FINAL MITIGATION PLAN

STINKING QUARTER

Guilford County, North Carolina

DMS Project ID No. 100193
Full Delivery Contract No. 200201-01
USACE Action ID No. SAW-2021-00347
DWR Project No. 20210395
RFP No. 16-20200201 (Issued: 5/15/2020)

Cape Fear River Basin
Cataloging Unit 03030002



Prepared for:

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1652

December 2023

Raymond Holz

From: Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>
Sent: Wednesday, December 13, 2023 2:23 PM
To: Dow, Jeremiah J
Cc: Isenhour, Kimberly T CIV USARMY CESAW (USA); Tugwell, Todd J CIV USARMY CESAW (USA); Davis, Erin B CIV USARMY CESAW (USA); Haupt, Mac; Polizzi, Maria; Merritt, Katie; Wilson, Travis W.; Munzer, Olivia; Matthews, Kathryn (kathryn_matthews@fws.gov); Bowers, Todd; Raymond Holz; Grant Lewis (glewis@axiomenvironmental.org); Bradley Breslow
Subject: RE: Approval Letter / NCDMS Stinking Quarter / SAW-2021-00347 / Guilford Co.
Attachments: Approval Letter_NCDMS Stinking Quarter_SAW-2021-00347.pdf; 100193_StinkingQuarter_Response to IRT Comments_2023-11-29_.pdf

Good afternoon Jeremiah,

Thank you for providing the Stinking Quarter Draft Mitigation Plan Comment Responses. We have evaluated the comments generated during the review period and determined that the responses adequately addressed IRT concerns, and we appreciate that the responses included an update to Figure J-1, a revised Section 8.1, and the photo documentation of the existing ATV trail. Please coordinate with the IRT and work with the SPO to record appropriate language regarding ATV Path maintenance following completion of construction. Additionally, please note that the ATV maintenance will need to be addressed as an allowable use in the CE prior to the first credit release.

As mentioned below, please provide a copy of the Final Mitigation Plan when you submit the Preconstruction Notice for the NWP 27. If no permit is required to construct the project, please submit a copy of the Final Mitigation Plan to our office at least 30 days prior to beginning construction. Also, please ensure that a copy of the Final Mitigation Plan is posted to the NCDMS project documents so that all members of the IRT have access to the Final plan.

Thank you,
Casey

Casey Haywood
Mitigation Specialist, Regulatory Division
U.S. Army Corps of Engineers, Wilmington District
(919) 750-7397 work cell

From: Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>
Sent: Wednesday, November 1, 2023 12:27 PM
To: Dow, Jeremiah J <jeremiah.dow@deq.nc.gov>
Cc: Isenhour, Kimberly T CIV USARMY CESAW (USA) <Kimberly.T.Isenhour@usace.army.mil>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Davis, Erin B CIV USARMY CESAW (USA) <Erin.B.Davis@usace.army.mil>; Haupt, Mac <mac.haupt@deq.nc.gov>; Polizzi, Maria <maria.polizzi@deq.nc.gov>; Merritt, Katie <katie.merritt@deq.nc.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>; Munzer, Olivia <olivia.munzer@ncwildlife.org>; Matthews, Kathryn (kathryn_matthews@fws.gov) <kathryn_matthews@fws.gov>; Bowers, Todd <bowers.todd@epa.gov>; Holz, Raymond <Raymond.Holz@davey.com>; Grant Lewis (glewis@axiomenvironmental.org) <glewis@axiomenvironmental.org>; Breslow, Bradley <brad.breslow@davey.com>
Subject: Approval Letter / NCDMS Stinking Quarter / SAW-2021-00347 / Guilford Co.

Good afternoon Jeremiah,

Attached is the approval letter for the NCDMS Stinking Quarter Mitigation Site (SAW-2021-00347) and copies of all comments generated during the project review. Please note that this letter approves the Draft Mitigation Plan provided that the Final Mitigation Plan adequately addresses all comments on the attached memo. Please provide a copy of the Final Mitigation Plan when you submit the Preconstruction Notice for the NWP 27. If no permit is required to construct the project, please submit a copy of the Final Mitigation Plan to our office at least 30 days prior to beginning

construction. Also, please ensure that a copy of the Final Mitigation Plan is posted to the NCDMS project documents so that all members of the IRT have access to the Final plan.

Thank you,
Casey

Casey Haywood
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From: Isenhour, Kimberly T CIV USARMY CESAW (USA) <Kimberly.T.Isenhour@usace.army.mil>
Sent: Thursday, October 12, 2023 5:33 PM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>; Davis, Erin B CIV USARMY CESAW (USA) <Erin.B.Davis@usace.army.mil>; Haupt, Mac <mac.haupt@deq.nc.gov>; Polizzi, Maria <maria.polizzi@deq.nc.gov>; Merritt, Katie <katie.merritt@deq.nc.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>; Munzer, Olivia <olivia.munzer@ncwildlife.org>; Matthews, Kathryn (kathryn_matthews@fws.gov) <kathryn_matthews@fws.gov>; Bowers, Todd <bowers.todd@epa.gov>
Cc: Dow, Jeremiah J <jeremiah.dow@deq.nc.gov>; Holz, Raymond <Raymond.Holz@davey.com>; Grant Lewis (glewis@axiomenvironmental.org) <glewis@axiomenvironmental.org>; Breslow, Bradley <brad.breslow@davey.com>
Subject: Notice of Intent to Approve / NCDMS Stinking Quarter / SAW-2021-00347 / Guilford Co.

Good evening IRT,

We have completed our review of the Draft Mitigation Plan for the NCDMS Stinking Quarter Mitigation Site (SAW-2021-00347). Please see the attached comment memo, which includes all NCIRT comments that were received during the review process along with additional comments provided by Wilmington District staff following our review.

We have evaluated the comments generated during the review period and determined that the concerns raised are generally minor and can be addressed in the final mitigation plan; however, we request that the sponsor provide a response to IRT comments prior to submitting the Final Mitigation Plan and ePCN. Once we review the response to comments, it is our intent to approve this Draft Mitigation Plan (contingent upon the attached comments being addressed in the Final Mitigation Plan) unless a member of the NCIRT initiates the Dispute Resolution Process, as described in the Final Mitigation Rule (33 CFR Section 332.8(e)). Please note that initiation of this process requires that a senior official of the agency objecting to the approval of the mitigation plan (instrument amendment) notify the District Engineer by letter within 15 days of this email (by COB on October 27, 2023). Please notify me if you intend to initiate the Dispute Resolution Process.

Provided that we do not receive any objections, we will provide an approval letter to NCDMS at the conclusion of the 15-day Dispute Resolution window. This approval will also transmit all comments generated during the review process to NCDMS, which must be addressed in the Final Mitigation Plan to be submitted with the Preconstruction Notification Application for NWP 27. All NCIRT members will receive a copy of the approval letter and all comments for your records.

Thank you for your participation. Please contact me if you have questions or wish to discuss.

Be well,
Kim

Kim Isenhour

Mitigation Project Manager
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Response to IRT Comments

Stinking Quarter Mitigation Site, Guildford County
DMS Project ID No. 100193, Full Delivery Contract No. 200201-01, RFP No. 16-20200201
USACE Action ID No. SAW-2021-00347, DWR Project No. 20210395
Cape Fear River Basin Cataloging Unit 03030002

Comments Received (Black Text) & Responses (Blue Text)

Olivia Munzer, NCDWR:

1. Pgs. 62, Pond Dam Removal. We recommend a slow drawdown of the pond, preferably outside the brumation period for turtles (i.e., summer). Fish should not be released from the pond and fish cannot be relocated to another pond. A pond/lake management company can be contacted to remove the fish appropriately. The pond should be drained through a sediment bag to prevent the downstream release of sediment and aquatic species. Once the pond is drained, the legacy sediment can be removed, and the dam breached.
   Ponds are to be dewatered slowly through sediment bags. No fish will be removed from the ponds. Timing of pond removal is expected to be conducted during the month of April, 2024.

2. Pg. 69, 8.5.1 Planting Plan. Last two sentences on page are smaller size text.
   The font of these sentences has been made consistent with the rest of the document.

3. Pg. 71, 8.5.1 and Figures In Table 18, the line between the common name and species name should be removed since the species name is italicized and in parentheses. Some of the plants only have the Genus; please add the species name.
   Table 18 and Figures 8A – 8D have been updated accordingly.

4. Pg. 69, 8.5.1 Planting Plan. The target vegetation communities are Piedmont Bottomland Hardwood Forest and Piedmont Headwater Forest. However, the planting Plan Figures depict where the Slope Forest will be planted. The table on the planting plan table on the figures has the Piedmont/Mountain Bottomland Forest (be consistent with name of community, such as Piedmont Bottomland Hardwood Forest), Dry-Mesic Oak Hickory Forest, and Stream-side Assemblage.
   Figures 8A – 8D have been updated to match table 18 with plant community nomenclature.

5. Please be consistent throughout the document on the vegetation community types.
   The document has been reviewed for consistency with vegetation community types.

6. Proposed Condition Figure 6 – Wetland creation is not included in this figure.
   Wetland creation is depicted on Figure 6, 6C, and 6D in locations of existing pond dams. However, due to the limited acreage and scrutiny of the creation area, these are being dropped from credit generation.

7. A groundwater gauge in the areas of wetland creation is recommended.
   As the wetland area at the Site is 52.636 acres and wetland creation area is 0.851 acres accounting for 0.284 WMUs (0.7% of credit) we have updated the document to remove wetland creation from credit generating areas, and will instead generate riparian buffer credit from these areas. Please note, the physical work associated with wetland creation areas will not change.

8. Wetland Reestablishment Figures – consider using different symbols to depict the different wetland enhancement types because they are difficult to differentiate.
   All wetland mitigation types (i.e., Reestablishment, Rehabilitation, Enhancement, Preservation, and Creation) are depicted using NCDMS' preferred symbology/color scheme. No one color represents more than one mitigation approach/ratio. If a specific example could be shown, we are willing to look to see if we can improve figure clarity.

9. Figure 11 looks like it has two easement boundary lines.
   The easement boundary was clarified in Figure 11.

10. The tricolored bat, which is likely to be listed prior to conclusion of construction activities, should be discussed in Section 7.1. Please describe the tree clearing strategy for when the tricolored is listed since there will be Time of Year restrictions.
    Discussions with USFWS representative Kathy Mathews occurred on October 25, 2023, to determine a path forward with Tricolored bat at the Site. Steps to avoid impacts to this species are outlined below. These steps are not required at this time; however, once the species is listed it will result in a NLAA biological conclusion.

    A discussion has been added to Section 7.1 (T&E Species) that includes the following.
    Tricolored Bat
    Tricolored Bat is Proposed to be listed as Endangered in Late 2023. During the winter, tricolored bats are found in caves and mines; however, in North Carolina are often found roosting in road culverts. In the spring, summer, and fall they are found in forested habitats where they roost in trees, primarily among leaves.

    Biological Conclusion
    The project is anticipated to have beneficial effects on riparian foraging areas without adverse impacts to Tricolored bats or their habitat. Tree removal activities will occur in the winter season and prior to pupping season (May 15th). Therefore, the biological conclusion for this species is **May Affect, Not Likely to Adversely Affect**.

Maria Polizzi / Mac Haupt, DWR:

1) Can any of these various farm ponds be removed? Multiple features begin restoration below an existing pond, which will continue to contribute agricultural runoff directly to the project, which will greatly minimize any uplift associated with the project itself. If not, are there any other plans to reduce agricultural inputs from these ponds from negatively affecting downstream restored areas?
   Farm ponds to be removed are proposed in the Detailed Restoration Plan. Other farm ponds must remain due to landowners wishes to have the ponds remain in place. The remaining ponds are outside of the easement and are not able to be modified as a part of this project.

2) Multiple maps in the attachments still show the pond on UT5 being included. Please ensure all maps and figures are up to date. It is unfortunate that this is no longer going to be removed as part of this project.
   Maps in the attachments (PJD and FEMA) that show the pond on UT5 cannot be changed as these were part of the original evaluation and show correspondence with regulatory authorities.

3) The maintenance plan states that a physical inspection is only required once per year through the monitoring period. Inspections should be conducted more regularly to ensure issues are identified and repaired quickly and that all monitoring equipment is functioning properly.
   The Maintenance plan has been changed to reflect that the Site will be inspected at least quarterly to identify issues for repair.

4) Please include a mini-map on design sheets that show the current sheet relative to the overall site. This prevents a lot of flipping back and forth and makes it much easier to find the page you are looking for.
   An index has been added to Figures 6A-6D indicating what figure is being viewed. Construction documents have an index key on the cover sheet.

5) DWR recommends adding a photo point at/below the drained pond on UT1.
   A photo point has been added immediately below the drained pond on UT1.

6) DWR recommends adding a photo point at/below the removed pond dam at the intersection of NPSQ and UT1.
   A photo point has been added immediately below pond at the intersection of UT1 and NPSQ.

7) DWR recommends having at least one veg plot per pond removal area.
A random vegetation transect has been moved to the pond upstream end of UT 1. With this random transect, Restoration Systems has two permanent vegetation plots and four transects within pond removal areas. As the ponds represent only a fraction of the area of the easement, we believe they are adequately covered by vegetation plots.

8) DWR recommends adding or moving groundwater gauges to the following locations:
   a. Wetland enhancement area above pond removal on upper UT1.
   The groundwater gauge has been moved from the enhancement area below the pond removal on upper UT1 to the requested location.

   b. Wetland preservation area south of the pond removal at the intersection of NPSQ and UT1.
   A groundwater gauge has been added at the requested location.

   c. Wetland enhancement area above pond removal on UT16.
   The groundwater gauge has been moved from the upper reaches of UT 15 (at the spring head) to the requested location.

   The removal of ponds may have an effect on surrounding hydrology and wetlands. It is important to document hydrology in these locations to ensure that wetlands continue to be present (whether enhanced or preserved).
   Understood.

9) DMS Comment 12b: It should be stated in the text that silt/sediment bags will be used specifically for pond dewatering. This BMP is not relevant to stockpiled or spread soil material.
Text has been changed to read as follows. "Dams will be drained through the use of silt/sediment bags and then notched and stabilized early in the construction process and the pond beds will be seeded with temporary grasses to stabilize sediments remaining in the pond." The reference for silt/sediment bags on stockpiled material has been removed.

10) DWR is curious to see the JD for this project when completed, specifically regarding UT18 which is described as intermittent. The DWR Stream ID form shows a score of 18 and the drainage area is 15 acres. "Rooted upland plants in the streambed" is marked as absent (3 points), but in the description and photograph of UT18 on page 36 it states that grass is growing in the channel. Even if this feature is considered jurisdictional, DWR is unsure whether this justifies 1:1 restoration credit.
UT 18 extends more than 640 linear feet upstream of the conservation easement. Land use and erosion from upstream areas have caused the current condition (wide, flat, vegetated swale) of this tributary. As the PJD was conducted by IRT member Mr. Todd Tugwell for the USACE, we feel the tributary should meet the jurisdictional flow regime as stated in the document and is suitable for a 1:1 credit ratio.

11) Please include a figure showing reaches presented in the descriptions (pages 12- 39). It is difficult to determine the exact locations being described.
Reach descriptions presented in the text (pages 12-39) match the reach descriptions listed on Figures 6A-6D.

12) If proposed credit ratios are different, DWR would appreciate a separate description for each reach. For example, on page 14, NPSQ Reaches 3 and 4 are grouped together, but R3 has a proposed 5:1 ratio and R4 is 2.5:1. Why is the credit ratio different? Is one reach more degraded? Is more work needed? The proposed mitigation activities on Page 64 are also grouped together, and since I have not seen this site in person, it would be helpful to have greater detail in order to evaluate justification of credit ratios requested. This comment is not limited to R3 and R4 of NPSQ.
Understood - to assist the reader, a note has been added to Reach Descriptions that indicated the difference in reaches across an existing conditions description.

13) The inclusion of Table 9 is unnecessary as a single soil profile description is not representative of the site. DWR recommends referencing the appropriate appendix section with the soil boring details.
Table 9 has been removed from the document and soil profiles have been referenced in the appropriate appendices.

14) It appears that a detailed soil survey was completed, however somewhat limited information is provided in the appendix. In the soils report, all core locations should be georeferenced. Additionally, they should be documented as "in" or "out" (can be shown as red vs. green dots on the map), and if a core is "in" it should list the hydric indicator associated with the boring.
All soil profile locations are georeferenced with the locations provided in Figures 4A to 4D. The latitude and longitude are labeled on the soil report. Soil profiles that are inside the easement have been labeled as such and color coded on Figures 4A to 4D. In addition, the labels have the hydric soil indicator added.

15) Per the 2016 Mitigation Guidance Document, at least one crest gauge is required on streams that are longer than 1000 LF. DWR recommends adding an additional crest gauges on UT1, UT6 and UT20.
Crest gauges have been added on UT1, UT6, and UT20.

16) DWR recommends including a specified entrenchment ratio metric in the performance criteria.
During a NC DMS technical work group with the IRT on November 27, 2018, it was agreed upon that entrenchment ratio was no longer required for performance criteria. Entrenchment ratio was dropped from success criteria because the value for entrenchment ratio should not change unless the Floodprone Area is contained within the channel banks (Entrenchment Ratio of <2.2 for C-type and E-type streams). This means that as long as the stream accesses the floodplain, the Entrenchment Ratio will stay the same. US Army Corps of Engineers representative Mr. Todd Tugwell attended this technical work group and concurred with the decision. As such, all NC DMS tables no longer have entrenchment ratio included for measurement and monitoring.

17) In Section 7.7 on page 60, DWR disagrees with the statement that 14 stream crossings do not constitute a significant reduction of functional uplift. Although the project is large, 14 crossings is still significant and only one crossing is proposed to be removed. In Section 8.1.1, under Channel Crossing, the plan also states that new crossings will be constructed, which sounds like the number of crossings is actually increasing. Please clarify how many new crossings are proposed and why these are needed if they are not present currently.
Text in section 7.7 has been changed to read as follows. "Easement breaks were evaluated as a potential project constraint as they fragment the Site and reduce the potential functional uplift. This project reduces the number of crossings at the Site from 15 crossings to 14 crossings. In addition, the Site is composed of more than 22,450 linear feet of stream, minimizing the number of crossings to the extent allowable by the landowners. Although easement breaks may reduce the functional uplift to the Site, landowner requirements on active farming operations are a necessary aspect of this stream mitigation project."

18) DWR also prefers to see internal crossings as it is easier to ensure maintenance is performed in a timely manner. Can any of these crossings be internal? If not, please explain why.
Landowner negotiations have dictated that all but two crossing are external to the easement.

19) Section 8.1.1 Floodplain Interceptor: Does "armored with…riffle bed material to control erosion until channel bank vegetation has established" mean rock? Rock should not be used for temporary stabilization, nor should it be used for bank stabilization on stream restoration projects.
The term riffle bed material has been removed from this discussion and replaced with willow stakes.

20) Please provide more information regarding the purpose and need for the ATV trail and what maintenance will be needed for this feature.
The ATV Path is an existing trail system used by the current landowners for passive recreation and observation of the riparian corridor. During landowner negotiations, the continued use of the trail was a requirement of the landowner for participation in the project.

The conservation easement prohibits the improvement of the trail system as it is subject to the conservation easement. However, to maintain the current use of the trail system, the landowner is allowed to clear fallen trees, and any vegetation that may cause a safety concern. No improvements will be made to the existing trail, i.e., placement of fill, excavation, resurfacing, etc.

Stream, wetland, and riparian buffer credit were removed from the footprint of the paths. Table 1 notes were added or updated for clarity to denote credit deduction from subject stream reaches and wetland areas.

Is there risk of erosion over time?
Baseline condition photos of the trail system have been added to the Mitigation Plan (Appendix J) and photo points were added to the Monitoring Plan. Under the current condition, the use of the trail system is not an erosive detriment to the stream, wetland, and forest systems; much of the system currently traverses existing wetlands and forested areas.

21) Section 8.1.4, second to last bullet point: DWR disagrees that proper and lawful timber harvesting is a threat to stream reaches. Streamside management zones (similar to buffers) are required by state law on all intermittent and perennial streams and data has shown that timber harvesting is not a risk to water quality when done properly. That being said, this preservation area will help to provide connectivity between portions of the mitigation project that would be a boon to the overall site.
The verbiage has been changed in the report to state the following. "Although the reach is not currently under direct threat of destruction, the IRT has agreed to allow preservation on this project to protect wetlands streams and to connect various reaches of the Site for mitigation purposes."

22) Please provide more detail about the "shoot cutoff" on the lower reaches of NPSQ.
The shoot cutoff on the lower reaches of NPSQ is a meander bend that has become so tortuous that the channel is in jeopardy of cutting back on itself. Once this happens, the surface water slope becomes very steep in the newly formed cutoff channel with resulting headcut migration up and downstream and further intrenchment of the channel. The current plan for the shoot cutoff is to tie in to the upstream and downstream reaches and control the slope with grade control and habitat structures, thereby creating habitat, reducing erosion, and inhibiting headcut migration.

23) Section 8.4, Soil Restoration: Is sufficient topsoil available to cover subgrade after construction is completed? If not, what strategies will be utilized to ensure proper organic matter/growing medium is present to ensure planted species are successful?
It is expected that sufficient topsoil is available to cover subgrade after construction. At present, there is no surface grading proposed on wetlands or streams at the site.

24) Table 18, Planting Plan: Is there concern for the long-term survival of Green Ash? Consider selecting a different species.
Though susceptible to the Emerald ash borer (EAB) we believe Green ash can provide a critical role as a primary successional tree on mitigation sites in that their fast-growing nature can provide early shade to secondary succession species. Green ash represents 4 percent of the proposed planted species. We do not believe planting 4% of the site with Green ash will pose a problem in meeting success criteria.

25) Due to the small drainage area (3.9 acres) and current vegetation on UT3, it is DWR's opinion that the 2.5:1 ratio for this feature should be reduced as minimal work is needed and functional uplift is limited due to the small watershed.
UT3 is a perennial stream that is accessed by livestock. Although the stream has a small watershed, the channel initiates at a spring that is relatively permanent. The channel has been vetted by the IRT during multiple site visits. However, the channel will be reduced to a 5:1 ratio to efficiently move the project through the permitting stage.

26) There are a significant number of drop structures proposed as part of this project. DWR understands that in order to line up grade between existing features this may sometimes be necessary. But would it be possible to limit the number of drop structures and instead spread the decreasing elevation across the length of the reach in some locations? Are there any concerns about using wood for all of these structures?
During channel design, one of the design criteria is maximum riffle slope. If the channel exceeds maximum riffle slope shear stress becomes a problem from an erosional standpoint. The way we deal with this is through dropping the channel off a structure and isolating the shear in a pool and away from the banks. We do not have concerns about using wood for the structures.

27) Table 14, pg. 56: The score for WAM 5 is high, but the corresponding location on the map shows wetland enhancement. What is being enhanced? DWR questions whether this justifies 2:1 credit if the wetland is already performing well.
Livestock have direct access to the wetlands associated with WAM 5. Removal of livestock from this area is the specific enhancement associated with this wetland.

28) Table 14, pg. 56: I do not see JH-07 or JA-01 on the map. JA-01 is also scoring as high (WAM). What is proposed for this location?
WAM for JH is WAM 9 as shown on Figure 4A. Wetland JA is outside of the easement in the upper reaches of UT 1. WAM for JA has been removed from the Table.

29) There are a number of wetland re-establishment or rehabilitation areas that extend to the easement boundary. Is there concern of hydrologic trespass in these locations? DWR is also concerned that future actions by the landowner could negatively affect the hydrology in these locations. It is typically preferred to have setback from the easement boundary to ensure wetland hydrology is protected in perpetuity.
The valley walls of the site are sloped such that hydrologic trespass will not occur outside the easement. Throughout the entirety of the Site, the easement extends to sloping valley walls and the floodplain is contained within the easement. This results in minimal impacts the landowner may have on wetlands inside the easement. A section will be added to Section 10.0 (Adaptive Management Plan) that states the following:

"Adaptive management strategies to ensure hydrologic trespass are proposed for this project to ensure groundwater does not extend beyond the conservation easement boundary into the adjacent property. Alternatives for adaptive management may include the following.

1) Construct a berm to limit hydrologic trespass outside of the easement.
2) Add drain tile outside of the easement and ensure the drain tile does not encroach into the easement. The drain tile must discharge at the floodplain elevation and outside the easement boundary.
3) Build up the floodplain outside of the easement such hydrologic trespass no longer exists."

Kim Isenhour, USACE:

1) Please confirm that the marsh treatment area at the top of UT1 is in a non-jurisdictional area, upstream of the stream origin of the enhancement II reach.
The marsh treatment area at the top of UT 1 is located up-valley of the origin point and is a non-jurisdiction area.

2) Figures 6B & 9B: Please confirm that the emergency spillway from the pond above UT5 is not credited. It's unclear on the figures. Additionally, I'm unable to locate UT8 and UT13 on any of the figures but they're listed on Figure 3.
   1) The spillway above UT5 is listed in black hatch as non-credit generating and is not credited. The black hatch has been added to the legend for clarification.
   2) UT8 and UT13 were dropped from the project. However, these tributaries were named on the PJD and we have left the nomenclature of all stream the same as the PJD. UT8 and UT13 have been removed from the legend on Figure 3.

3) Figure 9C: Please add a groundwater gauge to the creation wetland located south of N Prong Stinking Quarter Creek.
As the wetland area at the Site is 52.636 acres and wetland creation area is 0.851 acres accounting for 0.284 WMUs (0.7% of credit) we have updated the document to remove wetland creation from credit generating areas, and will instead generate riparian buffer credit from these areas. Please note, the physical work associated with wetland creation areas will not change.

4) Page 59, Section 7.4: I share the same concern as DWR's comment #29 regarding the potential for hydrologic trespass in adjacent agricultural fields. What is to stop the landowner from ditching along side the easement boundary to alleviate wetness in the ag-fields, which could potentially have a drainage effect on project wetlands, and could also alter surface flow that feeds the site? I appreciate that this site has wide buffers, but since similar soils and topography to the project also exist in the adjacent properties, there is risk of increasing wetness in adjacent ag-fields.
The valley walls of the site are sloped such that hydrologic trespass will not occur outside the easement. Throughout the entirety of the Site, the easement extends to sloping valley walls and the floodplain is contained within the easement. This results in minimal impacts the landowner may have on wetlands inside the easement. A section will be added to Section 10.0 (Adaptive Management Plan) that states the following. "Adaptive management strategies to ensure hydrologic trespass are proposed for this project to ensure groundwater does not extend beyond the conservation easement boundary into the adjacent property. Alternatives for adaptive management may include the following.

   1) Construct a berm to limit hydrologic trespass outside of the easement.
   2) Add drain tile outside of the easement and ensure the drain tile does not encroach into the easement. The drain tile must discharge at the floodplain elevation and outside the easement boundary.
   3) Build up the floodplain outside of the easement such hydrologic trespass no longer exists."

5) Page 62: The IRT has observed severe sediment cracking and fissures in pond bottoms where the existing pond sediment is not removed. In addition to placing suitable soil material where the channel will be constructed, I would caution that it's risky to leave the remaining mucky pond bottom material in the buffer after the ponds have dewatered.
Understood.

6) As a general rule, please include at least one random plot along each tributary each monitoring year to give an overall indication of vegetation success. Additionally, please add a random veg plot to areas where pond dams were removed, at least once during vegetation monitoring, preferably after monitoring year three.
Random transects are shown on each tributary, except for reaches that are too short, or are in wooded reaches. A Random transect was added to the pond south of NPSQ.

7) Section 9.2.2: I would suggest adding language that discusses the potential for the site to become too wet, and how that will be addressed. As well as discussing the potential for hydrologic trespass onto adjacent property.
A paragraph has been added to the Section 9.1 (Success Criteria) that states the following. "Due to floodplain soils being wet scattered openings dominated by herbs and shrubs are likely to develop over time. These areas are expected to be less than an acre in size and encompass less than 20% of the Site. If such a case arises, herbaceous plots may be utilized to show that a monoculture of one species is dominating the wetland area. Herbaceous plots are to be 2 meters by 5 meters and a minimum of three herbaceous species must occur in the plot to be successful."

   A section will be added to Section 10.0 (Adaptive Management Plan) that states the following. "Adaptive management strategies to ensure hydrologic trespass are proposed for this project to ensure groundwater does not extend beyond the conservation easement boundary into the adjacent property. Alternatives for adaptive management may include the following.

   1) Construct a berm to limit hydrologic trespass outside of the easement.

2) Add drain tile outside of the easement and ensure the drain tile effect does not encroach into the easement. The drain tile must discharge at the floodplain elevation and outside the easement boundary.
3) Build up the floodplain outside of the easement such hydrologic trespass no longer exists."

8) Figure 9B: Please shift the cross-sections on UT6 downstream to where the pond is being removed, just above the crossing.
Cross Sections have been shifted to the requested location, just above the crossing.

9) Figure 9D: Please shift the cross-sections on UT16, UT20 and UT17 to the pond bottoms that are being drained.
Cross Sections on UT16 and UT17 have been shifted into the pond bottoms. UT20 does not have a pond on its reach. Figure 9D has only to two ponds on UT16 and UT17.

10) The NCSAM score for SAM 5-UT5 (mid) is High, but this reach is proposed for restoration. Please justify in the text. Additionally, please justify the WAM5 area that scores High but is proposed for wetland enhancement. The functional uplift is unclear.
Text has been added to Section 8.1.2 (Stream Enhancement [Level I]) that reads as follows. "Stream enhancement (level I) will entail stream dimension restoration, installation of habitat and grade control structures, easement markers, and planting riparian buffers with native forest vegetation to facilitate stream recovery and prevent further stream degradation. Enhancement (Level I) occurs on UT 5 immediately downstream from the road accessing the western portion of the Site (identified as UT5 [mid] on SAM forms on Figure 4B Appendix A). Although this reach scored HIGH on SAM forms, the reach is relatively incised and straightened, and must be raised up to the floodplain elevation for downstream stream restoration to occur."

WAM 5 is in an area with livestock access to the wetland area. Functional uplift to this wetland revolves around removing livestock from the wetland.

11) Section 3.6: Please ensure that the signed PJD is included in the final mitigation plan, signed by Casey Haywood 12/01/2021, with updated map features provided by David Bailey 11/17/2021. The version included in the draft plan was not signed.
The final PJD was signed by Casey Haywood has been included with the final version of the document.

12) ESA: Please run the iPAC planning tool again since other species have been listed/uplisted since this report was run. Also, please make sure that the species surveys are current and conducted during the appropriate time of year. Most plan surveys expire after two years, and these were conducted in 2020 and 2021. Lastly, please include the species conclusion table in the final mitigation plan.
An updated IpaC list has been run and is included in Appendix E. In addition, protected species surveys were conducted for Schweinitz's sunflower that has expired. The updated survey letter has been included in Appendix E.

Discussions with USFWS representative Kathy Mathews occurred on October 25, 2023, to determine a path forward with Tricolored bat at the Site. Steps to avoid impacts to this species are outlined below. These steps are not required at this time; however, once the species is listed it will result in a NLAA biological conclusion. Tricolored Bat has been added to Table 15 (Threatened and Endangered Species), along with a discussion in the document that reads as follows.

"Tricolored Bat
Tricolored Bat is Proposed to be listed as Endangered in Late 2023. During the winter, tricolored bats are found in caves and mines; however, in North Carolina are often found roosting in road culverts. In the spring, summer, and fall they are found in forested habitats where they roost in trees, primarily among leaves.

Biological Conclusion
The project is anticipated to have beneficial effects on riparian foraging areas without adverse impacts to Tricolored bats or their habitat. Tree removal activities will occur in the winter season and prior to pupping

season (May 15th). Therefore, the biological conclusion for this species is **May Affect, Not Likely to Adversely Affect**".

13) Appendix H and page 62: Section H of the conservation easement does not allow for maintenance of existing roads/trails. The text on page 62 states that easement restrictions have been placed on the path; however, these restrictions are not clear except that maintenance is not allowed. Is the removal of downed tress the only allowable maintenance? Will the landowner be allowed to hand-cut vegetation that grows into the path? The location, width, length, current condition, and allowable maintenance should be clearly described on page 62 and in appendix H of the conservation easement.
Under "8.1.1 Stream Restoration - Existing Soil Path" draft MP page 62, was updated to "Existing ATV Path."

The revised section of the mitigation plan was updated to provide additional descriptive narrative of the trail system, including the proposed marking system which will line the trail systems every 100-feet. For marking, we've proposed Dual-Sided Utility Posts by Carsonite – which are flexible, and can survive a tire impact, we belief these to be the best solution for safety and marking; simar this example:
https://www.carsonite.com/products/utility/greenline-single-curve-(cgd)



Baseline condition photos of the trail system have been added to Appendix J of the Mitigation Plan. The Site's Maintenance Plan was updated to include maintenance language regarding the Paths. Photo points were added to the Monitoring Plan.

A revised version of Section 8.1.1 and Appendix J are attached to these comments for review.

The conservation easement was recorded in September of 2022. If deemed necessary by the IRT, and upon completion of construction, RS will work with the SPO to record appropriate language regarding ATV Path maintenance.

14) The IRT site visit summary indicates that Todd stressed the fact that credits may be adjusted if the ATV trails remain. I assume these trails are synonymous with the soil path on Figure 9D.
Correct, verbiage was updated in the mitigation plan to be consistent between all documents.

More discussion should be included in the text to describe the location of these trails, their intended use, maintenance, and how credit adjustments were calculated.
Baseline condition photos of the trail system have been added to Appendix J of the Mitigation Plan. The Site's Maintenance Plan was updated to include maintenance language regarding the Paths. Photo points were added to the Monitoring Plan.

Stream, wetland, and riparian buffer credit were removed from the footprint of the paths. Table 1 notes were added or updated for clarity to denote credit deduction from subject stream reaches and wetland areas.

15) UT12: It's not appropriate for stream restoration to go through wetland preservation areas. The wetlands that are impacted by stream restoration should be changed to wetland enhancement.
Wetlands have been changed from preservation to enhancement for 15 feet on each bank. This allows for construction equipment to access the stream for restoration purposes and is also the area for the Streamside Assemblage planting zone.

16) Appendix B and Table 7: Please explain why the two reference sites, Cedarock Park and Causey Farm have significantly lower drainage areas and bankfull discharge. How is this relevant to the site streams? Why wouldn't you use morphology parameters from the preservation reaches on-site?
The only preservation reaches on the Site are for N Prong Stinking Quarter Creek, which is impacted by upstream and downstream land uses. It is considered Preservation due to the forest surrounding the channel and is not suitable for reference measurements. The Cedrick Park and Causey Farm reference reaches are suitable for the Site due to the way reference reaches are used in design (dimensionless ratios). It is not feasible to measure an exact drainage area stream for a Site as there are many drainage areas within each Site. Dimensionless ratios allow a designer to use a smaller, or larger stream to compare with the target stream. As these reference sites have been used successfully on restoration sites in the immediate vicinity of the Site (Cause Farm located less than 1 mile east of the Site, it seems appropriate to use these reference reaches.

17) Table 1: The comments sections lists several 6-7 ft crossings that are not shown on the Figures. (NPSQ R1, UT 19 R1, UT 20 R3)
The 6-ft and 7-ft breaks are for the ATV paths. Table 1 notes were added or updated for clarity to denote credit deduction from subject stream reaches and wetland areas. Stream, wetland, and riparian buffer credit were removed from the footprint of the paths.

18) General comments on the design sheets: Several reaches have several drop structures, such as UT5, UT6 and UT9. Is it possible to spread these out over the length of the channel? I also question the transition points on some of the tributaries.
During channel design, one of the design criteria is maximum riffle slope. If the channel exceeds maximum riffle slope shear stress becomes a problem from an erosional standpoint. The way we deal with this is through dropping the channel off a structure and isolating the shear in a pool and away from the banks. We do not have concerns about using wood for the structures.

Transition points on the tributaries matches what was presented to the IRT during the walkthrough. We do not know what transition points are in question.

19) Table 4: The regulatory considerations for 401/404 are not yet resolved.
The intent of these indicating they are resolved is that they will be prior to final submittal. Moving forward we will list them as not resolved in the draft, and update them to resolved in the final document submitted with permits.

20) Section 3.5: I appreciate the individual descriptions, vegetation, invasives, channel conditions, and photos of each reach. This was helpful in the review and to document existing conditions.
Understood.

21) Page 47: The text describes wetter than normal conditions, immediately before the March 20 growing season through mid-April; however, gauges 9 and 16 show high groundwater levels well into June-August. Please further justify proposed rehabilitation when hydrology already meets the proposed performance standard. With the current existing gauge data, enhancement seems more appropriate in these two areas.
Gauge 9 is currently located in a wetland enhancement area. Gauge 16 is located immediately adjacent to a ditch capturing a spring. This gauge is expected to become significantly wetter once the ditch is filled.

22) There are several areas of wetland creation on site and I did not notice a grading plan or grading figure.
Wetland creation is limited to dam removal areas. The only grading is the removal of the earthen dams themselves. The footprint of the dams will be graded to match upstream and downstream elevations. Please note – wetland creation crediting was removed from the document.

23) I noted the absence of groundwater gauges in all wetland creation areas. While these areas are not large, you will still need to demonstrate that they are meeting wetland success criteria. Please explain how you will demonstrate this during monitoring without gauge data.
As the wetland area at the Site is 52.636 acres and wetland creation area is 0.851 acres accounting for 0.284 WMUs (0.7% of credit) we have updated the document to remove wetland creation from credit generating areas, and will instead generate riparian buffer credit from these areas. Please note, the physical work associated with wetland creation areas will not change.

24) Page 61: The section on channel crossings should be expanded to describe the current condition of each crossing and explain how it will be improved. Several existing crossings are being improved upon, so this should be explained in detail in this section. This should be detailed for each crossing individually. Also, an explanation as to why the crossings are not internal to the easement should be included.
A discussion has been added to Section 8.1.1 (Stream Restoration) titled Channel Crossings. The discussion includes a table with descriptions of crossing location, type, size, condition, notes, and proposed. The discussion expands upon the proposed crossings to include keeping the existing crossing in place, upgrading an existing crossing, remove crossing, and change crossing type. Two crossings are internal to the easement and the remaining crossings are external to the easement, based on landowner negotiations.

25) Table 18: There are several FACU species included in the planting mix for bottomland forest areas. These areas may be better suited to FAC/FACW species.
Planting plan is based on vegetation communities which include both FAC and FACW species. We believe it is appropriate to have a diverse planting plan that may include FACU species within/around wetland areas.

26) Table 20—Vegetation: Volunteer stems on the approved planting list may be counted towards success after being present for two years. Additionally, any single species can only account for up to 50% of the required number of stems withing any plot.
Table 20 has been updated accordingly.

27) Please provide a response to IRT comments prior to submitting final mitigation plan and ePCN.
Understood.

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Response to IRT Comments

Stinking Quarter Mitigation Site, Guildford County
DMS Project ID No. 100193, Full Delivery Contract No. 200201-01, RFP No. 16-20200201
USACE Action ID No. SAW-2021-00347, DWR Project No. 20210395
Cape Fear River Basin Cataloging Unit 03030002

Revised Mitigation Plan Language

Section 8.1.1

Existing ATV Paths

Existing ATV Paths were surveyed and platted in the recorded conservation easement plat (Appendix H). The ATV Paths are shown on Appendix A figures, and detailed in Appendix J, which includes an overview figure and exiting conditions photos.

The ATV Path is an existing trail system used by the current landowners for passive recreation and observation of the riparian corridor. During landowner negotiations, the continued use of the trail was a requirement of the landowner for participation in the project.

The ATV Paths includes two reaches (Figure J-1, Appendix J) and is 6-feet in width – as plated in the recorded conservation easement plat. The main reach enters the Site's southeastern corner, on the south side of the North Prong Stinking Quarter Creek (NPSQC) and runs west within the NPSQC's riparian floodplain. This segment of path is +/- 2,690 feet with some portions located outside of the easement area. Four (4) gates will be installed along the path, where it enters and exists the easement area. The second reach is a spur from the first and crosses NPSQC and UT-20 before existing the easement on the north side of the NPSQC's floodplain. This reach is +/- 580 feet and will require one (1) gate when it exists the easement area.

The conservation easement prohibits the improvement of the ATV Paths, as they are subject to the conservation easement. However, to maintain the current use of the trail system, the landowner is allowed to clear fallen trees, and any vegetation that may cause a safety concern. No improvements will be made to the existing trail, i.e., placement of fill, excavation, resurfacing, etc.

Dual-Sided Utility Posts by Carsonite will mark the ATC Paths every 100 feet. These markers are flexible, and can survive a tire impact, providing a safe, clear, and long-term marking solution.

The soil path has been removed from stream and wetland credit calculations and is not credit generating.

Maintenance Plan

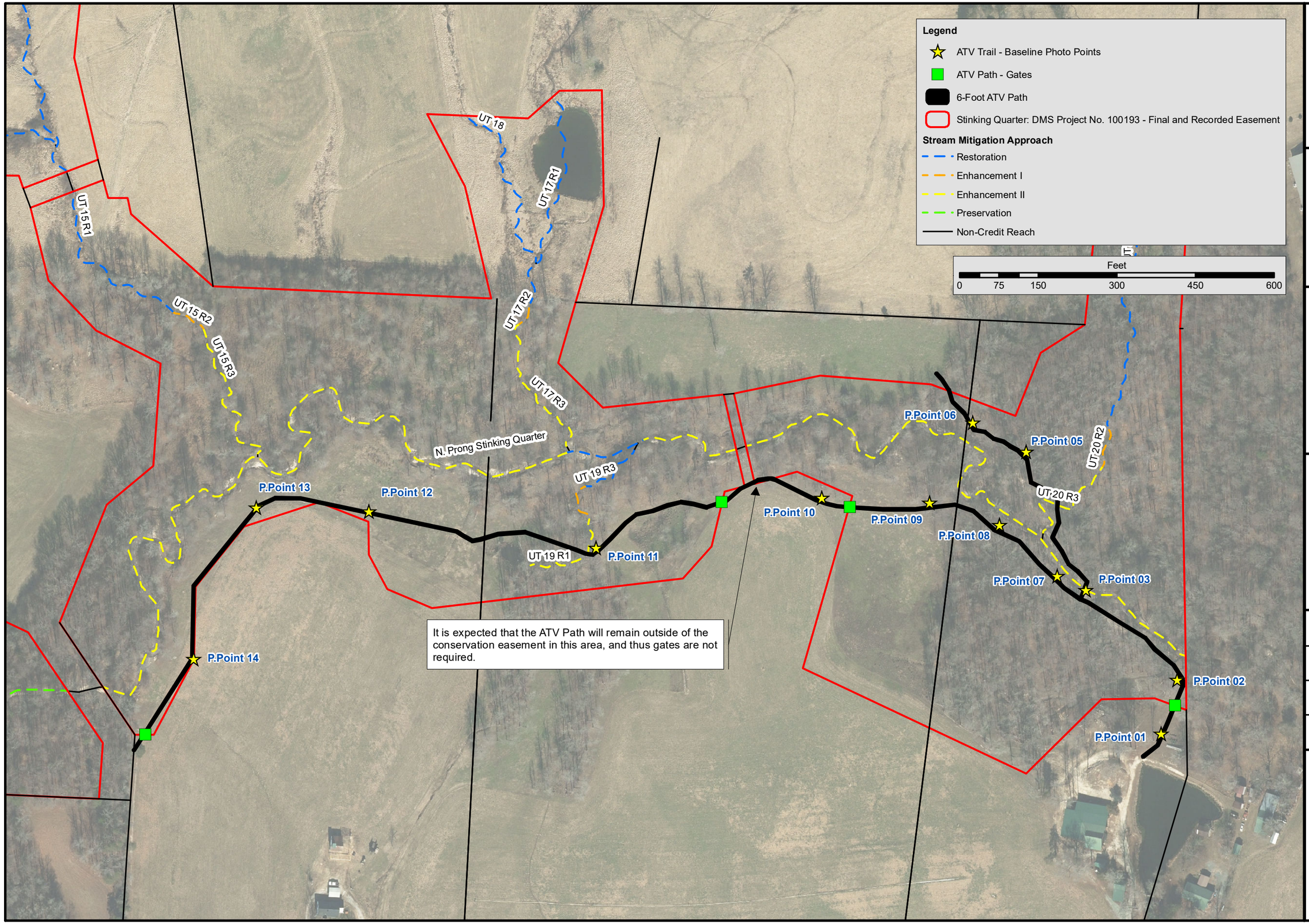
The Site shall be monitored on a regular basis and a physical inspection of the site shall be conducted a minimum of quarterly throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following:

Component/ Feature	Maintenance through project close-out
Stream	Routine channel maintenance and repair activities may include securing of loose coir matting and supplemental installations of live stakes and other target vegetation along the channel. Areas where stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Beaver	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 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.
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.

Existing ATV Paths

The ATV Path is an existing trail system used by the current landowners for passive recreation and observation of the riparian corridor. Existing ATV Paths were surveyed and platted in the recorded conservation easement plat (Appendix H). The conservation easement prohibits the improvement of the ATV Paths, as they are subject to the conservation easement. However, to maintain the current use of the trail system, the landowner is allowed to clear fallen trees, and any vegetation that may cause a safety concern. No improvements will be made to the existing trail, i.e., placement of fill, excavation, resurfacing, etc. Dual-Sided Utility Posts by Carsonite will mark the ATC Paths every 100 feet. These markers are flexible, and can survive a tire impact, providing a safe, clear, and long-term marking solution.

Included below is an overview figure of the ATV Paths and includes photo points and easement gate locations. Baseline condition photos are presented after the figure. Annual photo points were added to the Monitoring Plan and will be included in the yearly monitoring reports.



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ

Division of Mitigation Services

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING ATV PATH

CURRENT CONDITIONS PHOTO POINTS

Imagery Date: 2022-02-09

Drawn by: RJH

Date: NOVEMBER 2023

Scale: 1:2,000

Project No.: 100193

FIGURE

J-1

N



Photo Point 1: Looking northeast, towards the easement



Photo Point 2: Looking northwest



Photo Point 3: Stinking Quarter Crossing



Photo Point 3: Stinking Quarter Crossing



Photo Point 5: Looking northwest



Photo Point 6: Looking northwest, leaving the easement



Photo Point 7: Looking west/northwest along the southern floodplain of Stinking Quarter Creek



Photo Point 8: Looking west/northwest along the southern floodplain of Stinking Quarter Creek



Photo Point 9: Looking west, exiting the existing forested area



Photo Point 10: Looking west, along the existing forest's edge



Photo Point 11: Looking west, through the existing forested area associated with UT-19



Photo Point 12: Looking west, through the existing pasture



Photo Point 13: Looking south, at the edge of the existing row crops and pasture



Photo Point 14: Looking south, at the edge of the existing row crops and pasture, leaving the easement area

FINAL MITIGATION PLAN

STINKING QUARTER

Guilford County, North Carolina

DMS Project ID No. 100193
Full Delivery Contract No. 200201-01
USACE Action ID No. SAW-2021-00347
DWR Project No. 20210395
RFP No. 16-20200201 (Issued: 5/15/2020)

Cape Fear River Basin
Cataloging Unit 03030002

Prepared for:

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December 2023

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.

This document was assembled using the June 2017 DMS Stream and Wetland Mitigation Plan Template and Guidance and the October 24, 2016, NC Interagency Review Team Wilmington District Stream and Wetland Compensatory Mitigation Update.

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1 PROJECT INTRODUCTION

The Stinking Quarter Mitigation Site (hereafter referred to as the "Site") encompasses 107.6 acres of agricultural row crops, pasture, hay fields, and forest along warm waters of North Prong Stinking Quarter Creek and its unnamed tributaries. The Site is located approximately 1 mile northeast of Julian, 5 miles northwest of Liberty, and is adjacent to Highway 62 (Figures 1 and 2, Appendix A).

1.1 Directions to Site

Directions to the Site from Raleigh, North Carolina.

- Head west on US-64 for 38 miles,
- Turn right to merge onto US-421 North,
- After 16.5 miles, turn right onto Julian Airport Road,
- After 1 mile, turn right onto Liberty Road (Old US-421),
- Take and immediate left onto Bulb Road and travel 0.8 mile,
- Turn right onto NC-62,
- The Site is on both sides of the road after approximately 0.8 mile.
    - Site Latitude, Longitude
      35.9200, -79.6371 (WGS84)

1.2 USGS Hydrologic Unit Code and NCDWR River Basin Designation

The Site is located within the Cape Fear River Basin in 14-digit United States Geological Survey (USGS) Cataloging Unit 03030002040070 of the South Atlantic/Gulf Region (North Carolina Division of Water Resources [NCDWR] subbasin number 03-06-03) [Figures 1 and 2, Appendix A]). Site hydrology drains to warm waters of North Prong Stinking Quarter Creek and its unnamed tributaries (Stream Index Number 16-19-8-1), which has been assigned a Best Usage Classification of **WS-V, NSW** (NCDWR 2013). North Prong Stinking Quarter Creek is listed on the North Carolina Department of Environmental Quality (NCDEQ), Division of Water Resources (DWR) final 2022 303(d) list for exceeding Fair, Poor, or Severe fish community bioclassification (NCDEQ 2022).

1.3 Physiography and Land Use

The Site is in the Southern Outer Piedmont ecoregion of North Carolina. Regional physiography is characterized by dissected irregular plains, some low to high hills, ridges, and isolated monadnocks; low to moderate gradient streams with mostly cobble, gravel, and sandy substrates (Griffith et al. 2002). Onsite elevations range from a high of 740 feet National Geodetic Vertical Datum (NGVD) at the upper reaches to a low of approximately 660 feet NGVD at the Site outfall (USGS Climax and Kimesville, North Carolina 7.5-minute topographic quadrangles) (Figures 1 and 3, Appendix A).

Based on historic aerial photography, the Site has been in use for agriculture since before 1985. Aerials indicate that the primary residences, barns, ponds, and pastures were established at this time. Most of the Site had been cleared except for the downstream reach of North Prong Stinking Quarter Creek and the upper reaches of UT 1, which were cleared between 1999 and 2002. Channel modifications to North Prong Stinking Quarter Creek were conducted prior to 1993 including straightening of the upper reaches and construction of a pond on the south banks of the channel. Between 2002 and 2005 most of the clearing and conversion to pasture had been complete. A portion of the downstream, south bank of North Prong Stinking Quarter Creek floodplain was converted to row crops and pasture between 2009 and 2012.

The Site provides water quality functions to an approximately 3.05-square mile (1951.3-acre) watershed at the outfall; Site tributary watershed sizes range from 0.01 to 3.05 square miles (3.9 to 1951.3 acres) (Figure 3, Appendix A). The watershed is dominated by pasture, agricultural land, forest, and sparse

residential development. Impervious surfaces account for less than 2 percent of the upstream watershed land surface. Land use at the Site is characterized by agricultural row crops, pasture, hay fields, and forest.

1.4 Project Components and Structure

The Site encompasses 107.6 acres of agricultural row crops, livestock pasture, and forest along the warm waters of North Prong Stinking Quarter Creek (NPSQ Creek) and unnamed tributaries to the NPSQ Creek. The Site includes 22,452 linear feet of degraded stream channel (based on the approved PJD), 27.83 acres of degraded wetland, 27.77 acres of drained/impacted hydric soil (Figures 4 and 4A - 4D, Appendix A).

Site restoration activities include the construction of a meandering E/C-type stream channel, resulting in 13,511 linear feet of Priority I stream restoration, 563 linear feet of stream enhancement (Level I), 7,128 linear feet of stream enhancement (Level II at a 2.5:1 ratio), 851 linear feet of stream enhancement (Level II at a 5:1 ratio), 2,235 linear feet of stream preservation, 25.421 acres of riparian wetland re-establishment, 8.026 acres of riparian wetland rehabilitation, 16.258 acres of riparian wetland enhancement, 2.134 acres of riparian wetland preservation, and 0.851 acres of wetland creation (Table 1) (Figures 6 and 6A – 6D, Appendix A). Wetland creation is non-credit generating.

Completed project activities, reporting history, completion dates, project contacts, and background information are summarized in Tables 1-4.

Table 1 – Stinking Quarter (ID-100193) Project Components and Mitigation Credits

Project Segment	Original Mitigation Plan Ft/Ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits		Comments
Stream							
NPSQ Creek R1	2013	Warm	R	1.00000	1945.000		Reach has a 68 ft crossing that is non-credit generating.
NPSQ Creek R2	1916	Warm	P	10.00000	191.600		
NPSQ Creek R3	404	Warm	EII	5.00000	80.800		
NPSQ Creek R4	1325	Warm	EII	2.50000	530.000		
NPSQ Creek R5	155	Warm	R	1.00000	155.000		
NPSQ Creek R6	1456	Warm	EII	2.50000	572.000		Reach has a 20 ft and 6 ft crossing that are non-credit generating.
UT 1 R1	96	Warm	EII	5.00000	19.200		
UT 1 R2	1106	Warm	R	1.00000	1076.000		Reach has a 30 ft crossing that is non-credit generating.
UT 1 R3	792	Warm	EII	2.50000	316.800		
UT 1 R4	404	Warm	R	1.00000	404.000		
UT 1 R5	1209	Warm	EII	2.50000	458.800		Reach has a 62 ft crossing that is non-credit generating.
UT 1 R6	256	Warm	EII	2.50000	102.400		
UT 1 R7	738	Warm	R	1.00000	738.000		
UT 2	240	Warm	EII	5.00000	48.000		
UT 3	111	Warm	EII	5.00000	22.200		
UT 4	23	Warm	EII	2.50000	9.200		

Table 1 – Stinking Quarter (ID-100193) Project Components and Mitigation Credits (Continued)

Project Segment	Original Mitigation Plan Ft/Ac	Original Mitigation Category	Original Restoration Level	Original Mitigation Ratio (X:1)	Credits	Comments
Stream (Continued)						
UT 5 R1	1312	Warm	R	1.00000	1237.000	Reach has a 63 ft crossing and a 12 ft confluence that are non-credit generating.
UT 5 R2	274	Warm	EI	1.50000	182.667	
UT 5 R3	1805	Warm	R	1.00000	1745.000	Reach has a 60 ft crossing that is non-credit generating.
UT 5 R4	720	Warm	EII	2.50000	288.000	
UT 6 R1	157	Warm	EII	2.50000	62.800	
UT 6 R2	1060	Warm	R	1.00000	1038.000	Reach has a 22 ft crossing that is non-credit generating.
UT 7	81	Warm	EII	2.50000	32.400	
UT 9	798	Warm	R	1.00000	798.000	
UT 10	137	Warm	EII	2.50000	54.800	
UT 11	185	Warm	P	10.00000	18.500	
UT 12	726	Warm	R	1.00000	726.000	
UT 14	134	Warm	P	10.00000	13.400	
UT 15 R1	1317	Warm	R	1.00000	1276.000	Reach has a 41 ft crossing that is non-credit generating.
UT 15 R2	69	Warm	EI	1.50000	46.000	
UT 15 R3	331	Warm	EII	2.50000	132.400	
UT 16	844	Warm	R	1.00000	844.000	
UT 17 R1	443	Warm	R	1.00000	443.000	
UT 17 R2	52	Warm	EI	1.50000	34.667	
UT 17 R3	292	Warm	EII	2.50000	116.800	
UT 18	373	Warm	R	1.00000	373.000	
UT 19 R1	191	Warm	EII	2.50000	73.600	Reach has a 7 ft crossing that is non-credit generating
UT 19 R2	85	Warm	EI	1.50000	56.667	
UT 19 R3	131	Warm	R	1.00000	131.000	
UT 20 R1	582	Warm	R	1.00000	582.000	
UT 20 R2	83	Warm	EI	1.50000	55.333	
UT 20 R3	259	Warm	EII	2.50000	101.200	Reach has a 6 ft crossing that is non-credit generating.
				Total:	**17,131.233**	
Wetland						
Reestablishment	25.421	R	REE	1.00000	25.421	
Rehabilitation	8.026	R	RH	1.50000	5.351	
Enhancement	16.258	R	E	2.00000	8.129	
Preservation	2.134	R	P	10.00000	0.213	
Creation*	0.422	R	C	3.00000	0.000	
				Total:	**39.114**	

*Wetland Creation is non-credit generating.

Table 1 – Stinking Quarter (ID-100193) Mitigation Credits (Continued)

Restoration Level	Stream			Riparian Wetland		Non-riparian wetland	Coastal Marsh
	Warm	Cool	Cold	Riverine	Non-riverine		
Restoration	13,511.000	--	--	--	--	--	--
Re-establishment	--	--	--	25.421	--	--	--
Rehabilitation	--	--	--	5.351	--	--	--
Enhancement	--	--	--	8.129	--	--	--
Enhancement I	375.333	--	--	--	--	--	--
Enhancement II	3021.400	--	--	--	--	--	--
Preservation	223.500	--	--	0.213	--	--	--
Creation	--	--	--	0.000	--	--	--
Totals	**17,131.233**	**--**	--	**39.114**	--	--	--

Table 2 – Project Activity and Reporting History

Activity or Deliverable	Data Collection Complete	Completion or Delivery
Technical Proposal	October 2020	October 2020
Institution Date	--	February 9, 2021
Mitigation Plan	October 2023	November 2023
Construction Plans	--	November 2023

Table 3 – Project Contacts Table

Role	Firm
Full Delivery Provider, Planting Contractor, General Contractor	Restoration Systems 1101 Haynes Street, Suite 211 Raleigh, North Carolina 27604 Raymond Holz: 919-755-9490
Designer & Monitoring	Axiom Environmental, Inc. 218 Snow Avenue Raleigh, NC 27603 Grant Lewis: 919-215-1693
Engineer	Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606 Josh Dalton: 919-859-2243
Surveyor	k2 Design Group - John Rudolph (L-4194) 5688 U.S. Hwy. 70 East Goldsboro, NC 27534 919-394-2547

Table 4 – Project Attribute Table

Project Information	
Project Name	Stinking Quarter
Project County	Guilford County, North Carolina
Project Area (acres)	107.6
Project Coordinates (latitude & latitude)	35.9200, -79.6371
Planted Area (acres)	73.9
Project Watershed Summary Information	
Physiographic Province	Piedmont
Project River Basin	Cape Fear
USGS HUC for Project (14-digit)	03030002040070
NCDWR Sub-basin for Project	03-06-03
Project Drainage Area (acres)	1951.3
Percentage of Project Drainage Area that is Impervious	<5%
CGIA Land Use Classification	Managed Herbaceous Cover and Forest

Reach Summary Information												
Parameters	**NPSQ Creek Upstream**	**NPSQ Creek Downstream**	**UT 1 Upstream**	**UT1 Downstream**	**UT 2**	**UT 3**	**UT 4**	**UT 5 Upstream**	**UT 5 Downstream**	**UT 6**	**UT 7**	**UT 9**
Length of reach (linear feet)	1908	5256	3607	994	1106	792	23	1312	2799	1217	81	798
Valley Classification & Confinement	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII	VIII
Drainage Area (acres)	768	1951	96	804	14	4	158	166	422	58	6.4	189
NCDWR Stream ID Score	--	--	27.5/38.25	38.25	24.5	26	36	37.5	37.5	30.75	21.75	34.75
Stream Thermal Regime	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial/ Intermittent	Perennial	Intermittent	Intermittent	Perennial	Perennial	Perennial	Perennial	Intermittent	Perennial
NCDWR Water Quality Classification	WS-V, NSW											
Existing Morphological Description (Rosgen 1996)	Eg4	-----	G 5/6	Eg 4/5	-----	-----	-----	Eg 4/5	Eg 4	-----	-----	Ef 4/5
Proposed Stream Classification (Rosgen 1996)	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	NA	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4
Existing Evolutionary Stage (Simon and Hupp 1986)	III/IV	III/IV	II/III	III/IV	I	III	III/IV	IV	IV	II/III	II/III	III/IV
Underlying Mapped Soils	Chewacla	Chewacla	Wehadkee Vance Chewacla	Chewacla	Wehadkee	Vance	Vance	Appling Chewacla	Chewacla	Appling	Appling	Chewacla
Drainage Class	Somewhat poorly	Somewhat poorly	Poorly, Well, Somewhat poorly	Somewhat poorly	Poorly	Well	Well	Well, Somewhat poorly	Somewhat poorly	Well	Well	Somewhat poorly
Hydric Soil Status	Class B	Class B	Class A Nonhydric Class B	Class B	Class A	Nonhydric	Nonhydric	Nonhydric Class B	Class B	Nonhydric	Nonhydric	Class B
Valley Slope	0.0038	0.0031	0.0162	0.0065	0.0133	0.0440	NA	0.0106	0.0070	0.0166	0.0489	0.0090
FEMA Classification	AE floodway	AE floodway	NA	AE floodway	NA	NA	NA	NA	NA	NA	NA	NA
Native Vegetation Community	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods
Watershed Land Use/Land Cover (Site)	60 forest 35 agriculture* 5 residential	50 agriculture* 45 forest 5 residential	60 agriculture* 39 forest 1 residential	60 agriculture* 39 forest 1 residential	90 forest* 10 agriculture	100 agriculture*	70 forest 29 agriculture* 1 residential	60 agriculture* 29 forest 1 residential	70 agriculture* 19 forest 1 residential	60 forest 29 agriculture* 1 residential	100 agriculture*	70 forest 29 agriculture* 1 residential
Watershed Land Use/Land Cover (Ref)	100% forest											
Percent Composition of Exotic Invasive Vegetation	15%											

***Agriculture listed in Land Cover includes both livestock and row crop.**

Table 4 – Project Attribute Table (Continued)

Parameters	UT 10	UT 11	UT 12	UT 14	UT 15 Upstream	UT 15 Downstream	UT 16	UT 17	UT 18	UT 19	UT 20
Length of reach (linear feet)	137	185	726	134	921	796	844	787	373	407	924
Valley Classification & Confinement	III	VIII	VIII	VIII	VIII	VIII	VIII	VIII	III/VIII	VIII	VIII
Drainage Area (acres)	8	7	17	19	26	71	34	55	15	29	25
NCDWR Stream ID Score	22.5	32	32.5	34.75	20.5	-----	35.5	--	18	21.5	--
Stream Thermal Regime	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm	Warm
Perennial, Intermittent, Ephemeral	Intermittent	Perennial	Perennial	Perennial	Intermittent	Perennial	Perennial	Intermittent	Intermittent	Intermittent	Perennial
NCDWR Water Quality Classification	WS-V, NSW										
Existing Morphological Description (Rosgen 1996)	-----	-----	G 5/6	-----	F 5/6	Ge 5	F 4/5	Eg 5/6	G 4/5	-----	G 4/5
Proposed Stream Classification (Rosgen 1996)	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4	Ce 3/4
Existing Evolutionary Stage (Simon and Hupp 1986)	II	III/IV	III/IV	III/IV	III/IV	III	IV	IV/V	IV/V	II/III	II/III
Underlying Mapped Soils	Vance	Chewacla	Chewacla	Helena	Vance Chewacla	Chewacla	Vance Chewacla	Vance	Vance	Helena Chewacla	Vance Chewacla
Drainage Class	Well	Somewhat poorly	Somewhat poorly	Moderately well	Well, Somewhat poorly	Somewhat poorly	Well, Somewhat poorly	Well	Well	Moderately well, Somewhat poorly	Well, Somewhat poorly
Hydric Soil Status	Nonhydric	Class B	Class B	Class B	Nonhydric Class B	Class B	Nonhydric Class B	Nonhydric	Nonhydric	Class B Class B	Nonhydric Class B
Valley Slope	0.0336	0.0077	0.0299	0.0079	0.0334	0.0202	0.0370	0.0279	0.0373	0.0021	0.0253
FEMA Classification	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Native Vegetation Community	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods	Hardwoods
Watershed Land Use/Land Cover (Site)	60 agriculture* 40 forest	95 agriculture* 5 forest	80 agriculture* 20 forest	39 agriculture* 60 forest 1 residential	98 agriculture* 2 residential	97 agriculture* 2 forest 1 residential	95 agriculture* 5 forest	95 agriculture* 5 forest	98 agriculture* 2 forest	95 agriculture* 5 forest	98 agriculture* 2 forest
Watershed Land Use/Land Cover (Cedarock Reference Channel)	100% forest										
Percent Composition of Exotic Invasive Vegetation	15%										

***Agriculture listed in Land Cover includes both livestock and row crop.**

Table 4 – Project Attribute Table (Continued)

Wetland Summary Information			
Parameters	**Wetlands**		
Wetland acreage	27.77 acre drained & 27.83 acre degraded		
Wetland Type	Riparian riverine		
Mapped Soil Series	Chewacla and Wehadkee		
Drainage Class	Somewhat Poorly drained and Poorly drained		
Hydric Soil Status	Nonhydric (may contain hydric inclusions) and Hydric		
Source of Hydrology	Groundwater, stream overbank		
Hydrologic Impairment	Incised streams, ditches, drain tile, compacted soils, agriculture		
Native Vegetation Community	PiedmontMountain bottomland and Piedmont alluvial forest		
% Composition of Exotic Invasive Vegetation	<5%		
Restoration Method	Hydrologic and vegetative		
Enhancement Method	Livestock removal, vegetative restoration		
Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States-Section 401	Yes	Yes	Section 401 Certification
Waters of the United States-Section 404	Yes	Yes	Section 404 Permit
Endangered Species Act	Yes	Yes	CE Document (App E)
Historic Preservation Act	Yes	Yes	CE Document (App E)
Coastal Zone Management Act	No	--	NA
FEMA Floodplain Compliance	Yes	Yes	DMS FEMA Checklist (App F)
Essential Fisheries Habitat	No	--	NA

2 WATERSHED APPROACH AND SITE SELECTION

Primary considerations for Site selection included the potential for water quality improvement within a region of North Carolina under livestock/agricultural pressure. More specifically, considerations included: desired aquatic resource functions; hydrologic conditions; soil characteristics; aquatic habitat diversity; habitat connectivity; compatibility with adjacent land uses; reasonably foreseeable effects the mitigation project will have on ecologically important aquatic and terrestrial resources; and potential development trends and land use changes.

Currently, the proposed Site is characterized by agricultural row crops, pasture, hay fields, and forest. A summary of existing Site characteristics in favor of proposed stream and wetland activities includes the following.

- Streams and wetlands have been cleared of forest vegetation
- The Site receives nonpoint source inputs, including agricultural chemicals and sediment
- Wetland soils have been compacted by agricultural equipment
- Wetland hydrology has been removed by stream channel entrenchment, ditching, and drain tile

In addition to the opportunity for ecological improvements at the Site, the use of the particular mitigation activities and methods proposed in the Design Approach & Mitigation Work Plan (Section 8.0) are expected to produce naturalized stream and wetland resources that will be ecologically self-sustaining and requiring minimal long-term management (Long-term Management Plan [Section 11.0]).

The Cape Fear River Basin Restoration Priorities (RBRP) report (NCEEP 2009) documents that all land uses and discharges of wastewater and stormwater in subbasin 03-06-03 potentially contribute nutrients to B. Everett Jordan Lake. B. Everett Jordan Lake provides low-flow augmentation, flood control, recreation, fish and wildlife habitat, and water supply. The lake is impaired for aquatic life due to excessive levels of chlorophyll a in violation of current standards in all segments of the reservoir. In addition, the Site has a supplemental water quality classification of Nutrient Sensitive Waters, which include areas with water quality problems associated with excessive plant growth resulting from nutrient enrichment. The proposed mitigation activities will reduce sediment and nutrient levels, and improve water quality within the Site and downstream watersheds.

Site-specific mitigation goals and objectives have been developed by using the North Carolina Stream Assessment Method (NC SAM) and the North Carolina Wetland Assessment Method (NC WAM). Both are discussed further in Section 6.0 (Functional Uplift and Project Goals/Objectives).

3 BASELINE AND EXISTING CONDITIONS

3.1 Soils and Landform

Soils that occur within the Site, according to the *Web Soil Survey* (USDA 2021), are described in Table 5.

Table 5 – Web Soil Survey Soils Mapped within the Site

Map Unit Symbol	Map Unit Name (Classification)	Hydric Status	Description
ApB and ApC	Appling sandy loam (*Typic Kanhapludults*)	Non-hydric	This series consists of very deep, well drained, moderately permeable soils on ridges and side slopes of the Piedmont uplands. The parent material is residuum weathered from felsic igneous and metamorphic rock. Depth to the seasonal high-water table is more than 6 feet.
CcC and CeB2	Cecil sandy loam and sandy clay loam (*Typic Kanhapludults*)	Non-hydric	This series consists of very deep, well drained moderately permeable soils on ridges and side slopes of the Piedmont uplands. The parent material is residuum weathered from felsic, igneous and high-grade metamorphic rock. Depth to the seasonal high-water table is more than 6 feet.
ChA	Chewacla loam (*Fluvaquentic Dystrudepts*)	Non-hydric but may contain hydric inclusions	This series consists of frequently flooded, somewhat poorly drained soils found on floodplains with 0-2 percent slopes. The parent material is loamy alluvium derived from igneous and metamorphic rock. Depth to the water table is 6-24 inches and depth to restrictive features is more than 80 inches.

Table 5 – Web Soil Survey Soils Mapped within the Site (Continued)

Map Unit Symbol	Map Unit Name (Classification)	Hydric Status	Description
HeC	Helena sandy loam (*Aquic Hapludults*)	Non-hydric	This series consists of very deep, moderately well-drained, slowly permeable soils found on Piedmont ridges and hill slopes. The parent material is residuum weathered from a mixture of felsic, intermediate, or mafic igneous or high-grade metamorphic rock. Depth to the seasonal high-water table is 1.5 to 2.5 feet.
VaB, VaC, and VaD	Vance sandy loam (*Typic Hapludults)*	Non-hydric	This series consists of well drained, slowly permeable Piedmont soils. The parent material is residuum weathered from acid crystalline rock. Depth to the seasonal high-water table is 6 feet.
WhA	Wehadkee loam (*Fluvaquentic Endoaquepts)*	Hydric	This series consists of nearly level, poorly drained soils in depressions on floodplains. This series developed from loamy alluvium derived from igneous and metamorphic rock. Depth to the water table is about 0-12 inches. Depth to the restrictive layer is more than 80 inches.

3.2 Geology

The Site is located within the Southern Outer Piedmont which consists of heated and deformed (metamorphic) volcanic rocks, specifically metamudstone and Meta-Argillite. This area was located around a series of oceanic volcanic islands about 650-550 million years ago. Ash and rock from the volcanoes formed the parent material that, through extensive metamorphism, change the sediments into slates, phyllites, schists, and quartzites.

Specifically, the Site extends across two intrusive rock types including 1) metamorphosed Gabbro and Diorite which is foliated to massive and 2) Granitic Rock that is well metamorphosed, magacrystic and well foliated. Gabbro includes large bodies of dark-colored iron and magnesium-rich rocks that intruded within the Inner Piedmont belts. Diorite is an intermediate between that of mafic gabbro and felsic granite which is principally composed of silicate minerals also intruded in the area. These rocks were deposited by several large molten masses that intruded the overlying rocks. In the process, the original large magma bodies separated, producing smaller related masses.

Several areas of the Site exhibit bedrock contact; however, contact is confined to incised stream channels that will be backfilled or areas of stream enhancement (level II). The proposed stream channels will be tied into the bedrock were feasible to hinder headcut migration through the Site. The Site is an alluvial valley that is characterized by relatively deep deposits; therefore, bedrock is not expected to pose a hindrance to channel excavation. However, if bedrock contact is made during construction, the channel will be adjusted and noted on as-built red-line drawings.

3.3 Sediment Model

Sediment load modeling was performed using methodologies outlined in A Practical Method of Computing Streambank Erosion Rate (Rosgen 2009) and Estimating Sediment Loads using the Bank Assessment of Non-point Sources Consequences of Sediment (Rosgen 2011). These models provide a quantitative prediction of streambank erosions by calculating Bank Erosion Hazard Index (BEHI) and Near-Bank Stress (NBS) along each reach of the Site. The resulting BEHI and NBS values are then compared to streambank erodibility graphs prepared for North Carolina by the NC Stream Restoration Institute and NC Sea Grant.

Streambank characteristics involve measurements of bank height, angles, materials, presence of layers, rooting depth, rooting density, and percent of the bank protected by rocks, logs, roots, or vegetation. Site reaches have been measured for each BEHI and NBS characteristic and predicted lateral erosion rate, height, and length to calculate a cubic volume of sediment contributed per year by each reach. Data forms for the analysis are presented in Appendix B. Results of the model are shown in Table 6.

Table 6 – BEHI and NBS Modeling Summary

Stream Reach	Proposed Mitigation Treatment	Predicted Sediment Contribution (tons/year)
UT 1	Restoration and Enhancement (Level I and II)	188.8
UT 2	Enhancement (Level II)	0.0
UT 3	Enhancement (Level II)	4.1
UT 4	Enhancement (Level II)	0.0
UT 5	Restoration and Enhancement (Level I and II)	85.3
UT 6	Restoration and Enhancement (Level II)	1.7
UT 7	Enhancement (Level II)	0.8
UT 9	Restoration	13.6
UT 10	Enhancement (Level II)	0.4
UT 11	Preservation	0.0
UT 12	Restoration	2.2
UT 14	Preservation	0.0
UT 15	Restoration and Enhancement (Level I and II)	46.6
UT 16	Restoration	10.8
UT 17	Restoration and Enhancement (Level I and II)	1.4
UT 18	Restoration	0.0
UT 19	Restoration and Enhancement (Level I and II)	0.0
UT 20	Restoration and Enhancement (Level I and II)	32.7
NPSQ Creek	Restoration, Preservation, and Enhancement (Level II)	85.9
	Total Sediment Contribution (tons/year)	**474.4**

Based on this analysis, mitigation of Site streams will reduce streambank erosion and subsequent pollution of receiving waters.

3.4 Nutrient Model

Nutrient modeling was conducted using a method developed by the North Carolina Division of Mitigation Services (NCDMS) (NCDMS 2016) to determine nutrient and fecal coliform reductions from the exclusion of livestock from the buffer.

The equation for nutrient reduction for this model includes the following:

TN reduction (lbs/yr) = 51.04 (lbs/ac/yr) x Area (ac)
TP reduction (lbs/yr) = 4.23 (lbs/ac/yr) x Area (ac)

Where:
TN – total nitrogen;
TP – total phosphorus; and
Area – total area of restored riparian buffers inside of livestock exclusion fences.

Equations for fecal coliform reduction for this model include the following.
Fecal coliform reduction (col) = 2.2 x 10^{11} (col/AU/day) x AU x 0.085

Where:
Col - quantities of Fecal Coliform bacteria
AU - animal unit (1000 lbs of livestock)

Assuming approximately 87 acres of the Site will have livestock removed, and stocking rates include approximately 250 cows residing on the farm, the NCDMS analysis calculates approximately 4440.5 lbs/yr of nitrogen, 368.0 lbs/yr of phosphorus, and 46.8 x 10^{11} col of fecal coliform/day will be reduced via exclusion of livestock from the easement area.

3.5 Project Site Streams

Streams targeted for restoration include North Prong Stinking Quarter Creek and its unnamed tributaries, which have been cleared, straightened, plowed for agriculture production, and have eroded vertically and laterally. Approximately 38 percent of the existing stream channel has been degraded, contributing to sediment export from the Site. In addition, streamside wetlands have been cleared and drained by channel downcutting and land uses. Current Site conditions have resulted in degraded water quality, a loss of aquatic habitat, reduced nutrient and sediment retention, and unstable channel characteristics (loss of horizontal flow vectors that maintain pools and an increase in erosive forces to channel bed and banks). Site restoration activities will restore riffle-pool morphology, aid in energy dissipation, increase aquatic habitat, stabilize channel banks, and significantly reduce channel bank sediment loss.

Reach Descriptions

Individual reach descriptions are as follows.

N Prong Stinking Quarter (Reach 1)

Stream Origination – Upstream and off site.



Vegetation Condition – Vegetation community includes pasture on the left bank and young saplings and shrub/scrub on the right bank.

Vegetation List -

- Common Persimmon *(Diospyros virginiana)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Willow Oak *(Quercus phellos)* - FAC
- American Sycamore *(Platanus occidentalis)* - FACW
- Brookside Alder *(Alnus serrulate)* - OBL
- Callery Pear *(Pyrus calleryana)* - FACU
- Black Willow *(Salix nigra)* - OBL
- Chinese Privet *(Ligustrum sinense)* - FACU

Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream channel is approximately 2-4 feet in depth (BHR averages 1.2 and extends to a maximum of 1.5). The channel substrate is characterized by sand and gravel with a mixture of cobble.

N Prong Stinking Quarter (Reach 2)

Stream Origination – Upstream and off site.

Vegetation Condition – Vegetation community mature forest on both banks.

Vegetation List -

- Red Maple *(Acer rubrum)* - FAC
- American Sycamore *(Platanus occidentalis)* - FACW
- Slippery Elm *(Ulmus rubra)* - FAC
- Hickory *(Carya spp.)* - NA
- Black Willow *(Salix nigra)* - OBL
- Black Cherry *(Prunus serotina)* - FACU
- Tree-of-Heaven *(Ailanthus altissima)* - FACU

Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream channel is approximately 4-6 feet in depth with a substrate characterized by sand and gravel.



N Prong Stinking Quarter (Reaches 3 and 4*)

Stream Origination – Upstream and off site.

Vegetation Condition – Vegetation community mature forest on both banks with livestock access resulting in a disturbed understory.

Vegetation List -

- American Hornbeam *(Carpinus caroliniana)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Slippery Elm *(Ulmus rubra)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Shag-Bark Hickory *(Carya ovata)* - FACU
- Pignut Hickory *(Carya glabra)* - FACU
- Spotted Touch-Me-Not *(Impatiens capensis)* - FACW
- Chinese Privet *(Ligustrum sinense)* – FACU



Invasive Species – Invasive species are relatively widespread in this reach; however, the densities are not significant and treatment should be easily achievable.

Channel Condition – The stream channel is approximately 4-6 feet in depth with a substrate characterized by sand and gravel.

Note: N Prong Stinking Quarter Reach 3 is in similar condition as Reach 4; however, Reach 4 has livestock with direct access to the channel, while Reach 3 has pasture on one bank (right bank).

N Prong Stinking Quarter (Reaches 5 and 6)

Stream Origination – Upstream and off site.

Vegetation Condition – Vegetation community mature forest on both banks with livestock access resulting in a disturbed understory.

Vegetation List -

- American Hornbeam *(Carpinus caroliniana)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Slippery Elm *(Ulmus rubra)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Swamp Chestnut Oak *(Quercus michauxii)* - FACW
- Brookside Alder (Alnus serrulate) - OBL
- Chinese Privet *(Ligustrum sinense)* (heavy presence) - FACU
- Tree-of-Heaven *(Alianthus altissima)* (small amount) - FACU



Invasive Species – Invasive species are relatively widespread in this reach; however, the densities are not significant and treatment should be easily achievable.

Channel Condition – The stream channel is approximately 4-6 feet in depth with a substrate characterized by sand and gravel.

Note: N Prong Stinking Quarter Reach 5 is in similar condition as Reach 6; however, Reach 5 has a shoot cutoff that will be restored across one meander of stream.

UT 1 (Reaches 1 to 3)

Stream Origination – Off-site.

Vegetation Condition – Vegetation community includes mature forest on the left bank with a narrow strip of mature trees on the right bank. Livestock have access to forested areas and the brows line is apparent. On the right bank pasture extends beyond the forested fringe.

Vegetation List -

- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Green Ash *(Fraxinus pensylvanica)* - FACW
- Black Tupelo *(Nyssa sylvatica)* - FAC
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Japanese Silt Grass *(Microstegium viminuem)* - FAC

Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream has been dredged and straightened and is incised 2-4 feet (BHR ranges from 1.6 to 2.8). The channel substrate is characterized by sand, silt, and clay. Headcuts occur at roots where the stream drops. There are active cattle signs within and adjacent to the channel.



Note: UT 1 Reaches 1 to 3 are characterized by similar existing conditions. Reach 1 is a short reach above a pond that the IRT didn't feel needed restoration. Reach 2 and 3 are very similar; however, some bedrock held the bed and the IRT believed enhancement was warranted.

UT 1 (Reach 4)

Stream Origination – Upstream



Vegetation Condition – Vegetation community includes a narrow strip of mature trees with pasture extending beyond the forested fringe. Livestock access the stream and riparian fringe, disturbing the understory.

Vegetation List -

- Same species as above
- American Holly *(Ilex opaca)* - FACU
- White Oak *(Quercus alba)* - FACU
- Red Oak *(Quercus rubra)* - FACU
- Sedge *(Carex spp.)* - FAC
- Rush *(Juncus spp.)* - FACW
- Japanese Silt Grass (*Microstegium vimineum*) - FAC
- Tree-of-Heaven (*Alianthus altissima*) - FACU
- Rose (*Rosa multiflora*) - FACU

Invasive Species – Invasive species start at fence line perpendicular to stream. Invasive species are relatively dense and include Tree-of-Heaven and rose.

Channel Condition – The stream is incised 1-3 feet (BHR ranges from 1.6 to 2.1) with thick grasses and emergent vegetation in this area. The substrate is sand with some rocks cobble sized material.

UT 1 (Reach 5)

Stream Origination – Upstream

Vegetation Condition – Stream has pasture on the left bank and mature forest on right bank. Pasture includes mature trees with livestock access to the channel.

Vegetation List -

- American Beech *(Fagus grandiflora)* - FACU
- Shag-Bark Hickory *(Carya ovata)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Tulip tree (*Liriodendron tulipifera)* - FACU
- Swamp Chestnut Oak *(Quercus michauxii)* - FACW
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Rose *(Rosa multiflora)* (small amount) - FACU



Invasive Species – Invasive species are minimal and include dense pockets of rose. Treatment of rose should be managed easily.

Channel Condition – The stream ranges in depth from approximately 1 - 4 moderately sloping banks with sand and gravel bottom.

UT 1 (Reaches 6 and 7)

Stream Origination – Upstream

Vegetation Condition – Stream is surrounded by pasture (hay fields) with a narrow fringe of trees and shrubs along the channel.



Vegetation List -

- Willow Oak (*Quercus phellos*) - FAC
- Sweet gum (*Liquidambar styraciflua*) - FAC
- Black Willow (*Salix nigra*) - OBL
- Black Cherry (*Prunus serotina*) - FACU
- Goldenrod (*Solidago spp.*) - FACU
- American Pokeweed (*Phytolacca americana*) - FACU
- Chinese Privet (*Ligustrum sinense*) - FACU

Invasive Species – Invasive species are limited to stream bank margins and are not extensive in density. Treatment of Chinese Privet should be managed easily.

Channel Condition – Stream is incised 4-6 feet (BHR averages 1.3 and extends to 1.7) with steep cut banks, sandy gravel bottom, some clay banks exposed, some vegetation growth in the stream.

Note: UT 1 Reach 6 and 7 are characterized by similar conditions, with the only difference being that reach 6 cannot be restored as it is too close to NC 62.

UT 2

Stream Origination – Off-site.



Vegetation Condition – Vegetation community includes mature forest. Livestock have access to forested areas and the brows line is apparent.

Vegetation List -

- Loblolly Pine *(Pinus taeda)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Cat briar *(Smilax rotundifolia)* - FAC
- Sedge *(Carex spp.)* - FAC
- Rush *(Juncus spp.)* - FACW

Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream ranges in depth from approximately 0.5 to 2 feet with heavy presence of iron oxide. The channel is actively eroding in some areas, likely due to livestock access and deadfall in channel. The substrate is very muddy with some cobble present.

UT 3

Stream Origination – On-site.

Vegetation Condition – Vegetation community includes a narrow fringe of your saplings and shrub/scrub surrounded by pasture.

Vegetation List -

- Winged Elm *(Ulmus alata)* - FACW
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Green Ash *(Fraxinus pennsylvanica)* - FACW
- Red Maple *(Acer rubrum)* -FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Northern Red Oak *(Quercus rubra)* - FACU
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Cat briar *(Smilax rotundifolia)* - FAC
- Sedge *(Carex spp.)* - FAC

Invasive Species – Invasive species are minimal in size and density in this reach.



Channel Condition – Confluence and banks actively trampled, muddy sandy bottom, area immediately above confluence adjacent to stream is bare soil with no vegetation from cattle, upper portions are vegetated.

UT 5 (Reach 1)

Stream Origination – Off-site.



Vegetation Condition – Vegetation community pasture on both banks with few mature forest trees. Numerous wetland pockets have been cleared and are characterized by emergent herbs.

Vegetation List -

- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Winged Elm *(Ulmus alata)* - FACW
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Lamp Rush *(Juncus spp.)* - FACW
- Blackberry *(Rubus spp.)* - FACU

Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream ranges in depth from approximately 1 to 4 feet (BHR ranging from 1.0 to 1.8). The channel is actively eroding in some areas and is characterized by a substrate composed of sand and silt. Bedrock is exposed in areas of the channel and floodplain.

UT 5 (Reaches 2 and 3)

Stream Origination – Off-site.



Vegetation Condition – The vegetative community varies between disturbed forest and pasture, with some areas having both. Pasture does not appear to be frequently utilized, possibly leading to succession and disturbed forest conditions.

Vegetation List -

- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Brookside Alder *(Alnus serrulate)* - OBL
- Sugar-Berry *(Celtis laevigata)* - FACW
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Shell-Bark Hickory *(Carya laciniosa)* – FAC
- American Beech *(Fagus grandifolia)* (dominant) - FACU
- Blueberry *(Vaccinium corymbosum.)* - FACW
- Virginia-Creeper *(Parthenocissus quinquefolia)* - FACU
- Muscadine *(Vitus rotundifolia)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Christmas Fern *(Polystichum acrostichoides)* - FACU
- Chinese Privet (*Ligustrum sinense)* – FACU
- Russian -Olive *(Elaeagnus angustifolia)* - FACU
- Rose *(Rosa multiflora)* - FACU

Invasive Species – Invasive species are frequent in this reach and will require extensive treatment.

Channel Condition – The stream ranges in depth from approximately 2 to 6 feet, depending on debris jams and bedrock contact (BHR ranging from 1.0 to 2.1). The channel has some steep cut banks and appears to have been dredged and straightened in the past. Substrate is composed of sand and gravel. Bedrock is exposed in areas of the channel.

Note: UT 5 Reach 2 and 3 are characterized by similar conditions, with the only difference being that Reach 2 cannot be restored as it is too close to a maintained road.

UT 6 (Reaches 1 and 2)

Stream Origination – Off-site.

Vegetation Condition – The vegetative community is characterized by pasture, narrow fringe of disturbed forest, and pond margin.

Vegetation List -

- Northern Red Oak *(Quercus rubra)* - FACU
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Black Willow *(Salix nigra)* - OBL
- Willow Oak *(Quercus phellos)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Northern White Oak *(Quercus alba)* - FACU
- Slippery Elm *(Ulmus rubra)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Japanese Silt Grass *(Microstegium vimineum)* - FAC
- Buttercup *(Ranunculus Spp.)* - NA
- Ebony Spleenwort *(Asplenium platyneuron)* - FAC



Invasive Species – Invasive species are minimal in size and density in this reach.

Channel Condition – The stream enters the Site in a shallow channel that is perched by bedrock. Below the bedrock the channel incised to 2-4 feet in depth (BHR ranging from 1.8 to 2.5). The channel is actively eroding in some areas before becoming impounded by a dam in the lower reaches. The dam's outfall is at the confluence with UT 5. The substrate is primarily sand, silt, and gravel with some cobble spread throughout.

Note: UT 6 Reach 1 and 2 are characterized by similar conditions, with the only difference being that Reach 1 was held up by a bedrock sill and was not suitable for restoration.

UT 7

Stream Origination – At a piped outlet.

Vegetation Condition – The vegetative community is characterized by pasture. The channel enters UT 6 at a forested fringe.

Vegetation List -

- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Slippery Elm *(Ulmus rubra)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Callery Pear *(Pyrus calleryana)* - FACU
- Cat Briar *(Smilax rotundifolia)* - FAC

Invasive Species – Invasive species are infrequent in this reach.

Channel Condition – The stream ranges in depth from approximately 0.5 feet at the piped outlet to 3 feet as the channel cuts down to the elevation of UT 6. Substrate is composed of primarily of sand.



UT 9

Stream Origination – Off-site.



Vegetation Condition – The vegetative community is characterized by pasture with a few isolated stands of trees and shrubs.

Vegetation List -

- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- Winged Elm *(Ulmus alata)* - FACW
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Lamp Rush *(Juncus spp.)* - FACW
- Blackberry *(Rubus spp.)* - FACU

Invasive Species – Invasive species are infrequent in this reach.

Channel Condition – The stream ranges in depth from approximately 2 to 3 feet (BHR ranging from 1.0 – 1.4). The channel appears to have been dredged and straightened in the past and is actively eroding. The channel substrate is composed primarily of sand with gravel interspersed.

UT 10

Stream Origination – On-site.

Vegetation Condition – The vegetative community is characterized by mature forest that appears to have been utilized for grazing in the past. No signs of recent grazing are apparent.

Vegetation List -

- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Brookside Alder *(Alnus serrulate)* - OBL
- Sugar-Berry *(Celtis laevigata)* - FACW
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Willow Oak *(Quercus phellos)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Shell-Bark Hickory *(Carya laciniosa)* – FAC
- American Beech *(Fagus grandifolia)* (dominant) - FACU
- Blueberry *(Vaccinium corymbosum.)* - FACW
- Virginia-Creeper *(Parthenocissus quinquefolia)* - FACU
- Muscadine *(Vitus rotundifolia)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Christmas Fern *(Polystichum acrostichoides)* - FACU
- Chinese Privet (*Ligustrum sinense)* – FACU
- Russian -Olive *(Elaeagnus angustifolia)* - FACU
- Rose *(Rosa multiflora)* - FACU



Invasive Species – Invasive species are frequent in this reach and will require extensive treatment.

Channel Condition – The stream initiates within the Site at a small headcut and flows for approximately 300 feet prior to discharging across the UT 5 floodplain as sheet flow. The channel substrate is composed primarily of sand.

UT 11

Stream Origination – Off-site.

Vegetation Condition – The vegetative community is characterized by mature forest.

Vegetation List -

- Pignut Hickory *(Carya glabra)* - FACU
- Northern White Oak *(Quercus alba)* - FACU
- Shag-Bark Hickory *(Carya ovata)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Willow Oak *(Quercus phellos)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- American Beech *(Fagus grandifolia)* - FACU
- Sassafras *(Sassafras albidum)* - FACU
- Black Cherry *(Prunus serotina)* - FACU
- Christmas Fern *(Polystichum acrostichoides)* - FACU
- Ebony Spleenwort *(Asplenium scolopendrium*) - FACU
- Muscadine *(Vitis rotundifolia)* - FAC
- Rose *(Rosa multiflora)* - FACU
- Chinese Privet *(Ligustrum sinense)* - FACU

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream banks are incised from 1 to 3 feet in depth with silty sand substrate and some gravel/cobble interspersed throughout. The channel is relatively sinuous and occurs below an extensive headcut.



UT 12

Stream Origination – Off-site.

Vegetation Condition – The vegetative community is characterized by row crops on the left bank and mature forest on the right bank. Mature forest is disturbed in nature, as the forest grows from spoil piles lining the ditched stream channel.



Vegetation List -

- Shag-Bark Hickory *(Carya ovata)* - FACU
- Red Maple *(Acer rubrum)* - FAC
- Brookside Alder *(Alnus serrulate)* - OBL
- American Elm *(Ulmus americana)* - FACW
- Black Walnut *(Juglans nigra)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Porcelain Berry *(Ampelopsis brevipedunculata*) - NA
- Spotted Touch-Me-Not *(Impatiens capensis)* - FACW
- Sedge *(Carex spp.)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Netted Chain Fern *(Woodwordia areolate)* - FACW
- Rush *(Juncus effuses)* - FACW
- Jack-in-the-Pulpit *(Arisaema triphyllum)* - FACW
- Royal Fern *(Osmunda regalis)* - OBL
- Cinnamon Fern *(Osmundastrum cinnamomeum)* - FACW
- Tree-of-Heaven *(Ailanthus altissima)* - FACU
- Japanese Honeysuckle *(Lonicera japonica)* - FACU
- Rose *(Rosa multiflora)* - FACU

Invasive Species – Invasive species are frequent in this reach and will require extensive treatment.

Channel Condition – The channel has been dredged and straightened throughout its reach. A large headcut (presumably where dredging began) initiates incision within the channel and stream banks are 1 to 2 feet in depth (BHR ranging from 1.6 to 4.8). Spoil piles line the right bank of the channel. Channel substrate is composed of sand, silt, and gravel.

UT 14

Stream Origination – Off-site.

Vegetation Condition – The vegetative community is characterized by mature forest.

Vegetation List -

- Flowering Dogwood *(Cornus florida)* - FACU
- Tuliptree *(Liriodendron tulipifera)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Red Maple *(Acer rubrum)* - FAC
- American Elm *(Ulmus americana)* - FACW

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream banks are incised from 1 to 5 feet in depth with sand substrate. The channel occurs below an extensive headcut.



UT 15 (Reach 1)

Stream Origination – On-site at a capped spring head.

Vegetation Condition – The vegetative community is characterized by hay fields planted with grasses for livestock with a few natural recruits.

Vegetation List -

- Fescue *(Festuca spp.)* - NA
- Rose *(Rosa multiflora)* - FACU

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream ranges in depth from approximately 2 to 4 feet (BHR ranging from 3.3 – 5.8). The channel appears to have been dredged and straightened in the past and is actively eroding. The channel substrate is composed primarily of sand and silt with gravel interspersed.



UT 15 (Reaches 2 and 3)

Stream Origination – Upstream.



Vegetation Condition – The vegetative community is characterized by heavily grazed forest. The understory is open with much mortality of the mature trees. Open areas of the understory are colonized by herbaceous species.

Vegetation List -

- Slippery Elm *(Ulmus rubra)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Red Maple *(Acer rubrum)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Winged Elm *(Ulmus alata)* – FACU
- Callery Pear *(Pyrus calleryana)* - FACU
- Spotted Touch-Me-Not *(Impatiens capensis)* - FACW
- Cat Briar *(Smilax rotundifolia)* - FAC

Invasive Species – Invasive species are frequent and will require treatment.

Channel Condition – The stream ranges in depth from approximately 2 to 4 feet (BHR ranging from 1.9 – 4.5). The channel is heavily impacted by livestock hoof shear. In addition, the channel is incised as it joins with the larger and deeper N. Prong Stinking Quarter. The channel substrate is composed primarily of sand and gravel.

Note: UT 15 Reach 2 and Reach 3 are characterized by similar conditions; however, Reach 3 is a short section at the transition between restoration and Enhancement Level II.

UT 16

Stream Origination – Off-site.

Vegetation Condition – The vegetation is characterized by various communities along this reach including freshwater marsh at the upper reaches of an agriculture pond, pond margins are pasture, the pond dam is successional vegetation that has not been maintained in several years, and below the dam is pasture with a narrow fringe of saplings and shrubs that has pasture beyond the riparian fringe.



Vegetation List -

- Green Ash *(Fraxinus pennsylvanica)* - FACW
- Red Maple *(Acer rubrum)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Black Walnut *(Juglans nigra)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Annual Ragweed *(Ambrosia artemisifolia)* - FACU
- Japanese Silt Grass *(Microstegium vimineum)* - FAC
- Netted Chain Fern *(Woodwordia areolate)* - FACW
- Rose *(Rosa multiflora)* - FACU
- Chinese Privet *(Ligustrum sinense)* - FACU

Invasive Species – Invasive species are frequent and will require treatment.

Channel Condition – The stream ranges in depth from approximately 2 to 4 feet (BHR ranging from 2.6 – 4.2). The channel appears to have been dredged and straightened in the past and is actively eroding. A seam of bedrock crosses the channel below the pond dam, which results in an approximately 3-foot cascade off the bedrock. The channel substrate is composed primarily of sand and gravel with cobble interspersed.

UT 17 (Reach 1)

Stream Origination – Off-site in agriculture pond.

Vegetation Condition – The vegetative community is characterized by hay fields planted with grasses for livestock with a few natural recruits.

Vegetation List –

- Fescue *(Festuca spp.)* - NA
- Sedge *(Carex spp.)* – FAC
- Rush *(Juncus effuses)* - FACW
- Japanese Silt Grass *(Microstegium vimineum)* - FAC
- Annual Ragweed *(Ambrosia artemisifolia)* – FACU

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream ranges in depth from approximately 1 to 3 feet (BHR ranging from 1.7 – 4.1). The channel has been impounded in its upper reaches and then dredged and straightened in its lower reaches. The channel substrate is sand and silt with grass growing in the channel.



UT 17 (Reaches 2 and 3)

Stream Origination – Off-site in agriculture pond.



Vegetation Condition – The vegetative community is characterized by heavily grazed forest. The understory is open with much mortality of the mature trees. Open areas of the understory are colonized by herbaceous species.

Vegetation List -

- Shag-Bark Hickory *(Carya ovata)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Swamp Chestnut Oak *(Quercus michauxii)* - FACW
- Red Maple *(Acer rubrum)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- Slippery Elm *(Ulmus rubra)* - FAC
- Sedge *(Carex spp.)* - FAC
- Japanese Silt Grass *(Microstegium vimineum)* - FAC
- Cat Briar *(Smilax rotundifolia)* - FAC
- Annual Ragweed *(Ambrosia artemisifolia)* – FACU

Invasive Species – Invasive species are frequent and will require treatment.

Channel Condition – The stream ranges in depth from approximately 2 to 3 feet. The channel is heavily impacted by livestock hoof shear. In addition, the channel is incised as it joins with the larger and deeper N. Prong Stinking Quarter. The channel substrate is composed primarily of sand and gravel.

Note: UT 17 Reach 2 and Reach 3 are characterized by similar conditions; however, Reach 3 is a short section at the transition between restoration and Enhancement Level II.

UT 18

Stream Origination – Off-site.

Vegetation Condition – The vegetative community is characterized by hay fields planted with grasses for livestock with a few natural recruits.

Vegetation List -

- Sedge *(Carex spp.)* - FAC
- Fescue *(Festuca Spp.)* - NA
- Rush *(Juncus effuses)* - FACW

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream has been highly manipulated through this reach. The channel has been ditched and straightened. Fill for the dam on UT 17 has caused the rerouting of this reach. The channel is relatively flat and shallow within a man-made swale. The channel substrate is sand and silt with grass growing in the channel.



UT 19 (Reaches 1 to 3)

Stream Origination – On-site in agriculture pond.



Vegetation Condition – The vegetative community is characterized by heavily grazed forest. The understory is open with much mortality of the mature trees. Open areas of the understory are colonized by herbaceous species.

Vegetation List -

- Red Maple *(Acer rubrum)* - FAC
- Swamp Chestnut Oak *(Quercus michauxii)* - FACW
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Pignut Hickory *(Carya glabra)* - FACU
- Shag-Bark Hickory *(Carya ovata)* - FACU
- Sedge *(Carex spp.)* - FAC
- Spotted Touch-Me-Not *(Impatiens capensis)* - FACW
- Cat Briar *(Smilax rotundifolia)* – FAC

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream ranges in depth from approximately 2 to 3 feet. The channel is heavily impacted by livestock hoof shear. In addition, the channel is incised as it joins with the larger and deeper N. Prong Stinking Quarter. The channel substrate is composed primarily of sand and silt.

Note: UT 19 is characterized by similar conditions throughout its reach. Reach 1 is less incised, Reach 2 is slightly more incised as it drops to the depth of N Prong Stinking Quarter, and UT 3 is the tie into North Prong Stinking Quarter which has not existing conditions.

UT 20 (Reach 1)

Stream Origination – On-site at a headcut.

Vegetation Condition – The vegetative community is characterized by pasture for livestock with a few natural recruits.

Vegetation List -

- Fescue *(Festuca spp.)* - NA

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream ranges in depth from approximately 2 to 4 feet (BHR ranging from 2.4 – 4.1). The channel appears to have been dredged and straightened in the past and is actively eroding. The channel substrate is composed primarily of sand and silt with gravel interspersed.



UT 20 (Reach 2 and 3)



Stream Origination – Upstream.

Vegetation Condition – The vegetative community is characterized by heavily grazed forest. The understory is open with much mortality of the mature trees. Open areas of the understory are colonized by herbaceous species.

Vegetation List -

- Shag-Bark Hickory *(Carya ovata)* - FACU
- Red Maple *(Acer rubrum)* - FAC
- Sweet-Gum *(Liquidambar styraciflua)* - FAC
- Willow Oak *(Quercus phellos)* - FAC
- Eastern Red-Cedar *(Juniperus virginiana)* - FACU
- Slippery Elm *(Ulmus rubra)* - FAC
- Tuliptree *(Liriodendron tulipifera)* - FACU
- American Hornbeam *(Carpinus caroliniana)* - FAC
- Japanese Silt Grass *(Microstegium vimineum)* - FAC
- Lizard's-Tail *(Saururus cernus)* - OBL
- Common Persimmon *(Diospyros virginiana)* (at very top) - FAC
- Tree-of-Heaven *(Alianthus altissima)* (small amount at very top) - FACU
- Rose *(Rosa multiflora)* (small amount) - FACU
- Chinese Privet *(Ligustrum sinense)* (small amount) - FACU

Invasive Species – Invasive species are present but are not frequent or dense in nature.

Channel Condition – The stream ranges in depth from approximately 2 to 4 feet. The channel is heavily impacted by livestock hoof shear. In addition, the channel is incised as it joins with the larger and deeper N. Prong Stinking Quarter. The channel substrate is composed primarily of sand and gravel that is imbricated by silt.

Note: UT 20 Reach 2 and Reach 3 are characterized by similar conditions; however, Reach 3 is a short section at the transition between restoration and Enhancement Level II.

3.5.1 Existing Conditions Survey

Site stream dimension, pattern, and profile were measured to characterize existing channel conditions. Stream geometry measurements under existing conditions are summarized in Table 7 (Essential Morphology Parameters) and presented in detail in Table B1 (Appendix B).

3.5.2 Channel Classification and Morphology

Stream geometry and substrate data have been evaluated to classify existing stream conditions based on a classification utilizing fluvial geomorphic principles (Rosgen 1996). Existing Site reaches are classified as unstable, slightly entrenched G-, F-, Ef- and Eg-type streams with variable sinuosity. Existing Site reaches are characterized by variable substrate ranging from sand and gravel substrate due to channel impacts, including channel straightening, adjacent agriculture, and riparian vegetation removal; to Cobble substrate in preservation reaches.

3.5.3 Channel Evolution

Site streams targeted for restoration have been channelized and are continually eroding. As such, channels are primarily classified as channelized (Class II), degraded (Class III), and degraded and widened (Class IV) channels throughout the Site (Simon and Hupp 1986).

3.5.4 Valley Classification

Site Streams are characterized by two distinct valley types including 1) small stream, headwater, moderately confined, alluvial valleys with approximately 50- to 100-foot floodplain valley widths and 2) large stream, relatively unconfined, alluvial valleys with approximately 250 wide floodplains. Valley slopes are typical for the Piedmont region and range from 0.0038 on NPSQ Creek to 0.0373 on the upper reaches of UT 18.

Site Streams are characterized Valley Type VIII (Rosgen 1996) which are identified by the presence of multiple river terraces positioned laterally along broad valleys with gentle, down-valley elevation relief. Alluvial terraces and floodplains are the predominant depositional landforms. Typical streams in this region include C- and E-type streams with slightly entrenched, meandering channels with a riffle-pool sequence.

Table 7 – Essential Morphology Parameters

Parameter	Existing			Reference		Proposed		
	NPSQ Creek (Reach 1)	UT1 (Reach 1-5)	UT 1 (Reach 6-7)	Causey Farm	Cedarock	NPSQ Creek (Reach 1)	UT1 (Reach 1-5)	UT 1 (Reach 6-7)
Valley Width (ft)	200	100	125	131	18	200	100	125
Contributing Drainage Area (sq. mi.)	1.20	0.15	1.25	0.63	0.21	1.20	0.15	1.25
Channel/Reach Classification	Eg4/5	G5/6	Eg4/5	E5	Eb 4	Ce ¾	Ce ¾	Ce ¾
Discharge Width (ft)	17.4	6.4	11.5	11.0	8.1	17.8	8.8	18.0
Discharge Depth (ft)	1.3	0.8	2.0	1.4	0.8	1.3	0.6	1.3
Discharge Area (ft^2)	22.6	5.5	23.2	14.7	8.0	22.6	5.5	23.2
Discharge Velocity (ft/s)	4.2	3.8	5.4	4.1	3.9	4.2	3.8	5.4
Discharge (cfs)	94.7	21.1	97.5	59.8	30.9	94.7	21.1	97.5
Water Surface Slope	0.0036	0.0143	0.0061	0.0053	0.0258	0.0033	0.0141	0.0057
Sinuosity	1.07	1.13	1.07	1.46	1.20	1.15	1.15	1.15
Width/Depth Ratio	13.5	8.0	5.8	9	10.1	13.7	14.7	13.8
Bank Height Ratio	1.0-1.5	1.6-4.0	1.0-1.7	1.4	1.0	1.0	1.0	1.0
Entrenchment Ratio	7.5	1.6	8.7	12	2.1	11.2	11.4	6.9
Substrate	Gravel/Sand	Sand/Silt	Gravel/Sand	Cobble	Gravel	Gravel*	Gravel*	Gravel*

Note* Substrate change results from the addition of riffle bed material during construction activities, rather than changes in substrate from morphological flow parameters.

Table 7 – Essential Morphology Parameters (Continued)

Parameter	Existing			Reference		Proposed		
	UT 5 (Reach 1)	UT 5 (Reach 2-4)	UT 6 (Reach 1-2)	Causey Farm	Cedarock	UT 5 (Reach 1)	UT 5 (Reach 2-4)	UT 6 (Reach 1-2)
Valley Width (ft)	75	100	50	131	18	75	100	50
Contributing Drainage Area (sq. mi.)	0.26	0.66	0.09	0.63	0.21	0.26	0.66	0.09
Channel/Reach Classification	Eg4/5	Eg4	Eg4/5	E5	Eb 4	Ce ¾	Ce ¾	Ce ¾
Discharge Width (ft)	8.5	12.1	6.6	11.0	8.1	10.5	14.5	7.4
Discharge Depth (ft)	1.0	1.3	0.6	1.4	0.8	0.8	1.0	0.5
Discharge Area (ft^2)	7.9	15.1	3.5	14.7	8.0	7.9	15.1	3.9
Discharge Velocity (ft/s)	3.9	4.1	4.1	4.1	3.9	3.9	4.1	3.7
Discharge (cfs)	30.9	61.6	14.5	59.8	30.9	30.9	61.6	14.5
Water Surface Slope	0.0101	0.0064	0.0158	0.0053	0.0258	0.0092	0.0061	0.0144
Sinuosity	1.05	1.10	1.05	1.46	1.20	1.15	1.15	1.15
Width/Depth Ratio	9.0	9.9	11.0	9	10.1	13.1	14.5	14.8
Bank Height Ratio	1.0-1.8	1.0-2.1	1.8-2.5	1.4	1.0	1.0	1.0	1.0
Entrenchment Ratio	6.7	5.1	2.4	12	2.1	7.1	6.9	10.7
Substrate	Gravel/Sand	Gravel	Gravel/Sand	Cobble	Gravel	Gravel*	Gravel*	Gravel*

Note* Substrate change results from the addition of riffle bed material during construction activities, rather than changes in substrate from morphological flow parameters.

Table 7 – Essential Morphology Parameters (Continued)

Parameter	Existing				Reference		Proposed			
	UT 9	UT 12	UT 15 (Reach 1)	UT 15 (Reach 1-2)	Causey Farm	Cedarock	UT 9	UT 12	UT 15 (Reach 1)	UT 15 (Reach 1-2)
Valley Width (ft)	100	50	50	50	131	18	100	50	50	50
Contributing Drainage Area (sq. mi.)	0.29	0.02	0.04	0.11	0.63	0.21	0.29	0.02	0.04	0.11
Channel/Reach Classification	Ef4/5	G5/6	F5/6	Ge5	E5	Eb 4	Ce ¾	Ce ¾	Ce ¾	Ce ¾
Discharge Width (ft)	9.4	3.0	6.3	7.4	11.0	8.1	11.0	4.6	5.8	7.8
Discharge Depth (ft)	0.9	0.5	0.4	0.6	1.4	0.8	0.8	0.3	0.4	0.6
Discharge Area (ft^2)	8.7	1.5	2.4	4.4	14.7	8.0	8.7	1.5	2.4	4.4
Discharge Velocity (ft/s)	3.9	3.4	3.6	3.7	4.1	3.9	3.9	3.4	3.6	3.7
Discharge (cfs)	34.0	5.1	8.7	16.3	59.8	30.9	34.0	5.1	8.7	16.3
Water Surface Slope	0.0081	0.0296	0.0334	0.0196	0.0053	0.0258	0.0078	0.0305	0.0304	0.0176
Sinuosity	1.11	1.01	1.00	1.03	1.46	1.20	1.15	1.10	1.10	1.15
Width/Depth Ratio	10.4	6.0	15.8	12.3	9	10.1	13.8	15.3	14.5	13
Bank Height Ratio	1.0-1.4	1.6-4.8	3.3-5.8	1.9-4.5	1.4	1.0	1.0	1.0	1.0	1.0
Entrenchment Ratio	9.4	1.4	1.5	1.9	12	2.1	9.1	10.9	8.6	6.4
Substrate	Gravel/Sand	Sand/Silt	Sand/Silt	Sand	Cobble	Gravel	Gravel*	Gravel*	Gravel*	Gravel*

Note* Substrate change results from the addition of riffle bed material during construction activities, rather than changes in substrate from morphological flow parameters.

Table 7 – Essential Morphology Parameters (Continued)

Parameter	Existing				Reference		Proposed			
	UT 16	UT 17 (Reach 1-3)	UT 18	UT 20 (Reach 1-3)	Causey Farm	Cedarock	UT 16	UT 17 (Reach 1-3)	UT 18	UT 20 (Reach 1-3)
Valley Width (ft)	50	75	50	50	131	18	50	75	50	50
Contributing Drainage Area (sq. mi.)	0.04	0.08	0.02	0.04	0.63	0.21	0.04	0.08	0.02	0.04
Channel/Reach Classification	F4/5	Eg5/6	G4/5	G4/5	E5	Eb 4	Ce ¾	Ce ¾	Ce ¾	Ce ¾
Discharge Width (ft)	6.8	3.9	4.2	4.8	11.0	8.1	5.8	7.0	4.6	5.8
Discharge Depth (ft)	0.4	0.9	0.4	0.5	1.4	0.8	0.4	0.5	0.3	0.4
Discharge Area (ft^2)	2.4	3.5	1.5	2.4	14.7	8.0	2.4	3.5	1.5	2.4
Discharge Velocity (ft/s)	4.2	3.7	3.3	3.2	4.1	3.9	4.2	3.7	3.3	3.2
Discharge (cfs)	10.1	13.1	4.9	7.7	59.8	30.9	10.1	13.1	4.9	7.7
Water Surface Slope	0.0359	0.0243	0.0369	0.0228	0.0053	0.0258	0.0304	0.0243	0.0305	0.0228
Sinuosity	1.03	1.15	1.01	1.11	1.46	1.20	1.10	1.15	1.10	1.10
Width/Depth Ratio	19.9	4.3	12.4	9.6	9	10.1	14.5	14	15.3	14.5
Bank Height Ratio	2.6-4.2	1.7-4.1	2.3-4.8	2.4-4.1	1.4	1.0	1.0	1.0	1.0	1.0
Entrenchment Ratio	1.4	2.6	1.8	1.4	12	2.1	8.6	10.7	10.9	8.6
Substrate	Gravel/Sand	Sand/Silt	Gravel/Sand	Gravel/Sand	Cobble	Gravel	Gravel*	Gravel*	Gravel*	Gravel*

Note* Substrate change results from the addition of riffle bed material during construction activities, rather than changes in substrate from morphological flow parameters.

3.5.5 Discharge

This hydrophysiographic region is characterized by moderate rainfall, with precipitation averaging approximately 42.0 inches per year (USDA 1977). Drainage basin sizes range from 0.01- 1.26-square miles on UT3-UT1 and 3.05 square miles for NPSQ Creek at the Site outfall.

Based on indicators of bankfull at the reference reach and within the Site, the designed channel will equal approximately 93 percent of the channel size indicated by Piedmont regional curves (Harman et al. 1999); this is discussed in Section 5.2 (Bankfull Verification).

3.6 Project Site Wetlands

Jurisdictional wetlands/hydric soils within the Site were delineated in the field following guidelines outlined in the *Corps of Engineers Wetlands Delineation Manual* and subsequent regional supplements and located using GPS technology with reported submeter accuracy (Environmental Laboratory 1987). A jurisdictional wetland delineation was completed and approved by the United States Army Corps of Engineers (USACE) representative Casey Haywood during a field meeting on November 2, 2021. Documentation of the delineation is included in Appendix D. Existing jurisdictional wetlands are depicted in light blue, and drained/impacted hydric soils are shown in black hatch in Figures 4 and 4A - 4D (Appendix A).

In general, two distinct wetland types occur within the Site boundaries including 1) forested wetlands and 2) herbaceous wetlands.

<u>Forested Wetlands</u>

Forested wetlands range from reference condition to heavily impacted by livestock. Reference wetlands are generally composed of mature vegetation, with a relatively open understory and are colonized by a diverse assemblage of herbaceous species. The ground is characterized by microtopographic pools and sloughs that pond water in wet periods and frequently have flow patterns associated with overbank flooding. As livestock are introduced, the herb, shrub, and understory are grazed/browsed leading to an open understory and reduction of microtopographic variation as hoof action compacts the ground surface.



Although small pockets of forested wetlands are scattered throughout the Site, the largest areas are contained within wide stream bottoms such as the floodplains adjacent to UT 5 and NPSQ Creek.

Herbaceous Wetlands Herbaceous wetlands are in areas cleared for pasture, row crops, or hay fields and are too wet to keep maintained for the intended land use. These areas are colonized by herbaceous or emergent vegetation. Frequently, an attempt has been made to drain these areas with ditches, drain tile, or maintenance of the adjacent stream channel; however, suitable hydrology exists for the area to remain jurisdictional. Vegetation is primarily characterized by rushes and sedges with various planted grasses and other herbaceous or emergent vegetation interspersed. In general, microtopography has been removed by plowing, clearing, and livestock and surface water storage has been altered.

Herbaceous wetlands occur throughout the Site, in nearly every landscape position.



3.6.1 Hydrological Characterization

Construction activities are expected to provide for 52.8 acres of wetland reestablishment, rehabilitation, enhancement, preservation, and creation. Areas of the Site targeted for riparian wetlands will receive hydrological inputs from periodic overbank flooding of restored tributaries, groundwater migration into wetlands, upland/stormwater runoff, and, to a lesser extent, direct precipitation. Hydrological impairment in drained soils has resulted from lateral draw-down of the water table adjacent to existing, incised stream channels and ditching/drain tile installation.

Wetlands impacted by drainage features (incised channels or ditches) were monitored by groundwater gauges before mitigation alterations. Nineteen groundwater gauges were installed at the Site to catalog the existing hydrology of these wetland areas. The preconstruction gauge locations are depicted in Figures 4A through 4D, and the data is provided in Appendix K.

Overall, the gauges appeared to have water within 12 inches of the ground surface for between 2 days and 96 days of the growing season. For this analysis, the growing season is defined as occurring between March 20 to November 11 as determined using the latest 30 years of data from the nearest WETS station. It should be noted that during preconstruction groundwater monitoring, the growing season was unusually wet. Using the USACE Antecedent Precipitation Tool, it appears the period of monitoring is wetter than normal, particularly immediately before the March 20 growing season initiation through mid April. The Antecedent Precipitation Tool output is included in Appendix K.

Groundwater gauge data indicates an array of groundwater characterization across the Site; however, primarily that wetland rehabilitation areas are suitable for enhanced hydrology. Of the 19 groundwater gauges, only 5 have a wetland hydroperiod greater than 12.5% of the growing season. The only gauge that shows a significantly wet hydrologic regime is gauge 9, which is in a wetland enhancement area. The other 4 groundwater gauges (gauges 5, 13, 15 and 16) range from 12.7% to 19.5% of the growing season and appear suitable for wetland rehabilitation from groundwater and vegetation improvements, along with livestock removal from the Site.

The remaining 14 groundwater gauges have had hydrology reduced below jurisdictional status and appear suitable for wetland rehabilitation/reestablishment from ditch filling, drain tile removal, and restoration of incised stream channels. Gauge data from the spring of 2022 is presented in Table 8, and gauge graphs are presented in Appendix K.

Table 8 – Preconstruction Groundwater Gauge Data

Location	Gauge Number	Proposed Wetland Mitigation Treatment	Consecutive Days of Saturation	% of Growing Season
UT 9 Upstream	1	Rehabilitation	2	0.8
UT 9 Upstream	2	Rehabilitation	11	4.7
UT 9 Downstream	3	Rehabilitation	7	3.0
UT 5 Upstream	4	Rehabilitation	8	3.4
UT 5 Upstream	5	Rehabilitation	41	17.4
UT 5 Upstream	6	Rehabilitation	10	4.2
UT 1 Upstream	7	Rehabilitation	21	8.9
UT 1 Upstream	8	Enhancement	7	3.0
UT 1 Upstream	9	Enhancement	96	40.7
UT 1 Upstream	10	Rehabilitation	11	4.7
UT 5 Downstream	11	Rehabilitation	25	10.6
UT 5 Downstream	12	Rehabilitation	6	2.5
UT 5 Downstream	13	Rehabilitation	41	17.4
NPSQ Creek	14	Rehabilitation	2	0.8
UT 15	15	Rehabilitation	46	19.5
NPSQ Creek Downstream	16	Rehabilitation	30	12.7
NPSQ Creek Downstream	17	Rehabilitation	7	3.0
NPSQ Creek Downstream	18	Rehabilitation	8	3.4
UT 20	19	Reestablishment	4	1.7

3.6.2 Soil Characterization

Detailed soil mapping conducted by a North Carolina Licensed Soil Scientist (NCLSS) indicate the Site is underlain by hydric soils of the Wehadkee series (Figures 4 and 4A-4D, Appendix A). Wetlands have been cleared of vegetation and plowed for agriculture. Hydric soils have been affected by stream channel incision or relocation of stream channels to the floodplain margins.

Onsite hydric soils are grey to gley in color and have been cleared of vegetation, plowed for hay fields and row crops, and are trampled by livestock. Groundwater springs and surface runoff contribute hydrology to these areas. However, the dominant hydrological influence is the lateral draw-down of the water table adjacent to incised stream channels or streams relocated to the floodplain margins. Detailed soil profiles conducted by a NCLSS are provided in Appendix B.

The Web Soil Survey (USDA 2021) indicates that Site floodplains are underlain by Chewacla and Wehadkee soils. Chewacla is listed as a non-hydric soil series with hydric inclusion of the Wehadkee soil series. Detailed soil mapping confirms the mapped soil series, with some inclusions matching a Worsham soil series. However, disturbance from agriculture activities has made a direct profile correlation difficult. Therefore, hydric soil indicators such as F3 (Depleted Matrix) have been used to delineate soil mapping boundaries in the field.

4 REFERENCE STUDIES

4.1 REFERENCE STREAMS

Two reference reaches were identified for the Site that are in the same physiographic region and geology. The first reference stream, Cedarock Park is located approximately 11.5 miles east-northeast of the Site in Cedarock Park. Cedarock Park is situated along unnamed tributaries to Rock Creek which drain to Stinking Quarter Creek. The second reference stream (Causey Farm) is located less than one mile east of the Site on unnamed tributaries to North Prong Stinking Quarter Creek. The Causey Farm reference was measured in 2004 as a reference reach for the Causey Farm stream mitigation project, which was a successful project through five years of monitoring with no issues. Both reference reaches exhibit similar slope, size, geology, and substrate that is expected to occur in Site streams. The streams were measured and classified by stream type (Rosgen 1996).

4.1.1 Channel Classification

The reference reaches are both characterized as E-type streams; Cedarock is a moderately sinuous (1.2) channel dominated by gravel substrate and Causey Farm had slightly higher sinuosity channel, due to a lower valley slope, with a sand-dominated substrate.

4.1.2 Discharge

Field indicators of bankfull approximate an average discharge of 30.9 and 59.8 cfs, respectively for the Cedar Fork and Causey Farm reference reaches, which is 108 and 94 percent of that predicted by the regional curves.

4.1.3 Channel Morphology

Dimension: Data collected at Cedarock and Causey Farm indicate bankfull cross-sectional areas of 8.0 and 14.7 square feet, respectively. Cedarock was slightly larger than predicted by regional curves (7.5 square feet) and Causey Farm was slightly smaller than predicted by regional curves (15.7 square feet). Cedarock and Causey exhibit a bankfull width of 8.1 and 11.0, a bankfull depth of 0.8 and 1.4 feet, and width-to-

depth ratios of 10.1 and 9.0, respectively (see Table B1, Morphological Stream Characteristics). Figure 5 (Appendix A) provides plan view and cross-sectional data for the Cedarock reference reach. The reference reaches exhibit a bank-height ratio of 1.0 and 1.4, respectively. The Causey Farm reference reach was slightly incised; however, defined bankfull indicators were present, which assisted with determining the appropriate cross-sectional area.

Pattern and Profile: In-field measurements of the reference reaches have yielded an average sinuosity of 1.2 at Cedarock and 1.45 at Causey Farm (thalweg distance/straight-line distance). Onsite valley slopes of Site restoration reaches range from 0.0185-0.0241. Valley slopes exhibited by reference channels range from slightly higher (0.0310 at Cedarock) than the Site to slightly lower (0.0077 at Causey Farm), providing a good range of slopes to compare existing and proposed Site conditions. Although slightly incised, the Causey Farm reference reach had a suitable pattern with no shoot cutoffs, eroding outer bends, or excessively tight radius of curvatures, in addition to appropriate pool-to-pool spacing and meander wavelengths.

Substrate: Reference channels are characterized by substrate dominated by gravel and sand sized particles, respectively.

4.2 Reference Forest Ecosystem

A Reference Forest Ecosystem (RFE) is a forested area to model restoration efforts at the Site in relation to soils and vegetation. RFEs should be ecologically stable climax communities and should represent the area as it likely existed before human disturbances. Data describing plant community composition and structure should be collected at the RFEs and subsequently applied as reference data to emulate a natural climax community.

The RFE for this project is located along North Prong Stinking Quarter Creek within preservation wetlands. The RFE supports plant community and landform characteristics that restoration efforts will attempt to emulate. Tree and shrub species identified within the reference forest and outlined in Table 9 will be used, in addition to other relevant species listed in appropriate Schafale (2012) community descriptions.

Table 9 – Reference Forest Ecosystem

Piedmont/Mountain Bottomland Forest	
Red maple (*Acer rubrum*)	Sweetgum (*Liquidambar styraciflua*)
American Sycamore *(Platanus occidentalis)*	Tulip poplar (*Liriodendron tulipifera*)
Ironwood (*Carpinus caroliniana*)	Willow oak (*Quercus phellos*)
Shagbark hickory (*Carya ovata*)	Winged Elm *(Ulmus alata)*
Swamp chestnut oak (*Quercus michauxii*)	Pignut Hickory *(Carya glabra)*
Slippery elm (*Ulmus rubra*)	Tag alder (*Alnus serrulate*)
Green Ash *(Fraxinus pennsylvanica)*	American Elm *(Ulmus americana)*
American Beech *(Fagus grandifolia)*	Swamp Chestnut Oak *(Quercus michauxii)*

It should be noted that Piedmont/Mountain Bottomland Forest has both a High subtype and Typic Low subtype, both of which may occur within the larger reference forest floodplain. In addition, Piedmont Alluvial Forest may be intermingled within the Piedmont/Mountain Bottomland Forest community in

narrow portions of the reference forest floodplain or along smaller streams withing the Site. Alluvial species such as tulip poplar, American sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), and hackberry (*Celtis laevigata*) may occur in this community type. Some areas of the Site are likely to be characterized by Piedmont Headwater Stream Forest along smaller, drier streams that would include drier oak species such as white oak (*Quercus alba*) and red oak (*Quercus rubra*).

5 CHANNEL ASSESSMENTS

5.1 Channel Stability Assessment

Stream power and shear stress were estimated for 1) existing dredged and straightened reaches, 2) the reference reaches, and 3) proposed Site conditions. Important input values and output results (including stream power, shear stress, and per unit shear power and shear stress) are presented in Table 11. Average stream velocity and bankfull discharge values were calculated for the existing Site stream reaches, the reference reach, and proposed conditions.

The proposed channel should exhibit stream power and shear stress values to maintain sediment transport functions of a stable stream system, so the channel is neither aggrading nor degrading. The analysis indicates the proposed channel reaches are expected to maintain stream power as a function of width values of approximately 1.10-2.84 and shear stress values of approximately 0.23-0.66 (Table 10).

Table 10 – Stream Power (Ω) and Shear Stress (τ) Values

	Discharge (ft^3/s)	Water surface Slope (ft/ft)	Total Stream Power (Ω)	Ω/W	Hydraulic Radius	Shear Stress (τ)	Velocity (v)	τ v	τ_{max}
Existing Conditions									
NPSQ Creek	152.2	0.0036	**34.20**	**1.97**	1.90	**0.43**	4.02	1.71	**0.64**
UT 1 Upstream	68.7	0.0143	**61.32**	**9.58**	2.25	**2.01**	3.82	7.66	**3.01**
UT 1 Downstream	148.8	0.0061	**56.64**	**4.93**	2.39	**0.91**	4.01	3.65	**1.37**
UT 5 Upstream	50.9	0.0101	**32.10**	**3.78**	1.30	**0.82**	3.75	3.06	**1.22**
UT 5 Downstream	133.4	0.0064	**53.29**	**4.40**	2.28	**0.91**	3.98	3.63	**1.37**
UT 9	51.7	0.0081	**26.15**	**2.78**	1.23	**0.62**	3.75	2.33	**0.93**
UT 12	37.5	0.0296	**69.19**	**23.06**	2.55	**4.71**	3.67	17.30	**7.06**
UT 15 Downstream	176.8	0.0196	**216.26**	**29.22**	5.07	**6.20**	4.06	25.15	**9.30**
UT 17	143.2	0.0243	**217.21**	**55.69**	6.28	**9.52**	4.00	38.11	**14.29**
UT 20	163.9	0.0228	**233.12**	**34.28**	5.34	**7.60**	4.04	30.67	**11.40**
Reference Conditions									
Cedarock	30.9	0.0258	**49.75**	**6.14**	0.82	**1.33**	3.86	5.13	**1.99**
Causey Farm	59.8	0.0053	**19.78**	**1.80**	1.07	**0.35**	4.07	1.43	**0.53**

Table 11 – Stream Power (Ω) and Shear Stress (τ) Values (Continued)

	Discharge (ft^3/s)	Water surface Slope (ft/ft)	Total Stream Power (Ω)	Ω/W	Hydraulic Radius	Shear Stress (τ)	Velocity (v)	τ v	τ_{max}
Proposed Conditions									
NPSQ Creek	94.7	0.0033	**19.50**	**1.10**	1.11	**0.23**	4.19	0.96	**0.34**
UT 1 Upstream	21.1	0.0141	**18.56**	**2.11**	0.55	**0.48**	3.84	1.86	**0.73**
UT 1 Downstream	97.5	0.0057	**34.68**	**1.93**	1.13	**0.40**	4.20	1.68	**0.60**
UT 5 Upstream	30.9	0.0092	**17.74**	**1.69**	0.65	**0.37**	3.91	1.47	**0.56**
UT 5 Downstream	61.6	0.0061	**23.45**	**1.62**	0.92	**0.35**	4.08	1.42	**0.52**
UT 9	34	0.0078	**16.55**	**1.50**	0.69	**0.34**	3.91	1.31	**0.50**
UT 12	5.1	0.0272	**8.66**	**1.88**	0.29	**0.49**	3.40	1.66	**0.73**
UT 15 Downstream	16.3	0.0176	**17.90**	**2.30**	0.49	**0.54**	3.70	1.99	**0.81**
UT 17	13.1	0.0243	**19.86**	**2.84**	0.44	**0.66**	3.74	2.48	**1.00**
UT 20	7.7	0.0228	**10.95**	**2.28**	0.38	**0.54**	3.50	1.89	**0.81**

The Cedarock reference reach values for stream power are elevated due to steeper valley/water surface slopes and narrow width-to-depth ratios.

Existing, Site streams are characterized by a wide range of water surface slopes and varying degrees of degradation. In general, stream power values of existing streams are not significantly high due to several dams attenuating erosive stormwater pulses. Onsite channels have been straightened and are slightly incised, however, the channels do not receive excessive erosive forces that may lead to mass wasting. Overall, the existing channel stream power and shear stress values are slightly higher than the proposed values, particularly when compared on a reach-by-reach basis. Proposed stream power and shear stress values appear adequate to mobilize and transport sediment through the Site, without aggradation or erosion on proposed stream banks. The reduction in stream power and shear stress should normalize erosion across the Site and result in the direct reduction of 474.4 tons of sediment per year (see Section 3.3 Sediment Model).

5.2 Bankfull Verification

Discharge estimates for the Site utilize an assumed definition of "bankfull" and the return interval associated with that bankfull discharge. For this study, the bankfull channel is defined as the channel dimensions designed to support the "channel forming" or "dominant" discharge (Gordon et al. 1992).

Based on available Piedmont regional curves, the predicted bankfull discharge for the reference reaches average approximately 28.8 and 63.8 cubic feet per second (cfs) (Harmen et al. 1999). The Piedmont region's USGS regional regression equation indicates that bankfull discharge for the reference reach at a 1.3-1.5-year return interval averages approximately 27-32 and 53-65 cfs (USGS 2006).

Field indicators of bankfull, primarily topographic breaks identified on the banks, and riffle cross-sections were utilized to obtain an average bankfull cross-sectional area for the reference reaches. The Piedmont regional curves were then utilized to plot the watershed area and discharge for the reference reach cross-sectional area. Field indicators of bankfull approximate an average discharge of 30.9 and 59.8 for the

reference reach, which is 107 and 94 percent of that predicted by the regional curves, which is verified by the range approximated by the USGS regional regression equation.

Based on the above analysis of methods to determine bankfull discharge, proposed conditions at the Site will be based on reference reaches and indicators of bankfull on cross-sections located at the Site. The designed onsite channel restoration area will equal approximately 93 percent of the channel size indicated by Piedmont regional curves. Table 11 summarizes all methods analyzed for estimating bankfull discharge.

Table 12 – Reference Reach Bankfull Discharge Analysis

Method	Watershed Area (square miles)	Return Interval (years)	Discharge (cfs)
Cedarock Reference Reach			
Piedmont Regional Curves (Harman et al. 1999)	0.21	1.3-1.5	28.8
Piedmont Regional Regression Model (USGS 2004)	0.21	1.3-1.5	27-32
Field Indicators of Bankfull	0.21	1.3-1.5	30.9
Causey Farm Reference Reach			
Piedmont Regional Curves (Harman et al. 1999)	0.63	1.3-1.5	63.8
Piedmont Regional Regression Model (USGS 2004)	0.63	1.3-1.5	53-65
Field Indicators of Bankfull	0.63	1.3-1.5	59.8

6 FUNCTIONAL UPLIFT AND PROJECT GOALS/OBJECTIVES

Site-specific mitigation goals and objectives have been academically developed through the use of the North Carolina Stream Assessment Method (NC SAM) and the North Carolina Wetland Assessment Method (NC WAM) analyses of existing and reference stream systems at the Site (NC SFAT 2015 and NC WFAT 2010). These methodologies rate functional metrics for streams and wetlands as high, medium, or low based on field data collected on forms and transferred into a rating calculator. Using Boolean logic, the rating calculator assigns a high, medium, or low value for each metric and overall function. Site functional assessment data forms are included in Appendix B.

