendix H**. The native species selected for establishment at the Site will be early successional species that represent a range of growth rates and varying tolerances to shade and moisture. These range of characteristics were selected to ensure that the appropriate vegetation cover develops over the Site. Stream banks will be planted with live stakes and the channel toe will be planted with multiple herbaceous species. Permanent herbaceous seed will be spread on the streambanks, floodplain and disturbed areas within the Site easement. **Table 16** depicts the total number of stems and species distribution within each vegetation association. Planting will be conducted between November 15 and March 15 per IRT monitoring guidance.

Table 16. Site Woody Species Planting Plan with Species Type and Distribution

Vegetation Association		Piedmont Bottomland Forest		Piedmont Headwater Stream Forest		Streamside (Zone 1)		Total
Area (acres)		**6.37**		**46.80**		**5.90**		**59.07**
Scientific Name	**Common Name**	**# Planted**	**% of Total**	**# Planted**	**% of Total**	**# Planted**	**% of Total**	**# Planted**
Acer negundo	Boxelder	452	12%	--	--	--	--	452
Alnus serrulata	Hazel alder	--	--	--	--	7953	20%	7,953
Asiminia triloba	Pawpaw	--	--	2768	10%	--	--	2,768
Betula nigra	River birch	565	15%	4152	15%	--	--	4,717
Carpinus caroliniana	American hornbeam	--	--	2768	10%	--	--	2,768
Celtis laevigata	Sugarberry	--	--	2768	10%	--	--	2,768
Cephalanthus occidentalis	Buttonbush	--	--	--	--	7953	20%	7,953
Cornus amomum	Silky dogwood	377	10%	--	--	7953	20%	8,330
Diospyros virginiana	Common Persimmon	--	--	2768	10%	--	--	2,768
Fagus grandifolia	American beech	--	--	2768	10%	--	--	2,768
Ilex decidua	Possumhaw	377	10%	--	--	--	--	377
Lindera benzoin	Spicebush	--	--	1384	5%	--	--	1,384

Vegetation Association		Piedmont Bottomland Forest		Piedmont Headwater Stream Forest		Streamside (Zone 1)		Total
Platanus occidentalis	American sycamore	565	15%	4152	15%	--	--	4,717
Quercus nigra	Water oak	--	--	2768	10%	--	--	2,768
Quercus pagoda	Cherrybark oak	490	13%	--	--	--	--	490
Quercus phellos	Willow oak	452	12%	--	--	--	--	452
Salix sericea	Silky willow	--	--	--	--	7953	20%	7,953
Sambucus nigra	Elderberry	--	--	--	--	7953	20%	7,953
Ulmus americana	American elm	490	13%	--	--	--	--	490
Viburnum prunifolium	Blackhaw	--	--	1384	5%	--	--	1,384
Total		**3,768**	**100%**	**27,680**	**100%**	**39,765**	**100%**	**71,213**

*Planted at a density of 538 stems/acre ** Planted at a density of 4,840 stems/acre

7.5.1 Invasive Species Management

Invasive species within the easement area will be treated at the time of construction. The extent of invasive species coverage will be monitored, mapped, and controlled as necessary throughout the required monitoring period. An exception to this is the areas within the easement along South Fork Jones Creek that are outside the riparian zones of the restored tributaries and riparian wetlands. As these areas are being put into conservation easement to mitigate for unauthorized activities on the site, and not to produce mitigation credits, these areas will have invasives clearing and treatment during one growing season and not in following monitoring years. A copy of the map depicting one-time invasives treatment areas versus treatment throughout the monitoring period is contained in **Appendix A**. An invasive species vegetation treatment plan for the Site is included in **Appendix H**.

7.6 PROJECT RISKS AND UNCERTAINTIES

Although a formal risk assessment has not been conducted as a part of this project, the assessment and design process are structured to identify areas of concern and potential risk to the project success or liabilities that may develop in association with the project, as discussed in **Table 17**. This project is low risk. The land use surrounding the project is currently in agricultural row crop production, so there is no potential for accidental livestock access. There are no significant hydrologic or infrastructure constraints for the proposed ecological uplift at the Site. No overhead or buried utility lines are present. An easement break is proposed on Tributary 1A at the location of an existing 60" RCP culvert, which will remain in place. Any culvert maintenance will be the responsibility of FNI through completion of monitoring. At the completion of monitoring and project closeout, the culverts will be the responsibility of the landowner(s). The road and associated culverts will be relocated outside of the easement for Tributary 4 and 6.

No General Aviation, Commercial or Private airports are located within five miles of the Site. There are no other known site constraints that will affect the functional uplift of the project. The valley widths at the Site will allow for the development of pattern and dimensions to restore stable functioning streams and wetlands. Any potential changes in the watershed would alter hydrology, but reconnecting the channels to their floodplain, creating functioning riparian area, and restoring wetland function will help alleviate any increased flow regime.

It is anticipated that the site will remain in row crops in the foreseeable future. Corner posts and boundary markers consistent with current DMS guidelines will be placed along the perimeter of the conservation easement to provide visual barrier for row crop operations. The easement boundary will be checked visually through the monitoring period to ensure there are no encroachments into the easement. If any encroachments are detected, corrective actions including re-planting and boundary marker re-installation will be conducted and discussions will be had with the landowner reminding them of easement terms and conditions and legal duty to not disturb vegetation.

Table 17. Project Risks, Uncertainties, and Potential Actions

Risk/Uncertainty	Description	Action
Easement Encroachment	Potential encroachment of the conservation easement, which may include trespass, incidental mowing, equipment traffic, cattle, and timber harvesting.	The isolated nature of the site will minimize this risk. Easement boundaries will be clearly marked to prevent encroachment. The landowner has been made aware of the importance of encroachment prevention and accountability. Any encroachments that occur will be remedied to address any damage and provide any corrections required by the IRT.
Invasive and Nuisance Species	Herbaceous and woody vegetation competition from invasive and nuisance species in the surrounding area.	Herbaceous competition during the first two years will be managed by mechanical mowing and chemical herbicides. All herbicide application will be performed by a certified applicator in accordance with NC Department of Agriculture rules and regulations.
Droughts and Floods	Extreme climate conditions may occur during the monitoring period, including long-term inundation due to landscape position and soil characteristics.	Site vegetation includes obligate woody species that are adapted to periods of long-term inundation. Supplemental planting or replanting will be conducted if necessary. Additional actions may include removal of downstream obstructions (e.g., beaver dams, soil deposition) within the project easement.
Hydrologic Trespass	Potential hydrologic trespass on adjoining landowners.	The project is designed with a Priority 1 restoration approach, and all adjacent wetland cells will be graded to move water toward Tributary 1. There is no

Risk/Uncertainty	Description	Action
		concern about ditching along the conservation easement by current or future landowners in a way that would affect either the existing or proposed wetlands and streams. The proposed conservation easement will block the landowner from being able to outlet the ditch anywhere on the property. If the landowner were to install ditches adjacent to wetlands in the easement, such an effort would be futile as the ditches would be parallel to the area and, to make a ditch, there would have to be a place where the ditch can outlet. There would not be anywhere to 'outlet' the ditches because all potential outlets would be blocked by the conservation easement.

8.0 PERFORMANCE STANDARDS

The stream and wetland performance standards will conform to the performance criteria outlined in the NCDMS Mitigation Plan Template (ver. 06/2017), and US Army Corps of Engineers – Wilmington District Public Notice: Notification of Issuance of Guidance for Compensatory Stream and Wetland Mitigation Conducted for Wilmington District (October 24, 2016). The restoration and enhancement components are assigned specific performance standards for geomorphology, hydrology, and vegetation. Performance criteria is proposed to be evaluated throughout the seven-year monitoring period. **Table 18** provides a list of the performance standards associated with each project objective along with the associated monitoring approach. Annual monitoring and semi-annual site visits will be conducted to assess the condition of the finished project. Performance standards will be evaluated throughout the seven-year post construction monitoring and are detailed in **Table 18**. Monitoring information can be found in **Section 9**.

Table 18. Project Performance Standards.

Objective	Performance Standard	Monitoring Approach
Construct stream channels that will maintain proper dimension, pattern and profile and that meet jurisdictional status	Riffle section W/D ratios should remain within the range of the appropriate stream type. BHR should not exceed 1.2. BHR should not change more than 10% in any given monitoring interval. Changes that do occur should indicate a trend toward stability. Entrenchment Ratios should be ≥ 2.2 for C/E channels and ≥ 1.4 for B channels Document continuous surface flow in tributaries for at least 30 consecutive days in each year.	Survey of select cross sections, longitudinal profiles and visual assessment. Continuous stage recorders for base flow on tributaries and/or use of trail cameras
Construct streams with proper bankfull to floodplain relationship	Four bankfull events or greater, in separate years, will be documented during the monitoring period.	Continuous stage recorders and/or use of trail cameras as well as debris lines.
Construct streams that provide naturally stable dimensions and stabilize constructed banks with appropriate bioengineering techniques.	Channel banks should generally remain stable. Where bank migration does occur, it should not exceed 20% of the bankfull width for the duration of monitoring	Visual assessment and bank pin monitoring as necessary
Construct stable riffles and pools that provide an improved diversity of bedform and bed material class, and a reduction in fines relative to existing conditions	Profile should maintain a diversity of depths expressed in riffle/pool forms.	Survey of select cross sections, longitudinal profiles and visual assessment.
Construct in-stream habitat features from native material to provide a diversity of habitats	In-stream habitat structures should remain intact and functional.	Visual assessment and annual survey of structure elevations and configurations.
Establish a forested riparian buffer along all restored stream channels and South Fork Jones Creek.	Record conservation easement prior to implementation	Required annual visual inspection of easement boundary.
Plant native overstory tree species and understory species in the riparian zone	Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present at MY-5. Minimum of 210 stems/ac present at MY-7.	Vegetation plots

Objective	Performance Standard	Monitoring Approach
	Planted trees reach an average height of 7 ft by Year 5 and 10 ft by Year 7	
Restore riparian wetland hydrology by re-grading topography to eliminating ditches and other wetland drainage features	Groundwater elevation within 12 inches of the ground surface for 12% (31 days) of the growing season	Groundwater monitoring gages
Plant native wetland tree and shrub species habitat for lower trophic level organisms.	Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present at MY-5. Minimum of 210 stems/ac present at MY-7. Planted trees reach an average height of 7 ft by Year 5 and 10 ft by Year 7	Vegetation plots

8.1 STREAM RESTORATION SUCCESS CRITERIA

8.1.1 Bankfull Events

Four bankfull events must be documented over the 7-year monitoring period, and the bankfull events must occur in separate years. Otherwise, stream monitoring will continue until four bankfull events have been documented in separate years. This will be accomplished through the use of auto-logging pressure transducers at a stream gage.

8.1.2 Surface Flow

Stream reaches generating credit will be monitored to document surface flow. This will be accomplished through direct observation and the use of auto-logging pressure transducers at a stream gage/game cameras. Reaches must demonstrate a minimum of 30 consecutive days of flow each year.

8.1.3 Cross Sections

There will be little change in as-built cross sections. If changes do occur, they will be evaluated to determine if they are trending toward a less stable condition or are minor changes that represent an increase in stability. Cross sections shall be classified using the Rosgen stream classification method and all monitored cross sections should fall within the quantitative parameters defined for channels of the design stream type. Bank height ratio shall not exceed 1.2, and the entrenchment ratio shall be no less than 2.2 within restored riffle cross sections for C/E channels and no less than 1.4 for B channels.

8.1.4 Digital Image Evaluations

Digital images will be used to subjectively evaluate bank erosion, channel evolution (aggradation or degradation), riparian vegetation success, and effectiveness of erosion control measures. Longitudinal images should not indicate the formation of bars within the channel or excessive increase in channel depth. Lateral images should not indicate excessive erosion or continuing degradation of the banks over time. A time series of images should indicate maturation of riparian vegetation. Detrimental bank erosion, aggradation, structural integrity, and vegetative concerns must also be noted on the required Visual Assessment tables and spatial extent depicted on the CCPV each monitoring year.

8.2 WETLAND RESTORATION SUCCESS CRITERIA

The Natural Resources Conservation Service (NRCS) has a current WETS table (1991-2020) for Anson County upon which to determine average growing season. The closest comparable data station was determined to be WETS station: Wadesboro, NC. The station determined the growing season to be 262 days long, extending from March 8 to November 25, and is based upon the minimum temperature greater than 28 degrees Fahrenheit occurring in five of ten years (accessed from AgACIS).

Based upon field observations at the Site, NRCS soil mapping units show a good correlation to actual site conditions in the proposed wetland areas of the site. Mitigation guidance for soils in the Piedmont suggests a hydroperiod for Chewacla soil series of 10 to 12 percent of the growing season. Therefore, the hydrology success criterion for the Site is to restore the water table so that it will remain continuously within 12 inches of the soil surface for at least 12 percent of the growing season (approximately 31 days) at each groundwater gage location throughout the monitoring period.

8.3 VEGETATION SUCCESS CRITERIA

Specific and measurable success criteria for planting density within the wetlands and riparian buffers on the Site will follow IRT Guidance. Vegetative success will be the survival of at least 320 planted trees per acre at the end of Year 3, 260 planted trees at an average of seven feet in height at the end of Year 5, and the final vegetative success criteria of 210 trees per acre with an average height of ten feet at the end of Year 7. Height requirements may be omitted for designated understory and shrub species if deemed advantageous. Volunteer trees, present at least two growing seasons and listed on the approved planting list, will be counted, identified to species, and included in the yearly monitoring reports, and may be counted toward the success criteria of the total planted stems for year five and seven. Any single species can only account for up to 50 percent of the required number of stems within any vegetation plot. Any stems in excess of 50 percent will be shown in the monitoring table but will not be used to demonstrate success.

9.0 MONITORING PLAN

The Site monitoring plan has been developed to ensure that the required performance standards are met, and project goals and objectives are achieved. Annual monitoring data will be reported using the DMS Annual Monitoring Reporting Template (June 2017). The monitoring report shall provide project data chronology that will facilitate an understanding of project status and trends, ease population of DMS databases for analysis and research purposes and assist in close-out decision making. **Table 19** details Site monitoring components. Locations of vegetation plots, groundwater gages, and continuous stage recorders are included in **Figure 12**. The monitoring schedule is included in **Table 20**.

9.1 AS-BUILT SURVEY

Using the DMS Annual Monitoring Report Format, Data and Content Requirements guidance document (October 2020), a baseline monitoring document and as-built record drawings of the project will be developed within 60 days of the planting completion and monitoring installation on the restored site. The survey will include a complete profile of thalweg, water surface, bankfull, top of bank and other features required by the NCDMS As-Built Requirements document (October, 2020) to compare to future geomorphic data. Longitudinal profiles will not be required in annual monitoring reports unless requested by USACE.

9.2 VISUAL MONITORING

Visual monitoring of all mitigation areas will be conducted a minimum of twice per monitoring year (MY) by qualified individuals. The visual assessments will include vegetation density, vigor, invasive species, and easement encroachments. Visual assessments of stream stability will include a complete stream walk and structure inspection. Digital images will be taken at fixed representative locations to record each monitoring event, as well as any noted problem areas or areas of concern. Fixed image locations will exist at each cross section, vegetation plot, stage recorder, flow gage, groundwater, culverts and crossings. Results of visual monitoring will be presented in a plan view exhibit with a brief description of problem areas and digital images. Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation, and effectiveness of channel structures. Longitudinal photos should indicate the absence of developing bars within the channel or an excessive increase in channel depth. Lateral photos should not indicate excessive erosion or continuing degradation of the banks over time. A series of photos over time should indicate successional maturation of riparian vegetation.

9.3 STREAM HYDROLOGY

Continuous stage recorders, which utilize auto-logging pressure transducers that are capable of documenting height, frequency, and duration of bankfull events, will be installed on all perennial restoration reaches. For credit generating intermittent streams, monitoring flow gages will be installed to

track the frequency and duration of stream flow events. Additionally, a weather station with a rain gage will be installed on-site to measure precipitation events.

9.4 CROSS SECTIONS

Permanent cross sections will be installed at a minimum of one per 20 bankfull widths with half in pools and half in riffle on all Restoration and Enhancement I reaches. Morphological data will be measured and recorded for all cross-sections; however, only riffle cross sections will include bank height ratio and entrenchment ratio calculations. A total of 27 cross sections are proposed across the Project. These cross sections will be monitored in Years 1, 2, 3, 5, and 7.

9.5 WETLAND HYDROLOGY

Wetland hydrology will be monitored to document hydrologic conditions in the Site's wetland areas. This will be accomplished with automatic recording pressure transducer gages installed in representative locations across the restoration areas as well as some already jurisdictional wetland areas for reference conditions. These groundwater gages will be installed in accordance with USACE guidelines and subsequent NCIRT guidance. The gages will be downloaded quarterly and wetland hydroperiods will be calculated during the growing season. Visual observations of primary and secondary wetland hydrology indicators will also be recorded during quarterly site visits. A total of fourteen groundwater gages are proposed across the Site; seven in re-established wetlands, four in rehabilitated jurisdictional wetlands, serving as hydrologic references, and three in existing wetlands to ensure that the constructed stream channel does not adversely impact wetland hydroperiod.

At the end project monitoring, the extent of jurisdiction for existing wetlands will be re-verified and compared to pre-restoration conditions to ensure that no wetland area was lost as a result of restoration activities.

9.6 VEGETATION MONITORING

Vegetation monitoring plots will be a minimum of 0.0247 acres in size and cover a minimum of two percent of the planted area. There will be 56 plots within the planted area (59.07 acres). Plots will be a mixture of fixed and random plots, with 30 fixed plots and 26 random plots. Planted area indicates all area in the easement that will be planted with trees. Other areas lacking tree density throughout the Site will be planted with supplemental trees. These areas will be monitored each monitoring year with random plots to document both existing and planted trees to demonstrate both density and diversity. The following data will be recorded for all trees in the fixed plots: species, height, planting date (or volunteer), and grid location. For random plots, species and height will be recorded for all woody stems. The location (GPS coordinates and orientation) of the random plots will be identified in the annual monitoring reports. Vegetation will be planted, and plots established at least 180 days prior to the initiation of the first year of monitoring. Monitoring will occur in Years 1, 2, 3, 5, and 7 between July 1st and leaf drop. Invasive and

noxious species will be monitored so that none become dominant or alter the desired community structure of the Site. If necessary, a species-specific treatment plan will be developed.

9.7 SCHEDULE AND REPORTING

A baseline monitoring report with as-built drawings will be submitted within 60 days of planting completion. The report will include all information required by DMS mitigation plan guidelines, including elevations, photographs and sampling lot locations, gage locations, and a list of the species planted and associated densities. Baseline vegetation monitoring will include species, height, date of planting, and grid location of each stem. The baseline report will follow the most current DMS As-Built Baseline Monitoring Report Template found on the DMS website, USACE guidelines, and the October 2017 Mitigation Credit Calculation Memo.

The monitoring program will be implemented to document system development and progress toward achieving success criteria. The restored stream morphology will be assessed to determine the success of the mitigation. The monitoring program will be undertaken for seven years or until final success criteria are achieved, whichever is longer.

Monitoring reports will be prepared in the fall of each monitoring year and submitted to DMS by December 1. These reports will be based on the DMS Annual Monitoring Template (June 2017). While monitoring reports will be completed annually, not all monitoring reports will include the same information. All monitoring reports will include at least a brief narrative of site developments, a representative photo log, and a Current Condition Plan View (CCPV). Further monitoring measurements are detailed in the following sections.

Table 19. Site Monitoring Components

Parameter	Method	Quantity	Frequency	Notes
Dimension	Riffle Cross Sections	14	Year 1, 2, 3, 5 and 7	1
	Pool Cross Sections	13		
Pattern	Pattern	All restored channels	Year 0	2
Profile	Longitudinal Profile	All restored channels	Year 0	
Surface Water Hydrology	Continuous Stage Recorder and/or Trail Camera	7 surface water gages	Semi-Annual	3
Groundwater Hydrology	Groundwater Gages	14 gages	Semi-Annual	
Vegetation	Fixed Plots	30	Year 1, 2, 3, 5 and 7	4
	Random Plots	26		

Parameter	Method	Quantity	Frequency	Notes
Invasive and Noxious Vegetation	Visual		Annual	5
Site Boundary	Visual		Annual	6
Reference Photos	Photographs	298	Annual	7

Notes:
1. Cross-sections will be permanently marked with rebar to establish location. Surveys will include points measured at all breaks in slope, including top of bank, bankfull, edge of water, and thalweg.
2. Pattern and profile will be assessed visually during semi-annual site visits. Longitudinal profile will be collected during as-built baseline monitoring survey only, unless observations indicate lack of stability and profile survey is warranted in additional years.
3. Continuous stage recorders will be inspected quarterly to semi-annually, evidence of bankfull events will be documented with a photo when possible. Transducers will be set to record stage once every hour.
4. Both mobile and permanent vegetation plots will be utilized to evaluate the vegetation performance for the open areas planted. 2% of the open planted acreage will be monitored with permanent plots and mobile plots. Permanent vegetation monitoring plot assessments will follow CVS Level 2 protocols. Mobile vegetation monitoring plot assessments will document number of planted stems and species using a circular or 100m^2 square/rectangular plot. Planted shaded areas will be visually assessed.
5. Locations of exotic and nuisance vegetation will be mapped.
6. Locations of vegetation damage, boundary encroachments, etc. will be mapped.
7. Reference photos include: upstream and downstream photos at every cross-section, one photo at every surface water and groundwater gage, upstream and downstream photo at each easement break, and photos from all cardinal directions at each vegetation plot.

Table 20. Monitoring Schedule

Resource	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Streams	X	X	X		X		X
Wetlands	X	X	X	X	X	X	X
Vegetation	X	X	X		X		X
Visual Assessment	X	X	X	X	X	X	X
Report Submittal	X	X	X	X	X	X	X

10.0 ADAPTIVE MANAGEMENT PLAN

Adaptive management at the Site will include an Adaptive Management Remedial Action Plan (AMRAP), which will provide detailed steps to address how potential problems identified during project development will be resolved to ensure project success through the achievement of ecological performance standards. Routine maintenance should be expected, particularly in the first two years post-construction and may include the measures detailed in **Appendix I**. If the Site fails to achieve the defined performance standards, an AMRAP will be developed in coordination with NC DMS and the IRT. Remedial action required will be designed to achieve the success criteria previously specified and will include the identification and causes of the failure, actions to remedy the failure, schedule to implement the actions, and monitoring criteria. Most minor issues will be identified during annual post-construction monitoring and site inspections. Minor issues that requiring small scale corrective actions include supplemental planting and management of invasive species.

Anticipated project maintenance at the Site includes herbaceous vegetation control and addressing any areas that do not meet native woody species density due to seedling mortality during the first two years of establishment. Maintenance of groundwater gages and continuous stage recorders is anticipated during the post-construction monitoring period. The easement boundary will be marked by signage and will be monitored until project closeout. Identification of problems with project infrastructure during post-construction monitoring and site inspections will help address minor issues and help to prevent gaps in monitoring data.

Major issues discovered requiring large scale corrective measures include, but are not limited to, re-grading of the Site, repair, or reinstallation of stream structures, replanting more than 20% of the site to improve species composition or diversity, or the addition of additional stabilization structures. The AMRAP will follow Section 332.8(o)(9) of the 2008 Mitigation Rule.

Should issues arise during site monitoring and inspections that may affect project success and performance standards, NC DMS and the IRT will be notified of the need for an AMRAP. Once the plan has been prepared, the following actions will occur:

- USACE will be notified as required by NWP 27 general conditions
- NCDWR will be notified of Section 401 conditions, as necessary
- Performance standards, maintenance requirements, and monitoring requirements will be modified as required by USACE
- Obtain any additional required permits
- Submit the AMRAP for IRT review and approval
- Implement the AMRAP
- Provide NC DMS/IRT an as-built of remedial actions

11.0 LONG TERM MANAGEMENT PLAN

The site will be transferred to the NCDEQ Stewardship Program (or 3rd party if approved). This party shall serve as conservation easement holder and long-term steward for the property and will conduct periodic inspection of the site to ensure that restrictions required in the conservation easement are upheld. Funding will be supplied by the responsible party on a yearly basis until such time an endowment is established. The NCDEQ Stewardship Program is developing an endowment system within the non-reverting, interest- bearing Conservation Lands Conservation Fund Account. The use of funds from the Endowment Account will be governed by North Carolina General Statue GS 113A-232(d)(3). Interest gained by the endowment fund may be used for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable. The Stewardship Program will periodically install signage as needed to identify warranted boundary markings.

12.0 DETERMINATION OF CREDITS

The mitigation credits presented in **Table 1** and **Table 2** are projections based upon site soils, topography, stream characteristics, and existing and proposed hydrologic conditions and designs. Upon completion of the as-built survey, the project components and credits data will be revised, if necessary, with explanations of how and why any adjustments occurred. As-built stream linear footage will be based on surveyed stream center lines for credit calculations. Stream Restoration is requested at a ratio of 1:1, Stream Enhancement I is requested at a ratio of 1.5:1. Wetland Reestablishment is requested at a ratio of 1:1 and Wetland Rehabilitation is requested at a ratio of 1.5:1. No credits are being sought for Enhancement II, as the buffer area will not meet the 50-foot requirement on the right bank, and no credits are being sought for the enhancement of existing wetland areas. All proposed buffers meet, and in most cases exceed, the minimum 50-foot requirement for Piedmont streams. **Appendix J** contains a credit release schedule and financial assurance documentation is provided in **Appendix K**.

13.0 REFERENCES

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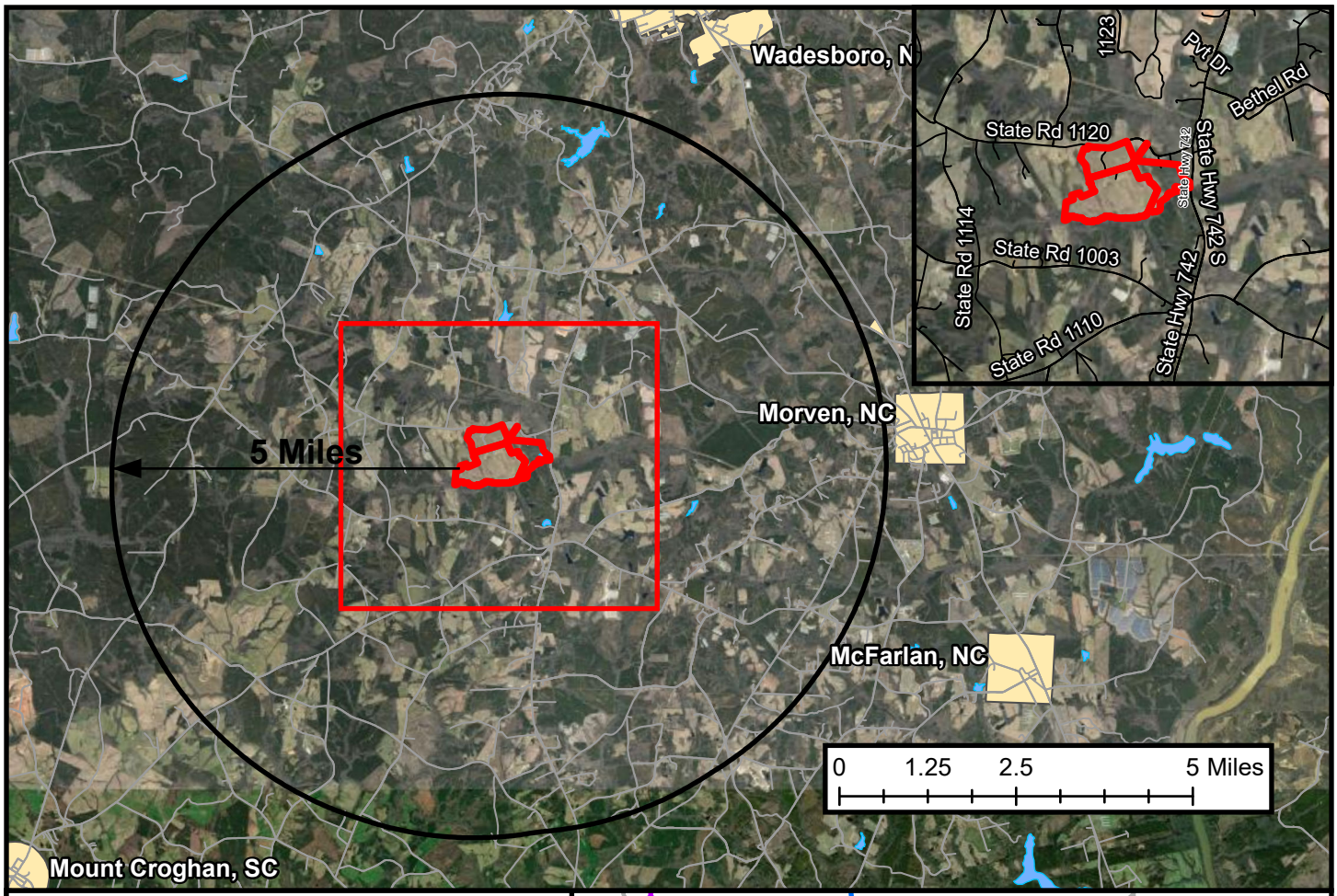

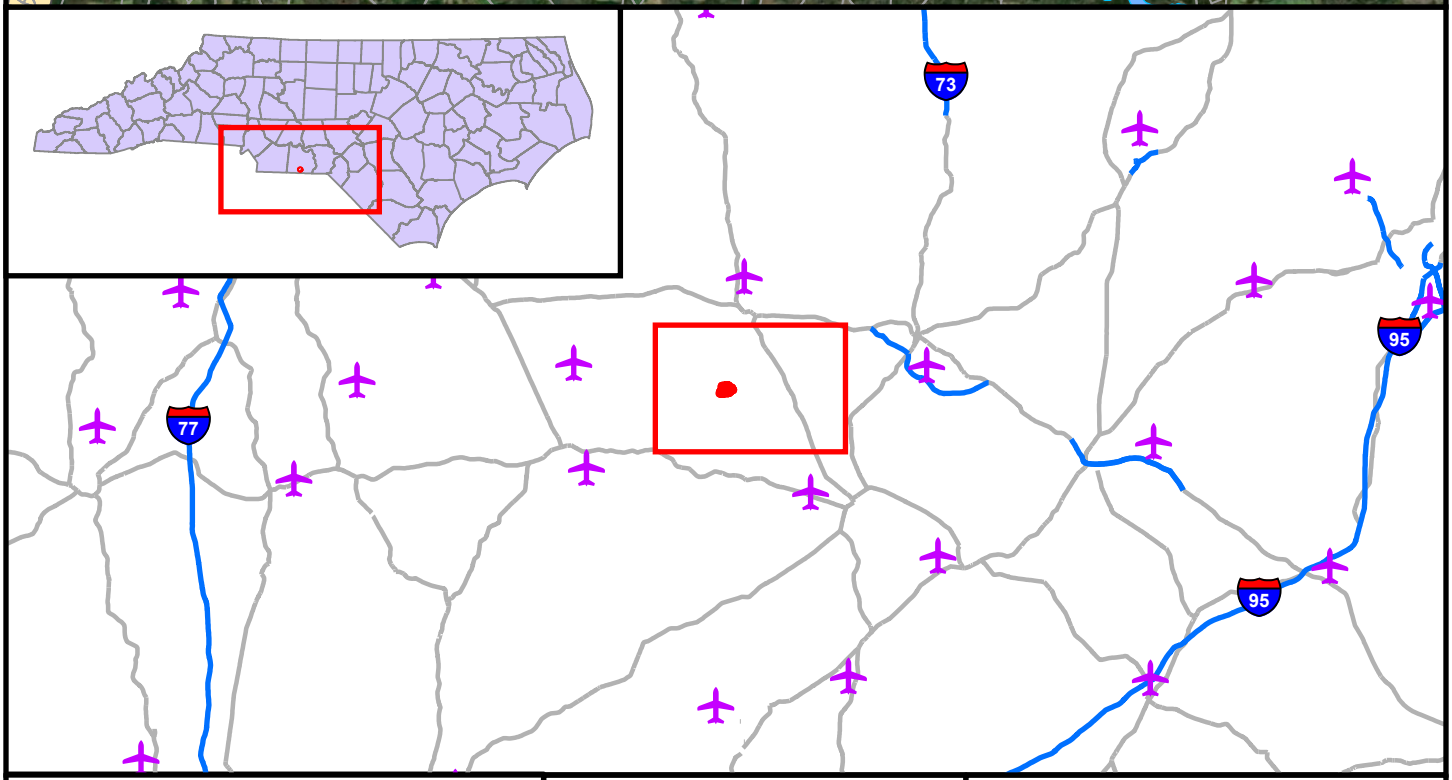

Legend

- Airports
- Project Site Tracts
- Project Area 5-mi Buffer
- NHD Waterbody
- Populated Places

FREESE AND NICHOLS
531 N Liberty St
Winston-Salem, NC 27101

Figure 1
Middendorf Springs Mitigation Project
Vicinity Map
NCDMS Project #: 100151

N

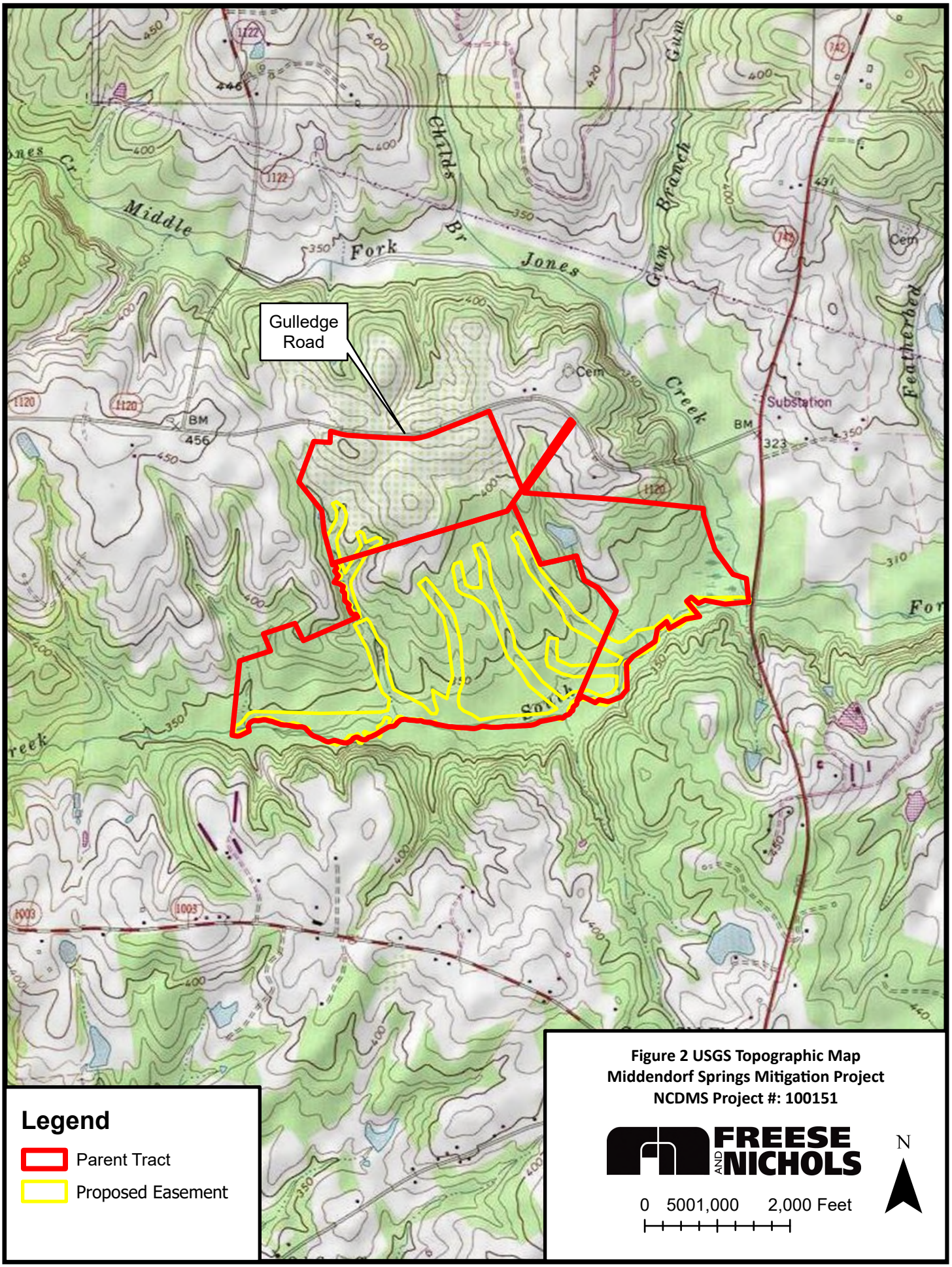

Figure 2 USGS Topographic Map
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

FREESE AND NICHOLS

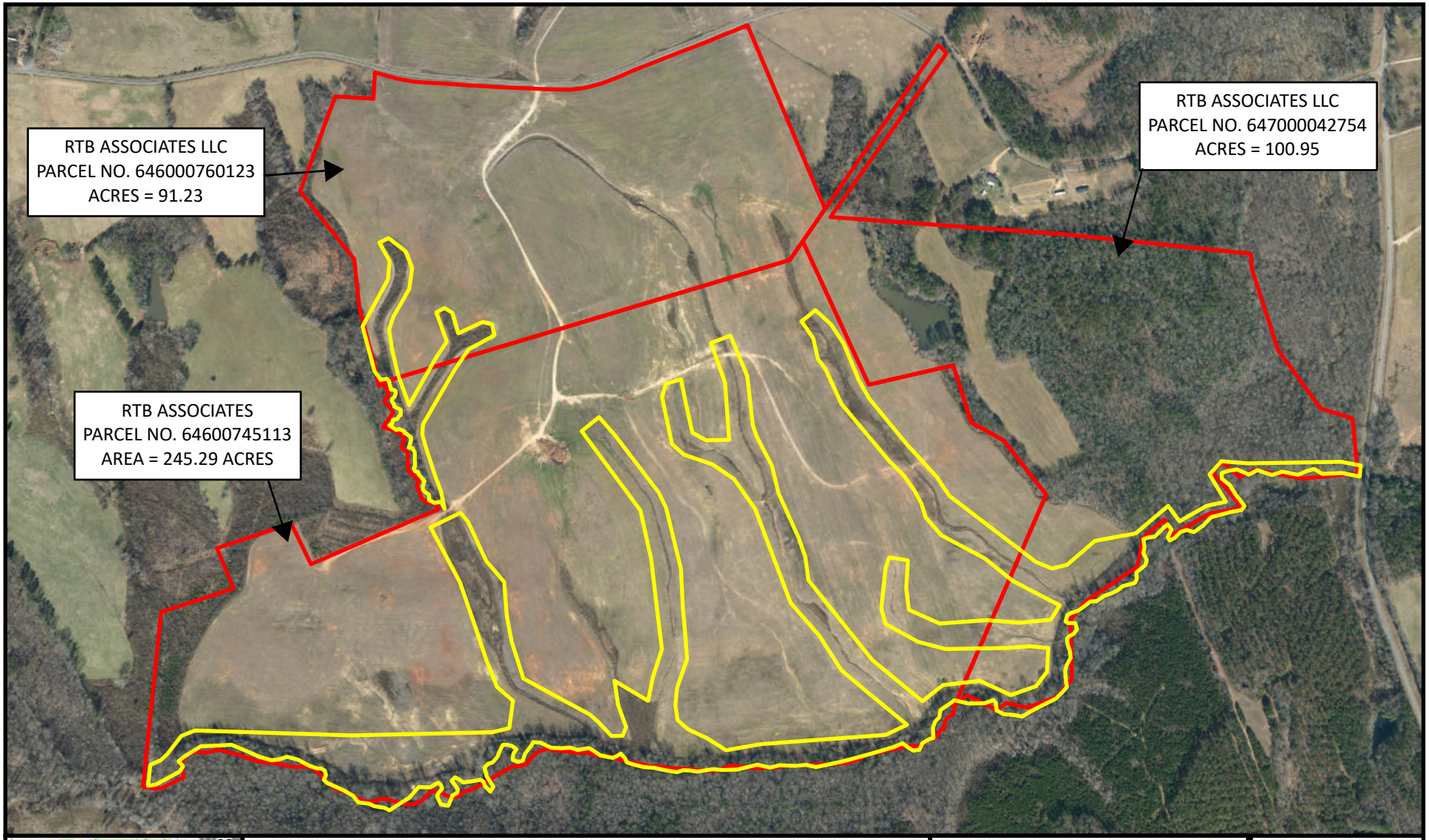

Figure 3 Landowner Map

Middendorf Springs Mitigation Project
Anson County, NC

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531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: http://www.co.anson.nc.us/252/GIS-Data-Downloads

Legend

- Parent Tract
- Proposed Easement

NCDMS Project #100151

N

0 0.05 0.1
Mi

0 395 790
Feet

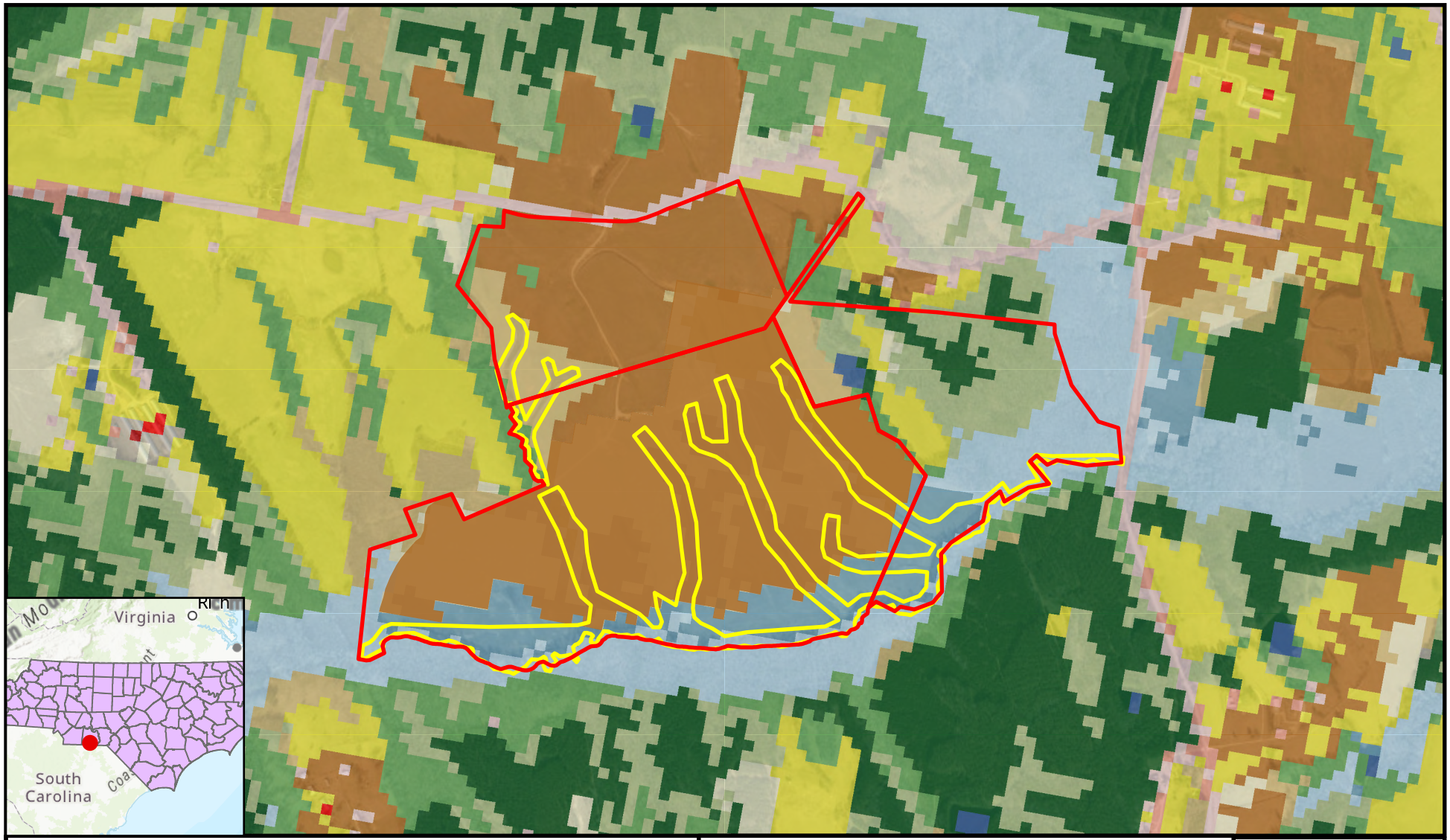

Figure 4 Land Use Map
Middendorf Springs Mitigation Project
Anson County, NC
NCDMS Project #:100151

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: www.mrlc.gov/data

Legend

- Parent Tract
- Proposed Easement

NC Land Cover

- Unclassified
- Open Water
- Perennial Snow/Ice
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands
- Cultivated Crop Poly

N

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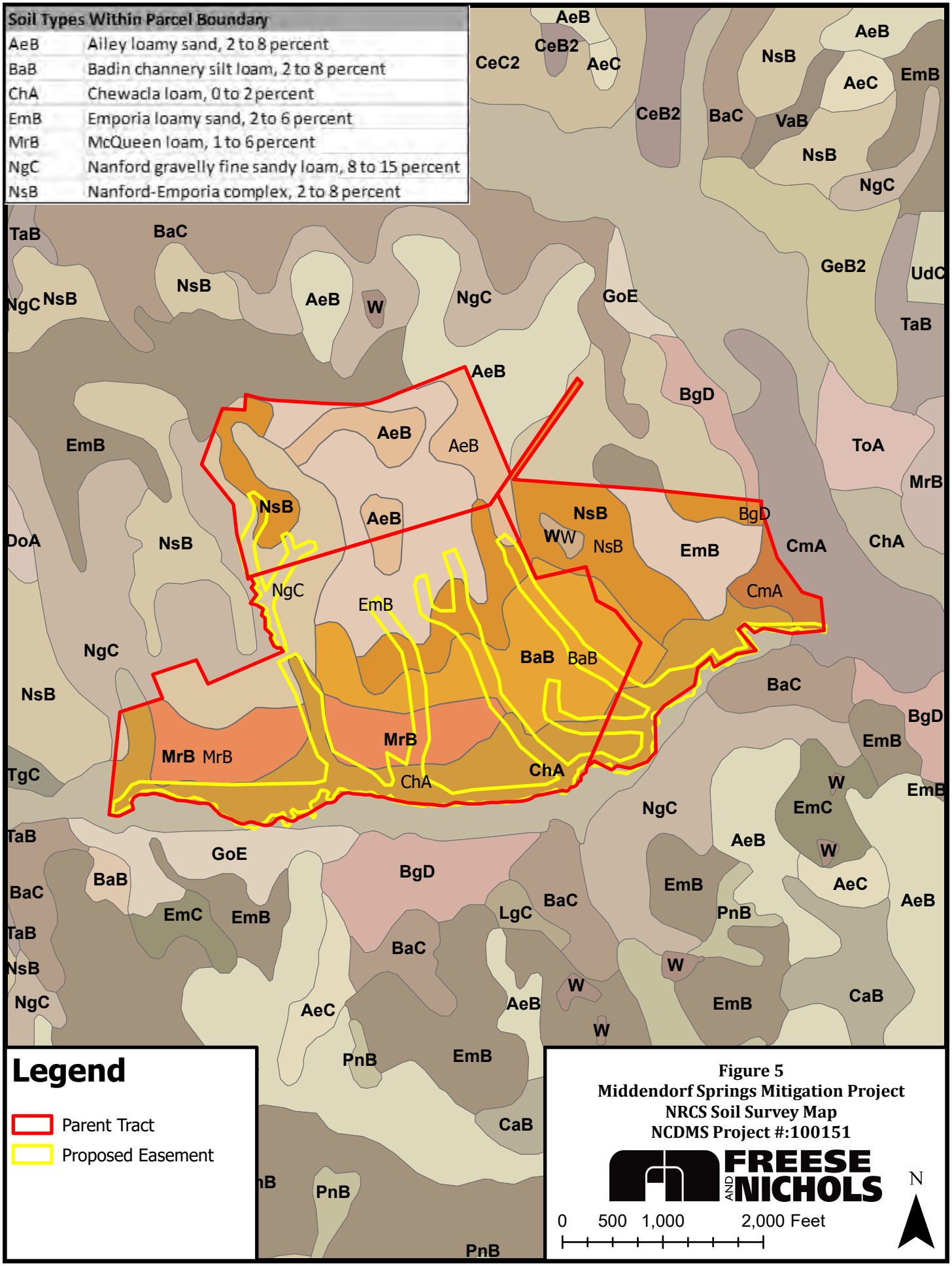
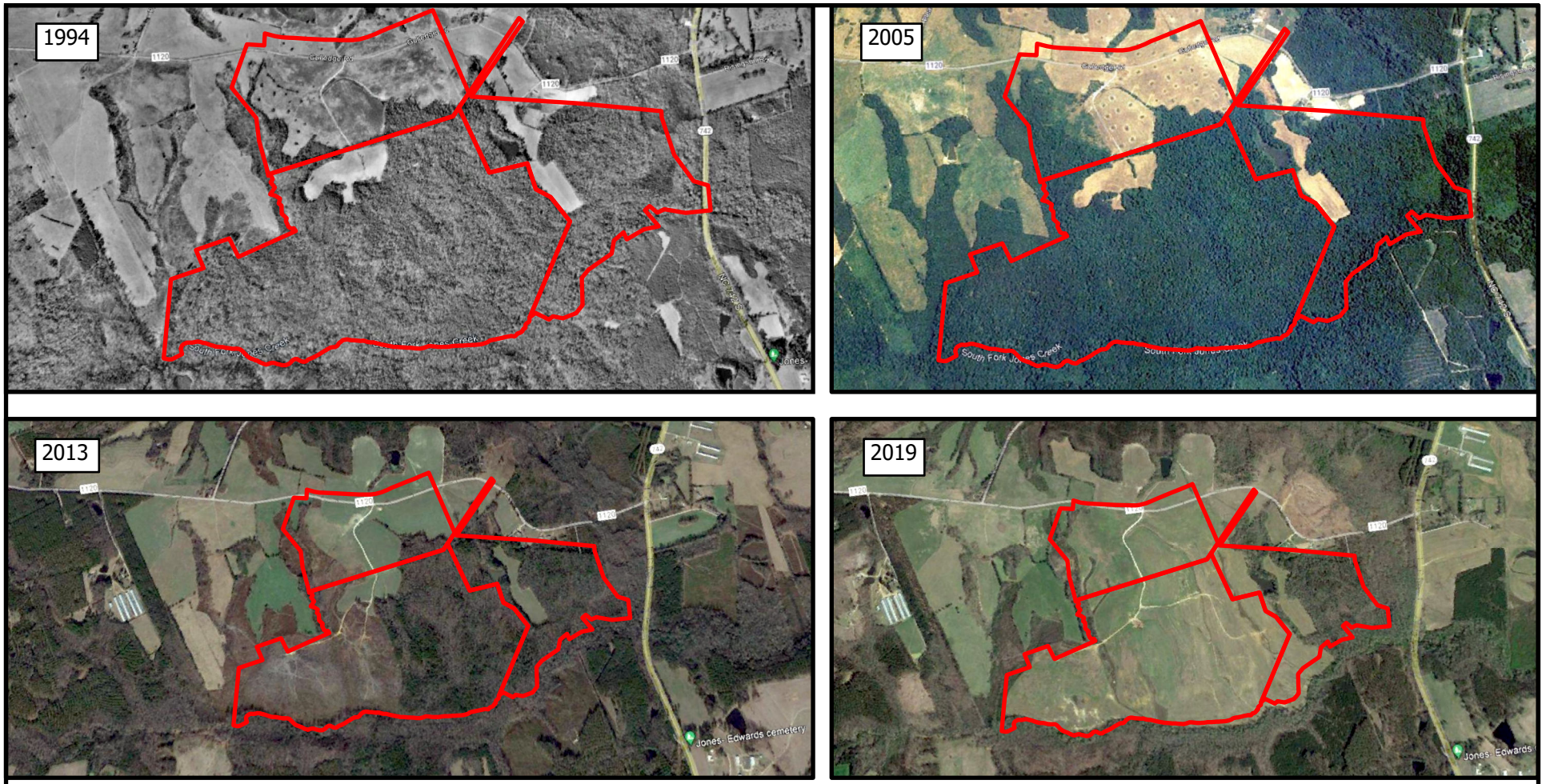
Mi

0 500 1,000
Feet


Soil Types Within Parcel Boundary
AeB Ailey loamy sand, 2 to 8 percent
BaB Badin channery silt loam, 2 to 8 percent
ChA Chewacla loam, 0 to 2 percent
EmB Emporia loamy sand, 2 to 6 percent
MrB McQueen loam, 1 to 6 percent
NgC Nanford gravelly fine sandy loam, 8 to 15 percent
NsB Nanford-Emporia complex, 2 to 8 percent
Legend
Parent Tract
Proposed Easement
Figure 5
Middendorf Springs Mitigation Project
NRCS Soil Survey Map
NCDMS Project #:100151
FREESE AND NICHOLS
N
0 500 1,000 2,000 Feet



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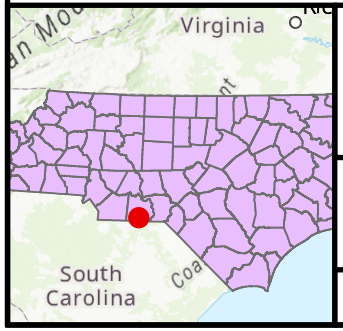


Figure 6 Historical Aerials Map

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

NCDMS Project #: 100151

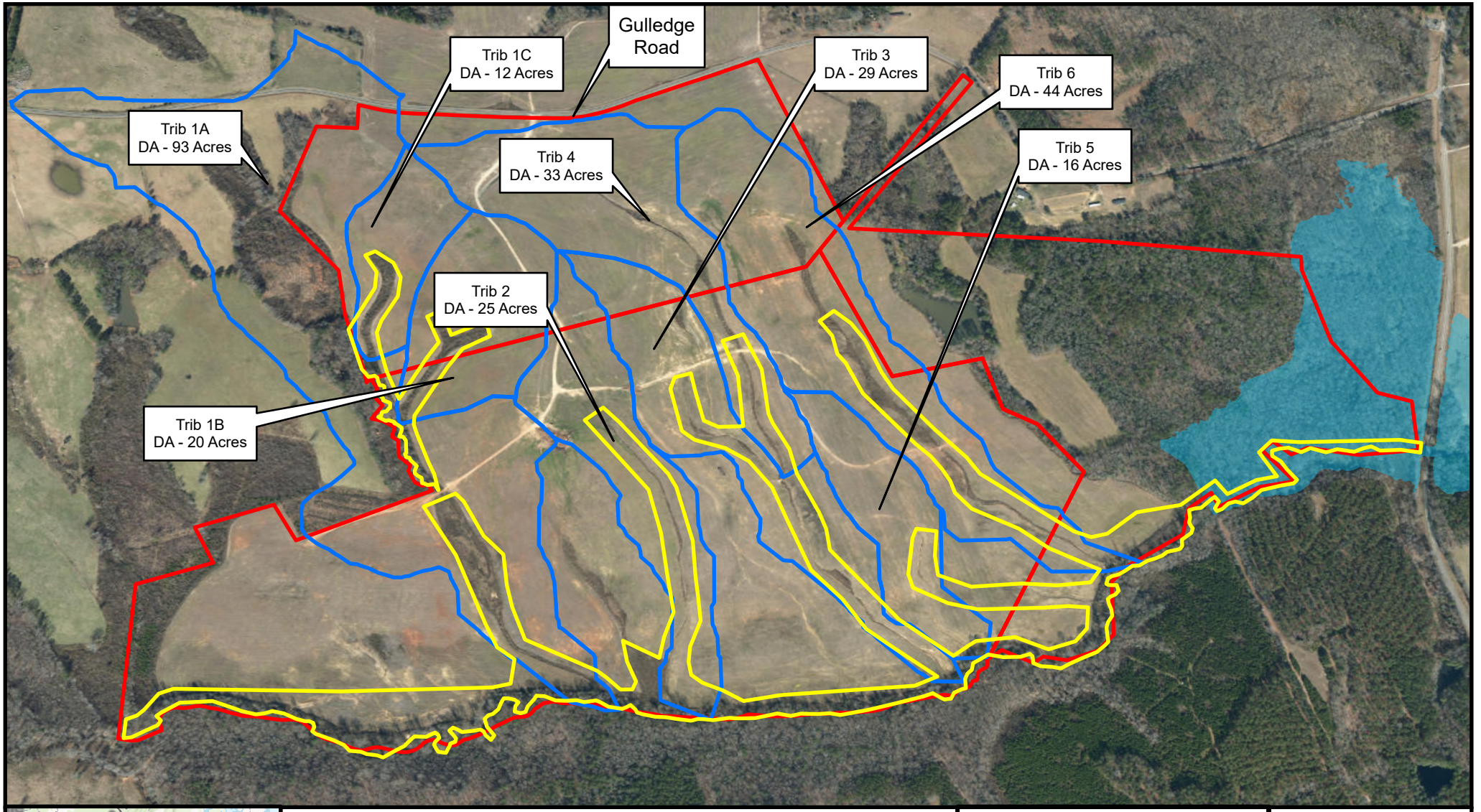
Legend

Parent Tract

N

0 0.25 0.5
Mi

0 1,500 3,000
Feet



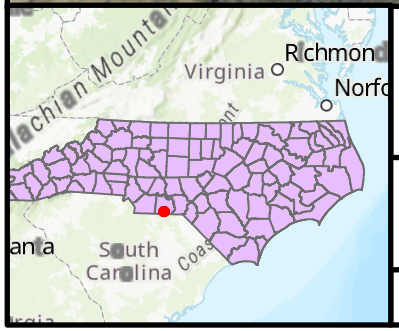


Figure 7 Drainage Area Map

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: fris.nc.gov

Legend

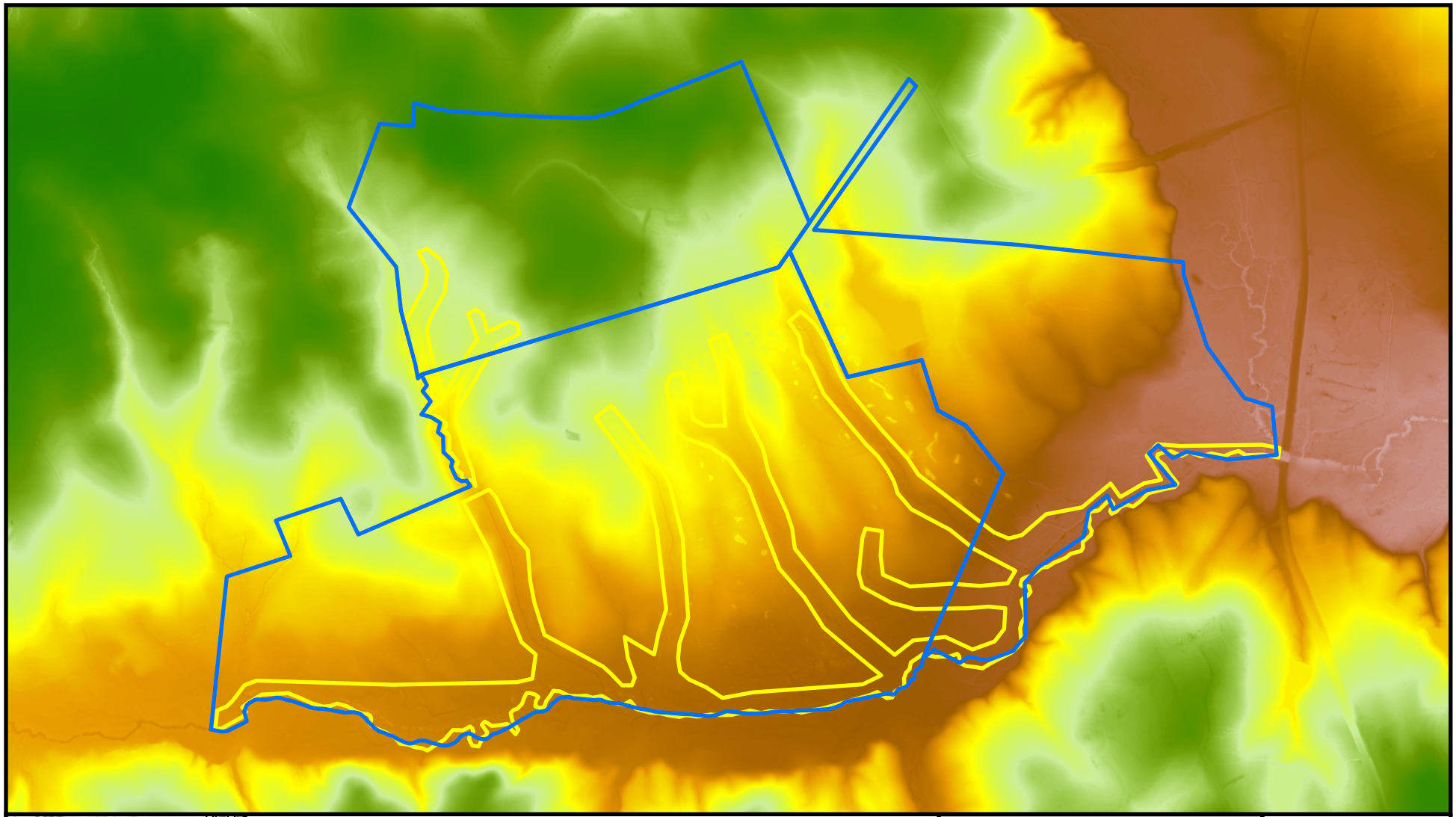
- Parent Tract
- 1% Annual Chance Flood Hazard
- Tributary Catchments
- Proposed Easement

NCDMS Project #: 100151

N

0 0.07 0.14
Mi

0 480 960
Feet



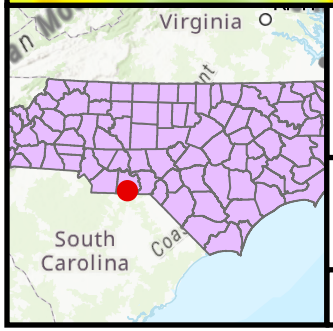


Figure 8 LiDAR Map

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: https://sdd.nc.gov/ NCDMS Project #: 100151

Legend

Parent Tract

Proposed Easement

LiDAR

Elevation (feet)

550

277

N

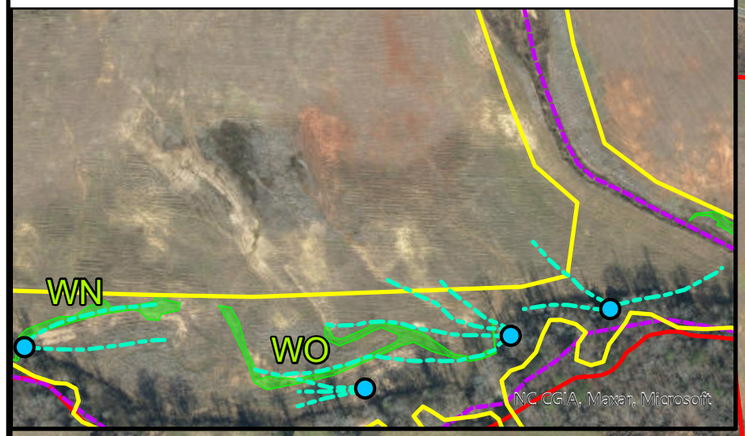
0 0.1 0.2

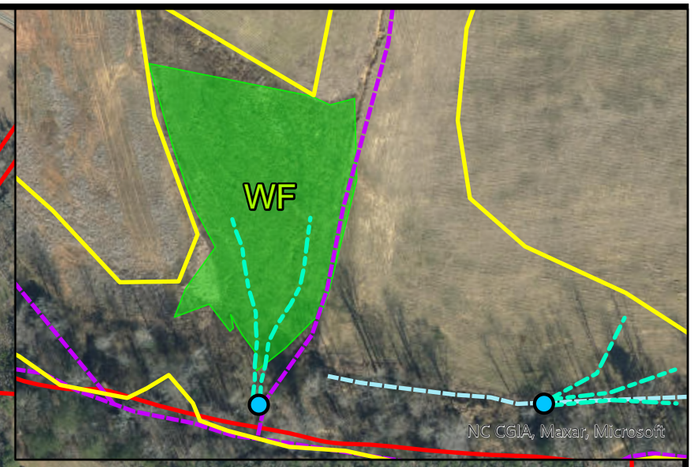
Mi

0 500 1,000

Feet

Locations of drainage tiles are approximated/reconstructed based on field evidence and discussions with Landowner





Gulledge Road

Existing Headcut

Existing Tributary 4

Existing 24in RCP

Existing Headcut

WB

XS 12

WA

Existing Tributary 1C

WD

WC

XS 11

Existing Tributary 3

WS

XS 8

WR

Existing Tributary 1B

WK

WJ

XS 7

WW

Existing Groundwater Seep

WL

WV

Existing Tributary 6

WH

Existing 24in RCP

WU

Existing 60in RCP

Existing Tributary 2

XS 3

WT

XS 1

XS 2

XS 9

WE

Existing Headcut

Existing Tributary 5

Existing ditch to be plugged and filled

Series of Existing Headcuts

WM

WI

Existing Drainage Tiles and Ditch (see left Inset)

Existing Tributary 1A

XS 10

XS 6

XS 4

WG

Existing Ditch

WP

XS 5

WF

WN

WO

Existing Drainage Tiles and Ditches (see right Inset)

Existing South Fork Jones Creek

Legend

- Parent Tracts
- Proposed Easement
- Existing Wetlands
- Drainage Tiles
- Tile/Ditch Outlet
- Stream Form Locations
- XS Locations

Stream Type

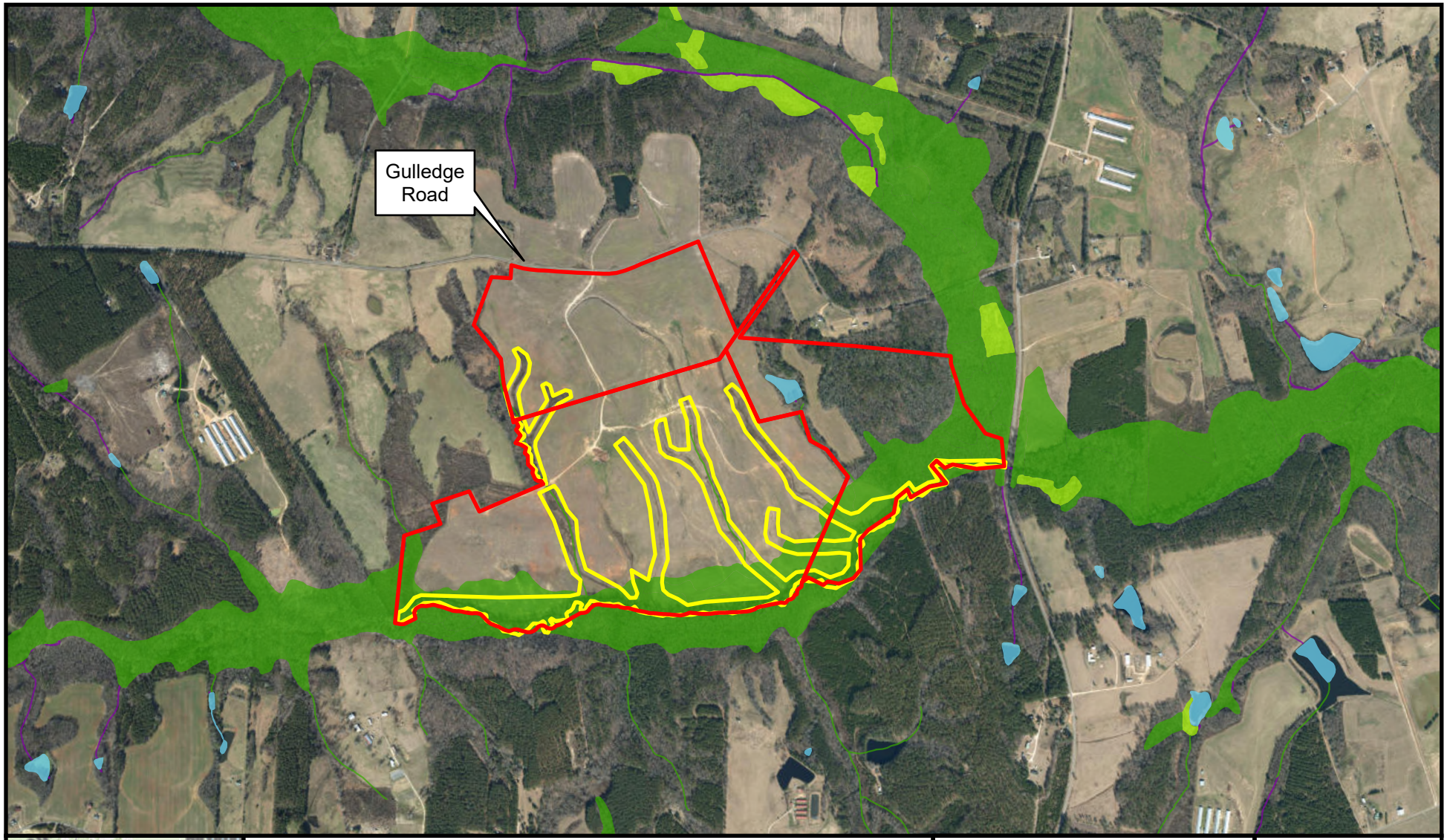
- Intermittent Stream
- Existing Ditch
- Perennial Stream

Figure 9 Existing Conditions Map
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

FREESE AND NICHOLS

N

0 245 490 980 Feet



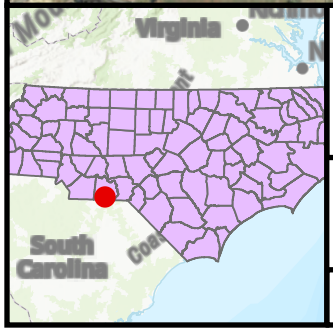


Figure 10 National Wetlands Inventory Map

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: www.fws.gov

NCDMS Project #: 100151

Legend

- Parent Tracts
- Proposed Easement

Wetland Type

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

N

0 0.15 0.3
Mi

0 500 1,000
Feet

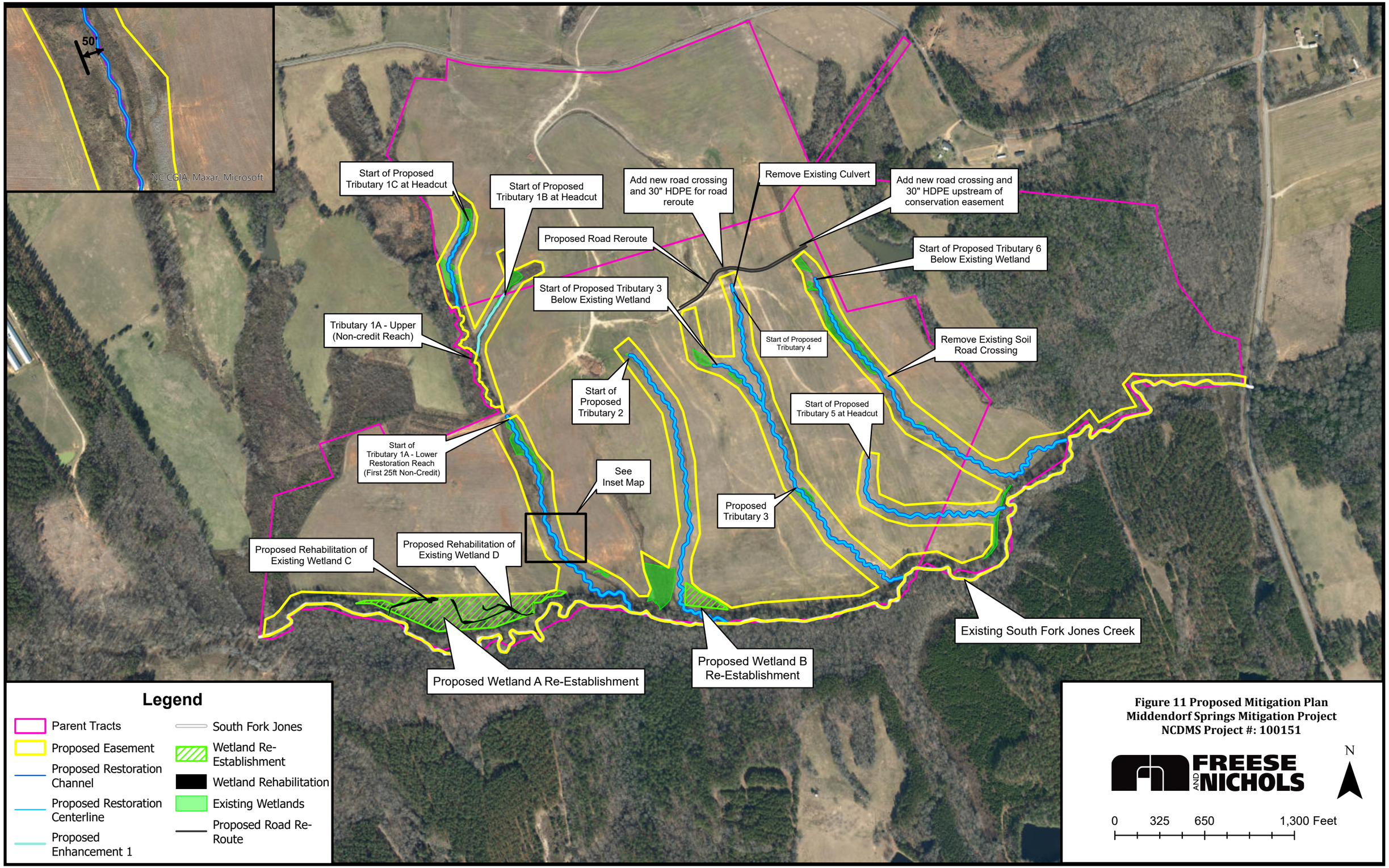


Figure 11 Proposed Mitigation Plan
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

FREESE AND NICHOLS

Photographs: Fixed image locations will exist at each cross section, vegetation plot, stage recorder, groundwater well, and easement break.