Tables 12 – 14 summarize NC SAM and NC WAM metrics targeted for functional uplift and the corresponding mitigation activities proposed to provide functional uplift. Metrics targeted to meet the Site's goals and objectives are depicted in bold.

Based on NC SAM output, all three primary stream functional metrics (Hydrology, Water Quality, and Habitat), and 20 sub-metrics are under-performing as exhibited by a LOW metric rating (see Figures 4 and 4A-4D, Appendix A for NC SAM data reaches). LOW performing metrics are targeted for functional uplift through mitigation activities, goals, objectives, monitoring, and success criteria.

Based on NC WAM output, all three of the primary wetland functional metrics (Hydrology, Water Quality, and Habitat) and 8 sub-metrics are under-performing as exhibited by a LOW metric rating. LOW performing metrics are targeted for functional uplift through mitigation activities, goals, objectives, monitoring, and success criteria. The following table outlines stream and wetland functions targeted for functional uplift, goals that are tied to the specific functions, and objectives to be completed to achieve the proposed goals.

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Table 13 – NC SAM Summary

NC SAM Function Class Rating Summary	SAM 1 - UTs 6 (upper), 7 & 9	SAM 2 - UTs 1 (upper), 2, 3, 5 (up), & 10	SAM 4- UT 5 (up-mid)	SAM 5 -UT5 (mid)	SAM 6 - UT 5 (low-mid)
(1) HYDROLOGY	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(2) Baseflow	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
(2) Flood Flow	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(3) Streamside Area Attenuation	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(4) Floodplain Access	MEDIUM	MEDIUM	**LOW**	MEDIUM	**LOW**
(4) Wooded Riparian Buffer	**LOW**	**LOW**	**LOW**	HIGH	HIGH
(4) Microtopography	**LOW**	**LOW**	**LOW**	MEDIUM	**LOW**
(3) Stream Stability	**LOW**	MEDIUM	**LOW**	MEDIUM	MEDIUM
(4) Channel Stability	MEDIUM	HIGH	MEDIUM	MEDIUM	MEDIUM
(4) Sediment Transport	**LOW**	**LOW**	**LOW**	**LOW**	MEDIUM
(4) Stream Geomorphology	MEDIUM	MEDIUM	MEDIUM	HIGH	MEDIUM
(1) WATER QUALITY	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(2) Baseflow	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
(2) Stream-side Area Vegetation	**LOW**	**LOW**	**LOW**	HIGH	MEDIUM
(3) Upland Pollutant Filtration	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(3) Thermoregulation	**LOW**	MEDIUM	**LOW**	HIGH	HIGH
(2) Indicators of Stressors	**YES**	**YES**	**YES**	NO	**YES**
(2) Aquatic Life Tolerance	**LOW**	HIGH	MEDIUM	MEDIUM	MEDIUM
(1) HABITAT	**LOW**	**LOW**	**LOW**	LOW	**LOW**
(2) In-stream Habitat	**LOW**	**LOW**	**LOW**	LOW	**LOW**
(3) Baseflow	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
(3) Substrate	**LOW**	**LOW**	**LOW**	**LOW**	MEDIUM
(3) Stream Stability	MEDIUM	MEDIUM	MEDIUM	MEDIUM	MEDIUM
(3) In-Stream Habitat	**LOW**	MEDIUM	MEDIUM	**LOW**	**LOW**
(2) Stream-side Habitat	**LOW**	**LOW**	**LOW**	HIGH	HIGH
(3) Stream-side Habitat	**LOW**	**LOW**	**LOW**	HIGH	MEDIUM
(3) Thermoregulation	**LOW**	**LOW**	**LOW**	HIGH	HIGH
OVERALL	**LOW**	**LOW**	**LOW**	HIGH	**LOW**

Table 12 – NC SAM Summary (Continued)

NC SAM Function Class Rating Summary	SAM 7 - UTs 1 (mid) & 5 (lower)	SAM 8 - UT 1 (lower) & NPSQ Creek	SAM 9 - UT 15 (lower)	SAM 10 - NPSQ Creek (lower)	SAM 11- UT 15, 18, 20
(1) HYDROLOGY	HIGH	MEDIUM	**LOW**	**LOW**	**LOW**
(2) Baseflow	HIGH	HIGH	HIGH	HIGH	HIGH
(2) Flood Flow	HIGH	MEDIUM	**LOW**	**LOW**	**LOW**
(3) Streamside Area Attenuation	HIGH	**LOW**	MEDIUM	MEDIUM	**LOW**
(4) Floodplain Access	HIGH	**LOW**	MEDIUM	MEDIUM	**LOW**
(4) Wooded Riparian Buffer	HIGH	**LOW**	MEDIUM	MEDIUM	**LOW**
(4) Microtopography	**LOW**	**LOW**	HIGH	**LOW**	**LOW**
(3) Stream Stability	HIGH	HIGH	**LOW**	**LOW**	**LOW**
(4) Channel Stability	HIGH	HIGH	MEDIUM	**LOW**	MEDIUM
(4) Sediment Transport	MEDIUM	**LOW**	**LOW**	**LOW**	**LOW**
(4) Stream Geomorphology	HIGH	HIGH	MEDIUM	MEDIUM	**LOW**
(1) WATER QUALITY	**LOW**	HIGH	**LOW**	**LOW**	**LOW**
(2) Baseflow	HIGH	HIGH	HIGH	HIGH	HIGH
(2) Stream-side Area Vegetation	MEDIUM	HIGH	**LOW**	**LOW**	**LOW**
(3) Upland Pollutant Filtration	**LOW**	HIGH	**LOW**	**LOW**	**LOW**
(3) Thermoregulation	HIGH	MEDIUM	MEDIUM	MEDIUM	**LOW**
(2) Indicators of Stressors	**YES**	NO	**YES**	**YES**	**YES**
(2) Aquatic Life Tolerance	MEDIUM	MEDIUM	**LOW**	HIGH	**LOW**
(1) HABITAT	**LOW**	**LOW**	**LOW**	HIGH	**LOW**
(2) In-stream Habitat	**LOW**	**LOW**	**LOW**	MEDIUM	**LOW**
(3) Baseflow	HIGH	HIGH	HIGH	HIGH	HIGH
(3) Substrate	MEDIUM	**LOW**	**LOW**	**LOW**	**LOW**
(3) Stream Stability	HIGH	HIGH	MEDIUM	**LOW**	MEDIUM
(3) In-Stream Habitat	**LOW**	MEDIUM	MEDIUM	HIGH	**LOW**
(2) Stream-side Habitat	HIGH	**LOW**	HIGH	HIGH	**LOW**
(3) Stream-side Habitat	HIGH	**LOW**	HIGH	HIGH	**LOW**
(3) Thermoregulation	HIGH	**LOW**	MEDIUM	MEDIUM	**LOW**
OVERALL	**LOW**	MEDIUM	**LOW**	**LOW**	**LOW**

Table 14 - NC WAM Summary

NC WAM Sub-function Rating Summary	WAM 1	WAM 2	WAM 3	WAM 4	WAM 5	WAM 6	WAM 7	WAM 8	WAM 9
Wetland Type	Headwater Forest	Bottomland Hardwood Forest	Seep	Bottomland Hardwood Forest	Bottomland Hardwood Forest	Bottomland Hardwood Forest	Headwater Forest	Headwater Forest	Headwater Forest
(1) HYDROLOGY	MEDIUM	**LOW**	**LOW**	**LOW**	HIGH	**LOW**	MEDIUM	**LOW**	MEDIUM
(2) Surface Storage & Retention	**LOW**	**LOW**	NA	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**
(2) Sub-surface Storage and Retention	HIGH	MEDIUM	NA	MEDIUM	MEDIUM	MEDIUM	HIGH	**LOW**	HIGH
(1) WATER QUALITY	**LOW**	**LOW**	**LOW**	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**
(2) Pathogen change	**LOW**	**LOW**	NA	**LOW**	HIGH	**LOW**	**LOW**	MEDIUM	MEDIUM
(2) Particulate Change	**LOW**	**LOW**	NA	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**
(2) Soluble change	**LOW**	**LOW**	NA	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**
(2) Physical Change	**LOW**	**LOW**	NA	**LOW**	HIGH	**LOW**	**LOW**	MEDIUM	MEDIUM
(1) HABITAT	**LOW**	**LOW**	**LOW**	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**
(2) Physical Structure	**LOW**	**LOW**	**LOW**	**LOW**	HIGH	MEDIUM	MEDIUM	**LOW**	**LOW**
(2) Landscape Patch Structure	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**	**LOW**
(2) Vegetative Composition	**LOW**	**LOW**	**LOW**	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	MEDIUM
OVERALL	**LOW**	**LOW**	**LOW**	**LOW**	HIGH	**LOW**	**LOW**	**LOW**	**LOW**

Table 15 – Targeted Functions, Goals, Objectives, and Uplift Evaluation

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Reconnect channels with floodplains and riparian wetlands to allow a natural flooding regime.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain. Remove overburden to reconnect with adjacent wetlands.	Dispersion of high flows on the floodplain, increase in biogeochemical cycling within the system, and recharging of riparian wetlands.	Four bankfull events and within separate years through the monitoring period.	4 Crest gauges (pressure transducers) on UT 5 upstream, UT 5 downstream, NPSQ Creek, and UT 15.	To be determined
Improve stability of stream channels.	Construct stream channels that will maintain stable cross- sections, patterns, and profiles over time.	Reduction in sediment inputs from bank erosion, reduction of shear stress, and improved overall hydraulic function.	Bank height ratios remain below 1.2 in riffle cross sections over the monitoring period. Visual assessments showing progression towards stability.	40 Cross sections	To be determined
Restore and enhance native floodplain and streambank vegetation.	Plant native tree and understory species in riparian zones and plant appropriate species on streambanks.	Reduction in floodplain sediment inputs from runoff, increased bank stability, increased LWD and organic material in streams, increased	Survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7.	37 permanently monument vegetation plots and 27 random vegetation transects.	To be determined
Restore and enhance groundwater hydrology to drained or impacted hydric soil areas.	Reduce channel depth in incised stream reaches, remove drain tile, fill drainage ditches, and alleviate soil compaction from agriculture activities.	Particulate and pollution conversion, groundwater storage and reduced downstream flooding, habitat diversification, and vegetative composition conversion.	Groundwater saturation within 12 inches of the soil surface for 12 % of the growing season for reestablishment and improvement of hydrology in rehabilitation areas.	41 groundwater gauges	To be determined

Note: Growing season for this project is from March 20 to November 11 as determined using the latest 30 years of data from the nearest WETS station.

7 SITE DESIGN AND IMPLEMENTATION CONSTRAINTS

The presence of conditions or characteristics that could hinder restoration activities on the Site was evaluated. The evaluation focused primarily on the presence of hazardous materials, utilities, restrictive easements, rare/threatened/endangered species or critical habitats, and the potential for hydrologic trespass. Existing information regarding Site constraints was acquired and reviewed. In addition, any Site conditions that could restrict the restoration design and implementation were documented during the field investigation.

No known Site constraints that may hinder proposed mitigation activities were identified during field surveys. Potential constraints reviewed include the following.

7.1 Threatened & Endangered Species

Listed federally protected species are summarized in the following table along with potential habitat and a preliminary biological conclusion for each.

Table 16 – Threatened and Endangered Species

Common Name (Scientific Name)	Federal Status	Habitat at Site	Biological Conclusion	Summary
Schweinitz's Sunflower (*Helianthus schweinitzii*)	Endangered	Yes	No Effect	Habitat exists in or near the project boundaries.
Small Whorled Pogonia (*Isotria medeoloides*)	Threatened	Yes	No Effect	Habitat exists in or near the project boundaries.
Tricolored Bat* (*Perimyotis subflavus*)	Proposed Endangered	Yes	May Affect, Not Likely To Adversely Affect	(See Tricolored Bat information below)

Schweinitz's Sunflower

Schweinitz's sunflower is found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and Piedmont longleaf pine forests, and other sunny or semi-sunny habitats where disturbances (e.g., mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. It is intolerant of full shade and excessive competition from other vegetation. Schweinitz's sunflower occurs in a variety of soil series; it is generally found growing on shallow sandy soils with high gravel content; shallow, poor, clayey hardpans; or shallow rocky soils, especially those derived from mafic rocks. Habitat for this species exists within the Site.

A Site-wide survey was conducted at the Site on October 27, 2020. For the survey, a known population nearby was visited and observed by Axiom biologist on October 27, 2020. Systematic surveys were then performed within all areas of suitable habitat within the Site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Schweinitz's sunflower.

Small Whorled Pogonia

Small whorled pogonia can be limited by shade. The species seems to require small light gaps or canopy breaks and generally grows in areas with sparse to moderate ground cover. Too many other plants in an area can be harmful to this plant. This orchid typically grows under canopies that are relatively open or near features that create long-persisting breaks in the forest canopy such as a road or a stream. It grows

in mixed-deciduous or mixed-deciduous/coniferous forests, generally in second or third-growth successional stages. The soils in which it lives are usually acidic, moist, and have very few nutrients. Habitat for this species exists within the Site.

A Site-wide survey was conducted at the Site on May 25, 2021. Systematic surveys were then performed within all areas of suitable habitat within the Site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Small whorled pogonia.

Tricolored Bat

Tricolored Bat is Proposed to be listed as Endangered in Late 2023. During the winter, tricolored bats are found in caves and mines; however, in North Carolina are often found roosting in road culverts. In the spring, summer, and fall they are found in forested habitats where they roost in trees, primarily among leaves.

Biological Conclusion

The project is anticipated to have beneficial effects on riparian foraging areas without adverse impacts to Tricolored bats or their habitat. Tree removal activities will occur in the winter season and prior to pupping season (May 15th). Therefore, the biological conclusion for this species is **May Affect, Not Likely to Adversely Affect.**

7.2 Cultural Resources

The term "cultural resources" refers to prehistoric or historic archaeological sites, structures, or artifact deposits over 50 years old. "Significant" cultural resources are those that are eligible or potentially eligible for inclusion in the National Register of Historic Places. Evaluations of site significance are made with reference to the eligibility criteria of the National Register (36 CFR 60) and in consultation with the North Carolina State Historic Preservation Office (SHPO).

Field visits were conducted at the Site in April and August 2019 and again in April through August 2020 to ascertain the presence of structures or other features that may be eligible for inclusion on the National Register of Historic Places. No structures were identified within proposed easement boundaries. SHPO concurrence for the project has been received and is included in Appendix E (Categorical Exclusion).

7.3 North Carolina Natural Heritage Elements

A query of the North Carolina Natural Heritage Program (NCNHP) database indicates there are no records for rare species, important natural communities, natural areas, or conservation/managed areas within the proposed project boundary. Within a one-mile radius of the Site, NCNHP lists one federally-protected species (Appendix E).

7.4 FEMA and Hydrologic Trespass

The following FEMA Flood Insurance Rate Maps were inspected for the project: Rate Map 3710870900J, Panel 8709, effective 6/18/2007, Rate Map 3710871800K, Panel 8708, effective 1/2/2008, Rate Map 3710871800K, Panel 8718, effective 1/2/2008, Rate Map 3710871900J, Panel 8719, effective 6/18/2007. FEMA mapping indicates that North Prong Stinking Quarter Creek and tributaries crossing the floodplain are located within a Zone AE flood area. Therefore, a HEC-RAS analysis will be completed on the existing and proposed conditions of North Prong Stinking Quarter Creek and its tributaries to assess hydraulic performance. As per North Carolina Floodplain Mapping requirements, a Conditional Letter of Map Revision (CLOMR) may need to be prepared for the Site.

Given the sloping nature of the Site, relatively confined valleys, and the landowner's possession of land adjacent to and immediately upstream of the project boundary, the risk of hydrologic trespass is relatively small. The Site's lower reaches will be modeled using a HEC RAS analysis for the CLOMR, during which adjustments may be made to reduce hydrologic trespass, if necessary; however, these adjustments are not expected.

7.5 Utilities

A powerline crosses UT 5 in a perpendicular manner in the lower restoration reach, just upstream from the downstream-most crossing. This powerline will be moved into the easement break.

7.6 Air Transport Facilities

There are three small air transport facilities located within five miles of the Site. Kecks Airport, which is a small dirt landing strip, is 0.7 miles from the Site (owned by project participants). Causey Aviation Service is 1.2 miles from the Site, and Southeast Greensboro Airport is 2.3 miles from the Site.

7.7 Easement Breaks

Easement breaks were evaluated as a potential project constraint as they fragment the Site and reduce the potential functional uplift. This project reduces the number of crossings at the Site from 15 crossings to 14 crossings. In addition, the Site is composed of more than 22,450 linear feet of stream, minimizing the number of crossings to the extent allowable by the landowners. Although easement breaks may reduce the functional uplift to the Site, landowner requirements on active farming operations are a necessary aspect of this stream mitigation project.

7.8 Future Development Trends

An analysis of future development prospects for the Site and surrounding properties was conducted to determine if high density residential or industrial development that may adversely affect the project is likely to occur in the future. The analysis included data from Guilford County, adjacent municipalities, NC Department of Transportation, and FEMA.

- The Site is not in the city limits or Extra Territorial Jurisdiction (ETJ) of any municipalities of Guilford County.
- The Site is zoned for agriculture use and no high-density residential development is located near the Site. A large industrial facility has been permitted near the Site, but no expansion of the facility is expected in the vicinity of the Site.
- The lower reaches of the Site are mapped by FEMA as a Zone AE floodway. Guilford County has extensive prohibitions for development in FEMA flood zones.
- The NC Department of Transportation, State Transportation Improvement Program (STIP) mapping (2020 to 2029) has no projects within 10 miles of the Site.

8 DESIGN APPROACH AND MITIGATION WORK PLAN

8.1 Stream Design

Onsite streams targeted for restoration have endured significant disturbance from land use activities such as land clearing, straightening/rerouting of channels, ditching within the floodplain, plowing, livestock production, and other anthropogenic maintenance. Site streams will be restored to emulate historical conditions at the Site utilizing parameters from relatively undisturbed reference streams (see Section 4.1 Reference Streams).

Primary activities designed to restore Site streams include 1) stream restoration, 2) stream enhancement (Level I), 3) stream enhancement (Level II), 4) stream preservation, 5) wetland re-establishment, 6) wetland rehabilitation, 7) wetland enhancement, 8) wetland preservation, 9) wetland creation, 10) construction of marsh treatment areas, and 11) vegetation planting (Figures 6 and 6A-6D, Appendix A).

8.1.1 Stream Restoration

Stream restoration efforts are designed to restore a stable stream that approximates hydrodynamics, stream geometry, and local microtopography relative to reference conditions. Restoration at the Site will be Priority I restoration; therefore, bankfull elevations will be raised to meet the adjacent valley floodplain elevation.

Stream restoration is expected to entail 1) channel excavation, 2) channel stabilization, 3) channel diversion, and 4) channel backfill.

In-stream Structures

In-stream structures will be used for grade control, habitat, and to elevate local water surface profiles in the channel, flattening the water energy slope or gradient and directing stream energy into the center of the channel and away from banks. The structures will consist of log cross-vanes or log j-hook vanes; however, rock cross-vanes or rock j-hook vanes may be substituted if dictated by field conditions at the engineer's discretion. In addition, the structures will be placed in relatively straight reaches to reduce bank erosion during bankfull events.

Log or rock cross vanes are expected to be interchangeable, depending upon the availability of materials. This will largely be a field decision based on the contractor. Given the availability of logs and the expense of rock, it is expected that logs will be primarily used for vane construction. Log vanes are used extensively in intermittent channels with success. They are designed to stabilize the stream banks until suitable vegetation has been established, which will reduce erosion.

Channel Crossing

Property access issues will necessitate the installation of piped, forded, and bridged channel crossings as depicted on Figures 6A to 6D (Appendix A). All crossings are located where existing crossings occur and the proposed project will do one of the following.

1) Keep the existing crossing in place,
2) Upgrade an existing crossing,
3) Remove crossing from Site.

The crossings should be constructed of bottomless culverts and will be constructed of properly sized pipes and hydraulically stable rip-rap or suitable rock. The crossing will be large enough to handle the weight of anticipated vehicular traffic. Approach grades to the crossing will be at an approximate 10:1 slope and constructed of hard, scour-resistant crushed rock or other permeable material, which is free of fines.

A list of existing crossings at the Site and proposed activities is included in Table 16.

Table 17 – Existing Crossings

Location	Type	Size (ft)	Condition	Notes	Proposed
NPSQC Downstream	ATV Ford (2)	NA	Good	Both banks stable, little to no erosion	Leave as is
NPSQC Mid	Bridge	30	Derelict and failing	Old truck chassis with banks failing	Replace with a ford
NPSQC Mid	ATV Log Crossing	30	Poor	Stable	Removed
NPSQC Mid	Forded crossing	25	Poor	Both banks rutted	Leave as is
NPSQC Up	Bridge	30	Poor, unstable, banks failing	Bridge is a choke point during bankful events, lots of wrack and erosion	Replace with a Ford
UT1 Down	Ford	40	Excellent	On Bedrock	Leave as is
UT1 Down	Ford	15	Good	Cattle and ATV active, stable	To be removed
UT1 Down	Ford	12	Good	Stable used for moving livestock	Leave as is
UT1 Up	Ford	15	Good	Stable only for moving livestock	Leave as is
UT5 Down	Ford	70	Good	Vehicle crossing heavy use	Leave as is
UT5 down	Ford	20	Good	Ford on Bedrock	Leave as is
UT5 Mid	Bridge	25’	Poor	Bridge/culvert failing	Upgrade culver
UT5 Mid	Pipe	20’	Derelict and failing	Concrete pipe has failed and is clogged perched heavy erosion	Replace with a Ford
UT5 Up	Dam	280	Good	Crossing on pond dam.	Replace with a ford
UT6	Ford	30	Good	Good bedrock crossing	Remove
UT15 R1 Down	Pipe	30	Good	Pipe is perched and collapsing, stream losing to hyporheic zone	Remove
UT15 R1 Up	Pipe	20	Poor	Failing concrete pipe being undermined by stream and groundwater flow	Replace with a pipe
UT16	Dam	250	Poor	Standpipe is clogged pond is overflowing and headcutting along leftbank of dam.	Remove
UT17	Pipe	20	Poor	Pipe is clogged and not allowing flow, eroding.	Remove

Marsh Treatment Areas

Two shallow wetland marsh treatment areas will be excavated in the floodplain to intercept surface waters draining through agricultural areas before discharging into Site tributaries. Marsh treatment areas are intended to improve the mitigation project and are not generating mitigation credit. The proposed marsh treatment area locations are depicted in Figure 6A and 6B (Appendix A). They will consist of shallow depressions that will provide treatment and attenuation of initial stormwater pulses. The outfall will be constructed of hydraulically stable rip-rap or other suitable material such as wood or riffle bed material to protect against headcut migration into the constructed depression. It is expected that the treatment area will fill with sediment and organic matter over time. No long-term maintenance is needed for this feature.

Floodplain Interceptor

A floodplain interceptor is a small depression in the design channel bank that directs return flow into the channel to reduces bank erosion/headcut formation in the channel bank. The interceptor will include a depression that is armored with erosion control matting and willow stakes to control erosion until channel bank vegetation has established. Floodplain interceptor locations will be determined in the field during construction.

Drop Structure

Drop structures are proposed at tie in points of smaller tributaries to larger channels, at culverts to existing roads, and as streams tie to the channel prior to leaving the easement at the Site outfall. Drop structures may be constructed out of large cobble depending upon anticipated scour from the restored stream channels. The structures will be built to resist erosive forces associated with hydraulic drops proposed at the Site.

Pond Dam Removal

This project has several small, agriculture pond dams to be removed. Dams will be drained through the use of silt/sediment bags and then notched and stabilized early in the construction process and the pond beds will be seeded with temporary grasses to stabilize sediments remaining in the pond. Care will be taken during notching of the dams to drain the maximum amount of water, thereby allowing sediments to dewater.

Once the ponds have dewatered and sediments have stabilized, the dams will be removed with finished grades matching elevations of the valley and floodplain above and below the dam location. Material removed from the dams, if suitable, may be used as channel backfill for reaches of stream to be abandoned during Priority I stream restoration efforts. If additional backfill remains, the material will be stockpiled outside of the easement, or spread evenly across the adjacent property and seeded for stabilization. Erosion control measures such as silt fence, seeding, and mulching will be implemented on all stockpiled or spread soil materials.

A determination on sediment quantity and quality within the abandoned pond will be made concerning the ability to work within, or to stabilize the sediment for stream construction. If sediment is deemed unsuitable for channel construction, the sediment will be removed from the vicinity of the design channel and spread along the outer margins of the pond. Subsequently, suitable soil material will be placed in the location of the design channel such that design channel banks will be stabilized without liquefaction. The removal of unsuitable material, installation of suitable material, and excavation of the design channel may occur simultaneously to reduce impacts of machinery on the pond bed.

Excavation of the design channel will occur in the pond bed similar to other reaches of restored stream, with stabilization using approved erosion control materials and techniques.

Existing ATV Paths

Existing ATV Paths were surveyed and platted in the recorded conservation easement plat (Appendix H). The ATV Paths are shown on Appendix A figures, and detailed in Appendix J, which includes an overview figure and exiting conditions photos.

The ATV Path is an existing trail system used by the current landowners for passive recreation and observation of the riparian corridor. During landowner negotiations, the continued use of the trail was a requirement of the landowner for participation in the project.

The ATV Paths includes two reaches (Figure J-1, Appendix J) and is 6-feet in width – as plated in the recorded conservation easement plat. The main reach enters the Site's southeastern corner, on the south side of the North Prong Stinking Quarter Creek (NPSQC) and runs west within the NPSQC's riparian floodplain. This segment of path is +/- 2,690 feet with some portions located outside of the easement area. Four (4) gates will be installed along the path, where it enters and exists the easement area. The second reach is a spur from the first and crosses NPSQC and UT-20 before existing the easement on the north side of the NPSQC's floodplain. This reach is +/- 580 feet and will require one (1) gate when it exists the easement area.

The conservation easement prohibits the improvement of the ATV Paths, as they are subject to the conservation easement. However, to maintain the current use of the trail system, the landowner is allowed to clear fallen trees, and any vegetation that may cause a safety concern. No improvements will be made to the existing trail, i.e., placement of fill, excavation, resurfacing, etc.

Dual-Sided Utility Posts by Carsonite will mark the ATC Paths every 100 feet. These markers are flexible, and can survive a tire impact, providing a safe, clear, and long-term marking solution.

The soil path has been removed from stream and wetland credit calculations and is not credit generating.

8.1.2 Stream Enhancement (Level I)

Stream enhancement (level I) will entail stream dimension restoration, installation of habitat and grade control structures, easement markers, and planting riparian buffers with native forest vegetation to facilitate stream recovery and prevent further stream degradation. Enhancement (Level I) occurs on UT 5 immediately downstream from the road accessing the western portion of the Site (identified as UT5 [mid] on SAM forms on Figure 4B Appendix A). Although this reach scored HIGH on SAM forms, the reach is relatively incised and straightened, and must be raised up to the floodplain elevation for downstream stream restoration to occur.

8.1.3 Stream Enhancement (Level II)

Stream enhancement (level II) will entail spot bank stabilization, installing easement markers, and planting riparian buffers with native forest vegetation to facilitate stream recovery and prevent further degradation of the stream.

8.1.4 Stream Preservation

Based on the mitigation rule (33 CFR Section 332.3 - General compensatory mitigation requirements), preservation may be used to provide compensatory mitigation if the following criteria are met.

- The resources to be preserved provide important physical, chemical, or biological functions for the watershed.
    - The Site is situated in WS-V, NSW waters that are listed on the final 2022 303d list. Once the project is complete, upstream preservation will serve as possible protection of a water supply that is currently not supporting its designated uses.
- The resources to be preserved contribute significantly to the ecological sustainability of the watershed.
    - The streams comprise part of the headwater system which drains into a water supply that is not supporting its designated uses.
- Preservation is determined by the district engineer to be appropriate and practicable.
    - Discussions with the IRT members indicate that preservation is appropriate.
- The resources are under threat of destruction or adverse modifications.
    - Although the reach is not currently under direct threat of destruction, the IRT has agreed to allow preservation on this project to protect wetlands and streams and to connect various reaches of the Site for mitigation purposes.
- The preserved resources will be permanently protected through an appropriate legal instrument.
    - A conservation easement will be implemented as required under the banking process.

8.2 Individual Reach Discussions

Mitigation strategies proposed for each reach are presented in Table 17.

Table 18 – Individual Reach Descriptions and Functional Uplift

Individual Reach	Mitigation Activities	Functional Uplift Provided for Identified Stressors
NPSQ Creek (Reach 1)	- Tie into upstream property boundary and elevate the stream bed with grade control/habitat structures and contour the channel banks to the appropriate dimension. - Move the channel across the floodplain using Priority 1 stream restoration on a new location. - Construct a forded channel crossing. - Remove a pond dam on the right bank of the channel. - Tie to the downstream preservation reaches. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
NPSQ Creek (Reach 2 - 6)	- Tie to upstream restoration reaches and begin stream preservation (R2). - Treat invasive species and fence livestock (All). - Once the stream enters livestock pasture, begin Enhance (Level II) with spot bank stabilization, fencing, and planting (R3 and 4). - In the lower reaches, a shoot cutoff is about to develop. Dig a new channel through the shoot cutoff to reduce sediment erosion and scour (R 5). - Tie to downstream elevations and continue Enhancement (Level II) (R6). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris

Table 17 – Individual Reach Descriptions and Functional Uplift (Continued)

Individual Reach	Mitigation Activities	Functional Uplift Provided for Identified Stressors
UT-1 (Reach 1 - 5)	- Install a marsh treatment at the upper end of UT 1. Stabilize the outlet and tie into the origin point for the stream (R1). - Remove an agriculture pond dam and excavate a channel through the pond bed/dam footprint (R2). - Tie into the downstream floodplain and begin P1 stream restoration (R2). - Install a forded crossing within an internal easement break (R2). - Tie into Enhancement (Level II reaches) (R3). - Install a forded stream crossing and initiate P1 stream restoration below the crossing (R4). - Below the restoration reach, tie into the channel and continue Enhancement (Level II) (R5). - Tie into an existing forded crossing over bedrock (R5). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT-1 (Reach 6 – 7)	- Tie into the road culvert and begin Enhance (Level II) activities (R6). - Reduce slope of the channel to initiate P1 stream restoration on the historic floodplain (R6 & 7). - Install a forded channel crossing (R6). - Tie into the downstream floodplain and begin P1 stream restoration (R7). - Discharge into NPSQ Creek at the appropriate location and elevation (R7). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT-2	- Fence livestock. - Supplemental plant where necessary.	- Sediment - Nutrients - Fecal Coliform
UT 3	- Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows
UT 4	- Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows
UT 5 (Reach 1)	- Tie into the existing stream and initiate P1 stream restoration at the historic floodplain elevation. - Install a forded stream crossing. - At the lower reaches tie into the existing piped road crossing with a drop structure. - Upgrade a piped crossing at the confluence with UT 9 (see Figure 6E (Appendix A). - Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris

Table 17 – Individual Reach Descriptions and Functional Uplift (Continued)

Individual Reach	Mitigation Activities	Functional Uplift Provided for Identified Stressors
UT 5 Reach (2 – 4)	- Tie into the upgraded piped road crossing and initiate Enhancement (Level I) with structures and channel dimension alterations (R2). - Once the channel is at the historic floodplain elevation, initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension (R3). - Install a forded stream crossing (R3). - Install a marsh treatment area (R3). - Move powerline in the lower reaches to the easement break (R3). - Tie into an existing downstream forded crossing (R 3 & 4). - Below the existing forded crossing initiate Enhancement (Level II) mitigation activities (R4). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 6 (Reach 1 – 2)	- Tie to stream at the property line and initiate Enhancement (Level II) (R1). - At bedrock sill, initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension (R2). - Remove an agriculture pond dam and excavate a channel through the pond bed/dam footprint (R2). - Install a forded stream crossing (R2). - Tie into UT 5 at the appropriate location/elevation (R2). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 7	- Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows
UT 9	- Tie to the stream bed at the property line and initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension. - Tie into UT 5 at the appropriate location/elevation. - Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 10	- Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows

Table 17 – Individual Reach Descriptions and Functional Uplift (Continued)

Individual Reach	Mitigation Activities	Functional Uplift Provided for Identified Stressors
UT 11	- Stop agriculture activities within the easement boundaries. - Protect with a conservation easement.	- NA
UT 12	- Tie to the stream bed at the property line and initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension. - Remove spoil berm on the right bank of the channel - Tie into NPSQ Creek at the appropriate location/elevation. - Fence livestock. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 14	- Stop agriculture activities within the easement boundaries. - Protect with a conservation easement.	- NA
UT 15 (Reach 1 – 3)	- Raise channel at spring box to allow P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension (R1). - Install a piped channel crossing (R1). - Tie into lower Enhancement (Level I) reaches and install grade control/habitat structures and contour the channel banks (R2). - Tie into Enhancement (Level II) reaches (R3). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 16	- Tie to the stream bed at the property line and initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension. - Remove an agriculture pond dam and excavate a channel through the pond bed/dam footprint. - Tie into UT 15 at the appropriate location/elevation. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 17 (Reach 1 – 3)	- Tie to the stream bed at the property line and initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension (R1). - Remove an agriculture pond dam and excavate a channel through the pond bed/dam footprint (R1). - Tie into lower Enhancement (Level I) reaches and install grade control/habitat structures and contour the channel banks (R2). - Tie into Enhancement (Level II) reaches (R3). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris

Table 17 – Individual Reach Descriptions and Functional Uplift (Continued)

Individual Reach	Mitigation Activities	Functional Uplift Provided for Identified Stressors
UT 18	- Tie to the stream bed at the property line and initiate P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension. - Tie into UT 17 at the appropriate location/elevation. - Plant a vegetative buffer within the entire floodplain.	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 19 (Reach 1 – 3)	- Initiate Enhancement (Level II) activities (R1). - Tie into downstream Enhancement (Level I) reaches and install grade control/habitat structures and contour the channel banks (R2). - At the oxbow of NPSQ Creek, initiate P1 stream restoration and then tie into NPSQ Creek with a drop structure (R3). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris
UT 20 (Reach 1 – 3)	- Raise channel at origin point to permit P1 stream restoration with grade control/habitat structures and contour the channel banks to the appropriate dimension (R1). - Tie into lower Enhancement (Level I) reaches and install grade control/habitat structures and contour the channel banks (R2). - Tie into Enhancement (Level II) reaches (R3). - Fence livestock (All). - Plant a vegetative buffer within the entire floodplain (All).	- Non-functioning riparian buffer/wetland vegetation - Sediment - Nutrients - Fecal Coliform - Peak Flows - Limited Bedform Diversity - Absence of Large Woody Debris

8.3 Wetland Reestablishment/Rehabilitation/Enhancement/Preservation/Creation

Alternatives for wetland mitigation are designed to restore a fully functioning wetland system, provide surface water storage, nutrient cycling, remove imported elements and compounds, and create a variety and abundance of wildlife habitat.

<u>Wetland Reestablishment/Rehabilitation</u>

Portions of the Site underlain by hydric soils have been impacted by stream dredging, vegetative clearing, agriculture plowing, and other land disturbances associated with land use management. Wetland re-establishment/rehabilitation options will focus on the restoration of vegetative communities, stream corridors, historic groundwater tables, soil structure, and microtopographic variations. These activities will result in the re-establishment and rehabilitation of approximately 25.421 and 8.026 acres of jurisdictional riparian riverine wetlands, respectively.

Wetland re-establishment is intended for portions of the Site that are currently not jurisdictional and will therefore include the restoration of wetland hydrology and vegetation. Wetland rehabilitation is intended for portions of the Site currently characterized by wetland hydrology; however, the hydrology has been impacted by stream channel incision, ditching, or drain tile installation.

Wetland Enhancement

Wetland enhancement is intended for portions of the Site currently characterized by wetland hydrology; therefore, hydrology cannot sufficiently be improved by proposed mitigation activities and functional uplift comes primarily from vegetation planting and removal of land use activities such as row crops, hay production, and/or livestock grazing. These activities will result in the enhancement of approximately 16.258 acres of jurisdictional riparian riverine wetlands.

Wetland Preservation

Wetland preservation will include relatively undisturbed portions of the Site characterized by mature vegetation and little active disturbance. Invasive species do not represent a signification problem in these areas; however, if invasive species present a problem, treatment with herbicide will occur using an NCDA & CS Licensed Pesticide Applicator.

Historic land use practices in the watershed including clearing riparian vegetation for agriculture result in a lack of quality and adequately distributed riparian buffer. Therefore, preservation of these remaining stable systems is vital to protect watershed in perpetuity. Protection of relatively undisturbed wetlands with a conservation easement will result in the preservation of approximately 2.134 acres of jurisdictional riparian riverine wetlands.

Wetland Creation

Wetland Creation includes areas with cut/fill exceeding 12 inches in depth, such as beneath dams that are being removed that are expected to have wetland soils, hydrology, and vegetation present after dam removal. These areas are expected to be minimal, accounting for approximately 0.851 acres of jurisdictional wetland area. Wetland creation is non-credit generating.

8.4 Soil Restoration

Soil grading will occur during stream restoration activities. Topsoil will be stockpiled during construction activities and spread across the Site's surface once critical subgrade has been established. The replaced topsoil will serve as a viable growing medium to provide nutrients and aid in the survival of planted species.

8.5 Natural Plant Community Restoration

Restoration of floodplain forest and streamside habitat allows for the development and expansion of characteristic species across the landscape. Ecotonal changes between community types contribute to the diversity and provide secondary benefits, such as enhanced feeding and nesting opportunities for mammals, birds, amphibians, and other wildlife. Reference Forest Ecosystem (RFE) data, onsite observations, and community descriptions from *Guide to the Classification of the Natural Communities of North Carolina (4th Approximation)* (Schafale, M.P. 2012) were used to develop the primary plant community associations that will be promoted during community restoration activities.

8.5.1 Planting Plan

Streamside trees and shrubs include species with high value for sediment stabilization, rapid growth rate, and the ability to withstand hydraulic forces associated with bankfull flow and overbank flood events. Streamside trees and shrubs will be planted within 15 feet of the channel top of bank throughout the meander belt-width. Piedmont/Mountain Bottomland Forest (a mix of High Subtype and Typic Subtype) is the target community for larger floodplain reaches of NPSQ Creek. It should be noted that Piedmont Headwater Forest is the typical planting zone for first and second order streams; however, as the Site is characterized by a significant amount of wetland area along these smaller streams a broader community

association will be planted which encompasses species from both the Headwater forest and Bottomland forest types. Dry, upland-side slopes are targeted for Dry-Mesic Oak-Hickory Forest.

Bare-root seedlings within the Piedmont/Mountain Bottomland and Dry-Mesic Oak-Hickory Forests will be planted at a density of approximately 680 stems per acre on 8-foot centers. Shrub species in the streamside assemblage will be planted at a density of 2,720 stems per acre on 4-foot centers. Live stakes will also be used on stream banks for additional stability. Live stake species may include: Black willow (*Salix nigra*), Silky willow (*Salix sericea*), Silky dogwood (*Cornus amomum*), Buttonbush (C*ephalanthus occidentalis*), Elderberry (*Sambucus canadensis*), and Arrowwood (*Viburnum dentatum*).

Table 18 depicts the total number of stems and species distribution within each vegetation association (Figures 8 and 8A-8D, Appendix A). Planting will be performed between December 1 and March 15 to allow plants to stabilize during the dormant period and set root during the spring season. Supplemental planting efforts may include species listed in Table 18 as well as other regionally appropriate native species including *Ulmus rubra, Ulmus alata, Crataegus* sp., and *Celtis occidentalis*.

Table 18B details the long term seed mix intended to provide sustained ecological uplift as the target forested natural community becomes established. The diverse mix provided is meant to provide soil stability, compatibility with establishment of bare-root plantings, food and cover for wildlife including pollinators, and landowner requested aesthetics.

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Table 19 – Planting Plan

Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage**		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Size	Ind. Status	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Shrub	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Tree	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Tree	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana)*	Small Tree	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (Celtis laevigata)	Tree	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Small Tree	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Shrub	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Shrub	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Small Tree	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus penn.*)	Tree	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulip.)*	Tree	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Small Tree	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Tree	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occed.*)	Tree	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus nigra*)	Tree	FAC	3,000	9%	800	11%			***3,800***
White oak *(Quercus alba*)	Tree	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus rubra*)	Tree	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Tree	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Tree	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Tree	FACW	2,000	6%					***2,000***
TOTAL			**34,500**	**100%**	**7,100**	**100%**	**34,800**	**100%**	**76,400**

* Planted at a density of 680 stems/acre. ** Planted at a density of 2720 stems/acre.

Table 18 B – Seed Mix

Long-Term Seed Mix: Native diversity, Pollinator Benefits & Stabilization					
Rate: 2 lbs /acre. Species subject to availability.					
Species	**%**		**Species**	**%**	
Carex vulpinoidea	5	OBL	*Chamaecrista nictitans*	1	FACU
Chamaecrista fasciculata	5	FACU	*Gaillardia pulchella*	1	UPL
Echinacea purpurea	5	NI	*Juncus effusus*	1	FACW
Elymus virginicus	5	FACW	*Juncus tenuis*	1	FAC
Rudbeckia hirta	5	FACU	*Lespedeza capitata*	1	FACU
Coreopsis lanceolata	4	NI	*Monarda fistulosa*	1	FACU
Coreopsis tinctoria	4	FAC	*Panicum anceps*	1	FAC
Panicum clandestinum	4	FAC	*Panicum dichotomiflorum*	1	FACW
Agrostis hyemalis	3	FAC	*Sorghastrum nutans*	1	FACU
Agrostis perennans	3	FACU	*Carex albolutescens*	0.5	FACW
Andropogon gerardi	3	FAC	*Carex lupulina*	0.5	OBL
Bidens aristosa	3	FACW	*Hibiscus moscheutos*	0.5	OBL
Cosmos bipinnatus	3	FACU	*Liatris spicata*	0.5	FAC
Delphinium ajacis	3	NI	*Monarda punctata*	0.5	FACU
Gaillardia aristata	3	NI	*Panicum rigidulum*	0.5	FACW
Heliopsis helianthoides	3	UPL	*Pycnanthemum tenuifolium*	0.5	FACW
Schizachyrium scoparium	3	FACU	*Scirpus cyperinus*	0.5	OBL
Senna hebecarpa	3	FAC	*Silphium perfoliatum*	0.5	FAC
Tridens flavus	3	FACU	*Vernonia gigantea*	0.5	FAC
Verbena hastata	2.5	FACW	*Zizia aurea*	0.5	FAC
Achillea millefolium	2	FACU	*Baptisia australis*	0.3	FACU
Agrostis alba	2	FACW	*Vernonia noveboracensis*	0.3	FACW
Desmodium canadense	2	FAC	*Penstemon digitalis*	0.2	FAC
Helianthus angustifolius	2	FACW	*Eupatorium coelestinum*	0.1	FAC
Panicum virgatum	2	FAC	*Eupatorium perfoliatum*	0.1	FACW
Rudbeckia amplexicaulis	2	FAC			

8.5.2 Nuisance Species Management

Invasive plant species will be observed and controlled mechanically and/or chemically as part of this project. No other nuisance species controls are proposed at this time. Inspections for beaver and other potential nuisance species will occur throughout the monitoring period. Appropriate actions may be taken to ameliorate any negative impacts regarding vegetation development and/or water management on an as-needed basis. The presence of nuisance species will be monitored over the course of the monitoring period.

The primary invasive species identified at the Site are Chinese privet (*Ligustrum sinense*), rose (*Rosa multiflora*), tree of heaven (*Alianthus altissima*), Russian olive (*Elaeagnus angustifolia*), and Japanese honeysuckle (*Lonicera japonica*). Although these species occur within the Site, the density and frequency

of these species is not high, and control should be attainable. These species will be targeted for control starting prior to construction and extending through the monitoring period. If necessary, chemical treatment by a licensed herbicide applicator will occur.

9 MONITORING AND SUCCESS CRITERIA

Monitoring will be conducted in accordance with 2016 NCIRT Guidelines. Monitoring will be conducted by Axiom Environmental, Inc based on the schedule in Table 19. A summary of monitoring is outlined in Table 21 (Figures 9 and 9A – 9D, Appendix A). Annual monitoring reports will be submitted to the NCDMS by Restoration Systems no later than December 1 of each monitoring year data is collected.

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

9.1 Success Criteria

Monitoring and success criteria for stream restoration should relate to project goals and objectives identified from onsite NC SAM and NC WAM data collection. From a mitigation perspective, several of the goals and objectives are assumed to be functionally elevated by restoration activities without direct measurement. Other goals and objectives will be considered successful upon achieving success criteria. Table 20 summarizes Site success criteria.

Due to floodplain soils being wet scattered openings dominated by herbs and shrubs are likely to develop over time. These areas are expected to be less than an acre in size and encompass less than 20% of the Site. If such a case arises, herbaceous plots may be utilized to show that a monoculture of one species is dominating the wetland area. Herbaceous plots are to be 2 meters by 5 meters and a minimum of three herbaceous species must occur in the plot to be successful.

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Table 21 – Success Criteria

Streams
- All streams must maintain an Ordinary High-Water Mark (OHWM), per RGL 05-05. - Bank height ratio (BHR) should not exceed 1.2 at any measured riffle cross-section. - BHR at any measured riffle cross-section should not change by more than 10% from baseline condition during any given monitoring period. - The stream project shall remain stable, and all other performance standards shall be met through four separate bankfull events, occurring in individual years, during the monitoring years 1-7. - Intermittent streams will demonstrate at least 30-days consecutive flow.
Wetland Hydrology
- Annual saturation or inundation within the upper 12 inches of the soil surface for, at a minimum, 12.5 percent of the growing season* during average climatic conditions.
Vegetation
- Within planted portions of the Site, a minimum of 320 stems per acre must be present at year 3; a minimum of 260 stems per acre must be present at year 5; and a minimum of 210 stems per acre must be present at year 7. - Trees must average 7 feet in height at year 5 and 10 feet in height at year 7 in each plot. - Planted and volunteer stems are counted, provided they are included in the approved planting list for the Site; natural recruits not on the planting list may be considered by the IRT on a case-by-case basis. Note: Volunteer stems on the approved planting list may be counted towards success after being present for two years. - Additionally, any single species can only account for up to 50% of the required number of stems withing any plot.

*Growing season for this project is from March 20 to November 11 as determined using the latest 30-years of data from the nearest WETS station.

Table 22 – Monitoring Summary

Stream Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Stream Profile	Full longitudinal survey	As-built (unless otherwise required)	All restored stream channels	Graphic and tabular data.
Stream Dimension	Cross-sections	Years 1, 2, 3, 5, and 7	Total of 40 cross-sections on restored channels	Graphic and tabular data.
Channel Stability	Visual Assessments	Yearly	All restored stream channels	Areas of concern will be depicted on a plan view figure with a written assessment and photographs
	Additional Cross-sections	Yearly	Only if instability is documented during monitoring	Graphic and tabular data.
Stream Hydrology	Continuous monitoring of surface water gauges and/or trail camera	Continuous recording through the monitoring period	3 surface water gauges on UT12, 15, and 18	Surface water data for each monitoring period
Bankfull Events	Continuous monitoring of surface water gauges and/or trail camera	Continuous recording through the monitoring period	7 Crest gauges (pressure transducers) on UT1, UT 5 upstream, UT 5 downstream, UT 6 NPSQ Creek, UT 15, and UT 20.	Surface water data for each monitoring period
	Visual/Physical Evidence	Continuous through the monitoring period	All restored stream channels	Visual evidence, photo documentation, and/or rain data.
Wetland Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Wetland Restoration	Groundwater gauges	Years 1, 2, 3, 4, 5, 6, and 7 throughout the year with the growing season*	42 gauges spread throughout restored wetlands	Ground water gauges presented graphically
Vegetation Parameters				
Parameter	**Method**	**Schedule/Frequency**	**Number/Extent**	**Data Collected/Reported**
Vegetation establishment and vigor	Permanent vegetation plots 0.0247 acre (100 square meters) in size; *CVS-EEP Protocol for Recording Vegetation, Version 4.2* (Lee et al. 2008) or other similar method	As-built, Years 1, 2, 3, 5, and 7	37 plots spread across the Site	Species, height, planted vs. volunteer, stems/acre
	Annual random vegetation plots, 0.0247 acre (100 square meters) in size	As-built, Years 1, 2, 3, 5, and 7	28 randomly located transects	Species and height

*Growing season for this project is from March 20 to November 11 as determined using the latest 30 years of data from the nearest WETS station.

9.2 Contingency

If stream success criteria are not fulfilled, a mechanism for contingency will be implemented. It should be noted that some aspects of adaptive management may require IRT review and USACE/NCDWR permit authorizations.

9.2.1 Stream Contingency

Stream contingency may include, but may not be limited to, 1) structure repair and/or installation; 2) repair of dimension, pattern, and/or profile variables; and 3) bank stabilization. The contingency method is expected to be dependent upon stream variables that are not in compliance with success criteria. Primary concerns, which may jeopardize stream success include 1) structure failure, 2) headcut migration through the Site, and/or 3) bank erosion.

Structure Failure

In the event that structures are compromised the affected structure will be repaired, maintained, or replaced. Once the structure is repaired or replaced, it must function to stabilize adjacent stream banks and/or maintain grade control within the channel. Structures that remain intact but exhibit flow around, beneath, or through the header/footer will be repaired by excavating a trench on the structure's upstream side and reinstalling filter fabric in front of the sills. Structures that have been compromised, resulting in shifting or collapse of a header/footer, will be removed and replaced with a structure suitable for Site flows.

Headcut Migration Through the Site

In the event that a headcut occurs within the Site (identified visually or through measurements [i.e., bank-height ratios exceeding 1.4]), provisions for impeding headcut migration and repairing damage caused by the headcut will be implemented. Headcut migration may be impeded by installing in-stream grade control structures (rip-rap sill and/or log cross-vane weir) and/or restoring stream geometry variables until channel stability is achieved. Channel repairs to stream geometry may include channel backfill with coarse material and stabilizing the material with erosion control matting, vegetative transplants, and/or willow stakes.

Bank Erosion

In the event that severe bank erosion occurs within the Site, resulting in incision, lateral instability, and/or elevated width-to-depth ratios locally or systemically, contingency measures to reduce bank erosion and width-to-depth ratio will be implemented. Bank erosion contingency measures may include the installation of log-vane weirs and/or other bank stabilization measures. If the resultant bank erosion induces shoot cutoffs or channel abandonment, a channel may be excavated to reduce shear stress to stable values.

Beaver

Indications of beaver establishment will be monitored throughout the 7-year monitoring period. If beaver are identified in the Site, the dam's location will be depicted on CCPV mapping and the beaver will be trapped. Once the beaver have been trapped, the dam will be removed. Removal of the dam is expected to occur by hand to minimized disturbance to the adjacent mitigation areas.

9.2.2 Wetland Contingency

Hydrological contingency will require consultation with hydrologists and regulatory agencies if wetland hydrology enhancement is not achieved. Floodplain surface modifications, including the construction of ephemeral pools, represent a likely mechanism to increase the floodplain area in support of jurisdictional

wetlands. Recommendations for a contingency to establish wetland hydrology will be implemented and monitored until Hydrology Success Criteria are achieved. IRT consultation and approval will be necessary if future earthwork is proposed. In addition, if the depth of ephemeral pools exceed 1 foot, the credit ratio may be changed to reflect wetland creation.

9.2.3 Vegetation Contingency

If vegetation success criteria are not achieved, supplemental planting may be performed with tree species from the above planting plan or otherwise approved by regulatory agencies. Supplemental planting will be completed as needed until the achievement of vegetation success criteria.

9.3 Compatibility with Project Goals

The following table outlines the compatibility of Site performance criteria described above to Site goals and objectives that will be utilized to evaluate if Site goals and objectives are achieved.

10 ADAPTIVE MANAGEMENT PLAN

If the mitigation Site, or a specific component of the Site fails to achieve the necessary performance standards as specified in the mitigation plan, the Sponsor shall notify the members of NCDMS and work with the IRT to develop contingency plans for remedial action.

Adaptive management strategies to ensure hydrologic trespass are proposed for this project to ensure groundwater does not extend beyond the conservation easement boundary into the adjacent property. Alternatives for adaptive management may include the following.

1) Construct a berm to limit hydrologic trespass outside of the easement.
2) Add drain tile outside of the easement and ensure the drain tile does not encroach into the easement. The drain tile must discharge at the floodplain elevation and outside the easement boundary.
3) Build up the floodplain outside of the easement such hydrologic trespass no longer exists.

11 LONG-TERM MANAGEMENT PLAN

The Site will be transferred to the NCDEQ Stewardship Program. This party shall serve as the 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 Statute 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.

Table 23 – Compatibility of Performance Criteria to Project Goals and Objectives

Goals	Objectives	Success Criteria
(1) HYDROLOGY		
- Minimize downstream flooding to the maximum extent possible. - Connect streams to functioning wetland systems.	- Construct a new channel at historic floodplain elevation to restore overbank flows and restore/enhance jurisdictional wetlands - Plant woody riparian buffer - Install marsh treatment areas - Remove agricultural activities - Deep rip floodplain soils to reduce compaction and increase soil surface roughness - Protect riparian buffers with a perpetual conservation easement	- BHR not to exceed 1.2 - Document four overbank events in separate monitoring years - Attain Wetland Hydrology Success Criteria - Attain Vegetation Success Criteria - Conservation Easement recorded
- Increase stream stability within the Site so that channels are neither aggrading nor degrading.	- Construct channels with a proper pattern, dimension, and longitudinal profile - Remove agricultural activities - Construct stable channels with the appropriate substrate - Upgrade forded crossings - Plant woody riparian buffer - Stabilize stream banks	- Cross-section measurements indicate a stable channel with the appropriate substrate - Visual documentation of stable channels and structures - BHR not to exceed 1.2 - < 10% change in BHR in any given year - Attain Vegetation Success Criteria
(1) WATER QUALITY		
- Remove direct nutrient and pollutant inputs from the Site and reduce contributions to downstream waters.	- Remove agricultural activities - Install marsh treatment areas - Plant woody riparian buffer - Restore/enhance jurisdictional wetlands adjacent to Site streams - Provide surface roughness and reduce compaction through deep ripping/plowing - Restore overbank flooding by constructing channels at historic floodplain elevation	- Attain Wetland Hydrology Success Criteria - Attain Vegetation Success Criteria
(1) HABITAT		
- Improve instream and streamside habitat.	- Construct stable channels with the appropriate substrate - Plant woody riparian buffer to provide organic matter and shade - Construct a new channel at historic floodplain elevation to restore overbank flows - Plant woody riparian buffer - Protect riparian buffers with a perpetual conservation easement - Restore/enhance jurisdictional wetlands adjacent to Site streams - Stabilize stream banks - Install in-stream structures	- Cross-section measurement indicates a stable channel with the appropriate substrate - Visual documentation of stable channels and in-stream structures - Attain Wetland Hydrology Success Criteria - Attain Vegetation Success Criteria - Conservation Easement recorded

12 REFERENCES

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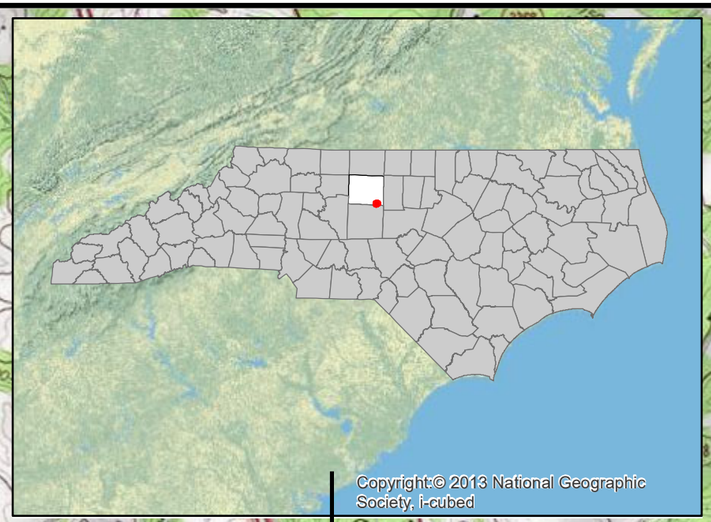
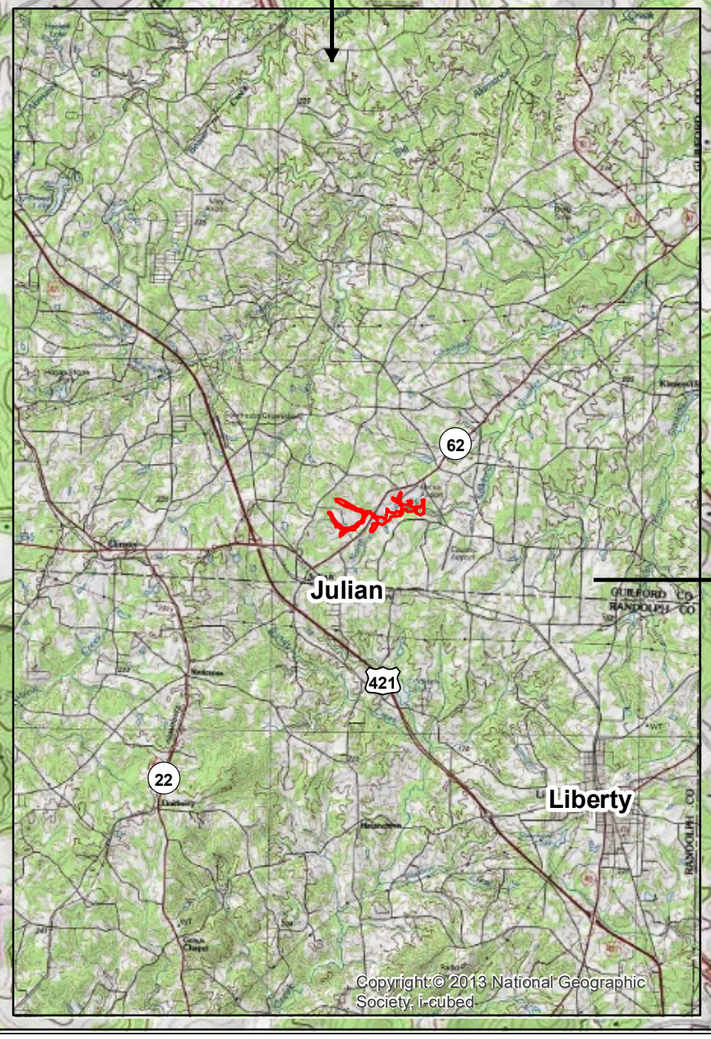
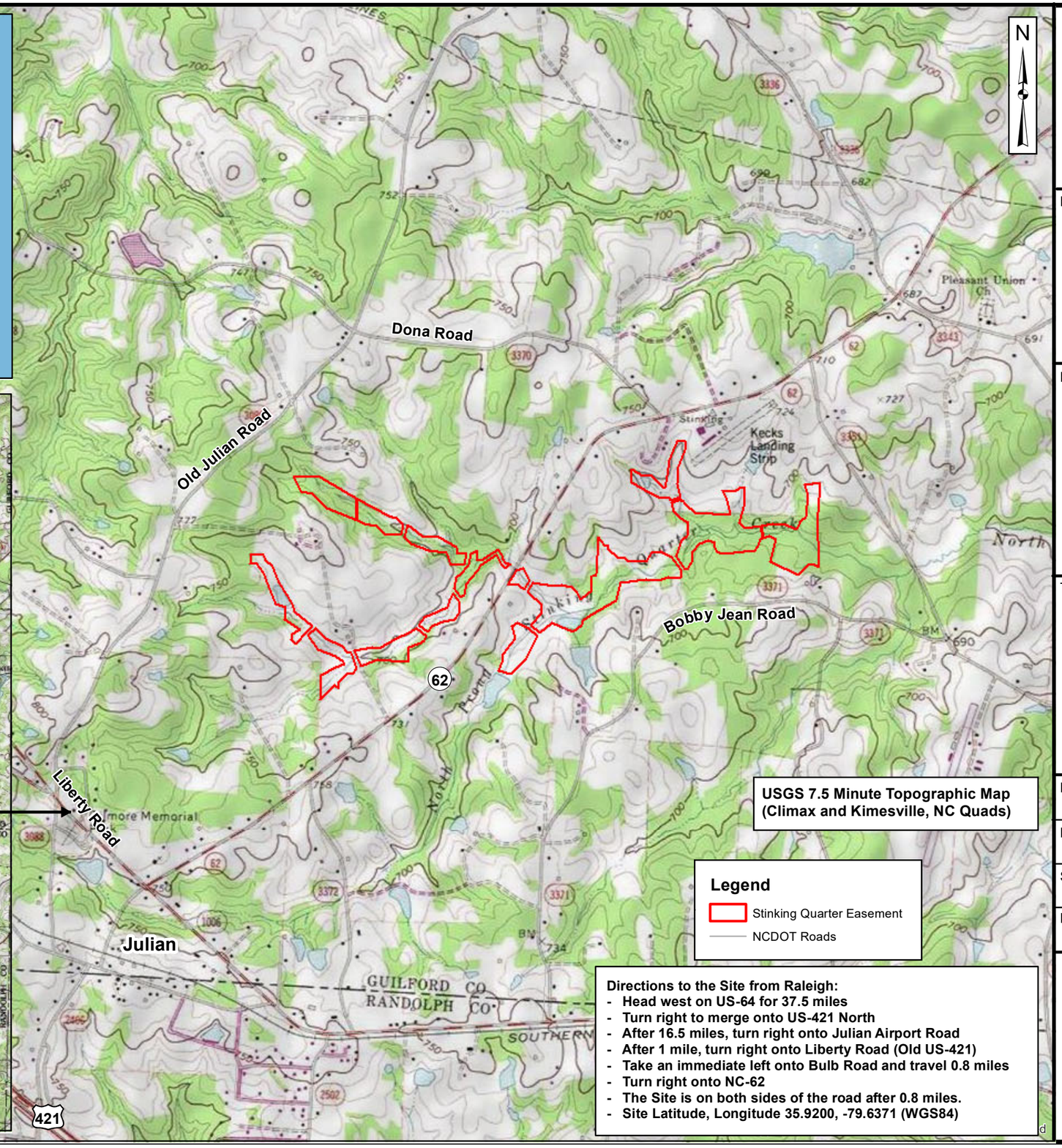
Appendix A: Figures

Figure 1. Site Location
Figure 2. Hydrologic Unit Map
Figure 3. Topography and Drainage Area
Figure 4, 4A-4D. Existing Conditions and Soils
Figure 5. Reference Reach Dimension, Pattern, and Profile
Figure 6, 6A-6E. Proposed Conditions
Figure 7. Proposed Dimension, Pattern, and Profile
Figure 8, 8A-8D. Planting Plan
Figure 9, 9A-9D. Monitoring Plan
Figure 10. Lidar
Figure 11. Historic Aerial







USGS 7.5 Minute Topographic Map (Climax and Kimesville, NC Quads)

Legend

- Stinking Quarter Easement
- NCDOT Roads

Directions to the Site from Raleigh:

- Head west on US-64 for 37.5 miles
- Turn right to merge onto US-421 North
- After 16.5 miles, turn right onto Julian Airport Road
- After 1 mile, turn right onto Liberty Road (Old US-421)
- Take an immediate left onto Bulb Road and travel 0.8 miles
- Turn right onto NC-62
- The Site is on both sides of the road after 0.8 miles.
- Site Latitude, Longitude 35.9200, -79.6371 (WGS84)

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

SITE LOCATION

Drawn by: WGL

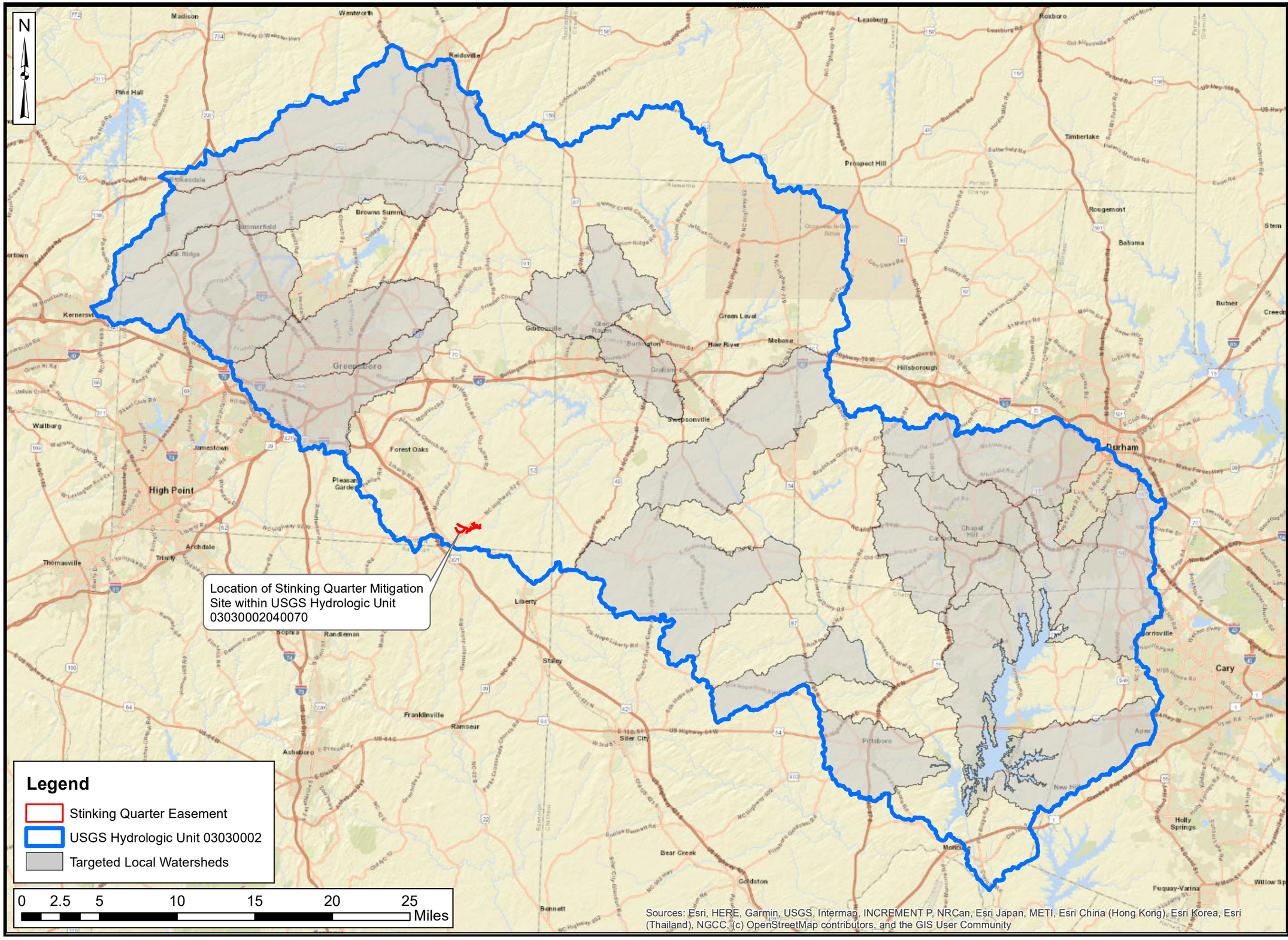
Date: DEC 2022

Scale: 1:20,000

Project No.: 21-012

FIGURE

1



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Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

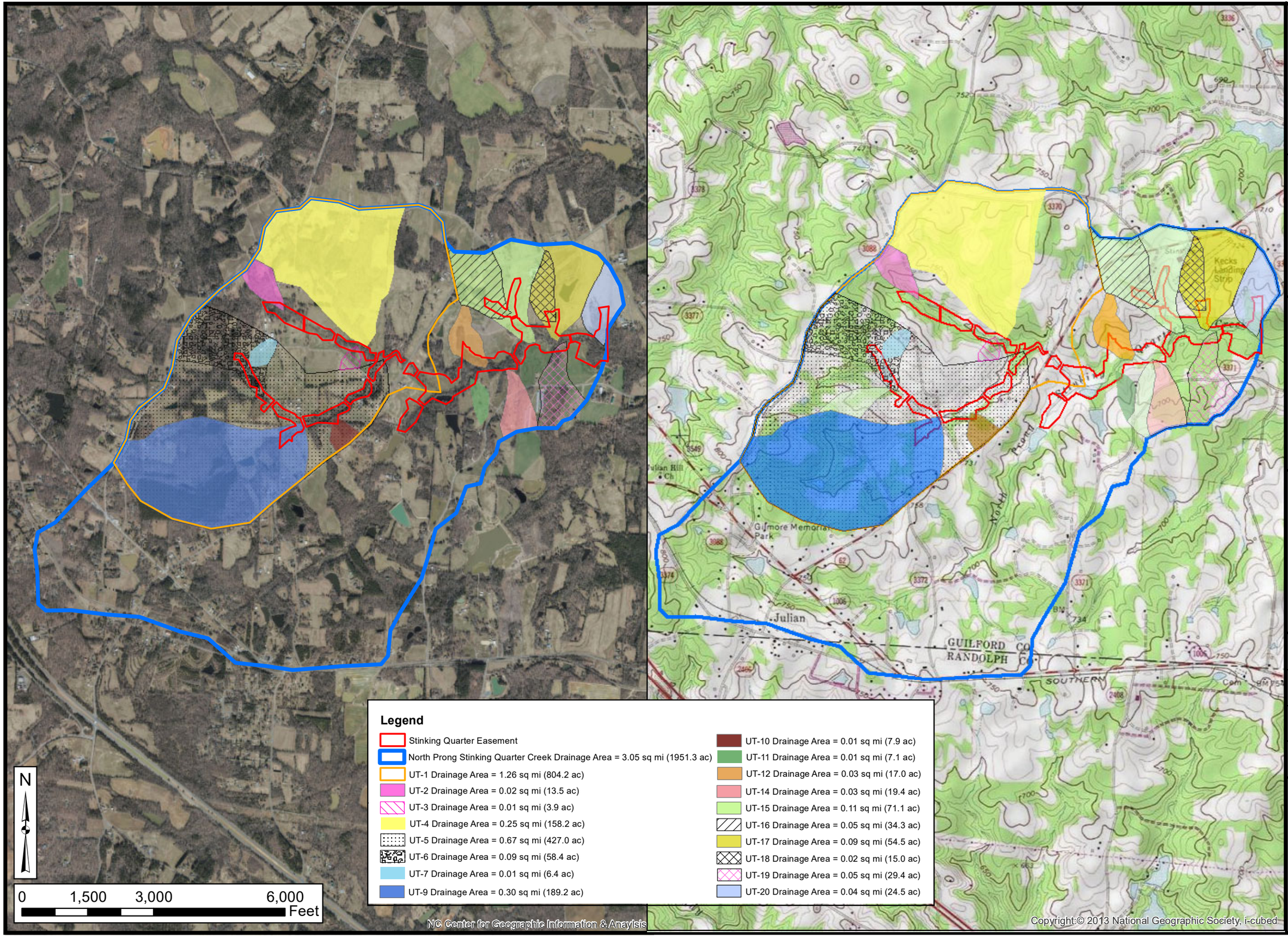
Title:

HYDROLOGIC UNIT MAP

Drawn by:	WGL
Date:	DEC 2022
Scale:	1:370,000
Project No.:	21-012

FIGURE

2



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Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

TOPOGRAPHY AND DRAINAGE AREA

Drawn by: WGL

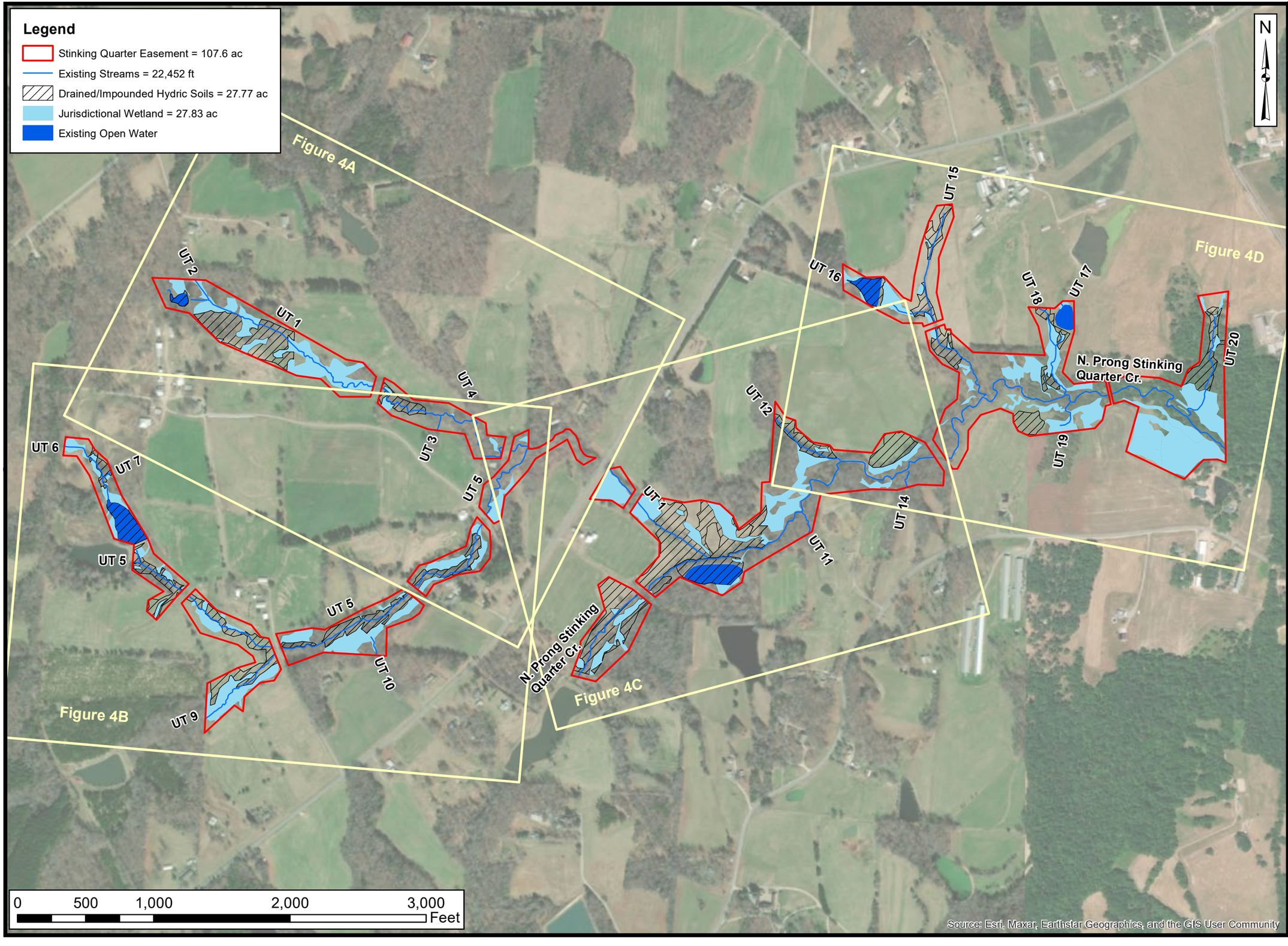
Date: DEC 2022

Scale: 1:25,000

Project No.: 21-012

FIGURE

3



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Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS AND SOILS

Drawn by: WGL

Date: DEC 2022

Scale: 1:8,000

Project No.: 21-012

FIGURE

4

Legend

- Guilford County Parcel
- Stinking Quarter Easement = 107.6 ac
- Existing Streams = 22,452 ft
- Drained/Impounded Hydric Soils = 27.77 ac
- Jurisdictional Wetlands = 27.83 ac
- Existing Open Water
- NRCS Soil Boundary
- NCSAM Form Location
- NCWAM Form Location
- NCDWR Form Location
- Soil Profile Collected in the Easement
- Soil Profile Collected Adjacent to the Easement
- GPS Points (3-4 soil borings at each point)
- Preconstruction Groundwater Gauges

Soil Map Unit	Soil Series	Hydric Status
ApC	Appling sandy loam	Non-Hydric
CcC	Cecil sandy loam	Non-Hydric
Ch	Chewacla sandy loam	Class B
HeC	Helena sandy loam	Non-Hydric
HhB	Helena-Sedgefiled sandy laom	Class B
VaB, VaC, and VaD	Vance sandy laom	Non-Hydric
Wh	Wehadkee silt loam	Class A

N

DWQ - 5
Score - 24.5

SAM - 7
Score - LOW

DWQ - 15
Score - 36

SAM - 2
Score - LOW

DWQ - 17
Score - 38.25

DWQ - 4
Score - 27.5

WAM - 9
Score - LOW

DWQ - 9
Score - 26

WAM - 5
Score - HIGH

UT-1
UT-2
UT-3
UT-4
UT-5

A - F3

0 250 500 1,000 Feet

Source: Esri, Maxar, Earthstar Geographi

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RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS AND SOILS

Drawn by: WGL

Date: DEC 2022

Scale: 1:3100

Project No.: 21-012

FIGURE

4A

Soil Map Unit	Soil Series	Hydric Status
ApC	Appling sandy loam	Non-Hydric
CcC	Cecil sandy loam	Non-Hydric
Ch	Chewacla sandy loam	Class B
HeC	Helena sandy loam	Non-Hydric
HhB	Helena-Sedgefiled sandy laom	Class B
VaB, VaC, and VaD	Vance sandy laom	Non-Hydric
Wh	Wehadkee silt loam	Class A

N

SAM - 1
Score - LOW

DWQ - 21
Score - 21.75

DWQ - 6
Score - 37.5

DWQ - 3
Score - 30.75

WAM - 1
Score - LOW

SAM - 4
Score - LOW

WAM - 3
Score - LOW

SAM - 5
Score - HIGH

DWQ - 9
Score - 26

DWQ - 15
Score - 36

SAM - 6
Score - LOW

WAM - 5
Score - HIGH

WAM - 2
Score - LOW

DWQ - 7
Score - 29.5

DWQ - 19
Score - 34.75

WAM - 4
Score - LOW

UT-1
UT-3
UT-5
UT-6
UT-7
UT-9
UT-10

A - F3
D - F3

ApB
ApC
VaB
VaC
VaD
Ch
HeC
HhB
W

0 250 500 1,000 Feet

Source: Esri

Legend

- Guilford County Parcels
- Stinking Quarter Easement = 107.6 ac
- Existing Streams = 22,452 ft
- Drained/Impounded Hydric Soil = 27.77 sc
- Jurisdictional Wetland = 27.83 ac
- Existing Open Water
- Existing Ditch/Swale
- Power Line
- Existing Drain Tile/Pipe
- NRCS Soil Boundary
- NCSAM Form Location
- NCWAM Form Location
- NCDWR Form Location
- Soil Profile Collected in the Easement
- Soil Profile Collected Adjacent to the Easement
- GPS Points (3-4 soil borings at each point)
- Preconstruction Groundwater Gauge

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RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS AND SOILS

Drawn by: WGL

Date: DEC 2022

Scale: 1:3200

Project No.: 21-012

FIGURE

4B

Legend

- Guilford County Parcels
- Stinking Quarter Easement = 107.6 ac
- Existing Streams = 22,452 ft
- Drained/Impounded Hydric Soil = 27.77 ac
- Jurisdictional Wetland = 27.83 ac
- Existing Open Water
- Existing Ditch/Swale
- Existing Drain Tile/Pipe
- NRCS Soil Boundary
- NCSAM Form Location
- NCWAM Form Location
- NCDWR Form Location
- Soil Profile Collected in the Easement
- Soil Profile Collected Adjacent to the Easement
- GPS Points (3-4 soil borings at each point)
- Preconstruction Groundwater Gauges

N

DWQ - 12
Score - 32.5

SAM - 8
Score - MEDIUM

WAM - 5
Score - HIGH

WAM - 6
Score - LOW

DWQ - 22
Score - 32

DWQ - 18
Score - 21.75

DWQ - 20
Score - 34.75

DWQ - 1
Score - 15.5

UT-1
UT-11
UT-12
UT-13
UT-14
Quarter Creek
North Prong Stinking
Ch

C - F3
H - F3
G - F3
14

VaB
VaC
VaD
HeC
HhB
W

0 250 500 1,000 Feet

Soil Map Unit	Soil Series	Hydric Status
ApC	Appling sandy loam	Non-Hydric
CcC	Cecil sandy loam	Non-Hydric
Ch	Chewacla sandy loam	Class B
HeC	Helena sandy loam	Non-Hydric
HhB	Helena-Sedgefiled sandy laom	Class B
VaB, VaC, and VaD	Vance sandy laom	Non-Hydric
Wh	Wehadkee silt loam	Class A

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RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS AND SOILS

Drawn by: WGL

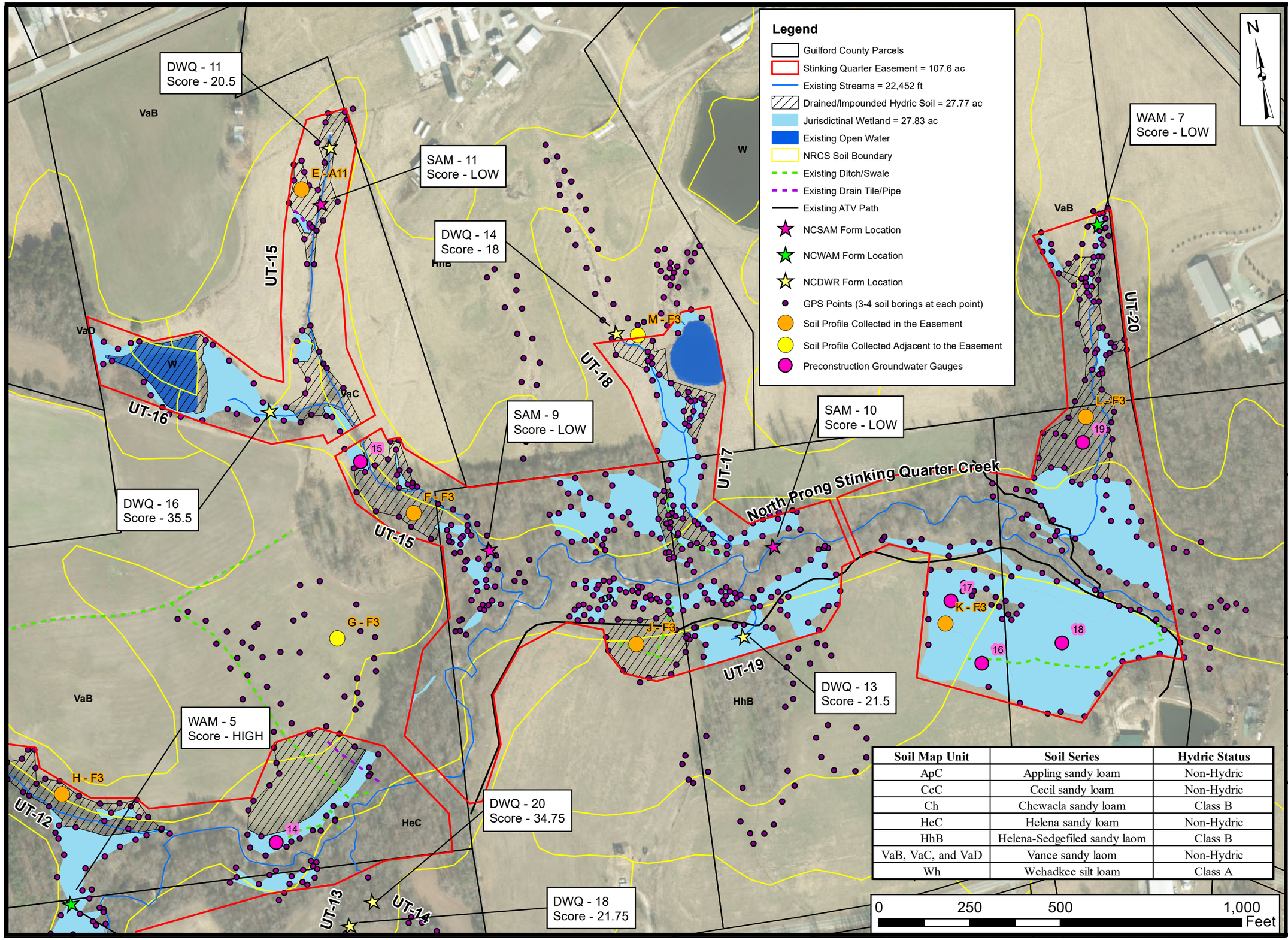
Date: DEC 2022

Scale: 1:2800

Project No.: 21-012

FIGURE

4C



Soil Map Unit	Soil Series	Hydric Status
ApC	Appling sandy loam	Non-Hydric
CcC	Cecil sandy loam	Non-Hydric
Ch	Chewacla sandy loam	Class B
HeC	Helena sandy loam	Non-Hydric
HhB	Helena-Sedgefiled sandy laom	Class B
VaB, VaC, and VaD	Vance sandy laom	Non-Hydric
Wh	Wehadkee silt loam	Class A

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Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS AND SOILS

Drawn by: WGL

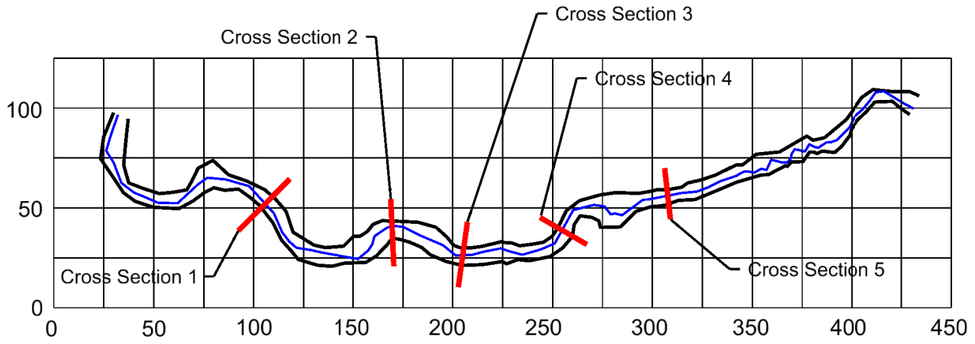
Date: DEC 2022

Scale: 1:3000

Project No.: 21-012

FIGURE

4D

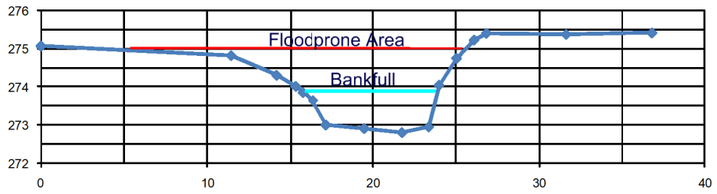


Reference Pattern

Lp-p = 37 (25 - 68) ft
Lm = 68 (44 - 116) ft
Wbelt = 23 (20 - 38) ft
Rc = 16 (11 - 27) ft
Lp-p/Wbkf = 4.6 (3.1 - 8.4)
Lm/Wbkf = 8.4 (5.5 - 14.3)
Wbelt/Wbkf = 2.8 (2.4 - 4.7)
Rc/Wbkf = 2.0 (1.4 - 3.3)
SIN = 1.20

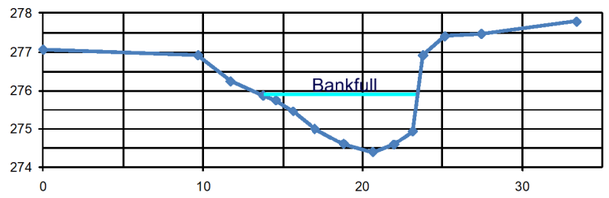
Pattern Legend

- Top of Bank
- Thalweg
- Cross Section



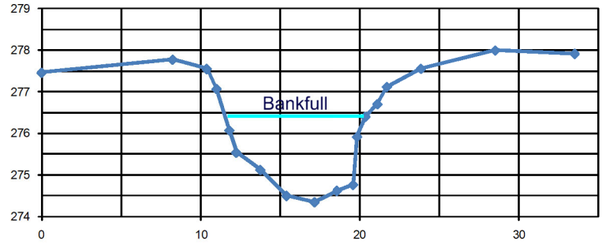
Cross Section 1 - Riffle

Abkf = 6.6 ft
Dave = 0.8 ft
Wbkf = 8.1 ft
Dmax = 1.1 ft
Bank Height = 2.0 ft
Bank Height Ratio = 1.8
W/D = 10.0
FPA = 18
ENT = 2.2
Stream Type = E



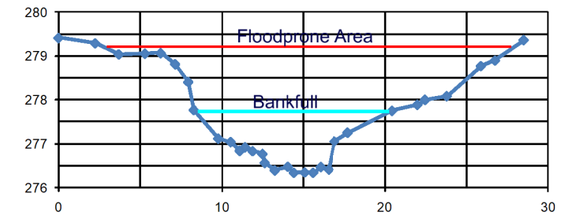
Cross Section 2 - Pool

Abkf = 9.0 ft
Wbkf = 9.7 ft
Dmax = 1.5 ft



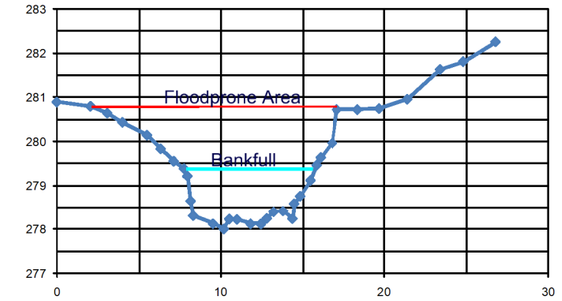
Cross Section 3 - Pool

Abkf = 13.1 ft
Wbkf = 8.9 ft
Dmax = 2.1 ft



Cross Section 4 - Riffle

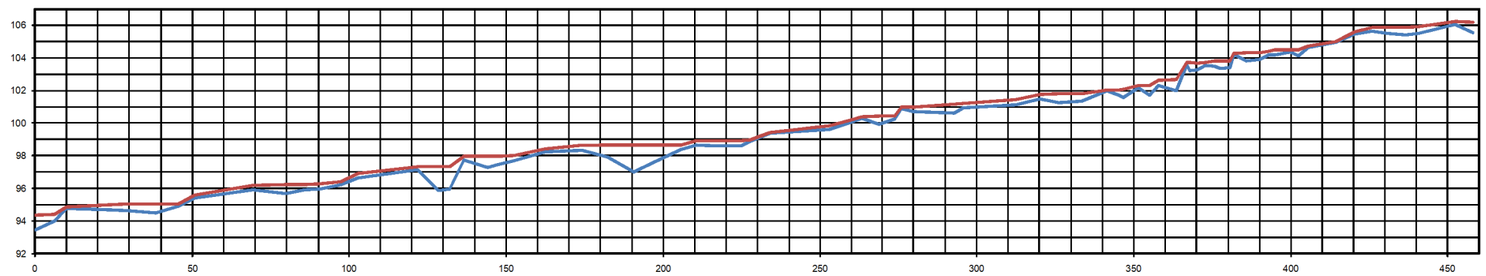
Abkf = 9.6 ft
Dave = 0.8 ft
Wbkf = 12.1 ft
Dmax = 1.4 ft
Bank Height = 1.4 ft
Bank Height Ratio = 1.0
W/D = 15.2
FPA = 25
ENT = 2.1
Stream Type = Eb



Cross Section 5 - Riffle

Abkf = 8.0 ft
Dave = 1.0 ft
Wbkf = 8.0 ft
Dmax = 1.4 ft
Bank Height = 1.4 ft
Bank Height Ratio = 1.0
W/D = 8.0
FPA = 15
ENT = 1.9
Stream Type = Eb

Cedarock Reference Reach



Profile (Reference Reach)

Save = 0.0258 rise/run
Svalley = 0.0310 rise/run
Sriffle = 0.0316 (0 - 0.0576) rise/run
Spool = 0.0007 (0 - 0.018) rise/run
Srun = 0.0353 (0 - 0.3565) rise/run
Sglide = 0.0029 (0 - 0.0431) rise/run

- Water Surface
- Channel Bed

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Cedarock Reference Reach Dimension, Pattern, and Profile

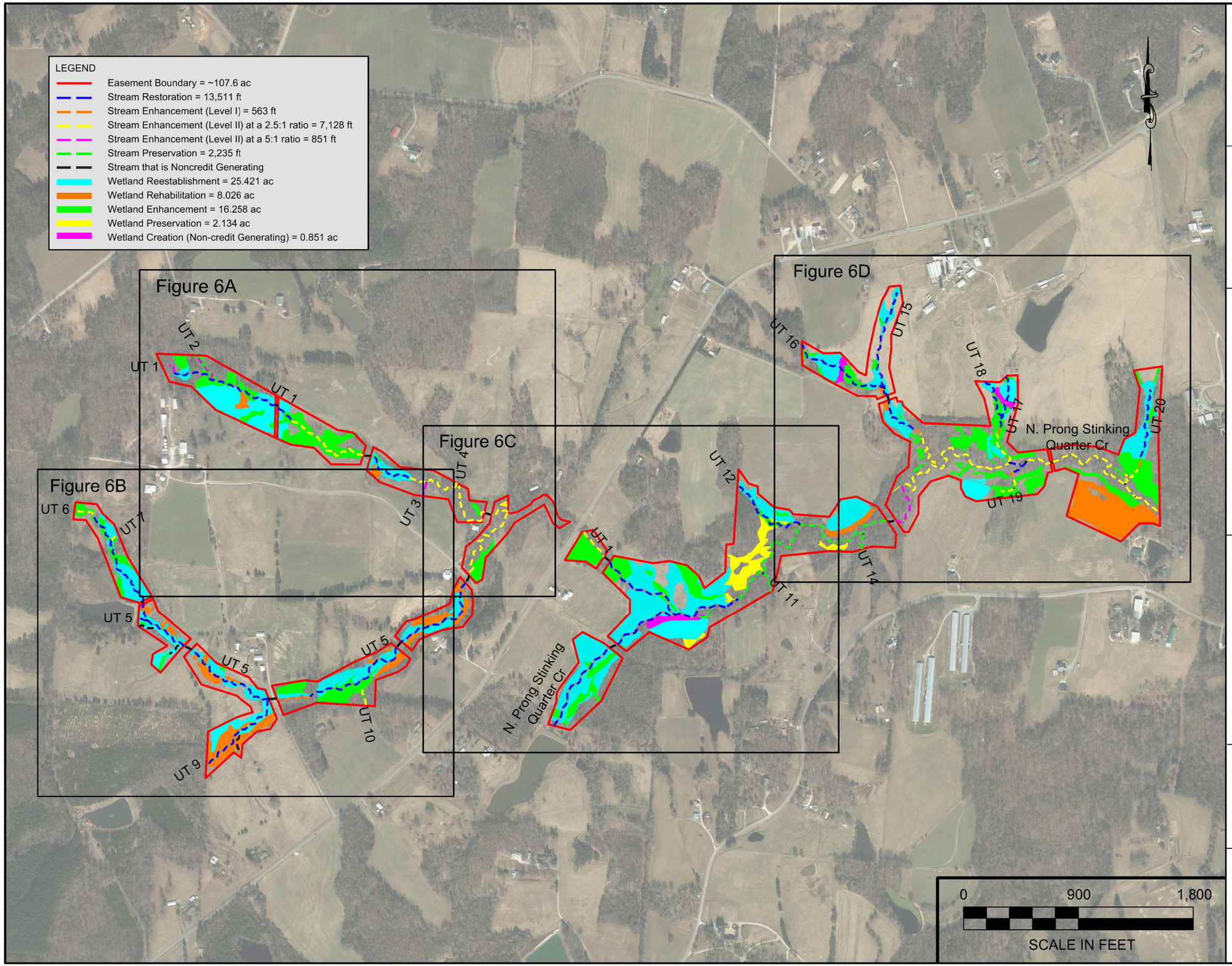
Scale: NA

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

5



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

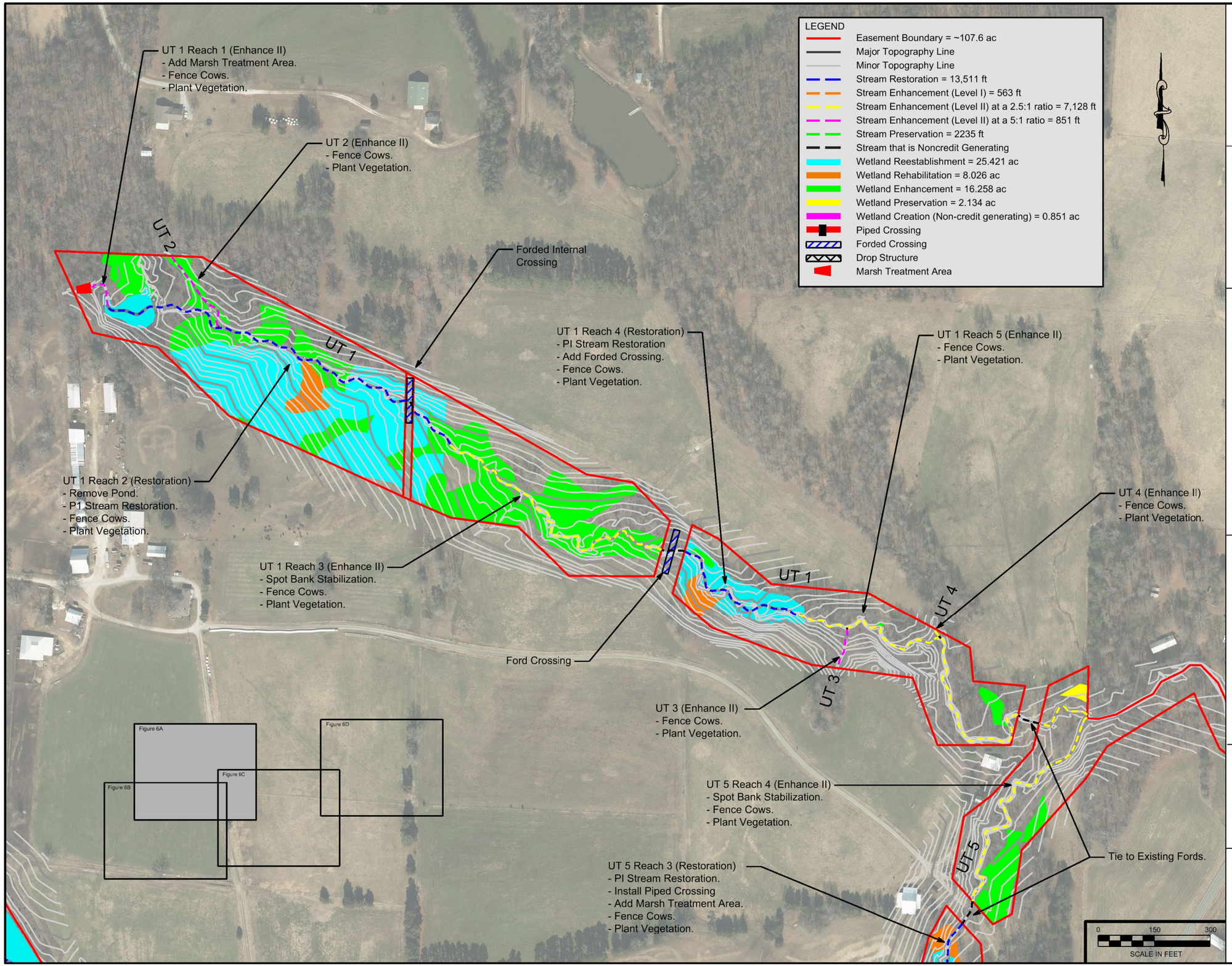
Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Proposed Conditions

Scale: As Shown	FIGURE NO. 6
Date: Sept 2022	
Project No.: 21-012	



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

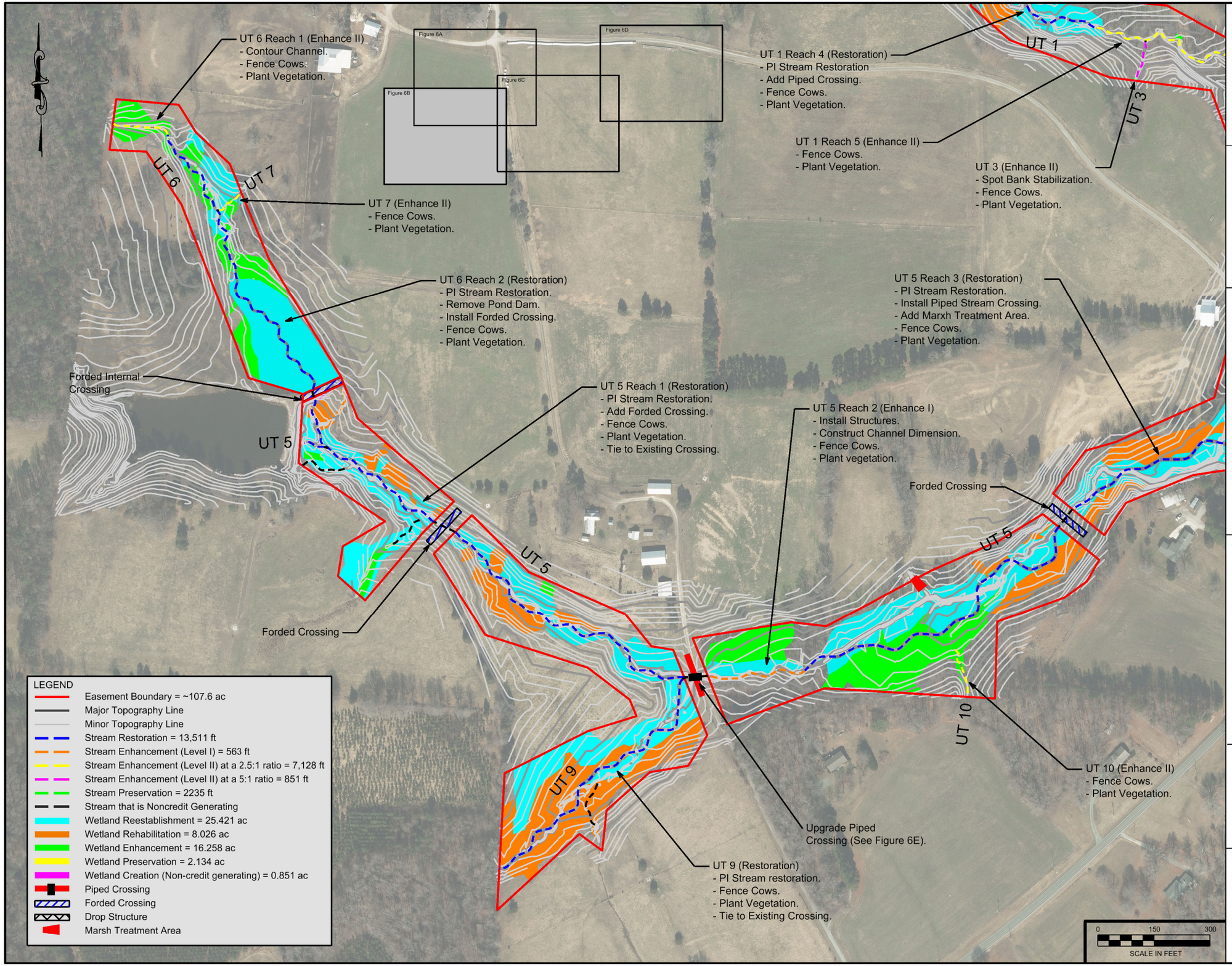
Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Proposed Conditions

Scale:	FIGURE NO.
As Shown	6A
Date: Sept 2022	
Project No.: 21-012	



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

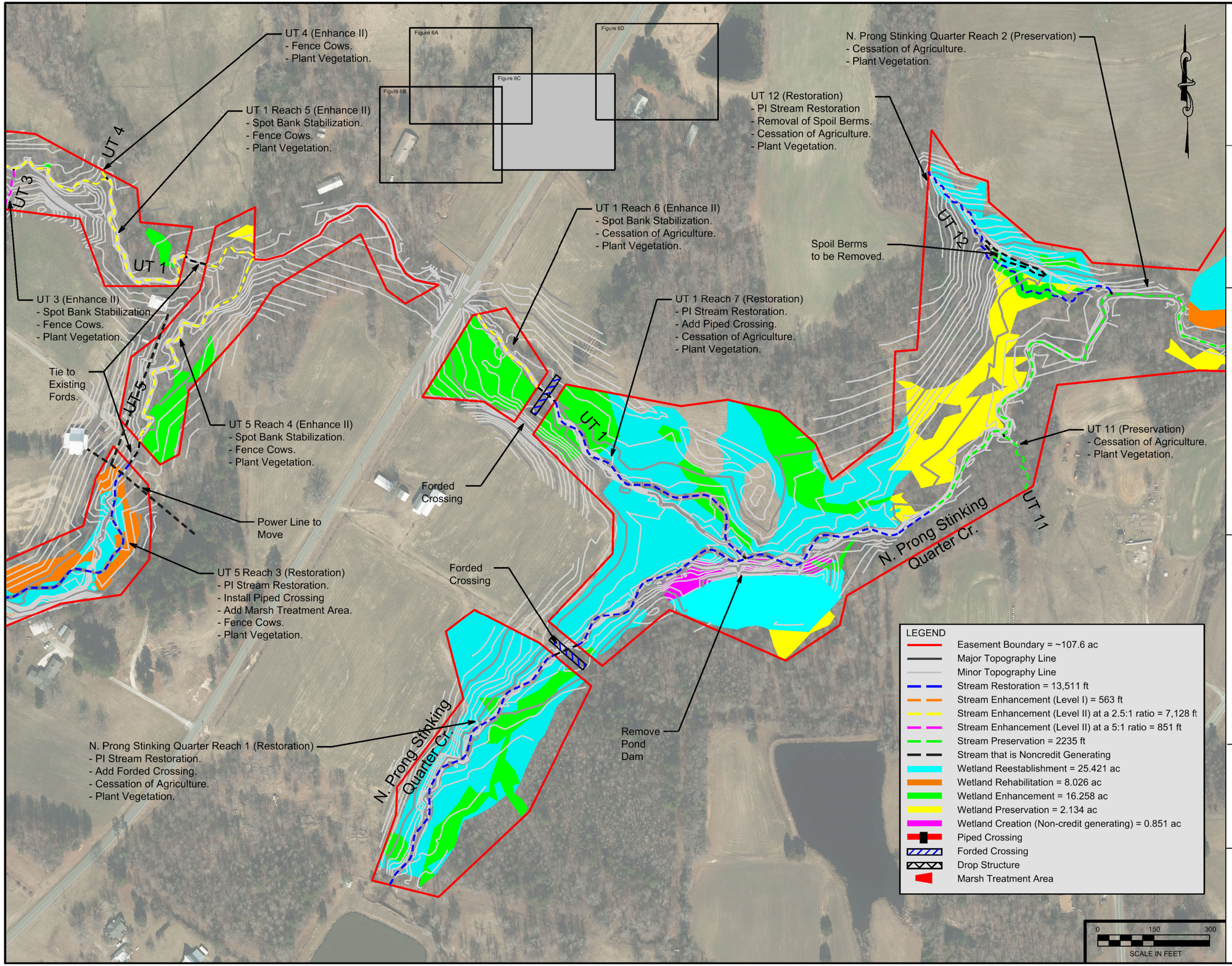
Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Proposed Conditions

Scale:	FIGURE NO.
As Shown	6B
Date: Sept 2022	
Project No.: 21-012	



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter
Mitigation Site
Guilford County
North Carolina

Title:

Proposed
Conditions

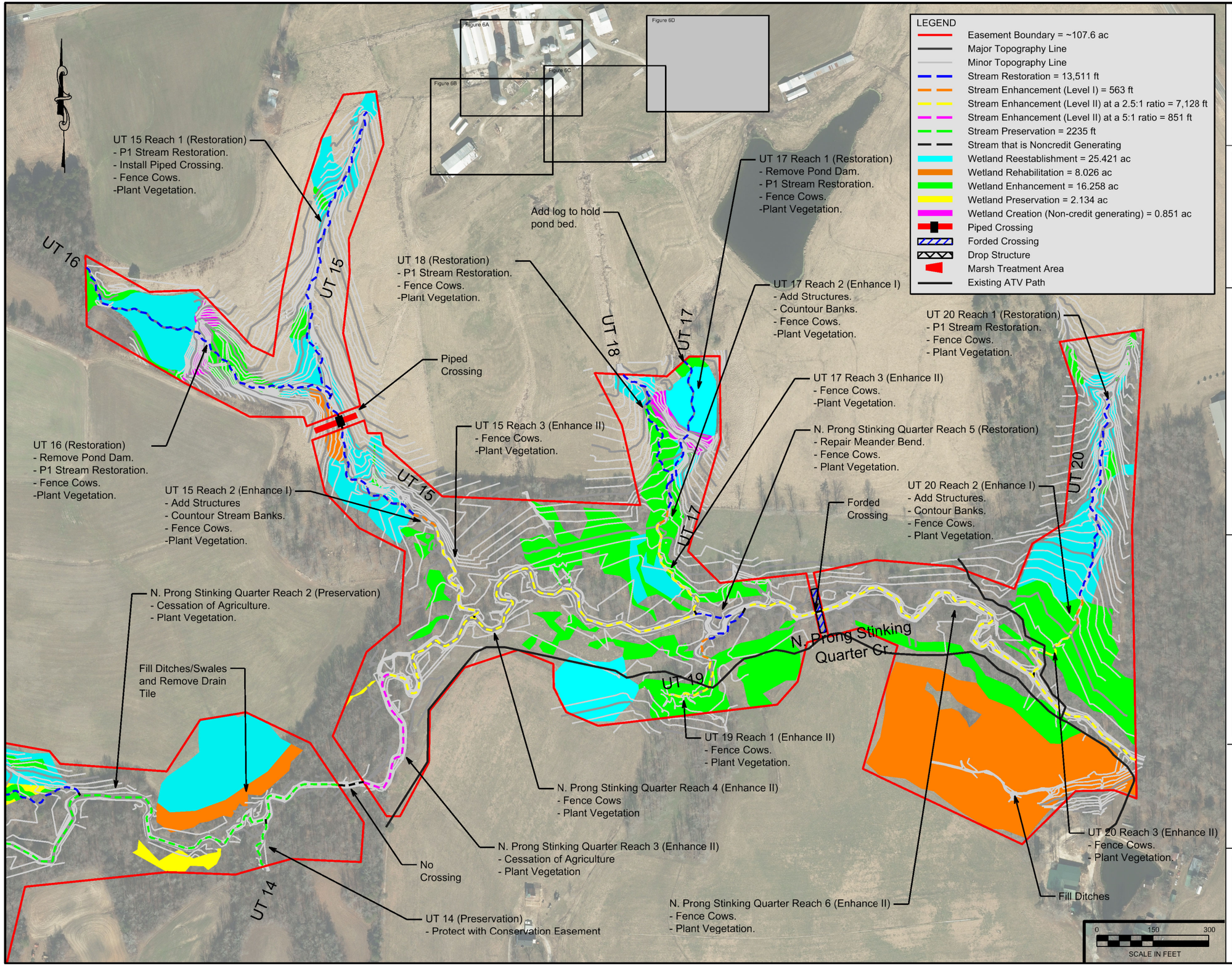
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

6C



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Proposed Conditions

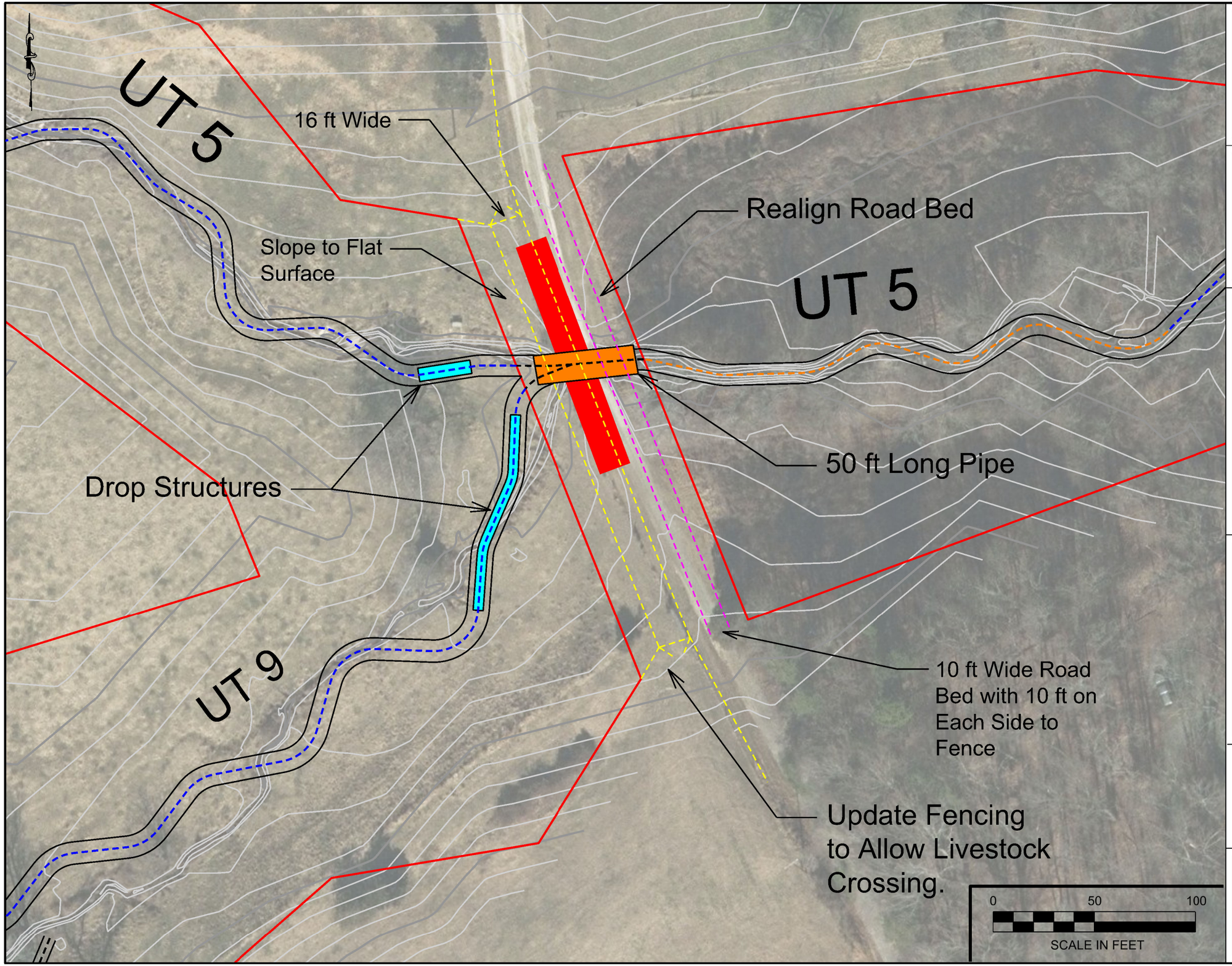
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

6D



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

UT 5 and UT 9 Crossing Upgrades

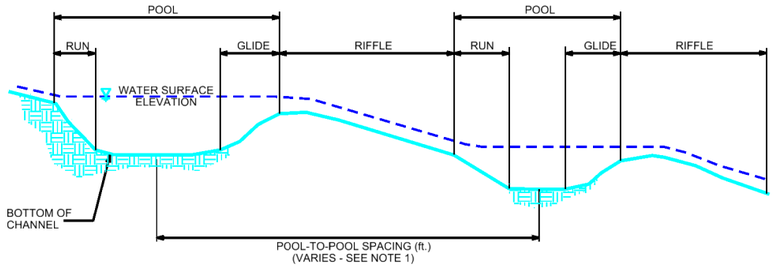
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

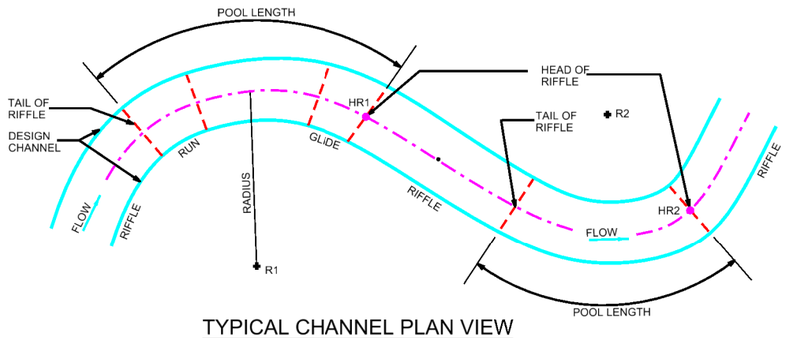
6E



TYPICAL CHANNEL PROFILE

NOTES:

1. POOL-TO-POOL SPACING IS MEASURED FROM CENTER OF POOL BEND TO CENTER OF POOL BEND.

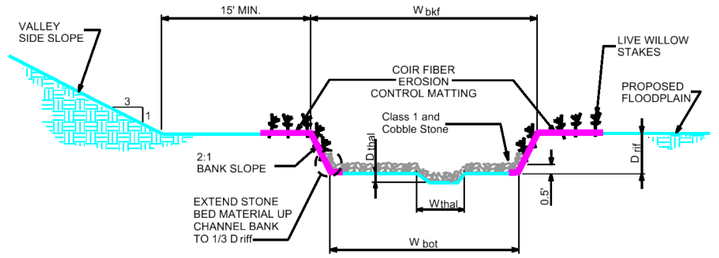


TYPICAL CHANNEL PLAN VIEW

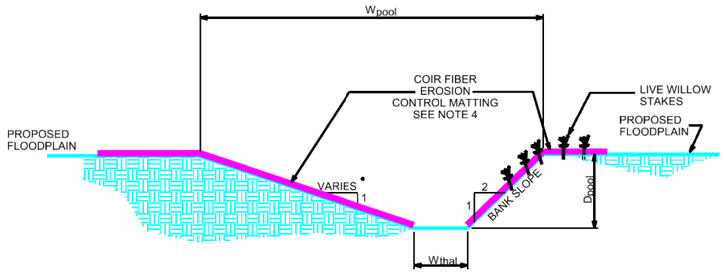
CHANNEL PLAN VIEW NOTES:

1. THE CONTRACTOR SHALL LAYOUT THE CHANNEL ALIGNMENT BY LOCATING THE RADII AND SCRIBING THE CENTER LINE FOR EACH POOL BEND. THE CONNECTING TANGENT SECTIONS SHALL COMPLETE THE LAYOUT OF THE CHANNEL.

2. FIELD ADJUSTMENTS OF THE ALIGNMENT MAY BE REQUIRED TO SAVE TREES OR AVOID OBSTACLES. THE STAKE-OUT SHALL BE APPROVED BY THE CONSTRUCTION MANAGER BEFORE CONSTRUCTION OF THE CHANNEL.



TYPICAL RIFFLE CROSS-SECTION



TYPICAL POOL CROSS-SECTION

CHANNEL CONSTRUCTION NOTES:

1. MATERIAL EXCAVATED FROM CHANNEL AND FLOODPLAIN SHALL BE USED TO BACKFILL EXISTING CHANNEL.

2. BANK PROTECTION SHALL CONSIST OF NATURAL COIR FIBER MATTING.

3. THE CONTRACTOR SHALL SUPPLY BED MATERIAL FOR THE ENTIRE BED LENGTH OF EACH RIFFLE SECTION. THE BED MATERIAL SHALL CONSIST OF A MIX OF CLASS A AND SMALLER STONE.