Vegetation plots: Each vegetation plot will be 100 square meters. In addition to the 30 fixed plots, there will be 26 random vegetation plots, for a total of 56 plots utilized for vegetative success. Random plots will be vary in location from year to year.

Total Planted Area: 59.07 Acres

Tributary 1C
Tributary 1B
Tributary 1A - Upper (Non-credit Reach)
Tributary 1A - Lower
Tributary 2
Tributary 3
Tributary 4
Tributary 5
Tributary 6
Wetland A
Wetland B
Wetland C
Wetland D
WA
WB
WC
WD
WE
WF
WG
WH
WI
WJ
WK
WL
WM
WN
WO
WP
WR
WS
WT
WU
WV
WW

Legend

- Proposed Easement
- Weather Station
- Groundwater Gauge
- Continuous Stage Recorder and Game Camera
- Vegetation Plot-Random
- Vegetation Plot - Fixed
- Culvert Photo Point Locations
- Permanent Monumented Cross Sections
- Wetland Re-Establishment
- Wetland Rehabilitation
- Proposed Enhancement 1
- Proposed Restoration Centerline
- Proposed Restoration Channel
- Existing Tributary 1A - Upper
- Existing Wetlands

Figure 12 Proposed Monitoring Plan
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

FREESE AND NICHOLS

N

0 237.5 475 950 Feet

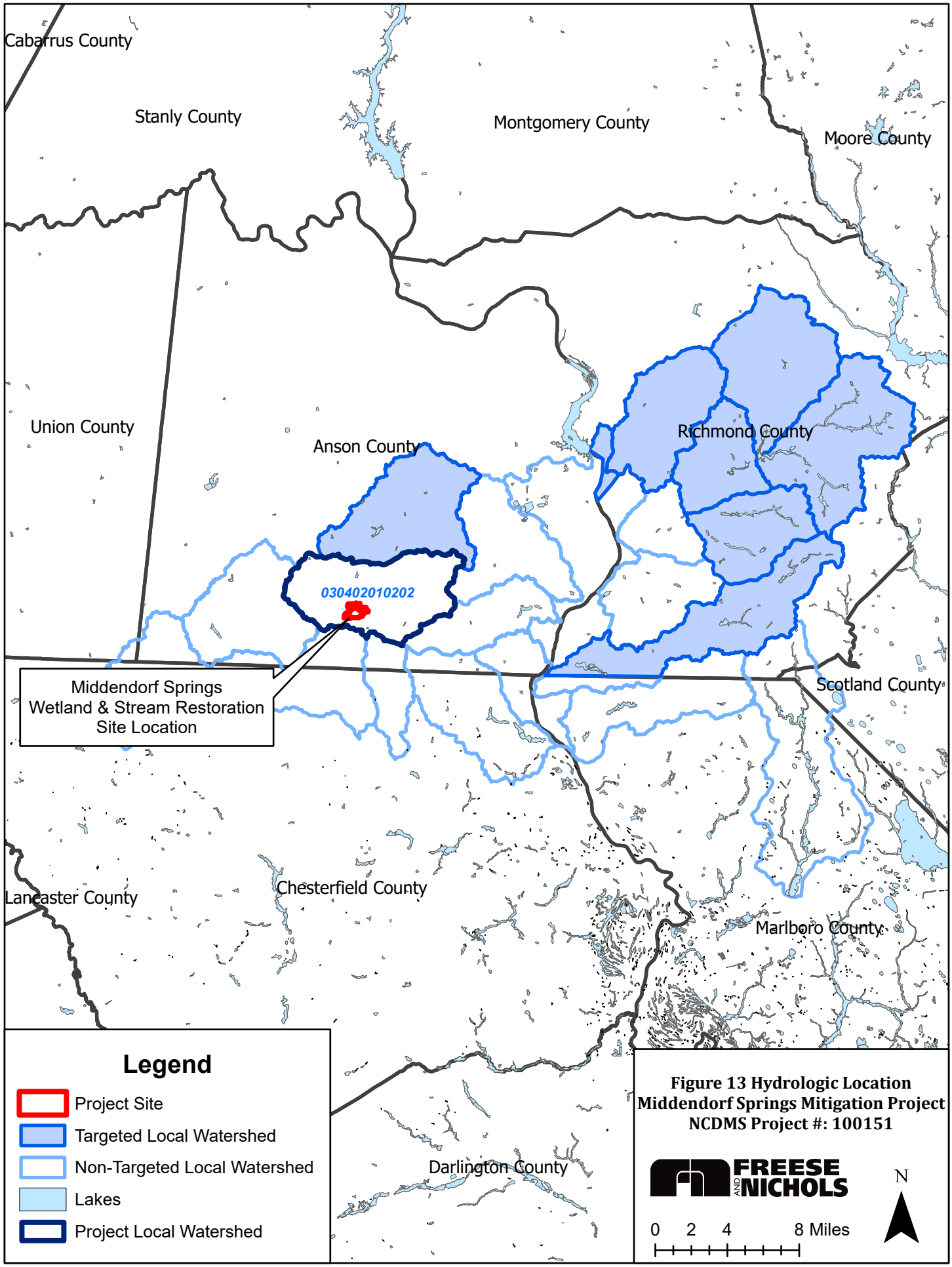
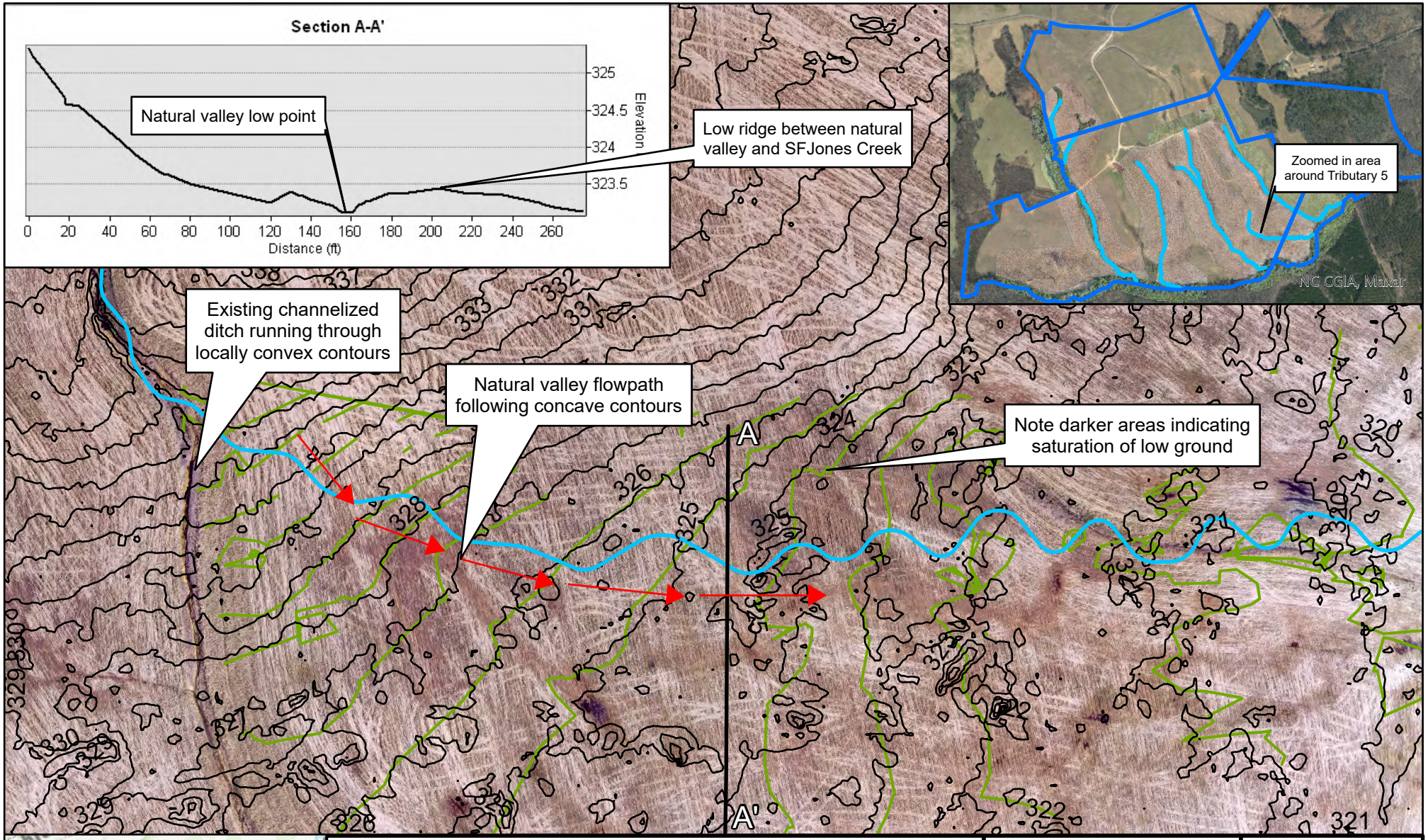


Figure 13 Hydrologic Location
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

FREESE AND NICHOLS



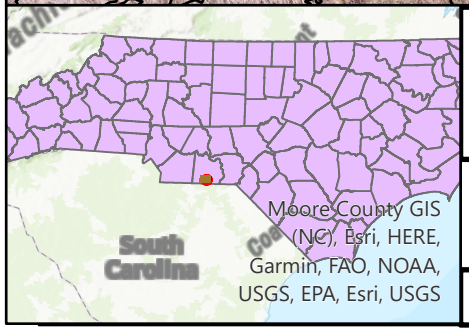


Figure 14 - Tributary 5 Contour Analysis

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St

Winston-Salem, NC 27101

NCDMS Project #: 100151

Legend

- Proposed Tributary 5 Alignment
- 1ft Contours
- Tributary 5 Survey Contours
- Profile

N

0 40 80

Feet

Figure 15 Existing Wetlands Impact Map
Middendorf Springs Mitigation Project
NCDMS Project #: 100151

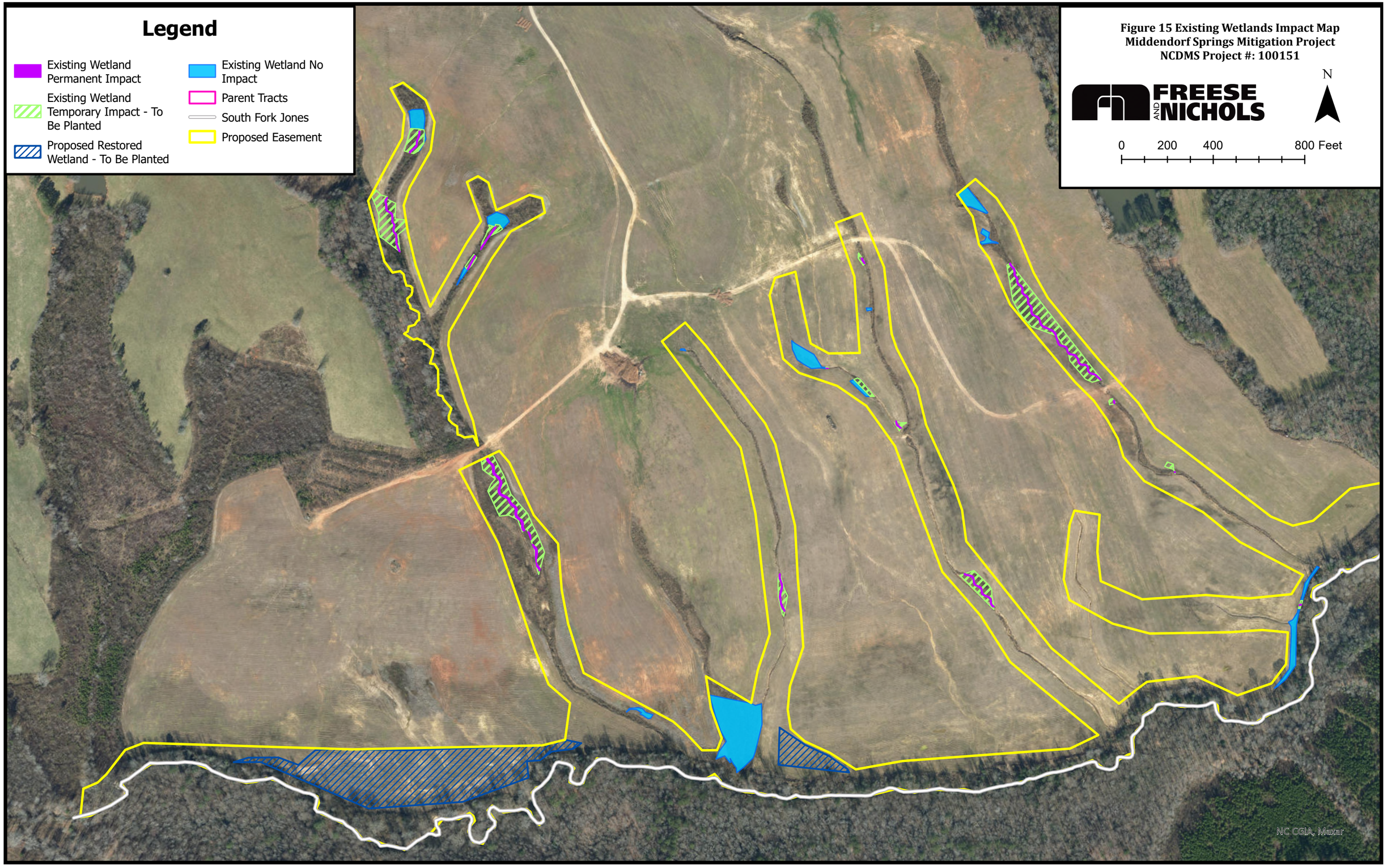
FREESE AND NICHOLS

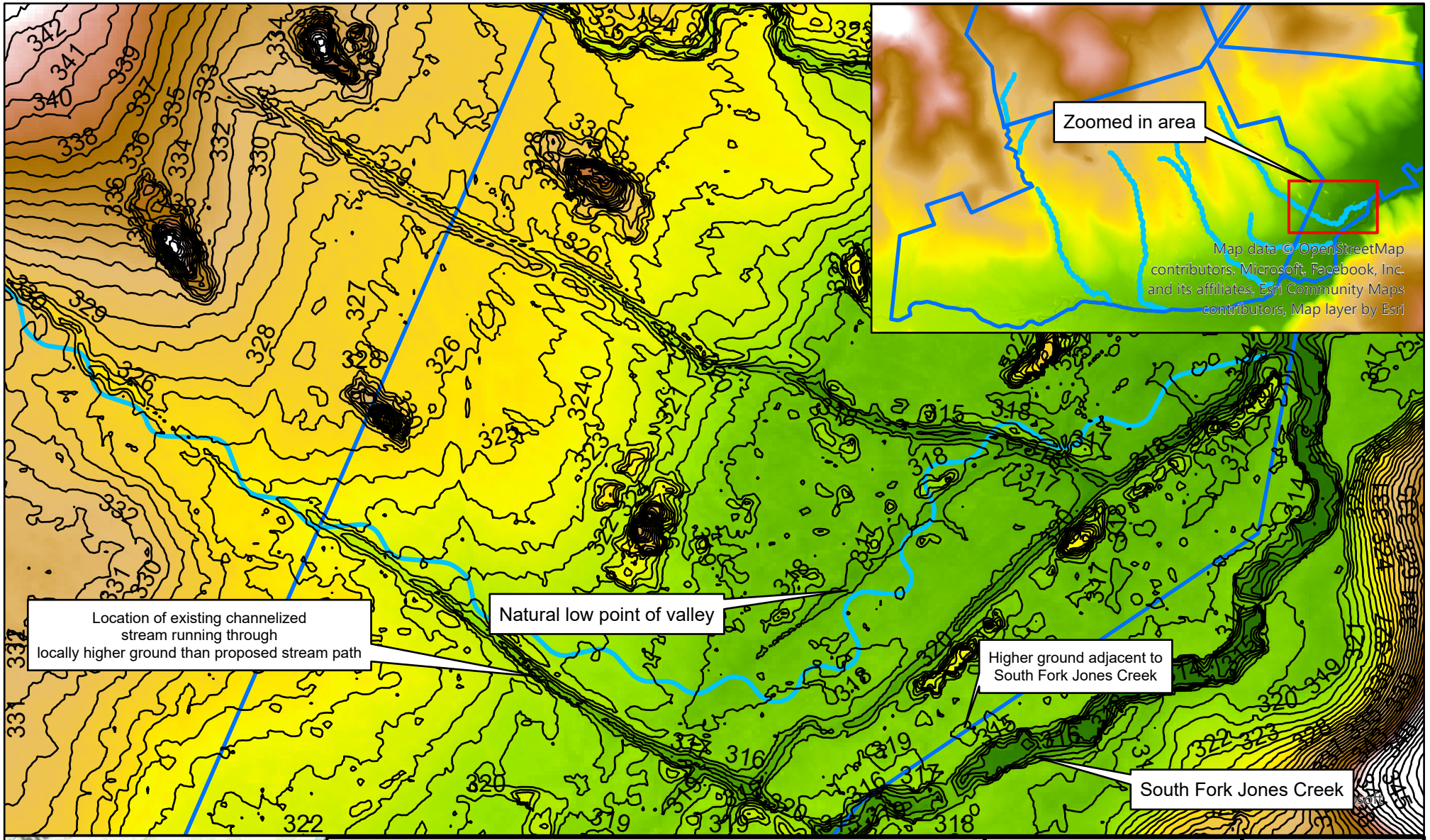
N

0 200 400 800 Feet

Legend

- Existing Wetland Permanent Impact
- Existing Wetland Temporary Impact - To Be Planted
- Proposed Restored Wetland - To Be Planted
- Existing Wetland No Impact
- Parent Tracts
- South Fork Jones
- Proposed Easement





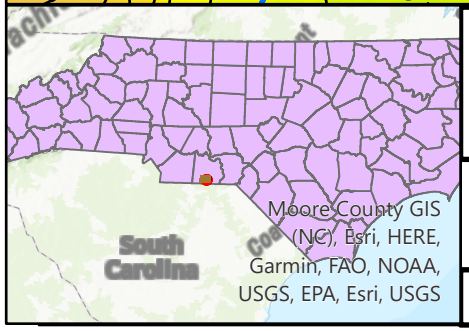


Figure 16 - Tributary 6 LiDAR Analysis

Middendorf Springs Mitigation Project

Anson County, NC

FREESE AND NICHOLS

531 N. Liberty St
Winston-Salem, NC 27101

Data Retrieved From: https://sdd.nc.gov/sdd/ NCDMS Project #: 100151

Legend

- 1ft Contours
- Proposed Tributary 6 Alignment
- Parent Tract

LiDAR

Elevation (feet)

High: 565

Low: 275

N

0 40 80

Feet

Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Appendix A

IRT Meeting Minutes

MEETING MINUTES

Innovative approaches
Practical results
Outstanding service

PROJECT:	Middendorf Springs Stream and Wetland Mitigation Site
NAME OF MEETING:	Post-Contract IRT Site Visit
RECORDED BY:	Ian Jewell, Bryan Dick
DATE:	June 8, 2020
LOCATION:	Middendorf Springs Site, Anson County, NC
ATTENDEES:	Todd Tugwell (USACE), Erin Davis (NCDEQ-DWR), Travis Wilson (NCWRC), Olivia Munzer (NCWRC), Pau Wiesner (NCDEQ- DMS), Matthew Reid (NCDEQ-DMS), Kelly Phillips (NCDEQ- DMS), Bryan Dick (FNI), Ian Jewell (FNI)

The following reflects our understanding of the items discussed during the subject meeting.

ITEM	DESCRIPTION
1.	DMS started with introductions and overarching description of site.
2.	FNI provided detailed overview of site, including description of underlying geology. Noted that the site sits at the intersection of sandhills Middendorf formation and slate belt meta-argillite formation, which is hypothesized to be the cause of numerous springs and seeps on site and presence of perennial flow in relatively small headwater streams. Option B in proposal is selected Option, which represents 13,000 stream mitigation units and 5 riparian wetland mitigation units. Described current impairment and impacts to streams and water quality.
3.	DMS opened up discussion to general questions before site tour began.
4.	NCDWR asked why one option listed restoration for all streams while another option listed enhancement for all streams. If enhancement is possible why restore? FNI indicated that the restoration approach to the streams was considered the best approach for full ecological uplift of the site, due to current level of degradation. Enhancement option was provided because it was uncertain whether IRT would agree with full need for restoration, so the option was given to provide flexibility in viewpoints. However, FNI believes based on its best scientific judgement and analysis of current conditions, that restoration on all reaches (with exception of Tributary 1B and 1C) is necessary.
5.	Question was asked by DWR as to why only one side of Tributary 1A(upper) was being proposed for protection in the Conservation Easement. Bryan responded because landowner only owns one side of the stream and because FNI wanted to provide connectivity between the restored reach of Tributary 1A(lower) and Tributary 1B and 1C. No credit is being proposed for the connecting reach on which only one side is available.
6.	USACE and NCDWR stated there was confusion in proposal about what the proposed wetland saturation/hydroperiod threshold would be for the project. In one place the proposal indicated 5% but the established threshold in the 2016 “Wilmington District Stream and Wetland Compensatory Mitigation Update” is 10% to 12% for Chewacla soils. FNI indicated that they intent is to follow the 2016 guidelines for the threshold, so the 5% is incorrect.

ITEM	DESCRIPTION
7.	Question was asked by DWR about the width and number of proposed crossings. They would like to only see one crossing and indicated that it must be less than the proposed 80'. They would like to see it get down to 30' to 40' in width. Bryan (FNI) explain that the crossing was made this wide due to past experience with farmers not being able to get large combine headers through a crossing without impact to conservation easement. However, FNI will discuss with landowners about reducing the width down to 40' to 60'.
8.	USACE indicated that they need to further investigate potential discharges of dredged and/or fill materials into Waters of the US, including wetlands and streams. Such discharges may be an unauthorized activity under Section 404 of the Clean Water Act (CWA). Information related to the site investigation has been forwarded to Scott Jones with the Asheville USACE office. They asked for contact information for the landowner. FNI will provide this.
9.	DWR indicated that they would like to see a buffer on South Fork Jones Creek if possible.
10.	For the sake of time, it was agreed that tour of the site would look at representative reaches and wetland areas rather than all streams on the site.
11.	Tour began at upstream end of Tributary 6. Based on review, USACE agreed that restoration approach could be justified here based on level of impairment. USACE asked about the transition from upstream where the tributary begins to the start of proposed restoration, and how the transition to a raised streambed would occur. FNI indicated that a flatter slope would be designed in the channel from the start of restoration until the Priority I elevation was achieved, which would require a short stretch of Priority II.
12.	DWR indicated that wood structures would be preferred. Bryan explained that wood sills would be the primary form of structure used for grade control and to create dynamic bedform in the channel.
13.	Tour continued to downstream end of Tributary 6. USACE noted that the flattening of the slope at the South Fork Jones Creek floodplain might create a challenge for maintaining a defined steam channel for the restored tributaries and may result in reduction of stream credits where the stream transitions into a wetland system. The relatively small watersheds and low slope within the South Fork Jones Creek floodplain may be problematic regarding sediment accumulation in the lower reach. It may be acceptable to maintain streams during the first few monitoring two monitoring years but should not be maintained after this time to allow for evidence of wetland conversion prior to project closeout. DWR asked if similar systems/reference systems could be examined across South Fork Jones Creek or elsewhere. Bryan indicated that there are likely similar systems nearby both in North and South Carolina and FNI will examine these during design for reference conditions. In addition, the ditches observed at the lower end of Tributary 6 and associated drain tiles may be a potentially unauthorized activity under Section 404 of the CWA.
14.	Tour continued upstream along Tributaries 5 and 4 and stopped at upstream end of Tributary 4b. Question was asked by DWR and NCWRC about why restoration started downstream of road when defined channel continues upstream of road. FNI explained that the channel upstream was dry when investigated in the fall of 2019 while the baseflow indicators seemed to start immediately below the road. USACE indicated a jurisdictional determination will be important to establish the origin point of jurisdictional status for all tributaries and help define appropriate starting point for restoration. USACE was concerned about impacts on restored channel if upstream channel left unprotected. DWR indicated that a wetland or marsh treatment could be used to help treat and filter nutrients prior to entering conservation easement and should be considered.

ITEM	DESCRIPTION
15.	Tour continued to upstream end of Tributary 1 and followed downstream to proposed wetland restoration area.
16.	Question was asked by USACE and DWR about widening the buffers due to numerous seeps and side springs adjacent to the stream. They would like to see buffer widened if possible.
17.	At proposed wetland restoration area, USACE indicated that they would like to see a buffer of the wetland, rather than wetland being the edge of the easement. Also should connect easement of wetland area to stream easement, rather than it being disconnected.
18.	USACE indicated that jurisdictional determination of wetlands on site will be needed to establish rehabilitation versus reestablishment approach to the wetland restoration. If significant impact is shown to wetland from tiling and draining and re-establishment is proposed, then will need gage data and establishment of water budget to show restoration of hydrology.
19.	DWR indicated that with rehabilitation, will need to see description of existing function and proposed function. Pre-construction function will need to be established with gage data. Any areas proposed for possible alternative wetland restoration areas would also need establishment of function through gages as well, so should install gages wherever we want to have option to propose wetland restoration.
20.	Todd with USACE indicated that he thought wetland restoration area would be majority 1:1 credit ratio however any wetland areas upstream of Tributaries 4 and 5 would be a lower credit ratio. USACE felt downstream wetland areas have a lot of potential for uplift.
21.	Tour continued to Tributaries 1B and 1C, which are upstream of Tributary 1A. After viewing these streams, USACE and DWR were concerned that Enhancement Level I wasn't fully justified for these reaches but indicated that FNI would need to provide good documentation and justification of proposed approach. USACE indicated that at tie-in point of Tributary 1B with Tributary 1A, 1B should not run parallel with 1A since this approach has created problems in the past. Both USACE and DWR indicated that minimal sinuosity would appropriate for these reaches.
22.	WRC asked where material to fill abandoned channels would come from. FNI indicated that material would be found on-site, primarily from areas lateral to the channel and from excavation of new channels. FNI will examine the fill and determine if it suitable for this use.
23.	DWR and WRC encourage monitoring of streamflow on site. USACE will require documentation of streamflow by gages or camera. WRC suggested using game cameras as a visual monitoring device for presence of baseflow. FNI indicated they had a couple of these at the site and would likely add more.

MEETING MINUTES

Innovative approaches
Practical results
Outstanding service

PROJECT:	Middendorf Springs Stream and Wetland Mitigation Site
NAME OF MEETING:	Middendorf Springs USACE/DMS/ Freese and Nichols Discussion of Project Next Steps following USACE Investigation
RECORDED BY:	Ian Jewell, Bryan Dick
DATE:	February 26, 2021
LOCATION:	Virtual Meeting
ATTENDEES:	Todd Tugwell (USACE), Scott Jones(USACE), Kim Browning (USACE), Casey Haywood (USACE), Paul Wiesner (NCDEQ- DMS), Matthew Reid (NCDEQ-DMS), Kelly Phillips (NCDEQ- DMS), Bryan Dick (FNI), Ian Jewell (FNI)

The following reflects our understanding of the items discussed during the subject meeting.

ITEM	DESCRIPTION
1.	Todd (USACE) began with update on results of their investigation: ○ USACE had meeting on site with the landowners. ○ USACE identified several unauthorized activities on the property: • Wetlands: ○ Landowners worked with NRCS, had worked with Forester. ○ It is not clear to USACE what NRCS had reviewed on site. ○ The Landowner's standpoint is they thought they had done what they needed to do with the wetlands on site. • Streams: ○ From USACE's review, the correspondence between landowners and NRCS didn't deal with streams as much as it did with wetlands. ○ USACE stated that if you straighten or ditch stream channels that requires a permit. ○ USACE didn't see anything in permit that gave landowner's permission to do what they did in the streams. ○ USACE reviewed all the tributaries and had the following findings: ▪ It was less clear that Tributaries 2, 3, 4 and 5 would have been jurisdictional prior to work on property. ▪ Looking at it from the standpoint of unauthorized activity: USACE wants to limit their remedial actions to tributaries that they can say were subject to their jurisdiction at the time of the activities.
2.	Todd stated that the way to move the project forward and to resolve a potential violation is to make remedial actions part of the mitigation project. Otherwise, it would be a lot more complicated to try to get the landowners to resolve it working with the USACE. ○ USACE's solution: adjust credit ratios to account for the impact that occurred. ○ FNI will need to go back and have conversation with landowner. Todd said that it is important that landowner knows they have to make some compromises.

ITEM	DESCRIPTION
	○ USACE wants to make this a viable project.
3.	USACE discussed potential adjustments for mitigation plan: **Streams:** ○ Reduced Credit Ratio on Tributary 1A lower and Tributary 6 ○ Tributaries 2, 3, 4 and 5 could still be considered to be viable as mitigation streams at the ratios that were originally proposed. **Wetlands:** ○ Todd stated that it is a little less clear that, because of past correspondence with NRCS, there is a violation with the wetlands, so it is hard to make an enforcement case. ○ It is possible to extend the buffer along South Fork Jones Creek to accommodate the additional wetland areas, this would be sufficient to address any clearing concerns within that area. ○ Within the buffer along the bottom- the buffer can come off the property line (centerline of South Fork Jones Creek) and be extended 50' off the bank and include the wetland areas on the project and connect the tributaries. ○ The buffer along South Fork Jones Creek should start west of Proposed Wetland 1 and continue along floodplain to Tributary 6. This would tie it in and make it a single complete buffer that would tie into South Fork Jones Creek. ○ USACE feels like there has to be an accounting for the clearing activity and that the reduced ratio addresses this. ○ USACE won't dictate a reduced ratio. They want FNI to discuss this with landowners and come back with a proposal for what reduction they would have.
4.	○ Todd stated that while the simplest approach to the streams is a credit reduction on Tributaries 1A lower and 6, there could also be a proposal that talks about widening buffer on the streams instead of a reduced credit ratio. ○ He stated that there needs to be meaningful change in ratio that accounts for change in function i.e., functional loss from landowner's activity versus uplift from the restoration.
5.	Paul (NCDMS) asked whether it would be possible to use the "buffer method" to expand buffer to get additional credit on site, so that is a way to equal the credit adjustment as well. Todd said he was fine with this: ○ Can use the buffer tool to resolve the difference in credit ratio. ○ However, if you proposed wider buffers, they would consider this regardless of the tool calculation results. ○ USACE said they like the idea of making wider buffer on Tributary 1A and on South Fork Jones Creek. ○ They believe there's a lot of value to protecting floodplain regardless of whether they are wetland, as well as protecting the extra wetland down there, so they would consider this is part of the package.
6.	Scott (USACE) said he wanted to re-emphasize what Todd said: based on what they looked at on site, there is a really great opportunity to grow wetlands along the floodplain and create uplift in those wetlands.

ITEM	DESCRIPTION
7.	Bryan (FNI) said he believes landowners will be amenable to a widened buffer on Tributary 1A lower, because of steep sandy soils on west bank and also with widened buffer on floodplain and widened valley flat of South Fork Jones Creek.
8.	Todd said one thing he will mention as part of the overall proposal is that having some type of BMP, such as a constructed wetland BMP, that starts at the top of these tributaries would also give a big benefit. o This would act as a sediment sink to help treat some of the agricultural runoff and herbicides etc.
9.	Paul mentioned that Kim said they (USACE) have a new buffer tool, as a heads up that FNI can use that tool.
10.	Paul said that, from a contract standpoint they can't re-negotiate the contracted cost per credit. FNI can come up with a adjusted contract value based on reduced total credits but can't propose a reduced cost per stream and wetland credit. Paul also stated that if FNI can't live with the adjustments, then they would have to kill the contract and put it back out to RFP.
11.	Paul said that the next step is for FNI to talk to the landowners, see where they stand, generate a proposal and then have a follow-up discussion.
12.	Todd said that DMS/FNI can email proposal to them for review, or they can have another call.
13.	FNI will put a proposal together, send it over to Paul and his team first, then they will work on setting up a follow-up meeting with Corps.
14.	Todd clarified that the IRT will not be involved in this proposal review since this is a violation resolution.
15.	Todd also stated that when we get to the mitigation plan development stage, FNI/DMS will need to spell out in the mitigation plan that there is a history to this site that involves past activities, and this needs to be taken into account and explained in the document.

MEMORANDUM

FREESE AND NICHOLS

Innovative approaches
Practical results
Outstanding service

531 N. Liberty St., + Winston-Salem, North Carolina 27101 + 336-790-6744 + FAX 817-735-7491 www.freese.com

TO: Todd Tugwell; Scott Jones (USACE)

CC: Paul Wiesner, Matthew Reid, Kelly Phillips (NCDEQ- Division of Mitigation Services)

FROM: Bryan Dick, PhD, PE, PH; Ian Jewell (Freese & Nichols, Inc.)

SUBJECT: Proposed Revisions to Middendorf Springs Stream and Wetland Restoration Site in response to Unauthorized Activities

DATE: 4/23/2021

PROJECT: Middendorf Springs Stream and Wetland Restoration (DMS Project # 100151)

The purpose of this brief memorandum is to outline proposed revisions to the Middendorf Springs Stream and Wetland Restoration site concept originally presented in a proposal to NC Division of Mitigation Services (NCDMS) on November 4, 2019 and reviewed by the Interagency Review Team (IRT) at a site meeting on June 8, 2020. In an investigation conducted by the USACE following the IRT site meeting, the USACE believes that unauthorized activities by the landowner had occurred in relation to the stream channels on the site. At a meeting between USACE, NCDMS and FNI on February 26, 2021, the USACE requested that FNI meet with the landowners to discuss potential modifications to the concept that would provide increased uplift of the site to compensate for the drop in uplift from alleged unauthorized activities. Specifically, the USACE stated that a reduced credit ratio could be proposed on Tributaries 1A Lower and Tributary 6 or, alternatively, a combination of widened buffers, buffering along South Fork Jones Creek as well as other improvements to the site could be used to provide the ecological uplift needed to offset impacts to ecological function as a result of alleged unauthorized activities by the landowners.

After having met with the landowners and evaluating potential for uplift from various activities, FNI proposes the following modifications to the proposed restoration based on landowner concessions. These modifications can also be seen on Exhibit 1, attached. It should be noted that the concessions made below are not an admission of liability or agreement by the landowners with the findings of the USACE that impacts were not authorized. Rather, the landowners agree that making substantial concessions as outlined below is in the greatest interest of all parties:

1. A minimum 50’ wide buffer will be established along the entire length of South Fork Jones Creek through the landowner’s property for a distance of approximately 8,500 feet, ending in the east at NC Highway 742. This will be included in the proposed conservation easement.
    - The buffer will extend from the top of bank of South Fork Jones Creek, to be confirmed by site survey (approximate location shown on Exhibit 1).
    - This buffer will provide protection of one side of this large stream as well as create a wildlife corridor through the property connected with the other easement areas.
    - This will also protect large swaths of hydric soils along the floodplain which will be planted along with the other wetland restoration areas originally proposed.
    - A perimeter ditch that runs alongside the edge of the property will be plugged to restore hydrology to this area.

- Since additional areas of buffer along South Fork Jones Creek are protected as part of this corrective action and not considered as credit-generating, we would propose these areas follow the normal visual and qualitative monitoring protocols of a typical restoration in response to a Notice of Violation (NOV), rather than the full monitoring protocols outlined in the 2016 Mitigation Guidelines from the Wilmington District.
- Similarly, we propose to treat the non-credit portions of the South Fork Jones Creek buffer with one round of invasive treatment and management of hardwoods. These areas would be delineated from the credit-generating portions of the buffer in the mitigation plan.

2. A buffer will also be established around the proposed wetland cell to the west of Tributary 1, in order to provide increased protection of the large area of hydric soils present in that area and provide greater uplift overall to the riparian wetland restoration cell.
3. Portions of the conservation easement of Tributary 1A- Lower will be widened above what was originally proposed to protect several large seeps and hillside areas. Specifically, the western side of Tributary 1 will be widened to approximately 110 feet from proposed top of bank of the restored stream while the eastern side will be widened by approximately 68 feet (from originally proposed 55 feet) to encompass a large seep (labeled "Seep 1" on attached Exhibit 1).
4. Portions of Tributary 3 will also be widened to encompass a large Seep ("Seep 2" on Exhibit 1) which will provide enhanced protection of the seep habitats present on the site. These areas will be planted with appropriate wetland vegetation to provide functional uplift of these areas.
5. Upstream of Tributary 4, a wetland stormwater control measure (SCM) will be constructed to help filter nutrients and sediment prior to entering the restoration reach. This SCM will be located inside the easement. This device was discussed at both he IRT site visit on June 8 and at the February 26 meeting. In addition, the existing crossing at the head of Tributary 4 will be replaced with an improved culvert crossing and the crossing will be moved upstream of the easement.
6. A large seep ("Seep 3") will be protected within the easement of Tributary 5. It should be noted that, on Exhibit 1, Tributary 5 is show in a different route than originally proposed. This is because further site analysis has revealed that the low point of the valley of Tributary 5 runs east rather than south, thus running the restored channel along this alignment will create increased uplift for the floodplain area of South Fork Jones Creek and the restored Tributary 5, while also allowing protection of Seep 3.
7. Tributary 6 will have some areas of widened buffer to protect small seeps and springs. In addition, the originally proposed crossing, which was located mid-way down the proposed alignment, will be eliminated and moved instead to upstream of the easement. In this way, there will be no breaks in the easement. The proposed alignment of Tributary 6 has also been modified slightly at the bottom to run along the low point of the valley, which was determined through further analysis since the IRT site meeting.

A summary of these proposed modifications is included in **Table 1** along with an approximate quantification of the potential uplift from these changes. In addition, the original mitigation credit table as originally proposed for "Option B" is included in **Table 2** for reference and a revised mitigation credit is shown in **Table 3**. The modifications to the proposed concept of the site, as listed above, presents a large amount of concession from the landowners to provide uplift the site as an offset to any unauthorized activity. In total, the landowners will be offering approximately 20 acres of additional easement to provide uplift to the site. The items outlined above were specifically discussed during the February 26 meeting as an alternative to a reduced credit ratio on Tributaries 1A lower and Tributary 6. Specifically, the protection of large swaths of the floodplain of South Fork Jones Creek will provide protection of areas of hydric soils and will provide a continuous wildlife corridor throughout the site. In addition, widening of buffers on the site to protect seeps and springs will help with overall uplift. We believe this proposal provides a level

of uplift that more than compensates for any decrease in function on the site due to unauthorized activities and will provide a greatly enhanced project overall.

Table 1. Summary of Quantification of Potential Uplift from Modifications to Mitigation Proposal

Modification	Quantification of Uplift
50' wide buffer will be established along the north side of the entire length of South Fork Jones Creek through the landowner's property	• Riparian buffer and hydric soils of approx. 8,500 feet of stream protected. • Equivalent credits would be approximately 425 SMU (assuming a 10:1 credit ratio, for half the length of stream to account for one sided buffer; however, no credits are being claimed for this reach, this just illustrates a potential credit equivalency of uplift) • Includes approximately 20 additional acres of easement above what was originally proposed. • Protects approximately 2 acres of additional hydric soil
Provide widened buffer around proposed Wetland Cell 1	• Protection of increased areas of hydric soils, with potential for increased wetland establishment above proposed credits • We made sure it encompassed a relict meander scroll from South Fork Jones Creek which is ecologically significant.
Widening of portions of buffer of Tributary 1A- Lower	• Buffers widened to be approx. 70' to 110' for approx. 730' of restored channel. • Equivalent to a 7% to 16% increase in credits for this length of channel*
Widening of portions of buffer of Tributary 3	• Buffer on widened to be approx. 100' on one side for approximately 270' of channel. • Equivalent to a 6% increase in credits for this length of channel*
Construction of wetland SCM upstream of Tributary 4	• Reduction in nutrients and sediment from upstream managed hillslope areas
Protection of seeps and springs along Tributaries 5 and 6 with widened buffer	• Protection of seep/spring habitat, wetlands, as well as source of water input into restored tributaries

*Based on USACE Wilmington District's "USACE Buffer Calculation Tool 20200904" provided by USACE on March 1, 2021.

Table 2. Original Credit Table from Proposed Option B

Reach/Wetland Name	Restored Length/Acres	Mitigation Type	Ratio (X:1)	Proposed Mitigation Credits (SMU/WMU)
Tributary 1A – Upper*	1055	Enhancement Level II (Low Uplift)	No Credit - Half Buffer Property Line	0
Tributary 1A - Lower	2188	Restoration	1	2188
Tributary 1B	590	Enhancement Level I	1.5	393
Tributary 1C	698	Enhancement Level I	1.5	465
Tributary 2	2616	Restoration	1	2616
Tributary 3	2622	Restoration	1	2622
Tributary 4	996	Restoration	1	996
Tributary 5	912	Restoration	1	912
Tributary 6	2808	Restoration	1	2808
Riparian Wetland 1	4	Restoration (Re-establishment)	1	4
Riparian Wetland 2	1	Restoration (Re-establishment)	1	1
Option B Summary		Total Stream Mitigation Units:		13,000
		Total Riparian Wetland Mitigation Units:		5
		Extra SMU - Contingency		700
		Extra WMU - Contingency		3

*Tributary 1A Upper was discussed at the IRT site meeting as having potential to generate credit, this will be discussed in the mitigation plan as potential contingency credits.

Table 3. Proposed Revised Credit Table

Reach/Wetland Name	Restored Length/Acres	Mitigation Type	Ratio (X:1)	Proposed Mitigation Credits (SMU/WMU)
Tributary 1A – Upper*	1055	Enhancement Level II (Low Uplift)	No Credit - Half Buffer Property Line	0
Tributary 1A - Lower	2036	Restoration	1	2036
Tributary 1B	590	Enhancement Level I	1.5	393
Tributary 1C	618	Enhancement Level I	1.5	412
Tributary 2	2554	Restoration	1	2554
Tributary 3	2536	Restoration	1	2536
Tributary 4	979	Restoration	1	979
Tributary 5	1172	Restoration	1	1172
Tributary 6	2918	Restoration	1	2918
Riparian Wetland 1	4	Restoration (Re-establishment)	1	4
Riparian Wetland 2	1	Restoration (Re-establishment)	1	1
Option B Summary		Total Stream Mitigation Units*		13,000
		Total Riparian Wetland Mitigation Units*		5

*Amount listed is contracted amount with DMS, however an an approximate 206 additional stream mitigation units and 3 additional Wetland Mitigation Unit credits are believed to be potentially obtainable from the site. Final credit amounts based on detailed design will be presented in the mitigation plan.

Mitigation Area	Increased Easement Area Above Original Proposal (acres)
Wetland Restoration Area 1	6.78
Tributary 1A	1.24
Tributary 2	2.02
Tributary 3	0.69
Tributary 4	0.34
Tributary 6	0.88
SFJC- Western Property Edge to Wetland	2.58
SFJC- Between Tributary 2 and Tributary 3	3.11
SFJC- Between Tributary 3 and Tributary 5	2.28
SFJC- Between Tributary 5 and Tributary 6	0.20
SFJC- Tributary 6 to Eastern Property Edge	2.23
Total	**22.33**

Construct Wetland SCM Upstream of Tributary 4 to Filter Nutrients and Sediment
Re-route Existing Road North of Easement

Place an HDPE Pipe Crossing Immediately Upstream of Easement Instead of Crossing Downstream

Replace Existing Crossing With an Archspan Culvert Along Re-routed Road

Min. 50' Buffer on South Fork Jones Creek for Entire Length of Property (detailed survey to confirm that min 50' is achieved from Top of Bank)

Eliminate This Crossing and Install Upstream of Easement Instead

Tributary 1C

Tributary 1B

Tributary 1A Upper

Tributary 4

Tributary 3

Seep 2: Protect within Widened Easement

Widen Buffer In Select Areas to Protect Seeps and Springs

South Fork Jones Creek

South Fork Jones Creek Invasive Treatment During One Growing Season

742

Seep 1: Protect within Widened Easement

Seep 3: Protect In Easement

Tributary 6

Run Trib 6 Along Low Point of Valley

Widen Easement to Protect Seeps and Wetland Areas

Tributary 1A Lower

Tributary 2

Tributary 5

Min. 50' Buffer on South Fork Jones Creek for Entire Length of Property (detailed survey to confirm that min 50' is achieved from Top of Bank)

Tributary 3

Tributary 5 to Run Along Low Point of Valley

Invasive Treatment During One Growing Season

Invasive Treatment During One Growing Season

Full Invasive Treatment

Plug Existing Perimeter Drainage Ditch

South Fork Jones Creek

South Fork Jones Creek

Full Invasive Treatment

Easement to Extend At Least 50' Into Existing Field Area

Widen Easement to Encompass Hydric Soils Area on Floodplain

Easement to Extend At Least 50' Into Existing Field Area

NC CGIA, Maxar, P

Legend

- Revised Easement Boundary
- Existing_Channel
- Wetland BMP
- Proposed Stream
- Original Proposal Easement Boundary
- Existing Wetland
- Wetland Restoration
- Parcels

Exhibit 1
Middendorf Springs
Wetland & Stream Restoration
Proposed Project Modifications
DMS Project # 100151

FREESE AND NICHOLS

N

0 225 450 900 Feet

Ian Jewell

From: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Sent: Tuesday, June 8, 2021 4:39 PM
To: Wiesner, Paul; Haywood, Casey M CIV (USA); Browning, Kimberly D CIV USARMY CESAW (USA); Jones, M Scott (Scott) CIV USARMY CESAW (USA)
Cc: Reid, Matthew; Phillips, Kelly D; Bryan Dick; Ian Jewell; Andrew Burleson
Subject: RE: Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (6-4-2021)
Attachments: Middendorf Springs_Proposed Project Modifications_Exhibit 1_Rev 6-4-21.pdf

Paul,

Scott and I have looked over the amended map/proposal (attached for reference) submitted by Freese & Nichols and agree with the proposed changes. Based on this, you may continue with development of the mitigation plan for the site. Please note that as discussed during our last call, the mitigation plan must still go through review by the NC Interagency Review Team, who may have further questions or recommendations, so it is possible that additional changes may be required as part of this review to ensure that the proposal meets the minimum acceptable standards for a site to be suitable to provide compensatory mitigation for impacts authorized by Corps of Engineers permit authorizations.

Additionally, implementation of the mitigation plan (once reviewed and approved by the NCIRT) will satisfactorily resolve the concerns associated with the unauthorized work within wetlands and waters conducted by the property owners, Aaron and Andrew Burleson, who are copied on this email for their awareness. Please note that if NCDMS chooses not to pursue the mitigation site, we will coordinate any further corrective actions necessary to resolve the unauthorized work directly with the Burlesons.

When preparing the mitigation plan, please be sure to include a discussion of the history of the site, including a description of the unauthorized activities carried out on the site and actions taken as part of the mitigation work to resolve those concerns. This is important to document resolution of those unauthorized actions, and also to inform the NCIRT of the situation during their review of the mitigation plan. A copy of this email should also be included with the agency corresponded normally included with the mitigation plan.

Please contact me if you have any questions or concerns.

Thank you,

Todd Tugwell
Mitigation Project Manager
Wilmington District, US Army Corps of Engineers
3331 Heritage Trade Drive, Suite 105
Wake Forest, North Carolina 27587
(919) 949-9005

We would appreciate your feedback on how we are performing our duties. Our automated Customer Service Survey is located at:
https://nam11.safelinks.protection.outlook.com/?url=https%3A%2F%2Fregulatory.ops.usace.army.mil%2Fcustomer-service-

survey%2F&data=04%7C01%7CIan.Jewell%40freese.com%7C1f7602ea527e449def1d08d92abd7590%7C191657eabcff43859d04659ef9cee515%7C0%7C0%7C637587815537815220%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C1000&sdata=Lzw1bydTtGIEJQArhmDAUPFB26lljFdPTjEFb%2BDA3l4%3D&reserved=0 Thank you for taking the time to visit this site and complete the survey.

-----Original Message-----
From: Wiesner, Paul <paul.wiesner@ncdenr.gov>
Sent: Monday, June 07, 2021 2:01 PM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>
Cc: Reid, Matthew <matthew.reid@ncdenr.gov>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Bryan Dick <Bryan.Dick@freese.com>; Ian Jewell <Ian.Jewell@freese.com>
Subject: [Non-DoD Source] Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (6-4-2021)

Good afternoon,

Please find attached the amended map/ proposal from Freese and Nichols, Inc based on our 5/24/2021 Web Ex meeting.

Here is a summary of the changes:

- Buffer of South Fork Jones Creek now includes 50' from the tree line at all locations.
- Added a table showing the additional acres of easement added compared with the original proposal, by location
- Corrected the easement boundary at the upper end of the reaches to include the "arc" at the upstream end of the buffer, as per the original proposal, and also revised to include the existing wetland on the west side of Tributary 2
- Added callouts indicating where we would propose reduced invasive treatment versus where we would manage invasives during the full life of the monitoring period.

Please let us know if you have any questions, comments or concerns.

I can set up a brief meeting this week to discuss if that would be helpful.

Thanks

Paul Wiesner
Western Regional 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: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Sent: Monday, May 17, 2021 8:03 PM
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Kim Browning <Kimberly.D.Browning@usace.army.mil>
Cc: Reid, Matthew <matthew.reid@ncdenr.gov>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>
Subject: RE: [External] RE: [Non-DoD Source] Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (4-26-2021)

CAUTION: External email. Do not click links or open attachments unless you verify. Send all suspicious email as an attachment to Report Spam.<mailto:report.spam@nc.gov>

Paul, sorry for the delay on this. Scott and I spoke and think we need to have a call with the provider to discuss the proposal. I've included Scott on this email chain. I am out of the office the rest of the week, but am free Monday, Thursday, or Friday next week if that would work with everyone.
Thanks,
Todd

-----Original Message-----
From: Wiesner, Paul <paul.wiesner@ncdenr.gov>
Sent: Monday, May 17, 2021 2:31 PM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>
Cc: Reid, Matthew <matthew.reid@ncdenr.gov>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>
Subject: RE: [External] RE: [Non-DoD Source] Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (4-26-2021)

Todd, Casey and Kim;

Any update on Middendorf Springs? I know you all are in the field this week w/ credit release site visits.

Please let me know when you are back in the office. I can set up a meeting if that would be helpful.

Thanks

Paul Wiesner
Western Regional Supervisor
North Carolina Department of Environmental Quality Division of Mitigation Services

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paul.wiesner@ncdenr.gov

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-----Original Message-----
From: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Sent: Thursday, April 29, 2021 12:54 PM
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Kim Browning <Kimberly.D.Browning@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>
Cc: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Ian Jewell <Ian.Jewell@freese.com>; Bryan Dick <Bryan.Dick@freese.com>; Reid, Matthew <matthew.reid@ncdenr.gov>
Subject: [External] RE: [Non-DoD Source] Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (4-26-2021)

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Paul, sorry I have not gotten back to you yet on this. We are discussing this and will get back to you soon with a response or possible meeting times.

Thanks,
Todd

-----Original Message-----
From: Wiesner, Paul <paul.wiesner@ncdenr.gov>
Sent: Monday, April 26, 2021 5:01 PM
To: Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Cc: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Ian Jewell <Ian.Jewell@freese.com>; Bryan Dick <Bryan.Dick@freese.com>; Reid, Matthew <matthew.reid@ncdenr.gov>
Subject: [Non-DoD Source] Middendorf Springs_DMS# 100151: Proposed Revisions to the Middendorf Springs Stream and Wetland Restoration Site (4-26-2021)

Good afternoon Casey, Kim, Scott and Todd;

As discussed at our 2/26/2021 meeting, please find Freese and Nichols' revised credit proposal for the Middendorf Springs project site in Anson County.

Please let us know if you have any questions, comments, or concerns.

We would like to set up an on-line meeting to discuss next steps for moving the project forward. If you all can provide a couple dates and times for a follow-up meeting, I will work with our team to set it up via WebEx.

Thanks

Paul Wiesner

Western Regional Supervisor

North Carolina Department of Environmental Quality

Division of Mitigation Services

828-273-1673 Mobile

paul.wiesner@ncdenr.gov <mailto:paul.wiesner@ncdenr.gov>

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Asheville, N.C. 28801

From: Wiesner, Paul
Sent: Wednesday, March 10, 2021 4:46 PM
To: Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Kim Browning <Kimberly.D.Browning@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Cc: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Ian Jewell <Ian.Jewell@freese.com>; Bryan Dick <Bryan.Dick@freese.com>; Reid, Matthew <matthew.reid@ncdenr.gov>
Subject: DMS/ USACE/ FNI Site Visit Meeting Minutes (2-26-2021): Middendorf Springs_DMS# 100151

Good afternoon Casey, Kim, Scott and Todd;

Thank you for meeting us via Web-Ex on Friday 2/26/2021. Please find the meeting minutes attached.

Please let us know if you have any additions, questions, comments or concerns.

As noted in the minutes, we will set up another meeting once FNI has had time to discuss options with the landowner and develop a proposal.

Thanks

Paul Wiesner

Western Regional Supervisor

North Carolina Department of Environmental Quality

Division of Mitigation Services

828-273-1673 Mobile

paul.wiesner@ncdenr.gov <mailto:paul.wiesner@ncdenr.gov>

Western DMS Field Office

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Suite 102

Asheville, N.C. 28801

Appendix B

Site Protection Instrument

STATE OF NORTH CAROLINA

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

ANSON COUNTY

SPO File Number: DMS
Project Number: 100151

Prepared by: Office of the Attorney General
Property Control Section
Return to: NC Department of Administration
State Property Office
1321 Mail Service Center
Raleigh, NC 27699-1321

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this_____day of_____, 2022, by RTB Associates, LLC and DEB, LLC., ("**Grantors**"), whose mailing address is 28838 Kendall's Church Rd., Richfield, NC 28137, 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 Freese and Nichols, Inc. and the North Carolina Department of Environment and Natural Resources, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environment and Natural Resources Purchase and Services Contract Number 8012-01.

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 8th day of February 2000; and

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

WHEREAS, Grantor owns in fee simple certain real property situated, lying, and being in Gulledge Township, Anson County, North Carolina (the "**Property**"), and being more particularly described as those certain parcels of land containing approximately 463.26 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 13 at Page 322, Deed Book 1037 at Page 206 and Deed Book 1026 at Page 1263** of the Anson 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 an unnamed tributary of Sandpit Branch.

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 and Right of Access together with an access easement to and from the Conservation Easement Area described below.

The Conservation Easement Area consists of the following:

Easement Areas A and B containing a total of 73.08 **acres** as shown on the plats of survey entitled "Conservation Easement Survey for the State of North Carolina Division of Mitigation Services, Middendorf Springs" SPO File No._____, DMS Site No. 100151, Current Owners: RTB Associates, LLC and DEB, LLC," dated August 29, 2022 by Mark Parris, PLS Number L-4529 and recorded in the Anson County, North Carolina Register of Deeds at **Plat Book_____Pages_____.**

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. ACCESS EASEMENT

Grantor hereby grants and conveys unto Grantee, its employees, agents, successors and assigns, a perpetual, non-exclusive easement for ingress and egress over and upon the Property at all reasonable times and at such location as practically necessary to access the Conservation Easement Area for the purposes set forth herein ("Access Easement"). This grant of easement shall not vest any rights in the public and shall not be construed as a public dedication of the Access Easement. Grantor covenants, represents and warrants that it is the sole owner of and is seized of the Property in fee simple and has the right to grant and convey this Access Easement.

III. 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.

IV. GRANTEE RESERVED USES

A. Right of Access, Construction, and Inspection. The Grantee, its employees, agents, successors and assigns, shall have a perpetual Right of Access over and upon the Conservation Easement Area to undertake or engage in any activities necessary to construct, maintain, manage, enhance, repair, restore, protect, monitor and inspect the stream, wetland and any other riparian resources in the Conservation Easement Area for the purposes set forth herein or any long-term management plan for the Conservation Easement Area developed pursuant to this Conservation Easement.

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

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.

V. 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.

VI. 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.

VII. 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 the Property 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)

NORTH CAROLINA
COUNTY OF _____

I,_____, a Notary Public in and for the County and State aforesaid, do hereby certify that_____, 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 _____ day of_____, 20_.