CROSS-SECTION DIMENSIONS

REACH	Wbkf (ft.)	Wbot (ft.)	Driff (ft.)	Dthal (ft.)	Dpool (ft.)	Wpool (ft.)	Wthal (ft.)
N. Prong Stinking Quarter Cr.	17.8	10.6	1.7	0.1	2.4	19.6	1.0
UT 1 Upstream	8.8	5.2	0.8	0.1	1.2	9.7	1.0
UT 1 Downstream	18.0	10.8	1.7	0.1	2.4	19.8	1.0
UT 5 Upstream	10.5	6.1	1.0	0.1	1.4	11.6	1.0
UT 5 Downstream	14.5	8.5	1.4	0.1	2.0	16.0	1.0
UT 17	7.0	4.2	0.6	0.1	1.0	7.7	1.0
UT 9	11.0	6.6	1.0	0.1	1.5	12.1	1.0
UT 6	7.4	4.6	0.6	0.1	1.0	8.1	1.0
UT 12 and 18	4.6	2.6	0.4	0.1	0.6	5.0	1.0
UT 15 Downstream	7.8	4.6	0.7	0.1	1.1	8.6	1.0
UT 15 Upstream, UT 12, and UT 20	5.8	3.4	0.5	0.1	0.8	6.4	1.0

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

PROPOSED DIMENSION, PATTERN, AND PROFILE

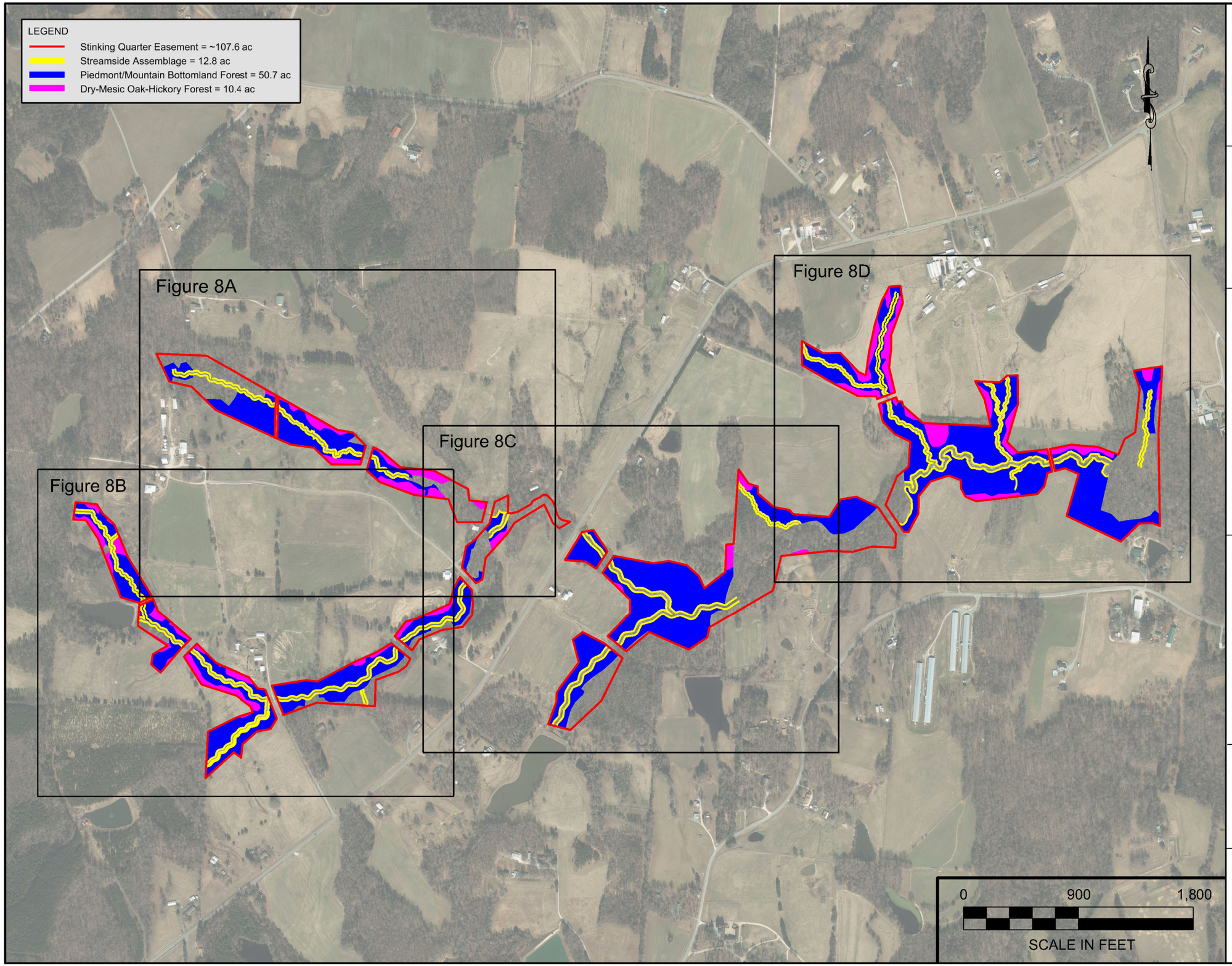
Scale: NA

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

7



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter
Mitigation Site
Guilford County
North Carolina

Title:

Planting
Plan

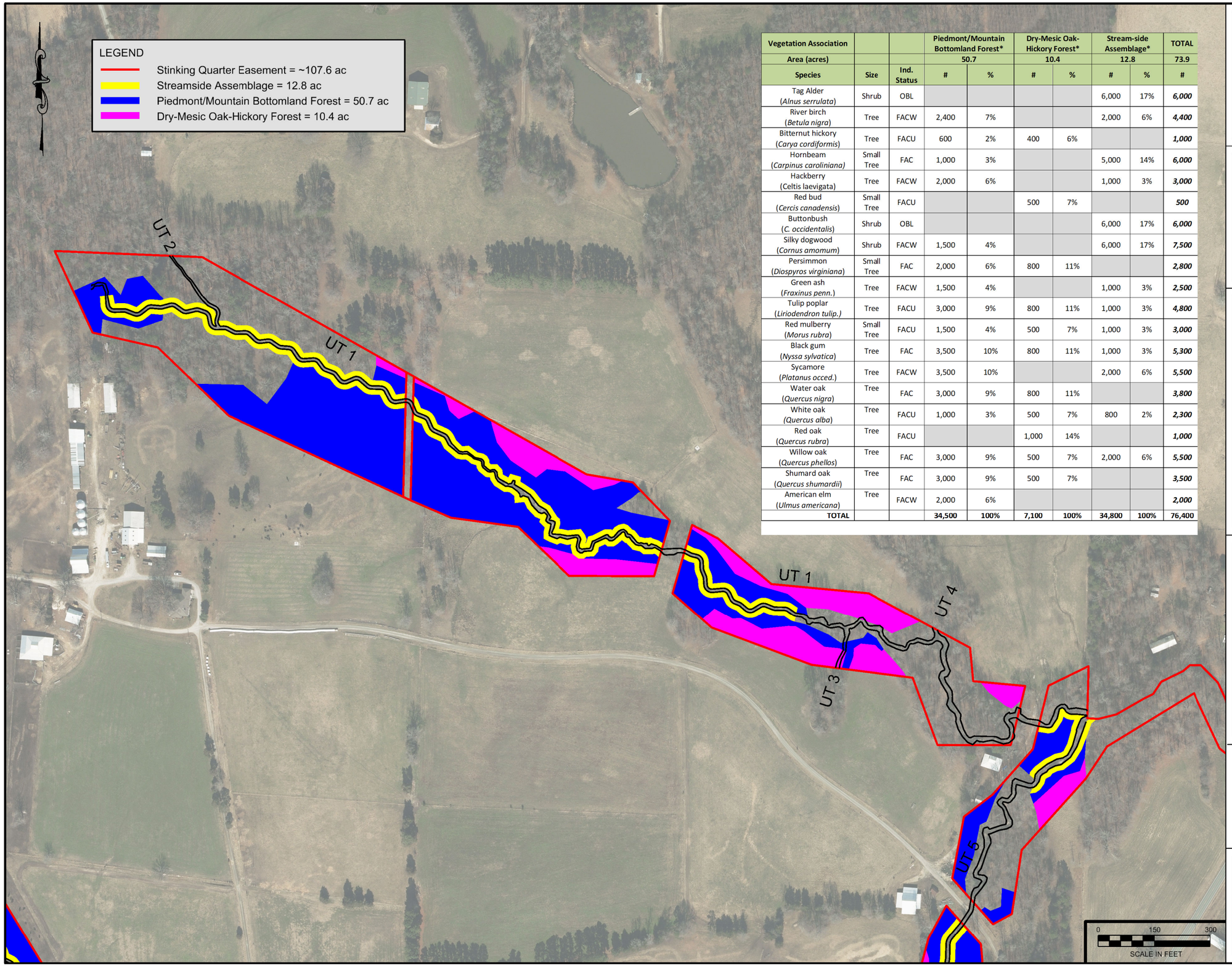
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

8



Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage*		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Size	Ind. Status	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Shrub	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Tree	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Tree	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana)*	Small Tree	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (Celtis laevigata)	Tree	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Small Tree	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Shrub	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Shrub	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Small Tree	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus penn.*)	Tree	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulip.)*	Tree	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Small Tree	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Tree	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occed.*)	Tree	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus nigra*)	Tree	FAC	3,000	9%	800	11%			***3,800***
White oak (*Quercus alba*)	Tree	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus rubra*)	Tree	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Tree	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Tree	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Tree	FACW	2,000	6%					***2,000***
TOTAL			34,500	100%	7,100	100%	34,800	100%	76,400

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Planting Plan

Scale:	FIGURE NO.
As Shown	8A
Date: Sept 2022	
Project No.: 21-012	

Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage*		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Size	Ind. Status	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Shrub	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Tree	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Tree	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana*)	Small Tree	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (Celtis laevigata)	Tree	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Small Tree	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Shrub	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Shrub	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Small Tree	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus penn.*)	Tree	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulip.*)	Tree	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Small Tree	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Tree	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occed.*)	Tree	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus nigra*)	Tree	FAC	3,000	9%	800	11%			***3,800***
White oak (*Quercus alba*)	Tree	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus rubra*)	Tree	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Tree	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Tree	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Tree	FACW	2,000	6%					***2,000***
TOTAL			34,500	100%	7,100	100%	34,800	100%	76,400

UT 1
UT 3
UT 6
UT 7
UT 5
UT 5
UT 5
UT 10
UT 9

LEGEND
- Stinking Quarter Easement = ~107.6 ac
- Streamside Assemblage = 12.8 ac
- Piedmont/Mountain Bottomland Forest = 50.7 ac
- Dry-Mesic Oak-Hickory Forest = 10.4 ac

0 150 300
SCALE IN FEET

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

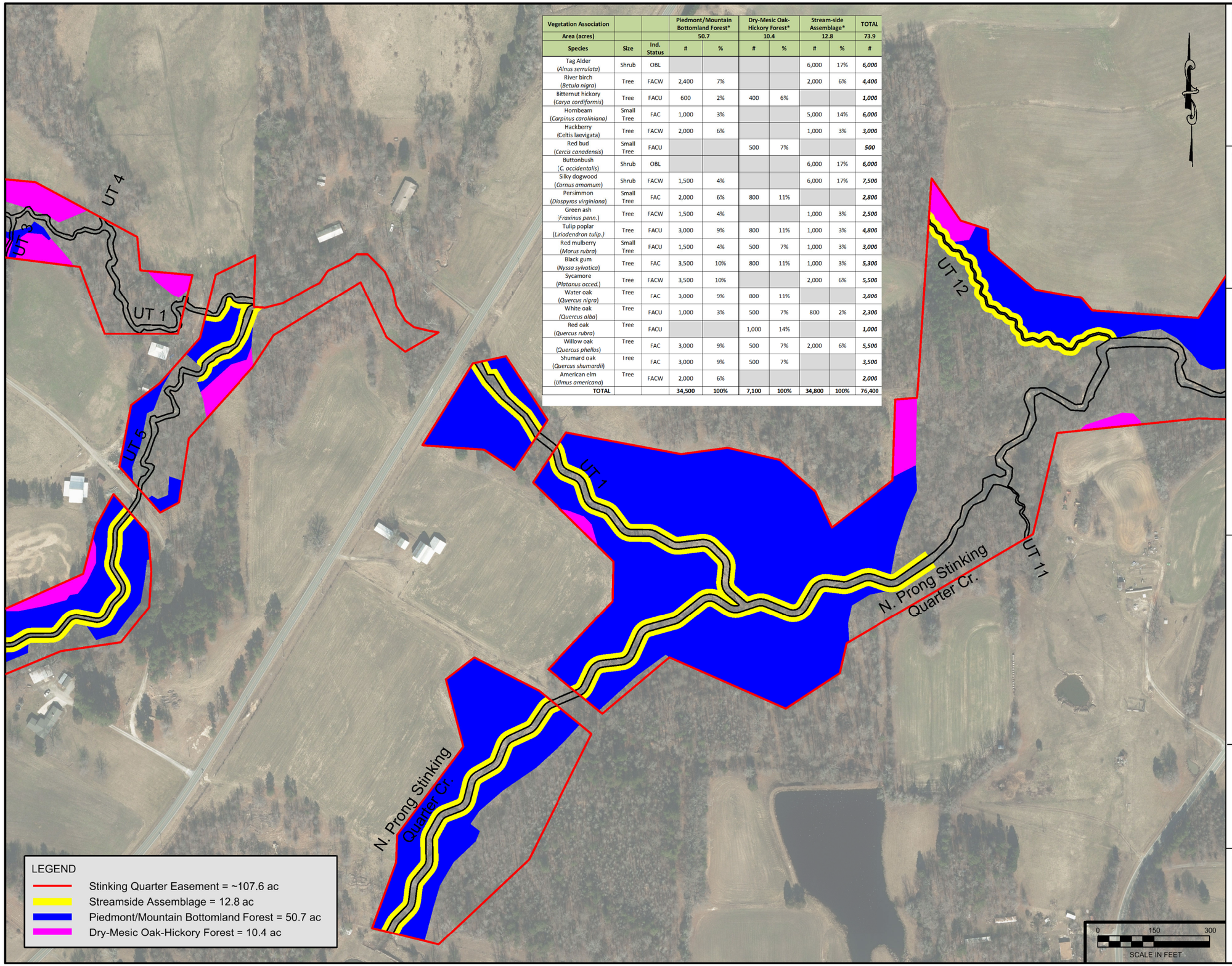
Title:

Planting Plan

Scale: As Shown
Date: Sept 2022
Project No.: 21-012

FIGURE NO.
8B

Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage*		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Size	Ind. Status	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Shrub	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Tree	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Tree	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana*)	Small Tree	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (Celtis laevigata)	Tree	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Small Tree	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Shrub	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Shrub	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Small Tree	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus penn.*)	Tree	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulip.*)	Tree	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Small Tree	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Tree	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occed.*)	Tree	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus nigra*)	Tree	FAC	3,000	9%	800	11%			***3,800***
White oak (*Quercus alba*)	Tree	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus rubra*)	Tree	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Tree	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Tree	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Tree	FACW	2,000	6%					***2,000***
TOTAL			34,500	100%	7,100	100%	34,800	100%	76,400



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Planting Plan

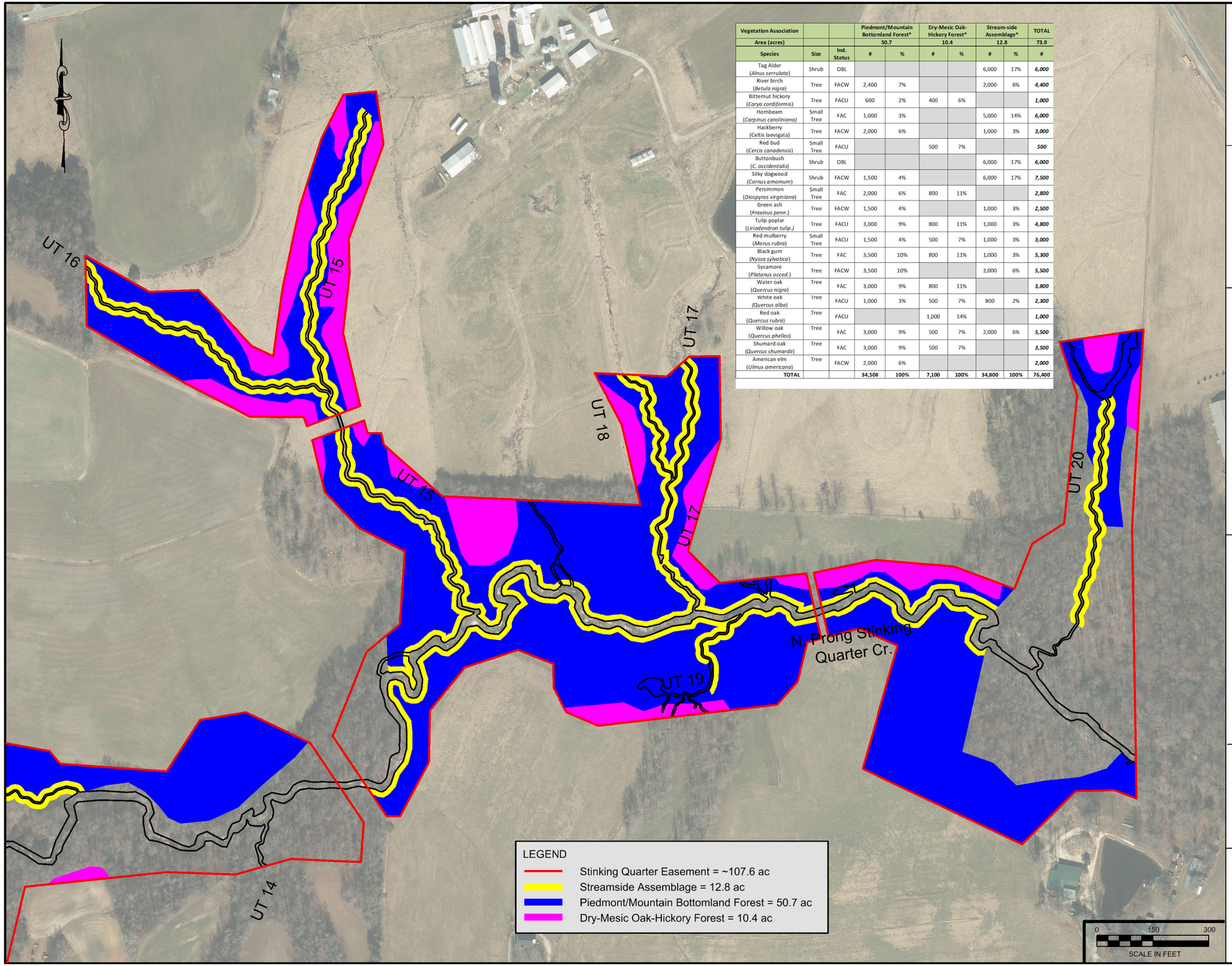
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

8C



Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage*		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Size	Ind. Status	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Shrub	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Tree	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Tree	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana*)	Small Tree	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (Celtis laevigata)	Tree	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Small Tree	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Shrub	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Shrub	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Small Tree	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus penn.*)	Tree	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulip.*)	Tree	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Small Tree	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Tree	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occed.*)	Tree	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus nigra*)	Tree	FAC	3,000	9%	800	11%			***3,800***
White oak (*Quercus alba*)	Tree	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus rubra*)	Tree	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Tree	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Tree	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Tree	FACW	2,000	6%					***2,000***
TOTAL			34,500	100%	7,100	100%	34,800	100%	76,400

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Planting Plan

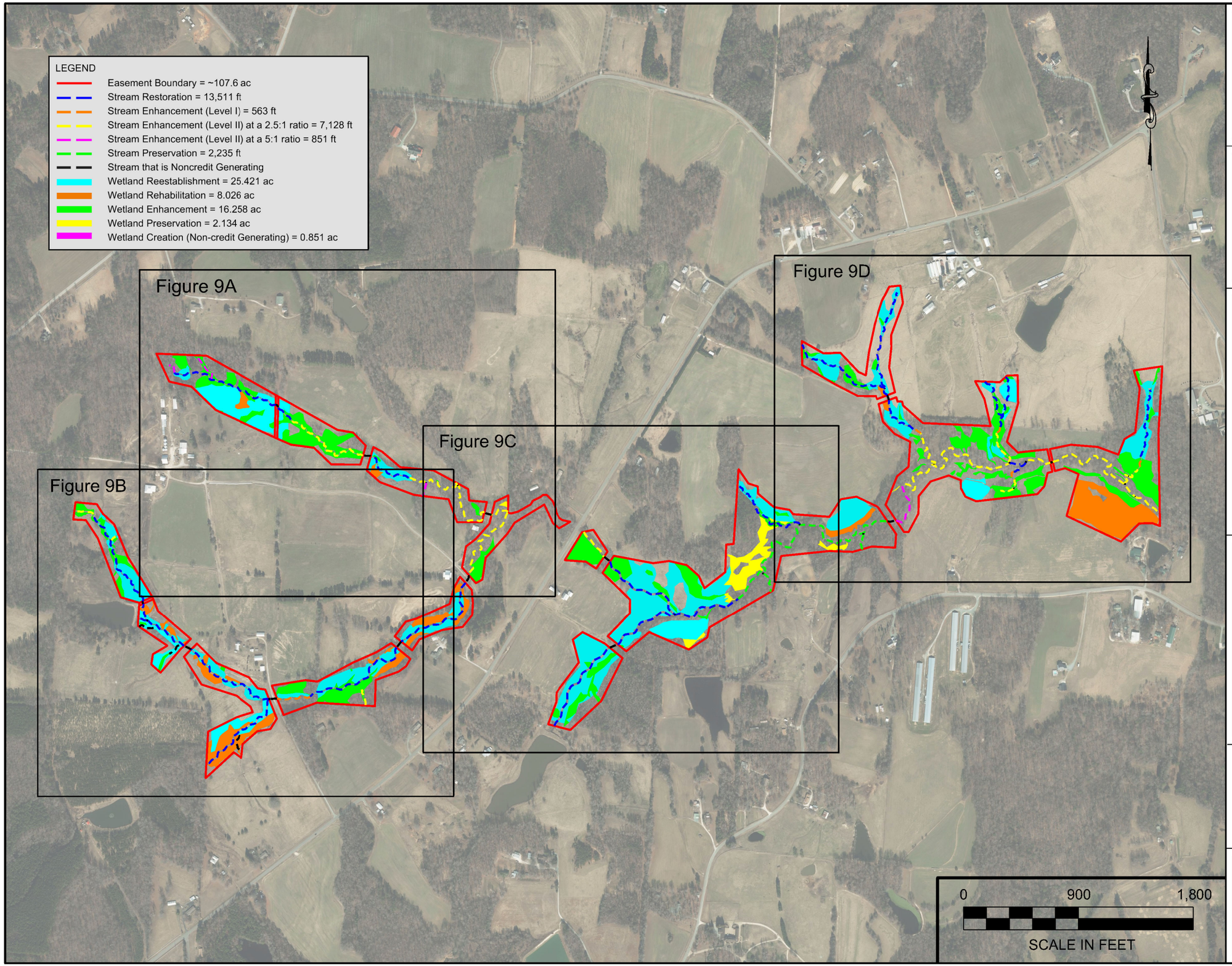
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

8D



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter
Mitigation Site
Guilford County
North Carolina

Title:

Monitoring
Plan

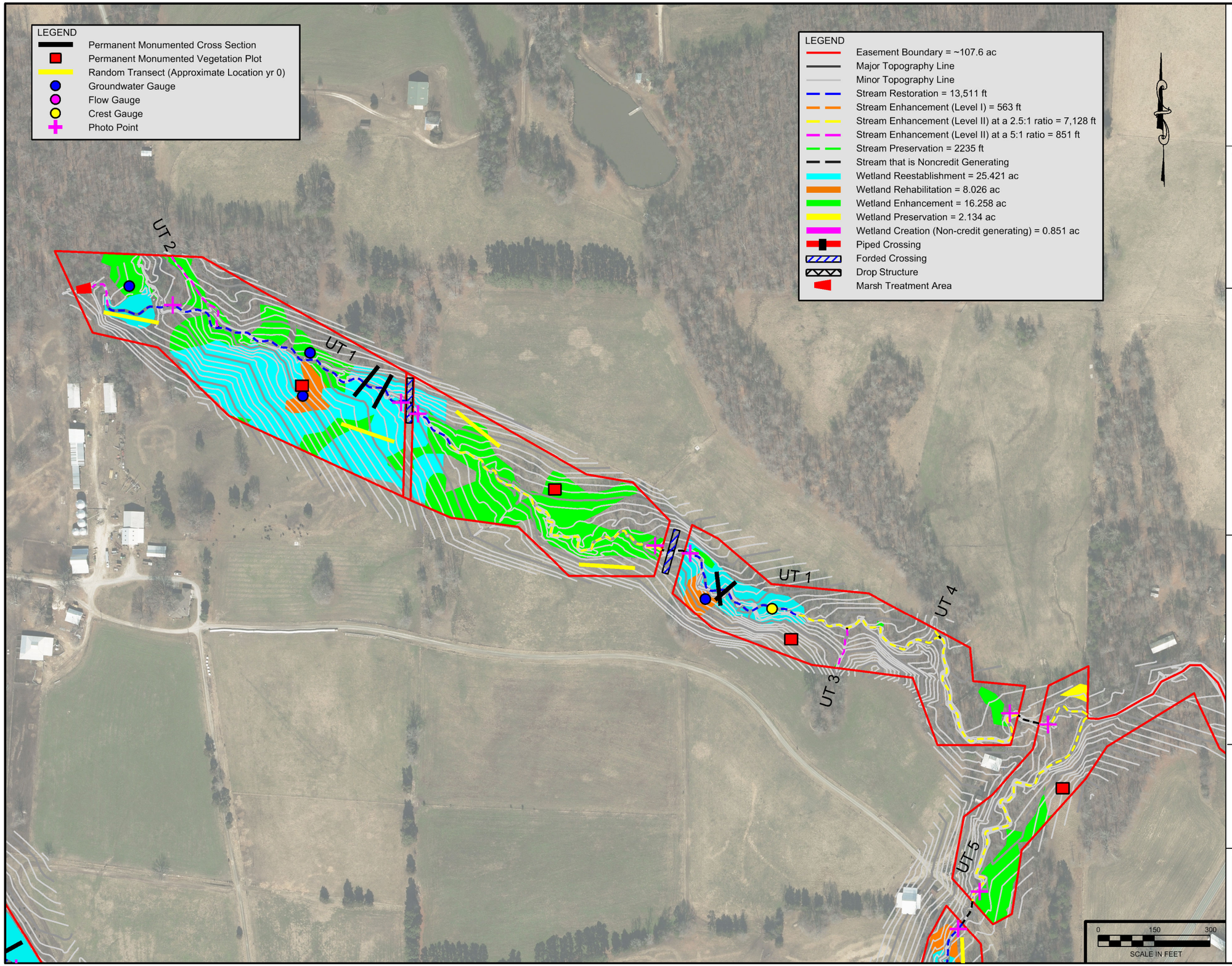
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

9



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

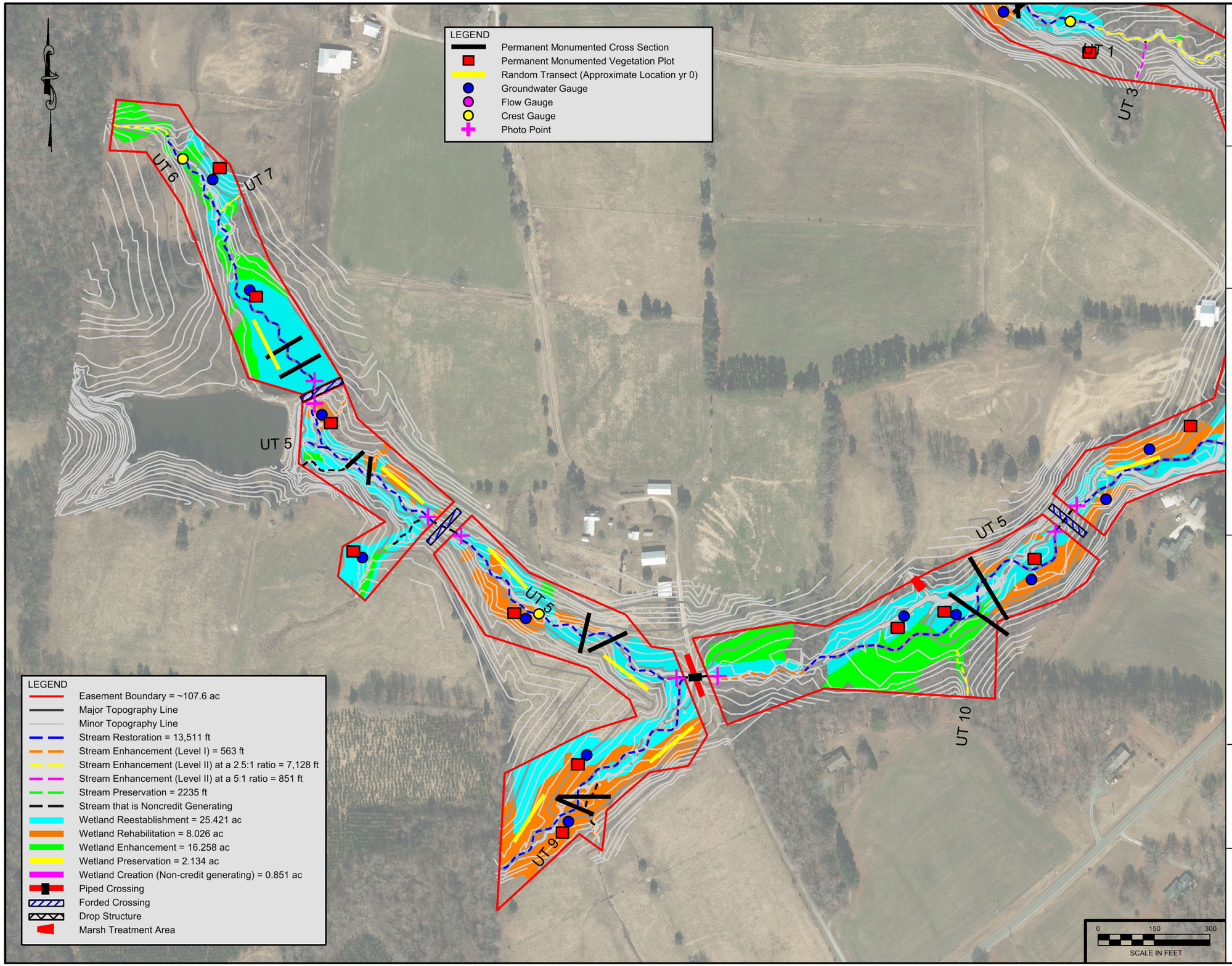
Project:

Stinking Quarter
Mitigation Site
Guilford County
North Carolina

Title:

Monitoring
Plan

Scale: As Shown	FIGURE NO. 9A
Date: Sept 2022	
Project No.: 21-012	



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Monitoring Plan

Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

9B

LEGEND

- Permanent Monumented Cross Section
- Permanent Monumented Vegetation Plot
- Random Transect (Approximate Location yr 0)
- Groundwater Gauge
- Flow Gauge
- Crest Gauge
- Photo Point

UT 4
UT 3
UT 1
UT 5
UT 1
UT 12
UT 11
N. Prong Stinking Quarter Cr.
N. Prong Stinking Quarter Cr.

LEGEND

- Easement Boundary = ~107.6 ac
- Major Topography Line
- Minor Topography Line
- Stream Restoration = 13,511 ft
- Stream Enhancement (Level I) = 563 ft
- Stream Enhancement (Level II) at a 2.5:1 ratio = 7,128 ft
- Stream Enhancement (Level II) at a 5:1 ratio = 851 ft
- Stream Preservation = 2235 ft
- Stream that is Noncredit Generating
- Wetland Reestablishment = 25.421 ac
- Wetland Rehabilitation = 8.026 ac
- Wetland Enhancement = 16.258 ac
- Wetland Preservation = 2.134 ac
- Wetland Creation (Non-credit generating) = 0.851 ac
- Piped Crossing
- Forded Crossing
- Drop Structure
- Marsh Treatment Area

0 150 300
SCALE IN FEET

Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Monitoring Plan

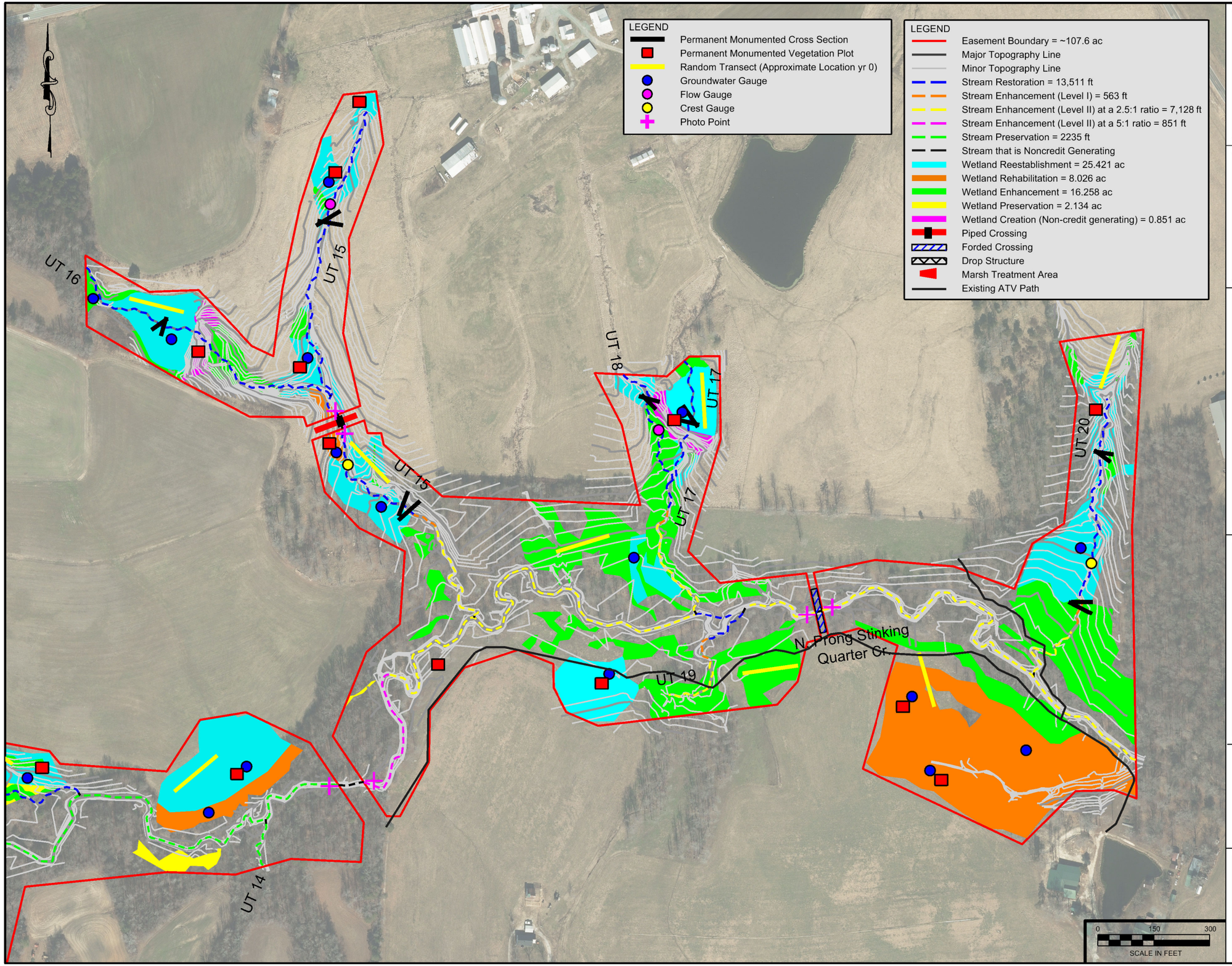
Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

9C



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Monitoring Plan

Scale: As Shown

Date: Sept 2022

Project No.: 21-012

FIGURE NO.

9D

Legend

Easement Boundary = 107.6 ac

N

UT-1
UT-2
UT-1
UT-1
UT-3
UT-4
UT-5
UT-6
UT-7
UT-5
UT-9
UT-10
UT-1
UT-12
UT-14
UT-11
UT-16
UT-15
UT-18
UT-17
UT-20
UT-19
Stinking Quarter Creek

UT-5 LiDAR Detail

Channel restoration will occur in the historic, low portion of the floodplain.

Historic channel meander scrolls from previous channel location

0 500 1,000 2,000 3,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

LIDAR

Drawn by: WGL

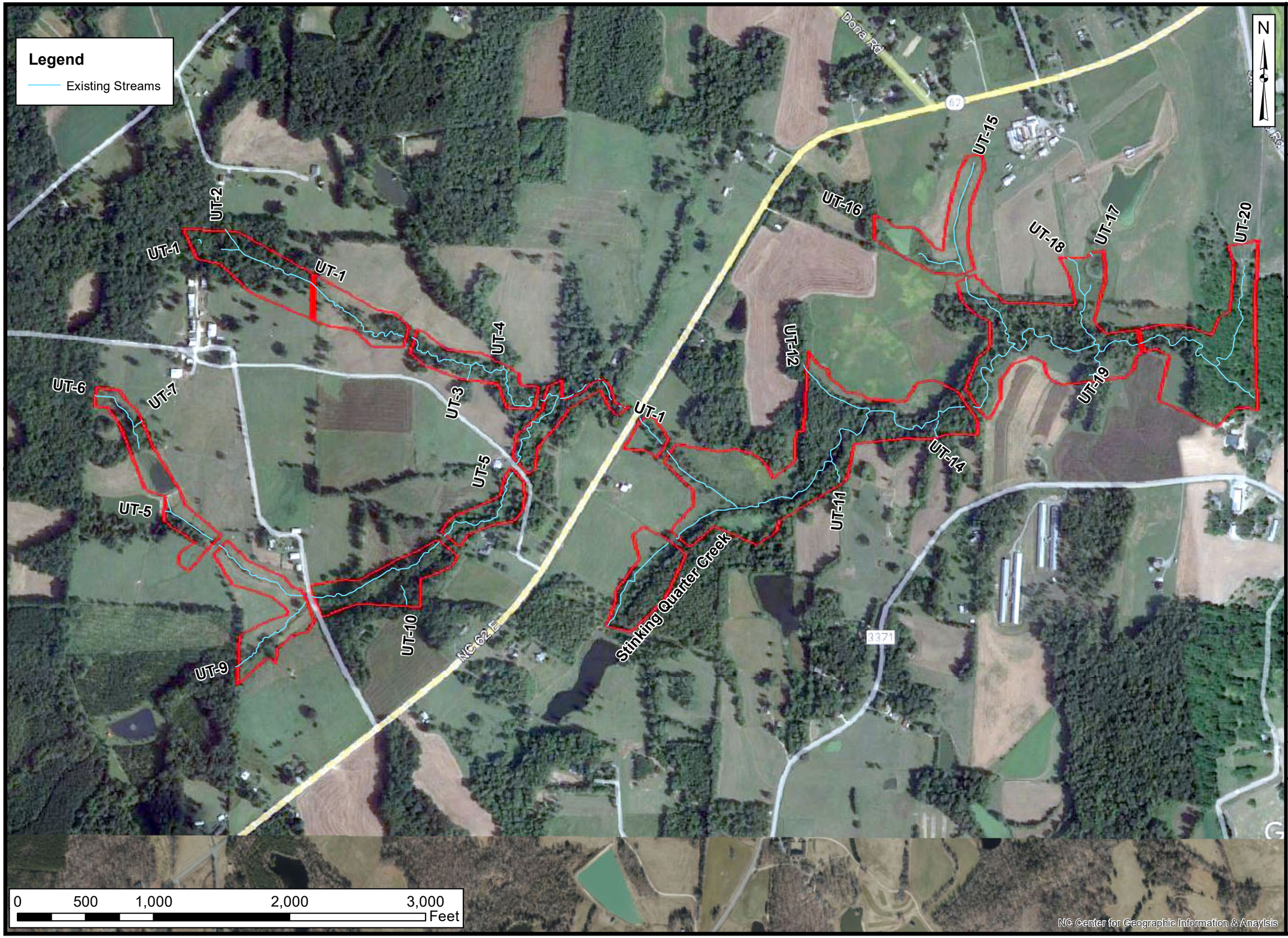
Date: DEC 2022

Scale: 1:7500

Project No.: 21-012

FIGURE

10



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

1993 Historic Aerial

Drawn by: WGL

Date: DEC 2022

Scale: 1:7500

Project No.: 21-012

FIGURE

11

Appendix B: Existing Stream & Wetland Data

Table B1. Stinking Quarter Morphological Stream Characteristics
Figure B1. Cross Section Location
Existing Stream Cross Section Data
NC SAM Forms
NC WAM Forms
NCDWQ Stream Forms
BEHI/NBS Data
Soil Boring Log

Table B1. Stinking Quarter Morphological Stream Characteristics

Variables	REFERENCE - CEDAROCK PARK	REFERENCE - CAUSEY* FARM	Existing (Stinking Quarter Upstream)	Proposed (Stinking Quarter Upstream)
Stream Type	Eb 4	E 5	Eg 4/5	Ce 3/4
Drainage Area (mi^2)	0.21	0.63	1.20	1.20
Bankfull Discharge (cfs)	30.9	59.8	94.7	94.7
Dimension Variables				
Bankfull Cross-Sectional Area (A_{bkf})	8.0	14.7	22.6	22.6
Existing Cross-Sectional Area ($A_{existing}$)	8.0	14.7	22.6 - 53.2	22.6
Bankfull Width (W_{bkf})	Mean: 8.1 Range: 8.0 - 12.1	Mean: 11.0 Range: 10.7 - 11.3	Mean: 17.4 Range: 13.7 to 23.8	Mean: 17.8 Range: 16.5 to 19.0
Bankfull Mean Depth (D_{bkf})	Mean: 0.8 Range: 0.8 - 1.0	Mean: 1.4 Range: 1.3 - 1.4	Mean: 1.3 Range: 0.9 to 1.7	Mean: 1.3 Range: 1.2 to 1.4
Bankfull Maximum Depth (D_{max})	Mean: 1.4 Range: 1.1 - 1.4	Mean: 2.0 Range: 1.9 - 2.0	Mean: 2.6 Range: 2.3 to 2.8	Mean: 1.8 Range: 1.5 to 2.1
Pool Width (W_{pool})	Mean: 9.3 Range: 8.9 - 9.7	Mean: 10.5 Range:	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 19.6 Range: 17.8 to 24.9
Maximum Pool Depth (D_{pool})	Mean: 1.8 Range: 1.5 - 2.1	Mean: 2.7 Range:		Mean: 2.4 Range: 1.7 to 2.7
Width of Floodprone Area (W_{fpa})	Mean: 18 Range: 15 - 25	Mean: 131 Range: 122 - 140	Mean: 150 Range: 40 to 150	Mean: 200 Range: 150 to 250
Dimension Ratios				
Entrenchment Ratio (W_{fpa}/W_{bkf})	Mean: 2.1 Range: 1.9 - 2.2	Mean: 12 Range: 11 - 13	Mean: 7.5 Range: 2.9 to 9.7	Mean: 11.2 Range: 9.1 to 13.1
Width / Depth Ratio (W_{bkf}/D_{bkf})	Mean: 10.1 Range: 8.0 - 15.1	Mean: 9 Range: 8 - 9	Mean: 13.5 Range: 8.1 to 26.4	Mean: 14.0 Range: 12.0 to 16.0
Max. D_{bkf}/ D_{bkf} Ratio	Mean: 1.4 Range: 1.4 - 1.8	Mean: 1.4 Range: 1.4 - 1.5	Mean: 2.0 Range: 1.4 to 3.0	Mean: 1.4 Range: 1.2 to 1.5
Low Bank Height / Max. D_{bkf} Ratio	Mean: 1.0 Range: 1.0 - 1.8	Mean: 1.4 Range:	Mean: 1.2 Range: 1.0 to 1.5	Mean: 1.0 Range: 1.0 to 1.3
Maximum Pool Depth / Bankfull Mean Depth (D_{pool}/D_{bkf})	Mean: 1.9 Range: 0 - 2.1	Mean: 2 Range:	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1
Pool Width / Bankfull Width (W_{pool}/W_{bkf})	Mean: 1.1 Range: 0 - 1.2	Mean: 1 Range:		Mean: 1.1 Range: 1.0 to 1.4
Pool Area / Bankfull Cross Sectional Area	Mean: 1.4 Range: 0 - 1.6	Mean: 1.4 Range:		Mean: 1.4 Range: 1.1 to 1.6

Variables	REFERENCE - Cedarock Park	REFERENCE - Causey Farm	Existing (Stinking Quarter Upstream)	Proposed (Stinking Quarter Upstream)
Pattern Variables				
Pool to Pool Spacing (L_{p-p})	Med: 37.2 Range: 25 - 69	Med: 44.3 Range: 22 - 81	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 71.2 Range: 53.4 to 142.3
Meander Length (L_m)	Med: 68.4 Range: 44 - 116	Med: 62.9 Range: 10 - 91		Med: 151.2 Range: 106.7 to 213.5
Belt Width (W_{belt})	Med: 22.8 Range: 20 - 38	Med: 29.8 Range: 17 - 36		Med: 53.4 Range: 26.7 to 88.9
Radius of Curvature (R_c)	Med: 16.5 Range: 11 - 27	Med: 30.6 Range: 9 - 113		Med: 53.4 Range: 35.6 to 71.2
Sinuosity (Sin)	1.20	1.46	1.07	1.15
Pattern Ratios				
Pool to Pool Spacing/ Bankfull Width (L_{p-p}/W_{bkf})	Med: 4.6 Range: 3.1 - 8.4	Med: 4 Range: 2.0 - 7.4	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0
Meander Length/ Bankfull Width (L_m/W_{bkf})	Med: 8.4 Range: 5.5 - 14.3	Med: 5.7 Range: 0.9 - 8.3		Med: 8.5 Range: 6.0 to 12.0
Meander Width Ratio (W_{belt}/W_{bkf})	Med: 2.8 Range: 2.4 - 4.7	Med: 2.7 Range: 1.5 - 3.5		Med: 3.0 Range: 1.5 to 5.0
Radius of Curvature/ Bankfull Width (Rc/W_{bkf})	Med: 2.0 Range: 1.4 - 3.3	Med: 2.8 Range: 0.8 - 10.3		Med: 3.0 Range: 2.0 to 4.0
Profile Variables				
Average Water Surface Slope (S_{ave})	0.0258	0.0053	0.0036	0.0033
Valley Slope (S_{valley})	0.0310	0.0077	0.0038	0.0038
Riffle Slope (S_{riffle})	Mean: 0.0316 Range: 0.01 - 0.0576	Mean: 0.0098 Range: 0.002 - 0.01198	No distinct repetitive pattern of riffles and pools due to channel incision	Mean: 0.0050 Range: 0.0040 to 0.0066
Pool Slope (S_{pool})	Mean: 0.0007 Range: 0 - 0.018	Mean: 0.0006 Range: 0 - 0.004		Mean: 0.0003 Range: 0.0000 to 0.0023
Run Slope (S_{run})	Mean: 0.0353 Range: 0 - 0.3565	Mean: Range:		Mean: 0.0013 Range: 0.0000 to 0.0026
Glide Slope (S_{glide})	Mean: 0.0029 Range: 0 - 0.0431	Mean: Range:		Mean: 0.0004 Range: 0.0000 to 0.0026
Profile Ratios				
Riffle Slope/ Water Surface Slope (S_{riffle}/S_{ave})	Mean: 1.2 Range: 0.39 - 2.23	Mean: 1.6 Range: 0 - 3.7	No distinct repetitive pattern of riffles and pools due to channel incision	Mean: 1.5 Range: 1.2 to 2.0
Pool Slope/Water Surface Slope (S_{pool}/S_{ave})	Mean: 0.0 Range: 0 - 0.70	Mean: 0.1 Range: 0 - 0.8		Mean: 0.1 Range: 0.0 to 0.7
Run Slope/Water Surface Slope (S_{run}/S_{ave})	Mean: 1.37 Range: 0 - 13.82	Mean: Range:		Mean: 0.4 Range: 0.0 to 0.8
Glide Slope/Water Surface Slope (S_{glide}/S_{ave})	Mean: 0.11 Range: 0 - 1.67	Mean: Range:		Mean: 0.1 Range: 0.0 to 0.8

* Causey Farm Reference includes measurments from a Reference Site measured in 2004.

Table B1 continued. Stinking Quarter Morphological Stream Characteristics

Variables	Existing (UT 1 Upstream)	Proposed (UT 1 Upstream)	Existing (UT 1 Downstream)	Proposed (UT 1 Downstream)	Existing (UT 5 Upstream)	Proposed (UT 5 Upstream)
Stream Type	G 5/6	Ce 3/4	Eg 4/5	Ce 3/4	Eg 4/5	Ce 3/4
Drainage Area (mi^2)	0.15	0.15	1.25	1.25	0.26	0.26
Bankfull Discharge (cfs)	21.1	21.1	97.5	97.5	30.9	30.9
Dimension Variables						
Bankfull Cross-Sectional Area (A_{bkf})	5.5	5.5	23.2	23.2	7.9	7.9
Existing Cross-Sectional Area ($A_{existing}$)	11.4 - 24.6	5.5	23.2 - 50.9	23.2	7.9 - 19.3	7.9
Bankfull Width (W_{bkf})	Mean: 6.4 Range: 5.0 to 21.7	Mean: 8.8 Range: 8.1 to 9.4	Mean: 11.5 Range: 11.2 to 14.3	Mean: 18.0 Range: 16.7 to 19.3	Mean: 8.5 Range: 6.2 to 10.2	Mean: 10.5 Range: 9.7 to 11.2
Bankfull Mean Depth (D_{bkf})	Mean: 0.8 Range: 0.3 to 1.1	Mean: 0.6 Range: 0.6 to 0.7	Mean: 2.0 Range: 1.6 to 2.1	Mean: 1.3 Range: 1.2 to 1.4	Mean: 1.0 Range: 0.8 to 1.3	Mean: 0.8 Range: 0.7 to 0.8
Bankfull Maximum Depth (D_{max})	Mean: 1.1 Range: 0.5 to 1.4	Mean: 0.9 Range: 0.8 to 1.0	Mean: 3.0 Range: 2.8 to 3.5	Mean: 1.8 Range: 1.5 to 2.1	Mean: 1.8 Range: 1.2 to 2.4	Mean: 1.1 Range: 0.9 to 1.2
Pool Width (W_{pool})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 9.7 Range: 8.8 to 12.3	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 19.8 Range: 18.0 to 25.2	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 11.6 Range: 10.5 to 14.7
Maximum Pool Depth (D_{pool})		Mean: 1.2 Range: 0.8 to 1.3		Mean: 2.4 Range: 1.7 to 2.7		Mean: 1.4 Range: 1.0 to 1.6
Width of Floodprone Area (W_{fpa})	Mean: 13 Range: 6 to 43	Mean: 100 Range: 75 to 125	Mean: 100 Range: 75 to 100	Mean: 125 Range: 100 to 150	Mean: 57 Range: 17 to 75	Mean: 75 Range: 50 to 100
Dimension Ratios						
Entrenchment Ratio (W_{fpa}/W_{bkf})	Mean: 1.6 Range: 1.1 to 6.1	Mean: 11.4 Range: 9.2 to 13.3	Mean: 8.7 Range: 5.2 to 8.9	Mean: 6.9 Range: 6.0 to 7.8	Mean: 6.7 Range: 1.9 to 11.8	Mean: 7.1 Range: 5.1 to 8.9
Width / Depth Ratio (W_{bkf}/D_{bkf})	Mean: 8.0 Range: 4.5 to 72.3	Mean: 14.0 Range: 12.0 to 16.0	Mean: 5.8 Range: 5.3 to 8.9	Mean: 14.0 Range: 12.0 to 16.0	Mean: 9.0 Range: 4.8 to 12.8	Mean: 14.0 Range: 12.0 to 16.0
Max. D_{bkf} / D_{bkf} Ratio	Mean: 1.4 Range: 1.0 to 1.7	Mean: 1.4 Range: 1.2 to 1.5	Mean: 1.7 Range: 1.3 to 1.8	Mean: 1.4 Range: 1.2 to 1.5	Mean: 1.6 Range: 1.3 to 2.7	Mean: 1.4 Range: 1.2 to 1.5
Low Bank Height / Max. D_{bkf} Ratio	Mean: 2.4 Range: 1.6 to 4.0	Mean: 1.0 Range: 1.0 to 1.3	Mean: 1.3 Range: 1.0 to 1.7	Mean: 1.0 Range: 1.0 to 1.3	Mean: 1.4 Range: 1.0 to 1.8	Mean: 1.0 Range: 1.0 to 1.3
Maximum Pool Depth / Bankfull Mean Depth (D_{pool}/D_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1
Pool Width / Bankfull Width (W_{pool}/W_{bkf})		Mean: 1.1 Range: 1.0 to 1.4		Mean: 1.1 Range: 1.0 to 1.4		Mean: 1.1 Range: 1.0 to 1.4
Pool Area / Bankfull Cross Sectional Area		Mean: 1.4 Range: 1.1 to 1.6		Mean: 1.4 Range: 1.1 to 1.6		Mean: 1.4 Range: 1.1 to 1.6

Variables	Existing (UT 1 Upstream)	Proposed (UT 1 Upstream)	Existing (UT 1 Downstream)	Proposed (UT 1 Downstream)	Existing (UT 5 Upstream)	Proposed (UT 5 Upstream)
Pattern Variables						
Pool to Pool Spacing (L_{p-p})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 35.1 Range: 26.3 to 70.2	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 72.1 Range: 54.1 to 144.2	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 42.1 Range: 31.5 to 84.1
Meander Length (L_m)		Med: 74.6 Range: 52.6 to 105.3		Med: 153.2 Range: 108.1 to 216.3		Med: 89.4 Range: 63.1 to 126.2
Belt Width (W_{belt})		Med: 26.3 Range: 13.2 to 43.9		Med: 54.1 Range: 27.0 to 90.1		Med: 31.5 Range: 15.8 to 52.6
Radius of Curvature (R_c)		Med: 26.3 Range: 17.5 to 35.1		Med: 54.1 Range: 36.0 to 72.1		Med: 31.5 Range: 21.0 to 42.1
Sinuosity (Sin)	1.13	1.15	1.07	1.15	1.05	1.15
Pattern Ratios						
Pool to Pool Spacing/ Bankfull Width (L_{p-p}/W_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0
Meander Length/ Bankfull Width (L_m/W_{bkf})		Med: 8.5 Range: 6.0 to 12.0		Med: 8.5 Range: 6.0 to 12.0		Med: 8.5 Range: 6.0 to 12.0
Meander Width Ratio (W_{belt}/W_{bkf})		Med: 3.0 Range: 1.5 to 5.0		Med: 3.0 Range: 1.5 to 5.0		Med: 3.0 Range: 1.5 to 5.0
Radius of Curvature/ Bankfull Width (Rc/W_{bkf})		Med: 3.0 Range: 2.0 to 4.0		Med: 3.0 Range: 2.0 to 4.0		Med: 3.0 Range: 2.0 to 4.0
Profile Variables						
Average Water Surface Slope (S_{ave})	0.0143	0.0141	0.0061	0.0057	0.0101	0.0092
Valley Slope (S_{valley})	0.0162	0.0162	0.0065	0.0065	0.0106	0.0106
Riffle Slope (S_{riffle})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0211 Range: 0.0169 to 0.0282	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0085 Range: 0.0068 to 0.0113	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0138 Range: 0.0111 to 0.0184
Pool Slope (S_{pool})		Mean: 0.0014 Range: 0.0000 to 0.0099		Mean: 0.0006 Range: 0.0000 to 0.0040		Mean: 0.0009 Range: 0.0000 to 0.0065
Run Slope (S_{run})		Mean: 0.0056 Range: 0.0000 to 0.0113		Mean: 0.0023 Range: 0.0000 to 0.0045		Mean: 0.0037 Range: 0.0000 to 0.0074
Glide Slope (S_{glide})		Mean: 0.0015 Range: 0.0000 to 0.0113		Mean: 0.0006 Range: 0.0000 to 0.0045		Mean: 0.0010 Range: 0.0000 to 0.0074
Profile Ratios						
Riffle Slope/ Water Surface Slope (S_{riffle}/S_{ave})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0
Pool Slope/Water Surface Slope (S_{pool}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.7		Mean: 0.1 Range: 0.0 to 0.7		Mean: 0.1 Range: 0.0 to 0.7
Run Slope/Water Surface Slope (S_{run}/S_{ave})		Mean: 0.4 Range: 0.0 to 0.8		Mean: 0.4 Range: 0.0 to 0.8		Mean: 0.4 Range: 0.0 to 0.8
Glide Slope/Water Surface Slope (S_{glide}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.8		Mean: 0.1 Range: 0.0 to 0.8		Mean: 0.1 Range: 0.0 to 0.8

Table B1 continued. Stinking Quarter Morphological Stream Characteristics

Variables	Existing (UT 5 Downstream)	Proposed (UT 5 Downstream)	Existing (UT 17)	Proposed (UT 17)	Existing (UT 9)	Proposed (UT 9)
Stream Type	Eg 4	Ce 3/4	Eg 5/6	Ce 3/4	Ef 4/5	Ce 3/4
Drainage Area (mi^2)	0.66	0.66	0.08	0.08	0.29	0.29
Bankfull Discharge (cfs)	61.6	61.6	13.1	13.1	34.0	34.0
Dimension Variables						
Bankfull Cross-Sectional Area (A_{bkf})	15.1	15.1	3.5	3.5	8.7	8.7
Existing Cross-Sectional Area ($A_{existing}$)	15.1 - 51.9	15.1	7.8 - 63.9	3.5	8.7 - 18.8	8.7
Bankfull Width (W_{bkf})	Mean: 12.1 Range: 9.3 to 14.3	Mean: 14.5 Range: 13.5 to 15.5	Mean: 3.9 Range: 3.8 to 6.1	Mean: 7.0 Range: 6.5 to 7.5	Mean: 9.4 Range: 8.8 to 17.8	Mean: 11.0 Range: 10.2 to 11.8
Bankfull Mean Depth (D_{bkf})	Mean: 1.3 Range: 1.1 to 1.6	Mean: 1.0 Range: 1.0 to 1.1	Mean: 0.9 Range: 0.6 to 0.9	Mean: 0.5 Range: 0.5 to 0.5	Mean: 0.9 Range: 0.5 to 1.0	Mean: 0.8 Range: 0.7 to 0.9
Bankfull Maximum Depth (D_{max})	Mean: 2.0 Range: 1.7 to 2.3	Mean: 1.5 Range: 1.2 to 1.7	Mean: 1.3 Range: 1.0 to 1.3	Mean: 0.7 Range: 0.6 to 0.8	Mean: 2.3 Range: 2.0 to 2.6	Mean: 1.1 Range: 0.9 to 1.3
Pool Width (W_{pool})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 16.0 Range: 14.5 to 20.4	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 7.7 Range: 7.0 to 9.8	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 12.1 Range: 11.0 to 15.5
Maximum Pool Depth (D_{pool})		Mean: 2.0 Range: 1.4 to 2.2		Mean: 1.0 Range: 0.7 to 1.1		Mean: 1.5 Range: 1.0 to 1.7
Width of Floodprone Area (W_{fpa})	Mean: 57 Range: 12 to 100	Mean: 100 Range: 75 to 125	Mean: 16 Range: 9 to 75	Mean: 75 Range: 50 to 100	Mean: 100 Range: 10 to 100	Mean: 100 Range: 75 to 125
Dimension Ratios						
Entrenchment Ratio (W_{fpa}/W_{bkf})	Mean: 5.1 Range: 1.3 to 10.8	Mean: 6.9 Range: 5.6 to 8.0	Mean: 2.6 Range: 2.3 to 19.7	Mean: 10.7 Range: 7.7 to 13.4	Mean: 9.4 Range: 1.1 to 11.4	Mean: 9.1 Range: 7.3 to 10.6
Width / Depth Ratio (W_{bkf}/D_{bkf})	Mean: 9.9 Range: 5.8 to 13.0	Mean: 14.0 Range: 12.0 to 16.0	Mean: 4.3 Range: 4.2 to 10.2	Mean: 14.0 Range: 12.0 to 16.0	Mean: 10.4 Range: 8.8 12.9 35.6	Mean: 14.0 Range: 12.0 to 16.0
Max. D_{bkf}/ D_{bkf} Ratio	Mean: 1.6 Range: 1.4 to 1.7	Mean: 1.4 Range: 1.2 to 1.5	Mean: 1.4 Range: 1.4 to 1.7	Mean: 1.4 Range: 1.2 to 1.5	Mean: 2.3 Range: 2.0 to 4.6	Mean: 1.4 Range: 1.2 to 1.5
Low Bank Height / Max. D_{bkf} Ratio	Mean: 1.6 Range: 1.0 to 2.1	Mean: 1.0 Range: 1.0 to 1.3	Mean: 1.8 Range: 1.7 to 4.1	Mean: 1.0 Range: 1.0 to 1.3	Mean: 1.0 Range: 1.0 to 1.4	Mean: 1.0 Range: 1.0 to 1.3
Maximum Pool Depth / Bankfull Mean Depth (D_{poo}/D_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1
Pool Width / Bankfull Width (W_{pool}/W_{bkf})		Mean: 1.1 Range: 1.0 to 1.4		Mean: 1.1 Range: 1.0 to 1.4		Mean: 1.1 Range: 1.0 to 1.4
Pool Area / Bankfull Cross Sectional Area		Mean: 1.4 Range: 1.1 to 1.6		Mean: 1.4 Range: 1.1 to 1.6		Mean: 1.4 Range: 1.1 to 1.6

Variables	Existing (UT 5 Downstream)	Proposed (UT 5 Downstream)	Existing (UT 17)	Proposed (UT 6 and 17)	Existing (UT 9)	Proposed (UT 9)
Pattern Variables						
Pool to Pool Spacing (L_{p-p})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 58.2 Range: 43.6 to 116.3	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 28.0 Range: 21.0 to 56.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 44.1 Range: 33.1 to 88.3
Meander Length (L_m)		Med: 123.6 Range: 87.2 to 174.5		Med: 59.5 Range: 42.0 to 84.0		Med: 93.8 Range: 66.2 to 132.4
Belt Width (W_{belt})		Med: 43.6 Range: 21.8 to 72.7		Med: 21.0 Range: 10.5 to 35.0		Med: 33.1 Range: 16.6 to 55.2
Radius of Curvature (R_c)		Med: 43.6 Range: 29.1 to 58.2		Med: 21.0 Range: 14.0 to 28.0		Med: 33.1 Range: 22.1 to 44.1
Sinuosity (Sin)	1.10	1.15	1.15	1.15	1.11	1.15
Pattern Ratios						
Pool to Pool Spacing/ Bankfull Width (L_{p-p}/W_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0
Meander Length/ Bankfull Width (L_m/W_{bkf})		Med: 8.5 Range: 6.0 to 12.0		Med: 8.5 Range: 6.0 to 12.0		Med: 8.5 Range: 6.0 to 12.0
Meander Width Ratio (W_{belt}/W_{bkf})		Med: 3.0 Range: 1.5 to 5.0		Med: 3.0 Range: 1.5 to 5.0		Med: 3.0 Range: 1.5 to 5.0
Radius of Curvature/ Bankfull Width (Rc/W_{bkf})		Med: 3.0 Range: 2.0 to 4.0		Med: 3.0 Range: 2.0 to 4.0		Med: 3.0 Range: 2.0 to 4.0
Profile Variables						
Average Water Surface Slope (S_{ave})	0.0064	0.0061	0.0243	0.0243	0.0081	0.0078
Valley Slope (S_{valley})	0.0070	0.0070	0.0279	0.0279	0.0090	0.0090
Riffle Slope (S_{riffle})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0091 Range: 0.0073 to 0.0122	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0364 Range: 0.0291 to 0.0485	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0117 Range: 0.0094 to 0.0157
Pool Slope (S_{pool})		Mean: 0.0006 Range: 0.0000 to 0.0043		Mean: 0.0024 Range: 0.0000 to 0.0170		Mean: 0.0008 Range: 0.0000 to 0.0055
Run Slope (S_{run})		Mean: 0.0024 Range: 0.0000 to 0.0049		Mean: 0.0097 Range: 0.0000 to 0.0194		Mean: 0.0031 Range: 0.0000 to 0.0063
Glide Slope (S_{glide})		Mean: 0.0007 Range: 0.0000 to 0.0049		Mean: 0.0027 Range: 0.0000 to 0.0194		Mean: 0.0009 Range: 0.0000 to 0.0063
Profile Ratios						
Riffle Slope/ Water Surface Slope (S_{riffle}/S_{ave})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0
Pool Slope/Water Surface Slope (S_{pool}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.7		Mean: 0.1 Range: 0.0 to 0.7		Mean: 0.1 Range: 0.0 to 0.7
Run Slope/Water Surface Slope (S_{run}/S_{ave})		Mean: 0.4 Range: 0.0 to 0.8		Mean: 0.4 Range: 0.0 to 0.8		Mean: 0.4 Range: 0.0 to 0.8
Glide Slope/Water Surface Slope (S_{glide}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.8		Mean: 0.1 Range: 0.0 to 0.8		Mean: 0.1 Range: 0.0 to 0.8

Table B1 continued. Stinking Quarter Morphological Stream Characteristics

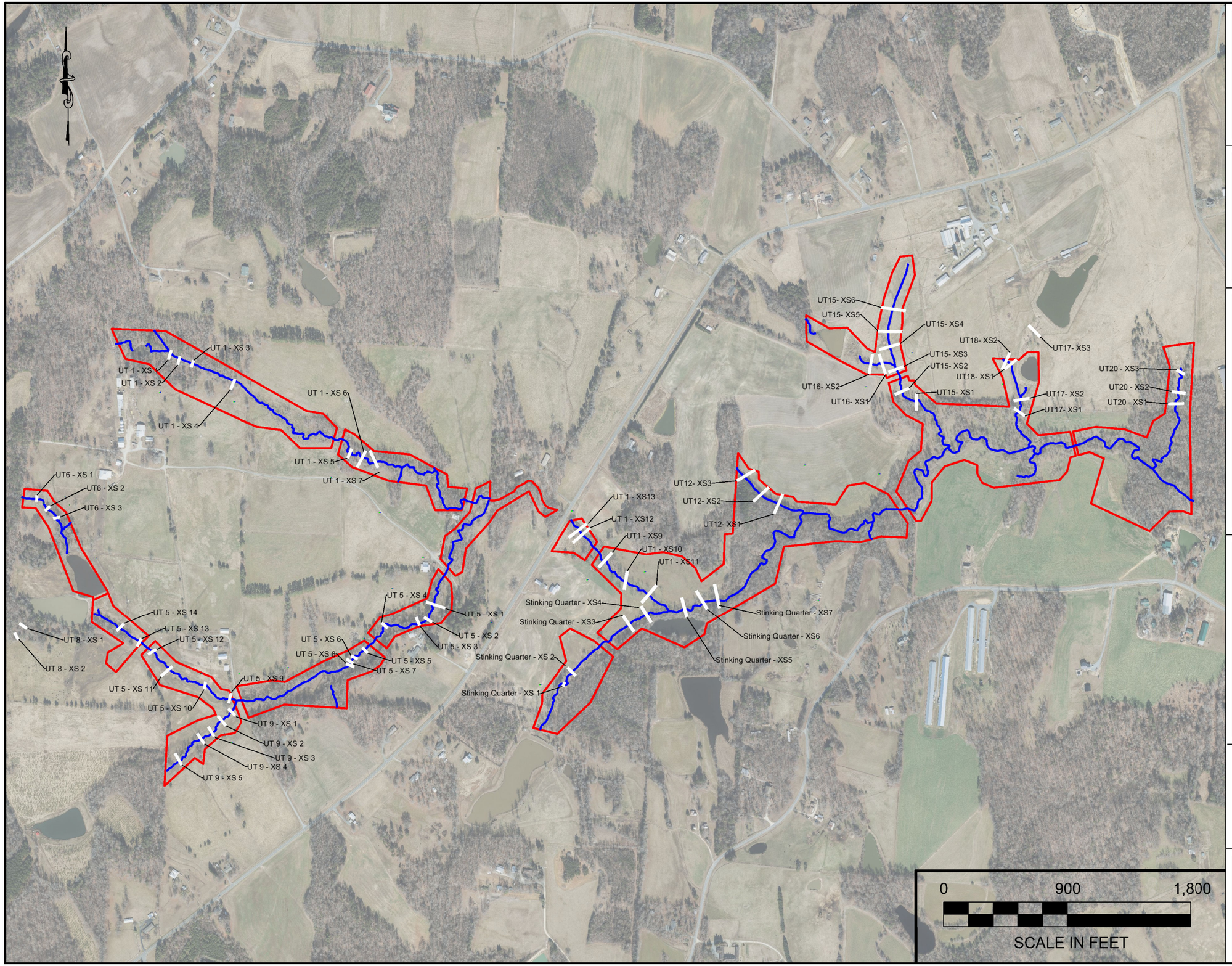
Variables	Existing (UT 6)	Proposed (UT 6)	Existing (UT 12)	Existing (UT 18)	Proposed (UT 12, 18, 19)
Stream Type	Eg 4/5	Ce 3/4	G 5/6	G 4/5	Ce 3/4
Drainage Area (mi^2)	0.09	0.09	0.02	0.02	0.02
Bankfull Discharge (cfs)	14.5	14.5	5.1	4.9	5.1
Dimension Variables					
Bankfull Cross-Sectional Area (A_{bkf})	3.9	3.9	1.5	1.4	1.5
Existing Cross-Sectional Area ($A_{existing}$)	12.9-14.5	3.9	3.0 - 17.3	5.8 - 23.6	1.5
Bankfull Width (W_{bkf})	Mean: 6.6 Range: 5.0 to 8.5	Mean: 7.4 Range: 6.8 to 7.9	Mean: 3.0 Range: 2.8 to 3.6	Mean: 4.2 Range: 3.8 to 4.6	Mean: 4.6 Range: 4.2 to 4.9
Bankfull Mean Depth (D_{bkf})	Mean: 0.6 Range: 0.5 to 0.8	Mean: 0.5 Range: 0.5 to 0.6	Mean: 0.5 Range: 0.4 to 0.6	Mean: 0.4 Range: 0.3 to 0.4	Mean: 0.3 Range: 0.3 to 0.4
Bankfull Maximum Depth (D_{max})	Mean: 1.2 Range: 1.0 to 1.2	Mean: 0.7 Range: 0.6 to 0.9	Mean: 0.7 Range: 0.6 to 0.8	Mean: 0.6 Range: 0.6 to 0.6	Mean: 0.5 Range: 0.4 to 0.5
Pool Width (W_{pool})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 8.1 Range: 7.4 to 10.3	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 5.0 Range: 4.6 to 6.4
Maximum Pool Depth (D_{pool})		Mean: 1.0 Range: 0.7 to 1.1			Mean: 0.6 Range: 0.4 to 0.7
Width of Floodprone Area (W_{fpa})	Mean: 20 Range: 6 to 25	Mean: 50 Range: 25 to 75	Mean: 5 Range: 4 to 7	Mean: 8 Range: 6 to 9	Mean: 50 Range: 25 to 75
Dimension Ratios					
Entrenchment Ratio (W_{fpa}/W_{bkf})	Mean: 2.4 Range: 1.2 to 3.8	Mean: 6.8 Range: 3.7 to 9.5	Mean: 1.4 Range: 1.4 to 2.3	Mean: 1.8 Range: 1.6 to 2.0	Mean: 10.9 Range: 5.9 to 15.3
Width / Depth Ratio (W_{bkf}/D_{bkf})	Mean: 11.0 Range: 6.3 to 17.0	Mean: 14.0 Range: 12.0 to 16.0	Mean: 6.0 Range: 4.7 to 9.0	Mean: 12.4 Range: 9.5 to 15.3	Mean: 14.0 Range: 12.0 to 16.0
Max. D_{bkf} / D_{bkf} Ratio	Mean: 2.0 Range: 1.5 to 2.0	Mean: 1.4 Range: 1.2 to 1.5	Mean: 1.4 Range: 1.3 to 1.5	Mean: 1.8 Range: 1.5 to 2.0	Mean: 1.4 Range: 1.2 to 1.5
Low Bank Height / Max. D_{bkf} Ratio	Mean: 1.8 Range: 1.8 to 2.5	Mean: 1.0 Range: 1.0 to 1.3	Mean: 4.3 Range: 1.6 to 4.8	Mean: 3.6 Range: 2.3 to 4.8	Mean: 1.0 Range: 1.0 to 1.3
Maximum Pool Depth / Bankfull Mean Depth (D_{pool}/D_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1
Pool Width / Bankfull Width (W_{pool}/W_{bkf})		Mean: 1.1 Range: 1.0 to 1.4			Mean: 1.1 Range: 1.0 to 1.4
Pool Area / Bankfull Cross Sectional Area		Mean: 1.4 Range: 1.1 to 1.6			Mean: 1.4 Range: 1.1 to 1.6

Variables	Existing (UT 6)	Existing (UT 6)	Existing (UT 12)	Existing (UT 18)	Proposed (UT 12, 18, 19)
Pattern Variables					
Pool to Pool Spacing (L_{p-p})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 29.6 Range: 22.2 to 59.1	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 18.3 Range: 13.7 to 36.7
Meander Length (L_m)		Med: 62.8 Range: 44.3 to 88.7			Med: 39.0 Range: 27.5 to 55.0
Belt Width (W_{belt})		Med: 22.2 Range: 11.1 to 36.9			Med: 13.7 Range: 6.9 to 22.9
Radius of Curvature (R_c)		Med: 22.2 Range: 14.8 to 29.6			Med: 13.7 Range: 9.2 to 18.3
Sinuosity (Sin)	1.05	1.15	1.01	1.01	1.10
Pattern Ratios					
Pool to Pool Spacing/ Bankfull Width (L_{p-p}/W_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0
Meander Length/ Bankfull Width (L_m/W_{bkf})		Med: 8.5 Range: 6.0 to 12.0			Med: 8.5 Range: 6.0 to 12.0
Meander Width Ratio (W_{belt}/W_{bkf})		Med: 3.0 Range: 1.5 to 5.0			Med: 3.0 Range: 1.5 to 5.0
Radius of Curvature/ Bankfull Width (Rc/W_{bkf})		Med: 3.0 Range: 2.0 to 4.0			Med: 3.0 Range: 2.0 to 4.0
Profile Variables					
Average Water Surface Slope (S_{ave})	0.0158	0.0144	0.0296	0.0369	0.0305
Valley Slope (S_{valley})	0.0166	0.0166	0.0299	0.0373	0.0336
Riffle Slope (S_{riffle})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0217 Range: 0.0173 to 0.0289	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0458 Range: 0.0367 to 0.0611
Pool Slope (S_{pool})		Mean: 0.0014 Range: 0.0000 to 0.0101			Mean: 0.0031 Range: 0.0000 to 0.0214
Run Slope (S_{run})		Mean: 0.0058 Range: 0.0000 to 0.0115			Mean: 0.0122 Range: 0.0000 to 0.0244
Glide Slope (S_{glide})		Mean: 0.0016 Range: 0.0000 to 0.0115			Mean: 0.0034 Range: 0.0000 to 0.0244
Profile Ratios					
Riffle Slope/ Water Surface Slope (S_{riffle}/S_{ave})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0
Pool Slope/Water Surface Slope (S_{pool}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.7			Mean: 0.1 Range: 0.0 to 0.7
Run Slope/Water Surface Slope (S_{run}/S_{ave})		Mean: 0.4 Range: 0.0 to 0.8			Mean: 0.4 Range: 0.0 to 0.8
Glide Slope/Water Surface Slope (S_{glide}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.8			Mean: 0.1 Range: 0.0 to 0.8

Table B1 continued. Stinking Quarter Morphological Stream Characteristics

Variables	Existing (UT 15 Downstream)	Proposed (UT 15 Downstream)	Existing (UT 15 Upstream)	Existing (UT 16)	Existing (UT 20)	Proposed (UT 15 Upstream, 16, and 20)
Stream Type	Ge 5	Ce 3/4	F 5/6	F 4/5	G 4/5	Ce 3/4
Drainage Area (mi^2)	0.11	0.11	0.04	0.05	0.04	0.04
Bankfull Discharge (cfs)	16.3	16.3	8.7	10.1	7.7	8.7
Dimension Variables						
Bankfull Cross-Sectional Area (A_{bkf})	4.4	4.4	2.4	2.8	2.2	2.4
Existing Cross-Sectional Area ($A_{existing}$)	16.4 - 70.9	4.4	24.1 - 31.2	8.9 - 23.1	17.4 - 63.9	2.4
Bankfull Width (W_{bkf})	Mean: 7.4 Range: 6.2 to 9.0	Mean: 7.8 Range: 7.3 to 8.4	Mean: 6.3 Range: 4.1 to 7.5	Mean: 6.8 Range: 6.6 to 7.0	Mean: 4.8 Range: 4.2 to 6.2	Mean: 5.8 Range: 5.4 to 6.2
Bankfull Mean Depth (D_{bkf})	Mean: 0.6 Range: 0.5 to 0.7	Mean: 0.6 Range: 0.5 to 0.6	Mean: 0.4 Range: 0.3 to 0.6	Mean: 0.4 Range: 0.3 to 0.4	Mean: 0.5 Range: 0.4 to 0.6	Mean: 0.4 Range: 0.4 to 0.4
Bankfull Maximum Depth (D_{max})	Mean: 1.0 Range: 1.0 to 1. 0	Mean: 0.8 Range: 0.7 to 0.9	Mean: 0.9 Range: 0.5 to 0.9	Mean: 0.6 Range: 0.6 to 0.6	Mean: 0.8 Range: 0.5 to 0.8	Mean: 0.6 Range: 0.5 to 0.7
Pool Width (W_{pool})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 8.6 Range: 7.8 to 11.0	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 6.4 Range: 5.8 to 8.1
Maximum Pool Depth (D_{pool})		Mean: 1.1 Range: 0.7 to 1.2				Mean: 0.8 Range: 0.5 to 0.9
Width of Floodprone Area (W_{fpa})	Mean: 14 Range: 10 to 17	Mean: 50 Range: 25 to 75	Mean: 7 Range: 6 to 12	Mean: 10 Range: 10 to 10	Mean: 7 Range: 6 to 10	Mean: 50 Range: 25 to 75
Dimension Ratios						
Entrenchment Ratio (W_{fpa}/W_{bkf})	Mean: 1.9 Range: 1.6 to 1.9	Mean: 6.4 Range: 3.4 to 8.9	Mean: 1.5 Range: 1.1 to 1.6	Mean: 1.4 Range: 1.4 to 1.5	Mean: 1.4 Range: 1.0 to 2.1	Mean: 8.6 Range: 4.7 to 12.1
Width / Depth Ratio (W_{bkf}/D_{bkf})	Mean: 12.3 Range: 8.9 to 18.0	Mean: 14.0 Range: 12.0 to 16.0	Mean: 15.8 Range: 6.8 to 25.0	Mean: 19.9 Range: 16.5 to 23.3	Mean: 9.6 Range: 7.0 to 15.5	Mean: 14.0 Range: 12.0 to 16.0
Max. D_{bkf}/ D_{bkf} Ratio	Mean: 1.7 Range: 1.4 to 2.0	Mean: 1.4 Range: 1.2 to 1.5	Mean: 1.5 Range: 1.3 to 3.0	Mean: 1.6 Range: 1.3 to 2.0	Mean: 1.3 Range: 1.3 to 1.6	Mean: 1.4 Range: 1.2 to 1.5
Low Bank Height / Max. D_{bkf} Ratio	Mean: 3.1 Range: 1.9 to 4.5	Mean: 1.0 Range: 1.0 to 1.3	Mean: 4.1 Range: 3.3 to 5.8	Mean: 3.4 Range: 2.6 to 4.2	Mean: 3.9 Range: 2.4 to 4.1	Mean: 1.0 Range: 1.0 to 1.3
Maximum Pool Depth / Bankfull Mean Depth (D_{pool}/D_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.9 Range: 1.3 to 2.1
Pool Width / Bankfull Width (W_{pool}/W_{bkf})		Mean: 1.1 Range: 1.0 to 1.4				Mean: 1.1 Range: 1.0 to 1.4
Pool Area / Bankfull Cross Sectional Area		Mean: 1.4 Range: 1.1 to 1.6				Mean: 1.4 Range: 1.1 to 1.6

Variables	Existing (UT 15 Downstream)	Proposed (UT 15 Downstream)	Existing (UT 15 Upstream)	Existing (UT 16)	Existing (UT 20)	Proposed (UT 15 Upstream, 16, and 20)
Pattern Variables						
Pool to Pool Spacing (L_{p-p})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 31.4 Range: 23.5 to 62.8	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 23.2 Range: 17.4 to 46.4
Meander Length (L_m)		Med: 66.7 Range: 47.1 to 94.2				Med: 49.3 Range: 34.8 to 69.6
Belt Width (W_{belt})		Med: 23.5 Range: 11.8 to 39.2				Med: 17.4 Range: 8.7 to 29.0
Radius of Curvature (R_c)		Med: 23.5 Range: 15.7 to 31.4				Med: 17.4 Range: 11.6 to 23.2
Sinuosity (Sin)	1.03	1.15	1.00	1.03	1.11	1.10
Pattern Ratios						
Pool to Pool Spacing/ Bankfull Width (L_{p-p}/W_{bkf})	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Med: 4.0 Range: 3.0 to 8.0
Meander Length/ Bankfull Width (L_m/W_{bkf})		Med: 8.5 Range: 6.0 to 12.0				Med: 8.5 Range: 6.0 to 12.0
Meander Width Ratio (W_{belt}/W_{bkf})		Med: 3.0 Range: 1.5 to 5.0				Med: 3.0 Range: 1.5 to 5.0
Radius of Curvature/ Bankfull Width (Rc/W_{bkf})		Med: 3.0 Range: 2.0 to 4.0				Med: 3.0 Range: 2.0 to 4.0
Profile Variables						
Average Water Surface Slope (S_{ave})	0.0196	0.0176	0.0334	0.0359	0.0228	0.0304
Valley Slope (S_{valley})	0.0202	0.0202	0.0334	0.0370	0.0253	0.0334
Riffle Slope (S_{riffle})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0263 Range: 0.0211 to 0.0351	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 0.0455 Range: 0.0364 to 0.0607
Pool Slope (S_{pool})		Mean: 0.0018 Range: 0.0000 to 0.0123				Mean: 0.0030 Range: 0.0000 to 0.0213
Run Slope (S_{run})		Mean: 0.0070 Range: 0.0000 to 0.0141				Mean: 0.0121 Range: 0.0000 to 0.0243
Glide Slope (S_{glide})		Mean: 0.0019 Range: 0.0000 to 0.0141				Mean: 0.0033 Range: 0.0000 to 0.0243
Profile Ratios						
Riffle Slope/ Water Surface Slope (S_{riffle}/S_{ave})	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	No distinct repetitive pattern of riffles and pools due to staightening activities	Mean: 1.5 Range: 1.2 to 2.0
Pool Slope/Water Surface Slope (S_{pool}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.7				Mean: 0.1 Range: 0.0 to 0.7
Run Slope/Water Surface Slope (S_{run}/S_{ave})		Mean: 0.4 Range: 0.0 to 0.8				Mean: 0.4 Range: 0.0 to 0.8
Glide Slope/Water Surface Slope (S_{glide}/S_{ave})		Mean: 0.1 Range: 0.0 to 0.8				Mean: 0.1 Range: 0.0 to 0.8



Axiom Environmental, Inc.

RESTORATION SYSTEMS | LLC

NOTES/REVISIONS

Project:

Stinking Quarter Mitigation Site
Guilford County
North Carolina

Title:

Cross Section Location

Scale: As Shown

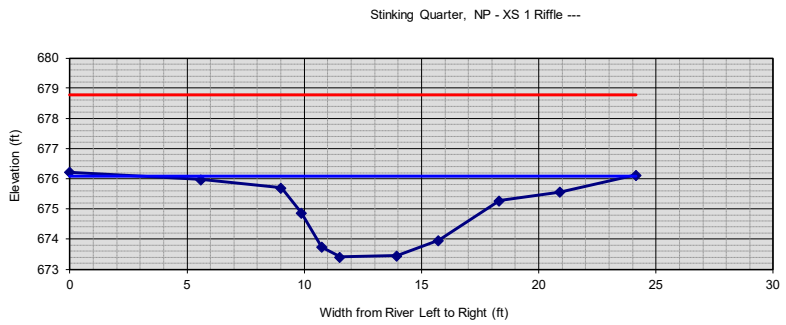
Date: Sept 2022

Project No.: 21-012

FIGURE NO.

B1

Cross Section



section: **Stinking Quarter, NP - XS 1**

Riffle

---

description: **Stinking Quarter, NP - XS 1**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**123.781**	676.219
	☐	**5.590586**	**124.03**	675.97
	☐	**9.015349**	**124.305**	675.695
	☐	**9.878057**	**125.124**	674.876
	☐	**10.75223**	**126.266**	673.734
	☐	**11.53254**	**126.586**	673.414
	☐	**13.95243**	**126.551**	673.449
	☐	**15.72585**	**126.044**	673.956
	☐	**18.32255**	**124.721**	675.279
	☐	**20.90391**	**124.436**	675.564
	☐	**24.1479**	**123.879**	676.121
	☐			
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	☐			

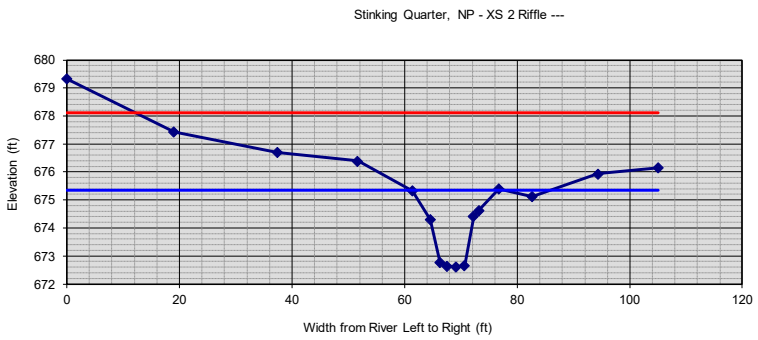
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
123.895	**123.895**	**150.0**		
676.105	676.105			

dimensions			
22.6	x-section area	1.1	d mean
21.5	width	22.9	wet P
2.7	d max	1.0	hyd radi
2.7	bank ht	20.4	w/d ratio
150.0	W flood prone area	7.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, NP - XS 2**

Riffle

---

description: **Stinking Quarter, NP - XS 2**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**120.679**	679.321
	☐	**19.03385**	**122.574**	677.426
	☐	**37.40598**	**123.306**	676.694
	☐	**51.69271**	**123.605**	676.395
	☐	**61.37715**	**124.668**	675.332
	☐	**64.54676**	**125.697**	674.303
	☐	**66.24229**	**127.219**	672.781
	☐	**67.60484**	**127.362**	672.638
	☐	**69.15663**	**127.389**	672.611
	☐	**70.63968**	**127.328**	672.672
	☐	**72.22454**	**125.586**	674.414
	☐	**73.20516**	**125.365**	674.635
	☐	**76.73343**	**124.599**	675.401
	☐	**82.67228**	**124.874**	675.126
	☐	**94.31634**	**124.064**	675.936
	☐	**105.0026**	**123.847**	676.153
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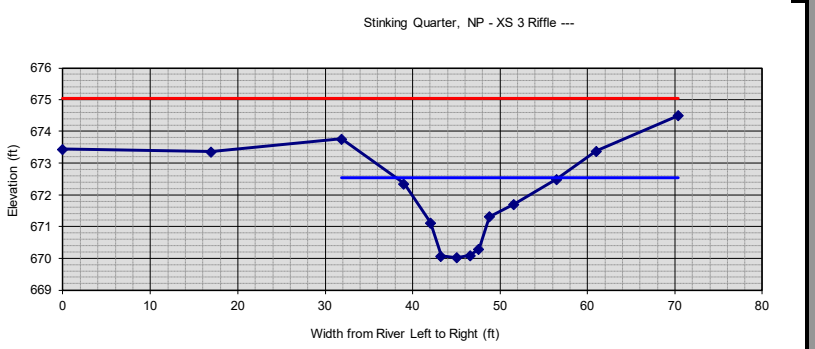
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
124.64	**124.599**	**150.0**		
675.36	675.401			

dimensions			
22.6	x-section area	0.9	d mean
23.8	width	25.5	wet P
2.7	d max	0.9	hyd radi
2.8	bank ht	25.2	w/d ratio
150.0	W flood prone area	6.3	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, NP - XS 3**

Riffle

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description: **Stinking Quarter, NP - XS 3**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	126.558	673.442
	☑	16.97483	126.645	673.355
	☐	31.87901	126.235	673.765
	☐	39.0099	127.647	672.353
	☐	42.07411	128.879	671.121
	☐	43.25638	129.926	670.074
	☐	45.04601	129.967	670.033
	☐	46.61613	129.905	670.095
	☐	47.58641	129.705	670.295
	☐	48.77291	128.685	671.315
	☐	51.60074	128.298	671.702
	☐	56.47206	127.512	672.488
	☐	61.02223	126.624	673.376
	☐	70.42444	125.5	674.5
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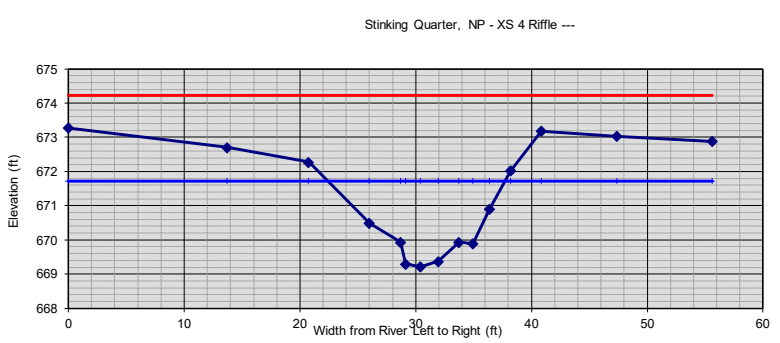
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
127.46	126.24	150.0		
672.54	673.76			

dimensions			
22.6	x-section area	1.2	d mean
18.7	width	19.8	wet P
2.5	d max	1.1	hyd radi
3.7	bank ht	15.4	w/d ratio
150.0	W flood prone area	8.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, NP - XS 4**

Riffle

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description: **Stinking Quarter, NP - XS 4**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	126.716	673.284
	☐	13.71571	127.297	672.703
	☐	20.76106	127.729	672.271
	☐	26.01424	129.509	670.491
	☐	28.68094	130.068	669.932
	☐	29.14986	130.701	669.299
	☐	30.39705	130.775	669.225
	☐	31.96965	130.627	669.373
	☐	33.76056	130.068	669.932
	☐	34.95145	130.108	669.892
	☐	36.39423	129.103	670.897
	☐	38.20617	127.978	672.022
	☐	40.8562	126.822	673.178
	☐	47.40013	126.966	673.034
	☐	55.61057	127.117	672.883
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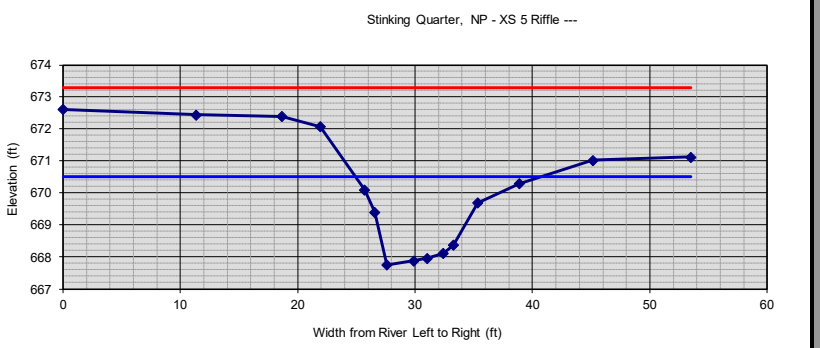
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
128.27	127.73	150.0		
671.73	672.27			

dimensions			
22.6	x-section area	1.5	d mean
15.4	width	16.6	wet P
2.5	d max	1.4	hyd radi
3.0	bank ht	10.5	w/d ratio
150.0	W flood prone area	9.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, NP - XS 5**

Riffle

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description: **Stinking Quarter, NP - XS 5**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**127.382**	672.618
	☐	**11.37277**	**127.56**	672.44
	☐	**18.64457**	**127.605**	672.395
	☐	**21.91418**	**127.933**	672.067
	☐	**25.70295**	**129.902**	670.098
	☐	**26.57542**	**130.601**	669.399
	☐	**27.62049**	**132.244**	667.756
	☐	**29.91778**	**132.114**	667.886
	☐	**31.06088**	**132.033**	667.967
	☐	**32.41807**	**131.889**	668.111
	☐	**33.28713**	**131.628**	668.372
	☐	**35.35397**	**130.304**	669.696
	☐	**38.87513**	**129.707**	670.293
	☐	**45.1428**	**128.982**	671.018
	☐	**53.53633**	**128.88**	671.12
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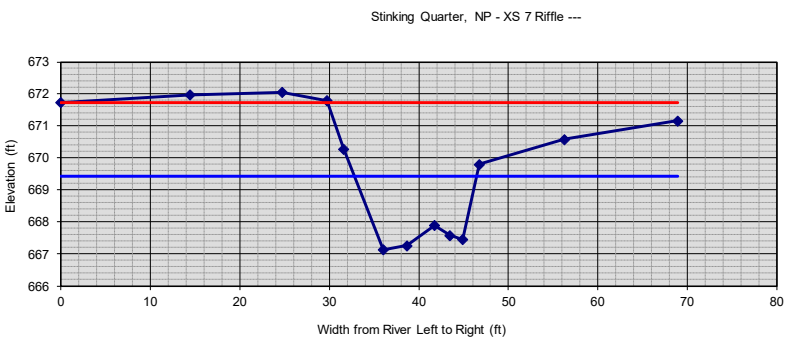
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
129.475	**128.98**	**150.0**		
670.525	671.02			

dimensions			
22.6	x-section area	1.4	d mean
16.0	width	17.8	wet P
2.8	d max	1.3	hyd radi
3.3	bank ht	11.3	w/d ratio
150.0	W flood prone area	9.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, NP - XS 7**

Riffle

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description: **Stinking Quarter, NP - XS 7**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**128.273**	671.727
	☐	**14.47589**	**128.028**	671.972
	☐	**24.73497**	**127.942**	672.058
	☐	**29.76694**	**128.214**	671.786
	☐	**31.61744**	**129.716**	670.284
	☐	**36.03195**	**132.864**	667.136
	☐	**38.67775**	**132.735**	667.265
	☐	**41.74504**	**132.107**	667.893
	☐	**43.47846**	**132.419**	667.581
	☐	**44.89798**	**132.552**	667.448
	☐	**46.77743**	**130.199**	669.801
	☐	**56.25641**	**129.421**	670.579
	☐	**68.89632**	**128.836**	671.164
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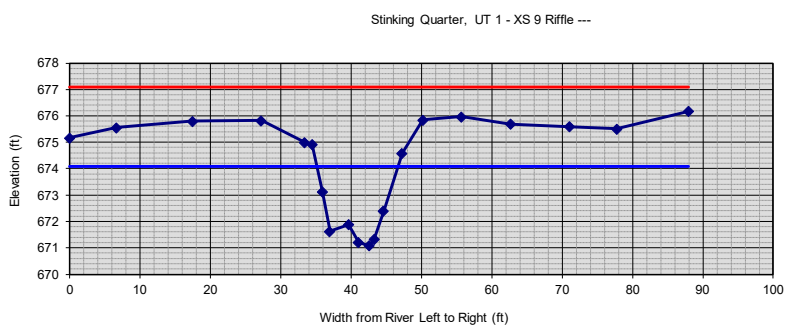
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
130.56	**130.2**	**40.0**		
669.44	669.8			

dimensions			
22.6	x-section area	1.7	d mean
13.7	width	15.5	wet P
2.3	d max	1.5	hyd radi
2.7	bank ht	8.3	w/d ratio
40.0	W flood prone area	2.9	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 1 - XS 9
	Riffle

	---
description:	Stinking Quarter, UT 1 - XS 9
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	124.829	675.171
	☐	6.696218	124.44	675.56
	☐	17.47515	124.208	675.792
	☐	27.23543	124.176	675.824
	☐	33.36559	125.005	674.995
	☐	34.45484	125.082	674.918
	☐	35.94065	126.872	673.128
	☐	36.98486	128.366	671.634
	☐	39.65062	128.118	671.882
	☐	41.04812	128.793	671.207
	☐	42.6184	128.917	671.083
	☐	43.3152	128.661	671.339
	☐	44.60287	127.607	672.393
	☐	47.26605	125.41	674.59
	☐	50.22939	124.149	675.851
	☐	55.69117	124.034	675.966
	☐	62.65838	124.315	675.685
	☐	71.03908	124.404	675.596
	☐	77.75757	124.489	675.511
	☐	87.95162	123.813	676.187
	☐			
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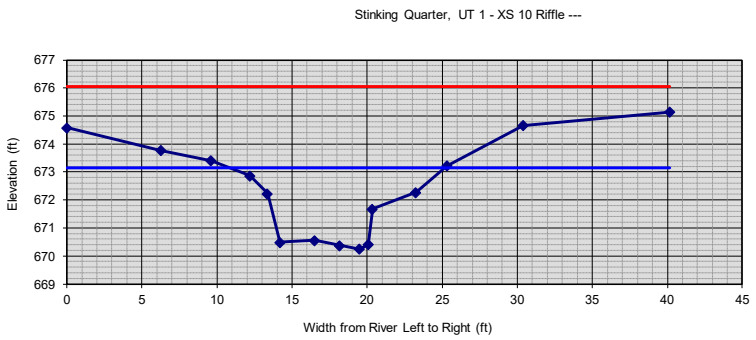
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
125.91	125.08	100.0		
674.09	674.92			

dimensions			
23.2	x-section area	2.0	d mean
11.5	width	14.0	wet P
3.0	d max	1.7	hyd radi
3.8	bank ht	5.7	w/d ratio
100.0	W flood prone area	8.7	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 1 - XS 10
	Riffle

	---
description:	Stinking Quarter, UT 1 - XS 10
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	125.418	674.582
	☐	6.267702	126.232	673.768
	☐	9.619068	126.601	673.399
	☐	12.19329	127.131	672.869
	☐	13.37224	127.778	672.222
	☐	14.20629	129.511	670.489
	☐	16.50919	129.446	670.554
	☐	18.17766	129.626	670.374
	☐	19.48412	129.748	670.252
	☐	20.06942	129.595	670.405
	☐	20.36291	128.328	671.672
	☐	23.24745	127.73	672.27
	☐	25.33504	126.778	673.222
	☐	30.40641	125.337	674.663
	☐	40.14268	124.868	675.132
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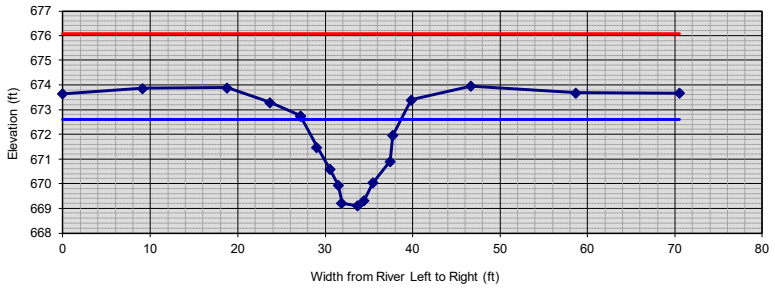
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
126.85	126.85	75.0		
673.15	673.15			

dimensions			
23.2	x-section area	1.6	d mean
14.3	width	16.9	wet P
2.9	d max	1.4	hyd radi
2.9	bank ht	8.9	w/d ratio
75.0	W flood prone area	5.2	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 11**

Riffle

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description: **Stinking Quarter, UT 1 - XS 11**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	126.36	673.64
	☐	9.150867	126.141	673.859
	☐	18.75684	126.114	673.886
	☐	23.69933	126.711	673.289
	☐	27.20262	127.258	672.742
	☐	27.21566	127.26	672.74
	☐	29.05171	128.519	671.481
	☐	30.58237	129.418	670.582
	☐	31.49045	130.07	669.93
	☐	31.92029	130.789	669.211
	☐	33.69802	130.897	669.103
	☐	34.4571	130.691	669.309
	☐	35.45224	129.966	670.034
	☐	37.42184	129.096	670.904
	☐	37.73088	128.04	671.96
	☐	39.83881	126.603	673.397
	☐	46.67288	126.039	673.961
	☐	58.69766	126.312	673.688
	☐	70.56501	126.325	673.675
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	☐			

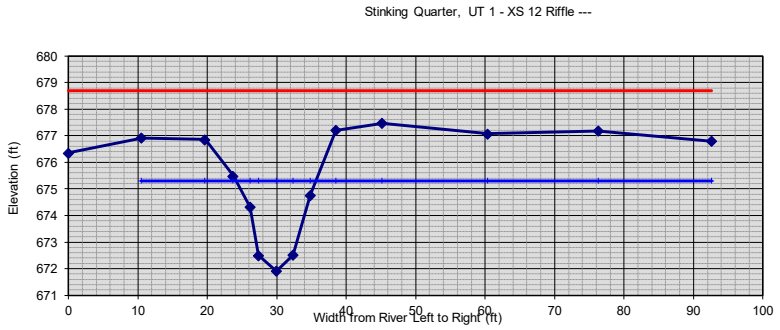
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
127.4	126.6	100.0		
672.6	673.4			

dimensions			
23.2	x-section area	2.1	d mean
11.2	width	13.9	wet P
3.5	d max	1.7	hyd radi
4.3	bank ht	5.5	w/d ratio
100.0	W flood prone area	8.9	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 12**

Riffle

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description: **Stinking Quarter, UT 1 - XS 12**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	123.6445	676.3555
	☐	10.54484	123.0881	676.9119
	☐	19.6654	123.1375	676.8625
	☐	23.72919	124.5149	675.4851
	☐	26.14572	125.6772	674.3228
	☐	27.39155	127.4967	672.5033
	☐	29.93459	128.074	671.926
	☐	32.3626	127.4843	672.5157
	☐	34.80368	125.2358	674.7642
	☐	38.54195	122.7904	677.2096
	☐	45.1943	122.5318	677.4682
	☐	60.37022	122.9315	677.0685
	☐	76.30927	122.8229	677.1771
	☐	92.60094	123.2002	676.7998
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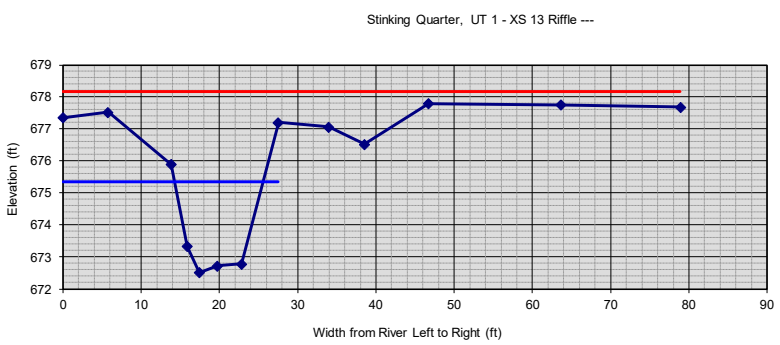
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
124.68	123.14	100.0		
675.32	676.86			

dimensions			
23.2	x-section area	2.0	d mean
11.6	width	13.9	wet P
3.4	d max	1.7	hyd radi
4.9	bank ht	5.8	w/d ratio
100.0	W flood prone area	8.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 13**

Riffle

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description: **Stinking Quarter, UT 1 - XS 13**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**122.6542**	677.3458
	☐	**5.775408**	**122.4841**	677.5159
	☐	**13.82732**	**124.1129**	675.8871
	☐	**15.88381**	**126.6707**	673.3293
	☐	**17.46467**	**127.474**	672.526
	☐	**19.77742**	**127.2746**	672.7254
	☐	**22.84182**	**127.2129**	672.7871
	☐	**27.55129**	**122.8009**	677.1991
	☑	**33.95568**	**122.9385**	677.0615
	☑	**38.53828**	**123.476**	676.524
	☑	**46.73587**	**122.21**	677.79
	☑	**63.66578**	**122.246**	677.754
	☑	**78.91679**	**122.3205**	677.6795
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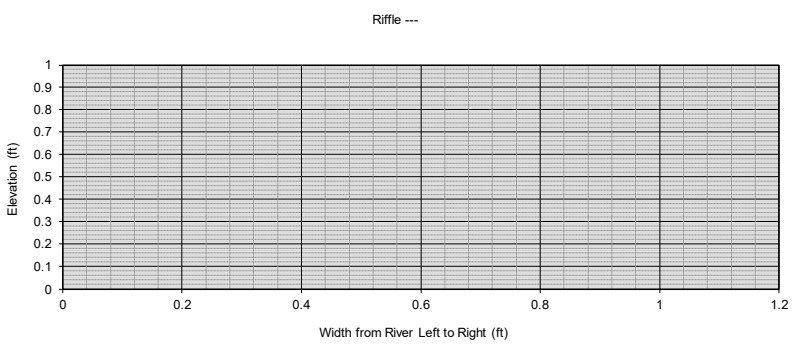
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
124.65	**122.8**	**100.0**		
675.35	677.2			

dimensions			
23.2	x-section area	2.1	d mean
11.3	width	13.5	wet P
2.8	d max	1.7	hyd radi
4.7	bank ht	5.5	w/d ratio
100.0	W flood prone area	8.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:

Riffle

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description:

height of instrument (ft):

notes	omit pt.	distance (ft)	FS (ft)	elevation
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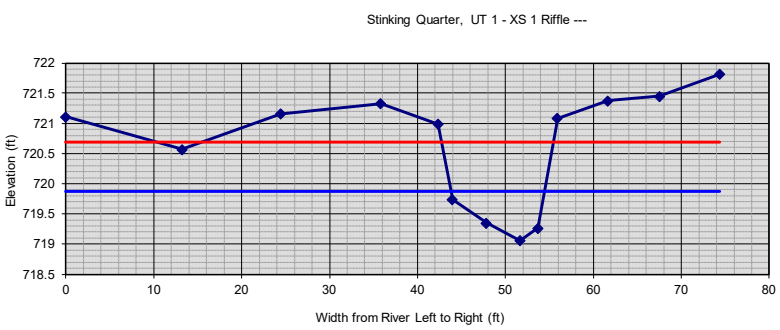
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
0	---			

dimensions			
0.0	x-section area	0.0	d mean
0.0	width	0.0	wet P
0.0	d max	0.0	hyd radi
0.0	bank ht	0.0	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 1**

Riffle

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description: **Stinking Quarter, UT 1 - XS 1**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**78.892**	721.108
	☐	**13.24005**	**79.429**	720.571
	☐	**24.46423**	**78.844**	721.156
	☐	**35.85129**	**78.672**	721.328
	☐	**42.34212**	**79.012**	720.988
	☐	**43.99836**	**80.264**	719.736
	☐	**47.85866**	**80.648**	719.352
	☐	**51.65548**	**80.941**	719.059
	☐	**53.68523**	**80.734**	719.266
	☐	**55.93349**	**78.917**	721.083
	☐	**61.67862**	**78.627**	721.373
	☐	**67.54674**	**78.55**	721.45
	☐	**74.38981**	**78.186**	721.814
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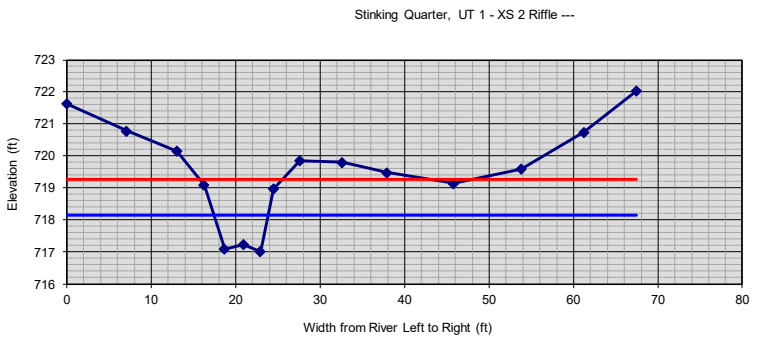
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
80.125	**79.01**	**14.0**		
719.875	720.99			

dimensions			
5.5	x-section area	0.5	d mean
10.6	width	10.9	wet P
0.8	d max	0.5	hyd radi
1.9	bank ht	20.5	w/d ratio
14.0	W flood prone area	1.3	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 2**

Riffle

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description: **Stinking Quarter, UT 1 - XS 2**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**78.37**	721.63
	☐	**7.108995**	**79.216**	720.784
	☐	**13.04815**	**79.846**	720.154
	☐	**16.26114**	**80.905**	719.095
	☐	**18.69719**	**82.91**	717.09
	☐	**20.93891**	**82.771**	717.229
	☐	**22.94414**	**82.979**	717.021
	☐	**24.49511**	**81.03**	718.97
	☐	**27.57054**	**80.145**	719.855
	☐	**32.61155**	**80.203**	719.797
	☐	**37.8772**	**80.517**	719.483
	☐	**45.80178**	**80.861**	719.139
	☐	**53.78683**	**80.409**	719.591
	☐	**61.20958**	**79.264**	720.736
	☐	**67.44254**	**77.969**	722.031
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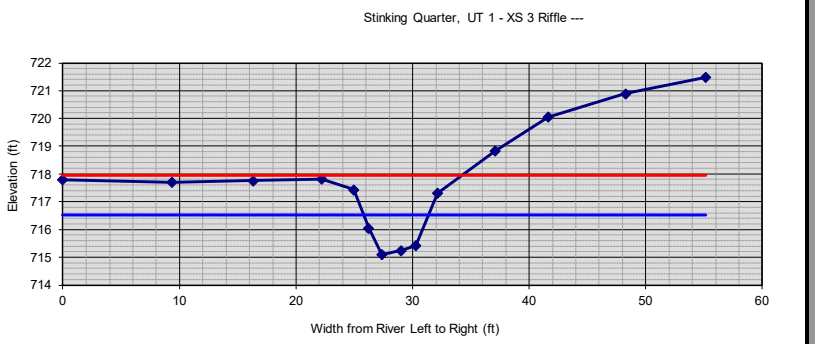
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
81.85	**80.15**	**10.0**		
718.15	719.85			

dimensions			
5.5	x-section area	0.8	d mean
6.4	width	7.4	wet P
1.1	d max	0.7	hyd radi
2.8	bank ht	7.6	w/d ratio
10.0	W flood prone area	1.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 3**

Riffle

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description: **Stinking Quarter, UT 1 - XS 3**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**82.205**	717.795
	☐	**9.352912**	**82.293**	717.707
	☐	**16.33963**	**82.242**	717.758
	☐	**22.19194**	**82.178**	717.822
	☐	**24.96341**	**82.558**	717.442
	☐	**26.24924**	**83.96**	716.04
	☐	**27.36969**	**84.902**	715.098
	☐	**29.04872**	**84.757**	715.243
	☐	**30.26375**	**84.582**	715.418
	☐	**32.13678**	**82.689**	717.311
	☐	**37.07297**	**81.174**	718.826
	☐	**41.64503**	**79.951**	720.049
	☐	**48.27815**	**79.108**	720.892
	☐	**55.15854**	**78.508**	721.492
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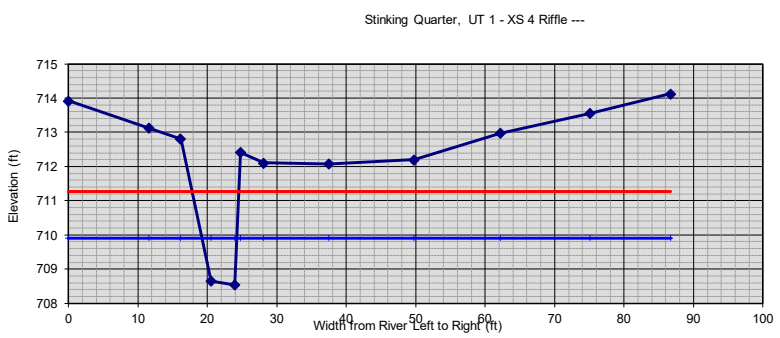
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
83.47	**82.56**	**34.0**		
716.53	717.44			

dimensions			
5.5	x-section area	1.0	d mean
5.6	width	6.6	wet P
1.4	d max	0.8	hyd radi
2.3	bank ht	5.6	w/d ratio
34.0	W flood prone area	6.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 4**

Riffle

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description: **Stinking Quarter, UT 1 - XS 4**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**86.079**	713.921
	☐	**11.61914**	**86.872**	713.128
	☐	**16.17251**	**87.194**	712.806
	☐	**20.57574**	**91.344**	708.656
	☐	**23.98195**	**91.459**	708.541
	☐	**24.79217**	**87.589**	712.411
	☐	**28.0795**	**87.896**	712.104
	☐	**37.55819**	**87.921**	712.079
	☐	**49.80294**	**87.798**	712.202
	☐	**62.20208**	**87.023**	712.977
	☐	**75.10551**	**86.44**	713.56
	☐	**86.72229**	**85.868**	714.132
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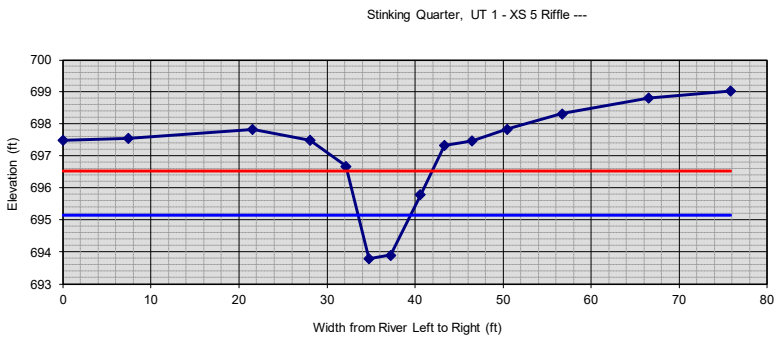
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
90.09	**87.59**	**6.0**		
709.91	712.41			

dimensions			
5.5	x-section area	1.1	d mean
5.0	width	6.6	wet P
1.4	d max	0.8	hyd radi
3.9	bank ht	4.6	w/d ratio
6.0	W flood prone area	1.2	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 5**

Riffle

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description: **Stinking Quarter, UT 1 - XS 5**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**102.507**	697.493
	☐	**7.452906**	**102.445**	697.555
	☐	**21.56397**	**102.168**	697.832
	☐	**28.07158**	**102.51**	697.49
	☐	**32.16343**	**103.319**	696.681
	☐	**34.777**	**106.208**	693.792
	☐	**37.2164**	**106.094**	693.906
	☐	**40.61996**	**104.213**	695.787
	☐	**43.35154**	**102.667**	697.333
	☐	**46.45239**	**102.527**	697.473
	☐	**50.50708**	**102.161**	697.839
	☐	**56.7315**	**101.677**	698.323
	☐	**66.51605**	**101.188**	698.812
	☐	**75.84632**	**100.956**	699.044
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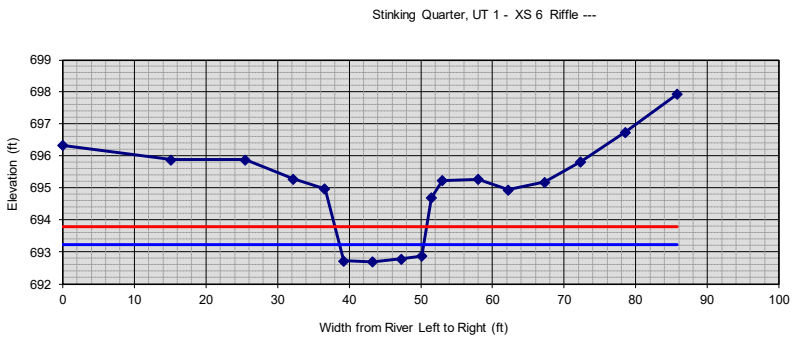
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
104.835	**103.32**	**10.0**		
695.165	696.68			

dimensions			
5.5	x-section area	0.9	d mean
6.0	width	6.9	wet P
1.4	d max	0.8	hyd radi
2.9	bank ht	6.5	w/d ratio
10.0	W flood prone area	1.7	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 1 - XS 6**

Riffle

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description: **Stinking Quarter, UT 1 - XS 6**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**103.668**	696.332
	☐	**15.16187**	**104.122**	695.878
	☐	**25.46029**	**104.119**	695.881
	☐	**32.20062**	**104.714**	695.286
	☐	**36.59441**	**105.029**	694.971
	☐	**39.23897**	**107.273**	692.727
	☐	**43.24511**	**107.3**	692.7
	☐	**47.29509**	**107.213**	692.787
	☐	**50.10391**	**107.127**	692.873
	☐	**51.51235**	**105.307**	694.693
	☐	**52.97321**	**104.765**	695.235
	☐	**57.98057**	**104.728**	695.272
	☐	**62.21202**	**105.063**	694.937
	☐	**67.3163**	**104.821**	695.179
	☐	**72.33731**	**104.178**	695.822
	☐	**78.5158**	**103.259**	696.741
	☐	**85.83511**	**102.063**	697.937
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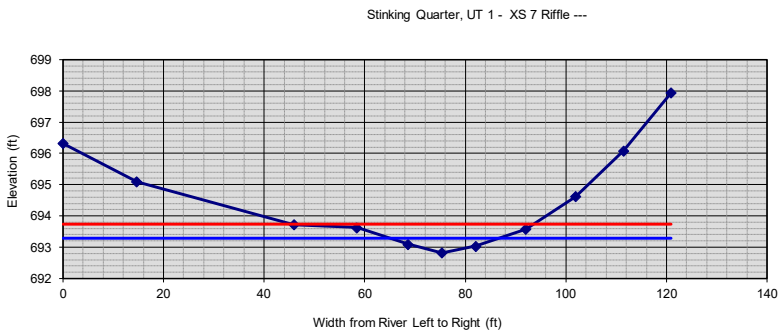
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
106.755	**105.31**	**13.0**		
693.245	694.69			

dimensions			
5.5	x-section area	0.5	d mean
11.8	width	12.1	wet P
0.5	d max	0.5	hyd radi
2.0	bank ht	25.0	w/d ratio
13.0	W flood prone area	1.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	**Stinking Quarter, UT 1 - XS 7**
	Riffle

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description:	**Stinking Quarter, UT 1 - XS 7**
height of instrument (ft):	**800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**103.684**	696.316
	☐	**14.7215**	**104.91**	695.09
	☐	**45.96989**	**106.28**	693.72
	☐	**58.45757**	**106.37**	693.63
	☐	**68.60284**	**106.907**	693.093
	☐	**75.3725**	**107.172**	692.828
	☐	**82.04888**	**106.962**	693.038
	☐	**92.01006**	**106.42**	693.58
	☐	**101.9197**	**105.381**	694.619
	☐	**111.4619**	**103.919**	696.081
	☐	**120.8739**	**102.054**	697.946
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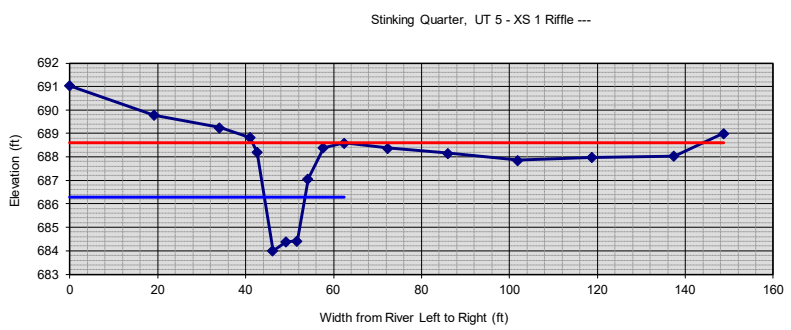
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
106.714	**106.37**	**43.0**		
693.286	693.63			

dimensions			
5.5	x-section area	0.3	d mean
21.7	width	21.7	wet P
0.5	d max	0.3	hyd radi
0.8	bank ht	85.6	w/d ratio
43.0	W flood prone area	2.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 5 - XS 1
	Riffle

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description:	Stinking Quarter, UT 5 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	108.96	691.04
	☐	19.20961	110.226	689.774
	☐	34.08901	110.746	689.254
	☐	41.01363	111.17	688.83
	☐	42.63821	111.807	688.193
	☐	46.20355	115.989	684.011
	☐	49.21658	115.619	684.381
	☐	51.73847	115.573	684.427
	☐	54.2275	112.926	687.074
	☐	57.67633	111.616	688.384
	☐	62.46537	111.411	688.589
	☑	72.33929	111.618	688.382
	☑	85.9934	111.84	688.16
	☑	101.9811	112.147	687.853
	☑	118.7286	112.024	687.976
	☑	137.4799	111.964	688.036
	☑	148.7775	110.991	689.009
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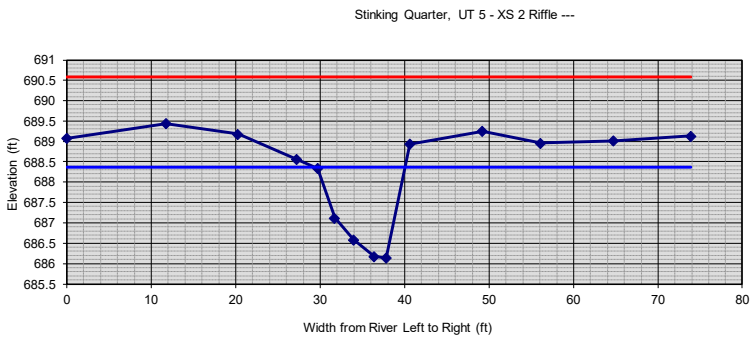
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
113.69	111.81	100.0		
686.31	688.19			

dimensions			
15.1	x-section area	1.6	d mean
9.3	width	11.2	wet P
2.3	d max	1.4	hyd radi
4.2	bank ht	5.7	w/d ratio
100.0	W flood prone area	10.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 5 - XS 2
	Riffle

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description:	Stinking Quarter, UT 5 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	110.926	689.074
	☐	11.77642	110.562	689.438
	☐	20.26785	110.821	689.179
	☐	27.25957	111.444	688.556
	☐	29.72319	111.663	688.337
	☐	31.71045	112.876	687.124
	☐	33.95672	113.414	686.586
	☐	36.36523	113.825	686.175
	☐	37.80552	113.853	686.147
	☐	40.61208	111.063	688.937
	☐	49.21823	110.749	689.251
	☐	56.08725	111.044	688.956
	☐	64.71298	110.987	689.013
	☐	73.91024	110.872	689.128
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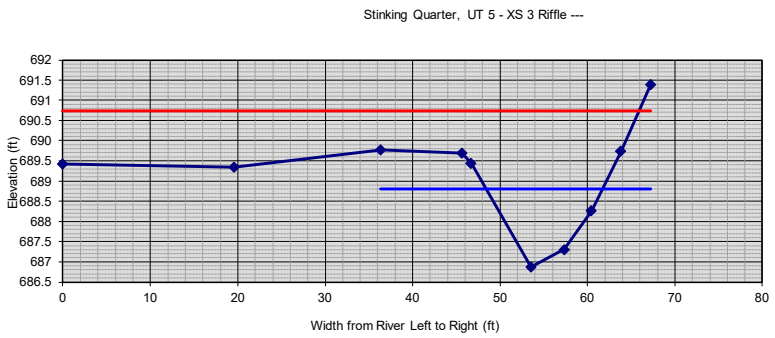
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
111.63	111.63	100.0		
688.37	688.37			

dimensions			
15.1	x-section area	1.4	d mean
10.7	width	12.0	wet P
2.2	d max	1.3	hyd radi
2.2	bank ht	7.5	w/d ratio
100.0	W flood prone area	9.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 3**

Riffle

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description: **Stinking Quarter, UT 5 - XS 3**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	**0**	**110.576**	689.424
	☑	**19.57805**	**110.654**	689.346
	☐	**36.38061**	**110.227**	689.773
	☐	**45.64499**	**110.307**	689.693
	☐	**46.69627**	**110.562**	689.438
	☐	**53.53059**	**113.122**	686.878
	☐	**57.35715**	**112.688**	687.312
	☐	**60.46223**	**111.73**	688.27
	☐	**63.82981**	**110.261**	689.739
	☐	**67.26669**	**108.604**	691.396

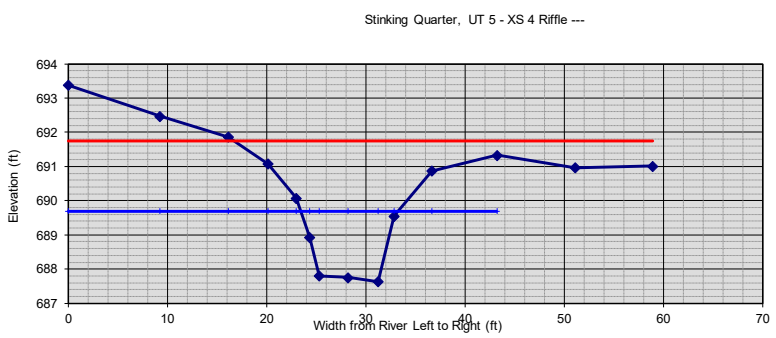
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
111.185	**110.56**	**100.0**		
688.815	689.44			

dimensions			
15.1	x-section area	1.1	d mean
13.4	width	14.0	wet P
1.9	d max	1.1	hyd radi
2.6	bank ht	11.8	w/d ratio
100.0	W flood prone area	7.5	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 4**

Riffle

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description: **Stinking Quarter, UT 5 - XS 4**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**106.614**	693.386
	☐	**9.206496**	**107.524**	692.476
	☐	**16.11253**	**108.134**	691.866
	☐	**20.13165**	**108.922**	691.078
	☐	**22.98248**	**109.922**	690.078
	☐	**24.30758**	**111.062**	688.938
	☐	**25.27899**	**112.194**	687.806
	☐	**28.18729**	**112.245**	687.755
	☐	**31.24081**	**112.355**	687.645
	☐	**32.81364**	**110.447**	689.553
	☐	**36.63767**	**109.127**	690.873
	☐	**43.19421**	**108.666**	691.334
	☑	**51.08663**	**109.034**	690.966
	☑	**58.91463**	**108.992**	691.008
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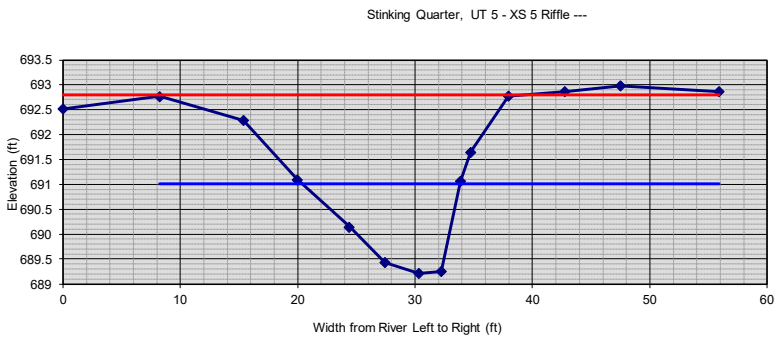
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
110.3	**109.13**	**75.0**		
689.7	690.87			

dimensions			
15.1	x-section area	1.5	d mean
9.8	width	11.5	wet P
2.1	d max	1.3	hyd radi
3.2	bank ht	6.4	w/d ratio
75.0	W flood prone area	7.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 5**

Riffle

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description: **Stinking Quarter, UT 5 - XS 5**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	**0**	**107.483**	692.517
	☐	**8.232679**	**107.233**	692.767
	☐	**15.40363**	**107.714**	692.286
	☐	**19.96848**	**108.904**	691.096
	☐	**24.41172**	**109.852**	690.148
	☐	**27.43289**	**110.569**	689.431
	☐	**30.31588**	**110.783**	689.217
	☐	**32.22552**	**110.747**	689.253
	☐	**33.85504**	**108.935**	691.065
	☐	**34.76297**	**108.348**	691.652
	☐	**37.97808**	**107.227**	692.773
	☐	**42.764**	**107.137**	692.863
	☐	**47.50541**	**107.017**	692.983
	☐	**55.91484**	**107.136**	692.864
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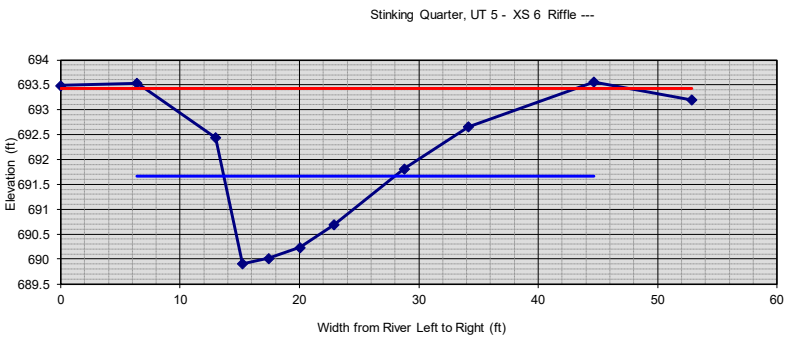
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
108.99	**107.71**	**30.0**		
691.01	692.29			

dimensions			
15.1	x-section area	1.1	d mean
13.4	width	14.4	wet P
1.8	d max	1.0	hyd radi
3.1	bank ht	12.0	w/d ratio
30.0	W flood prone area	2.2	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 6**

Riffle

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description: **Stinking Quarter, UT 5 - XS 6**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	**0**	**106.515**	693.485
	☐	**6.419651**	**106.472**	693.528
	☐	**12.99327**	**107.561**	692.439
	☐	**15.23903**	**110.091**	689.909
	☐	**17.43666**	**109.984**	690.016
	☐	**20.0743**	**109.764**	690.236
	☐	**22.90037**	**109.307**	690.693
	☐	**28.78481**	**108.184**	691.816
	☐	**34.13763**	**107.341**	692.659
	☐	**44.66093**	**106.437**	693.563
	☑	**52.87961**	**106.802**	693.198
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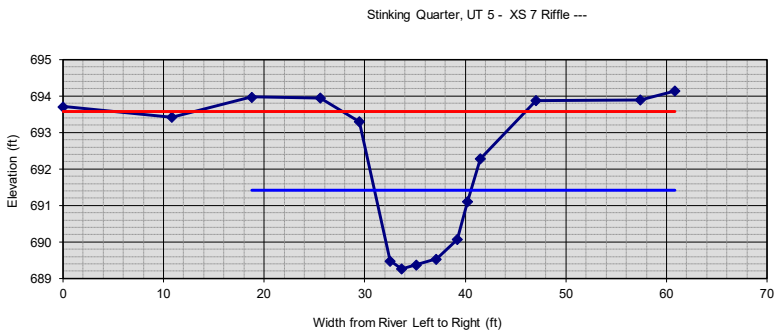
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
108.33	**107.56**	**39.0**		
691.67	692.44			

dimensions			
15.1	x-section area	1.1	d mean
14.3	width	15.3	wet P
1.8	d max	1.0	hyd radi
2.5	bank ht	13.6	w/d ratio
39.0	W flood prone area	2.7	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	**Stinking Quarter, UT 5 - XS 7**
	Riffle

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description:	**Stinking Quarter, UT 5 - XS 7**
height of instrument (ft):	**800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	**0**	**106.285**	693.715
	☑	**10.8093**	**106.579**	693.421
	☐	**18.79805**	**106.024**	693.976
	☐	**25.60675**	**106.053**	693.947
	☐	**29.48326**	**106.703**	693.297
	☐	**32.527**	**110.52**	689.48
	☐	**33.65629**	**110.728**	689.272
	☐	**35.16666**	**110.619**	689.381
	☐	**37.13391**	**110.461**	689.539
	☐	**39.19721**	**109.927**	690.073
	☐	**40.19892**	**108.89**	691.11
	☐	**41.46937**	**107.716**	692.284
	☐	**47.00396**	**106.124**	693.876
	☐	**57.38766**	**106.102**	693.898
	☐	**60.86712**	**105.859**	694.141
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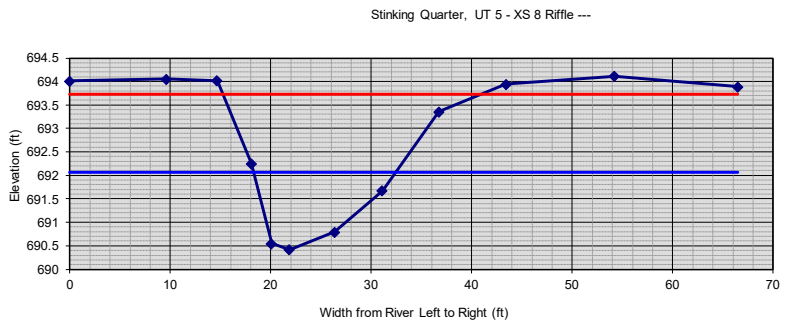
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
108.57	**106.7**	**12.0**		
691.43	693.3			

dimensions			
15.1	x-section area	1.6	d mean
9.6	width	11.2	wet P
2.2	d max	1.4	hyd radi
4.0	bank ht	6.1	w/d ratio
12.0	W flood prone area	1.3	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 8**

Riffle

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description: **Stinking Quarter, UT 5 - XS 8**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**105.992**	694.008
	☐	**9.632171**	**105.949**	694.051
	☐	**14.66297**	**105.985**	694.015
	☐	**18.06549**	**107.75**	692.25
	☐	**20.07093**	**109.453**	690.547
	☐	**21.85908**	**109.58**	690.42
	☐	**26.35282**	**109.206**	690.794
	☐	**31.09703**	**108.328**	691.672
	☐	**36.7474**	**106.642**	693.358
	☐	**43.42518**	**106.058**	693.942
	☐	**54.23263**	**105.885**	694.115
	☐	**66.49674**	**106.112**	693.888
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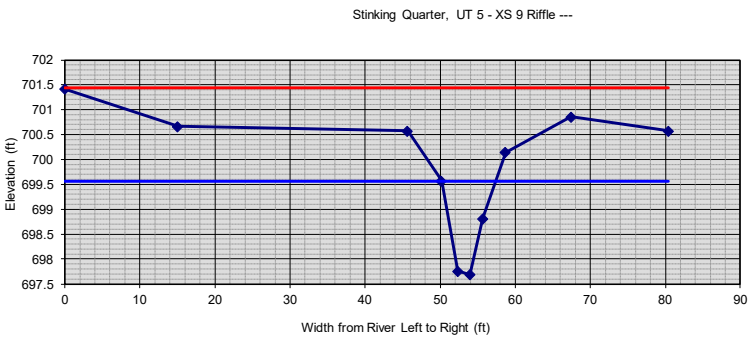
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
107.925	**106.06**	**26.0**		
692.075	693.94			

dimensions			
15.1	x-section area	1.1	d mean
14.2	width	14.9	wet P
1.7	d max	1.0	hyd radi
3.5	bank ht	13.3	w/d ratio
26.0	W flood prone area	1.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 9**

Riffle

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description: **Stinking Quarter, UT 5 - XS 9**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**98.58328**	701.4167
	☐	**15.05169**	**99.33414**	700.6659
	☐	**45.65353**	**99.4287**	700.5713
	☐	**50.16717**	**100.4258**	699.5742
	☐	**52.35904**	**102.2416**	697.7584
	☐	**53.96733**	**102.3028**	697.6972
	☐	**55.69598**	**101.1855**	698.8145
	☐	**58.70303**	**99.8556**	700.1444
	☐	**67.45577**	**99.14473**	700.8553
	☐	**80.41023**	**99.42928**	700.5707
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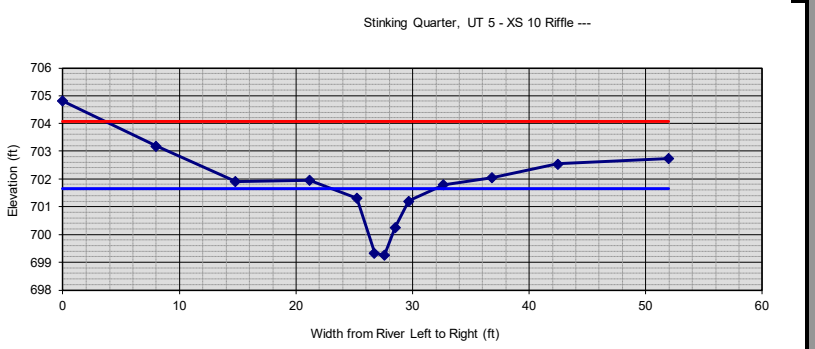
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
100.43	**99.86**	**75.0**		
699.57	700.14			

dimensions			
7.9	x-section area	1.1	d mean
7.2	width	8.4	wet P
1.9	d max	0.9	hyd radi
2.4	bank ht	6.7	w/d ratio
75.0	W flood prone area	10.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 5 - XS 10
	Riffle

	---
description:	Stinking Quarter, UT 5 - XS 10
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	95.18195	704.818
	☐	7.972918	96.81358	703.1864
	☐	14.81256	98.09309	701.9069
	☐	21.14799	98.04929	701.9507
	☐	25.21643	98.68729	701.3127
	☐	26.74185	100.672	699.328
	☐	27.60369	100.7396	699.2604
	☐	28.53828	99.73531	700.2647
	☐	29.6603	98.79433	701.2057
	☐	32.67216	98.21016	701.7898
	☐	36.80382	97.95657	702.0434
	☐	42.4788	97.45236	702.5476
	☐	51.9947	97.26134	702.7387
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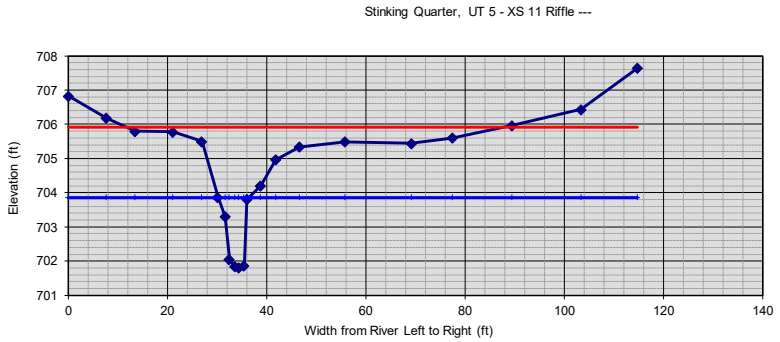
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
98.33	98.33	75.0		
701.67	701.67			

dimensions			
7.9	x-section area	0.9	d mean
9.1	width	10.9	wet P
2.4	d max	0.7	hyd radi
2.4	bank ht	10.5	w/d ratio
75.0	W flood prone area	8.2	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
0.0	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 5 - XS 11
	Riffle

	---
description:	Stinking Quarter, UT 5 - XS 11
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	93.16759	706.8324
	☐	7.666159	93.81386	706.1861
	☐	13.38208	94.19987	705.8001
	☐	21.05771	94.21677	705.7832
	☐	26.91927	94.50366	705.4963
	☐	30.14029	96.12737	703.8726
	☐	31.61245	96.69692	703.3031
	☐	32.44648	97.95368	702.0463
	☐	33.60498	98.15735	701.8427
	☐	34.40473	98.19839	701.8016
	☐	35.40737	98.13951	701.8605
	☐	36.00544	96.19719	703.8028
	☐	38.78476	95.7876	704.2124
	☐	41.80152	95.03768	704.9623
	☐	46.56601	94.65566	705.3443
	☐	55.71969	94.51041	705.4896
	☐	69.16405	94.55425	705.4457
	☐	77.44903	94.39686	705.6031
	☐	89.46835	94.02827	705.9717
	☐	103.3004	93.56482	706.4352
	☐	114.7551	92.35937	707.6406
	☐			
	☐			
	☐			
	☐			

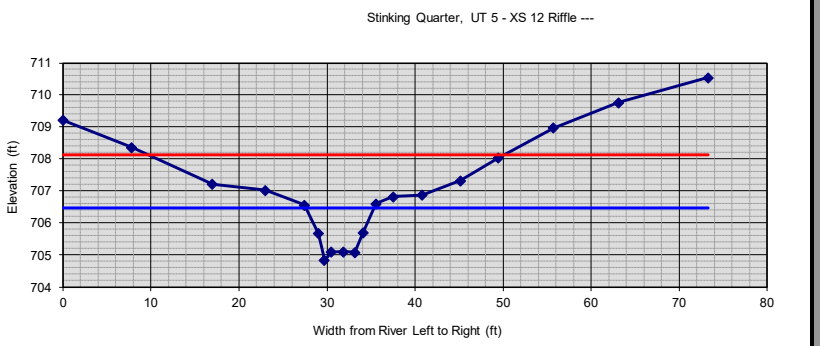
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
96.14	95.04	73.0		
703.86	704.96			

dimensions			
7.9	x-section area	1.3	d mean
6.2	width	8.5	wet P
2.1	d max	0.9	hyd radi
3.2	bank ht	4.9	w/d ratio
73.0	W flood prone area	11.7	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
0.0	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 12**

Riffle

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description: **Stinking Quarter, UT 5 - XS 12**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	90.78789	709.2121
	☐	7.810425	91.63418	708.3658
	☐	16.99135	92.79071	707.2093
	☐	22.97721	92.97722	707.0228
	☐	27.42347	93.44124	706.5588
	☐	29.0305	94.32596	705.674
	☐	29.70671	95.15781	704.8422
	☐	30.49098	94.90958	705.0904
	☐	31.83666	94.8953	705.1047
	☐	33.15208	94.9215	705.0785
	☐	34.13787	94.29636	705.7036
	☐	35.56423	93.40008	706.5999
	☐	37.51078	93.17918	706.8208
	☐	40.80394	93.12734	706.8727
	☐	45.18542	92.67589	707.3241
	☐	49.45598	91.96769	708.0323
	☐	55.73673	91.03041	708.9696
	☐	63.11733	90.2407	709.7593
	☐	73.28732	89.45532	710.5447
	☐			
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	☐			
	☐			

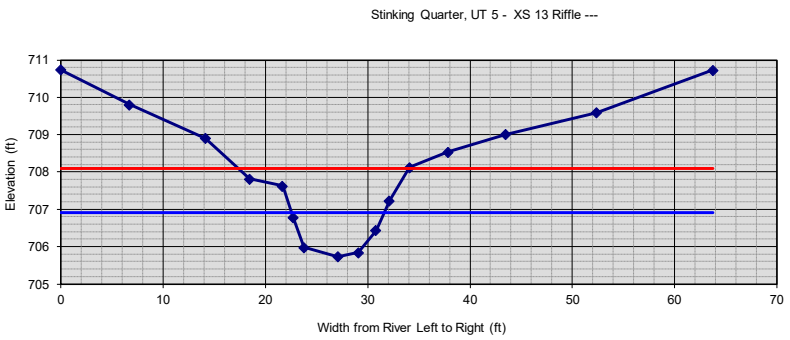
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
93.514	93.44	40.0		
706.486	706.56			

dimensions			
7.9	x-section area	1.0	d mean
7.8	width	8.9	wet P
1.6	d max	0.9	hyd radi
1.7	bank ht	7.8	w/d ratio
40.0	W flood prone area	5.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
0.0	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 5 - XS 13**

Riffle

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description: **Stinking Quarter, UT 5 - XS 13**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	89.26327	710.7367
	☐	6.739539	90.19911	709.8009
	☐	14.16925	91.10272	708.8973
	☐	18.47067	92.18682	707.8132
	☐	21.6778	92.37567	707.6243
	☐	22.73823	93.21965	706.7803
	☐	23.80091	94.02466	705.9753
	☐	27.07235	94.26071	705.7393
	☐	29.0696	94.15923	705.8408
	☐	30.81396	93.56671	706.4333
	☐	32.13127	92.76878	707.2312
	☐	34.07852	91.87549	708.1245
	☐	37.83523	91.46611	708.5339
	☐	43.45302	90.99679	709.0032
	☐	52.36607	90.41524	709.5848
	☐	63.77215	89.27585	710.7241
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	☐			
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	☐			