_____
Notary Public

My commission expires:

_____

Exhibit A

Easement Area A

Beginning at a 5/8" rebar with aluminum easement cap number 27;
thence N 66°46'42" E a distance of 67.34' to a 5/8" rebar with aluminum easement cap;
thence N 46°42'58" E a distance of 53.15' to a 5/8" rebar with aluminum easement cap;
thence N 37°39'04" E a distance of 134.12' to a 5/8" rebar with aluminum easement cap;
thence N 68°52'40" E a distance of 86.09' to a 5/8" rebar with aluminum easement cap;
thence S 88°12'41" E a distance of 912.72' to a 5/8" rebar with aluminum easement cap;
thence S 88°53'05" E a distance of 238.90' to a 5/8" rebar with aluminum easement cap;
thence N 87°50'06" E a distance of 589.96' to a 5/8" rebar with aluminum easement cap;
thence N 76°18'25" E a distance of 103.69' to a 5/8" rebar with aluminum easement cap;
thence N 07°44'54" E a distance of 162.18' to a 5/8" rebar with aluminum easement cap;
thence N 49°15'47" W a distance of 123.87' to a 5/8" rebar with aluminum easement cap;
thence N 21°38'59" W a distance of 169.30' to a 5/8" rebar with aluminum easement cap;
thence N 18°37'56" W a distance of 187.43' to a 5/8" rebar with aluminum easement cap;
thence N 18°56'41" W a distance of 294.59' to a 5/8" rebar with aluminum easement cap;
thence N 28°05'18" W a distance of 365.88' to a 5/8" rebar with aluminum easement cap number 43;
said point lies
N 72°16'50" E a distance of 700.13' from a Granite Monument;
thence N 64°12'13" E a distance of 194.66' to a 5/8" rebar with aluminum easement cap;
thence S 40°12'54" E a distance of 68.40' to a 5/8" rebar with aluminum easement cap;
thence S 24°52'33" E a distance of 252.86' to a 5/8" rebar with aluminum easement cap;
thence S 40°33'24" E a distance of 163.01' to a 5/8" rebar with aluminum easement cap;
thence S 04°29'20" E a distance of 204.31' to a 5/8" rebar with aluminum easement cap;
thence S 10°49'06" E a distance of 148.23' to a 5/8" rebar with aluminum easement cap;
thence S 17°25'02" E a distance of 226.88' to a 5/8" rebar with aluminum easement cap;
thence S 53°14'48" E a distance of 142.17' to a 5/8" rebar with aluminum easement cap;
thence S 65°22'43" E a distance of 304.79' to a 5/8" rebar with aluminum easement cap;
thence S 48°22'57" E a distance of 69.21' to a 5/8" rebar with aluminum easement cap;
thence S 43°07'19" E a distance of 109.07' to a 5/8" rebar with aluminum easement cap;
thence N 89°16'30" E a distance of 65.35' to a 5/8" rebar with aluminum easement cap;
thence N 21°47'30" E a distance of 55.91' to a 5/8" rebar with aluminum easement cap;
thence N 20°03'20" W a distance of 139.22' to a 5/8" rebar with aluminum easement cap;
thence N 08°35'17" W a distance of 141.57' to a 5/8" rebar with aluminum easement cap;
thence S 59°26'17" E a distance of 229.43' to a 5/8" rebar with aluminum easement cap;
thence N 11°19'27" E a distance of 145.02' to a 5/8" rebar with aluminum easement cap;
thence N 18°18'10" E a distance of 168.09' to a 5/8" rebar with aluminum easement cap;
thence N 07°10'12" W a distance of 249.46' to a 5/8" rebar with aluminum easement cap;
thence N 06°29'42" W a distance of 280.98' to a 5/8" rebar with aluminum easement cap;
thence N 12°37'53" W a distance of 294.16' to a 5/8" rebar with aluminum easement cap;
thence N 36°29'11" W a distance of 578.38' to a 5/8" rebar with aluminum easement cap;
thence N 51°06'04" E a distance of 130.57' to a 5/8" rebar with aluminum easement cap;

thence S 41°40'35" E a distance of 135.71' to a 5/8" rebar with aluminum easement cap;
thence S 37°23'10" E a distance of 426.90' to a 5/8" rebar with aluminum easement cap;
thence S 25°49'10" E a distance of 101.60' to a 5/8" rebar with aluminum easement cap;
thence S 13°34'07" E a distance of 366.80' to a 5/8" rebar with aluminum easement cap;
thence S 02°57'01" E a distance of 233.68' to a 5/8" rebar with aluminum easement cap;
thence S 05°16'29" E a distance of 129.35' to a 5/8" rebar with aluminum easement cap;
thence S 04°16'31" E a distance of 167.05' to a 5/8" rebar with aluminum easement cap;
thence S 18°53'45" W a distance of 181.16' to a 5/8" rebar with aluminum easement cap;
thence S 05°30'55" W a distance of 102.24' to a 5/8" rebar with aluminum easement cap;
thence S 08°56'11" E a distance of 87.03' to a 5/8" rebar with aluminum easement cap;
thence S 48°53'10" E a distance of 80.94' to a 5/8" rebar with aluminum easement cap;
thence S 65°10'08" E a distance of 122.95' to a 5/8" rebar with aluminum easement cap;
thence S 57°14'52" E a distance of 132.29' to a 5/8" rebar with aluminum easement cap;
thence N 79°46'14" E a distance of 207.08' to a 5/8" rebar with aluminum easement cap;
thence N 85°45'42" E a distance of 733.92' to a 5/8" rebar with aluminum easement cap;
thence N 64°30'17" E a distance of 137.33' to a 5/8" rebar with aluminum easement cap;
thence N 50°31'23" W a distance of 309.06' to a 5/8" rebar with aluminum easement cap;
thence N 49°54'25" W a distance of 190.86' to a 5/8" rebar with aluminum easement cap;
thence N 32°32'05" W a distance of 239.80' to a 5/8" rebar with aluminum easement cap;
thence N 41°06'31" W a distance of 254.44' to a 5/8" rebar with aluminum easement cap;
thence N 20°52'46" W a distance of 319.72' to a 5/8" rebar with aluminum easement cap;
thence N 20°25'06" W a distance of 268.24' to a 5/8" rebar with aluminum easement cap;
thence N 35°25'43" W a distance of 215.00' to a 5/8" rebar with aluminum easement cap;
thence N 55°29'42" W a distance of 154.83' to a 5/8" rebar with aluminum easement cap;
thence N 71°12'47" W a distance of 176.31' to a 5/8" rebar with aluminum easement cap;
thence N 48°45'27" W a distance of 92.21' to a 5/8" rebar with aluminum easement cap;
thence N 11°56'54" W a distance of 284.18' to a 5/8" rebar with aluminum easement cap;
thence N 17°08'38" E a distance of 79.26' to a 5/8" rebar with aluminum easement cap;
thence N 72°52'35" E a distance of 93.16' to a 5/8" rebar with aluminum easement cap;
thence S 10°59'20" E a distance of 117.44' to a 5/8" rebar with aluminum easement cap;
thence S 12°32'55" E a distance of 203.45' to a 5/8" rebar with aluminum easement cap;
thence S 61°11'41" E a distance of 90.20' to a 5/8" rebar with aluminum easement cap;
thence N 89°05'04" E a distance of 135.69' to a 5/8" rebar with aluminum easement cap;
thence N 04°03'55" W a distance of 335.20' to a 5/8" rebar with aluminum easement cap;
thence N 19°18'55" W a distance of 247.64' to a 5/8" rebar with aluminum easement cap;
thence N 69°34'49" E a distance of 120.91' to a 5/8" rebar with aluminum easement cap;
thence S 22°43'16" E a distance of 254.43' to a 5/8" rebar with aluminum easement cap;
thence S 06°33'43" E a distance of 294.22' to a 5/8" rebar with aluminum easement cap;
thence S 18°54'17" E a distance of 67.02' to a 5/8" rebar with aluminum easement cap;
thence S 27°28'13" E a distance of 193.29' to a 5/8" rebar with aluminum easement cap;
thence S 13°37'46" E a distance of 167.82' to a 5/8" rebar with aluminum easement cap;
thence S 24°27'47" E a distance of 287.05' to a 5/8" rebar with aluminum easement cap;
thence S 19°06'46" E a distance of 116.63' to a 5/8" rebar with aluminum easement cap;
thence S 07°34'36" E a distance of 137.76' to a 5/8" rebar with aluminum easement cap;
thence S 38°36'04" E a distance of 599.20' to a 5/8" rebar with aluminum easement cap;
thence S 50°29'42" E a distance of 379.80' to a 5/8" rebar with aluminum easement cap;
thence N 51°20'58" E a distance of 105.30' to a 5/8" rebar with aluminum easement cap;

thence N 53°36'35" E a distance of 50.19' to a 5/8" rebar with aluminum easement cap;
thence N 83°26'41" E a distance of 216.46' to a 5/8" rebar with aluminum easement cap;
thence S 65°06'18" E a distance of 199.28' to a 5/8" rebar with aluminum easement cap;
thence N 70°33'10" E a distance of 157.55' to a 5/8" rebar with aluminum easement cap;
thence N 36°59'26" E a distance of 105.58' to a 5/8" rebar with aluminum easement cap;
thence N 03°07'35" E a distance of 138.62' to a 5/8" rebar with aluminum easement cap;
thence N 84°28'53" W a distance of 111.19' to a 5/8" rebar with aluminum easement cap;
thence S 86°01'15" W a distance of 143.31' to a 5/8" rebar with aluminum easement cap;
thence S 89°02'33" W a distance of 349.40' to a 5/8" rebar with aluminum easement cap;
thence N 75°10'35" W a distance of 166.27' to a 5/8" rebar with aluminum easement cap;
thence N 61°21'53" W a distance of 216.90' to a 5/8" rebar with aluminum easement cap;
thence N 15°21'23" W a distance of 93.80' to a 5/8" rebar with aluminum easement cap;
thence N 06°05'39" E a distance of 240.90' to a 5/8" rebar with aluminum easement cap;
thence N 19°01'37" E a distance of 64.47' to a 5/8" rebar with aluminum easement cap;
thence S 80°44'24" E a distance of 111.23' to a 5/8" rebar with aluminum easement cap;
thence S 03°24'22" W a distance of 162.51' to a 5/8" rebar with aluminum easement cap;
thence S 06°48'13" E a distance of 129.19' to a 5/8" rebar with aluminum easement cap;
thence S 66°19'40" E a distance of 197.22' to a 5/8" rebar with aluminum easement cap;
thence N 86°08'36" E a distance of 277.79' to a 5/8" rebar with aluminum easement cap;
thence S 85°38'18" E a distance of 190.35' to a 5/8" rebar with aluminum easement cap;
thence N 84°31'45" E a distance of 186.13' to a 5/8" rebar with aluminum easement cap;
thence N 31°23'13" E a distance of 98.09' to a 5/8" rebar with aluminum easement cap;
thence N 62°22'10" W a distance of 311.39' to a 5/8" rebar with aluminum easement cap;
thence N 51°10'24" W a distance of 209.08' to a 5/8" rebar with aluminum easement cap;
thence N 62°07'12" W a distance of 288.43' to a 5/8" rebar with aluminum easement cap;
thence N 40°44'42" W a distance of 139.72' to a 5/8" rebar with aluminum easement cap;
thence N 17°18'07" W a distance of 84.39' to a 5/8" rebar with aluminum easement cap;
thence N 29°02'51" W a distance of 89.95' to a 5/8" rebar with aluminum easement cap;
thence N 35°11'45" W a distance of 106.44' to a 5/8" rebar with aluminum easement cap;
thence N 45°17'15" W a distance of 115.27' to a 5/8" rebar with aluminum easement cap;
thence N 39°54'42" W a distance of 234.92' to a 5/8" rebar with aluminum easement cap;
thence N 39°52'05" W a distance of 206.80' to a 5/8" rebar with aluminum easement cap;
thence N 24°26'51" W a distance of 222.14' to a 5/8" rebar with aluminum easement cap;
thence N 21°35'51" W a distance of 195.30' to a 5/8" rebar with aluminum easement cap;
thence N 34°47'55" W a distance of 119.36' to a 5/8" rebar with aluminum easement cap;
thence N 50°13'29" E a distance of 104.31' to a 5/8" rebar with aluminum easement cap number 149;
said point lies
S 6°26'08" W a distance of 568.85' from a 3/4" bent OTP;
thence S 47°42'53" E a distance of 124.26' to a 5/8" rebar with aluminum easement cap;
thence S 33°14'09" E a distance of 139.78' to a 5/8" rebar with aluminum easement cap;
thence S 22°19'08" E a distance of 225.63' to a 5/8" rebar with aluminum easement cap;
thence S 29°25'28" E a distance of 125.85' to a 5/8" rebar with aluminum easement cap;
thence S 39°10'34" E a distance of 184.00' to a 5/8" rebar with aluminum easement cap;
thence S 39°44'56" E a distance of 174.39' to a 5/8" rebar with aluminum easement cap;
thence S 42°32'44" E a distance of 248.84' to a 5/8" rebar with aluminum easement cap;
thence S 33°39'41" E a distance of 132.15' to a 5/8" rebar with aluminum easement cap;

thence S 52°37'11" E a distance of 636.33' to a 5/8" rebar with aluminum easement cap;
thence S 67°33'25" E a distance of 103.75' to a 5/8" rebar with aluminum easement cap;
thence N 76°22'54" E a distance of 91.38' to a 5/8" rebar with aluminum easement cap;
thence N 49°08'31" E a distance of 214.42' to a 5/8" rebar with aluminum easement cap;
thence N 79°26'07" E a distance of 244.34' to a 5/8" rebar with aluminum easement cap;
thence N 49°49'45" E a distance of 249.08' to a 5/8" rebar with aluminum easement cap;
thence S 36°02'35" E a distance of 111.74' to a 5/8" rebar with aluminum easement cap;
thence N 60°09'31" E a distance of 182.44' to a 5/8" rebar with aluminum easement cap;
thence N 78°16'30" E a distance of 115.82' to a 5/8" rebar with aluminum easement cap;
thence N 30°52'44" W a distance of 187.13' to a 5/8" rebar with aluminum easement cap;
thence N 42°24'55" E a distance of 104.57' to a 5/8" rebar with aluminum easement cap;
thence S 85°14'08" E a distance of 151.99' to a 5/8" rebar with aluminum easement cap;
thence N 89°02'45" E a distance of 549.75' to a 5/8" rebar with aluminum easement cap;
thence S 79°25'06" E a distance of 117.08' to a 5/8" rebar with aluminum easement cap number 172 at the right of way for NC 742;
thence S 06°09'10" W a distance of 64.80' to a point in the center of South Fork of Jones Creek;
thence N 79°19'49" W a distance of 106.47' to a point in the center of South Fork of Jones Creek;
thence S 87°54'32" W a distance of 114.23' to a point in the center of South Fork of Jones Creek;
thence N 59°25'07" W a distance of 55.39' to a point in the center of South Fork of Jones Creek;
thence S 74°01'58" W a distance of 48.43' to a point in the center of South Fork of Jones Creek;
thence S 66°50'32" W a distance of 51.91' to a point in the center of South Fork of Jones Creek;
thence N 79°06'58" W a distance of 93.03' to a point in the center of South Fork of Jones Creek;
thence S 72°35'21" W a distance of 64.88' to a point in the center of South Fork of Jones Creek;
thence N 71°18'55" W a distance of 89.19' to a point in the center of South Fork of Jones Creek;
thence S 62°40'55" W a distance of 56.43' to a point in the center of South Fork of Jones Creek;
thence N 66°08'47" W a distance of 74.21' to a point in the center of South Fork of Jones Creek;
thence S 82°41'30" W a distance of 51.51' to a point in the center of South Fork of Jones Creek;
thence S 71°14'17" W a distance of 43.09' to a point in the center of South Fork of Jones Creek;
thence S 00°22'08" E a distance of 33.38' to a point in the center of South Fork of Jones Creek;
thence S 51°19'01" E a distance of 61.01' to a point in the center of South Fork of Jones Creek;
thence S 31°12'38" E a distance of 61.16' to a point in the center of South Fork of Jones Creek;
thence S 38°19'37" E a distance of 88.57' to a point in the center of South Fork of Jones Creek;
thence S 37°41'59" W a distance of 29.68' to a point in the center of South Fork of Jones Creek;
thence S 78°43'36" W a distance of 67.93' to a point in the center of South Fork of Jones Creek;
thence S 75°31'35" W a distance of 113.69' to a point in the center of South Fork of Jones Creek;
thence S 44°36'04" W a distance of 71.69' to a point in the center of South Fork of Jones Creek;
thence S 53°55'53" W a distance of 63.69' to a point in the center of South Fork of Jones Creek;
thence N 72°39'57" W a distance of 43.80' to a point in the center of South Fork of Jones Creek;
thence S 71°36'26" W a distance of 39.16' to a point in the center of South Fork of Jones Creek;
thence S 44°23'44" W a distance of 50.14' to a point in the center of South Fork of Jones Creek;
thence S 65°55'41" W a distance of 32.17' to a point in the center of South Fork of Jones Creek;
thence N 30°40'57" W a distance of 20.40' to a point in the center of South Fork of Jones Creek;
thence N 26°04'29" E a distance of 51.62' to a point in the center of South Fork of Jones Creek;
thence N 36°59'31" W a distance of 38.17' to a point in the center of South Fork of Jones Creek;
thence S 48°21'42" W a distance of 30.16' to a point in the center of South Fork of Jones Creek;
thence S 45°16'39" W a distance of 74.61' to a point in the center of South Fork of Jones Creek;
thence S 82°46'34" W a distance of 36.26' to a point in the center of South Fork of Jones Creek;

thence S 71°16'45" W a distance of 31.61' to a point in the center of South Fork of Jones Creek;
thence S 06°01'48" E a distance of 22.53' to a point in the center of South Fork of Jones Creek;
thence S 08°14'04" E a distance of 26.84' to a point in the center of South Fork of Jones Creek;
thence S 12°46'31" W a distance of 32.86' to a point in the center of South Fork of Jones Creek;
thence S 25°34'53" E a distance of 27.82' to a point in the center of South Fork of Jones Creek;
thence S 30°08'12" E a distance of 17.12' to a point in the center of South Fork of Jones Creek;
thence S 15°17'55" W a distance of 31.18' to a point in the center of South Fork of Jones Creek;
thence S 49°56'09" W a distance of 69.26' to a point in the center of South Fork of Jones Creek;
thence S 04°24'14" E a distance of 39.73' to a point in the center of South Fork of Jones Creek;
thence S 31°38'43" W a distance of 24.84' to a point in the center of South Fork of Jones Creek;
thence S 75°10'11" W a distance of 72.99' to a point in the center of South Fork of Jones Creek;
thence S 49°39'55" W a distance of 37.69' to a point in the center of South Fork of Jones Creek;
thence S 64°33'25" W a distance of 43.05' to a point in the center of South Fork of Jones Creek;
thence S 70°40'01" W a distance of 41.81' to a point in the center of South Fork of Jones Creek;
thence S 55°25'55" W a distance of 55.72' to a point in the center of South Fork of Jones Creek;
thence S 86°49'05" W a distance of 36.77' to a point in the center of South Fork of Jones Creek;
thence S 52°26'18" W a distance of 53.10' to a point in the center of South Fork of Jones Creek;
thence S 55°11'53" W a distance of 41.27' to a point in the center of South Fork of Jones Creek;
thence S 72°49'57" W a distance of 39.98' to a point in the center of South Fork of Jones Creek;
thence S 58°18'21" W a distance of 24.53' to a point in the center of South Fork of Jones Creek;
thence S 15°02'03" W a distance of 37.99' to a point in the center of South Fork of Jones Creek;
thence S 54°12'52" E a distance of 14.68' to a point in the center of South Fork of Jones Creek;
thence S 87°40'31" E a distance of 18.02' to a point in the center of South Fork of Jones Creek;
thence N 88°10'19" E a distance of 26.74' to a point in the center of South Fork of Jones Creek;
thence S 16°03'23" E a distance of 39.44' to a point in the center of South Fork of Jones Creek;
thence S 37°00'17" W a distance of 32.39' to a point in the center of South Fork of Jones Creek;
thence S 63°08'58" W a distance of 27.56' to a point in the center of South Fork of Jones Creek;
thence S 44°08'44" W a distance of 22.90' to a point in the center of South Fork of Jones Creek;
thence S 08°49'40" E a distance of 28.52' to a point in the center of South Fork of Jones Creek;
thence S 17°37'48" E a distance of 45.56' to a point in the center of South Fork of Jones Creek;
thence S 06°20'51" E a distance of 40.36' to a point in the center of South Fork of Jones Creek;
thence S 30°12'40" W a distance of 47.12' to a point in the center of South Fork of Jones Creek;
thence S 13°46'25" W a distance of 37.50' to a point in the center of South Fork of Jones Creek;
thence S 05°06'48" E a distance of 55.48' to a point in the center of South Fork of Jones Creek;
thence S 07°29'39" E a distance of 38.43' to a point in the center of South Fork of Jones Creek;
thence S 39°23'52" W a distance of 29.35' to a point in the center of South Fork of Jones Creek;
thence S 44°53'18" W a distance of 64.55' to a point in the center of South Fork of Jones Creek;
thence S 64°07'08" W a distance of 94.94' to a point in the center of South Fork of Jones Creek;
thence S 61°31'46" W a distance of 71.60' to a point in the center of South Fork of Jones Creek;
thence S 58°19'54" W a distance of 57.73' to a point in the center of South Fork of Jones Creek;
thence N 78°07'14" W a distance of 46.23' to a point in the center of South Fork of Jones Creek;
thence N 84°45'58" W a distance of 65.68' to a point in the center of South Fork of Jones Creek;
thence N 61°27'50" W a distance of 45.32' to a point in the center of South Fork of Jones Creek;
thence N 04°26'16" W a distance of 43.88' to a point in the center of South Fork of Jones Creek;
thence N 41°10'52" W a distance of 21.78' to a point in the center of South Fork of Jones Creek;
thence S 70°34'46" W a distance of 53.71' to a point in the center of South Fork of Jones Creek;
thence S 88°42'34" W a distance of 96.49' to a point in the center of South Fork of Jones Creek;

thence N 76°57'05" W a distance of 83.72' to a point in the center of South Fork of Jones Creek;
thence S 53°44'16" W a distance of 48.64' to a point in the center of South Fork of Jones Creek;
thence S 57°08'41" W a distance of 50.27' to a point in the center of South Fork of Jones Creek;
thence S 10°12'05" W a distance of 45.32' to a point in the center of South Fork of Jones Creek;
thence S 44°19'12" W a distance of 35.03' to a point in the center of South Fork of Jones Creek;
thence S 19°36'02" W a distance of 37.84' to a point in the center of South Fork of Jones Creek;
thence S 03°04'26" E a distance of 60.22' to a point in the center of South Fork of Jones Creek;
thence S 74°31'46" W a distance of 26.13' to a point in the center of South Fork of Jones Creek;
thence S 60°22'53" W a distance of 46.11' to a point in the center of South Fork of Jones Creek;
thence S 23°35'24" W a distance of 43.34' to a point in the center of South Fork of Jones Creek;
thence S 83°46'54" W a distance of 36.12' to a point in the center of South Fork of Jones Creek;
thence N 59°56'24" W a distance of 24.28' to a point in the center of South Fork of Jones Creek;
thence N 53°57'31" W a distance of 50.92' to a point in the center of South Fork of Jones Creek;
thence S 67°33'24" W a distance of 55.67' to a point in the center of South Fork of Jones Creek;
thence S 73°43'10" W a distance of 74.41' to a point in the center of South Fork of Jones Creek;
thence S 73°59'39" W a distance of 109.33' to a point in the center of South Fork of Jones Creek;
thence S 74°40'16" W a distance of 130.02' to a point in the center of South Fork of Jones Creek;
thence S 78°02'31" W a distance of 157.26' to a point in the center of South Fork of Jones Creek;
thence N 77°08'17" W a distance of 58.10' to a point in the center of South Fork of Jones Creek;
thence S 85°22'50" W a distance of 66.17' to a point in the center of South Fork of Jones Creek;
thence N 87°54'38" W a distance of 91.53' to a point in the center of South Fork of Jones Creek;
thence S 76°11'28" W a distance of 57.69' to a point in the center of South Fork of Jones Creek;
thence N 76°34'58" W a distance of 75.97' to a point in the center of South Fork of Jones Creek;
thence S 76°11'56" W a distance of 122.40' to a point in the center of South Fork of Jones Creek;
thence S 88°37'24" W a distance of 78.41' to a point in the center of South Fork of Jones Creek;
thence N 87°14'58" W a distance of 37.72' to a point in the center of South Fork of Jones Creek;
thence N 84°13'05" W a distance of 27.12' to a point in the center of South Fork of Jones Creek;
thence S 81°06'02" W a distance of 90.84' to a point in the center of South Fork of Jones Creek;
thence N 82°20'32" W a distance of 48.76' to a point in the center of South Fork of Jones Creek;
thence N 87°01'13" W a distance of 34.76' to a point in the center of South Fork of Jones Creek;
thence S 72°03'12" W a distance of 37.99' to a point in the center of South Fork of Jones Creek;
thence N 80°47'35" W a distance of 77.41' to a point in the center of South Fork of Jones Creek;
thence N 77°41'59" W a distance of 58.59' to a point in the center of South Fork of Jones Creek;
thence N 86°01'08" W a distance of 62.48' to a point in the center of South Fork of Jones Creek;
thence N 75°23'51" W a distance of 70.08' to a point in the center of South Fork of Jones Creek;
thence N 70°04'17" W a distance of 32.68' to a point in the center of South Fork of Jones Creek;
thence N 22°12'55" W a distance of 20.93' to a point in the center of South Fork of Jones Creek;
thence N 40°40'14" W a distance of 41.12' to a point in the center of South Fork of Jones Creek;
thence S 58°55'05" W a distance of 28.84' to a point in the center of South Fork of Jones Creek;
thence S 64°04'44" W a distance of 23.88' to a point in the center of South Fork of Jones Creek;
thence N 79°03'40" W a distance of 75.74' to a point in the center of South Fork of Jones Creek;
thence N 54°48'31" W a distance of 55.11' to a point in the center of South Fork of Jones Creek;
thence N 62°46'26" W a distance of 26.16' to a point in the center of South Fork of Jones Creek;
thence S 79°36'32" W a distance of 65.73' to a point in the center of South Fork of Jones Creek;
thence N 70°48'43" W a distance of 41.31' to a point in the center of South Fork of Jones Creek;
thence S 86°41'53" W a distance of 56.84' to a point in the center of South Fork of Jones Creek;
thence N 86°50'49" W a distance of 60.54' to a point in the center of South Fork of Jones Creek;

thence N 63°45'08" W a distance of 65.89' to a point in the center of South Fork of Jones Creek;
thence N 85°11'35" W a distance of 45.02' to a point in the center of South Fork of Jones Creek;
thence S 27°30'31" W a distance of 24.38' to a point in the center of South Fork of Jones Creek;
thence S 37°03'24" W a distance of 60.63' to a point in the center of South Fork of Jones Creek;
thence S 18°03'08" W a distance of 39.62' to a point in the center of South Fork of Jones Creek;
thence S 73°29'21" W a distance of 28.63' to a point in the center of South Fork of Jones Creek;
thence N 69°37'19" W a distance of 34.71' to a point in the center of South Fork of Jones Creek;
thence N 07°05'16" E a distance of 36.78' to a point in the center of South Fork of Jones Creek;
thence N 35°21'18" E a distance of 29.37' to a point in the center of South Fork of Jones Creek;
thence N 50°10'29" W a distance of 28.29' to a point in the center of South Fork of Jones Creek;
thence N 74°04'55" W a distance of 34.98' to a point in the center of South Fork of Jones Creek;
thence S 88°28'32" W a distance of 24.02' to a point in the center of South Fork of Jones Creek;
thence S 26°49'30" W a distance of 35.78' to a point in the center of South Fork of Jones Creek;
thence S 20°38'14" W a distance of 42.13' to a point in the center of South Fork of Jones Creek;
thence S 43°08'49" W a distance of 41.98' to a point in the center of South Fork of Jones Creek;
thence S 70°10'07" W a distance of 28.60' to a point in the center of South Fork of Jones Creek;
thence S 42°26'10" W a distance of 29.42' to a point in the center of South Fork of Jones Creek;
thence S 13°17'36" E a distance of 53.77' to a point in the center of South Fork of Jones Creek;
thence S 33°33'02" E a distance of 71.44' to a point in the center of South Fork of Jones Creek;
thence S 32°26'28" W a distance of 34.47' to a point in the center of South Fork of Jones Creek;
thence N 43°41'44" W a distance of 43.18' to a point in the center of South Fork of Jones Creek;
thence N 20°37'31" W a distance of 27.44' to a point in the center of South Fork of Jones Creek;
thence N 53°28'33" W a distance of 22.15' to a point in the center of South Fork of Jones Creek;
thence S 77°30'33" W a distance of 33.76' to a point in the center of South Fork of Jones Creek;
thence S 82°56'12" W a distance of 68.35' to a point in the center of South Fork of Jones Creek;
thence N 56°22'24" W a distance of 34.86' to a point in the center of South Fork of Jones Creek;
thence N 60°59'10" W a distance of 21.93' to a point in the center of South Fork of Jones Creek;
thence S 44°13'53" W a distance of 29.15' to a point in the center of South Fork of Jones Creek;
thence S 37°43'59" E a distance of 24.98' to a point in the center of South Fork of Jones Creek;
thence S 34°23'01" E a distance of 36.85' to a point in the center of South Fork of Jones Creek;
thence S 12°18'28" W a distance of 24.06' to a point in the center of South Fork of Jones Creek;
thence S 68°36'18" W a distance of 29.25' to a point in the center of South Fork of Jones Creek;
thence S 11°49'24" W a distance of 14.11' to a point in the center of South Fork of Jones Creek;
thence S 24°09'36" W a distance of 52.34' to a point in the center of South Fork of Jones Creek;
thence N 80°07'14" W a distance of 42.33' to a point in the center of South Fork of Jones Creek;
thence N 28°36'33" W a distance of 23.91' to a point in the center of South Fork of Jones Creek;
thence N 22°29'33" W a distance of 28.64' to a point in the center of South Fork of Jones Creek;
thence N 17°46'05" E a distance of 20.24' to a point in the center of South Fork of Jones Creek;
thence N 41°21'21" E a distance of 35.07' to a point in the center of South Fork of Jones Creek;
thence N 17°15'41" W a distance of 21.74' to a point in the center of South Fork of Jones Creek;
thence N 50°56'31" W a distance of 21.86' to a point in the center of South Fork of Jones Creek;
thence S 57°27'17" W a distance of 19.42' to a point in the center of South Fork of Jones Creek;
thence S 61°56'00" W a distance of 35.58' to a point in the center of South Fork of Jones Creek;
thence N 87°46'13" W a distance of 65.88' to a point in the center of South Fork of Jones Creek;
thence S 41°53'03" W a distance of 35.70' to a point in the center of South Fork of Jones Creek;
thence S 41°04'23" W a distance of 49.27' to a point in the center of South Fork of Jones Creek;
thence S 58°47'54" W a distance of 58.28' to a point in the center of South Fork of Jones Creek;

thence S 56°21'35" W a distance of 78.12' to a point in the center of South Fork of Jones Creek;
thence N 64°53'20" W a distance of 34.54' to a point in the center of South Fork of Jones Creek;
thence N 80°50'19" W a distance of 59.33' to a point in the center of South Fork of Jones Creek;
thence N 64°49'31" W a distance of 34.83' to a point in the center of South Fork of Jones Creek;
thence N 83°28'30" W a distance of 61.59' to a point in the center of South Fork of Jones Creek;
thence N 38°22'29" W a distance of 49.35' to a point in the center of South Fork of Jones Creek;
thence N 60°01'34" W a distance of 65.50' to a point in the center of South Fork of Jones Creek;
thence N 66°00'24" W a distance of 104.37' to a point in the center of South Fork of Jones Creek;
thence N 47°04'19" W a distance of 27.21' to a point in the center of South Fork of Joens Creek;
thence N 23°14'21" E a distance of 30.23' to a point in the center of South Fork of Joens Creek;
thence N 13°46'14" W a distance of 27.89' to a point in the center of South Fork of Joens Creek;
thence N 61°24'55" W a distance of 23.21' to a point in the center of South Fork of Joens Creek;
thence N 87°08'12" W a distance of 25.14' to a point in the center of South Fork of Joens Creek;
thence N 71°42'51" W a distance of 47.79' to a point in the center of South Fork of Joens Creek;
thence N 61°39'05" W a distance of 77.64' to a point in the center of South Fork of Joens Creek;
thence N 74°54'36" W a distance of 64.26' to a point in the center of South Fork of Joens Creek;
thence S 71°13'41" W a distance of 48.88' to a point in the center of South Fork of Joens Creek;
thence S 83°23'15" W a distance of 44.32' to a point in the center of South Fork of Joens Creek;
thence N 74°11'10" W a distance of 78.86' to a point in the center of South Fork of Joens Creek;
thence N 65°43'51" W a distance of 78.48' to a point in the center of South Fork of Joens Creek;
thence N 67°13'40" W a distance of 97.01' to a point in the center of South Fork of Joens Creek;
thence S 85°50'33" W a distance of 45.91' to a point in the center of South Fork of Joens Creek;
thence S 87°17'52" W a distance of 133.02' to a point in the center of South Fork of Jones Creek;
thence S 57°57'07" W a distance of 116.44' to a point in the center of South Fork of Jones Creek;
thence S 51°16'08" W a distance of 38.87' to a point in the center of South Fork of Jones Creek;
thence S 39°22'49" E a distance of 39.50' to a point in the center of South Fork of Jones Creek;
thence S 29°38'01" W a distance of 34.29' to a point in the center of South Fork of Jones Creek;
thence S 61°30'29" W a distance of 78.03' to a point in the center of South Fork of Jones Creek;
thence S 60°53'01" W a distance of 84.80' to a point in the center of South Fork of Jones Creek;
thence S 82°03'23" W a distance of 45.76' to a point in the center of South Fork of Jones Creek;
thence N 06°13'13" E a distance of 21.97' to a metal T-Post;
thence N 06°13'13" E a distance of 102.76' to a 5/8" rebar with aluminum easement cap number 27;
which is the point of beginning,
having an area of 67.74 acres

Easement Area B

Beginning at a 5/8" rebar with aluminum easement cap number 1;
thence N 28°11'25" E a distance of 156.36' to a 5/8" rebar with aluminum easement cap;
thence N 28°39'26" E a distance of 155.20' to a 5/8" rebar with aluminum easement cap
thence N 01°16'05" W a distance of 70.26' to a 5/8" rebar with aluminum easement cap;
thence N 22°15'22" E a distance of 57.22' to a 5/8" rebar with aluminum easement cap;
said point lies
S 06°39'01" E a distance of 937.37' from a 1/2" OTP;
thence N 86°39'36" E a distance of 77.63' to a 5/8" rebar with aluminum easement cap;
thence S 37°46'19" E a distance of 72.26' to a 5/8" rebar with aluminum easement cap;
thence S 07°44'47" W a distance of 127.17' to a 5/8" rebar with aluminum easement cap;
thence S 29°46'52" W a distance of 184.22' to a 5/8" rebar with aluminum easement cap;

thence S 18°25'10" W a distance of 82.81' to a 5/8" rebar with aluminum easement cap;
thence S 08°50'41" E a distance of 118.89' to a 5/8" rebar with aluminum easement cap;
thence S 13°17'35" E a distance of 148.40' to a 5/8" rebar with aluminum easement cap;
thence S 19°31'14" E a distance of 190.90' to a 5/8" rebar with aluminum easement cap;
thence N 29°42'42" E a distance of 317.31' to a 5/8" rebar with aluminum easement cap;
thence N 42°07'29" E a distance of 195.75' to a 5/8" rebar with aluminum easement cap;
thence S 58°40'06" E a distance of 71.06' to a 5/8" rebar with aluminum easement cap;
thence S 01°36'19" E a distance of 56.16' to a 5/8" rebar with aluminum easement cap;
thence S 34°49'41" W a distance of 145.28' to a 5/8" rebar with aluminum easement cap;
thence S 29°58'31" W a distance of 369.50' to a 5/8" rebar with aluminum easement cap;
thence S 04°31'10" W a distance of 58.82' to a 5/8" rebar with aluminum easement cap;
thence S 14°24'25" E a distance of 59.84' to a 5/8" rebar with aluminum easement cap;
thence S 17°53'27" E a distance of 196.78' to a 5/8" rebar with aluminum easement cap;
thence S 20°59'59" E a distance of 91.63' to a 5/8" rebar with aluminum easement cap;
thence S 11°33'00" E a distance of 109.33' to a 5/8" rebar with aluminum easement cap number 25; said point lies
N 66°50'47" E a distance of 814.81' from a granite monument;
thence with the center line of the creek the following;
N 26°37'36" W a distance of 46.59' to a point in the creek;
thence S 81°13'27" W a distance of 39.50' to a point in the creek;
thence N 61°24'46" W a distance of 20.34' to a point in the creek;
thence N 74°34'14" W a distance of 12.08' to a point in the creek;
thence N 03°06'29" W a distance of 35.74' to a point in the creek;
thence N 58°43'40" W a distance of 24.92' to a point in the creek;
thence N 43°09'00" W a distance of 21.73' to a point in the creek;
thence N 01°46'54" W a distance of 17.18' to a point in the creek;
thence N 19°48'56" E a distance of 34.20' to a point in the creek;
thence N 41°19'39" W a distance of 51.63' to a point in the creek;
thence N 18°38'42" W a distance of 16.31' to a point in the creek;
thence N 75°08'57" W a distance of 18.12' to a point in the creek;
thence N 18°47'12" W a distance of 21.59' to a point in the creek;
thence N 42°04'02" E a distance of 10.16' to a point in the creek;
thence N 00°59'37" W a distance of 82.76' to a point in the creek;
thence N 31°31'41" W a distance of 28.63' to a point in the creek;
thence N 80°59'38" W a distance of 20.09' to a point in the creek;
thence N 17°35'45" E a distance of 42.04' to a point in the creek;
thence N 00°46'14" E a distance of 18.44' to a point in the creek;
thence N 49°53'58" W a distance of 37.01' to a point in the creek;
thence N 72°47'54" W a distance of 11.67' to a point in the creek;
thence N 02°00'42" E a distance of 9.91' to a point in the creek;
thence N 67°19'40" W a distance of 33.58' to a point in the creek;
thence S 71°39'45" W a distance of 16.56' to a point in the creek;
thence N 57°06'51" W a distance of 48.46' to a point in the creek;
thence N 59°08'00" E a distance of 18.82' to a point in the creek;
thence N 09°42'05" E a distance of 21.82' to a point in the creek;
thence N 75°16'21" E a distance of 27.42' to a point in the creek;
thence N 31°04'14" E a distance of 21.25' to a point in the creek;

thence N 63°33'52" E a distance of 9.70' to a point in the creek;
thence N 00°13'20" E a distance of 28.12' to a point in the creek;
thence N 42°04'16" W a distance of 9.04' to a point in the creek;
thence N 63°56'23" W a distance of 35.79' to a point in the creek;
thence N 00°08'56" E a distance of 11.17' to a point in the creek;
thence N 36°28'50" W a distance of 21.89' to a point in the creek;
thence N 01°47'08" W a distance of 13.41' to a point in the creek;
thence N 47°41'33" E a distance of 23.69' to a point in the creek;
thence N 14°08'14" E a distance of 15.29' to a point in the creek;
thence N 00°13'46" E a distance of 15.98' to a point in the creek;
thence N 43°40'15" W a distance of 11.31' to a point in the creek;
thence N 82°39'51" W a distance of 18.10' to a point in the creek;
thence N 16°39'30" W a distance of 31.53' to a point in the creek;
thence N 09°25'39" W a distance of 20.07' to a point in the creek;
thence N 49°37'00" W a distance of 19.50' to a point in the creek;
thence S 79°19'57" W a distance of 34.00' to a point in the creek;
thence leaving the creek; N 35°55'45" W a distance of 60.50' to a metal T-Post;
thence N 15°01'15" W a distance of 273.94' to a 5/8" rebar with aluminum easement cap;
which is the point of beginning,
having an area of 5.34 acres

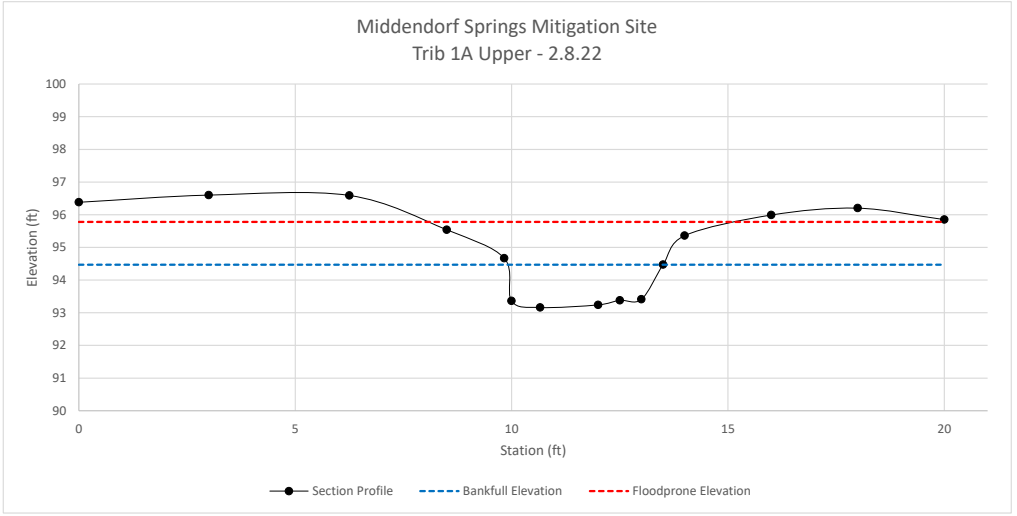
Appendix C

Geomorphological Site Data

River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1A Upper - 2.8.22
Drainage Area (sq. mi.)	0.145
Date:	Feburary 8th, 2022
Field Crew:	L. Ward, L. Hales

Station	Elevation
0	96.38
3	96.6
6.25	96.59
8.5	95.54
9.83	94.67
10	93.36
10.66	93.16
12	93.24
12.5	93.38
13	93.41
13.5	94.47
14	95.36
16	95.99
18	96.2
20	95.85

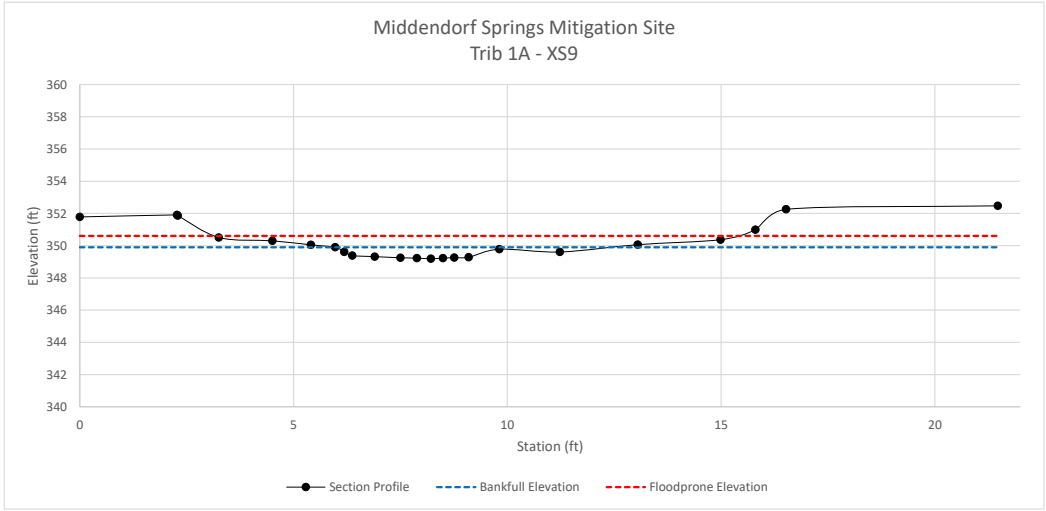
Geomorphic Summary Data	
Bankfull Elevation (ft):	94.47
Bankfull Cross-sectional Area (ft^2):	3.96
Bankfull Width (ft):	3.64
Floodprone Area Elevation (ft):	95.78
Floodprone Width (ft):	7.35
Max Depth at Bankfull (ft):	1.31
Mean Depth at Bankfull (ft):	1.09
W/D Ratio:	3.34
Entrenchment Ratio:	2.02
Bank Height Ratio:	1.00



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1A - XS9
Drainage Area (sq. mi.)	0.145
Date:	January 10th, 2022
Field Crew:	I. Jewell, E. Brown, M. Mizutani

Station	Elevation
0	351.784
2.2776	351.91
2.2942	351.867
3.2536	350.506
4.5069	350.3
5.4058	350.05
5.9749	349.898
6.19	349.609
6.3771	349.386
6.9012	349.319
7.5005	349.25
7.8875	349.224
8.2144	349.189
8.4972	349.225
8.7597	349.258
9.1	349.286
9.8163	349.779
11.2327	349.609
13.0553	350.064
14.99	350.373
15.8057	350.993
16.5237	352.256
21.4762	352.471

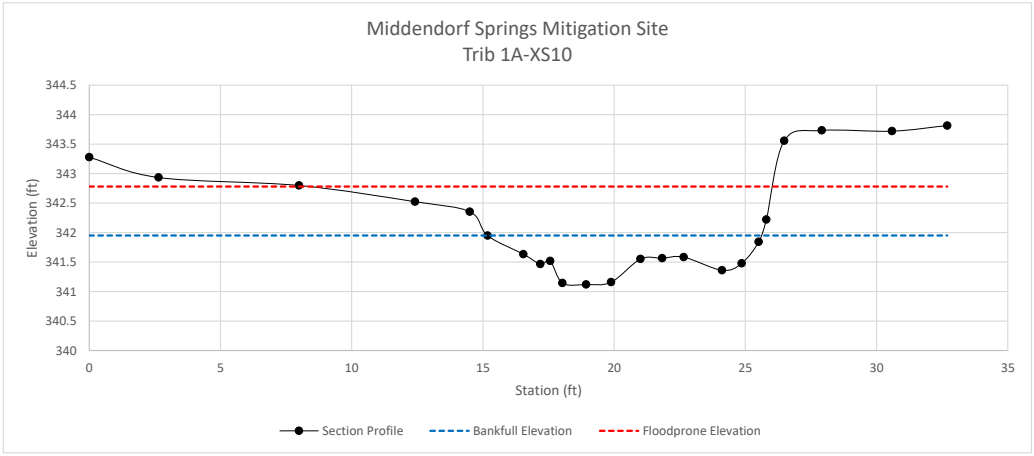
Geomorphic Summary Data	
Bankfull Elevation (ft):	349.898
Bankfull Cross-sectional Area (ft^2):	2.09
Bankfull Width (ft):	3.83
Floodprone Area Elevation (ft):	350.61
Floodprone Width (ft):	12.12
Max Depth at Bankfull (ft):	0.71
Mean Depth at Bankfull (ft):	0.55
W/D Ratio:	6.96
Entrenchment Ratio:	3.16
Bank Height Ratio:	1.85



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1A -XS10
Drainage Area (sq. mi.)	0.145
Date:	January 10th, 2022
Field Crew:	I. Jewell, E. Brown, M. Mizutani

Station	Elevation
0	343.276
2.6428	342.933
7.9918	342.798
12.4157	342.523
14.5011	342.353
15.1788	341.948
16.5437	341.633
17.1874	341.466
17.562	341.518
18.0326	341.144
18.9322	341.119
19.8885	341.159
21.0052	341.551
21.8311	341.565
22.6529	341.584
24.1115	341.36
24.8595	341.477
25.51	341.841
25.8016	342.221
26.4793	343.556
27.9112	343.731
30.5863	343.719
32.6929	343.814

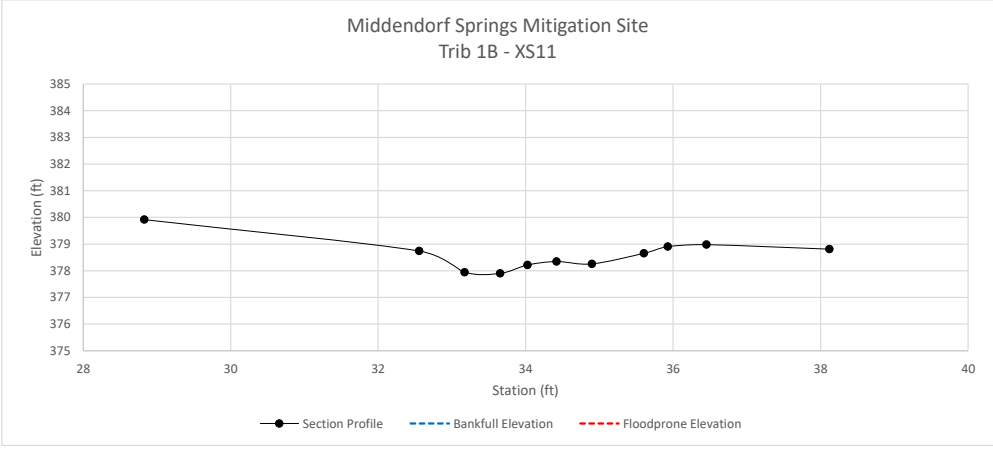
Geomorphic Summary Data	
Bankfull Elevation (ft):	341.95
Bankfull Cross-sectional Area (ft^2):	5.04
Bankfull Width (ft):	10.42
Floodprone Area Elevation (ft):	342.78
Floodprone Width (ft):	17.82
Max Depth at Bankfull (ft):	0.83
Mean Depth at Bankfull (ft):	0.48
W/D Ratio:	21.71
Entrenchment Ratio:	1.71
Bank Height Ratio:	2.02



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1B - XS11
Drainage Area (sq. mi.)	0.031
Date:	January 10th, 2022
Field Crew:	I. Jewell, E. Brown, M. Mizutani

Station	Elevation
28.8286	379.917
32.5578	378.741
33.173	377.944
33.6557	377.903
34.0258	378.217
34.4198	378.347
34.8986	378.258
35.6032	378.655
35.9271	378.903
36.4529	378.979
38.1211	378.811

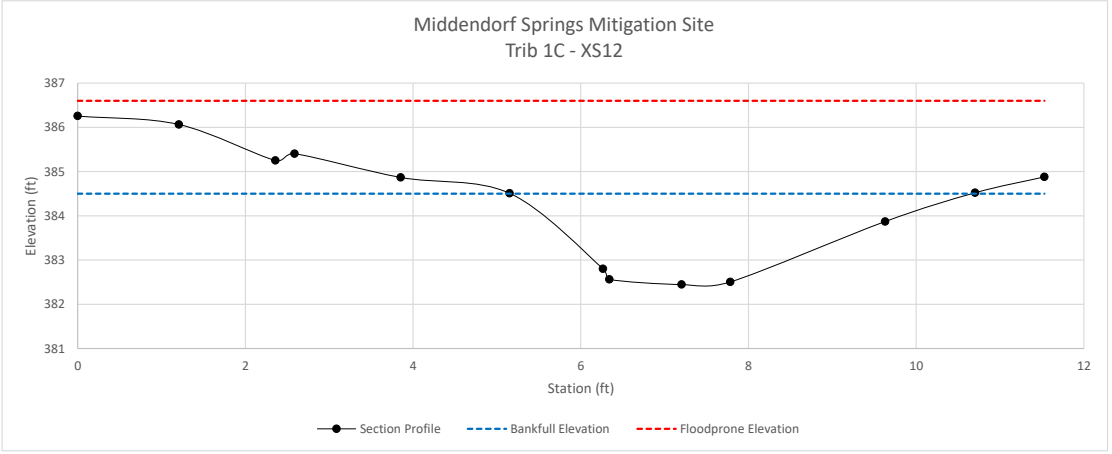
Geomorphic Summary Data	
Bankfull Elevation (ft):	378.8
Bankfull Cross-sectional Area (ft^2):	0.43
Bankfull Width (ft):	2.2
Floodprone Area Elevation (ft):	378.8
Floodprone Width (ft):	3.81
Max Depth at Bankfull (ft):	0.45
Mean Depth at Bankfull (ft):	0.2
W/D Ratio:	11
Entrenchment Ratio:	1.73
Bank Height Ratio:	0.99



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1C - XS12
Drainage Area (sq. mi.)	0.018
Date:	January 10th, 2022
Field Crew:	I. Jewell, E. Brown, M. Mizutani

Station	Elevation
0	386.255
1.2079	386.064
2.359	385.251
2.5867	385.403
3.853	384.867
5.1511	384.51
6.2655	382.802
6.3414	382.563
7.203	382.445
7.7848	382.506
9.6296	383.871
10.7039	384.521
11.5293	384.88

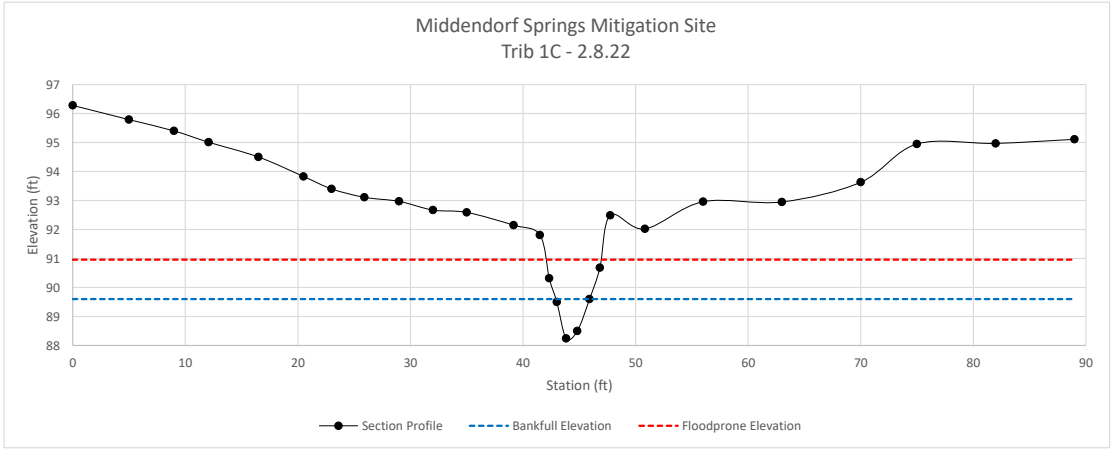
Geomorphic Summary Data	
Bankfull Elevation (ft):	384.51
Bankfull Cross-sectional Area (ft^2):	6.78
Bankfull Width (ft):	5.53
Floodprone Area Elevation (ft):	386.57
Floodprone Width (ft):	11.53
Max Depth at Bankfull (ft):	2.06
Mean Depth at Bankfull (ft):	1.22
W/D Ratio:	4.53
Entrenchment Ratio:	2.08
Bank Height Ratio:	1.00



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 1C - 2.8.22
Drainage Area (sq. mi.)	0.018
Date:	Feburary 8th, 2022
Field Crew:	L. Ward, L. Hales

Station	Elevation
0	96.28
5	95.79
9	95.4
12.08	95.01
16.5	94.5
20.5	93.83
23	93.4
25.91	93.11
29	92.97
32	92.67
35	92.59
39.16	92.15
41.5	91.81
42.33	90.32
43	89.5
43.83	88.24
44.83	88.5
45.91	89.6
46.83	90.68
47.75	92.49
50.83	92.02
56	92.96
63	92.95
70	93.63
75	94.95
82	94.97
89	95.11

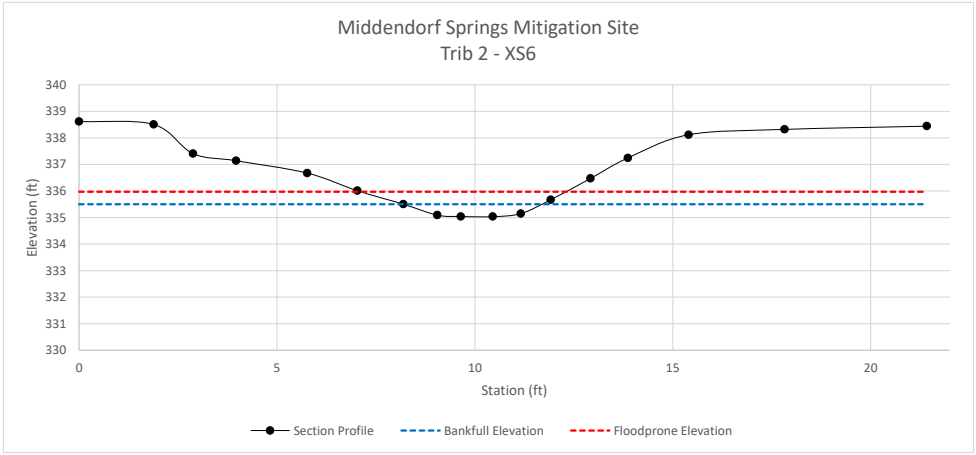
Geomorphic Summary Data	
Bankfull Elevation (ft):	89.6
Bankfull Cross-sectional Area (ft^2):	2.43
Bankfull Width (ft):	2.99
Floodprone Area Elevation (ft):	90.96
Floodprone Width (ft):	5
Max Depth at Bankfull (ft):	1.36
Mean Depth at Bankfull (ft):	0.81
W/D Ratio:	3.69
Entrenchment Ratio:	1.67
Bank Height Ratio:	2.63



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 2 -XS6
Drainage Area (sq. mi.)	0.039
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	338.618
1.8852	338.507
2.8807	337.408
3.9641	337.14
5.7636	336.674
7.032	336.008
8.1927	335.502
9.0473	335.09
9.6416	335.038
10.452	335.032
11.1619	335.147
11.9143	335.666
12.9208	336.47
13.8638	337.24
15.3985	338.117
17.8244	338.319
21.4166	338.441

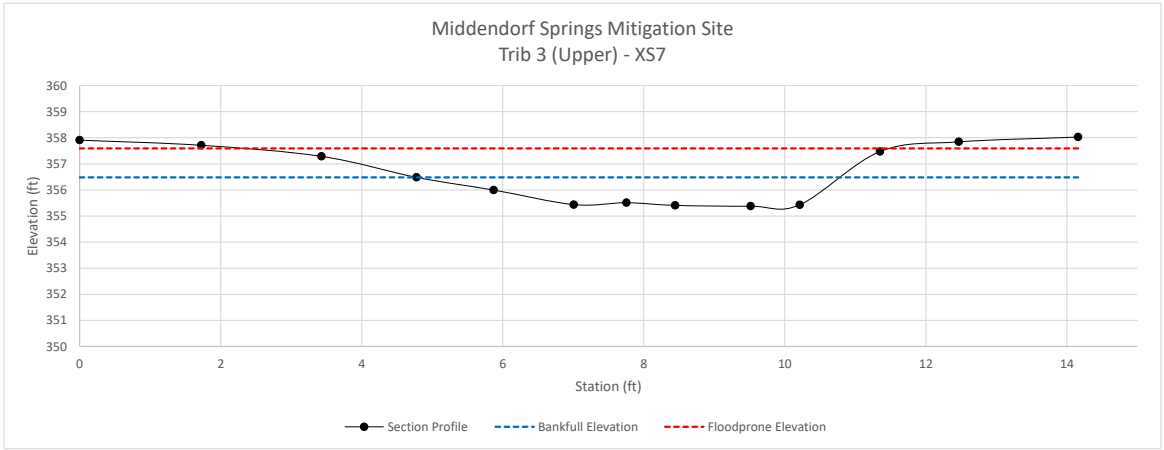
Geomorphic Summary Data	
Bankfull Elevation (ft):	335.5
Bankfull Cross-sectional Area (ft^2):	1.19
Bankfull Width (ft):	3.48
Floodprone Area Elevation (ft):	335.97
Floodprone Width (ft):	5.17
Max Depth at Bankfull (ft):	0.47
Mean Depth at Bankfull (ft):	0.34
W/D Ratio:	10.24
Entrenchment Ratio:	1.49
Bank Height Ratio:	6.57



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 3 (Upper) - XS7
Drainage Area (sq. mi.)	0.045
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	357.907
1.7249	357.71
3.43	357.286
4.7779	356.481
5.8726	355.994
7.0071	355.437
7.7543	355.51
8.4453	355.406
9.5173	355.375
10.2131	355.43
11.3502	357.471
12.4681	357.843
14.1591	358.027

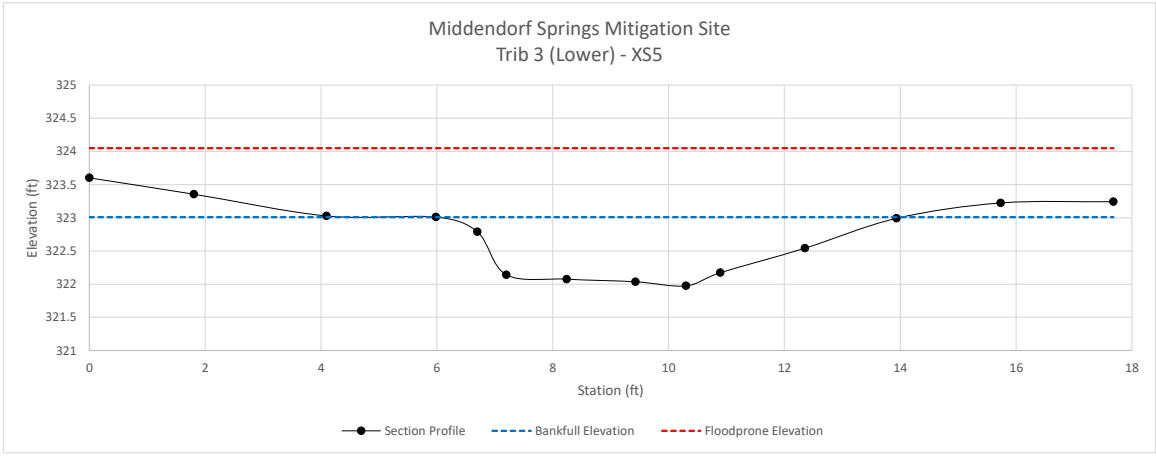
Geomorphic Summary Data	
Bankfull Elevation (ft):	356.48
Bankfull Cross-sectional Area (ft^2):	4.82
Bankfull Width (ft):	6.02
Floodprone Area Elevation (ft):	357.59
Floodprone Width (ft):	9.47
Max Depth at Bankfull (ft):	1.11
Mean Depth at Bankfull (ft):	0.8
W/D Ratio:	7.52
Entrenchment Ratio:	1.57
Bank Height Ratio:	0.99



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 3 (Lower) - XS5
Drainage Area (sq. mi.)	0.045
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	323.602
1.8067	323.355
4.0969	323.028
5.9848	323.011
6.6987	322.789
7.1996	322.141
8.2424	322.075
9.4304	322.036
10.3037	321.974
10.896	322.173
12.3551	322.542
13.9362	322.992
15.7339	323.224
17.6802	323.243

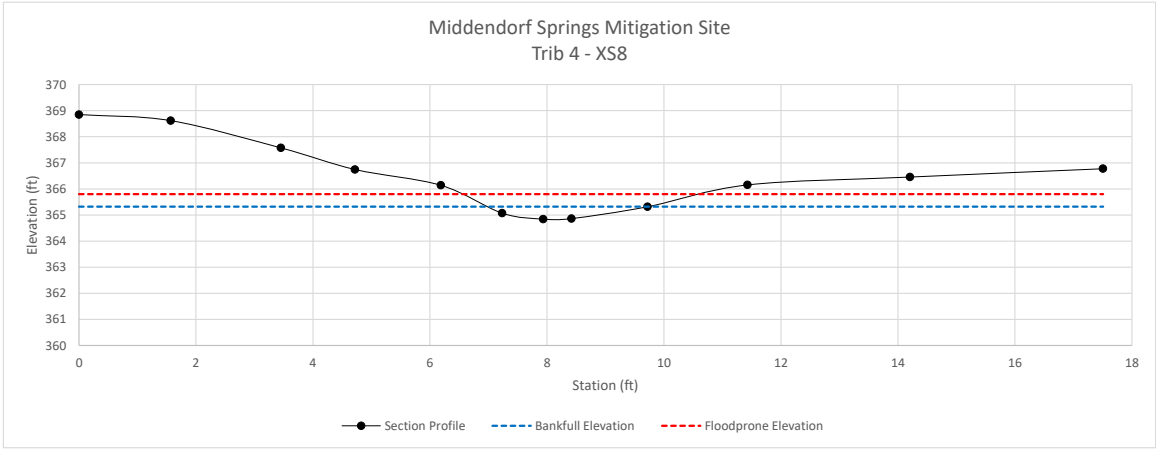
Geomorphic Summary Data	
Bankfull Elevation (ft):	323.01
Bankfull Cross-sectional Area (ft^2):	5.2
Bankfull Width (ft):	8.09
Floodprone Area Elevation (ft):	324.05
Floodprone Width (ft):	17.68
Max Depth at Bankfull (ft):	1.04
Mean Depth at Bankfull (ft):	0.64
W/D Ratio:	12.64
Entrenchment Ratio:	2.19
Bank Height Ratio:	1.00



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 4 - XS8
Drainage Area (sq. mi.)	0.051
Date:	November 1st, 2019
Field Crew:	I. Jewell, B.Dick

Station	Elevation
0	368.849
1.569	368.616
3.4523	367.572
4.72	366.743
6.1876	366.138
7.2358	365.07
7.9382	364.843
8.4192	364.863
9.721	365.317
11.4278	366.152
14.209	366.455
17.5073	366.773

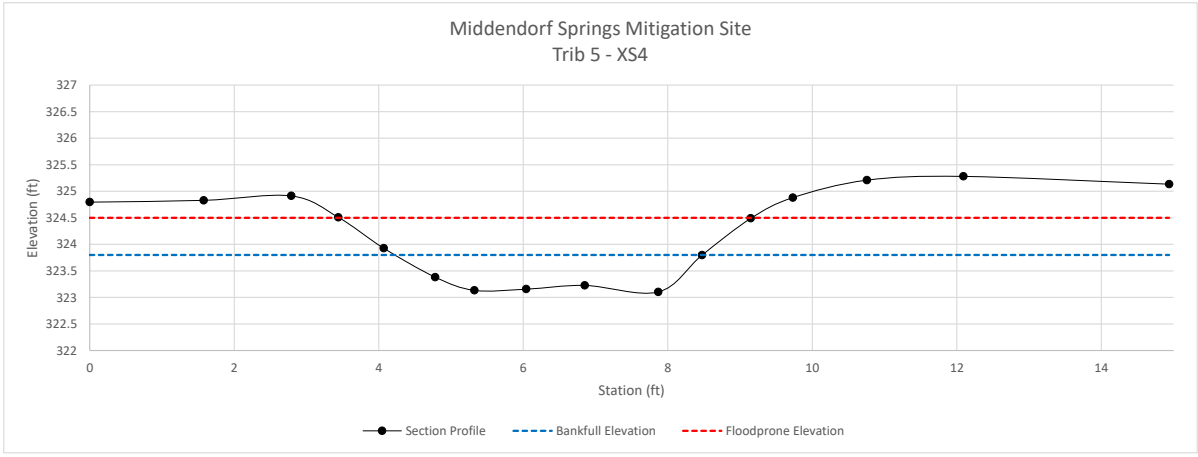
Geomorphic Summary Data	
Bankfull Elevation (ft):	365.32
Bankfull Cross-sectional Area (ft^2):	0.81
Bankfull Width (ft):	2.74
Floodprone Area Elevation (ft):	365.8
Floodprone Width (ft):	4.18
Max Depth at Bankfull (ft):	0.48
Mean Depth at Bankfull (ft):	0.3
W/D Ratio:	9.13
Entrenchment Ratio:	1.53
Bank Height Ratio:	2.69



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 5 - XS4
Drainage Area (sq. mi.)	0.025
Date:	November 1st, 2019
Field Crew:	I. Jewell, B.Dick

Station	Elevation
0	324.795
1.5772	324.829
2.7893	324.912
3.4418	324.508
4.07	323.926
4.7819	323.382
5.3251	323.133
6.0422	323.156
6.8526	323.226
7.8689	323.103
8.475	323.798
9.1489	324.489
9.7311	324.88
10.7556	325.209
12.0924	325.28
14.9385	325.134

Geomorphic Summary Data	
Bankfull Elevation (ft):	323.8
Bankfull Cross-sectional Area (ft^2):	2.23
Bankfull Width (ft):	4.24
Floodprone Area Elevation (ft):	324.5
Floodprone Width (ft):	5.71
Max Depth at Bankfull (ft):	0.7
Mean Depth at Bankfull (ft):	0.53
W/D Ratio:	8
Entrenchment Ratio:	1.35
Bank Height Ratio:	2.59

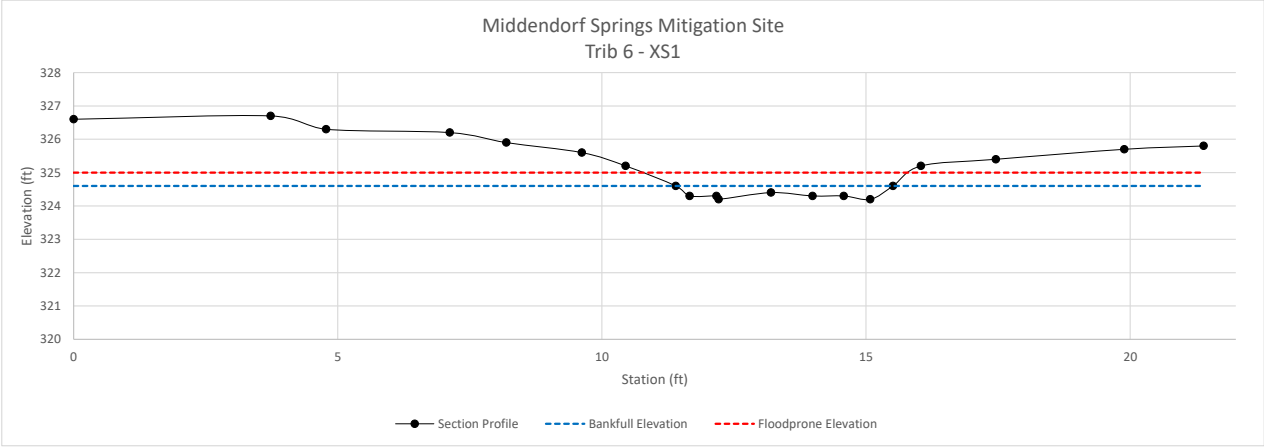


River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 6 - XS1
Drainage Area (sq. mi.)	0.069
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	326.6
3.73	326.7
4.78	326.3
7.12	326.2
8.19	325.9
9.62	325.6
10.45	325.2
11.4	324.6
11.66	324.3
12.17	324.3
12.21	324.2
13.2	324.4
13.99	324.3
14.58	324.3
15.08	324.2
15.51	324.6
16.04	325.2
17.46	325.4
19.89	325.7
21.39	325.8

0	324.6
21.39	324.6
0	325
21.39	325

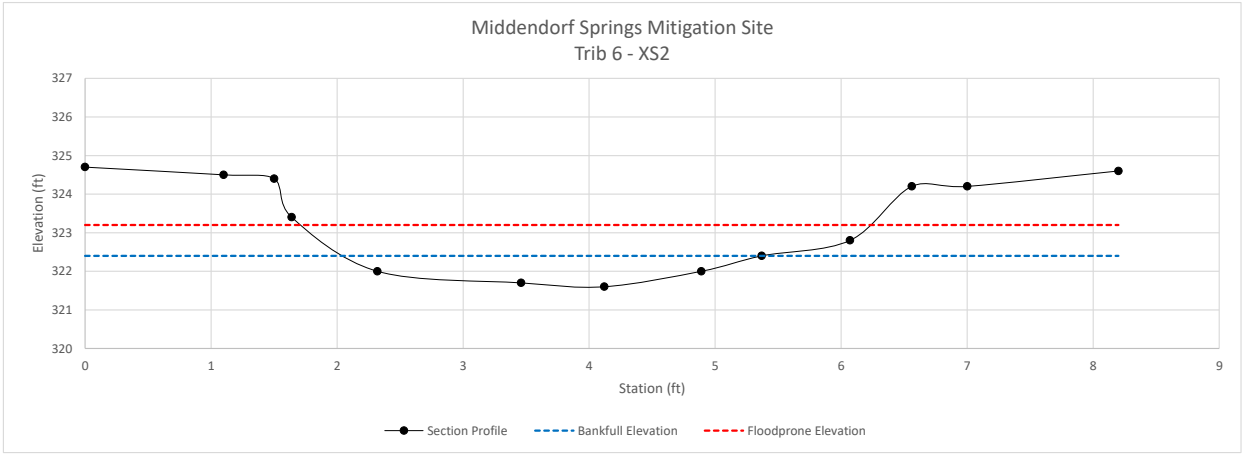
Geomorphic Summary Data	
Bankfull Elevation (ft):	324.6
Bankfull Cross-sectional Area (ft^2):	1.14
Bankfull Width (ft):	4.11
Floodprone Area Elevation (ft):	325
Floodprone Width (ft):	5.1
Max Depth at Bankfull (ft):	0.4
Mean Depth at Bankfull (ft):	0.28
W/D Ratio:	14.68
Entrenchment Ratio:	1.24
Bank Height Ratio:	2.50



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 6 - XS2
Drainage Area (sq. mi.)	0.069
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	324.7
1.1	324.5
1.5	324.4
1.64	323.4
2.32	322
3.46	321.7
4.12	321.6
4.89	322
5.37	322.4
6.07	322.8
6.56	324.2
7	324.2
8.2	324.6

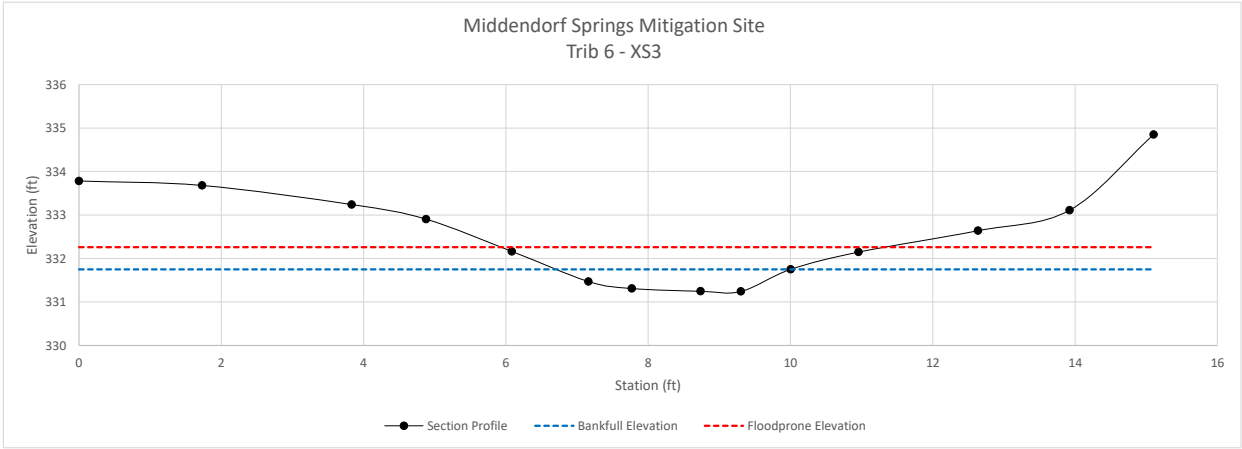
Geomorphic Summary Data	
Bankfull Elevation (ft):	322.4
Bankfull Cross-sectional Area (ft^2):	1.72
Bankfull Width (ft):	3.24
Floodprone Area Elevation (ft):	323.2
Floodprone Width (ft):	4.47
Max Depth at Bankfull (ft):	0.8
Mean Depth at Bankfull (ft):	0.53
W/D Ratio:	6.11
Entrenchment Ratio:	1.38
Bank Height Ratio:	3.25



River Basin:	Yadkin - Pee Dee
Site	Middendorf Springs Mitigation Site
XS ID	Trib 6 - XS3
Drainage Area (sq. mi.)	0.069
Date:	November 1st, 2019
Field Crew:	I. Jewell, B. Dick

Station	Elevation
0	333.782
1.7313	333.68
3.8317	333.241
4.8785	332.904
6.0837	332.163
7.1592	331.471
7.7704	331.31
8.7369	331.246
9.304	331.242
10.0032	331.75
10.9568	332.147
12.6365	332.639
13.9232	333.11
15.1042	334.85

Geomorphic Summary Data	
Bankfull Elevation (ft):	331.75
Bankfull Cross-sectional Area (ft^2):	1.2
Bankfull Width (ft):	3.28
Floodprone Area Elevation (ft):	332.26
Floodprone Width (ft):	5.41
Max Depth at Bankfull (ft):	0.51
Mean Depth at Bankfull (ft):	0.37
W/D Ratio:	8.86
Entrenchment Ratio:	1.65
Bank Height Ratio:	4.78



Middendorf Springs, DMS # 100151, Yadkin River Basin CU 03040201
Tributaries 1A-6

Geomorphic Parameter	Reference Reach - Spencer Creek 3			Reference Reach - UT to Rocky Creek			Reference Reach - UT to Cane Creek			Existing Tributary 1A		Proposed Tributary 1A		Existing Tributary 1B		Proposed Tributary 1B		Existing Tributary 1C	
Rosgen Stream Type	E4			E4b			C4												
Drainage Area	0.37 square miles			1.05 square miles			0.29 square miles			0.15 square miles		0.15 square miles		0.029 square miles		0.029 square miles		0.036 square miles	
Design/Calculated Bankfull Discharge	35 cfs			85 cfs			40 cfs			7.4		7.4		1.6		1.6		1.1	
Dimension	**Riffle**	**Pool**	**Avg**	**Riffle**	**Pool**	**Avg**	**Riffle**	**Pool**	**Avg**	**Riffle**	**Pool**	**Riffle**	**Pool**	**Riffle**	**Pool**	**Riffle**	**Pool**	**Riffle**	**Pool**
FP Width (ft)	14.00	125.0	-	-	-	72.4	-	-	31.0	21.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present	63.00	-	22.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present			52.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present
BF Width (ft)	6.3	9.3	-	-	-	12.2	11.5	12.3	-	10.42		8.00	8.00	2.20		4.00	6.00	2.99	
BF Cross Sectional Area (ft^2)	6.6	8.7	-	-	-	16.3	8.9	12.2	-	5.04		5.80	10.00	0.43		1.80	3.15	2.43	
BF Mean Depth (ft)	0.8	1.0	-	-	-	1.3	0.8	1.0	-	0.48		0.73	1.25	0.20		0.45	0.53	0.81	
BF Max Depth (ft)	1.0	1.2	-	-	-	1.8	1.2	1.6	-	0.83		1.30	2.00	0.45		0.80	0.90	1.36	
Width/Depth Ratio	7.9	9.3	-	-	-	9.1	12.3	14.4	-	21.71		11.03	6.40	11.00		8.89	11.43	3.69	
Entrenchment Ratio	1.7	4.3	-	-	-	6.0	2.5	2.7	-	3.16		>2.2	>2.2	1.73		>2.2	>2.2	1.67	
Wetted Perimeter (ft)	-	-	-	-	-	-	-	-	-	6.96		8.43	-	2.57		4.32	-	4.21	
Hydraulic radius (ft)	-	-	-	-	-	-	-	-	-	0.48		0.61	0.95	0.17		0.37	0.47	0.58	
Bank Height Ratio	1.0	1.0	-	-	-	-	1.4	2.5	-	1.59		1.00	1.00	1.10		1.00	1.0	2.63	
Pool Area/Riffle Area	1.0	1.1	-	-	-	1.2	1.2	1.4	-	1.00		1.72		1.00		1.75		1.00	
Max riffle depth/mean riffle depth	1.25	1.2	-	-	-	1.38	1.5	1.6	-	1.73		1.78		2.25		1.78		1.68	
Max pool depth/mean riffle depth	1.5	1.8	-	-	-	1.6	1.00	2.9	-	1.00		2.74		1.00		2.00		1.00	
Pattern	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Channel Beltwidth (ft)	10.00	50.00	-	-	-	-	-	-	102	Existing channel is straight and lacks dynamic planform		8.58	40.18	Existing channel is straight and lacks dynamic planform		Enhancement Reach- no proposed planform modifications		Existing channel is straight and lacks dynamic planform	
Radius of Curvature (ft)	12.00	85.00	-	-	-	-	-	-	-			20.00	50.00						
Meander Wavelength	55.00	142.00	-	-	-	-	45.00	81.00	-			86.48	127.14						
Meander Width ratio	1.60	5.40	-	-	-	-	8.30	8.90	-			1.07	5.02						
Radius of Curvature/Riffle Width (ft)	1.90	9.10	-	-	-	-	2.00	3.10	-			2.50	8.62						
Meander Length Ratio	8.73	15.27	-	-	-	-	3.90	6.60	-			10.81	15.89						
Pool Length/Riffle Width	-	-	-	-	-	-	-	-	-			4.61	10.18						
Pool to Pool Spacing/ Riffle Width	1.43	4.95	-	-	-	-	2.60	4.70	-			7.09	17.82						
Profile	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**			**Min**	**Max**			**Min**	**Max**		
Riffle Length (ft)	-	-	-	-	-	-	-	-	-	Incised and lacks bedform		19.54	37.62	Incised and lacks bedform				Incised and lacks bedform	
Pool length (ft)	-	-	-	-	-	-	-	-	-			36.85	81.40						
Pool spacing (ft)	9.00	46.00	-	26.30	81.00	-	49.00	91.00	-			56.69	142.52						
Riffle slope (ft/ft)	0.0180	0.0343	-	0.0610	0.0890	-	0.0150	0.0350	-			0.02				0.04			
Pool slope (ft/ft)	0.0010	0.0140	-	0.0000	0.0040	-	0.0008	0.0030	-			0.00				0.00			
Riffle Slope/Avg. Water Surface Slope	0.97	1.56	-	2.54	3.71	-	1.00	2.33	-			1.72							
Pool Slope/Avg. Water Surface Slope	0.04	0.64	-	0.00	0.17	-	0.05	0.20	-			0.00							
Substrate	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**										
Description (based on D50)	Medium Gravel			Coarse Gravel			Medium Gravel			Very Fine Gravel		Small Cobble		Medium Sand		Small Cobble		Very Fine Gravel	
D16 (mm)	1.866			<0.063			0.6			0.21		50.80		0.14		50.80		0.21	
D35 (mm)	8.85			2.4			12.20			0.63		---		0.21		---		0.63	
D50 (mm)	11.00			22.6			27.80			3.33		101.60		0.42		101.60		3.33	
D84 (mm)	64.00			120			74.50			27.97		---		4.00		---		27.97	
D95 (mm)	128.00			256			128.00			54.50		152.40		10.48		152.40		54.50	
Additional Reach Parameters	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**	**Min**	**Max**	**Avg**			**Min**	**Max**						
Valley Length (ft)	-	-	-	-	-	-	-	-	-	1761.00		1761.00		495.81		495.81		669.38	
Channel Length (ft)	-	-	-	-	-	-	-	-	-	1800.00		1950.86		500.12		500.12		698.00	
Valley Slope (ft/ft)	0.02200	0.03100	-	0.02600	-	-	0.02600	-	-	0.0151		0.013		0.045		0.045		0.059	
Channel Slope (ft/ft)	0.01900	0.02200	-	0.02400	-	-	0.01500	-	-	0.0145		0.012		0.044		0.044		0.054	
Sinuosity	1.00	1.3	-	1.10	-	-	1.40	-	-	1.02		1.11		1.01		1.01		1.04	

Proposed Tributary 1C		Existing Tributary 2		Proposed Tributary 2		Existing Tributary 3		Proposed Tributary 3		Existing Tributary 4		Proposed Tributary 4		Existing Tributary 5		Proposed Tributary 5		Existing Tributary 6		Proposed Tributary 6	
		G5								G5				G4				G4			
0.036 square miles		0.048 square miles		0.048 square miles		0.055 square miles		0.055 square miles		0.048 square miles		0.048 square miles		0.033 square miles		0.033 square miles		0.079 square miles		0.079 square miles	
1.1		2.6		2.6		2.9		2.9		3.2		3.2		1.8		1.8		4.1		4.1	
Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool	Riffle	Pool
11.00	-	5.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present	55.00	-	6.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present	131.50	-	23.00	Channel has been modified into ditch with uniform bedform- No Pools Present	65.00	-	8.00	Channel has severely degraded with lack of dyamic bedform- No Pools Present	335.00	-	11.00	Channel has been modified into ditch with uniform bedform- No Pools Present	66.00	-
4.00	6.00	3.48		4.00	6.00	8.09		4.00	6.00	2.74		4.00	7.00	4.24		4.00	6.00	3.28		4.00	6.00
1.80	3.15	1.19		1.80	3.15	5.20		1.80	5.30	0.81		1.80	3.90	2.23		1.80	3.15	1.20		1.80	6.20
0.45	0.53	0.34		0.45	0.53	0.64		0.45	0.88	0.30		0.45	0.56	0.53		0.45	0.53	0.37		0.45	1.03
0.80	0.90	0.47		0.80	0.90	1.04		0.80	1.40	0.48		0.80	1.00	0.70		0.80	0.90	0.51		0.80	1.60
8.89	11.43	10.24		8.89	11.43	12.64		8.89	6.79	9.13		8.89	12.56	8.00		8.89	11.43	8.86		8.89	5.81
>2.2	>2.2	1.49		>2.2	>2.2	2.19		>2.2	>2.2	1.53		>2.2	>2.2	1.35		>2.2	>2.2	1.65		>2.2	>2.2
4.32	-	3.69		4.32	-	8.59		4.32	-	2.96		4.32	-	4.77		4.32	-	3.55		4.32	-
0.37	0.47	0.32		0.37	0.47	0.61		0.37	0.68	0.27		0.37	0.48	0.47		0.37	0.47	0.34		0.37	0.77
1.00	1.00	6.57		1.00	1.00	1.00		1.00	1.00	2.69		1.00	1.00	2.59		1.00	1.00	4.78		1.00	1.00
1.75		1.00		1.75		1.00		2.94		0.00		2.17		1.00		1.75		1.00		3.44	
1.78		1.38		1.78		1.63		1.78		1.60		1.78		1.32		1.78		1.38		1.78	
2.00		1.00		2.00		1.00		3.11		0.00		2.22		1.00		2.00		1.00		3.56	
Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
4.31	24.33	Existing channel is straight and lacks dynamic planform		14.47	34.01	Existing channel is straight and lacks dynamic planform		9.94	29.78	Existing channel is straight and lacks dynamic planform		11.16	22.37	Existing channel is straight and lacks dynamic planform		8.92	31.65	Existing channel is straight and lacks dynamic planform		8.85	36.36
15.00	21.00			15.00	40.00			15.00	80.00			17.00	75.00			17.00	45.00			15.00	38.00
48.41	75.59			50.47	94.32			49.02	79.20			50.16	87.34			53.71	89.12			47.03	77.25
1.08	6.08			3.62	8.50			2.49	7.45			2.79	5.59			2.23	7.91			2.21	9.09
3.75	11.67			3.75	22.22			3.75	44.44			4.25	41.67			4.25	25.00			3.75	21.11
12.10	18.90			12.62	23.58			12.26	19.80			12.54	21.84			13.43	22.28			11.76	19.31
3.68	2.98			3.49	7.86			3.61	5.54			3.12	4.11			1.78	7.61			2.30	6.92
4.34	6.20			6.20	14.55			6.07	11.45			5.58	12.64			5.29	11.83			3.33	11.24
Min	Max			Min	Max			Min	Max			Min	Max			Min	Max			Min	Max
12.98	47.16	Incised and lacks bedform		5.54	41.37	Incised and lacks bedform		8.06	29.68	Incised and lacks bedform		8.49	18.49	Incised and lacks bedform		3.96	37.83	Incised and lacks bedform		2.02	36.16
14.71	17.87			13.94	31.42			14.44	22.14			12.47	16.45			7.10	30.45			9.20	27.66
17.37	37.22			24.78	58.20			24.27	45.79			22.31	50.56			21.14	47.30			13.32	44.96
0.04				0.04				0.04				0.04				0.04				0.04	
0.00				0.00				0.00				0.00				0.00				0.00	
1.67				1.45				1.72				1.51				2.18				2.64	
0.00				0.00				0.00				0.00				0.00				0.00	
Small Cobble		Coarse Sand		Small Cobble		Coarse Gravel		Small Cobble		Coarse Sand		Small Cobble		Medium Gravel		Small Cobble		Fine Gravel		Small Cobble	
50.80		0.24		50.80		0.18		50.80		0.24		50.80		0.05		50.80		0.15		50.80	
---		0.61		---		7.08		---		0.50		---		1.00		---		2.50		---	
101.60		0.95		101.60		16.47		101.60		0.97		101.60		12.15		101.60		5.70		101.60	
---		13.65		---		40.27		---		29.31		---		38.00		---		18.93		---	
152.40		20.95		152.40		58.30		152.40		48.80		152.40		53.44		152.40		30.66		152.40	
669.38		2054.60		2318.81		2167.30		2205.30		914.19		914.19		941.75		1336.52		2200.63		2576.14	
698.00		2180.00		2525.75		2185.00		2451.11		926.15		971.46		973.31		1489.44		2343.00		2875.49	
0.027		0.02875		0.02321		0.0253		0.0206		0.02452		0.02492		0.02088		0.01798		0.02740		0.01710	
0.026		0.02710		0.02131		0.0251		0.0185		0.02420		0.02345		0.02020		0.01613		0.02580		0.01532	
1.04		1.06		1.09		1.01		1.11		1.01		1.06		1.03		1.11		1.06		1.12	

Appendix D

Jurisdictional Determination Information

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **SAW-2021-01973** County: **Anson** U.S.G.S. Quad: **NC-Morven West**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Requestor: **Freese & Nichols, Inc.**
Attn: Jason Steele
Address: **531 N. Liberty Street**
Winston-Salem, NC 27101

Size (acres) **~72** Nearest Town **Wadesboro**
Nearest Waterway **South Fork Jones Creek** River Basin **Lower Pee Dee**
USGS HUC **03040201** Coordinates **34.854514, -80.105156**
Location description: **The project area is located between Gulledge Road, and South Fork Jones Creek, approximately 0.7 mile west of NC Highway 742, near Wadesboro, Anson County, North Carolina.**

The Approved Jurisdictional Determination Review Area is shown as the purple outlined "AJD Review Area" on the attached map entitled "Exhibit 4 WOTUS Features."

The Preliminary Jurisdictional Determination Review Area is shown as the pink outlined "PJD Review Area" on the attached maps entitled "Exhibit 2 WOTUS Features", "Exhibit 3 WOTUS Features", and "Exhibit 4 WOTUS Features."

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 within the above-described PJD Review Area on the enclosed delineation map. 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 wetlandson 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.

SAW-2021-01973

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

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

☒ **There are no waters of the U.S., to include wetlands, present within the above-described AJD Review Area which are subject to the permit requirements of Section 404 of the Clean Water Act (33 USC 1344). Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification**

☐ The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management 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 **David E. Bailey at (919) 554-4884 X 30 or David.E.Bailey2@usace.army.mil**.

C. Basis For Determination: See the preliminary and Preliminary Jurisdictional Determination forms, dated 07/27/2022.

D. Remarks:

E. Attention USDA Program Participants

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

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

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: Mr. Philip A. Shannin
Administrative Appeal Review Officer
60 Forsyth Street SW, Floor M9
Atlanta, Georgia 30303-8803
AND
PHILIP.A.SHANNIN@USACE.ARMY.MIL

SAW-2021-01973

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: 2022.07.27 17:19:07 -04'00'

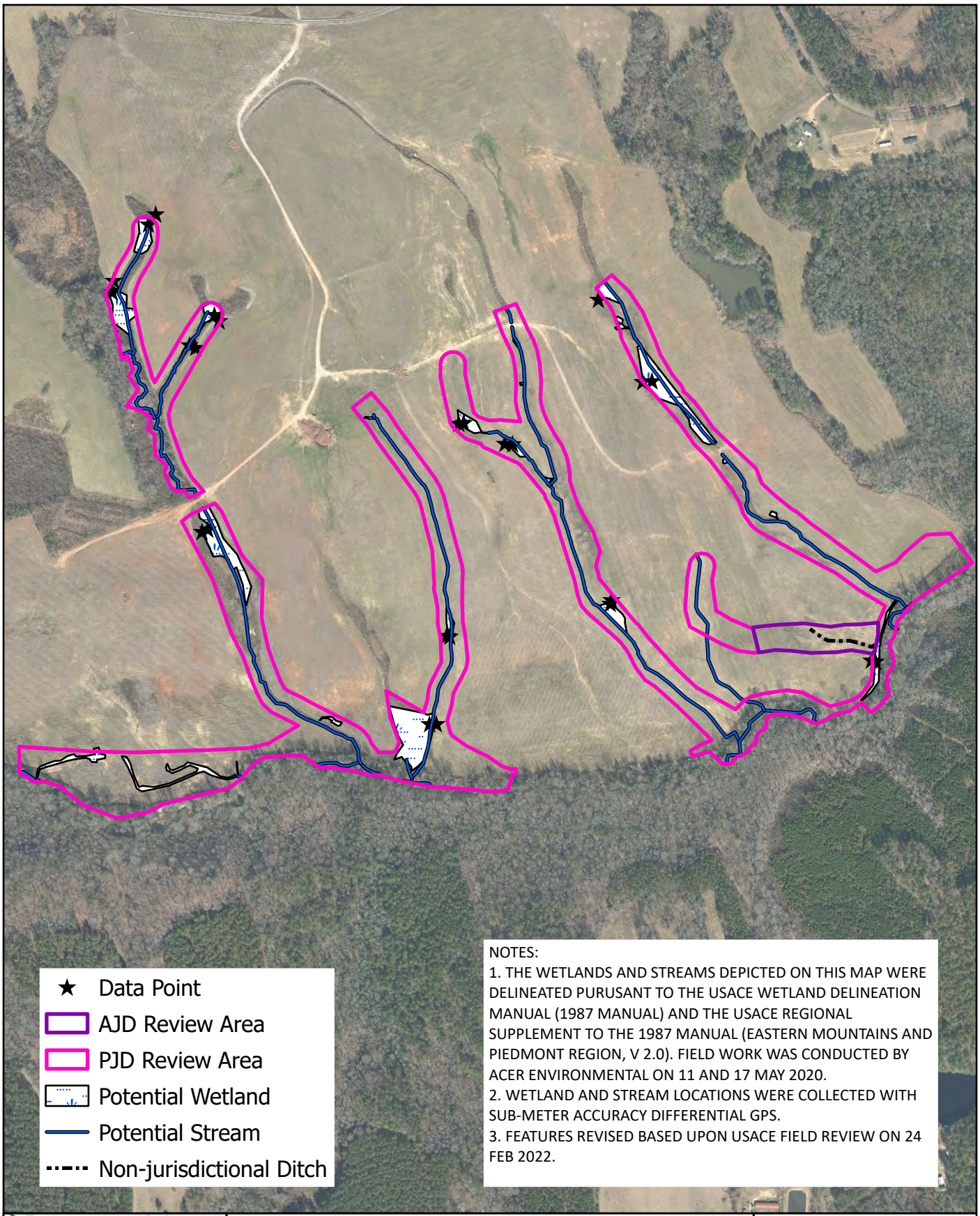
Date of JD: **07/27/2022**

Expiration Date of Approved JD: **7/27/2027**

Expiration Date of Preliminary 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 https://regulatory.ops.usace.army.mil/customer-service-survey/.

Electronic Copies Furnished:
Chad Turlington, NCDWR
Tim Baumgartner, NCDMS



NOTES:
1. THE WETLANDS AND STREAMS DEPICTED ON THIS MAP WERE DELINEATED PURUSANT TO THE USACE WETLAND DELINEATION MANUAL (1987 MANUAL) AND THE USACE REGIONAL SUPPLEMENT TO THE 1987 MANUAL (EASTERN MOUNTAINS AND PIEDMONT REGION, V 2.0). FIELD WORK WAS CONDUCTED BY ACER ENVIRONMENTAL ON 11 AND 17 MAY 2020.
2. WETLAND AND STREAM LOCATIONS WERE COLLECTED WITH SUB-METER ACCURACY DIFFERENTIAL GPS.
3. FEATURES REVISED BASED UPON USACE FIELD REVIEW ON 24 FEB 2022.

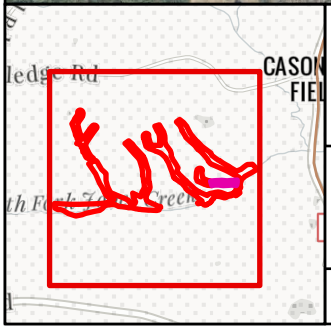


Exhibit 1 WOTUS Features

Middendorf Springs Mitigation Site
Anson County, NC

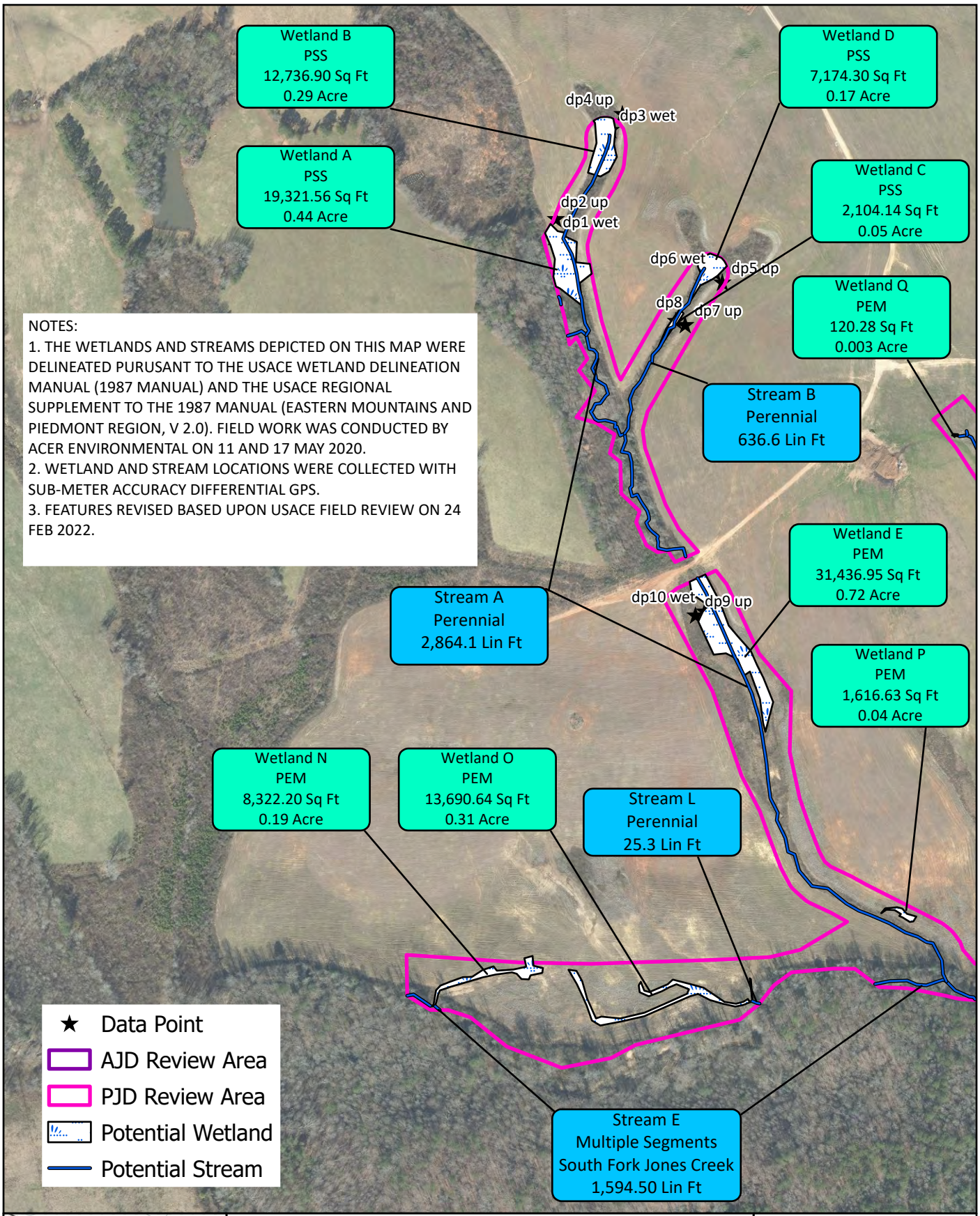
FREESE AND NICHOLS
531 N. Liberty St
Winston-Salem, NC 27101

Coordinate System: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

N

0 0.05 0.1 Mi

0 437.5 875 Feet



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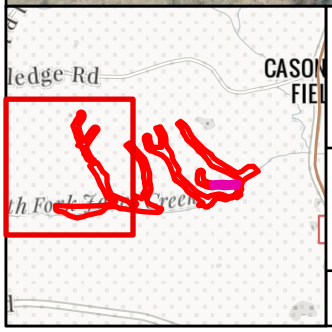


Exhibit 2 WOTUS Features

Middendorf Springs Mitigation Site
Anson County, NC

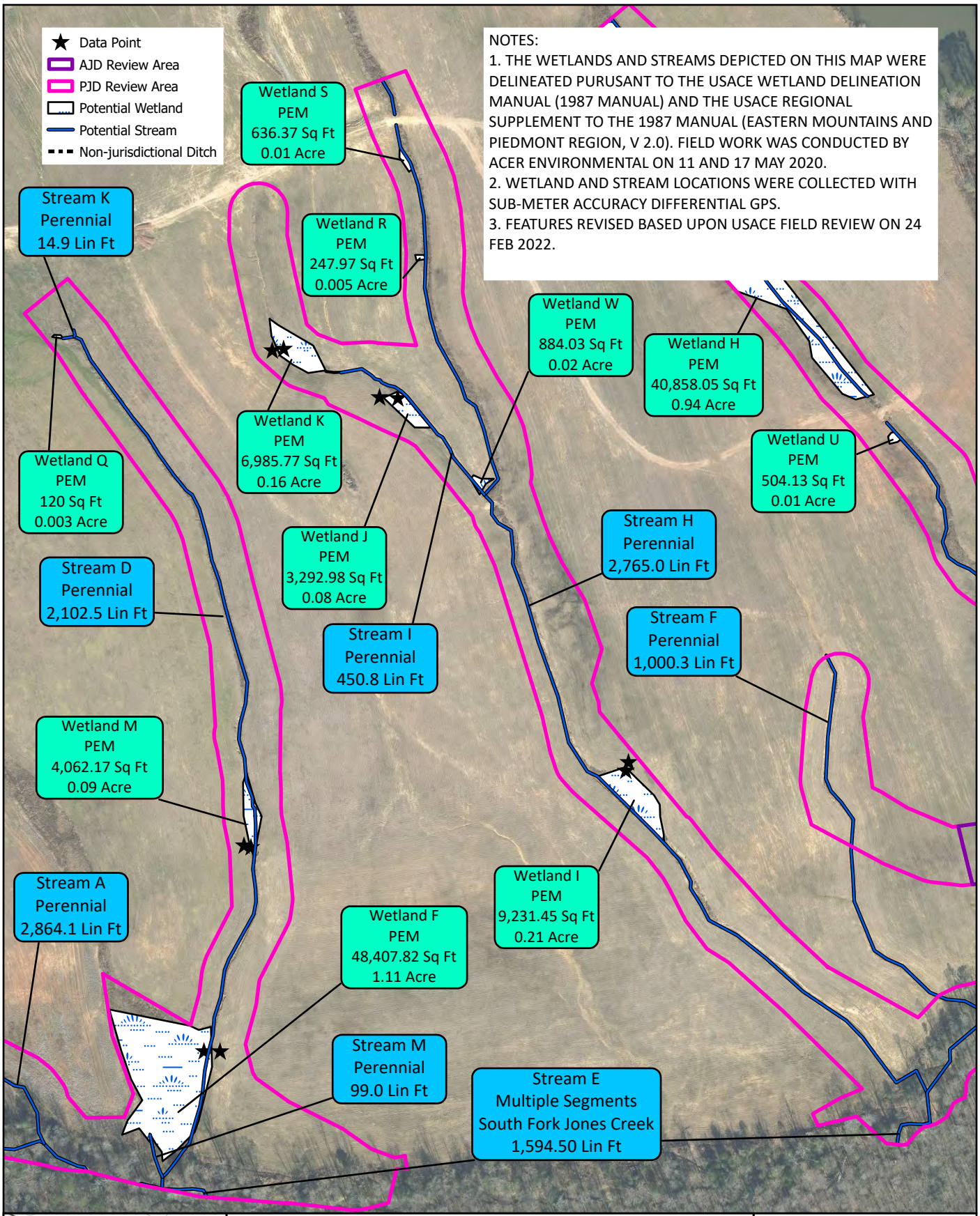
FREESE AND NICHOLS
531 N. Liberty St
Winston-Salem, NC 27101

Coordinate System: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

N

0 0.04 0.09 Mi

0 275 550 Feet



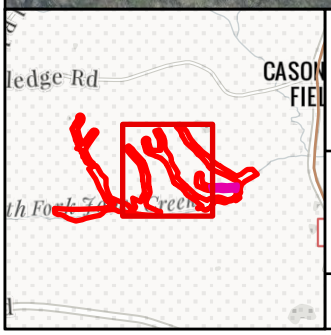


Exhibit 3 WOTUS Features

Middendorf Springs Mitigation Site
Anson County, NC

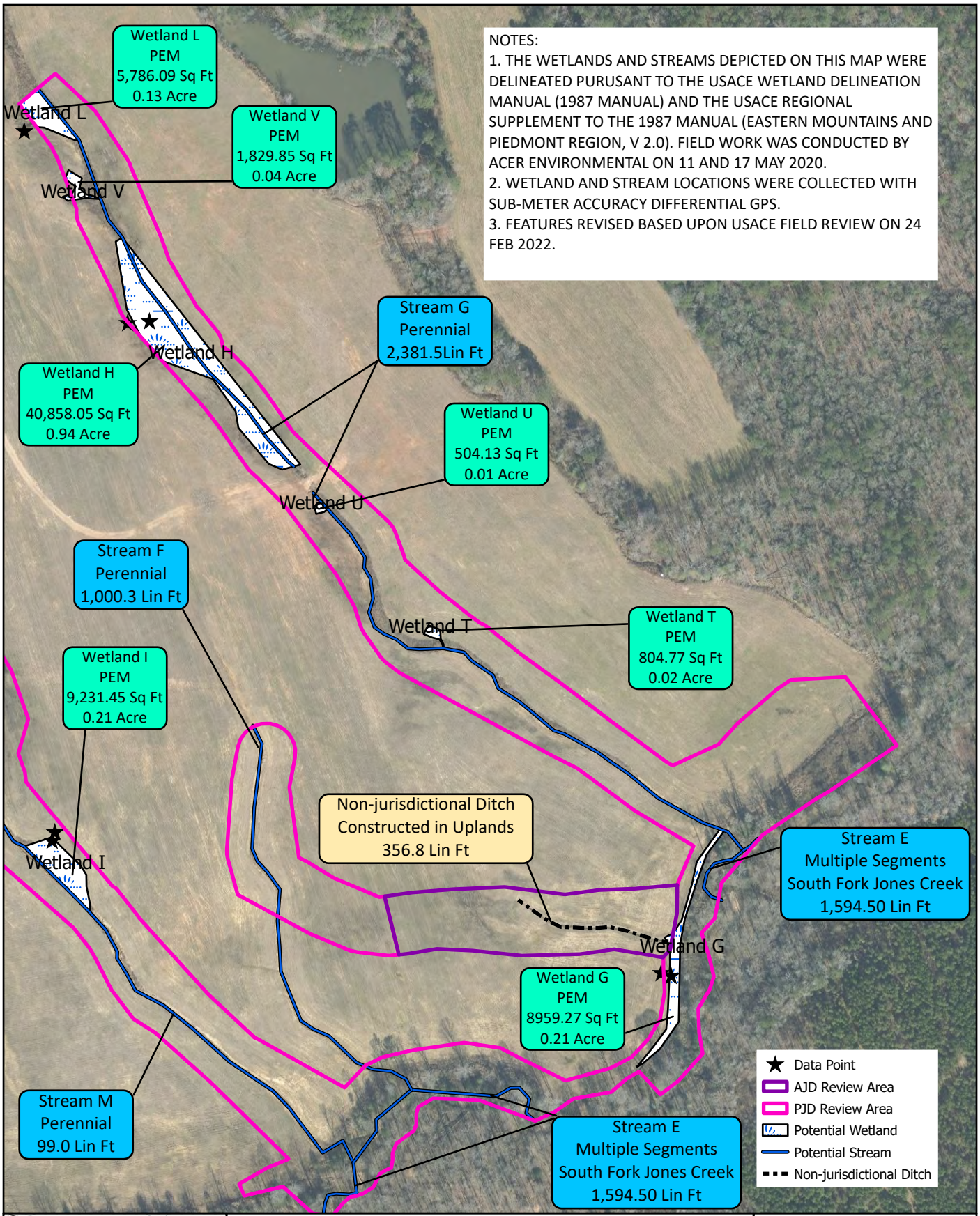
FREESE AND NICHOLS
531 N. Liberty St
Winston-Salem, NC 27101

Coordinate System: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

N

0 0.03 0.06 Mi

0 187.5 375 Feet



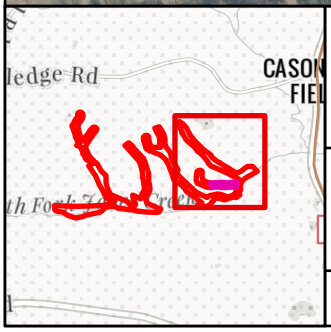


Exhibit 4 WOTUS Features

Middendorf Springs Mitigation Site
Anson County, NC

FREESE AND NICHOLS
531 N. Liberty St
Winston-Salem, NC 27101

Coordinate System: NAD 1983 StatePlane North Carolina FIPS 3200 Feet

N

0 0.03 0.06 Mi

0 187.5 375 Feet

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Freese & Nichols, Inc. (Attn: Jason Steele)**	File Number: **SAW-2021-01973**	Date: **07/27/2022**

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

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at 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: David E. Bailey** **Raleigh Regulatory Office** **U.S Army Corps of Engineers** **3331 Heritage Trade Drive, Suite 105** **Wake Forest, North Carolina 27587**	If you only have questions regarding the appeal process you may also contact: MR. PHILIP A. SHANNIN ADMINISTRATIVE APPEAL REVIEW OFFICER CESAD-PDS-O 60 FORSYTH STREET SOUTHWEST, FLOOR M9 ATLANTA, GEORGIA 30303-8803 PHONE: (404) 562-5136; FAX (404) 562-5138 EMAIL: PHILIP.A.SHANNIN@USACE.ARMY.MIL

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: David E. Bailey, 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. Philip Shannin, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801
Phone: (404) 562-5137

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): July 27, 2022

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Middendorf Springs, SAW-2021-01973

C. PROJECT LOCATION AND BACKGROUND INFORMATION: The AJD Review Area is shown on the map entitled "Exhibit 4 WOTUS Features" as the purple outlined "AJD Review Area."

State: **North Carolina** County/parish/borough: **Anson County** City:
Center coordinates of site (lat/long in degree decimal format): Lat. **34.85725°N**, Long. **-80.10923° W**
Universal Transverse Mercator: **17 581426.3 3857574.59**
Name of nearest waterbody: **South Fork Jones Creek**
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pee Dee River
Name of watershed or Hydrologic Unit Code (HUC): **Lower Pee Dee, 03040201**
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form:

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination. Date:
☒ Field Determination. Date(s): **3/1/2022**

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]

☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are no** "*waters of the U.S.*" within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☐ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet, wide, and/or acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Not Applicable.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☒ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain: **The feature labeled as "Non-jurisdictional Ditch Constructed in Uplands" meets the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and appropriate Regional Supplement (though it does not have consistent OHWM indicators). However, based on my site visit, QL2 LiDAR, and aerial photography, this feature was constructed entirely in uplands. This information indicates that this feature was constructed as a ditch through upland soils between 2015 and 2022. There are no potentially jurisdictional features above the "Non-jurisdictional Ditch" that drain into it. Further, the areas immediately alongside the feature did not display any indicators of wetland vegetation, wetland hydrology, or hydric soils. Federal Register pg. 41217, Vol. 51, No. 219, 11/13/1986,**

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

states that "Non-tidal drainage and irrigation ditches excavated on dry land" are generally not considered to be waters of the US; as such, the "Non-jurisdictional Ditch Constructed in Uplands" is not considered a water of the US.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. TNW
Identify TNW:

Summarize rationale supporting determination:

2. Wetland adjacent to TNW
Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. Characteristics of non-TNWs that flow directly or indirectly into TNW

(i) General Area Conditions:
Watershed size: **Pick List**
Drainage area: **Pick List**
Average annual rainfall: inches
Average annual snowfall: inches

(ii) Physical Characteristics:
(a) Relationship with TNW:
☐ Tributary flows directly into TNW.
☐ Tributary flows through **Pick List** tributaries before entering TNW.

Project waters are **Pick List** river miles from TNW.
Project waters are **Pick List** river miles from RPW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Project waters are **Pick List** aerial (straight) miles from RPW.
Project waters cross or serve as state boundaries. Explain:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.

Identify flow route to TNW[5]:
Tributary stream order, if known:

(b) General Tributary Characteristics (check all that apply):
Tributary is: ☐ Natural
☐ Artificial (man-made). Explain:
☐ Manipulated (man-altered). Explain:

Tributary properties with respect to top of bank (estimate):
Average width: feet
Average depth: feet
Average side slopes: **Pick List.**

Primary tributary substrate composition (check all that apply):
☐ Silts ☐ Sands ☐ Concrete
☐ Cobbles ☐ Gravel ☐ Muck
☐ Bedrock ☐ Vegetation. Type/% cover:
☐ Other. Explain:

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain:
Presence of run/riffle/pool complexes. Explain:
Tributary geometry: **Pick List**
Tributary gradient (approximate average slope): %

(c) Flow:
Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime:
Other information on duration and volume:

Surface flow is: **Pick List.** Characteristics:

Subsurface flow: **Pick List**. Explain findings:
☐ Dye (or other) test performed:

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):
☐ clear, natural line impressed on the bank ☐ the presence of litter and debris
☐ changes in the character of soil ☐ destruction of terrestrial vegetation
☐ shelving ☐ the presence of wrack line
☐ vegetation matted down, bent, or absent ☐ sediment sorting
☐ leaf litter disturbed or washed away ☐ scour
☐ sediment deposition ☐ multiple observed or predicted flow events
☐ water staining ☐ abrupt change in plant community
☐ other (list):
☐ Discontinuous OHWM.[7] Explain:

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):
☐ High Tide Line indicated by: ☐ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects ☐ survey to available datum;
☐ fine shell or debris deposits (foreshore) ☐ physical markings;
☐ physical markings/characteristics ☐ vegetation lines/changes in vegetation types.
☐ tidal gauges
☐ other (list):

(iii) Chemical Characteristics:
Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain:
Identify specific pollutants, if known:

[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.
[6] A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7] Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

☐ Riparian corridor. Characteristics (type, average width):
☐ Wetland fringe. Characteristics:
☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:
Properties:
Wetland size: acres
Wetland type. Explain:
Wetland quality. Explain:
Project wetlands cross or serve as state boundaries. Explain:

(b) General Flow Relationship with Non-TNW:
Flow is: **Pick List**. Explain:

Surface flow is**: Pick List**
Characteristics:

Subsurface flow: **Pick List**. Explain findings:
☐ Dye (or other) test performed:

(c) Wetland Adjacency Determination with Non-TNW:
☐ Directly abutting
☐ Not directly abutting
- ☐ Discrete wetland hydrologic connection. Explain:
- ☐ Ecological connection. Explain:
- ☐ Separated by berm/barrier. Explain:

(d) Proximity (Relationship) to TNW
Project wetlands are **Pick List** river miles from TNW.
Project waters are **Pick List** aerial (straight) miles from TNW.
Flow is from: **Pick List.**
Estimate approximate location of wetland as within the **Pick List** floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain:
Identify specific pollutants, if known:

(iii) Biological Characteristics. Wetland supports (check all that apply):

☐ Riparian buffer. Characteristics (type, average width):
☐ Vegetation type/percent cover. Explain:
☐ Habitat for:
- ☐ Federally Listed species. Explain findings:
- ☐ Fish/spawn areas. Explain findings:
- ☐ Other environmentally-sensitive species. Explain findings:
- ☐ Aquatic/wildlife diversity. Explain findings:

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: **Pick List**
Approximately acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet, wide, Or acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☐ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial:
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

   Provide estimates for jurisdictional waters in the review area (check all that apply):
   - ☐ Tributary waters: linear feet wide.
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters:

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   - ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):

[8]See Footnote # 3.

☐ Tributary waters: linear feet, wide.
☐ Other non-wetland waters: acres.
Identify type(s) of waters:

4. Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.
☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW:

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.
☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.
☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

Provide estimates for jurisdictional wetlands in the review area: acres.

7. Impoundments of jurisdictional waters.[9]
As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
☐ Demonstrate that impoundment was created from "waters of the U.S.," or
☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
☐ which are or could be used for industrial purposes by industries in interstate commerce.
☐ Interstate isolated waters. Explain:
☐ Other factors. Explain:

Identify water body and summarize rationale supporting determination:

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet, wide.
☐ Other non-wetland waters: acres.
Identify type(s) of waters:
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).

[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.*

☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain:
☒ Other: (explain, if not covered above): **The feature labeled as "Non-jurisdictional Ditch Constructed in Uplands" meets the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and appropriate Regional Supplement (though it does not have consistent OHWM indicators). However, based on my site visit, QL2 LiDAR, and aerial photography, this feature was constructed entirely in uplands. This information indicates that this feature was constructed as a ditch through upland soils between 2015 and 2022. There are no potentially jurisdictional features above the "Non-jurisdictional Ditch" that drain into it. Further, the areas immediately alongside the feature did not display any indicators of wetland vegetation, wetland hydrology, or hydric soils. Federal Register pg. 41217, Vol. 51, No. 219, 11/13/1986, states that "Non-tidal drainage and irrigation ditches excavated on dry land" are generally not considered to be waters of the US; as such, the "Non-jurisdictional Ditch Constructed in Uplands" is not considered a water of the US.**

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☒ Wetlands: **0.05** acres.

Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, wide.
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource:
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: **Aerial, soils, and topo maps (F&N)**
☒ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
  ☒ Office concurs with data sheets/delineation report.
  ☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps:
☐ Corps navigable waters' study:
☐ U.S. Geological Survey Hydrologic Atlas:
  ☐ USGS NHD data.
  ☐ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name: **1:24K; Morven West**
☒ USDA Natural Resources Conservation Service Soil Survey. Citation: **Anson Co. Soil Survey**
☐ National wetlands inventory map(s). Cite name:
☐ State/Local wetland inventory map(s):
☐ FEMA/FIRM maps:
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): **2015 and 2021 NCCGIA**
  or ☐ Other (Name & Date):
☐ Previous determination(s). File no. and date of response letter:
☐ Applicable/supporting case law:
☐ Applicable/supporting scientific literature:
☒ Other information (please specify): **QL2 LiDAR (NC SDD website)**

B. ADDITIONAL COMMENTS TO SUPPORT JD:

Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 7/27/2022

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Jason Steele, 531 N. Liberty St, Winston-Salem, NC 27101

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: SAW-2021-01973 (Middendorf Springs / NCDMS)

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:
(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: NC County/parish/borough: Anson City:

Center coordinates of site (lat/long in degree decimal format):

Lat.: 34.855 Long.: -80.1075

Universal Transverse Mercator:

Name of nearest waterbody: South Fork Jones Creek

E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):

☐ Office (Desk) Determination.

☒ Field Determination. Date(s): 3/1/2022

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
	See	Attached	Table		

TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.

Site Number	Latitude (decimal degrees)	Longitude (decimal degrees)	Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable)	Type of aquatic resource (i.e., wetland vs. non-wetland waters)	Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404)
Stream A	34.8597	-80.113	2864 feet	Non-wetland waters	Section 404
Stream B	34.8584	-80.112	637 feet	Non-wetland waters	Section 404
Stream D	34.857	-80.1091	2103 feet	Non-wetland waters	Section 404
Stream E segments	34.8518	-80.115	1595 feet	Non-wetland waters	Section 404
Stream F	34.855	-80.1034	1000 feet	Non-wetland waters	Section 404
Stream G	34.8589	-80.105	2382 feet	Non-wetland waters	Section 404
Stream H	34.8586	-80.1067	2765 feet	Non-wetland waters	Section 404
Stream I	34.8568	-80.107	451 feet	Non-wetland waters	Section 404
Stream K	34.857	-80.109	15 feet	Non-wetland waters	Section 404
Stream L	34.8518	-80.1113	25 feet	Non-wetland waters	Section 404
Stream M	34.8521	-80.1084	99 feet	Non-wetland waters	Section 404
Wetland A	34.8585	-80.1135	0.4436 acres	Wetland	Section 404
Wetland B	34.8597	-80.1131	0.2924 acres	Wetland	Section 404
Wetland C	34.858	-80.1122	0.0483 acres	Wetland	Section 404
Wetland D	34.8585	-80.1119	0.1647 acres	Wetland	Section 404
Wetland E	34.855	-80.1116	0.7217 acres	Wetland	Section 404
Wetland F	34.8525	-80.1083	1.1113 acres	Wetland	Section 404
Wetland G	34.8536	-80.1002	0.2057 acres	Wetland	Section 404
Wetland H	34.8573	-80.104	0.938 acres	Wetland	Section 404
Wetland I	34.8542	-80.1048	0.2119 acres	Wetland	Section 404
Wetland J	34.8565	-80.1065	0.0756 acres	Wetland	Section 404
Wetland K	34.8569	-80.1074	0.1604 acres	Wetland	Section 404
Wetland L	34.8588	-80.105	0.1328 acres	Wetland	Section 404
Wetland M	34.854	-80.1077	0.9327 acres	Wetland	Section 404
Wetland N	34.852	-80.1138	0.191 acres	Wetland	Section 404
Wetland O	34.852	-80.1133	0.3143 acres	Wetland	Section 404
Wetland P	34.8526	-80.1097	0.0371 acres	Wetland	Section 404
Wetland Q	34.857	-80.1092	0.0028 acres	Wetland	Section 404
Wetland R	34.8575	-80.1065	0.0057 acres	Wetland	Section 404
Wetland S	34.8581	-80.1066	0.0146 acres	Wetland	Section 404
Wetland T	34.8556	-80.1021	0.0185 acres	Wetland	Section 404
Wetland U	34.8564	-80.1029	0.0116 acres	Wetland	Section 404
Wetland V	34.8584	-80.1048	0.042 acres	Wetland	Section 404
Wetland W	34.8561	-80.106	0.0203 acres	Wetland	Section 404

[1] 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.

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:

- [x] Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
  Map: Aerial, soils, and topo maps (F&N).
- [x] Data sheets prepared/submitted by or on behalf of the PJD requestor.
  - [x] 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.
- [x] U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 Morven West Quad.
- [x] Natural Resources Conservation Service Soil Survey. Citation: Anson Co. Soil Survey.
- [x] National wetlands inventory map(s). Cite name: _____.
- [ ] State/local wetland inventory map(s): _____.
- [x] FEMA/FIRM maps: _____.
- [ ] 100-year Floodplain Elevation is: _____.(National Geodetic Vertical Datum of 1929)
- [x] Photographs: [x] Aerial (Name & Date): Most recent available, State of NC (accessed 2021).
  or [ ] Other (Name & Date): _____.
- [ ] Previous determination(s). File no. and date of response letter: _____.
- [x] Other information (please specify): QL2 LiDAR (NC SDD website).

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.

Date: 2022.07.27 16:30:48 -04'00'

Signature and date of Regulatory staff member completing PJD

Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

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

Stream A

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: 36.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

B. Hydrology (Subtotal = 9)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

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

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

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICT & BMD	**County:** Anson	**Longitude:**
Total Points: 21.5 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:*

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

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

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

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

Notes:

Sketch:

Stream C

NC DWQ Stream Identification Form Version 4.11

Date: 11/2/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: 25 *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30**	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 12)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

B. Hydrology (Subtotal = 7)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 6)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: IGT & BMD	**County:** Anson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 37	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 20.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

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

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	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:

TRIBUTARY @ Start

Stream J

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:*

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

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

B. Hydrology (Subtotal = 9)				
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. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 (Other = 0)			

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

Notes:

Sketch:

TRIBUTARY 4 HEADCUT

Stream I

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 25.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 11.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	(0)	1	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	1	(2)	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

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

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

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

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34.5	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	2	(3)
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		(Yes = 3)	

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

B. Hydrology (Subtotal = 9)				
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. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	(0.5)	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	(0.5)	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes:

Sketch:

NC DWQ Stream Identification Form Version 4.11

Date: 10/28/19	**Project/Site:** Middendorf	**Latitude:**
Evaluator: ICJ & BMD	**County:** Anson	**Longitude:**
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 35.5	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 19.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	(3)
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	2	(3)
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	1	(2)	3
8. Headcuts	0	1	(2)	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	(No = 0)		Yes = 3	

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

B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	(0)	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	(1.5)
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 8)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	0	0.5	(1)	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	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:

Appendix E

Hydric Soils Investigation

ACER
Environmental, LLC.

BURLESON MITIGATION SITE

Hydric Soil Investigation

Executive Summary

The Burleson Mitigation Site is located near the Town of Morven, Anson County, North Carolina. A site investigation was undertaken to determine the presence/absence of hydric soils within one area of this property, located along Jones Creek. The investigation was conducted by NC Licensed Soil Scientist, Jan Gay (#1158) on 27 and 30 October 2019. Thirteen areas of hydric soil were identified, totaling approximately 17 acres. It is highly likely that additional hydric soil areas are present within this area.

Introduction

The Burleson Mitigation Site is located within a currently fallow agricultural field near the Town of Morven, Anson County, North Carolina. A portion of this site is being considered as a riparian wetland mitigation area. One area of this property, totaling approximately 200 acres, was targeted for the hydric soil investigation. This report outlines key personnel, methodology, and results.

The investigation area is located within a currently fallow agricultural field, with a rolling landscape. The hydric soil investigation focused on the lower lying areas, either along Jones Creek or the unnamed tributaries within the site that flow into Jones Creek.

Due to time constraints, the hydric soil investigation effort was not a complete review of the entire area, but a focused evaluation in areas with a high probability of containing hydric soils. It is very likely that other areas of hydric soil are present within the review area.

Key Personnel

Mr. Jan Gay, NC Licensed Soil Scientist #1158, conducted the hydric soil delineation. Mr. Gay has been a Licensed Soil Scientist for more than 22 years, as well as a professional ecologist. Mr. Gay has conducted jurisdictional wetland delineations for more than 24 years, across 7 states.

Methods

The field investigation centered on identification of soil characteristics following criteria set forth by the USDA Natural Resources Conservation Service *Field Indicators of Hydric Soils in the United States* Version 8.2 (USDA 2018). Soil characteristics evaluated include horizon depth, soil texture, moist soil color (determined using a Munsell color chart), and identification of any other soil features (mottles, depletions, Mn concentrations, *etc.*).

The field investigation was conducted using a hand auger to evaluate the soil profile across the study area. The investigation area was subjected to a pedestrian survey, with a hand auger evaluation conducted in areas deemed likely to contain hydric soils. The hand auger evaluation was conducted to a depth of 3 feet, or until a hydric soil indicator was identified. After a hydric soil had been identified in the field, a

series of soil borings were conducted on a closer spacing, to establish a boundary for a hydric soil unit. A transect of soil borings was conducted, beginning within the hydric soil unit, and continued until a non-hydric soil was encountered. Flagging tape was hung at this boundary and location data was collected, using a hand help Garmin GPSMAP 64st, which is a non-survey grade unit. The gps data was used to approximate hydric soil unit boundaries.

Prior to initiation of the field effort, available resources were reviewed, including available NRCS online soil mapping and USGS topographic mapping. Seven soil mapping units are shown as present within the study areas, Ailey loamy sand, 2-8% slopes; Badin channery silt loam, 2-8% slopes; Chewacla loam, 0-2% slopes, frequently flooded; Emporia loamy sand, 2-8% slopes; McQueen loam, 1-6% slopes; Nanford-Emporia complex, 2-8% slopes; and Nanford gravelly fine sandly loam, 8-15% slopes. .

Results

Thirteen areas of hydric soil were delineated. The hydric soil areas were typically linear in shape, associated with stream channels in the area. The investigation indicated that several of the linear stream features originating within the property have hydric soil pockets at or near the channel origins.

Hydric Soil Site 1 is approximately 10.5 acres in areal extent. This site is located in the floodplain area of Jones Creek and appears to have been part of the historical channel.

Hydric Soil Site 2 is approximately 0.4 acre in areal extent. This site is located adjacent to a small unnamed tributary to Jones Creek and appears to be part of the floodplain.

Hydric Soil Site 3 is approximately 0.2 acre in areal extent. This site is located south of Site 2 and encompasses both sides of the unnamed tributary.

Hydric Soil Site 4 is approximately 2.8 acres in areal extent. This site near the confluence of a small stream channel and Jones Creek.

Hydric Soil Site 5 is approximately 1.5 acres in areal extent. This site is located in the floodplain area of Jones Creek and did not have an apparent connection to any of the stream channels within the property.

Hydric Soil Site 6 is approximately 0.2 acre in areal extent. This site is located near the boundary of the review area, within the floodplain of Jones Creek.

Hydric Soil Site 7 is >0.1 acre in areal extent. This site is adjacent to a small unnamed tributary to Jones Creek.

Hydric Soil Site 8 is approximately 0.3 acre in areal extent. This site is adjacent to a small unnamed tributary to Jones Creek.

Hydric Soil Site 9 is approximately 0.3 acre in areal extent. This site appears to be a wet area associated with an unnamed tributary to Jones Creek.

Hydric Soil Site 10 is approximately 0.1 acre in areal extent. This site is located at the origin of an unnamed tributary to Jones Creek and may have been a headwater area.

Hydric Soil Site 11 is approximately 0.1 acre in areal extent. This site is located in the floodplain area of Jones Creek and appears to have a connection to an unnamed tributary.

Hydric Soil Site 12 is >0.1 acre in areal extent. This site is located near the origin of an unnamed tributary to Jones Creek and may have been part of a headwater area or wet floodplain.

Hydric Soil Site 13 is approximately 0.5 acre in areal extent. This site is located along an unnamed tributary to Jones Creek.

As previously noted, it is highly likely that additional areas of hydric soil are present within the investigation site.

On 27 and 30 October 2019, I conducted the soil evaluation within the Burleson Mitigation Site and delineated the hydric soil boundaries as shown in this report.

31 October 2019

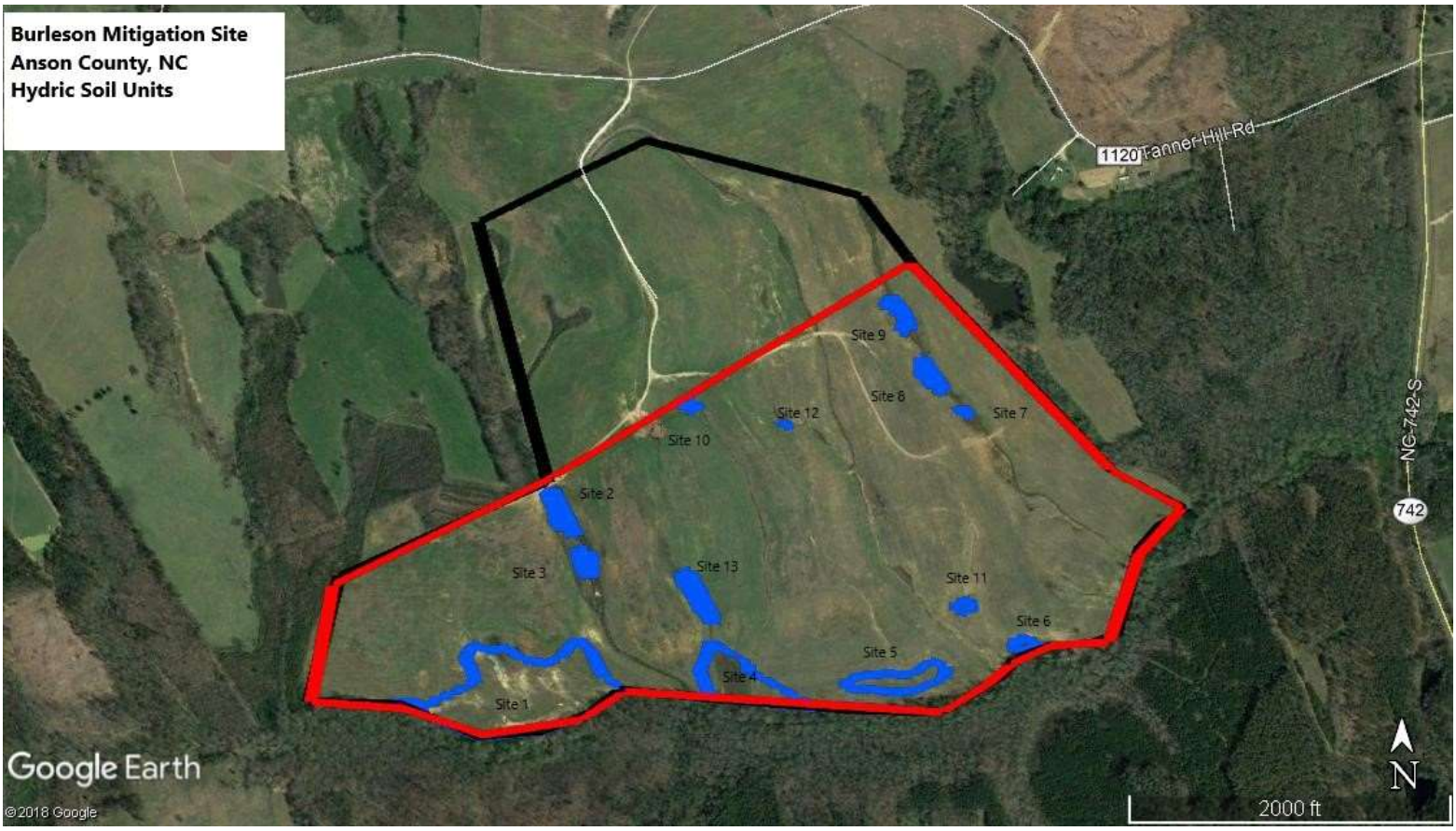


Figure 1. Young's Mill Mitigation Site Hydric Soil Areas.

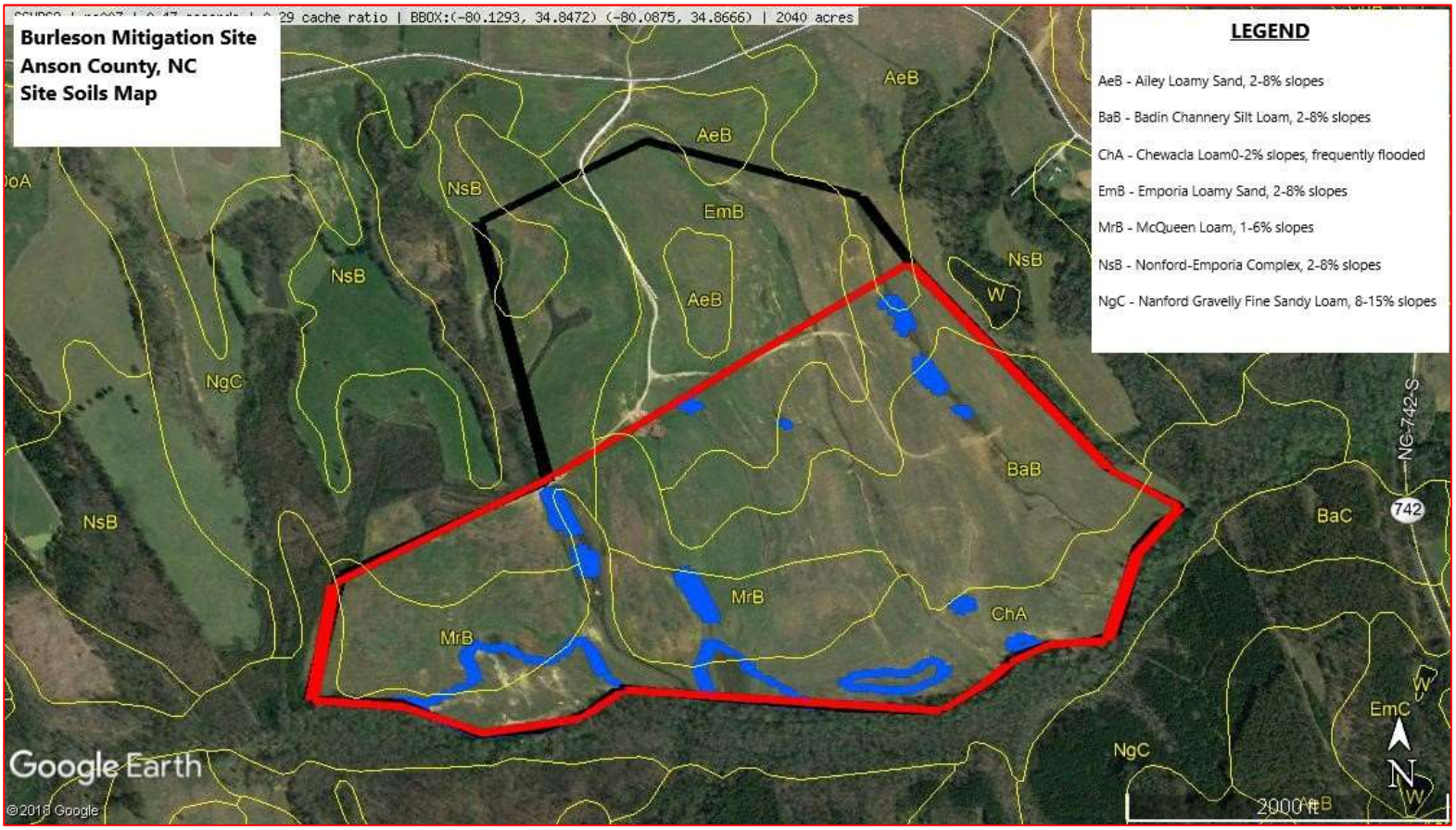


Figure 2. Young's Mill Mitigation Site Soil Map.

Soil Boring	Unit 1		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-10	2.5Y 5/1	Silty Clay Loam	5% 10YR 5/6 concentrations
10-14	2.5Y 5/2	Silty Clay Loam	5% 10YR 4/4 concentrations

Soil Boring	Unit 2		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-14	10YR 5/2	Silty Clay Loam	10% 7.5YR 5/4 concentrations, free water at 14"

Soil Boring	Unit 3		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-5	2.5Y 5/2	Silty Clay Loam	5% 10YR 4/4 concentrations
5-14	10YR 5/1	Silty Clay Loam	5% 10YR 5/4 concentrations

Soil Boring	Unit 4		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-14			

Soil Boring	Unit 5		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-16	2.5Y 5/1	Silty Clay Loam	5% 10YR 5/4 concentrations

Soil Boring	Unit 6		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-14	10YR 5/2	Silty Clay Loam	5% 10YR 5/4 concentrations

Soil Boring	Unit 7		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-3	10YR 5/2	Silty Clay Loam	5% 10YR 5/6 concentrations
3-14	10YR 5/1	Silty Clay Loam	

Soil Boring	Unit 8		Hydric Soil Indicator:	None met
			Possible Buried/Impacted Depleted Matix	

Depth (inches)	Color	Texture	Notes
0-3	10YR 5/2	Silty Clay Loam	5% 10YR 5/6 concentrations
3-14	10YR 5/1	Silty Clay Loam	

Soil Boring	Unit 9		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-12	2.5Y 5/2	Silty Clay Loam	5% 10YR 5/6 concentrations
			wet area associated with channel

Soil Boring	Unit 10		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-14	2.5Y 5/2	Silty Clay Loam	5% 10YR 5/4 concentrations. Appears to be a headwater area

Soil Boring	Unit 11		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-3	10YR 5/2	Silty Clay Loam	5% 10YR 5/4 concentrations
3-14	10YR 5/1	Silty Clay Loam	10% 10YR 5/6 concentrations

Soil Boring	Unit 12		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-14	2.5Y 5/1	Silty Clay Loam	5% 10YR 4/4 concentrations

Soil Boring	Unit 13		Hydric Soil Indicator:	Depleted Matrix

Depth (inches)	Color	Texture	Notes
0-12	10YR 5/2	Silty Clay Loam	10% 10YR 5/6 concentrations
			5% 10YR 5/4 concentrations

Appendix F

Approved FHWA Categorical Exclusion

Appendix A

Categorical Exclusion Form for Division of Mitigation Services Projects
Version 2

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

Part 1: General Project Information	
Project Name:	Middendorf Springs Mitigation Site
County Name:	Anson County
DMS Number:	100151
Project Sponsor:	Freese and Nichols, Inc.
Project Contact Name:	Ian Jewell
Project Contact Address:	531 N. Liberty St, Winston-Salem, NC 27101
Project Contact E-mail:	Ian.Jewell@freese.com
DMS Project Manager:	Kelly Phillips

Project Description

The Middendorf Springs Mitigation Site is a stream and wetland mitigation project located approximately 10 miles south of Wadesboro and 5 miles east of Lowrys in Anson County, NC. The project includes 6 unnamed tributaries to South Fork Jones Creek for a total of more than 14,000 linear feet of stream and associated wetlands. The site has historically been managed for timber and is currently managed for row crop agriculture. The project will provide stream and wetaldn mitigation units to the Division of Mitigation Services in the Yadkin Pee-Dee River Basin (03040201).

For Official Use Only

Reviewed By:

10/13/2021	Kelly Phillips
Date	**DMS Project Manager**

Conditional Approved By:

Date	**For Division Administrator FHWA**

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

Final Approval By:

10-14-21	Donald W Brew
Date	**For Division Administrator FHWA**

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

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

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

Middendorf Springs Mitigation Site
Categorical Exclusion

SUMMARY

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, or other emergency releases of pollutants and contaminants into the environment.

Since the Middendorf Springs Mitigation Site is a full-delivery project, a Government Environmental Records Report was ordered for the site through Envirosite Corporation on March 23, 2021. Neither the target property, nor adjacent properties, were listed in any of the Federal, State, or Tribal environmental databases searched by Envirosite. The assessment revealed no evidence of any recognized environmental conditions (RECs) connected to the target property. The Report is included in the Appendix.

National Historic Preservation Action (Section 106)

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

Freese and Nichols, Inc. (FNI) requested a review and comment from the State Historic Preservation Office (SHPO) with respect to architectural and archaeological resources related to Middendorf Springs Mitigation Site on April 24, 2020. SHPO responded on June 11,2020 and stated they were aware of "no historic resources which would be affected by the project" and would have no further comment. Section 106 correspondence is included in the Appendix.

Uniform Relocation Assistance and Real Property Acquisition Act (Uniform Act)

These acts, known collectively as the Uniform Act, provide for uniform and equitable treatment of persons displaced from their homes, businesses, non-profit associations, or farms by Federal and Federally-assisted programs, and establish uniform and equitable land acquisition policies.

Middendorf Springs Mitigation Site is a full-delivery project that includes land acquisition. Notification of the fair market value of the project property and the lack of condemnation authority by FNI was provided to the property owners. A copy of the notification is included in the Appendix.

Endangered Species Act (ESA)

Section 7 requires federal agencies, in consultation with and with the assistance of the Secretary of the Interior or of Commerce, as appropriate, to ensure that actions they authorize, fund or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat for these species.

The Anson County listed endangered species includes Red-cockaded woodpecker, Carolina heelsplitter, and Schweinitz's sunflower. The project area does not include any in-stream work, and no habitat for red-cockaded woodpecker is present within the project area. Therefore, due to lack of habitat for the listed species at the site, the project has been determined by FNI to have "no effect" on listed species.

FNI requested review and comment from the US Fish and Wildlife Service (USFWS) on April 24, 2020 for the Middendorf Springs Mitigation Site and its potential impacts on threatened and endangered species. USFWS responded on May 13, 2020 stating that suitable summer roosting habitat may be present for the federally threatened northern long-eared bat (*Myotis septentrionalis*), and the agency encouraged "…conduct any associated tree clearing activities outside of the pup season (June 1 to July 31) and/or active season (April 1 to October 31) to reduce the chance of impacting identified maternity roosts." In addition, occurrences of Schweinitz's sunflower (*Helianthus schweinitzii*) were identified in the vicinity of the project area. A targeted survey was requested during the optimal survey window of late August – October. A habitat assessment and survey for Schweinitz's sunflower was conducted by FNI environmental scientists on September 28, 2020, and results were submitted to USFWS on January 18, 2021. USFWS responded with concurrence on the negative species survey documentation on January 22, 2021: "Based on the information provided, we have no concerns for any other federally protected species and we require no further action at this time." All documents submitted to USFWS are included in the Appendix.

Farmland Protection Policy Act (FPPA)

The FPPA requires that, before taking or approving any Federal action that would result in the conversion of farmland, the agency must examine the effects of the action using the criteria set forth in the FPPA, and, if there are adverse effects, must consider alternatives to lessen them.

The Middendorf Springs Mitigation Stie includes the conversion of prime farmland. As such, Form AD-1006 has been completed and submitted to the National Resources Conservation Service (NRCS). The completed form and correspondence documenting its submittal are included in the Appendix.

Fish and Wildlife Coordination Act (FWCA)

The FWCA requires consultation with the USFWS and appropriate state wildlife agencies on projects that impounded, diverted, deepened or otherwise modify waterbodies. The Middendorf Springs Mitigation project includes stream restoration. FNI requested comment on the project from both the UFSWS and the North Carolina Wildlife Resources Commission (WRC) on April 24, 2020. NCWRC responded on May 18, 2020 with comments about the possible presence of rare and aquatic species in the project area: "NCWRC does not have any known records of federal or state-listed rare, threatened, or endangered species near the site." All correspondence with USFWS and WRC are included in the Appendix.

Migratory Bird Treaty Act (MBTA)

The MBTA makes it unlawful for anyone to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. The indirect killing of birds by destroying their nests and eggs is covered by the MBTA, so construction in nesting areas during nesting seasons can constitute a taking.