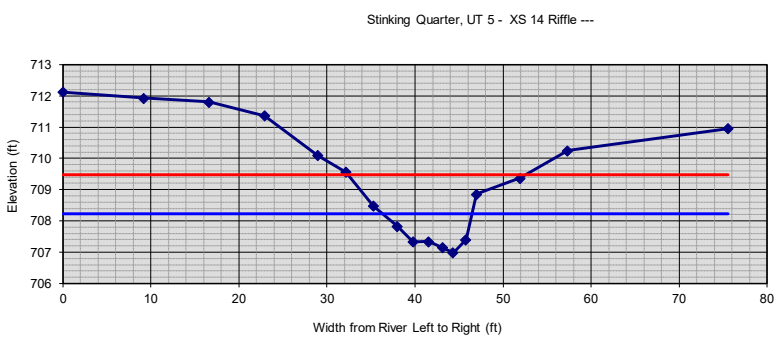
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
93.08	92.19	17.0		
706.92	707.81			

dimensions			
7.9	x-section area	0.9	d mean
9.1	width	9.6	wet P
1.2	d max	0.8	hyd radi
2.1	bank ht	10.4	w/d ratio
17.0	W flood prone area	1.9	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
0.0	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 5 - XS 14
	Riffle

	---
description:	Stinking Quarter, UT 5 - XS 14
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	87.87902	712.121
	☐	9.212316	88.07684	711.9232
	☐	16.58449	88.19967	711.8003
	☐	22.90107	88.63368	711.3663
	☐	28.95961	89.90225	710.0977
	☐	32.14173	90.43744	709.5626
	☐	35.30248	91.52328	708.4767
	☐	37.95793	92.1618	707.8382
	☐	39.79734	92.66686	707.3331
	☐	41.55796	92.66273	707.3373
	☐	43.11411	92.85205	707.1479
	☐	44.33664	93.01072	706.9893
	☐	45.78953	92.59574	707.4043
	☐	47.00447	91.14634	708.8537
	☐	51.91744	90.63141	709.3686
	☐	57.34034	89.75545	710.2446
	☐	75.54581	89.0485	710.9515
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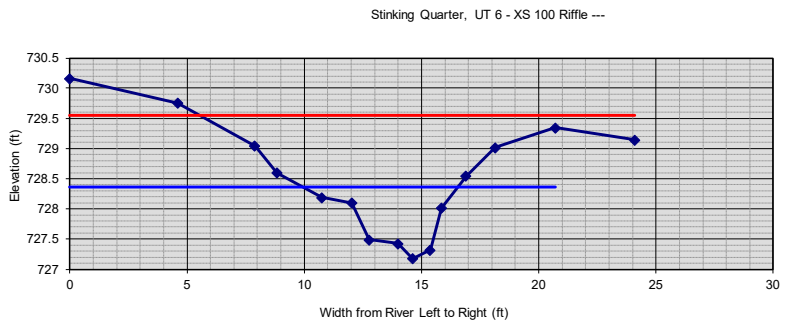
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
91.76	91.15	20.0		
708.24	708.85			

dimensions			
7.9	x-section area	0.8	d mean
10.2	width	10.8	wet P
1.3	d max	0.7	hyd radi
1.9	bank ht	13.1	w/d ratio
20.0	W flood prone area	2.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 6 - XS 100
	Riffle

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description:	Stinking Quarter, UT 6 - XS 100
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	69.83603	730.164
	☐	4.608308	70.24825	729.7517
	☐	7.896426	70.95532	729.0447
	☐	8.843999	71.40054	728.5995
	☐	10.75154	71.81013	728.1899
	☐	12.03142	71.90111	728.0989
	☐	12.76539	72.50869	727.4913
	☐	14.00573	72.57462	727.4254
	☐	14.62729	72.81916	727.1808
	☐	15.37999	72.68142	727.3186
	☐	15.86023	71.98417	728.0158
	☐	16.89932	71.45271	728.5473
	☐	18.14437	70.98467	729.0153
	☐	20.70917	70.65501	729.345
	☑	24.10661	70.85523	729.1448
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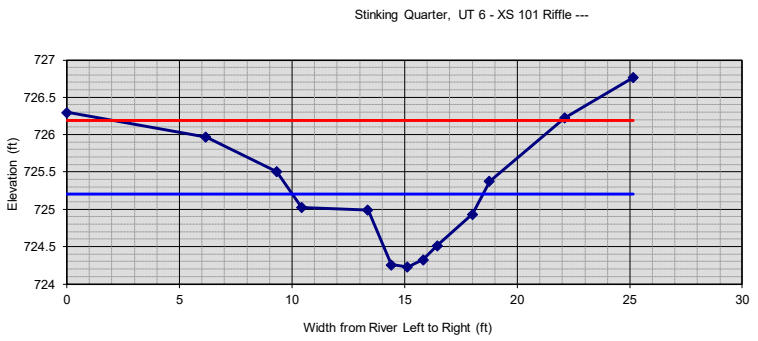
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
71.63	70.66	25.0		
728.37	729.34			

dimensions			
3.9	x-section area	0.6	d mean
6.6	width	7.4	wet P
1.2	d max	0.5	hyd radi
2.2	bank ht	11.4	w/d ratio
25.0	W flood prone area	3.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 6 - XS 101
	Riffle

	---
description:	Stinking Quarter, UT 6 - XS 101
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	73.7013	726.2987
	☐	6.184419	74.03353	725.9665
	☐	9.327369	74.49605	725.504
	☐	10.43804	74.97603	725.024
	☐	13.3772	75.01039	724.9896
	☐	14.4116	75.7428	724.2572
	☐	15.13566	75.7719	724.2281
	☐	15.82531	75.67303	724.327
	☐	16.4634	75.48668	724.5133
	☐	18.02665	75.06287	724.9371
	☐	18.7763	74.62321	725.3768
	☐	22.10675	73.77738	726.2226
	☐	25.16236	73.2379	726.7621
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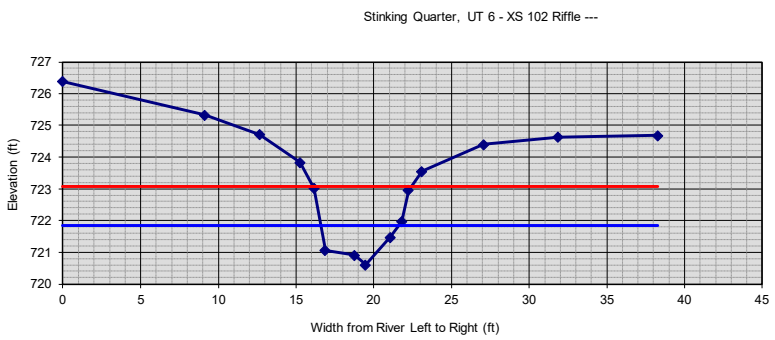
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
74.79	74	20.0		
725.21	726			

dimensions			
3.9	x-section area	0.5	d mean
8.5	width	8.9	wet P
1.0	d max	0.4	hyd radi
1.8	bank ht	18.4	w/d ratio
20.0	W flood prone area	2.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 6 - XS 102
	Riffle

	---
description:	Stinking Quarter, UT 6 - XS 102
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	73.61341	726.3866
	☐	9.106507	74.66817	725.3318
	☐	12.65541	75.29229	724.7077
	☐	15.25341	76.16363	723.8364
	☐	16.16046	76.98055	723.0194
	☐	16.87631	78.94	721.06
	☐	18.75172	79.08742	720.9126
	☐	19.47519	79.38885	720.6112
	☐	21.05605	78.52382	721.4762
	☐	21.79643	78.0347	721.9653
	☐	22.24247	77.04192	722.9581
	☐	23.1039	76.44678	723.5532
	☐	27.06319	75.60112	724.3989
	☐	31.86578	75.36565	724.6343
	☐	38.27772	75.31852	724.6815
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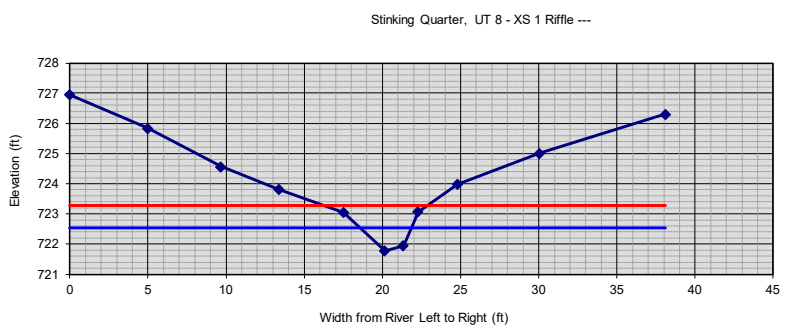
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
78.15	76.4	6.0		
721.85	723.6			

dimensions			
3.9	x-section area	0.8	d mean
5.0	width	6.0	wet P
1.2	d max	0.7	hyd radi
3.0	bank ht	6.5	w/d ratio
6.0	W flood prone area	1.2	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 8 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 8 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	73.03545	726.9645
	☐	4.991446	74.15846	725.8415
	☐	9.672606	75.43715	724.5628
	☐	13.37577	76.18672	723.8133
	☐	17.526	76.95062	723.0494
	☐	20.15108	78.20674	721.7933
	☐	21.3501	78.05216	721.9478
	☐	22.286	76.92976	723.0702
	☐	24.80116	76.01502	723.985
	☐	30.05765	74.9914	725.0086
	☐	38.09992	73.69942	726.3006
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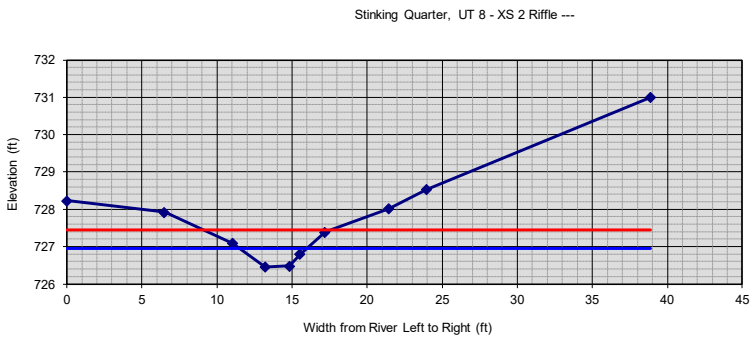
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
77.46	76.95	5.0		
722.54	723.05			

dimensions			
1.5	x-section area	0.5	d mean
3.3	width	3.7	wet P
0.7	d max	0.4	hyd radi
1.3	bank ht	6.9	w/d ratio
5.0	W flood prone area	1.5	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 8 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 8 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	71.77186	728.2281
	☐	6.507396	72.0776	727.9224
	☐	11.03748	72.91328	727.0867
	☐	13.21523	73.5387	726.4613
	☐	14.84773	73.51363	726.4864
	☐	15.54791	73.20236	726.7976
	☐	17.21085	72.61003	727.39
	☐	21.44702	71.98505	728.0149
	☐	23.95847	71.47206	728.5279
	☐	38.89699	68.99081	731.0092
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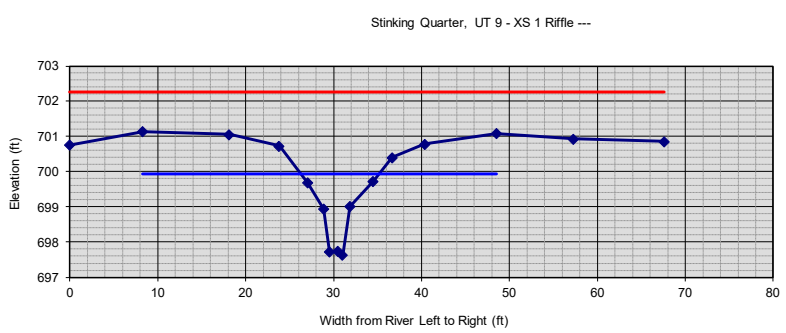
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
73.04	72.91	8.0		
726.96	727.09			

dimensions			
1.5	x-section area	0.3	d mean
4.5	width	4.7	wet P
0.5	d max	0.3	hyd radi
0.6	bank ht	13.8	w/d ratio
8.0	W flood prone area	1.8	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 9 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 9 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	99.2412	700.7588
	☐	8.329867	98.85731	701.1427
	☐	18.14541	98.94556	701.0544
	☐	23.83495	99.26926	700.7307
	☐	27.06455	100.3165	699.6835
	☐	28.87796	101.064	698.936
	☐	29.52251	102.2687	697.7313
	☐	30.49673	102.2631	697.7369
	☐	31.03759	102.3718	697.6282
	☐	31.8665	100.9843	699.0157
	☐	34.52726	100.2654	699.7346
	☐	36.68122	99.59585	700.4041
	☐	40.37228	99.21744	700.7826
	☐	48.53526	98.91337	701.0866
	☑	57.27661	99.07386	700.9261
	☑	67.65284	99.13874	700.8613
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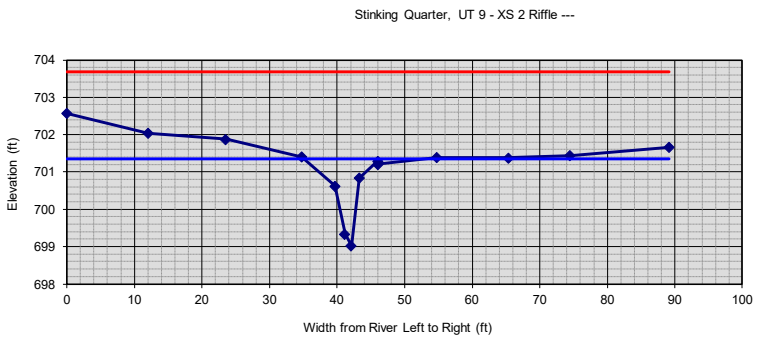
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
100.05	99.22	100.0		
699.95	700.78			

dimensions			
8.7	x-section area	1.0	d mean
9.0	width	10.8	wet P
2.3	d max	0.8	hyd radi
3.2	bank ht	9.3	w/d ratio
100.0	W flood prone area	11.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 9 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 9 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	97.42902	702.571
	☐	12.02996	97.96421	702.0358
	☐	23.54741	98.12098	701.879
	☐	34.75129	98.59455	701.4054
	☐	39.70065	99.37691	700.6231
	☐	41.17309	100.6588	699.3412
	☐	42.1312	100.9806	699.0194
	☐	43.29716	99.16566	700.8343
	☐	46.07158	98.70846	701.2915
	☐	46.08589	98.78886	701.2111
	☐	54.7357	98.61165	701.3883
	☐	65.39159	98.62558	701.3744
	☐	74.52077	98.56348	701.4365
	☐	89.12997	98.34279	701.6572
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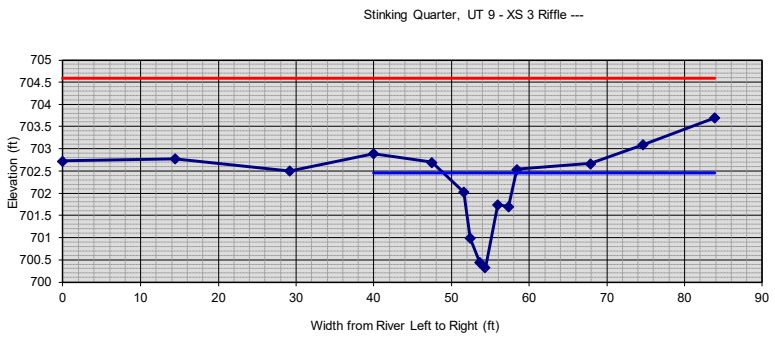
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
98.65	98.65	100.0		
701.35	701.35			

dimensions			
8.7	x-section area	0.5	d mean
17.8	width	19.4	wet P
2.3	d max	0.4	hyd radi
2.3	bank ht	36.3	w/d ratio
100.0	W flood prone area	5.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 9 - XS 3**

Riffle

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description: **Stinking Quarter, UT 9 - XS 3**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	97.27793	702.7221
	☑	14.46229	97.22651	702.7735
	☑	29.20865	97.4961	702.5039
	☐	39.98531	97.10773	702.8923
	☐	47.49294	97.30146	702.6985
	☐	51.57794	97.97804	702.022
	☐	52.4322	99.0116	700.9884
	☐	53.63964	99.55617	700.4438
	☐	54.35528	99.67386	700.3261
	☐	55.93534	98.26512	701.7349
	☐	57.37709	98.29984	701.7002
	☐	58.43054	97.46236	702.5376
	☐	67.90227	97.33401	702.666
	☐	74.66723	96.90843	703.0916
	☐	83.88333	96.30156	703.6984
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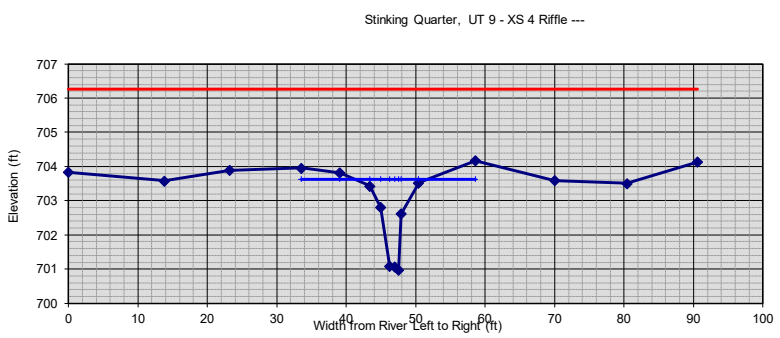
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
97.54	97.46	100.0		
702.46	702.54			

dimensions			
8.7	x-section area	0.9	d mean
9.4	width	10.9	wet P
2.1	d max	0.8	hyd radi
2.2	bank ht	10.2	w/d ratio
100.0	W flood prone area	10.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 9 - XS 4**

Riffle

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description: **Stinking Quarter, UT 9 - XS 4**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	96.16463	703.8354
	☑	13.88302	96.41847	703.5815
	☑	23.23244	96.10782	703.8922
	☐	33.59532	96.04647	703.9535
	☐	39.11556	96.18398	703.816
	☐	43.40004	96.56568	703.4343
	☐	44.98894	97.19768	702.8023
	☐	46.28487	98.90392	701.0961
	☐	46.98967	98.92223	701.0778
	☐	47.56718	99.01701	700.983
	☐	47.94439	97.3851	702.6149
	☐	50.43813	96.47784	703.5222
	☐	58.58336	95.83206	704.1679
	☑	70.01451	96.40646	703.5935
	☑	80.42469	96.48923	703.5108
	☑	90.56581	95.86857	704.1314
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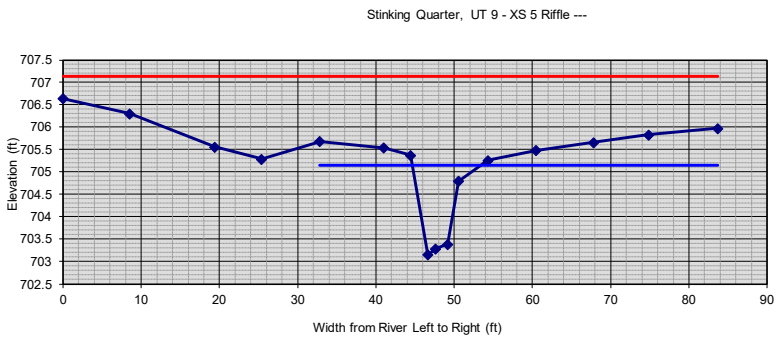
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
96.37	96.37	100.0		
703.63	703.63			

dimensions			
8.7	x-section area	0.8	d mean
10.6	width	13.0	wet P
2.6	d max	0.7	hyd radi
2.6	bank ht	13.0	w/d ratio
100.0	W flood prone area	9.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 9 - XS 5
	Riffle

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description:	Stinking Quarter, UT 9 - XS 5
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	93.35677	706.6432
	☑	8.519661	93.6978	706.3022
	☑	19.3892	94.44425	705.5557
	☑	25.4087	94.71091	705.2891
	☐	32.85159	94.31985	705.6801
	☐	41.02723	94.46437	705.5356
	☐	44.43936	94.6294	705.3706
	☐	46.64228	96.8445	703.1555
	☐	47.66784	96.71397	703.286
	☐	49.14592	96.6141	703.3859
	☐	50.56578	95.20745	704.7925
	☐	54.33325	94.74149	705.2585
	☐	60.46304	94.52121	705.4788
	☐	67.81053	94.34103	705.659
	☐	74.85329	94.16726	705.8327
	☐	83.69861	94.02837	705.9716
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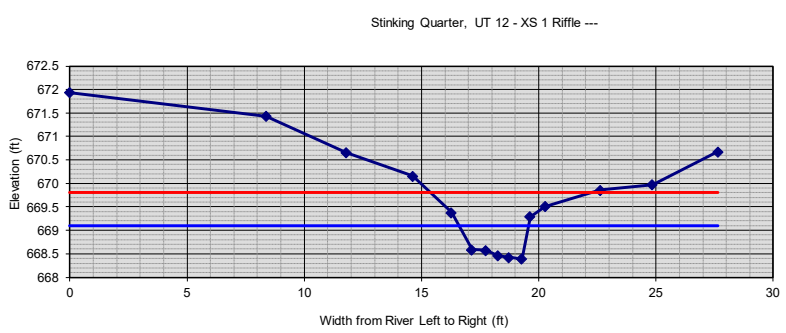
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
94.85	94.74	100.0		
705.15	705.26			

dimensions			
8.7	x-section area	1.0	d mean
8.8	width	10.2	wet P
2.0	d max	0.8	hyd radi
2.1	bank ht	8.9	w/d ratio
100.0	W flood prone area	11.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 12 - XS 1
	Riffle

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description:	Stinking Quarter, UT 12 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	128.0631	671.9369
	☐	8.376129	128.5696	671.4304
	☐	11.80427	129.3488	670.6512
	☐	14.6321	129.8437	670.1563
	☐	16.28055	130.6167	669.3833
	☐	17.15223	131.4106	668.5894
	☐	17.74076	131.4247	668.5753
	☐	18.26508	131.5426	668.4574
	☐	18.72606	131.5725	668.4275
	☐	19.28477	131.6105	668.3895
	☐	19.63367	130.7078	669.2922
	☐	20.26822	130.4894	669.5106
	☐	22.63029	130.1457	669.8543
	☐	24.84583	130.0295	669.9705
	☐	27.63903	129.3254	670.6746
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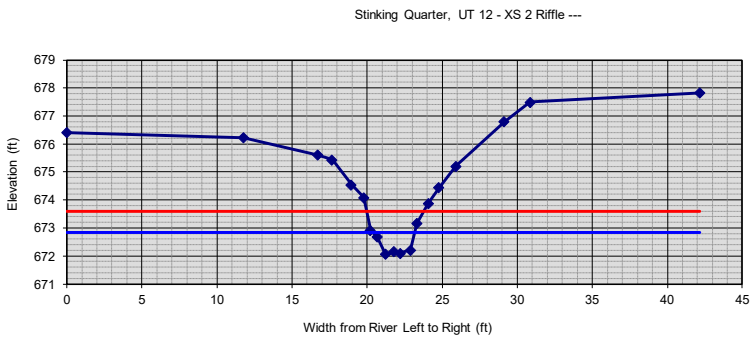
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
130.9	130.49	7.0		
669.1	669.51			

dimensions			
1.5	x-section area	0.5	d mean
3.0	width	3.7	wet P
0.7	d max	0.4	hyd radi
1.1	bank ht	5.7	w/d ratio
7.0	W flood prone area	2.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 12 - XS 2
	Riffle

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description:	Stinking Quarter, UT 12 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	123.5935	676.4065
	☐	11.77665	123.7724	676.2276
	☐	16.71233	124.3898	675.6102
	☐	17.66718	124.5688	675.4312
	☐	18.94291	125.4512	674.5488
	☐	19.78609	125.9169	674.0831
	☐	20.22353	127.0867	672.9133
	☐	20.68902	127.3146	672.6854
	☐	21.23456	127.9325	672.0675
	☐	21.7867	127.8451	672.1549
	☐	22.21954	127.9041	672.0959
	☐	22.8973	127.7876	672.2124
	☐	23.31805	126.8373	673.1627
	☐	24.09338	126.1177	673.8823
	☐	24.78676	125.5533	674.4467
	☐	25.93215	124.7964	675.2036
	☐	29.13494	123.2099	676.7901
	☐	30.85159	122.5141	677.4859
	☐	42.15793	122.1778	677.8222
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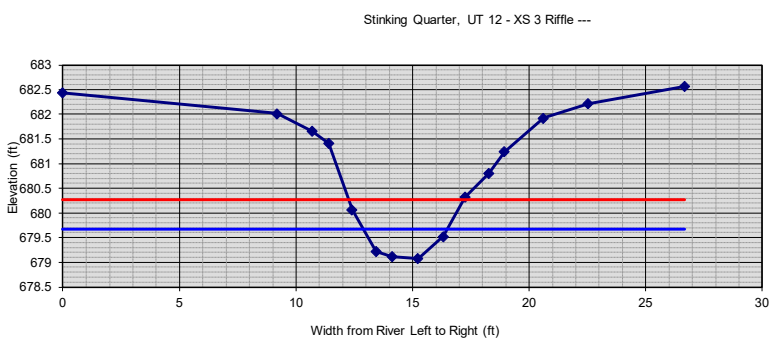
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
127.16	124.57	4.0		
672.84	675.43			

dimensions			
1.5	x-section area	0.6	d mean
2.8	width	3.5	wet P
0.8	d max	0.4	hyd radi
3.4	bank ht	5.1	w/d ratio
4.0	W flood prone area	1.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	**Stinking Quarter, UT 12 - XS 3**
	Riffle

	---
description:	**Stinking Quarter, UT 12 - XS 3**
height of instrument (ft):	**800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**117.5628**	682.4372
	☐	**9.185813**	**117.9857**	682.0143
	☐	**10.69028**	**118.3393**	681.6607
	☐	**11.40249**	**118.5896**	681.4104
	☐	**12.41152**	**119.9355**	680.0645
	☐	**13.43262**	**120.7769**	679.2231
	☐	**14.11804**	**120.883**	679.117
	☐	**15.23661**	**120.914**	679.086
	☐	**16.32014**	**120.4732**	679.5268
	☐	**17.25625**	**119.6759**	680.3241
	☐	**18.26928**	**119.1957**	680.8043
	☐	**18.94398**	**118.7589**	681.2411
	☐	**20.61324**	**118.0787**	681.9213
	☐	**22.53555**	**117.7827**	682.2173
	☐	**26.66806**	**117.4318**	682.5682
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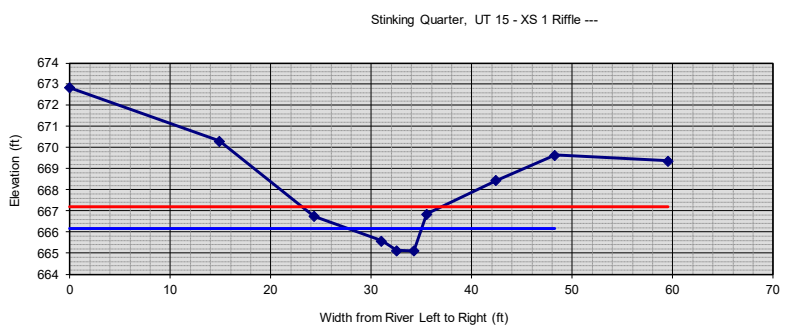
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
120.32	**117.99**	**5.0**		
679.68	682.01			

dimensions			
1.5	x-section area	0.4	d mean
3.6	width	3.9	wet P
0.6	d max	0.4	hyd radi
2.9	bank ht	8.5	w/d ratio
5.0	W flood prone area	1.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 15 - XS 1**

Riffle

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description: **Stinking Quarter, UT 15 - XS 1**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**127.1639**	672.8361
	☐	**14.88138**	**129.6998**	670.3002
	☐	**24.30323**	**133.2557**	666.7443
	☐	**31.03917**	**134.4104**	665.5896
	☐	**32.52215**	**134.8688**	665.1312
	☐	**34.26952**	**134.8774**	665.1226
	☐	**35.52855**	**133.1468**	666.8532
	☐	**42.43545**	**131.5611**	668.4389
	☐	**48.29778**	**130.3534**	669.6466
	☑	**59.55907**	**130.6325**	669.3675
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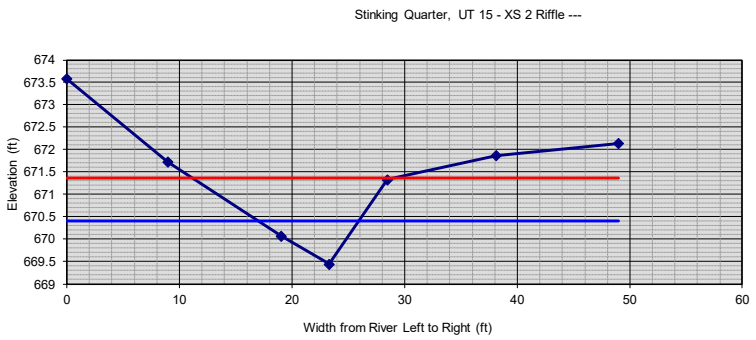
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
133.83	**130.35**	**14.0**		
666.17	669.65			

dimensions			
4.4	x-section area	0.6	d mean
7.4	width	8.0	wet P
1.0	d max	0.5	hyd radi
4.5	bank ht	12.4	w/d ratio
14.0	W flood prone area	1.9	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material		
0	measured D84 (mm)	
0.0	relative roughness	0.0 fric. factor
0.000	Manning's n from channel material	

Cross Section



section: **Stinking Quarter, UT 15 - XS 2**

Riffle

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description: **Stinking Quarter, UT 15 - XS 2**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**126.4185**	673.5815
	☐	**8.976194**	**128.2758**	671.7242
	☐	**19.06753**	**129.9356**	670.0644
	☐	**23.30119**	**130.5515**	669.4485
	☐	**28.47427**	**128.6704**	671.3296
	☐	**38.1439**	**128.1321**	671.8679
	☐	**49.02528**	**127.8668**	672.1332
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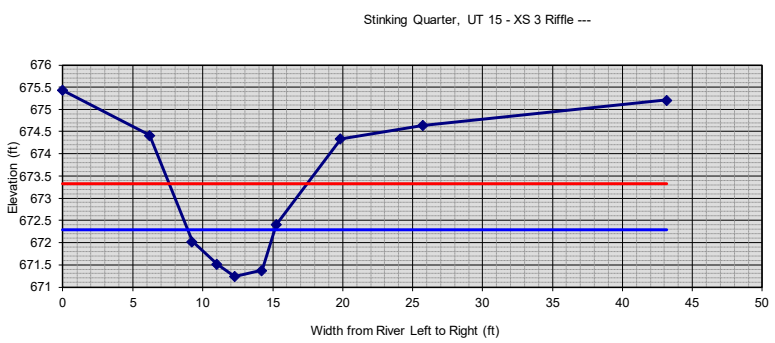
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
129.59	**128.67**	**17.0**		
670.41	671.33			

dimensions			
4.4	x-section area	0.5	d mean
9.0	width	9.2	wet P
1.0	d max	0.5	hyd radi
1.9	bank ht	18.3	w/d ratio
17.0	W flood prone area	1.9	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material		
0	measured D84 (mm)	
0.0	relative roughness	0.0 fric. factor
0.000	Manning's n from channel material	

Cross Section



section: **Stinking Quarter, UT 15 - XS 3**

Riffle

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description: **Stinking Quarter, UT 15 - XS 3**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**124.5715**	675.4285
	☐	**6.208505**	**125.5811**	674.4189
	☐	**9.246674**	**127.9741**	672.0259
	☐	**11.02657**	**128.4886**	671.5114
	☐	**12.27187**	**128.753**	671.247
	☐	**14.22368**	**128.6209**	671.3791
	☐	**15.24865**	**127.5946**	672.4054
	☐	**19.86111**	**125.6635**	674.3365
	☐	**25.74085**	**125.3596**	674.6404
	☐	**43.16573**	**124.7889**	675.2111

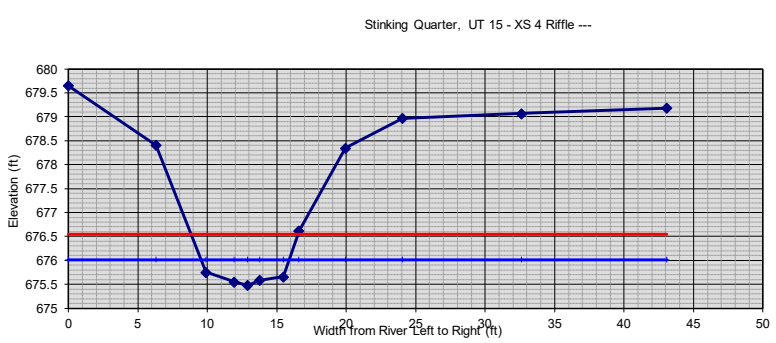
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
127.71	**125.66**	**10.0**		
672.29	674.34			

dimensions			
4.4	x-section area	0.7	d mean
6.2	width	6.8	wet P
1.0	d max	0.7	hyd radi
3.1	bank ht	8.7	w/d ratio
10.0	W flood prone area	1.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 15 - XS 4**

Riffle

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description: **Stinking Quarter, UT 15 - XS 4**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**120.3393**	679.6607
	☐	**6.299524**	**121.592**	678.408
	☐	**9.921475**	**124.2444**	675.7556
	☐	**11.94801**	**124.4434**	675.5566
	☐	**12.88685**	**124.5188**	675.4812
	☐	**13.78508**	**124.4125**	675.5875
	☐	**15.48247**	**124.3375**	675.6625
	☐	**16.61069**	**123.3749**	676.6251
	☐	**19.93914**	**121.6502**	678.3498
	☐	**24.05132**	**121.0283**	678.9717
	☐	**32.62162**	**120.928**	679.072
	☐	**43.09978**	**120.818**	679.182

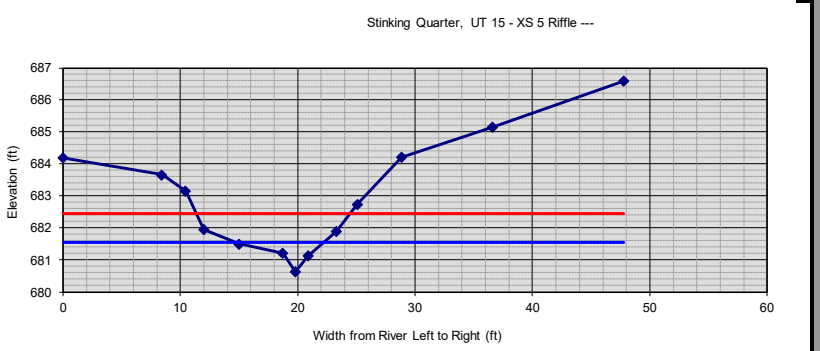
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
123.98	**121.59**	**7.0**		
676.02	678.41			

dimensions			
2.4	x-section area	0.4	d mean
6.3	width	6.6	wet P
0.5	d max	0.4	hyd radi
2.9	bank ht	16.5	w/d ratio
7.0	W flood prone area	1.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 15 - XS 5**

Riffle

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description: **Stinking Quarter, UT 15 - XS 5**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**115.8128**	684.1872
	☐	**8.435739**	**116.3391**	683.6609
	☐	**10.44994**	**116.8509**	683.1491
	☐	**12.00311**	**118.0448**	681.9552
	☐	**15.01032**	**118.4979**	681.5021
	☐	**18.73628**	**118.7913**	681.2087
	☐	**19.80745**	**119.3613**	680.6387
	☐	**20.9021**	**118.8628**	681.1372
	☐	**23.30728**	**118.1066**	681.8934
	☐	**25.07849**	**117.2599**	682.7401
	☐	**28.86293**	**115.7849**	684.2151
	☐	**36.60337**	**114.8482**	685.1518
	☐	**47.76161**	**113.4077**	686.5923
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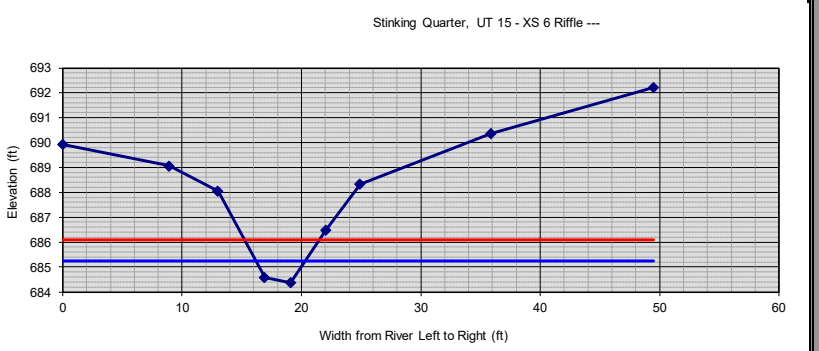
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
118.45	**116.34**	**12.0**		
681.55	683.66			

dimensions			
2.4	x-section area	0.3	d mean
7.5	width	7.9	wet P
0.9	d max	0.3	hyd radi
3.0	bank ht	23.6	w/d ratio
12.0	W flood prone area	1.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section: **Stinking Quarter, UT 15 - XS 6**

Riffle

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description: **Stinking Quarter, UT 15 - XS 6**

height of instrument (ft): **800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**110.0678**	689.9322
	☐	**8.92595**	**110.927**	689.073
	☐	**13.01177**	**111.9525**	688.0475
	☐	**16.92817**	**115.4177**	684.5823
	☐	**19.09139**	**115.6059**	684.3941
	☐	**22.0514**	**113.5201**	686.4799
	☐	**24.91571**	**111.6637**	688.3363
	☐	**35.87672**	**109.6394**	690.3606
	☐	**49.50076**	**107.7896**	692.2104
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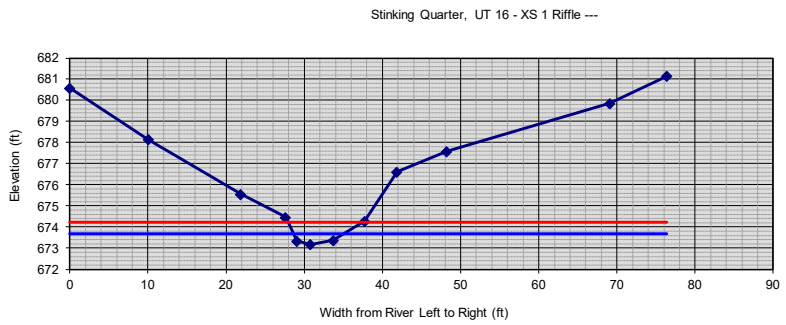
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
114.75	**111.95**	**6.0**		
685.25	688.05			

dimensions			
2.4	x-section area	0.6	d mean
4.1	width	4.7	wet P
0.9	d max	0.5	hyd radi
3.7	bank ht	7.1	w/d ratio
6.0	W flood prone area	1.5	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 16 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 16 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	119.4275	680.5725
	☐	10.04512	121.8578	678.1422
	☐	21.88773	124.4513	675.5487
	☐	27.60814	125.5349	674.4651
	☐	29.04649	126.6541	673.3459
	☐	30.76504	126.8291	673.1709
	☐	33.70303	126.6284	673.3716
	☐	37.72117	125.7156	674.2844
	☐	41.88959	123.3891	676.6109
	☐	48.26273	122.4131	677.5869
	☐	69.10668	120.1523	679.8477
	☐	76.4008	118.8428	681.1572
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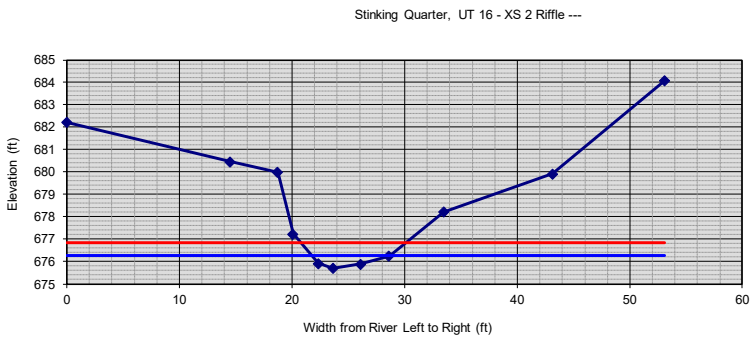
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
126.29	125.54	10.0		
673.71	674.46			

dimensions			
2.4	x-section area	0.4	d mean
6.6	width	6.8	wet P
0.5	d max	0.4	hyd radi
1.3	bank ht	18.2	w/d ratio
10.0	W flood prone area	1.5	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material		
0	measured D84 (mm)	
0.0	relative roughness	0.0 fric. factor
0.000	Manning's n from channel material	

Cross Section



section:	Stinking Quarter, UT 16 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 16 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	117.7811	682.2189
	☐	14.50132	119.5431	680.4569
	☐	18.73809	120.0128	679.9872
	☐	20.09057	122.7712	677.2288
	☐	22.3548	124.0857	675.9143
	☐	23.65076	124.279	675.721
	☐	26.08433	124.1087	675.8913
	☐	28.61342	123.7476	676.2524
	☐	33.494	121.7877	678.2123
	☐	43.13277	120.0831	679.9169
	☐	53.09946	115.9355	684.0645
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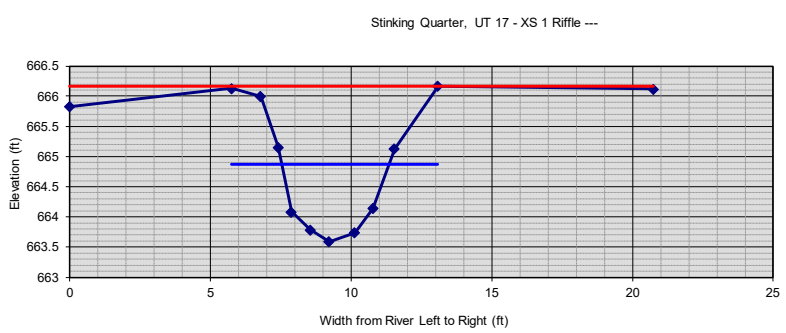
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
123.72	121.79	9.5		
676.28	678.21			

dimensions			
2.4	x-section area	0.3	d mean
7.0	width	7.1	wet P
0.6	d max	0.3	hyd radi
2.5	bank ht	20.2	w/d ratio
9.5	W flood prone area	1.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material		
0	measured D84 (mm)	
0.0	relative roughness	0.0 fric. factor
0.000	Manning's n from channel material	

Cross Section



section:	Stinking Quarter, UT 17 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 17 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☑	0	134.1751	665.8249
	☐	5.757726	133.8683	666.1317
	☐	6.788405	134.0029	665.9971
	☐	7.417691	134.8463	665.1537
	☐	7.882475	135.9139	664.0861
	☐	8.550973	136.2138	663.7862
	☐	9.215498	136.4066	663.5934
	☐	10.13466	136.2583	663.7417
	☐	10.77563	135.8594	664.1406
	☐	11.537	134.8706	665.1294
	☐	13.08837	133.8349	666.1651
	☑	20.7389	133.879	666.121
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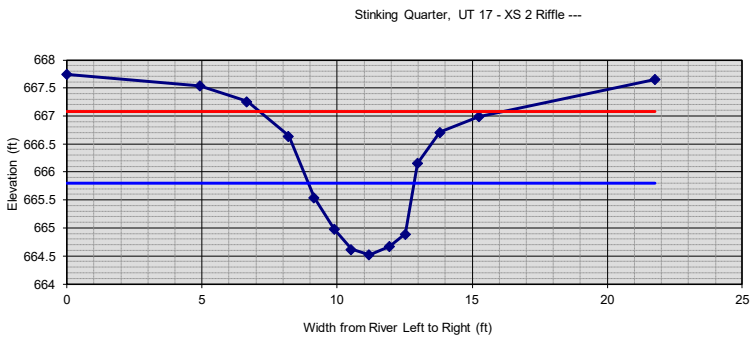
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
135.12	134	75.0		
664.88	666			

dimensions			
3.5	x-section area	0.9	d mean
3.8	width	4.9	wet P
1.3	d max	0.7	hyd radi
2.4	bank ht	4.2	w/d ratio
75.0	W flood prone area	19.7	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 17 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 17 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	132.2545	667.7455
	☐	4.931214	132.4637	667.5363
	☐	6.669706	132.74	667.26
	☐	8.210156	133.3577	666.6423
	☐	9.157078	134.46	665.54
	☐	9.896931	135.0233	664.9767
	☐	10.52992	135.3813	664.6187
	☐	11.19458	135.4807	664.5193
	☐	11.93953	135.3288	664.6712
	☐	12.52526	135.1043	664.8957
	☐	12.97835	133.8451	666.1549
	☐	13.80846	133.2912	666.7088
	☐	15.25141	133.0113	666.9887
	☐	21.76706	132.3494	667.6506
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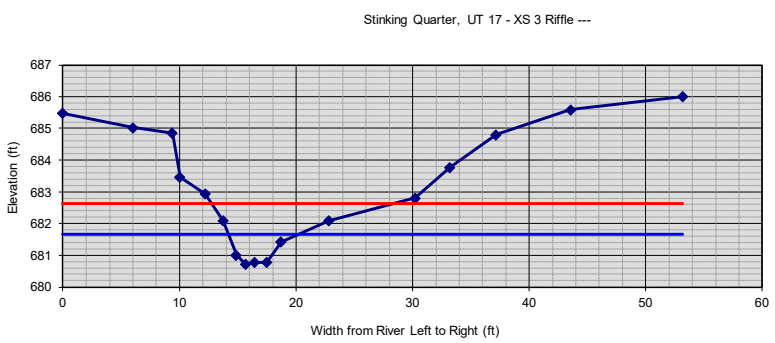
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
134.2	133.29	9.0		
665.8	666.71			

dimensions			
3.5	x-section area	0.9	d mean
3.9	width	5.0	wet P
1.3	d max	0.7	hyd radi
2.2	bank ht	4.4	w/d ratio
9.0	W flood prone area	2.3	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	**Stinking Quarter, UT 17 - XS 3**
	Riffle

	---
description:	**Stinking Quarter, UT 17 - XS 3**
height of instrument (ft):	**800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**114.5223**	685.4777
	☐	**5.994445**	**114.9731**	685.0269
	☐	**9.378976**	**115.1476**	684.8524
	☐	**10.05138**	**116.5415**	683.4585
	☐	**12.22321**	**117.0607**	682.9393
	☐	**13.75443**	**117.9091**	682.0909
	☐	**14.87444**	**118.9894**	681.0106
	☐	**15.66252**	**119.2709**	680.7291
	☐	**16.43031**	**119.2182**	680.7818
	☐	**17.49802**	**119.2231**	680.7769
	☐	**18.71488**	**118.5798**	681.4202
	☐	**22.80137**	**117.9143**	682.0857
	☐	**30.20874**	**117.1982**	682.8018
	☐	**33.21824**	**116.2314**	683.7686
	☐	**37.17177**	**115.1988**	684.8012
	☐	**43.55942**	**114.413**	685.587
	☐	**53.1869**	**113.9883**	686.0117
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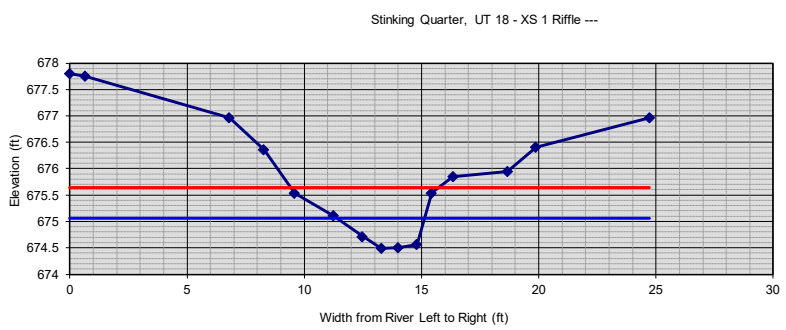
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
118.32	**115.15**	**16.0**		
681.68	684.85			

dimensions			
3.5	x-section area	0.6	d mean
6.1	width	6.6	wet P
1.0	d max	0.5	hyd radi
4.1	bank ht	10.9	w/d ratio
16.0	W flood prone area	2.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 18 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 18 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	122.1997	677.8003
	☐	0.65477	122.2458	677.7542
	☐	6.806033	123.0372	676.9628
	☐	8.28094	123.6433	676.3567
	☐	9.596033	124.4646	675.5354
	☐	11.23752	124.8869	675.1131
	☐	12.48768	125.2824	674.7176
	☐	13.28245	125.5044	674.4956
	☐	14.01367	125.4946	674.5054
	☐	14.80492	125.4351	674.5649
	☐	15.42732	124.4601	675.5399
	☐	16.34645	124.1489	675.8511
	☐	18.66152	124.0526	675.9474
	☐	19.87636	123.593	676.407
	☐	24.71844	123.0368	676.9632
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

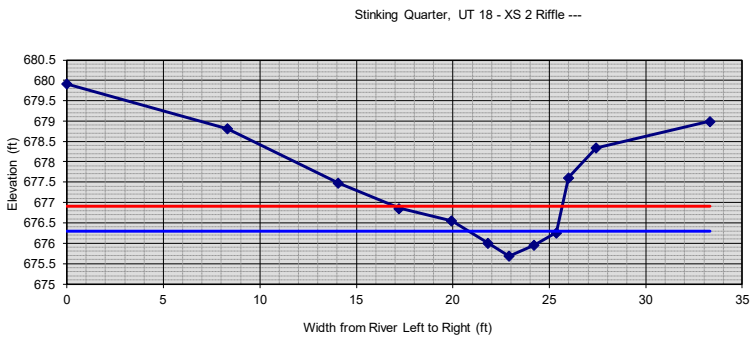
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
124.93	124.15	6.0		
675.07	675.85			

dimensions			
1.5	x-section area	0.4	d mean
3.8	width	4.1	wet P
0.6	d max	0.4	hyd radi
1.4	bank ht	9.5	w/d ratio
6.0	W flood prone area	1.6	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 18 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 18 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	120.0873	679.9127
	☐	8.330777	121.1882	678.8118
	☐	14.08164	122.5252	677.4748
	☐	17.21974	123.1431	676.8569
	☐	19.94067	123.4517	676.5483
	☐	21.83653	124.0011	675.9989
	☐	22.90884	124.307	675.693
	☐	24.19507	124.0463	675.9537
	☐	25.36376	123.7448	676.2552
	☐	25.99123	122.3915	677.6085
	☐	27.41832	121.6611	678.3389
	☐	33.32003	121.0108	678.9892
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

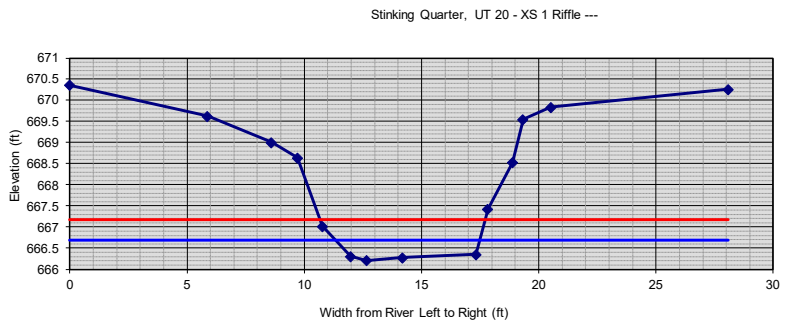
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
123.7	121.66	9.0		
676.3	678.34			

dimensions			
1.5	x-section area	0.3	d mean
4.6	width	4.8	wet P
0.6	d max	0.3	hyd radi
2.6	bank ht	14.2	w/d ratio
9.0	W flood prone area	2.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 20 - XS 1
	Riffle

	---
description:	Stinking Quarter, UT 20 - XS 1
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	129.6327	670.3673
	☐	5.883437	130.3769	669.6231
	☐	8.607476	130.996	669.004
	☐	9.712212	131.3608	668.6392
	☐	10.77765	132.9831	667.0169
	☐	11.98254	133.6904	666.3096
	☐	12.65401	133.785	666.215
	☐	14.18387	133.7204	666.2796
	☐	17.32351	133.6501	666.3499
	☐	17.82952	132.5697	667.4303
	☐	18.88973	131.4733	668.5267
	☐	19.33333	130.4538	669.5462
	☐	20.51999	130.1652	669.8348
	☐	28.08977	129.7395	670.2605
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

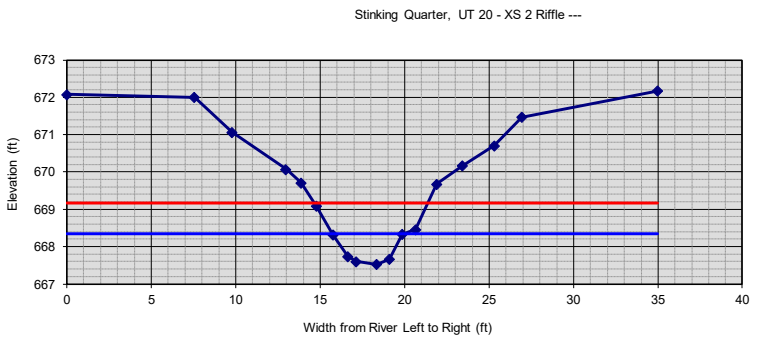
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
133.3	131.36	6.5		
666.7	668.64			

dimensions			
2.4	x-section area	0.4	d mean
6.2	width	6.5	wet P
0.5	d max	0.4	hyd radi
2.4	bank ht	16.2	w/d ratio
6.5	W flood prone area	1.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	Stinking Quarter, UT 20 - XS 2
	Riffle

	---
description:	Stinking Quarter, UT 20 - XS 2
height of instrument (ft):	800.00

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	0	127.9259	672.0741
	☐	7.564851	127.9988	672.0012
	☐	9.789598	128.9397	671.0603
	☐	12.98826	129.9317	670.0683
	☐	13.86126	130.2859	669.7141
	☐	14.77882	130.9162	669.0838
	☐	15.77082	131.6877	668.3123
	☐	16.626	132.2649	667.7351
	☐	17.13829	132.3938	667.6062
	☐	18.33966	132.4737	667.5263
	☐	19.10034	132.3386	667.6614
	☐	19.85529	131.6665	668.3335
	☐	20.65173	131.5453	668.4547
	☐	21.89519	130.3244	669.6756
	☐	23.41584	129.8392	670.1608
	☐	25.30257	129.2931	670.7069
	☐	26.9323	128.5345	671.4655
	☐	34.98737	127.8252	672.1748
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

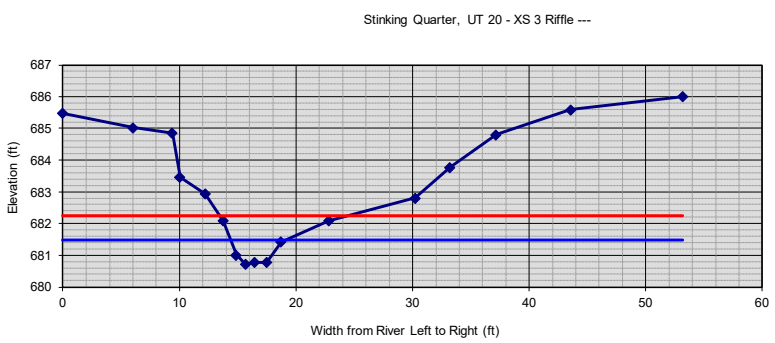
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
131.65	128.53	6.0		
668.35	671.47			

dimensions			
2.4	x-section area	0.6	d mean
4.2	width	4.7	wet P
0.8	d max	0.5	hyd radi
3.9	bank ht	7.5	w/d ratio
6.0	W flood prone area	1.4	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Cross Section



section:	**Stinking Quarter, UT 20 - XS 3**
	Riffle

	---
description:	**Stinking Quarter, UT 20 - XS 3**
height of instrument (ft):	**800.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
	☐	**0**	**114.5223**	685.4777
	☐	**5.994445**	**114.9731**	685.0269
	☐	**9.378976**	**115.1476**	684.8524
	☐	**10.05138**	**116.5415**	683.4585
	☐	**12.22321**	**117.0607**	682.9393
	☐	**13.75443**	**117.9091**	682.0909
	☐	**14.87444**	**118.9894**	681.0106
	☐	**15.66252**	**119.2709**	680.7291
	☐	**16.43031**	**119.2182**	680.7818
	☐	**17.49802**	**119.2231**	680.7769
	☐	**18.71488**	**118.5798**	681.4202
	☐	**22.80137**	**117.9143**	682.0857
	☐	**30.20874**	**117.1982**	682.8018
	☐	**33.21824**	**116.2314**	683.7686
	☐	**37.17177**	**115.1988**	684.8012
	☐	**43.55942**	**114.413**	685.587
	☐	**53.1869**	**113.9883**	686.0117
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
118.51	**115.15**	**10.0**		
681.49	684.85			

dimensions			
2.4	x-section area	0.5	d mean
4.8	width	5.2	wet P
0.8	d max	0.5	hyd radi
4.1	bank ht	9.4	w/d ratio
10.0	W flood prone area	2.1	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate, Q (cfs)
0.00	shear stress ((lbs/ft sq)
0.00	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor u/u*
~~0.0~~	threshold grain size (mm)

check from channel material			
0	measured D84 (mm)		
0.0	relative roughness	0.0	fric. factor
0.000	Manning's n from channel material		

Draft NC SAM Stream Rating Sheet
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SAM 1 - UT 6 (upper), also representative of UTs 7 & 9

Stream Site Name	Stinking Quarter Mitigation Site-SAM1	Date of Assessment	August 29, 2019
Stream Category	Pa1	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**MEDIUM**	
(4) Wooded Riparian Buffer	**LOW**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**MEDIUM**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**LOW**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

SAM 2 - UT 1 (upper)
also representative of UTs 2, 3, 5 (up), & 10

Stream Site Name	Stinking Quarter Mitigation Site-SAM2	Date of Assessment	August 29, 2019
Stream Category	Pa1	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**MEDIUM**	
(4) Wooded Riparian Buffer	**LOW**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**MEDIUM**	
(4) Channel Stability	**HIGH**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**MEDIUM**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**MEDIUM**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**MEDIUM**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

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Stream Site Name	Stinking Quarter Mitigation Site-SAM4	Date of Assessment	August 29, 2019
Stream Category	Pa2	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**LOW**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**MEDIUM**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**MEDIUM**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**HIGH**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**MEDIUM**	
(2) Stream-side Habitat	**LOW**	
(3) Stream-side Habitat	**LOW**	
(3) Thermoregulation	**LOW**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
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SAM 5 - UT 5 (mid)

Stream Site Name	Stinking Quarter Mitigation Site-SAM5	Date of Assessment	August 29, 2019
Stream Category	Pa3	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

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

Draft NC SAM Stream Rating Sheet
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SAM 6 - UT 5 (low mid)

Stream Site Name	Stinking Quarter Mitigation Site-SAM6	Date of Assessment	August 29, 2019
Stream Category	Pa3	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**LOW**	
(4) Floodplain Access	**LOW**	
(4) Wooded Riparian Buffer	**HIGH**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**MEDIUM**	
(4) Channel Stability	**MEDIUM**	
(4) Sediment Transport	**MEDIUM**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**MEDIUM**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**HIGH**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**MEDIUM**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**HIGH**	
(3) Substrate	**MEDIUM**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**MEDIUM**	
(3) Thermoregulation	**HIGH**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

SAM 7 - UT 1 (mid),
also representative of UT 5 (lower)

Stream Site Name	Stinking Quarter Mitigation Site-SAM7	Date of Assessment	August 29, 2019
Stream Category	Pa3	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**HIGH**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**HIGH**	
(3) Streamside Area Attenuation	**HIGH**	
(4) Floodplain Access	**HIGH**	
(4) Wooded Riparian Buffer	**HIGH**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**HIGH**	
(4) Channel Stability	**HIGH**	
(4) Sediment Transport	**MEDIUM**	
(4) Stream Geomorphology	**HIGH**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**MEDIUM**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**HIGH**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**MEDIUM**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**HIGH**	
(3) Substrate	**MEDIUM**	
(3) Stream Stability	**HIGH**	
(3) In-stream Habitat	**LOW**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**HIGH**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

SAM 8 - UT 1 (low),
also representative of NPSQC

Stream Site Name	Stinking Quarter Mitigation Site-SAM8	Date of Assessment	August 29, 2019
Stream Category	Pa3	Assessor Name/Organization	Smith/Keith - Axiom

Notes of Field Assessment Form (Y/N)	YES
Presence of regulatory considerations (Y/N)	YES
Additional stream information/supplementary measurements included (Y/N)	YES
NC SAM feature type (perennial, intermittent, Tidal Marsh Stream)	Perennial

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

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

Stream Site Name	Stinking Quarter Mitigation Site-SAM9	Date of Assessment	June 8, 2020
Stream Category	Pa1	Assessor Name/Organization	Jernigan - Axiom

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

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**MEDIUM**	
(4) Floodplain Access	**MEDIUM**	
(4) Wooded Riparian Buffer	**MEDIUM**	
(4) Microtopography	**HIGH**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**MEDIUM**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**LOW**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**LOW**	
(2) In-stream Habitat	**LOW**	
(3) Baseflow	**HIGH**	
(3) Substrate	**LOW**	
(3) Stream Stability	**MEDIUM**	
(3) In-stream Habitat	**MEDIUM**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**MEDIUM**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

SAM 10 - NPSQC (down)

Stream Site Name	Stinking Quarter Mitigation Site-SAM10	Date of Assessment	June 8, 2020
Stream Category	Pa4	Assessor Name/Organization	Jernigan - Axiom

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

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	
(2) Baseflow	**HIGH**	
(2) Flood Flow	**LOW**	
(3) Streamside Area Attenuation	**MEDIUM**	
(4) Floodplain Access	**MEDIUM**	
(4) Wooded Riparian Buffer	**MEDIUM**	
(4) Microtopography	**LOW**	
(3) Stream Stability	**LOW**	
(4) Channel Stability	**LOW**	
(4) Sediment Transport	**LOW**	
(4) Stream Geomorphology	**MEDIUM**	
(2) Stream/Intertidal Zone Interaction	NA	
(2) Longitudinal Tidal Flow	NA	
(2) Tidal Marsh Stream Stability	NA	
(3) Tidal Marsh Channel Stability	NA	
(3) Tidal Marsh Stream Geomorphology	NA	
(1) Water Quality	**LOW**	
(2) Baseflow	**HIGH**	
(2) Streamside Area Vegetation	**LOW**	
(3) Upland Pollutant Filtration	**LOW**	
(3) Thermoregulation	**MEDIUM**	
(2) Indicators of Stressors	**YES**	
(2) Aquatic Life Tolerance	**HIGH**	
(2) Intertidal Zone Filtration	NA	
(1) Habitat	**HIGH**	
(2) In-stream Habitat	**MEDIUM**	
(3) Baseflow	**HIGH**	
(3) Substrate	**LOW**	
(3) Stream Stability	**LOW**	
(3) In-stream Habitat	**HIGH**	
(2) Stream-side Habitat	**HIGH**	
(3) Stream-side Habitat	**HIGH**	
(3) Thermoregulation	**MEDIUM**	
(2) Tidal Marsh In-stream Habitat	NA	
(3) Flow Restriction	NA	
(3) Tidal Marsh Stream Stability	NA	
(4) Tidal Marsh Channel Stability	NA	
(4) Tidal Marsh Stream Geomorphology	NA	
(3) Tidal Marsh In-stream Habitat	NA	
(2) Intertidal Zone	NA	
Overall	**LOW**	

Draft NC SAM Stream Rating Sheet
Accompanies User Manual Version 2.1

SAM 11 - UT 15, also representative of UTs 18, 20

Stream Site Name	Stinking Quarter Mitigation Site-SAM11	Date of Assessment	June 8, 2020
Stream Category	Pa1	Assessor Name/Organization	Jernigan - Axiom

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

Function Class Rating Summary	USACE/ All Streams	NCDWR Intermittent
(1) Hydrology	**LOW**	**LOW**
(2) Baseflow	**HIGH**	**HIGH**
(2) Flood Flow	**LOW**	**LOW**
(3) Streamside Area Attenuation	**LOW**	**LOW**
(4) Floodplain Access	**LOW**	**LOW**
(4) Wooded Riparian Buffer	**LOW**	**LOW**
(4) Microtopography	**LOW**	**LOW**
(3) Stream Stability	**LOW**	**LOW**
(4) Channel Stability	**MEDIUM**	**MEDIUM**
(4) Sediment Transport	**LOW**	**LOW**
(4) Stream Geomorphology	**LOW**	**LOW**
(2) Stream/Intertidal Zone Interaction	NA	NA
(2) Longitudinal Tidal Flow	NA	NA
(2) Tidal Marsh Stream Stability	NA	NA
(3) Tidal Marsh Channel Stability	NA	NA
(3) Tidal Marsh Stream Geomorphology	NA	NA
(1) Water Quality	**LOW**	**LOW**
(2) Baseflow	**HIGH**	**HIGH**
(2) Streamside Area Vegetation	**LOW**	**LOW**
(3) Upland Pollutant Filtration	**LOW**	**LOW**
(3) Thermoregulation	**LOW**	**LOW**
(2) Indicators of Stressors	**YES**	**YES**
(2) Aquatic Life Tolerance	**LOW**	**NA**
(2) Intertidal Zone Filtration	NA	NA
(1) Habitat	**LOW**	**LOW**
(2) In-stream Habitat	**LOW**	**MEDIUM**
(3) Baseflow	**HIGH**	**HIGH**
(3) Substrate	**LOW**	**LOW**
(3) Stream Stability	**MEDIUM**	**MEDIUM**
(3) In-stream Habitat	**LOW**	**HIGH**
(2) Stream-side Habitat	**LOW**	**LOW**
(3) Stream-side Habitat	**LOW**	**LOW**
(3) Thermoregulation	**LOW**	**LOW**
(2) Tidal Marsh In-stream Habitat	NA	NA
(3) Flow Restriction	NA	NA
(3) Tidal Marsh Stream Stability	NA	NA
(4) Tidal Marsh Channel Stability	NA	NA
(4) Tidal Marsh Stream Geomorphology	NA	NA
(3) Tidal Marsh In-stream Habitat	NA	NA
(2) Intertidal Zone	NA	NA
Overall	**LOW**	**LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM1	Date of Assessment	190828
Wetland Type	Headwater Forest	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM2	Date of Assessment	190828
Wetland Type	Bottomland Hardwood Forest	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM3	Date of Assessment	190828
Wetland Type	Seep	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	NA
	Sub-surface Storage and Retention	Condition	NA
Water Quality	Pathogen Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Particulate Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Soluble Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Physical Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**LOW**
	Landscape Patch Structure	Condition	**LOW**
	Vegetation Composition	Condition	**LOW**

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM4	Date of Assessment	190828
Wetland Type	Bottomland Hardwood Forest	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM5	Date of Assessment	190828
Wetland Type	Bottomland Hardwood Forest	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

Function	Sub-function	Metrics	Rating
Hydrology	Surface Storage and Retention	Condition	**HIGH**
	Sub-surface Storage and Retention	Condition	**MEDIUM**
Water Quality	Pathogen Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**YES**
	Particulate Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**YES**
	Soluble Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**YES**
	Physical Change	Condition	**HIGH**
		Condition/Opportunity	**HIGH**
		Opportunity Presence (Y/N)	**YES**
	Pollution Change	Condition	NA
		Condition/Opportunity	NA
		Opportunity Presence (Y/N)	NA
Habitat	Physical Structure	Condition	**HIGH**
	Landscape Patch Structure	Condition	**LOW**
	Vegetation Composition	Condition	**HIGH**

Function Rating Summary

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

Overall Wetland Rating **HIGH**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM6	Date of Assessment	190828
Wetland Type	Bottomland Hardwood Forest	Assessor Name/Organization	Smith/Keith - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	WAM7	Date of Assessment	200810
Wetland Type	Headwater Forest	Assessor Name/Organization	Jernigan - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

NC WAM Wetland Rating Sheet
Accompanies User Manual Version 5.0

Wetland Site Name	JH-WAM9	Date of Assessment	190828
Wetland Type	Headwater Forest	Assessor Name/Organization	Perkinson - Axiom

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

Sub-function Rating Summary

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

Function Rating Summary

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

Overall Wetland Rating **LOW**

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NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11

Date: 8/24/19	**Project/Site:** Sandy Ridge	**Latitude:** 35.918964
Evaluator: Smith + Keith	**County:** Guilford	**Longitude:** -79.636172
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 15.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** Climax, NC *e.g. Quad Name:*

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

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

B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 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:

Ephemeral channel draining into Wetland AH and pond. More so drainagee patterns in a wetland. Located south side of N Prong Stinking Quarter.

SWIT-3

6 UT-

NC Division of Water Quality –Methodology for Identification of Intermittent and Perennial Streams and Their Origins v. 4.11

NC DWQ Stream Identification Form Version 4.11 UT to UT 13 SWIT21 = Sample 1

Date: 8/29/19	**Project/Site:** Dry Ridge	35.919912
Evaluator: Smith + Keith	Guilford	-79.650941
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 30.75	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	Climax *e.g. Quad Name:*

A. Geomorphology (Subtotal = 15.5)	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

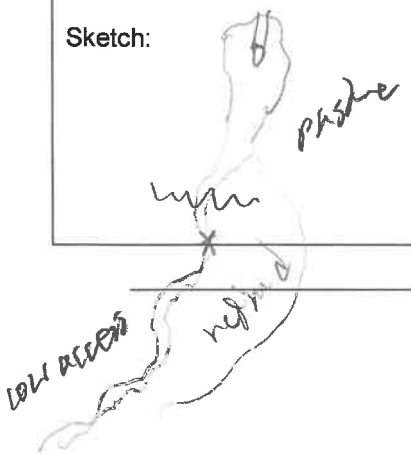
B. Hydrology (Subtotal = 8)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 7.25)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes: Sirens, worm, left-handed snail

Sketch:



SWIT- 4

NC DWQ Stream Identification Form Version 4.11

UT-1 (3) Main

Date: 8/30/2019	**Project/Site:** Sandy Ridge	**Latitude:** 35.925152
Evaluator: Radecki / Axiom	**County:** Guilford	**Longitude:** -79.650229
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 27.5	**Stream Determination (circle one)** Ephemeral **Intermittent** Perennial	**Other** Climax *e.g. Quad Name:*

A. Geomorphology (Subtotal = 15)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

B. Hydrology (Subtotal = 6)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 4)				
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:

SWIT-5

NC DWQ Stream Identification Form Version 4.11 UT-2

Date: 8/30/2019	**Project/Site:** Sandy Ridge	**Latitude:** 35.925550
Evaluator: Rapecki / Axiom	**County:** Guilford	**Longitude:** -79.649537
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 24.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Climax

A. Geomorphology (Subtotal = 10.5)	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:

UT 5 - Per. origin

NC DWQ Stream Identification Form Version 4.11

Date: 6/01/2021	**Project/Site:** Stinking Quarter	**Latitude:** 35.920205
Evaluator: Perkinson/Harris/D. Lewis	**County:** Guilford	**Longitude:** -79.653036
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 37.5	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* Climax

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 = 10.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	(0.5)	1	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		(Yes = 3)	

C. Biology (Subtotal = 7.5)				
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: frogs, several fish species, salamander, snails

Sketch: First cobble riffle below fence line
Steep cut banks 2-3'

UT - B - Int

NC DWQ Stream Identification Form Version 4.11

Date: 06/02/2021	**Project/Site:** Stinking Quarter	**Latitude:** 35.919392
Evaluator: Perkinson/Harris/D. Lewis	**County:** Guilford	**Longitude:** -79.652705
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 29.5	**Stream Determination (circle one)** Ephemeral (Intermittent) Perennial	**Other** *e.g. Quad Name:* Climax

A. Geomorphology (Subtotal = 12.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	(1)	2	3
2. Sinuosity of channel along thalweg	0	1	(2)	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	(1)	2	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	0	(1)	2	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	0	(1)	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = 0		Yes = 3	

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

B. Hydrology (Subtotal = 10)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	(1)	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	0.5	(1)	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 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: frogs, crayfish burrow - sand, mud, clay

Sketch: Immediately below significant root headcut
Large debris pile DS where trapping sediment & cons crossing. Generally incised w/ cattle access

SWIT-9

NC DWQ Stream Identification Form Version 4.11

UT-3

Date: 8/30/2019	**Project/Site:** Sand Ridge	**Latitude:** 35.922089
Evaluator: Radecki / Axiom	**County:** Guilford	**Longitude:** -79.64367
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 26	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** Climax *e.g. Quad Name:*

A. Geomorphology (Subtotal = 13)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

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

C. Biology (Subtotal = 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:

SWIT - 10

NC DWQ Stream Identification Form Version 4.11

UT-10

Date: 8/30/2019	**Project/Site:** Sandy Ridge	**Latitude:** 35.917734
Evaluator: RADECKI	**County:** Guilford	**Longitude:** -79.644939
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 22.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** Climax *e.g. Quad Name:*

A. Geomorphology (Subtotal = 9.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	2	3
2. Sinuosity of channel along thalweg	0	1	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	2	3
4. Particle size of stream substrate	0	1	2	3
5. Active/relict floodplain	0	1	2	3
6. Depositional bars or benches	0	1	2	3
7. Recent alluvial deposits	0	1	2	3
8. Headcuts	0	1	2	3
9. Grade control	0	0.5	1	1.5
10. Natural valley	0	0.5	1	1.5
11. Second or greater order channel	No = 0		Yes = 3	

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

B. Hydrology (Subtotal = 7)				
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:

SWIT # 11

NC DWQ Stream Identification Form Version 4.11

UT-15

Date: 8/10/20	**Project/Site:** Stinking Quarter	**Latitude:** 35.926712
Evaluator: Jernigan / Axiom	**County:** Guilford	**Longitude:** -79.630999
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 20.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 7.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank DITCH	(0)	1	2	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	(2)	3
4. Particle size of stream substrate	0	(1)	2	3
5. Active/relict floodplain	(0)	1	2	3
6. Depositional bars or benches	0	(1)	2	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	(0)	0.5	1	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = (0)		Yes = 3	

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

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

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

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

Notes: Amphipods + 1 Crayfish found

Sketch:

SWIT #12

NC DWQ Stream Identification Form Version 4.11

UT-12

Date: 8/10/20	**Project/Site:** Stinking Quarter	**Latitude:** 35.922934
Evaluator: Terrigar / Axiom	**County:**	**Longitude:** -79.635313
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 32.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 14.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank	0	1	(2)	3
2. Sinuosity of channel along thalweg	0	(1)	2	3
3. In-channel structure: ex. riffle-pool, step-pool, ripple-pool sequence	0	1	←(2)	3
4. Particle size of stream substrate	0	1	(2)	3
5. Active/relict floodplain	0	1	(2)	3
6. Depositional bars or benches	0	1	(2)	3
7. Recent alluvial deposits	0	(1)	2	3
8. Headcuts	(0)	1	2	3
9. Grade control	0	0.5	(1)	1.5
10. Natural valley	0	0.5	1	(1.5)
11. Second or greater order channel	No = (0)		Yes = 3	

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

B. Hydrology (Subtotal = 11)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	0	1	(2)	3
14. Leaf litter	(1.5)	1	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = (3)	

C. Biology (Subtotal = 7)				
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: Amphipods

Sketch:

SWIT #13

UT-19

NC DWQ Stream Identification Form Version 4.11

Date: 8/10/20	**Project/Site:** Stinking Quarter	**Latitude:** 35.922555
Evaluator: Jernigan / Axiom	**County:** Guilford	**Longitude:** -79.627964
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.5	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 8.5)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank Ditch	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 = 4.5)				
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: Riffle beetles, Amphipods, + several fish

Sketch:

SW #14

NC DWQ Stream Identification Form Version 4.11

UT-18

Date: 8/10/20	**Project/Site:** Stinking Quarter	**Latitude:** 35.924970
Evaluator: Jernigan / Axiom	**County:** Guilford	**Longitude:** -79.628653
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 18	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:*

A. Geomorphology (Subtotal = 6)	Absent	Weak	Moderate	Strong
1[a]. Continuity of channel bed and bank Ditch	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 = 4)				
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 determined to be intermittent. Geomorphology not scored due to channel ditched.

Pic. 014

UT-4 - P

NC DWQ Stream Identification Form Version 4.11

Date: 6/02/2021	**Project/Site:** stinking quarter	**Latitude:** 35.922641
Evaluator: Perkinson/Harris/D.Lewis	**County:** Guilford	**Longitude:** -79.69262
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 36	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Climax

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

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

Notes: beetles, tadpoles, salamander

Sketch: Major debris pile/log jam above fence
Silt accumulation - heavy cattle use immediately upstream
looks like contributing significant erosion + runoff

UT-16 P

NC DWQ Stream Identification Form Version 4.11

Date: 6/02/2021	**Project/Site:** Stinking Quarter	**Latitude:** 35.924829
Evaluator: Perkinson/Harris/D. Lewis	**County:** Guilford	**Longitude:** -79.631959
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:* Climax

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 = 5.5)				
12. Presence of Baseflow	0	1	2	(3)
13. Iron oxidizing bacteria	(0)	1	2	3
14. Leaf litter	1.5	(1)	0.5	0
15. Sediment on plants or debris	0	0.5	(1)	1.5
16. Organic debris lines or piles	0	(0.5)	1	1.5
17. Soil-based evidence of high water table?	(No = 0)		Yes = 3	

C. Biology (Subtotal = 9.25)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. 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: Damselfly, midge larvae, caddis fly

Sketch: Rocky waterfall area below Dam

HT-1-P below pond

NC DWQ Stream Identification Form Version 4.11

Date: 6/02/2021	**Project/Site:** Staking Quarter	**Latitude:** 35.924949
Evaluator: Perkinson/Hart/D.Lewis	**County:** Guilford	**Longitude:** -79.649484
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 38.25	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* Climax

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 = 9.75)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	(3)	2	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	0	(0.5)	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes: Tadpoles, snails, frogs, 2 salamander

Sketch: Current drought conditions

UT 13 - I

NC DWQ Stream Identification Form Version 4.11

Date: 6/02/2021	Project/Site: Stinking Quarter	Latitude: 35.920898
Evaluator: Perkinson/Harris/D. Lewis	County: Guilford	Longitude: -79.632022
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.75	Stream Determination (circle one) Ephemeral (Intermittent) Perennial	Other *e.g. Quad Name:* Climax

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

C. Biology (Subtotal = 2.75)				
18. Fibrous roots in streambed	3	2	(1)	0
19. Rooted upland plants in streambed	3	2	(1)	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	(0)	0.5	1	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes:

Sketch: Major Headcuts
Head[illegible] incised
Drought conditions
Undercutting

UT-9-Per

NC DWQ Stream Identification Form Version 4.11

Date: 6/1/2021	**Project/Site:** Stinking quarter	**Latitude:** 35.917073
Evaluator: Perkinson/Harris/D. Lewis	**County:** Guilford	**Longitude:** -79.648597
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34.75	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* Climax

A. Geomorphology (Subtotal = 18)	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 = 7.75)				
18. Fibrous roots in streambed	(3)	2	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	0	(1)	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	(1)	1.5
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	FACW = (0.75); OBL = 1.5 Other = 0			

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

Notes: Snails, frogs, beetles

Sketch: Heavy cattle use, incised
Drought conditions, strong baseflow

UT - 14 - P

NC DWQ Stream Identification Form Version 4.11

Date: 6/2/2021	**Project/Site:** Stinking Quarter	**Latitude:** 35.921048
Evaluator: Perkinson/Harris/D. Lewis	**County:** Guilford	**Longitude:** -79.631772
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 34.75	**Stream Determination (circle one)** Ephemeral Intermittent (Perennial)	**Other** *e.g. Quad Name:* Climax

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 = 6.25)				
18. Fibrous roots in streambed	3	(2)	1	0
19. Rooted upland plants in streambed	3	(2)	1	0
20. Macrobenthos (note diversity and abundance)	(0)	1	2	3
21. Aquatic Mollusks	(0)	1	2	3
22. Fish	(0)	0.5	1	1.5
23. Crayfish	(0)	0.5	1	1.5
24. Amphibians	0	0.5	1	(1.5)
25. Algae	(0)	0.5	1	1.5
26. Wetland plants in streambed	(FACW = 0.75) OBL = 1.5 Other = 0			

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

Notes: lots of frogs, good baseflow below headcut

Sketch: deposition at root grade control
zone - moderate iron oxide
very sandy/gravel bottom

UT-7-Int

NC DWQ Stream Identification Form Version 4.11

Date: 6/01/2021	**Project/Site:** Stinking Quarter	**Latitude:** 35.921512
Evaluator: Perkuson/Horns/D. Lewis	**County:** Guilford	**Longitude:** -79.651546
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 21.75	**Stream Determination (circle one)** Ephemeral Intermittent Perennial	**Other** *e.g. Quad Name:* Climax

A. Geomorphology (Subtotal = 13.5)	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 = 3)				
12. Presence of Baseflow	0	1	2	3
13. Iron oxidizing bacteria	0	1	2	3
14. Leaf litter	1.5	1	0.5	0
15. Sediment on plants or debris	0	0.5	1	1.5
16. Organic debris lines or piles	0	0.5	1	1.5
17. Soil-based evidence of high water table?	No = 0		Yes = 3	

C. Biology (Subtotal = 5.25)				
18. Fibrous roots in streambed	3	2	1	0
19. Rooted upland plants in streambed	3	2	1	0
20. Macrobenthos (note diversity and abundance)	0	1	2	3
21. Aquatic Mollusks	0	1	2	3
22. Fish	0	0.5	1	1.5
23. Crayfish	0	0.5	1	1.5
24. Amphibians	0	0.5	1	1.5
25. Algae	0	0.5	1	1.5
26. Wetland plants in streambed	FACW = 0.75; OBL = 1.5 Other = 0			

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

Notes: Beetle, mosquito larvae, worm, snail

Sketch: Boring reveals gray sand layer - did not hit hydric - [illegible]

Ut - 11 - P

NC DWQ Stream Identification Form Version 4.11

Date: 6/2/2021	**Project/Site:** Staking Quarter	**Latitude:** 35.920606
Evaluator: Perkinson/Harris/D.Lea	**County:** Guilford	**Longitude:** -79.634319
Total Points: *Stream is at least intermittent if ≥ 19 or perennial if ≥ 30** 32	**Stream Determination (circle one)** Ephemeral Intermittent ~~Perennial~~	**Other** *e.g. Quad Name:* Climax

A. Geomorphology (Subtotal = 15.5)	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 = 10.5)				
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: Crayfish, Snail, frogs

Sketch: Baseflow in drought conditions
Heavily forested
incised 2-3'

Site		Stinking Quarter Mitigation Site						
Stream		UT1			Bank Length		10742	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	129	right	Low	Low	0	129	1	0.0
2	390	right	Low	Low	0	261	2	0.0
3	531	right	High	Low	0.01	141	3	4.2
4	644	right	Low	Low	0	113	1	0.0
5	904	right	Very High	Mod	0.8	260	4	832.0
6	1263	right	Low	Low	0	359	1	0.0
7	1651	right	Low	Low	0	388	2	0.0
8	1933	right	Mod	Low	0.02	282	2	11.3
9	2359	right	High	Mod	0.15	426	4	255.6
10	2654	right	Mod	Low	0.02	295	2	11.8
11	2819	right	Low	Low	0	165	2	0.0
12	2962	right	High	Mod	0.15	143	2	42.9
13	3190	right	High	Mod	0.15	228	3	102.6
14	3312	right	Very High	Mod	0.8	122	4	390.4
15	3444	right	High	Low	0.01	132	3	4.0
16	3574	right	Mod	Mod	0.8	130	3	312.0
17	3807	right	Low	Low	0	233	2	0.0
18	3875	right	Mod	Low	0.02	68	3	4.1
19	3968	right	Mod	Low	0.02	93	4	7.4
20	4081	right	Low	Low	0	113	3	0.0
21	4285	right	Mod	Low	0.02	204	3	12.2
22	4365	right	High	Mod	0.15	80	3	36.0
23	5371	right	Mod	Low	0.02	1006	4	80.5
24								
26	129	left	Low	Low	0	129	1	0.0
27	390	left	Low	Low	0	261	2	0.0
28	531	left	High	Low	0.01	141	3	4.2
29	644	left	Low	Low	0	113	1	0.0
30	904	left	Very High	Mod	0.8	260	4	832.0
31	1263	left	Low	Low	0	359	1	0.0
32	1651	left	Low	Low	0	388	2	0.0
33	1933	left	Mod	Low	0.02	282	2	11.3
34	2359	left	High	Mod	0.15	426	4	255.6
35	2654	left	Mod	Low	0.02	295	2	11.8
36	2819	left	Low	Low	0	165	2	0.0
37	2962	left	High	Mod	0.15	143	2	42.9
38	3190	left	High	Mod	0.15	228	3	102.6
39	3312	left	Very High	Mod	0.8	122	4	390.4
40	3444	left	High	Low	0.01	132	3	4.0
41	3574	left	Mod	Mod	0.05	130	3	19.5
42	3807	left	Low	Low	0	233	2	0.0
43	3875	left	Mod	Low	0.02	68	3	4.1
44	3968	left	Mod	Low	0.02	93	4	7.4
45	4081	left	Low	Low	0	113	3	0.0
46	4285	left	Mod	Low	0.02	204	3	12.2
47	4365	left	High	Mod	0.15	80	3	36.0
48	5371	left	Mod	Low	0.02	1006	4	80.5
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		3921.5
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		145.2
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		188.8
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.018

Site		Stinking Quarter Mitigation Site						
Stream		UT 2			Bank Length		350	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	175	right	Low	Low	0	175	1	0.0
2								
3	175	left	Low	Low	0	175	1	0.0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 3			Bank Length		470	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	27	right	Low	Low	0	27	1	0.0
2	136	right	High	Mod	0.15	109	2	32.7
3	235	right	High	Low	0.1	99	1	9.9
4								
5	27	left	Low	Low	0	27	1	0.0
6	136	left	Mod	Low	0.15	109	2	32.7
7	235	left	Low	Low	0.1	99	1	9.9
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		85.2
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		3.2
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		4.1
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.009

Site		Stinking Quarter Mitigation Site						
Stream		UT 4			Bank Length		60	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	30	right	Low	Low	0	30	1	0.0
2								
3	30	left	Low	Low	0	30	1	0.0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 5			Bank Length		8644	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	186	right	Low	Low	0	186	2	0.0
2	630	right	Mod	Low	0.02	444	3	26.6
3	830	right	Mod	Low	0.02	200	2	8.0
4	854	right	High	Low	0.1	24	3	7.2
5	925	right	High	Low	0.1	71	4	28.4
6	1186	right	Mod	Low	0.02	261	3	15.7
7	1482	right	Mod	Low	0.02	296	2	11.8
8	1596	right	Mod	Mod	0.05	114	4	22.8
9	1850	right	Low	Low	0	254	4	0.0
10	2227	right	High	Mod	0.15	377	4	226.2
11	2545	right	Mod	Low	0.02	318	4	25.4
12	2765	right	Mod	Low	0.02	220	3	13.2
13	2928	right	High	Mod	0.15	163	4	97.8
14	3061	right	High	Mod	0.15	133	3	59.9
15	3138	right	High	Low	0.1	77	3	23.1
16	3241	right	High	Mod	0.15	103	4	61.8
17	3447	right	High	Mod	0.15	206	3	92.7
18	3627	right	Low	Low	0	180	2	0.0
19	3975	right	High	Mod	0.15	348	3	156.6
20	4119	right	Mod	Low	0.02	144	3	8.6
21	4322	right	Low	Low	0	203	2	0.0
22								
23	186	left	Low	Low	0	186	2	0.0
24	630	left	Mod	Low	0.02	444	3	26.6
25	830	left	Mod	Low	0.02	200	2	8.0
26	854	left	High	Low	0.1	24	3	7.2
27	925	left	High	Low	0.1	71	4	28.4
28	1186	left	Mod	Low	0.02	261	3	15.7
29	1482	left	Mod	Low	0.02	296	2	11.8
30	1596	left	Mod	Mod	0.05	114	4	22.8
31	1850	left	Low	Low	0	254	4	0.0
32	2227	left	High	Mod	0.15	377	4	226.2
33	2545	left	Mod	Low	0.02	318	4	25.4
34	2765	left	Mod	Low	0.02	220	3	13.2
35	2928	left	High	Mod	0.15	163	4	97.8
36	3061	left	High	Mod	0.15	133	3	59.9
37	3138	left	High	Low	0.1	77	3	23.1
38	3241	left	High	Mod	0.15	103	4	61.8
39	3447	left	High	Mod	0.15	206	3	92.7
40	3627	left	Low	Low	0	180	2	0.0
41	3975	left	High	Mod	0.15	348	3	156.6
42	4119	left	Mod	Low	0.02	144	3	8.6
43	4322	left	Low	Low	0	203	2	0.0
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		1771.7
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		65.6
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		85.3
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.010

Site		Stinking Quarter Mitigation Site						
Stream		UT 6			Bank Length		1256	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	213	right	Low	Low	0	213	1	0.0
2	383	right	High	Low	0.01	170	3	5.1
3	597	right	Mod	Low	0.02	214	3	12.8
4	628	right	Low	Low	0	31	1	0.0
5								
6	213	left	Low	Low	0	213	1	0.0
7	383	left	High	Low	0.01	170	3	5.1
8	597	left	Mod	Low	0.02	214	3	12.8
9	628	left	Low	Low	0	31	1	0.0
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		35.9
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		1.3
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		1.7
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.001

Site		Stinking Quarter Mitigation Site						
Stream		UT 7			Bank Length		174	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	44	right	High	Low	0.1	44	2	8.8
2	87	right	Low	Low	0	43	1	0.0
3								
4	44	left	High	Low	0.1	44	2	8.8
5	87	left	Low	Low	0	43	1	0.0
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		17.6
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.7
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.8
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.005

Site		Stinking Quarter Mitigation Site						
Stream		UT 9			Bank Length		1646	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	405	right	High	Low	0.1	405	3	121.5
2	569	right	Mod	Low	0.02	164	3	9.8
3	823	right	Mod	Low	0.02	254	2	10.2
4								
5	405	left	High	Low	0.1	405	3	121.5
6	569	left	Mod	Low	0.02	164	3	9.8
7	823	left	Mod	Low	0.02	254	2	10.2
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		283.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		10.5
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		13.6
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.008

Site		Stinking Quarter Mitigation Site						
Stream		UT 10			Bank Length		366	
Observers		AEK			Date		29-Aug-19	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	108	right	Mod	Low	0.02	108	2	4.3
2	183	right	Low	Low	0	75	1	0.0
3								
4	108	left	Mod	Low	0.02	108	2	4.3
5	183	left	Low	Low	0	75	1	0.0
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		8.6
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.3
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.4
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.001

Site		Stinking Quarter Mitigation Site						
Stream		UT 11			Bank Length		470	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	235	right	Low	Low	0	235	1	0.0
2								
3	235	left	Low	Low	0	235	1	0.0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 12			Bank Length		218	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	34	right	Low	Low	0	34	1	0.0
2	109	right	High	Low	0.1	75	3	22.5
3								
4	34	left	Low	Low	0.02	34	1	0.7
5	109	left	High	Low	0.1	75	3	22.5
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		45.7
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		1.7
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		2.2
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.010

Site		Stinking Quarter Mitigation Site						
Stream		UT 14			Bank Length		324	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	162	right	Low	Low	0	162	2	0.0
2								
3	162	left	Low	Low	0	162	2	0.0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 15			Bank Length		3200	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	93	right	Mod	Low	0.02	93	4	7.4
2	493	right	High	Mod	0.15	400	4	240.0
3	578	right	High	High	0.2	85	4	68.0
4	668	right	Low	Low	0	90	1	0.0
5	738	right	Low	Low	0	70	2	0.0
6	785	right	Mod	Low	0.02	47	3	2.8
7	983	right	High	Mod	0.15	198	4	118.8
8	1033	right	Mod	Low	0.02	50	3	3.0
9	1118	right	High	Mod	0.15	85	3	38.3
10	1216	right	Low	Low	0	98	3	0.0
11	1442	right	Low	Low	0	226	2	0.0
12	1475	right	Mod	Low	0.02	33	3	2.0
13	1526	right	Low	Low	0	51	3	0.0
14	1558	right	Mod	Low	0.02	32	3	1.9
15	1619	right	Low	Low	0	61	3	0.0
16								
17	93	left	Mod	Low	0.02	93	4	7.4
18	145	left	High	Low	0.1	52	5	26.0
19	494	left	High	Mod	0.15	349	4	209.4
20	579	left	High	High	0.2	85	4	68.0
21	669	left	Low	Low	0	90	1	0.0
22	739	left	Low	Low	0	70	2	0.0
23	786	left	Mod	Low	0.02	47	3	2.8
24	984	left	High	Mod	0.15	198	4	118.8
25	1034	left	Low	Low	0	50	3	0.0
26	1119	left	High	Mod	0.15	85	3	38.3
27	1217	left	Low	Low	0	98	3	0.0
28	1476	left	Low	Low	0	259	2	0
29	1513	left	Mod	Low	0.02	37	3	2.22
30	1581	left	Low	Low	0	68	3	0
31	1620	left	High	Low	0.1	39	3	11.7
32								
33								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		966.8
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		35.8
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		46.6
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.015

Site		Stinking Quarter Mitigation Site						
Stream		UT 16			Bank Length		690	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	113	right	Low	Low	0	113	1	0.0
2	176	right	High	Mod	0.15	63	3	28.4
3	245	right	Mod	Low	0.02	69	3	4.1
4	345	right	High	High	0.2	100	4	80.0
5								
6	113	left	Low	Low	0	113	1	0.0
7	176	left	High	Mod	0.15	63	3	28.4
8	245	left	Mod	Low	0.02	69	3	4.1
9	345	left	High	High	0.2	100	4	80.0
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		225.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		8.3
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		10.8
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.016

Site		Stinking Quarter Mitigation Site						
Stream		UT 17			Bank Length		1598	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	283	right	Low	Low	0	283	1	0.0
2	321	right	Mod	Low	0.02	38	3	2.3
3	449	right	Low	Low	0	128	2	0.0
4	488	right	High	Low	0.1	39	2	7.8
5	778	right	Low	Low	0	290	2	0.0
6	799	right	High	Low	0.1	21	2	4.2
7								
8	283	left	Low	Low	0	283	1	0.0
9	321	left	Mod	Low	0.02	38	3	2.3
10	449	left	Low	Low	0	128	2	0.0
11	488	left	High	Low	0.1	39	2	7.8
12	756	left	Low	Low	0	268	2	0.0
13	776	left	High	Low	0.1	20	2	4.0
14	799	left	Low	Low	0	23	2	0.0
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		28.4
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		1.1
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		1.4
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.001

Site		Stinking Quarter Mitigation Site						
Stream		UT 18			Bank Length		360	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	180	right	Low	Low	0	180	1	0.0
2								
3								
4								
5								
6								
7	180	left	Low	Low	0	180	1	0.0
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 19			Bank Length		516	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	258	right	Low	Low	0	258	2	0.0
2								
3	258	left	Low	Low	0	258	2	0.0
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		0.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		0.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		0.0
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.000

Site		Stinking Quarter Mitigation Site						
Stream		UT 20			Bank Length		1814	
Observers		KRJ			Date		8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	330	right	High	Mod	0.15	330	5	247.5
2	560	right	High	Low	0.1	230	4	92.0
3	907	right	Low	Low	0	347	2	0.0
4								
5	330	left	High	Mod	0.15	330	5	247.5
6	560	left	High	Low	0.1	230	4	92.0
7	907	left	Low	Low	0	347	2	0.0
8								
9								
10								
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		679.0
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		25.1
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		32.7
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.018

Site		Sandy Ridge Mitigation Site						
Stream		North Prong Stinking Quarter Cre				Bank Length	7747	
Observers		AEK				Date	8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	217	right	Low	Low	0	217	2	0.0
2	294	right	High	Low	0.1	77	4	30.8
3	416	right	Mod	Low	0.02	122	4	9.8
4	522	right	High	Mod	0.15	106	4	63.6
5	685	right	Mod	Mod	0.05	163	4	32.6
6	894	right	Mod	Low	0.02	209	4	16.7
7	1063	right	Low	Low	0	169	4	0.0
8	1162	right	High	Low	0.1	99	4	39.6
9	1469	right	Mod	Low	0.02	307	4	24.6
10	1611	right	Mod	Low	0.02	142	3	8.5
11	1769	right	High	Low	0.1	158	4	63.2
12	1935	right	Mod	Low	0.02	166	4	13.3
13	4294	right	Low	Low	0	2359	3	0.0
14	4444	right	Mod	Low	0.02	150	3.5	10.5
15	5288	right	High	Low	0.1	844	3.5	295.4
16	5651	right	Mod	Low	0.02	363	4	29.0
17	5719	right	High	Mod	0.15	68	4	40.8
18	6283	right	Mod	Low	0.02	564	3	33.8
19	6312	right	High	Mod	0.15	29	4	17.4
20	6667	right	Mod	Low	0.02	355	3	21.3
21	6710	right	High	Mod	0.15	43	4	25.8
22	7747	right	Mod	Low	0.02	1037	3	62.2
23								
24								
25								
26								
27								
28								
29								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		838.9
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		31.1
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		40.4
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.005

Site		Sandy Ridge Mitigation Site						
Stream		North Prong Stinking Quarter Cre				Bank Length	7747	
Observers		KRJ				Date	8-Jun-20	
	Station	Bank	BEHI	NBS	Erosion Rate	Length	Bank Height	Erosion
1	217	left	Low	Low	0	217	2	0.0
2	294	left	High	Low	0.1	77	4	30.8
3	416	left	Mod	Low	0.02	122	4	9.8
4	522	left	High	Mod	0.15	106	4	63.6
5	685	left	Mod	Mod	0.05	163	4	32.6
6	894	left	Mod	Low	0.02	209	4	16.7
7	1063	left	Low	Low	0	169	4	0.0
8	1162	left	High	Low	0.1	99	4	39.6
9	1469	left	Mod	Low	0.02	307	4	24.6
10	1611	left	Mod	Low	0.02	142	3	8.5
11	1769	left	High	Low	0.1	158	4	63.2
12	1935	left	Mod	Low	0.02	166	4	13.3
13	4294	left	Low	Low	0	2359	3	0.0
14	4444	left	Mod	Low	0.02	150	3.5	10.5
15	5288	left	High	Low	0.1	844	3.5	295.4
16	5607	left	Mod	Low	0.02	319	4	25.5
17	5651	left	Very High	Mod	0.8	44	4	140.8
18	6241	left	Mod	Low	0.02	590	3	35.4
19	6275	left	High	Mod	0.15	34	4	20.4
20	6581	left	Mod	Low	0.02	306	3	18.4
21	6629	left	High	Mod	0.15	48	4	28.8
22	7747	left	Mod	Low	0.02	1118	3	67.1
23								
24								
25								
26								
27								
28								
29								
Sum erosion sub-totals for each BEHI/NBS						Total Erosion (ft3/yr)		944.9
Divide total erosion (ft3) by 27						Total Erosion (yd/yr)		35.0
Multiply Total erosion (yard3) by 1.3						Total Erosion (tons/yr)		45.5
Erosion per unit length						Total Erosion (Tons/yr/ft)		0.006

BEHI/NBS Summary

Stream Reach	Erosion Rate (tons/year)
UT 1	188.8
UT 2	0.0
UT 3	4.1
UT 4	0.0
UT 5	85.3
UT 6	1.7
UT 7	0.8
UT 9	13.6
UT 10	0.4
UT 11	0.0
UT 12	2.2
UT 14	0.0
UT 15	46.6
UT 16	10.8
UT 17	1.4
UT 18	0.0
UT 19	0.0
UT 20	32.7
North Prong Stinking Quarter Creek	85.9
Total	**474.4**

AXIOM ENVIRONMENTAL, INC
218 Snow Avenue
Raleigh, North Carolina 27603
919-215-1693

Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/28/2019

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile A (35.923012, -79.644567)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-2	10 YR 4/2	100					sandy loam
2-8	10 YR 5/1	95	10 YR 4/4	5	C	PL	sandy loam
8-10	10 YR 4/2	60	10 YR 4/6	3	C	M	loamy sand
	10 YR 5/1	37					
10-18	10 YR 4/2	40	10 YR 6/6	20	C	M	sand
	10 YR 7/2	40					
18 +	10 YR 6/1	80	10 YR 4/2	18	D	M	sand
			10 YR 6/6	2	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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919-215-1693

Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/28/2019

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile C (35.919828, -79.637735)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-1	10 YR 5/3	100					loam
1-7	10 YR 6/2	80	10 YR 5/2	10	D	M	sandy loam
			10 YR 7/3	7	C	M	
			10 YR 4/4	3	C	PL	
7-17	10 YR 6/2	80	10 YR 4/4	10	C	M	loamy sand
			10 YR 3/4	10	C	M	
17+	10 YR 6/1	90	10 YR 5/4	5	C	M	loamy sand
			10 YR 4/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

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Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/28/2019

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile D (35.91826, -79.648622)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-1	10 YR 4/2	97	10 YR 4/4	3	C	PL	loam
1-7	10 YR 5/2	80	10 YR 4/6	5	C	PL	sandy loam
7-16	10 YR 6/3	70	10 YR 6/1	20	D	M	clay
			10 YR 5/4	10	C	PL	
16+	10 YR 6/2	90	10 YR 4/6	7	C	M	gravely loam
			10 YR 2/1	3	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile E (35.926445, -79.631322)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-4	10 YR 3/2	100					loam
4-9	10 YR 4/2	40	10 YR 5/6	10	C	PL	loamy sand
	10 YR 5/3	40	10 YR 6/1	10	D	M	
9-11	10 YR 5/3	70	10 YR 5/6	15	C	M	sand
			10 YR 6/1	15	D	M	
11-14	10 YR 5/6	60	10 YR 6/1	35	D	M	clay
			10 YR 6/2	5	D	M	
14+	10 YR 5/3	90	10 YR 6/2	10	D	M	sand

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile F (35.923888, -79.630793)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

	Matrix		Mottling				
Depth (inches)	Color	%	Color	%	Type	Location	Texture
0-8	10 YR 5/1	70	10 YR 7/1	10	D	M	loamy sand
			10 YR 6/1	10	D	M	
			10 YR 5/6	10	C	PL	
8-14	2.5 Y 7/2	60	2.5 Y 8/3	30	C	M	loamy sand
			2.5 Y 7/6	5	C	M	
14+	2.5 Y 7/1	70	2.5 Y 7/4	20	C	M	loamy sand
			2.5 Y 4/1	10	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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919-215-1693

Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile G (35.923055, -79.63169)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling		Type	Location	Texture
	Color	%	Color	%			
0-3	10 YR 4/1	97	10 YR 5/6	3	C	PL	loamy clay
3-9	10 YR 5/1	90	10 YR 6/2	7	D	M	sandy loam
			10 YR 4/4	3	C	PL	
9-11	10 YR 5/1	40	10 YR 4/4	10	D	M	loamy sand
	10 YR 7/2	40	10 YR 4/1	10	D	PL	
11+	10 YR 6/3	70	10 YR 4/1	10	D	M	loamy sand
			10 YR 4/4	10	C	M	
			10 YR 6/6	10	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile H (35.922244, -79.34459)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling		Type	Location	Texture
	Color	%	Color	%			
0-3	10 YR 4/2	97	10 YR 5/4	3	C	PL	sandy loam
3-9	10 YR 4/2	80	10 YR 6/2	18	D	M	sandy loam
			10 YR 4/4	2	C	PL	
9+	10 YR 6/2	80	10 YR 5/1	10	D	M	sand
			10 YR 7/4	10	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

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Number: 1233

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Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile J (35.922634, -79.628955)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling		Type	Location	Texture
	Color	%	Color	%			
0-3	10 YR 5/1	90	10 YR 6/1	7	D	M	sandy loam
			10 YR 5/6	3	C	PL	
3-9	10 YR 6/1	95	10 YR 7/1	3	D	M	clay loam
			10 YR 4/6	2	C	PL	
9+	10 YR 6/2	80	10 YR 6/6	10	C	M	clay
			10 YR 4/6	10	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile K (35.922395, -79.626086)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-7	10 YR 3/1	100					fine sandy loam
7-14	10 YR 6/2	60	10 YR 4/1	30	D	M	fine sandy loam
			10 YR 6/1	5	D	M	
			10 YR 5/6	5	C	PL	
14+	10 YR 7/1	80	10 YR 6/6	20	C	M	sandy clay

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

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Name/Print: W. Grant Lewis

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SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile L (35.923756, -79.624475)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-8	10 YR 5/2	95	10 YR 6/1	3	D	M	sandy loam
			10 YR 5/6	2	C	PL	
8-14	10 YR 6/1	70	10 YR 7/1	20	D	M	loamy sand
			10 YR 4/2	5	C	M	
			10 YR 5/6	5	C	M	
14+	10 YR 7/1	80	10 YR 5/6	10	C	M	sandy loam
			10 YR 6/6	10	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

Name/Print: W. Grant Lewis

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Axiom Environmental, Inc.

SOIL BORING LOG

Date: 8/10/2020

Project/Site: Sandy Ridge

County, State: Guilford County, NC

Sampling Point/
Coordinates: **Soil Profile M (35.924931, -79.628461)**

Investigator: W. Grant Lewis

Soil Series: Chewacla Variant

Notes: Location is shown on Figure 4.

Depth (inches)	Matrix		Mottling				Texture
	Color	%	Color	%	Type	Location	
0-3	10 YR 4/2	95	10 YR 6/2	5	C	M	loamy sand
3-5	10 YR 7/2	80	10 YR 7/4	10	C	M	loamy sand
			10 YR 5/6	5	C	M	
			10 YR 4/2	5	D	M	
5-14	10 YR 5/1	90	10 YR 7/2	7	C	M	loamy sand
			10 YR 5/6	3	C	M	
14+	10 YR 7/2	70	10 YR 5/1	25	D	M	loamy sand
			10 YR 5/6	5	C	M	

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. Locaction: PL=Pore Lining, M=Matrix

North Carolina Licensed Soil Scientist

Number: 1233

Signature: W Grant Lewis

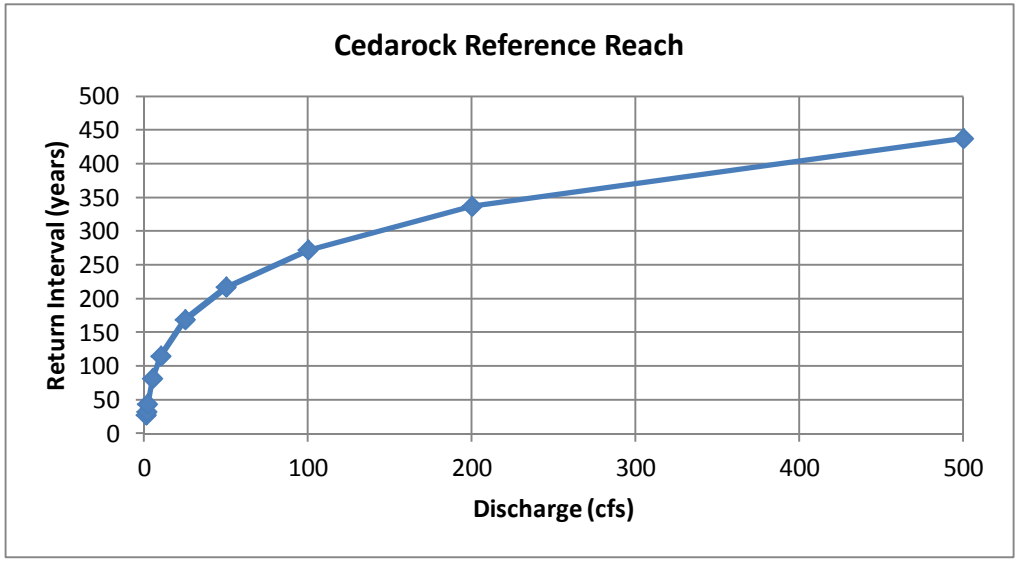
Name/Print: W. Grant Lewis

Appendix C: Flood Frequency Analysis Data

Reference Reaches
Flood Frequency Analaysis-Regional Regression Equation (USGS 2004)

Cedarock Reference Reach

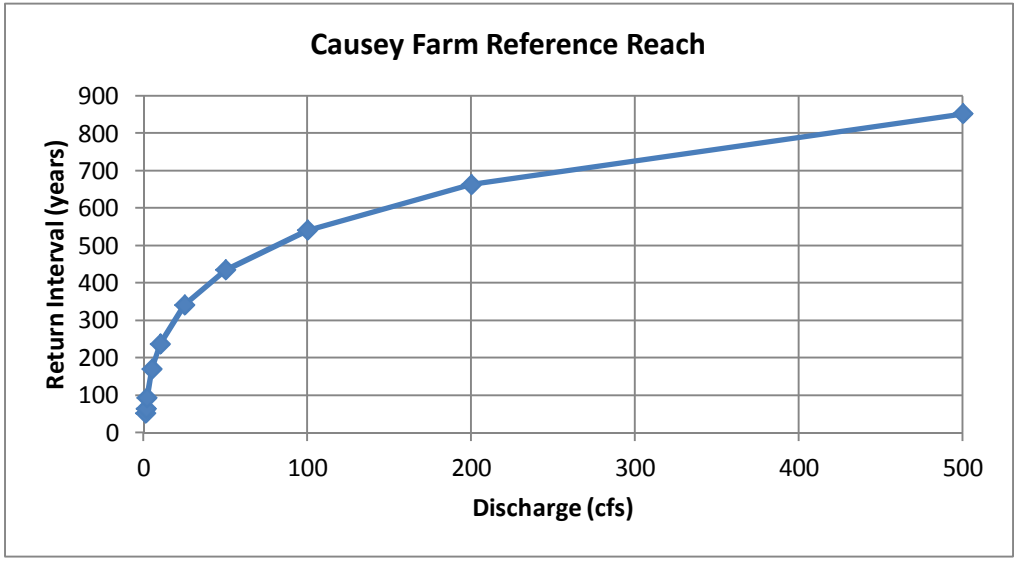
Return Interval (years)	Discharge (cfs)
1.3	**27**
1.5	**32**
2	43.6
5	81.4
10	115
25	169
50	217
100	272
200	337
500	438



Note: Bold values are interpolated.

Causey Farm Reference Reach

Return Interval (years)	Discharge (cfs)
1.3	**53**
1.5	**65**
2	94.3
5	171
10	238
25	342
50	435
100	541
200	663
500	852



Appendix D: Jurisdictional Determination Info

2021-00347

U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT

Action Id. **2021-00347** County: **Guilford** U.S.G.S. Quad: **NC-Climax**

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Requestor: **Axiom Environmental, Inc**
Grant Lewis
Address: **218 Snow Avenue**
Raleigh, NC 27603
Telephone Number: **(919) 215-1693**
E-mail: **glewis@axiomenvironmental.org**

Size (acres) **116** Nearest Town **Julian**
Nearest Waterway **North Prong Stinking Quarter Creek** River Basin **Cape Fear**
USGS HUC **03030002** Coordinates Latitude: **35.920355**
Longitude: **-79.640139**

Location description: **The Site is located off NC-62 in Julian, NC (35.9200, -79.6371).**

Indicate Which of the Following Apply:

A. Preliminary Determination

☒ **There appear to be waters, including wetlands on the above described project area/property, that may be subject to Section 404 of the Clean Water Act (CWA)(33 USC § 1344) and/or Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403). The waters, including wetlands have been delineated, and the delineation has been verified by the Corps to be sufficiently accurate and reliable. The approximate boundaries of these waters are shown on the enclosed delineation map dated 11/2/2021. Therefore, this preliminary jurisdiction determination may be used in the permit evaluation process, including determining compensatory mitigation. For purposes of computation of impacts, compensatory mitigation requirements, and other resource protection measures, a permit decision made on the basis of a preliminary JD will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional waters of the U.S. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). However, you may request an approved JD, which is an appealable action, by contacting the Corps district for further instruction.**

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

B. Approved Determination

☐ There are Navigable Waters of the United States within the above described project area/property subject to the permit requirements of Section 10 of the Rivers and Harbors Act (RHA) (33 USC § 403) and Section 404 of the Clean Water Act (CWA)(33 USC § 1344). Unless there is a change in law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

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

☐ We recommend you have the **waters, including wetlands** on your project area/property delineated. As the Corps may not be able to accomplish this wetland delineation in a timely manner, you may wish to obtain a consultant to conduct a delineation that can be verified by the Corps.

☐ The **waters, including wetlands** on your project area/property have been delineated and the delineation has been verified by the Corps. The approximate boundaries of these waters are shown on the enclosed delineation map dated **DATE**. 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 **DATE**. Unless there is a change in the law or our published regulations, this determination may be relied upon for a period not to exceed five years from the date of this notification.

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

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

Placement of dredged or fill material within waters of the US, including wetlands, without a Department of the Army permit may constitute a violation of Section 301 of the Clean Water Act (33 USC § 1311). Placement of dredged or fill material, construction or placement of structures, or work within navigable waters of the United States without a Department of the Army permit may constitute a violation of Sections 9 and/or 10 of the Rivers and Harbors Act (33 USC § 401 and/or 403). If you have any questions regarding this determination and/or the Corps regulatory program, please contact **Casey Haywood at (910) 750-7397 or Casey.M.Haywood@usace.army.mil**.

C. Basis For Determination: See the preliminary jurisdictional determination form dated 12/01/2021.

D. Remarks: *See attached Delineation Maps entitled, "Potential Jurisdictional Features" Nov. 2021*

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

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: Haywood, Casey M. Digitally signed by Haywood, Casey M. Date: 2021.12.01 11:40:22 -05'00'

Date of JD: **12/01/2021** Expiration Date of JD: **Not applicable**

PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM

BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR PJD: 12/01/2021

B. NAME AND ADDRESS OF PERSON REQUESTING PJD: Axiom Environmental, Inc, Grant Lewis, 218 Snow Avenue, Raleigh, NC 27603

C. DISTRICT OFFICE, FILE NAME, AND NUMBER: Wilmington District, Stinking Quarter, 2021-00347

D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION: The Site is located off NC-62 in Julian, NC (35.9200, -79.6371).

(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)

State: NC County: Guilford City: Julian

Center coordinates of site (lat/long in degree decimal format): Latitude: 35.920355 Longitude: -79.640139

Universal Transverse Mercator:

Name of nearest waterbody: North Prong Stinking Quarter Creek

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

☐ Office (Desk) Determination. Date:

☒ Field Determination. Date(s): November 02, 2021

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)
North Prong Stinking Quarter Creek	35.921798	-79.631779	7162 feet	Non-wetland waters	Section 404
Pond PA	35.924959	-79.649903	0.194 acres		Section 404
Pond PB	35.919509	-79.636624	1.133 acres		Section 404
Pond PC	35.919764	-79.651841	1.707 acres		Section 404
Pond PD	35.919924	-79.632446	0.151 acres		Section 404
Pond PE	35.92526	-79.632827	0.645 acres		Section 404
Pond PF	35.924706	-79.627954	0.437 acres		Section 404
Pond PG	35.920416	-79.651224	1.151 acres		Section 404
Stream UT 1	35.925146	-79.650166	43 feet	Non-wetland waters	Section 404
Stream UT 13	35.920468	-79.632195	312 feet	Non-wetland waters	Section 404
Stream UT 15	35.925796	-79.631356	781 feet	Non-wetland waters	Section 404
Stream UT 6	35.921727	-79.65205	630 feet	Non-wetland waters	Section 404
Stream UT-1	35.922525	-79.642889	5222 feet	Non-wetland waters	Section 404
Stream UT-10	35.917984	-79.645024	184 feet	Non-wetland waters	Section 404
Stream UT-11	35.920499	-79.634289	235 feet	Non-wetland waters	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.

Stream UT-12	35.922176	-79.634593	745 feet	Non-wetland waters	Section 404
Stream UT-13	35.921224	-79.631797	322 feet	Non-wetland waters	Section 404
Stream UT-14	35.920951	-79.631641	172 feet	Non-wetland waters	Section 404
Stream UT-15	35.923904	-79.630544	836 feet	Non-wetland waters	Section 404
Stream UT-16	35.924772	-79.631822	345 feet	Non-wetland waters	Section 404
Stream UT-17	35.923386	-79.628122	799 feet	Non-wetland waters	Section 404
Stream UT-18	35.924597	-79.628359	439 feet	Non-wetland waters	Section 404
Stream UT-19	35.922747	-79.627815	258 feet	Non-wetland waters	Section 404
Stream UT-2	35.925157	-79.649362	175 feet	Non-wetland waters	Section 404
Stream UT-20	35.923812	-79.62432	907 feet	Non-wetland waters	Section 404
Stream UT-3	35.922349	-79.643525	237 feet	Non-wetland waters	Section 404
Stream UT-4	35.922831	-79.642623	30 feet	Non-wetland waters	Section 404
Stream UT-5	35.91854	-79.645261	4333 feet	Non-wetland waters	Section 404
Stream UT-6	35.919787	-79.650902	99 feet	Non-wetland waters	Section 404
Stream UT-7	35.921435	-79.651684	88 feet	Non-wetland waters	Section 404
Stream UT-8	35.919468	-79.652641	79 feet	Non-wetland waters	Section 404
Stream UT-9	35.917211	-79.648297	808 feet	Non-wetland waters	Section 404
Wetland AA	35.925485	-79.633336	0.119 acres	Wetland	Section 404
Wetland AB	35.920646	-79.651666	0.01 acres	Wetland	Section 404
Wetland AC	35.918596	-79.645378	0.007 acres	Wetland	Section 404
Wetland AD	35.918797	-79.644797	0.05 acres	Wetland	Section 404
Wetland AF	35.923173	-79.64473	0.03 acres	Wetland	Section 404
Wetland AG	35.922685	-79.643131	0.006 acres	Wetland	Section 404
Wetland AH	35.919253	-79.636351	0.15 acres	Wetland	Section 404
Wetland AJ	35.920509	-79.636228	0.777 acres	Wetland	Section 404
Wetland AY	35.921326	-79.632611	0.189 acres	Wetland	Section 404
Wetland AZ	35.925093	-79.624579	0.064 acres	Wetland	Section 404
Wetland DB	35.921782	-79.632165	0.414 acres	Wetland	Section 404
Wetland GA	35.926186	-79.631357	0.029 acres	Wetland	Section 404
Wetland GAZ	35.920742	-79.637487	0.041 acres	Wetland	Section 404
Wetland GB	35.92502	-79.632304	0.638 acres	Wetland	Section 404
Wetland GBZ	35.922524	-79.631067	0.033 acres	Wetland	Section 404
Wetland GC	35.925256	-79.631543	0.067 acres	Wetland	Section 404
Wetland GCZ	35.920369	-79.651528	0.126 acres	Wetland	Section 404
Wetland GD	35.923856	-79.630405	0.08 acres	Wetland	Section 404
Wetland GDF	35.922024	-79.633987	0.054 acres	Wetland	Section 404
Wetland GDG	35.921138	-79.634738	1.869 acres	Wetland	Section 404
Wetland GE	35.923348	-79.6303	0.086 acres	Wetland	Section 404
Wetland GW	35.918373	-79.645092	1.645 acres	Wetland	Section 404
Wetland GWE	35.922814	-79.635296	0.079 acres	Wetland	Section 404
Wetland GWV	35.922722	-79.627748	1.273 acres	Wetland	Section 404
Wetland GWX	35.922207	-79.625319	4.434 acres	Wetland	Section 404
Wetland GWY	35.922879	-79.625011	0.014 acres	Wetland	Section 404
Wetland GWZ	35.925199	-79.628044	0.267 acres	Wetland	Section 404
Wetland GX	35.917061	-79.648491	1.555 acres	Wetland	Section 404
Wetland GY	35.91928	-79.652929	0.143 acres	Wetland	Section 404
Wetland GZ	35.919964	-79.652758	0.055 acres	Wetland	Section 404
Wetland HZ	35.918397	-79.650877	0.401 acres	Wetland	Section 404
Wetland JD	35.924883	-79.649119	0.67 acres	Wetland	Section 404
Wetland JE	35.924558	-79.648211	0.457 acres	Wetland	Section 404
Wetland JF	35.924018	-79.648151	0.241 acres	Wetland	Section 404
Wetland JH	35.923374	-79.646616	3.653 acres	Wetland	Section 404
Wetland JI	35.922871	-79.644781	0.138 acres	Wetland	Section 404
Wetland JJ	35.922351	-79.643547	0.004 acres	Wetland	Section 404
Wetland JK	35.921971	-79.64367	0.036 acres	Wetland	Section 404
Wetland JL	35.922097	-79.642099	0.08 acres	Wetland	Section 404
Wetland JM	35.92225	-79.641078	0.291 acres	Wetland	Section 404
Wetland JX	35.920816	-79.641973	0.598 acres	Wetland	Section 404
Wetland JY	35.919687	-79.643256	0.394 acres	Wetland	Section 404
Wetland KA	35.921246	-79.651719	0.011 acres	Wetland	Section 404
Wetland KDB	35.925069	-79.624074	0.052 acres	Wetland	Section 404
Wetland KE	35.918196	-79.646928	0.399 acres	Wetland	Section 404
Wetland KWA	35.923647	-79.628966	0.85 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.

Wetland KWB	35.923839	-79.628129	1.066 acres	Wetland	Section 404
Wetland KWC	35.922966	-79.624574	1.541 acres	Wetland	Section 404
Wetland KWD	35.92059	-79.632157	0.05 acres	Wetland	Section 404
Wetland KWE	35.920131	-79.632397	0.046 acres	Wetland	Section 404
Wetland KWH	35.920407	-79.631398	0.538 acres	Wetland	Section 404
Wetland KWI	35.92303	-79.629175	0.149 acres	Wetland	Section 404
Wetland KWJ	35.922937	-79.629444	0.02 acres	Wetland	Section 404
Wetland MA	35.924146	-79.648937	0.021 acres	Wetland	Section 404
Wetland PA	35.924518	-79.63127	0.179 acres	Wetland	Section 404
Wetland PB	35.924154	-79.630845	0.032 acres	Wetland	Section 404
Wetland PD	35.923108	-79.630244	0.044 acres	Wetland	Section 404
Wetland PQ	35.918362	-79.648522	0.072 acres	Wetland	Section 404
Wetland PR	35.918614	-79.648794	0.029 acres	Wetland	Section 404
Wetland PS	35.918698	-79.649173	0.56 acres	Wetland	Section 404
Wetland PT	35.920046	-79.642465	0.334 acres	Wetland	Section 404
Wetland PTT	35.919139	-79.649762	0.031 acres	Wetland	Section 404
Wetland PU	35.919036	-79.644371	0.033 acres	Wetland	Section 404
Wetland PUU	35.919398	-79.65016	0.091 acres	Wetland	Section 404
Wetland PV	35.919677	-79.650267	0.105 acres	Wetland	Section 404
Wetland PW	35.919888	-79.650817	0.119 acres	Wetland	Section 404
Wetland PWA	35.921391	-79.651681	0.029 acres	Wetland	Section 404
Wetland PWB	35.921849	-79.6523	0.446 acres	Wetland	Section 404
Wetland PWC	35.920245	-79.653015	0.038 acres	Wetland	Section 404
Wetland PWD	35.919383	-79.651724	0.054 acres	Wetland	Section 404
Wetland PWE	35.919567	-79.650919	0.023 acres	Wetland	Section 404
Wetland PWF	35.917732	-79.640008	0.152 acres	Wetland	Section 404
Wetland PWG	35.918287	-79.639007	0.825 acres	Wetland	Section 404
Wetland PWT	35.92018	-79.637023	0.283 acres	Wetland	Section 404
Wetland PWU	35.92473	-79.624243	0.02 acres	Wetland	Section 404
Wetland PWV	35.924218	-79.624219	0.076 acres	Wetland	Section 404
Wetland PX	35.920174	-79.63425	0.01 acres	Wetland	Section 404
Wetland PZ	35.919824	-79.635989	0.051 acres	Wetland	Section 404
Wetland PZZ	35.920987	-79.651575	0.245 acres	Wetland	Section 404
Wetland RA	35.925235	-79.649953	0.226 acres	Wetland	Section 404
Wetland RF	35.921036	-79.638696	1.841 acres	Wetland	Section 404
Wetland RG	35.918754	-79.639088	0.036 acres	Wetland	Section 404

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 are included in the administrative record and are appropriately cited:

☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:
Map: **Restoration Systems, LLC for NCDMS**

☒ Data sheets prepared/submitted by or on behalf of the PJD requestor. Datasheets:

☐ Office concurs with data sheets/delineation report.