FNI requested comment on the Middendorf Springs Mitigation Site from the USFWS regarding migratory birds on April 14, 2021. The USFWS responded on May 13, 2020 and recommended that, "To avoid impacts to migratory birds, we recommend conducting a visual inspection of any migratory bird nesting habitat within the project area during the migratory bird nesting season of March through September and avoiding impacting the nests during the migratory bird nesting season. If birds are discovered nesting near the project area during years prior to the proposed construction date, we recommend that you and the NCDOT, in consultation with US Fish and Wildlife Service, develop measures to discourage birds from

establishing nests within the project area by means that will not result in the take of birds or eggs; or avoid construction activities during the nesting period." All correspondence with USFWS is included in the Appendix.

Middendorf Springs Mitigation Site
Categorical Exclusion

APPENDIX

Middendorf Springs Mitigation Site
Categorical Exclusion

CERCLA DOCUMENTATION

Government Records Report | 2021

Order Number: 52637

Report Generated: 03/23/2021

Project Name: Middendorf Springs

Project Number: Middendorf

Middendorf Springs
Gulledge Rd
Wadesboro, NC 28170

2 Corporate Drive
Suite 450
Shelton, CT 06484
Toll Free: 866-211-2028
www.envirositecorp.com

Table of Contents 2021

Envirosite Corporation has conducted a search of all reasonably ascertainable records in accordance with EPA's AAI (40 CFR Part 312) requirements and the ASTM E-1527-13 Environmental Site Assessments standard.

SUBJECT PROPERTY INFORMATION:

ADDRESS:

Middendorf Springs
Gulledge Rd
Wadesboro, NC 28170

COORDINATES:

Latitude (North):	34.855547 - 34°51'20"
Longitude (West):	-80.108185 - -80°6'29.5"
Universal Transverse Mercator:	Zone 17N
UTM X (Meters):	581523.51
UTM Y (Meters):	3857386.54

ELEVATION:

Elevation:	369.944 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH SUBJECT PROPERTY:

Subject Property Map: 34080-G1 Morven West, NC
Most Recent Revision: 2016

No Mapped Sites

SUBJECT PROPERTY SEARCH RESULTS:

The subject property was not listed in any of the databases searched by Envirosite Corporation.

SEARCH RESULTS:

No unmappable sites reported.

DATABASE(S) WITH NO MAPPED SITES:

FEDERAL RCRA NON-CORRACTS TSD FACILITIES LIST

ARCHIVED RCRA TSDF	Archived Resource Conservation and Recovery Act: Treatment Storage and Disposal Facilities
RCRA_TSDF	Resource Conservation and Recovery Act: Treatment Storage and Disposal Facilities

FEDERAL CERCLIS LIST

CERCLIS NFRAP	Comprehensive Environmental Response Compensation and Liability Act No Further Remedial Action Planned
CERCLIS-HIST	Comprehensive Environmental Response Compensation and Liability Act
FEDERAL FACILITY	Federal Facility sites
SEMS_8R_ACTIVE SITES	Sites on SEMS Active Site Inventory
SEMS_8R_ARCHIVED SITES	Sites on SEMS Archived Site Inventory

FEDERAL RCRA CORRACTS FACILITIES LIST

CORRACTS	Hazardous Waste Corrective Action
HIST CORRACTS 2	Historical Hazardous Waste Corrective Action

FEDERAL DELISTED NPL SITE LIST

DELISTED NPL	Delisted National Priority List
DELISTED PROPOSED NPL	Delisted proposed National Priority List
SEMS_DELETED NPL	Sites Deleted from National Priorities List

FEDERAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS

EPA LF MOP	EPA Landfill Methane Outreach Project Database

FEDERAL ERNS LIST

ERNS	Emergency Response Notification System

FEDERAL INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES

FED E C	Engineering Controls
FED I C	Institutional Controls
RCRA IC_EC	RCRA sites with Institutional and Engineering Controls

FEDERAL RCRA GENERATORS LIST

HIST RCRA_CESQG	Historical Resource Conservation and Recovery Act_Conditionally Exempt Small Quantity Generators
HIST RCRA_LQG	Historical Resource Conservation and Recovery Act_ Large Quantity Generators
HIST RCRA_NONGEN	Historical Resource Conservation and Recovery Act_Non Generators
HIST RCRA_SQG	Historical Resource Conservation and Recovery Act_Small Quantity Generators
RCRA_LQG	Resource Conservation and Recovery Act_ Large Quantity Generators
RCRA_NONGEN	Resource Conservation and Recovery Act_Non Generators
RCRA_SQG	Resource Conservation and Recovery Act_Small Quantity Generators
RCRA_VSQG	Resource Conservation and Recovery Act_Very Small Quantity Generator

FEDERAL NPL SITE LIST

NPL	National Priority List
NPL EPA R1 GIS	GIS for EPA Region 1 NPL
NPL EPA R3 GIS	GIS for EPA Region 3 NPL

FEDERAL NPL SITE LIST *(cont.)*

NPL EPA R6 GIS	GIS for EPA Region 6 NPL
NPL EPA R8 GIS	GIS for EPA Region 8 NPL
NPL EPA R9 GIS	GIS for EPA Region 9 NPL
PART NPL	Part National Priority List
PROPOSED NPL	Proposed National Priority List
SEMS_FINAL NPL	Sites included on the Final National Priorities List
SEMS_PROPOSED NPL	Sites Proposed to be Added to the National Priorities List

STATE- AND TRIBAL - EQUIVALENT CERCLIS

ARCHIVED HSDS - NC	Archived Hazardous Substance Disposal Sites
ARCHIVED HSDS AREAS - NC	Areas of Archived Hazardous Substance Disposal Sites
FRB SUPERFUND - NC	FRB Superfund - NC
SHWS - NC	State Hazardous Waste Sites

STATE AND TRIBAL REGISTERED STORAGE TANK LISTS

FEMA UST	FEMA Underground Storage Tanks
INDIAN UST R1	Underground Storage Tanks on Indian Land in EPA Region 1
INDIAN UST R10	Underground Storage Tanks on Indian Land in EPA Region 10
INDIAN UST R2	Underground Storage Tanks on Indian Land in EPA Region 2
INDIAN UST R4	Underground Storage Tanks on Indian Land in EPA Region 4
INDIAN UST R5	Underground Storage Tanks on Indian Land in EPA Region 5
INDIAN UST R6	Underground Storage Tanks on Indian Land in EPA Region 6
INDIAN UST R7	Underground Storage Tanks on Indian Land in EPA Region 7
INDIAN UST R8	Underground Storage Tanks on Indian Land in EPA Region 8
INDIAN UST R9	Underground Storage Tanks on Indian Land in EPA Region 9
AST - NC	Aboveground Storage Tanks
UST - NC	Underground Storage Tanks
UST 2 - NC	UST Facilities

STATE AND TRIBAL BROWNFIELD SITES

TRIBAL BROWNFIELDS	Tribal Brownfields
BROWNFIELDS - NC	Brownfield

STATE RCRA GENERATORS LIST

HWG - NC	State Hazardous Waste Generators

STATE INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES

I C - NC	Institutional Controls

STATE AND TRIBAL LEAKING STORAGE TANK LISTS

INDIAN LUST R1	Leaking Underground Storage Tanks on Indian Land in EPA Region 1
INDIAN LUST R10	Leaking Underground Storage Tanks on Indian Land in EPA Region 10
INDIAN LUST R2	Leaking Underground Storage Tanks on Indian Land in EPA Region 2
INDIAN LUST R4	Leaking Underground Storage Tanks on Indian Land in EPA Region 4
INDIAN LUST R5	Leaking Underground Storage Tanks on Indian Land in EPA Region 5
INDIAN LUST R6	Leaking Underground Storage Tanks on Indian Land in EPA Region 6
INDIAN LUST R7	Leaking Underground Storage Tanks on Indian Land in EPA Region 7
INDIAN LUST R8	Leaking Underground Storage Tanks on Indian Land in EPA Region 8
INDIAN LUST R9	Leaking Underground Storage Tanks on Indian Land in EPA Region 9
LAST - NC	Leaking Aboveground Storage Tanks
LUST - NC	Leaking Underground Storage Tanks
LUST TRUST - NC	Leaking Underground Storage Tanks: Trust

STATE AND TRIBAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS

PRLF - NC	Pre-Regulatory Landfill Sites
SWF/LF - NC	Solid Waste Facilities Landfills

LOCAL BROWNFIELD LISTS

BROWNFIELDS-ACRES	EPA ACRES Brownfields
FED BROWNFIELDS	Federal Brownfields

LOCAL LISTS OF HAZARDOUS WASTE / CONTAMINATED SITES

FED CDL	DOJ Clandestine Drug Labs
US HIST CDL	Historical Clandestine Drug Labs
INACTIVE HWS - NC	Inacitve Hazardous Waste Sites

LOCAL LISTS OF LANDFILL / SOLID WASTE DISPOSAL SITES

HIST INDIAN ODI R8	Historical Open Dump Inventory
INDIAN ODI R8	Open Dump Inventory
ODI	Open Dump Inventory
TRIBAL ODI	Indian Open Dump Inventory Sites
SWRCY - NC	Recycling Facilities
SWRCY 2 - NC	Material Recovery Facilities
SWTIRE - NC	Solid Waste Tire

RECORDS OF EMERGENCY RELEASE REPORTS

HMIRS (DOT)	Hazardous Materials Information Reporting Systems

LOCAL LAND RECORDS

LIENS 2	CERCLA Lien Information

OTHER ASCERTAINABLE RECORDS

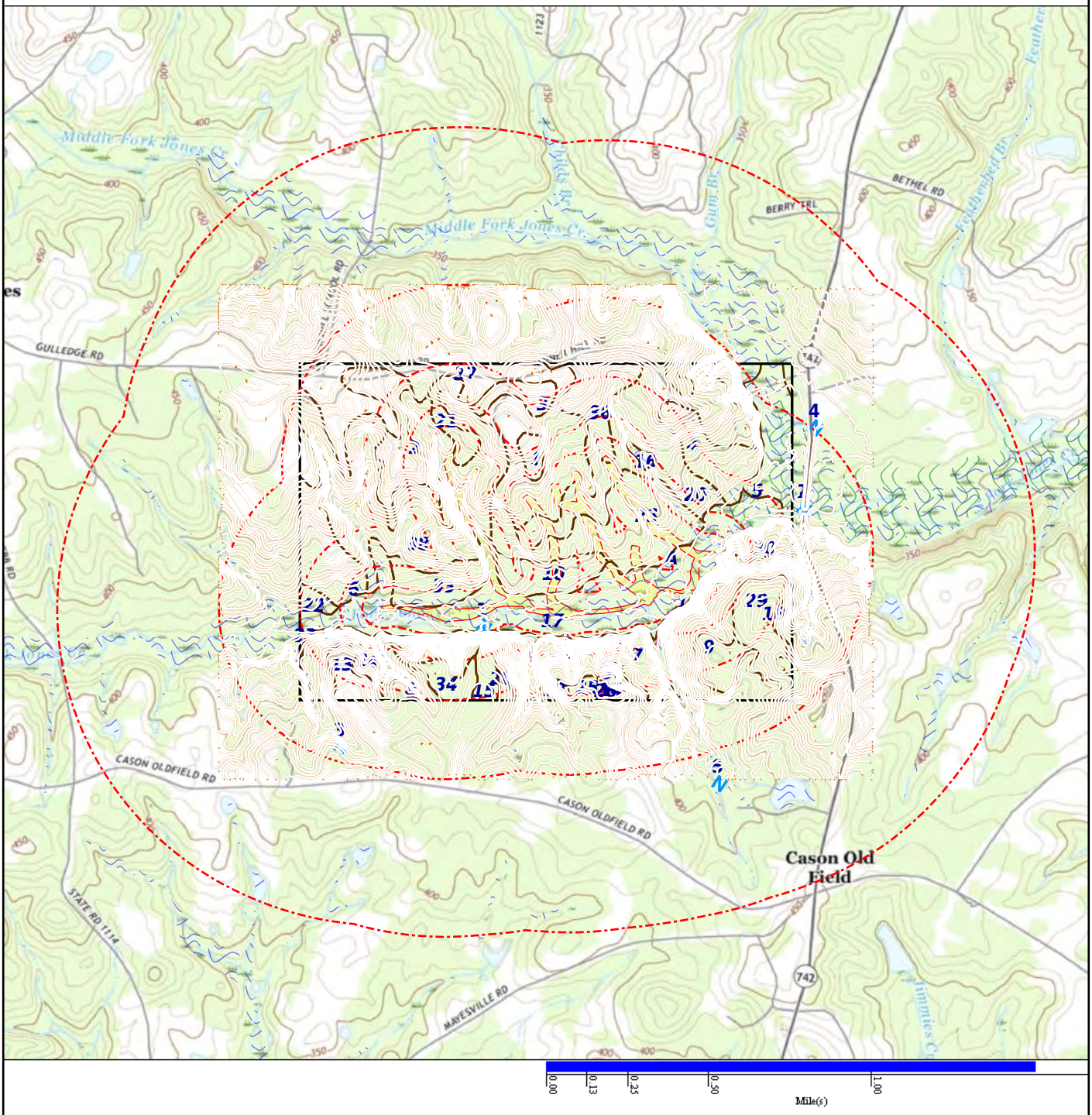
AFS	Air Facility Systems
ALT FUELING	Alternative Fueling Stations
AST PBS	ASTs at Bulk Petroleum Terminals
BRS	Biennial Reporting Systems
CDC HAZDAT	Hazardous Substance Release and Health Effects Information
COAL ASH DOE	Coal Ash: Department of Energy
COAL ASH EPA	Coal Ash: Environmental Protection Agency
COAL GAS	Coal Gas Plants
CONSENT (DECREES)	Superfund Consent Decree
CORRECTIVE ACTIONS_2020	Wastes - Hazardous Waste - Corrective Action
DEBRIS EPA LF	EPA Disaster Debris Landfill Sites
DEBRIS EPA SWRCY	EPA Disaster Debris Recovery Sites
DOD	Department of Defense
DOT OPS	Department of Transportation Office of Pipeline Safety
ECHO	EPA Enforcement and Compliance History Online
ENOI	Electronic Notice of Intent
EPA FUELS	EPA Fuels Registration, Reporting, and Compliance List
EPA OSC	EPA On-Site Coordinator
EPA WATCH	EPA Watch List
FA HWF	Financial Assurance for Hazardous Waste Facilities
FEDLAND	Federal Lands
FRS	Facility Index Systems
FTTS	FIFRA/TSCA Tracking System
FTTS INSP	FIFRA/TSCA Tracking System: Inspections
FUDS	Formerly Used Defense Sites
HIST AFS	Historical Air Facility Systems
HIST AFS 2	Historical Air Facility Systems
HIST DOD	Department of Defense historical sites
HIST LEAD_SMELTER	Historical Lead Smelter Sites
HIST MLTS	Historical Material Licensing Tracking Systems
HIST PCB TRANS	Historical Polychlorinated Biphenyl (PCB) Facilities
HIST PCS ENF	Historical Enforced Permit Compliance Facilities
HIST PCS FACILITY	Historical Permit Compliance Facilities
HIST SSTS	Historical Section 7 Tracking Systems
HWC DOCKET	Hazardous Waste Compliance Docket
ICIS	Integrated Compliance Information System
INACTIVE PCS	Inactive Permit Compliance Facilities
INDIAN RESERVATION	Indian Reservations
LUCIS	Land Use Control Information Systems

OTHER ASCERTAINABLE RECORDS *(cont.)*

LUCIS 2	Land Use Control Information Systems 2
MINES	Mines
MINES USGS	Mines list from USGS
MLTS	Material Licensing Tracking Systems
NPL AOC	Areas related to NPL remediation sites
NPL LIENS	National Priority List Liens
OSHA	Occupational Safety & Health Administration
PADS	PCB Activity Database Systems
PCB TRANSFORMER	Polychlorinated Biphenyl (PCB) Waste
PCS ENF	Enforced Permit Compliance Facilities
PCS FACILITY	Permit Compliance Facilities
RAATS	RCRA Administrative Action Tracking Systems
RADINFO	Radiation Information Systems
RMP	Risk Management Plans
ROD	Record of Decision
SCRD DRYCLEANERS	SCRD Drycleaners
SEMS_SMELTER	Sites on SEMS Potential Smelter Activity
SSTS	Section 7 Tracking Systems
STORMWATER	Storm Water Permits
TOSCA-PLANT	Toxic Substance Control Act: Plants
TRIS	Toxic Release Inventory Systems
UMTRA	Uranium Mill Tailing Sites
VAPOR	EPA Vapor Intrusion
BROWNFIELDS AEC - NC	Brownfields with Areas of Environmental Concern
COAL ASH - NC	Coal Ash sites
DAYCARE - NC	Daycare Facility
DRYCLEANERS - NC	Drycleaners
DRYCLEANERS 2 - NC	Drycleaners
DRYCLEANERS CLEANUP - NC	Drycleaners Cleanup
HIST COAL ASH - NC	Historical Coal Ash sites
IMD - NC	Incident Management Database
MGP - NC	Manufactured Gas Plant Sites
NFA - NC	No Further Action Sites
NPDES - NC	State Wastewater and NPDES Permits
OLI - NC	Old Landfill Inventory
UIC - NC	Underground Injection Controls

SUBJECT NAME: Middendorf Springs
ADDRESS: Gulledge Rd, Wadesboro, NC, 28170
LAT/LONG: 34.855547 / -80.108185

PREPARED FOR: Freese and Nichols, Inc.
ORDER #: 52637
REPORT DATE: March 23, 2021



- Subject Property
- CDC HAZDAT (No Data)
- Federal Lands (No Data)
- Historical DOD (No Data)
- Equal/Higher Elevation
- Department of Defense (No Data)
- FEMA FloodZone 100 (No Data)
- Indian Reservation (No Data)
- Lower Elevation
- DFIRM Floodzone 100
- FEMA FloodZone 500 (No Data)
- National Priority List (No Data)
- Brownfields Areas (No Data)
- DFIRM Floodzone 500 (No Data)
- Hazardous Substance Disposal Sites (No Data)
- NWI

SUBJECT NAME: Middendorf Springs
ADDRESS: Gulledge Rd, Wadesboro, NC, 28170
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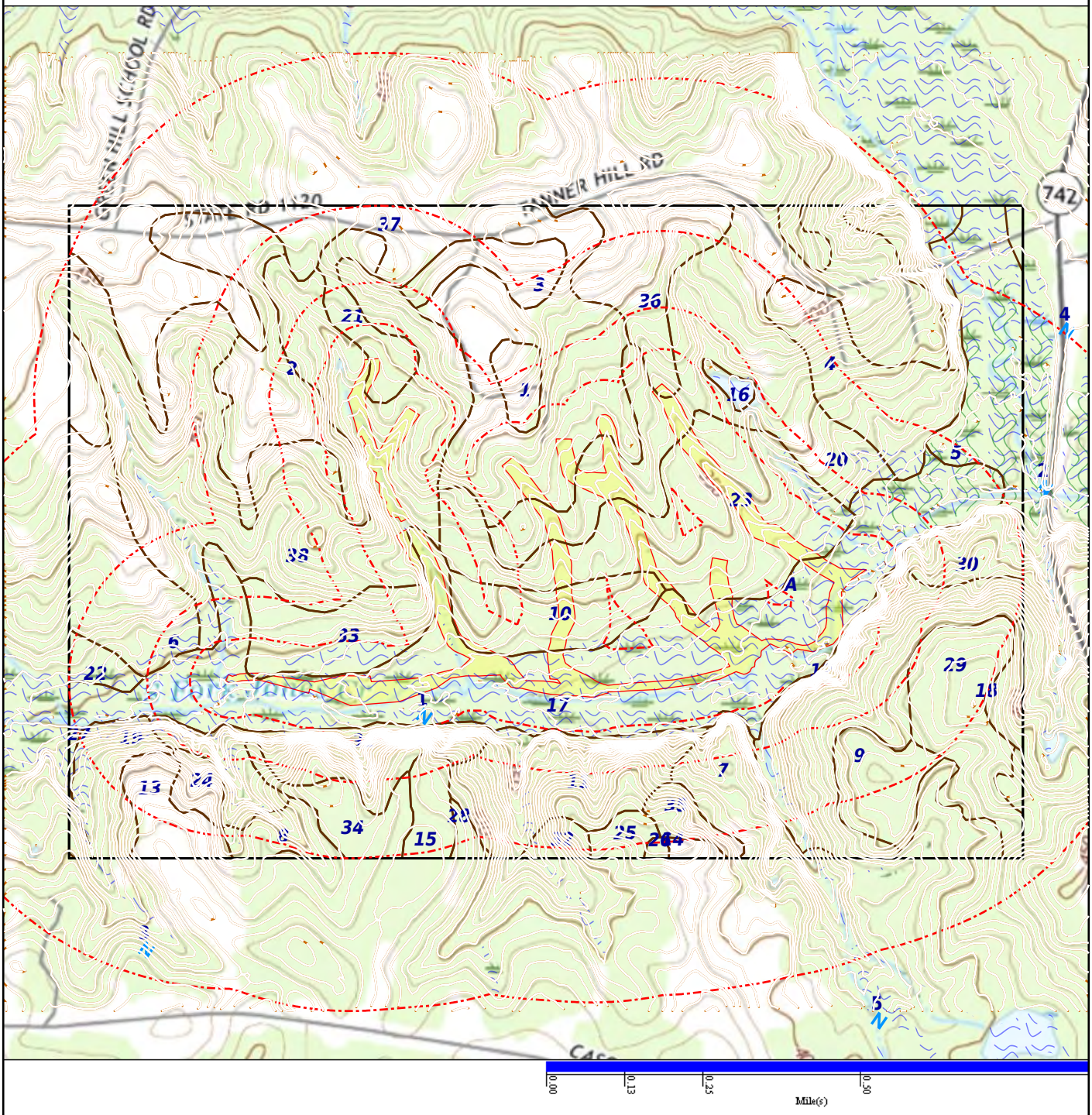

- Subject Property
- CDC HAZDAT (No Data)
- Federal Lands (No Data)
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- National Priority List (No Data)
- Brownfields Areas (No Data)
- DFIRM Floodzone 500 (No Data)
- Hazardous Substance Disposal Sites (No Data)
- NWI

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
FEDERAL RCRA NON-CORRACTS TSD FACILITIES LIST								
ARCHIVED RCRA TSDF		0.500	0	0	0	--	--	0
RCRA_TSDF		0.500	0	0	0	--	--	0
FEDERAL CERCLIS LIST								
CERCLIS NFRAP		0.500	0	0	0	--	--	0
CERCLIS-HIST		0.500	0	0	0	--	--	0
FEDERAL FACILITY		1.000	0	0	0	0	--	0
SEMS_8R_ACTIVE SITES		0.500	0	0	0	--	--	0
SEMS_8R_ARCHIVED SITES		0.500	0	0	0	--	--	0
FEDERAL RCRA CORRACTS FACILITIES LIST								
CORRACTS		1.000	0	0	0	0	--	0
HIST CORRACTS 2		1.000	0	0	0	0	--	0
FEDERAL DELISTED NPL SITE LIST								
DELISTED NPL		1.000	0	0	0	0	--	0
DELISTED PROPOSED NPL		1.000	0	0	0	0	--	0
SEMS_DELETED NPL		1.000	0	0	0	0	--	0
FEDERAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS								
EPA LF MOP		0.500	0	0	0	--	--	0
FEDERAL ERNS LIST								
ERNS		SP	0	--	--	--	--	0
FEDERAL INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES								
FED E C		0.500	0	0	0	--	--	0
FED I C		0.500	0	0	0	--	--	0
RCRA IC_EC		0.250	0	0	--	--	--	0
FEDERAL RCRA GENERATORS LIST								
HIST RCRA_CESQG		0.250	0	0	--	--	--	0
HIST RCRA_LQG		0.250	0	0	--	--	--	0
HIST RCRA_NONGEN		0.250	0	0	--	--	--	0
HIST RCRA_SQG		0.250	0	0	--	--	--	0
RCRA_LQG		0.250	0	0	--	--	--	0
RCRA_NONGEN		0.250	0	0	--	--	--	0
RCRA_SQG		0.250	0	0	--	--	--	0
RCRA_VSQG		0.250	0	0	--	--	--	0

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
FEDERAL NPL SITE LIST								
NPL		1.000	0	0	0	0	--	0
NPL EPA R1 GIS		1.000	0	0	0	0	--	0
NPL EPA R3 GIS		1.000	0	0	0	0	--	0
NPL EPA R6 GIS		1.000	0	0	0	0	--	0
NPL EPA R8 GIS		1.000	0	0	0	0	--	0
NPL EPA R9 GIS		1.000	0	0	0	0	--	0
PART NPL		1.000	0	0	0	0	--	0
PROPOSED NPL		1.000	0	0	0	0	--	0
SEMS_FINAL NPL		1.000	0	0	0	0	--	0
SEMS_PROPOSED NPL		1.000	0	0	0	0	--	0
STATE- AND TRIBAL - EQUIVALENT CERCLIS								
ARCHIVED HSDS - NC		1.000	0	0	0	0	--	0
ARCHIVED HSDS AREAS - NC		1.000	0	0	0	0	--	0
FRB SUPERFUND - NC		1.000	0	0	0	0	--	0
SHWS - NC		1.000	0	0	0	0	--	0
STATE AND TRIBAL REGISTERED STORAGE TANK LISTS								
FEMA UST		0.250	0	0	--	--	--	0
INDIAN UST R1		0.250	0	0	--	--	--	0
INDIAN UST R10		0.250	0	0	--	--	--	0
INDIAN UST R2		0.250	0	0	--	--	--	0
INDIAN UST R4		0.250	0	0	--	--	--	0
INDIAN UST R5		0.250	0	0	--	--	--	0
INDIAN UST R6		0.250	0	0	--	--	--	0
INDIAN UST R7		0.250	0	0	--	--	--	0
INDIAN UST R8		0.250	0	0	--	--	--	0
INDIAN UST R9		0.250	0	0	--	--	--	0
AST - NC		0.250	0	0	--	--	--	0
UST - NC		0.250	0	0	--	--	--	0
UST 2 - NC		0.250	0	0	--	--	--	0
STATE AND TRIBAL BROWNFIELD SITES								
TRIBAL BROWNFIELDS		0.500	0	0	0	--	--	0
BROWNFIELDS - NC		0.500	0	0	0	--	--	0
STATE RCRA GENERATORS LIST								
HWG - NC		0.250	0	0	--	--	--	0

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
STATE INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES								
I C - NC		0.500	0	0	0	--	--	0
STATE AND TRIBAL LEAKING STORAGE TANK LISTS								
INDIAN LUST R1		0.500	0	0	0	--	--	0
INDIAN LUST R10		0.500	0	0	0	--	--	0
INDIAN LUST R2		0.500	0	0	0	--	--	0
INDIAN LUST R4		0.500	0	0	0	--	--	0
INDIAN LUST R5		0.500	0	0	0	--	--	0
INDIAN LUST R6		0.500	0	0	0	--	--	0
INDIAN LUST R7		0.500	0	0	0	--	--	0
INDIAN LUST R8		0.500	0	0	0	--	--	0
INDIAN LUST R9		0.500	0	0	0	--	--	0
LAST - NC		0.500	0	0	0	--	--	0
LUST - NC		0.500	0	0	0	--	--	0
LUST TRUST - NC		0.500	0	0	0	--	--	0
STATE AND TRIBAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS								
PRLF - NC		1.000	0	0	0	0	--	0
SWF/LF - NC		0.500	0	0	0	--	--	0
LOCAL BROWNFIELD LISTS								
BROWNFIELDS-ACRES		0.500	0	0	0	--	--	0
FED BROWNFIELDS		0.500	0	0	0	--	--	0
LOCAL LISTS OF HAZARDOUS WASTE / CONTAMINATED SITES								
FED CDL		SP	0	--	--	--	--	0
US HIST CDL		SP	0	--	--	--	--	0
INACTIVE HWS - NC		1.000	0	0	0	0	--	0
LOCAL LISTS OF LANDFILL / SOLID WASTE DISPOSAL SITES								
HIST INDIAN ODI R8		0.500	0	0	0	--	--	0
INDIAN ODI R8		0.500	0	0	0	--	--	0
ODI		0.500	0	0	0	--	--	0
TRIBAL ODI		0.500	0	0	0	--	--	0
SWRCY - NC		0.500	0	0	0	--	--	0
SWRCY 2 - NC		0.500	0	0	0	--	--	0
SWTIRE - NC		0.500	0	0	0	--	--	0

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
RECORDS OF EMERGENCY RELEASE REPORTS								
HMIRS (DOT)		SP	0	--	--	--	--	0
LOCAL LAND RECORDS								
LIENS 2		SP	0	--	--	--	--	0
OTHER ASCERTAINABLE RECORDS								
AFS		SP	0	--	--	--	--	0
ALT FUELING		0.250	0	0	--	--	--	0
AST PBS		0.250	0	0	--	--	--	0
BRS		SP	0	--	--	--	--	0
CDC HAZDAT		1.000	0	0	0	0	--	0
COAL ASH DOE		0.500	0	0	0	--	--	0
COAL ASH EPA		0.500	0	0	0	--	--	0
COAL GAS		1.000	0	0	0	0	--	0
CONSENT (DECREES)		1.000	0	0	0	0	--	0
CORRECTIVE ACTIONS_2020		0.500	0	0	0	--	--	0
DEBRIS EPA LF		0.500	0	0	0	--	--	0
DEBRIS EPA SWRCY		0.500	0	0	0	--	--	0
DOD		1.000	0	0	0	0	--	0
DOT OPS		SP	0	--	--	--	--	0
ECHO		SP	0	--	--	--	--	0
ENOI		SP	0	--	--	--	--	0
EPA FUELS		SP	0	--	--	--	--	0
EPA OSC		0.125	0	--	--	--	--	0
EPA WATCH		SP	0	--	--	--	--	0
FA HWF		SP	0	--	--	--	--	0
FEDLAND		1.000	0	0	0	0	--	0
FRS		SP	0	--	--	--	--	0
FTTS		SP	0	--	--	--	--	0
FTTS INSP		SP	0	--	--	--	--	0
FUDS		1.000	0	0	0	0	--	0
HIST AFS		SP	0	--	--	--	--	0
HIST AFS 2		SP	0	--	--	--	--	0
HIST DOD		1.000	0	0	0	0	--	0
HIST LEAD_SMELTER		SP	0	--	--	--	--	0
HIST MLTS		SP	0	--	--	--	--	0
HIST PCB TRANS		SP	0	--	--	--	--	0

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
OTHER ASCERTAINABLE RECORDS *(cont.)*								
HIST PCS ENF		SP	0	--	--	--	--	0
HIST PCS FACILITY		SP	0	--	--	--	--	0
HIST SSTS		SP	0	--	--	--	--	0
HWC DOCKET		SP	0	--	--	--	--	0
ICIS		SP	0	--	--	--	--	0
INACTIVE PCS		SP	0	--	--	--	--	0
INDIAN RESERVATION		1.000	0	0	0	0	--	0
LUCIS		0.500	0	0	0	--	--	0
LUCIS 2		0.500	0	0	0	--	--	0
MINES		0.250	0	0	--	--	--	0
MINES USGS		0.250	0	0	--	--	--	0
MLTS		SP	0	--	--	--	--	0
NPL AOC		1.000	0	0	0	0	--	0
NPL LIENS		SP	0	--	--	--	--	0
OSHA		SP	0	--	--	--	--	0
PADS		SP	0	--	--	--	--	0
PCB TRANSFORMER		SP	0	--	--	--	--	0
PCS ENF		SP	0	--	--	--	--	0
PCS FACILITY		SP	0	--	--	--	--	0
RAATS		SP	0	--	--	--	--	0
RADINFO		SP	0	--	--	--	--	0
RMP		0.500	0	0	0	--	--	0
ROD		1.000	0	0	0	0	--	0
SCRD DRYCLEANERS		0.250	0	0	--	--	--	0
SEMS_SMELTER		SP	0	--	--	--	--	0
SSTS		SP	0	--	--	--	--	0
STORMWATER		SP	0	--	--	--	--	0
TOSCA-PLANT		SP	0	--	--	--	--	0
TRIS		SP	0	--	--	--	--	0
UMTRA		0.500	0	0	0	--	--	0
VAPOR		0.500	0	0	0	--	--	0
BROWNFIELDS AEC - NC		0.500	0	0	0	--	--	0
COAL ASH - NC		0.500	0	0	0	--	--	0
DAYCARE - NC		SP	0	--	--	--	--	0
DRYCLEANERS - NC		0.250	0	0	--	--	--	0
DRYCLEANERS 2 - NC		0.250	0	0	--	--	--	0

DATABASE	SUBJECT PROPERTY	SEARCH DISTANCE (MILES)	<1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	>1	TOTAL MAPPED
OTHER ASCERTAINABLE RECORDS *(cont.)*								
DRYCLEANERS CLEANUP - NC		0.500	0	0	0	--	--	0
HIST COAL ASH - NC		0.500	0	0	0	--	--	0
IMD - NC		0.500	0	0	0	--	--	0
MGP - NC		1.000	0	0	0	0	--	0
NFA - NC		0.500	0	0	0	--	--	0
NPDES - NC		SP	0	--	--	--	--	0
OLI - NC		0.500	0	0	0	--	--	0
UIC - NC		SP	0	--	--	--	--	0

No unmappable sites reported.

FEDERAL RCRA NON-CORRACTS TSD FACILITIES LIST

ARCHIVED RCRA TSDF: Resource Conservation and Recovery Act hazardous waste transportation storage disposal and treatment facilities

Agency Version Date: 10/12/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

RCRA_TSDF: Resource Conservation and Recovery Act hazardous waste transportation storage disposal and treatment facilities

Agency Version Date: 10/12/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

FEDERAL CERCLIS LIST

CERCLIS NFRAP: The CERCLIS sites with No Further Remedial Action Planned from the CERCLIS program database. The Environmental Protection Agency decommissioned the CERCLIS data in 2014. The last update was November 12, 2013.

Agency Version Date: 10/25/2013
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 800-424-9346
Most Recent Contact: 02/12/2021

CERCLIS-HIST: The CERCLIS program database contains information on the assessment and remediation of federal hazardous waste sites. The Environmental Protection Agency decommissioned the CERCLIS data in 2014. The last update was November 12, 2013.

Agency Version Date: 10/29/2013
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 800-424-9346
Most Recent Contact: 02/12/2021

FEDERAL FACILITY: Sites where Federal Facilities Restoration and Reuse Office (FFRRO) arranged cleanup for Base Closure and Property Transfer at Federal Facilities

Agency Version Date: 11/17/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8712
Most Recent Contact: 02/12/2021

SEMS_8R_ACTIVE SITES: The Active Site Inventory Report displays site and location information at active SEMS sites. An active site is one at which site assessment, removal, remedial, enforcement, cost recovery, or oversight activities are being planned or conducted. NPL sites include latitude and longitude information. For non-NPL sites, a brief site status is provided.

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

SEMS_8R_ARCHIVED SITES: The Archived Site Inventory displays site and location information at sites archived from SEMS. An archived site is one at which EPA has determined that assessment has been completed and no further remedial action is planned under the Superfund program at this time.

Agency Version Date: 10/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

FEDERAL RCRA CORRACTS FACILITIES LIST

CORRACTS: List of facilities where Resource Conservation and Recovery Act Corrective Action Program used to investigate and remediate hazardous releases

Agency Version Date: 10/12/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-1667
Most Recent Contact: 01/15/2021

HIST CORRACTS 2: List of facilities where Resource Conservation and Recovery Act Corrective Action Program used to investigate and remediate hazardous releases that are no longer in current agency list.

Agency Version Date: 10/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/08/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-1667
Most Recent Contact: 03/12/2021

FEDERAL DELISTED NPL SITE LIST

DELISTED NPL: National Priority List of sites that were delisted and no longer require action

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

DELISTED PROPOSED NPL: Sites that have been delisted from the proposed National Priority List

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

SEMS_DELETED NPL: All Deleted National Priority List Sties

Agency Version Date: 10/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

FEDERAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS

EPA LF MOP: Sites in the EPA Landfill Methane Outreach Program

Agency Version Date: 01/11/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/09/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 01/11/2021

FEDERAL ERNS LIST

ERNS: Emergency Response Notification System records of reported spills

Agency Version Date: 02/04/2021
Agency Update Frequency: Annually
Planned Next Contact: 05/03/2021
Agency: National Response Center United States Coast Guard
Agency Contact: N/R
Most Recent Contact: 02/04/2021

FEDERAL INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES

FED E C: Federal listing of remediation sites with engineering controls

Agency Version Date: 03/11/2021
Agency Update Frequency: Varies
Planned Next Contact: 06/07/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 800-424-9346
Most Recent Contact: 03/11/2021

FEDERAL INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES (cont.)

FED I C: Federal listing of remediation sites with institutional controls

Agency Version Date: 03/11/2021
Agency Update Frequency: Varies
Planned Next Contact: 06/07/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 800-424-9346
Most Recent Contact: 03/11/2021

RCRA IC_EC: Sites with institutional or engineering controls related to Resource Conservation and Recovery Act

Agency Version Date: 02/19/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/18/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 02/19/2021

FEDERAL RCRA GENERATORS LIST

HIST RCRA_CESQG: List of Resource Conservation and Recovery Act licensed conditionally exempt small quantity generators that are no longer in current agency list.

Agency Version Date: 10/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/08/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 03/12/2021

HIST RCRA_LQG: List of Resource Conservation and Recovery Act licensed large quantity generators that are no longer in current agency list.

Agency Version Date: 10/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/08/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 03/12/2021

HIST RCRA_NONGEN: List of Resource Conservation and Recovery Act licensed non-generators that are no longer in current agency list.

Agency Version Date: 10/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/08/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 03/12/2021

HIST RCRA_SQG: List of Resource Conservation and Recovery Act licensed small quantity generators that are no longer in current agency list.

Agency Version Date: 10/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/08/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 03/12/2021

RCRA_LQG: Resource Conservation and Recovery Act listing of licensed large quantity generators

Agency Version Date: 10/12/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

RCRA_NONGEN: Resource Conservation and Recovery Act listing of licensed non-generators

Agency Version Date: 10/12/2020
Agency Update Frequency: Varies
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

RCRA_SQG: Resource Conservation and Recovery Act listing of licensed small quantity generators

Agency Version Date: 10/12/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

FEDERAL RCRA GENERATORS LIST (cont.)

RCRA_VSQG: Resource Conservation and Recovery Act listing of licensed very small quantity generators.

Agency Version Date: 10/12/2020
Agency Update Frequency: Varies
Planned Next Contact: 04/13/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 215-814-2469
Most Recent Contact: 01/15/2021

FEDERAL NPL SITE LIST

NPL: List of priority contaminated sites among identified releases or threatened releases of hazardous substances pollutants or contaminants nationally

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

NPL EPA R1 GIS: Geospatial data for the Environmental Protection Agency Region 1 National Priority List subject to environmental regulation

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-2132
Most Recent Contact: 02/12/2021

NPL EPA R3 GIS: Geospatial data for the Environmental Protection Agency Region 3 National Priority List subject to environmental regulation

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-2132
Most Recent Contact: 02/12/2021

NPL EPA R6 GIS: Geospatial data for the Environmental Protection Agency Region 6 National Priority List subject to environmental regulation

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-2132
Most Recent Contact: 02/12/2021

NPL EPA R8 GIS: Geospatial data for the Environmental Protection Agency Region 8 National Priority List subject to environmental regulation

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-2132
Most Recent Contact: 02/12/2021

NPL EPA R9 GIS: Geospatial data for the Environmental Protection Agency Region 9 National Priority List subject to environmental regulation

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-2132
Most Recent Contact: 02/12/2021

PART NPL: Sites that are a part of an National Priority List site referred to as the parent site

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

FEDERAL NPL SITE LIST (cont.)

PROPOSED NPL: Sites that have been proposed for the National Priority List

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

SEMS_FINAL NPL: All Included National Priority List Sites

Agency Version Date: 10/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

SEMS_PROPOSED NPL: All Proposed National Priority List Sites

Agency Version Date: 10/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

STATE- AND TRIBAL - EQUIVALENT CERCLIS

ARCHIVED HSDS - NC: The Hazardous Substance Disposal Sites that were listed on both the National Priority List and the State Priority List as of June 21, 1995. Updated 1998 and 2004.

Agency Version Date: 12/13/2018
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 05/24/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 02/25/2021

ARCHIVED HSDS AREAS - NC: Areas of Archived Hazardous Substance Disposal Sites

Agency Version Date: 12/13/2018
Agency Update Frequency: Quarterly
Planned Next Contact: 05/24/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 02/25/2021

FRB SUPERFUND - NC: The NC DENR Federal Remediation Branch list of Superfund and CERCLA sites.

Agency Version Date: 12/21/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 06/15/2021
Agency: Department of Environmental Quality
Agency Contact: (919) 707-8200
Most Recent Contact: 03/19/2021

SHWS - NC: Hazardous Substances Cleanup Fund list of sites

Agency Version Date: 02/11/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/10/2021
Agency: Department of Environmental Quality
Agency Contact: (919) 707-8200
Most Recent Contact: 02/11/2021

STATE AND TRIBAL REGISTERED STORAGE TANK LISTS

FEMA UST: FEMA underground storage tank listing

Agency Version Date: 06/21/2019
Agency Update Frequency: Varies
Planned Next Contact: 04/16/2021
Agency: FEMA
Agency Contact: 202-212-5283
Most Recent Contact: 01/19/2021

INDIAN UST R1: Underground Storage Tanks on Indian Land in EPA Region 1

Agency Version Date: 02/03/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/03/2021
Agency: U.S. Environmental Protection Agency Region 1
Agency Contact: 855-246-3642
Most Recent Contact: 02/03/2021

STATE AND TRIBAL REGISTERED STORAGE TANK LISTS (cont.)

INDIAN UST R10: Underground Storage Tanks on Indian Land in EPA Region 10

Agency Version Date: 12/02/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/27/2021
Agency: U.S. Environmental Protection Agency Region 10
Agency Contact: 855-246-3642
Most Recent Contact: 03/01/2021

INDIAN UST R2: Underground Storage Tanks on Indian Land in EPA Region 2

Agency Version Date: 12/07/2016
Agency Update Frequency: Quarterly
Planned Next Contact: 05/05/2021
Agency: U.S. Environmental Protection Agency Region 2
Agency Contact: 855-246-3642
Most Recent Contact: 02/05/2021

INDIAN UST R4: Underground Storage Tanks on Indian Land in EPA Region 4

Agency Version Date: 04/14/2020
Agency Update Frequency: Semi Annually
Planned Next Contact: 05/27/2021
Agency: U.S. Environmental Protection Agency Region 4
Agency Contact: 855-246-3642
Most Recent Contact: 03/01/2021

INDIAN UST R5: Underground Storage Tanks on Indian Land in EPA Region 5

Agency Version Date: 11/19/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/14/2021
Agency: U.S. Environmental Protection Agency Region 5
Agency Contact: 855-246-3642
Most Recent Contact: 02/15/2021

INDIAN UST R6: Underground Storage Tanks on Indian Land in EPA Region 6

Agency Version Date: 12/18/2020
Agency Update Frequency: Semi Annually
Planned Next Contact: 06/11/2021
Agency: U.S. Environmental Protection Agency Region 6
Agency Contact: 855-246-3642
Most Recent Contact: 03/17/2021

INDIAN UST R7: Underground Storage Tanks on Indian Land in EPA Region 7

Agency Version Date: 11/19/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/14/2021
Agency: U.S. Environmental Protection Agency Region 7
Agency Contact: 855-246-3642
Most Recent Contact: 02/15/2021

INDIAN UST R8: Underground Storage Tanks on Indian Land in EPA Region 8

Agency Version Date: 02/01/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/29/2021
Agency: U.S. Environmental Protection Agency Region 8
Agency Contact: 855-246-3642
Most Recent Contact: 02/01/2021

INDIAN UST R9: Underground Storage Tanks on Indian Land in EPA Region 9

Agency Version Date: 02/01/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/29/2021
Agency: U.S. Environmental Protection Agency Region 9
Agency Contact: 855-246-3642
Most Recent Contact: 02/01/2021

AST - NC: Oil terminal facility Locations

Agency Version Date: 02/05/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/04/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 715-1117
Most Recent Contact: 02/05/2021

UST - NC: Registered Underground Storage Tanks

Agency Version Date: 01/08/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/06/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 01/08/2021

STATE AND TRIBAL REGISTERED STORAGE TANK LISTS (cont.)

UST 2 - NC: UST Facility Operating Permits

Agency Version Date: 01/26/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/23/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 01/26/2021

STATE AND TRIBAL BROWNFIELD SITES

TRIBAL BROWNFIELDS: Tribal brownfield remediation site listing

Agency Version Date: 02/10/2017
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 04/02/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 01/05/2021

BROWNFIELDS - NC: Brownfield Projects Inventory

Agency Version Date: 02/11/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 02/11/2021

STATE RCRA GENERATORS LIST

HWG - NC: Hazardous Waste sites that are regulated by the hazardous waste portions of the Resource Conservation and Recovery Act (RCRA)

Agency Version Date: 01/05/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/01/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 01/05/2021

STATE INSTITUTIONAL CONTROLS / ENGINEERING CONTROLS REGISTRIES

I C - NC: Sites with land Use Restrictions Monitoring

Agency Version Date: 02/11/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 02/11/2021

STATE AND TRIBAL LEAKING STORAGE TANK LISTS

INDIAN LUST R1: Leaking Underground Storage Tanks on Indian Land in EPA Region 1

Agency Version Date: 02/02/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/30/2021
Agency: U.S. Environmental Protection Agency Region 1
Agency Contact: 855-246-3642
Most Recent Contact: 02/02/2021

INDIAN LUST R10: Leaking Underground Storage Tanks on Indian Land in EPA Region 10

Agency Version Date: 04/14/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/27/2021
Agency: U.S. Environmental Protection Agency Region 10
Agency Contact: 855-246-3642
Most Recent Contact: 03/01/2021

INDIAN LUST R2: Leaking Underground Storage Tanks on Indian Land in EPA Region 2

Agency Version Date: 12/07/2016
Agency Update Frequency: Quarterly
Planned Next Contact: 05/05/2021
Agency: U.S. Environmental Protection Agency Region 2
Agency Contact: 855-246-3642
Most Recent Contact: 02/05/2021

STATE AND TRIBAL LEAKING STORAGE TANK LISTS (cont.)

INDIAN LUST R4: Leaking Underground Storage Tanks on Indian Land in EPA Region 4

Agency Version Date: 12/02/2020
Agency Update Frequency: Semi Annually
Planned Next Contact: 05/27/2021
Agency: U.S. Environmental Protection Agency Region 4
Agency Contact: 855-246-3642
Most Recent Contact: 03/01/2021

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land in EPA Region 5

Agency Version Date: 11/19/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/14/2021
Agency: U.S. Environmental Protection Agency Region 5
Agency Contact: 855-246-3642
Most Recent Contact: 02/15/2021

INDIAN LUST R6: Leaking Underground Storage Tanks on Indian Land in EPA Region 6

Agency Version Date: 11/23/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/18/2021
Agency: U.S. Environmental Protection Agency Region 6
Agency Contact: 855-246-3642
Most Recent Contact: 02/19/2021

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land in EPA Region 7

Agency Version Date: 04/15/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/14/2021
Agency: U.S. Environmental Protection Agency Region 7
Agency Contact: 855-246-3642
Most Recent Contact: 02/15/2021

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land in EPA Region 8

Agency Version Date: 11/23/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/18/2021
Agency: U.S. Environmental Protection Agency Region 8
Agency Contact: 855-246-3642
Most Recent Contact: 02/19/2021

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land in EPA Region 9

Agency Version Date: 02/01/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/29/2021
Agency: U.S. Environmental Protection Agency Region 9
Agency Contact: 855-246-3642
Most Recent Contact: 02/01/2021

LAST - NC: Aboveground Storage Tanks with reported leaks

Agency Version Date: 12/15/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/09/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 03/12/2021

LUST - NC: Underground Storage Tanks with reported leaks

Agency Version Date: 12/15/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/09/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8150
Most Recent Contact: 03/12/2021

LUST TRUST - NC: State Trust Fund Database

Agency Version Date: 01/07/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/05/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 01/07/2021

STATE AND TRIBAL LANDFILL AND/OR SOLID WASTE DISPOSAL SITE LISTS

PRLF - NC: List of non-permitted landfills that have been closed since 1/1/1983.

Agency Version Date: 01/29/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/27/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 01/29/2021

SWF/LF - NC: Landfill sites

Agency Version Date: 02/10/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8200
Most Recent Contact: 02/10/2021

LOCAL BROWNFIELD LISTS

BROWNFIELDS-ACRES: EPA Brownfields Assessment, Cleanup and Redevelopment Exchange System.

Agency Version Date: 12/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 03/26/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 12/28/2020

FED BROWNFIELDS: Federal brownfield remediation sites

Agency Version Date: 02/05/2021
Agency Update Frequency: Semi Annually
Planned Next Contact: 05/05/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 02/05/2021

LOCAL LISTS OF HAZARDOUS WASTE / CONTAMINATED SITES

FED CDL: The U.S. Department of Justice listing of clandestine drug lab locations

Agency Version Date: 01/28/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/26/2021
Agency: U.S. Department of Justice
Agency Contact: 202-307-7610
Most Recent Contact: 01/28/2021

US HIST CDL: The U.S. Department of Justice historical listing of clandestine drug lab locations

Agency Version Date: 08/05/2019
Agency Update Frequency: Quarterly
Planned Next Contact: 05/31/2021
Agency: U.S. Department of Justice
Agency Contact: 202-307-7610
Most Recent Contact: 03/03/2021

INACTIVE HWS - NC: Listing of inactive hazardous sites where a hazardous substance release has been identified

Agency Version Date: 01/07/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/05/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 01/07/2021

LOCAL LISTS OF LANDFILL / SOLID WASTE DISPOSAL SITES

HIST INDIAN ODI R8: List of Region 8 Indian land open dump inventory sites maintained within the STARS program that is no longer in current agency list.

Agency Version Date: 11/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 04/29/2021
Agency: Indian Health Service
Agency Contact: 855-246-3642
Most Recent Contact: 02/01/2021

INDIAN ODI R8: Region 8 Indian land open dump inventory sites maintained within the STARS program

Agency Version Date: 02/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: Indian Health Service
Agency Contact: 855-246-3642
Most Recent Contact: 02/12/2021

LOCAL LISTS OF LANDFILL / SOLID WASTE DISPOSAL SITES (cont.)

ODI: Open dump inventory sites

Agency Version Date: 10/03/2017
Agency Update Frequency: No Update
Planned Next Contact: 05/24/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 02/25/2021

TRIBAL ODI: Indian land open dump inventory for all regions

Agency Version Date: 12/18/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/04/2021
Agency: Indian Health Service
Agency Contact: 301-443-3593
Most Recent Contact: 03/10/2021

SWRCY - NC: Listing of recycling facilities

Agency Version Date: 11/13/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: 919.707.8236
Most Recent Contact: 02/10/2021

SWRCY 2 - NC: Material Recovery Facilities (MRFs)

Agency Version Date: 02/04/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/03/2021
Agency: Department of Environment and Natural Resources
Agency Contact: 919.707.8236
Most Recent Contact: 02/04/2021

SWTIRE - NC: Solid Waste Permitted Facility List

Agency Version Date: 02/11/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/10/2021
Agency: Department of Environmental Quality
Agency Contact: (919) 707-8200
Most Recent Contact: 02/11/2021

RECORDS OF EMERGENCY RELEASE REPORTS

HMIRS (DOT): Hazardous Material spills reported by the Department of Transportation

Agency Version Date: 01/05/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/02/2021
Agency: U.S. Department of Transportation
Agency Contact: (202) 366-4996
Most Recent Contact: 01/05/2021

LOCAL LAND RECORDS

LIENS 2: Comprehensive Environmental Response Compensation and Liability Act sites with liens

Agency Version Date: 05/11/2017
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 04/02/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 800-424-9346
Most Recent Contact: 01/05/2021

OTHER ASCERTAINABLE RECORDS

AFS: Air Facility Systems Quarterly Extract

Agency Version Date: 02/16/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/14/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/16/2021

ALT FUELING: Alternative Fueling Stations by fuel type.

Agency Version Date: 01/14/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/12/2021
Agency: U.S. Department of Energy
Agency Contact: N/R
Most Recent Contact: 01/14/2021

OTHER ASCERTAINABLE RECORDS (cont.)

AST PBS: Bulk petroleum terminals with a total bulk storage capacity of 50,000 barrels or more.

Agency Version Date: 12/11/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 06/04/2021
Agency: Department of Homeland Security
Agency Contact: 202-853-5361
Most Recent Contact: 03/09/2021

BRS: Reporting of hazardous waste generation and management from large quantity generators

Agency Version Date: 10/12/2020
Agency Update Frequency: Biennial
Planned Next Contact: 04/13/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/15/2021

CDC HAZDAT: The Agency for Toxic Substances and Disease Registry's Hazardous Substance Release/Health Effects Database.

Agency Version Date: 08/21/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: Agency for Toxic Substances and Disease Registry
Agency Contact: 770-488-6399
Most Recent Contact: 02/12/2021

COAL ASH DOE: List of existing and planned generators with 1 megawatt or greater of combined capacity that are utilizing coal ash impoundments.

Agency Version Date: 01/08/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/07/2021
Agency: Department of Energy
Agency Contact: (202) 586-8800
Most Recent Contact: 01/08/2021

COAL ASH EPA: Coal Combustion Residues Surface Impoundments List

Agency Version Date: 02/18/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/17/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/18/2021

COAL GAS: Manufactured Gas Plant locations

Agency Version Date: 01/22/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/20/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 01/22/2021

CONSENT (DECREES): Legal decisions regarding responsibility for Superfund locations

Agency Version Date: 11/13/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/10/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 02/10/2021

CORRECTIVE ACTIONS_2020: In 2009 the EPA created the 2020 Corrective Action Baseline list of contaminated or potentially contaminated sites with a cleanup goal to complete 95% by the year 2020. The names on the list indicate the facility owners who may or may not have caused the contamination.

Agency Version Date: 12/21/2018
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 05/04/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: N/R
Most Recent Contact: 02/05/2021

DEBRIS EPA LF: EPA list of designated landfill facilities for the safe disposal of disaster debris.

Agency Version Date: 01/26/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/27/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 01/26/2021

OTHER ASCERTAINABLE RECORDS (cont.)

DEBRIS EPA SWRCY: EPA list of facilities for the safe recovery, recycling, and disposal of disaster debris.

Agency Version Date: 01/26/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/27/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 01/26/2021

DOD: Department of Defense sites

Agency Version Date: 11/17/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 02/12/2021

DOT OPS: Incident Data Report

Agency Version Date: 11/30/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/26/2021
Agency: U.S. Department of Transportation
Agency Contact: (202) 366-4996
Most Recent Contact: 02/26/2021

ECHO: ECHO is EPA Enforcement and Compliance History Online website to search for facilities in your community to assess their compliance with environmental regulations related to CAA, CWA, RCRA, & SDWA.

Agency Version Date: 01/07/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 04/05/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 202-566-1667
Most Recent Contact: 01/07/2021

ENOI: The Electronic Notice of Intent (eNOI) database contains construction sites and industrial facilities that submit permit requests to EPA for Construction General Permits (CGP) and Multi-Sector General Permits (MSGP).

Agency Version Date: 09/25/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 06/15/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 03/19/2021

EPA FUELS: List of companies and facilities registered to participate in EPA Fuel Programs under Title 40 CFR Part 80.

Agency Version Date: 11/23/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/18/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: (202) 564-2307
Most Recent Contact: 02/19/2021

EPA OSC: Listing of oil spills and hazardous substance release sites requiring EPA On-Site Coordinators.

Agency Version Date: 10/09/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/02/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: (202) 564-2307
Most Recent Contact: 01/05/2021

EPA WATCH: The EPA Watch List was used 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. EPA maintained the lists from 2011 - 2013.

Agency Version Date: 02/09/2018
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 04/02/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: (202) 564-2307
Most Recent Contact: 01/05/2021

FA HWF: Hazardous Waste Facilities with Financial Assurance

Agency Version Date: 01/20/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/19/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 01/20/2021

OTHER ASCERTAINABLE RECORDS (cont.)

FEDLAND: Federal land locations

Agency Version Date: 01/06/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/07/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 02/09/2021

FRS: Facility Registry Systems

Agency Version Date: 11/27/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/24/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/23/2021

FTTS: Tracking of administrative and enforcement activities related to FIFRA/TSCA

Agency Version Date: 04/16/2013
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 04/20/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-2280
Most Recent Contact: 01/22/2021

FTTS INSP: Tracking of inspections related to FIFRA/TSCA

Agency Version Date: 05/08/2017
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 04/13/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-2280
Most Recent Contact: 01/15/2021

FUDS: Defense sites that require cleanup

Agency Version Date: 11/23/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/19/2021
Agency: US Army Corps of Engineering
Agency Contact: (202) 761-0011
Most Recent Contact: 02/19/2021

HIST AFS: List of Air Facility Systems Quarterly Extract that are no longer in current agency list.

Agency Version Date: 06/14/2019
Agency Update Frequency: Quarterly
Planned Next Contact: 04/01/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/05/2021

HIST AFS 2: List of Air Facility Systems Quarterly Extract that are no longer in current agency list.

Agency Version Date: 11/26/2018
Agency Update Frequency: Quarterly
Planned Next Contact: 05/04/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/05/2021

HIST DOD: Department of Defense historical sites

Agency Version Date: 08/17/2018
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 05/11/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 02/12/2021

HIST LEAD_SMELTER: List of former lead smelter sites that is no longer in current agency list.

Agency Version Date: 12/12/2018
Agency Update Frequency: Annually
Planned Next Contact: 04/19/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/21/2021

HIST MLTS: List of sites in possession/use of radioactive materials regulated by NRC that is no longer in current agency list.

Agency Version Date: 07/13/2016
Agency Update Frequency: Annually
Planned Next Contact: 04/29/2021
Agency: Nuclear Regulatory Commission
Agency Contact: (800) 397-4209
Most Recent Contact: 02/01/2021

OTHER ASCERTAINABLE RECORDS (cont.)

HIST PCB TRANS: List of PCB Disposal Facilities that are no longer in current agency list.

Agency Version Date: 01/18/2018
Agency Update Frequency: No Update
Planned Next Contact: 05/17/2021
Agency: Environmental Protection Agency
Agency Contact: (703) 308-8404
Most Recent Contact: 02/18/2021

HIST PCS ENF: List of permitted facilities to discharge wastewater (Federal equivalent to NPDES) that are no longer in current agency list.

Agency Version Date: 12/08/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/04/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-6582
Most Recent Contact: 03/09/2021

HIST PCS FACILITY: List of Permitted facilities to discharge wastewater (Federal equivalent to NPDES) that are no longer in current agency list.

Agency Version Date: 12/18/2018
Agency Update Frequency: Annually
Planned Next Contact: 06/03/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-6582
Most Recent Contact: 03/09/2021

HIST SSTS: List of tracking of facilities who produce pesticides and their quantity that are no longer in current agency list.

Agency Version Date: 02/13/2019
Agency Update Frequency: Annually
Planned Next Contact: 05/21/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/23/2021

HWC DOCKET: Listing of Federal facilities which are managing or have managed hazardous waste; or have had a release of hazardous waste.

Agency Version Date: 02/16/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/17/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: (202) 564-2307
Most Recent Contact: 02/16/2021

ICIS: Comprised of all Federal Administrative and Judicial enforcement information [intended to replace PCS] by tracking enforcement and compliance information (also contains what used to be known as FFTS)

Agency Version Date: 01/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/12/2021

INACTIVE PCS: Inactive Permitted facilities to discharge wastewater

Agency Version Date: 01/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-6582
Most Recent Contact: 01/12/2021

INDIAN RESERVATION: Indian Reservation sites

Agency Version Date: 10/26/2020
Agency Update Frequency: Varies
Planned Next Contact: 04/19/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 01/21/2021

LUCIS: Land Use Control Information Systems

Agency Version Date: 07/24/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 04/06/2021
Agency: Department of the Navy: BRAC PMO
Agency Contact: (619) 532-0900
Most Recent Contact: 01/08/2021

OTHER ASCERTAINABLE RECORDS (cont.)

LUCIS 2: Land Use Control Information Systems

Agency Version Date: 01/17/2018
Agency Update Frequency: No Longer Maintained
Planned Next Contact: 05/18/2021
Agency: Department of the Navy: BRAC PMO
Agency Contact: (619) 532-0900
Most Recent Contact: 02/19/2021

MINES: Mines Master Index Files

Agency Version Date: 01/11/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Department of Labor
Agency Contact: (202) 693-9400
Most Recent Contact: 01/11/2021

MINES USGS: Listing of all active mines and mineral plants in 2003

Agency Version Date: 02/02/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/13/2021
Agency: USGS Mineral Resources Program
Agency Contact: (703) 648-5953
Most Recent Contact: 01/15/2021

MLTS: Sites in possession/use of radioactive materials regulated by NRC

Agency Version Date: 05/19/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/04/2021
Agency: Nuclear Regulatory Commission
Agency Contact: (800) 397-4209
Most Recent Contact: 02/05/2021

NPL AOC: Areas of Concern related to NPL remediation sites

Agency Version Date: 11/17/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: Environmental Protection Agency
Agency Contact: N/R
Most Recent Contact: 02/12/2021

NPL LIENS: National Priority List of sites with Liens

Agency Version Date: 10/28/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

OSHA: OSHA's listing of inspections violations and fatality information

Agency Version Date: 10/16/2020
Agency Update Frequency: Varies
Planned Next Contact: 04/08/2021
Agency: Occupational Safety & Health Administration
Agency Contact: 800-321-6742
Most Recent Contact: 01/11/2021

PADS: Listing of generators transporters commercial store/ brokers and disposers of PCB

Agency Version Date: 02/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: Environmental Protection Agency
Agency Contact: (703) 308-8404
Most Recent Contact: 02/12/2021

PCB TRANSFORMER: Disposal and Storage of Polychlorinated Biphenyl (PCB) Waste

Agency Version Date: 11/27/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/24/2021
Agency: Environmental Protection Agency
Agency Contact: (703) 308-8404
Most Recent Contact: 02/24/2021

PCS ENF: Permitted facilities to discharge wastewater (Federal equivalent to NPDES)

Agency Version Date: 01/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-6582
Most Recent Contact: 01/12/2021

OTHER ASCERTAINABLE RECORDS (cont.)

PCS FACILITY: Permitted facilities to discharge wastewater (Federal equivalent to NPDES)

Agency Version Date: 01/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-6582
Most Recent Contact: 01/12/2021

RAATS: Listing of major violators with enforcement actions issued under RCRA. Includes administrative and civil actions filed by the EPA. This dataset is no longer maintained.

Agency Version Date: 09/23/2019
Agency Update Frequency: Varies
Planned Next Contact: 05/04/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 02/05/2021

RADINFO: EPA regulated facilities with radiation and radioactive materials

Agency Version Date: 08/01/2019
Agency Update Frequency: Varies
Planned Next Contact: 04/23/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/26/2021

RMP: Facilities producing/handling/ process/ distribute/ store specific chemicals report plans required by the Clean Air Act

Agency Version Date: 03/17/2020
Agency Update Frequency: Monthly
Planned Next Contact: 04/16/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 564-2534
Most Recent Contact: 01/19/2021

ROD: Permanent remedy at an NPL site

Agency Version Date: 11/17/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/11/2021
Agency: Environmental Protection Agency
Agency Contact: (800) 424-9346
Most Recent Contact: 02/12/2021

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners

Agency Version Date: 12/18/2020
Agency Update Frequency: No Update
Planned Next Contact: 06/14/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 03/16/2021

SEMS_SMELTER: This report includes sites that have smelting-related, or potentially smelting-related, indicators in the SEMS database. The report includes information on the site location as well as contaminants of concern.

Agency Version Date: 10/28/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/11/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 703-603-8867
Most Recent Contact: 02/12/2021

SSTS: Tracking of facilities who produce pesticides and their quantity

Agency Version Date: 12/25/2020
Agency Update Frequency: Annually
Planned Next Contact: 06/18/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 03/23/2021

STORMWATER: Permitted storm water sites

Agency Version Date: 01/12/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/12/2021

OTHER ASCERTAINABLE RECORDS (cont.)

TOSCA-PLANT: Plants controlled by the Toxic Substance Control Act

Agency Version Date: 12/28/2020
Agency Update Frequency: Varies
Planned Next Contact: 03/26/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 12/28/2020

TRIS: Information regarding toxic chemicals that are being used/manufactured/ treated/ transported/released into the environment

Agency Version Date: 10/14/2020
Agency Update Frequency: Varies
Planned Next Contact: 04/09/2021
Agency: Environmental Protection Agency
Agency Contact: (202) 566-1667
Most Recent Contact: 01/11/2021

UMTRA: Uranium Recovery Sites

Agency Version Date: 01/14/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/12/2021
Agency: United States Nuclear Regulatory Commission
Agency Contact: (301) 415-8200
Most Recent Contact: 01/14/2021

VAPOR: EPA Vapor Intrusion Database

Agency Version Date: 12/21/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/15/2021
Agency: U.S. Environmental Protection Agency
Agency Contact: 855-246-3642
Most Recent Contact: 03/19/2021

BROWNFIELDS AEC - NC: Brownfield projects with Areas of Environmental Concern (AEC) boundaries.

Agency Version Date: 11/16/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/10/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 02/11/2021

COAL ASH - NC: Coal Ash Disposal Sites

Agency Version Date: 01/15/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/13/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 01/15/2021

DAYCARE - NC: Daycare facility sites

Agency Version Date: 11/10/2020
Agency Update Frequency: Varies
Planned Next Contact: 05/05/2021
Agency: Division of Child Development and Early Education
Agency Contact: (919) 662-4499
Most Recent Contact: 02/05/2021

DRYCLEANERS - NC: Drycleaner Sites

Agency Version Date: 12/18/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/14/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 03/16/2021

DRYCLEANERS 2 - NC: Listing of dry cleaning facilities.

Agency Version Date: 02/22/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/19/2021
Agency: North Carolina Department of Environmental Quality
Agency Contact: N/R
Most Recent Contact: 02/22/2021

DRYCLEANERS CLEANUP - NC: Listing dry cleaning facilities under remediation.

Agency Version Date: 11/25/2020
Agency Update Frequency: Quarterly
Planned Next Contact: 05/19/2021
Agency: North Carolina Department of Environmental Quality
Agency Contact: N/R
Most Recent Contact: 02/22/2021

OTHER ASCERTAINABLE RECORDS (cont.)

HIST COAL ASH - NC: List of Coal Ash Disposal Sites that is no longer in current agency list.

Agency Version Date: 06/05/2017
Agency Update Frequency: Annually
Planned Next Contact: 06/04/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 03/08/2021

IMD - NC: List of sites from the Incident Management Database for Regional Underground Storage Tanks (RUST) and the Aboveground Incident Management Database

Agency Version Date: 12/15/2020
Agency Update Frequency: Varies
Planned Next Contact: 06/09/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 03/12/2021

MGP - NC: Locations of all Manufactured Gas Plants involved in the MGP Assessment and Remediation Program

Agency Version Date: 01/15/2021
Agency Update Frequency: No Update
Planned Next Contact: 04/13/2021
Agency: North Carolina Center for Geographic Information and analysis
Agency Contact: (919) 754-6585
Most Recent Contact: 01/15/2021

NFA - NC: No further action cleanup sites listing

Agency Version Date: 02/11/2021
Agency Update Frequency: Quarterly
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 02/11/2021

NPDES - NC: Active General permits: NPDES and wastewater facility Location listing

Agency Version Date: 02/04/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/03/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 02/04/2021

OLI - NC: Old Landfill inventory location information

Agency Version Date: 02/10/2021
Agency Update Frequency: Varies
Planned Next Contact: 05/10/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8200
Most Recent Contact: 02/10/2021

UIC - NC: Underground Injection Wells Database List

Agency Version Date: 01/19/2021
Agency Update Frequency: Varies
Planned Next Contact: 04/16/2021
Agency: Department of Environment and Natural Resources
Agency Contact: (919) 707-8234
Most Recent Contact: 01/19/2021

Middendorf Springs Mitigation Site
Categorical Exclusion

SECTION 106 CORRESPONDENCE

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April 24, 2020

Renee Gledhill-Earley
State Historic Preservation Office
4617 Mail Service Center
Raleigh, NC 27699-4617
Via email: Environmental.Review@ncdcr.gov

Subject: Middendorf Springs Mitigation Site
Anson County, North Carolina

Dear Ms. Gledhill-Earley,

Freese and Nichols, Inc. requests review and comment on any possible issues that may emerge with respect to archaeological or cultural resources associated with the Middendorf Springs Mitigation Site. A project review narrative, Site Map, Topographic Map, Aerial Photograph and results from the NC Historic Preservation Office database are attached.

The Middendorf Springs Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts in the Yadkin Pee-Dee River Basin. This project will include stream restoration to unnamed tributaries of South Fork Jones Creek and restoration and rehabilitation of degraded riparian wetlands located adjacent to the unnamed tributaries. The site has been disturbed due to agricultural row crop use. Historically the site has been in agricultural production (crops and timber) for the last 70 years. Furthermore, no archaeological artifacts have been observed or noted during preliminary surveys for restoration purposes.

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

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concernting the project.