☐ Office does not concur with data sheets/delineation report. Rationale:_____

☒ Data sheets prepared by the Corps: QL2 LiDAR & Antecedent Precipitation Tool Version 1.0

☐ 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: **Climax (1970), and Kimesville (1970), NC 7.5-minute topographic quadrangle.**

☒ Natural Resources Conservation Service Soil Survey. Citation: **Web Soil Survey (online at http://websoilsurvey.nrcs.usda.gov), and Soil Survey of Guilford County (1977)**

☐ National wetlands inventory map(s). Cite name:

☐ State/local wetland inventory map(s):_____

☐ FEMA/FIRM maps:

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

☒ Photographs: ☒ Aerial (Name & Date): **NC OneMap 2018 Orthoimagery.**

or ☐ Other (Name & Date):

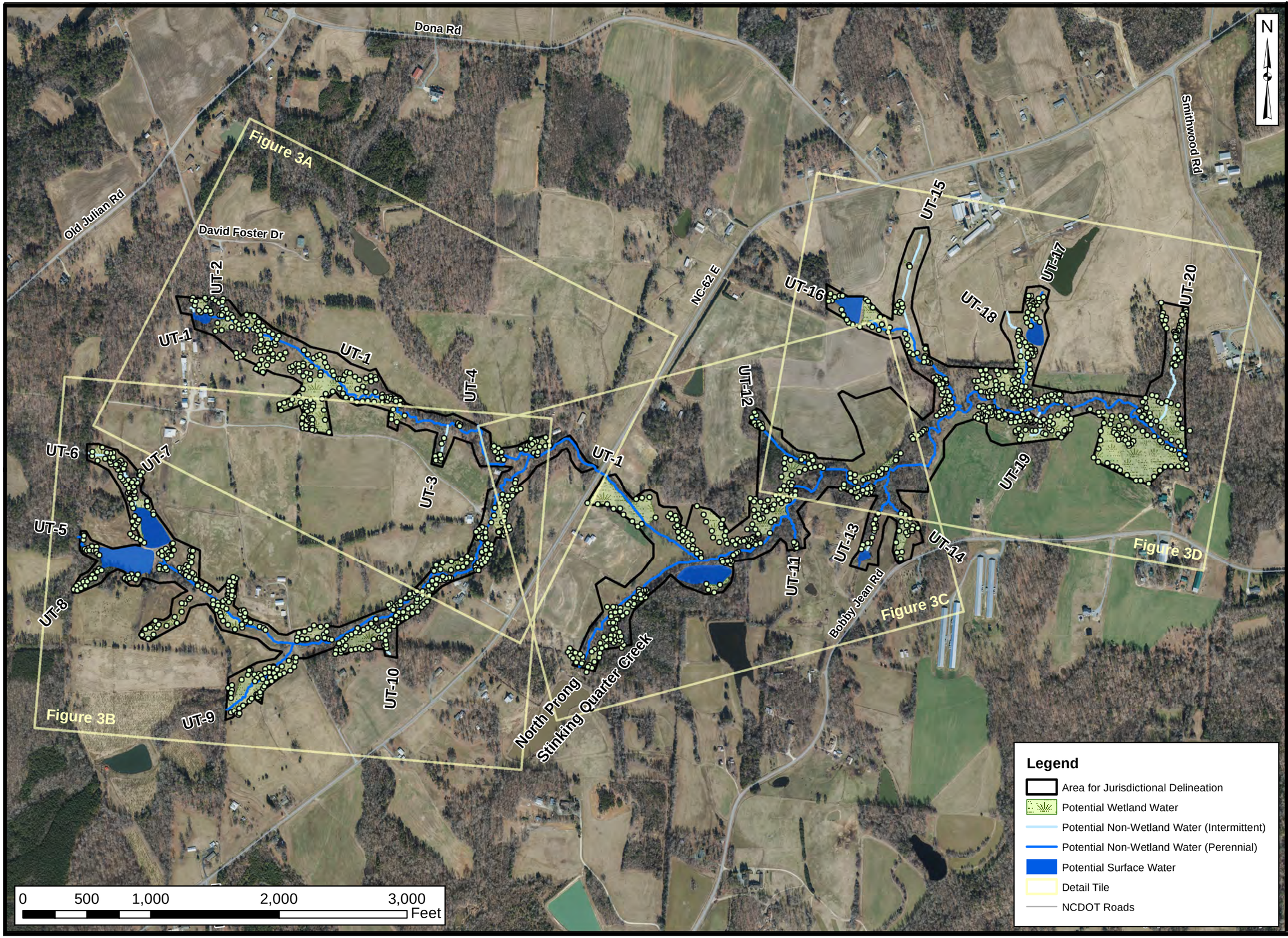
☐ Previous determination(s). File no. and date of response letter:_____

☐ Other information (please specify):

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

Signature and date of Regulatory staff member completing PJD 12/01/2021	Signature and date of person requesting PJD (REQUIRED, unless obtaining the signature is impracticable)[1]

[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



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

INDEX TO POTENTIAL JURISDICTIONAL FEATURES

Drawn by: AEK

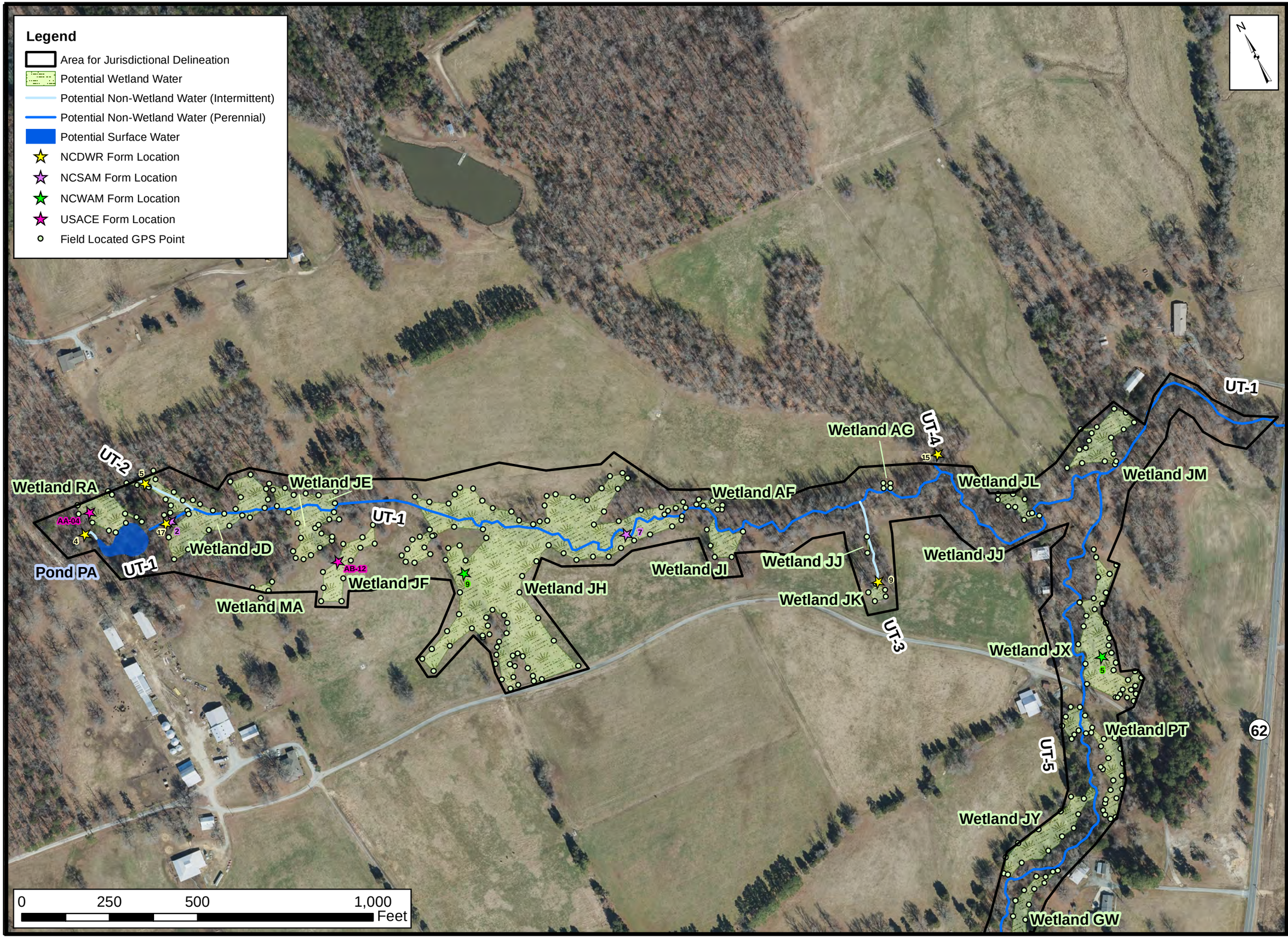
Date: NOV. 2021

Scale: 1:8500

Project No.: 20-012

FIGURE

3



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

POTENTIAL JURISDICTIONAL FEATURES

Drawn by: AEK

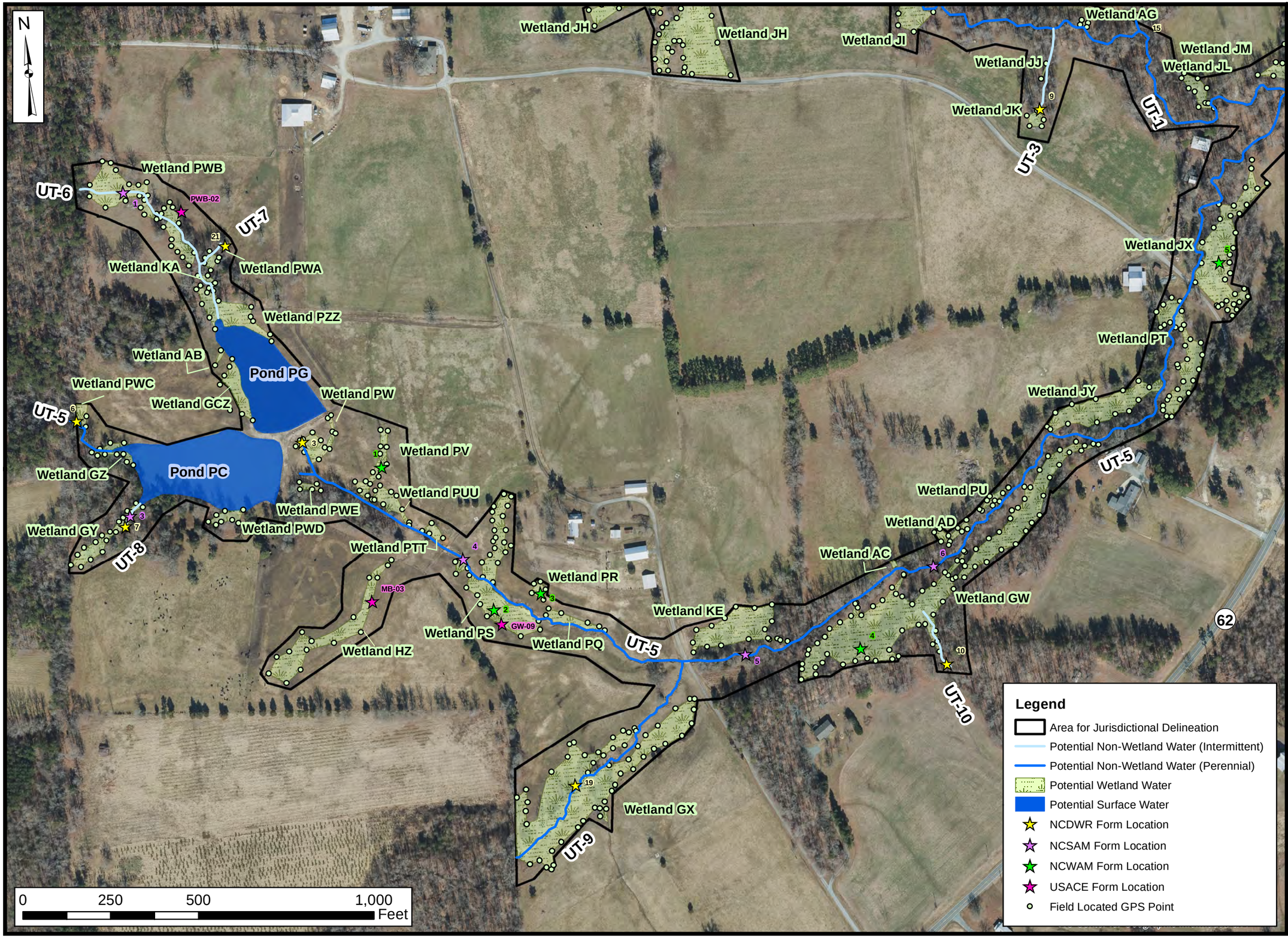
Date: NOV. 2021

Scale: 1:3100

Project No.: 21-012

FIGURE

3A



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

POTENTIAL JURISDICTIONAL FEATURES

Drawn by: AEK

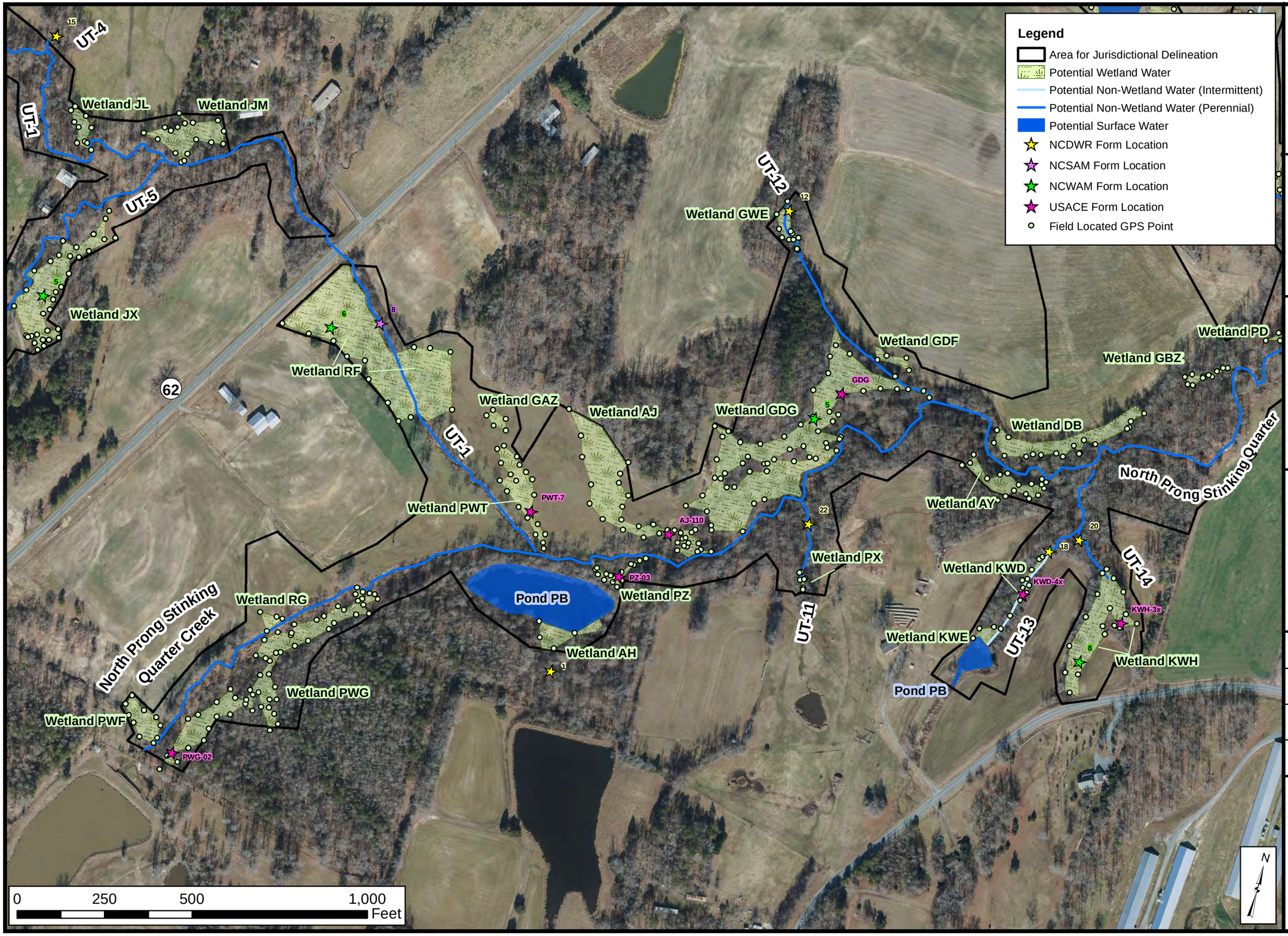
Date: NOV. 2021

Scale: 1:3000

Project No.: 21-012

FIGURE

3B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

POTENTIAL JURISDICTIONAL FEATURES

Drawn by: AEK

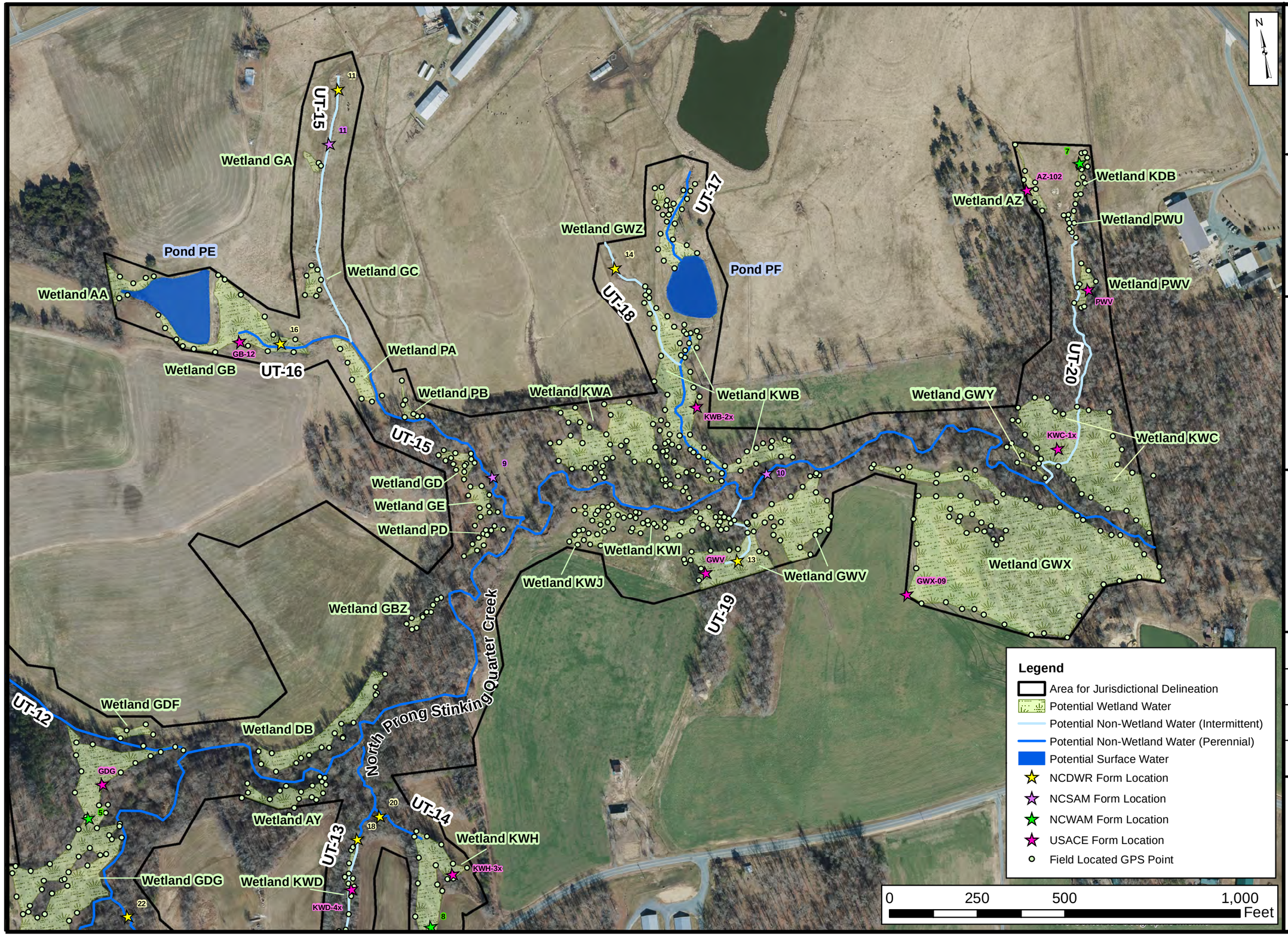
Date: NOV. 2021

Scale: 1:3100

Project No.: 20-012

FIGURE

3C



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

POTENTIAL JURISDICTIONAL FEATURES

Drawn by: AEK

Date: NOV. 2021

Scale: 1:3000

Project No.: 20-012

FIGURE

3D

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: **Axiom Environmental, Inc**, **Grant Lewis**	File Number: **2021-00347**	Date: **12/01/2021**

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: Casey Haywood** **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: Casey Haywood, 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

Appendix E: NC NHP Letter, IPaC, T&E Surveys, and Categorical Exclusion Document

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**
Susi Hamilton, **Secretary**
Walter Clark, **Director, Land and Water Stewardship**

NCNHDE-10322

September 25, 2019

Allison Keith
Axiom Environmental
218 Snow Ave
Raleigh, NC 27603
RE: Sandy Ridge; 19-001.07

Dear Allison Keith:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

Based on the project area mapped with your request, a query of the NCNHP database indicates that there are no records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. Please note that although there may be no documentation of natural heritage elements within the project boundary, it does not imply or confirm their absence; the area may not have been surveyed. The results of this query should not be substituted for field surveys where suitable habitat exists. In the event that rare species are found within the project area, please contact the NCNHP so that we may update our records.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is found within the project area or is indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

The NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Clean Water Management Trust Fund easement, or Federally-listed species are documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Sandy Ridge
Project No. 19-001.07
September 25, 2019
NCNHDE-10322

Element Occurrences Documented Within a One-mile Radius of the Project Area

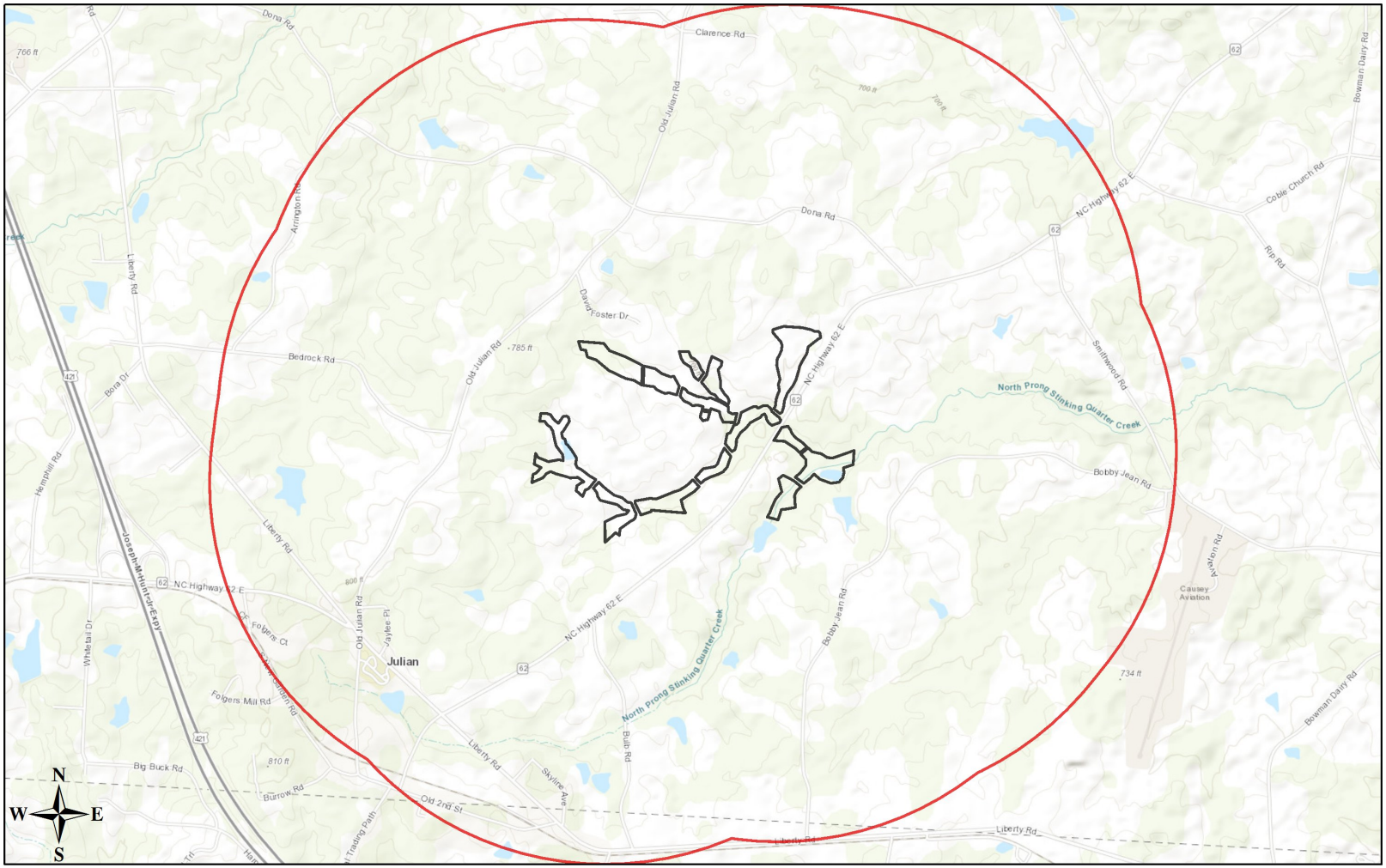
Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	38672	Helianthus schweinitzii	Schweinitz's Sunflower	2018-09-27	E	2-High	Endangered	Endangered	G3	S3

No Natural Areas are Documented Within a One-mile Radius of the Project Area

No Managed Areas are Documented Within a One-mile Radius of the Project Area

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/content/help. Data query generated on September 25, 2019; source: NCNHP, Q3 Jul 2019. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-10322: Sandy Ridge



September 25, 2019

- Project Boundary
- Buffered Project Boundary

1:27,072

0 0.225 0.45 0.9 mi

0 0.35 0.7 1.4 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

Location

Guilford County, North Carolina



Local office

Raleigh Ecological Services Field Office

(919) 856-4520
(919) 856-4556

MAILING ADDRESS
Post Office Box 33726
Raleigh, NC 27636-3726

PHYSICAL ADDRESS
551 Pylon Drive, Suite F
Raleigh, NC 27606-1487

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information. IPaC only shows species that are regulated by USFWS (see FAQ).
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS
Tricolored Bat Perimyotis subflavus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

Insects

NAME	STATUS
Monarch Butterfly Danaus plexippus Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/9743	Candidate

Flowering Plants

NAME	STATUS
Schweinitz's Sunflower Helianthus schweinitzii Wherever found No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/3849	Endangered
Small Whorled Pogonia Isotria medeoloides No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1890	Threatened

NOT FOR CONSULTATION

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

There are no critical habitats at this location.

You are still required to determine if your project(s) may have effects on all above listed species.

Bald & Golden Eagles

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

Additional information can be found using the following links:

- Eagle Managment https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)

NOT FOR CONSULTATION

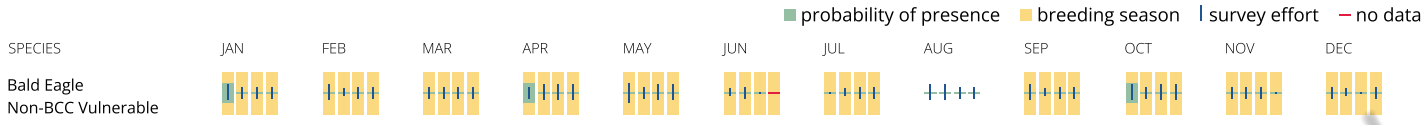
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



What does IPaC use to generate the potential presence of bald and golden eagles in my specified location?

The potential for eagle presence is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply). To see a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs of bald and golden eagles in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur. Please contact your local Fish and Wildlife Service Field Office if you have questions.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/ documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area,

visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle Haliaeetus leucocephalus This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Sep 1 to Jul 31
Chimney Swift Chaetura pelagica This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will Antrostomus vociferus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Aug 20
Kentucky Warbler Oporornis formosus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 20
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Prothonotary Warbler Protonotaria citrea This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

Breeding Season (■)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

NOT FOR CONSULTATION

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

There are no refuge lands at this location.

Fish hatcheries

There are no fish hatcheries at this location.

Wetlands in the National Wetlands Inventory (NWI)

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND
- PEM1A

FRESHWATER FORESTED/SHRUB WETLAND
- PFO1A
- PSS1A

FRESHWATER POND
- PUBHh

RIVERINE
- R4SBC
- R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

NOTE: This initial screening does **not** replace an on-site delineation to determine whether wetlands occur. Additional information on the NWI data is provided below.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate Federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

Axiom Environmental, Inc.

Axiom Environmental, Inc.

218 Snow Avenue, Raleigh, North Carolina 27603 423-400-8882

October 25, 2023

Worth Creech
Restoration Systems
1101 Hayes Street Suite 211
Raleigh, NC 27604

Re: Schweinitz's Sunflower Survey
Stinking Quarter Mitigation Site, Guilford County 21-012

Dear Mr. Creech:

Axiom Environmental, Inc. (Axiom) is pleased to provide you with this summary letter of a survey for Schweinitz's sunflower on the Stinking Quarter Mitigation Site in Guilford County. The survey was conducted by Axiom biologists Allison Keith, Phillip Perkinson, and Maddie Adams on October 24, 2023.

We hope this information will be of assistance. If you have any questions about this information, please feel free to give me a call (423-400-8882) or send me an email (akeith@axiomenvironmental.org).

Yours truly,

AXIOM ENVIRONMENTAL, INC.

Allison Keith

Allison E. Keith
Senior Scientist

Schweinitz's Sunflower Survey
Stinking Quarter Stream and Wetland Mitigation Site

A review of U.S. Fish and Wildlife Service (USFWS) Interactive Planning and Consultation (IPaC) tool indicates Schweinitz's sunflower (*Helianthus schweinitzii*) may occur within the site. The USFWS has determined the optimal survey window for Schweinitz's sunflower to be between late August and October (frost). Axiom Environmental Inc. conducted a survey within areas of suitable habitat for Schweinitz's sunflower in the fall of 2023. The following is a brief discussion of the species and the results of the survey.

Schweinitz's sunflower

Habitat Description: This species is found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and other sunny or semi-sunny habitats where disturbances (e.g., mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. Roadsides and forest edges represent suitable habitat. It is intolerant of full shade and excessive competition from other vegetation.

> **Biological Conclusion**: Suitable habitat for Schweinitz's sunflower occurs on site within disturbed areas including the edges of pastures, forests, and farm roads. The USFWS has determined the optimal survey windows for the sunflower is late August to October (or the first frost). A review of NCNHP records dated October 25, 2023, indicates an occurrence of Schweintz's sunflower within 1.0 mile of the site. A known population nearby was visited and observed by Axiom biologist on October 24, 2023, prior to conducting surveys at the site. Systematic surveys were then performed within all areas of suitable habitat and no individuals were identified. This project is therefore anticipated to have **No Effect** on Schweinitz's sunflower.

Stinking Quarter Mitigation Site

Guilford County, North Carolina

DMS Project No. 100193

Categorical Exclusion/ERTR



Prepared for:

North Carolina Department of Environmental Quality

Division of Mitigation Services

1652 Mail Service Center

Raleigh, NC 27699-1652

March 2021

TASK 1 b.) Categorical Exclusion Summary:
Part 1: General Project Information (Attached)

Part 2: All Projects Regulation/Questions

Coastal Zone Management Act
No issue – project is not located within a CAMA county.

CERCLA
No issue within project boundaries – please see the attached Executive Summary from a Limited Phase 1 Site Assessment performed by Environmental Data Resources, Inc. on June 8th, 2021.

National Historic Preservation Act (Section 106)
No Issue – please see attached letter from Ramona M. Bartos, State of the Historic Preservation Office.

Uniform Act
Please see the attached letters, sent to the landowners March 18th, 2021.

Part 3: Ground-Disturbing Activates Regulation/Questions

American Indian Religious Freedom Act (AIRFA)
Not applicable – the Project is not located in a county claimed as "territory" by the Eastern Band of Cherokee Indians.

Antiquities Act (AA)
Not applicable – Project is not located on Federal land.

Archaeological Resources Protection Act (ARPA)
Not applicable – Project is not located on Federal or Indian lands.

Endangered Species Act (ESA)
See attached notice from the US FWS Raleigh Field Office.

Executive Order 13007 (Indian Sacred Sites)
Not applicable – Project is not located in a county claimed as "territory" by the Eastern Band of Cherokee Indians.

Farmland Protection Policy Act (FPPA)
Please find the attached Form AD-1006 and correspondence from Kristen May of the NRCS.

Fish and Wildlife Coordination Act (FWCA)
Find attached USF&W and WRC correspondence.

Land & Water Conservation Fund Act (Section 6(f))
Not applicable

Magnuson-Stevens Fishery Conservation and Management Act
(Essential Fish Habitat)
Not applicable – Project is not located within an estuarine system.

Migratory Bird Treaty Act (MBTA)
USFWS provided no recommendations for the Project relative to the MBTA. Please see the attached letter sent from USFWS.

Wilderness Act
Not applicable – the Project is not located within a Wilderness area.

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:	Stinking Quarter Mitigation Site
County Name:	Guilford
DMS Number:	100193
Project Sponsor:	Restoration Systems, LLC
Project Contact Name:	Worth Creech
Project Contact Address:	1101 Haynes Street, Ste. 211, Raleigh, NC 27604
Project Contact E-mail:	worth@restorationsystems.com
DMS Project Manager:	Lindsay Crocker

Project Description

The site is a culmination of eight families and neighbors participating in a one-of-a-kind opportunity to restore/enhance up to five miles of stream, sixty-three acres of wetlands, and permanently protecting 116.6 acres of riparian corridor on one continuous mitigation project. The Site occurs within 14-digit Cataloging Unit 03030002040070 along North Prong Stinking Quarter Creek and unnamed tributaries to North Prong Stinking Quarter Creek. The Site is located approximately 1-mile northeast of Julian, 5 miles northwest of Liberty, and is adjacent to Highway 62. The Site is not located within a Targeted Local Watershed or Targeted Resource Area.

For Official Use Only

Reviewed By:

7/19/2021 — L.H. Crocker

Date — **DMS Project Manager**

Conditional Approved By:

Date — **For Division Administrator FHWA**

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

Final Approval By:

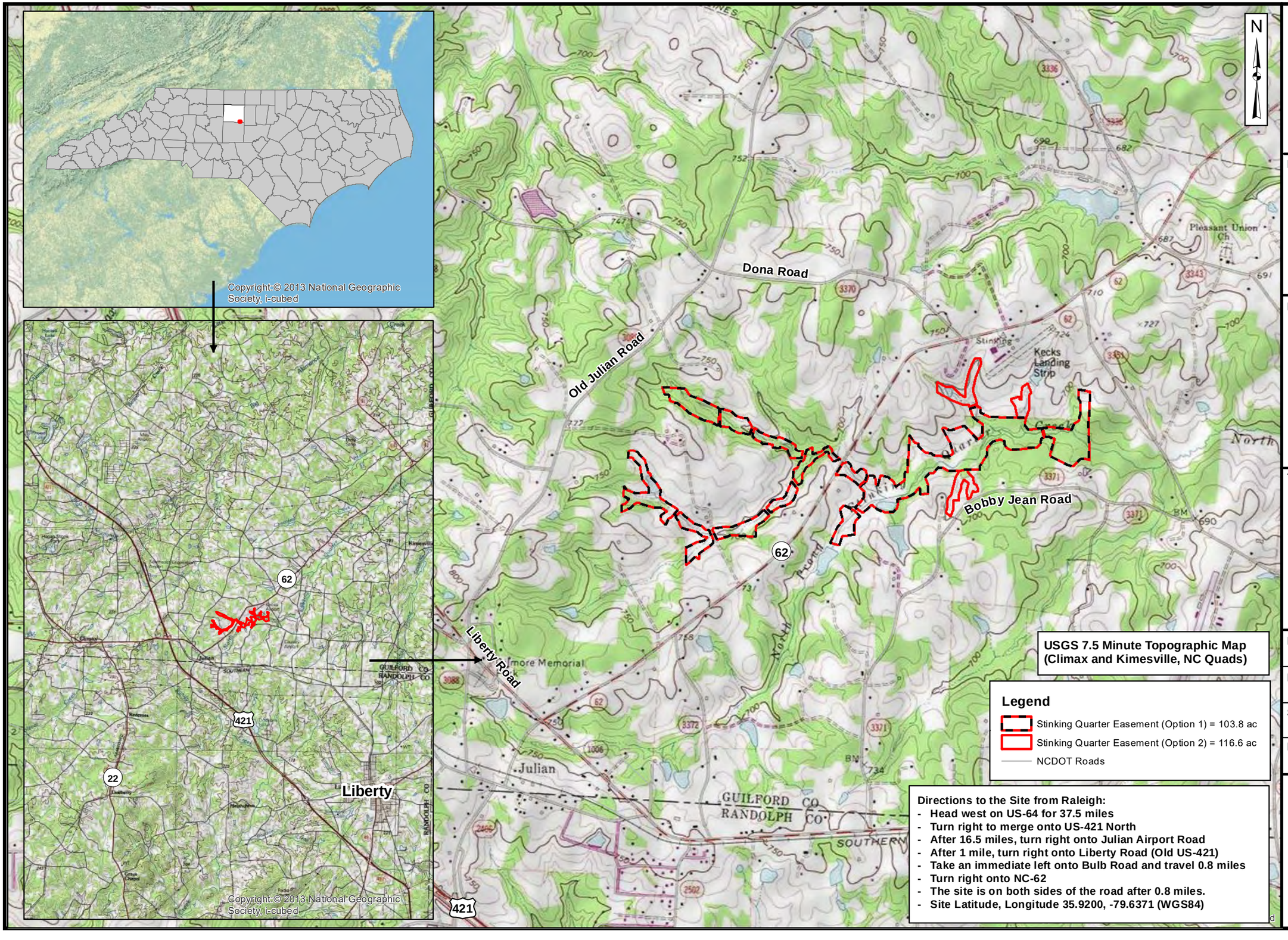
7-16-21 — Donald W Brew

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



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

SITE LOCATION & EASEMENT OPTION OVERVIEW

Drawn by: KRJ

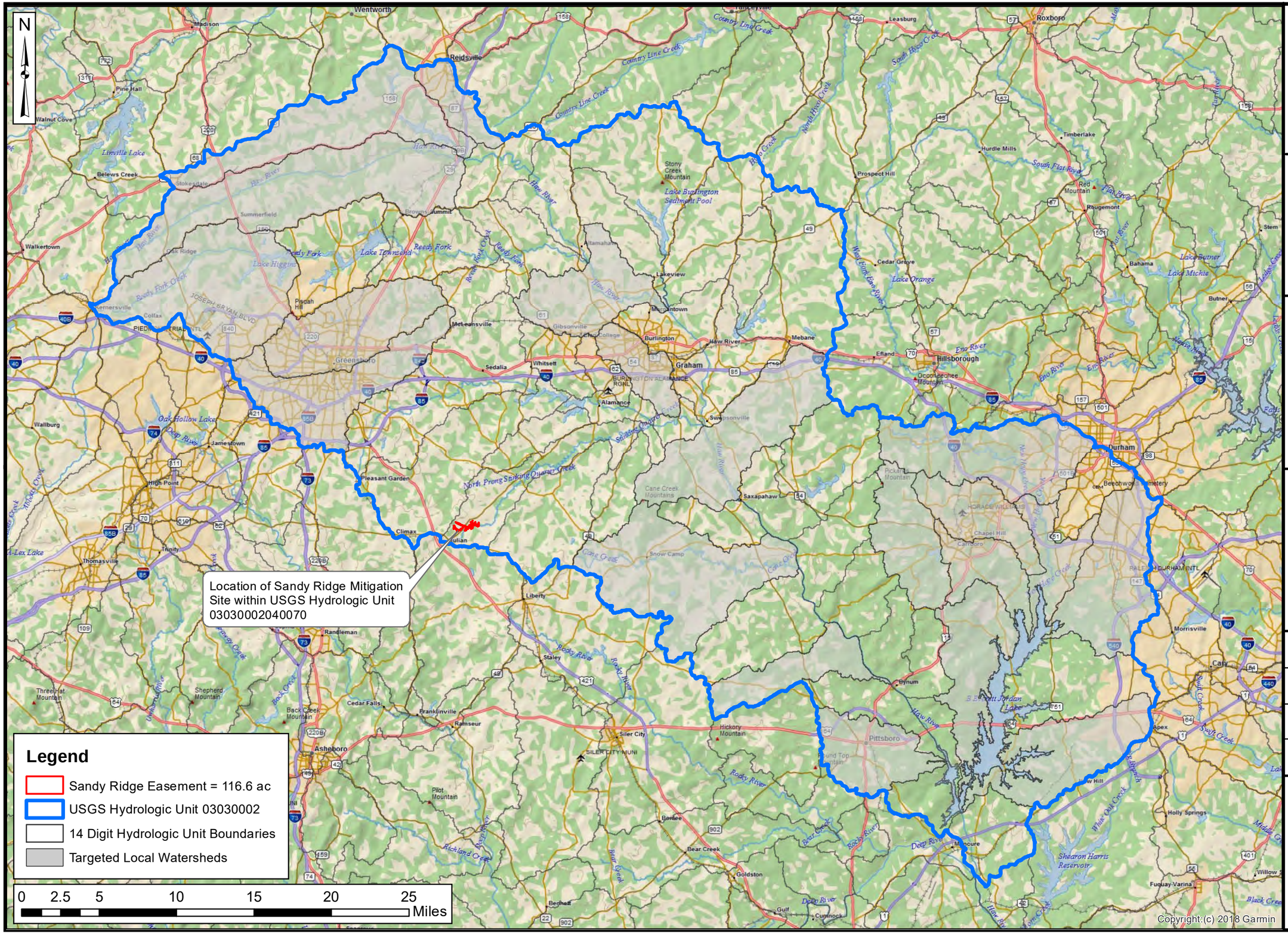
Date: OCT 2020

Scale: 1:20,000

Project No.: 20-001.05

FIGURE

1



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

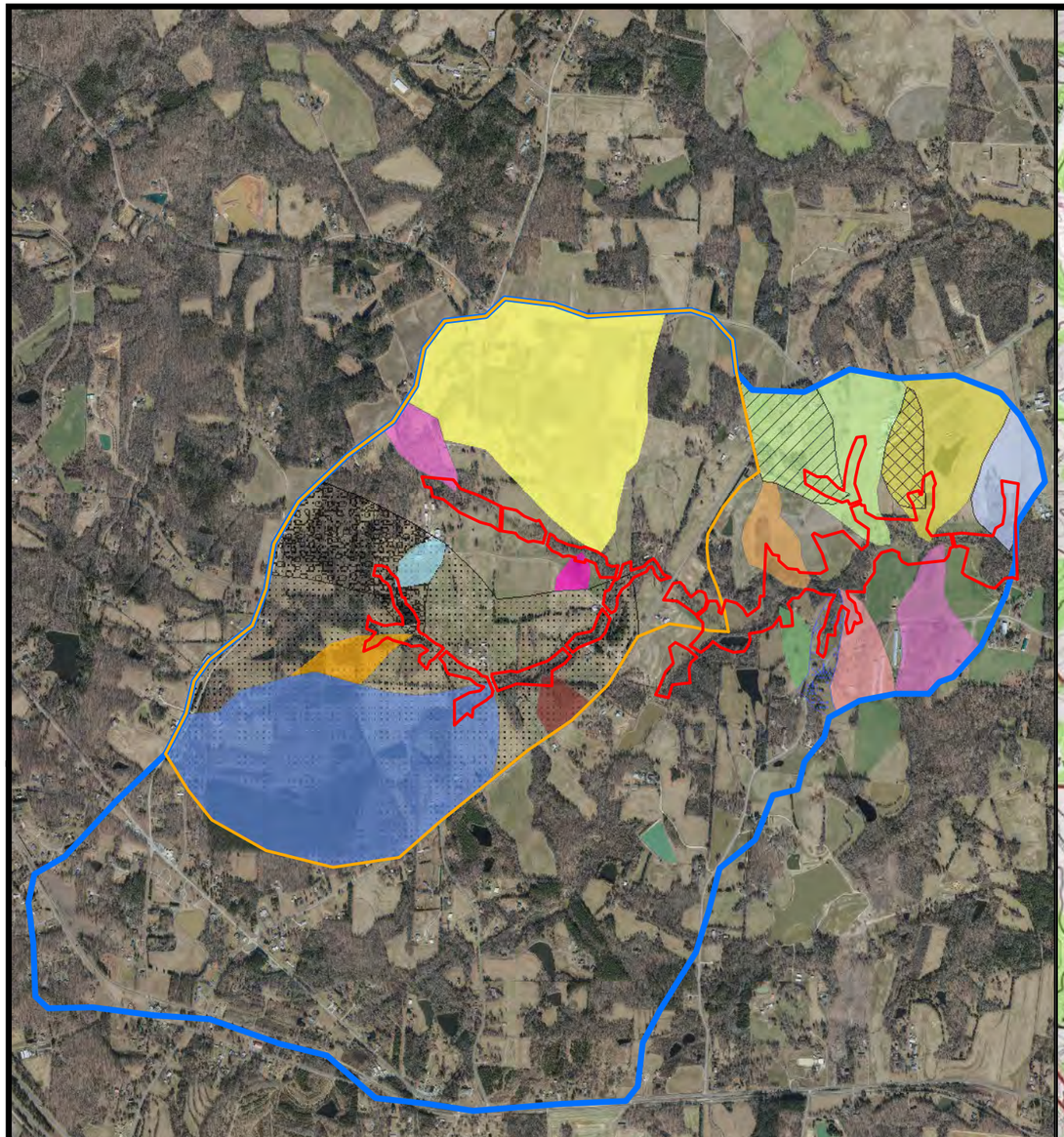
Title:

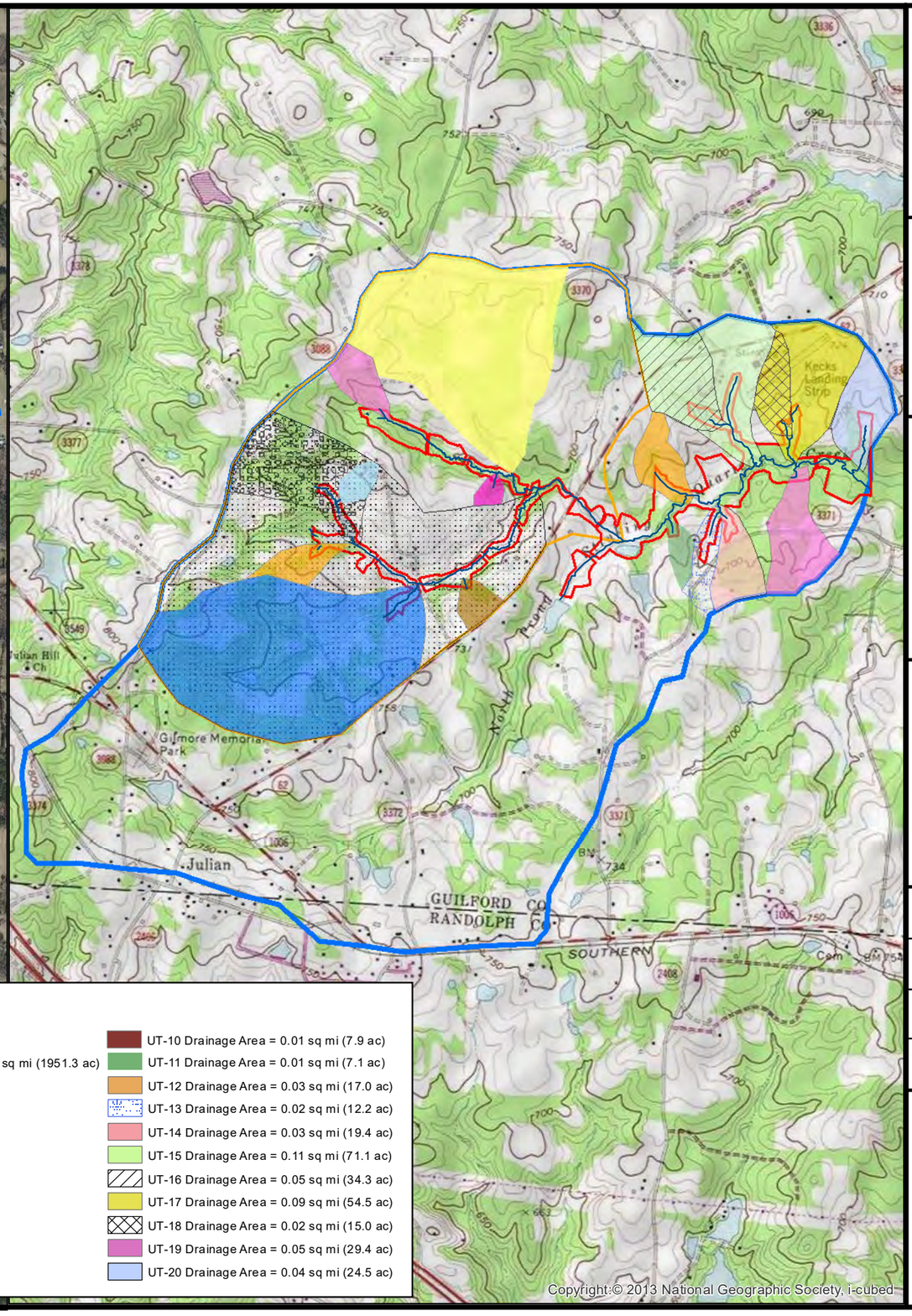
HYDROLOGIC UNIT MAP

Drawn by:	KRJ
Date:	OCT 2020
Scale:	1:370,000
Project No.:	20-001.05

FIGURE

2





N

0 1,500 3,000 6,000 Feet

Legend

- Sandy Ridge Easement = 116.6 ac
- North Prong Stinking Quarter Creek Drainage Area = 3.05 sq mi (1951.3 ac)
- UT-1 Drainage Area = 1.26 sq mi (804.2 ac)
- UT-2 Drainage Area = 0.02 sq mi (13.5 ac)
- UT-3 Drainage Area = 0.01 sq mi (3.9 ac)
- UT-4 Drainage Area = 0.25 sq mi (158.2 ac)
- UT-5 Drainage Area = 0.67 sq mi (427.0 ac)
- UT-6 Drainage Area = 0.09 sq mi (58.4 ac)
- UT-7 Drainage Area = 0.01 sq mi (6.4 ac)
- UT-8 Drainage Area = 0.02 sq mi (12.0 ac)
- UT-9 Drainage Area = 0.30 sq mi (189.2 ac)
- UT-10 Drainage Area = 0.01 sq mi (7.9 ac)
- UT-11 Drainage Area = 0.01 sq mi (7.1 ac)
- UT-12 Drainage Area = 0.03 sq mi (17.0 ac)
- UT-13 Drainage Area = 0.02 sq mi (12.2 ac)
- UT-14 Drainage Area = 0.03 sq mi (19.4 ac)
- UT-15 Drainage Area = 0.11 sq mi (71.1 ac)
- UT-16 Drainage Area = 0.05 sq mi (34.3 ac)
- UT-17 Drainage Area = 0.09 sq mi (54.5 ac)
- UT-18 Drainage Area = 0.02 sq mi (15.0 ac)
- UT-19 Drainage Area = 0.05 sq mi (29.4 ac)
- UT-20 Drainage Area = 0.04 sq mi (24.5 ac)

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

TOPOGRAPHY AND DRAINAGE AREA

Drawn by: KRJ

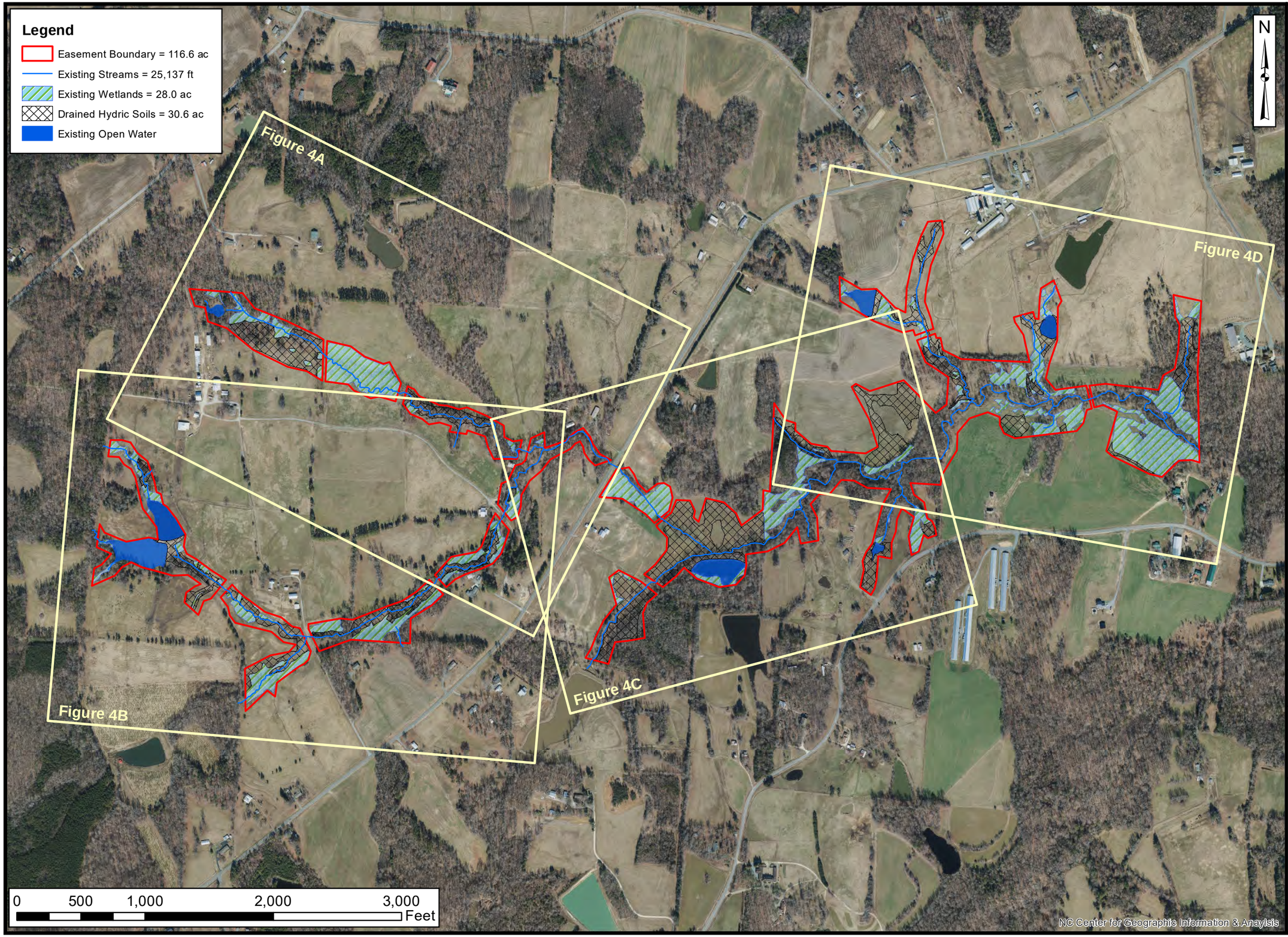
Date: OCT 2020

Scale: 1:23,500

Project No.: 20-001.05

FIGURE

3



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:8500

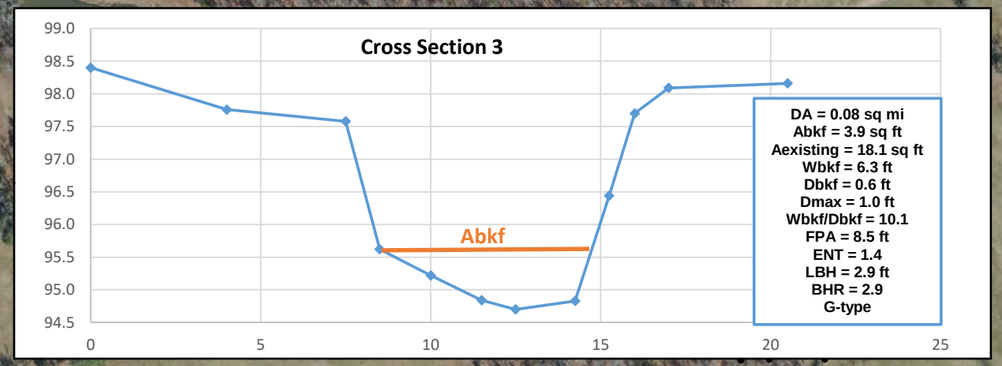
Project No.: 20-001.05

FIGURE

4

Legend

- Easement Boundary = 116.6 ac
- Existing Streams = 25,137 ft
- Existing Wetlands = 28.0 ac
- Drained Hydric Soils = 30.6 ac
- Existing Open Water
- NCDWR Forms
- NCSAM Forms
- NCWAM Forms
- Detailed Soil Profiles
- Cross Sections
- GPS Points (3-4 soil borings at each point)



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

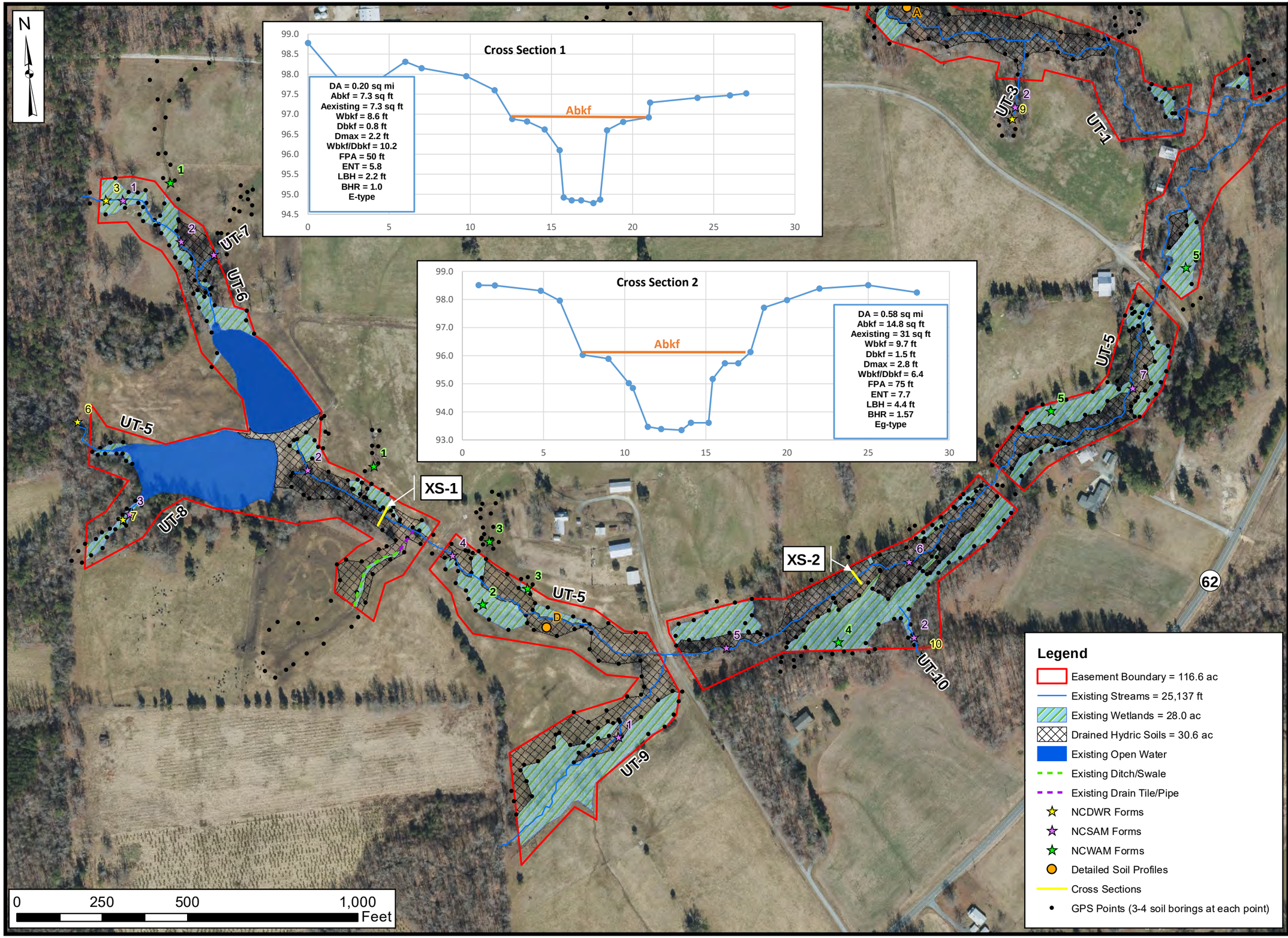
Date: OCT 2020

Scale: 1:3100

Project No.: 20-001.05

FIGURE

4A



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

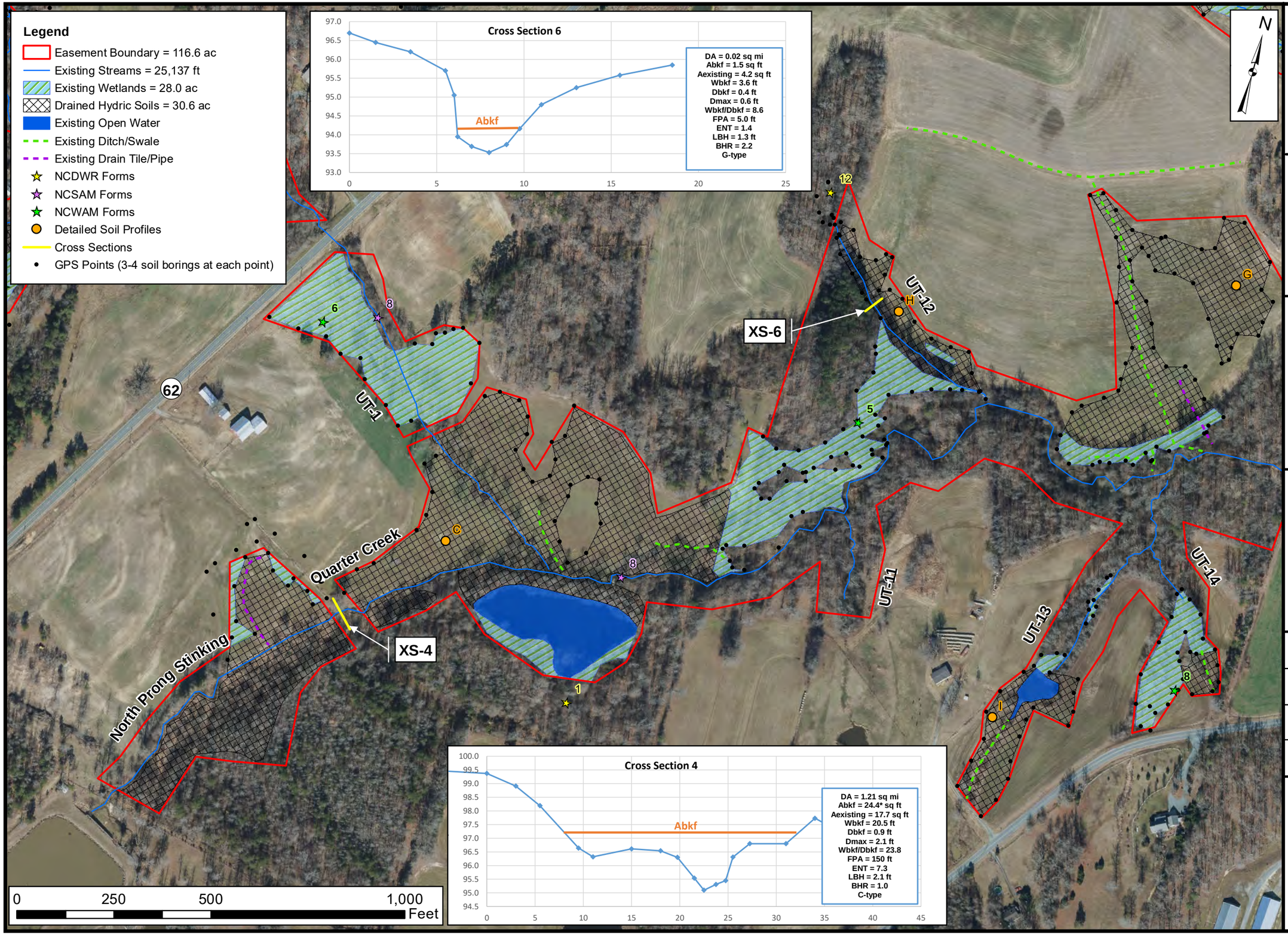
Date: OCT 2020

Scale: 1:3200

Project No.: 20-001.05

FIGURE

4B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:2800

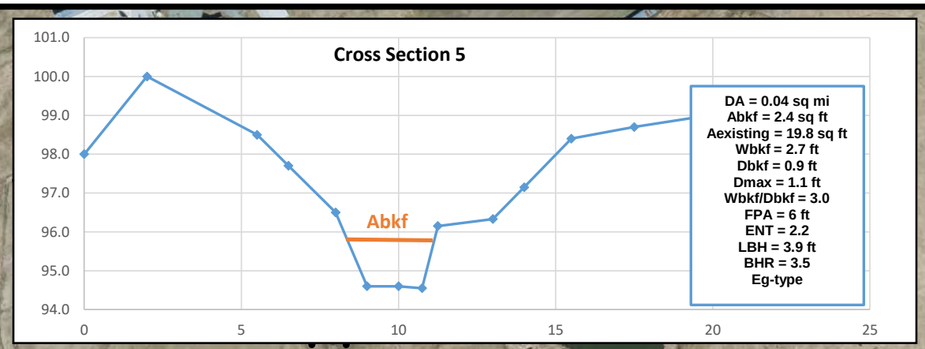
Project No.: 20-001.05

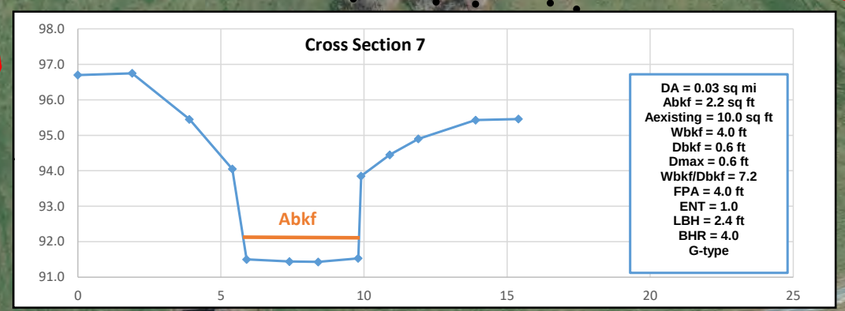
FIGURE

4C

Legend

- Easement Boundary = 116.6 ac
- Existing Streams = 25,137 ft
- Existing Wetlands = 28.0 ac
- Drained Hydric Soils = 30.6 ac
- Existing Open Water
- Existing Ditch/Swale
- Existing Drain Tile/Pipe
- NCDWR Forms
- NCSAM Forms
- NCWAM Forms
- Detailed Soil Profiles
- Cross Sections
- GPS Points (3-4 soil borings at each point)
- Existing ATV Path





UT-15
UT-16
UT-18
UT-17
UT-19
UT-20
UT-12
UT-13
UT-14
North Prong Stinking Quarter Creek
XS-5
XS-7
N
0 250 500 1,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:3000

Project No.: 20-001.05

FIGURE

4D

Legend

Easement Boundary = 116.6 ac

N

UT-5 LiDAR Detail

Channel restoration will occur in the historic, low portion of the floodplain.

Historic channel meander scrolls from previous channel location

0 500 1,000 2,000 3,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

LIDAR

Drawn by: KRJ

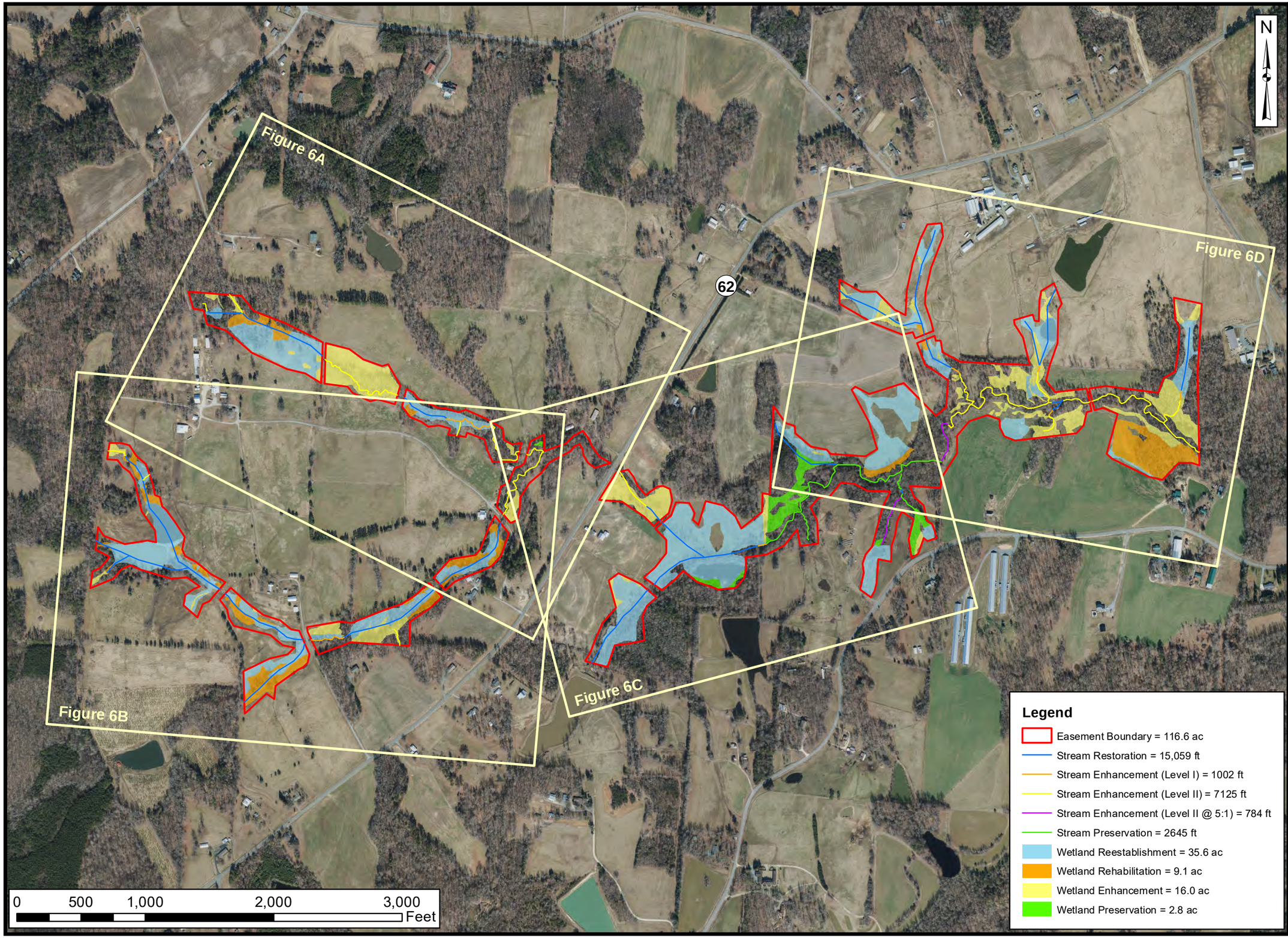
Date: OCT 2020

Scale: 1:7500

Project No.: 20-001.05

FIGURE

5



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

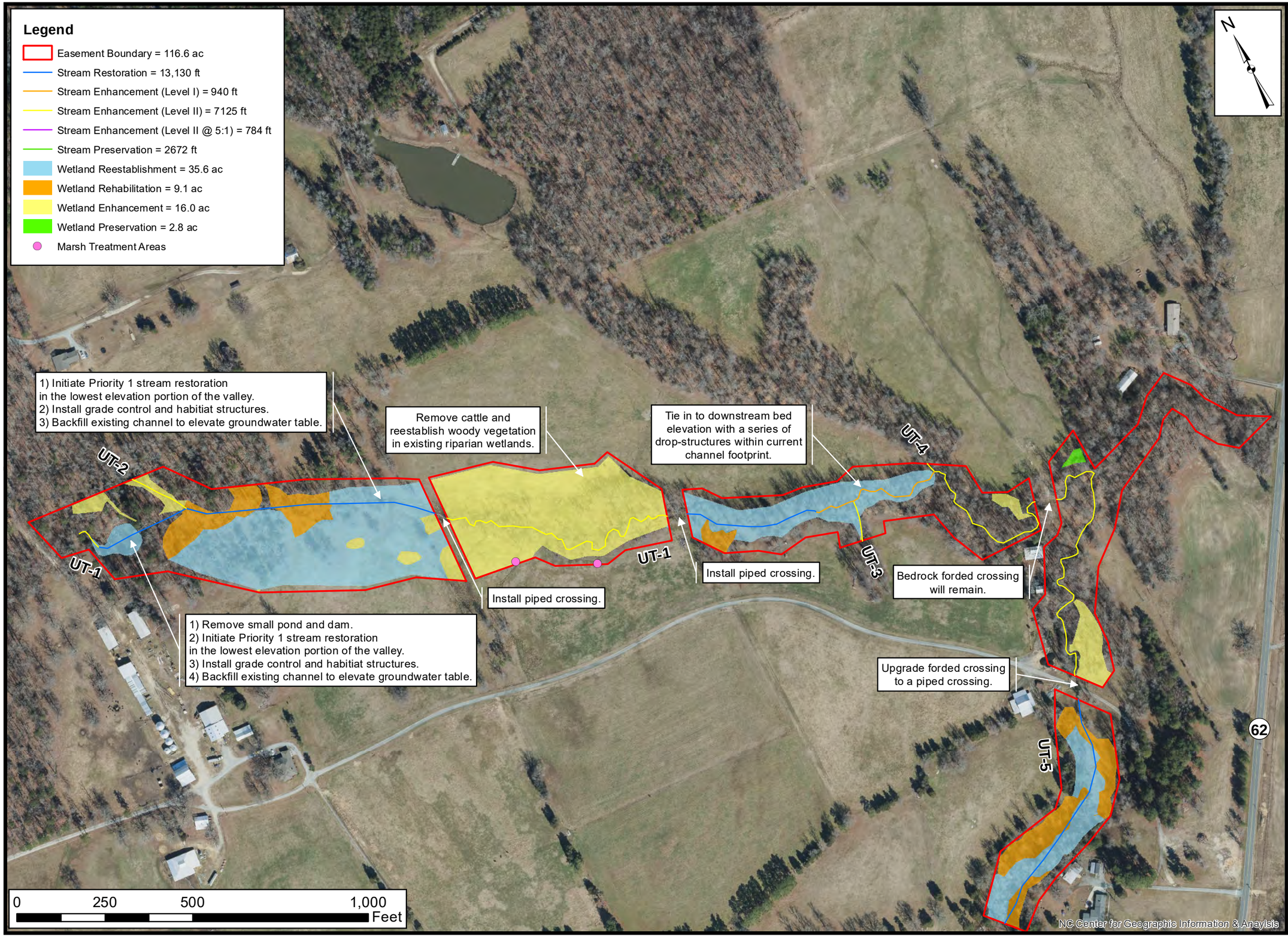
Date: OCT 2020

Scale: 1:8500

Project No.: 20-001.05

FIGURE

6



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

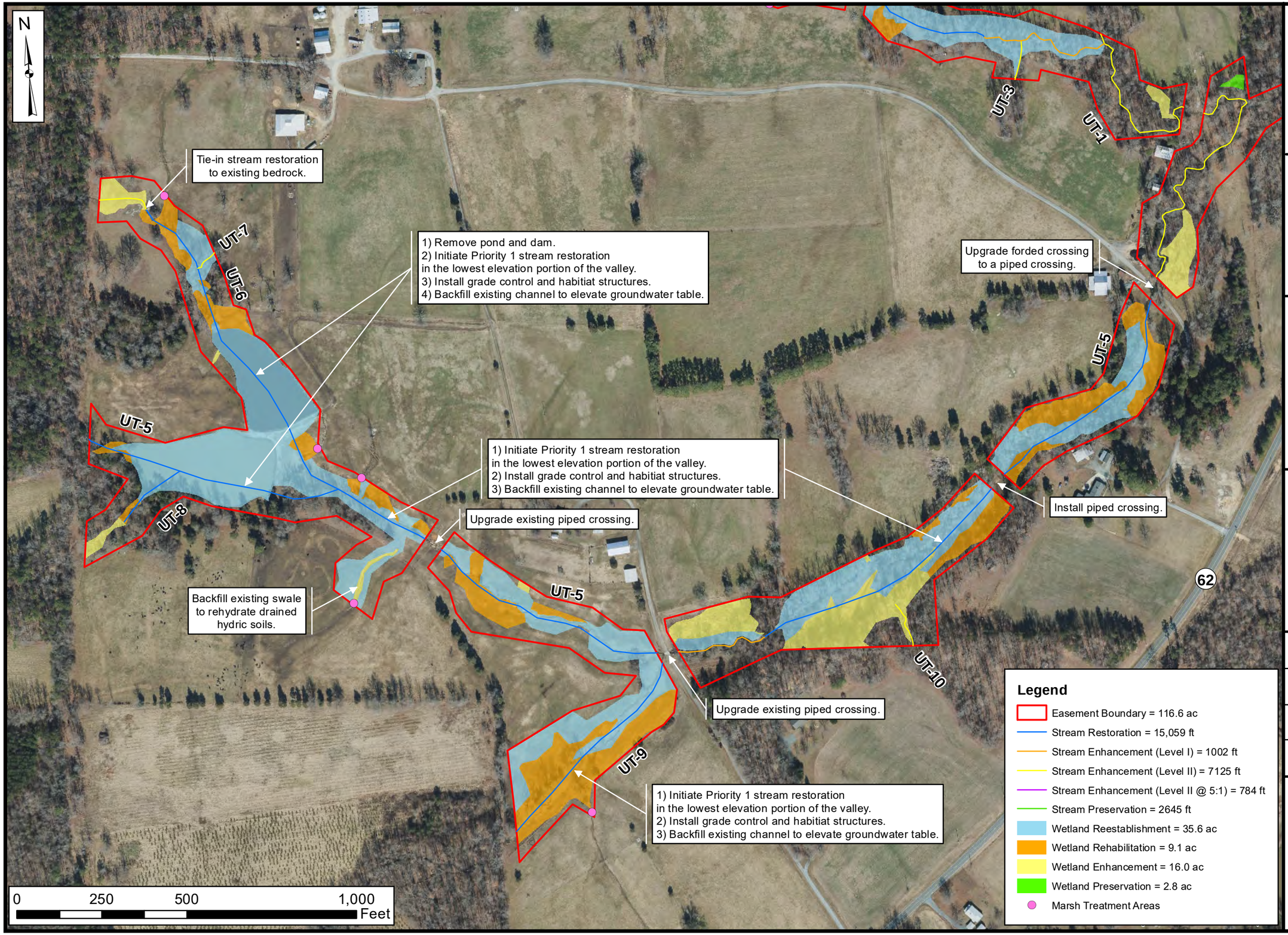
Date: OCT 2020

Scale: 1:3100

Project No.: 20-001.05

FIGURE

6A



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

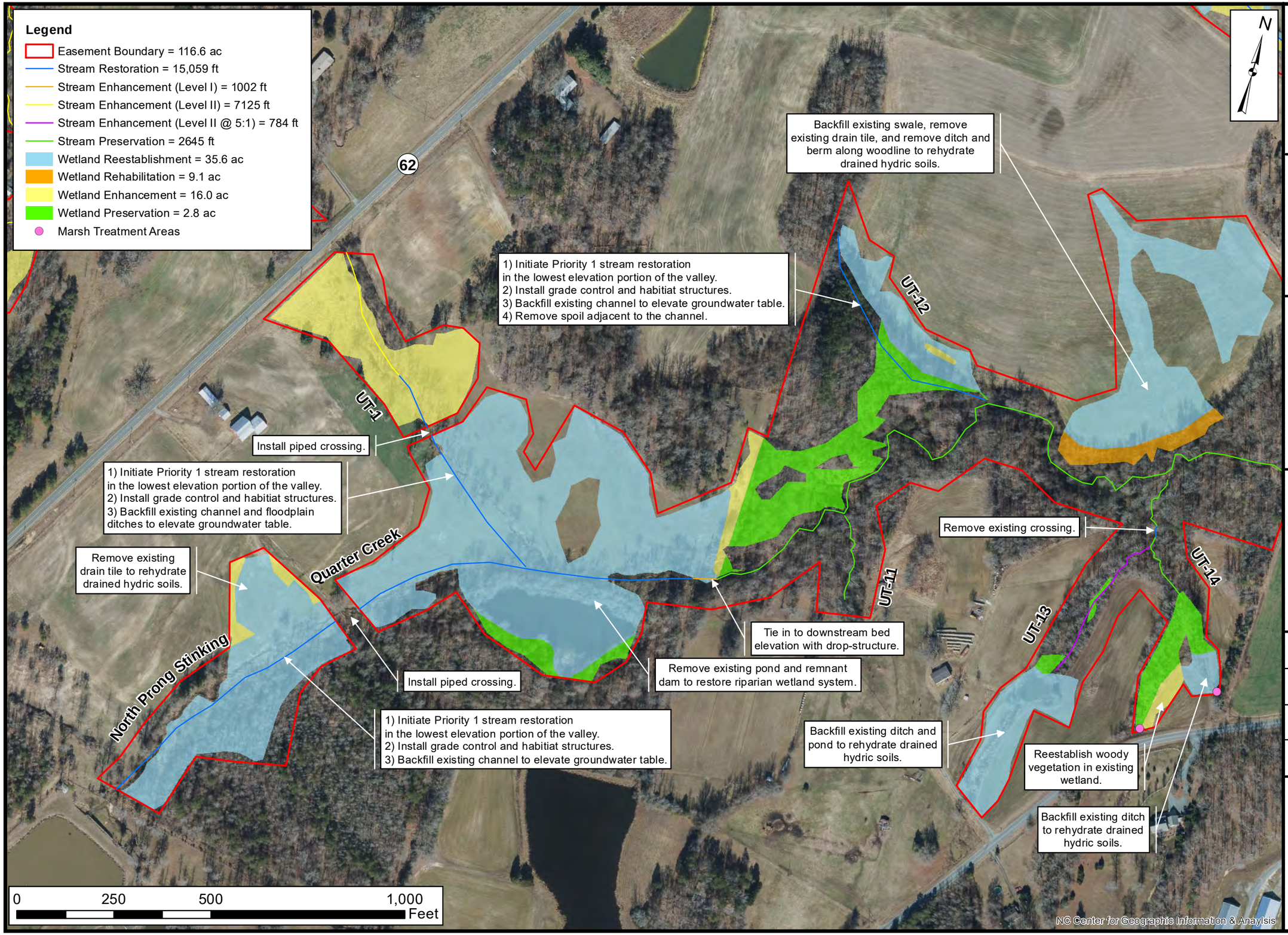
Date: OCT 2020

Scale: 1:3200

Project No.: 20-001.05

FIGURE

6B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

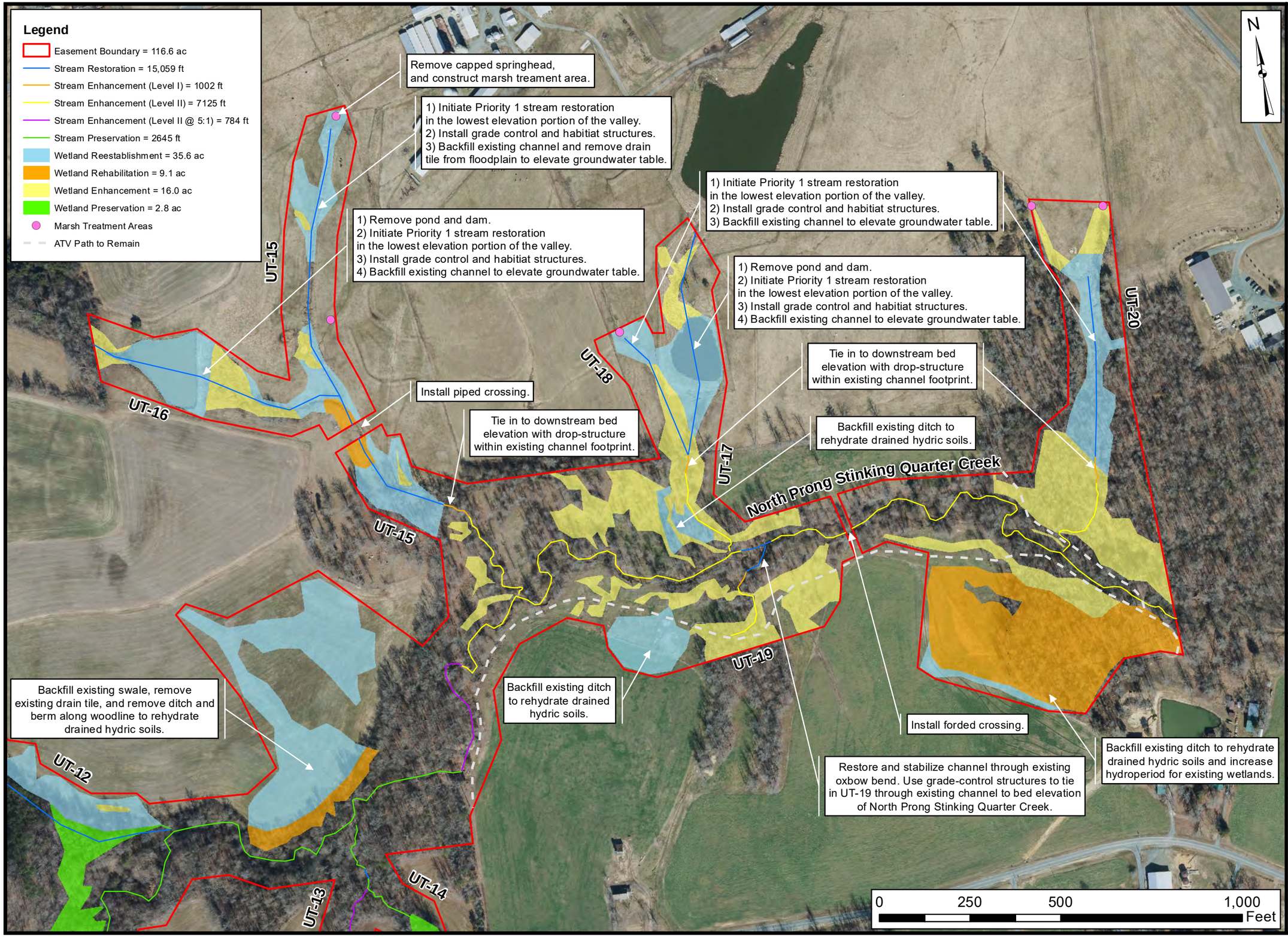
Date: OCT 2020

Scale: 1:2800

Project No.: 20-001.05

FIGURE

6C



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:3000

Project No.: 20-001.05

FIGURE

6D

3/18/2021

Tony Harmon
7035 Bobby Jean Rd
Julian, NC 27283

Dear Mr Harmon:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Frank Staley Jr.
7132 Bobby Jean Rd
Julian, NC 27283

Dear Mr Staley:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Patricia Shoffner
2247 NC 62 East
Julian, NC 27283

Dear Mrs Shoffner:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Mickey Keck
2379 NC 62 East
Julian, NC 27283

Dear Mr Keck:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Mark Keck
2131 NC 62 East
Julian, NC 27283

Dear Mr Keck:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Judy Shoffner
5615 Pinedale School
Rd Julian, NC 27283

Dear Mrs Schoffner:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Don York
4627 Old Julian Rd
Julian, NC 27283

Dear Mr York:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

3/18/2021

Curtis York
2259 NC 62 East
Julian, NC 27283

Dear Mr York:

The purpose of this letter is to notify you that Restoration Systems, LLC, in offering to purchase your property in Guilford County, North Carolina, does not have the power to acquire it by eminent domain. Also, Restoration Systems' offer to purchase your property is based on what we believe to be its fair market.

If you have any questions, please feel free to call me at 919-755-9490.

Sincerely,



JD Hamby
Project Manager

North Carolina Department of Natural and Cultural Resources

State Historic Preservation Office

Ramona M. Bartos, Administrator

Governor Roy Cooper
Secretary Reid Wilson

Office of Archives and History
Deputy Secretary Kevin Cherry

June 28, 2021

Casey M. Haywood
US Army Corps of Engineers
Wilmington District
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

casey.m.haywood@usace.army.mil

Re: Stinking Quarter Mitigation Site, 35.920355, -79.640139, ER 21-1188

Dear Casey Haywood:

Thank you for your letter of April 29, 2021, regarding the above-referenced undertaking. We have reviewed the submittal and offer the following comments.

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

cc: John Hamby, Restoration Systems, LLC jhabmy@restorationsystems.com



North Carolina Wildlife Resources Commission

Cameron Ingram, Executive Director

25 May 2021

Mr. JD Hamby
Restoration Systems
1101 Haynes St., Suite 211
Raleigh, North Carolina 27604

SUBJECT: Environmental Review of the Stinking Quarter Mitigation Site in Guilford County, North Carolina.

Mr. Hamby,

Biologists with the North Carolina Wildlife Resource Commission (NCWRC) received your request for review and comments on any possible concerns regarding the Stinking Quarter Mitigation Bank. 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 Stinking Quarter Mitigation Site is located north of Liberty Road and straddles Highway 62 in southeastern Guilford County, North Carolina. The proposed project would restore, enhance, and preserve portions of the North Prong Stinking Quarter Creek and its unnamed tributaries and wetlands in existing cattle pastures and forested areas. The Stinking Quarter Mitigation Project will provide in-kind mitigation for unavoidable impacts to streams and wetland within watersheds of the Cape Fear River basin.

We have records of the federally endangered Schweinitz's sunflower (*Helianthus schweinitzii*) and state significantly rare Carolina ladle crayfish (*Cambarus davidi*) near the site. We recommend contacting USFWS at (828) 258-3939 to ensure that any issues related to the Schweinitz's sunflower are addressed. Although we have no records at the site, this does not preclude the presence of 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. We offer the following general 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.

Mailing Address: Habitat Conservation • 1721 Mail Service Center • Raleigh, NC 27699-1721
Telephone: (919) 707-0220 • **Fax:** (919) 707-0028

2. We recommend a plant list that consists of species typically found in reference streams and the appropriate natural vegetation community, as described by M.P. Schafale in The Guide To The Natural Communities of North Carolina, Fourth Approximation (https://www.ncnhp.org/references/nhp-publications/fourth-approximation-descriptions).
3. Avoid using orchard grass, tall fescue, or cereal rye, which exhibits allelopathic characteristics, for soil stabilization.
4. To increase wildlife habitat, we recommend leaving downed woody debris and some snags and/or dying trees. Seed the site with a variety of native pollinator species.
5. Avoid tree clearing activities during the maternity roosting season for bats (May 15 – August 15) because of the decline in populations of several bat species, including rare species.
6. 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. If I can be of additional assistance, please call (336) 269-0074 or email olivia.munzer@ncwildlife.org.

Sincerely,



Olivia Munzer
Western Piedmont Habitat Conservation Coordinator
Habitat Conservation Program

United States Department of Agriculture

Natural Resources
Conservation Service

North Carolina
State Office

4407 Bland Rd.
Suite 117
Raleigh
North Carolina 27609
Voice (704) 680-3541
Fax (844) 325-2156

May 19, 2021

JD Hamby
Project Manager
Restoration Systems LLC
1101 Haynes Street, Suite 211
Raleigh, NC 27604

Dear JD Hamby;

The following information is in response to your request soliciting comments regarding the Proposed Stinking Quarter Mitigation Site in Guilford County, NC.

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

For the purpose of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Farmland subject to FPPA requirements does not have to be currently used for cropland. It can be forest land, pastureland, cropland, or other land, but not water or urban built-up land. Farmland means prime or unique farmlands as defined in section 1540(c)(1) of the Act or farmland that is determined by the appropriate state or unit of local government agency or agencies with concurrence of the Secretary to be farmland of statewide of local importance.

“Farmland" does not include land already in or committed to urban development or water storage. Farmland ``already in" urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as ``urbanized area" (UA) on the Census Bureau Map, or as urban area mapped with a ``tint overprint" on the USGS topographical maps, or as ``urban-built-up" on the USDA Important Farmland Maps. See over for more information.

The area in question includes land classified as Prime Farmland. In accordance with the Code of Federal Regulations 7CFR 658, Farmland Protection Policy Act, the CPA-106 was initiated. NRCS Completed Parts II, IV, V of the form and returned for completion by the requesting agency.

If you have any questions, please feel free to call me at (704) 680-3541 office or (704) 754-6734 cell.

Sincerely,

Kristin L May

Kristin L May
Acting State Soil Scientist

cc:
Brandon King, supervisory soil conservationist, NRCS, Burlington, NC

The Natural Resources Conservation Service
is an agency of the Department of Agriculture's
Farm Production and Conservation (FPAC).

An Equal Opportunity Provider, Employer, and Lender

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*		Date Of Land Evaluation Request 5/10/2021	
Name of Project Stinking Quarter		Federal Agency Involved FHWA	
Proposed Land Use Stream and Wetland Restoration		County and State Guilford County, NC	
PART II *(To be completed by NRCS)*		Date Request Received By NRCS 5/10/2021	Person Completing Form: Kristin Mav
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 89
Major Crop(s) Corn	Farmable Land In Govt. Jurisdiction Acres: 92.35 % 388,494	Amount of Farmland As Defined in FPPA Acres: 92.35 % 388,494	
Name of Land Evaluation System Used Guilford Co. LESA	Name of State or Local Site Assessment System NA	Date Land Evaluation Returned by NRCS 5/19/2021	

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	116.6			
B. Total Acres To Be Converted Indirectly	1.5			
C. Total Acres In Site	118.1			
PART IV *(To be completed by NRCS)* Land Evaluation Information				
A. Total Acres Prime And Unique Farmland	53.2			
B. Total Acres Statewide Important or Local Important Farmland	57.5			
C. Percentage Of Farmland in County Or Local Govt. Unit To Be Converted	0.028			
D. Percentage Of Farmland in Govt. Jurisdiction With Same Or Higher Relative Value	31.80			
PART V (To be completed by NRCS) Land Evaluation Criterion Relative Value of Farmland To Be Converted (Scale of 0 to 100 Points)	71			

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)	15			
4. Protection Provided By State and Local Government	(20)	0			
5. Distance From Urban Built-up Area	(15)	14			
6. Distance To Urban Support Services	(15)	14			
7. Size Of Present Farm Unit Compared To Average	(10)	5			
8. Creation Of Non-farmable Farmland	(10)	0			
9. Availability Of Farm Support Services	(5)	5			
10. On-Farm Investments	(20)	12			
11. Effects Of Conversion On Farm Support Services	(10)	0			
12. Compatibility With Existing Agricultural Use	(10)	1			
TOTAL SITE ASSESSMENT POINTS	160	91	0	0	0
PART VII ***(To be completed by Federal Agency)***					
Relative Value Of Farmland *(From Part V)*	100	71	0	0	0
Total Site Assessment *(From Part VI above or local site assessment)*	160	91	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	162	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)**

STEPS IN THE PROCESSING THE FARMLAND AND CONVERSION IMPACT RATING FORM

Step 1 - Federal agencies (or Federally funded projects) involved in proposed projects that may convert farmland, as defined in the Farmland Protection Policy Act (FPPA) to nonagricultural uses, will initially complete Parts I and III of the form. For Corridor type projects, the Federal agency shall use form NRCS-CPA-106 in place of form AD-1006. The Land Evaluation and Site Assessment (LESA) process may also be accessed by visiting the FPPA website, http://fppa.nrcs.usda.gov/lesa/.

Step 2 - Originator (Federal Agency) will send one original copy of the form together with appropriate scaled maps indicating location(s)of project site(s), to the Natural Resources Conservation Service (NRCS) local Field Office or USDA Service Center and retain a copy for their files. (NRCS has offices in most counties in the U.S. The USDA Office Information Locator may be found at http://offices.usda.gov/scripts/ndISAPI.dll/oip_public/USA_map**,** or the offices can usually be found in the Phone Book under U.S. Government, Department of Agriculture. A list of field offices is available from the NRCS State Conservationist and State Office in each State.)

Step 3 - NRCS will, within 10 working days after receipt of the completed form, make a determination as to whether the site(s) of the proposed project contains prime, unique, statewide or local important farmland. (When a site visit or land evaluation system design is needed, NRCS will respond within 30 working days.

Step 4 - For sites where farmland covered by the FPPA will be converted by the proposed project, NRCS will complete Parts II, IV and V of the form.

Step 5 - NRCS will return the original copy of the form to the Federal agency involved in the project, and retain a file copy for NRCS records.

Step 6 - The Federal agency involved in the proposed project will complete Parts VI and VII of the form and return the form with the final selected site to the servicing NRCS office.

Step 7 - The Federal agency providing financial or technical assistance to the proposed project will make a determination as to whether the proposed conversion is consistent with the FPPA.

INSTRUCTIONS FOR COMPLETING THE FARMLAND CONVERSION IMPACT RATING FORM

(For Federal Agency)

Part I: When completing the "County and State" questions, list all the local governments that are responsible for local land use controls where site(s) are to be evaluated.

Part III: When completing item B (Total Acres To Be Converted Indirectly), include the following:

1. Acres not being directly converted but that would no longer be capable of being farmed after the conversion, because the conversion would restrict access to them or other major change in the ability to use the land for agriculture.
2. Acres planned to receive services from an infrastructure project as indicated in the project justification (e.g. highways, utilities planned build out capacity) that will cause a direct conversion.

Part VI: Do not complete Part VI using the standard format if a State or Local site assessment is used. With local and NRCS assistance, use the local Land Evaluation and Site Assessment (LESA).

1. Assign the maximum points for each site assessment criterion as shown in § 658.5(b) of CFR. In cases of corridor-type project such as transportation, power line and flood control, criteria #5 and #6 will not apply and will, be weighted zero, however, criterion #8 will be weighed a maximum of 25 points and criterion #11 a maximum of 25 points.

2. Federal agencies may assign relative weights among the 12 site assessment criteria other than those shown on the FPPA rule after submitting individual agency FPPA policy for review and comment to NRCS. In all cases where other weights are assigned, relative adjustments must be made to maintain the maximum total points at 160. For project sites where the total points equal or exceed 160, consider alternative actions, as appropriate, that could reduce adverse impacts (e.g. Alternative Sites, Modifications or Mitigation).

Part VII: In computing the "Total Site Assessment Points" where a State or local site assessment is used and the total maximum number of points is other than 160, convert the site assessment points to a base of 160.
Example: if the Site Assessment maximum is 200 points, and the alternative Site "A" is rated 180 points:

$$\frac{\text{Total points assigned Site A}}{\text{Maximum points possible}} = \frac{180}{200} \times 160 = 144 \text{ points for Site A}$$

For assistance in completing this form or FPPA process, contact the local NRCS Field Office or USDA Service Center.

NRCS employees, consult the FPPA Manual and/or policy for additional instructions to complete the AD-1006 form.

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Raleigh ES Field Office
551-F Pylon Drive
Raleigh, North Carolina 27606

May 12, 2021

Kim Browning
U.S. Army Corps of Engineers, Wilmington District
Mitigation Field Office
3331 Heritage Trade Drive, Suite 105
Wake Forest, NC 27587

Re: NCDMS Stinking Quarter Mitigation Site / SAW-2021-00347/ Guilford County

Dear Mrs. Browning:

The U.S. Fish and Wildlife Service (Service) has reviewed the project advertised in the above referenced Public Notice. The project, as advertised in the Public Notice, is expected to have minimal adverse impacts to fish and wildlife resources. Therefore, we have no objection to the activity as described in the permit application.

In accordance with the Endangered Species Act of 1973, as amended, (ESA) and based on the information provided, and other available information, it appears the action is not likely to adversely affect federally listed species or their critical habitat as defined by the ESA. We believe that the requirements of section 7 (a)(2) of the ESA have been satisfied for this project. Please remember that obligations under the ESA must be reconsidered if: (1) new information identifies impacts of this action that may affect listed species or critical habitat in a manner not previously considered; (2) this action is modified in a manner that was not considered in this review; or, (3) a new species is listed or critical habitat determined that may be affected by the identified action.

For your convenience a list of all federally protected endangered and threatened species in North Carolina is now available on our website at <http://www.fws.gov/raleigh>. Our web page contains a complete and updated list of federally protected species, and a list of federal species of concern known to occur in each county in North Carolina.

The Service appreciates the opportunity to review and provide comments on the proposed action. Should you have any questions regarding the project, please contact John Ellis at (919) 856-4520, extension 26.

Sincerely,

for Pete Benjamin,
Field Supervisor

cc: NMFS, Beaufort, NC
EPA, Atlanta, GA
WRC, Raleigh

United States Department of the Interior

FISH AND WILDLIFE SERVICE

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

Date: 6/6/2021

Self-Certification Letter

Project Name Stinking Quarter

Dear Applicant:

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

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

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

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

Sincerely,

/s/Pete Benjamin

Pete Benjamin
Field Supervisor
Raleigh Ecological Services

Enclosures - project review package

Threatened & Endangered Species

Listed federally protected species are listed are summarized in the following table along with potential habitat and a biological conclusion for each (USFWS 2018).

Threatened and Endangered Species

Common Name (Scientific Name)	Biological Conclusion	ESA Section 7	Note
Schweinitz's Sunflower (*Helianthus schweinitzii*)	**Suitable habitat present, species not present**	Not likely to adversely affect	Survey did not locate any specimens
Small Whorled Pogonia (*Isotria medeoloides*)	**Suitable habitat present, species not present**	Not likely to adversely affect	Survey did not locate any specimens

Schweinitz's Sunflower

Schweinitz's sunflower is found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and Piedmont longleaf pine forests, and other sunny or semi-sunny habitats where disturbances (e.g., mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. It is intolerant of full shade and excessive competition from other vegetation. Schweinitz's sunflower occurs in a variety of soil series; it is generally found growing on shallow sandy soils with high gravel content; shallow, poor, clayey hardpans; or shallow rocky soils, especially those derived from mafic rocks. Habitat for this species exists within the project area, but no specimens were located during the survey on October 27th, 2020.

Small Whorled Pogonia

Small whorled pogonia can be limited by shade. The species seems to require small light gaps or canopy breaks and generally grows in areas with sparse to moderate ground cover. Too many other plants in an area can be harmful to this plant. This orchid typically grows under canopies that are relatively open or near features that create long-persisting breaks in the forest canopy such as a road or a stream. It grows in mixed-deciduous or mixed-deciduous/coniferous forests, generally in second or third-growth successional stages. The soils in which it lives are usually acidic, moist, and have very few nutrients. Habitat for this species exists within the project area but no specimens were located during the survey on May 25th, 2021.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Phone: (919) 856-4520 Fax: (919) 856-4556

In Reply Refer To: May 07, 2021
Consultation Code: 04EN2000-2021-SLI-1122
Event Code: 04EN2000-2021-E-02522
Project Name: Stinking Quarter Mitigation Site

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The species list generated pursuant to the information you provided identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

Section 7 of the Act requires that all federal agencies (or their designated non-federal representative), in consultation with the Service, insure that any action federally authorized, funded, or carried out by such agencies is not likely to jeopardize the continued existence of any federally-listed endangered or threatened species. A biological assessment or evaluation may be prepared to fulfill that requirement and in determining whether additional consultation with the Service is necessary. In addition to the federally-protected species list, information on the species' life histories and habitats and information on completing a biological assessment or

evaluation and can be found on our web page at http://www.fws.gov/raleigh. Please check the web site often for updated information or changes

If your project contains suitable habitat for any of the federally-listed species known to be present within the county where your project occurs, the proposed action has the potential to adversely affect those species. As such, we recommend that surveys be conducted to determine the species' presence or absence within the project area. The use of North Carolina Natural Heritage program data should not be substituted for actual field surveys.

If you determine that the proposed action may affect (i.e., likely to adversely affect or not likely to adversely affect) a federally-protected species, you should notify this office with your determination, the results of your surveys, survey methodologies, and an analysis of the effects of the action on listed species, including consideration of direct, indirect, and cumulative effects, before conducting any activities that might affect the species. If you determine that the proposed action will have no effect (i.e., no beneficial or adverse, direct or indirect effect) on federally listed species, then you are not required to contact our office for concurrence (unless an Environmental Impact Statement is prepared). However, you should maintain a complete record of the assessment, including steps leading to your determination of effect, the qualified personnel conducting the assessment, habitat conditions, site photographs, and any other related articles.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

Not all Threatened and Endangered Species that occur in North Carolina are subject to section 7 consultation with the U.S Fish and Wildlife Service. Atlantic and shortnose sturgeon, sea turtles,when in the water, and certain marine mammals are under purview of the National Marine Fisheries Service. If your project occurs in marine, estuarine, or coastal river systems you should also contact the National Marine Fisheries Service, http://www.nmfs.noaa.gov/

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office. If you have any questions or comments, please contact John Ellis of this office at john_ellis@fws.gov.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Raleigh Ecological Services Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
(919) 856-4520

Project Summary

Consultation Code: 04EN2000-2021-SLI-1122
Event Code: 04EN2000-2021-E-02522
Project Name: Stinking Quarter Mitigation Site
Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES
Project Description: Stream and wetland mitigation site for NC DMS
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@35.922328699999994,-79.63144149171737,14z



Counties: Guilford County, North Carolina

Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Flowering Plants

NAME	STATUS
Schweinitz's Sunflower *Helianthus schweinitzii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3849	Endangered
Small Whorled Pogonia *Isotria medeoloides* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1890	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Axiom Environmental, Inc.

218 Snow Avenue, Raleigh, North Carolina 27603 423-400-8882

May 28, 2021

Worth Creech
Restoration Systems
1101 Hayes Street Suite 211
Raleigh, NC 27604

Re: Small Whorled Pogonia Survey
Stinking Quarter Mitigation Site, Guilford County **20-001.05**

Dear Mr. Creech:

Axiom Environmental, Inc. (Axiom) is pleased to provide you with this summary letter of a survey for small whorled pogonia on the approximately 116-acre Stinking Quarter Mitigation Site in Guilford County. The survey was conducted by Axiom biologists Mason Harris and Allison Keith on May 25, 2021.

We hope this information will be of assistance. If you have any questions about this information, please feel free to give me a call (423-400-8882) or send me an email (akeith@axiomenvironmental.org).

Yours truly,

AXIOM ENVIRONMENTAL, INC.



Allison E. Keith
Project Scientist

Small Whorled Pogonia Survey
Stinking Quarter Stream and Wetland Mitigation Site

Axiom Environmental Inc. conducted a survey of suitable habitat for various protected species in the fall of 2020. Surveys were conducted for Schweinitz's sunflower and bald eagles. At this time, a survey for small whorled pogonia was not completed as it was not the optimal survey window (mid-May to early June) for this species. Therefore, a second site-wide survey was conducted on May 25, 2021, the optimal survey window for small whorled pogonia. The following is a brief discussion of the species and the results of the survey.

Small whorled pogonia

Habitat Description: Small whorled pogonia is found in open, dry deciduous or mixed pine-deciduous forest, or along stream banks. Examples of areas providing suitable conditions (having an open canopy and shrub layer with a sparse herb layer) include old fields, cutover forests, old orchards, and semi-permanent canopy breaks along roads, streams, lakes, and cliffs. In the mountains and piedmont of North Carolina, this species is usually found in association with white pine.

> **Biological Conclusion**: Suitable habitat for small whorled pogonia occurs on site within wooded areas supporting moderate to sparse ground cover and shaded areas with abundant light gaps. The USFWS has determined the optimal survey windows for small whorled pogonia is mid-May through early July. A site-wide survey was conducted at the Site on May 25, 2021. Systematic surveys were then performed within all areas of suitable habitat within the site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Small whorled pogonia.

A review of NCNHP records dated October 28, 2020, indicates no known occurrences within 1.0 mile of the site.

Axiom Environmental, Inc.

Axiom Environmental, Inc.

218 Snow Avenue, Raleigh, North Carolina 27603 423-400-8882

October 30, 2020

Worth Creech
Restoration Systems
1101 Hayes Street Suite 211
Raleigh, NC 27604

Re: Federally Protected Species Survey
Stinking Quarter Mitigation Site, Guilford County **20-001.05**

Dear Mr. Creech:

Axiom Environmental, Inc. (Axiom) is pleased to provide you with this summary letter of a survey for federally protected species on an approximately 116-acre tract (hereafter referred to as the site) planned for Stinking Quarter Stream and Wetland Mitigation Site in Guilford County (see attached map). The survey was conducted by Axiom biologists Kenan Jernigan and Allison Keith on October 27, 2020.

We hope this information will be of assistance. If you have any questions about this information, please feel free to give me a call (423-400-8882) or send me an email (akeith@axiomenvironmental.org).

Yours truly,

AXIOM ENVIRONMENTAL, INC.

Allison Keith

Allison E. Keith
Project Scientist

Attachments: Figure 1, NCNHP report, & IPaC report

Federally Protected Species Survey
Stinking Quarter Stream and Wetland Mitigation Site

As of July 17, 2020, the U.S. Fish and Wildlife Service (USFWS) lists five federally protected species for Guilford County. According to the USFWS's Information for Planning and Consultation (IPaC) website, only two species are listed specifically for this site, Schweinitz's sunflower (*Helianthus schweinitzii*), and small whorled pogonia (*Isotria medeoloides*). In addition, the USFWS lists one species protected by the Bald and Golden Eagle Protection Act (BGPA), bald eagle (*Haliaeetus leucocephalus*). For each species, a brief discussion of habitat is included below along with the Biological Conclusion rendered based on survey results within the site.

Schweinitz's sunflower

Habitat Description: This species is found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and Piedmont longleaf pine forests, and other sunny or semi-sunny habitats where disturbances (e.g., mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. It is intolerant of full shade and excessive competition from other vegetation.

> **Biological Conclusion**: Suitable habitat for Schweinitz's sunflower occurs on site within disturbed areas including the edges of pastures, forests, and farm roads. The USFWS has determined the optimal survey windows for the sunflower is late August to October (or the first frost). A review of NCNHP records dated October 28, 2020, indicates known occurrences of Schweintz's sunflower within 1.0 mile of the site. A known population nearby was visited and observed by Axiom biologist on October 27, 2020 prior to conducting surveys at the site. Systematic surveys were then performed within all areas of suitable habitat within the site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Schweinitz's sunflower.

Small whorled pogonia

Habitat Description: Small whorled pogonia is found in open, dry deciduous or mixed pine-deciduous forest, or along stream banks. Examples of areas providing suitable conditions (having an open canopy and shrub layer with a sparse herb layer) include old fields, cutover forests, old orchards, and semi-permanent canopy breaks along roads, streams, lakes, and cliffs. In the mountains and piedmont of North Carolina, this species is usually found in association with white pine.

> **Biological Conclusion**: Suitable habitat for small whorled pogonia occurs on site within wooded areas supporting moderate to sparse ground cover and shaded areas with abundant light gaps. The USFWS has determined the optimal survey windows for small whorled pogonia is mid-May through early July. Systematic surveys of suitable habitat will be conducted during the appropriate survey window to determine the presence or absence of this species. Until then, the biological conclusion for small whorled pogonia is **Unresolved**. A review of NCNHP records dated October 28, 2020, indicates no known occurrences within 1.0 mile of the site.

Bald Eagle

Habitat Description**:** Habitat for bald eagle primarily consists of 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.

Biological Conclusion: A review of aerial photography reveals several small ponds within one mile of the study area that may be large enough and sufficiently open to be considered potential feeding and roosting habitat. An investigation of onsite trees found no eagles or eagle nests. A review of NCNHP records dated October 28, 2020, indicates no known occurrences within 1.0 mile of the site. This project is therefore anticipated to have **No Effect** on bald eagle.

NC DEPARTMENT OF
NATURAL AND CULTURAL RESOURCES

Roy Cooper, **Governor**
Susi Hamilton, **Secretary**
Walter Clark, **Director, Land and Water Stewardship**

NCNHDE-13181

October 28, 2020

Allison Keith
Axiom Environmental
218 Snow Ave
Raleigh, NC 27603
RE: Stinking Quarter ; 20-001.05

Dear Allison Keith:

The North Carolina Natural Heritage Program (NCNHP) appreciates the opportunity to provide information about natural heritage resources for the project referenced above.

Based on the project area mapped with your request, a query of the NCNHP database indicates that there are no records for rare species, important natural communities, natural areas, and/or conservation/managed areas within the proposed project boundary. Please note that although there may be no documentation of natural heritage elements within the project boundary, it does not imply or confirm their absence; the area may not have been surveyed. The results of this query should not be substituted for field surveys where suitable habitat exists. In the event that rare species are found within the project area, please contact the NCNHP so that we may update our records.

The attached 'Potential Occurrences' table summarizes rare species and natural communities that have been documented within a one-mile radius of the property boundary. The proximity of these records suggests that these natural heritage elements may potentially be present in the project area if suitable habitat exists. Tables of natural areas and conservation/managed areas within a one-mile radius of the project area, if any, are also included in this report.

If a Federally-listed species is found within the project area or is indicated within a one-mile radius of the project area, the NCNHP recommends contacting the US Fish and Wildlife Service (USFWS) for guidance. Contact information for USFWS offices in North Carolina is found here: https://www.fws.gov/offices/Directory/ListOffices.cfm?statecode=37.

Please note that natural heritage element data are maintained for the purposes of conservation planning, project review, and scientific research, and are not intended for use as the primary criteria for regulatory decisions. Information provided by the NCNHP database may not be published without prior written notification to the NCNHP, and the NCNHP must be credited as an information source in these publications. Maps of NCNHP data may not be redistributed without permission.

The NC Natural Heritage Program may follow this letter with additional correspondence if a Dedicated Nature Preserve, Registered Heritage Area, Clean Water Management Trust Fund easement, or Federally-listed species are documented near the project area.

If you have questions regarding the information provided in this letter or need additional assistance, please contact Rodney A. Butler at rodney.butler@ncdcr.gov or 919-707-8603.

Sincerely,
NC Natural Heritage Program

Natural Heritage Element Occurrences, Natural Areas, and Managed Areas Within a One-mile Radius of the Project Area
Stinking Quarter
Project No. 20-001.05
October 28, 2020
NCNHDE-13181

Element Occurrences Documented Within a One-mile Radius of the Project Area

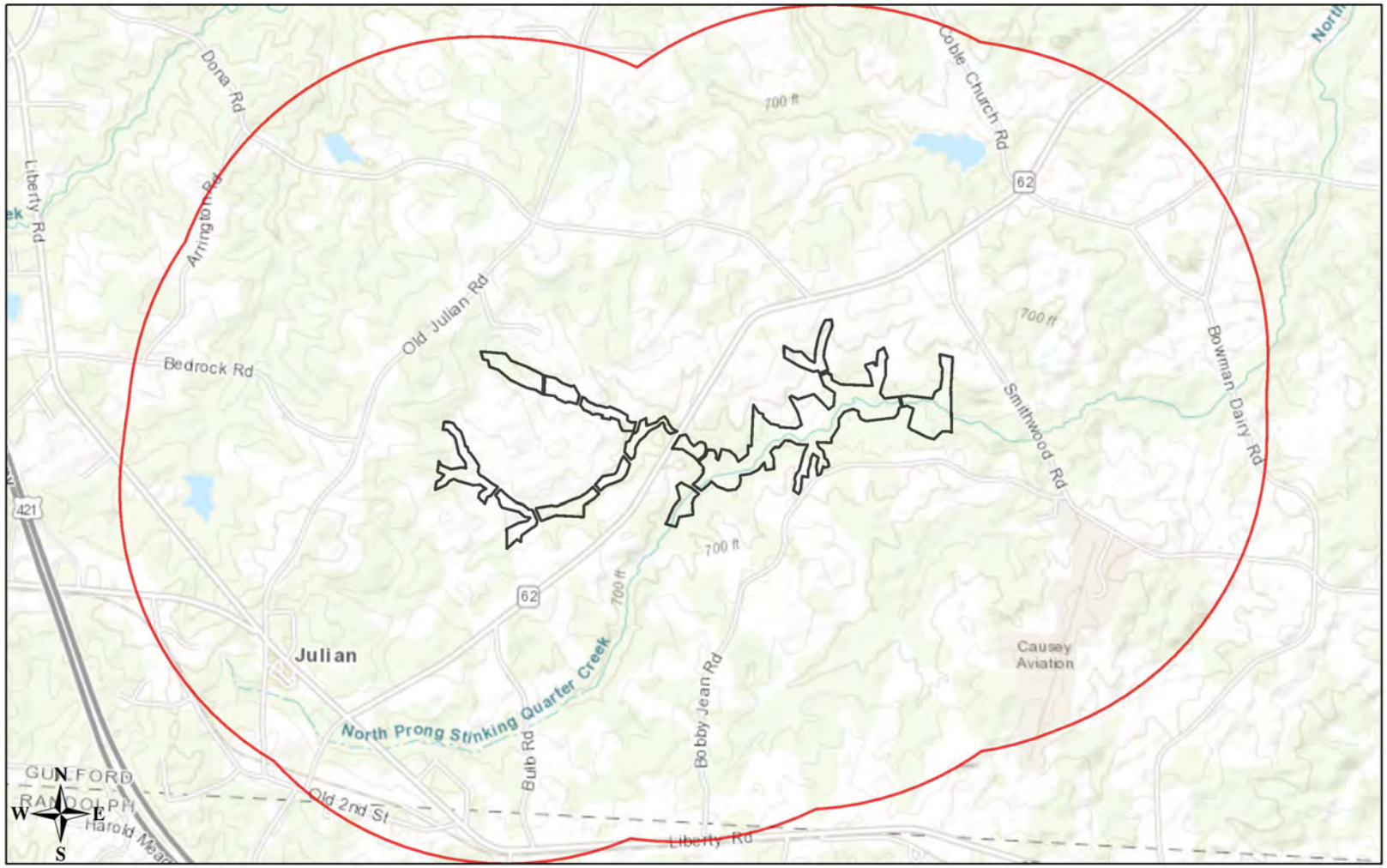
Taxonomic Group	EO ID	Scientific Name	Common Name	Last Observation Date	Element Occurrence Rank	Accuracy	Federal Status	State Status	Global Rank	State Rank
Vascular Plant	38672	Helianthus schweinitzii	Schweinitz's Sunflower	2018-09-27	E	2-High	Endangered	Endangered	G3	S3

No Natural Areas are Documented Within a One-mile Radius of the Project Area

No Managed Areas are Documented Within a One-mile Radius of the Project Area

Definitions and an explanation of status designations and codes can be found at https://ncnhde.natureserve.org/help. Data query generated on October 28, 2020; source: NCNHP, Q3 October 2020. Please resubmit your information request if more than one year elapses before project initiation as new information is continually added to the NCNHP database.

NCNHDE-13181: Stinking Quarter



October 28, 2020

Project Boundary

Buffered Project Boundary

1:27,627

0 0.225 0.45 0.9 mi

0 0.375 0.75 1.5 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

Guilford County, North Carolina



Local office

Raleigh Ecological Services Field Office

(919) 856-4520
(919) 856-4556

MAILING ADDRESS

Post Office Box 33726
Raleigh, NC 27636-3726

PHYSICAL ADDRESS

551 Pylon Drive, Suite F

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

NOT FOR CONSULTATION

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Flowering Plants

NAME	STATUS

Schweinitz's Sunflower Helianthus schweinitzii — Endangered
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/3849

Small Whorled Pogonia Isotria medeoloides — Threatened
No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/1890

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

NOT FOR CONSULTATION

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird

species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON (IF A BREEDING SEASON IS INDICATED FOR A BIRD ON YOUR LIST, THE BIRD MAY BREED IN YOUR PROJECT AREA SOMETIME WITHIN THE TIMEFRAME SPECIFIED, WHICH IS A VERY LIBERAL ESTIMATE OF THE DATES INSIDE WHICH THE BIRD BREEDS ACROSS ITS ENTIRE RANGE. "BREEDS ELSEWHERE" INDICATES THAT THE BIRD DOES NOT LIKELY BREED IN YOUR PROJECT AREA.)
Prairie Warbler Dendroica discolor This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Red-headed Woodpecker Melanerpes erythrocephalus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Sep 10
Rusty Blackbird Euphagus carolinus This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds elsewhere
Wood Thrush Hylocichla mustelina This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 10 to Aug 31

NOT FOR CONSULTATION

Probability of Presence Summary

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

To see a bar's probability of presence score, simply hover your mouse cursor over the bar.

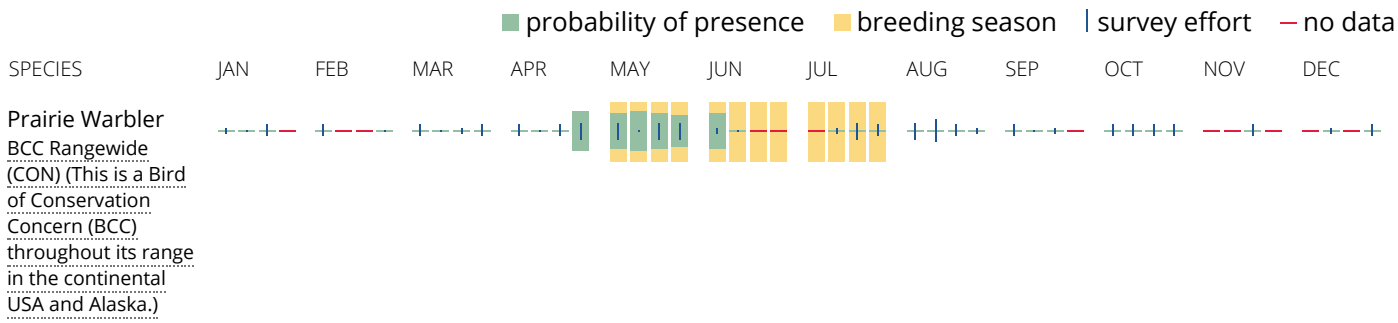
Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

To see a bar's survey effort range, simply hover your mouse cursor over the bar.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.



NOT FOR CONSULTATION

Red-headed Woodpecker
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Rusty Blackbird
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



Wood Thrush
BCC Rangewide (CON) (This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.)



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Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the AKN Phenology Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report

The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ “What does IPaC use to generate the migratory birds potentially occurring in my specified location”. Please be aware this report provides the “probability of presence” of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look

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carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

This location overlaps the following wetlands:

FRESHWATER EMERGENT WETLAND

PEM1A

FRESHWATER FORESTED/SHRUB WETLAND

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PFO1A
PSS1A

FRESHWATER POND
PUBHh

RIVERINE
R4SBC
R5UBH

A full description for each wetland code can be found at the National Wetlands Inventory website

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

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Stinking Quarter Mitigation Site
2330 NC-62
Julian, NC 27283

Inquiry Number: 6527120.2s
June 08, 2021

The EDR Radius Map™ Report with GeoCheck®

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

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

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EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13), the ASTM Standard Practice for Environmental Site Assessments for Forestland or Rural Property (E 2247-16), the ASTM Standard Practice for Limited Environmental Due Diligence: Transaction Screen Process (E 1528-14) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

2330 NC-62
JULIAN, NC 27283

COORDINATES

Latitude (North):	35.9211060 - 35° 55' 15.98''
Longitude (West):	79.6390440 - 79° 38' 20.55''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	622788.3
UTM Y (Meters):	3975853.5
Elevation:	688 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	5945663 CLIMAX, NC
Version Date:	2013
East Map:	5945539 KIMESVILLE, NC
Version Date:	2013

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20140705
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
2330 NC-62
JULIAN, NC 27283

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
1	KECK'S DAIRY, INC.	2416 N.C. 62 EAST	UST	Higher	964, 0.183, NE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

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

DATABASES WITH NO MAPPED SITES

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

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

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

Federal Delisted NPL site list

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

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing
SEMS ---------- Superfund Enterprise Management System

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE ---------- Superfund Enterprise Management System Archive

Federal RCRA CORRACTS facilities list

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

Federal RCRA non-CORRACTS TSD facilities list

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

Federal RCRA generators list

RCRA-LQG ---------- RCRA - Large Quantity Generators
RCRA-SQG ---------- RCRA - Small Quantity Generators
RCRA-VSQG ---------- RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

US ENG CONTROLS ..... Engineering Controls Sites List
US INST CONTROLS ..... Institutional Controls Sites List

Federal ERNS list

ERNS ..... Emergency Response Notification System

State- and tribal - equivalent NPL

NC HSDS ..... Hazardous Substance Disposal Site

State- and tribal - equivalent CERCLIS

SHWS ..... Inactive Hazardous Sites Inventory

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

SWF/LF ..... List of Solid Waste Facilities
OLI ..... Old Landfill Inventory
DEBRIS ..... Solid Waste Active Disaster Debris Sites Listing
LCID ..... Land-Clearing and Inert Debris (LCID) Landfill Notifications

State and tribal leaking storage tank lists

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

State and tribal registered storage tank lists

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

State and tribal institutional control / engineering control registries

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

State and tribal voluntary cleanup sites

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

State and tribal Brownfields sites

BROWNFIELDS ..... Brownfields Projects Inventory

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

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

Local Lists of Landfill / Solid Waste Disposal Sites

SWRCY ..... Recycling Center Listing

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

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL	Delisted National Clandestine Laboratory Register
US CDL	National Clandestine Laboratory Register

Local Land Records

LIENS 2	CERCLA Lien Information

Records of Emergency Release Reports

HMIRS	Hazardous Materials Information Reporting System
SPILLS	Spills Incident Listing
IMD	Incident Management Database
SPILLS 90	SPILLS 90 data from FirstSearch
SPILLS 80	SPILLS 80 data from FirstSearch

Other Ascertainable Records

RCRA NonGen / NLR	RCRA - Non Generators / No Longer Regulated
FUDS	Formerly Used Defense Sites
DOD	Department of Defense Sites
SCRD DRYCLEANERS	State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR	Financial Assurance Information
EPA WATCH LIST	EPA WATCH LIST
2020 COR ACTION	2020 Corrective Action Program List
TSCA	Toxic Substances Control Act
TRIS	Toxic Chemical Release Inventory System
SSTS	Section 7 Tracking Systems
ROD	Records Of Decision
RMP	Risk Management Plans
RAATS	RCRA Administrative Action Tracking System
PRP	Potentially Responsible Parties
PADS	PCB Activity Database System
ICIS	Integrated Compliance Information System
FTTS	FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS	Material Licensing Tracking System
COAL ASH DOE	Steam-Electric Plant Operation Data
COAL ASH EPA	Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER	PCB Transformer Registration Database
RADINFO	Radiation Information Database
HIST FTTS	FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS	Incident and Accident Data
CONSENT	Superfund (CERCLA) Consent Decrees
INDIAN RESERV	Indian Reservations
FUSRAP	Formerly Utilized Sites Remedial Action Program
UMTRA	Uranium Mill Tailings Sites
LEAD SMELTERS	Lead Smelter Sites

US AIRS ---- Aerometric Information Retrieval System Facility Subsystem
US MINES ---- Mines Master Index File
ABANDONED MINES ---- Abandoned Mines
FINDS ---- Facility Index System/Facility Registry System
UXO ---- Unexploded Ordnance Sites
DOCKET HWC ---- Hazardous Waste Compliance Docket Listing
ECHO ---- Enforcement & Compliance History Information
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
AIRS ---- Air Quality Permit Listing
ASBESTOS ---- ASBESTOS
COAL ASH ---- Coal Ash Disposal Sites
DRYCLEANERS ---- Drycleaning Sites
Financial Assurance ---- Financial Assurance Information Listing
NPDES ---- NPDES Facility Location Listing
UIC ---- Underground Injection Wells Listing
AOP ---- Animal Operation Permits Listing
MINES MRDS ---- Mineral Resources Data System
CCB ---- Coal Ash Structural Fills (CCB) Listing
PCSRP ---- Petroleum-Contaminated Soil Remediation Permits
SEPT HAULERS ---- Permitted Septage Haulers Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants
EDR Hist Auto ---- EDR Exclusive Historical Auto Stations
EDR Hist Cleaner ---- EDR Exclusive Historical Cleaners

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS ---- Recovered Government Archive State Hazardous Waste Facilities List
RGA LF ---- Recovered Government Archive Solid Waste Facilities List
RGA LUST ---- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

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

EXECUTIVE SUMMARY

STANDARD ENVIRONMENTAL RECORDS

State and tribal registered storage tank lists

UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Environment & Natural Resources' Petroleum Underground Storage Tank Database.

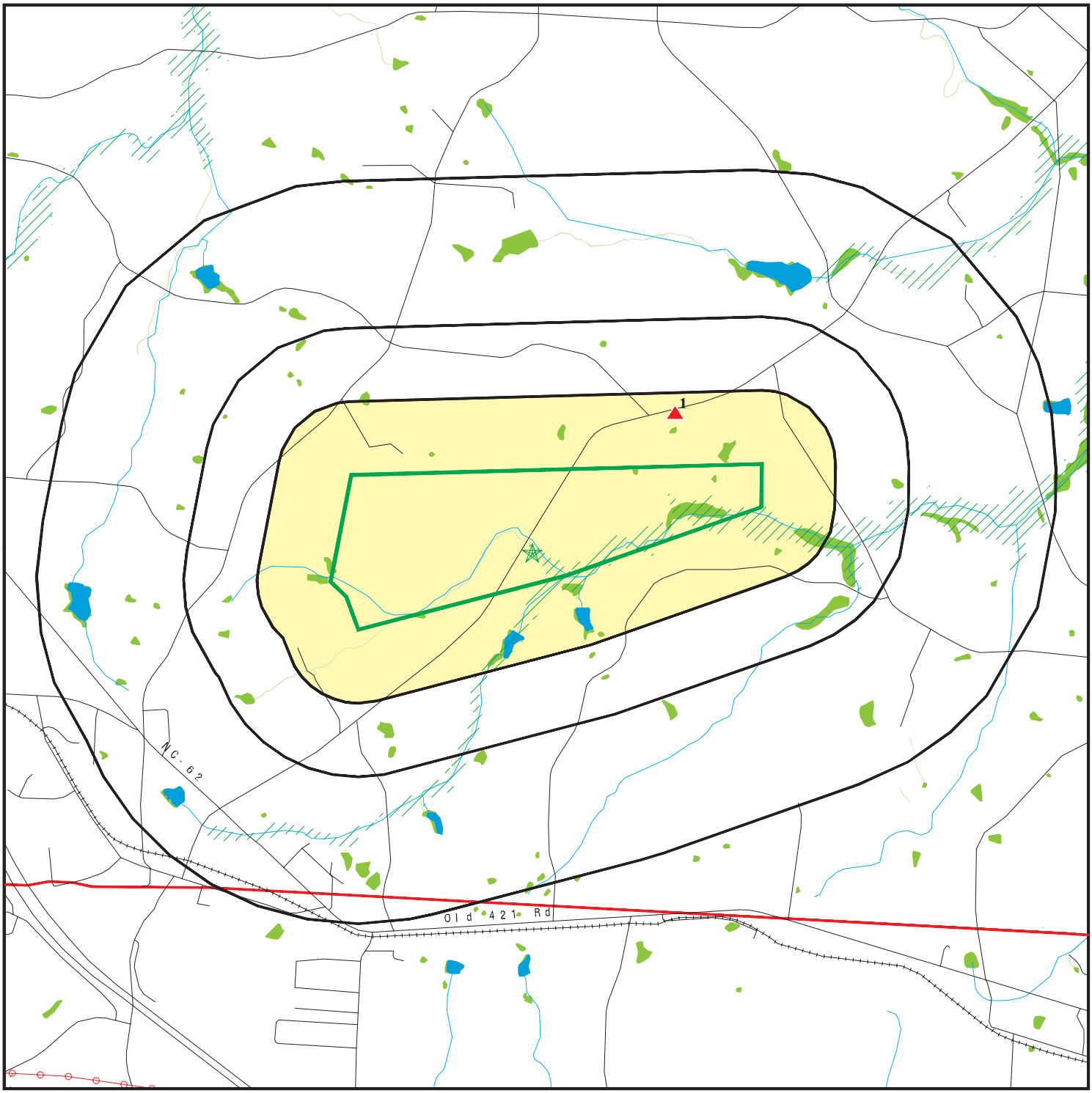
A review of the UST list, as provided by EDR, and dated 01/22/2021 has revealed that there is 1 UST site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KECK'S DAIRY, INC. Tank Status: Current Tank Status: Removed Facility Id: 00-0-0000010857	2416 N.C. 62 EAST	NE 1/8 - 1/4 (0.183 mi.)	1	8

EXECUTIVE SUMMARY

There were no unmapped sites in this report.

OVERVIEW MAP - 6527120.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- County Boundary
- Power transmission lines
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

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

SITE NAME: Stinking Quarter Mitigation Site	CLIENT: Restoration Systems, LLC
ADDRESS: 2330 NC-62	CONTACT: JD Hamby
Julian NC 27283	INQUIRY #: 6527120.2s
LAT/LONG: 35.921106 / 79.639044	DATE: June 08, 2021 12:39 pm

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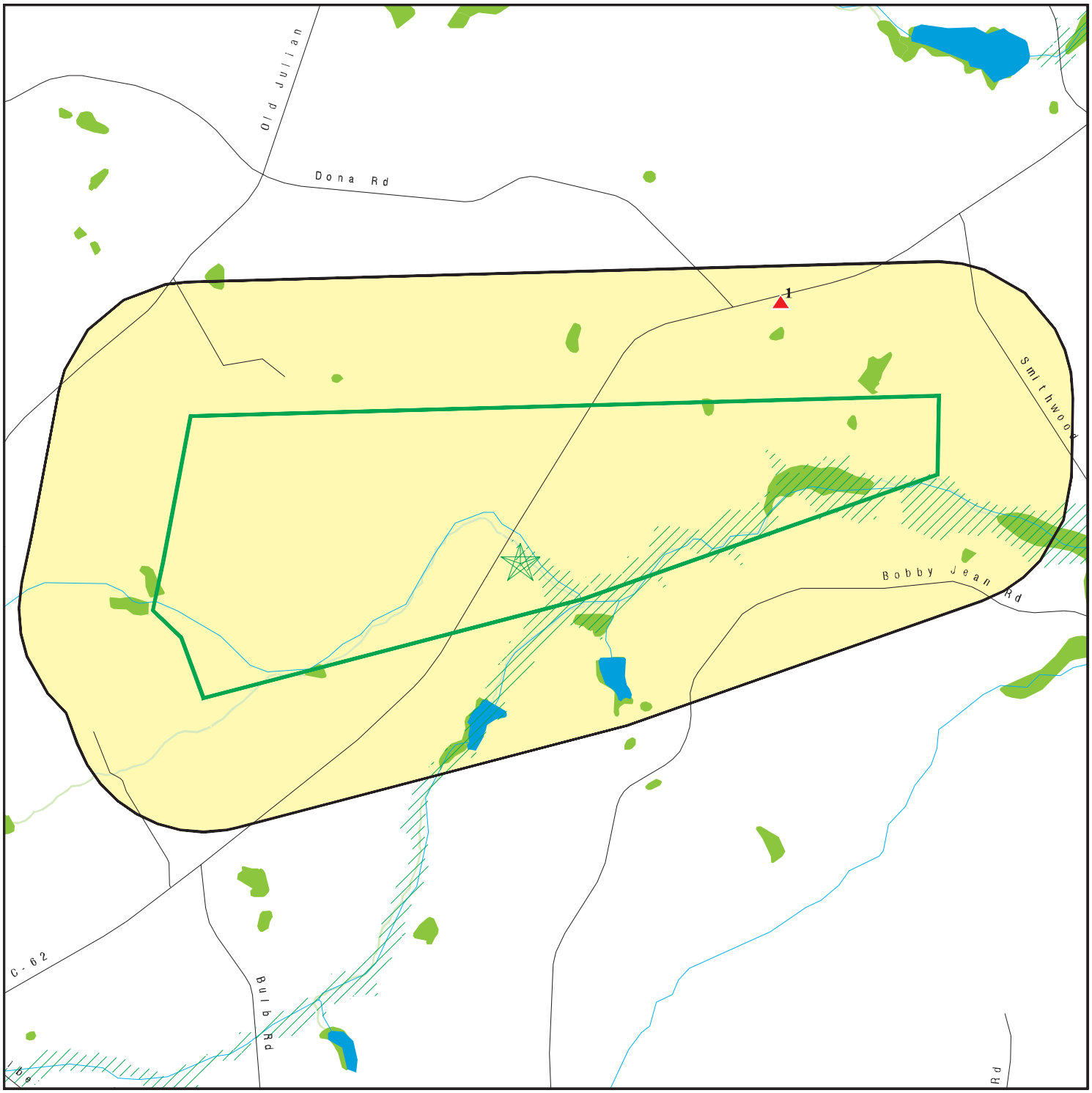
DETAIL MAP - 6527120.2S



0 1/4 1/2 1 Miles

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Special Flood Hazard Area (1%)
- 0.2% Annual Chance Flood Hazard
- National Wetland Inventory
- State Wetlands
- Hazardous Substance Disposal Sites

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

SITE NAME: Stinking Quarter Mitigation Site	CLIENT: Restoration Systems, LLC
ADDRESS: 2330 NC-62 Julian NC 27283	CONTACT: JD Hamby
LAT/LONG: 35.921106 / 79.639044	INQUIRY #: 6527120.2s DATE: June 08, 2021 12:40 pm

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MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000		0	0	0	0	NR	0
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	1.000		0	0	0	0	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500		0	0	0	NR	NR	0
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	0	0	NR	NR	0
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	0	NR	NR	NR	0
RCRA-VSQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500		0	0	0	NR	NR	0
US INST CONTROLS	0.500		0	0	0	NR	NR	0
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
NC HSDS	1.000		0	0	0	0	NR	0
State- and tribal - equivalent CERCLIS								
SHWS	1.000		0	0	0	0	NR	0
State and tribal landfill and/or solid waste disposal site lists								
SWF/LF	0.500		0	0	0	NR	NR	0
OLI	0.500		0	0	0	NR	NR	0
DEBRIS	0.500		0	0	0	NR	NR	0
LCID	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
State and tribal leaking storage tank lists								
LAST	0.500		0	0	0	NR	NR	0
LUST	0.500		0	0	0	NR	NR	0
INDIAN LUST	0.500		0	0	0	NR	NR	0
LUST TRUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
UST	0.250		0	1	NR	NR	NR	1
AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
INST CONTROL	0.500		0	0	0	NR	NR	0
State and tribal voluntary cleanup sites								
INDIAN VCP	0.500		0	0	0	NR	NR	0
VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
BROWNFIELDS	0.500		0	0	0	NR	NR	0
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	0	0	NR	NR	0
Local Lists of Landfill / Solid Waste Disposal Sites								
SWRCY	0.500		0	0	0	NR	NR	0
HIST LF	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
SPILLS	0.001		0	NR	NR	NR	NR	0
IMD	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
SPILLS 90	0.001		0	NR	NR	NR	NR	0
SPILLS 80	0.001		0	NR	NR	NR	NR	0
Other Ascertainable Records								
RCRA NonGen / NLR	0.250		0	0	NR	NR	NR	0
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000		0	0	0	0	NR	0
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	1.000		0	0	0	0	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.250		0	0	NR	NR	NR	0
FINDS	0.001		0	NR	NR	NR	NR	0
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001		0	NR	NR	NR	NR	0
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
AIRS	0.001		0	NR	NR	NR	NR	0
ASBESTOS	0.001		0	NR	NR	NR	NR	0
COAL ASH	0.500		0	0	0	NR	NR	0
DRYCLEANERS	0.250		0	0	NR	NR	NR	0
Financial Assurance	0.001		0	NR	NR	NR	NR	0
NPDES	0.001		0	NR	NR	NR	NR	0
UIC	0.001		0	NR	NR	NR	NR	0
AOP	0.001		0	NR	NR	NR	NR	0
MINES MRDS	0.001		0	NR	NR	NR	NR	0
CCB	0.500		0	0	0	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
PCSRP	0.500		0	0	0	NR	NR	0
SEPT HAULERS	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0
EDR Hist Auto	0.125		0	NR	NR	NR	NR	0
EDR Hist Cleaner	0.125		0	NR	NR	NR	NR	0
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
RGA HWS	0.001		0	NR	NR	NR	NR	0
RGA LF	0.001		0	NR	NR	NR	NR	0
RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		0	0	1	0	0	0	1

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

1
NE
1/8-1/4
0.183 mi.
964 ft.

KECK'S DAIRY, INC.
2416 N.C. 62 EAST
JULIAN, NC 27283

UST **U001192842**
N/A

Relative:
Higher

Actual:
707 ft.

UST:

Name:	KECK'S DAIRY, INC.
Address:	2416 N.C. 62 EAST
City,State,Zip:	JULIAN, NC 27283
Facility Id:	00-0-0000010857
Contact:	L.R. KECK
Contact Address1:	2416 N.C. 62 EAST
Contact Address2:	Not reported
Contact City/State/Zip:	JULIAN, NC 27283
FIPS County Desc:	Guilford
Latitude:	35.92788
Longitude:	-79.62908

Tank Id:	1
Tank Status:	Current
Installed Date:	02/23/1982
Perm Close Date:	Not reported
Product Name:	Gasoline, Gas Mix
Tank Capacity:	1000
Root Tank Id:	Not reported
Main Tank:	No
Compartment Tank:	No
Manifold Tank:	Not reported
Commercial:	No
Regulated:	No
Other CP Tank:	Not reported
Overfill Protection Name:	Unknown
Spill Protection Name:	Unknown
Leak Detection Name:	Unknown
Decode for TCONS_KEY:	Single Wall Steel
Decode for PCONS_KEY:	Single Wall Steel
Decode for PSYS_KEY:	Unknown

Click here to access the North Carolina DEQ records for this facility:

Tank Id:	2
Tank Status:	Current
Installed Date:	02/23/1982
Perm Close Date:	Not reported
Product Name:	Diesel
Tank Capacity:	1000
Root Tank Id:	Not reported
Main Tank:	No
Compartment Tank:	No
Manifold Tank:	Not reported
Commercial:	No
Regulated:	No
Other CP Tank:	Not reported
Overfill Protection Name:	Unknown
Spill Protection Name:	Unknown
Leak Detection Name:	Unknown
Decode for TCONS_KEY:	Single Wall Steel

KECK'S DAIRY, INC. (Continued) **U001192842**

Decode for PCONS_KEY: Single Wall Steel
Decode for PSYS_KEY: Unknown

Click here to access the North Carolina DEQ records for this facility:

Tank Id: 3
Tank Status: Removed
Installed Date: 02/24/1980
Perm Close Date: 08/31/1990
Product Name: Diesel
Tank Capacity: 275
Root Tank Id: Not reported
Main Tank: No
Compartment Tank: No
Manifold Tank: Not reported
Commercial: No
Regulated: No
Other CP Tank: Not reported
Overfill Protection Name: Unknown
Spill Protection Name: Unknown
Leak Detection Name: Unknown
Decode for TCONS_KEY: Single Wall Steel
Decode for PCONS_KEY: Single Wall Steel
Decode for PSYS_KEY: Unknown

Click here to access the North Carolina DEQ records for this facility:

Count: 0 records.

ORPHAN SUMMARY

City	EDR ID	Site Name	Site Address	Zip	Database(s)
		NO SITES FOUND			

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

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

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

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: National Priority List

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

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL Site Boundaries

Sources:

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

EPA Region 1
Telephone 617-918-1143

EPA Region 6
Telephone: 214-655-6659

EPA Region 3
Telephone 215-814-5418

EPA Region 7
Telephone: 913-551-7247

EPA Region 4
Telephone 404-562-8033

EPA Region 8
Telephone: 303-312-6774

EPA Region 5
Telephone 312-886-6686

EPA Region 9
Telephone: 415-947-4246

EPA Region 10
Telephone 206-553-8665

Proposed NPL: Proposed National Priority List Sites

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

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

NPL LIENS: Federal Superfund Liens

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

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

Source: EPA
Telephone: 202-564-4267
Last EDR Contact: 08/15/2011
Next Scheduled EDR Contact: 11/28/2011
Data Release Frequency: No Update Planned

Federal Delisted NPL site list

Delisted NPL: National Priority List Deletions

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

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: N/A
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

Federal CERCLIS list

FEDERAL FACILITY: Federal Facility Site Information listing

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

Date of Government Version: 04/03/2019
Date Data Arrived at EDR: 04/05/2019
Date Made Active in Reports: 05/14/2019
Number of Days to Update: 39

Source: Environmental Protection Agency
Telephone: 703-603-8704
Last EDR Contact: 03/30/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

SEMS: Superfund Enterprise Management System

SEMS (Superfund Enterprise Management System) tracks hazardous waste sites, potentially hazardous waste sites, and remedial activities performed in support of EPA's Superfund Program across the United States. The list was formerly know as CERCLIS, renamed to SEMS by the EPA in 2015. The list contains data on potentially hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). This dataset also contains sites which are either proposed to or on the National Priorities List (NPL) and the sites which are in the screening and assessment phase for possible inclusion on the NPL.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: Superfund Enterprise Management System Archive

SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Quarterly

Federal RCRA CORRACTS facilities list

CORRACTS: Corrective Action Report

CORRACTS identifies hazardous waste handlers with RCRA corrective action activity.

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: EPA
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF: RCRA - Treatment, Storage and Disposal

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

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal RCRA generators list

RCRA-LQG: RCRA - Large Quantity Generators

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

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-SQG: RCRA - Small Quantity Generators

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

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

RCRA-VSQG: RCRA - Very Small Quantity Generators (Formerly Conditionally Exempt Small Quantity Generators)

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

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

Federal institutional controls / engineering controls registries

LUCIS: Land Use Control Information System

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

Date of Government Version: 02/09/2021
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 39

Source: Department of the Navy
Telephone: 843-820-7326
Last EDR Contact: 05/05/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US ENG CONTROLS: Engineering Controls Sites List

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

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US INST CONTROLS: Institutional Controls Sites List

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

Date of Government Version: 02/22/2021
Date Data Arrived at EDR: 02/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 703-603-0695
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

Federal ERNS list

ERNS: Emergency Response Notification System

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

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/15/2020
Date Made Active in Reports: 12/22/2020
Number of Days to Update: 7

Source: National Response Center, United States Coast Guard
Telephone: 202-267-2180
Last EDR Contact: 12/15/2020
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

State- and tribal - equivalent NPL

HSDS: Hazardous Substance Disposal Site

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

Date of Government Version: 08/09/2011
Date Data Arrived at EDR: 11/08/2011
Date Made Active in Reports: 12/05/2011
Number of Days to Update: 27

Source: North Carolina Center for Geographic Information and Analysis
Telephone: 919-754-6580
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: No Update Planned

State- and tribal - equivalent CERCLIS

SHWS: Inactive Hazardous Sites Inventory

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

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/10/2021
Date Made Active in Reports: 05/27/2021
Number of Days to Update: 78

Source: Department of Environment, Health and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 03/10/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

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

SWF/LF: List of Solid Waste Facilities

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

Date of Government Version: 09/10/2020
Date Data Arrived at EDR: 09/23/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 82

Source: Department of Environment and Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

OLI: Old Landfill Inventory

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

Date of Government Version: 09/11/2020
Date Data Arrived at EDR: 10/09/2020
Date Made Active in Reports: 12/30/2020
Number of Days to Update: 82

Source: Department of Environment & Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

DEBRIS: Solid Waste Active Disaster Debris Sites Listing

NCDEQ Division of Waste Management Solid Waste Section Temporary Disaster Debris Staging Site (TDDSS) Locations which are available to be activated in a disaster or emergency.. Disaster Debris Sites can only be used for temporary disaster debris storage if the site's responsible party activates the site for use by notifying the NCDEQ DWM Solid Waste Section staff during an emergency

Date of Government Version: 01/06/2021
Date Data Arrived at EDR: 03/16/2021
Date Made Active in Reports: 06/02/2021
Number of Days to Update: 78

Source: Department of Environmental Quality
Telephone: 919-707-8247
Last EDR Contact: 03/16/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

LCID: Land-Clearing and Inert Debris (LCID) Landfill Notifications

A list all of the Land-Clearing and Inert Debris (LCID) Landfill Notification facilities (under 2 acres in size) in North Carolina.

Date of Government Version: 04/30/2020
Date Data Arrived at EDR: 07/09/2020
Date Made Active in Reports: 09/23/2020
Number of Days to Update: 76

Source: Department of Environmental Quality
Telephone: 919-707-8248
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

State and tribal leaking storage tank lists

LUST: Regional UST Database

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

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/03/2021
Date Made Active in Reports: 04/29/2021
Number of Days to Update: 85

Source: Department of Environment and Natural Resources
Telephone: 919-707-8200
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

LAST: Leaking Aboveground Storage Tanks

A listing of leaking aboveground storage tank site locations.

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/03/2021
Date Made Active in Reports: 04/29/2021
Number of Days to Update: 85

Source: Department of Environment & Natural Resources
Telephone: 877-623-6748
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

INDIAN LUST R8: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Colorado, Montana, North Dakota, South Dakota, Utah and Wyoming.

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6271
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R7: Leaking Underground Storage Tanks on Indian Land

LUSTs on Indian land in Iowa, Kansas, and Nebraska

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

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

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: EPA Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R9: Leaking Underground Storage Tanks on Indian Land
LUSTs on Indian land in Arizona, California, New Mexico and Nevada

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: Environmental Protection Agency
Telephone: 415-972-3372
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

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

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN LUST R5: Leaking Underground Storage Tanks on Indian Land
Leaking underground storage tanks located on Indian Land in Michigan, Minnesota and Wisconsin.

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86
Source: EPA, Region 5
Telephone: 312-886-7439
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

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

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84
Source: EPA Region 4
Telephone: 404-562-8677
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

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

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84
Source: EPA Region 6
Telephone: 214-665-6597
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

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

Date of Government Version: 01/04/2021
Date Data Arrived at EDR: 01/06/2021
Date Made Active in Reports: 03/25/2021
Number of Days to Update: 78
Source: Department of Environment and Natural Resources
Telephone: 919-733-1315
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

State and tribal registered storage tank lists

FEMA UST: Underground Storage Tank Listing
A listing of all FEMA owned underground storage tanks.

Date of Government Version: 01/29/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33

Source: FEMA
Telephone: 202-646-5797
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

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

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/03/2021
Date Made Active in Reports: 04/28/2021
Number of Days to Update: 84

Source: Department of Environment and Natural Resources
Telephone: 919-733-1308
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

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

Date of Government Version: 12/15/2020
Date Data Arrived at EDR: 03/16/2021
Date Made Active in Reports: 06/03/2021
Number of Days to Update: 79

Source: Department of Environment and Natural Resources
Telephone: 919-715-6183
Last EDR Contact: 03/15/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

INDIAN UST R9: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 9 (Arizona, California, Hawaii, Nevada, the Pacific Islands, and Tribal Nations).

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 9
Telephone: 415-972-3368
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R7: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 7 (Iowa, Kansas, Missouri, Nebraska, and 9 Tribal Nations).

Date of Government Version: 09/30/2020
Date Data Arrived at EDR: 12/22/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 80

Source: EPA Region 7
Telephone: 913-551-7003
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R6: Underground Storage Tanks on Indian Land
The Indian Underground Storage Tank (UST) database provides information about underground storage tanks on Indian land in EPA Region 6 (Louisiana, Arkansas, Oklahoma, New Mexico, Texas and 65 Tribes).

Date of Government Version: 04/08/2020
Date Data Arrived at EDR: 05/20/2020
Date Made Active in Reports: 08/12/2020
Number of Days to Update: 84

Source: EPA Region 6
Telephone: 214-665-7591
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R10: Underground Storage Tanks on Indian Land

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

Date of Government Version: 11/12/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 10
Telephone: 206-553-2857
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R5: Underground Storage Tanks on Indian Land

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

Date of Government Version: 10/07/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 5
Telephone: 312-886-6136
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R4: Underground Storage Tanks on Indian Land

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

Date of Government Version: 10/02/2020
Date Data Arrived at EDR: 12/18/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 84

Source: EPA Region 4
Telephone: 404-562-9424
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R8: Underground Storage Tanks on Indian Land

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

Date of Government Version: 10/09/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA Region 8
Telephone: 303-312-6137
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

INDIAN UST R1: Underground Storage Tanks on Indian Land

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

Date of Government Version: 10/01/2020
Date Data Arrived at EDR: 12/16/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 86

Source: EPA, Region 1
Telephone: 617-918-1313
Last EDR Contact: 04/23/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

State and tribal institutional control / engineering control registries

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

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

Date of Government Version: 09/04/2020
Date Data Arrived at EDR: 09/09/2020
Date Made Active in Reports: 12/03/2020
Number of Days to Update: 85

Source: Department of Environmental Quality
Telephone: 919-508-8400
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Quarterly

State and tribal voluntary cleanup sites

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

Date of Government Version: 03/01/2021
Date Data Arrived at EDR: 03/10/2021
Date Made Active in Reports: 05/27/2021
Number of Days to Update: 78

Source: Department of Environment and Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 06/07/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

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

Date of Government Version: 07/27/2015
Date Data Arrived at EDR: 09/29/2015
Date Made Active in Reports: 02/18/2016
Number of Days to Update: 142

Source: EPA, Region 1
Telephone: 617-918-1102
Last EDR Contact: 03/22/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

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

Date of Government Version: 03/20/2008
Date Data Arrived at EDR: 04/22/2008
Date Made Active in Reports: 05/19/2008
Number of Days to Update: 27

Source: EPA, Region 7
Telephone: 913-551-7365
Last EDR Contact: 04/20/2009
Next Scheduled EDR Contact: 07/20/2009
Data Release Frequency: Varies

State and tribal Brownfields sites

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

Date of Government Version: 12/01/2020
Date Data Arrived at EDR: 12/08/2020
Date Made Active in Reports: 12/09/2020
Number of Days to Update: 1

Source: Department of Environment and Natural Resources
Telephone: 919-733-4996
Last EDR Contact: 03/30/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: A Listing of Brownfields Sites
Brownfields are real property, the expansion, redevelopment, or reuse of which may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Cleaning up and reinvesting in these properties takes development pressures off of undeveloped, open land, and both improves and protects the environment. Assessment, Cleanup and Redevelopment Exchange System (ACRES) stores information reported by EPA Brownfields grant recipients on brownfields properties assessed or cleaned up with grant funding as well as information on Targeted Brownfields Assessments performed by EPA Regions. A listing of ACRES Brownfield sites is obtained from Cleanups in My Community. Cleanups in My Community provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81

Source: Environmental Protection Agency
Telephone: 202-566-2777
Last EDR Contact: 03/16/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Semi-Annually

Local Lists of Landfill / Solid Waste Disposal Sites

HIST LF: Solid Waste Facility Listing
A listing of solid waste facilities.

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

Source: Department of Environment & Natural Resources
Telephone: 919-733-0692
Last EDR Contact: 01/19/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SWRCY: Recycling Center Listing
A listing of recycling center locations.

Date of Government Version: 01/28/2021
Date Data Arrived at EDR: 01/29/2021
Date Made Active in Reports: 04/23/2021
Number of Days to Update: 84

Source: Department of Environment & Natural Resources
Telephone: 919-707-8137
Last EDR Contact: 04/22/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

INDIAN ODI: Report on the Status of Open Dumps on Indian Lands
Location of open dumps on Indian land.

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

Source: Environmental Protection Agency
Telephone: 703-308-8245
Last EDR Contact: 04/22/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

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

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

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

DEBRIS REGION 9: Torres Martinez Reservation Illegal Dump Site Locations
A listing of illegal dump sites location on the Torres Martinez Indian Reservation located in eastern Riverside County and northern Imperial County, California.

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

Source: EPA, Region 9
Telephone: 415-947-4219
Last EDR Contact: 04/14/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: No Update Planned

IHS OPEN DUMPS: Open Dumps on Indian Land
A listing of all open dumps located on Indian Land in the United States.

Date of Government Version: 04/01/2014
Date Data Arrived at EDR: 08/06/2014
Date Made Active in Reports: 01/29/2015
Number of Days to Update: 176

Source: Department of Health & Human Serivces, Indian Health Service
Telephone: 301-443-1452
Last EDR Contact: 04/29/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Varies

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL: National Clandestine Laboratory Register

A listing of clandestine drug lab locations that have been removed from the DEAs National Clandestine Laboratory Register.

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/22/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: No Update Planned

US CDL: Clandestine Drug Labs

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

Date of Government Version: 12/07/2020
Date Data Arrived at EDR: 12/09/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 83

Source: Drug Enforcement Administration
Telephone: 202-307-1000
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Quarterly

Local Land Records

LIENS 2: CERCLA Lien Information

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

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 202-564-6023
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Semi-Annually

Records of Emergency Release Reports

HMIRS: Hazardous Materials Information Reporting System

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

Date of Government Version: 12/16/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: U.S. Department of Transportation
Telephone: 202-366-4555
Last EDR Contact: 03/24/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

SPILLS: Spills Incident Listing

A listing spills, hazardous material releases, sanitary sewer overflows, wastewater treatment plant bypasses and upsets, citizen complaints, and any other environmental emergency calls reported to the agency.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 05/03/2021
Number of Days to Update: 83

Source: Department of Environment & Natural Resources
Telephone: 919-807-6308
Last EDR Contact: 06/02/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

IMD: Incident Management Database

Groundwater and/or soil contamination incidents

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/03/2021
Date Made Active in Reports: 04/29/2021
Number of Days to Update: 85

Source: Department of Environment and Natural Resources
Telephone: 877-623-6748
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: No Update Planned

SPILLS 90: SPILLS90 data from FirstSearch

Spills 90 includes those spill and release records available exclusively from FirstSearch databases. Typically, they may include chemical, oil and/or hazardous substance spills recorded after 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 90.

Date of Government Version: 09/27/2012
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/06/2013
Number of Days to Update: 62

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

SPILLS 80: SPILLS80 data from FirstSearch

Spills 80 includes those spill and release records available from FirstSearch databases prior to 1990. Typically, they may include chemical, oil and/or hazardous substance spills recorded before 1990. Duplicate records that are already included in EDR incident and release records are not included in Spills 80.

Date of Government Version: 06/14/2001
Date Data Arrived at EDR: 01/03/2013
Date Made Active in Reports: 03/06/2013
Number of Days to Update: 62

Source: FirstSearch
Telephone: N/A
Last EDR Contact: 01/03/2013
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

Other Ascertainable Records

RCRA NonGen / NLR: RCRA - Non Generators / No Longer Regulated

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

Date of Government Version: 03/22/2021
Date Data Arrived at EDR: 03/23/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 57

Source: Environmental Protection Agency
Telephone: (404) 562-8651
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

FUDS: Formerly Used Defense Sites

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

Date of Government Version: 02/11/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 47

Source: U.S. Army Corps of Engineers
Telephone: 202-528-4285
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

DOD: Department of Defense Sites

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

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

Source: USGS
Telephone: 888-275-8747
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Semi-Annually

FEDLAND: Federal and Indian Lands

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

Date of Government Version: 04/02/2018
Date Data Arrived at EDR: 04/11/2018
Date Made Active in Reports: 11/06/2019
Number of Days to Update: 574

Source: U.S. Geological Survey
Telephone: 888-275-8747
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: N/A

SCRD DRYCLEANERS: State Coalition for Remediation of Drycleaners Listing

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

Date of Government Version: 01/01/2017
Date Data Arrived at EDR: 02/03/2017
Date Made Active in Reports: 04/07/2017
Number of Days to Update: 63

Source: Environmental Protection Agency
Telephone: 615-532-8599
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: Varies

US FIN ASSUR: Financial Assurance Information

All owners and operators of facilities that treat, store, or dispose of hazardous waste are required to provide proof that they will have sufficient funds to pay for the clean up, closure, and post-closure care of their facilities.

Date of Government Version: 12/14/2020
Date Data Arrived at EDR: 12/17/2020
Date Made Active in Reports: 03/12/2021
Number of Days to Update: 85

Source: Environmental Protection Agency
Telephone: 202-566-1917
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Quarterly

EPA WATCH LIST: EPA WATCH LIST

EPA maintains a "Watch List" to facilitate dialogue between EPA, state and local environmental agencies on enforcement matters relating to facilities with alleged violations identified as either significant or high priority. Being on the Watch List does not mean that the facility has actually violated the law only that an investigation by EPA or a state or local environmental agency has led those organizations to allege that an unproven violation has in fact occurred. Being on the Watch List does not represent a higher level of concern regarding the alleged violations that were detected, but instead indicates cases requiring additional dialogue between EPA, state and local agencies - primarily because of the length of time the alleged violation has gone unaddressed or unresolved.

Date of Government Version: 08/30/2013
Date Data Arrived at EDR: 03/21/2014
Date Made Active in Reports: 06/17/2014
Number of Days to Update: 88

Source: Environmental Protection Agency
Telephone: 617-520-3000
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

2020 COR ACTION: 2020 Corrective Action Program List

The EPA has set ambitious goals for the RCRA Corrective Action program by creating the 2020 Corrective Action Universe. This RCRA cleanup baseline includes facilities expected to need corrective action. The 2020 universe contains a wide variety of sites. Some properties are heavily contaminated while others were contaminated but have since been cleaned up. Still others have not been fully investigated yet, and may require little or no remediation. Inclusion in the 2020 Universe does not necessarily imply failure on the part of a facility to meet its RCRA obligations.

Date of Government Version: 09/30/2017
Date Data Arrived at EDR: 05/08/2018
Date Made Active in Reports: 07/20/2018
Number of Days to Update: 73

Source: Environmental Protection Agency
Telephone: 703-308-4044
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

TSCA: Toxic Substances Control Act

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

Date of Government Version: 12/31/2016
Date Data Arrived at EDR: 06/17/2020
Date Made Active in Reports: 09/10/2020
Number of Days to Update: 85

Source: EPA
Telephone: 202-260-5521
Last EDR Contact: 03/19/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Every 4 Years

TRIS: Toxic Chemical Release Inventory System

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

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 08/14/2020
Date Made Active in Reports: 11/04/2020
Number of Days to Update: 82

Source: EPA
Telephone: 202-566-0250
Last EDR Contact: 05/17/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

SSTS: Section 7 Tracking Systems

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

Date of Government Version: 01/20/2021
Date Data Arrived at EDR: 01/21/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 60

Source: EPA
Telephone: 202-564-4203
Last EDR Contact: 04/20/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Annually

ROD: Records Of Decision

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

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: EPA
Telephone: 703-416-0223
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Annually

RMP: Risk Management Plans

When Congress passed the Clean Air Act Amendments of 1990, it required EPA to publish regulations and guidance for chemical accident prevention at facilities using extremely hazardous substances. The Risk Management Program Rule (RMP Rule) was written to implement Section 112(r) of these amendments. The rule, which built upon existing industry codes and standards, requires companies of all sizes that use certain flammable and toxic substances to develop a Risk Management Program, which includes a(n): Hazard assessment that details the potential effects of an accidental release, an accident history of the last five years, and an evaluation of worst-case and alternative accidental releases; Prevention program that includes safety precautions and maintenance, monitoring, and employee training measures; and Emergency response program that spells out emergency health care, employee training measures and procedures for informing the public and response agencies (e.g the fire department) should an accident occur.

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/18/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 82
Source: Environmental Protection Agency
Telephone: 202-564-8600
Last EDR Contact: 04/19/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

RAATS: RCRA Administrative Action Tracking System

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

Date of Government Version: 04/17/1995
Date Data Arrived at EDR: 07/03/1995
Date Made Active in Reports: 08/07/1995
Number of Days to Update: 35
Source: EPA
Telephone: 202-564-4104
Last EDR Contact: 06/02/2008
Next Scheduled EDR Contact: 09/01/2008
Data Release Frequency: No Update Planned

PRP: Potentially Responsible Parties

A listing of verified Potentially Responsible Parties

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 01/14/2021
Date Made Active in Reports: 03/05/2021
Number of Days to Update: 50
Source: EPA
Telephone: 202-564-6023
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

PADS: PCB Activity Database System

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

Date of Government Version: 11/19/2020
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73
Source: EPA
Telephone: 202-566-0500
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

ICIS: Integrated Compliance Information System

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

Date of Government Version: 11/18/2016
Date Data Arrived at EDR: 11/23/2016
Date Made Active in Reports: 02/10/2017
Number of Days to Update: 79
Source: Environmental Protection Agency
Telephone: 202-564-2501
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

FTTS: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
FTTS tracks administrative cases and pesticide enforcement actions and compliance activities related to FIFRA, TSCA and EPCRA (Emergency Planning and Community Right-to-Know Act). To maintain currency, EDR contacts the Agency on a quarterly basis.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA/Office of Prevention, Pesticides and Toxic Substances
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

FTTS INSP: FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
A listing of FIFRA/TSCA Tracking System (FTTS) inspections and enforcements.

Date of Government Version: 04/09/2009
Date Data Arrived at EDR: 04/16/2009
Date Made Active in Reports: 05/11/2009
Number of Days to Update: 25
Source: EPA
Telephone: 202-566-1667
Last EDR Contact: 08/18/2017
Next Scheduled EDR Contact: 12/04/2017
Data Release Frequency: No Update Planned

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

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/11/2021
Date Made Active in Reports: 05/11/2021
Number of Days to Update: 61
Source: Nuclear Regulatory Commission
Telephone: 301-415-7169
Last EDR Contact: 04/16/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Quarterly

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

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 12/01/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 70
Source: Department of Energy
Telephone: 202-586-8719
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

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

Date of Government Version: 01/12/2017
Date Data Arrived at EDR: 03/05/2019
Date Made Active in Reports: 11/11/2019
Number of Days to Update: 251
Source: Environmental Protection Agency
Telephone: N/A
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Varies

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

Date of Government Version: 09/13/2019
Date Data Arrived at EDR: 11/06/2019
Date Made Active in Reports: 02/10/2020
Number of Days to Update: 96
Source: Environmental Protection Agency
Telephone: 202-566-0517
Last EDR Contact: 05/07/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

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

Date of Government Version: 07/01/2019
Date Data Arrived at EDR: 07/01/2019
Date Made Active in Reports: 09/23/2019
Number of Days to Update: 84

Source: Environmental Protection Agency
Telephone: 202-343-9775
Last EDR Contact: 03/25/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Quarterly

HIST FTTS: FIFRA/TSCA Tracking System Administrative Case Listing

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

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

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

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

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

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

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

DOT OPS: Incident and Accident Data

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

Date of Government Version: 01/02/2020
Date Data Arrived at EDR: 01/28/2020
Date Made Active in Reports: 04/17/2020
Number of Days to Update: 80

Source: Department of Transporation, Office of Pipeline Safety
Telephone: 202-366-4595
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

CONSENT: Superfund (CERCLA) Consent Decrees

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

Date of Government Version: 12/31/2020
Date Data Arrived at EDR: 01/13/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 68

Source: Department of Justice, Consent Decree Library
Telephone: Varies
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

BRS: Biennial Reporting System

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

Date of Government Version: 12/31/2017
Date Data Arrived at EDR: 06/22/2020
Date Made Active in Reports: 11/20/2020
Number of Days to Update: 151

Source: EPA/NTIS
Telephone: 800-424-9346
Last EDR Contact: 03/23/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Biennially

INDIAN RESERV: Indian Reservations

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

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 07/14/2015
Date Made Active in Reports: 01/10/2017
Number of Days to Update: 546

Source: USGS
Telephone: 202-208-3710
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

FUSRAP: Formerly Utilized Sites Remedial Action Program

DOE established the Formerly Utilized Sites Remedial Action Program (FUSRAP) in 1974 to remediate sites where radioactive contamination remained from Manhattan Project and early U.S. Atomic Energy Commission (AEC) operations.

Date of Government Version: 08/08/2017
Date Data Arrived at EDR: 09/11/2018
Date Made Active in Reports: 09/14/2018
Number of Days to Update: 3

Source: Department of Energy
Telephone: 202-586-3559
Last EDR Contact: 04/28/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Varies

UMTRA: Uranium Mill Tailings Sites

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

Date of Government Version: 08/30/2019
Date Data Arrived at EDR: 11/15/2019
Date Made Active in Reports: 01/28/2020
Number of Days to Update: 74

Source: Department of Energy
Telephone: 505-845-0011
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Varies

LEAD SMELTER 1: Lead Smelter Sites

A listing of former lead smelter site locations.

Date of Government Version: 04/27/2021
Date Data Arrived at EDR: 05/03/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 16

Source: Environmental Protection Agency
Telephone: 703-603-8787
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 07/12/2021
Data Release Frequency: Varies

LEAD SMELTER 2: Lead Smelter Sites

A list of several hundred sites in the U.S. where secondary lead smelting was done from 1931and 1964. These sites may pose a threat to public health through ingestion or inhalation of contaminated soil or dust

Date of Government Version: 04/05/2001
Date Data Arrived at EDR: 10/27/2010
Date Made Active in Reports: 12/02/2010
Number of Days to Update: 36

Source: American Journal of Public Health
Telephone: 703-305-6451
Last EDR Contact: 12/02/2009
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

US AIRS (AFS): Aerometric Information Retrieval System Facility Subsystem (AFS)

The database is a sub-system of Aerometric Information Retrieval System (AIRS). AFS contains compliance data on air pollution point sources regulated by the U.S. EPA and/or state and local air regulatory agencies. This information comes from source reports by various stationary sources of air pollution, such as electric power plants, steel mills, factories, and universities, and provides information about the air pollutants they produce. Action, air program, air program pollutant, and general level plant data. It is used to track emissions and compliance data from industrial plants.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US AIRS MINOR: Air Facility System Data

A listing of minor source facilities.

Date of Government Version: 10/12/2016
Date Data Arrived at EDR: 10/26/2016
Date Made Active in Reports: 02/03/2017
Number of Days to Update: 100

Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 09/26/2017
Next Scheduled EDR Contact: 01/08/2018
Data Release Frequency: Annually

US MINES: Mines Master Index File

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

Date of Government Version: 02/01/2021
Date Data Arrived at EDR: 02/24/2021
Date Made Active in Reports: 05/19/2021
Number of Days to Update: 84

Source: Department of Labor, Mine Safety and Health Administration
Telephone: 303-231-5959
Last EDR Contact: 05/25/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Semi-Annually

MINES VIOLATIONS: MSHA Violation Assessment Data

Mines violation and assessment information. Department of Labor, Mine Safety & Health Administration.

Date of Government Version: 11/24/2020
Date Data Arrived at EDR: 11/30/2020
Date Made Active in Reports: 01/25/2021
Number of Days to Update: 56

Source: DOL, Mine Safety & Health Admi
Telephone: 202-693-9424
Last EDR Contact: 05/26/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

US MINES 2: Ferrous and Nonferrous Metal Mines Database Listing

This map layer includes ferrous (ferrous metal mines are facilities that extract ferrous metals, such as iron ore or molybdenum) and nonferrous (Nonferrous metal mines are facilities that extract nonferrous metals, such as gold, silver, copper, zinc, and lead) metal mines in the United States.

Date of Government Version: 05/06/2020
Date Data Arrived at EDR: 05/27/2020
Date Made Active in Reports: 08/13/2020
Number of Days to Update: 78

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

US MINES 3: Active Mines & Mineral Plants Database Listing

Active Mines and Mineral Processing Plant operations for commodities monitored by the Minerals Information Team of the USGS.

Date of Government Version: 04/14/2011
Date Data Arrived at EDR: 06/08/2011
Date Made Active in Reports: 09/13/2011
Number of Days to Update: 97

Source: USGS
Telephone: 703-648-7709
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

ABANDONED MINES: Abandoned Mines

An inventory of land and water impacted by past mining (primarily coal mining) is maintained by OSMRE to provide information needed to implement the Surface Mining Control and Reclamation Act of 1977 (SMCRA). The inventory contains information on the location, type, and extent of AML impacts, as well as, information on the cost associated with the reclamation of those problems. The inventory is based upon field surveys by State, Tribal, and OSMRE program officials. It is dynamic to the extent that it is modified as new problems are identified and existing problems are reclaimed.

Date of Government Version: 12/11/2020
Date Data Arrived at EDR: 12/11/2020
Date Made Active in Reports: 03/02/2021
Number of Days to Update: 81
Source: Department of Interior
Telephone: 202-208-2609
Last EDR Contact: 06/02/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Quarterly

FINDS: Facility Index System/Facility Registry System

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

Date of Government Version: 02/03/2021
Date Data Arrived at EDR: 03/03/2021
Date Made Active in Reports: 04/05/2021
Number of Days to Update: 33
Source: EPA
Telephone: (404) 562-9900
Last EDR Contact: 05/18/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

DOCKET HWC: Hazardous Waste Compliance Docket Listing

A complete list of the Federal Agency Hazardous Waste Compliance Docket Facilities.

Date of Government Version: 11/03/2020
Date Data Arrived at EDR: 11/17/2020
Date Made Active in Reports: 02/09/2021
Number of Days to Update: 84
Source: Environmental Protection Agency
Telephone: 202-564-0527
Last EDR Contact: 05/21/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

ECHO: Enforcement & Compliance History Information

ECHO provides integrated compliance and enforcement information for about 800,000 regulated facilities nationwide.

Date of Government Version: 01/02/2021
Date Data Arrived at EDR: 01/08/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 73
Source: Environmental Protection Agency
Telephone: 202-564-2280
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Quarterly

UXO: Unexploded Ordnance Sites

A listing of unexploded ordnance site locations

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 07/02/2020
Date Made Active in Reports: 09/17/2020
Number of Days to Update: 77
Source: Department of Defense
Telephone: 703-704-1564
Last EDR Contact: 04/13/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Varies

FUELS PROGRAM: EPA Fuels Program Registered Listing

This listing includes facilities that are registered under the Part 80 (Code of Federal Regulations) EPA Fuels Programs. All companies now are required to submit new and updated registrations.

Date of Government Version: 02/17/2021
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 03/22/2021
Number of Days to Update: 33
Source: EPA
Telephone: 800-385-6164
Last EDR Contact: 05/14/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Quarterly

AIRS: Air Quality Permit Listing

A listing of facilities with air quality permits.

Date of Government Version: 03/09/2021
Date Data Arrived at EDR: 03/10/2021
Date Made Active in Reports: 05/27/2021
Number of Days to Update: 78

Source: Department of Environmental Quality
Telephone: 919-707-8726
Last EDR Contact: 06/07/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

ASBESTOS: ASBESTOS
Asbestos notification sites

Date of Government Version: 02/05/2021
Date Data Arrived at EDR: 02/09/2021
Date Made Active in Reports: 05/03/2021
Number of Days to Update: 83

Source: Department of Health & Human Services
Telephone: 919-707-5973
Last EDR Contact: 05/06/2021
Next Scheduled EDR Contact: 08/02/2021
Data Release Frequency: Varies

COAL ASH: Coal Ash Disposal Sites
A listing of coal combustion products distribution permits issued by the Division for the treatment, storage, transportation, use and disposal of coal combustion products.

Date of Government Version: 09/10/2020
Date Data Arrived at EDR: 09/23/2020
Date Made Active in Reports: 12/14/2020
Number of Days to Update: 82

Source: Department of Environment & Natural Resources
Telephone: 919-807-6359
Last EDR Contact: 03/26/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

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

Date of Government Version: 09/08/2020
Date Data Arrived at EDR: 09/16/2020
Date Made Active in Reports: 12/08/2020
Number of Days to Update: 83

Source: Department of Environment & Natural Resources
Telephone: 919-508-8400
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 06/28/2021
Data Release Frequency: Varies

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

Date of Government Version: 01/22/2021
Date Data Arrived at EDR: 02/03/2021
Date Made Active in Reports: 04/28/2021
Number of Days to Update: 84

Source: Department of Environment & Natural Resources
Telephone: 919-733-1322
Last EDR Contact: 05/03/2021
Next Scheduled EDR Contact: 08/16/2021
Data Release Frequency: Quarterly

Financial Assurance 2: Financial Assurance Information Listing
Information for solid waste facilities. Financial assurance is intended to ensure that resources are available to pay for the cost of closure, post-closure care, and corrective measures if the owner or operator of a regulated facility is unable or unwilling to pay.

Date of Government Version: 10/02/2012
Date Data Arrived at EDR: 10/03/2012
Date Made Active in Reports: 10/26/2012
Number of Days to Update: 23

Source: Department of Environmental & Natural Resources
Telephone: 919-508-8496
Last EDR Contact: 04/05/2021
Next Scheduled EDR Contact: 07/05/2021
Data Release Frequency: Varies

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

Date of Government Version: 03/08/2021
Date Data Arrived at EDR: 03/09/2021
Date Made Active in Reports: 05/26/2021
Number of Days to Update: 78
Source: Department of Environment & Natural Resources
Telephone: 919-707-8222
Last EDR Contact: 06/02/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Varies

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

Date of Government Version: 01/01/2021
Date Data Arrived at EDR: 01/27/2021
Date Made Active in Reports: 04/19/2021
Number of Days to Update: 82
Source: Department of Environment & Natural Resources
Telephone: 919-733-7015
Last EDR Contact: 04/27/2021
Next Scheduled EDR Contact: 05/10/2021
Data Release Frequency: Varies

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

Date of Government Version: 10/26/2020
Date Data Arrived at EDR: 11/30/2020
Date Made Active in Reports: 12/07/2020
Number of Days to Update: 7
Source: Department of Environment & Natural Resources
Telephone: 919-807-6412
Last EDR Contact: 06/04/2021
Next Scheduled EDR Contact: 09/13/2021
Data Release Frequency: Quarterly

AOP: Animal Operation Permits Listing
This listing includes animal operations that are required to be permitted by the state.

Date of Government Version: 04/01/2020
Date Data Arrived at EDR: 05/26/2020
Date Made Active in Reports: 05/27/2020
Number of Days to Update: 1
Source: Department of Environmental Quality
Telephone: 919-707-9129
Last EDR Contact: 03/12/2021
Next Scheduled EDR Contact: 06/21/2021
Data Release Frequency: Varies

MINES MRDS: Mineral Resources Data System
Mineral Resources Data System

Date of Government Version: 04/06/2018
Date Data Arrived at EDR: 10/21/2019
Date Made Active in Reports: 10/24/2019
Number of Days to Update: 3
Source: USGS
Telephone: 703-648-6533
Last EDR Contact: 05/27/2021
Next Scheduled EDR Contact: 09/06/2021
Data Release Frequency: Varies

SEPT HAULERS: Permitted Septage Haulers Listing
This list of all active and permitted Septage Land Application Site (SLAS) and Septage Detention and Treatment Facility (SDTF) sites in North Carolina. The purpose of this map is to provide the public and government entities a visual overview of the businesses that manage septage and septage facilities throughout the state.

Date of Government Version: 05/13/2020
Date Data Arrived at EDR: 07/07/2020
Date Made Active in Reports: 09/23/2020
Number of Days to Update: 78
Source: Department of Environmental Quality
Telephone: 919-707-8248
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

PCS: Permit Compliance System
PCS is a computerized management information system that contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks the permit, compliance, and enforcement status of NPDES facilities.

Date of Government Version: 07/14/2011
Date Data Arrived at EDR: 08/05/2011
Date Made Active in Reports: 09/29/2011
Number of Days to Update: 55
Source: EPA, Office of Water
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

PCS INACTIVE: Listing of Inactive PCS Permits
An inactive permit is a facility that has shut down or is no longer discharging.

Date of Government Version: 11/05/2014
Date Data Arrived at EDR: 01/06/2015
Date Made Active in Reports: 05/06/2015
Number of Days to Update: 120
Source: EPA
Telephone: 202-564-2496
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Semi-Annually

PCS ENF: Enforcement data
No description is available for this data

Date of Government Version: 12/31/2014
Date Data Arrived at EDR: 02/05/2015
Date Made Active in Reports: 03/06/2015
Number of Days to Update: 29
Source: EPA
Telephone: 202-564-2497
Last EDR Contact: 03/31/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

CCB: Coal Ash Structural Fills (CCB) Listing
These are not permitted Coal Ash landfills A list all of the now closed Coal Ash Structural Fills (CCB) in North Carolina, in point data form. The purpose is to provide the public and other government entities a visual overview of coal ash structural fills throughout the state and increase public awareness of their current locations.

Date of Government Version: 02/27/2020
Date Data Arrived at EDR: 07/07/2020
Date Made Active in Reports: 09/23/2020
Number of Days to Update: 78
Source: Department of Environmental Quality
Telephone: 919-707-8248
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

PCSRP: Petroleum-Contaminated Soil Remediation Permits
To treat petroleum-contaminated soil in order to protect North Carolinaa??s environment and the health of the citizens of North Carolina.

Date of Government Version: 12/30/2020
Date Data Arrived at EDR: 12/30/2020
Date Made Active in Reports: 03/17/2021
Number of Days to Update: 77
Source: Department of Environmental Quality
Telephone: 919-707-8248
Last EDR Contact: 04/06/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Varies

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP: EDR Proprietary Manufactured Gas Plants
The EDR Proprietary Manufactured Gas Plant Database includes records of coal gas plants (manufactured gas plants) compiled by EDR's researchers. Manufactured gas sites were used in the United States from the 1800's to 1950's to produce a gas that could be distributed and used as fuel. These plants used whale oil, rosin, coal, or a mixture of coal, oil, and water that also produced a significant amount of waste. Many of the byproducts of the gas production, such as coal tar (oily waste containing volatile and non-volatile chemicals), sludges, oils and other compounds are potentially hazardous to human health and the environment. The byproduct from this process was frequently disposed of directly at the plant site and can remain or spread slowly, serving as a continuous source of soil and groundwater contamination.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A
Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: No Update Planned

EDR Hist Auto: EDR Exclusive Historical Auto Stations
EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR Hist Cleaner: EDR Exclusive Historical Cleaners

EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

Date of Government Version: N/A
Date Data Arrived at EDR: N/A
Date Made Active in Reports: N/A
Number of Days to Update: N/A

Source: EDR, Inc.
Telephone: N/A
Last EDR Contact: N/A
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

RGA HWS: Recovered Government Archive State Hazardous Waste Facilities List

The EDR Recovered Government Archive State Hazardous Waste database provides a list of SHWS incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/24/2013
Number of Days to Update: 176

Source: Department of Environment, Health and Natural Resources
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LF: Recovered Government Archive Solid Waste Facilities List

The EDR Recovered Government Archive Landfill database provides a list of landfills derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 01/13/2014
Number of Days to Update: 196

Source: Department of Environment, Health and Natural Resources
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

RGA LUST: Recovered Government Archive Leaking Underground Storage Tank

The EDR Recovered Government Archive Leaking Underground Storage Tank database provides a list of LUST incidents derived from historical databases and includes many records that no longer appear in current government lists. Compiled from Records formerly available from the Department of Environment, Health and Natural Resources in North Carolina.

Date of Government Version: N/A
Date Data Arrived at EDR: 07/01/2013
Date Made Active in Reports: 12/20/2013
Number of Days to Update: 172

Source: Department of Environment, Health and Natural Resources
Telephone: N/A
Last EDR Contact: 06/01/2012
Next Scheduled EDR Contact: N/A
Data Release Frequency: Varies

OTHER DATABASE(S)

Depending on the geographic area covered by this report, the data provided in these specialty databases may or may not be complete. For example, the existence of wetlands information data in a specific report does not mean that all wetlands in the area covered by the report are included. Moreover, the absence of any reported wetlands information does not necessarily mean that wetlands do not exist in the area covered by the report.

CT MANIFEST: Hazardous Waste Manifest Data

Facility and manifest data. Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a tsd facility.

Date of Government Version: 10/05/2020
Date Data Arrived at EDR: 02/17/2021
Date Made Active in Reports: 05/10/2021
Number of Days to Update: 82

Source: Department of Energy & Environmental Protection
Telephone: 860-424-3375
Last EDR Contact: 05/11/2021
Next Scheduled EDR Contact: 08/23/2021
Data Release Frequency: No Update Planned

NJ MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 12/31/2018
Date Data Arrived at EDR: 04/10/2019
Date Made Active in Reports: 05/16/2019
Number of Days to Update: 36

Source: Department of Environmental Protection
Telephone: N/A
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/19/2021
Data Release Frequency: Annually

NY MANIFEST: Facility and Manifest Data

Manifest is a document that lists and tracks hazardous waste from the generator through transporters to a TSD facility.

Date of Government Version: 01/01/2019
Date Data Arrived at EDR: 04/29/2020
Date Made Active in Reports: 07/10/2020
Number of Days to Update: 72

Source: Department of Environmental Conservation
Telephone: 518-402-8651
Last EDR Contact: 04/30/2021
Next Scheduled EDR Contact: 08/09/2021
Data Release Frequency: Quarterly

PA MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 06/30/2018
Date Data Arrived at EDR: 07/19/2019
Date Made Active in Reports: 09/10/2019
Number of Days to Update: 53

Source: Department of Environmental Protection
Telephone: 717-783-8990
Last EDR Contact: 04/09/2021
Next Scheduled EDR Contact: 07/26/2021
Data Release Frequency: Annually

RI MANIFEST: Manifest information

Hazardous waste manifest information

Date of Government Version: 12/31/2019
Date Data Arrived at EDR: 02/11/2021
Date Made Active in Reports: 02/24/2021
Number of Days to Update: 13

Source: Department of Environmental Management
Telephone: 401-222-2797
Last EDR Contact: 05/13/2021
Next Scheduled EDR Contact: 08/30/2021
Data Release Frequency: Annually

WI MANIFEST: Manifest Information

Hazardous waste manifest information.

Date of Government Version: 05/31/2018
Date Data Arrived at EDR: 06/19/2019
Date Made Active in Reports: 09/03/2019
Number of Days to Update: 76

Source: Department of Natural Resources
Telephone: N/A
Last EDR Contact: 06/03/2021
Next Scheduled EDR Contact: 09/20/2021
Data Release Frequency: Annually

Oil/Gas Pipelines
Source: Endeavor Business Media
Petroleum Bundle (Crude Oil, Refined Products, Petrochemicals, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)) N = Natural Gas Bundle (Natural Gas, Gas Liquids (LPG/NGL), and Specialty Gases (Miscellaneous)). This map includes information copyrighted by Endeavor Business Media. This information is provided on a best effort basis and Endeavor Business Media does not guarantee its accuracy nor warrant its fitness for any particular purpose. Such information has been reprinted with the permission of Endeavor Business Media.

Electric Power Transmission Line Data
Source: Endeavor Business Media
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Sensitive Receptors: There are individuals deemed sensitive receptors due to their fragile immune systems and special sensitivity to environmental discharges. These sensitive receptors typically include the elderly, the sick, and children. While the location of all sensitive receptors cannot be determined, EDR indicates those buildings and facilities - schools, daycares, hospitals, medical centers, and nursing homes - where individuals who are sensitive receptors are likely to be located.

AHA Hospitals:
Source: American Hospital Association, Inc.
Telephone: 312-280-5991
The database includes a listing of hospitals based on the American Hospital Association's annual survey of hospitals.

Medical Centers: Provider of Services Listing
Source: Centers for Medicare & Medicaid Services
Telephone: 410-786-3000
A listing of hospitals with Medicare provider number, produced by Centers of Medicare & Medicaid Services, a federal agency within the U.S. Department of Health and Human Services.

Nursing Homes
Source: National Institutes of Health
Telephone: 301-594-6248
Information on Medicare and Medicaid certified nursing homes in the United States.

Public Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on elementary and secondary public education in the United States. It is a comprehensive, annual, national statistical database of all public elementary and secondary schools and school districts, which contains data that are comparable across all states.

Private Schools
Source: National Center for Education Statistics
Telephone: 202-502-7300
The National Center for Education Statistics' primary database on private school locations in the United States.

Daycare Centers: Child Care Facility List
Source: Department of Health & Human Services
Telephone: 919-662-4499

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: US Fish & Wildlife Service
Telephone: 703-358-2171

GOVERNMENT RECORDS SEARCHED / DATA CURRENCY TRACKING

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

STREET AND ADDRESS INFORMATION

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GEOCHECK ®- PHYSICAL SETTING SOURCE ADDENDUM

TARGET PROPERTY ADDRESS

STINKING QUARTER MITIGATION SITE
2330 NC-62
JULIAN, NC 27283

TARGET PROPERTY COORDINATES

Latitude (North):	35.921106 - 35° 55' 15.98''
Longitude (West):	79.639044 - 79° 38' 20.56''
Universal Tranverse Mercator:	Zone 17
UTM X (Meters):	622788.3
UTM Y (Meters):	3975853.5
Elevation:	688 ft. above sea level

USGS TOPOGRAPHIC MAP

Target Property Map:	5945663 CLIMAX, NC
Version Date:	2013
East Map:	5945539 KIMESVILLE, NC
Version Date:	2013

EDR's GeoCheck Physical Setting Source Addendum is provided to assist the environmental professional in forming an opinion about the impact of potential contaminant migration.

Assessment of the impact of contaminant migration generally has two principle investigative components:

1. Groundwater flow direction, and
2. Groundwater flow velocity.

Groundwater flow direction may be impacted by surface topography, hydrology, hydrogeology, characteristics of the soil, and nearby wells. Groundwater flow velocity is generally impacted by the nature of the geologic strata.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW DIRECTION INFORMATION

Groundwater flow direction for a particular site is best determined by a qualified environmental professional using site-specific well data. If such data is not reasonably ascertainable, it may be necessary to rely on other sources of information, such as surface topographic information, hydrologic information, hydrogeologic data collected on nearby properties, and regional groundwater flow information (from deep aquifers).

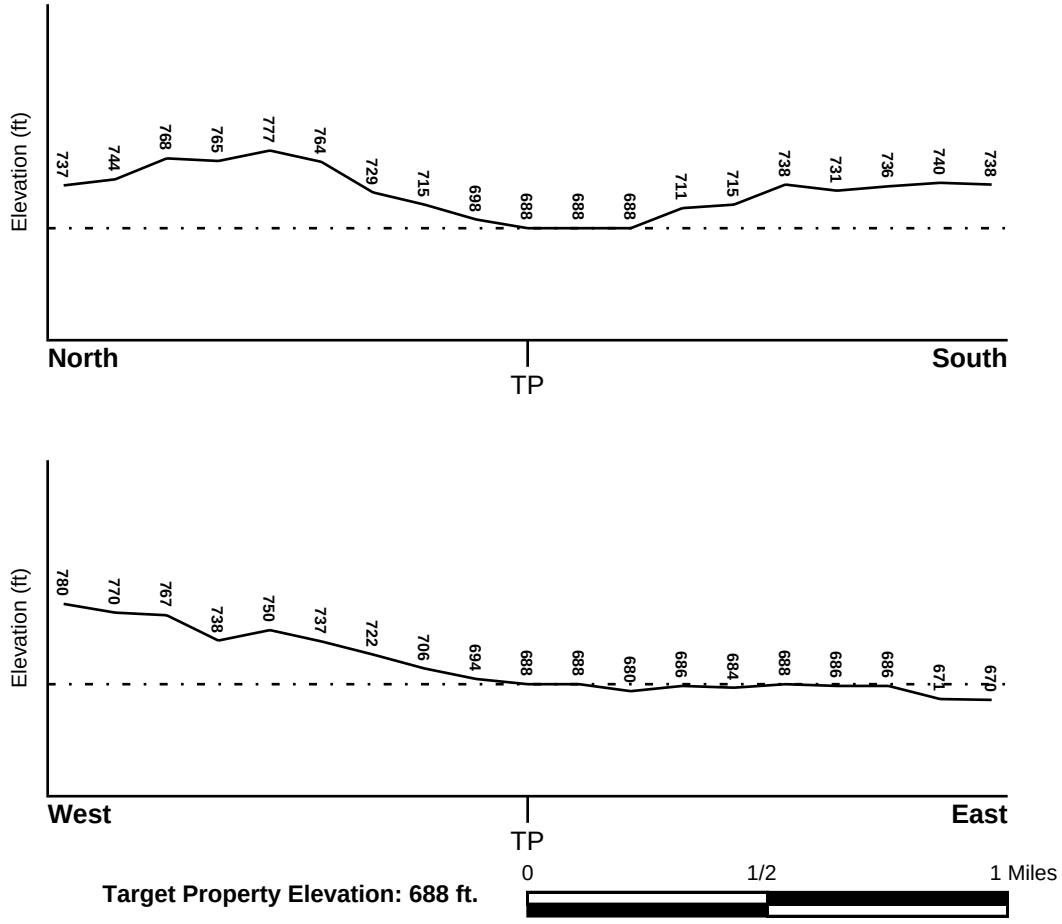
TOPOGRAPHIC INFORMATION

Surface topography may be indicative of the direction of surficial groundwater flow. This information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

TARGET PROPERTY TOPOGRAPHY

General Topographic Gradient: General SE

SURROUNDING TOPOGRAPHY: ELEVATION PROFILES



Source: Topography has been determined from the USGS 7.5' Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

HYDROLOGIC INFORMATION

Surface water can act as a hydrologic barrier to groundwater flow. Such hydrologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

Refer to the Physical Setting Source Map following this summary for hydrologic information (major waterways and bodies of water).

FEMA FLOOD ZONE

Flood Plain Panel at Target Property	FEMA Source Type
3710871900J	FEMA FIRM Flood data

Additional Panels in search area:	FEMA Source Type
3710870900J	FEMA FIRM Flood data
3710871800K	FEMA FIRM Flood data
3710870800K	FEMA FIRM Flood data

NATIONAL WETLAND INVENTORY

NWI Quad at Target Property	NWI Electronic Data Coverage
CLIMAX	YES - refer to the Overview Map and Detail Map

HYDROGEOLOGIC INFORMATION

Hydrogeologic information obtained by installation of wells on a specific site can often be an indicator of groundwater flow direction in the immediate area. Such hydrogeologic information can be used to assist the environmental professional in forming an opinion about the impact of nearby contaminated properties or, should contamination exist on the target property, what downgradient sites might be impacted.

AQUIFLOW®

Search Radius: 1.000 Mile.

EDR has developed the AQUIFLOW Information System to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted by environmental professionals to regulatory authorities at select sites and has extracted the date of the report, groundwater flow direction as determined hydrogeologically, and the depth to water table.

MAP ID	LOCATION FROM TP	GENERAL DIRECTION GROUNDWATER FLOW
Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

GROUNDWATER FLOW VELOCITY INFORMATION

Groundwater flow velocity information for a particular site is best determined by a qualified environmental professional using site specific geologic and soil strata data. If such data are not reasonably ascertainable, it may be necessary to rely on other sources of information, including geologic age identification, rock stratigraphic unit and soil characteristics data collected on nearby properties and regional soil information. In general, contaminant plumes move more quickly through sandy-gravelly types of soils than silty-clayey types of soils.

GEOLOGIC INFORMATION IN GENERAL AREA OF TARGET PROPERTY

Geologic information can be used by the environmental professional in forming an opinion about the relative speed at which contaminant migration may be occurring.

ROCK STRATIGRAPHIC UNIT

Era:	Paleozoic
System:	Ordovian
Series:	Lower Paleozoic granitic rocks
Code:	Pzg1 *(decoded above as Era, System & Series)*

GEOLOGIC AGE IDENTIFICATION

Category: Plutonic and Intrusive Rocks

Geologic Age and Rock Stratigraphic Unit Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - a digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

SSURGO SOIL MAP - 6527120.2s



Target Property
SSURGO Soil
Water

0 1/16 1/8 1/4 Miles

N

SITE NAME:	Stinking Quarter Mitigation Site	CLIENT:	Restoration Systems, LLC
ADDRESS:	2330 NC-62 Julian NC 27283	CONTACT:	JD Hamby
LAT/LONG:	35.921106 / 79.639044	INQUIRY #:	6527120.2s
		DATE:	June 08, 2021 12:40 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

DOMINANT SOIL COMPOSITION IN GENERAL AREA OF TARGET PROPERTY

The U.S. Department of Agriculture's (USDA) Soil Conservation Service (SCS) leads the National Cooperative Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. The following information is based on Soil Conservation Service SSURGO data.

Soil Map ID: 1

Soil Component Name: Chewacla

Soil Surface Texture: loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Somewhat poorly drained

Hydric Status: Partially hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 38 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 3.6
2	5 inches	14 inches	silty clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 3.6
3	14 inches	22 inches	sandy clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 3.6

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
4	22 inches	50 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 3.6
5	50 inches	59 inches	loamy fine sand	Silt-Clay Materials (more than 35 pct. passing No. 200), Clayey Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 141 Min: 14	Max: 6.5 Min: 3.6

Soil Map ID: 2

Soil Component Name: Vance

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	5 inches	sandy loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 5.5 Min: 4.5

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	5 inches	40 inches		Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 5.5 Min: 4.5
3	40 inches	72 inches	clay loam	Granular materials (35 pct. or less passing No. 200), Silty, or Clayey Gravel and Sand.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand. COARSE-GRAINED SOILS, Sands, Sands with fines, Silty Sand.	Max: 14 Min: 4	Max: 5.5 Min: 4.5

Soil Map ID: 3

Soil Component Name: Vance

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	35 inches	50 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
2	50 inches	61 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5
3	0 inches	5 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5
4	5 inches	35 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5

Soil Map ID: 4

Soil Component Name: Vance

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	35 inches	50 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5
2	50 inches	78 inches	clay loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5
3	0 inches	5 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5
4	5 inches	35 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	FINE-GRAINED SOILS, Silts and Clays (liquid limit 50% or more), Fat Clay.	Max: 1.4 Min: 0.42	Max: 5.5 Min: 4.5

Soil Map ID: 5

Soil Component Name: Helena

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class: Moderately well drained

Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: High

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 61 inches

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

Soil Layer Information							
	Boundary			Classification		Saturated hydraulic conductivity micro m/sec	Soil Reaction (pH)
Layer	Upper	Lower	Soil Texture Class	AASHTO Group	Unified Soil		
1	0 inches	12 inches	sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
2	12 inches	29 inches	clay	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
3	29 inches	44 inches	fine sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 14 Min: 4	Max: 5.5 Min: 3.5
4	44 inches	78 inches	gravelly sandy loam	Silt-Clay Materials (more than 35 pct. passing No. 200), Silty Soils.	COARSE-GRAINED SOILS, Sands, Sands with fines, Clayey sand.	Max: 14 Min: 4	Max: 5.5 Min: 3.5

Soil Map ID: 6

Soil Component Name: Water

Soil Surface Texture: sandy loam

Hydrologic Group: Class C - Slow infiltration rates. Soils with layers impeding downward movement of water, or soils with moderately fine or fine textures.

Soil Drainage Class:
Hydric Status: Not hydric

Corrosion Potential - Uncoated Steel: Not Reported

Depth to Bedrock Min: > 0 inches

Depth to Watertable Min: > 0 inches

No Layer Information available.

GEOCHECK® - PHYSICAL SETTING SOURCE SUMMARY

LOCAL / REGIONAL WATER AGENCY RECORDS

EDR Local/Regional Water Agency records provide water well information to assist the environmental professional in assessing sources that may impact ground water flow direction, and in forming an opinion about the impact of contaminant migration on nearby drinking water wells.

WELL SEARCH DISTANCE INFORMATION

DATABASE	SEARCH DISTANCE (miles)
Federal USGS	1.000
Federal FRDS PWS	Nearest PWS within 1 mile
State Database	1.000

FEDERAL USGS WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
1	USGS40000891657	1/2 - 1 Mile South

FEDERAL FRDS PUBLIC WATER SUPPLY SYSTEM INFORMATION

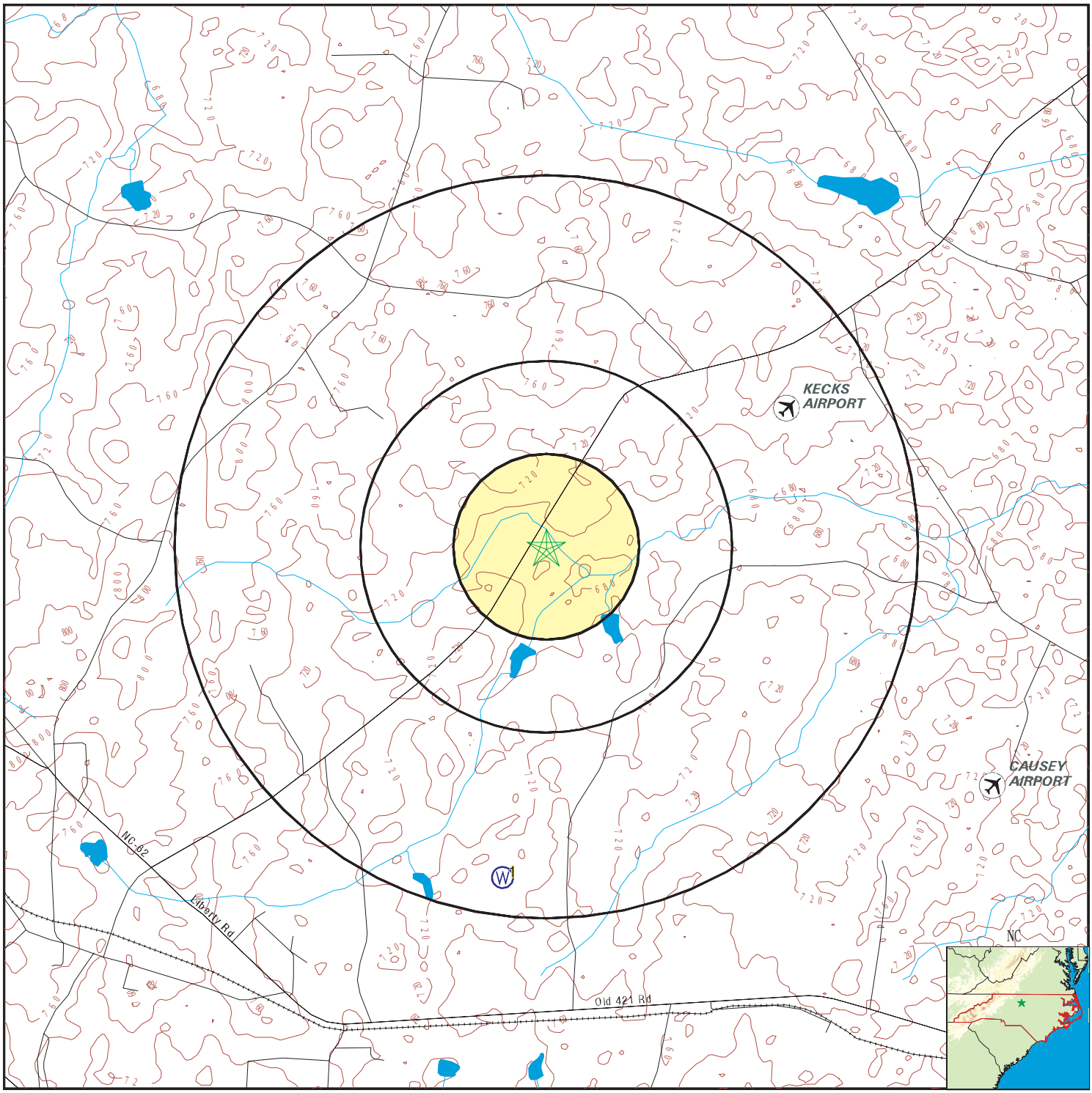
MAP ID	WELL ID	LOCATION FROM TP
No PWS System Found		

Note: PWS System location is not always the same as well location.

STATE DATABASE WELL INFORMATION

MAP ID	WELL ID	LOCATION FROM TP
No Wells Found		

PHYSICAL SETTING SOURCE MAP - 6527120.2s



- County Boundary
- Major Roads
- Contour Lines
- Airports
- Earthquake epicenter, Richter 5 or greater
- Water Wells
- Public Water Supply Wells
- Cluster of Multiple Icons
- Groundwater Flow Direction
- GI Indeterminate Groundwater Flow at Location
- GV Groundwater Flow Varies at Location
- Wildlife Areas
- Natural Areas
- Rare & Endangered Species

SITE NAME:	Stinking Quarter Mitigation Site	CLIENT:	Restoration Systems, LLC
ADDRESS:	2330 NC-62 Julian NC 27283	CONTACT:	JD Hamby
		INQUIRY #:	6527120.2s
LAT/LONG:	35.921106 / 79.639044	DATE:	June 08, 2021 12:40 pm

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GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS

Map ID
Direction
Distance
Elevation | Database | EDR ID Number

1
South
1/2 - 1 Mile
Higher | **FED USGS** | **USGS40000891657**

Organization ID:	USGS-NC		
Organization Name:	USGS North Carolina Water Science Center		
Monitor Location:	GU-531 NEAR JULIAN, NC	Type:	Well
Description:	GUILFORD COUNTY GROUND-WATER PROJECT		
HUC:	03030002	Drainage Area:	Not Reported
Drainage Area Units:	Not Reported	Contrib Drainage Area:	Not Reported
Contrib Drainage Area Unts:	Not Reported		
Aquifer:	Piedmont and Blue Ridge crystalline-rock aquifers		
Formation Type:	Felsic Metaigneous Rock	Aquifer Type:	Unconfined single aquifer
Construction Date:	19900322	Well Depth:	145
Well Depth Units:	ft	Well Hole Depth:	Not Reported
Well Hole Depth Units:	Not Reported		

Ground water levels,Number of Measurements:	1	Level reading date:	1990
Feet below surface:	5	Feet to sea level:	Not Reported
Note:	Not Reported		

GEOCHECK® - PHYSICAL SETTING SOURCE MAP FINDINGS
RADON

AREA RADON INFORMATION

State Database: NC Radon

Radon Test Results

Num Results	Avg pCi/L	Min pCi/L	Max pCi/L
1	1.00	1	1

Federal EPA Radon Zone for GUILFORD County: 3

Note: Zone 1 indoor average level > 4 pCi/L.
: Zone 2 indoor average level >= 2 pCi/L and <= 4 pCi/L.
: Zone 3 indoor average level < 2 pCi/L.

Federal Area Radon Information for Zip Code: 27283

Number of sites tested: 1

Area	Average Activity	% <4 pCi/L	% 4-20 pCi/L	% >20 pCi/L
Living Area - 1st Floor	0.700 pCi/L	100%	0%	0%
Living Area - 2nd Floor	Not Reported	Not Reported	Not Reported	Not Reported
Basement	Not Reported	Not Reported	Not Reported	Not Reported

PHYSICAL SETTING SOURCE RECORDS SEARCHED

TOPOGRAPHIC INFORMATION

USGS 7.5' Digital Elevation Model (DEM)
Source: United States Geologic Survey
EDR acquired the USGS 7.5' Digital Elevation Model in 2002 and updated it in 2006. The 7.5 minute DEM corresponds to the USGS 1:24,000- and 1:25,000-scale topographic quadrangle maps. The DEM provides elevation data with consistent elevation units and projection.

Current USGS 7.5 Minute Topographic Map
Source: U.S. Geological Survey

HYDROLOGIC INFORMATION

Flood Zone Data: This data was obtained from the Federal Emergency Management Agency (FEMA). It depicts 100-year and 500-year flood zones as defined by FEMA. It includes the National Flood Hazard Layer (NFHL) which incorporates Flood Insurance Rate Map (FIRM) data and Q3 data from FEMA in areas not covered by NFHL.
Source: FEMA
Telephone: 877-336-2627
Date of Government Version: 2003, 2015

NWI: National Wetlands Inventory. This data, available in select counties across the country, was obtained by EDR in 2002, 2005 and 2010 from the U.S. Fish and Wildlife Service.

State Wetlands Data: Wetland Inventory
Source: US Fish & Wildlife Service
Telephone: 703-358-2171

HYDROGEOLOGIC INFORMATION

AQUIFLOW^{R} Information System
Source: EDR proprietary database of groundwater flow information
EDR has developed the AQUIFLOW Information System (AIS) to provide data on the general direction of groundwater flow at specific points. EDR has reviewed reports submitted to regulatory authorities at select sites and has extracted the date of the report, hydrogeologically determined groundwater flow direction and depth to water table information.

GEOLOGIC INFORMATION

Geologic Age and Rock Stratigraphic Unit
Source: P.G. Schruben, R.E. Arndt and W.J. Bawiec, Geology of the Conterminous U.S. at 1:2,500,000 Scale - A digital representation of the 1974 P.B. King and H.M. Beikman Map, USGS Digital Data Series DDS - 11 (1994).

STATSGO: State Soil Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
The U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) leads the national Conservation Soil Survey (NCSS) and is responsible for collecting, storing, maintaining and distributing soil survey information for privately owned lands in the United States. A soil map in a soil survey is a representation of soil patterns in a landscape. Soil maps for STATSGO are compiled by generalizing more detailed (SSURGO) soil survey maps.

SSURGO: Soil Survey Geographic Database
Source: Department of Agriculture, Natural Resources Conservation Service (NRCS)
Telephone: 800-672-5559
SSURGO is the most detailed level of mapping done by the Natural Resources Conservation Service, mapping scales generally range from 1:12,000 to 1:63,360. Field mapping methods using national standards are used to construct the soil maps in the Soil Survey Geographic (SSURGO) database. SSURGO digitizing duplicates the original soil survey maps. This level of mapping is designed for use by landowners, townships and county natural resource planning and management.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

LOCAL / REGIONAL WATER AGENCY RECORDS

FEDERAL WATER WELLS

PWS: Public Water Systems
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Public Water System data from the Federal Reporting Data System. A PWS is any water system which provides water to at least 25 people for at least 60 days annually. PWSs provide water from wells, rivers and other sources.

PWS ENF: Public Water Systems Violation and Enforcement Data
Source: EPA/Office of Drinking Water
Telephone: 202-564-3750
Violation and Enforcement data for Public Water Systems from the Safe Drinking Water Information System (SDWIS) after August 1995. Prior to August 1995, the data came from the Federal Reporting Data System (FRDS).

USGS Water Wells: USGS National Water Inventory System (NWIS)
This database contains descriptive information on sites where the USGS collects or has collected data on surface water and/or groundwater. The groundwater data includes information on wells, springs, and other sources of groundwater.

STATE RECORDS

North Carolina Public Water Supply Wells
Source: Department of Environmental Health
Telephone: 919-715-3243

OTHER STATE DATABASE INFORMATION

North Carolina Wildlife Resources/Game Lands
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
All publicly owned game lands managed by the North Carolina Wildlife Resources Commission and as listed in Hunting and Fishing Maps.

NC Natural Heritage Sites: Natural Heritage Element Occurrence Sites
Source: Natural Heritage Occurrence Sites Center for Geographic Information and Analysis
Telephone: 919-733-2090
A point coverage identifying locations of rare and endangered species, occurrences of exemplary or unique natural ecosystems (terrestrial or aquatic), and special animal habitats (e.g., colonial waterbird nesting sites).

NC Natural Areas: Significant Natural Heritage Areas
Source: Center for Geographic Information and Analysis
Telephone: 919-733-2090
A polygon converage identifying sites (terrestrial or aquatic) that have particular biodiversity significance. A site's significance may be due to the presenceof rare species, rare or high quality natural communities, or other important ecological features.

RADON

State Database: NC Radon
Source: Department of Environment & Natural Resources
Telephone: 919-733-4984
Radon Statistical and Non Statiscal Data

Area Radon Information
Source: USGS
Telephone: 703-356-4020
The National Radon Database has been developed by the U.S. Environmental Protection Agency (USEPA) and is a compilation of the EPA/State Residential Radon Survey and the National Residential Radon Survey. The study covers the years 1986 - 1992. Where necessary data has been supplemented by information collected at private sources such as universities and research institutions.

PHYSICAL SETTING SOURCE RECORDS SEARCHED

EPA Radon Zones
Source: EPA
Telephone: 703-356-4020
Sections 307 & 309 of IRAA directed EPA to list and identify areas of U.S. with the potential for elevated indoor radon levels.

OTHER

Airport Landing Facilities: Private and public use landing facilities
Source: Federal Aviation Administration, 800-457-6656

Epicenters: World earthquake epicenters, Richter 5 or greater
Source: Department of Commerce, National Oceanic and Atmospheric Administration

Earthquake Fault Lines: The fault lines displayed on EDR's Topographic map are digitized quaternary faultlines, prepared in 1975 by the United State Geological Survey

STREET AND ADDRESS INFORMATION

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Appendix F: FEMA Coordination

From: Brent Gatlin
To: Grant Lewis; Worth Creech
Cc: Kaye Graybeal; Teresa Andrews; Josh Dalton
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site
Date: Wednesday, January 19, 2022 12:08:50 PM
Attachments: image003.png
image004.png
image005.png
image006.png
image008.png
image009.png
image010.png
image011.png
image012.png
image013.png
image000061.png
image488994.png
image357392.png
image793217.png
TA-21-10-GCPL-09184 STAFF REPORT - Floodplain No-fill Provision.pdf

---

Grant,
Attached is Staff Report with the proposed text amendment to our ordinance which is on the agenda for tomorrow's Board of County Commissioners meeting tomorrow. The amendment already passed Planning Board and now just needs BOCC approval which we hope and expect to receive tomorrow. See page 2 of attached (highlighted portion is the language being added to ordinance).

This amendment (once approved) will provide an exclusion to the no-fill provision, which allows minor filling where needed to protect or restore natural floodplain function, such as part of a stream restoration project.

Regards,
Brent

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections
Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Thursday, September 30, 2021 10:42 AM
To: Grant Lewis <glewis@axiomenvironmental.org>; Worth Creech <worth@restorationsystems.com>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Grant,
Attached is some additional feedback we've received from CRS so far. Please take a look and let me know if you have any additional thoughts or questions.

We are reviewing and assessing our options with CRS as to what amendments can be made to our ordinance to allow such a project while keeping our current CRS score. We prefer remaining contact with CRS as this point as this pertains to more than this one project and of course our CRS certification/score.

Thank You,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
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kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Wednesday, September 29, 2021 10:44 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>; Worth Creech <worth@restorationsystems.com>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Hello Brent;

I wanted to check in if you had updates from your CRS folks to determine concerning our stream restoration project in Guilford County. Given the minor fill allowance for "natural floodplain functions" such as channel restoration projects, it seems we should be exempt.

We will begin studies in earnest in about a month and would like to have some resolution, or at least the beginning of discussions as soon as possible. May we contact someone and initiate consultation?

Thanks for your assistance Brent. It is much appreciated.

Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Friday, September 3, 2021 10:24 AM
To: Worth Creech <worth@restorationsystems.com>; Grant Lewis <glewis@axiomenvironmental.org>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Worth,
Thanks for the info. FYI – the "no fill" provision was added to Guilford County's ordinance in 2017/2018 to achieve the CRS points/score we now have, so it wasn't around at the time of those earlier projects you mentioned, but good to know you have experience in the area. Will let you all know once we have more feedback from the CRS folks.

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections
Guilford County Government
400 West Market Street, Greensboro, NC 27401
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kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Worth Creech <worth@restorationsystems.com>
Sent: Friday, September 3, 2021 10:07 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>; Grant Lewis <glewis@axiomenvironmental.org>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Thank you Brent. Grant is on a backwoods vacation this week. The Stinking Quarter project is my company, Restoration Systems' and we are happy to discuss how to resolve this. I just now read through your email attachment and I think you have asked the correct questions. I do think a Teams call would be great. Hopefully we can set something up next week when Grant returns.

Also, We have a history of doing restoration in Guilford County with the Causey Farm Stream and Wetland Site as mitigation for the FEDEX Hub back in 2004 (just downstream of this site), the Haw River Wetland Site on the Guilford /Rockingham boundary on Church Street in 2005 which was performed for NCDMS, and the NCDMS Holly Grove Stream Site completed in 2008 off of Highway 61 near Osceola. I'm sure there are many more similar projects completed as well over the years by other firms.

Thanks again and look forward to working with you to resolve this. Worth

---

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Thursday, September 2, 2021 10:57 AM
To: Grant Lewis <glewis@axiomenvironmental.org>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>; Worth Creech <worth@restorationsystems.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Grant,
We received some initial feedback from CRS and requested further clarification, though I don't have direct response to my specific questions yet (correspondence attached). I think it would be best for the County to have some discussion with our CRS rep first, then hopefully they would be willing to have call / Teams meeting with all of us to discuss more the specific questions stream restoration / project related questions you may have. Take a look at attached and let me know if there is anything you would like us to run by them in the meantime.

Thank You for your patience and we will let you know once we have more info from the CRS reps.

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353

kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Thursday, August 19, 2021 3:21 PM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>; Josh Dalton <jdalton@sungatedesign.com>; (worth@restorationsystems.com) <worth@restorationsystems.com>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Hey Brent;

I appreciate you time and would like to continue discussions concerning the Minor Fill requirement for the Guilford County CRS rating system. We are in the early stages of our stream and wetland restoration project, so we have time to figure out the best way forward with the project. Would it be possible to discuss our project with the CRS specialist and/or County to determine if we would affect the CSR rating? If so, what is the best avenue for discussions? Any insight would be helpful and appreciated.

Thank you
Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Thursday, August 12, 2021 1:00 PM
To: Grant Lewis <glewis@axiomenvironmental.org>
Cc: Kaye Graybeal <kgraybeal@guilfordcountync.gov>; Teresa Andrews <tandrews@guilfordcountync.gov>

Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Hello Grant,
I left you a message earlier. Please give me a call when you get a chance. I know this seems simple and we of course want to promote stream and wetland restoration & mitigation projects, but we currently have an issue with the "no-fill" provision in our ordinance that does not allow fill anywhere in the floodplain. This includes not approving CLOMRs based on fill.

This no-fill provision stems for FEMA's Community Rating System (CRS) for which we receive points for Activity 430 Higher Regulatory Standard - Element DL1 "Prohibition of fill". This higher regulation allows us to have a CRS Score = 7 giving residents in floodplains in Guilford County unincorporated area a discount on flood insurance. Any variance from this would result in the County losing our CRS Score and residents losing their discount.

There is a provision highlighted below that allows "minor filling" to restore natural floodplain functions, such as a part of a channel restoration project. This is something we can discuss with our CRS Specialist as "minor filling" is not well defined in the manual, but my understanding is that means CLOMR cannot happen. If you have thoughts on this, then we can run it by our CRS Specialist to try to get a determination. I will go ahead and reach out to them, but if you have any ideas you would like to present, then that could be helpful. I will not be sending the projects specifics or plans to them and will leave it general for now, unless you are OK with me forwarding your current plan info to them. The CRS Specialist is who reviews our annual recertification of our CRS program on behalf of FEMA.

Snippets below regarding provision are directly from FEMA's CRS Coordinator's Manual for your reference. Additional CRS Info and Coordinator's Manual linked below:
https://www.fema.gov/floodplain-management/community-rating-system

Snippets from CRS Coordinator's Manual (pages 430 – 431):

Credit Criteria for DL
(1) Prohibition of fill (DL1):

(a) Prohibition of all fill (DL1a): This credit is for prohibiting all filling in the regulatory floodplain.

This includes the community's NOT approving Conditional Letters or Letters of Map Revision based on Fill (CLOMR-F or LOMR-F). If a CLOMR-F or LOMR-F is issued for a property in the community, then DL1 credit will be denied. This applies to CLOMRs and LOMRs that include filling as part of the reason for requesting a map change.

Minor filling may be allowed where needed to protect or restore natural floodplain functions, such as a part of a channel restoration project.

The following regulatory approaches do not warrant credit for DL1:

- Regulations that prohibit loss of storage only if it adversely affects flood heights on other properties. This credit is for prohibiting all filling, particularly because of its adverse effect on natural floodplain functions.
- Subdivision regulations that do not apply to all new development.
- Regulations that apply to buildings or private development, but not to bridges, highways, parking lots, and other floodplain uses.
- The standard NFIP language that prohibits increases in flood heights in floodways. That standard does not prohibit fill—it allows filling that can be shown by an engineering study not to increase flood levels. It reads

  Prohibit encroachments, including fill, new construction, substantial improvements and other developments unless certification (with supporting technical data) by a registered professional engineer is provided demonstrating that encroachments shall not result in any increase in flood levels during occurrence of the base flood discharge; . . .

Please bear with us as we see what can possibly be done. I apologize for delay in getting back to you on this, but please know it is something we have been researching and discussing what can be done for a project like this.

Regards,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Thursday, August 12, 2021 11:36 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Hello Brent;

I wanted to inquire about your progress with the EEP Floodplain Checklist. This form is very simple

for you to execute, all that is required is to check a box and sign the form. This will determine our path forward with the project when we get to permitting. If I can be of assistance, please let me know.

Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Grant Lewis
Sent: Friday, June 18, 2021 10:20 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

I will be the contact. The State Engineer and Coordinator are only contacted if there is no local authority.

I am not sure who the EEP (Now Division of Mitigation Services or DMS) project manager is, but once you and I sign the form, I submit with our Categorical Exclusion document.

Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Friday, June 18, 2021 10:17 AM
To: Grant Lewis <glewis@axiomenvironmental.org>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Thank You. Who are the contacts the EEP checklist has been (or will be) submitted to:

- NFIP attn: State NFIP Engineer = ?
- NC Floodmapping Unit attn: State NFIP Coordinator = ?
- NC Ecosystem Enhancement Program attn: ?
- Others?

Thank You,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Friday, June 18, 2021 9:10 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Brent;

Attached you will fine some figures with FEMA Flood Zones overlain by the work plan. I don't have GIS layers of the FIRM map, so I hope these work.

As far as schedule, I believe we are a year to year and a half for design and another half year till permitting and construction. It's hard to say, as the project is so preliminary and we are just initiating the Categorical Exclusion Studies.

Please speak with anyone you need for this stage of the project. Also, note that this document does not replace the normal floodplain permit application process. We will conduct the appropriate coordination with Guilford County when we apply for permits.

Thanks
Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Thursday, June 17, 2021 5:54 PM
To: Grant Lewis <glewis@axiomenvironmental.org>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Grant,
Can you please provide exhibit of proposed work overlaid on FIRM map or add the Floodplain, Floodway and Sections to the proposed work exhibits? I need a better understanding of where the work in taking place in relation to the floodplain and floodway.

Do you have an anticipated schedule for design, permitting, and start of construction?

Also, I will need to speak with one of the NFIP Planners at NCDPS about this as I have not gone through process for stream restorations, especially at this scale. Please bear with me. Looks like a great project!

Thank You,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections
Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Tuesday, June 15, 2021 2:59 PM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>

Subject: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Hello Brent;

I spoke on the phone with you yesterday about the attached EEP Floodplain Requirement Checklist for my stream restoration project in Guilford County. Please have a look at the attached information. All I really need is the last page checked and signed.

Please note, we will coordinate with FEMA on this project as part of the permitting process. This checklist is simply a method for initiating the project with the State of North Carolina.

Thank you for your time.
Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

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From: Grant Lewis
To: Brent Gatlin
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site
Date: Thursday, August 12, 2021 11:35:00 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Hello Brent;

I wanted to inquire about your progress with the EEP Floodplain Checklist. This form is very simple for you to execute, all that is required is to check a box and sign the form. This will determine our path forward with the project when we get to permitting. If I can be of assistance, please let me know.

Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)



From: Grant Lewis
Sent: Friday, June 18, 2021 10:20 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

I will be the contact. The State Engineer and Coordinator are only contacted if there is no local authority.

I am not sure who the EEP (Now Division of Mitigation Services or DMS) project manager is, but once you and I sign the form, I submit with our Categorical Exclusion document.

Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue

Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)

From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Friday, June 18, 2021 10:17 AM
To: Grant Lewis <glewis@axiomenvironmental.org>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Thank You. Who are the contacts the EEP checklist has been (or will be) submitted to:

- NFIP attn: State NFIP Engineer = ?
- NC Floodmapping Unit attn: State NFIP Coordinator = ?
- NC Ecosystem Enhancement Program attn: ?
- Others?

Thank You,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Friday, June 18, 2021 9:10 AM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Brent;

Attached you will fine some figures with FEMA Flood Zones overlain by the work plan. I don't have GIS layers of the FIRM map, so I hope these work.

As far as schedule, I believe we are a year to year and a half for design and another half year till permitting and construction. It's hard to say, as the project is so preliminary and we are just initiating the Categorical Exclusion Studies.

Please speak with anyone you need for this stage of the project. Also, note that this document does not replace the normal floodplain permit application process. We will conduct the appropriate coordination with Guilford County when we apply for permits.

Thanks
Grant

Grant Lewis
Senior Project Manager
Axiom Environmental, Inc.
218 Snow Avenue
Raleigh, North Carolina 27603
glewis@axiomenvironmental.org
(919) 215-1693 (cell)



From: Brent Gatlin <kgatlin@guilfordcountync.gov>
Sent: Thursday, June 17, 2021 5:54 PM
To: Grant Lewis <glewis@axiomenvironmental.org>
Subject: RE: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

Grant,
Can you please provide exhibit of proposed work overlaid on FIRM map or add the Floodplain, Floodway and Sections to the proposed work exhibits? I need a better understanding of where the work in taking place in relation to the floodplain and floodway.

Do you have an anticipated schedule for design, permitting, and start of construction?

Also, I will need to speak with one of the NFIP Planners at NCDPS about this as I have not gone through process for stream restorations, especially at this scale. Please bear with me. Looks like a great project!

Thank You,

Brent Gatlin, PE, LEED AP
Watershed-Stormwater Engineer
PLN/Inspections

Guilford County Government
400 West Market Street, Greensboro, NC 27401
336-641-3753 | m: 336-402-4353
kgatlin@guilfordcountync.gov | www.guilfordcountync.gov

From: Grant Lewis <glewis@axiomenvironmental.org>
Sent: Tuesday, June 15, 2021 2:59 PM
To: Brent Gatlin <kgatlin@guilfordcountync.gov>
Subject: EEP Floodplain Requirement Checklist - Stinking Quarter Stream Restoration Site

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Hello Brent;

I spoke on the phone with you yesterday about the attached EEP Floodplain Requirement Checklist for my stream restoration project in Guilford County. Please have a look at the attached information. All I really need is the last page checked and signed.

Please note, we will coordinate with FEMA on this project as part of the permitting process. This checklist is simply a method for initiating the project with the State of North Carolina.

Thank you for your time.
Grant

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Axiom Environmental, Inc.

Axiom Environmental, Inc.

218 Snow Avenue, Raleigh, North Carolina 27603 919-215-1693

June 15, 2021

Brent Gatlin
Guilford County Stormwater Engineer
400 West Market Street
Greensboro, NC 27401

Re: Stinking Quarter Stream and Wetland mitigation project
Guilford County **21-012**
FEMA Floodplain Requirements Checklist

Dear Mr. Gatlin:

The purpose of this letter is to request concurrence from Guilford County concerning a stream and wetland restoration site located in near the Town of Julian. The Site encompasses approximately 116 acres of agriculture land used for row crops and livestock pasture along North Prong Stinking Quarter Creek and its unnamed tributaries. Proposed activities at the Site include the restoration of stream channels and riparian wetlands.

FEMA mapping was reviewed to determine if the project is in a FEMA study area (DFIRM panel numbers 8709, 8719, 8708, and 8718). Based on existing floodplain mapping, North Prong Stinking Quart Creek and its floodplain are characterized as an AE Flood Zone. We request guidance from your organization as to how to move forward with the project.

We thank you in advance for your timely response and cooperation. Please feel free to contact me at the above referenced phone number with any questions that you may have with this project.

Yours truly,

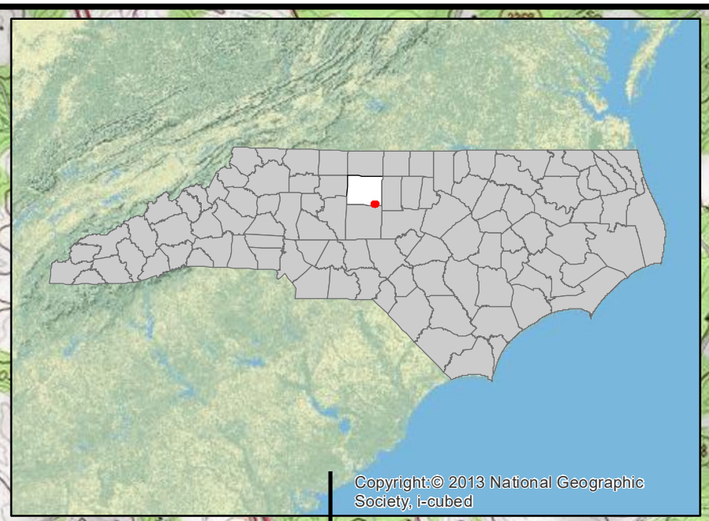
AXIOM ENVIRONMENTAL

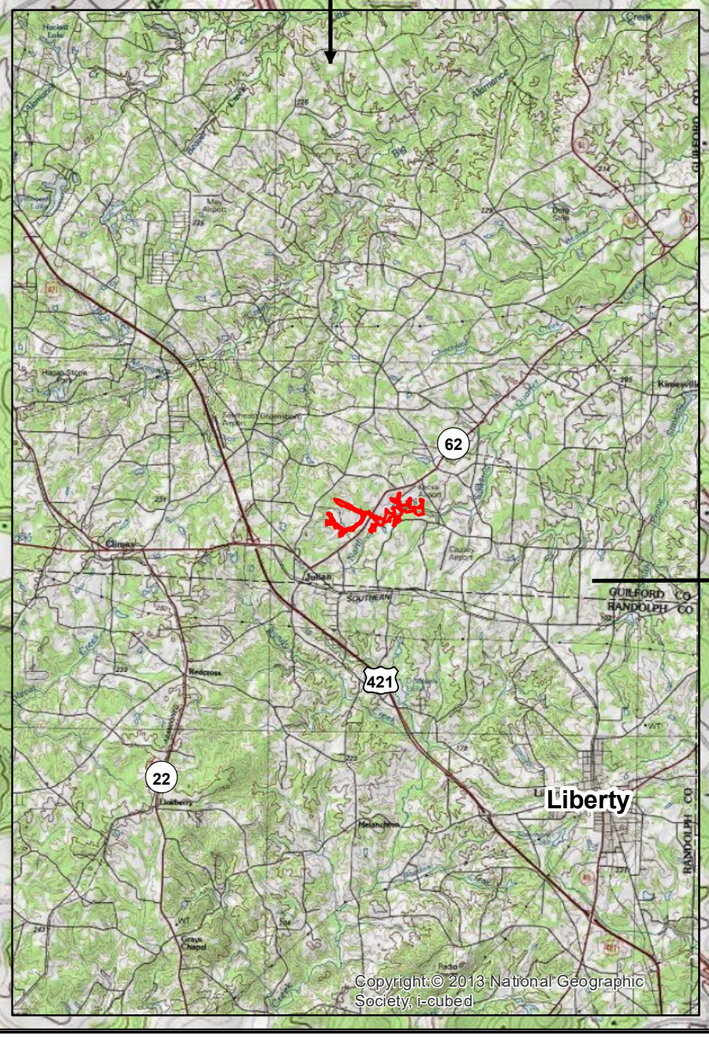
W Grant Lewis

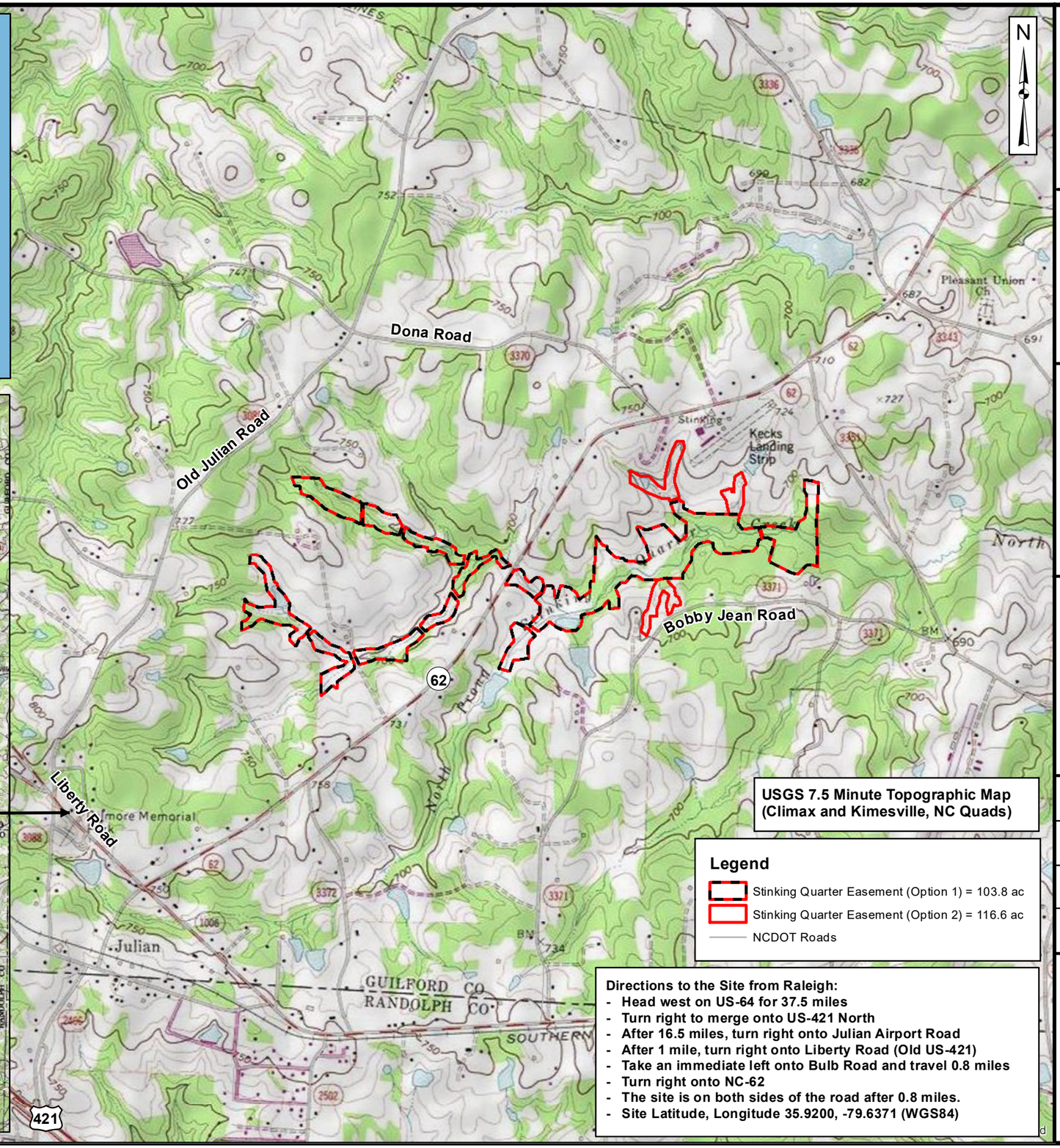
W. Grant Lewis
Senior Project Manager

Attachments

- Figure 1 Site Location
- Figure 2 Hydrologic Unit Map
- Figure 3 Topography and Drainage Area
- Figure 4 and 4A-4D Existing Conditions
- Figure 5 LIDAR
- Figure 6 and 6A-6D Proposed Conditions
- EEP Floodplain Requirements Checklist







USGS 7.5 Minute Topographic Map (Climax and Kimesville, NC Quads)

Legend

- Stinking Quarter Easement (Option 1) = 103.8 ac
- Stinking Quarter Easement (Option 2) = 116.6 ac
- NCDOT Roads

Directions to the Site from Raleigh:

- Head west on US-64 for 37.5 miles
- Turn right to merge onto US-421 North
- After 16.5 miles, turn right onto Julian Airport Road
- After 1 mile, turn right onto Liberty Road (Old US-421)
- Take an immediate left onto Bulb Road and travel 0.8 miles
- Turn right onto NC-62
- The site is on both sides of the road after 0.8 miles.
- Site Latitude, Longitude 35.9200, -79.6371 (WGS84)

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

SITE LOCATION

Drawn by: KRJ

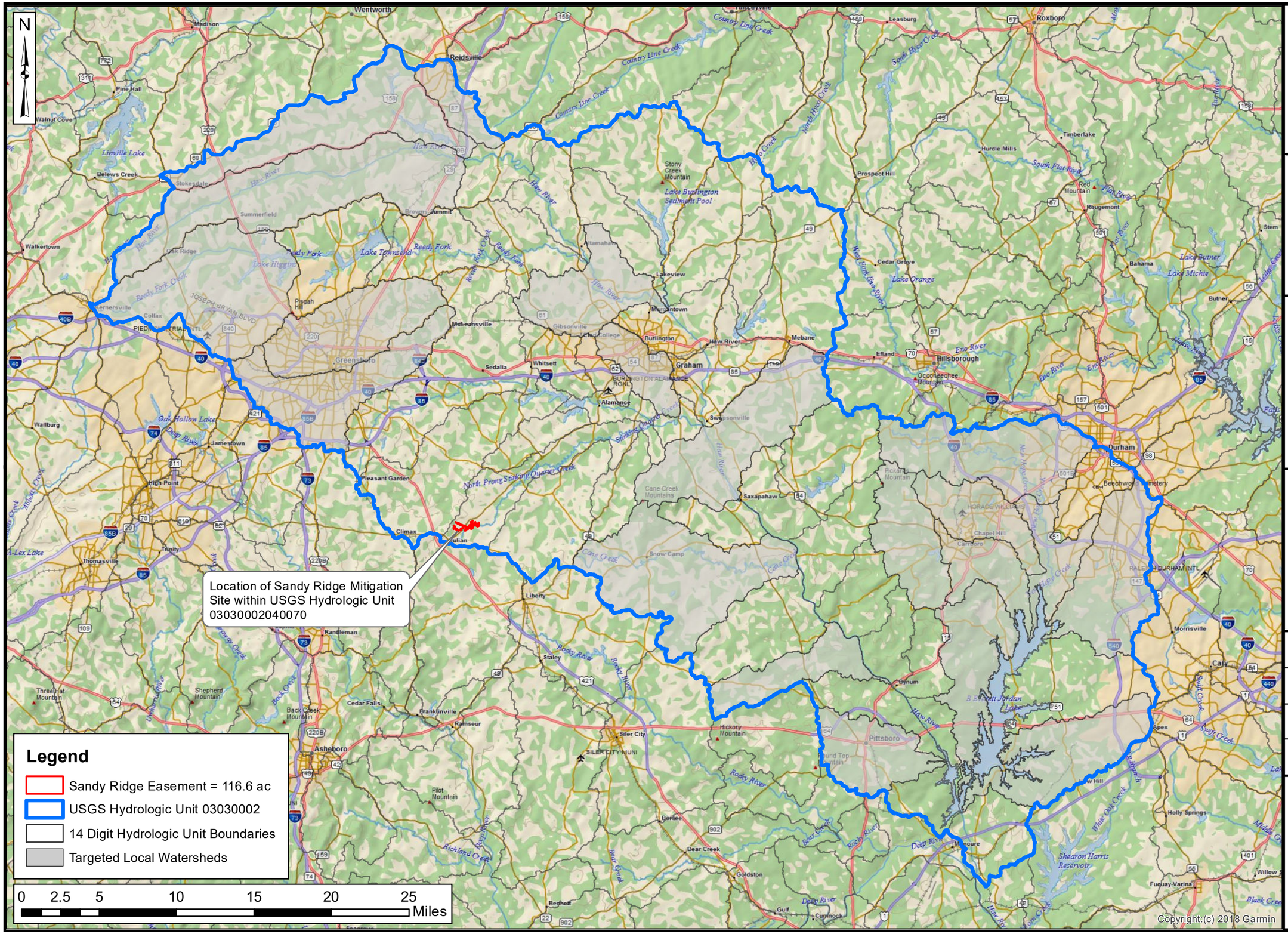
Date: OCT 2020

Scale: 1:20,000

Project No.: 20-001.05

FIGURE

1



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STINKING QUARTER MITIGATION SITE

Guilford County, NC

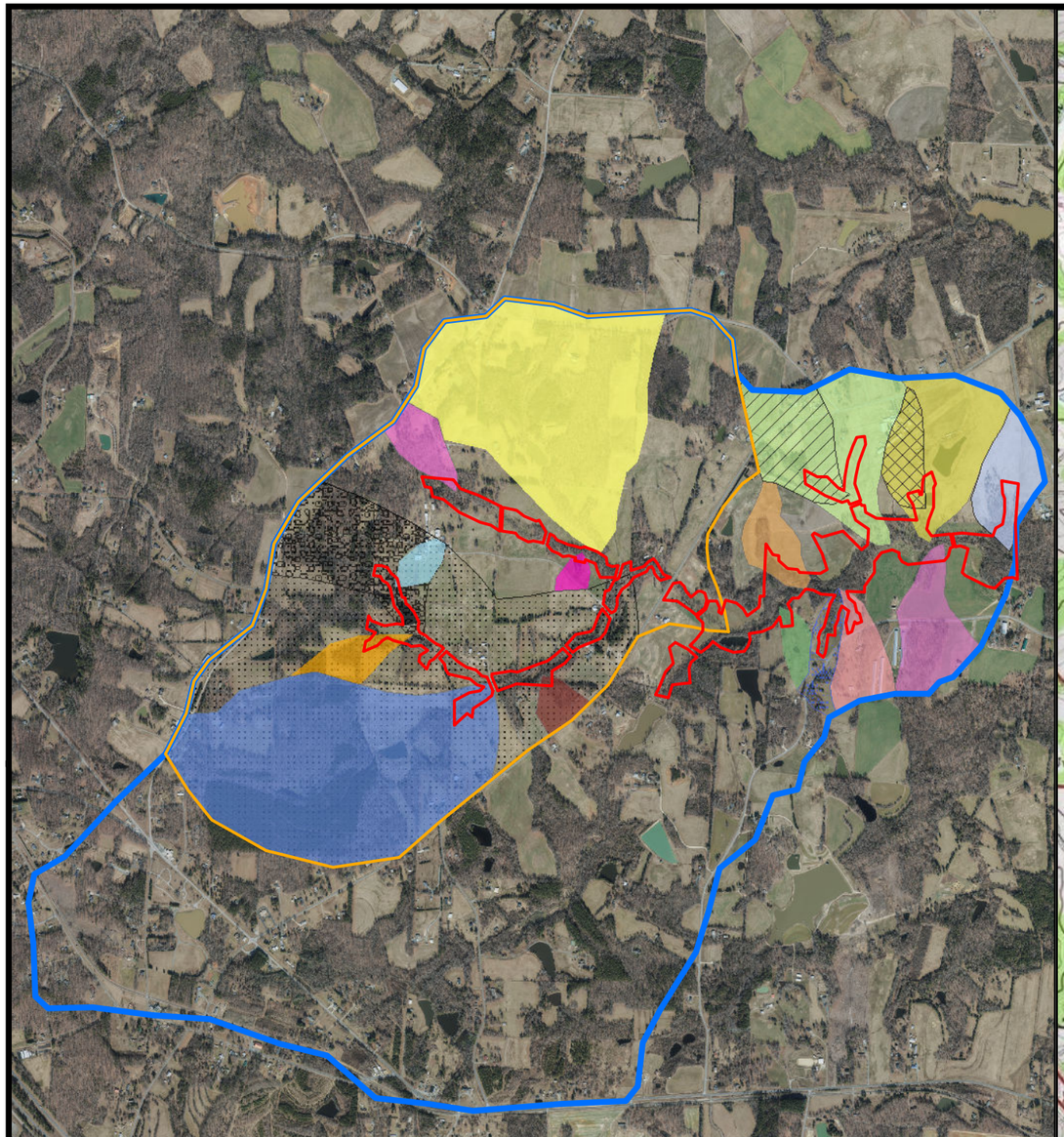
Title:

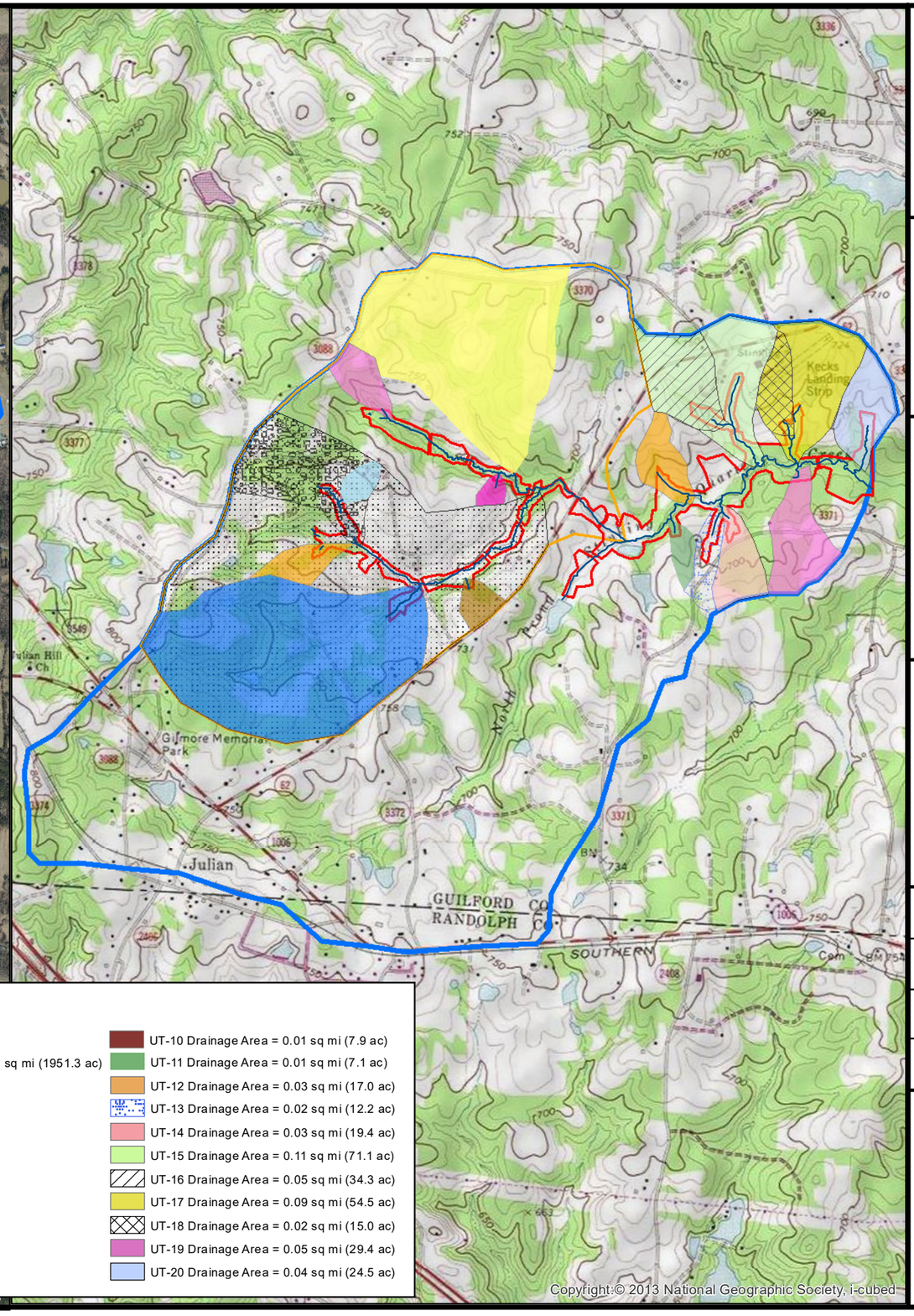
HYDROLOGIC UNIT MAP

Drawn by:	KRJ
Date:	OCT 2020
Scale:	1:370,000
Project No.:	20-001.05

FIGURE

2





Legend

- Sandy Ridge Easement = 116.6 ac
- North Prong Stinking Quarter Creek Drainage Area = 3.05 sq mi (1951.3 ac)
- UT-1 Drainage Area = 1.26 sq mi (804.2 ac)
- UT-2 Drainage Area = 0.02 sq mi (13.5 ac)
- UT-3 Drainage Area = 0.01 sq mi (3.9 ac)
- UT-4 Drainage Area = 0.25 sq mi (158.2 ac)
- UT-5 Drainage Area = 0.67 sq mi (427.0 ac)
- UT-6 Drainage Area = 0.09 sq mi (58.4 ac)
- UT-7 Drainage Area = 0.01 sq mi (6.4 ac)
- UT-8 Drainage Area = 0.02 sq mi (12.0 ac)
- UT-9 Drainage Area = 0.30 sq mi (189.2 ac)
- UT-10 Drainage Area = 0.01 sq mi (7.9 ac)
- UT-11 Drainage Area = 0.01 sq mi (7.1 ac)
- UT-12 Drainage Area = 0.03 sq mi (17.0 ac)
- UT-13 Drainage Area = 0.02 sq mi (12.2 ac)
- UT-14 Drainage Area = 0.03 sq mi (19.4 ac)
- UT-15 Drainage Area = 0.11 sq mi (71.1 ac)
- UT-16 Drainage Area = 0.05 sq mi (34.3 ac)
- UT-17 Drainage Area = 0.09 sq mi (54.5 ac)
- UT-18 Drainage Area = 0.02 sq mi (15.0 ac)
- UT-19 Drainage Area = 0.05 sq mi (29.4 ac)
- UT-20 Drainage Area = 0.04 sq mi (24.5 ac)

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Prepared for:

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Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

TOPOGRAPHY AND DRAINAGE AREA

Drawn by: KRJ

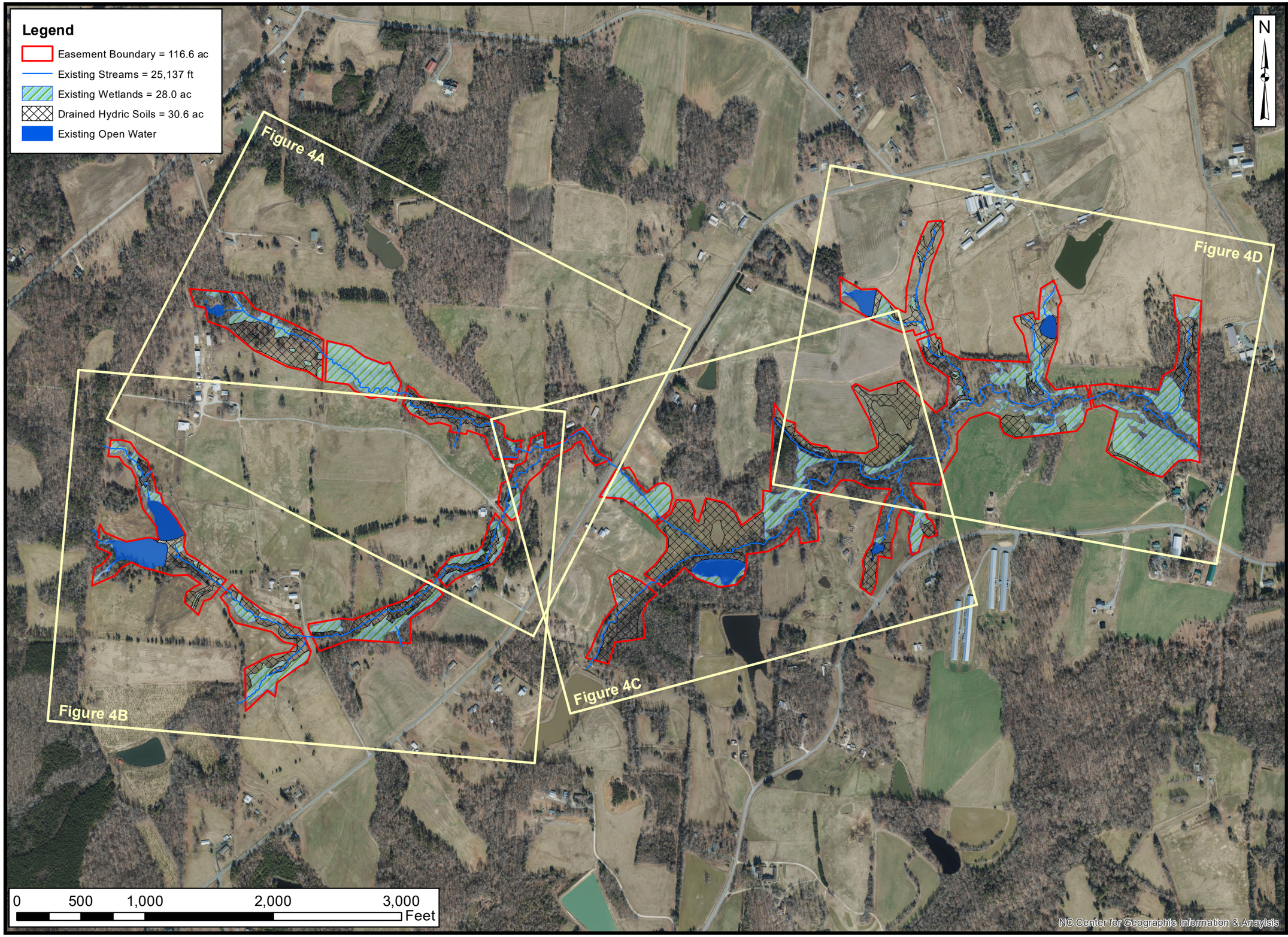
Date: OCT 2020

Scale: 1:23,500

Project No.: 20-001.05

FIGURE

3



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Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:8500

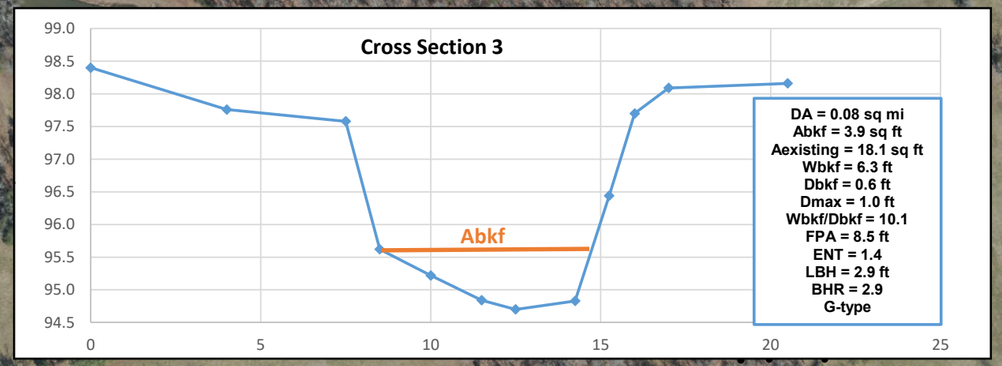
Project No.: 20-001.05

FIGURE

4

Legend

- Easement Boundary = 116.6 ac
- Existing Streams = 25,137 ft
- Existing Wetlands = 28.0 ac
- Drained Hydric Soils = 30.6 ac
- Existing Open Water
- NCDWR Forms
- NCSAM Forms
- NCWAM Forms
- Detailed Soil Profiles
- Cross Sections
- GPS Points (3-4 soil borings at each point)



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Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

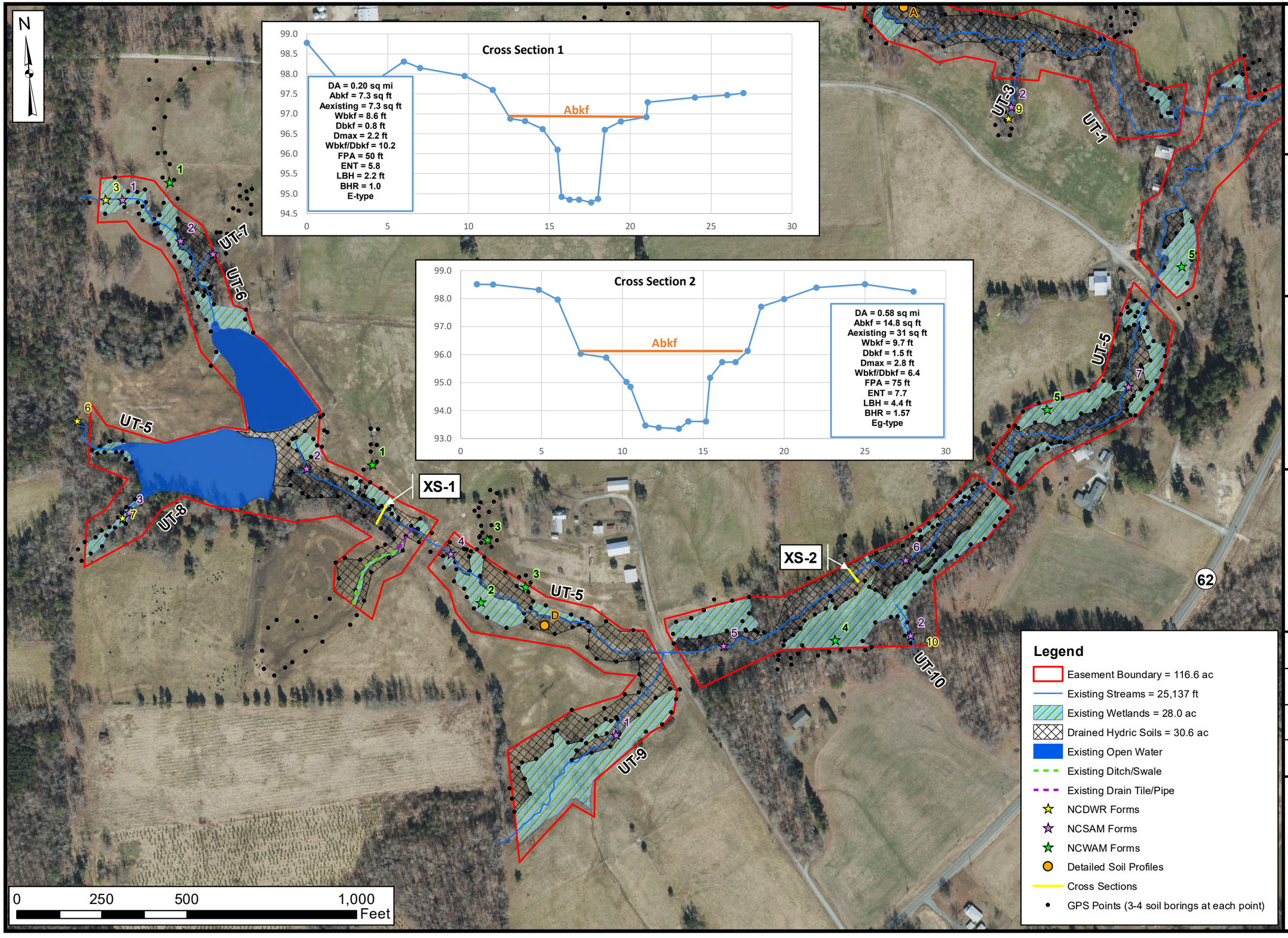
Date: OCT 2020

Scale: 1:3100

Project No.: 20-001.05

FIGURE

4A



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RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:3200

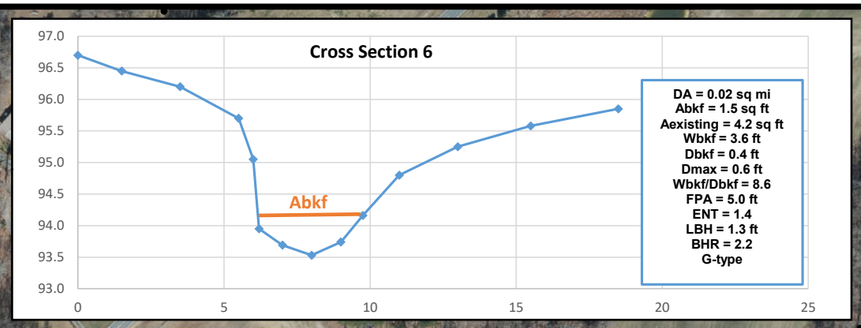
Project No.: 20-001.05

FIGURE

4B

Legend

- Easement Boundary = 116.6 ac
- Existing Streams = 25,137 ft
- Existing Wetlands = 28.0 ac
- Drained Hydric Soils = 30.6 ac
- Existing Open Water
- Existing Ditch/Swale
- Existing Drain Tile/Pipe
- NCDWR Forms
- NCSAM Forms
- NCWAM Forms
- Detailed Soil Profiles
- Cross Sections
- GPS Points (3-4 soil borings at each point)





N

XS-6

XS-4

UT-1

UT-12

UT-11

UT-13

UT-14

Quarter Creek

North Prong Stinking

62

0 250 500 1,000 Feet

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Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:2800

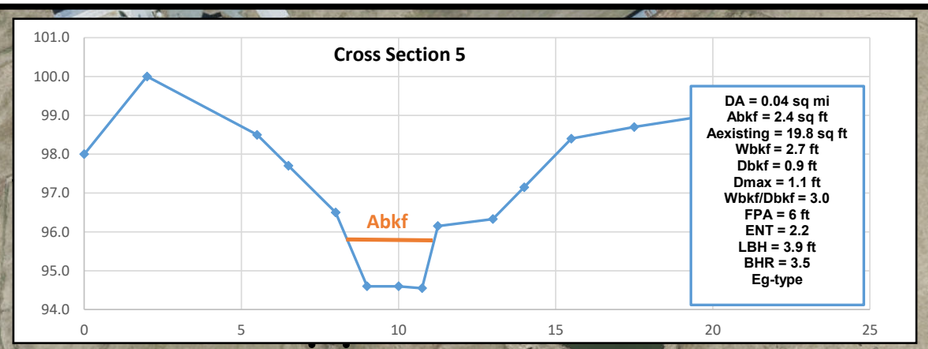
Project No.: 20-001.05

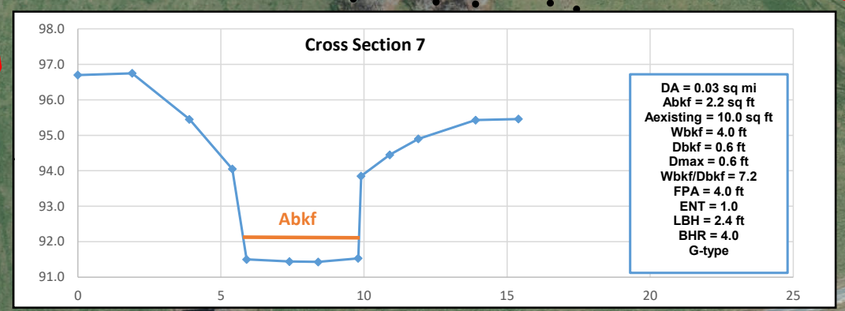
FIGURE

4C

Legend

- Easement Boundary = 116.6 ac
- Existing Streams = 25,137 ft
- Existing Wetlands = 28.0 ac
- Drained Hydric Soils = 30.6 ac
- Existing Open Water
- Existing Ditch/Swale
- Existing Drain Tile/Pipe
- NCDWR Forms
- NCSAM Forms
- NCWAM Forms
- Detailed Soil Profiles
- Cross Sections
- GPS Points (3-4 soil borings at each point)
- Existing ATV Path





UT-15
UT-16
UT-18
UT-17
UT-20
UT-19
UT-12
UT-13
UT-14
North Prong Stinking Quarter Creek
XS-5
XS-7
E
F
G
H
J
K
L
M
1
2
5
7
9
10
11
13
14

N

0 250 500 1,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

EXISTING CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:3000

Project No.: 20-001.05

FIGURE

4D

Legend

Easement Boundary = 116.6 ac

N

UT-5 LiDAR Detail

Channel restoration will occur in the historic, low portion of the floodplain.