Sincerely,
Freese and Nichols, Inc.

Jason Steele, PWS
Environmental Scientist

Enclosures:
1) Project Review Package

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

June 11, 2020

Jason Steele
Freese and Nichols, Inc.
531 North Liberty Street
Winston-Salem, NC 27101

Jason.Steele@freese.com

Re: Middendorf Springs mitigation, Tanner Hill Road, Wadesboro, Anson County, ER 20-1048

Dear Mr. Steele:

Thank you for your email of April 24, 2020, 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 919-814-6579 or environmental.review@ncdcr.gov. In all future communication concerning this project, please cite the above referenced tracking number.

Sincerely,

Renee Gledhill-Earley

for Ramona Bartos, Deputy
State Historic Preservation Officer

Middendorf Springs Mitigation Site
Categorical Exclusion

UNIFORM ACT DOCUMENTATION

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www.freese.com

July 26, 2021

DEB, LLC
28838 Kendalls Ch Rd
Richfield, NC 28137

Dear Mr. Burleson:

The purpose of this letter is to notify you that Freese and Nichols, Inc., in offering to purchase an easement on your property in Anson County, North Carolina, does not have the power to acquire it by eminent domain. Also, Freese and Nichol's offer to purchase an easement on your property is based on what we believe to be its fair market value.

If you have any questions, please feel free to call me at 919-418-8430.

Sincerely,

Ian Jewell
Project Manager

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www.freese.com

July 26, 2021

RTB Associates, LLC
28838 Kendalls Ch Rd
Richfield, NC 28137

Dear Mr. Burleson:

The purpose of this letter is to notify you that Freese and Nichols, Inc., in offering to purchase an easement on your property in Anson County, North Carolina, does not have the power to acquire it by eminent domain. Also, Freese and Nichol's offer to purchase an easement on your property is based on what we believe to be its fair market value.

If you have any questions, please feel free to call me at 919-418-8430.

Sincerely,

Ian Jewell
Project Manager

Middendorf Springs Mitigation Site
Categorical Exclusion

USFWS CORRESPONDENCE

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April 20, 2020

Claire Ellwanger
US Fish and Wildlife Service
Asheville Field Office
160 Zilicoa Street
Asheville, NC 28801
Via email: claire_ellwanger@fws.gov

Re: Middendorf Springs Mitigation Site, Anson County, North Carolina
Ref: USFWS Consultation Code 04EN1000-2020-SLI-0542

Dear Ms. Ellwanger,

Freese and Nichols, Inc. requests review and comment on any possible issues that might emerge with respect to threatened, endangered and candidate species, migratory birds, or other trust resources with a potential stream and wetland restoration project on the Middendorf Springs Mitigation Site located in Anson County, NC. A USGS Topographic Map and Overview Map showing the approximate project are enclosed. The site is depicted on the attached project location map (**Figure 1**), quadrangle map (**Figure 2**) and aerial photograph (**Figure 3**).

The Middendorf Springs Mitigation Site is being developed to provide stream and wetland mitigation in the Yadkin Pee-Dee River Basin. The project includes the restoration and enhancement of unnamed tributaries of South Fork Jones Creek and the restoration and rehabilitation of riparian wetlands. Currently, the streams throughout the site are extensively impacted by row crop agriculture, lack of riparian and streambank vegetation, active erosion, nutrient loading from fertilization practices, upland erosion and sedimentation, incision, and altered groundwater hydrology. The major goals of the proposed project are to provide ecological and water quality enhancement to the Yadkin Pee-Dee River Basin while creating a functional riparian corridor at the site level. This will be accomplished by restoring native riparian vegetation, creating stable stream dimension, pattern and profile, improving in-stream habitat, and protecting the site in perpetuity through establishing a conservation easement.

The enclosed project review package provides the information about the species, critical habitat, and bald eagles considered in our review, and the species conclusions table included in the package identifies our determinations for the resources that may be affected by the project. All applicable erosion and sediment control and stormwater regulations will be adhered to for the entirety of the project.

If we have not heard from you in 30 days, we will assume that you concur with the Species Conclusion Table, do not have any comments regarding any associated laws, and that you do not have any

information relevant to this project at the current time.

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

Sincerely,

Freese and Nichols, Inc.

Jason Steele, PWS
Senior Environmental Scientist

Enclosures:

1) Figures
    a. Figure 1 – Project Location
    b. Figure 2 – Topographic Map
    c. Figure 3 – Aerial Photograph
2) USFWS IPaC Official Species List
3) NC Natural Heritage Program Project Review Species List
4) USFWS IPaC Species Conclusion Table
5) Site Photographs

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Asheville Field Office
160 Zillicoa Street Suite #B
Asheville, North Carolina 28801

May 13, 2020

Jason Steele
Senior Environmental Scientist
531 North Liberty Street
Winston Salem, NC 27101

Subject: 20-276 Middendorf Springs Mitigation Site; Anson Co

Dear Jason Steele,

This responds to your email received by our office on April 24th, 2020, concerning the subject project. We have reviewed the information presented and submit the following comments and recommendations in accordance with the provisions of Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. §§1531-1543); the Fish and Wildlife Coordination Act, as amended (16 U.S.C. §§661-667e); the Clean Water Act (33 U.S.C. §1251 et seq.); the Migratory Bird Treaty Act (16 U.S.C. §§703-712); and the National Environmental Policy Act (42 U.S.C. §4321 et seq.).

Project Summary

Freese and Nichols on behalf of the Federal Highway Administration proposes a stream and wetland restoration project on the Middendorf Springs Mitigation Site in Anson County, NC. The project includes restoring native riparian vegetation, developing a stable stream profile and improving in-stream habitat for ecological and water quality enhancement to the Yadkin Pee-Dee River Basin. The surrounding area is dominated by agricultural land with aquatic resources (forested wetlands, streams and ponds) occur throughout the site. Your letter did not provide a detailed project description nor site plans.

We offer the following recommendations in the interest of protecting federally threatened and endangered species, migratory birds, as well as other fish, wildlife, and natural resources.

Federally Listed Endangered and Threatened Species

In accordance with section 7 (a)(2) of the Endangered Species Act and 50 CFR Part 402.01, before any federal authorization/permits or funding can be issued for this project, it is the responsibility of the appropriate federal regulatory/permitting and/or funding agency(ies) to determine whether the project may affect any federally endangered or threatened species (listed species) or designated critical habitat. A species list for counties in North Carolina can be found online here: https://www.fws.gov/raleigh/species/cntylist/nc_counties.html. If it is determined that this project may affect any listed species or designated critical habitat, you must initiate section 7 consultation with this office. Please note that federal species of concern are not legally

protected under the Endangered Species Act and are not subject to any of its provisions, including section 7, unless they are formally proposed or listed as endangered or threatened.

Suitable summer roosting habitat may be present in the project area for the federally threatened northern long-eared bat (*Myotis septentrionalis*). However, the final 4(d) rule (effective as of February 16, 2016), exempts incidental take of northern long-eared bat associated with activities that occur greater than 0.25 miles from a known hibernation site, and greater than 150 feet from a known, occupied maternity roost during the pup season (June 1 – July 31). Based on the information provided, the project would occur at a location where any incidental take that may result from associated activities is exempt under the 4(d) rule. **Although not required, we encourage you to conduct any associated tree clearing activities outside the pup season (June 1 to July 31) and/or active season (April 1 to October 31) to reduce the chance of impacting unidentified maternity roosts.**

Service records show known occurrences of the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) in the vicinity of the project area. This species is known to occur in clearings, forest edges, roadsides, utility rights of way, old pastures, and woodland openings. The information provided indicates that suitable habitat for this species may occur within the project impact area. To ensure that this plant is not inadvertently lost, targeted surveys should be conducted by a qualified botanist where the proposed work would alter its suitable habitats. Surveys are not required where suitable habitats for this species do not occur. The survey window for this species is late August – October. We request that the Applicant provide our office with survey results and/or an evaluation to complete our review and inform a prudent effect determination.

Migratory Birds

The MBTA (16 §U.S.C. 703-712) prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. To avoid impacts to migratory birds, we recommend conducting a visual inspection of any migratory bird nesting habitat within the project area during the migratory bird nesting season of March through September and avoiding impacting the nests during the migratory bird nesting season. If birds are discovered nesting near the project area during years prior to the proposed construction date, we recommend that you and the NCDOT, in consultation with US Fish and Wildlife Service, develop measures to discourage birds from establishing nests within the project area by means that will not result in the take of birds or eggs; or avoid construction activities during the nesting period.

Erosion and Sedimentation Control

Construction activities near streams, rivers, and lakes have the potential to cause water pollution and stream degradation if measures to control site runoff are not properly installed and maintained. In order to effectively reduce erosion and sedimentation impacts, best management practices specific to the extent and type of construction should be designed and installed during land-disturbing activities and should be maintained until the project is complete and appropriate stormwater conveyances and vegetation are reestablished on the site.

A complete design manual, which provides extensive details and procedures for developing site-specific plans to control erosion and sediment and is consistent with the requirements of the North Carolina Sedimentation and Pollution Control Act and Administrative Rules, is available at:

http://portal.ncdenr.org/web/lr/publications

For maximum benefits to water quality and bank stabilization, riparian areas should be forested; however, if the areas are maintained in grass, they should not be mowed. We recommend planting disturbed areas with native riparian species. The U.S. Fish and Wildlife Service can provide information on potential sources of plant material upon request.

Stream Buffers

Natural, forested riparian buffers are critical to the health of aquatic ecosystems. They accomplish the following:

1. catch and filter runoff, thereby helping to prevent nonpoint-source pollutants from reaching streams;
2. enhance the in-stream processing of both point- and nonpoint-source pollutants;
3. act as "sponges" by absorbing runoff (which reduces the severity of floods) and by allowing runoff to infiltrate and recharge groundwater levels (which maintains stream flows during dry periods);
4. catch and help prevent excess woody debris from entering the stream and creating logjams;
5. stabilize stream banks and maintain natural channel morphology;
6. provide coarse woody debris for habitat structure and most of the dissolved organic carbon and other nutrients necessary for the aquatic food web; and
7. maintain air and water temperatures around the stream.

Forested riparian buffers (a minimum 50 feet wide along intermittent streams and 100 feet wide along perennial streams [or the full extent of the 100-year floodplain, whichever is greater]) should be created and/or maintained along all aquatic areas. Within the watersheds of streams supporting endangered aquatic species, we recommend undisturbed, forested buffers that are naturally vegetated with trees, shrubs, and herbaceous vegetation and extend a minimum of 200 feet from the banks of all perennial streams and a minimum of 100 feet from the banks of all intermittent streams, or the full extent of the 100-year floodplain, whichever is greater.) Impervious surfaces, ditches, pipes, roads, utility lines (sewer, water, gas, transmission, etc.), and other infrastructures that require maintained, cleared rights-of-way and/or compromise the functions and values of the forested buffers should not occur within these riparian areas.

If you have questions about these comments please contact Ms. Claire Ellwanger of our staff at 828/258-3939, Ext. 42235. In any future correspondence concerning these projects, please reference our Log Number 20-276.

Sincerely,

-- original signed –

Janet Mizzi
Field Supervisor

Jason Steele

From: Quast, Karla L <karla_quast@fws.gov>
Sent: Friday, January 22, 2021 15:38
To: Jason Steele
Cc: Youngman, Holland J
Subject: Re: [EXTERNAL] RE: 20-276 Middendorf Springs Mitigation Site; Anson Co
Attachments: Middendorf Mitigation Site Sunflower Survey.pdf

Hello Jason,

Thank you for providing the survey results to our office. Claire Ellwanger has found a new position with Forest Services however, Ms. Holland Youngman is now our new DOT biologist and cc'd on this email.

Service records show known occurrences of the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) in the vicinity of the project and suitable habitat occurs onsite. Targeted surveys for this species was conducted, September 28, 2020 during the respective optimal survey window. No evidence for this plant was detected at that time.

Based on the information provided, we have no concerns for any other federally protected species and we require no further action at this time. Please be aware that obligations under section 7 of the Endangered Species Act must be reconsidered if: (1) new information reveals impacts of this identified action that may affect listed species or critical habitat in a manner not previously considered, (2) this action is subsequently modified in a manner that was not considered in this review, or (3) a new species is listed or critical habitat is determined that may be affected by the identified action.

Please feel free to reach out with any quesions.

Thank you,

Karla Quast
Administrative Assistant
Asheville Field Office
U.S. Fish & Wildlife Service, South Atlantic/Gulf Region
160 Zillicoa St. Suite B
Asheville, NC 28801
karla_quast@fws.gov
office 828/258-3939, ext. 42232
cell 828/230-7836

From: Jason Steele <Jason.Steele@freese.com>
Sent: Monday, January 18, 2021 4:14 PM

To: Quast, Karla L <karla_quast@fws.gov>
Cc: Ellwanger, Claire F <claire_ellwanger@fws.gov>
Subject: [EXTERNAL] RE: 20-276 Middendorf Springs Mitigation Site; Anson Co

Hi Karla,

Please find the Schweinitz's sunflower (*Helianthus schweinitzii*) habitat assessment and survey for Middendorf Springs Mitigation Site, Anson County, attached for your review. If you require hard copies, or have any questions, please let me know.

Best Regards,

Jason Steele, PhD, PWS
Environmental Scientist

Freese and Nichols, Inc.
531 N. Liberty St.
Winston-Salem, NC 27101
(540) 449-2837 (mobile)
www.freese.com

From: Quast, Karla L <karla_quast@fws.gov>
Sent: Thursday, May 14, 2020 3:29 PM
To: Jason Steele <Jason.Steele@freese.com>
Cc: Ellwanger, Claire F <claire_ellwanger@fws.gov>
Subject: 20-276 Middendorf Springs Mitigation Site; Anson Co

Hello Mr. Steele,

Please find the attached document regarding Middendorf Springs Mitigation Site. Feel free to reach out with any questions you may have.

Karla Quast
Administrative Assistant
Asheville Field Office
U.S. Fish & Wildlife Service, South Atlantic/Gulf Region
160 Zillicoa St.
Asheville, NC 28801

karla_quast@fws.gov
office 828/258-3939, ext. 42232

Middendorf Springs Mitigation Site Categorical Exclusion

FARMLAND PROTECTION POLICY ACT DOCUMENTATION

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April 24, 2020

Milton Cortes
Natural Resources Conservation Service
4407 Bland Rd, Suite 117
Raleigh, NC 27609
Via email: milton.cortes@nc.usda.gov

Subject: Middendorf Springs Mitigation Site
Anson County, North Carolina

Dear Mr. Cortes,

Freese and Nichols, Inc. requests review and a completed AD-1006 form for a NC Department of Mitigation Services stream and wetland restoration project (Middendorf Springs Mitigation Site) located in Anson County, NC. A zipped shapefile of the project boundary is attached for your review.

The Middendorf Springs Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts in the Yadkin Pee-Dee River Basin. This project will include stream restoration to unnamed tributaries of South Fork Jones Creek and restoration and rehabilitation of degraded riparian wetlands located adjacent to the unnamed tributaries. The site has been disturbed due to agricultural row crop use. Historically the site has been in agricultural production (crops and timber) for the last 70 years.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concernting the project.

Sincerely,
Freese and Nichols, Inc.

Jason Steele, PWS
Environmental Scientist

Enclosures:
1) Project Boundary shapefile (.shp)

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 04/24/2020
Name of Project Middendorf Springs Mitigation Site	Federal Agency Involved FHWA
Proposed Land Use Land conversion for mitigation	County and State Anson County, NC
PART II *(To be completed by NRCS)*	Date Request Received By NRCS 04/24/2020 / Person Completing Form: Milton Cortes NC NRCS

Does the site contain Prime, Unique, Statewide or Local Important Farmland? *(If no, the FPPA does not apply - do not complete additional parts of this form)*	YES ☑ NO ☐	Acres Irrigated: none	Average Farm Size: 195 acres
Major Crop(s): CORN	Farmable Land In Govt. Jurisdiction — Acres: 82.7 % 284,274 acres	Amount of Farmland As Defined in FPPA — Acres: 57.6 % 168,075 acres	
Name of Land Evaluation System Used: Anson Co., NC LESA	Name of State or Local Site Assessment System: N/A	Date Land Evaluation Returned by NRCS: June 11, 2020 by eMail	

PART III *(To be completed by Federal Agency)*	Alternative Site Rating: Site A	Site B	Site C	Site D
A. Total Acres To Be Converted Directly	44.8			
B. Total Acres To Be Converted Indirectly	0.0			
C. Total Acres In Site	44.8			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	29.40			
B. Total Acres Statewide Important or Local Important Farmland	15.40			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.0267			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	16.7			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	87			

PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(Criteria are explained in 7 CFR 658.5 b. For Corridor project use form NRCS-CPA-106)*	**Maximum Points**	Site A	Site B	Site C	Site D
1. Area In Non-urban Use	(15)	15			
2. Perimeter In Non-urban Use	(10)	10			
3. Percent Of Site Being Farmed	(20)	20			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	15			
6. Distance To Urban Support Services	(15)	10			
7. Size Of Present Farm Unit Compared To Average	(10)	10			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	0			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	0			
TOTAL SITE ASSESSMENT POINTS	160	85	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	87	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	85	0	0	0
TOTAL POINTS ***(Total of above 2 lines)***	260	172	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? YES ☐ NO ☐

Reason For Selection:

Name of Federal agency representative completing this form:	Date:

(See Instructions on reverse side) **Form AD-1006 (03-02)**

Middendorf Springs Mitigation Site Categorical Exclusion

FISH & WILDLIFE COORDINATION ACT
NC WILDLIFE RESOURCES COMMISSION
CORRESPONDENCE

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April 24, 2020

Olivia Munzer
Western Piedmont Coordionator
North Carolina Wildlife Resource Commission
Rogers Lake Depot
1718 NC Hwy 56 W
Creedmor, NC 27522
Via email: olivia.munzer@ncwildlife.org

Subject: Middendorf Springs Mitigation Site
Anson County, North Carolina

Dear Ms. Munzer,

Freese and Nichols, Inc. requests review and comment on any possible issues that may emerge with respect to fish and wildlife issues associated with the Middendorf Springs Mitigation Site. A Site Map, Topographic Map and Aerial Photograph showing the approximate project area are enclosed.

The Middendorf Springs Mitigation Site is being developed to provide in-kind mitigation for unavoidable stream channel and wetland impacts in the Yadkin Pee-Dee River Basin. This project will include stream restoration to unnamed tributaries of South Fork Jones Creek and restoration and rehabilitation of degraded riparian wetlands located adjacent to the unnamed tributaries. The site has been disturbed due to agricultural row crop use. Historically the site has been in agricultural production (crops and timber) for the last 70 years.

We thank you in advance for your timely response and cooperation. Please feel free to contact us with any questions that you may have concernting the project.

Sincerely,
Freese and Nichols, Inc.

Jason Steele, PWS
Environmental Scientist

Enclosures:
1) Figure 1 – Vicinity Map
2) Figure 2 – Topographic Map
3) Figure 3 – Aerial Photograph

North Carolina Wildlife Resources Commission

Gordon Myers, Executive Director

18 May 2020

Mr. Jason Steele
Freese & Nichols, Inc.
531 North Liberty Street
Winston-Salem, North Carolina 27101

SUBJECT: Environmental Review of the Middendorf Springs Mitigation Site in Anson County, North Carolina.

Biologists with the North Carolina Wildlife Resource Commission (NCWRC) received your request to review and comment on any possible concerns regarding the Middendorf Springs Mitigation Site. 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 Middendorf Springs Mitigation Site is located south of State Road 1120 and west of NC 742 in Wadesboro, Anson County, North Carolina. The site has been used for agriculture and timber purposes for the last 70 years. The proposed project would restore and/or rehabilitate unnamed tributaries and associated riparian wetlands of the South Fork Jones Creek in the Yadkin-Pee Dee River Basin.

NCWRC does not have any known records of federal or state-listed rare, threatened, or endangered species near the site. However, the lack of records from the site does not imply or confirm the absence of federal or state rare, threatened, or endangered 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. Based upon the information provided to NCWRC, it is unlikely that stream and wetland mitigation will adversely affect any federal or state-listed species. However, we offer the following preliminary recommendations to minimize impacts to aquatic and terrestrial wildlife resources:

1. We recommend riparian buffers are as wide as possible, given site constraints and landowner needs. NCWRC generally recommends a woody buffer of 100 feet on perennial streams to maximize the benefits of buffers, including bank stability, stream shading, treatment of overland runoff, and wildlife habitat.
2. We recommend minimizing or avoiding green ash (*Fraxinus pennsylvanica*) in the planting list due to the presence of the emerald ash borer (*Agrilus planipennis*) in North Carolina. Please see the following link for a recommended list of riparian tree, herbaceous, and grass species for NC

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

stream restoration site in the Piedmont (https://www.bae.ncsu.edu/wp-content/uploads/2017/07/piedmont_riparian_species.pdf).

3. Due to the decline in bat populations, we recommend leaving snags and mature trees, or if necessary, remove tees outside the maternity roosting season for bats (May 15 – August 15).
4. The use of biodegradable and wildlife-friendly sediment and erosion control devices is strongly recommended. Silt fencing, fiber rolls and/or other products should have loose-weave netting that is made of natural fiber materials with movable joints between the vertical and horizontal twines. Silt fencing that has been reinforced with plastic or metal mesh should be avoided as it impedes the movement of terrestrial wildlife species. Excessive silt and sediment loads can have detrimental effects on aquatic resources including destruction of spawning habitat, suffocation of eggs, and clogging of gills.

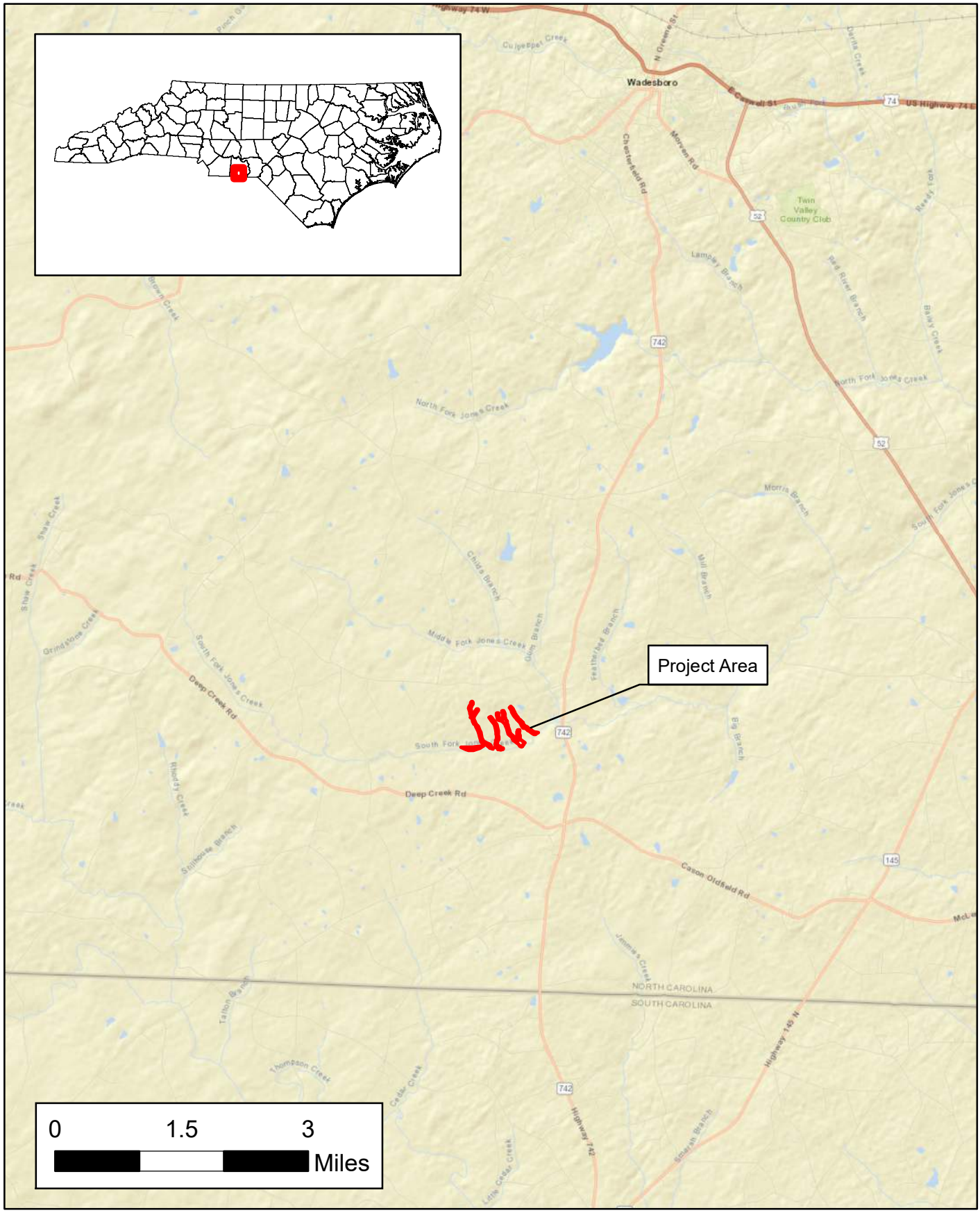
Thank you for the opportunity to provide comments. Any additional comments regarding the project will be made after the site visit. If I can be of additional assistance, please call (919) 707-0364 or email olivia.munzer@ncwildlife.org.

Sincerely,

Olivia Munzer
Western Piedmont Habitat Conservation Coordinator
Habitat Conservation Program

Middendorf Springs Mitigation Site
Categorical Exclusion

FIGURES



N

VICINITY MAP

Middendorf Springs Mitigation Site
Anson County, NC

FIGURE 1

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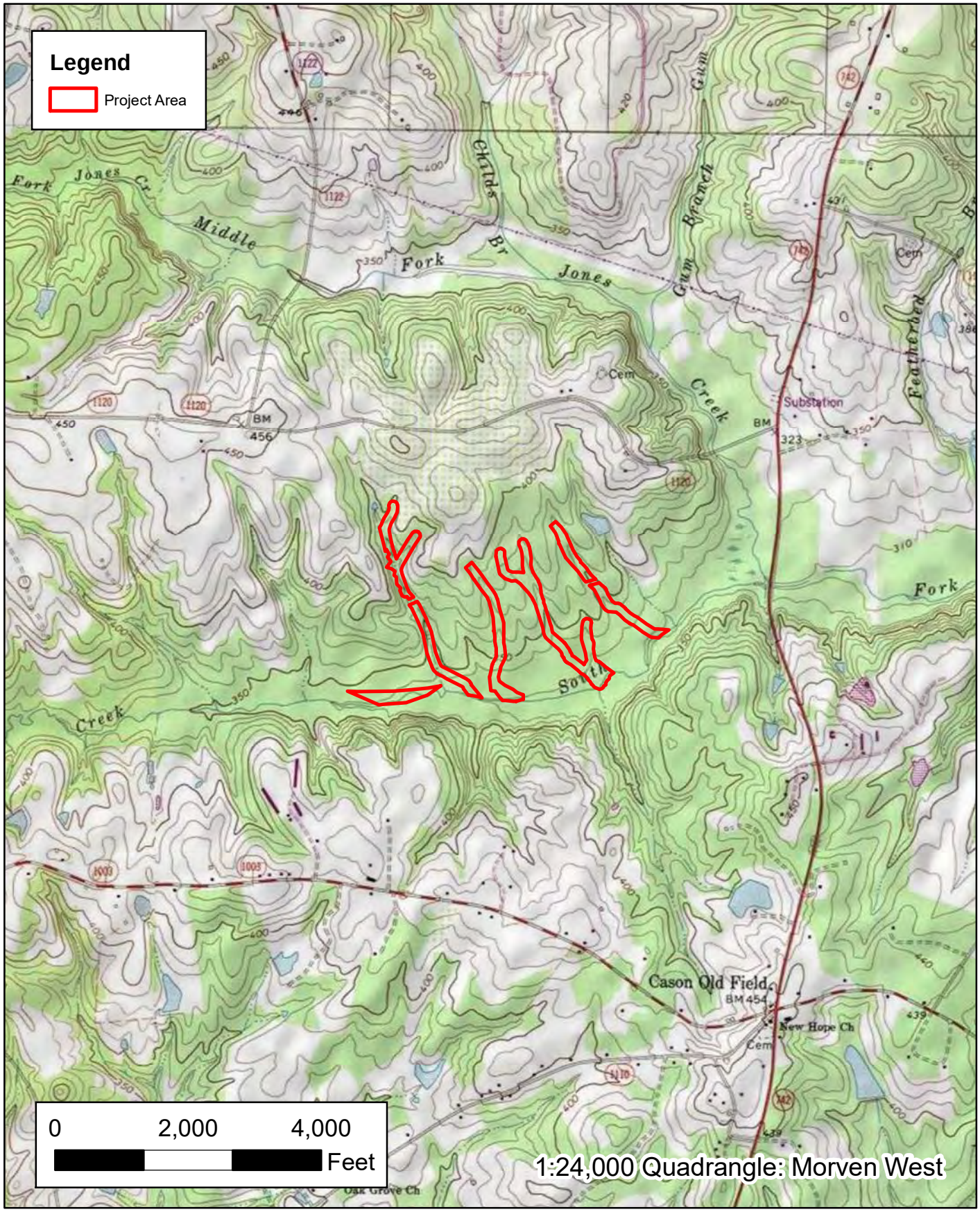

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PROJECT LOCATION AND TOPOGRAPHY

Middendorf Springs Mitigation Site
Anson County, NC

FIGURE 2

FREESE AND NICHOLS
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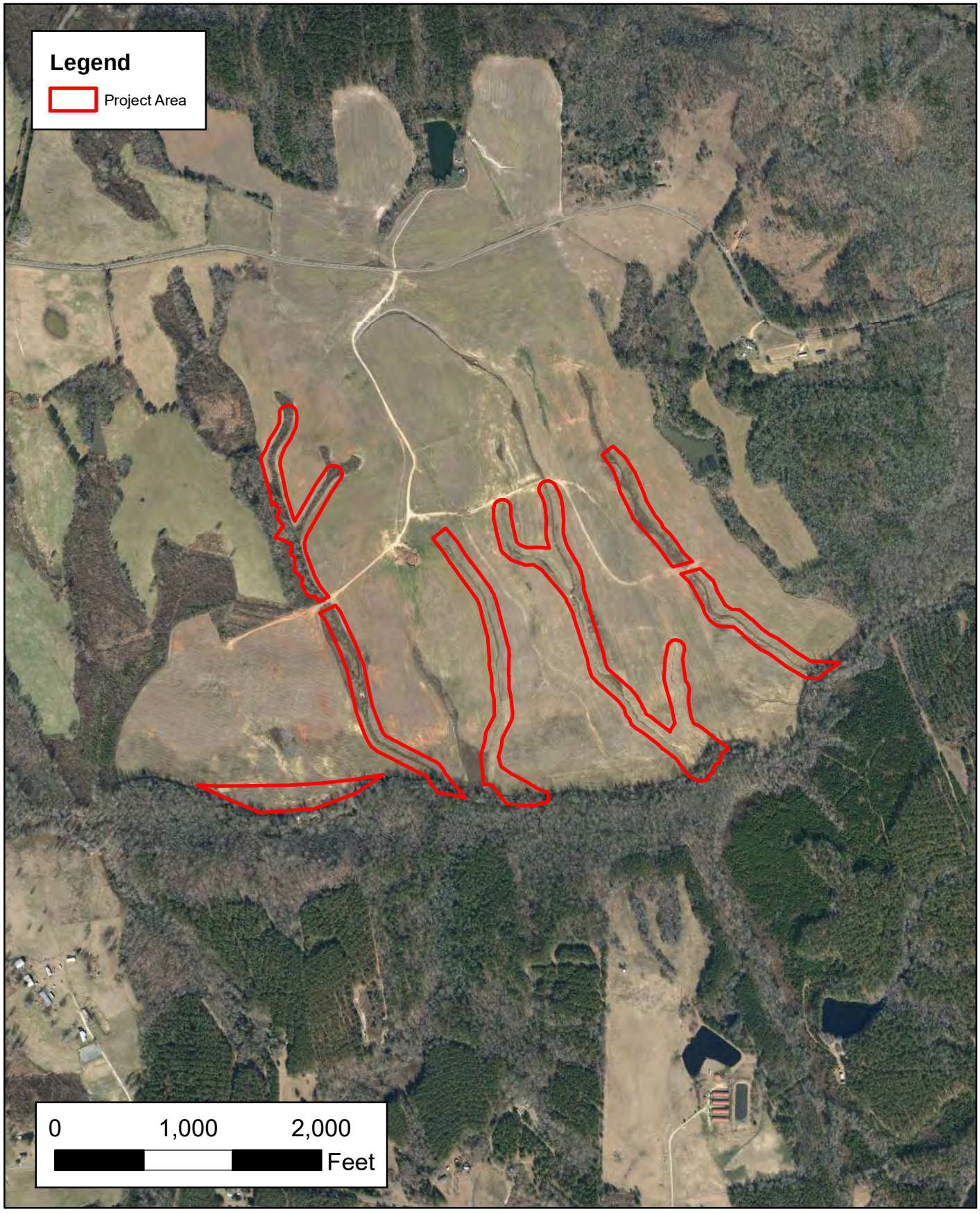

N

AERIAL PHOTOGRAPH

Middendorf Springs Mitigation Site
Anson County, NC

FIGURE 3

FREESE AND NICHOLS

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Appendix G

Design Data and Plan Sheets

NC DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES

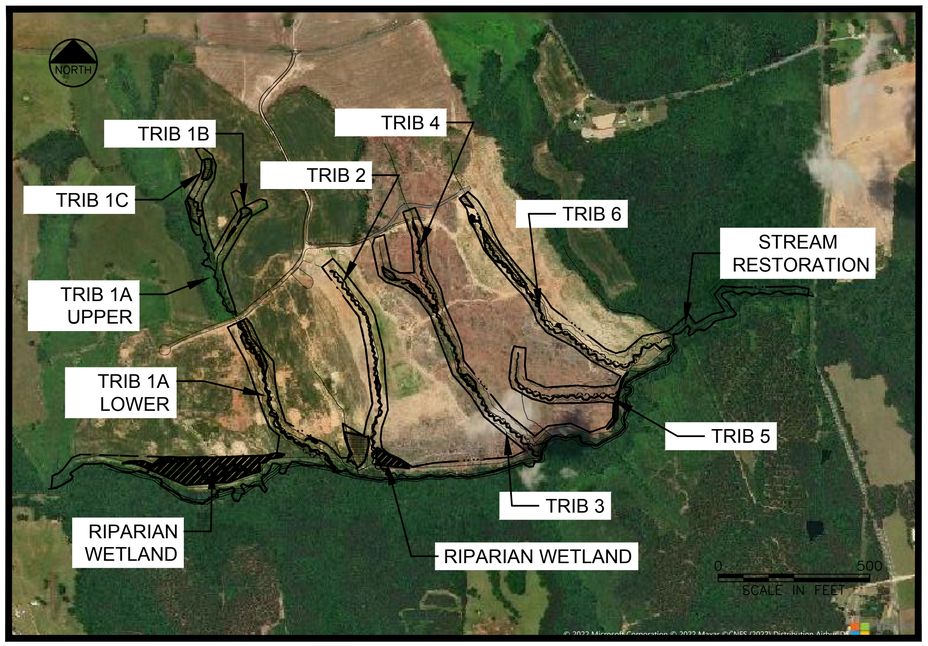
SITE DATA TABLE	
RIVER BASIN	YADKIN
8-DIGIT HUC	03040201
TOTAL DISTURBED AREA	57.6 Acres
DMS PROJECT ID NO.	100151
FULL DELIVERY CONTRACT NO.	8012-01
USACE ACTION ID NO.	2021-01973
DWR PROJECT NO.	2020-0775v1
RFP NO.	16-008012
COORDINATE SYSTEM	NAD83 NORTH CAROLINA STATE PLANE, US FOOT

MITIGATION SUMMARY	
TRIBUTARY 1A - UPPER (PROTECTED BUFFER ON EAST BANK)	1055 LF
TRIBUTARY 1A - LOWER RESTORED LENGTH	1951 LF
TRIBUTARY 1B RESTORED LENGTH	500 LF
TRIBUTARY 1C RESTORED LENGTH	698 LF
TRIBUTARY 2 RESTORED LENGTH	2525 LF
TRIBUTARY 3 RESTORED LENGTH	2451 LF
TRIBUTARY 4 RESTORED LENGTH	971 LF
TRIBUTARY 5 RESTORED LENGTH	1489 LF
TRIBUTARY 6 RESTORED LENGTH	2875 LF
SOUTH FORK JONES CREEK (PROTECTED BUFFER ON N.ORTH BANK)	8500 LF
RIPARIAN WETLAND A RE-ESTABLISHMENT	4.79 AC
RIPARIAN WETLAND B RE-ESTABLISHMENT	0.46 AC
RIPARIAN WETLAND C REHABILITATION AREA	0.17 AC
RIPARIAN WETLAND D REHABILITATION AREA	0.31 AC

CONSTRUCTION PLANS
Middendorf Springs Mitigation Site

ANSON COUNTY

DATE: December 1, 2023



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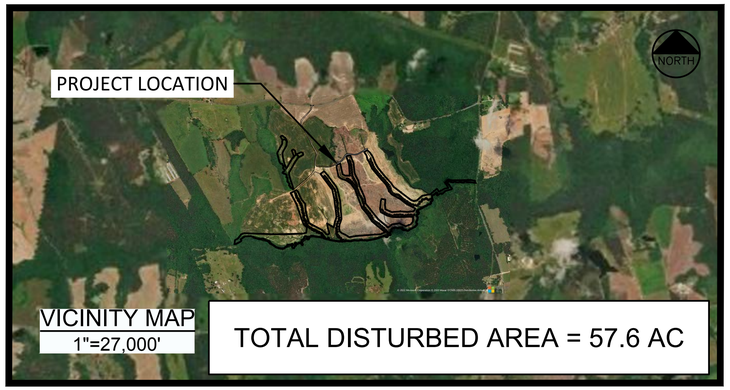

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RESTORATION LEVEL	TRIBUTARY 1A - UPPER	TRIBUTARY 1A - LOWER	TRIBUTARY 1B	TRIBUTARY 1C	TRIBUTARY 2	TRIBUTARY 3	TRIBUTARY 4	TRIBUTARY 5	TRIBUTARY 6	SOUTH FORK JONES CREEK	RIPARIAN WETLAND A	RIPARIAN WETLAND B	RIPARIAN WETLAND C	RIPARIAN WETLAND D
RESTORATION		1950.858		698.479	2525.745	2451.109	971.458	1489.440	2875.494					
ENHANCEMENT LEVEL I			500.119											
ENHANCEMENT LEVEL II (LOW UPLIFT)	1055.000													
REESTABLISHMENT											4.790	0.460		
REHABILITATION													0.170	0.310
TOTALS	1055.000	1950.858	500.119	698.479	2525.745	2451.109	971.458	1489.440	2875.494		4.790	0.460	0.110	0.207
MITIGATION UNITS	0	1950.858	333.412	698.479	2525.745	2451.109	971.458	1489.440	2875.494		4.790	0.460	0.110	0.207

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MITIGATION PLAN SUBMITTAL

LEGEND

PLAN

EXISTING

- EXISTING WETLAND
- MAJOR CONTOUR (5-FT)
- MINOR CONTOUR (1-FT)

PROPOSED

- PROPOSED STREAM ALIGNMENT
- LOD — LIMITS OF DISTURBANCE
- PROPOSED CONSERVATION EASEMENT
- PROPOSED DIRT ROAD
- PROPOSED WETLAND
- ANGLED LOG SILL ROLLER
- CONSTRUCTED RIFFLE
- PLANTING ZONE 1
- PLANTING ZONE 2

PROFILE

- EXISTING GROUND
- PROPOSED BANKFULL
- PROPOSED THALWEG

MITIGATION PLAN

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NC DEPARTMENT OF MITIGATION SERVICES

MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

SYMBOLS

NO.	ISSUE	BY	DATE

F&N JOB NO. NCM20306
DATE Dec-23
DESIGNED FNJ
DRAWN EDB
REVISED ACE
CHECKED

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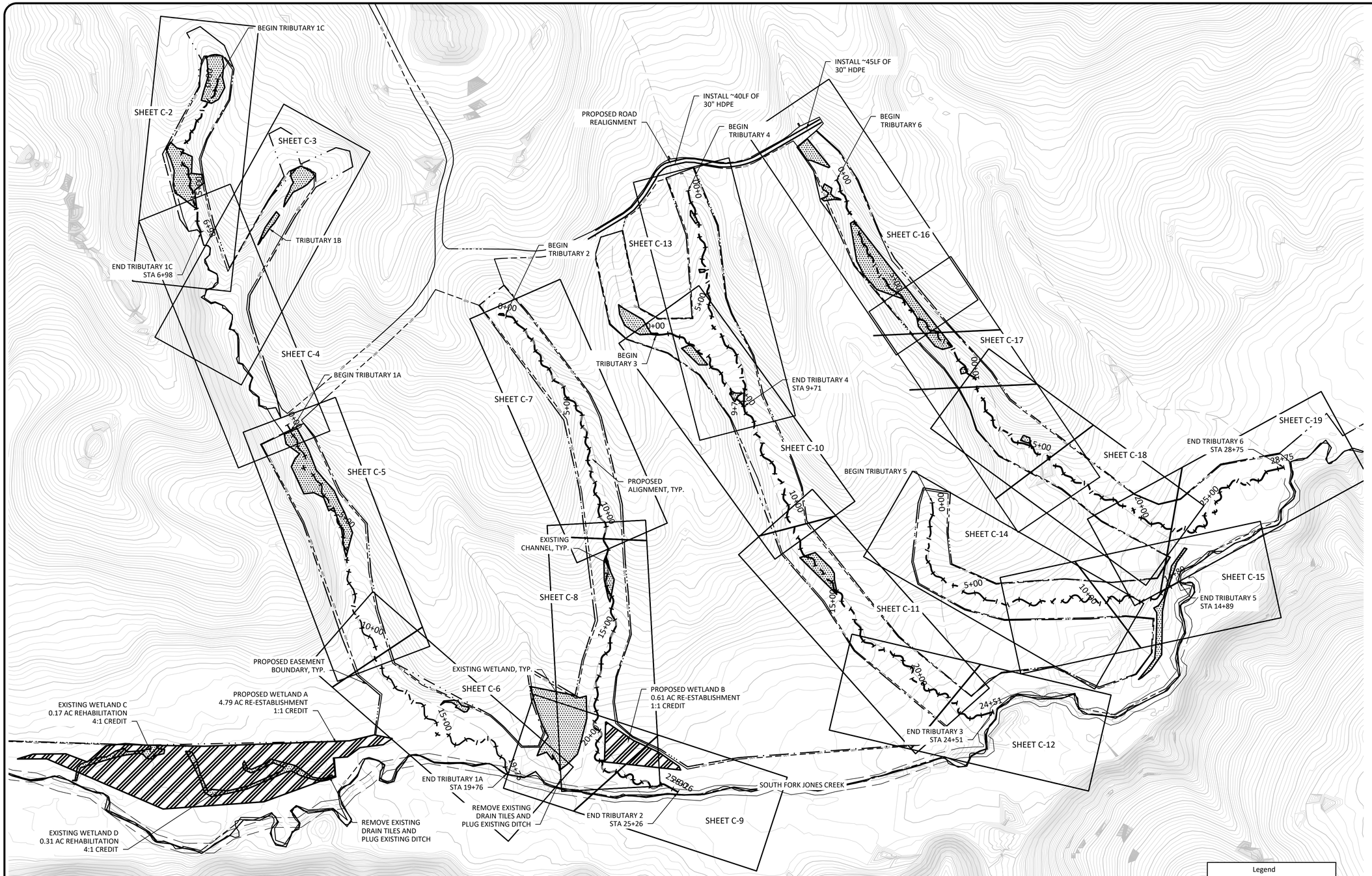

MITIGATION PLAN

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MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

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DATE Dec-23
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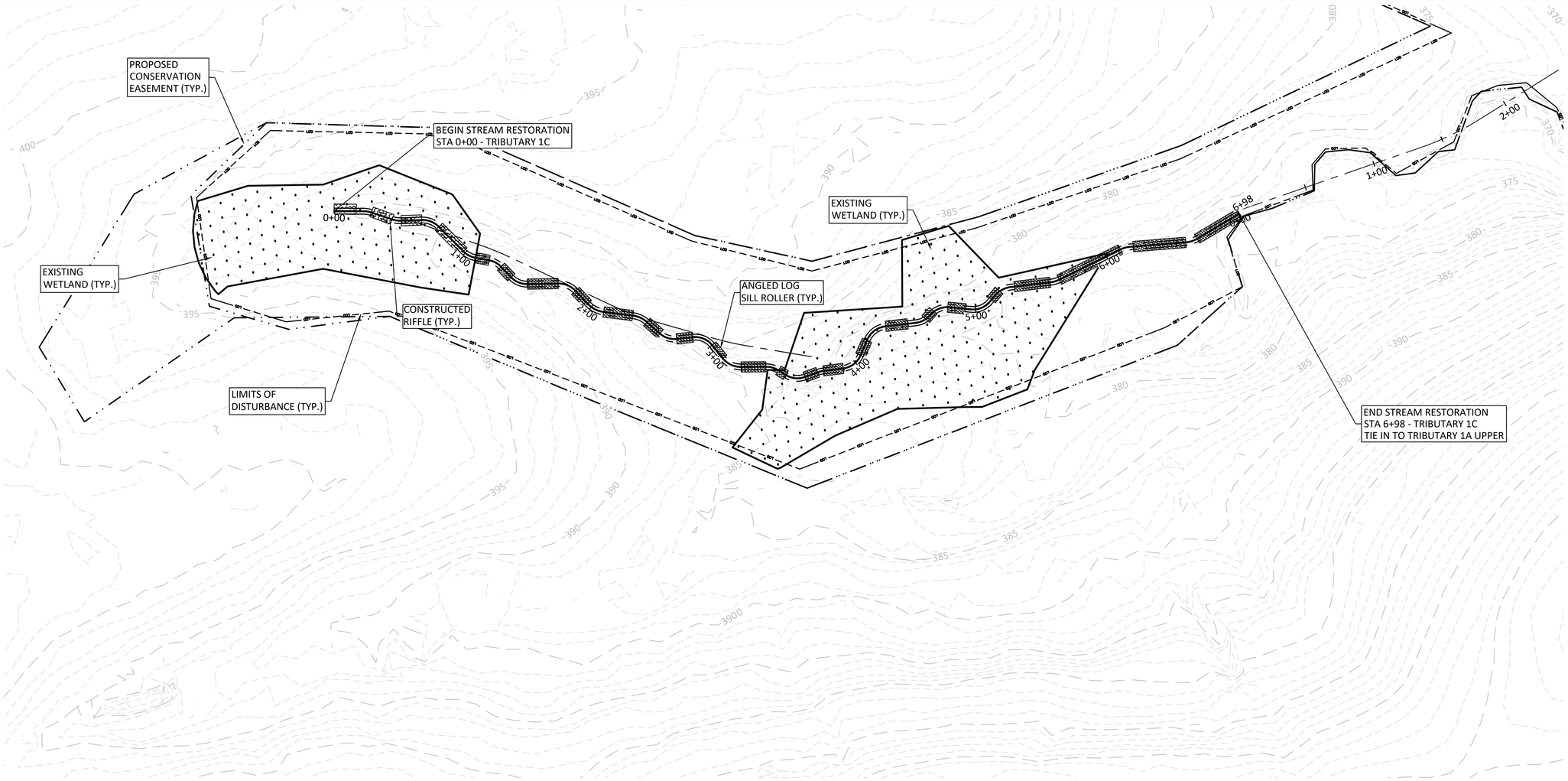

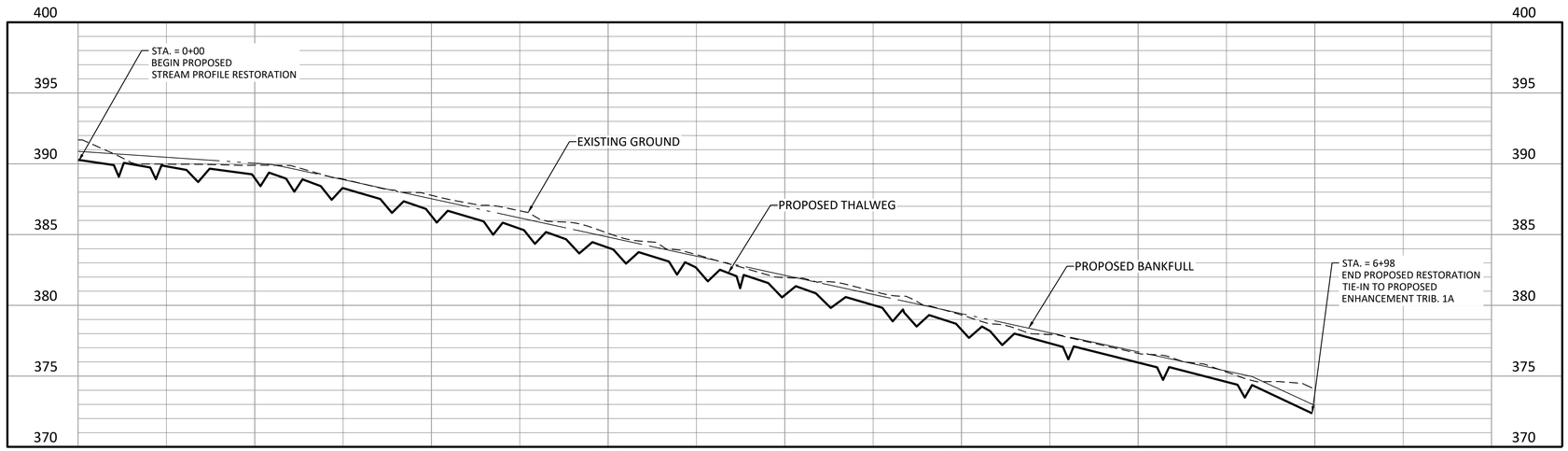

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SCALE IN FEET
HORIZONTAL

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SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

MITIGATION PLAN

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MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

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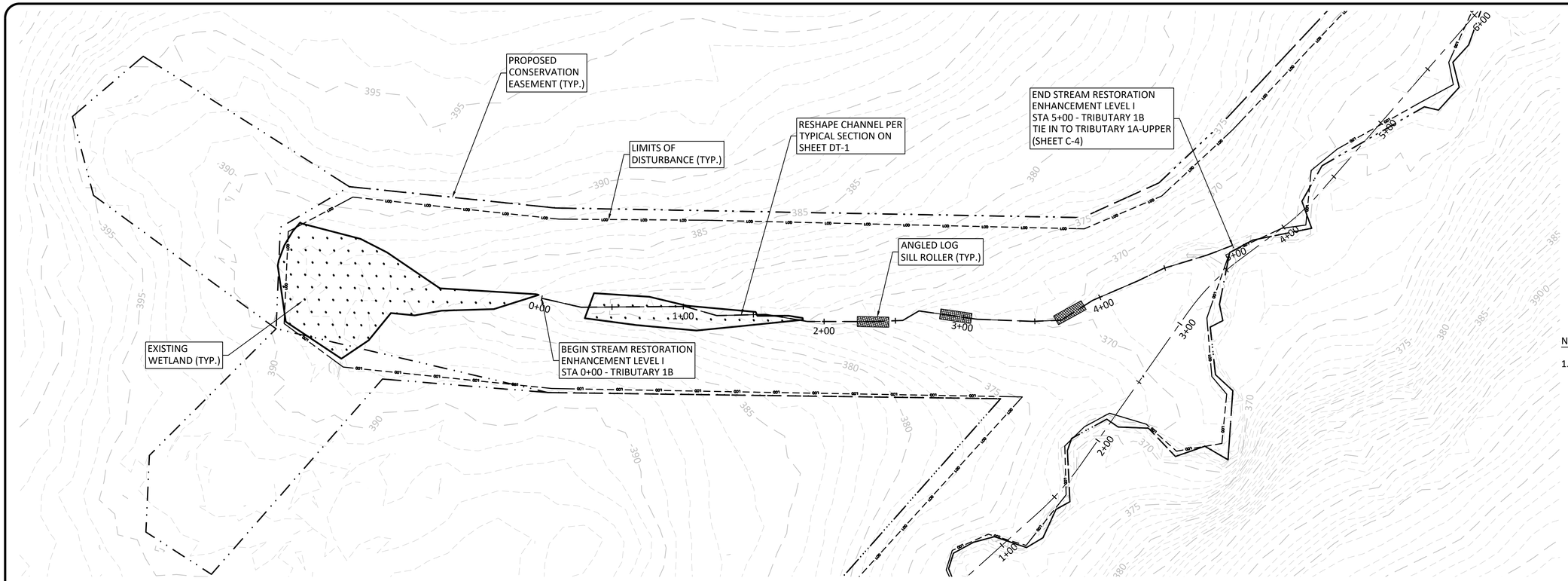

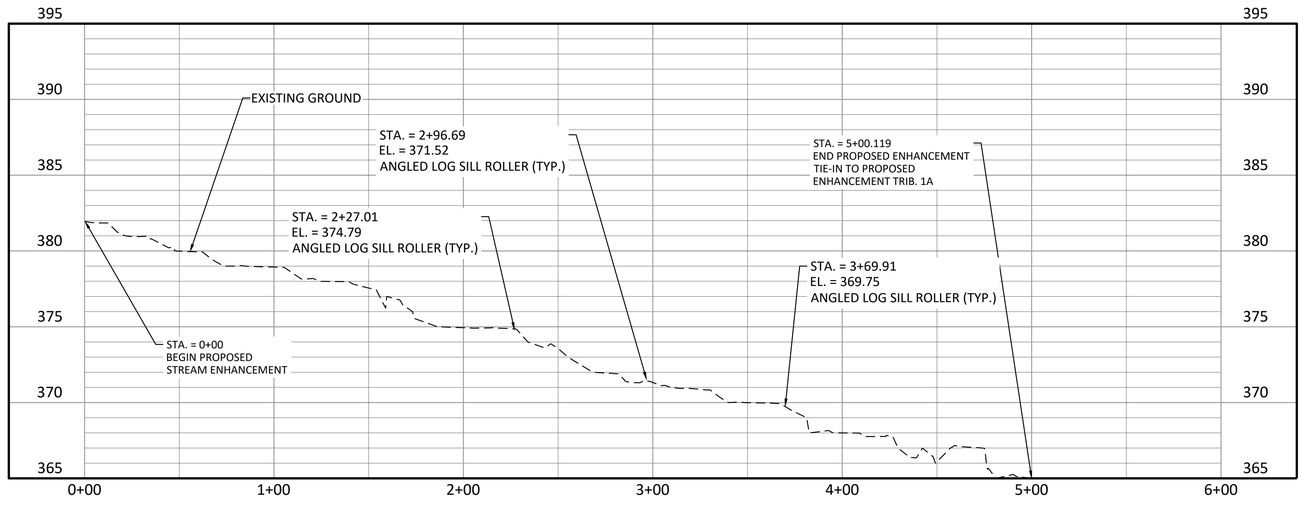

NORTH

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SCALE IN FEET
HORIZONTAL

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SCALE IN FEET
VERTICAL

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MITIGATION PLAN

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NC DEPARTMENT OF MITIGATION SERVICES

MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

CIVIL

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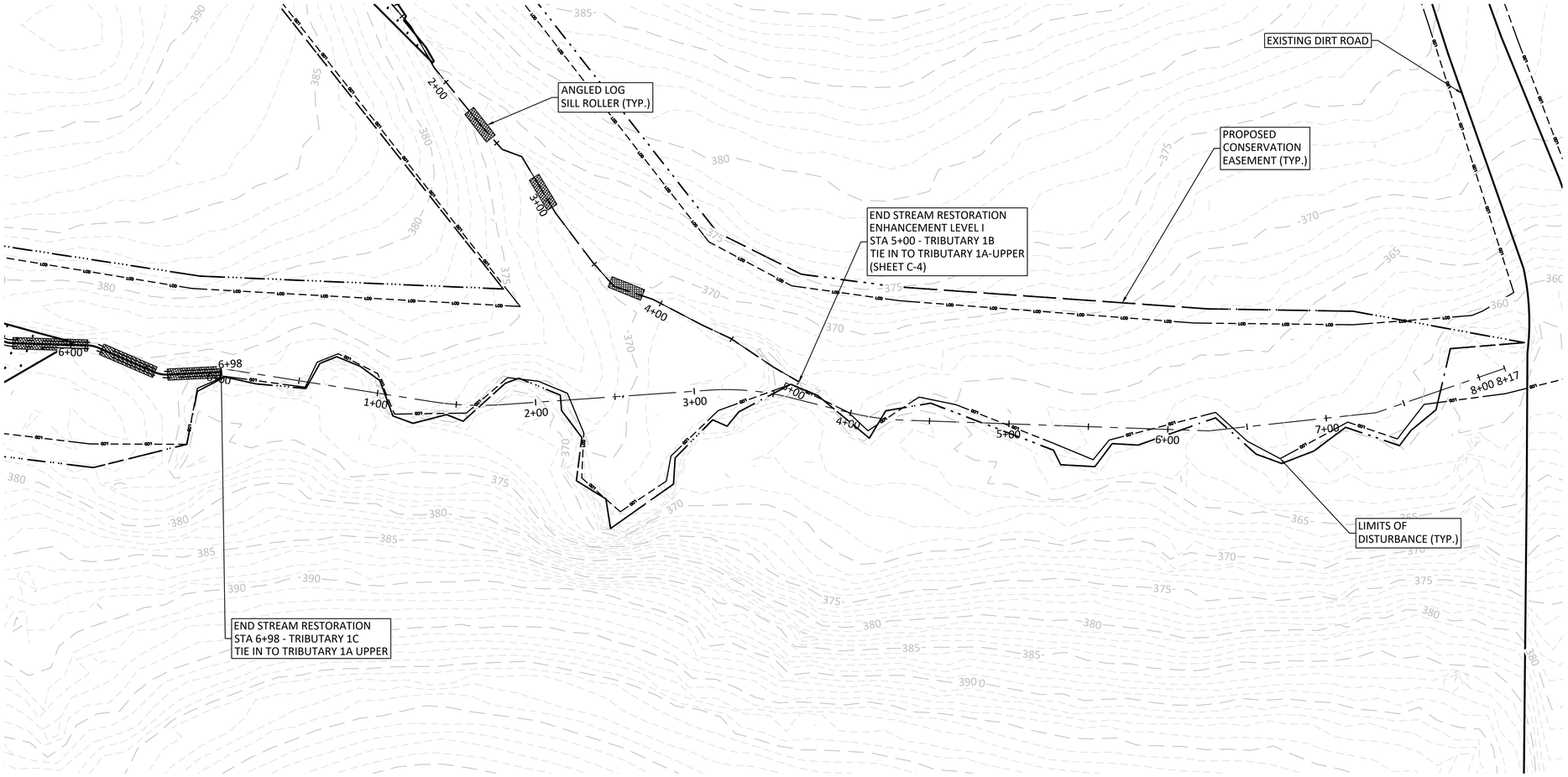

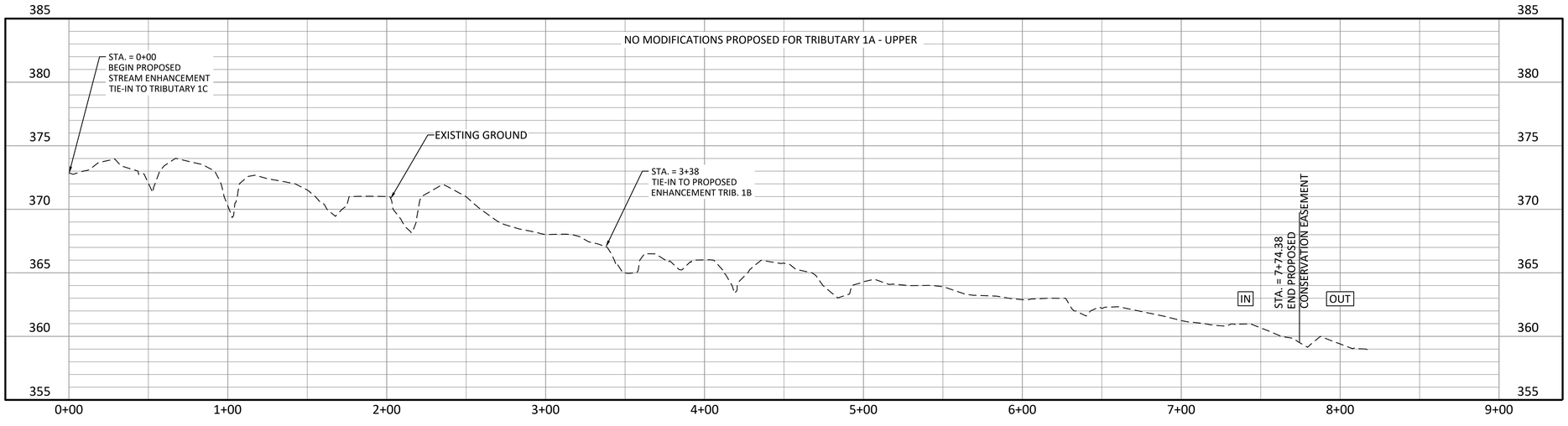

NOTES:

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MITIGATION PLAN

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

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North Carolina Registered Engineering Firm C-3916

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NC DEPARTMENT OF MITIGATION SERVICES
MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN
CIVIL

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PLAN AND PROFILE

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DATE FEB 2023
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FILE NAME C-PP-STREAM-01.dwg

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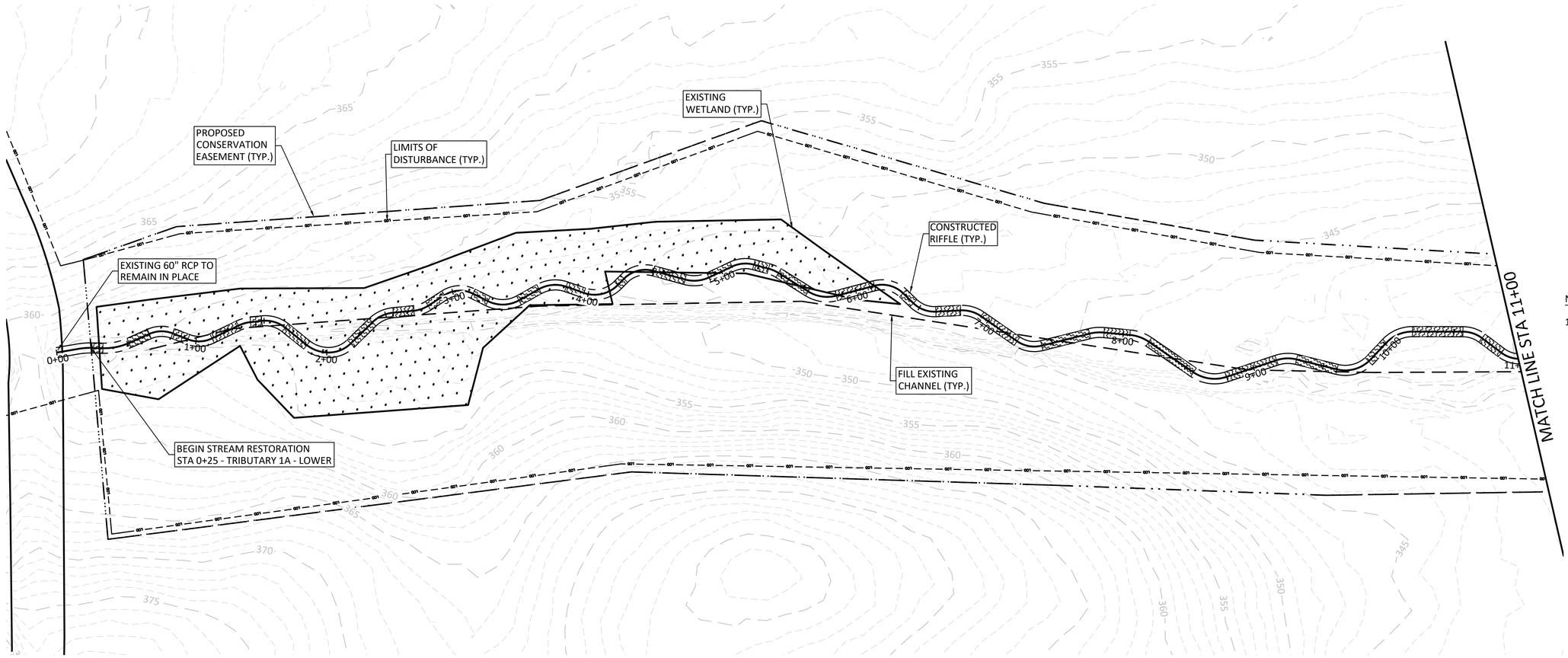

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HORIZONTAL

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SCALE IN FEET
VERTICAL

NOTES:

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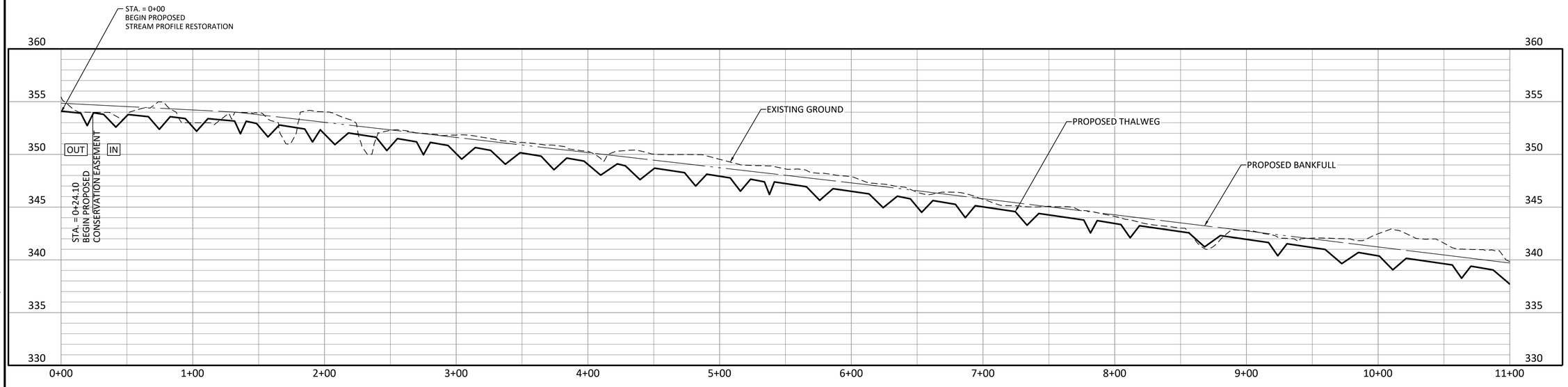

MITIGATION PLAN

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

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NC DEPARTMENT OF MITIGATION SERVICES
MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN
CIVIL
TRIBUTARY 1 - STA 10+00 TO STA 21+00 PLAN AND PROFILE

F&N JOB NO. NCM20306
DATE FEB 2023
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REVISED ACE
CHECKED XXX

NO.	ISSUE	BY	DATE

FILE NAME C-PP-STREAM-01.dwg

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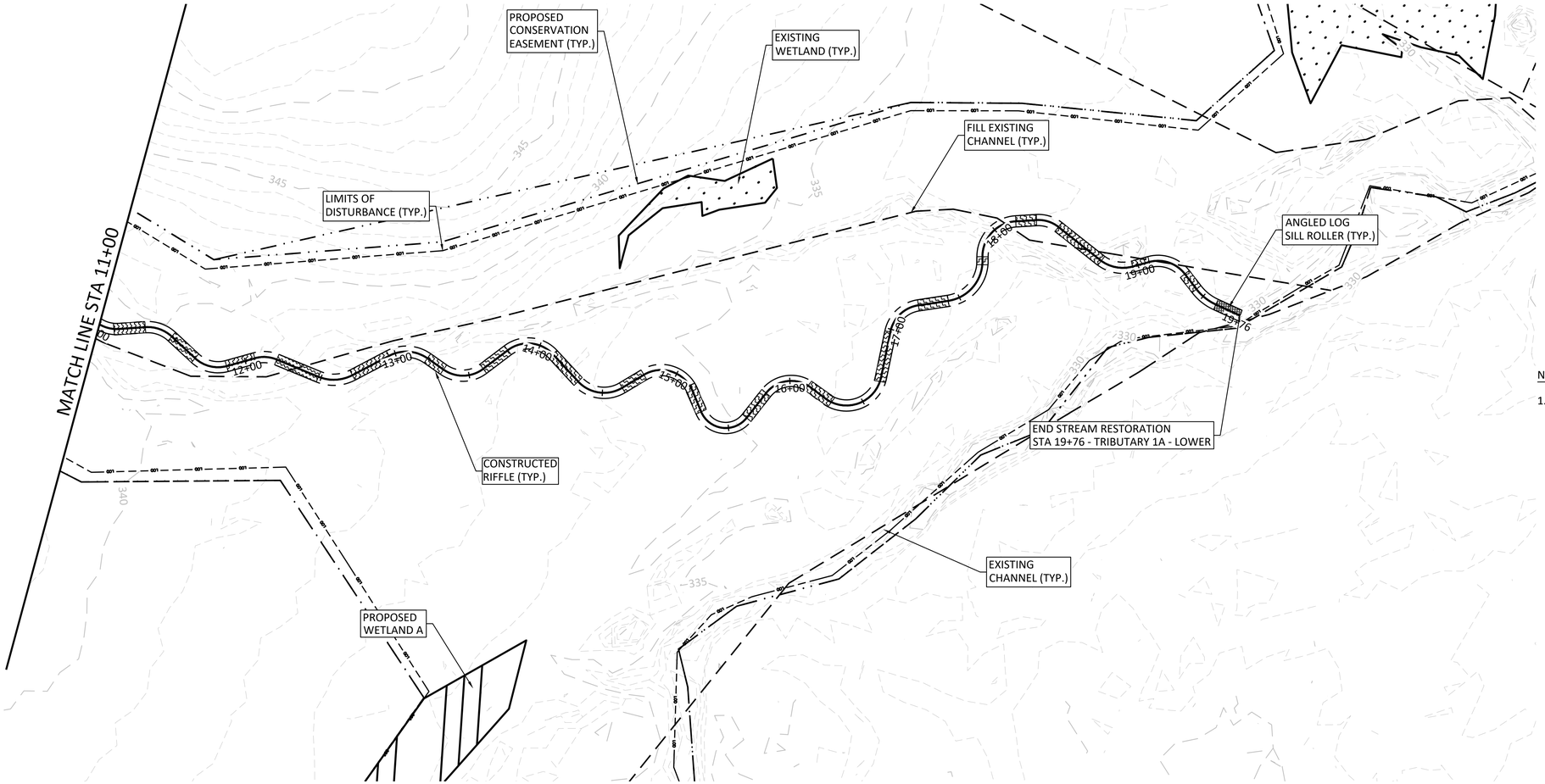

NORTH

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SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

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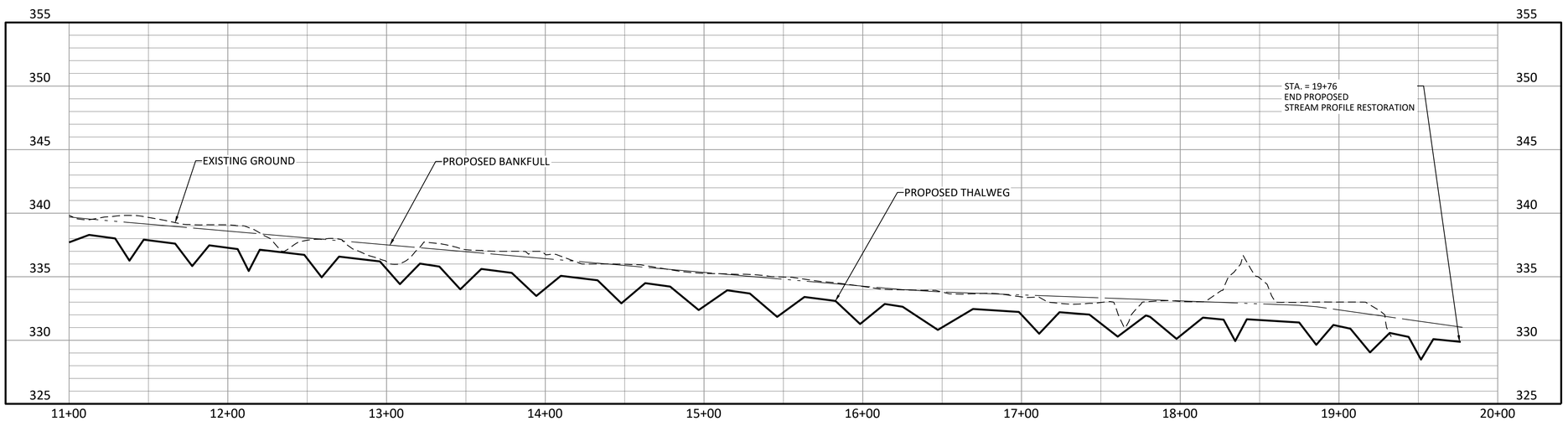

MITIGATION PLAN

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NC DEPARTMENT OF MITIGATION SERVICES

MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

CIVIL

TRIBUTARY 1 - STA 21+00 TO END
PLAN AND PROFILE

F&N JOB NO.	NCM20306
DATE	FEB 2023
DESIGNED	FNJ
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REVISED	ACE
CHECKED	XXX
FILE NAME	C-PP-STREAM-01.dwg

NO.	ISSUE	BY	DATE

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0 1

SHEET C-6
SEQ. 6 OF 19

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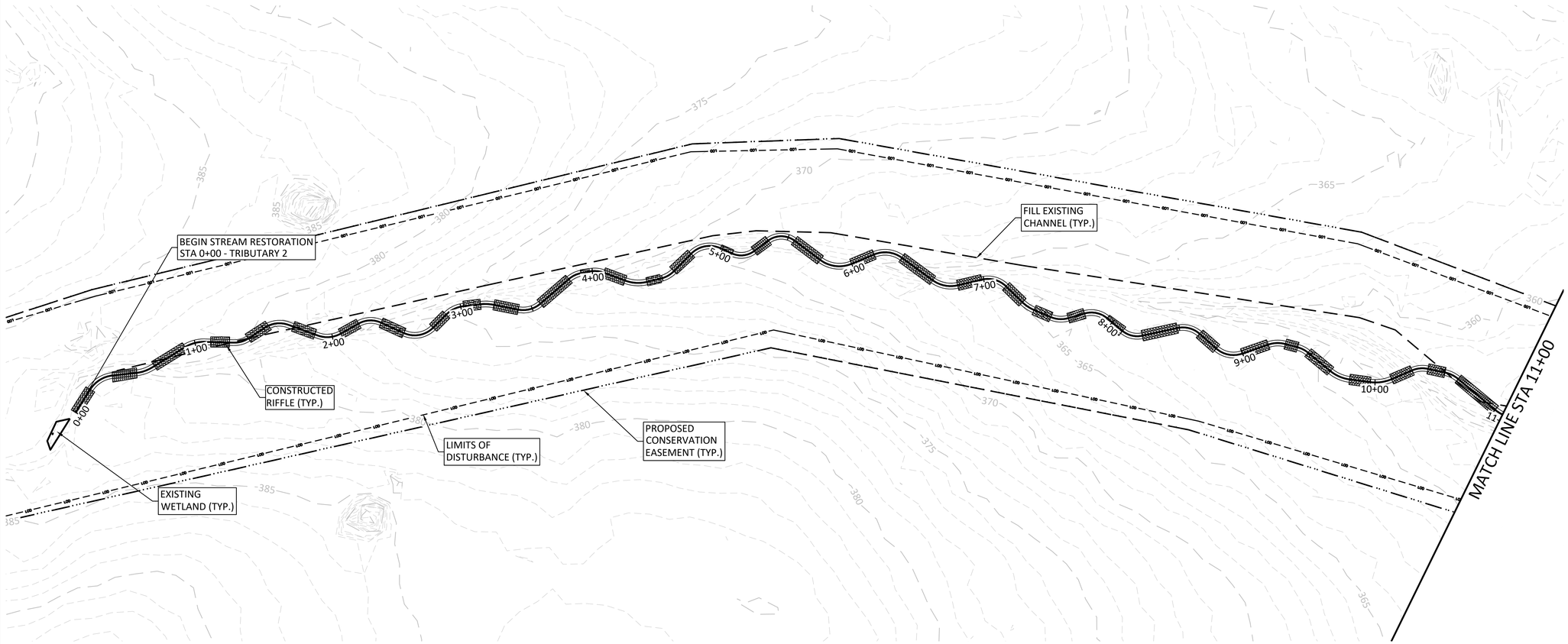
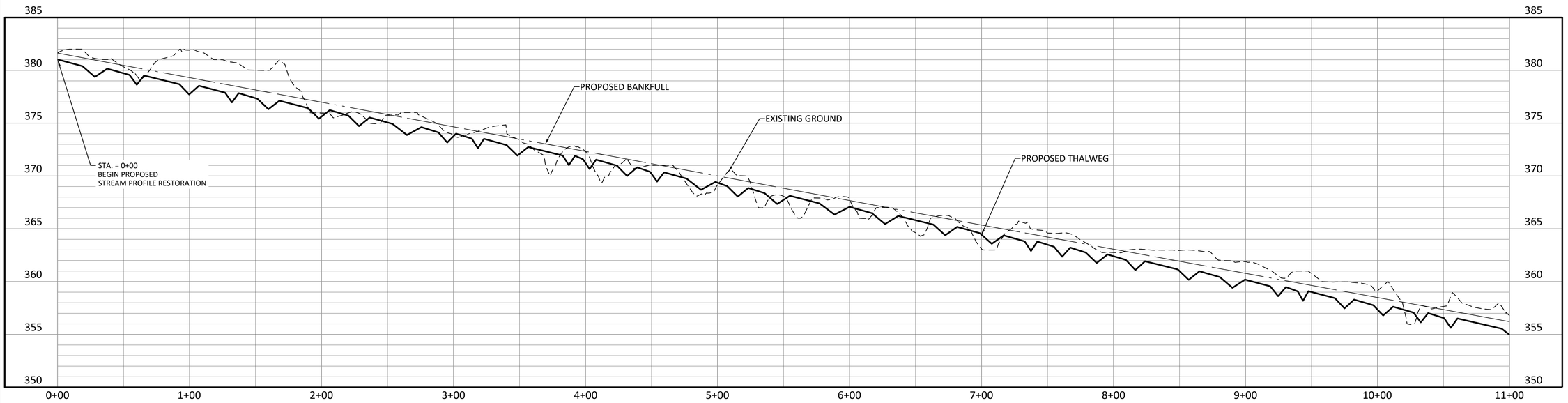


NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.