Historic channel meander scrolls from previous channel location

0 500 1,000 2,000 3,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

LIDAR

Drawn by: KRJ

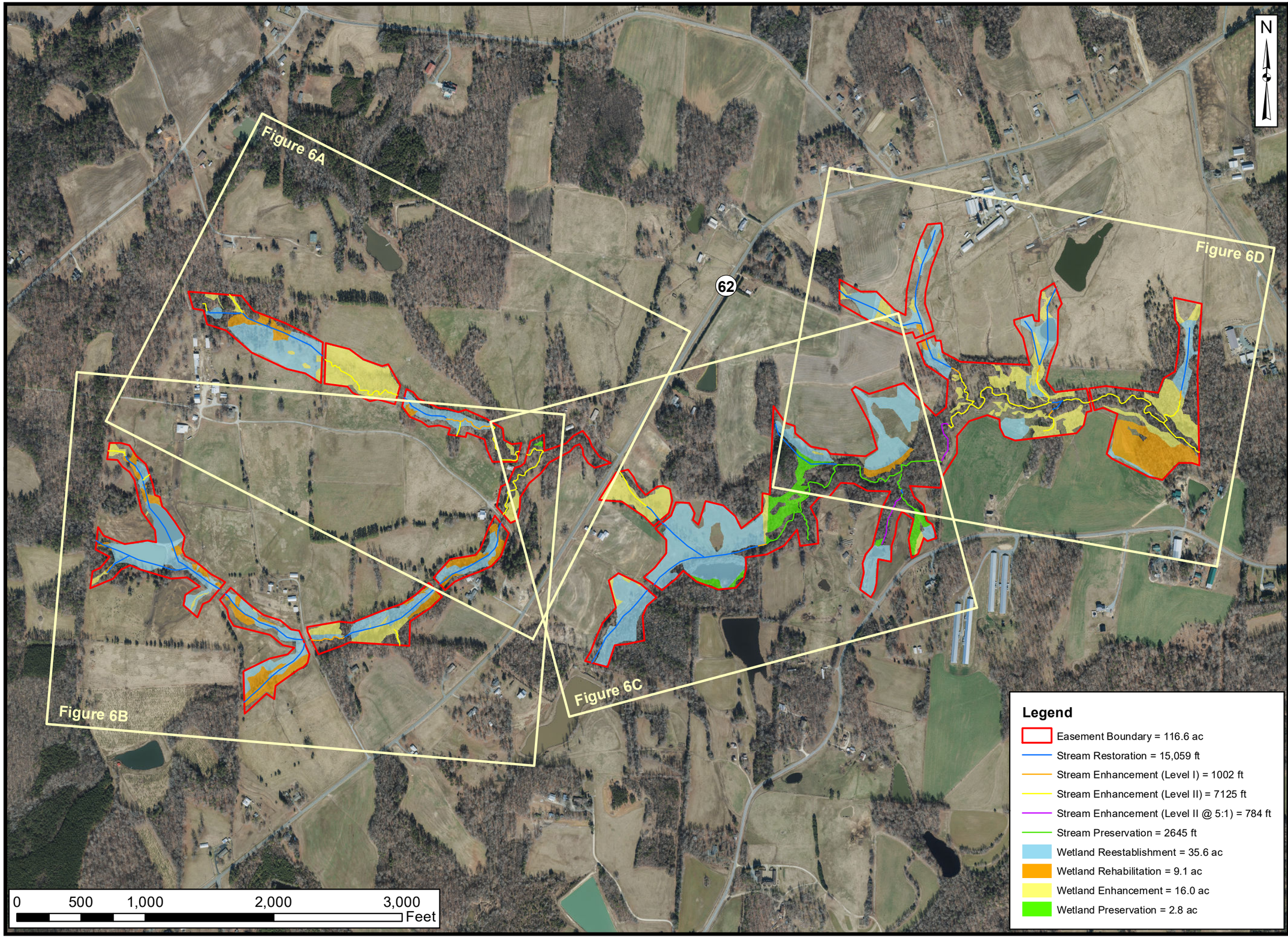
Date: OCT 2020

Scale: 1:7500

Project No.: 20-001.05

FIGURE

5



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

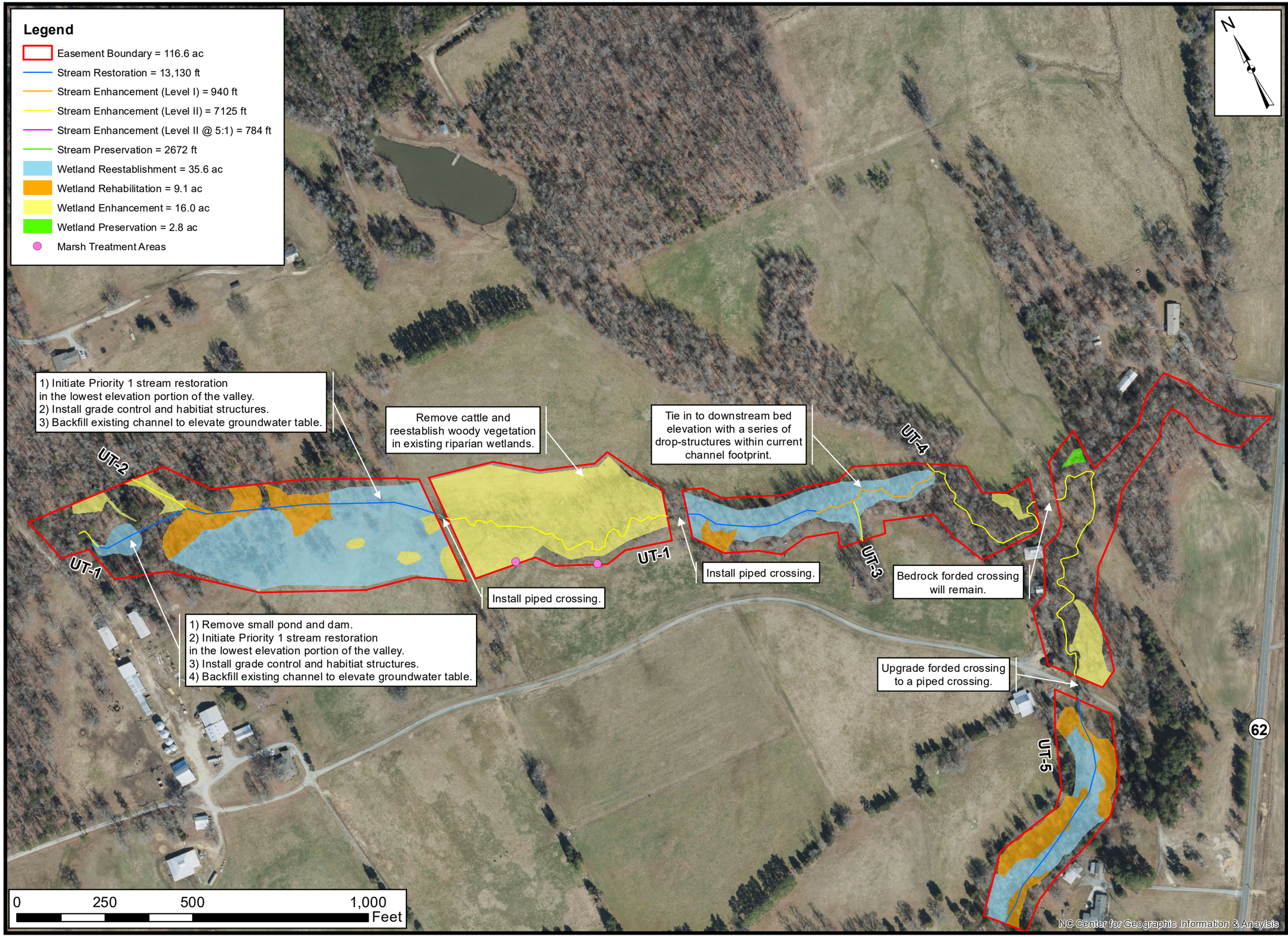
Date: OCT 2020

Scale: 1:8500

Project No.: 20-001.05

FIGURE

6



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STINKING QUARTER MITIGATION SITE

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Title:

PROPOSED CONDITIONS

Drawn by: KRJ

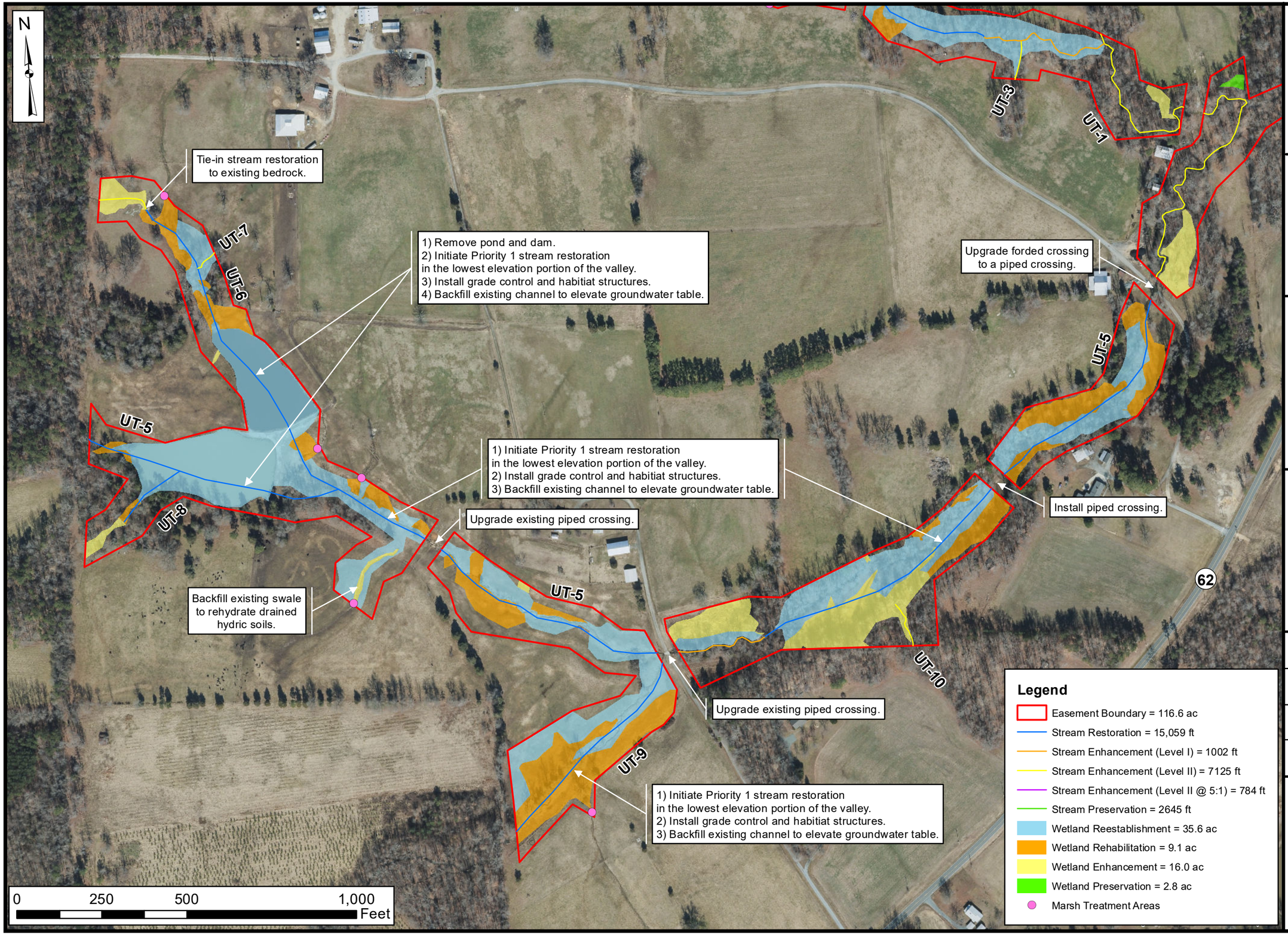
Date: OCT 2020

Scale: 1:3100

Project No.: 20-001.05

FIGURE

6A



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STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

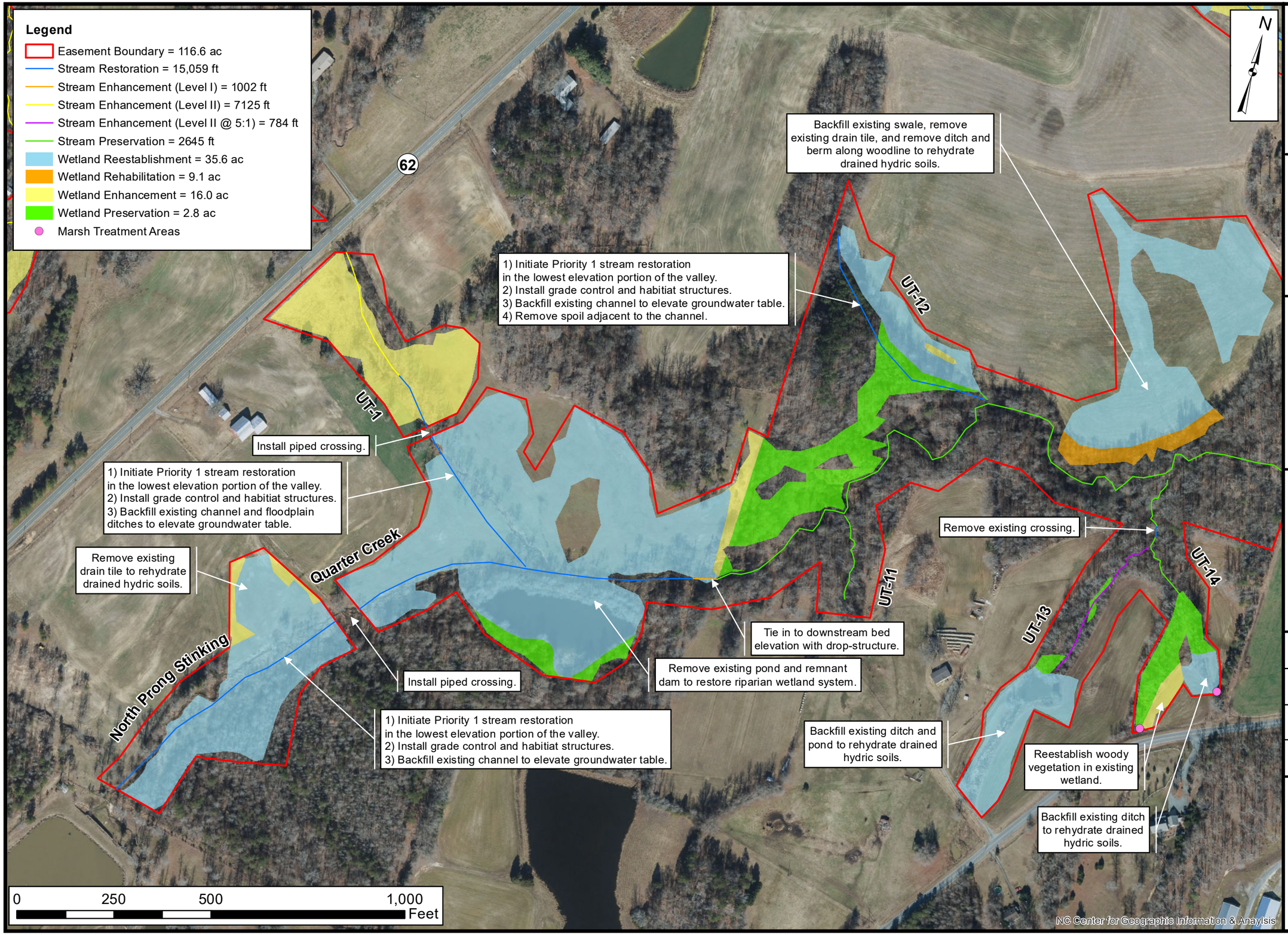
Date: OCT 2020

Scale: 1:3200

Project No.: 20-001.05

FIGURE

6B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:2800

Project No.: 20-001.05

FIGURE

6C

Legend

- Easement Boundary = 116.6 ac
- Stream Restoration = 15,059 ft
- Stream Enhancement (Level I) = 1002 ft
- Stream Enhancement (Level II) = 7125 ft
- Stream Enhancement (Level II @ 5:1) = 784 ft
- Stream Preservation = 2645 ft
- Wetland Reestablishment = 35.6 ac
- Wetland Rehabilitation = 9.1 ac
- Wetland Enhancement = 16.0 ac
- Wetland Preservation = 2.8 ac
- Marsh Treatment Areas
- ATV Path to Remain

Remove capped springhead, and construct marsh treament area.

1) Initiate Priority 1 stream restoration in the lowest elevation portion of the valley.
2) Install grade control and habitiat structures.
3) Backfill existing channel and remove drain tile from floodplain to elevate groundwater table.

1) Remove pond and dam.
2) Initiate Priority 1 stream restoration in the lowest elevation portion of the valley.
3) Install grade control and habitiat structures.
4) Backfill existing channel to elevate groundwater table.

1) Initiate Priority 1 stream restoration in the lowest elevation portion of the valley.
2) Install grade control and habitiat structures.
3) Backfill existing channel to elevate groundwater table.

1) Remove pond and dam.
2) Initiate Priority 1 stream restoration in the lowest elevation portion of the valley.
3) Install grade control and habitiat structures.
4) Backfill existing channel to elevate groundwater table.

Tie in to downstream bed elevation with drop-structure within existing channel footprint.

Install piped crossing.

Tie in to downstream bed elevation with drop-structure within existing channel footprint.

Backfill existing ditch to rehydrate drained hydric soils.

Backfill existing swale, remove existing drain tile, and remove ditch and berm along woodline to rehydrate drained hydric soils.

Backfill existing ditch to rehydrate drained hydric soils.

Install forded crossing.

Restore and stabilize channel through existing oxbow bend. Use grade-control structures to tie in UT-19 through existing channel to bed elevation of North Prong Stinking Quarter Creek.

Backfill existing ditch to rehydrate drained hydric soils and increase hydroperiod for existing wetlands.

UT-15
UT-16
UT-18
UT-17
UT-20
UT-15
UT-19
UT-12
UT-13
UT-14
North Prong Stinking Quarter Creek

N

0 250 500 1,000 Feet

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER MITIGATION SITE

Guilford County, NC

Title:

PROPOSED CONDITIONS

Drawn by: KRJ

Date: OCT 2020

Scale: 1:3000

Project No.: 20-001.05

FIGURE

6D

EEP Floodplain Requirements Checklist

This form was developed by the National Flood Insurance program, NC Floodplain Mapping program and Ecosystem Enhancement Program to be filled for all EEP projects. The form is intended to summarize the floodplain requirements during the design phase of the projects. The form should be submitted to the Local Floodplain Administrator with three copies submitted to NFIP (attn. State NFIP Engineer), NC Floodplain Mapping Unit (attn. State NFIP Coordinator) and NC Ecosystem Enhancement Program.

Project Location

Name of project:	Stinking Quarter Site
Name if stream or feature:	North Prong Stinking Quarter Creek
County:	Guilford
Name of river basin:	Cape Fear
Is project urban or rural?	Rural
Name of Jurisdictional municipality/county:	Greensboro/Guilford
DFIRM panel number for entire site:	8709, 8719, 8708, and 8718
Consultant name:	Axiom Environmental, Inc.
Phone number:	919-215-1693
Address:	218 Snow Avenue Raleigh, NC 27603

Design Information

Provide a general description of project (one paragraph). Include project limits on a reference orthophotograph at a scale of 1" = 500". (See Attached)

Summarize stream reaches or wetland areas according to their restoration priority.
(See Attached)

Example

Reach	Length	Priority
Example: Reach A	*1000*	*One (Restoration)*
Example: Reach B	*2000*	*Three (Enhancement)*

Floodplain Information

Is project located in a Special Flood Hazard Area (SFHA)?

☉ Yes ○ No The lower reaches

If project is located in a SFHA, check how it was determined:

☐ Redelineation

☐ Detailed Study

☐ Limited Detail Study

☐ Approximate Study

☑ Don't know

List flood zone designation:

Check if applies:

☑ AE Zone

- ☉ Floodway
- ○ Non-Encroachment
- ○ None

☐ A Zone

- ○ Local Setbacks Required
- ○ No Local Setbacks Required

If local setbacks are required, list how many feet:

Does proposed channel boundary encroach outside floodway/non-encroachment/setbacks?

○ Yes ☉ No

Land Acquisition (Check)

☐ State owned (fee simple)

☐ Conservation easment (Design Bid Build)

☑ Conservation Easement (Full Delivery Project)

Note: if the project property is state-owned, then all requirements should be addressed to the Department of Administration, State Construction Office (attn: Herbert Neily, (919) 807-4101)

Is community/county participating in the NFIP program?

○ Yes ◉ No

Note: if community is not participating, then all requirements should be addressed to NFIP (attn: State NFIP Engineer, (919) 715-8000

Name of Local Floodplain Administrator: Brent Gatlin
Phone Number: 336-641-3753

Floodplain Requirements

This section to be filled by designer/applicant following verification with the LFPA

☐ No Action

☐ No Rise

☐ Letter of Map Revision

☐ Conditional Letter of Map Revision

☐ Other Requirements

List other requirements:

Comments:

Name: W. Grant Lewis Signature: W Grant L

Title: President Date: 6/15/2021

Appendix G: Financial Assurances

Pursuant to Section IV H and Appendix III of the NCDEQ DMS (formerly Ecosystem Enhancement Program) In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environmental Quality (NCDEQ) has provided the USACE-Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by NCDEQ DMS. This commitment provides financial assurance for all mitigation projects implemented by the program.

Appendix H: Site Protection Instrument

Book 210 Page 49

8/4 K2 Design

Book 210 Page 49

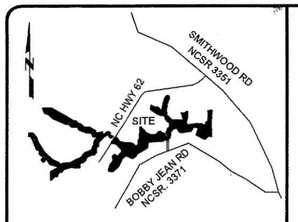
STINKING QUARTER

DMS PROJECT ID# 100193

BK: P 210
PG: 49-59
RECORDED:
09-01-2022
10:54:23 AM
BY: KELLY SALO
DEPUTY-GB

2022055180
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00



VICINITY MAP (NTS)

DEED REFERENCE(S):
BEING A PORTION OF THE PROPERTIES RECORDED IN D.B. 2598, PG. 564, D.B. 4842, PG. 2179, AND D.B. 7901, PG. 2880 OF THE GUILFORD COUNTY REGISTER OF DEEDS.

MAP REFERENCE(S):
P.B. 179, PG. 136
P.B. 91, PG. 119
P.B. 201, PG. 71

LEGEND:
ISS - IRON STAKE SET
ECM - EXISTING CONCRETE MARKER
EIP - EXISTING IRON PIPE
EN - EXISTING NAIL
PTI - PINCH TOP IRON
EIS - EXISTING IRON STAKE
EPP - EXISTING PUMP PIPE
EIB - EXISTING IRON BAR
PPS - PUMP PIPE SET
NMC - NON-MONUMENTED CORNER
R/W - RIGHT OF WAY
EOP - EDGE OF PAVEMENT
E/B - EASEMENT BOUNDARY
CL - CENTERLINE
PKN - PK NAIL
P.B. - PLAT BOOK
D.B. - DEED BOOK
PG. - PAGE
CMP - CORRUGATED METAL PIPE
CPP - CORRUGATED PLASTIC PIPE
RCP - REINFORCED CORRUGATED PIPE
MW - MONITORING WELL
SG - STREAM GAUGE
O NON-MONUMENTED CORNER
● No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
CONSERVATION EASEMENT LINE
TIE DOWN LINE
RIGHT OF WAY LINE OR ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

CERTIFICATE OF LOCAL JURISDICTION APPROVAL FOR RECORDATION:

I, Oliver Bass, as a representative of the Guilford County Planning and Development Department hereby certify that this plat meets the design standards and specifications set forth in the Guilford County Unified Development Ordinance and is approved for recordation this 31st day of August A.D. 2022.

FOR Planning & Development Director

CERTIFICATE STATING NO APPROVAL IS REQUIRED BY DIVISION OF HIGHWAYS OF THE NCDOT:

This plat does not require certificate approval by the Division of Highways as provided in N.C.G.S. 136-102.6, subsection (g).

8/31/22 Date
FOR Planning Director

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG._____.

Register of Deeds By

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

I, Aron Calloway , Review Officer of Guilford County, certify that the map or plat to which this certification is affixed meets all statutory requirements for recording.

8-31-22 Date
Review Officer

SURVEYORS CERTIFICATION(S)

Surveyor's disclaimer: No attempt was made to locate any cemeteries, wetlands, hazardous material sites, underground utilities or any other features above, or below ground other than those shown. However, no visible evidence of cemeteries or utilities, aboveground or otherwise, was observed by the undersigned (other than those shown).

I certify that the survey is of another category such as the recombination of existing parcels, a court-ordered survey, or other exception to the definition of subdivision (conservation easement).

I, JOHN A. RUDOLPH, certify that this plat was drawn under my supervision from an actual survey made under my supervision (deed description recorded in Book SEE , Page REFS , etc.) (other); that the boundaries not surveyed are clearly indicated as drawn from information found in Book____, page____; that the ratio of precision or positional accuracy as calculated is 1/10,000+; that this plat was prepared in accordance with G.S. 47-30 as amended. Witness my original signature, license number and seal this 26th day of August, 2022.

SEAL OR STAMP

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH

Professional Land Surveyor L-4194 License Number

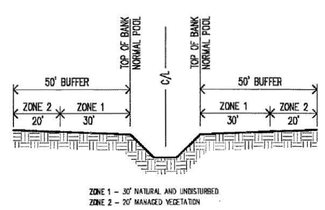
GENERAL NOTES:

1. NOTE: NO ABSTRACT OF TITLE, NOR TITLE COMMITMENT, OR RESULTS OF TITLE SEARCH WERE FURNISHED TO THE SURVEYOR. ALL DOCUMENTS OF RECORD REVIEWED ARE NOTED HEREON (SEE REFERENCES). THERE MAY EXIST OTHER DOCUMENTS OF RECORD THAT MAY AFFECT THIS SURVEYED PARCEL.

   ALL DISTANCES SHOWN ARE HORIZONTAL GROUND DISTANCES.
2. COORDINATES SHOWN ARE BASED ON LOCALIZED GROUND DISTANCES OTHER THAN ISS (901) SEE DATUM DESCRIPTION.
3. FLOOD HAZARD AREAS SHOWN WERE TAKEN FROM N.C. FLOODPLAIN MAPPING PROGRAM: www.flood.nc.gov/ncflood/mappingprogram.html
4. ALL EXISTING FENCES LOCATED IN THE CONSERVATION EASEMENTS TO BE REMOVED (NOT SHOWN FOR CLARITY).
5. ALL EXISTING PIPES SHOWN WITHIN CONSERVATION EASEMENT AREAS TO BE REMOVED
6. DEED RESTRICTION - RESTRICTIVE COVENANT
   Development of subject property is required to be in accordance with applicable state and federal regulations for the National Pollutant Discharge Elimination System (NPDES) Phase II stormwater management program. The recording of this document establishes an enforceable restriction on property usage that runs with the land to ensure that future development and/or redevelopment shall maintain the site in a manner consistent with applicable law and the approved project plans. Any alterations to the site shall not be permitted without review and approval by the local governmental office having jurisdiction for watershed/stormwater management protection.
7. A Non-encroachment Area (NEA), not shown on the effective FIRM map, exists within the floodplain based on cross-sectional and dimensional information in the Limited Detail Flood Hazard Data available from FRIS. The NEA serves as the same function as a Floodway and adheres to the same Floodway rules.
8. All areas of the conservation easements at the time of survey, were located within the AG zoning district, Guilford County.

RIPARIAN BUFFER, STREAM & FLOODPLAIN NOTES:

1. This property is located within the Jordan Lake Watershed where associated riparian buffer rules apply.
2. Jurisdictional streams, wetlands, and other waters of the U.S. are subject to USACE and NCDEQ regulations. Required approvals and permits must be obtained from USACE and NCDEQ prior to impacts to jurisdictional streams, wetlands and other waters of the U.S. The owner and contractor are responsible for ensuring all appropriate permits have been obtained prior to construction.
3. Buffer Authorization application must be approved by Guilford County (or NCDEQ for projects requiring their review of buffers) prior to land disturbance within a riparian buffer, unless the land disturbance is explicitly stated as an "Exempt" use in the Guilford County UDO and NCAC rules that apply.
4. No development or land disturbance is allowed within the SFHA (a.k.a. 1% Annual Chance SFHA or 100-year Floodplain) unless approved by Guilford County via a Floodplain Development Permit. No deviations from the approved plan for proposed work in the SFHA shall be made, unless otherwise requested by the applicant and approved in writing by Guilford County prior to work being performed.
5. No fill is allowed within the Special Flood Hazard Area (SFHA) per Guilford County UDO Section 9.3.P.1.p. except for projects that have received a Floodplain Development Permit from Guilford County per UDO Section 9.3.P.1.p.(2)(a) for minor fill where needed to protect or restore natural floodplain functions, such as part of a stream restoration project.
6. Riparian Buffer Detail (see below):



50' RIPARIAN BUFFER SECTION

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PLAT IS BASED ON NORTH CAROLINA STATE PLANE COORDINATES ESTABLISHED BY USING THE ONLINE POSITIONING USER SERVICE (OPUS) PROVIDED BY THE NATIONAL GEODETIC SURVEY.

ISS (901) NC GRID COORDINATES NAD 83 (2011)
N=790,543.0810'
E=1,810,847.8350'

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PLAT IS 0.99991217 (GROUND TO GRID). THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM ISS (901) TO ISS (138) IS N16°43'57"E 114.17 FEET.

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES.

GEOID-2012B CONUS

GNSS RECEIVER - TOPCON HIPER V WITH MINIMUM TIME OF 2+ HOURS COMPLETED ON 03/09/2022

THE FOLLOWING BASE STATIONS WERE USED:

PID	DESIGNATION	LATITUDE (m)	LONGITUDE (m)
DL3891	NCJL JORDAN LAKE CORS ARP	N354652.496	W0790203.927
DF9213	NCBU BURLINGTON CORS ARP	N360529.586	W0792612.176
AI4198	HIPT HIGH CORS ARP	N355756.486	W0800048.937

CONSERVATION EASEMENT ACREAGE DATA:

DONALD RAY YORK AND WIFE, ELIZABETH G. YORK	SPO# 41-LA-712 PIN 8709715553	D.B. 2598, PG. 564, D.B. 4842, PG. 2179, AND D.B. 7901, PG. 2880	CONSERVATION EASEMENT AREA 1	10.90 ACRES±	43.68 ACRES±
			CONSERVATION EASEMENT AREA 2	4.34 ACRES±	
			CONSERVATION EASEMENT AREA 3	3.34 ACRES±	
			CONSERVATION EASEMENT AREA 4	2.05 ACRES±	
			CONSERVATION EASEMENT AREA 7	3.14 ACRES±	
			CONSERVATION EASEMENT AREA 11	1.81 ACRES±	
			CONSERVATION EASEMENT AREA 12A	1.29 ACRES±	
			CONSERVATION EASEMENT AREA 12B	11.67 ACRES±	
			CONSERVATION EASEMENT AREA 13	5.14 ACRES±	
CURTIS R. YORK AND WIFE, WAYNETTE G.YORK	SPO# 41-LA-713 PIN 8708994865	D.B. 4842, PG. 2163	CONSERVATION EASEMENT AREA 5	0.91 ACRES±	2.02 ACRES±
			CONSERVATION EASEMENT AREA 6	1.11 ACRES±	
JUDY KECK SHOFFNER, AND HUSBAND, TIMOTHY N. SHOFFNER	SPO# 41-LA-714 PIN 8719217827	D.B. 8476, PG. 591	CONSERVATION EASEMENT AREA 15	8.87 ACRES±	17.17 ACRES±
			CONSERVATION EASEMENT AREA 16	1.09 ACRES±	
			CONSERVATION EASEMENT AREA 19	1.37 ACRES±	
			CONSERVATION EASEMENT AREA 20	5.84 ACRES±	
MICKEY LEE KECK AND WIFE, JEAN C. KECK	SPO# 41-LA-715 PIN 8719426891	D.B. 8206, PG. 2173	CONSERVATION EASEMENT AREA 22	2.11 ACRES±	2.11 ACRES±
MARK STANLEY KECK AND WIFE, JUDY JONES KECK	SPO# 41-LA-716 PIN 8719326588	D.B. 8206, PG. 2169	CONSERVATION EASEMENT AREA 21	2.13 ACRES±	2.13 ACRES±
PATRICIA FLINCHUM SHOFFNER AND HUSBAND, FRED SHOFFNER, JR., AND JEAN FLINCHUM CLAPP, WIDOWED	SPO# 41-LA-717 PIN 8709705192	D.B. 1004, PG. 379	CONSERVATION EASEMENT AREA 8	1.54 ACRES±	11.69 ACRES±
			CONSERVATION EASEMENT AREA 9	6.02 ACRES±	
			CONSERVATION EASEMENT AREA 10	4.13 ACRES±	
TONY PAUL HARMON & WIFE, SHERRI SMITH HARMON	SPO# 41-LA-718 PIN 8719315186 & 8719413174	D.B. 7159 PG. 2627, & D.B. 7428, PG. 321	CONSERVATION EASEMENT AREA 17	12.34 ACRES±	23.64 ACRES±
	SPO# 41-LA-718 PIN 8719413174 & 8719510113	D.B. 7428, PG. 321 & D.B. 7391, PG. 2605	CONSERVATION EASEMENT AREA 18	11.30 ACRES±	
FRANKLIN ELI STALEY, JR. AND WIFE, GLENNA STALEY	SPO# 41-LA-719 PIN 8719202060, 8719203491 & 8719206674	D.B. 7428, PG. 321 & D.B. 7391, PG. 2605	CONSERVATION EASEMENT AREA 14	5.01 ACRES±	5.01 ACRES±
TOTAL CONSERVATION EASEMENT EXCLUDING ALL ACCESS EASEMENTS AND EXCLUDING ALL UTILITY EASEMENTS AND INCLUDING ALL INTERNAL CROSSINGS BY COORDINATE COMPUTATION					107.45 ACRES±

FEMA FLOOD STATEMENT:
A PORTION OF THE AREA REPRESENTED BY THIS PLAT IS LOCATED IN A SPECIAL FLOOD HAZARD AREA (SFHA) ACCORDING TO FEMA MAP NUMBER(S) 3710870900J, 3710870800K, 3710871800K & 3710871900J, ZONE(S) X, AE, DATED: JUNE 6, 2007, JANUARY 2, 2008, JANUARY 2, 2008 & JUNE 6, 2007 CONSECUTIVELY. (SEE GENERAL NOTE 7)

NOTE:

SEE SHEET 11 OF 11 FOR OWNER'S SIGNATURES

SHEET 1 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES
DMS PROJECT ID# 100193
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600
GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

DRAWN BY: FGR
DATE: 08/26/22
DWG. NO.: RSS515MR22
SURVEYED BY: J.A.R.

k2 design group
774 S. Beston Road
La Grange, NC 28551
252.582.3097
www.k2designgroup.com

FIRM LICENSE No.: C-2171 K2 DESIGN GROUP, P.A. CORPORATE SEAL 2000 NORTH CAROLINA

RESTORATION SYSTEMS, LLC
1101 HAYNES STREET
SUITE 211
RALEIGH, NC 27604

Book 210 Page 50

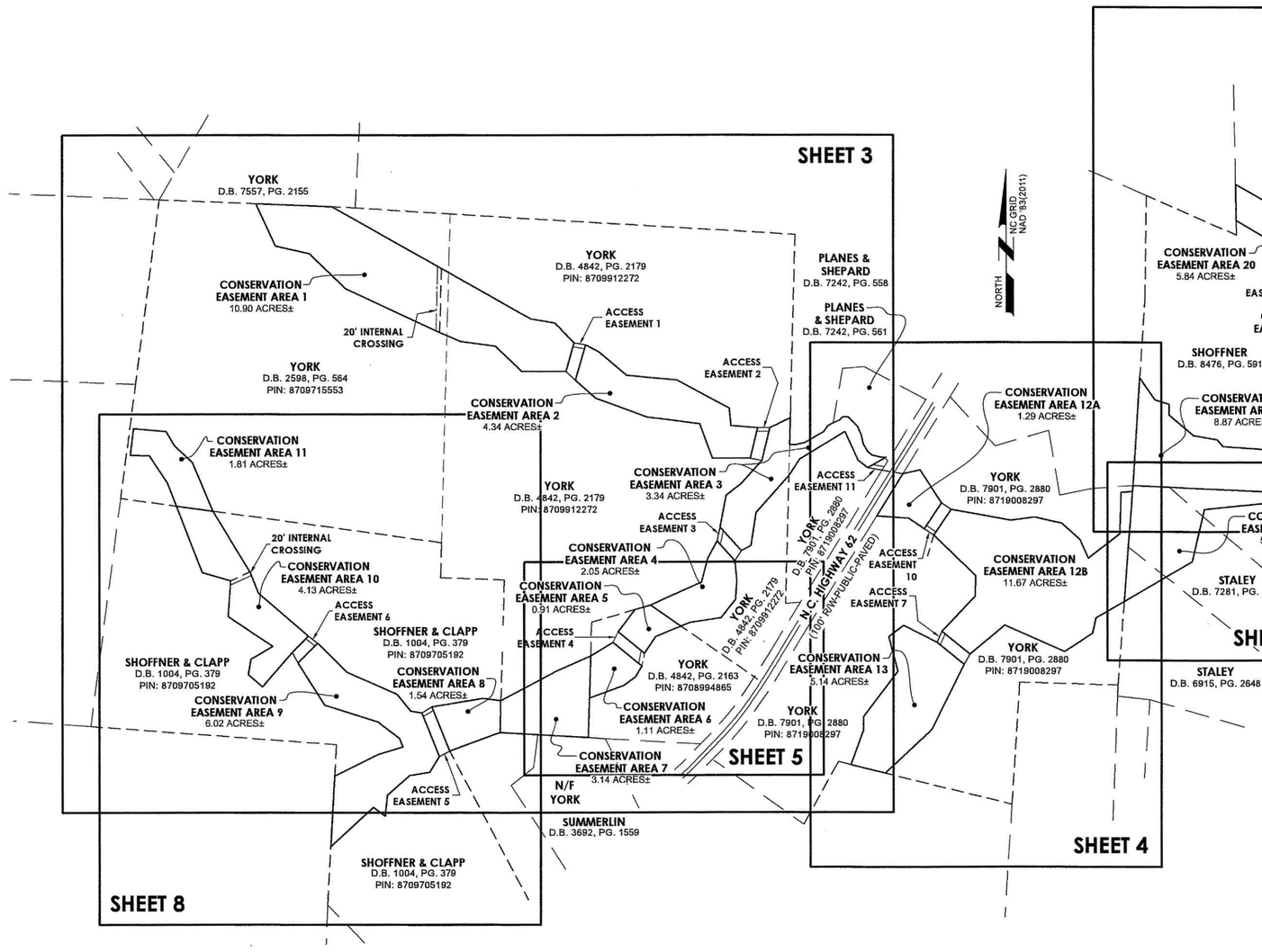
STINKING QUARTER

DMS PROJECT ID# 100193

BK: P 210
PG: 49-59
RECORDED:
09-01-2022
10:54:23 AM
BY: KELLY SALO
DEPUTY-GB

2022055180
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00



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NOTE:

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SHEET 2 OF 11

INDEX SHEET

500 250 0 500 1000 1500

GRAPHIC SCALE 1" = 500'

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG_____.

_____ _____
Register of Deeds By

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY ADOLPH

08/26/2022

CASE NUMBER 22-08-GCPL-05842

Book 210 Book 51

BK: P 210
PG: 49-59
RECORDED
05-01-2022
10:54:23 AM
BY: KELLY SALO
DEPUTY-GB

2022055180
GUILFORD COUNTY, NC
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CONSERVATION EASEMENT LINE
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EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

YORK
D.B. 7557, PG. 2155

ROCK 914 — S87°36'52"E 500.86' (TIE DOWN) — 1 — S87°36'52"E 394.14' — 2 — ROCK 915 — S86°19'28"E 493.08' (TIE DOWN) — EIS 916 — S86°32'13"E 1787.51' (TIE DOWN) — ROCK 917

N24°44'05"W 241.61' — 15" RCP — POND TO BE REMOVED — UT-1 — UT-2 — BROKEN CONCRETE HEADWALL — MW

YORK
D.B. 2598, PG. 564
PIN: 8709715553

S60°30'45"E 650.89' — 28 — S60°30'45"E 537.54' — 3 — L1 — 4 — L199 — L2 — 5 — L3 — L4 — 13 — 14

12 — 178.66' N77°10'06"W — 11 — 283.17' N46°03'15"W — 10 — 6.2' — 536.57' N65°06'26"W — 9B — 180.96' N82°15'08"W — 9 — 189.64' N48°16'05"W — 8 — 227.48' N89°45'16"W — 7 — L9 — 6 — L200 — 25 — 139.28' N48°36'50"W — 24 — 285.35' N89°31'41"W — 23 — 273.28' N82°44'26"W — 22 — 191.57' N20°16'57"W — 21

CONSERVATION EASEMENT AREA 1
10.90 ACRES±

L601

20' INTERNAL CROSSING
AREA = 0.15 ACRES± BY COORDINATE COMPUTATION (20' WEST OF LINE FROM ISS 28 TO ISS 9B)

ACCESS EASEMENT 1
NEW 20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS & REGRESS TO BE CONVEYED TO THE STATE OF NORTH CAROLINA (AREA = 0.03 ACRES± BY COORDINATE COMPUTATION) (SOUTH OF LINE FROM ISS 5 TO ISS 13)

ACCESS EASEMENT 2
NEW 20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS & REGRESS TO BE CONVEYED TO THE STATE OF NORTH CAROLINA (AREA = 0.03 ACRES± BY COORDINATE COMPUTATION) (SOUTH OF THE LINE FROM ISS 19 TO ISS 26)

YORK
D.B. 4842, PG. 2179
PIN: 8709912272

YORK
D.B. 8021, PG. 2984
PIN: 8709715553

YORK
D.B. 2598, PG. 564
PIN: 8709715553

N66°40'16"W 117.99'

CONSERVATION EASEMENT AREA 2
4.34 ACRES±

S49°30'56"E 187.18' — 14 — 15 — S84°31'17"E 261.39' — 16 — S61°40'14"E 308.63' — 17 — L5 — L6 — L201 — 18 — 19 — L7 — L10 — 26 — L11 — 27

UT-4 — UT-1 — UT-3

ROCK 913 — N07°18'32"E 966.20' (TIE DOWN)

PLANES & SHEPARD
D.B. 7242, PG. 558

PLANES & SHEPARD
D.B. 7242, PG. 561

BUILDING (TYPICAL)

CONSERVATION EASEMENT RUNS ALONG PROPERTY LINE IN CENTERLINE OF DITCH FROM "A" TO "B" (SEE LINE TABLE (L13 - L28))

EIP 919 — L12 — EIP 28 — "A" — L42 — L33 — 32 — L32 — L29 — "B" — 29 — L31 — L30 — 31 — CONCRETE BRIDGE — 113 — 501 — ISS 940 — L311 — L310 — 30 — UP — R/W — E — EOP — EOP — E — R/W

CONSERVATION EASEMENT AREA 3
3.34 ACRES±

ACCESS EASEMENT 11
NEW 20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS & REGRESS TO BE CONVEYED TO THE STATE OF NORTH CAROLINA (AREA = 0.03 ACRES± BY COORDINATE COMPUTATION) (NORTH OF THE LINE FROM ISS 30 TO ISS 940)

S01°29'25"W 896.65' (TIE DOWN)

108 — L99 — 109 — L98 — L100 — 116 — L101 — 111 — 4" CPP — CONSERVATION EASEMENT AREA 11 1.81 ACRES± — 107 — 106 — L97 — UT-6 — UT-7

S07°30'20"W 595.51' (TIE DOWN) — N33°34'55"W 169.30' — 105 — L96 — L94 — 101 — UT-6 — S27°38'21"E 275.85' — S31°23'09"E 369.32'

ROCK 912 — S82°08'16"E 291.21' (TIE DOWN) — 100 — N82°08'16"W 1195.21' (TIE DOWN) — ROCK 926

N21°12'16"W 370.12'

POND TO BE REMOVED

SHOFFNER & CLAPP
D.B. 1004, PG. 379
PIN: 8709705192

SHOFFNER & CLAPP
D.B. 1004, PG. 379
PIN: 8709705192

N01°26'55"E 181.59' (TIE DOWN) — 924 EIP — N87°51'56"W 330.17' (TIE DOWN) — EIP 923

N01°40'34"E 626.20' (TIE DOWN)

SHOFFNER & CLAPP
D.B. 1004, PG. 379
PIN: 8709705192

ACCESS EASEMENT 3
NEW 20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS & REGRESS TO BE CONVEYED TO THE STATE OF NORTH CAROLINA (AREA = 0.03 ACRES± BY COORDINATE COMPUTATION) (EAST OF THE LINE FROM ISS 38 TO ISS 53)

WOODEN BARN TO BE REMOVED

UTILITY LINE TO BE REMOVED

L204 — 39 — 40 — L40 — L41 — L35 — 34 — EIP — L34 — 33 — CONSERVATION EASEMENT AREA 3 3.34 ACRES± — 41 — L8 — 20 — L202 — 21

L39 — UP — UT-5 — 35 — L36 — 36 — 38 — 39

BUILDINGS (TYPICAL) — 53 — L54 — L53 — 52 — UP — SG — 42 — L37 — 37 — L203 — GRAVEL ROAD — L52 — 51 — L43 — UP — MW — L44 — UTILITY LINE TO BE REMOVED — 43 — 44 — L45 — 45

CONSERVATION EASEMENT AREA 4
2.05 ACRES±

S73°55'49"W 233.94' (TIE DOWN) — 48 EIP — 566 — L56B — L48 — 47 — L47 — 46 — L46 — MW

S01°40'16"W 175.25' (TIE DOWN) — 921 ISS — 56 — L205 — L57 — L56 — 54 — L55 — BUILDINGS (TYPICAL)

YORK
D.B. 4842, PG. 2179
PIN: 8709912272

CONSERVATION EASEMENT AREA 5
0.91 ACRES±

N55°06'52"W 184.17' (TIE DOWN)

62 PTI — L64 — L59 — SG — MW — L205 — 55 — 57 — L58 — 58 — L61 — 59 — L62 — 60 — 61

ACCESS EASEMENT 4
NEW 20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS & REGRESS TO BE CONVEYED TO THE STATE OF NORTH CAROLINA (AREA = 0.03 ACRES± BY COORDINATE COMPUTATION) (WEST OF THE LINE FROM ISS 56 TO ISS 58)

L70 — 67 — L69 — UT-5 — L63 — L65 — L66 — EIP 932

L75 — 72 — L76 — 66 — L68 — 1 — L67 — EIP 65 — EIP 64 — NORTHERN PROPERTY LINE OF SUMMERLIN — EIP 63 — N86°34'36"W 87.83' (TIE DOWN)

CONSERVATION EASEMENT AREA 8
1.54 ACRES±

CONSERVATION EASEMENT AREA 7
3.14 ACRES±

CONSERVATION EASEMENT AREA 6
1.11 ACRES±

SUMMERLIN
D.B. 3692, PG. 1559

N/F YORK

YORK
D.B. 4842, PG. 2163
PIN: 8708994865

YORK
D.B. 7901, PG. 2880
PIN: 8719008297

N.C. HIGHWAY 62
(100' R/W-PUBLIC-PAVED)

N31°40'16"E 257.04' — L505 — 140 — UP — E — E — UP — 919 EIP

NORTH — NC GRID NAD '83(2011)

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH
08/26/2022

SHEET 3 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF DONALD RAY YORK AND WIFE, ELIZABETH GRAHAM YORK, CURRENT OWNERS PER D.B. 2598, PG. 564, D.B. 4842, PG. 2179, AND D.B. 7901, PG. 2880 (PIN NUMBERS 8709715553, 8709912272 & 8719008297)
DMS PROJECT ID# 100193
SPO NUMBER 41-LA-712
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____, 2022 in the Register of Deeds

Office. Recorded in P.B. _____, PG_____.

Register of Deeds By

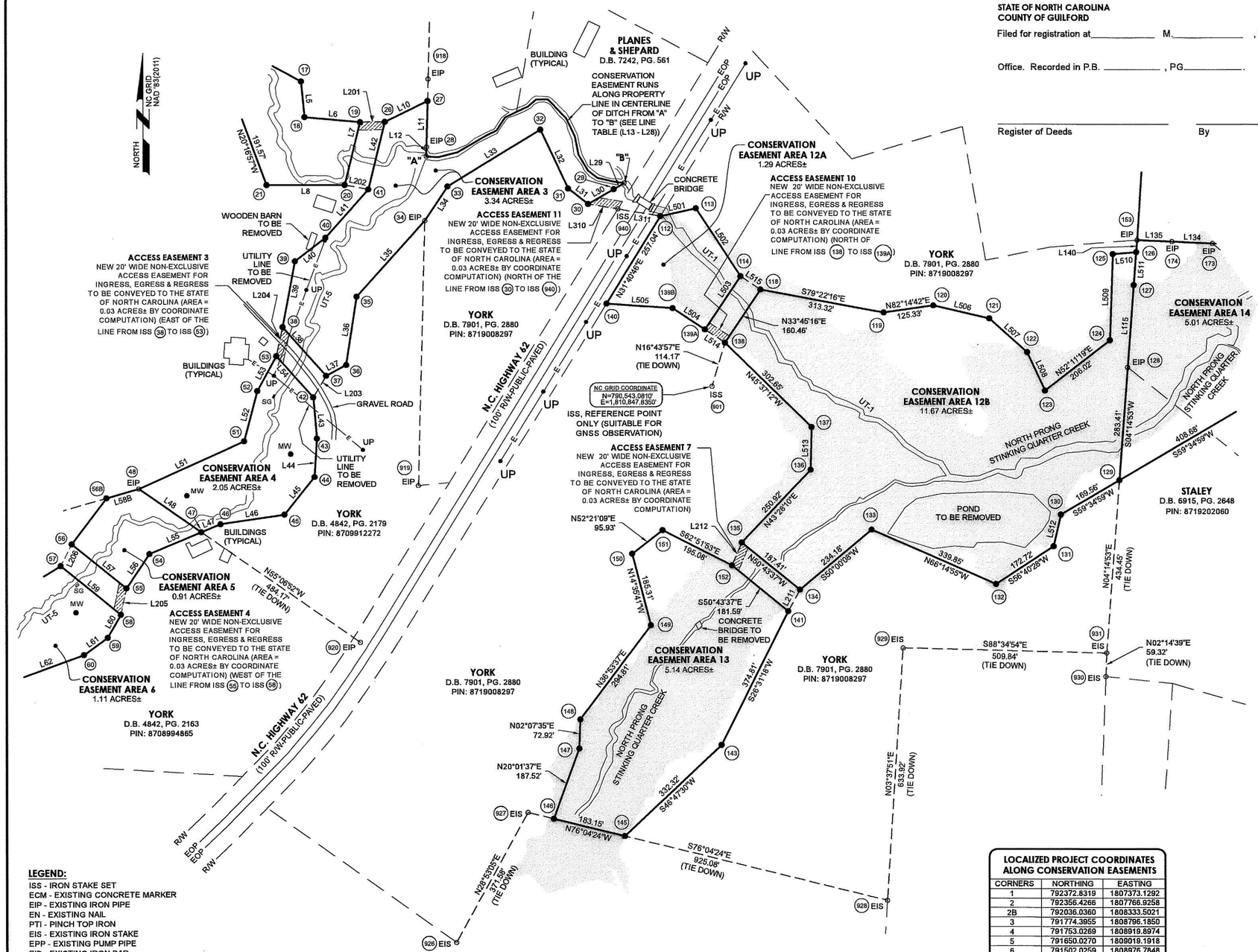
Book 210 Page 52

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG_____.

_____ _____
Register of Deeds By



CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
(1) - (27)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(28)	1.0" O.D. IRON PIPE FLUSH WITH GRADE
(29) - (33)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(34)	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE
(35) - (53) & (61)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(62)	1.0" O.D. PINCHED-TOP IRON 0.2' BELOW GRADE
(63)	1.0" O.D. IRON PIPE 0.3' ABOVE GRADE
(64)	0.5" O.D. IRON PIPE FLUSH WITH GRADE
(65)	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE
(66) - (68) (100) & (101)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(105) - (127)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(128)	1.0" O.D. IRON PIPE, LEANING 3.5' ABOVE GRADE
(129) - (151)	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
(901)	No. 5 REBAR WITH BLUE PLASTIC CAP INSCRIBED: "K2 DESIGN CONTROL POINT" FLUSH WITH GRADE SUITABLE FOR GNSS OBSERVATIONS
(912)	2" X 2" ROCK BY FENCE POST
(913)	4" X 4" ROCK 0.4' ABOVE GRADE
(914)	2" X 8" ROCK 0.2' ABOVE GRADE ENGRAVED WITH AN "X"
(915)	1" X 3" ROCK 0.1' ABOVE GRADE
(916)	No. 4 REBAR 1.3' ABOVE GRADE
(917)	6" X 6" ROCK 1.0' ABOVE GRADE ENGRAVED WITH AN "X" WITNESSED BY AN IRON PIPE, BENT
(918)	0.5" O.D. IRON PIPE 0.2' ABOVE GRADE
(920)	1.0" O.D. IRON PIPE, BENT 0.2' BELOW GRADE
(921)	NON-MONUMENTED CORNER
(922)	1.0" O.D. PINCHED-TOP IRON, LEANING 0.2' BELOW GRADE
(923)	0.5" O.D. IRON PIPE, 0.2' ABOVE GRADE
(924)	0.5" O.D. IRON PIPE, BENT 0.1' BELOW GRADE
(925)	2" X 2" ROCK 0.8' ABOVE GRADE WITNESSED BY AN AUGER/FENCE POST
(926)	No. 5 REBAR 0.4' BELOW GRADE
(927)	No. 5 REBAR FLUSH WITH GRADE
(928)	1.5" O.D. IRON PIPE, LEANING 0.2' ABOVE GRADE
(929)	No. 5 REBAR 0.2' ABOVE GRADE
(930)	4" X 4" CONCRETE MARKER 0.5' BELOW GRADE
(931)	2" X 3" ROCK 0.4' ABOVE GRADE
(932)	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE
(940)	No 5 REBAR FLUSH WITH GRADE

LEGEND:

ISS - IRON STAKE SET
ECM - EXISTING CONCRETE MARKER
EIP - EXISTING IRON PIPE
EN - EXISTING NAIL
PTI - PINCH TOP IRON
EIS - EXISTING IRON STAKE
EPP - EXISTING PUMP PIPE
EIB - EXISTING IRON BAR
PPS - PUMP PIPE SET
NMC - NON-MONUMENTED CORNER
R/W - RIGHT OF WAY
EOP - EDGE OF PAVEMENT
E/B - EASEMENT BOUNDARY
CL - CENTERLINE
PKN - PK NAIL
P.B. - PLAT BOOK
D.B. - DEED BOOK
PG. - PAGE
CMP - CORRUGATED METAL PIPE
CPP - CORRUGATED PLASTIC PIPE
RCP - REINFORCED CORRUGATED PIPE
MW - MONITORING WELL
SG - STREAM GAUGE
O NON-MONUMENTED CORNER
● No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
CONSERVATION EASEMENT LINE
TIE DOWN LINE
RIGHT OF WAY LINE OR ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS

CORNER	NORTHING	EASTING
41	791038.9638	1809989.7185
42	790517.6852	1809850.9975
43	790414.5031	1809859.8518
44	790318.3984	1809854.1041
45	790223.9540	1809778.4097
46	790200.3429	1809618.6874
47	790180.4270	1809570.7284
48	790289.4449	1809414.3703
49	NOT USED	
50	NOT USED	
51	790407.9817	1809677.8454
52	790533.8657	1809711.2357
53	790621.3841	1809758.8208
61	789808.3868	1809097.0237
62	790026.1595	1809103.3769
63	789602.8258	1809091.0267
64	789618.6516	1808829.2338
65	789630.1140	1808634.8216
66	789795.8476	1808639.6714
67	789945.6801	1808921.4189
68	NOT USED	
100	790805.0854	1806960.4744
101	790779.0980	1807148.6671
105	790924.8921	1806913.9927
106	791065.9317	1806820.3502
107	791070.8219	1806721.9355
108	791206.1582	1806739.7659
109	791191.1324	1806906.7639
110	791116.7006	1806952.9589
111	791033.6921	1807042.4857
112	790970.5335	1810719.6969
113	790989.7491	1810808.3788
114	790819.1306	1810919.9539
115	POINT NOT USED	
116	POINT NOT USED	
117	POINT NOT USED	
118	790785.8247	1810969.8610
119	790728.0343	1811277.8007
120	790744.9467	1811401.9873
121	790712.6478	1811541.4260
122	790628.0123	1811636.4781
123	790531.6582	1811680.7489
124	790657.9603	1811843.5093
125	790873.9399	1811851.1546
126	790878.6601	1811909.3469
127	790796.0631	1811903.0627
128	790589.8166	1811887.3710
129	790307.1877	1811866.3779
130	790221.3426	1811720.1572
131	790141.6927	1811701.8317
132	790046.9014	1811557.5132
133	790183.6829	1811246.4455
134	790033.1636	1811067.0496
135	790151.7983	1810921.9665
136	790333.8998	1811094.5898
137	790440.7378	1811097.0140
138	790652.4155	1810880.7046
139A	790685.7537	1810830.8191
139B	790739.8553	1810749.8641
140	790751.7937	1810584.7092
141	789979.4655	1811037.9347
142	POINT NOT USED	
143	789644.0980	1810870.5692
144	POINT NOT USED	
145	789454.6991	1810640.7953
146	789498.4494	1810464.3604
147	789636.8311	1810514.8012
148	789709.6971	1810517.5066
149	789945.4688	1810694.4883
150	790124.7945	1810647.7953
151	790183.3883	1810723.7501
152	790094.4126	1810897.3612

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS

CORNERS	NORTHING	EASTING
1	792372.8319	1807373.1292
2	792356.4266	1807766.9258
2B	792036.0360	1808333.5021
3	791774.3955	1808796.1850
4	791753.0269	1808919.8974
5	791650.0270	1809019.1918
6	791502.0259	1808976.7848
7	791503.0009	1808749.3071
8	791634.0978	1808612.2750
9	791658.4934	1808432.9681
9B	791705.2167	1808324.6282
10	791902.2106	1807867.8474
11	792113.7103	1807648.4215
12	792153.3886	1807474.2232
13	791639.2439	1809078.5166
14	791602.7728	1809147.9006
15	791481.2450	1809280.2618
16	791456.2884	1809550.4614
17	791309.8315	1809822.1260
18	791220.4978	1809830.5249
19	791207.7558	1809969.5019
20	791049.9574	1809930.6330
21	791050.0384	1809735.3572
22	791229.7259	1809668.9510
23	791264.2586	1809397.8639
24	791364.0575	1809130.5395
25	791456.1470	1809026.0534
26	791208.5602	1810031.4934
27	791260.7458	1810138.3913
28	791145.3876	1810135.4013
29	791038.6110	1810603.0079
30	791001.7260	1810539.1761
31	791040.7885	1810489.2629
32	791188.3580	1810419.8185
33	791046.2139	1810187.6136
34	790960.1543	1810130.7339
35	790770.0094	1809959.9299
36	790599.0175	1809933.5749
37	790571.6921	1809883.2687
38	790694.1170	1809774.4466
39	790858.9851	1809805.8500
40	790917.7253	1809882.1666

LINE DATA ALONG CONSERVATION EASEMENT AREA 1

LINE	BEARING	DISTANCE
L1	S80°12'00"E	125.54'
L2	S43°57'02"E	143.07'
L3	S15°59'19"W	153.86'

LINE DATA ALONG CONSERVATION EASEMENT AREA 2

LINE	BEARING	DISTANCE
L4	S62°16'18"E	78.39'
L5	S05°22'16"E	89.73'
L6	S84°45'41"E	139.56'
L7	S13°50'15"W	162.52'
L8	N89°58'34"W	195.28'
L9	N15°59'19"E	190.46'

LINE DATA ALONG CONSERVATION EASEMENT AREA 3

LINE	BEARING	DISTANCE
L10	N63°58'45"E	118.86'
L11	S01°29'05"W	115.40'
L12	S01°26'36"W	23.75'
L13	S86°14'21"E	29.54'
L14	N75°51'49"E	49.60'
L15	N60°08'14"E	84.80'
L16	N63°26'06"E	27.57'
L17	N33°27'02"E	39.10'
L18	N64°02'53"E	31.85'
L19	N64°02'53"E	32.55'
L20	N49°36'59"E	25.15'
L21	S89°53'33"E	29.76'
L22	S44°21'56"E	65.47'
L23	S24°44'50"E	49.64'
L24	S11°44'58"E	47.64'
L25	S31°02'01"E	46.82'
L26	S53°14'37"E	29.17'
L27	S76°34'06"E	43.53'
L28	S81°19'55"E	24.13'
L29	S59°58'43"W	30.00'
L30	S59°58'43"W	73.72'
L31	N51°57'11"W	63.38'
L32	N25°12'04"W	163.09'
L33	S58°31'38"W	272.26'
L34	S33°27'43"W	103.16'
L35	S41°55'58"W	255.60'
L36	S08°45'43"W	173.01'
L37	S61°28'24"W	57.25'
L38	N41°38'01"W	163.80'
L39	N10°47'03"E	167.83'
L40	N52°24'54"E	96.30'
L41	N41°34'35"E	162.07'
L42	N13°50'15"E	174.67'

LINE DATA ALONG CONSERVATION EASEMENT AREA 4

LINE	BEARING	DISTANCE
L43	S04°54'17"E	103.56'
L44	S03°25'21"W	96.28'
L45	S38°42'40"W	121.03'
L46	S81°35'28"W	161.46'
L47	S67°26'54"W	51.93'
L48	N55°06'52"W	190.61'
L49	NOT USED	
L50	NOT USED	
L51	N65°46'38"E	288.91'
L52	N14°51'19"E	130.24'
L53	N28°32'01"E	99.62'
L54	S41°38'01"E	138.74'

LINE DATA ALONG CONSERVATION EASEMENT AREA 7

LINE	BEARING	DISTANCE
L63	S01°40'16"W	217.87'
L65	S01°40'16"W	205.65'
L66	N86°32'26"W	262.27'
L67	N86°37'33"W	194.75'
L68	N01°40'34"E	165.80'
L69	N61°59'46"E	319.11'
L70	N66°08'25"E	198.96'
L71	NOT USED	

LINE DATA ALONG CONSERVATION EASEMENT AREA 11

LINE	BEARING	DISTANCE
L94	N82°08'16"W	189.98'
L96	N21°12'18"W	128.51'
L97	N87°09'19"W	98.54'
L98	N07°30'20"E	136.51'
L99	S84°51'33"E	167.69'
L100	S31°48'51"E	87.59'
L101	S47°09'49"E	122.09'

LINE DATA ALONG CONSERVATION EASEMENT AREAS 12A & 12B

LINE	BEARING	DISTANCE
L115	S04°21'03"W	206.84'
L140	S04°21'03"W	30.37'
L501	N77°46'27"E	90.74'
L502	S33°10'57"E	203.86'
L503	S33°45'16"W	160.42'
L504	N56°14'44"W	97.37'
L505	N85°51'56"W	165.59'
L506	S76°57'30"E	143.13'
L507	S48°19'04"E	127.27'
L508	S24°40'37"E	106.04'
L509	N02°01'38"E	216.11'
L510	N85°21'46"E	58.38'
L511	S04°21'03"W	82.84'
L512	S12°57'25"W	81.73'
L513	N01°18'00"E	106.87'

LINE DATA

LINE	BEARING	DISTANCE
L199	S79°41'53"E	60.30'
L200	N47°02'25"W	67.32'
L201	N89°15'24"E	62.00'
L202	N79°27'36"W	60.10'
L203	S30°51'36"W	62.91'
L204	S12°07'30"W	74.39'
L310	S80°11'48"E	75.43'
L311	S80°11'48"E	107.77'
L514	N56°14'44"W	60.00'
L515	S56°16'57"E	60.00'

NC FEE $231.00

2022005180
GUILFORD COUNTY, NC
JEFF THIGPEN
REGISTER OF DEEDS

BK: P 210
PG: 49-59
RECORDED:
09-01-2022
10:54:23 AM
BY: SALO
DEPUTY-GB

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH
08/26/2022

SHEET 4 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF DONALD RAY YORK AND WIFE, ELIZABETH GRAHAM YORK, CURRENT OWNERS PER D.B. 2598, PG. 564, D.B. 4842, PG. 2179, AND D.B. 7901, PG. 2880 (PIN NUMBERS 8709715553, 8709912272 & 8719008297)

DMS PROJECT ID# 100193

SPO NUMBER 41-LA-712

STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

Book 210 Page 53

CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
47	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
48	1.0" O.D. IRON PIPE, BENT 0.4' ABOVE GRADE
56B & 55 - 61	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
62	1.0" O.D. PINCHED-TOP IRON 0.2' BELOW GRADE
63	1.0" O.D. IRON PIPE 0.3' ABOVE GRADE
136	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE
901	No. 5 REBAR WITH BLUE PLASTIC CAP INSCRIBED: "K2 DESIGN CONTROL POINT" FLUSH WITH GRADE SUITABLE FOR GNSS OBSERVATIONS
920	1.0" O.D. IRON PIPE, BENT 0.2' BELOW GRADE
921	No. 5 REBAR FLUSH WITH GRADE
932	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE

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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00

LINE DATA ALONG CONSERVATION EASEMENT AREA 5		
LINE	BEARING	DISTANCE
L48	S55°06'52"E	190.61'
L55	S67°26'54"W	140.93'
L56	S33°42'12"W	103.71'
L57	N50°51'30"W	176.22'
L58	N37°08'48"E	143.96'
L58B	N73°55'49"E	84.39'

LINE DATA ALONG CONSERVATION EASEMENT AREA 6		
LINE	BEARING	DISTANCE
L59	S50°51'30"E	194.01'
L60	S29°43'59"W	66.18'
L61	S54°10'50"W	73.87'
L62	S70°04'51"W	190.76'
L63	N01°40'16"E	217.87'
L64	N58°35'04"E	135.04'

LINE DATA		
LINE	BEARING	DISTANCE
L205	S11°54'53"W	67.48'
L206	S26°50'43"W	61.41'

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS		
CORNER	NORTHING	EASTING
47	790180.4270	1809570.7284
48	790289.4449	1809414.3703
54	790126.3776	1809440.5730
55	790040.0997	1809383.0258
56	790151.3376	1809246.3512
56B	790266.0863	1809333.2821
57	790096.5469	1809218.6200
58	789974.0770	1809369.0949
59	789916.6081	1809336.2713
60	789873.3789	1809276.3755
61	789808.3868	1809097.0237
62	790026.1595	1809103.3769

LEGEND:
ISS - IRON STAKE SET
ECM - EXISTING CONCRETE MARKER
EIP - EXISTING IRON PIPE
EN - EXISTING NAIL
PTI - PINCH TOP IRON
EIS - EXISTING IRON STAKE
EPP - EXISTING PUMP PIPE
EIB - EXISTING IRON BAR
PPS - PUMP PIPE SET
NMC - NON-MONUMENTED CORNER
R/W - RIGHT OF WAY
EOP - EDGE OF PAVEMENT
E/B - EASEMENT BOUNDARY
CL - CENTERLINE
PKN - PK NAIL
P.B. - PLAT BOOK
D.B. - DEED BOOK
PG. - PAGE
CMP - CORRUGATED METAL PIPE
CPP - CORRUGATED PLASTIC PIPE
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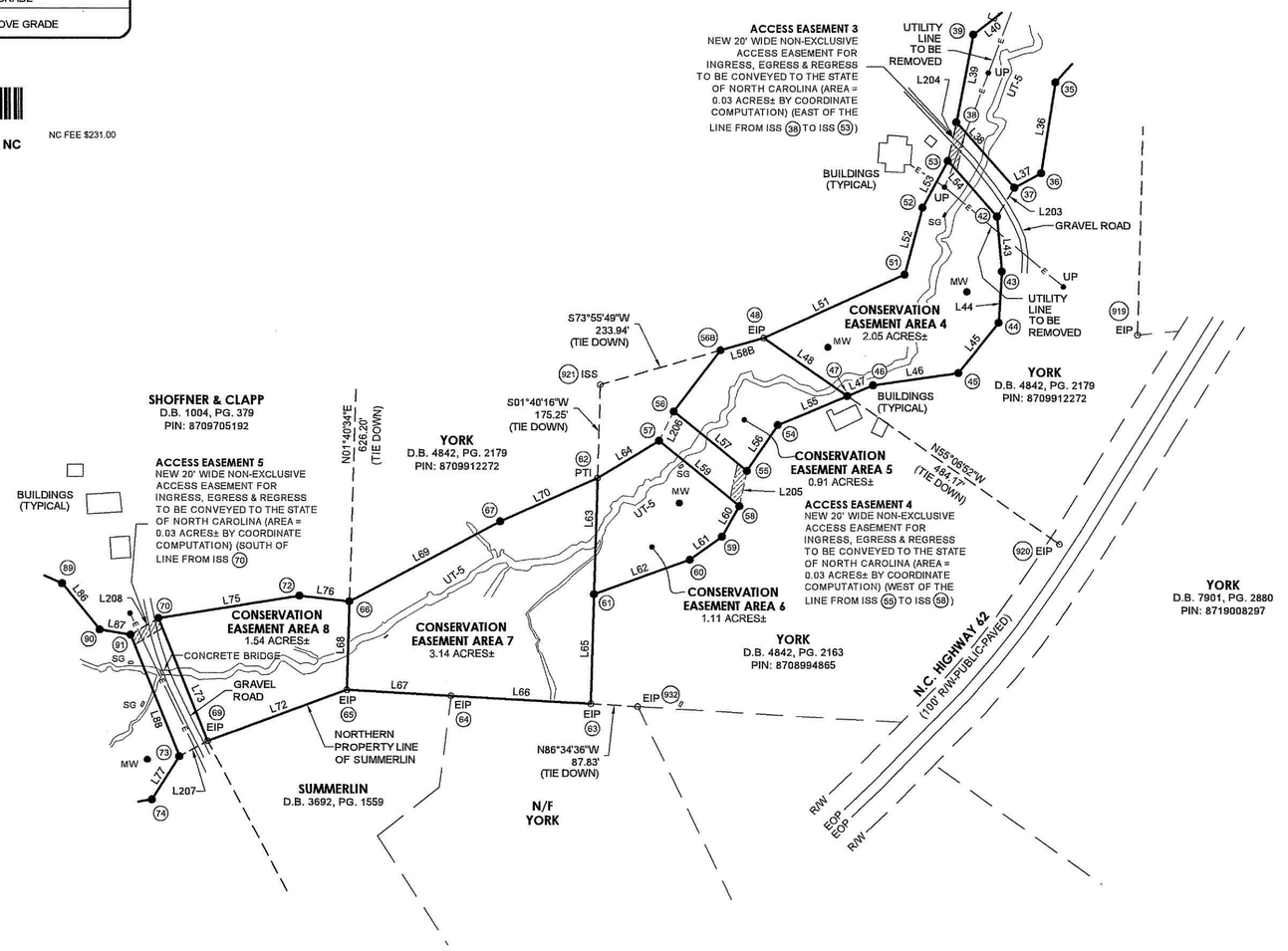
MW - MONITORING WELL
SG - STREAM GAUGE
O NON-MONUMENTED CORNER
● No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
CONSERVATION EASEMENT LINE
TIE DOWN LINE
RIGHT OF WAY LINE OR ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)



NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH
08/26/2022

SHEET 5 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF CURTIS R. YORK & WIFE, WAYNETTE G. YORK, CURRENT OWNERS PER D.B. 4842, PG. 2163 (PIN NUMBER: 8708994865)
DMS PROJECT ID# 100193
SPO NUMBER 41-LA-713
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA
(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600
GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

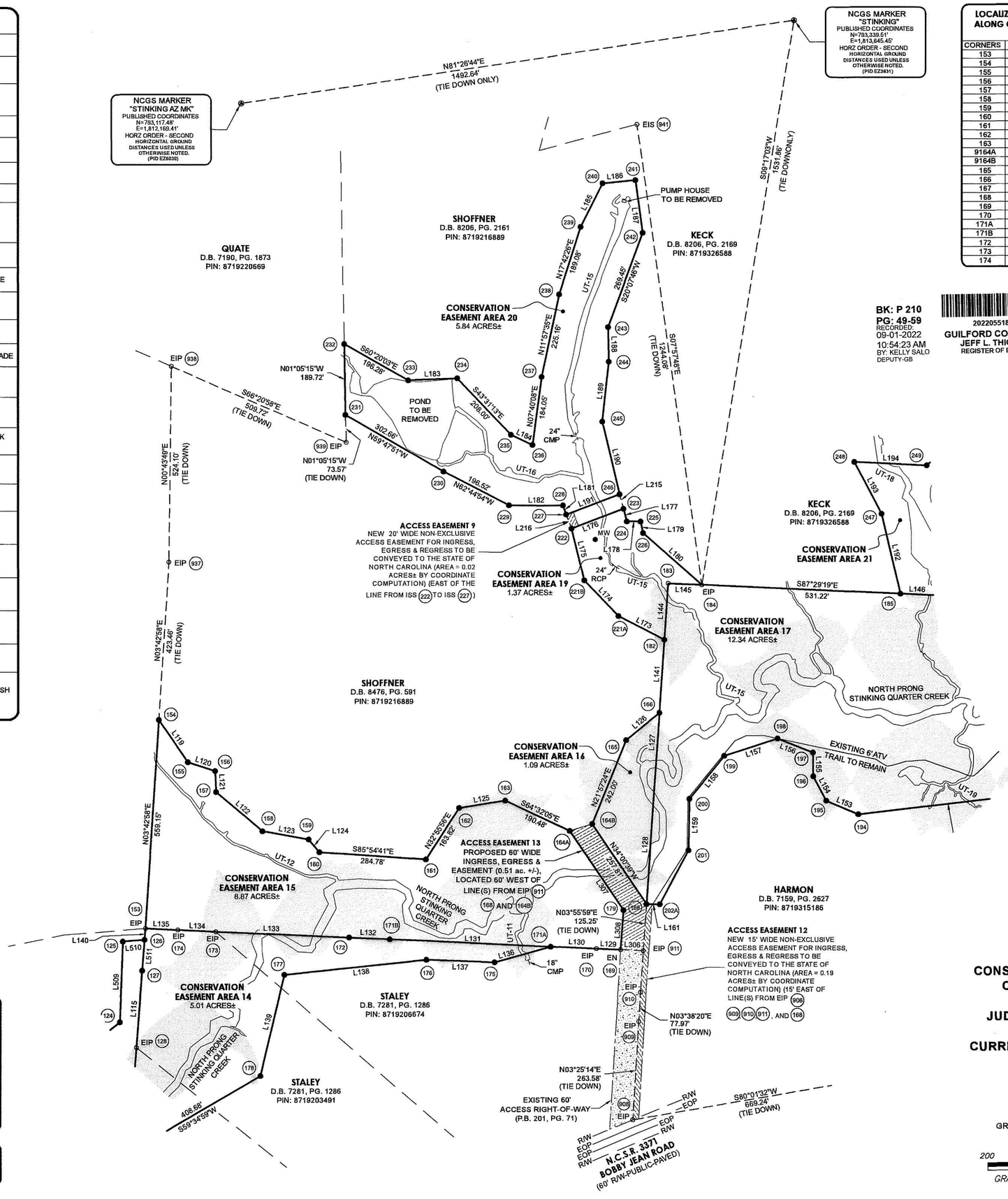
STATE OF NORTH CAROLINA
COUNTY OF GUILFORD
Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG._____.

_____ _____
Register of Deeds By

Book 210 Page 54

CORNER #	CORNER DESCRIPTIONS DESCRIPTION
153	3" X 6" ROCK WITH NAIL SET
154 - 166	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
167	IRON PIPE 0.5" O.D. 0.2' ABOVE GRADE
168	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
169	NAIL SET IN PINE TREE ROOT
170	1.5" O.D. IRON PIPE 0.6' ABOVE GRADE
171A 171B 172	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
173	IRON PIPE 0.5" O.D. 1.0' ABOVE GRADE
174	LEANING IRON PIPE 1.5" O.D. 1.5' ABOVE GRADE
182	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
183	IRON PIPE 1.5" O.D. 1.0' ABOVE GRADE
184	IRON STAKE NUMBER 2 REBAR 0.4' ABOVE GRADE
221A - 226	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
227 - 246	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
908	IRON PIPE 2.5" O.D. 0.3' BELOW GRADE WITH PK NAIL SET IN CENTER
909	IRON PIPE 1.5" O.D. 2.0' ABOVE GRADE
910	IRON PIPE 1.5" O.D. 0.5' ABOVE GRADE
911	IRON PIPE 1.0" O.D. 0.5' ABOVE GRADE
937	IRON PIPE 0.5" O.D. FLUSH WITH GRADE
938	IRON PIPE 1.0" O.D. 0.2' ABOVE GRADE
939	IRON PIPE 1.0" O.D. 0.3' ABOVE GRADE
941	No. 5 REBAR FLUSH WITH GRADE
901	No. 5 REBAR WITH BLUE PLASTIC CAP INSCRIBED: "K2 DESIGN CONTROL POINT" FLUSH WITH GRADE SUITABLE FOR GNSS OBSERVATIONS



LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 15 & 16		
CORNERS	NORTHING	EASTING
153	790908.9455	1811911.6511
154	791466.9185	1811947.8918
155	791353.5482	1812025.5958
156	791330.1107	1812098.5125
157	791274.1211	1812101.1167
158	791168.6523	1812224.8146
159	791146.2565	1812348.2521
160	791112.4023	1812376.8979
161	791092.0977	1812660.9518
162	791229.5977	1812750.0143
163	791249.9102	1812873.4518
9164A	791168.0121	1813045.4225
9164B	791186.3131	1813105.4556
165	791410.7584	1813195.9406
166	791484.8199	1813284.8948
167	791288.4305	1813271.3784
168	790972.6024	1813249.6648
169	790973.1903	1813052.1312
170	790858.6940	1812994.1124
171A	790878.6657	1812564.5016
171B	790883.7030	1812456.1431
172	790883.7030	1812456.1431
173	790900.2512	1812100.1764
174	790904.9185	1811998.4288

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GUILFORD COUNTY, NC
JEFF L. THIGPEN
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NC FEE $231.00

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CONSERVATION EASEMENT LINE
TIE DOWN LINE
RIGHT OF WAY LINE OR ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 19		
CORNERS	NORTHING	EASTING
182	791680.5728	1813298.3674
183	791831.6558	1813308.7656
184	791827.7210	1813398.3135
221A	791743.3378	1813175.6903
221B	791838.8239	1813084.5444
222	791977.6399	1813050.6378
223	792030.4441	1813189.6058
224	791996.5169	1813198.6861
225	791996.5169	1813235.1444
226	791965.7771	1813241.8795

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 20		
CORNERS	NORTHING	EASTING
227	792014.9952	1813036.3343
228	792039.3014	1813028.1208
229	792040.3864	1812883.8066
230	792130.3711	1812709.1028
231	792282.6255	1812447.5304
232	792472.3115	1812443.9294
233	792375.1628	1812614.4847
234	792380.0132	1812746.0028
235	792229.1885	1812889.2319
236	792202.0618	1812946.7406
237	792384.4683	1812971.3018
238	792604.7374	1813017.9598
239	792784.8589	1813075.4685
240	792902.0464	1813134.0623
241	792813.5475	1813246.4186
242	792819.5738	1813259.5645
243	792516.7319	1813148.5635
244	792424.5010	1813150.7337
245	792263.9107	1813133.3725
246	792069.2604	1813179.1472

LINE DATA ALONG CONSERVATION EASEMENT AREA 15		
LINE	BEARING	DISTANCE
L119	S34°25'36"E	137.44'
L120	S72°10'52"E	76.59'
L121	S02°39'47"E	56.05'
L122	S49°32'53"E	162.56'
L123	S79°42'59"E	125.45'
L124	S40°14'11"E	44.35'
L125	N80°39'19"E	125.10'
L129	N87°46'19"W	64.92'
L130	S87°20'18"W	121.83'
L131	N87°20'18"W	430.07'
L132	N87°20'18"W	108.48'
L133	N87°20'18"W	356.35'
L134	N87°22'25"W	101.85'
L135	N87°20'35"W	86.87'
L307	S34°00'39"E	255.60'
L308	S04°10'30"W	105.91'

LINE DATA ALONG CONSERVATION EASEMENT AREA 16		
LINE	BEARING	DISTANCE
L126	N50°13'12"E	115.75'
L127	S03°56'14"W	196.85'
L128	S03°55'59"W	316.57'

LINE DATA ALONG CONSERVATION EASEMENT AREA 19		
LINE	BEARING	DISTANCE
L144	S03°56'14"W	151.44'
L145	S87°29'02"E	89.63'
L173	N62°54'15"W	137.80'
L174	N43°40'04"W	132.00'
L175	N13°43'34"W	142.90'
L176	N69°11'40"E	148.66'
L177	S14°59'01"E	35.12'
L178	S90°00'00"W	36.46'
L179	S12°21'29"E	31.47'
L180	S48°34'15"E	208.64'

LINE DATA ALONG CONSERVATION EASEMENT AREA 20		
LINE	BEARING	DISTANCE
L181	N18°40'15"W	25.56'
L182	N89°34'09"W	144.32'
L183	N87°53'16"E	131.61'
L184	S64°44'49"E	63.59'
L185	N26°33'54"E	131.02'
L186	N84°09'20"E	87.53'
L187	S07°57'48"E	142.65'
L188	S01°20'52"E	92.26'
L189	S06°10'13"W	161.53'
L190	S13°14'00"E	199.96'
L191	S69°11'40"W	152.78'

LINE DATA		
LINE	BEARING	DISTANCE
L215	N15°04'46"W	40.20'
L216	N20°57'07"W	40.00'

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDDOCK
08/26/2022

SHEET 6 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF JUDY KECK SHOFFNER AND HUSBAND, TIMOTHY N. SHOFFNER, CURRENT OWNERS PER D.B. 8476, PG. 591, (PIN NUMBER 8719216889)

DMS PROJECT ID# 100193
SPO NUMBER 41-LA-714
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

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CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
183	IRON PIPE 1.5" O.D. 1' ABOVE GRADE
184	IRON STAKE NUMBER 2 REBAR 0.4' ABOVE GRADE
185 & 186	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
208	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
209	IRON PIPE 0.5" O.D. 0.4' ABOVE GRADE
210	4" X 5" ROCK WITH NO MARKINGS
247 - 254	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
255	IRON STAKE NUMBER 2 REBAR FLUSH WITH GRADE
901	No. 5 REBAR FLUSH WITH GRADE AND BLUE PLASTIC CAP INSCRIBED WITH "K2 DESIGN CONTROL POINT" SUITABLE FOR GNSS OBSERVATION
902	IRON STAKE NUMBER 2 REBAR 0.3' ABOVE GRADE
903	IRON PIPE 0.5" O.D. 0.5' ABOVE GRADE
933	IRON STAKE NUMBER 2 REBAR 0.1' ABOVE GRADE
935	IRON PIPE 1.0" O.D. 0.1' BELOW GRADE

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 21		
CORNERS	NORTHING	EASTING
185	791804.4436	1813929.0184
186	791797.3718	1814090.2485
247	792018.3572	1813879.2518
248	792157.0017	1813806.6957
249	792148.1159	1813999.7737
250	792201.0792	1814059.6808
251A	792202.3652	1814140.5652
251B	791981.1939	1814143.7547

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 22		
CORNERS	NORTHING	EASTING
208	791755.1106	1815061.9211
209	791747.4505	1815238.2271
210	791747.0511	1815243.2603
252	792097.0815	1815096.7929
253	792240.2542	1815050.0601
254	792273.1100	1815273.5021
255	791832.2190	1815248.1086

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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS
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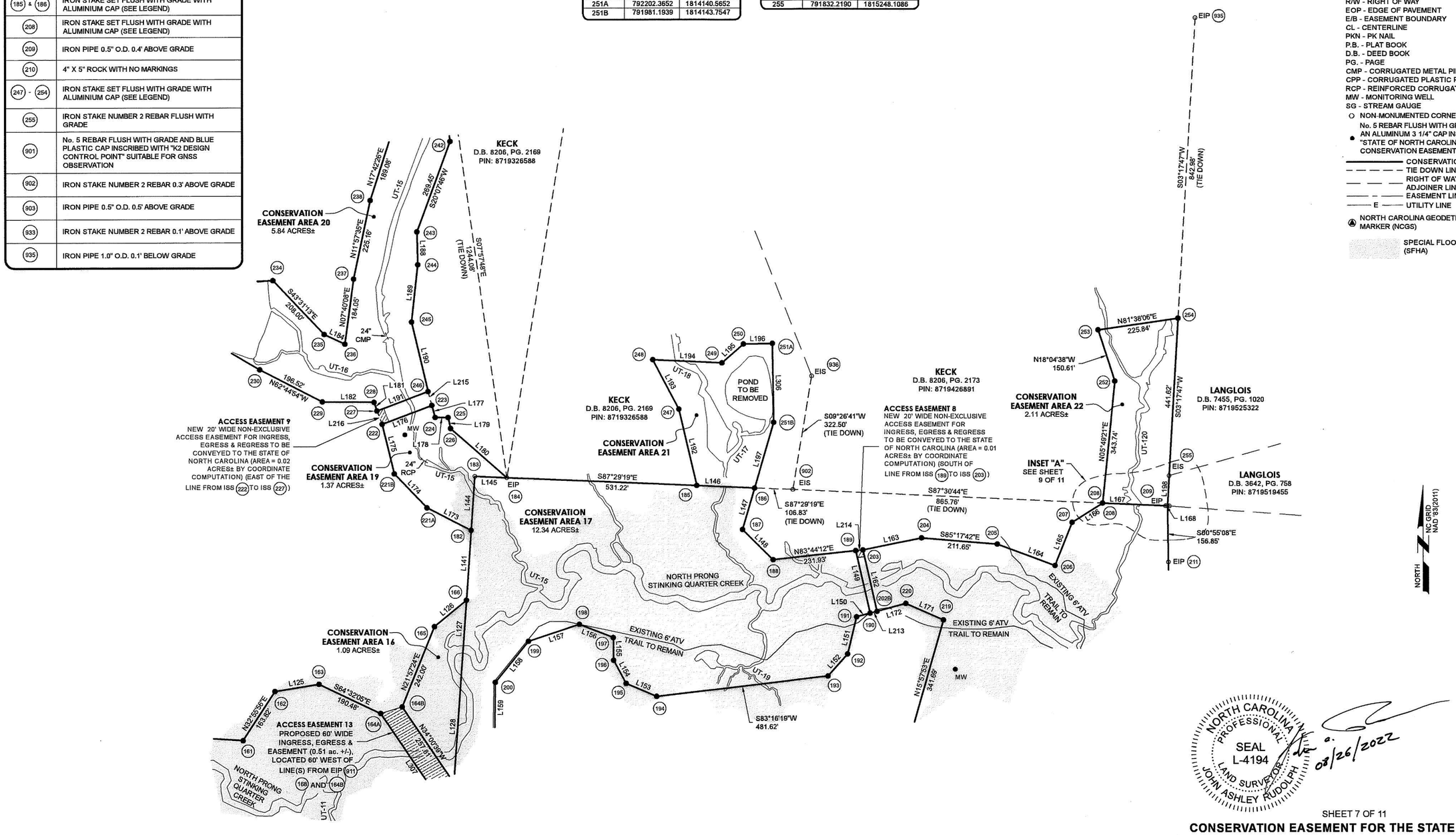

LINE DATA ALONG CONSERVATION EASEMENT AREA 21		
LINE	BEARING	DISTANCE
L146	N87°29'19"W	161.39'
L192	N13°05'48"W	219.63'
L193	N27°37'27"W	156.48'
L194	S87°21'54"E	193.28'
L195	N48°31'13"E	79.96'
L196	N89°05'21"E	80.89'
L197	S16°13'44"W	191.45'
L306	S00°49'34"E	221.19'

LINE DATA ALONG CONSERVATION EASEMENT AREA 22		
LINE	BEARING	DISTANCE
L157	N87°30'44"W	176.47'
L168	N85°27'46"W	5.05'
L198	S03°15'29"W	85.31'

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

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Office. Recorded in P.C. _____ , Sl._____

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NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH
08/26/2022

SHEET 7 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF MARK STANLEY KECK AND WIFE, JUDY JONES KECK CURRENT OWNERS PER D.B. 8206, PG. 2169 AND MICKEY LEE KECK AND WIFE, JEAN C. KECK CURRENT OWNERS PER D.B. 8206, PG. 2173 (PIN NUMBERS 8719326588 & 8719426891)
DMS PROJECT ID# 100193
SPO NUMBERS 41-LA-715 & 41-LA-716
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA
(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600
GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

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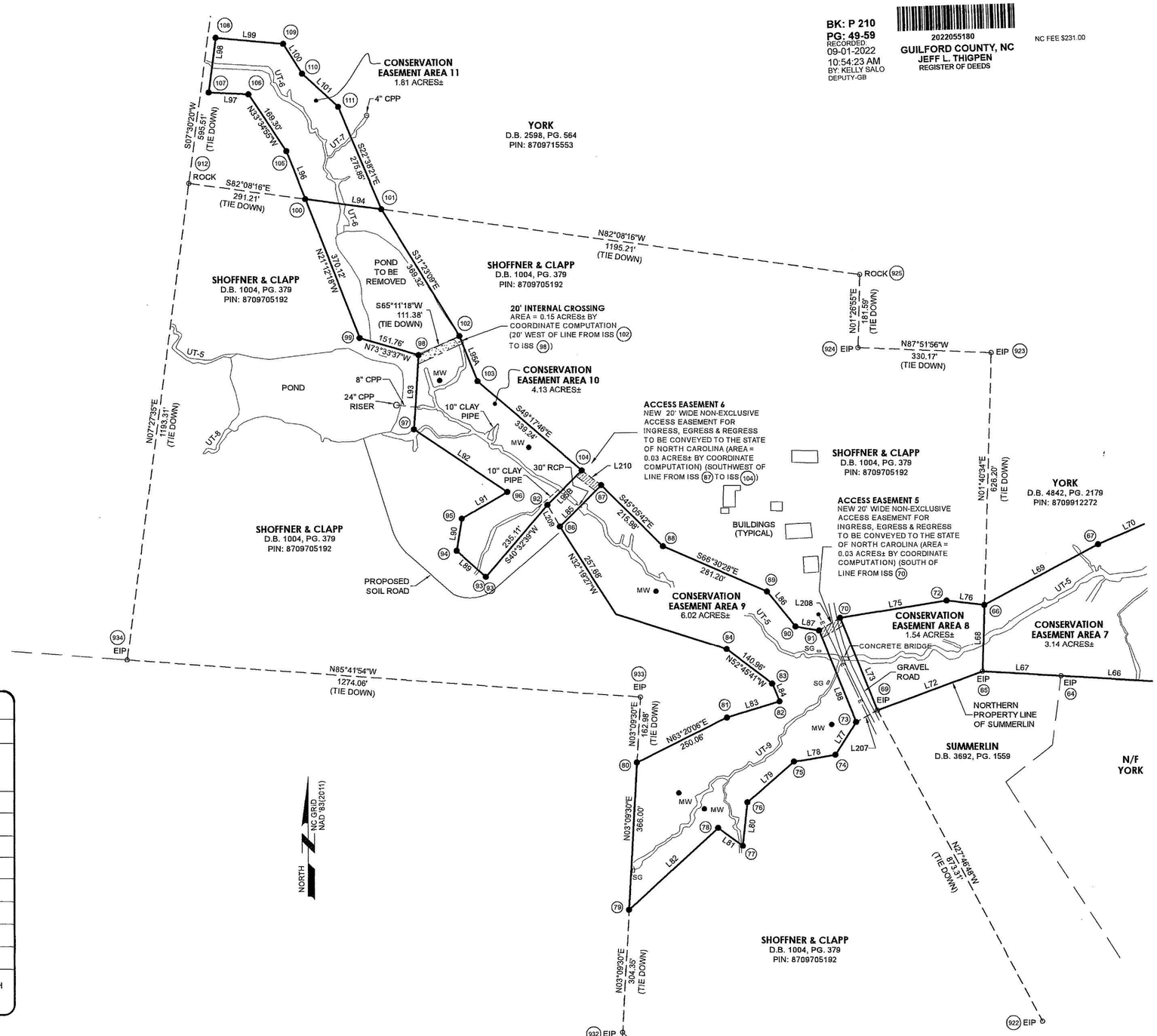
LINE DATA ALONG CONSERVATION EASEMENT AREA 8		
LINE	BEARING	DISTANCE
L68	S01°40'34"W	165.80'
L72	S69°43'45"W	277.62'
L73	N21°47'37"W	247.65'
L74	NOT USED	
L75	N80°50'16"E	267.27'
L76	S83°31'49"E	93.96'

LINE DATA ALONG CONSERVATION EASEMENT AREA 9		
LINE	BEARING	DISTANCE
L77	S32°06'28"W	95.98'
L78	S80°27'48"W	103.85'
L79	S48°49'44"W	153.46'
L80	S06°11'19"W	108.71'
L81	N54°07'04"W	75.53'
L82	S47°22'47"W	300.44'
L83	N72°51'36"E	136.18'
L84	N22°18'45"W	47.60'
L85	N44°40'47"E	145.04'
L86	S38°59'04"E	111.64'
L87	S80°39'54"E	58.93'
L88	S21°47'37"E	245.43'

LINE DATA ALONG CONSERVATION EASEMENT AREA 10		
LINE	BEARING	DISTANCE
L89	N48°17'33"W	97.02'
L90	N09°15'37"E	80.92'
L91	N59°35'33"E	131.09'
L92	N56°01'09"W	278.68'
L93	N03°38'03"E	184.82'
L94	S82°08'16"E	189.98'
L95A	S21°52'13"E	120.82'
L95B	S44°40'47"W	120.51'

LINE DATA		
LINE	BEARING	DISTANCE
L207	N61°08'52"E	60.46'
L208	S59°04'05"W	60.77'
L209	S29°24'02"E	62.39'
L210	N52°22'12"W	60.46'



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TIE DOWN LINE
RIGHT OF WAY LINE OR
ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS		
CORNERS	NORTHING	EASTING
65	789630.1140	1808634.8216
66	789795.8476	1808639.6714
69	789533.9294	1808374.3917
70	789763.8782	1808282.4491
71	NOT USED	
72	789806.4352	1808546.3051
73	789504.7552	1808321.4383
74	789423.4553	1808270.4235
75	789406.2334	1808167.9134
76	789305.2096	1808052.3973
77	789197.1367	1808040.6785
78	789241.4076	1807979.4806
79	789037.9722	1807758.4026
80	789403.4148	1807778.5666
81	789515.6366	1808002.0343
82	789555.7700	1808132.1673
83	789599.8098	1808114.0840
84	789685.1102	1808001.8722
85	789772.6576	1807726.8764
86	789990.4092	1807589.0903
87	790093.5388	1807691.0735
88	789941.0706	1807844.0482
89	789828.9765	1808101.9412
90	789742.1991	1808172.1732
91	789732.6405	1808230.3207
92	790044.7665	1807558.4609
93	789866.1026	1807405.6294
94	789930.6539	1807333.1975
95	790010.5150	1807346.2183
96	790076.8671	1807459.2788
97	790232.6235	1807228.1935
98	790417.0735	1807239.9084
99	790460.0234	1807094.3491
100	790805.0854	1806960.4744
101	790779.0980	1807148.6671
102	790463.8136	1807341.0100
103	790351.6901	1807386.0157
104	790130.4515	1807643.1934

CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
65, 66, 69, 70, 72 - 104	No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
912	2" X 2" ROCK BY FENCE POST
922	1.0" O.D. PINCHED-TOP IRON, LEANING 0.2' BELOW GRADE
923	0.5" O.D. IRON PIPE, 0.2' ABOVE GRADE
924	0.5" O.D. IRON PIPE, BENT 0.1' BELOW GRADE
925	2" X 2" ROCK 0.8' ABOVE GRADE WITNESSED BY AN AUGER/FENCE POST
932	1.0" O.D. IRON PIPE 0.2' ABOVE GRADE
933	1.0" O.D. IRON PIPE 0.1' ABOVE GRADE
934	3/4" O.D. IRON PIPE 1.0' ABOVE GRADE
901	No. 5 REBAR WITH BLUE PLASTIC CAP INSCRIBED: "K2 DESIGN CONTROL POINT" FLUSH WITH GRADE SUITABLE FOR GNSS OBSERVATIONS

SHEET 8 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF PATRICIA F. SHOFFNER & JEAN F. CLAPP PER GUILFORD COUNTY GIS WEBSITE (PIN NUMBER: 8709705192)
DMS PROJECT ID# 100193
SPO NUMBER 41-LA-717
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDDUCK

08/26/2022

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at _____ M. _____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG. _____.

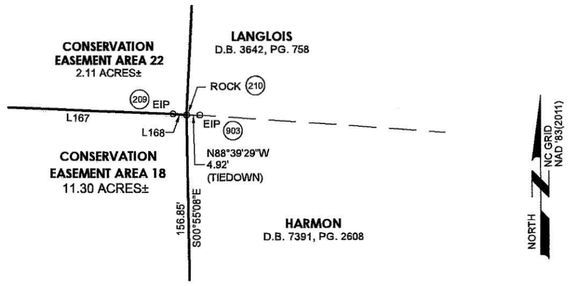
Register of Deeds _____ By _____

CASE NUMBER 22-08-GCPL-05842

Book 210 Page 57

CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
164B & 166	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
167	IRON PIPE 0.5" O.D. 0.2' ABOVE GRADE
168 - 182	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
183	IRON PIPE 1.5" O.D. 1' ABOVE GRADE
184	IRON STAKE NUMBER 2 REBAR 0.4' ABOVE GRADE
185 - 208	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
209	IRON PIPE 0.5" O.D. 0.4' ABOVE GRADE
210	4" X 5" ROCK WITH NO MARKINGS
211	IRON STAKE NUMBER 4 REBAR 0.3' ABOVE GRADE
212	IRON STAKE NUMBER 4 REBAR 0.3' ABOVE GRADE
213	IRON STAKE NUMBER 4 REBAR 0.2' ABOVE GRADE
214	IRON STAKE NUMBER 4 REBAR 0.2' ABOVE GRADE
215 - 220	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
902	IRON STAKE NUMBER 2 REBAR 0.3' ABOVE GRADE
903	IRON PIPE 0.5" O.D. 0.5' ABOVE GRADE
904	PINCH TOP IRON 0.5" O.D. FLUSH WITH GRADE
905	IRON STAKE NUMBER 4 REBAR 0.1' ABOVE GRADE
906	IRON PIPE 1" O.D. 0.2' ABOVE GRADE
907	IRON PIPE 1" O.D. 0.4' BELOW GRADE
908	IRON PIPE 2.5" O.D. 0.3' BELOW GRADE,WITH PKN IN CENTER
909	IRON PIPE 1.5" O.D. 2' ABOVE GRADE
910	IRON PIPE 1.5" O.D. 0.5' ABOVE GRADE
911	IRON PIPE 1" O.D. 0.5' ABOVE GRADE
936	IRON PIPE 1" O.D. 0.5' ABOVE GRADE

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS		
CORNERS	NORTHING	EASTING
166	791484.8199	1813284.8948
167	791288.4305	1813271.3784
168	790972.6024	1813249.6648
182	791680.5728	1813298.3674
183	791831.6558	1813308.7656
184	791827.7210	1813398.3135
185	791804.4436	1813929.0184
186	791797.3718	1814090.2485
187	791681.3075	1814056.4649
188	791596.3652	1814141.8325
189	791621.6688	1814372.3802
190	791446.4243	1814412.4208
191	791436.2044	1814374.6583
192	791332.0378	1814349.4847
193	791270.2543	1814294.5436
194	791213.8307	1813816.2450
195	791250.3537	1813730.7347
196	791315.4579	1813696.0125
197	791378.8259	1813695.1444
198	791416.1523	1813600.5264
199	791369.2773	1813458.1653
200	791254.6940	1813365.2833
201	791116.6732	1813362.6792
202A	790972.4958	1813285.4646
202B	791451.3378	1814431.8136
203	791623.6371	1814392.4459
204	791657.7367	1814556.7630
205	791640.3756	1814767.7005
206	791580.4798	1814929.1589
207	791701.1395	1814976.9019
208	791755.1106	1815061.9211
209	791747.4505	1815238.2271
210	791747.0511	1815243.2603
211	791590.2240	1815245.7758
212	791419.2372	1815248.6260
213	791111.4977	1815253.6790
214	791019.9562	1815255.2474
215	791042.1625	1815195.0279
216	791039.5584	1815092.5973
217	790897.8063	1814949.7635
218	791099.1952	1814523.5483
219	791427.7020	1814617.5269
220	791473.7089	1814512.4922



INSET "A"

40 20 0 40 80 120

GRAPHIC SCALE 1" = 40'

LINE DATA ALONG CONSERVATION EASEMENT AREA 17		
LINE	BEARING	DISTANCE
L127	N03°56'14"E	196.85'
L128	N03°55'59"E	316.57'
L141	N03°56'14"E	196.22'
L142	NOT USED	
L143	NOT USED	
L144	N03°56'14"E	151.44'
L145	S87°29'02"E	89.63'
L146	S87°29'19"E	161.39'
L147	S16°13'44"W	120.88'
L148	S45°08'35"E	120.43'
L149	S12°52'13"E	179.76'
L150	S74°51'23"W	39.12'
L151	S13°35'10"W	107.17'
L152	S41°38'43"W	82.68'
L153	N66°52'18"W	92.98'
L154	N28°04'21"W	73.78'
L155	N00°47'05"W	63.37'
L156	N68°28'16"W	101.71'
L157	S71°46'30"W	149.88'
L158	S38°01'42"W	147.50'
L159	S01°04'51"W	138.05'
L160	S28°10'17"W	163.55'
L161	N89°49'46"W	35.80'

LINE DATA ALONG CONSERVATION EASEMENT AREA 18		
LINE	BEARING	DISTANCE
L162	S12°52'13"E	176.74'
L163	N78°16'34"E	167.82'
L164	S69°38'48"E	172.21'
L165	N21°35'16"E	129.76'
L166	N57°35'32"E	100.70'
L167	S87°30'44"E	176.47'
L168	S85°27'46"E	5.05'
L169	N69°45'30"W	64.18'
L170	S88°32'37"W	102.46'
L171	N66°20'45"W	114.67'
L172	S74°30'07"W	83.72'

LINE DATA		
LINE	BEARING	DISTANCE
L213	N75°46'56"E	20.01'
L214	N84°23'51"E	20.16'

LEGEND:

ISS - IRON STAKE SET
ECM - EXISTING CONCRETE MARKER
EIP - EXISTING IRON PIPE
EN - EXISTING NAIL
PTI - PINCH TOP IRON
EIS - EXISTING IRON STAKE
EPP - EXISTING PUMP PIPE
EIB - EXISTING IRON BAR
PPS - PUMP PIPE SET
NMC - NON-MONUMENTED CORNER
R/W - RIGHT OF WAY
EOP - EDGE OF PAVEMENT
E/B - EASEMENT BOUNDARY
CL - CENTERLINE
PKN - PK NAIL
P.B. - PLAT BOOK
D.B. - DEED BOOK
PG. - PAGE
CMP - CORRUGATED METAL PIPE
CPP - CORRUGATED PLASTIC PIPE
RCP - REINFORCED CORRUGATED PIPE
MW - MONITORING WELL
SG - STREAM GAUGE
O NON-MONUMENTED CORNER
● No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
CONSERVATION EASEMENT LINE
TIE DOWN LINE
RIGHT OF WAY LINE OR ADJOINER LINE
EASEMENT LINE
E UTILITY LINE
NORTH CAROLINA GEODETIC SURVEY MARKER (NCGS)
SPECIAL FLOOD HAZARD AREA (SFHA)

BK: P 210
PG: 49-59
RECORDED:
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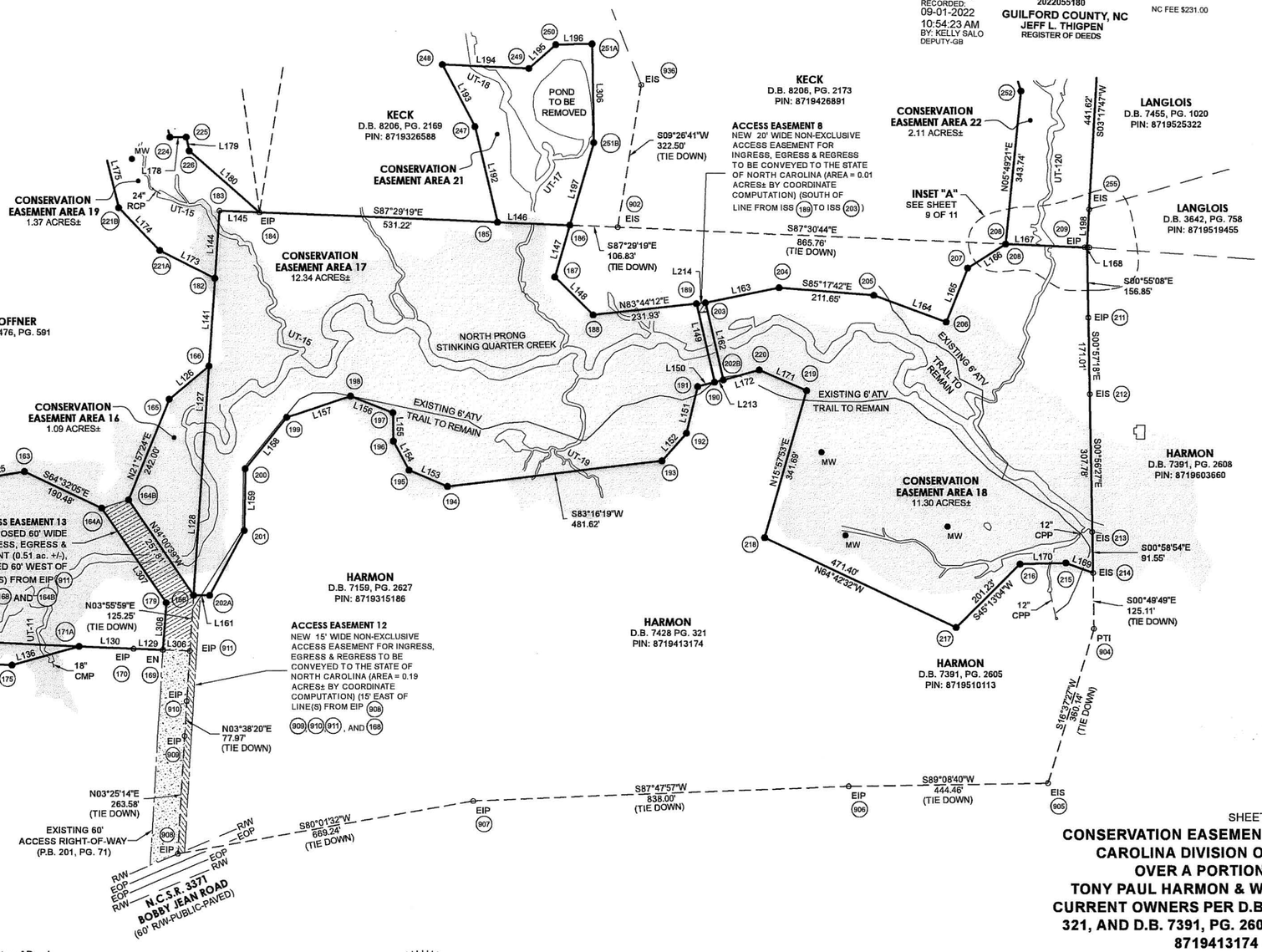
10:54:23 AM
BY: KELLY SALO
DEPUTY-GB

2022055180
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00



STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.C. _____ , Sl._____

_____ _____
Register of Deeds By

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH

08/26/2022

SHEET 9 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF TONY PAUL HARMON & WIFE SHERRI SMITH HARMON CURRENT OWNERS PER D.B. 7159, PG. 2627, D.B. 7428, PG. 321, AND D.B. 7391, PG. 2605 (PIN NUMBERS 8719315186, 8719413174 & 8719510113)
DMS PROJECT ID# 100193
SPO NUMBER 41-LA-718
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

Book 210 - Page 58

CORNER DESCRIPTIONS	
CORNER #	DESCRIPTION
(126) & (127)	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
(128)	LEANING IRON PIPE 1.0" O.D. 3.5' ABOVE GRADE
(129)	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
(153)	3" X 6" ROCK WITH NAIL SET
(164B) & (168)	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
(169)	NAIL SET IN PINE TREE ROOT
(170)	1.5" O.D. IRON PIPE 0.6' ABOVE GRADE
(171A) - (172)	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
(173)	IRON PIPE 0.5" O.D. 1.0' ABOVE GRADE
(174)	LEANING IRON PIPE 1.5" O.D. 1.5' ABOVE GRADE
(175) - (178)	IRON STAKE SET FLUSH WITH GRADE WITH ALUMINIUM CAP (SEE LEGEND)
(901)	No. 5 REBAR WITH BLUE PLASTIC CAP INSCRIBED: "K2 DESIGN CONTROL POINT" FLUSH WITH GRADE SUITABLE FOR GNSS OBSERVATIONS
(908)	IRON PIPE 2.5" O.D. 0.3' BELOW GRADE WITH PK NAIL SET IN CENTER
(909)	IRON PIPE 1.5" O.D. 2.0' ABOVE GRADE
(910)	IRON PIPE 1.5" O.D. 0.5' ABOVE GRADE
(911)	IRON PIPE 1.0" O.D. 0.5' ABOVE GRADE

BK: P 210
PG: 49-59
RECORDED:
09-01-2022
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2022055180
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00

LOCALIZED PROJECT COORDINATES ALONG CONSERVATION EASEMENTS 14		
CORNERS	NORTHING	EASTING
126	790878.6601	1811909.3469
127	790796.0631	1811903.0627
128	790589.8166	1811887.3710
129	790307.1877	1811866.3779
153	790298.0154	1807342.3545
170	790858.6940	1812994.1124
171A	790878.6657	1812564.5016
171B	790883.7030	1812456.1431
173	790900.2512	1812100.1764
174	790904.9185	1811998.4288
175	790817.0898	1812844.6062
176	790823.6003	1812662.3146
177	790784.5135	1812282.8247
178	790514.0998	1812218.8126

LINE DATA		
LINE	BEARING	DISTANCE
L129	N87°46'19"W	64.92'
L130	N87°20'18"E	121.83'
L306	N87°16'58"W	60.46'

LINE DATA ALONG CONSERVATION EASEMENT AREA 14		
LINE	BEARING	DISTANCE
L115	N04°21'03"E	206.84'
L131	S87°20'18"E	430.07'
L132	S87°20'18"E	108.48'
L133	S87°20'18"E	356.35'
L134	S87°22'25"E	101.85'
L135	S87°20'35"E	55.87'
L136	S74°26'58"W	155.19'
L137	N87°57'17"W	182.41'
L138	S84°07'10"W	381.50'
L139	S13°19'04"W	277.89'
L140	N04°21'03"E	30.37'
L511	N04°21'03"E	82.84'

LEGEND:
ISS - IRON STAKE SET
ECM - EXISTING CONCRETE MARKER
EIP - EXISTING IRON PIPE
EN - EXISTING NAIL
PTI - PINCH TOP IRON
EIS - EXISTING IRON STAKE
EPP - EXISTING PUMP PIPE
EIB - EXISTING IRON BAR
PPS - PUMP PIPE SET
NMC - NON-MONUMENTED CORNER
R/W - RIGHT OF WAY
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● No. 5 REBAR FLUSH WITH GRADE WITH AN ALUMINUM 3 1/4" CAP INSCRIBED: "STATE OF NORTH CAROLINA CONSERVATION EASEMENT"
CONSERVATION EASEMENT LINE
TIE DOWN LINE
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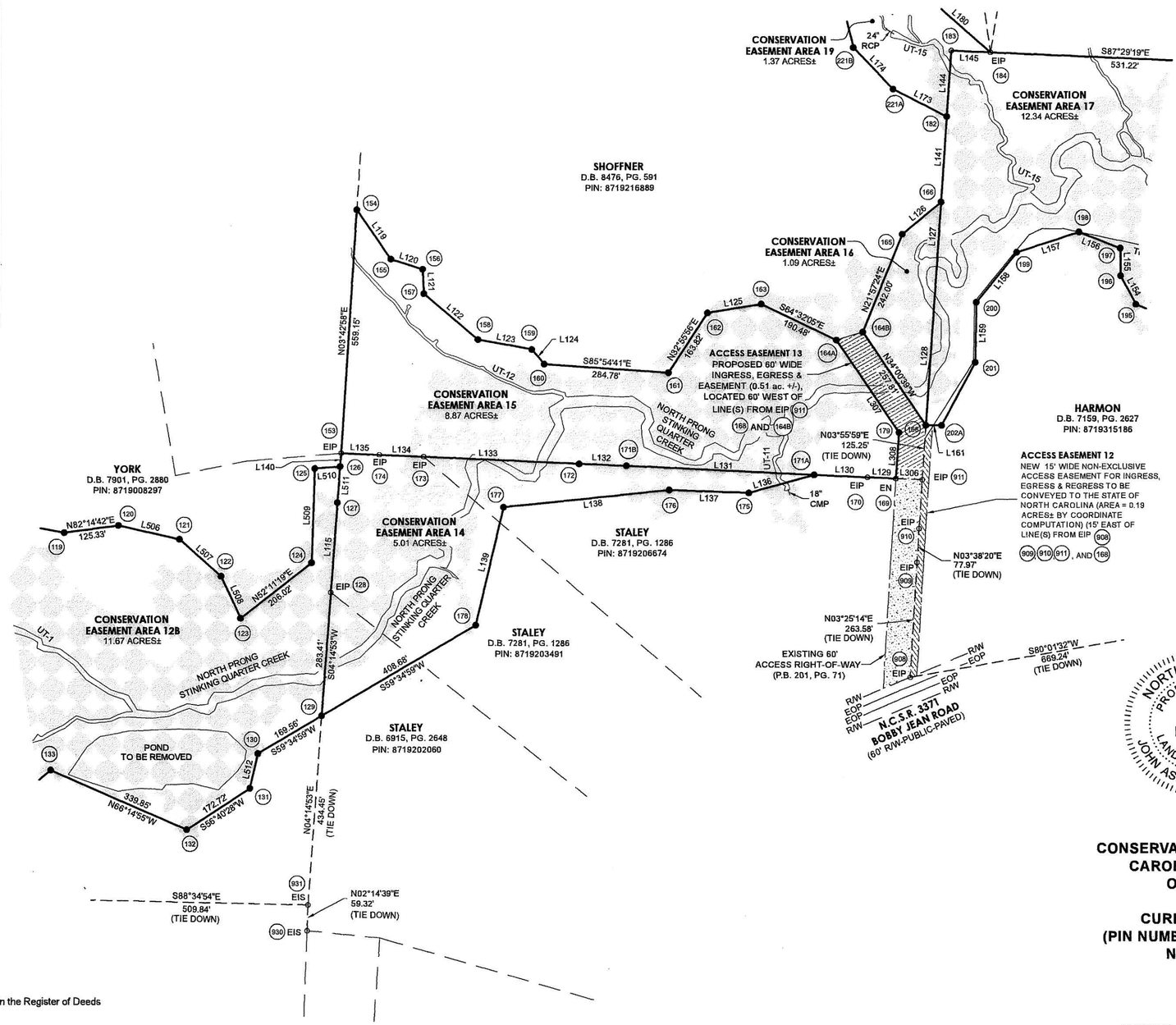

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH

08/26/2022

SHEET 10 OF 11

CONSERVATION EASEMENT FOR THE STATE OF NORTH CAROLINA DIVISION OF MITIGATION SERVICES OVER A PORTION OF THE LANDS OF FRANKLIN ELI STALEY, JR. , CURRENT OWNERS PER D.B. 6915, PG. 2648 (PIN NUMBER 8719202060) AND D.B. 7281, PG. 1286 (PIN NUMBERS 8719203491 & 8719206674)
DMS PROJECT ID# 100193
SPO NUMBER 41-LA-719
STINKING QUARTER

GREENE & CLAY TOWNSHIP GUILFORD COUNTY NORTH CAROLINA

(THE FIELD SURVEY TOOK PLACE DURING MARCH 2022)

200 100 0 200 400 600

GRAPHIC SCALE 1" = 200'

CASE NUMBER 22-08-GCPL-05842

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M._____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG._____.

_____ _____
Register of Deeds By

Book 210 Page 59

STINKING QUARTER
DMS PROJECT ID# 100193

BK: P 210
PG: 49-59
RECORDED:
09-01-2022
10:54:23 AM
BY: KELLY SALO
DEPUTY-GB

2022055180
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $231.00

OWNER'S SIGNATURES

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBERS (PIN NUMBERS 8709715553, 8709912272 & 8719008297):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8/3/22 Donald Ray York
Date Donald Ray York

8-3-22 Elizabeth G. York
Date Elizabeth Graham York

CERTIFICATE OF OWNERSHIP AND DEDICATION (PIN NUMBERS (PIN NUMBERS: 8708994865):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8-3-2022 Curtis R. York
Date Curtis R. York

8-3-2022 Waynette G. York
Date Waynette G. York

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBERS (PIN NUMBER 8719216889):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8-03-22 Judy Keck Shoffner
Date Judy Keck Shoffner

8-03-22 Timothy N. Shoffner
Date Timothy N. Shoffner

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBER 8719426891):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8-3-22 Mickey L. Keck
Date Mickey Lee Keck

8-3-22 Jean C. Keck
Date Jean C. Keck

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBER 8719326588):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8/3/22 Mark Stanley Keck
Date Mark Stanley Keck

8/3/22 Judy Jones Keck
Date Judy Jones Keck

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBERS (PIN NUMBER: 8709705192):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8/3/22 Patricia Flinchum Shoffner
Date Patricia Flinchum Shoffner

8/3/22 John Terry Shoffner
Date ~~[illegible]~~ JOHN TERRY SHOFFNER JTS

8/3/22 Jean Flinchum Clapp
Date Jean Flinchum Clapp, widowed

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBERS 8719315186 & 8719413174 & 8719510113):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8-3-22 Tony Paul Harmon
Date Tony Paul Harmon

8-3-22 Sherri Smith Harmon
Date Sherri Smith Harmon

CERTIFICATE OF OWNERSHIP AND DEDICATION
(PIN NUMBERS 8719202060, 8719203491 & 8719206674):

The undersigned hereby acknowledge that the land shown on this plat is within the subdivision regulation jurisdiction of the Board of Commissioners of Guilford County and this plat and allotment to be our free act and deed and hereby dedicate(s) to public use as streets and eaasements, forever all areas so shown or indicated on said plat.

8/3/22 Franklin Eli Staley Jr.
Date Franklin Eli Staley, Jr.

8/3/22 Glenna Staley
Date Glenna Staley

NORTH CAROLINA PROFESSIONAL SEAL L-4194 LAND SURVEYOR JOHN ASHLEY RUDOLPH

07/25/22

STATE OF NORTH CAROLINA
COUNTY OF GUILFORD

Filed for registration at_____ M_____ , 2022 in the Register of Deeds

Office. Recorded in P.B. _____ , PG_____.

Register of Deeds By

CASE NUMBER 22-08-GCPL-05842

BK: R 8657
PG: 2155-2165
RECORDED:
09-09-2022
12:27:46 PM
BY: MISTY MARTIN
DEPUTY-GB

2022056594
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $321.00

Excise Tax $ 321.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-719
DMS Project Number: 100193

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 7 day of September, 2022, by Franklin Eli Staley, Jr. and wife, Glenna Staley, ("**Grantor**"), whose mailing address is 7132 Bobby Jean Road, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (collectively, the "**Property**"), and being more particularly described as (i) that certain parcel of land containing approximately 10.245 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 6915 at Page 2648** of the Guilford County Registry, North Carolina; (ii) that certain parcel of land containing approximately 9.29 acres and being conveyed to Grantor by deed recorded in **Deed Book 7281 at Page 1286** of the Guilford County Registry, North Carolina; and (iii) that certain parcel of land containing approximately 10.241 acres and being conveyed to Grantor by deed recorded in **Deed Book 7281 at Page 1286** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 14 containing a total of approximately 5.01 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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.

Franklin Eli Staley Jr. (SEAL)
Franklin Eli Staley, Jr.

Glenna Staley (SEAL)
Glenna Staley

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Franklin Eli Staley, Jr. and wife, Glenna Staley, as 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 7 day of September, 2022.

Notary Public

My commission expires:

01/26/2027

WILLIAM H. FLOWE, JR. NOTARY PUBLIC GUILFORD COUNTY, NC

Exhibit A
Legal Description

Conservation Easement Area 14

BEING ALL of "Conservation Easement Area 14" of the Stinking Quarter Creek Site over a portion of the lands of Franklin Eli Staley, Jr. (PIN No. 8719202060, 8719203491 & 8719206674) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 129 and being the most Southwestern corner of the Conservation Easement Area and being located South 76°57'37" East 1045.50' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 129), North 04°14'53" East 283.41' to an iron pipe;
thence North 04°21'03" East 206.84' to an iron stake;
thence North 04°21'03" East 82.84' to an iron stake;
thence North 04°21'03" East 30.37' to a 3" x 6" rock with nail set;
thence South 87°20'35" East 86.87' to an iron pipe;
thence South 87°22'25" East 101.85' to an iron pipe;
thence South 87°20'18" East 356.35' to an iron stake;
thence South 87°20'18" East 108.48' to an iron stake;
thence South 87°20'18" East 430.07' to an iron stake;
thence South 74°26'58" West 155.19' to an iron stake;
thence North 87°57'17" West 182.41' to an iron stake;
thence South 84°07'10" West 381.50' to an iron stake;
thence South 13°19'04" West 277.89' to an iron stake;
thence South 59°34'59" West 408.68' to an iron stake;
which is the point of beginning, having an area of approximately 5.01 acres.

THE FOREGOING CONSERVATION EASEMENT AREA as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

TOGETHER WITH, as an appurtenance thereto, a general perpetual, non-exclusive easement for ingress and egress over and upon the Property (as hereinafter defined) as described in the Deed of Conservation Easement and Right of Access to which this Exhibit is attached ("Conservation Easement Deed"). The term "Property" as used in this Exhibit A shall have the meaning ascribed to it in the Conservation Easement Deed.

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BY: MISTY MARTIN
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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $749.00

Excise Tax $ 749.00
STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-717
DMS Project Number: 100193

14mm

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 8 day of September, 2022, by Patricia Flinchum Shoffner and husband John Terry Shoffner and Jean Flinchum Clapp, widowed (collectively "**Grantor**"), whose mailing address is 2247 NC 62 East, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 71.34 acres (commonly known as Guilford County Tax PIN 8709705192) and being conveyed to the Grantor by will probated in the Estate of Lena Ruth W. Flinchum, Guilford County Superior Court Case Number 01 E 1859. See also deeds recorded in **Deed Book 1004 at Page 379** and **Deed Book 1572 at Page 545** of the Guilford County Registry, North Carolina, conveying the Property to Lena Ruth W. Flinchum and her husband Vester H. Flinchum (a/k/a V. H. Flinchum), who predeceased her, as tenants by the entireties; 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 8 containing a total of approximately 1.54 acres, Conservation Easement Area 9 containing a total of approximately 6.02 acres, and Conservation Easement Area 10 containing approximately 4.13 acres for a total of 11.69 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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 the locations more particularly described as new, non-exclusive access easements labeled as "Access Easement 5" and "Access Easement 6" on **Exhibit A** ("**Access Easement**") attached hereto and incorporated herein by this reference, to access the Conservation Easement Area for the purposes set forth herein. 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.

Patricia Flinchum Shoffner (SEAL)
Patricia Flinchum Shoffner

John Terry Shoffner (SEAL)
John Terry Shoffner

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Patricia Flinchum Shoffner and husband John Terry Shoffner, as 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 8th day of September, 2022.

Notary Public

My commission expires:

01/26/2027

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

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

Jean Flinchum Clapp (SEAL)
Jean Flinchum Clapp

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Jean Flinchum Clapp, as 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 8th day of September, 2022.

Notary Public

My commission expires:

01/26/2027

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

Exhibit A
Legal Description

Conservation Easement Area 8

BEING ALL of "Conservation Easement Area 8" of the Stinking Quarter Creek Site over a portion of the lands of Patricia F. Shoffner & Jean F. Clapp (PIN No. 8709705192) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 66 and being a Southeastern corner of the Conservation Easement Area and being located South 71°18'16" West 2331.17' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 66), South 01°40'34" West 165.80' to an iron pipe;
thence South 69°43'45" West 277.62' to an iron pipe;
thence North 21°47'37" West 247.65' to an iron pipe;
thence North 80°50'16" East 267.27' to an iron stake;
thence South 83°31'49" East 93.96' to an iron stake;
which is the point of beginning, having an area of approximately 1.54 acres

Conservation Easement Area 9

BEING ALL of "Conservation Easement Area 9" of the Stinking Quarter Creek Site over a portion of the lands of Patricia F. Shoffner & Jean F. Clapp (PIN No. 8709705192) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 87 and being the most Northern corner of the Conservation Easement Area and being located South 81°53'43" West 3188.61' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 87), South 45°05'42" East 215.98' to an iron stake;
thence South 66°30'28" East 281.20' to an iron stake;
thence South 38°59'04" East 111.64' to an iron stake;
thence South 80°39'54" East 58.93' to an iron stake;
thence South 21°47'37" East 245.43' to an iron stake;
thence South 32°06'28" West 95.98' to an iron stake;
thence South 80°27'48" West 103.95' to an iron stake;
thence South 48°49'44" West 153.46' to an iron stake;
thence South 06°11'19" West 108.71' to an iron stake;
thence North 54°07'04" West 75.53' to an iron stake;

thence South 47°22'47" West 300.44' to an iron stake;
thence North 03°09'30" East 366.00' to an iron stake;
thence North 63°20'06" East 250.06' to an iron stake;
thence North 72°51'36" East 136.18' to an iron stake;
thence North 22°18'45" West 47.60' to an iron stake;
thence North 52°45'41" West 140.96' to an iron stake;
thence North 72°20'26" West 288.60' to an iron stake;
thence North 32°19'27" West 257.68' to an iron stake;
thence North 44°40'47" East 145.04' to an iron stake;
which is the point of beginning, having an area of approximately 6.02 acres.

Conservation Easement Area 10

BEING ALL of "Conservation Easement Area 10" of the Stinking Quarter Creek Site over a portion of the lands of Patricia F. Shoffner & Jean F. Clapp (PIN No. 8709705192) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 104 and being the most Eastern corner of the Conservation Easement Area and being located South 82°39'47" West 3231.10' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 104), South 44°40'47" West 120.51' to an iron stake;
thence South 40°32'39" West 235.11' to an iron stake;
thence North 48°17'33" West 97.02' to an iron stake;
thence North 09°15'37" East 80.92' to an iron stake;
thence North 59°35'33" East 131.09' to an iron stake;
thence North 56°01'09" West 278.68' to an iron stake;
thence North 03°38'03" East 184.82' to an iron stake;
thence North 73°33'37" West 151.76' to an iron stake;
thence North 21°12'18" West 370.12' to an iron stake;
thence South 82°08'16" East 189.98' to an iron stake;
thence South 31°23'09" East 369.32' to an iron stake;
thence South 21°52'13" East 120.82' to an iron stake;
thence South 49°17'46" East 339.24' to an iron stake;
which is the point of beginning, having an area of approximately 4.13 acres.

ALL OF THE FOREGOING CONSERVATION EASEMENT AREAS as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

AND SUCH CONSERVATION EASEMENT AREAS TOGETHER WITH, as an appurtenance thereto, those certain new non-exclusive access easements labeled as "Access Easement 5" and "Access Easement 6" for ingress, egress, and regress, and as shown and more particularly described on the foregoing described plat of survey recorded in Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

BK: R 8657
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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $1099.00

Excise Tax $ 1,099.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-714
DMS Project Number: 100193

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 7 day of September, 2022, by Judy Keck Shoffner and husband, Timothy N. Shoffner, ("**Grantor**"), whose mailing address is 5615 Pinedale School Road, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 61.01 in total acres and being conveyed to the Grantor by deeds as recorded in **Deed Book 8206 at Page 2161** (56.29 acres) and **Deed Book 8476 at Page 591** (4.72 acres) of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 15 containing a total of approximately 8.87 acres, Conservation Easement Area 16 containing a total of approximately 1.09 acres, Conservation Easement Area 19 containing a total of approximately 1.37 acres, and Conservation Easement Area 20 containing approximately 5.84 acres for a total of 17.17 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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 the locations more particularly described as new, non-exclusive access easements labeled as "Access Easement 9" and "Access Easement 13" on **Exhibit A** ("**Access Easement**") attached hereto and incorporated herein by this reference, to access the Conservation Easement Area for the purposes set forth herein. 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.

Judy Keck Shoffner (SEAL)
Judy Keck Shoffner

Timothy N. Shoffner (SEAL)
Timothy N. Shoffner

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Judy Keck Shoffner and husband, Timothy N. Shoffner, as 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 7th day of September, 2022.

Notary Public

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 15

BEING ALL of "Conservation Easement Area 15" of the Stinking Quarter Creek Site over a portion of the lands of Judy Keck Shoffner and husband, Timothy N. Shoffner (PIN No. 8719216889) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at a rock (Point of Beginning) labeled as Point No. 153 and being the most Southwestern corner of the Conservation Easement Area and being located North 71°01'16" East 1124.97' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 153), North 03°42'58" East 559.15' to an iron stake;
thence South 34°25'36" East 137.44' to an iron stake;
thence South 72°10'52" East 76.59' to an iron stake;
thence South 02°39'47" East 56.05' to an iron stake;
thence South 49°32'53" East 162.56' to an iron stake;
thence South 79°42'59" East 125.45' to an iron stake;
thence South 40°14'11" East 44.35' to an iron stake;
thence South 85°54'41" East 284.78' to an iron stake;
thence North 32°55'56" East 163.82' to an iron stake;
thence North 80°39'19" East 125.10' to an iron stake;
thence South 64°32'05" East 190.48' to an iron stake;
thence South 34°00'39" East 255.60' to an iron stake;
thence South 04°10'30" West 105.91' to a nail set in pine tree root;
thence North 87°46'19" West 64.92' to an iron pipe;
thence North 87°20'18" West 121.83' to an iron stake;
thence North 87°20'18" West 430.07' to an iron stake;
thence North 87°20'18" West 108.48' to an iron stake;
thence North 87°20'18" West 356.35' to an iron pipe;
thence North 87°22'25" West 101.85' to an iron pipe;
thence North 87°20'35" West 86.87' to a 3" x 6" rock with nail set;
which is the point of beginning, having an area of approximately 8.87 acres.

Conservation Easement Area 16

BEING ALL of "Conservation Easement Area 16" of the Stinking Quarter Creek Site over a portion of the lands of Judy Keck Shoffner and husband, Timothy N. Shoffner (PIN No. 8719216889) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 168 and being the most Southern corner of the Conservation Easement Area and being located North 79°51'39" East 2439.93' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 168), North 34°00'39" West 257.81' to an iron stake;
thence North 21°57'24" East 242.00' to an iron stake;
thence North 50°13'12" East 115.75' to an iron stake;
thence South 03°56'14" West 196.85' to an iron pipe;
thence South 03°55'59" West 316.57' to an iron stake;
which is the point of beginning, having an area of approximately 1.09 acres.

Conservation Easement Area 19

BEING ALL of "Conservation Easement Area 19" of the Stinking Quarter Creek Site over a portion of the lands of Judy Keck Shoffner and husband, Timothy N. Shoffner (PIN No. 8719216889) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 182 and being the most Southern corner of the Conservation Easement Area and being located North 65°06'01" East 2701.67' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 182), North 62°54'16" West 137.80' to an iron stake;
thence North 43°40'04" West 132.00' to an iron stake;
thence North 13°43'34" West 142.90' to an iron stake;
thence North 69°11'40" East 148.66' to an iron stake;
thence South 14°59'01" East 35.12' to an iron stake;
thence North 90°00'00" East 36.46' to an iron stake;
thence South 12°21'29" East 31.47' to an iron stake;
thence South 48°34'15" East 208.64' to an iron pipe;
thence North 87°29'02" West 89.63' to an iron pipe;
thence South 03°56'14" West 151.44' to an iron stake;
which is the point of beginning, having an area of approximately 1.37 acres.

Conservation Easement Area 20

BEING ALL of "Conservation Easement Area 20" of the Stinking Quarter Creek Site over a portion of the lands of Judy Keck Shoffner and husband, Timothy N. Shoffner (PIN No. 8719216889) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 227 and being the most Southern corner of the Conservation Easement Area and being located North 56°04'35" East 2637.43 feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 227), North 18°40'16" West 25.66' to an iron stake;
thence North 89°34'09" West 144.32' to an iron stake;
thence North 62°44'54" West 196.52' to an iron stake;
thence North 59°47'51" West 302.66' to an iron stake;
thence North 01°05'15" West 189.72' to an iron stake;
thence South 60°20'03" East 196.28' to an iron stake;
thence North 87°53'16" East 131.61' to an iron stake;
thence South 43°31'13" East 208.00' to an iron stake;
thence South 64°44'49" East 63.59' to an iron stake;
thence North 07°40'08" East 184.05' to an iron stake;
thence North 11°57'35" East 225.16' to an iron stake;
thence North 17°42'26" East 189.08' to an iron stake;
thence North 26°33'54" East 131.02' to an iron stake;
thence North 84°09'20" East 87.93' to an iron stake;
thence South 07°57'48" East 142.65' to an iron stake;
thence South 20°07'46" West 269.45' to an iron stake;
thence South 01°20'52" East 92.26' to an iron stake;
thence South 06°10'13" West 161.53' to an iron stake;
thence South 13°14'00" East 199.96' to an iron stake;
thence South 69°11'40" West 152.78' to an iron stake;
which is the point of beginning, having an area of approximately 5.84 acres.

ALL OF THE FOREGOING CONSERVATION EASEMENT AREAS as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

AND SUCH CONSERVATION EASEMENT AREAS TOGETHER WITH, as an appurtenance thereto, those certain new non-exclusive access easements labeled as "Access Easement 9" and "Access Easement 13" for ingress, egress, and regress, and as shown and more particularly described on the foregoing described plat of survey recorded in Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $42.00
STATE OF NC
REAL ESTATE
EXTX $3076.00

Excise Tax $ 3,076.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-712
DMS Project Number: 100193

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 7th day of September, 2022, by Donald Ray York and wife, Elizabeth G. York, ("**Grantor**"), whose mailing address is 4627 Old Julian Road, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (collectively, the "**Property**"), and being more particularly described as (i) that certain parcel of land containing approximately 61.5 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 2598 at Page 566** of the Guilford County Registry, North Carolina; (ii) that certain parcel of land containing approximately 90.89 acres and being conveyed to Grantor by deed recorded in **Deed Book 4842 at Page 2179** of the Guilford County Registry, North Carolina; and (iii) that certain parcel of land containing approximately 64.31 acres and being conveyed to Grantor by deed recorded in **Deed Book 7901 at Page 2880** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 1 containing a total of approximately 10.90 acres, Conservation Easement Area 2 containing a total of approximately 4.34 acres, Conservation Easement Area 3 containing a total of approximately 3.34 acres, Conservation Easement Area 4 containing a total of approximately 2.05 acres, Conservation Easement Area 7 containing a total of approximately 3.14 acres, Conservation Easement Area 11 containing a total of approximately 1.81 acres, Conservation Easement Area 12A containing a total of approximately 1.29 acres, Conservation Easement Area 12B containing a total of approximately 11.67 acres, and Conservation Easement Area 13 containing approximately 5.14 acres for a total of 43.68 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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 the locations more particularly described as new, non-exclusive access easements labeled as "Access Easement 1", "Access Easement 2", "Access Easement 3", "Access Easement 7", "Access Easement 10", and "Access Easement 11" on **Exhibit A** ("**Access Easement**") attached hereto and incorporated herein by this reference, to access the Conservation Easement Area for the purposes set forth herein. 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)
Donald Ray York

_____ (SEAL)
Elizabeth G. York

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Donald Ray York and wife, Elizabeth G. York, as 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 7 day of September, 2022.

_____
Notary Public

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 1

BEING ALL of "Conservation Easement Area 1" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8709715553 & 8709912272) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 1 and being the most Northwestern corner of the Conservation Easement Area and being located North 62°13'45" West 3927.03 feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 1), South 87°36'52" East 394.14' to an iron stake;

thence South 60°30'45" East 650.89' to an iron stake;

thence South 60°30'45" East 531.54' to an iron stake;

thence South 80°12'00" East 125.54' to an iron stake;

thence South 43°57'02" East 143.07' to an iron stake;

thence South 15°59'19" West 153.96' to an iron stake;

thence North 89°45'16" West 227.48' to an iron stake;

thence North 46°16'05" West 189.64' to an iron stake;

thence North 82°15'08" West 180.96' to an iron stake;

thence North 66°40'16" West 117.99' to an iron stake;

thence North 65°06'26" West 536.57' to an iron stake;

thence North 46°03'13" West 263.17' to an iron stake;

thence North 77°10'06" West 178.66' to an iron stake;

thence North 24°44'05" West 241.61' to an iron stake;

which is the point of beginning, having an area of approximately 10.90 acres.

Conservation Easement Area 2

BEING ALL of "Conservation Easement Area 2" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8709912272) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 13 and being a Northwestern corner of the Conservation Easement Area and being located North 58°13'13" West 2081.36' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 13), South 62°16'18" East 78.39' to an iron stake;

thence South 49°30'50" East 187.18' to an iron stake;

thence South 84°31'17" East 261.39' to an iron stake;

thence South 61°40'14" East 308.63' to an iron stake;

thence South 05°22'16" East 89.73' to an iron stake;

thence South 84°45'41" East 139.56' to an iron stake;

thence South 13°50'15" West 162.52' to an iron stake;

thence North 89°58'34" West 195.28' to an iron stake;

thence North 20°16'57" West 191.57' to an iron stake;

thence North 82°44'26" West 273.28' to an iron stake;

thence North 69°31'41" West 285.35' to an iron stake;

thence North 48°36'30" West 139.28' to an iron stake;

thence North 15°59'19" East 190.46' to an iron stake;

which is the point of beginning, having an area of approximately 4.34 acres.