MITIGATION PLAN

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

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Winston-Salem, NC 27101
Phone - (336) 790-6744
Web - www.freese.com

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MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN
CIVIL

TRIBUTARY 2 - STA 0+00 TO STA 11+00
PLAN AND PROFILE

F&N JOB NO.	NCM20306
DATE	FEB 2023
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REVISED	ACE
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FILE NAME	C-PP-STREAM-01.dwg

NO.	ISSUE	BY	DATE

Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
VERIFY SCALE 0 1

SHEET C-7
SEQ. 7 OF 19

ACAD Rel: 24.2s (LMS Tech)
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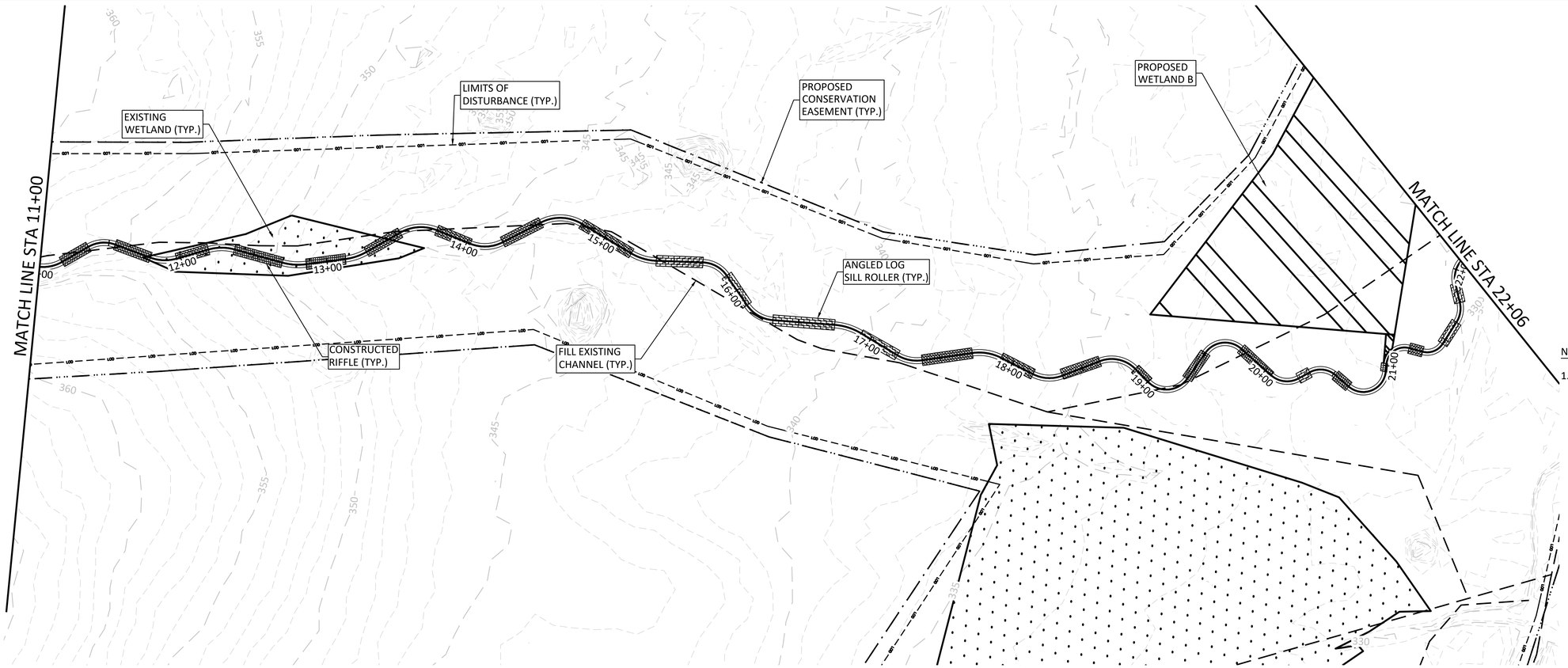

NOTES:

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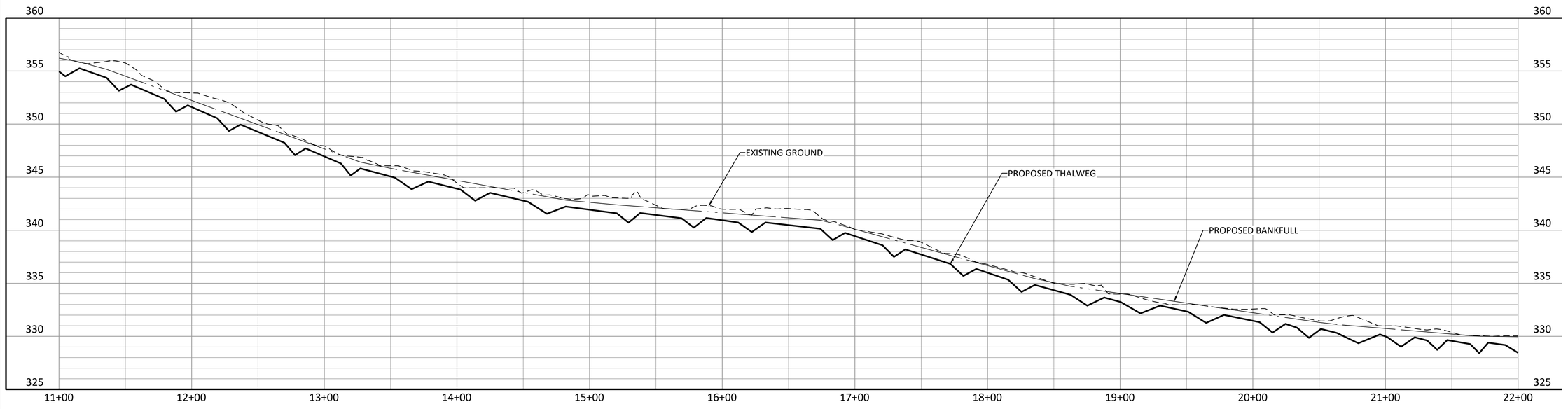
0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL



MITIGATION PLAN

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

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DRAFT MITIGATION PLAN

CIVIL

TRIBUTARY 2 - STA 11+00 TO STA 22+00
PLAN AND PROFILE

F&N JOB NO. NCM20306
DATE FEB 2023
DESIGNED FNI
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REVISED ACE
CHECKED XXX
FILE NAME C-PP-STREAM-01.dwg

NO.	ISSUE	BY	DATE

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0 1"

SHEET C-8
SEQ. 8 OF 19

ACAD Rel: 24.2s (LMS Tech)
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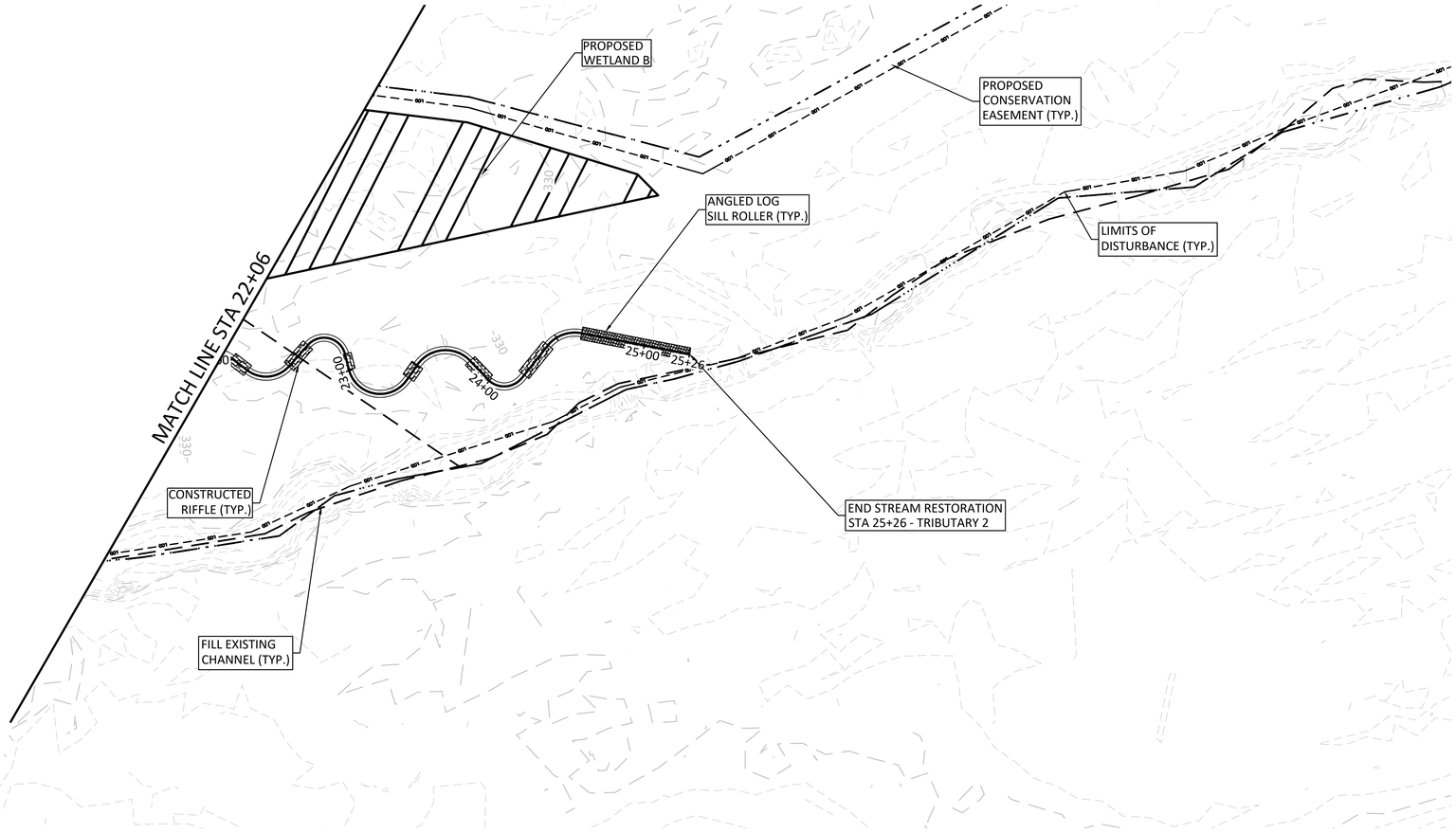
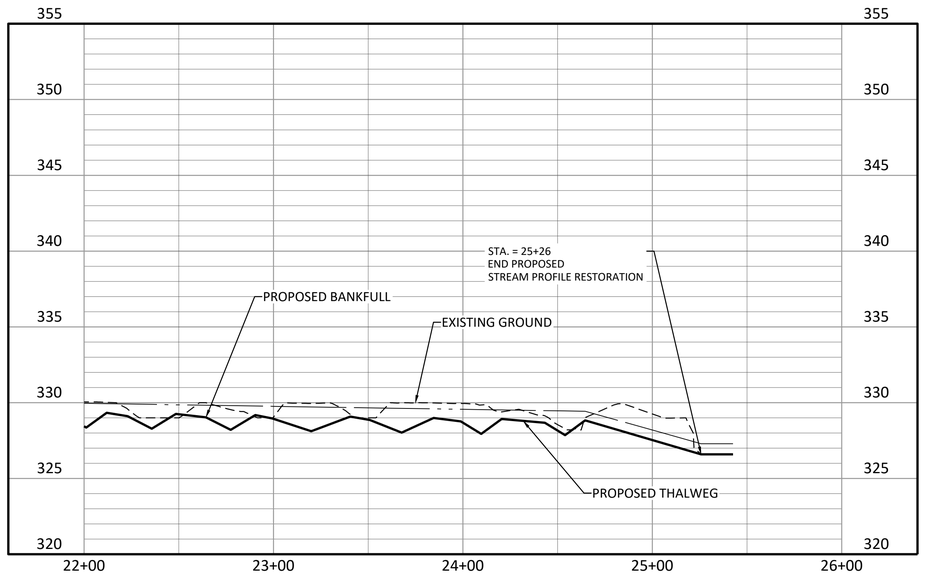


NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.



MITIGATION PLAN

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CIVIL

TRIBUTARY 2 - STA 22+00 TO END
PLAN AND PROFILE

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REVISED ACE
CHECKED XXX
FILE NAME C-PP-STREAM-01.dwg

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0 1

SHEET C-9
SEQ. 9 OF 19

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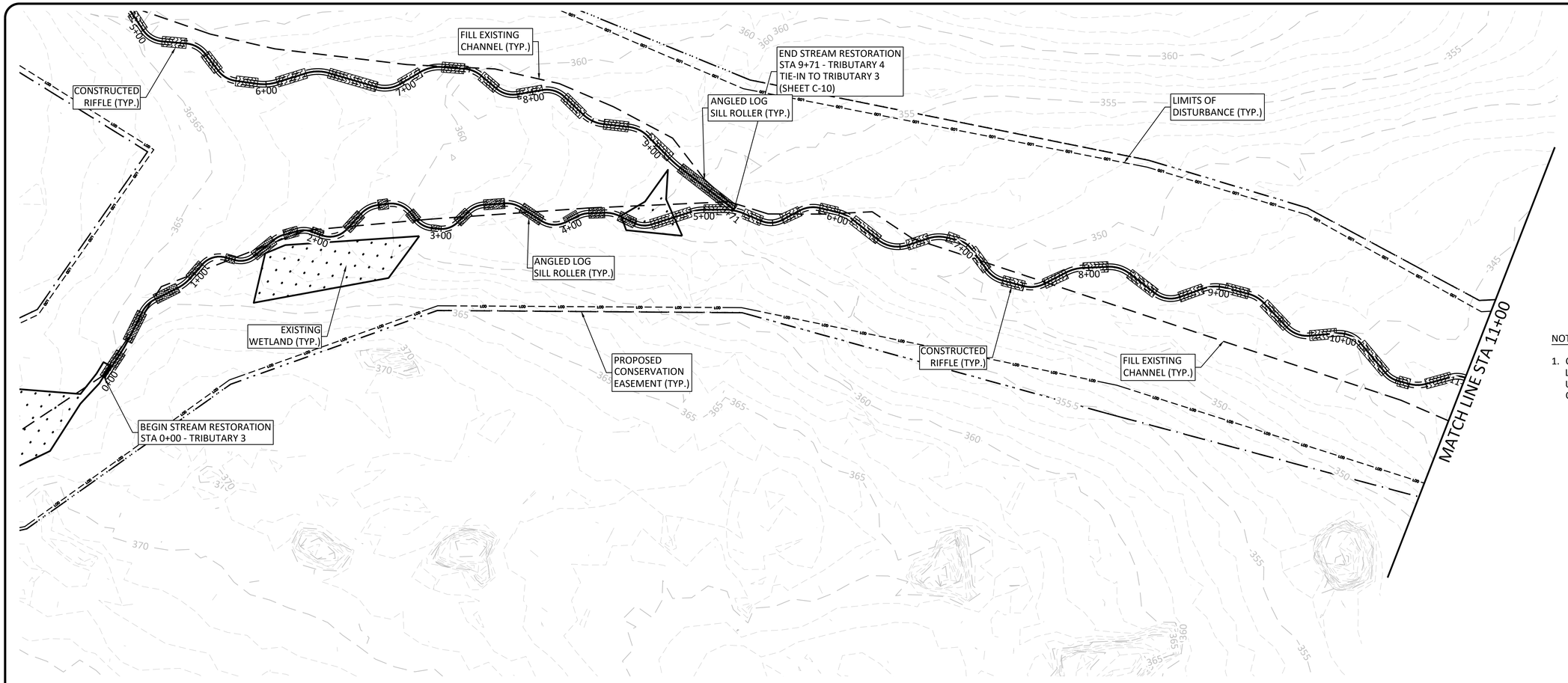

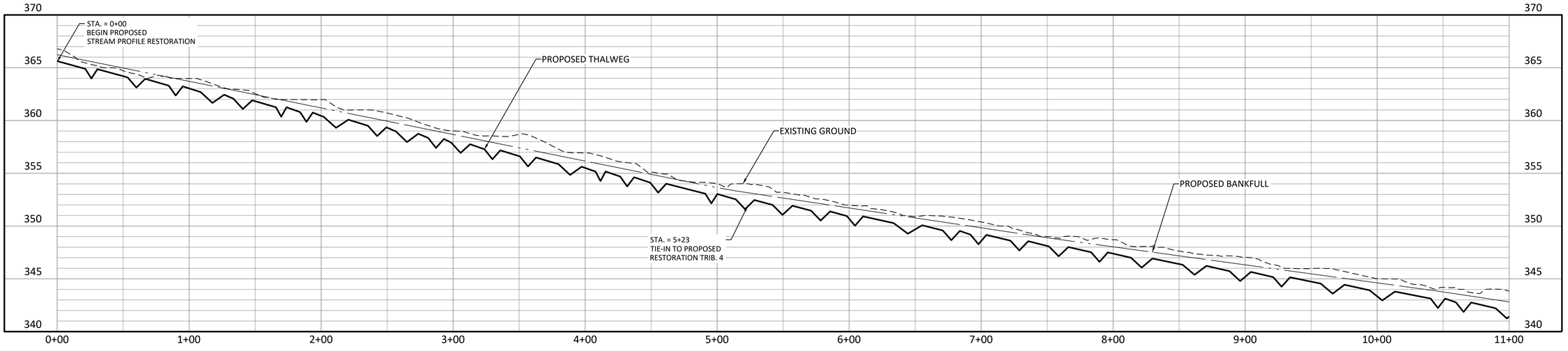

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

MITIGATION PLAN

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North Carolina Registered Engineering Firm C-3916

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CIVIL

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PLAN AND PROFILE

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DATE	FEB 2023
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FILE NAME	C-PP-STREAM-02.dwg

NO.	ISSUE	BY	DATE

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VERIFY SCALE 0 1

SHEET C-10
SEQ. 10 OF 19

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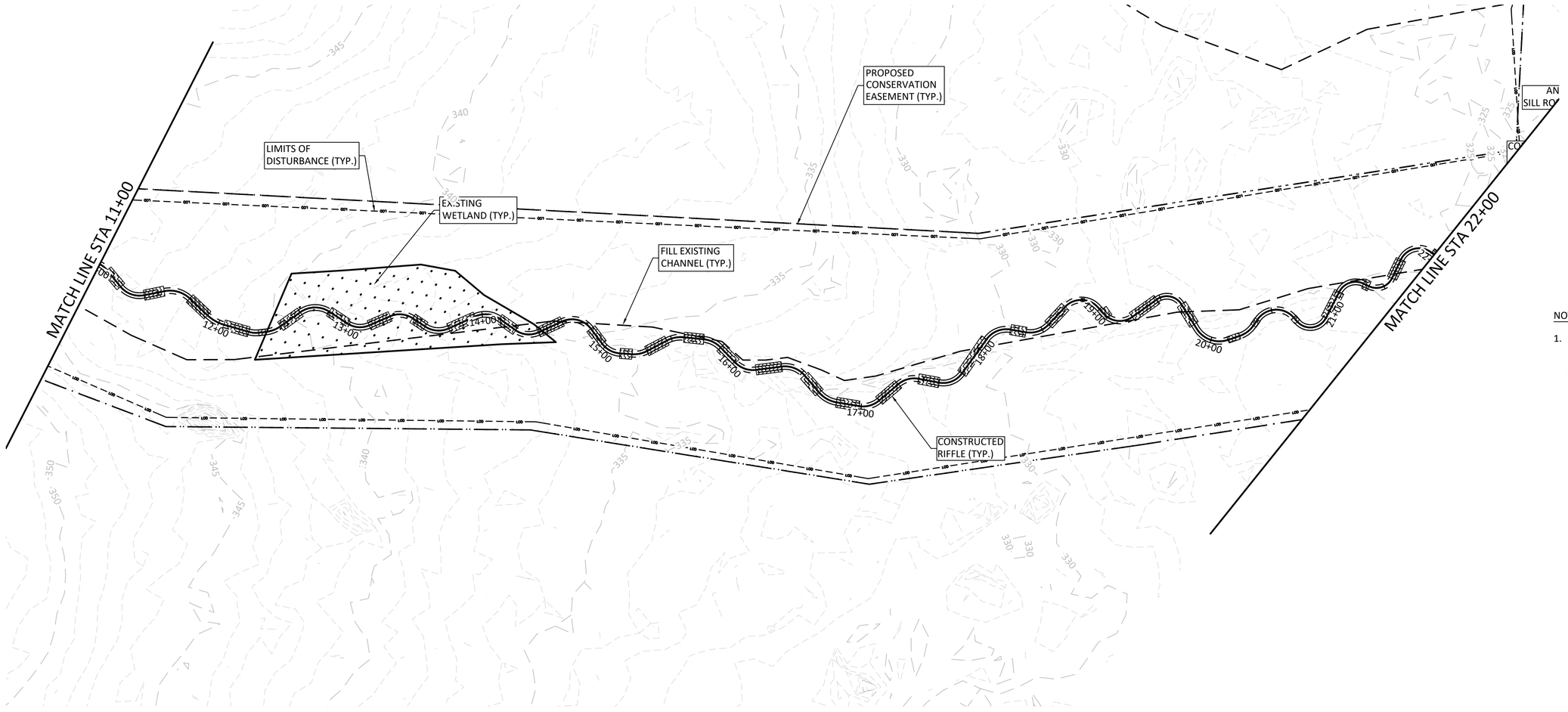

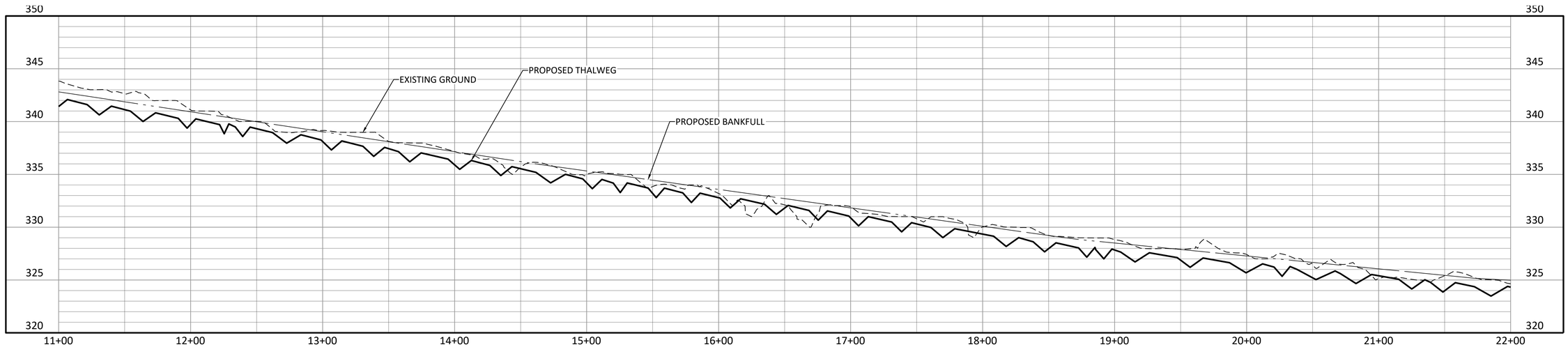

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

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MITIGATION PLAN

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CIVIL

TRIBUTARY 3 - STA 11+00 TO STA 22+00
PLAN AND PROFILE

FAN JOB NO.	NCM20306
DATE	FEB 2023
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REVISED	ACE
CHECKED	XXX
FILE NAME	C-PP-STREAM-02.dwg

NO.	ISSUE	BY	DATE

Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
VERIFY SCALE 0 1

SHEET C-11
SEQ. 11 OF 19

ACAD Rel: 24.2s (LMS Tech)
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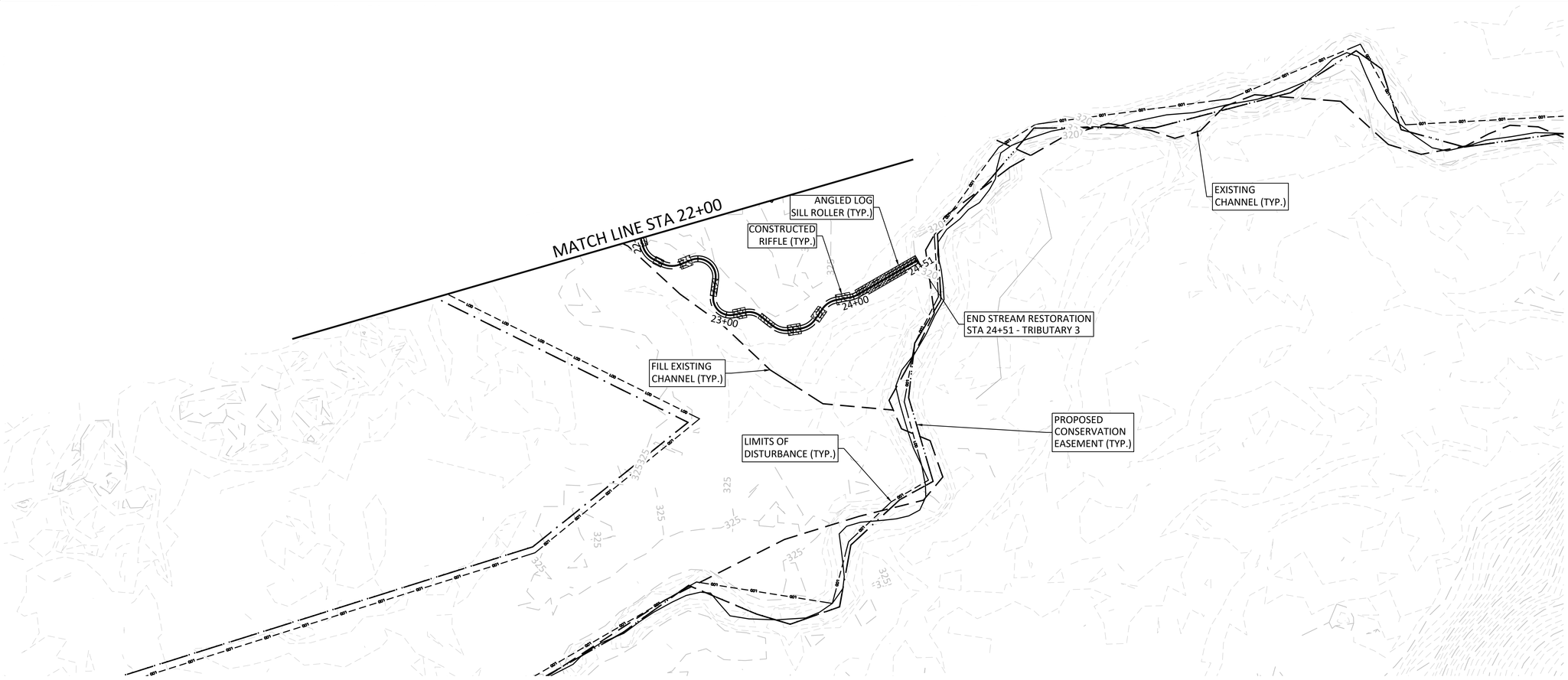

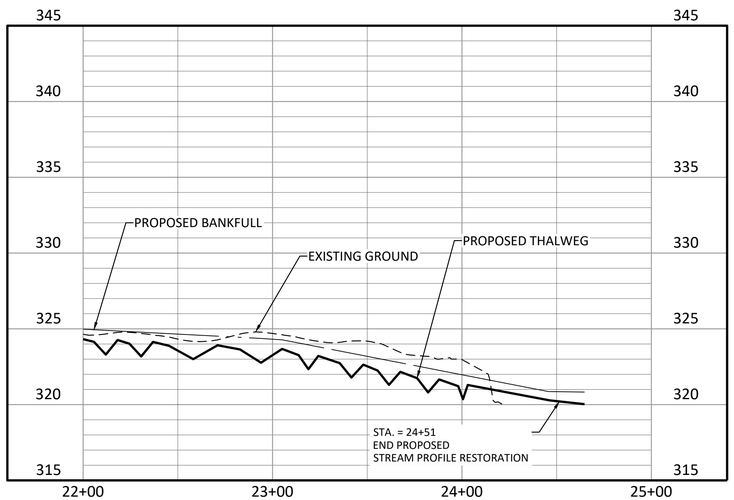

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

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MITIGATION PLAN

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North Carolina Registered Engineering Firm C-3916

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TRIBUTARY 3 - STA 22+00 TO END
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FILE NAME C-PP-STREAM-02.dwg

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0 1

SHEET C-12
SEQ. 12 OF 19

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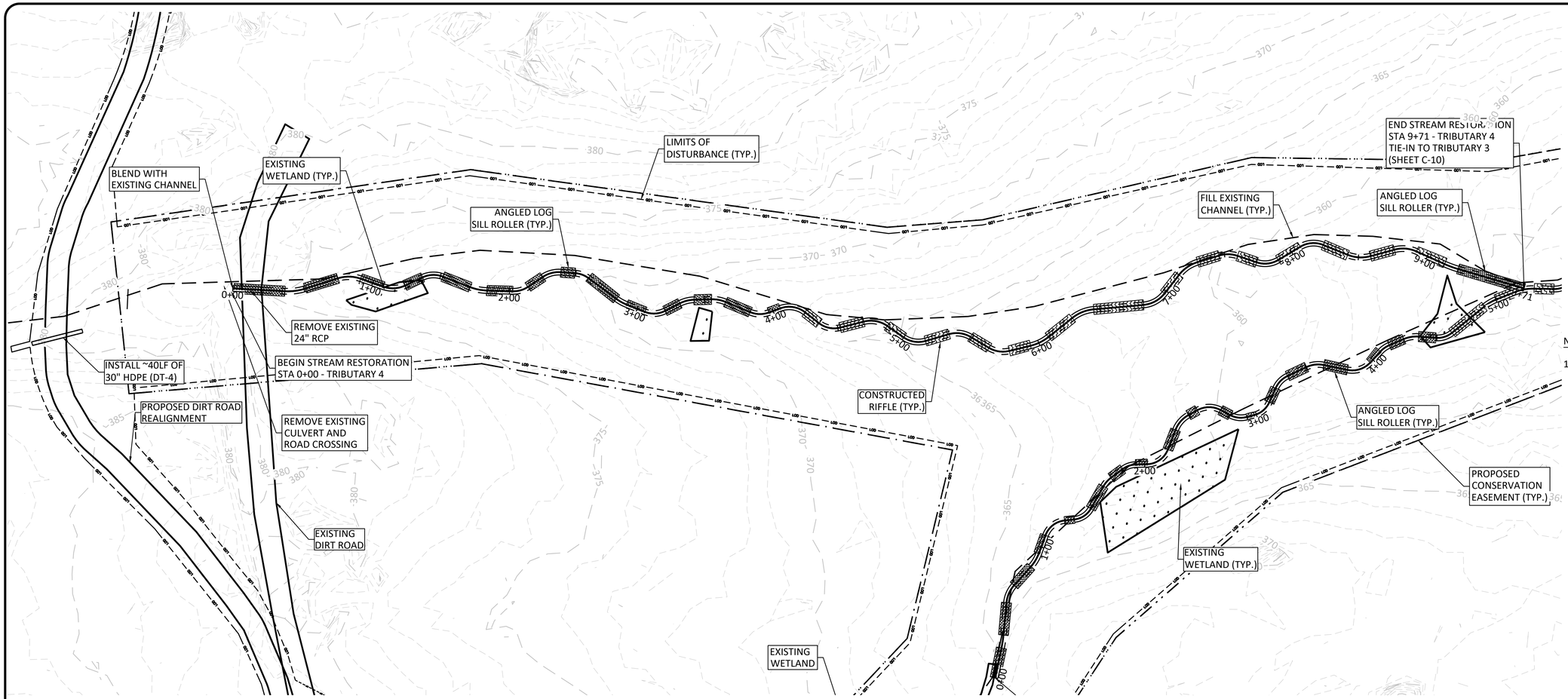


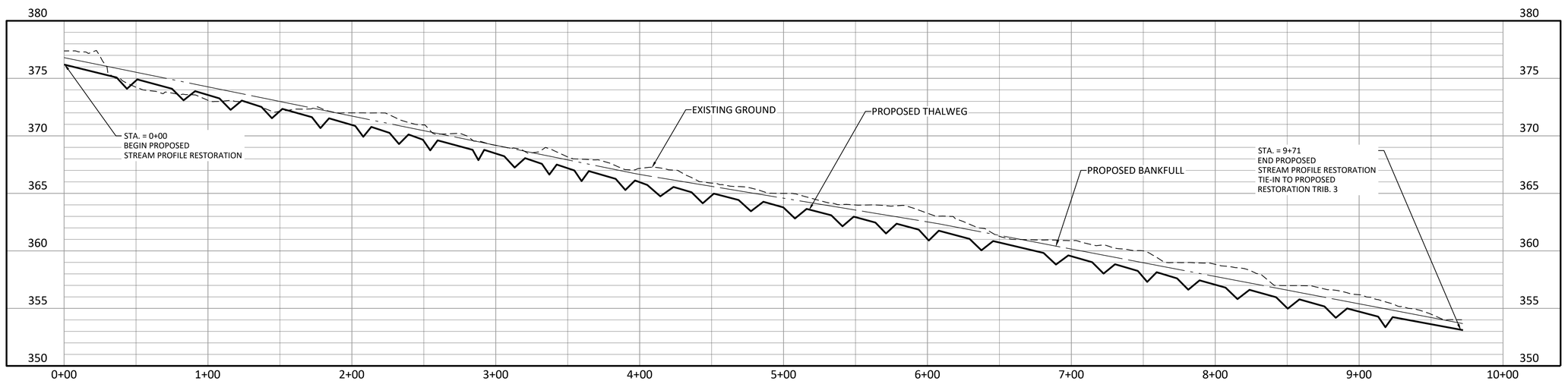
NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.



MITIGATION PLAN

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North Carolina Registered Engineering Firm C-3916

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DRAFT MITIGATION PLAN

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REVISED ACE
CHECKED XXX
FILE NAME C-PP-STREAM-02.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-13
SEQ. 13 OF 19

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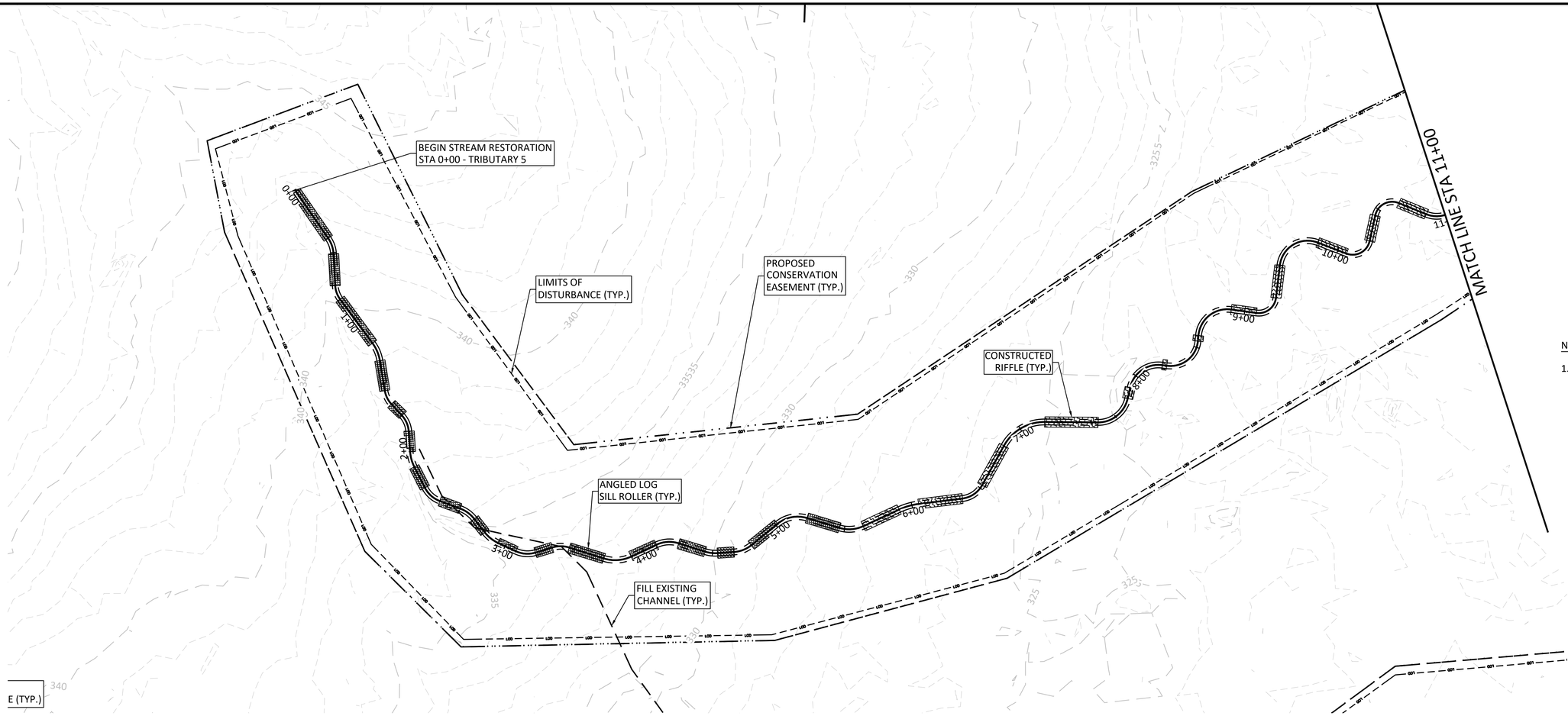

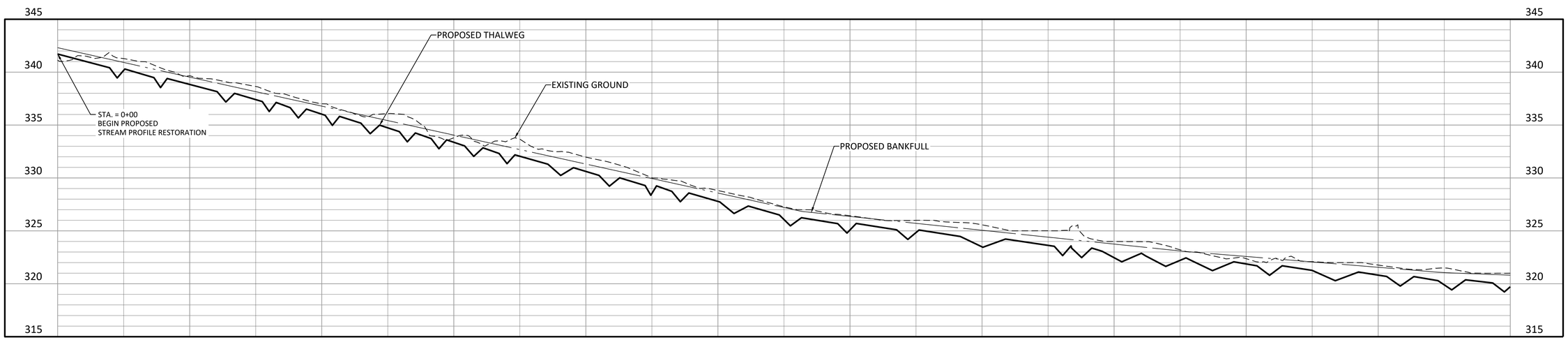

MITIGATION PLAN

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

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North Carolina Registered Engineering Firm C-3916

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TRIBUTARY 5 - STA 0+00 TO STA 11+00
PLAN AND PROFILE

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VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-14
SEQ. 14 OF 19

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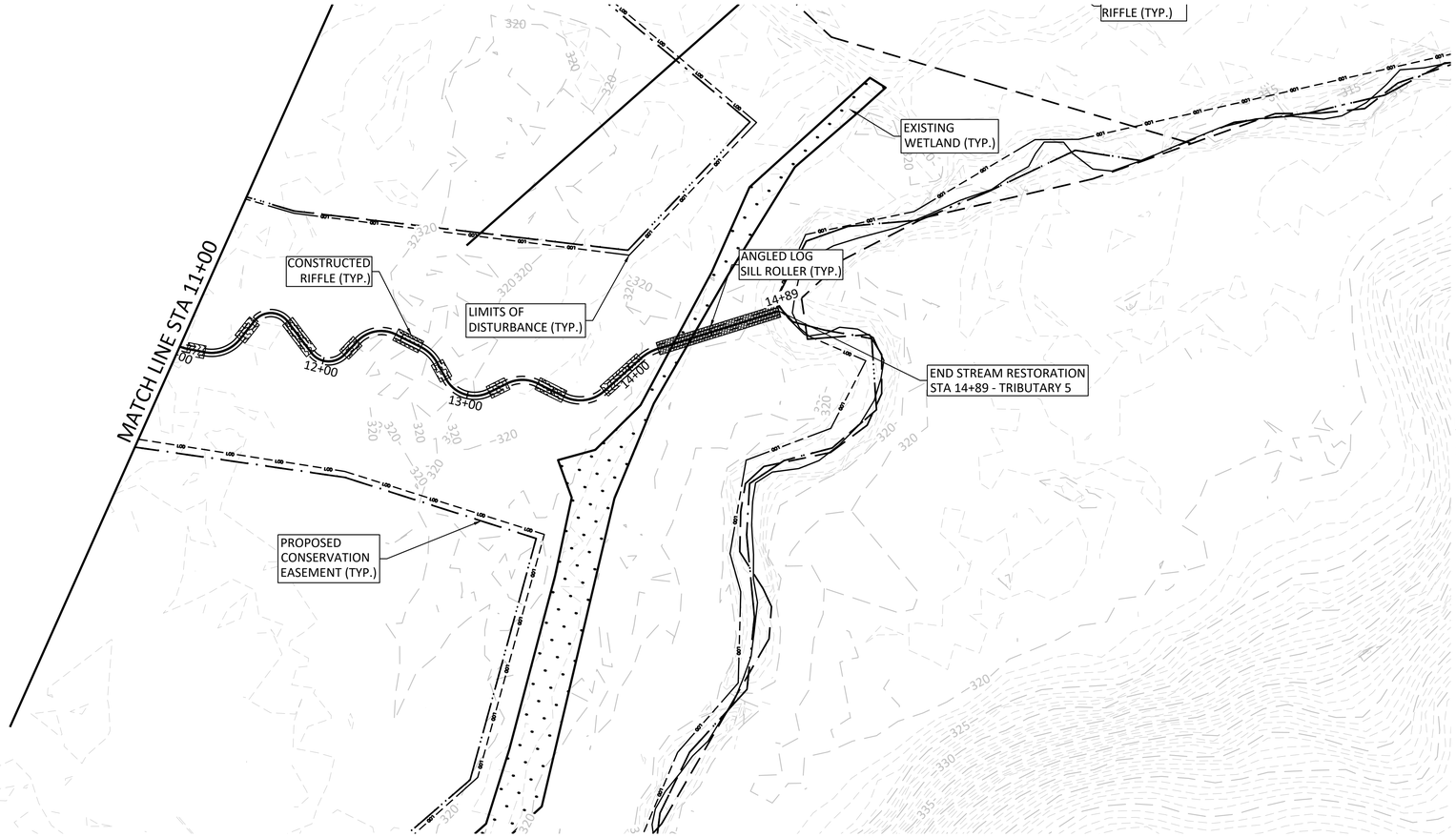

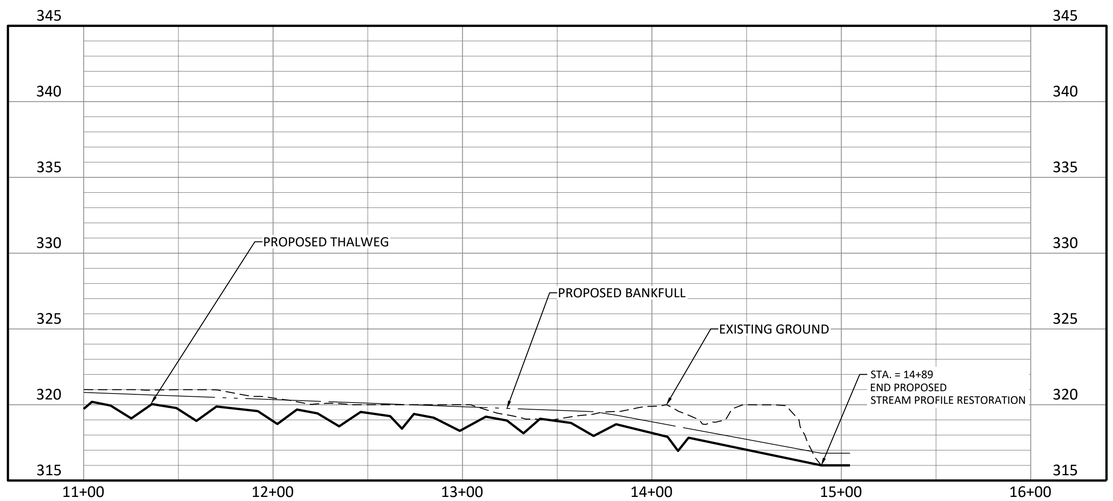

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

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MITIGATION PLAN

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DRAFT MITIGATION PLAN

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TRIBUTARY 5 - STA 11+00 TO END
PLAN AND PROFILE

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FILE NAME C-PP-STREAM-02.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-15
SEQ. 15 OF 19

ACAD Rel: 24.2s (LMS Tech)
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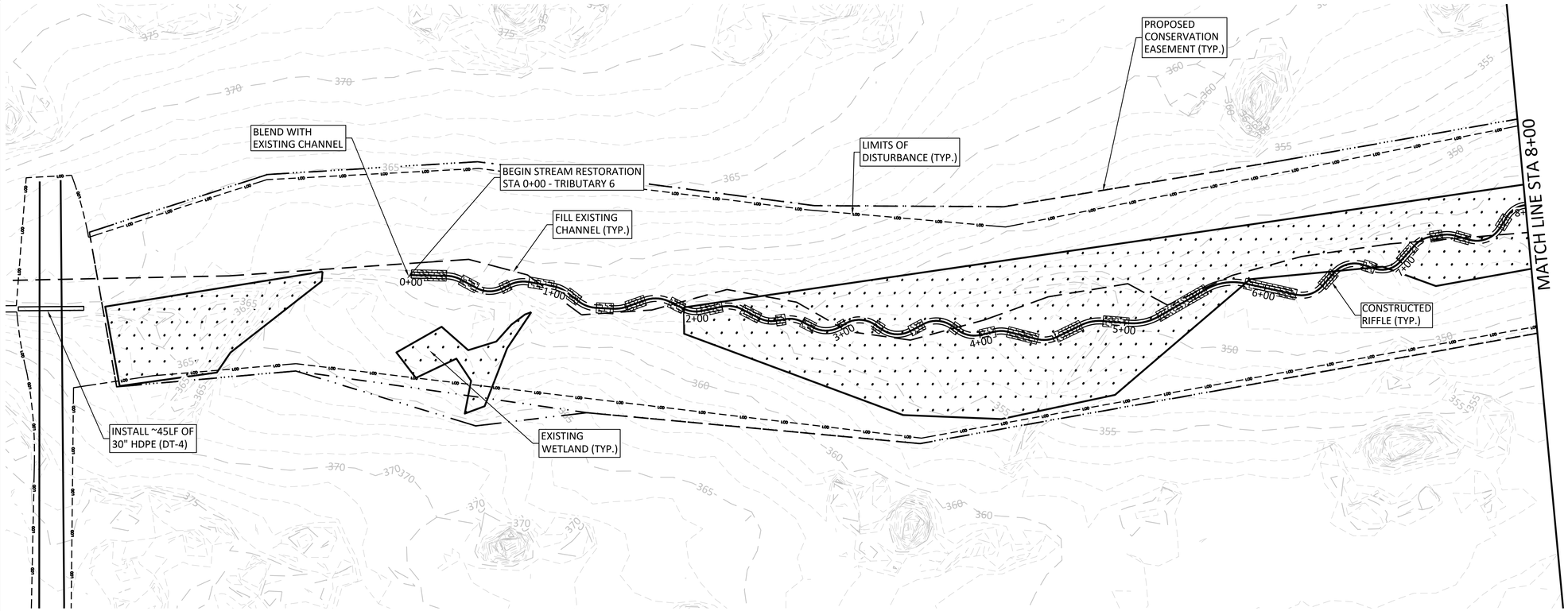

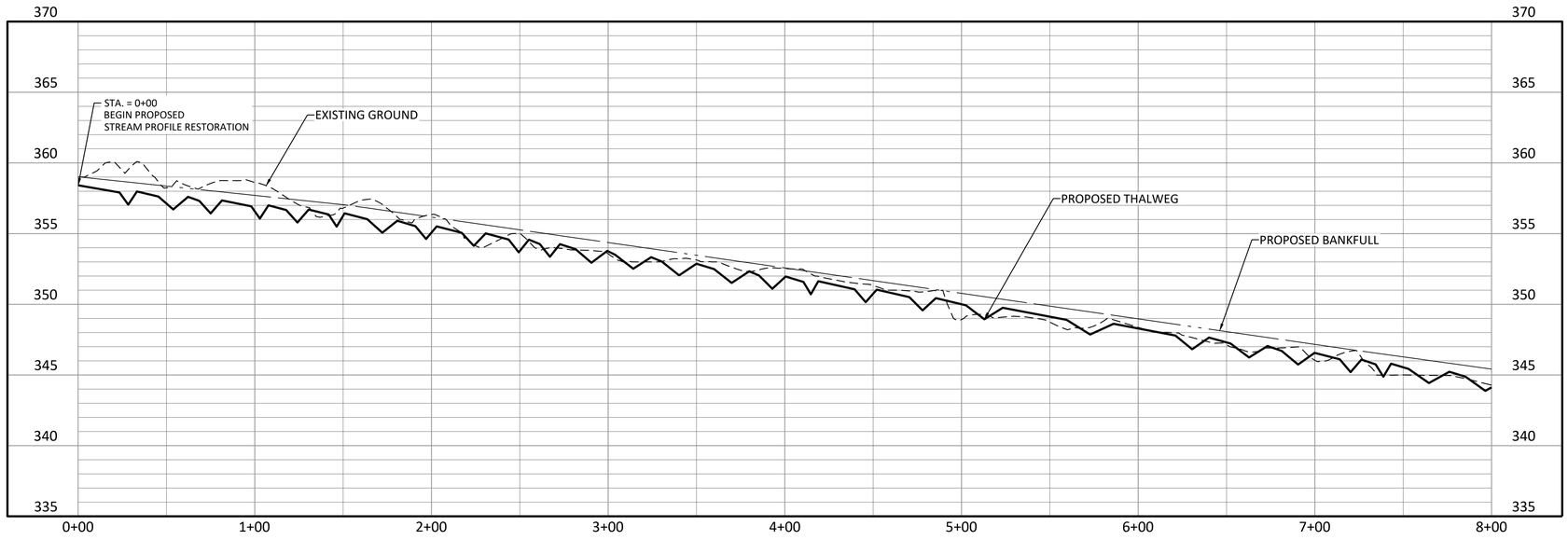

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

MITIGATION PLAN

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DRAFT MITIGATION PLAN

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TRIBUTARY 6 - STA 0+00 TO STA 8+00
PLAN AND PROFILE

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F&N JOB NO. NCM20306
DATE FEB 2023
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REVISED ACE
CHECKED XXX
FILE NAME C-PP-STREAM-02.dwg

VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-16
SEQ. 16 OF 19

ACAD Rel: 24.2s (LMS Tech)
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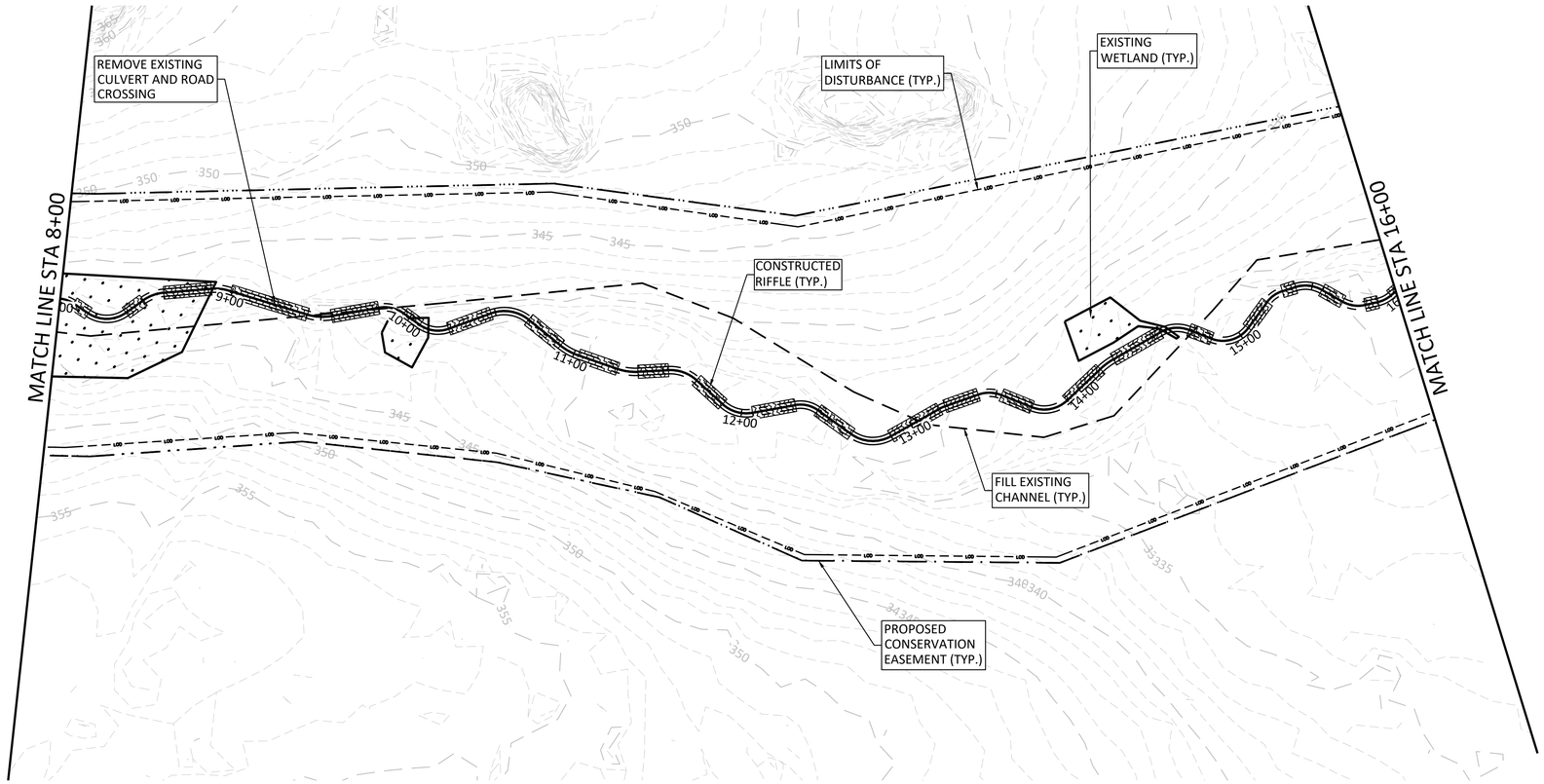

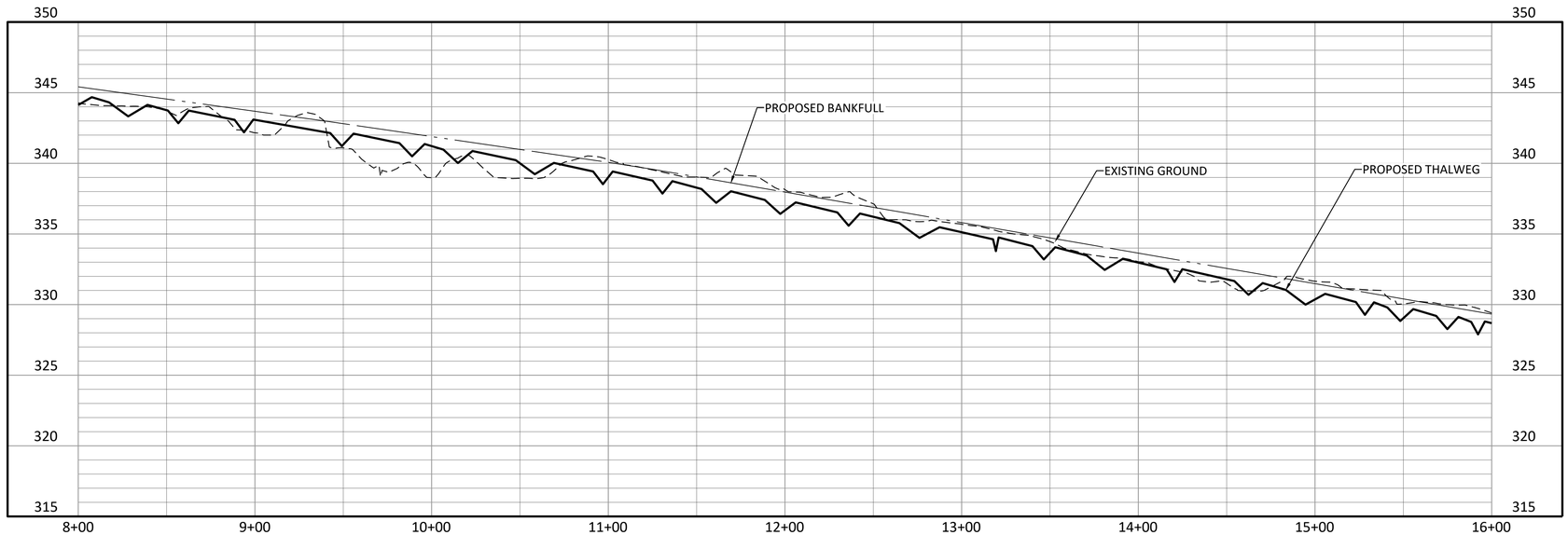

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

NOTES:

1. CONTRACTOR SHALL VERIFY LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO BEGINNING OF CONSTRUCTION.

MITIGATION PLAN

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

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NC DEPARTMENT OF MITIGATION SERVICES

MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN

CIVIL

TRIBUTARY 6 - STA 8+00 TO STA 16+00
PLAN AND PROFILE

F&N JOB NO.	NCM20306
DATE	FEB 2023
DESIGNED	FNJ
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REVISED	ACE
CHECKED	XXX
FILE NAME	C-PP-STREAM-02.dwg

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VERIFY SCALE Bar is one inch on original drawing. If not one inch on this sheet, adjust scale.
0 1"

SHEET C-17

SEQ. 17 OF 19

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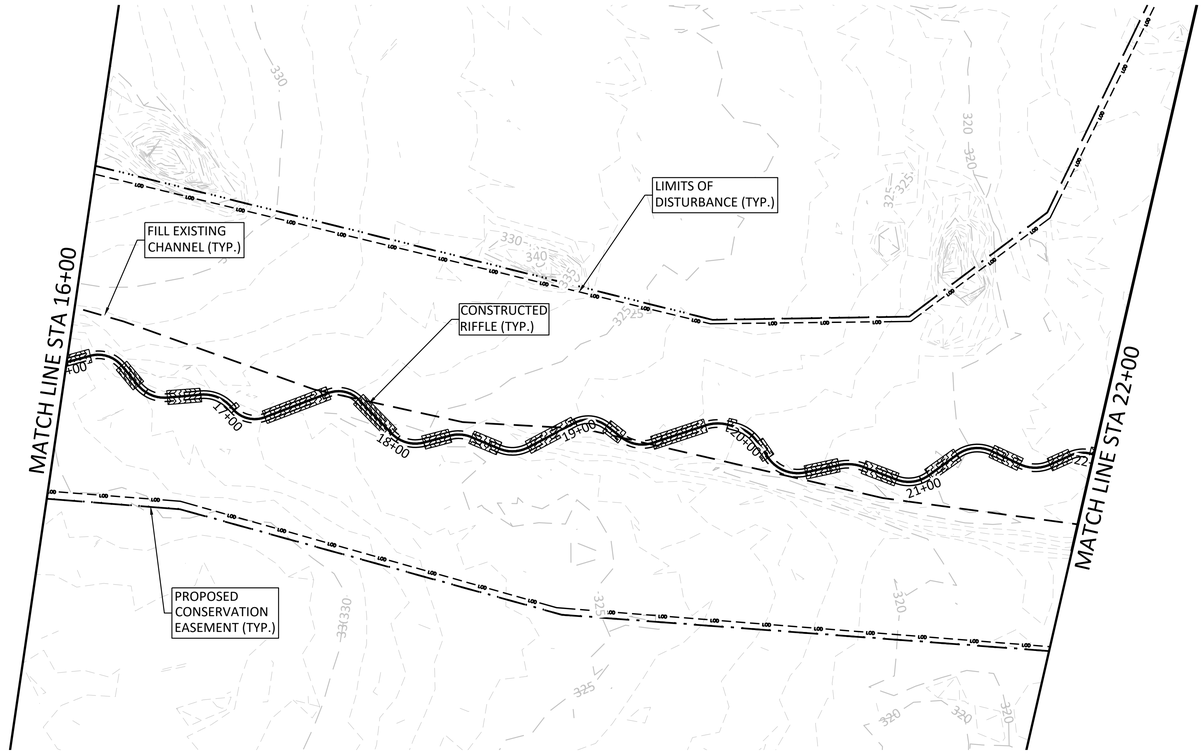

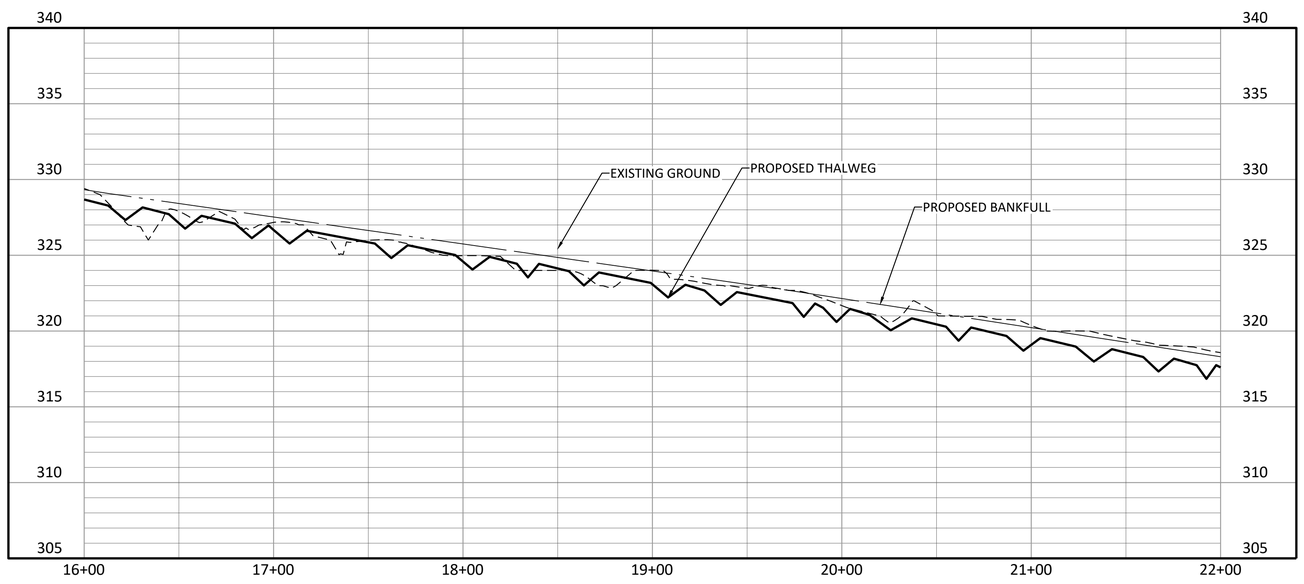

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NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

MITIGATION PLAN

Freese and Nichols, Inc
North Carolina Registered Engineering Firm C-3916

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TRIBUTARY 6 - STA 16+00 TO STA 22+00
PLAN AND PROFILE

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SHEET C-18
SEQ. 18 OF 19

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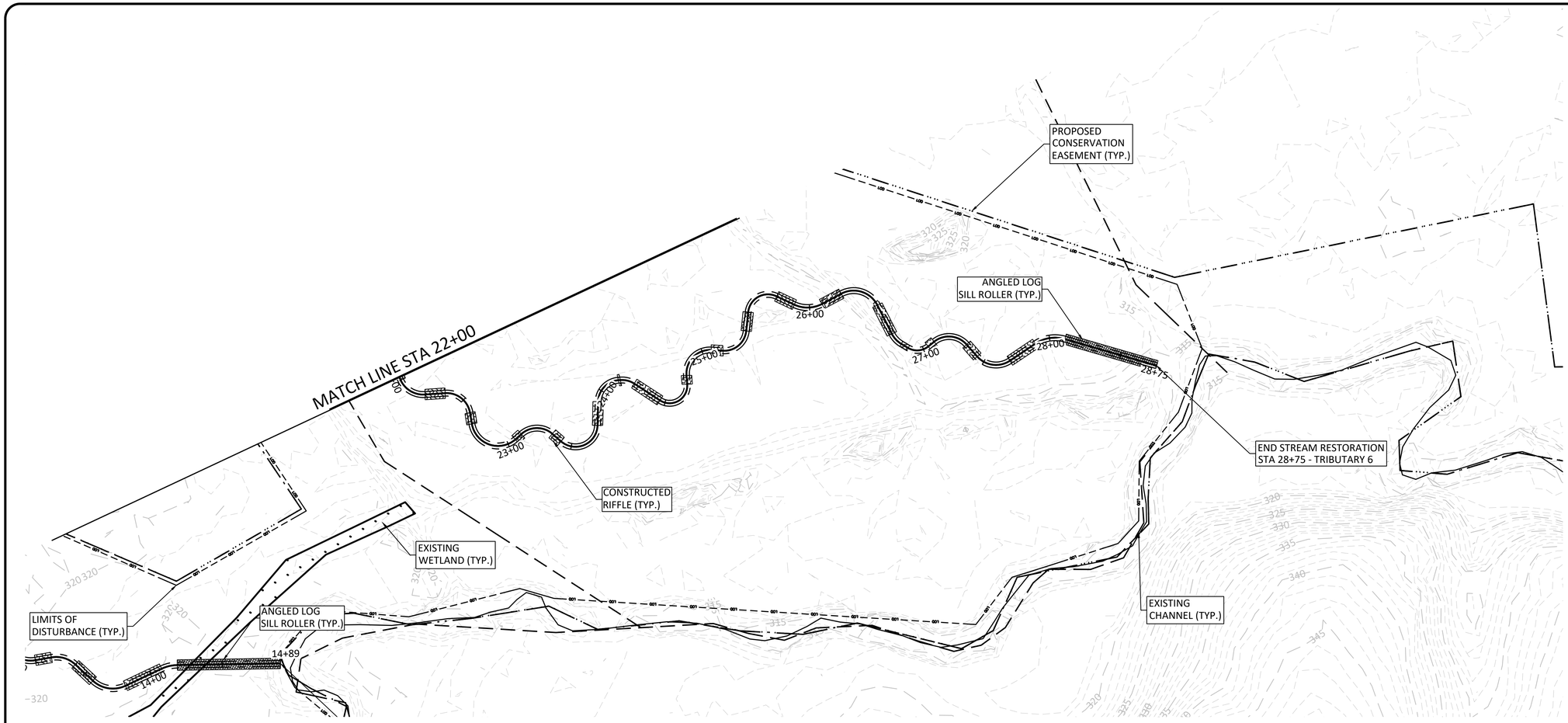

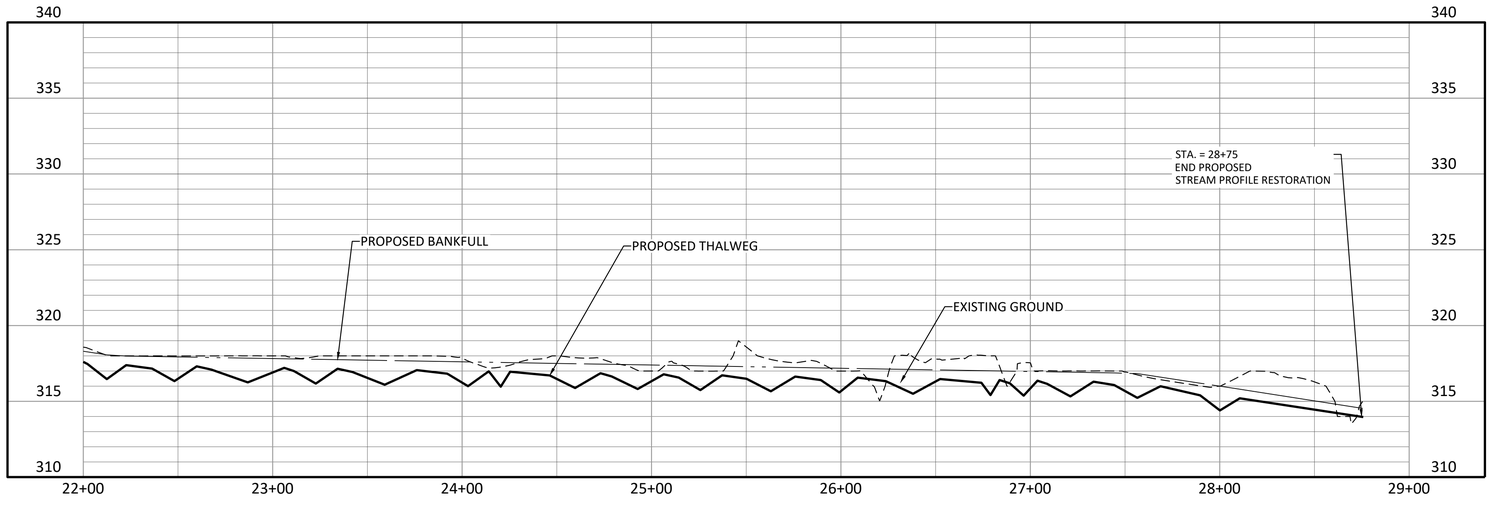

NORTH

0 40' 80'
SCALE IN FEET
HORIZONTAL

0 10' 20'
SCALE IN FEET
VERTICAL

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TRIBUTARY 6 - STA 22+00 TO END
PLAN AND PROFILE

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SHEET C-19
SEQ. 19 OF 19

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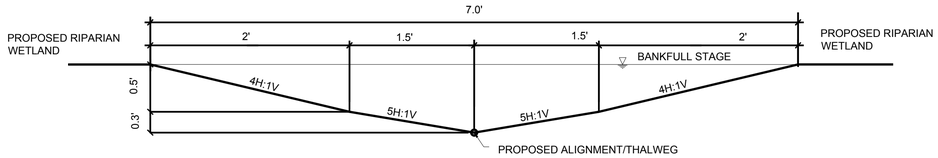
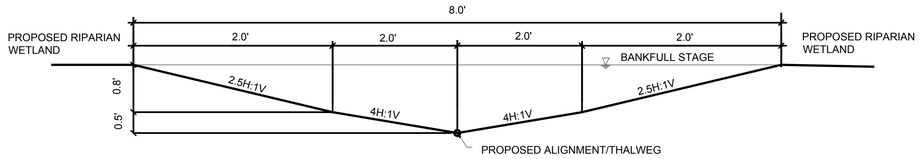
TRIBUTARY 1 A - TYPICAL CHANNEL DIMENSIONS



1 DT-1

TRIBUTARY 1A - STA 0+00 TO STA 11+66
RIFFLE CROSS SECTION

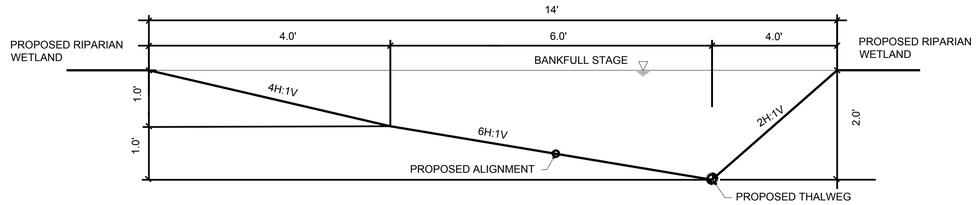
NOT TO SCALE



2 DT-1

TRIBUTARY 1A - STA 11+66 TO END
RIFFLE CROSS SECTION

NOT TO SCALE

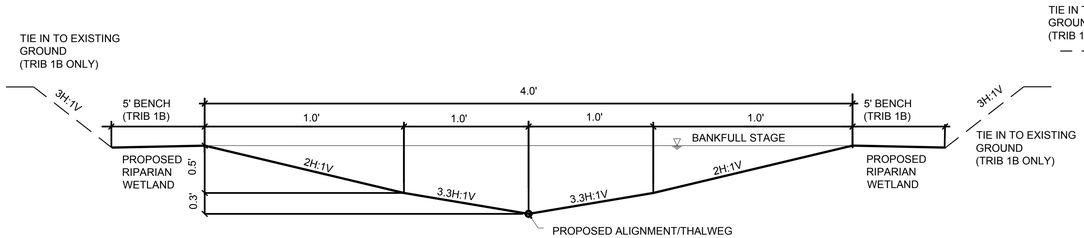


3 DT-1

TRIBUTARY 1A
POOL CROSS SECTION

NOT TO SCALE

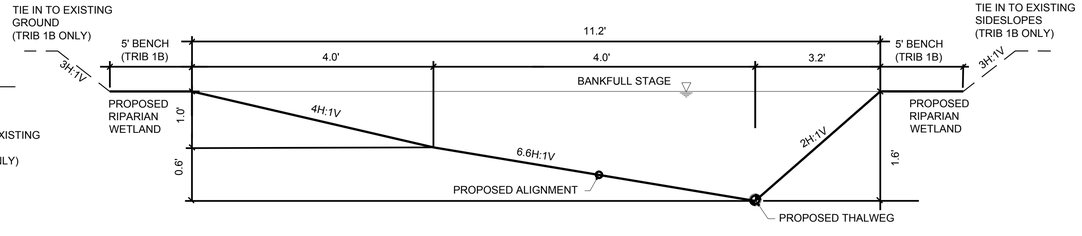
TRIBUTARY 1B, 1C, 2,3,4,5,6 - TYPICAL CHANNEL DIMENSIONS



4 DT-1

TRIBUTARY 1B, 1C, 2 - 6
RIFFLE CROSS SECTION

NOT TO SCALE



5 DT-1

TRIBUTARY 1B, 1C, 2 - 6
POOL CROSS SECTION

NOT TO SCALE

TYPICAL SECTION NOTES (APPLIES TO ALL DETAILED SECTIONS):

1. POOL TYPICAL FOR RIGHT MEANDER SHOWN. MIRROR SECTION FOR LEFT MEANDERS.
2. RIFFLE CROSS-SECTION TYPICALLY OCCURS AT MID-RIFFLE AND POOL CROSS-SECTION AT THE MID-POOL. CHANNEL DEPTH AND SIDE SLOPES WILL VARY ALONG TRANSITION FROM POOL CROSS-SECTION TO RIFFLE CROSS-SECTION. REFER TO PROPOSED PROFILE FOR DEPTHS FROM BANKFULL ELEVATION TO THALWEG ELEVATION.
3. SEE DETAILED CROSS-SECTION SHEETS FOR VARIATION IN SLOPES AND WIDTHS.

MITIGATION PLAN

Freese and Nichols, Inc.
North Carolina Registered Engineering Firm C-3916

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TYPICAL SECTIONS
PROJECT DETAILS

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FILE NAME	DT-9 TREATMENT MARSH.dwg

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SHEET DT-1

SEQ. 1 OF 8

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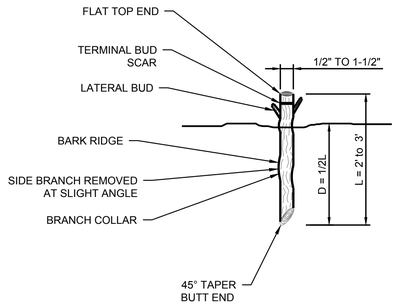
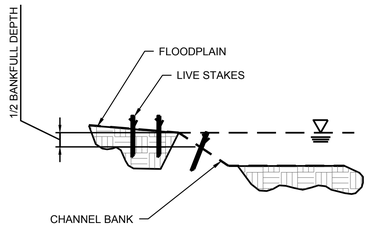
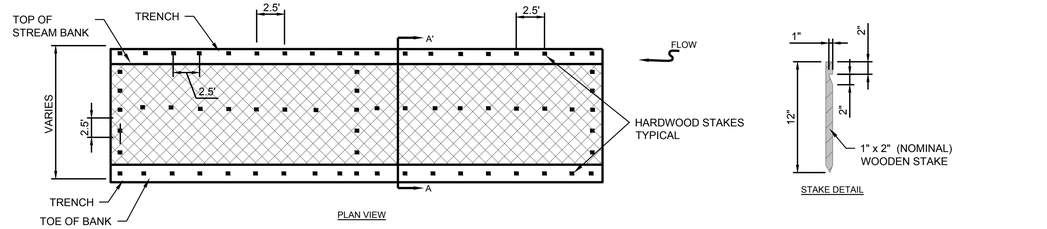


NOTES:

1. ALL LATERAL BRANCHES SHALL BE TRIMMED TO AVOID DAMAGE TO THE BARK RIDGE AND BRANCH COLLAR.
2. A MINIMUM OF TWO BUDS (ONE LATERAL PLUS ONE TERMINAL OR TWO TERMINAL) SHALL BE ABOVE THE PLANTING DEPTH.

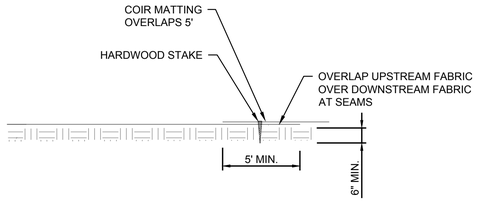


1 DT-2 LIVE STAKES
NOT TO SCALE

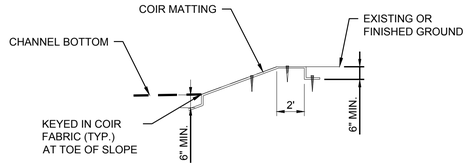


PLAN VIEW

STAKE DETAIL



PROFILE VIEW



SECTION A-A'

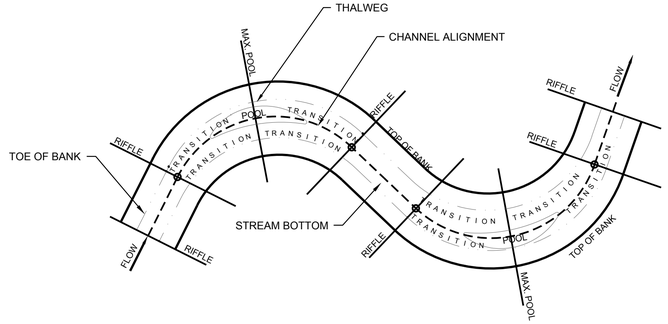
NOTES:

1. MAXIMUM SINGLE LENGTH OF MATTING/MESH IS 100'.
2. TOP AND BOTTOM EDGES OF MATTING/MESH SHALL BE KEYED IN.
3. COIR MATTING DETAIL SHOWN IS FOR PERMANENT INSTALLATION. TEMPORARY INSTALLATION FOR EROSION CONTROL PROTECTION AS STIPULATED SHALL BE TO THE EXTENT THAT THE PROJECT SITE NEEDS TO BE PROTECTED FOR EROSION AND SEDIMENT CONTROL DURING NON-WORKING HOURS.

2 DT-2 COIR MATTING
NOT TO SCALE

NOTES:

1. AREAS IN BETWEEN LABELED FEATURES ARE TRANSITION AREAS.
2. SEE DETAILED CROSS-SECTIONS



CROSS SECTION TRANSITION LOCATIONS
SCALE: NTS

MITIGATION PLAN

Freese and Nichols, Inc.
North Carolina Registered Engineering Firm C-3916

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NORTH CAROLINA NO. 035724
ON DATE: NOV. 2023
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DETAILS
PROJECT DETAILS

NO.	ISSUE	BY	DATE

F&N JOB NO.	NCM20306
DATE	Dec-23
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CHECKED	ICA
FILE NAME	DT-9 TREATMENT MARSH.dwg

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SHEET DT-2
SEQ. 2 OF 8

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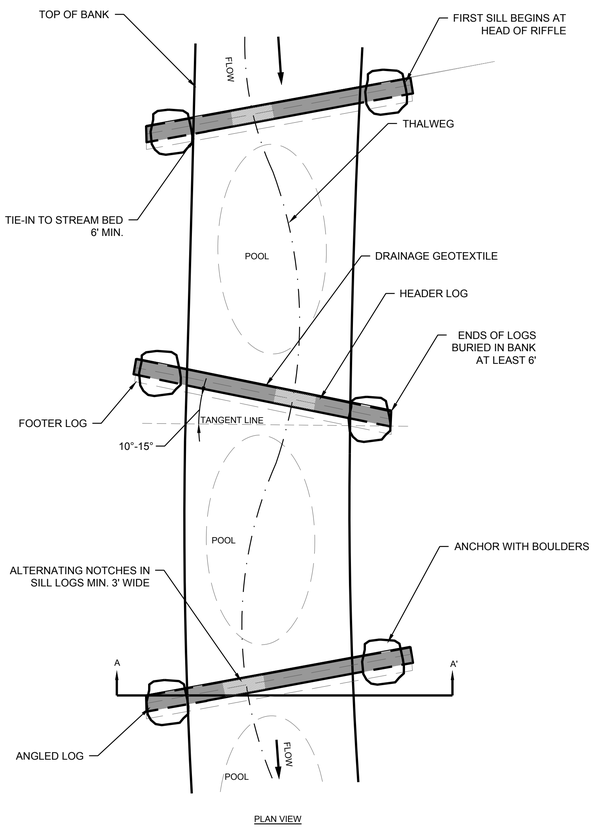
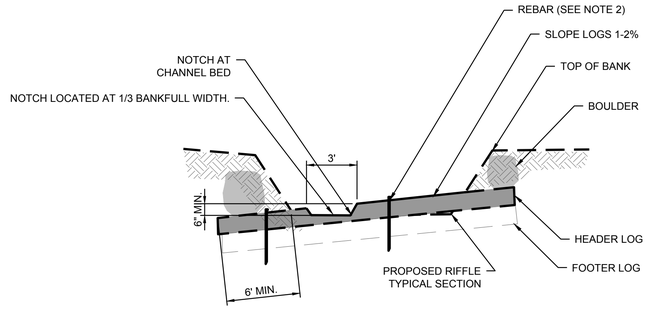
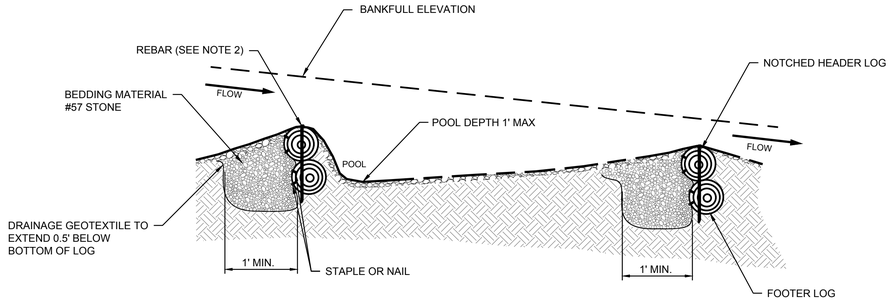


PLAN VIEW



LOG SECTION A - A' LOOKING UPSTREAM



CHANNEL PROFILE

NOTE:

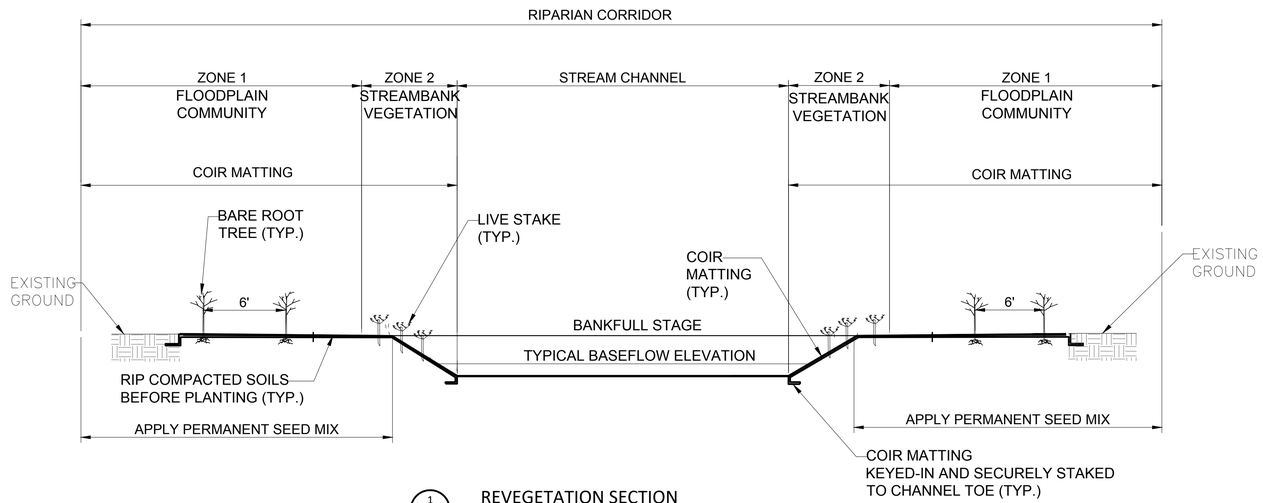
1. ALTERNATE SILL DIRECTION AND SLOPE IN ACCORDANCE WITH PLANS.
2. DRILL 1-1/8" DIAMETER HOLE IN LOGS AND DRIVE #8 REBAR THROUGH. BEND AT TOP.
3. NOTCH LOCATED AT 1/3 BANKFULL, ALTERNATING IN RIFFLE, OR LOCATED AT MIDDLE FOR THE HEAD OF POOL.
4. LOG SHALL BE EMBEDDED IN BANK A MINIMUM OF 6'.
5. ROCK SILL SHALL BE USED IN PLACE OF LOG SILL IN THE STEP POOL AT THE DIRECTION OF THE ENGINEER.
6. MAXIMUM DROP BETWEEN HEADERS SHALL BE 1 FOOT.
7. LOGS SHALL BE A MIN. 10" DIAMETER HARDWOOD.

1 DT-3 ANGLED LOG SILL ROLLER

NOT TO SCALE

NOTES:

1. THIS IS A TYPICAL SECTION; DIMENSIONS WILL VARY BASED ON STREAM REACH LOCATION AND EXISTING TIE-IN CONDITIONS.
3. RIP COMPACTED SOILS BEFORE PLANTING.
4. PLANT BARE ROOT SEEDLINGS ON 6X6 SPACING, STAGGER BETWEEN ROWS.
5. SEE LANDSCAPE SHEETS FOR CHANNEL PLANTING ZONE LOCATIONS AND LIST OF SPECIES TO BE APPLIED IN CHANNEL.



1 DT-3 REVEGETATION SECTION

NOT TO SCALE

MITIGATION PLAN

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DETAILS
PROJECT DETAILS

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FILE NAME DT-9 TREATMENT MARSH.dwg

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SHEET DT-3

SEQ. 3 OF 8

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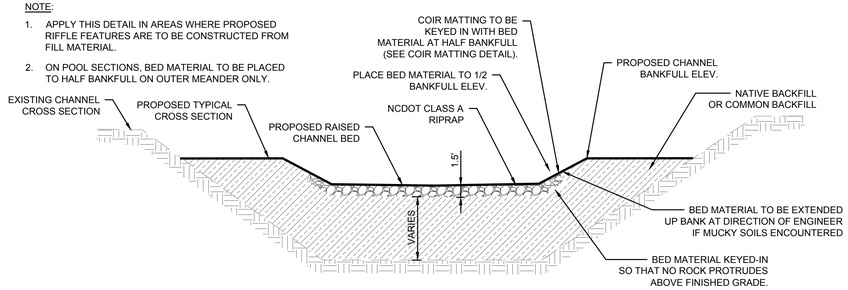
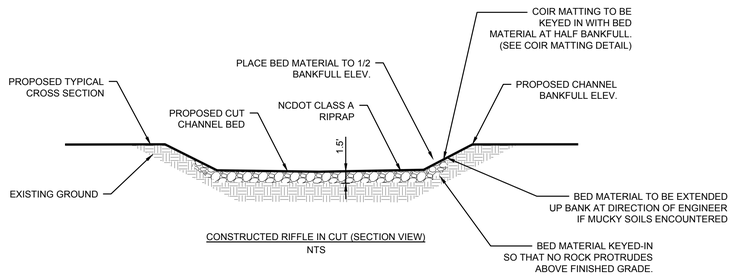
NOTE:

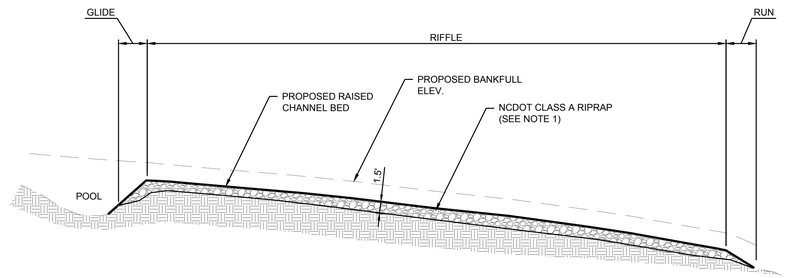
1. APPLY THIS DETAIL IN AREAS WHERE PROPOSED RIFFLE FEATURES ARE TO BE CONSTRUCTED FROM FILL MATERIAL.
2. ON POOL SECTIONS, BED MATERIAL TO BE PLACED TO HALF BANKFULL ON OUTER MEANDER ONLY.



CONSTRUCTED RIFFLE IN FILL (SECTION VIEW)
NTS



CONSTRUCTED RIFFLE IN CUT (SECTION VIEW)
NTS

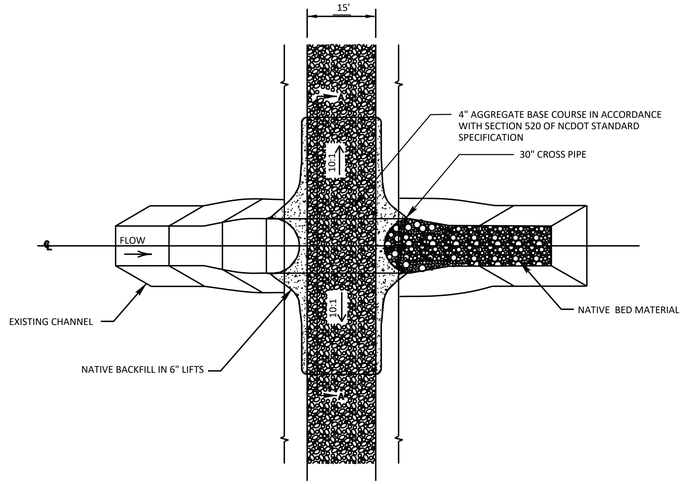


PROFILE VIEW
NTS

NOTES:

1. SOURCED MATERIAL SHALL HAVE TEXTURE, SHAPE, AND APPEARANCE TYPICAL OF SLATE BELT STREAM MATERIAL, AS DIRECTED BY ENGINEER.

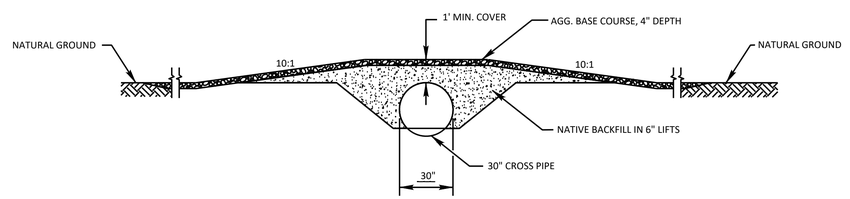
CONSTRUCTED RIFFLE
SCALE: NTS



PLAN VIEW
NTS

NOTES:

1. BURY PIPE INVERTS BELOW THE ELEVATION OF THE STREAMBED BY 20% OF THE CULVERT DIAMETER (6" FOR 30" DIAMETER PIPE) TO ALLOW LOW FLOW PASSAGE OF WATER AND AQUATIC LIFE.



SECTION A-A' VIEW
NTS

PERMANENT STREAM CROSSING
SCALE: NTS

MITIGATION PLAN

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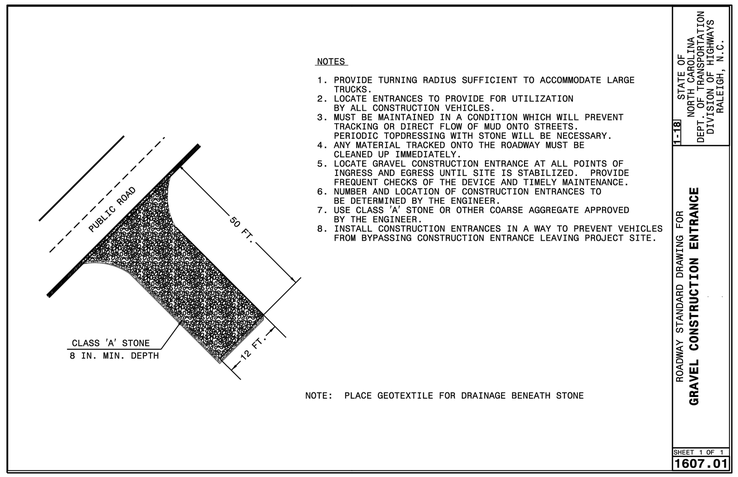


NOTES

1. PROVIDE TURNING RADIUS SUFFICIENT TO ACCOMMODATE LARGE TRUCKS.
2. LOCATE ENTRANCES TO PROVIDE FOR UTILIZATION BY ALL CONSTRUCTION VEHICLES.
3. MUST BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR DIRECT FLOW OF MUD ONTO STREETS. PERIODIC TOPDRESSING WITH STONE WILL BE NECESSARY.
4. ANY MATERIAL TRACKED ONTO THE ROADWAY MUST BE CLEANED UP IMMEDIATELY.
5. LOCATE GRAVEL CONSTRUCTION ENTRANCE AT ALL POINTS OF INGRESS AND EGRESS UNTIL SITE IS STABILIZED. PROVIDE FREQUENT CHECKS OF THE DEVICE AND TIMELY MAINTENANCE.
6. NUMBER AND LOCATION OF CONSTRUCTION ENTRANCES TO BE DETERMINED BY THE ENGINEER.
7. USE CLASS 'A' STONE OR OTHER COARSE AGGREGATE APPROVED BY THE ENGINEER.
8. INSTALL CONSTRUCTION ENTRANCES IN A WAY TO PREVENT VEHICLES FROM BYPASSING CONSTRUCTION ENTRANCE LEAVING PROJECT SITE.

NOTE: PLACE GEOTEXTILE FOR DRAINAGE BENEATH STONE

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

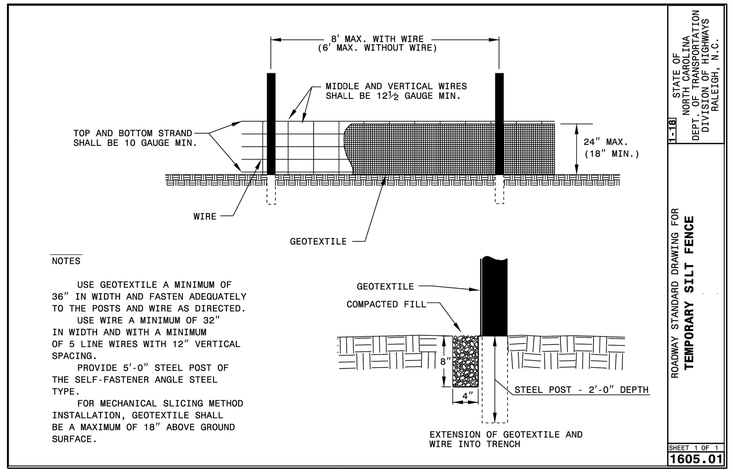
1-18

ROADWAY STANDARD DRAWING FOR
GRAVEL CONSTRUCTION ENTRANCE

SHEET 1 OF 1
1607.01

1 / DT-6 GRAVEL CONSTRUCTION ENTRANCE
NOT TO SCALE

MAINTENANCE REQUIREMENTS:
1. GRAVEL CONSTRUCTION ENTRANCES MUST BE MAINTAINED PER THE NCDOT EROSION AND SEDIMENT CONTROL MANUAL.
2. GRAVEL CONSTRUCTION ENTRANCES MUST BE MAINTAINED IN A CONDITION TO PREVENT TRACKING OR DIRECT FLOW OF SEDIMENT ONTO ADJACENT ROADWAYS.



NOTES

USE GEOTEXTILE A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE POSTS AND WIRE AS DIRECTED.

USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 5 LINE WIRES WITH 12" VERTICAL SPACING.

PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.

FOR MECHANICAL SLICING METHOD INSTALLATION, GEOTEXTILE SHALL BE A MAXIMUM OF 18" ABOVE GROUND SURFACE.

STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

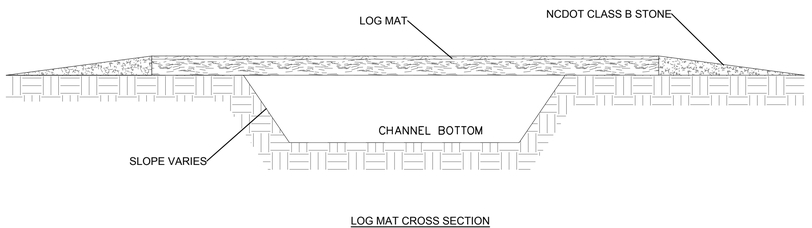
1-18

ROADWAY STANDARD DRAWING FOR
TEMPORARY SILT FENCE

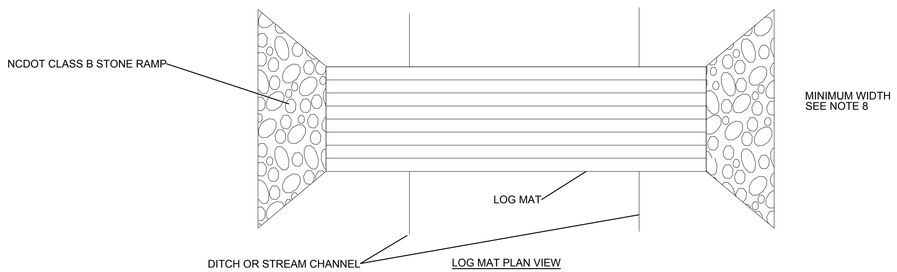
SHEET 1 OF 1
1605.01

2 / DT-6 TEMPORARY SILT FENCE
NOT TO SCALE

MAINTENANCE REQUIREMENTS:
1. TEMPORARY SILT FENCE MUST BE MAINTAINED PER THE NCDOT EROSION AND SEDIMENT CONTROL MANUAL.
2. AT A MINIMUM, REMOVE AND DISPOSE OF ALL SILT ACCUMULATION WHEN THE DEPTH REACHES ½ OF THE HEIGHT OF THEMATC GEOTEXTILE. DO NOT UNDERMINE DURING CLEANOUT.



LOG MAT CROSS SECTION



LOG MAT 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. 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.
7. STABILIZE AN ACCESS RAMP OF CLASS B STONE TO THE EDGE OF THE MUD MAT.
8. THE LOG MAT SHALL BE OF SUFFICIENT SIZE AND WIDTH TO SUPPORT THE LARGEST VEHICLE CROSSING THE CHANNEL.
9. CONTRACTOR SHALL DETERMINE AN APPROPRIATE RAMP ANGLE ACCORDING TO EQUIPMENT UTILIZED, RECOMMENDED AT A 5:1 SLOPE.

3 / DT-6 LOG MAT - TEMPORARY STREAM CROSSING
NOT TO SCALE

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NC DEPARTMENT OF MITIGATION SERVICES
MIDDENDORF SPRINGS MITIGATION SITE
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MITIGATION PLAN

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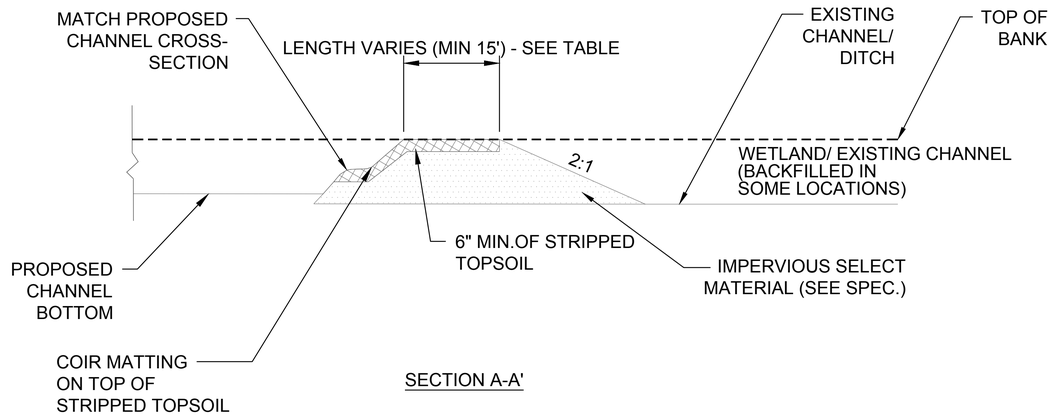
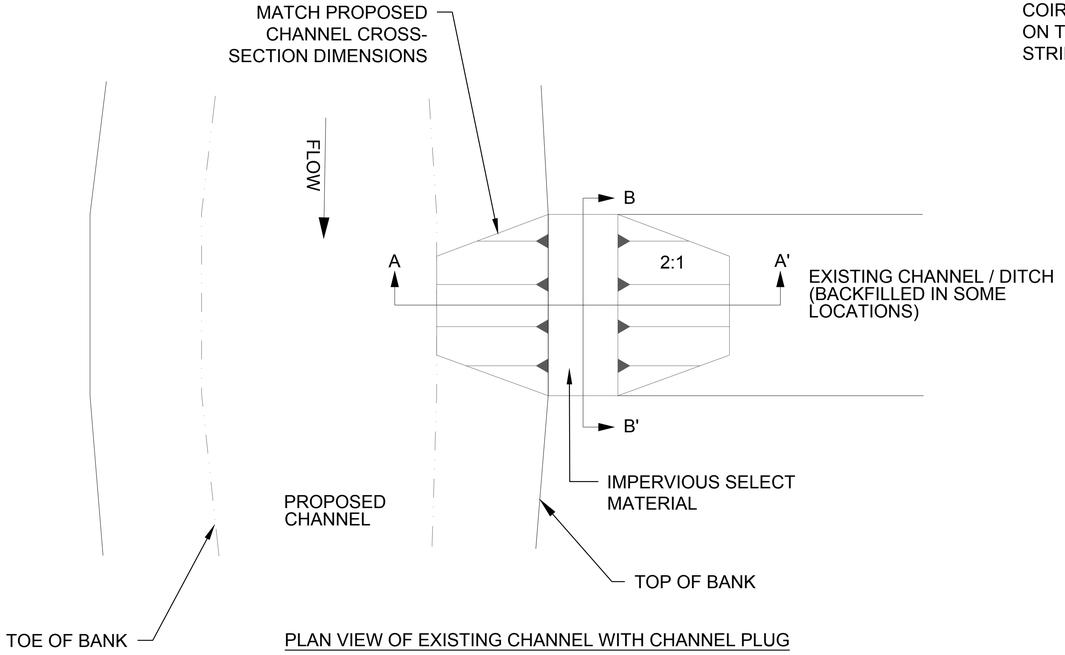
NOTES:

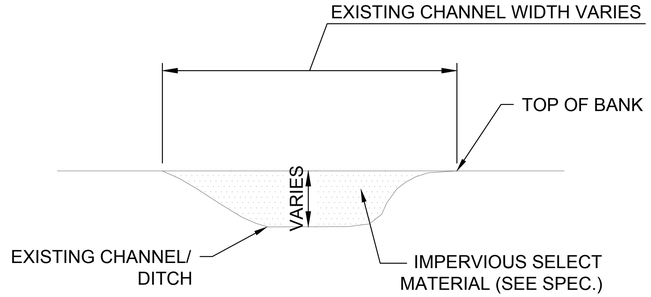
1. 90% COMPACTION RATE IS REQUIRED ON CHANNEL PLUG OR AS APPROVED BY THE ENGINEER.
2. IMPERVIOUS SELECT MATERIAL TO BE ON SITE FILL COMPACTED IN 6" LIFTS
3. SIDE SLOPE THAT IS ADJACENT TO PROPOSED STREAM NEEDS TO MATCH PROPOSED CROSS SECTION IN THAT REGION.
4. CHANNEL PLUG LENGTH IS 15' UNLESS SPECIFIED TO BE LONGER BY DIRECTION OF THE ENGINEER.



SECTION A-A'



PLAN VIEW OF EXISTING CHANNEL WITH CHANNEL PLUG



SECTION B-B'

1 / DT-6

CHANNEL/DITCH PLUG - FOR DITCHES AND ABANDONED CHANNELS

NOT TO SCALE

MITIGATION PLAN

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North Carolina Registered Engineering Firm C-3916

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CHANNEL PLUG DETAIL

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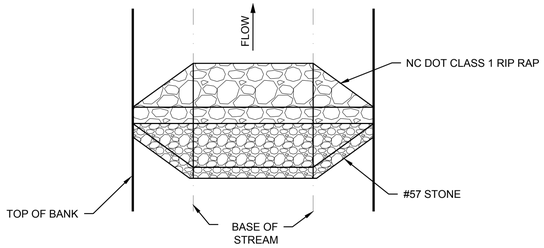
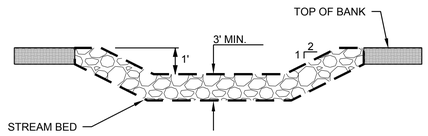
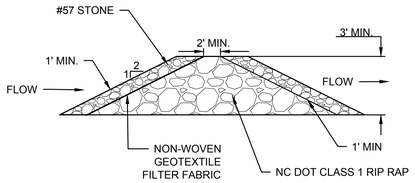


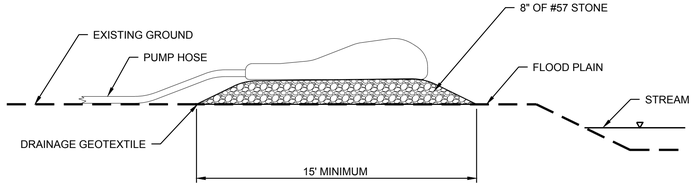
STONE IMPERVIOUS DIKE
PLAN VIEW



STONE IMPERVIOUS DIKE
CROSS SECTION



STONE IMPERVIOUS DIKE
PROFILE



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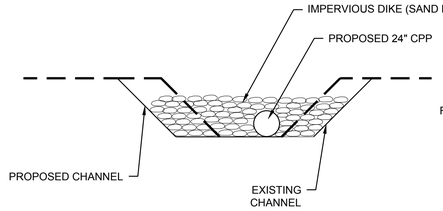
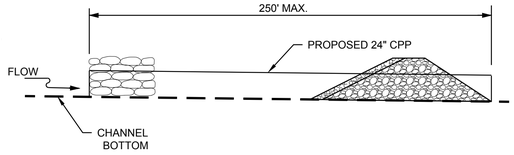
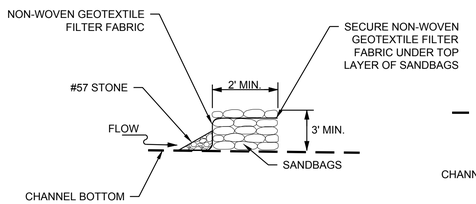


PIPE DIVERSION CROSS SECTION

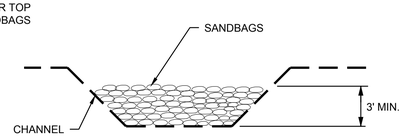


PIPE DIVERSION PROFILE

NOTE:
1. PIPE MUST HAVE POSITIVE DRAINAGE WHEN USING DIVERSION (0.3% TO 2.0% PIPE SLOPE IS RECOMMENDED)



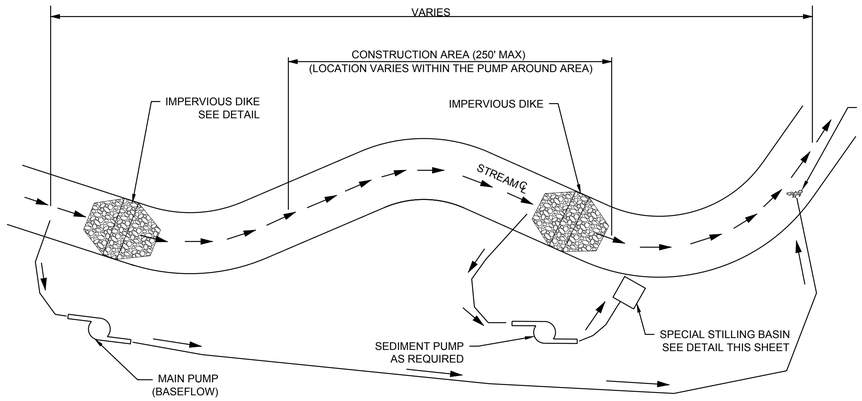
SANDBAG IMPERVIOUS
DIKE PROFILE



SANDBAG IMPERVIOUS DIKE
CROSS SECTION

NOTE:
1. THE STRUCTURE SHALL BE USED FOR DIVERTING AND PUMPING ONLY. THE STRUCTURE SHALL BE RELOCATED OR REMOVED ONCE PUMPING/DIVERTING IS COMPLETE.
2. EITHER TYPE OF IMPERVIOUS DIKE (SANDBAG OR STONE) MAY BE USED.

1 / DT-7 **IMPERVIOUS DIKE**
NOT TO SCALE



PUMP-AROUND DIVERSION PLANVIEW

NOTE:
1. CHANNEL SHALL BE MATTED WITH COIR FIBER MATTING PRIOR TO THE CLOSE OF EACH WORK DAY.
2. IF FINAL CHANNEL GRADING HAS NOT BEEN PERFORMED, TEMPORARILY SECURE COIR MATTING WITH STAKES OR ROCK

2 / DT-7 **PUMP AROUND DIVERSION**
NOT TO SCALE

MITIGATION PLAN

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WOODY PLANTING											
Riparian Wetlands (277525.9 square feet, 6.37 acres)						**Planting Quantity**						
Planting Stock	**Scientific Name**	**Common Name**	**Stratum**	**Wildlife Value**	**Wetland Indicator Status**	**Wetland A (5.28 acres)**	**Wetland B (0.61 acres)**	**Wetland C (0.17 acres)**	**Wetland D (0.31 acres)**	**Total**	**Percent Composition**	**Remarks**
BARE ROOT	*Acer negundo*	Boxelder	Overstory	Supports Imperial moth larvae. Seed source for birds and small mammals.	FAC	375	44	12	22	452	12%	Planted on 9-ft centers, with species randomly distributed.
	Betula nigra	River birch	Overstory	Host for Mourning Cloak and Dreamy Duskywing butterflies. Seed source for grouse, turkey, small birds, and rodents. Catkins are food source for birds and squirrels.	FACW	468	54	15	27	565	15%	
	Cornus amomum	Silky dogwood	Shrub	Pollinator food source, fruits eaten by songbirds, grouse, quail, turkey, large mammals. Wildlife cover and nesting.	FACW	312	36	10	18	377	10%	
	Ilex decidua	Possumhaw	Understory	Host for Henry's Elfin butterfly. Provides nectar for butterflies and other pollinators. Soft mast food source for songbirds and small mammals.	FACW	312	36	10	18	377	10%	
	Platanus occidentalis	American sycamore	Overstory	Seed source and nesting for multiple bird species.	FACW	468	54	15	27	565	15%	
	Quercus pagoda	Cherrybark oak	Overstory	Support multiple moth larvae. Hard mast food source for birds, small mammals, deer and bear.	FACW	406	47	13	24	490	13%	
	Quercus phellos	Willow oak	Overstory	Support multiple moth larvae. Hard mast food source for birds, small mammals, deer and bear.	FAC	375	44	12	22	452	12%	
	Ulmus americana	American elm	Overstory	Supports multiple butterfly larvae. Seeds are food source for songbirds and small mammals.	FACW	406	47	13	24	490	13%	

1 DT-8

RIPARIAN WETLAND PLANT LIST

NOT TO SCALE

WOODY PLANTING								
Zone 2 Riparian Area (2038487.7 square feet, 46.80 acres)								
Planting Stock	**Scientific Name**	**Common Name**	**Stratum**	**Wildlife Value**	**Wetland Indicator Status**	**Total**	**Percent Composition**	**Remarks**
BARE ROOT	*Asiminia triloba*	Pawpaw	Understory	Soft mast food source for opossum, raccoon, fox, squireel, and beare. Browse source for deer.	FAC	2768	10%	Planted on 9-ft centers, with species randomly distributed.
	Betula nigra	River birch	Overstory	Host for Mourning Cloak and Dreamy Duskywing butterflies. Seed source for grouse, turkey, small birds, and rodents. Catkins are food source for birds and squirrels.	FACW	4152	15%	
	Carpinus caroliniana	American hornbeam	Understory	Larval host for the Eastern Tiger swallowtail and Red-spotted purple butterflies. Seed and buds are a food source for songbirds, grouse, quail, turky, fox and squirrels.	FAC	2768	10%	
	Celtis laevigata	Sugarberry	Overstory	Larval host for several butterflies (American Snout, Mourning Cloak, Tawny Emperor, Hackberry Emperor, Question Mark Butterfly). Soft mast food source for many birds and mammals.	FACW	2768	10%	
	Diospyros virginiana	Common Persimmon	Understory	Soft mast food source for birds and mammals	FAC	2768	10%	
	Fagus grandifolia	American beech	Overstory	Hard mast food source for small mammals, deer, bear, fox, grouse, turkey, ducks, woodpeckers, and assorted songbirds.	FACU	2768	10%	
	Lindera benzoin	Spicebush	Understory	Laval host plant for Palamedes swallowtail and Spicebush swallowtail. Soft mast food source for birds, especially in the fall.	FAC	1384	5%	
	Platanus occidentalis	American sycamore	Overstory	Seed source and nesting for multiple bird species.	FACW	4152	15%	
	Quercus nigra	Water oak	Overstory	Support multiple moth larvae. Hard mast food source for birds, small mammals, deer and bear.	FAC	2768	10%	
	Viburnum prunifolium	Blackhaw	Understory	Soft mast food source for birds and mammals.	FACU	1384	5%	

2 DT-8

ZONE 2 RIPARIAN AREA PLANT LIST

NOT TO SCALE

WOODY PLANTING								
Zone 1 Live Stakes (256884.2 square feet, 5.90 acres)								
Planting Stock	**Scientific Name**	**Common Name**	**Stratum**	**Wildlife Value**	**Wetland Indicator Status**	**Total**	**Percent Composition**	**Remarks**
LIVE STAKES	*Alnus serrulata*	Hazel alder	Shrub	Supports Harvester butterfly larvae. Browse source for deer. Flower clusters food source for birds and small mammals.	OBL	7953	20%	Outer meanders planted on 1.5-ft centers, with species randomly dstributed. All other areas planted on 3-ft centers, with species randomly distributed.
	Cephalanthus occidentalis	Buttonbush	Shrub	Attracts hummingbirds, butterflies, and bees. Food source for waterfowl and songbirds.	OBL	7953	20%	
	Cornus amomum	Silky dogwood	Shrub	Pollinator food source, fruits eaten by songbirds, grouse, quail, turkey, large mammals. Wildlife cover and nesting.	FACW	7953	20%	
	Salix sericea	Silky willow	Shrub	Attracts pollinators, only native larval host for viceroy butterfly. Also larval host for Eastern Tiger Swallowtail. Wildlife cover and nesting, browse for mammals.	OBL	7953	20%	
	Sambucus nigra	Elderberry	Shrub	Attracts pollinators, fruits eaten by songbirds and mammals, nesting and cover for quail and pheasants.	FAC	7953	20%	

3 DT-8

LIVE STAKE PLANT LIST

NOT TO SCALE

HERBACEOUS PLANTING				
All Disturbed Area (0.0 square feet, 0.00 acres)				
TEMPORARY SEEDING	Warm Season (May 15 - Aug 15) - German Millet			Apply at 40 lbs/acre to all disturbed areas
	Cool Season (Aug 15 - May 15) - Virginia Rye			
PERMANENT SEEDING	**Scientific Name**	**Common Name**	**% by Weight**	Apply at 25 lb/acre to disturbed areas
	Agrostis hyemalis	Winter bentgrass	0.5%	
	Agrostis perennans	Upland bentgrass	0.5%	
	Andropogon gerardii	Big bluestem	15.0%	
	Andropogon virginicus	Broomsedge	0.5%	
	Coleataenia anceps	Beaked panicgrass	1.0%	
	Coreopsis lanceolata	Lanceleaf coreopsis	1.0%	
	Dichanthelium dichotomiflorum	Fall panicgrass	0.5%	
	Elymus virginicus	Virginia wildrye	34.0%	
	Juncus effusus	Soft rush	0.5%	
	Panicum virgatum	Switchgrass	13.0%	
	Pycnanthemum tenuifolium	Narrowleaf mountainmint	0.5%	
	Rudbeckia hirta	Blackeyed susan	0.5%	
	Schizachyrium scoparium	Little bluestem	10.0%	
	Solidago speciosa	Showy goldenrod	0.5%	
	Sorghastrum nutans	Indian grass	7.0%	
	Tradescantia subaspera	Zigzag spiderwort	1.0%	
	Tripsacum dactyloides	Eastern gamagrass	12.0%	
	Zizia aurea	Golden zizia	2.0%	

4 DT-8

HERBACEOUS PLANT LIST

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MITIGATION PLAN

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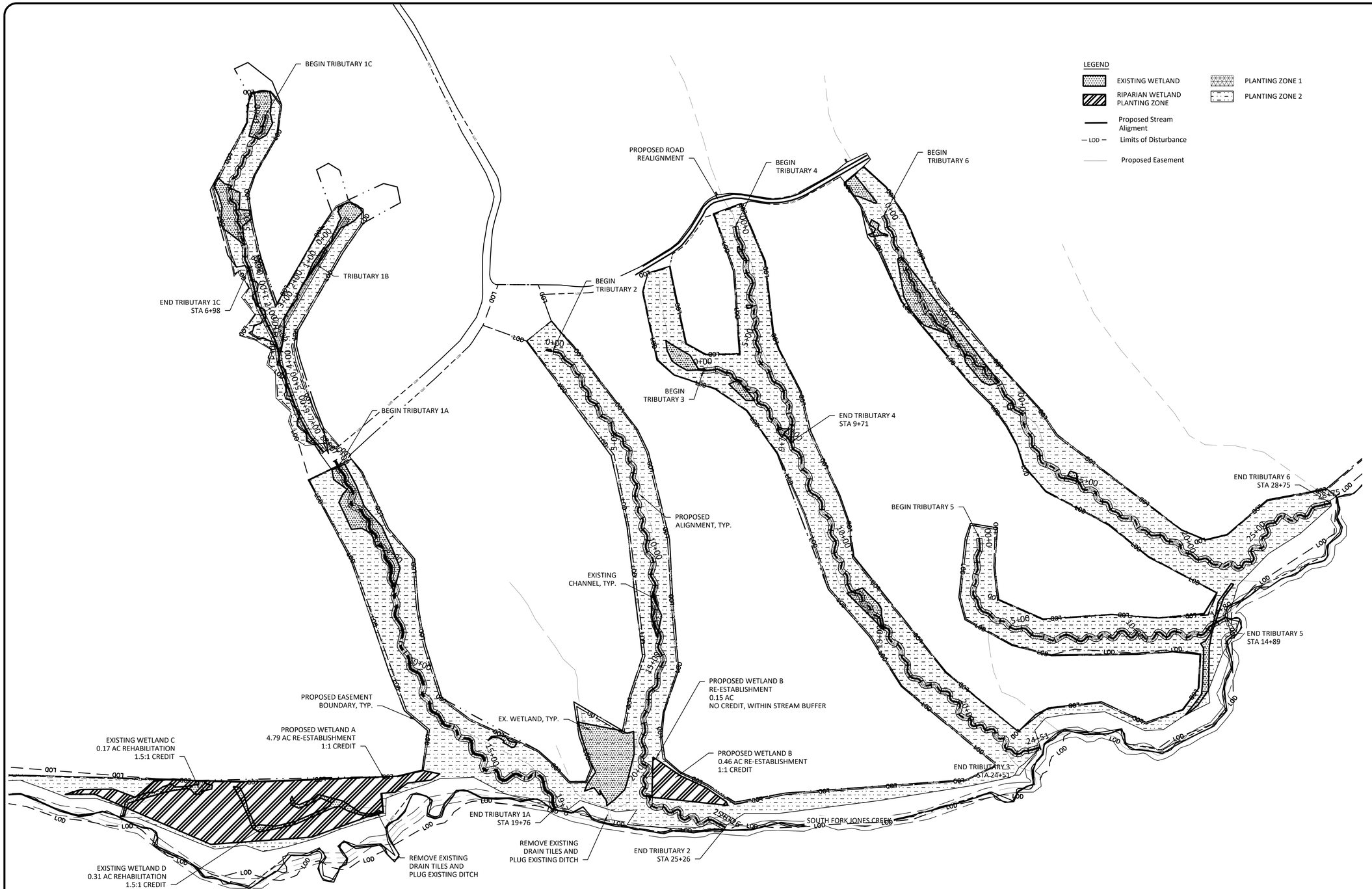

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NC DEPARTMENT OF MITIGATION SERVICES
MIDDENDORF SPRINGS MITIGATION SITE
DRAFT MITIGATION PLAN
PLANTING PLANVIEW

F&N JOB NO.	NCM20306
DATE	FEB 2023
DESIGNED	#FNI
DRAWN	#EDB
REVISED	####
CHECKED	#KKK
FILE NAME	P-1 PLANTING PLAN.dwg

NO.	ISSUE	BY	DATE

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SHEET P-1
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Last Saved: 11/30/2023 1:00 PM Saved By: 04322

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Appendix H

Invasive Species Control Plan

Invasive Species Plan

Invasive species identified at the Site prior to construction included Japanese honeysuckle (*Lonicera japonica*) and Chinese privet (*Ligustrum sinense*) along the stream corridors. During construction, the existing vegetation will be controlled using mechanical methods.

During the monitoring period, the Site will be reviewed annually to locate and quantify any residual invasive species vegetation. If invasive species are identified at the Site during the monitoring period, their location and extent will be shown on the current condition plan view (CCPV). A corresponding discussion will be included in the annual monitoring report outlining the proposed management plan. Invasive species vegetation will be managed and reviewed on an annual basis to minimize its long term impact on the planted native species. Any vegetation control requiring chemical control (i.e., herbicide application) will be performed in accordance with the NC Department of Agriculture rules and regulations.

Parts of the conservation easement areas along South Fork Jones Creek that lie outside the riparian zones of the restored tributaries and riparian wetlands will have invasives clearing and treatment during one growing season and not in following monitoring years. These areas are being put into conservation easement to mitigate for unauthorized activities on the site, and not to produce mitigation credits. They are depicted on “Proposed Mitigation Plan” figure in the Middendorf Springs Mitigation Plan.

Invasive species will be managed and controlled using a combination of chemical and mechanical control methods to ensure that these species comprise less than 1% of the total easement acreage. Management and control will continue throughout the project until this control is achieved.

Appendix I

Maintenance Plan

Maintenance Plan

The Site shall be visited semi-annually, and a physical inspection of the site shall be conducted a minimum of once a year throughout the post-construction period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following measures:

Component/Feature	Maintenance through project closeout
Stream	Routine channel maintenance and repair activities may include chinking of in-stream structures to prevent piping, securing of loose coir matting, and supplemental installations of live stakes and other target vegetation along the channel. Areas where stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting. Stream maintenance activities will be documented and reported in annual monitoring reports. Stream maintenance will continue through the monitoring period.
Wetland	Routine wetland maintenance and repair activities may include supplemental installations of target vegetation within the wetland. Areas where storm water and floodplain flows intercept the wetland may also require maintenance to prevent scour that adversely and persistently threatens wetland habitat or function.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be treated by mechanical and/or chemical methods. Any vegetation requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations. Vegetation maintenance activities will be documented and reported in annual monitoring reports. Vegetation maintenance will continue through the monitoring period.
Beavers	Beaver and associated dams are to be removed as they colonize and until the project is closed.
Site Boundary	Site boundaries shall be identified in the field to ensure clear distinction between the mitigation site and adjacent properties. Boundaries will be marked with signs identifying the property as a mitigation site and will include the name of the long-term steward and a contact number. Boundaries may be identified by fence, marker, bollard, post, tree-blazing, or other means as allowed by site conditions and/or conservation easement. Boundary markers disturbed, damaged, or destroyed will be repaired and/or replaced on an as-needed basis. Easement monitoring and staking/signage maintenance will continue in perpetuity as a stewardship activity.
Farm Road Crossing	Road crossings within the site may be maintained only as allowed by conservation easement or existing easement, deed restrictions, rights of way, or corridor agreements. Crossings in easement breaks are the responsibility of the landowner to maintain.

Appendix J

Credit Release Schedule

Credit Release Schedule

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

Table D1. Stream Credit Release Schedule

Monitoring Year	Credit Release Activity	Interim Release	Total Release
0	Initial allocation – see requirements below	30%	30%
1	First year monitoring report demonstrates performance standards are being met.	10%	40%
2	Second year monitoring report demonstrates performance standards are being met.	10%	50%
3	Third year monitoring report demonstrates performance standards are being met.	10%	60%
4*	Fourth year monitoring report demonstrates performance standards are being met.	5%	65% (75%)**
5	Fifth year monitoring report demonstrates performance standards are being met.	10%	75% (85%)**
6*	Sixth year monitoring report demonstrates performance standards are being met.	5%	80% (90%)**
7	Seventh year monitoring report demonstrates performance standards are being met and the project has received closeout approval.	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 D2. Wetland Credit Release Schedule

Monitoring Year	Credit Release Activity	Interim Release	Total Release
0	Initial allocation – see requirements below	30%	30%
1	First year monitoring report demonstrates performance standards are being met.	10%	40%
2	Second year monitoring report demonstrates performance standards are being met.	10%	50%
3	Third year monitoring report demonstrates performance standards are being met.	10%	60%

Monitoring Year	Credit Release Activity	Interim Release	Total Release
4	Fourth year monitoring report demonstrates performance standards are being met.	10%	70%
5	Fifth year monitoring report demonstrates performance standards are being met. Provided that all performance standards are met, the IRT may allow the DMS to discontinue hydrologic monitoring after the fifth year, but vegetation monitoring must continue for an additional two years after the fifth year for a total of seven years.	10%	80%
6	Sixth year monitoring report demonstrates performance standards are being met.	10%	90%
7	Seventh year monitoring report demonstrates performance standards are being met and the project has received closeout approval.	10%	100%

Initial Allocation of Released Credits

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

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

Subsequent Credit Releases

All subsequent credit releases must be approved by the DE, in consultation with the IRT, based on a determination that required performance standards have been achieved. For stream projects a reserve of 10% of a site's total stream credits shall 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 shall be at the discretion of the IRT. As projects approach milestones associated with credit release, DMS will submit a request for credit release to the DE along with documentation substantiating achievement of criteria required for release to occur. This documentation will be included with the annual monitoring report.

Appendix K

Financial Assurance

Financial Assurances

Pursuant to Section IV H and Appendix III of the Division of Mitigation Services' In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environmental Quality has provided the U.S. Army Corps of Engineers Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by DMS. This commitment provides financial assurance for all mitigation projects implemented by the program.

LANDOWNER AUTHORIZATION FORM

PROPERTY LEGAL DESCRIPTION:

Deed Book: **013, 037** Page: **322,206** County: **Anson**

Parcel ID Number(s): **646000745113, 647000042754, 646000760123**

Street Address: **Near Gulledge Rd**
Morven, NC

Property Owner(please print): **RTB ASSOCIATES, LLC**

Property Owner (please print): **DEB, LLC**

The undersigned, registered property owner(s) of the above property, do hereby authorize Freese & Nichols, Inc. to take all actions necessary for the evaluation of the property as a potential stream, wetland and/or riparian buffer mitigation project, including conducting stream and/or wetland determinations and delineations, as well as issuance and acceptance of any required permit(s) or certification(s). I agree to allow regulatory agencies, including the US Army Corps of Engineers, to visit the property as part of these environmental reviews.

Property Owner(s) Address (if different than above): **28838 Kendall Church Rd**
Richfield, NC 28137-9676

Property Owner Telephone Number: **(704) 985-0438**

We hereby certify the above information to be true and accurate to the best of our knowledge.

Andrew Burleson 8-2-21

(Property Owner Authorized Signature) (Date)

Ann Burleson 8-2-21

(Property Owner Authorized Signature) (Date)