Conservation Easement Area 3

BEING ALL of "Conservation Easement Area 3" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No.'s 8709912272 & 8719008297) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 27 and being a Northern corner of the Conservation Easement Area and being located North 44°40'12" West 1009.13' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 27), South 01°29'05" West 115.40' to an iron stake;

thence South 01°26'36" West 23.75' to an iron stake;

thence South 86°14'21" East 29.54' to a point;

thence North 75°51'49" East 49.60' to a point;

thence North 60°08'14" East 84.90' to a point;

thence North 63°26'06" East 27.57' to a point;

thence North 33°27'02" East 39.10' to a point;

thence North 64°02'53" East 31.85' to a point;

thence North 64°02'53" East 32.55' to a point;

thence North 49°36'59" East 25.15' to a point;

thence South 89°53'33" East 29.76' to a point;

thence South 44°21'56" East 65.47' to a point;

thence South 24°44'50" East 49.64' to a point;

thence South 11°44'58" East 47.64' to a point;

thence South 31°02'01" East 46.82' to a point;

thence South 53°14'37" East 29.17' to a point;

thence South 76°34'06" East 43.53' to a point;

thence South 81°19'55" East 24.13' to a point;

thence South 59°58'43" West 30.00' to an iron stake;

thence South 59°58'43" West 73.72' to an iron stake;

thence North 51°57'11" West 63.38' to an iron stake;

thence North 25°12'04" West 163.09' to an iron stake;

thence South 58°31'38" West 272.26' to an iron stake;

thence South 33°27'43" West 103.16' to an iron pipe;

thence South 41°55'58" West 255.60' to an iron stake;

thence South 08°45'43" West 173.01' to an iron stake;

thence South 61°29'24" West 57.25' to an iron stake;

thence North 41°38'01" West 163.80' to an iron stake;

thence North 10°47'03" East 167.83' to an iron stake;

thence North 52°24'54" East 96.30' to an iron stake;

thence North 41°34'35" East 162.07' to an iron stake;

thence North 13°50'15" East 174.67' to an iron stake;

thence North 63°58'45" East 118.96' to an iron stake;

which is the point of beginning, having an area of approximately 3.34 acres.

Conservation Easement Area 4

BEING ALL of "Conservation Easement Area 4" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8709912272) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 53 and being the most Northern corner of the Conservation Easement Area and being located North 85°53'14" West 1091.83' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 53), South 41°38'01" East 138.74' to an iron stake;

thence South 04°54'17" East 103.56' to an iron stake;

thence South 03°25'21" West 96.28' to an iron stake;

thence South 38°42'40" West 121.03' to an iron stake;

thence South 81°35'28" West 161.46' to an iron stake;

thence South 67°26'54" West 51.93' to an iron stake;

thence North 55°06'52" West 190.61' to an iron stake;

thence North 65°46'38" East 288.91' to an iron stake;

thence North 14°51'19" East 130.24' to an iron stake;

thence North 28°32'01" East 99.62' to an iron stake;

which is the point of beginning, having an area of approximately 2.05 acres.

Conservation Easement Area 7

BEING ALL of "Conservation Easement Area 7" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8709912272) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at a pinched top iron stake (Point of Beginning) labeled as Point No. 62 and being the most Northern corner of the Conservation Easement Area and being located South 73°29'39" West 1819.43' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 62), South 01°40'16" West 217.87' to an iron stake;

thence South 01°40'16" West 205.65' to an iron pipe;

thence North 86°32'26" West 262.27' to an iron pipe;

thence North 86°37'33" West 194.75' to an iron pipe;

thence North 01°40'34" East 165.80' to an iron stake;

thence North 61°59'46" East 319.11' to an iron stake;

thence North 66°08'25" East 198.96' to a pinched top iron stake;

which is the point of beginning, having an area of approximately 3.14 acres.

Conservation Easement Area 11

BEING ALL of "Conservation Easement Area 11" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8709715553) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 108 and being the most Northwestern corner of the Conservation Easement Area and being located North 80°49'52" West

4161.24' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 108), South 84°51'33" East 167.69' to an iron stake;

thence South 31°48'51" East 87.59' to an iron stake;

thence South 47°09'49" East 122.09' to an iron stake;

thence South 22°38'21" East 275.85' to an iron stake;

thence North 82°08'16" West 189.98' to an iron stake;

thence North 21°12'18" West 128.51' to an iron stake;

thence North 33°34'55" West 169.30' to an iron stake;

thence North 87°09'19" West 98.54' to an iron stake;

thence North 07°30'20" East 136.51' to an iron stake;

which is the point of beginning, having an area of approximately 1.81 acres.

Conservation Easement Area 12A

BEING ALL of "Conservation Easement Area 12A" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8719008297) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 140 and being the most Southwestern corner of the Conservation Easement Area and being located North 51°34'42" West 335.85' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 140), thence North 31°40'46" East 257.04' to an iron stake;

thence North 77°46'27" East 90.74' to an iron stake;

thence South 33°10'57" East 203.86' to an iron stake;

thence South 33°45'16" West 160.42' to an iron stake;

thence North 56°14'44" West 97.37' to an iron stake;

thence North 85°51'56" West 165.59' to an iron stake;

which is the point of beginning, having an area of approximately 1.29 acres.

Conservation Easement Area 12B

BEING ALL of "Conservation Easement Area 12B" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8719008297) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 126 and being the most Northeastern corner of the Conservation Easement Area and being located North 72°27'24" East 1113.29' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 126), South 04°21'03" West 82.84' to an iron stake; thence South 04°21'03" West 206.84' to an iron pipe;

thence South 04°14'53" West 283.41' to an iron stake;

thence South 59°34'59" West 169.56' to an iron stake;

thence South 12°57'25" West 81.73' to an iron stake;

thence South 56°40'28" West 172.72' to an iron stake;

thence North 66°14'55" West 339.85' to an iron stake;

thence South 50°00'08" West 234.18' to an iron stake;

thence North 50°43'37" West 187.41' to an iron stake;

thence North 43°28'10" East 250.92' to an iron stake;

thence North 01°18'00" East 106.87' to an iron stake;

thence North 45°37'12" West 302.65' to an iron stake;

thence North 33°45'16" East 160.46' to an iron stake;

thence South 79°22'16" East 313.32' to an iron stake;

thence North 82°14'42" East 125.33' to an iron stake;

thence South 76°57'30" East 143.13' to an iron stake;

thence South 48°19'04" East 127.27' to an iron stake;

thence South 24°40'37" East 106.04' to an iron stake;

thence North 52°11'19" East 206.02' to an iron stake;

thence North 02°01'38" East 216.11' to an iron stake;

thence North 85°21'46" East 58.38' to an iron stake;

which is the point of beginning, having an area of approximately 11.67 acres.

Conservation Easement Area 13

BEING ALL of "Conservation Easement Area 13" of the Stinking Quarter Creek Site over a portion of the lands of Donald Ray York and wife Elizabeth Graham York (PIN No. 8719008297) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 151 and being the most Northern corner of the Conservation Easement Area and being located South 19°01'59" West 380.49' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 151), South 62°51'53" East 195.08' to an iron stake;

thence South 50°43'37" East 181.59' to an iron stake;

thence South 26°31'18" West 374.81' to an iron stake;

thence South 46°47'30" West 332.32' to an iron stake;

thence North 76°04'24" West 183.15' to an iron stake;

thence North 20°01'37" East 187.52' to an iron stake;

thence North 02°07'35" East 72.92' to an iron stake;

thence North 36°53'37" East 294.81' to an iron stake;

thence North 14°35'41" West 185.31' to an iron stake;

thence North 52°21'09" East 95.93' to an iron stake;

which is the point of beginning, having an area of approximately 5.14 acres.

ALL OF THE FOREGOING CONSERVATION EASEMENT AREAS as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

AND SUCH CONSERVATION EASEMENT AREAS TOGETHER WITH, as an appurtenance thereto, those certain new non-exclusive access easements labeled as "Access Easement 1", "Access Easement 2", "Access Easement 3", "Access Easement 7", "Access Easement 10", and "Access Easement 11" for ingress, egress, and regress, and as shown and more particularly described on the foregoing described plat of survey recorded in Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

BK: R 8657
PG: 2373-2384
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09-09-2022
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BY: MISTY MARTIN
DEPUTY-GB

2022056621
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $130.00

Excise Tax $ 130.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-713
DMS Project Number: 100193

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

12 MW

THIS DEED OF CONSERVATION EASEMENT AND RIGHT OF ACCESS, made this 7th day of September, 2022, by Curtis R. York and wife, Waynette G. York, ("**Grantor**"), whose mailing address is 2259 NC 62 East, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 10.43 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 4842 at Page 2163** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 5 containing a total of approximately 0.91 acres and Conservation Easement Area 6 containing approximately 1.11 acres for a total of 2.02 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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 the location more particularly described as new, non-exclusive access easements labeled as "Access Easement 4" on **Exhibit A** ("**Access Easement**") attached hereto and incorporated herein by this reference, to access the Conservation Easement Area for the purposes set forth herein. 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.

Curt R York (SEAL)
Curtis R. York

Waynette G. York (SEAL)
Waynette G. York

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Curtis R. York and wife, Waynette G. York, as 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 7th day of September, 2022.

Notary Public

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 5

BEING ALL of "Conservation Easement Area 5" of the Stinking Quarter Creek Site over a portion of the lands of Curtis R. York & wife, Waynette G. York (PIN No. 8708994865) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron pipe (Point of Beginning) labeled as Point No. 48 and being the most Northeastern corner of the Conservation Easement Area and being located South 79°57'58" West 1455.73' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 129), South 55°06'52" East 190.61' to an iron pipe;
thence South 67°26'54" West 140.93' to an iron stake;
thence South 33°42'12" West 103.71' to an iron stake;
thence North 50°51'30" West 176.22' to an iron stake;
thence North 37°08'48" East 143.96' to an iron stake;
thence North 73°55'49" East 84.39' to an iron stake;
which is the point of beginning, having an area of approximately 0.91 acres.

Conservation Easement Area 6

BEING ALL of "Conservation Easement Area 6" of the Stinking Quarter Creek Site over a portion of the lands of Curtis R. York & wife, Waynette G. York (PIN No. 8708994865) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 57 and being the most Northern corner of the Conservation Easement Area and being located South 74°40'22" West 1689.30' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 57), South 50°51'30" East 194.01' to an iron stake;
thence South 29°43'59" West 66.18' to an iron stake;
thence South 54°10'50" West 73.87' to an iron stake;
thence South 70°04'51" West 190.76' to an iron stake;
thence North 01°40'16" East 217.87' to a pinched top iron stake;
thence North 58°35'04" East 135.04' to an iron stake;
which is the point of beginning, having an area of approximately 1.11 acres.

BOTH OF THE FOREGOING CONSERVATION EASEMENT AREAS as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A.

Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

AND SUCH CONSERVATION EASEMENT AREAS TOGETHER WITH, as an appurtenance thereto, that certain new non-exclusive access easement labeled as "Access Easement 4" for ingress, egress, and regress, and as shown and more particularly described on the foregoing described plat of survey recorded in Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

BK: R 8657
PG: 2399-2409
RECORDED:
09-09-2022
12:45:52 PM
BY: MISTY MARTIN
DEPUTY-GB

2022056624
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $136.00

Excise Tax $ 136.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-715
DMS Project Number: 100193

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 7th day of September, 2022, by Mickey Lee Keck and wife, Jean C. Keck, ("**Grantor**"), whose mailing address is 2131 NC Hwy. 62 E., Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 55.93 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 8206 at Page 2173** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 22 containing a total of approximately 2.11 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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.

Mickey Lee Keck (SEAL)
Mickey Lee Keck

Jean C. Keck (SEAL)
Jean C. Keck

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Mickey Lee Keck and wife, Jean C. Keck, as 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 7th day of September, 2022.

Notary Public

WILLIAM H. FLOWE, JR.
NOTARY PUBLIC
GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 22

BEING ALL of "Conservation Easement Area 22" of the Stinking Quarter Creek Site over a portion of the lands of Mickey Lee Keck and wife, Jean C. Keck (PIN No. 8719426891) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 208 and being the most Southwestern corner of the Conservation Easement Area and being located North 73°57'15" East 4384.92' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 208), North 05°49'21" East 343.74' to an iron stake; thence North 18°04'38" West 150.61' to an iron stake; thence North 81°38'06" East 225.84' to an iron stake; thence South 03°17'47" West 441.62' to an iron stake; thence South 03°15'29" West 85.31' to a rock; thence North 85°27'46" West 5.05' to an iron pipe; thence North 87°30'44" West 176.47' to an iron stake which is the Point of Beginning (Point No. 208), having an area of approximately 2.11 acres.

TOGETHER WITH, as an appurtenance thereto, a general perpetual, non-exclusive easement for ingress and egress over and upon the Easement 22 Property (as hereinafter defined) as described in the Deed of Conservation Easement and Right of Access to which this Exhibit is attached. The term "Easement 22 Property" as used in this Exhibit A shall mean the following real property (being also defined as the "Property" in the Deed of Conservation Easement to which this Exhibit A is attached):

BEING ALL of Tract 3, Map 2 or 2, of the Exempt Plat for property owners: Mickey L. Keck, Mark S. Keck & Judy Keck Shoffner, as shown on a plat thereof recorded in Plat Book 201, Page 72, in the Office of the Register of Deeds of Guilford County, North Carolina.

THE FOREGOING CONSERVATION EASEMENT AREA 22 as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

BK: R 8657
PG: 2435-2445
RECORDED:
09-09-2022
12:48:50 PM
BY: MISTY MARTIN
DEPUTY-GB

2022056630
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $137.00

Excise Tax $ 137.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-716
DMS Project Number: 100193

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 7th day of September, 2022, by Mark Stanley Keck and wife, Judy Jones Keck, ("**Grantor**"), whose mailing address is 2379 NC Hwy. 62 E., Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (the "**Property**"), and being more particularly described as that certain parcel of land containing approximately 29.64 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 8206 at Page 2169** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 21 containing a total of approximately 2.13 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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.

Mark Stanley Keck (SEAL)

Judy Jones Keck (SEAL)

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Mark Stanley Keck and wife, Judy Jones Keck, as 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 7th day of September, 2022.

Notary Public

WILLIAM H. FLOWE, JR. NOTARY PUBLIC GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 21

BEING ALL of "Conservation Easement Area 21" of the Stinking Quarter Creek Site over a portion of the lands of Mark Stanley Keck and wife, Judy Jones Keck (PIN No. 8719326588) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 185 and being the most Southwestern corner of the Conservation Easement Area and being located North 67°44'13" East 3329.37' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 185), North 13°05'48" West 219.63' to an iron stake; thence North 27°37'27" West 156.48' to an iron stake; thence South 87°21'54" East 193.28' to an iron stake; thence North 48°31'13" East 79.96' to an iron stake; thence North 89°05'21" East 80.89' to an iron stake; thence South 00°49'34" East 221.19' to an iron stake; thence South 16°13'44" West 191.45' to an iron stake; thence North 87°29'19" West 161.39' to an iron stake which is the Point of Beginning (Point No. 185), having an area of approximately 2.13 acres.

TOGETHER WITH, as an appurtenance thereto, a general perpetual, non-exclusive easement for ingress and egress over and upon the Easement 21 Property (as hereinafter defined) as described in the Deed of Conservation Easement and Right of Access to which this Exhibit is attached. The term "Easement 21 Property" as used in this Exhibit A shall mean the following real property (being also defined as the "Property" in the Deed of Conservation Easement to which this Exhibit A is attached):

BEING ALL of Tract 2, Map 2 or 2, of the Exempt Plat for property owners: Mickey L. Keck, Mark S. Keck & Judy Keck Shoffner, as shown on a plat thereof recorded in Plat Book 201, Page 72, in the Office of the Register of Deeds of Guilford County, North Carolina.

THE FOREGOING CONSERVATION EASEMENT AREA 21 as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

BK: R 8657
PG: 2449-2460
RECORDED:
09-09-2022
12:51:40 PM
BY: MISTY MARTIN
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2022056632
GUILFORD COUNTY, NC
JEFF L. THIGPEN
REGISTER OF DEEDS

NC FEE $26.00
STATE OF NC
REAL ESTATE
EXTX $1513.00

Excise Tax $ 1,513.00

STATE OF NORTH CAROLINA

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

GUILFORD COUNTY

SPO File Number: 41-LA-718
DMS Project Number: 100193

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 7th day of September, 2022, by Tony Paul Harmon and wife, Sherri Smith Harmon, ("**Grantor**"), whose mailing address is 7035 Bobby Jean Road, Julian, NC 27283, 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 Environmental Quality (formerly Department of Environment and Natural Resources), for the purposes of acquiring, maintaining, restoring, enhancing, creating and preserving wetland and riparian resources that contribute to the protection and improvement of water quality, flood prevention, fisheries, aquatic habitat, wildlife habitat, and recreational opportunities; and

WHEREAS, this Conservation Easement from Grantor to Grantee has been negotiated, arranged and provided for as a condition of a full delivery contract between Restoration Systems, LLC, a North Carolina limited liability company, 1101 Hayes Street, Suite 211, Raleigh, NC 27604 and the North Carolina Department of Environmental Quality, to provide stream, wetland and/or buffer mitigation pursuant to the North Carolina Department of Environmental Quality Purchase and Services Contract Number 200201-01.

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 Environmental Quality (formerly 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 Greene and Clay Township, Guilford County, North Carolina (collectively, the "**Property**"), and being more particularly described as (i) that certain parcel of land containing approximately 20.15 acres and being conveyed to the Grantor by deed as recorded in **Deed Book 7159 at Page 2627** of the Guilford County Registry, North Carolina; (ii) that certain parcel of land containing approximately 26.20 acres and being conveyed to Grantor by deed recorded in **Deed Book 7428 at Page 321** of the Guilford County Registry, North Carolina; and (iii) that certain parcel of land containing approximately 12.40 acres and being conveyed to Grantor by deed recorded in **Deed Book 7391 at Page 2605** of the Guilford 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 Stinking Quarter Creek.

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:

BEING ALL of Conservation Easement Area 17 containing a total of approximately 12.34 acres and Conservation Easement Area 18 containing approximately 11.30 acres for a total of 23.64 acres, as shown on the plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter" in Green & Clay Township, Guilford County, North Carolina, dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

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 the locations more particularly described as new, non-exclusive access easements labeled as "Access Easement 8", and "Access Easement 12" on **Exhibit A** ("**Access Easement**") attached hereto and incorporated herein by this reference, to access the Conservation Easement Area for the purposes set forth herein. 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.

Tony Paul Harmon (SEAL)
Tony Paul Harmon

Sherri Smith Harmon (SEAL)
Sherri Smith Harmon

NORTH CAROLINA
COUNTY OF Randolph

I, William H. Flowe, Jr., a Notary Public in and for the County and State aforesaid, do hereby certify that Tony Paul Harmon and wife, Sherri Smith Harmon, as 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 7th day of September, 2022.

Notary Public

WILLIAM H. FLOWE, JR. NOTARY PUBLIC GUILFORD COUNTY, NC

My commission expires:

01/26/2027

Exhibit A
Legal Description

Conservation Easement Area 17

BEING ALL of "Conservation Easement Area 17" of the Stinking Quarter Creek Site over a portion of the lands of Tony Paul Harmon & wife Sherri Smith Harmon (PIN No. 8719315186 & 8719413174) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron pipe (Point of Beginning) labeled as Point No. 183 and being the most Northwestern corner of the Conservation Easement Area and being located North 62°21'46" East 2777.88' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 183), South 87°29'02" East 89.63' to an iron pipe;
thence South 87°29'19" East 531.22' to an iron stake;
thence South 87°29'19" East 161.39' to an iron stake;
thence South 16°13'44" West 120.88' to an iron stake;
thence South 45°08'35" East 120.43' to an iron stake;
thence North 83°44'12" East 231.93' to an iron stake;
thence South 12°52'13" East 179.76' to an iron stake;
thence South 74°51'23" West 39.12' to an iron stake;
thence South 13°35'10" West 107.17' to an iron stake;
thence South 41°38'43" West 82.68' to an iron stake;
thence South 83°16'19" West 481.62' to an iron stake;
thence North 66°52'18" West 92.98' to an iron stake;
thence North 28°04'21" West 73.78' to an iron stake;
thence North 00°47'05" West 63.37' to an iron stake;
thence North 68°28'16" West 101.71' to an iron stake;
thence South 71°46'30" West 149.88' to an iron stake;
thence South 39°01'42" West 147.50' to an iron stake;
thence South 01°04'51" West 138.05' to an iron stake;
thence South 28°10'17" West 163.55' to an iron stake;
thence North 89°49'46" West 35.80' to an iron stake;
thence North 03°55'59" East 316.57' to an iron pipe;
thence North 03°56'14" East 196.85' to an iron stake;
thence North 03°56'14" East 196.22' to an iron stake;
thence North 03°56'14" East 151.44' to an iron pipe;
which is the point of beginning, having an area of approximately 12.34 acres.

Conservation Easement Area 18

BEING ALL of "Conservation Easement Area 18" of the Stinking Quarter Creek Site over a portion of the lands of Tony Paul Harmon & wife Sherri Smith Harmon (PIN No. 8719413174 &

8719510113) lying and being situated in Greene & Clay Township, Guilford County, North Carolina and particularly described as follows (all distances are ground distances unless otherwise noted):

Beginning at an iron stake (Point of Beginning) labeled as Point No. 218 and being a Western corner of the Conservation Easement Area and being located North 81°23'48" East 3717.54' feet from an iron stake (Point No. 901) with N.C. Grid Coordinates N=588,051.4748' E=1,934,363.0374' (NAD '83, 2011).

Thence from the Point of Beginning (Point No. 218), North 15°57'53" East 341.69' to an iron stake;
thence North 66°20'45" West 114.67' to an iron stake;
thence South 74°30'07" West 83.72' to an iron stake;
thence North 12°52'13" West 176.74' to an iron stake;
thence North 78°16'34" East 167.82' to an iron stake;
thence South 85°17'42" East 211.65' to an iron stake;
thence South 69°38'48" East 172.21' to an iron stake;
thence North 21°35'16" East 129.76' to an iron stake;
thence North 57°35'32" East 100.70' to an iron stake;
thence South 87°30'44" East 176.47' to an iron pipe;
thence South 85°27'46" East 5.05' to a 4" x 5" rock with no markings;
thence South 00°55'08" East 156.85' to an iron pipe;
thence South 00°57'18" East 171.01' to an iron stake;
thence South 00°56'27" East 307.78' to an iron stake;
thence South 00°58'54" East 91.55' to an iron stake;
thence North 69°45'30" West 64.18' to an iron stake;
thence South 88°32'37" West 102.46' to an iron stake;
thence South 45°13'04" West 201.23' to an iron stake;
thence North 64°42'32" West 471.40' to an iron stake;
which is the point of beginning, having an area of approximately 11.30 acres.

BOTH OF THE FOREGOING CONSERVATION EASEMENT AREAS as shown on plat of survey titled "Conservation Easement for the State of North Carolina Division of Mitigation Services, DMS Project ID# 100193, Stinking Quarter", dated August 26, 2022, by John A. Rudolph, PLS Number L-4194, K2 Design Group, and recorded in the Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

AND SUCH CONSERVATION EASEMENT AREAS TOGETHER WITH, as an appurtenance thereto, those certain new non-exclusive access easements labeled as "Access Easement 8" and "Access Easement 12" for ingress, egress, and regress, and as shown and more particularly described on the foregoing described plat of survey recorded in Guilford County, North Carolina Register of Deeds at Plat Book 210, Pages 49 through 59.

Appendix I: Credit Release Schedule

The schedules below list the updated credit release schedules for stream and wetland mitigation projects developed by the ILF/NCDMS in North Carolina:

Credit Release Schedule and Milestones for Wetlands			
Credit Release Milestone	**Release Activity**	**ILF/NCDMS**	
		Interim Release	**Total Released**
1	Site Establishment (includes all required criteria stated above)	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	Year 1 monitoring report demonstrates that interim performance standards have been met	10%	40%
4	Year 2 monitoring report demonstrates that interim performance standards have been met	10%	50%
5	Year 3 monitoring report demonstrates that interim performance standards have been met	15%	65%
6*	Year 4 monitoring report demonstrates that interim performance standards have been met	5%	70%
7	Year 5 monitoring report demonstrates that interim performance standards have been met	15%	85%
8*	Year 6 monitoring report demonstrates that interim performance standards have been met	5%	90%
9	Year 7 monitoring report demonstrates that performance standards have been met	10%	100%

*Please note that vegetation plot 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.

Credit Release Schedule and Milestones for Streams			
Credit Release Milestone	**Release Activity**	**ILF/NCDMS**	
		Interim Release	**Total Released**
1	Site Establishment (includes all required criteria stated above)	0%	0%
2	Completion of all initial physical and biological improvements made pursuant to the Mitigation Plan	30%	30%
3	Year 1 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	40%
4	Year 2 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	50%
5	Year 3 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	60%
6*	Year 4 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	65% (75%**)
7	Year 5 monitoring report demonstrates that channels are stable and interim performance standards have been met	10%	75% (85%**)
8*	Year 6 monitoring report demonstrates that channels are stable and interim performance standards have been met	5%	80% (90%**)
9	Year 7 monitoring report demonstrates that channels are stable, performance standards have been met	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.

Appendix J: Maintenance Plan

Figure J1. Existing ATV Path – Current Conditions Photo Points
Photo Log – ATV Paths, Existing Conditions

Maintenance Plan

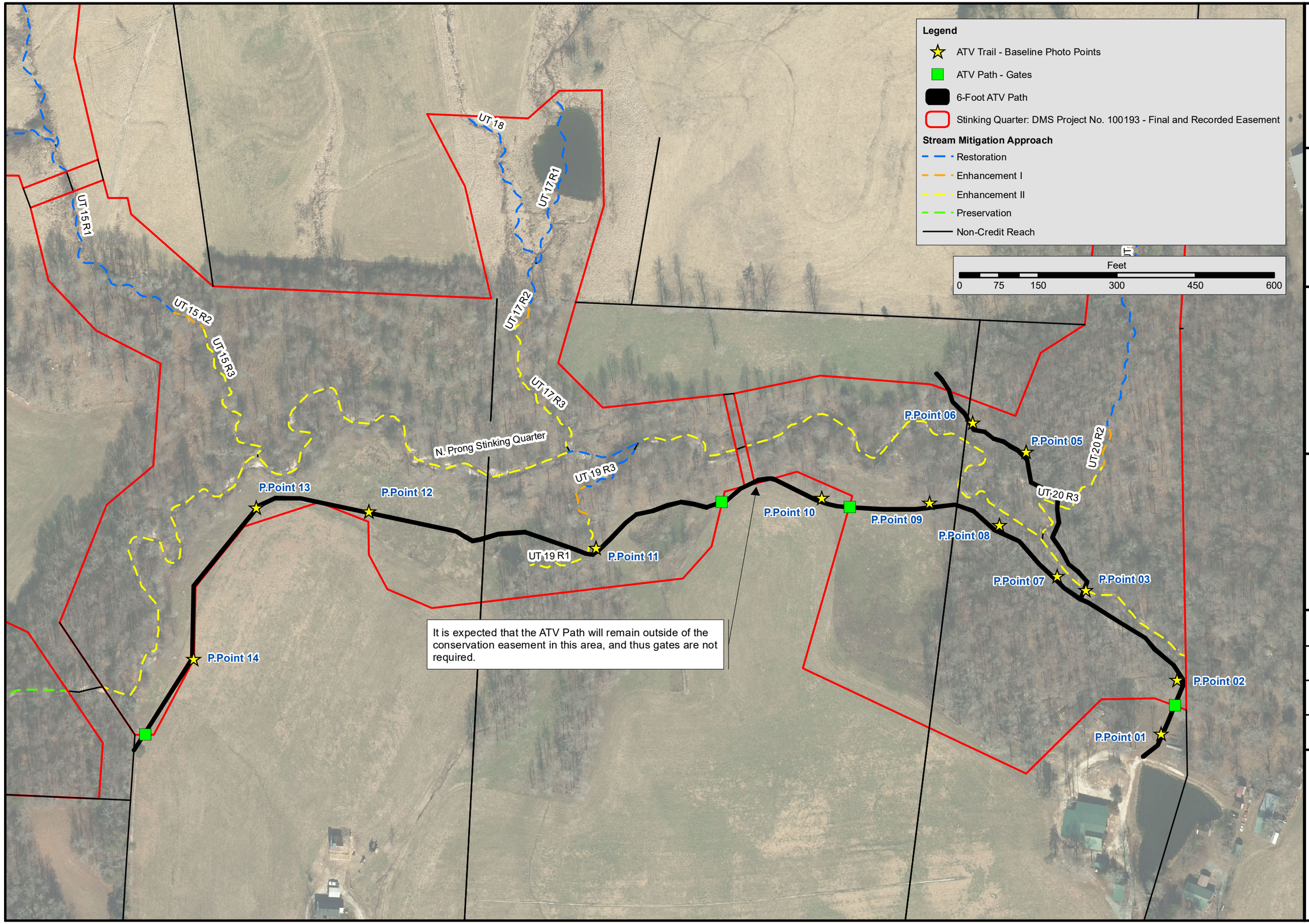
The Site shall be monitored on a regular basis and a physical inspection of the site shall be conducted a minimum of quarterly throughout the post-construction monitoring period until performance standards are met. These site inspections may identify site components and features that require routine maintenance. Routine maintenance should be expected most often in the first two years following site construction and may include the following:

Component/ Feature	Maintenance through project close-out
Stream	Routine channel maintenance and repair activities may include securing of loose coir matting and supplemental installations of live stakes and other target vegetation along the channel. Areas where stormwater and floodplain flows intercept the channel may also require maintenance to prevent bank failures and head-cutting.
Vegetation	Vegetation shall be maintained to ensure the health and vigor of the targeted plant community. Routine vegetation maintenance and repair activities may include supplemental planting, pruning, mulching, and fertilizing. Exotic invasive plant species shall be controlled by mechanical and/or chemical methods. Any vegetation control requiring herbicide application will be performed in accordance with NC Department of Agriculture (NCDA) rules and regulations.
Beaver	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 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.
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.

Existing ATV Paths

The ATV Path is an existing trail system used by the current landowners for passive recreation and observation of the riparian corridor. Existing ATV Paths were surveyed and platted in the recorded conservation easement plat (Appendix H). The conservation easement prohibits the improvement of the ATV Paths, as they are subject to the conservation easement. However, to maintain the current use of the trail system, the landowner is allowed to clear fallen trees, and any vegetation that may cause a safety concern. No improvements will be made to the existing trail, i.e., placement of fill, excavation, resurfacing, etc. Dual-Sided Utility Posts by Carsonite will mark the ATC Paths every 100 feet. These markers are flexible, and can survive a tire impact, providing a safe, clear, and long-term marking solution.

Included below is an overview figure of the ATV Paths and includes photo points and easement gate locations. Baseline condition photos are presented after the figure. Annual photo points were added to the Monitoring Plan and will be included in the yearly monitoring reports.



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ

Division of Mitigation Services

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING ATV PATH

CURRENT CONDITIONS PHOTO POINTS

Imagery Date: 2022-02-09

Drawn by: RJH

Date: NOVEMBER 2023

Scale: 1:2,000

Project No.: 100193

FIGURE

J-1

N



Photo Point 1: Looking northeast, towards the easement



Photo Point 2: Looking northwest



Photo Point 3: Stinking Quarter Crossing



Photo Point 3: Stinking Quarter Crossing



Photo Point 5: Looking northwest



Photo Point 6: Looking northwest, leaving the easement



Photo Point 7: Looking west/northwest along the southern floodplain of Stinking Quarter Creek



Photo Point 8: Looking west/northwest along the southern floodplain of Stinking Quarter Creek



Photo Point 9: Looking west, exiting the existing forested area



Photo Point 10: Looking west, along the existing forest's edge



Photo Point 11: Looking west, through the existing forested area associated with UT-19



Photo Point 12: Looking west, through the existing pasture



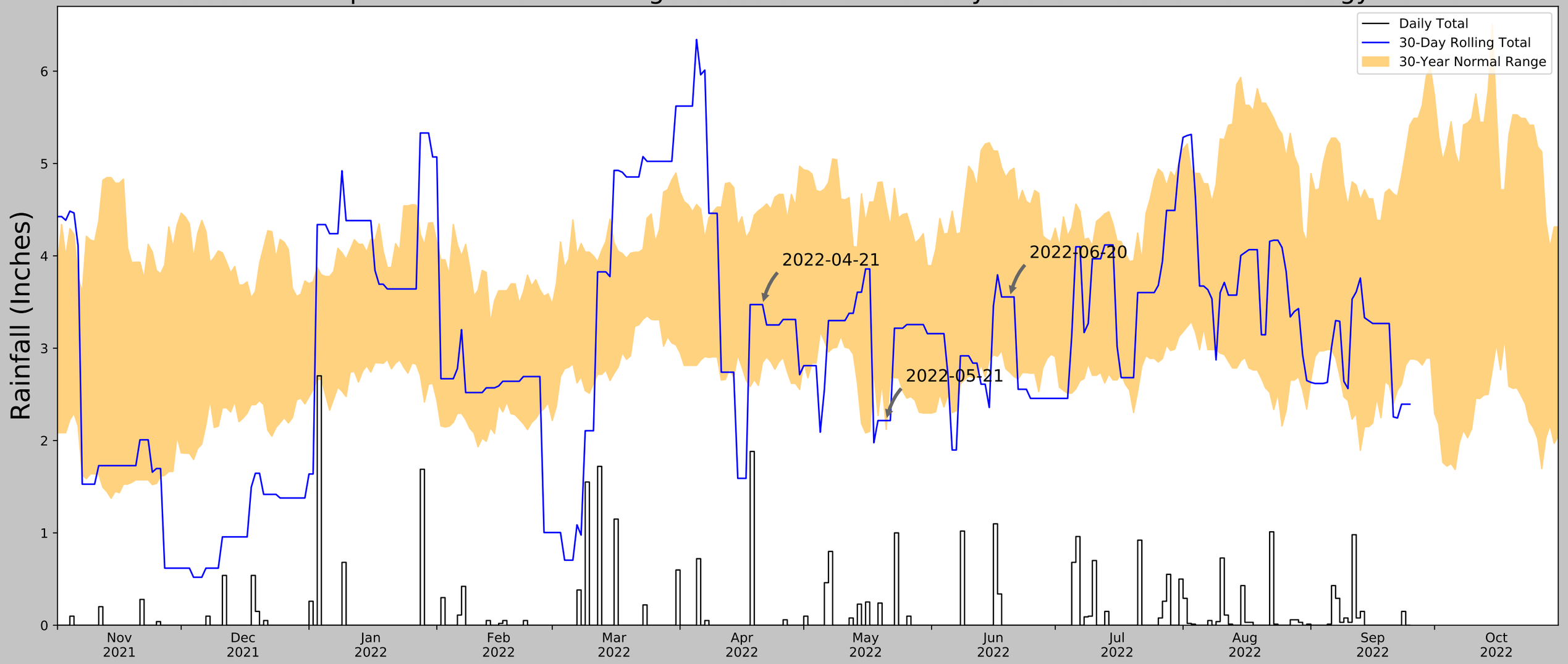
Photo Point 13: Looking south, at the edge of the existing row crops and pasture



Photo Point 14: Looking south, at the edge of the existing row crops and pasture, leaving the easement area

Appendix K: Preconstruction Groundwater Gauges

Antecedent Precipitation vs Normal Range based on NOAA's Daily Global Historical Climatology Network



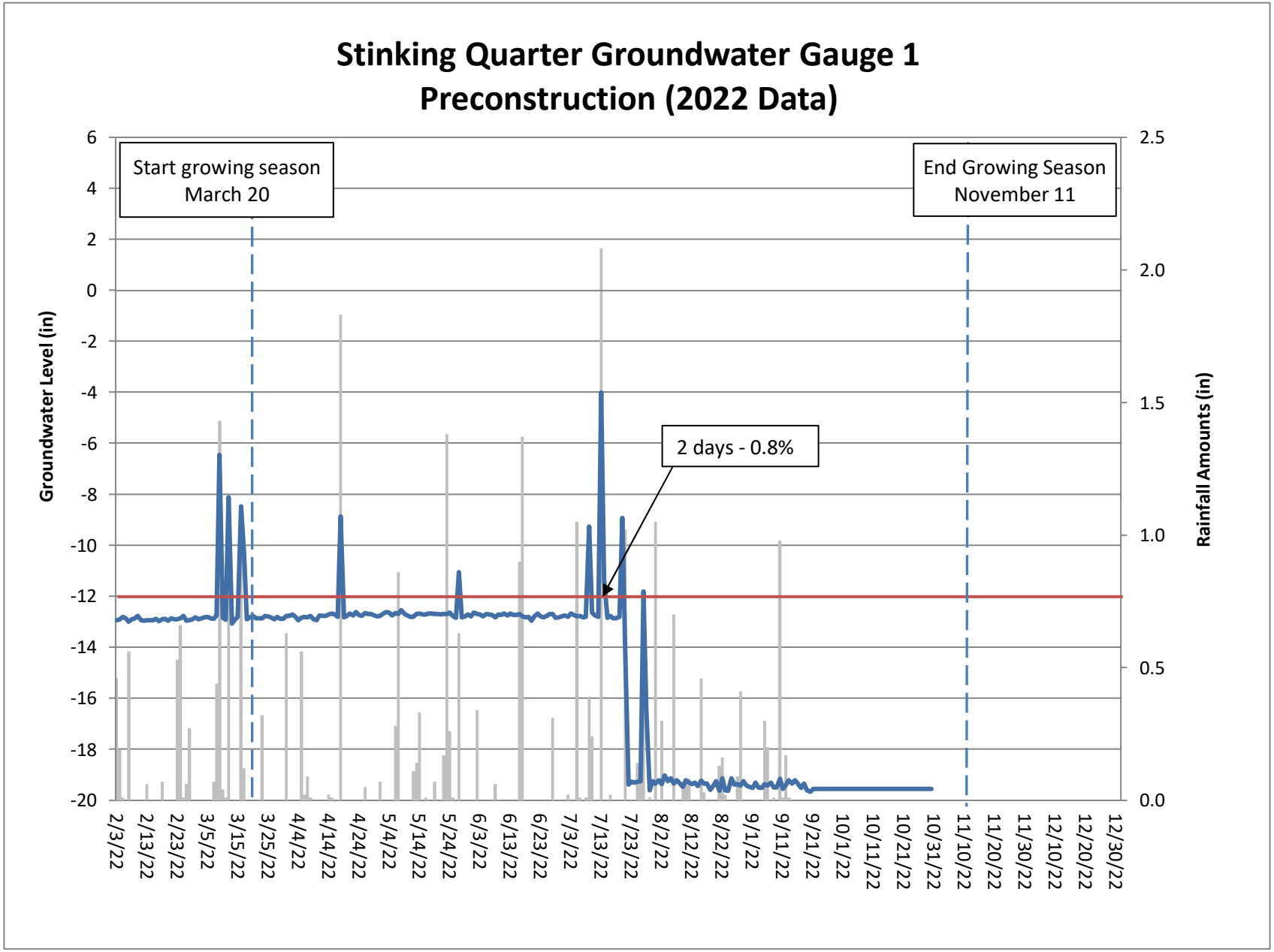
Coordinates	35.9200, -79.6371
Observation Date	2022-06-20
Elevation (ft)	674.51
Drought Index (PDSI)	Moderate drought
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2022-06-20	2.738976	4.920079	3.555118	Normal	2	3	6
2022-05-21	2.120079	4.541732	2.216536	Normal	2	2	4
2022-04-21	2.846063	4.520473	3.472441	Normal	2	1	2
Result							Normal Conditions - 12

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days (Normal)	Days (Antecedent)
RANDLEMAN	35.8222, -79.7917	810.039	10.981	135.529	6.43	10870	90
CLIMAX 4.5 SSE	35.8529, -79.6825	750.984	5.287	76.474	2.783	1	0
GREENSBORO 6.8 ESE	36.0456, -79.7129	705.053	9.658	30.543	4.641	20	0
RANDLEMAN 0.8 NNE	35.8277, -79.7987	675.853	11.069	1.343	4.996	5	0
GIBSONVILLE 3.1 S	36.0594, -79.5454	638.123	10.911	36.387	5.307	15	0
ELON COLLEGE 0.6 SSW	36.0866, -79.5165	666.995	13.34	7.515	6.103	30	0
BURLINGTON ALAMANCE AP	36.0467, -79.4769	617.126	12.524	57.384	6.354	376	0
ELON 0.6 SW	36.0925, -79.5189	657.152	13.627	17.358	6.369	1	0
BURLINGTON FIRE STN #5	36.06, -79.4481	660.105	14.325	14.405	6.653	34	0
GREENSBORO WTP	36.0831, -79.8045	765.092	14.647	90.582	7.918	1	0

Figure and tables made by the
Antecedent Precipitation Tool
Version 1.0

Written by Jason Deters
U.S. Army Corps of Engineers


Stinking Quarter Groundwater Gauge 1
Preconstruction (2022 Data)
Start growing season
March 20
End Growing Season
November 11
2 days - 0.8%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
1.0
0.5
0.0
2/3/22
2/13/22
2/23/22
3/5/22
3/15/22
3/25/22
4/4/22
4/14/22
4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
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10/1/22
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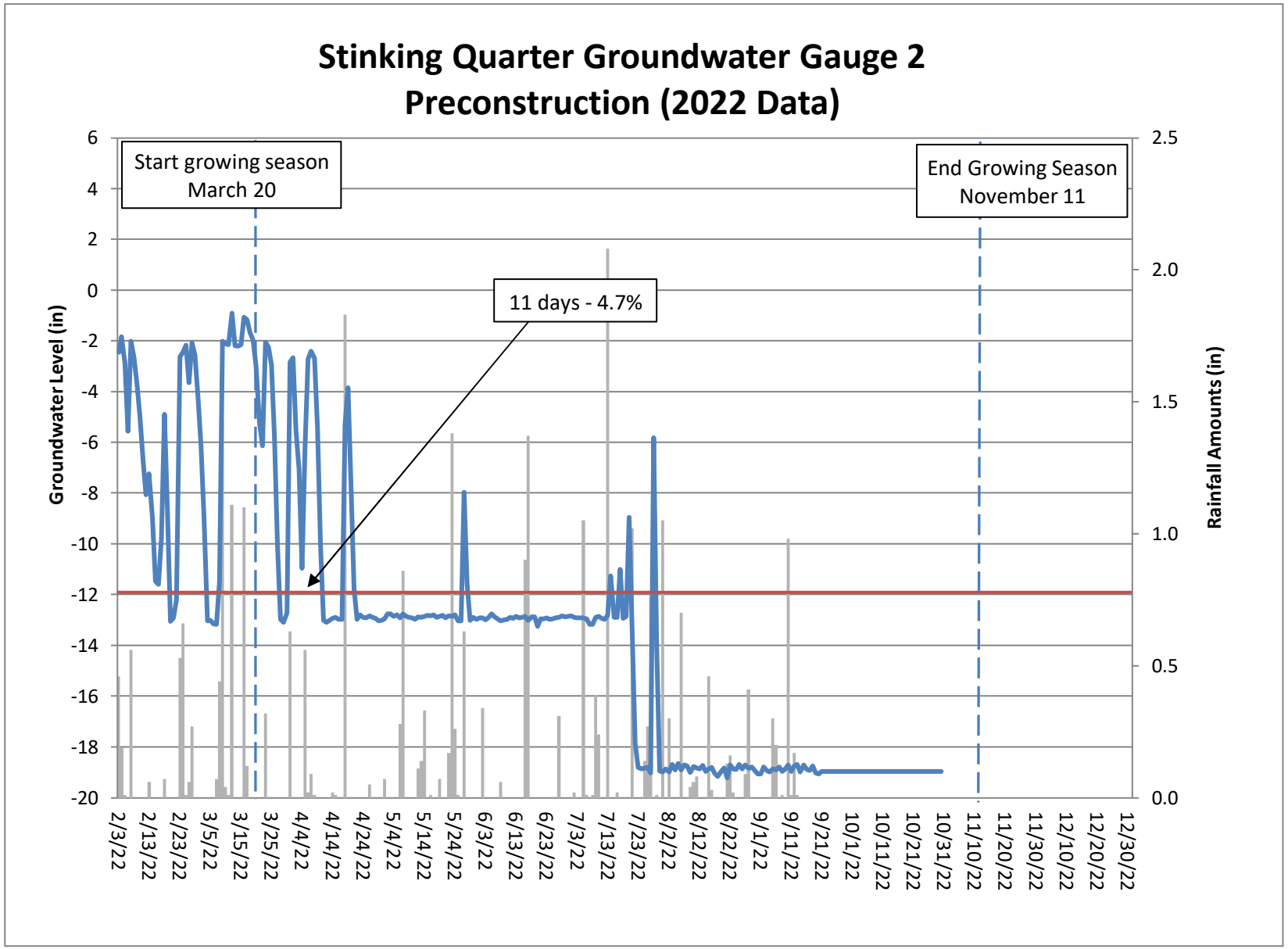
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 2
Preconstruction (2022 Data)
Start growing season
March 20
End Growing Season
November 11
11 days - 4.7%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
1.0
0.5
0.0
2/3/22
2/13/22
2/23/22
3/5/22
3/15/22
3/25/22
4/4/22
4/14/22
4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
9/11/22
9/21/22
10/1/22
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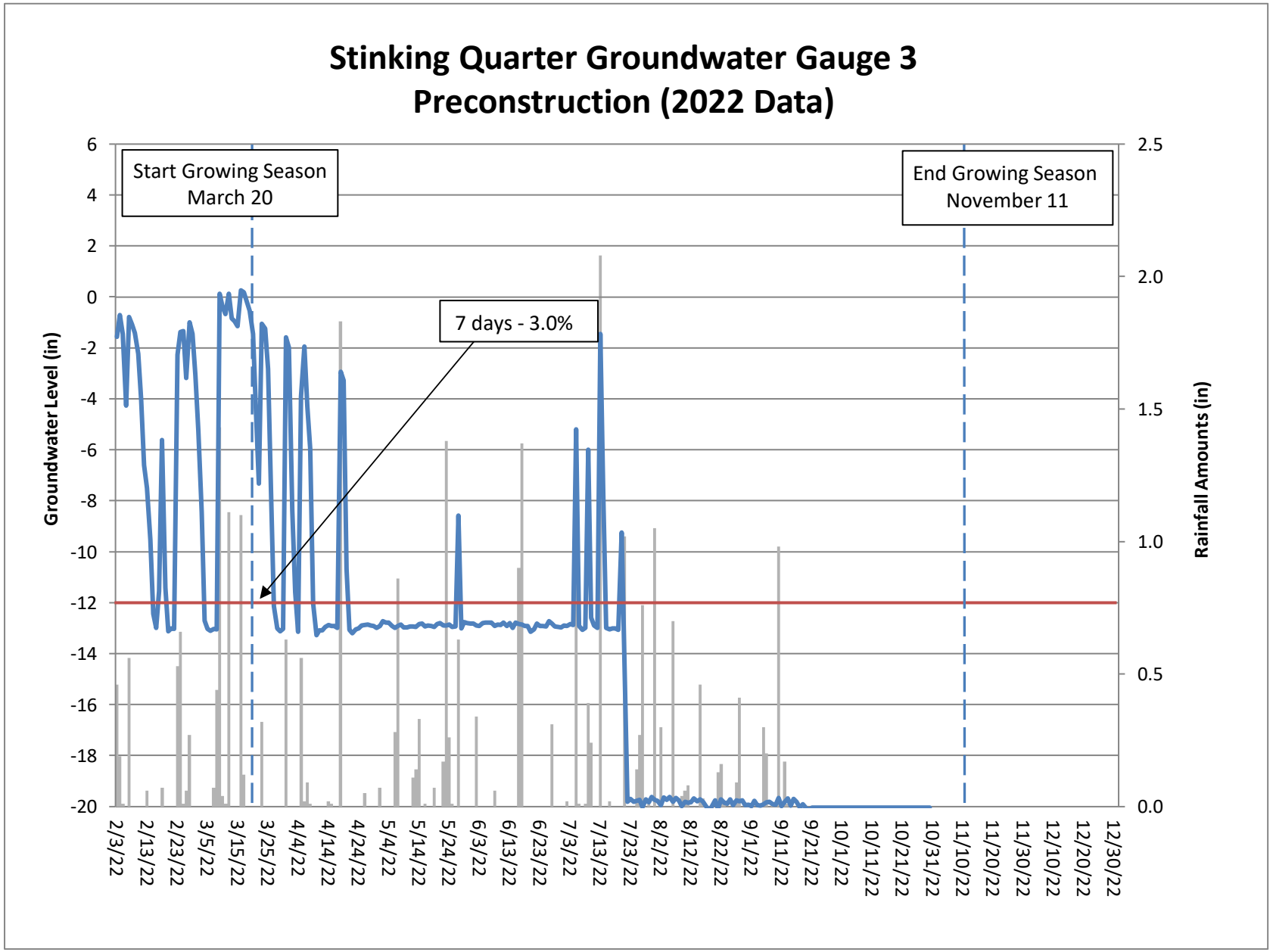
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 3
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
7 days - 3.0%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
1.0
0.5
0.0
2/3/22
2/13/22
2/23/22
3/5/22
3/15/22
3/25/22
4/4/22
4/14/22
4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
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9/11/22
9/21/22
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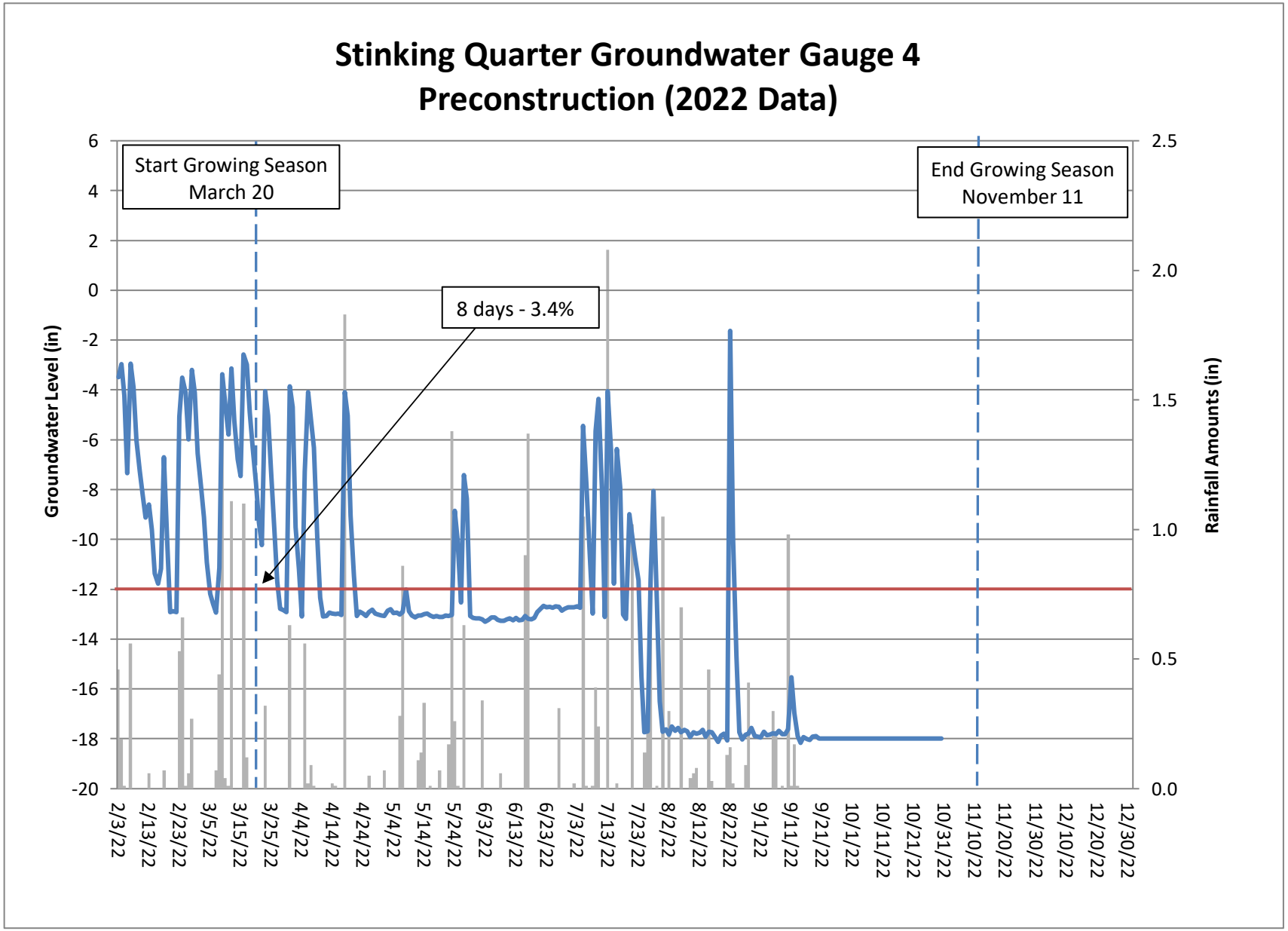
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 4
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
8 days - 3.4%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
1.0
0.5
0.0
2/3/22
2/13/22
2/23/22
3/5/22
3/15/22
3/25/22
4/4/22
4/14/22
4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
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6/23/22
7/3/22
7/13/22
7/23/22
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9/21/22
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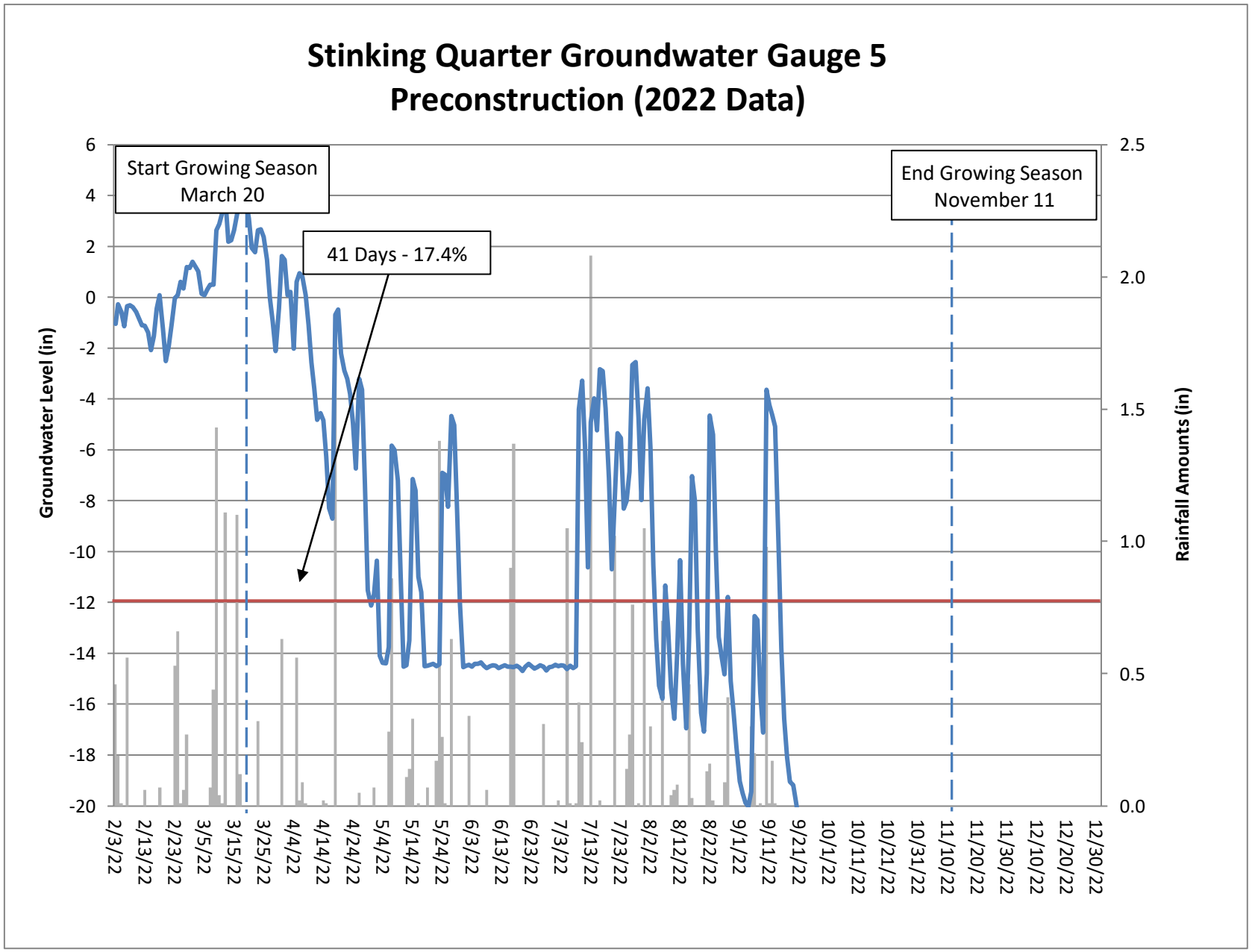
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 5
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
41 Days - 17.4%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
1.0
0.5
0.0
2/3/22
2/13/22
2/23/22
3/5/22
3/15/22
3/25/22
4/4/22
4/14/22
4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
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9/1/22
9/11/22
9/21/22
10/1/22
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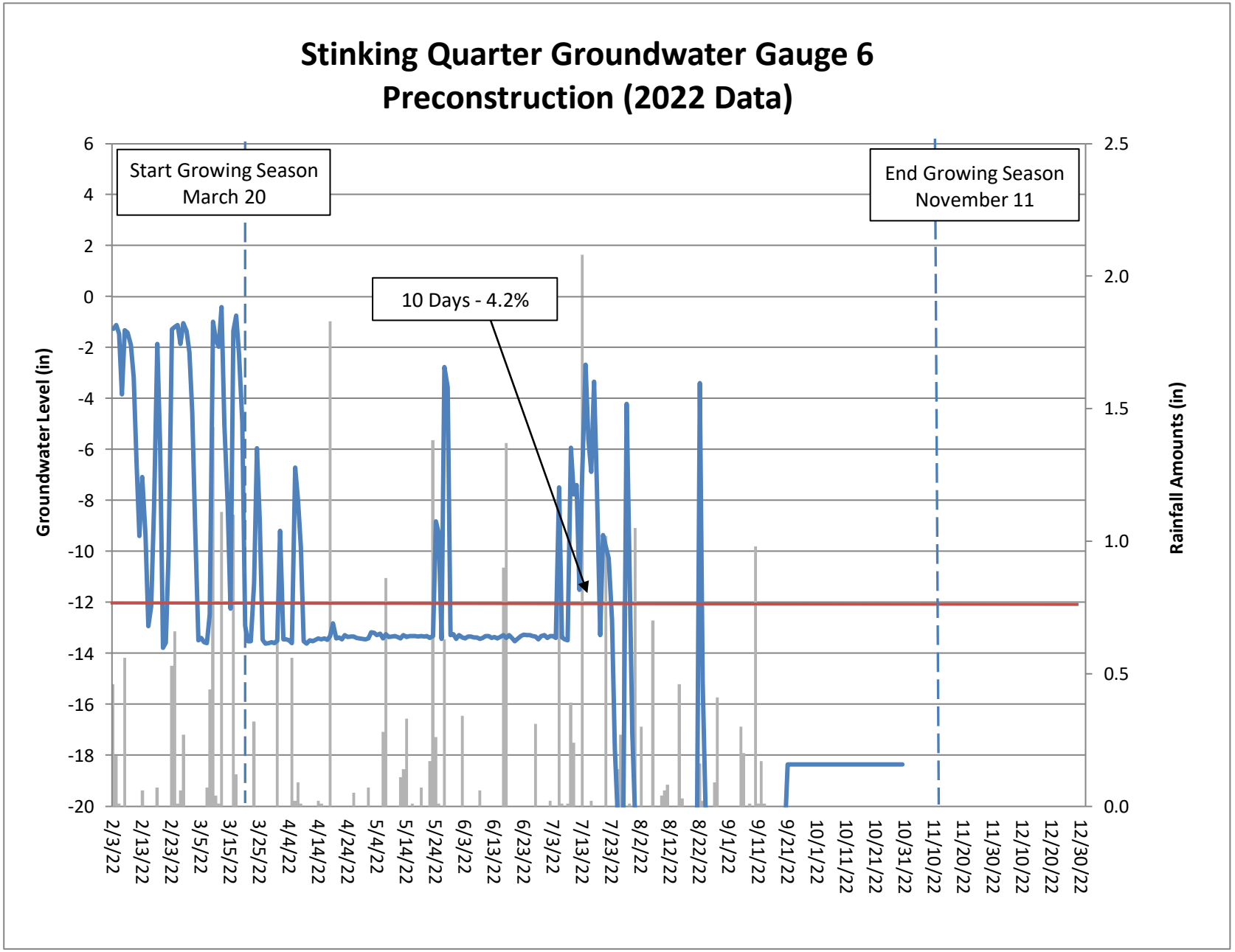
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 6
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
10 Days - 4.2%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
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5/24/22
6/3/22
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6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
9/11/22
9/21/22
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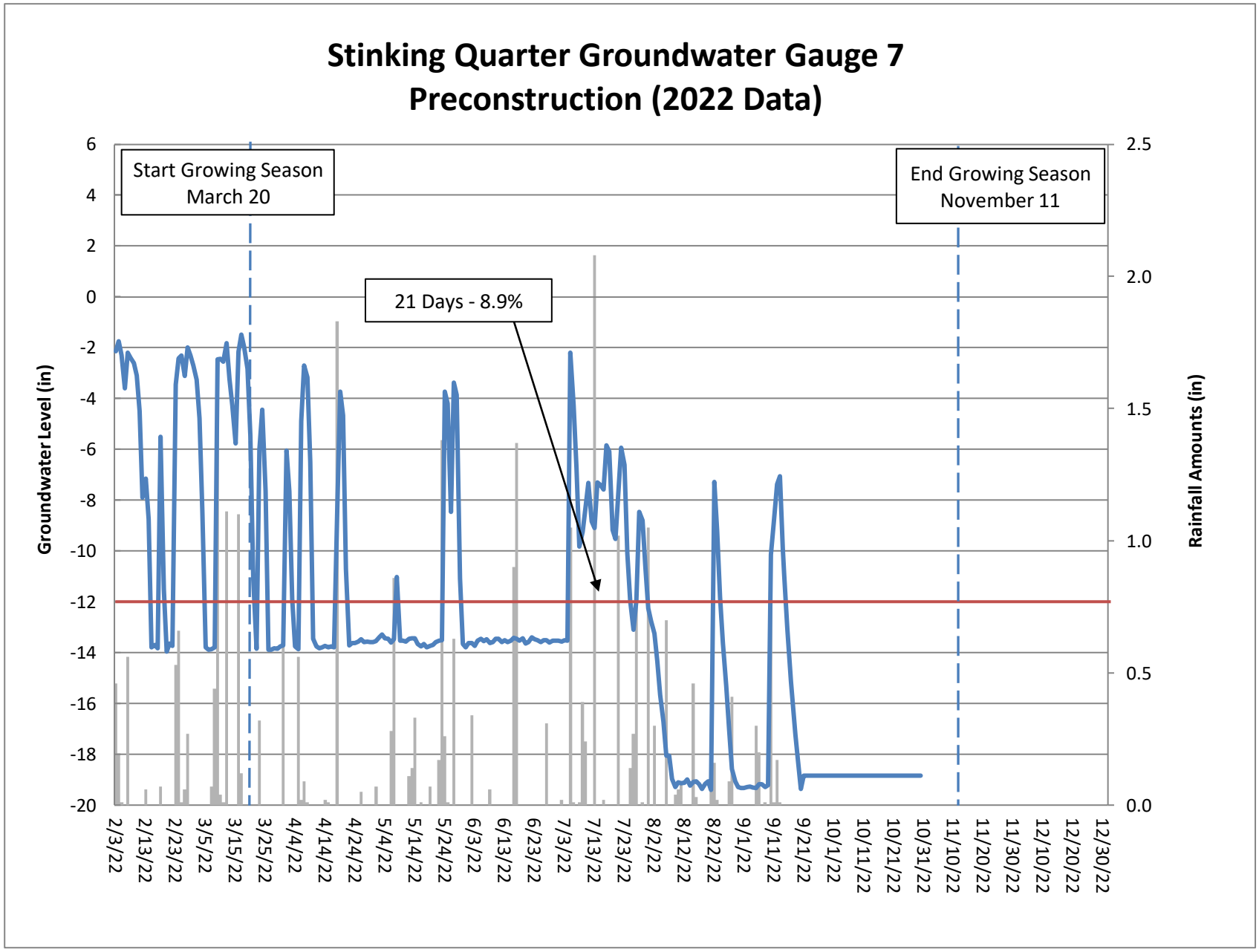
12/30/22


Stinking Quarter Groundwater Gauge 7
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
21 Days - 8.9%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
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4/14/22
4/24/22
5/4/22
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7/3/22
7/13/22
7/23/22
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8/12/22
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9/21/22
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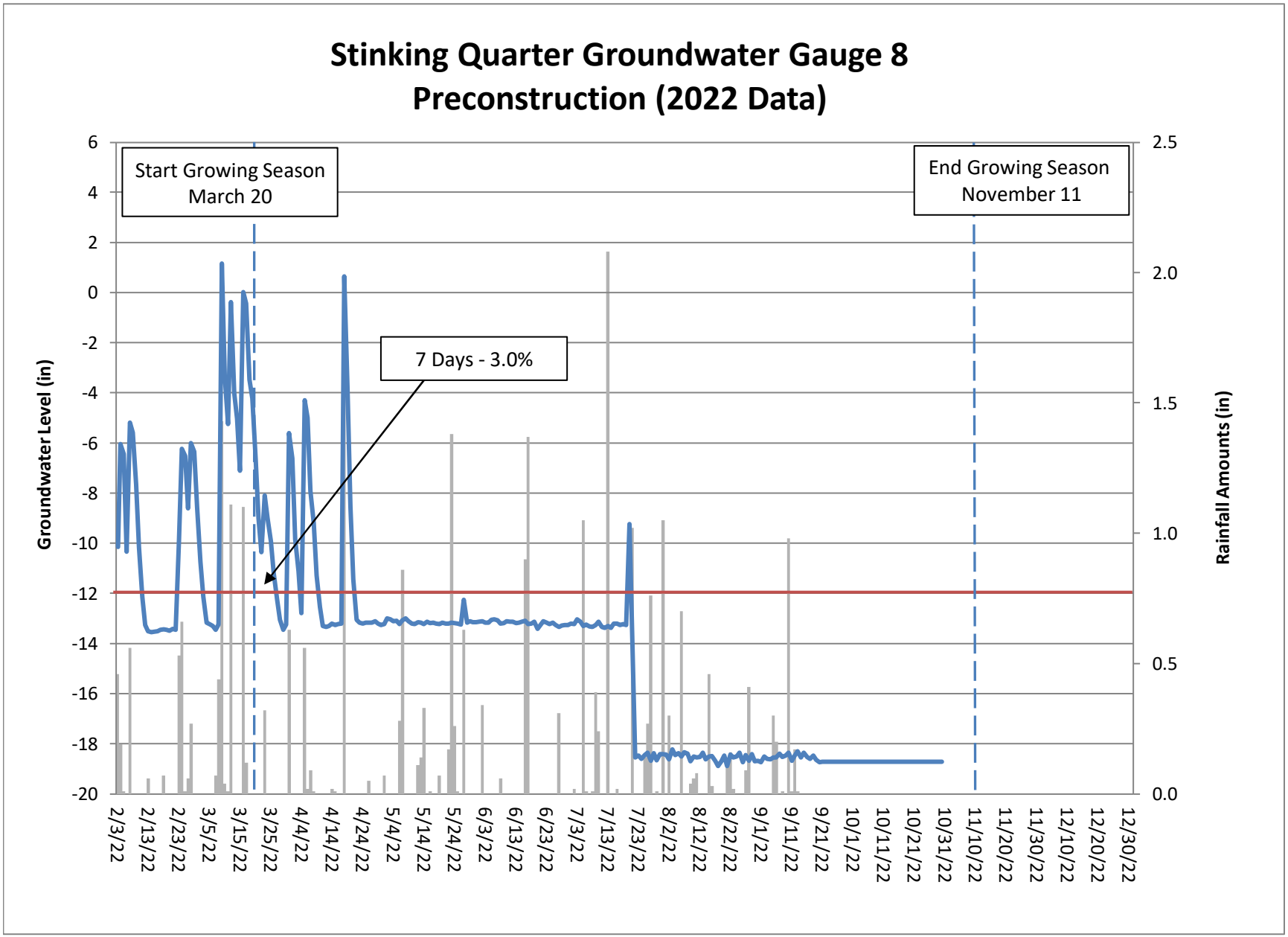
12/30/22


Stinking Quarter Groundwater Gauge 8
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
7 Days - 3.0%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
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3/5/22
3/15/22
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4/24/22
5/4/22
5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
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9/21/22
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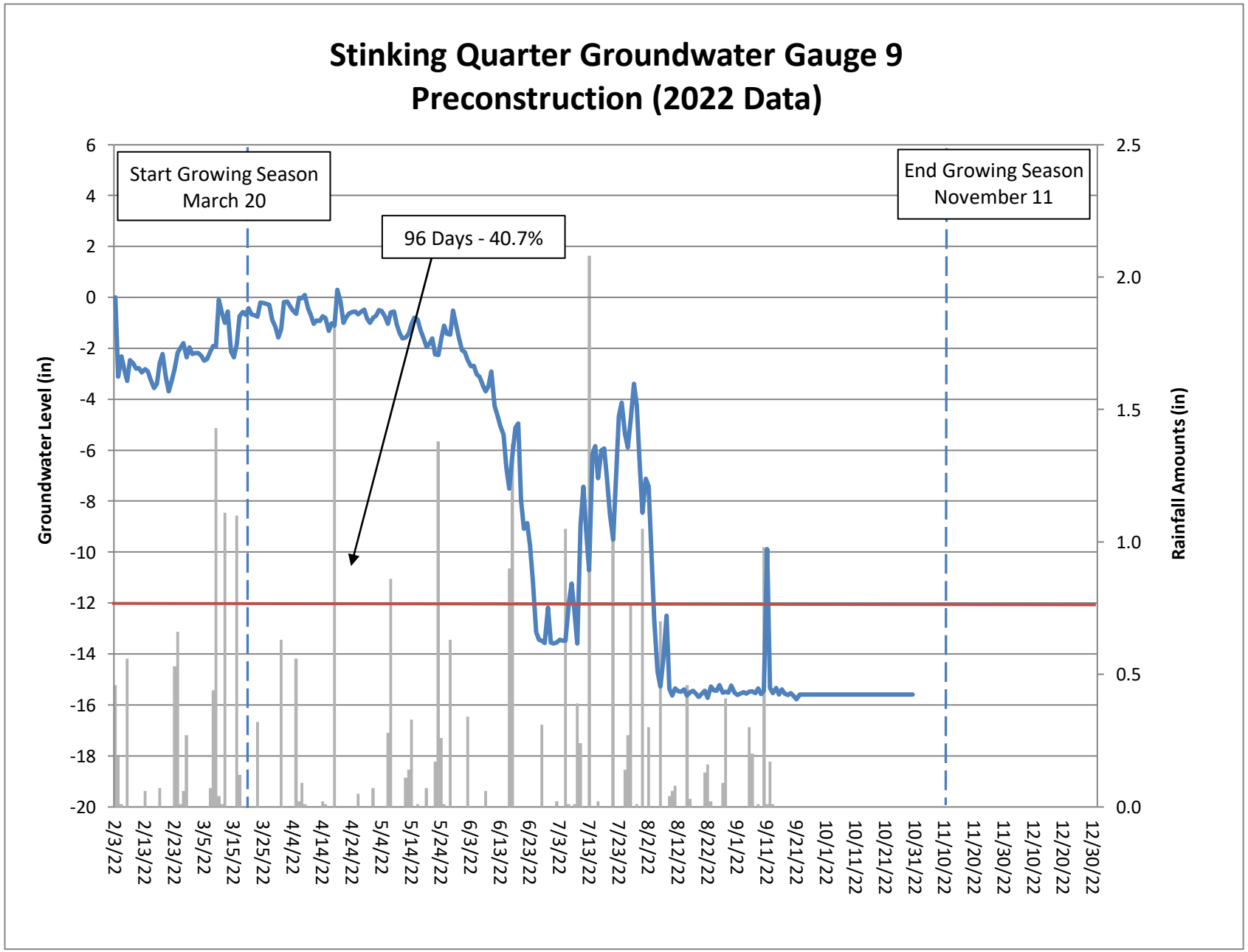
12/30/22


Stinking Quarter Groundwater Gauge 9
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
96 Days - 40.7%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
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5/24/22
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6/23/22
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7/23/22
8/2/22
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9/21/22
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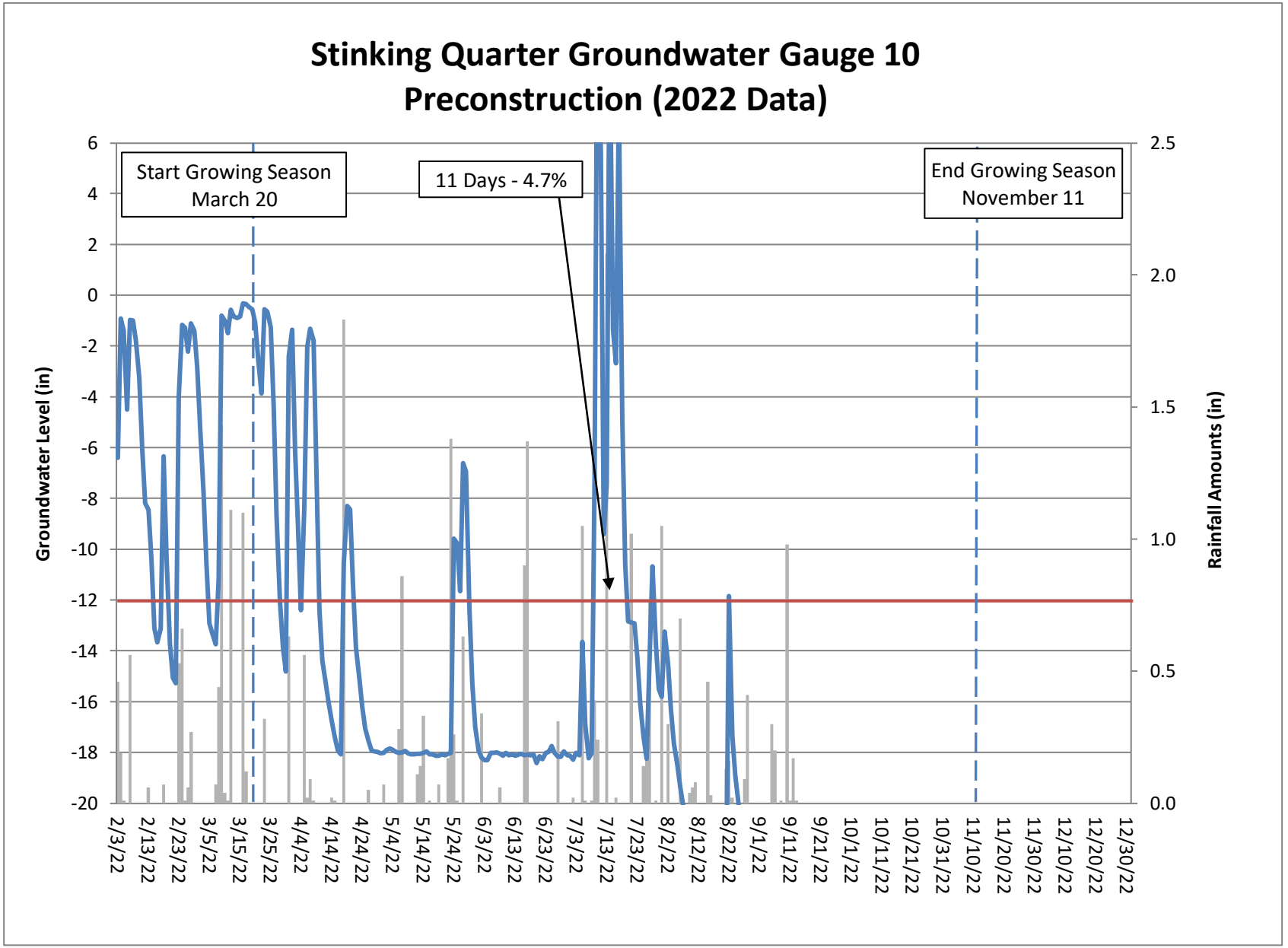
12/30/22


Stinking Quarter Groundwater Gauge 10
Preconstruction (2022 Data)
Start Growing Season
March 20
11 Days - 4.7%
End Growing Season
November 11
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
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4/24/22
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6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
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9/1/22
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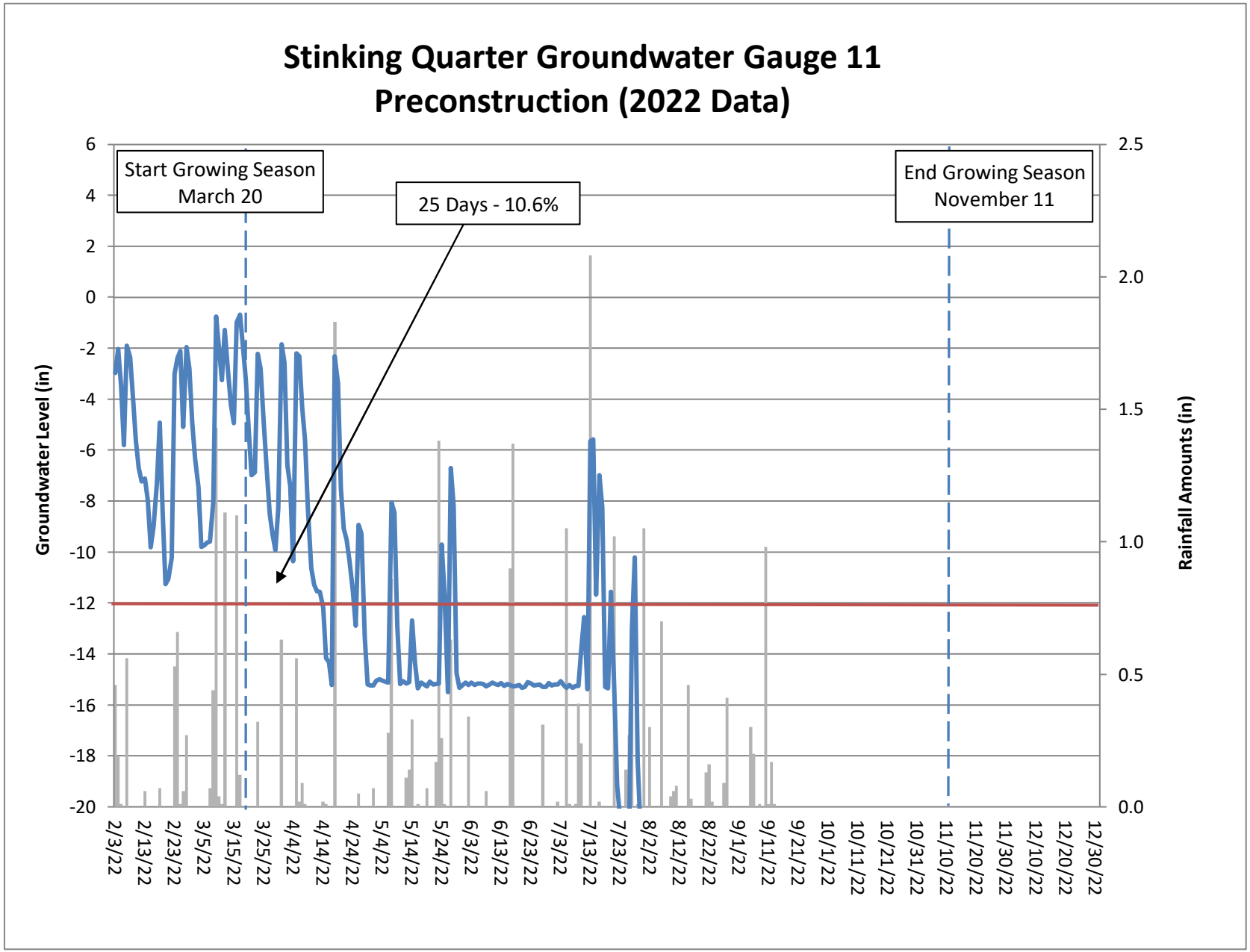
Stinking Quarter Groundwater Gauge 11
Preconstruction (2022 Data)
Start Growing Season
March 20
25 Days - 10.6%
End Growing Season
November 11
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
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2.0
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6/23/22
7/3/22
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7/23/22
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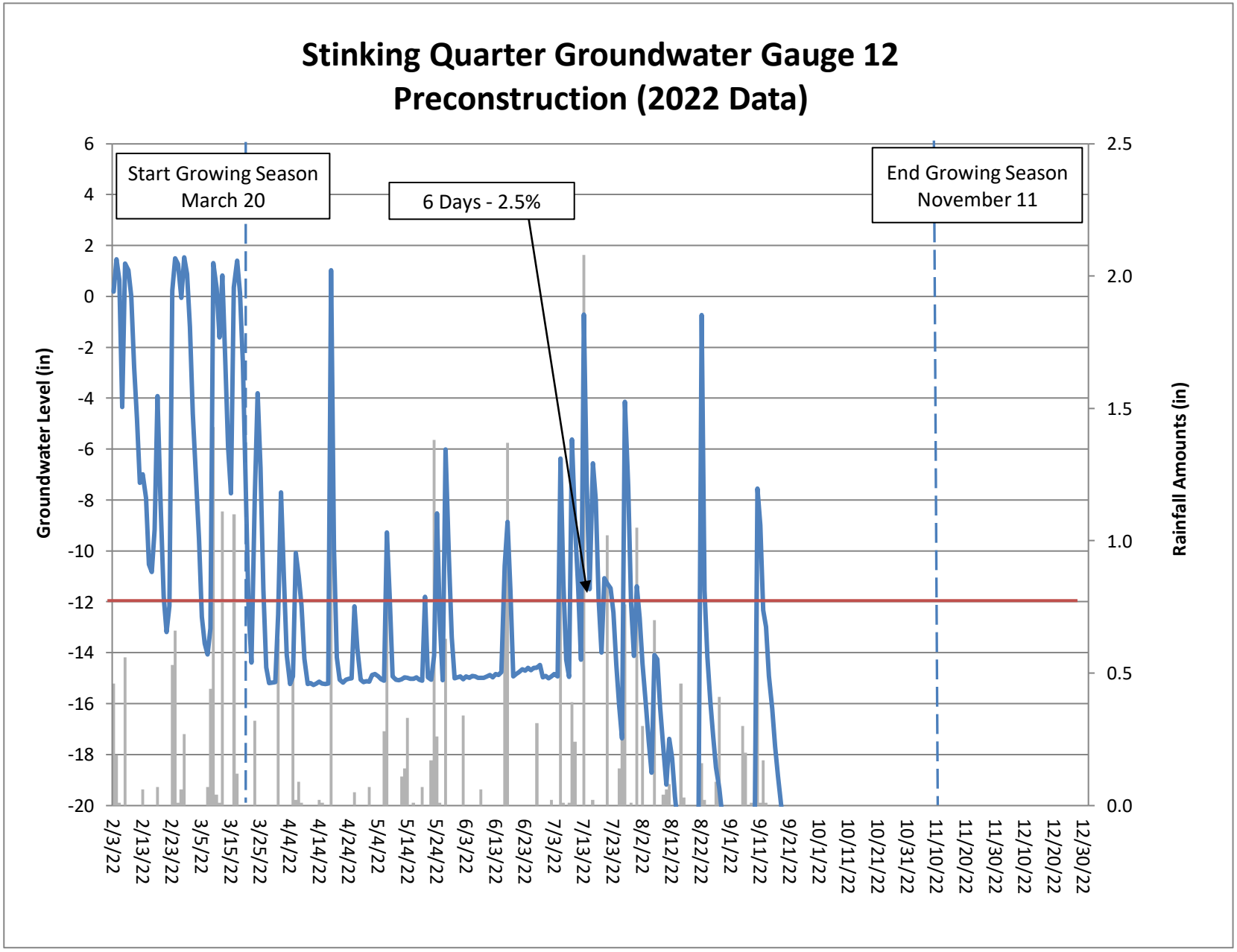
Stinking Quarter Groundwater Gauge 12
Preconstruction (2022 Data)
Start Growing Season
March 20
6 Days - 2.5%
End Growing Season
November 11
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
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-6
-8
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-16
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7/3/22
7/13/22
7/23/22
8/2/22
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9/1/22
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9/21/22
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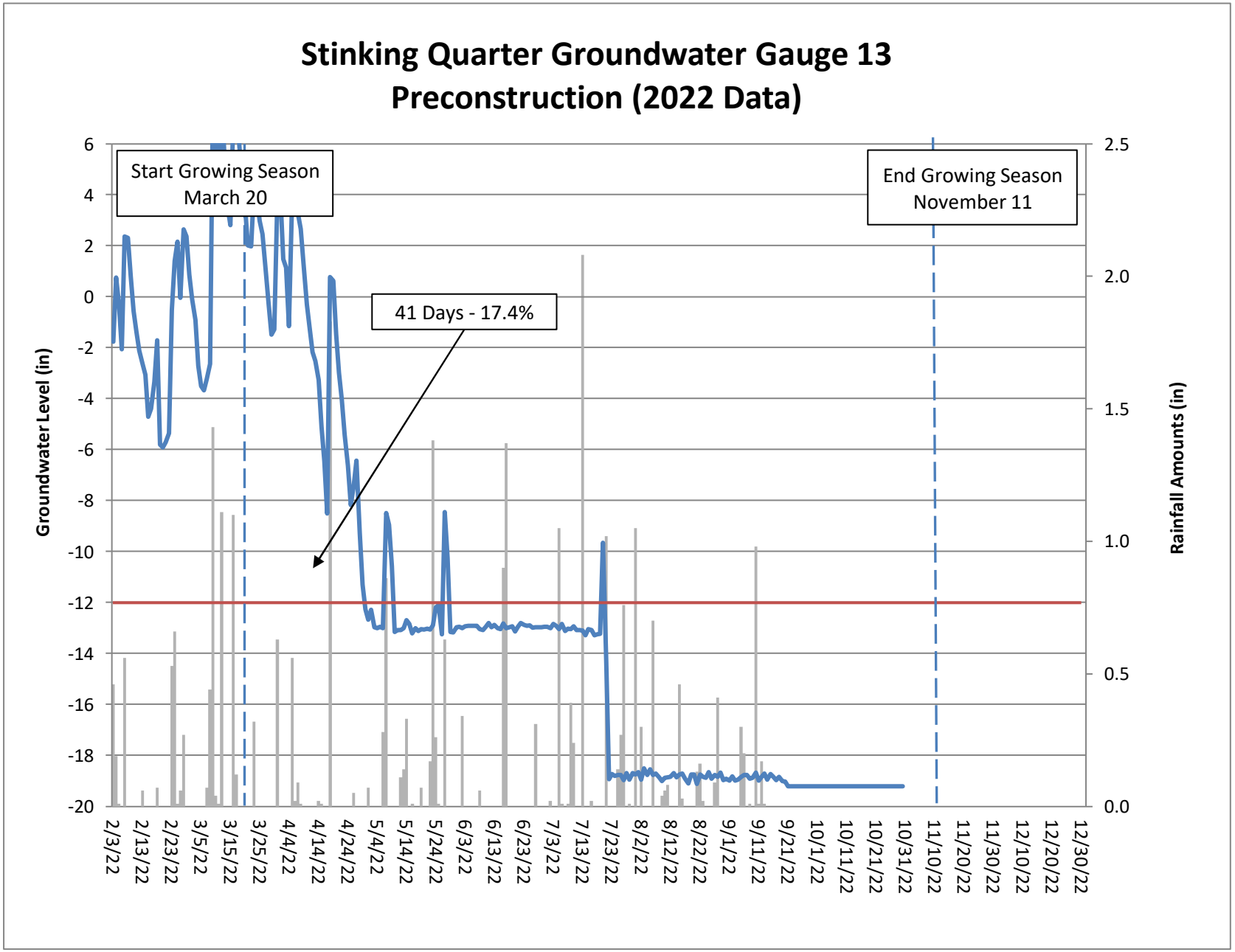
12/30/22


Stinking Quarter Groundwater Gauge 13
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
41 Days - 17.4%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
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-18
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6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
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9/21/22
10/1/22
10/11/22
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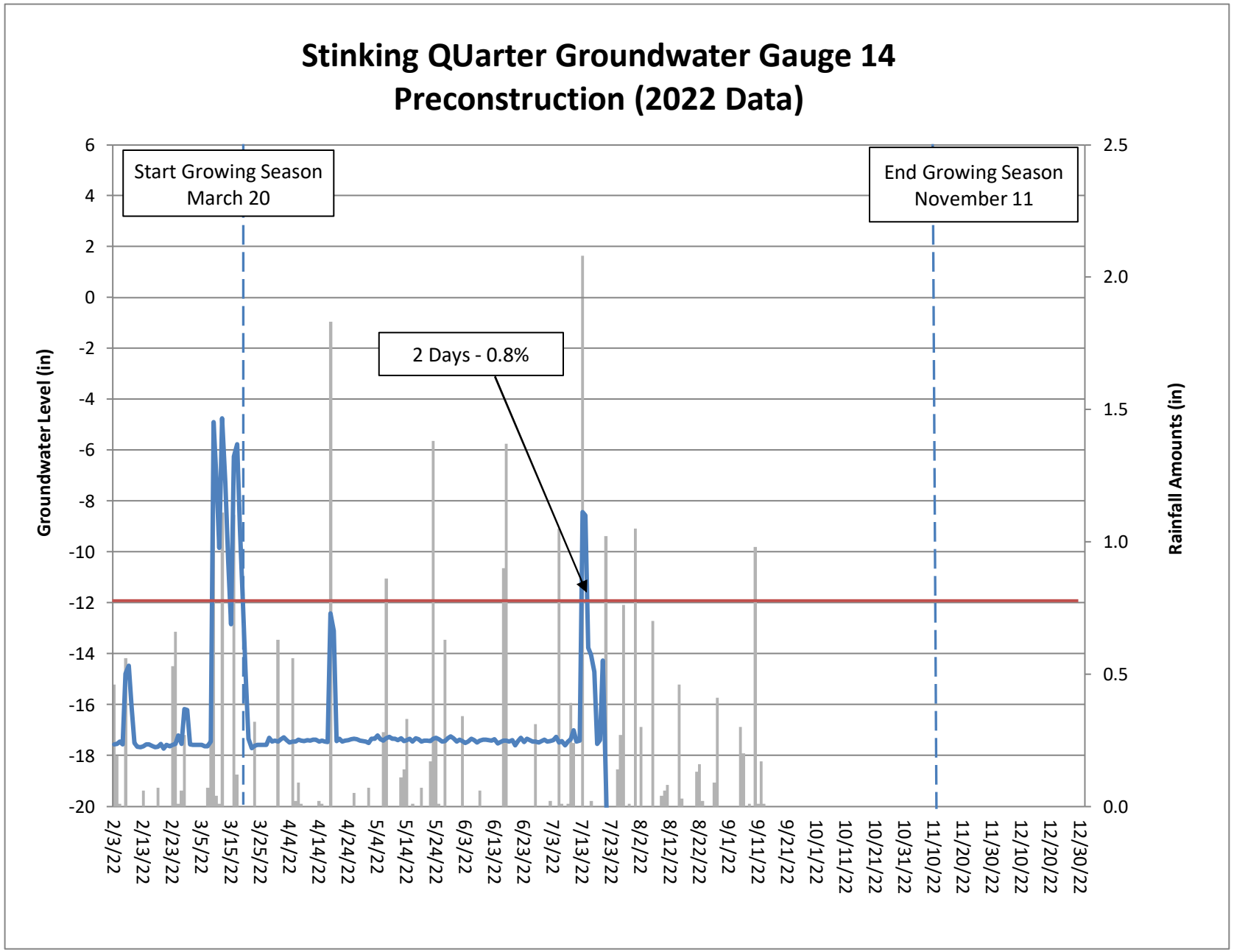
12/30/22


Stinking QUarter Groundwater Gauge 14
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
2 Days - 0.8%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
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5/4/22
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7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
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9/21/22
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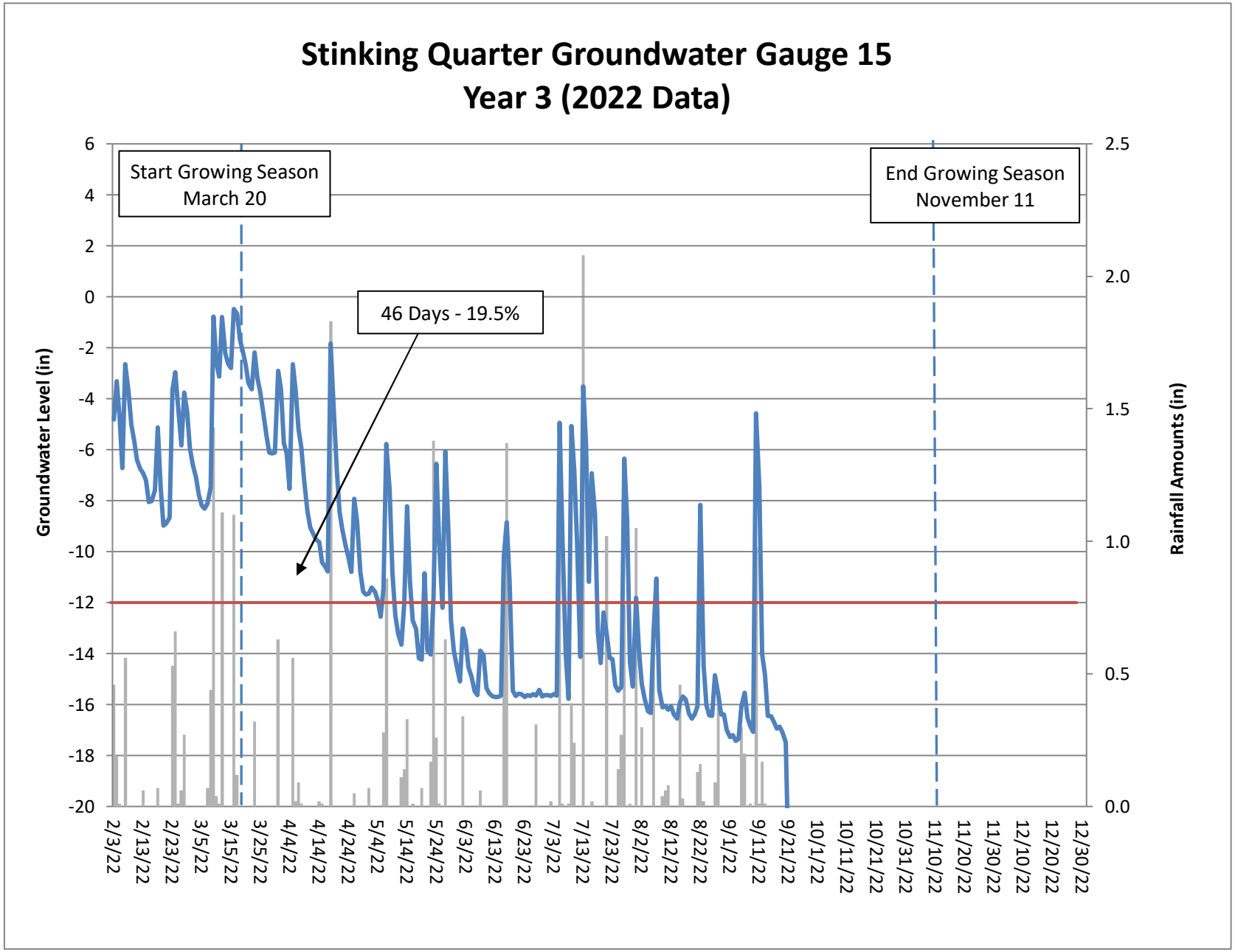
12/30/22


Stinking Quarter Groundwater Gauge 15
Year 3 (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
46 Days - 19.5%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
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3/5/22
3/15/22
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5/4/22
5/14/22
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6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
9/11/22
9/21/22
10/1/22
10/11/22
10/21/22
10/31/22
11/10/22
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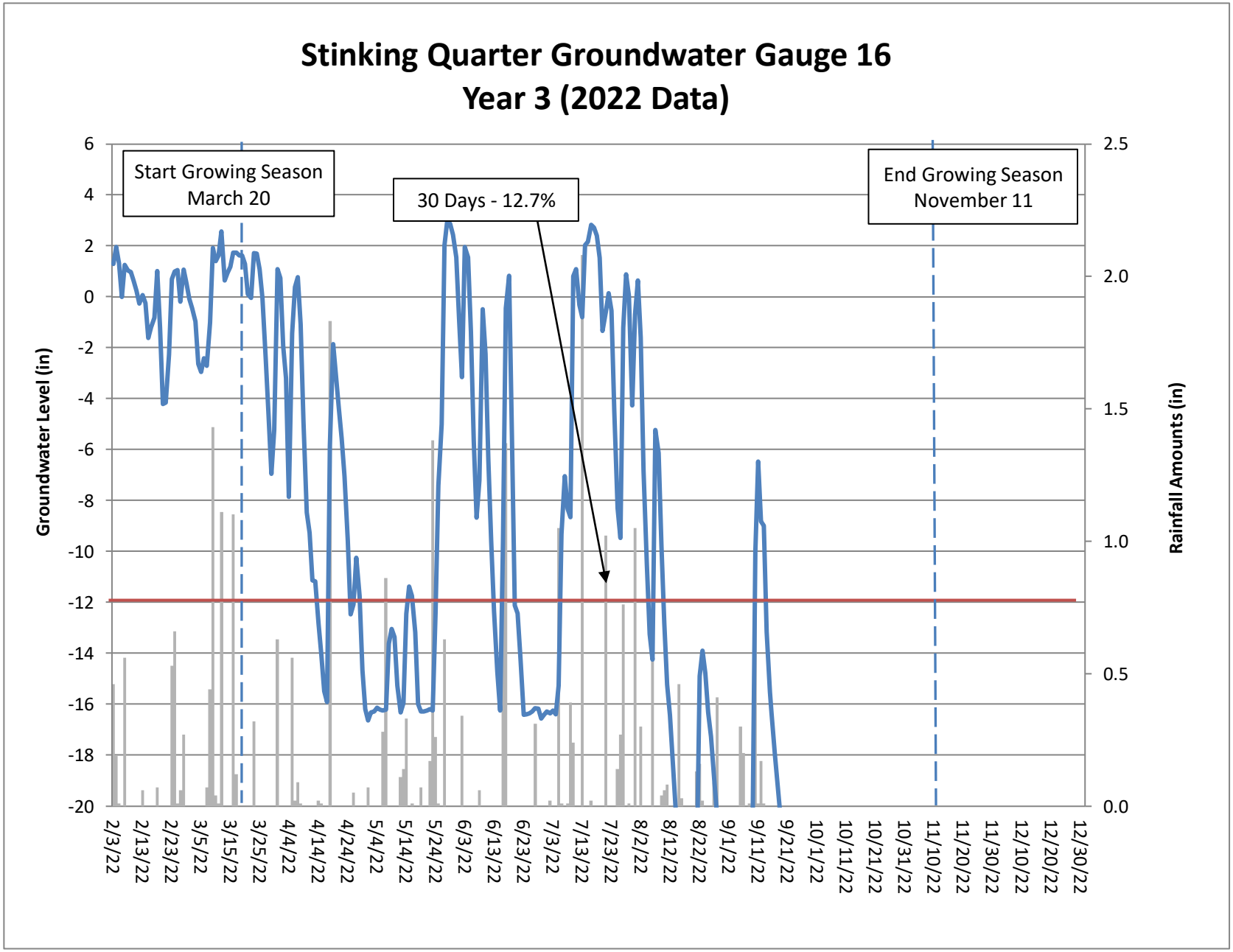
12/20/22
12/30/22


Stinking Quarter Groundwater Gauge 16
Year 3 (2022 Data)
Start Growing Season
March 20
30 Days - 12.7%
End Growing Season
November 11
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
1.5
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3/15/22
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5/14/22
5/24/22
6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
9/11/22
9/21/22
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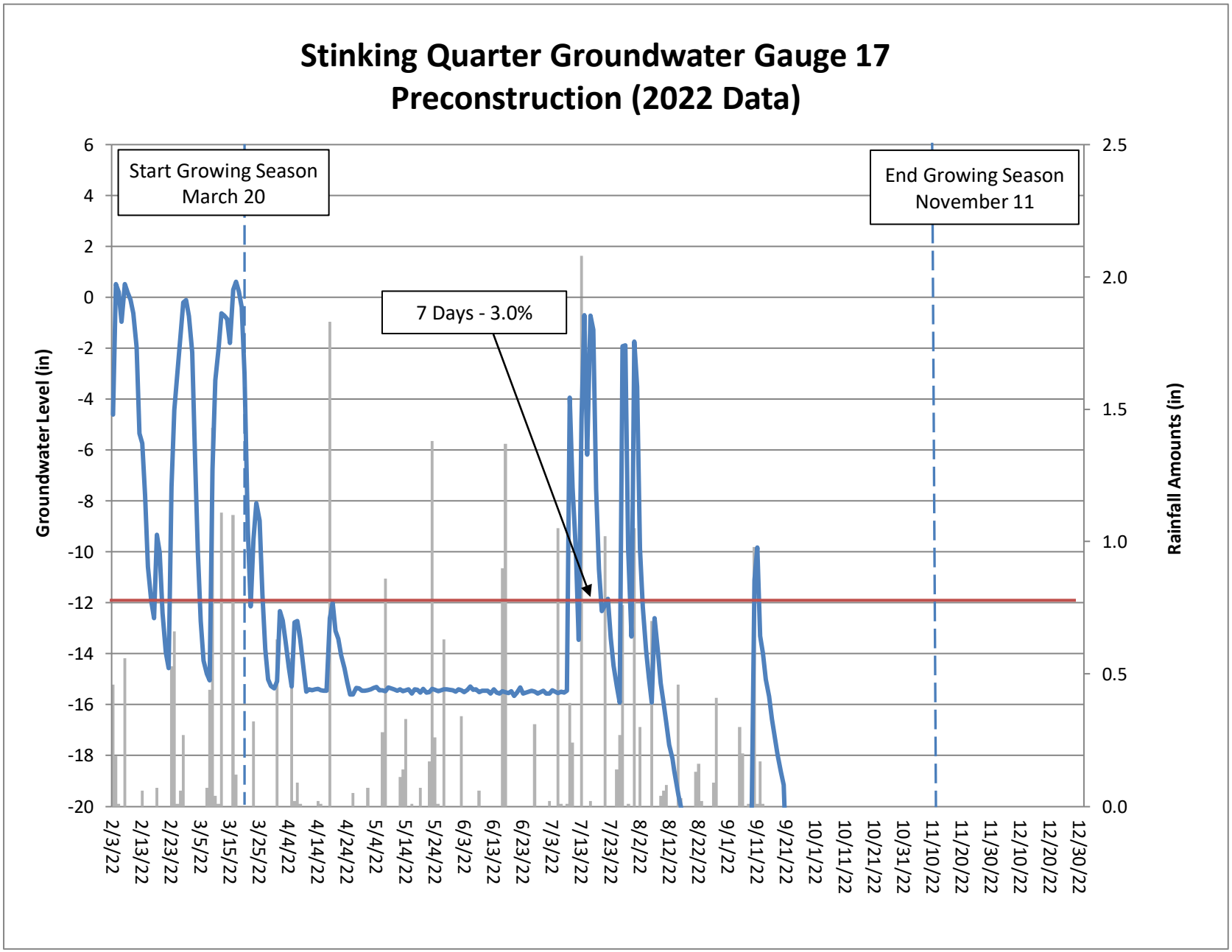
12/30/22


Stinking Quarter Groundwater Gauge 17
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
7 Days - 3.0%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
-20
2.5
2.0
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6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
8/12/22
8/22/22
9/1/22
9/11/22
9/21/22
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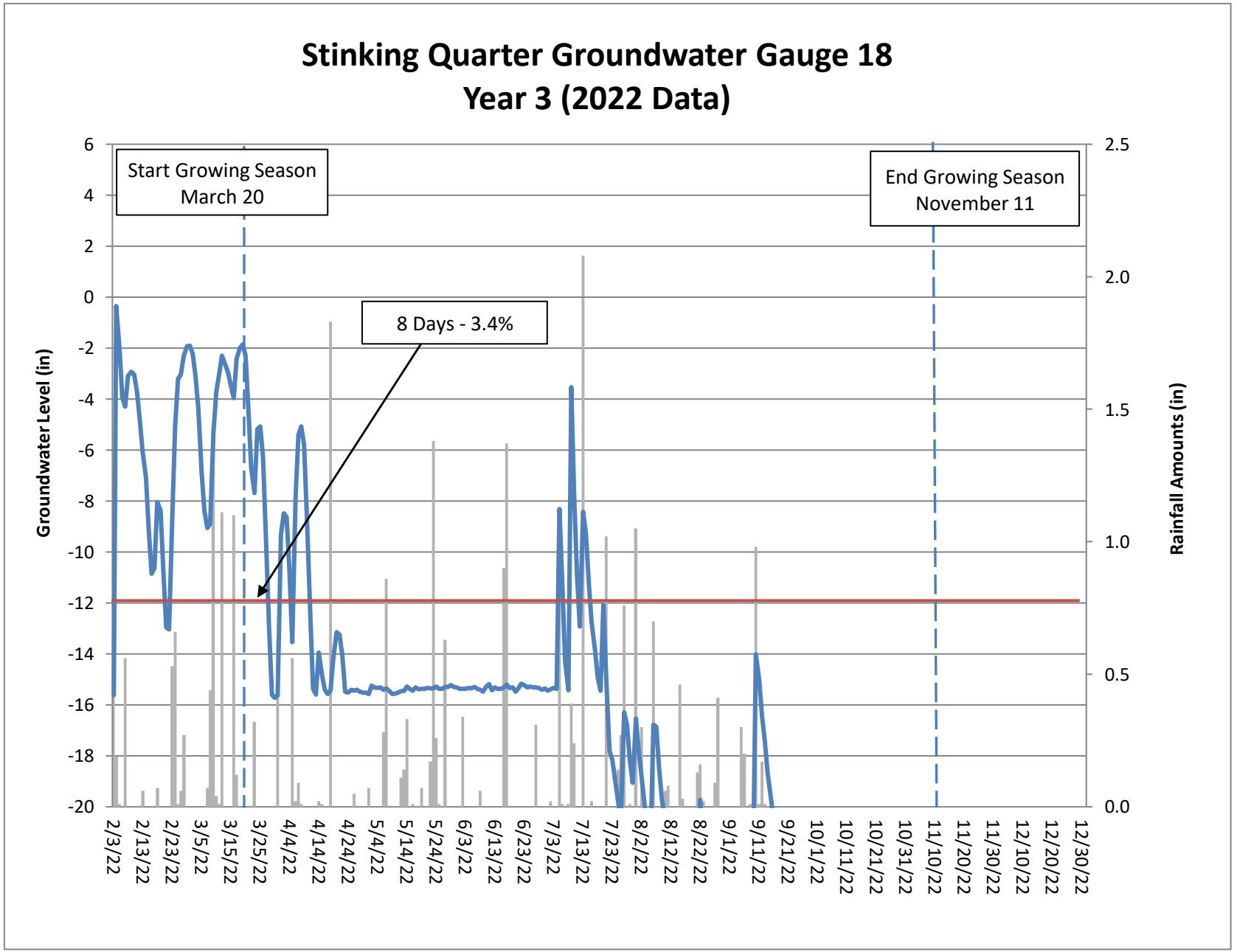
Stinking Quarter Groundwater Gauge 18
Year 3 (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
8 Days - 3.4%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
-18
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2.5
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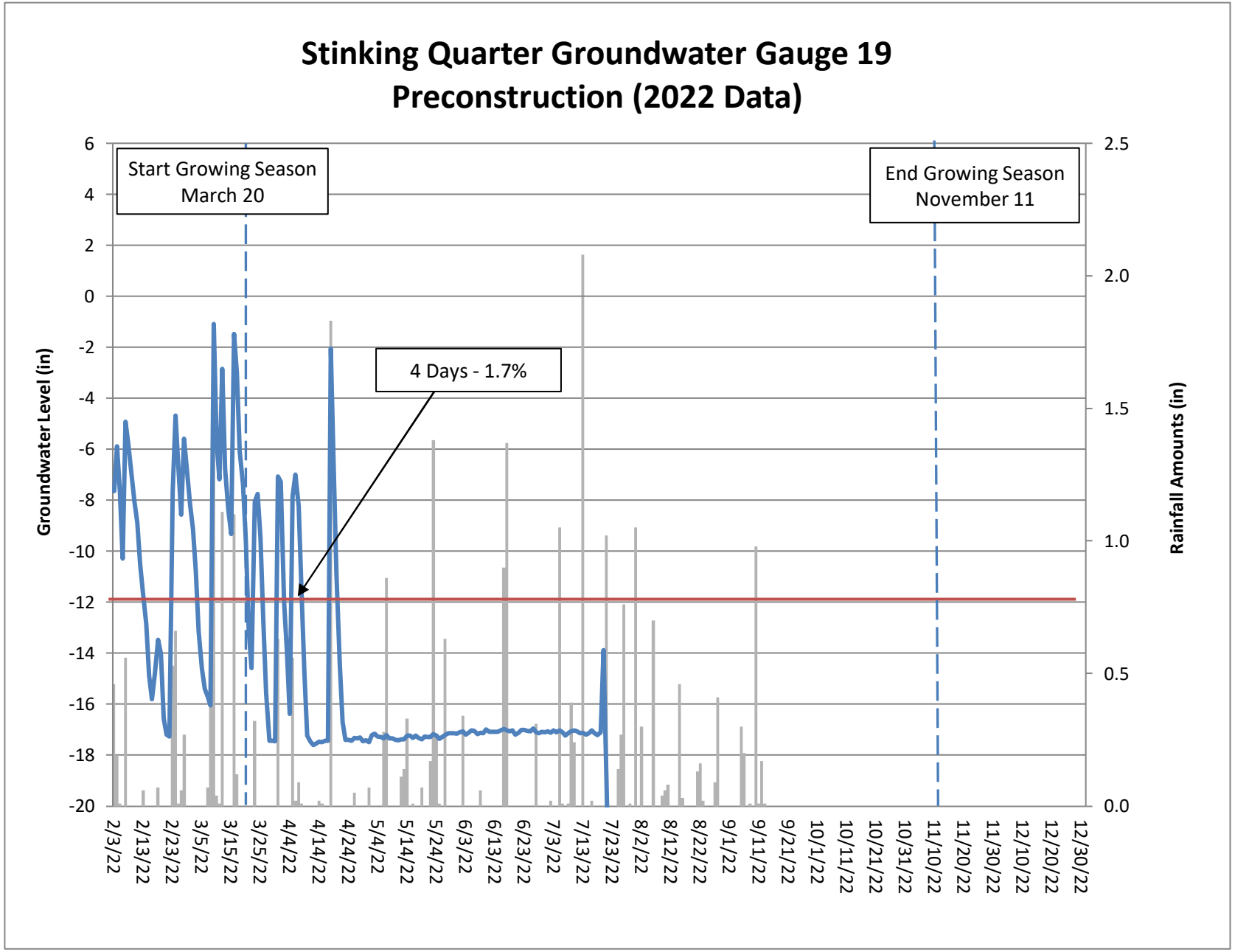
Stinking Quarter Groundwater Gauge 19
Preconstruction (2022 Data)
Start Growing Season
March 20
End Growing Season
November 11
4 Days - 1.7%
Groundwater Level (in)
Rainfall Amounts (in)
6
4
2
0
-2
-4
-6
-8
-10
-12
-14
-16
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-20
2.5
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6/3/22
6/13/22
6/23/22
7/3/22
7/13/22
7/23/22
8/2/22
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Appendix L: Post Contract IRT Visit Minutes

Task 1 a.) Inter-Agency Post Contract Site Visit: Site Visit Notes

As specified within RFP #16-20200201, an on-site meeting with regulatory agencies and DMS staff was conducted on April 19, 2021 for the Stinking Quarter Mitigation Site (DMS Contract #200201-01). Below is a list of attendees and general site visit notes.

Attendees:

USACE:
- Todd Tugwell

NC WRC:
- Travis Wilson

NC DMS:
- Lindsay Crocker
- Tim Baumgartner

NC DWR:
- Erin Davis

Restoration Systems:
- Worth Creech

Axiom Environmental:
- Grant Lewis
- Kenan Jernigan

General notes:

- Overall, the project was well received by the IRT. IRT members agreed with the restoration approach and ratios in the proposal with the exception of the specific changes described below.
- A map of locations of detailed soil borings will be included in the Mitigation Plan.
- Grading details must be provided in wetland reestablishment areas. Grading will need to be minimized, and in areas of priority 2 stream restoration, wetland creation is more appropriate.
- This project will likely require several different planting communities/zones. Consider levels of inundation when assessing target planting communities. Try to find reference communities.
- Wetland enhancement credit can be used to make up for losses in R credits if they are called out in the Mitigation Plan and meet IRT monitoring requirements.
- Provide a detailed plan for dewatering existing ponds in the mitigation plan. The use of silt bags to catch sediment and invasive vegetation is recommended.
- Work with landowners to minimize the number of crossings, and try to get them included in the easement if possible.

Specific notes:

- The reach of UT 1 just above the confluence with UT 4 should be enhancement (level II) instead of level I. This will likely reduce the amount of wetland reestablishment along this reach.
- UT 1 above existing pond should be enhancement (level II) at 5:1.

- Forested wetlands along the upstream reach of UT 1 should be enhancement as only hydrology, not vegetation, is being uplifted.
- UT 2 should be enhancement (level II) at 5:1.
- UT 12 - Be sure to minimize stream restoration through the preservation portion of the wetland.
- Install flow gauge in UT 12.
- Remove the short restoration reach on UT 13 where the culvert will be removed. Instead, address the incision starting at the head-cut upstream with Enhancement (Level I) and bring it through the removed culvert.
- Change ratio of upper reach of UT 13 to 7:1 to the head-cut.
- UT 14: address head-cut, modify below head-cut to be E1. Upper section, 7:1 where light work is proposed.
- Provide details of ATV trail demarcation along Stinking Quarter Creek within the easement in the Mitigation Plan.
- The lower reach of Stinking Quarter Creek (EII) should be evaluated for bank work where needed.
- Piped crossings are not recommended for streams the size of Stinking Quarter Creek. Crossings should be forded, and given the sandy substrate, a solid foundation will need to be built in the stream bed to support the fords.

Sincerely,



Worth Creech
Restoration Systems LLC

From:	Tugwell, Todd J CIV USARMY CESAW (USA)
To:	Crocker, Lindsay; Davis, Erin B; Wilson, Travis W.
Cc:	Browning, Kimberly D CIV USARMY CESAW (USA); Haywood, Casey M CIV (USA); Kenan Jernigan; "worth@restorationsystems.com"; Grant Lewis
Subject:	RE: Stinking Quarter IRT post-contract site visit notes
Date:	Thursday, April 29, 2021 10:15:07 AM

Thanks Lindsay. Good notes - just a couple clarifications/additions:
1. For the ATV trails to remain, once we get the draft mit plan and can see the extent/proximity of the trails to the streams we may want to discuss credit adjustments.
2. Wetlands located between UT 12 and UT 15 are in a large open field with depleted matrix. Wetland boundary would be adjusted so preservation starts past stream restoration limits. (
3. Stream restoration will not occur within the wetland preservation areas.
4. A JD needs to be done for the whole site confirm.
Thanks,

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://regulatory.ops.usace.army.mil/customer-service-survey/ Thank you for taking the time to visit this site and complete the survey.

-----Original Message-----
From: Crocker, Lindsay <Lindsay.Crocker@ncdenr.gov>
Sent: Tuesday, April 27, 2021 1:18 PM
To: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>
Cc: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Kenan Jernigan <kjernigan@axiomenvironmental.org>; 'worth@restorationsystems.com' <worth@restorationsystems.com>; Grant Lewis (glewis@axiomenvironmental.org) <glewis@axiomenvironmental.org>
Subject: [Non-DoD Source] Stinking Quarter IRT post-contract site visit notes

All,

Attached are the post-contract notes for the Stinking Quarter site visit that occurred 4/19/2021. Please provide additional comments and an email response to document agreement for the record. Thanks very much,

Lindsay

Technical Proposal located on SharePoint:

https://ncconnect.sharepoint.com/sites/IRT-DMS/SitePages/Home.aspx
<Blockedhttps://ncconnect.sharepoint.com/sites/IRT-DMS/SitePages/Home.aspx>

Lindsay Crocker

NC DEQ Division of Mitigation Services

217 West Jones St., Raleigh, NC 27603

919.594.3910

lindsay.crocker@ncdenr.gov <mailto:lindsay.crocker@ncdenr.gov>

Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties unless the content is exempt by statute or other regulation.

From:	Wilson, Travis W.
To:	Crocker, Lindsay; Tugwell, Todd J CIV USARMY CESAW (US); Davis, Erin B
Cc:	Kim Browning; Haywood, Casey M CIV (USA); Kenan Jernigan; "worth@restorationsystems.com"; Grant Lewis; Jones, Brena K.; Munzer, Olivia
Subject:	RE: Stinking Quarter IRT post-contract site visit notes
Date:	Friday, April 30, 2021 10:59:19 AM
Attachments:	Mussels .kmz

One addition: There were mussels present in the North Prong of Stinking Quarter Creek, both relic and live individuals were observed in the preservation portion. Above the preservation section is a restoration section below the pond additional survey work may be necessary to identify the species that are present and the extent of those populations (specifically in the restoration reach). I am CC Brena Jones our Central Aquatic Wildlife Diversity Research Coordinator to include her in this conversation.

Brena you may be familiar with the upper portions of this watershed, but I do not have any survey records in close proximity to this area. The mussels I observerd looked larger than most *Elliptio* I have seen, they were also extended well above the substrate in a very sandy portion of the stream. In the mid 2000's it looks like the inline pond just upstream breached, so I'm not sure if they are a pond mussel that washed down or what (not my area of expertise). I believe Lindsay took some pictures and I am including a KMZ with the location.

From: Crocker, Lindsay <Lindsay.Crocker@ncdenr.gov>
Sent: Tuesday, April 27, 2021 1:18 PM
To: Tugwell, Todd J CIV USARMY CESAW (US) <Todd.J.Tugwell@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>
Cc: Kim Browning <Kimberly.D.Browning@usace.army.mil>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Kenan Jernigan <kjernigan@axiomenvironmental.org>; 'worth@restorationsystems.com' <worth@restorationsystems.com>; Grant Lewis (glewis@axiomenvironmental.org) <glewis@axiomenvironmental.org>
Subject: Stinking Quarter IRT post-contract site visit notes

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Attached are the post-contract notes for the Stinking Quarter site visit that occurred 4/19/2021. Please provide additional comments and an email response to document agreement for the record. Thanks very much,

Lindsay

Technical Proposal located on SharePoint:

https://ncconnect.sharepoint.com/sites/IRT-DMS/SitePages/Home.aspx

Lindsay Crocker
NC DEQ Division of Mitigation Services

217 West Jones St., Raleigh, NC 27603
919.594.3910
lindsay.crocker@ncdenr.gov

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Appendix M: Construction Plans

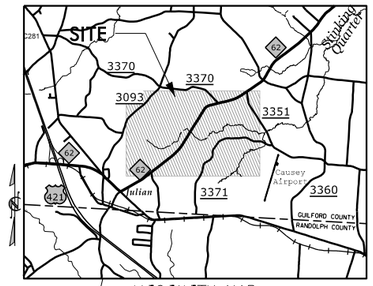
09/08/99

NC DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
CONSTRUCTION PLANS
STINKING QUARTER SITE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	STINKING QUARTER SITE	1	

LOCATION: GUILFORD COUNTY, NORTH CAROLINA

TYPE OF WORK: STREAM RESTORATION AND ENHANCEMENT (CLEARING, GRUBBING, GRADING, EROSION CONTROL AND PLANTING)

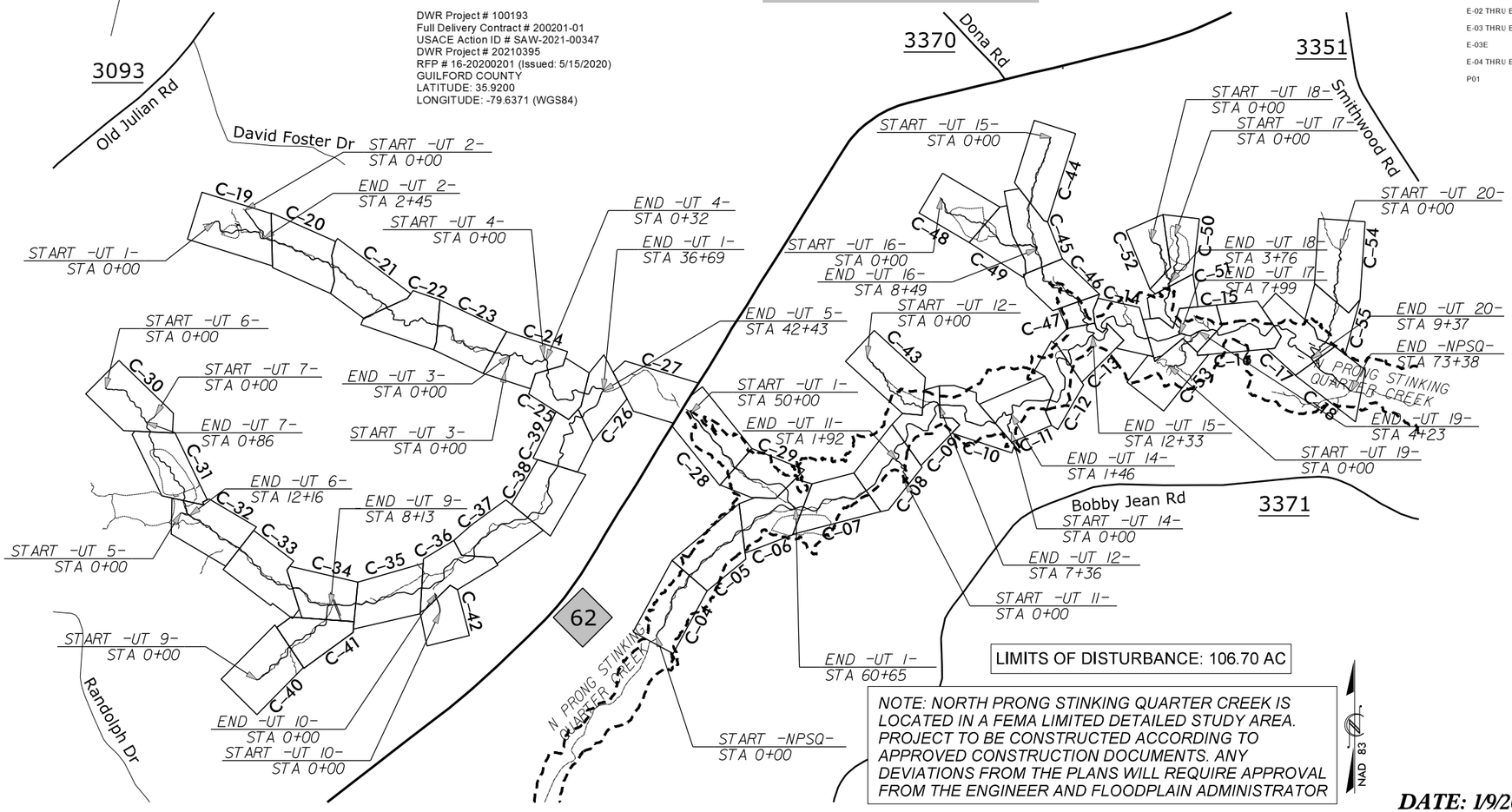


VICINITY MAP
Not to Scale

STINKING QUARTER SITE

DWR Project # 100193
Full Delivery Contract # 200201-01
USACE Action ID # SAW-2021-00347
DWR Project # 20210395
RFP # 16-20200201 (Issued: 5/15/2020)
GUILFORD COUNTY
LATITUDE: 35.9200
LONGITUDE: -79.6371 (WGS84)

IRT SUBMITTAL PLANS



LIMITS OF DISTURBANCE: 106.70 AC

NOTE: NORTH PRONG STINKING QUARTER CREEK IS LOCATED IN A FEMA LIMITED DETAILED STUDY AREA. PROJECT TO BE CONSTRUCTED ACCORDING TO APPROVED CONSTRUCTION DOCUMENTS. ANY DEVIATIONS FROM THE PLANS WILL REQUIRE APPROVAL FROM THE ENGINEER AND FLOODPLAIN ADMINISTRATOR

NAD 83

INDEX OF SHEETS

SHEET NUMBER	SHEET
C-01	Title Sheet
C-01A	Symbology
C-01B	Notes
C-02	Typicals
C-02A THRU C-02F	Details
C-02G	Driveway Realignment
C-03	Control Points and Location Map
C-03A THRU C-03F	Conservation Easement
C-03G	Limits of Disturbance
C-03H THRU C-03M	Wetland Reestablishment
C-04 THRU C-55	Plan and Profile Sheets
E-02 THRU E-02E	Erosion Control Notes
E-03 THRU E-03D	Erosion Control Details
E-03E	Haul Roads
E-04 THRU E-25	Erosion Control Plans
P01	Planting Plan

CONTRACT: STINKING QUARTER SITE

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

PROPOSED LENGTH OF -NPSQ- = 7,269	PROPOSED LENGTH OF -UT 10- = 137
PROPOSED LENGTH OF -UT 1- = 4,601	PROPOSED LENGTH OF -UT 11- = 185
PROPOSED LENGTH OF -UT 2- = 240	PROPOSED LENGTH OF -UT 12- = 726
PROPOSED LENGTH OF -UT 3- = 111	PROPOSED LENGTH OF -UT 14- = 134
PROPOSED LENGTH OF -UT 4- = 23	PROPOSED LENGTH OF -UT 15- = 1,717
PROPOSED LENGTH OF -UT 5- = 4,111	PROPOSED LENGTH OF -UT 16- = 844
PROPOSED LENGTH OF -UT 6- = 1,217	PROPOSED LENGTH OF -UT 17- = 787
PROPOSED LENGTH OF -UT 7- = 81	PROPOSED LENGTH OF -UT 18- = 373
PROPOSED LENGTH OF -UT 9- = 798	PROPOSED LENGTH OF -UT 19- = 407
	PROPOSED LENGTH OF -UT 20- = 924

TOTAL STREAM LENGTHS (LF) = 24,685

RESTORATION LEVEL	STREAM (credits)	RIPARIAN WETLAND (credits)	NONRIPARIAN WETLAND (credits)
RESTORATION (Ratio 1:1)	13,506.000	25.444 (Reestablishment)	0.000
ENHANCEMENT I	375.333	0.141 (Creation)	0.000
ENHANCEMENT II	3,051.200	8.079 (Enhancement)	0.000
PRESERVATION	223.500	.230 (Preservation)	
		5.650 (Rehabilitation)	
TOTALS	17,156.033	39.544	0.000
MITIGATION UNITS	17156 SMU	39.544 RIPARIAN WMUs	NONRIPARIAN WMUs

Axiom Environmental, Inc.
Axiom Environmental
218 Snow Ave
Raleigh, NC 27603
GRANT LEWIS
PROJECT DESIGNER

RESTORATION SYSTEMS LLC
Restoration Systems
1101 Haynes St.
Suite 211
Raleigh, NC 27604
BRAD BRESLOW
SITE CONSTRUCTION MANAGER

Prepared In the Office of:
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

JOSHUA G. DALTON, P.E.
PROJECT ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DATE: 1/9/2024

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 2601 JOSHUA G. DALTON

DATE:

1/9/2024
Stnk01r_PSH_C-01.dgn
jharvey

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Fence Gate
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign (S)
- Well (W)
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream (JS)
- Buffer Zone 1 (BZ 1)
- Buffer Zone 2 (BZ 2)
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch (FLOW)

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point

- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line (RW)
- New Right of Way Line with Pin and Cap (RW)
- New Right of Way Line with Concrete or Granite R/W Marker (RW)
- New Control of Access Line with Concrete C/A Marker (CA)
- Existing Control of Access (CA)
- New Control of Access (CA)
- Existing Easement Line (E)
- New Conservation Easement (CE)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer (S)

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*) (W)
- U/G Water Line LOS C (S.U.E*) (W)
- U/G Water Line LOS D (S.U.E*) (W)
- Above Ground Water Line (A/G Water)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (S.U.E.*) (G)
- Above Ground Gas Line (A/G Gas)

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?UTL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records (AATUR)
- End of Information (E.O.I.)
- Riffle Rip Rap
- Log Vane
- Log Cross Vane
- Step Pool Structure (Begin / End)
- Stream Plug
- Floodplain Interceptor
- Proposed Fence
- Proposed Fence at Crossings
- Limits of Disturbance (LOD)
- Fill Existing Channel

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: 919.851.1415
ENG FIRM LICENSE NO. C-890

Ardurra Environmental, Inc.

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STINKING QUARTER
GUILFORD COUNTY, NC

SYMBOLOGY

PROJECT # : 1221-21015
DRAWING NAME: STNKQTR PSH C-01A
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C-01A**

1/9/2024
StnkQtr_PSH_C-01a.dgn
harvey

General Watershed Notes:

1. *This property is in the NPDES, non-water supply watershed area.*

Riparian Buffer & Stream Notes:

1. *This property is located within the Jordan Lake where associated riparian buffer rules apply.*
2. *Jurisdictional streams, wetlands, and other waters of the U.S. are subject to USACE and NCDEQ regulations. Required approvals and permits must be obtained from USACE and NCDEQ prior to impacts to jurisdictional streams, wetlands and other waters of the U.S. The owner and contractor are responsible for ensuring all appropriate permits have been obtained prior to construction.*
3. *Buffer Authorization application must be approved by Guilford County (or NCDEQ for projects requiring their review of buffers) prior to land disturbance within a riparian buffer, unless the land disturbance is explicitly stated as an "Exempt" use in the Guilford County UDO and NCAC rules that apply.*

Floodplain Notes

1. *A 100-year Floodplain (SFHA) exists on the property based on FIRM Map # 8718 with effective date 1/2/08 (Zone AE) and FIRM Map #8719 with effective date 6/18/07 (Zone AE)*
2. *No development or land disturbance is allowed within the 100-year Floodplain (SFHA) unless approved by Guilford County via a Floodplain Development Permit. No deviations from the approved plan for proposed work in the 100-year Floodplain (SFHA) shall be made, unless otherwise requested by the applicant and approved in writing by Guilford County prior to work being performed.*
3. *No fill is allowed within the 100-year Floodplain (SFHA) per Guilford County UDO Section 9.3.P.1.p. except for projects that have received a Floodplain Development Permit from Guilford County per UDO Section 9.3.P.1.p.(2)(a) for minor fill where needed to protect or restore natural floodplain functions, such as part of a stream restoration project.*

SUNGATE DESIGN GROUP, P.A.
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Axiom Environmental, Inc.

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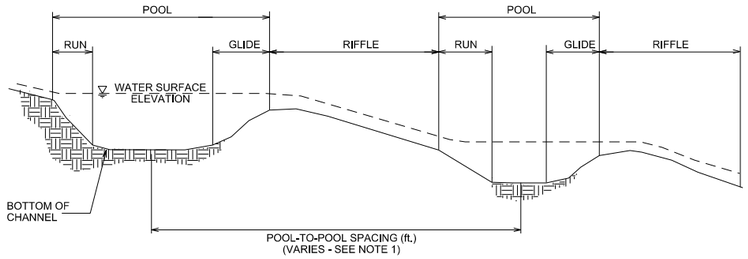
STINKING QUARTER
GUILFORD COUNTY, NC

NOTES

PROJECT # : 1221-21015
DRAWING NAME: STNKQTR PSH C-01B
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C-01B

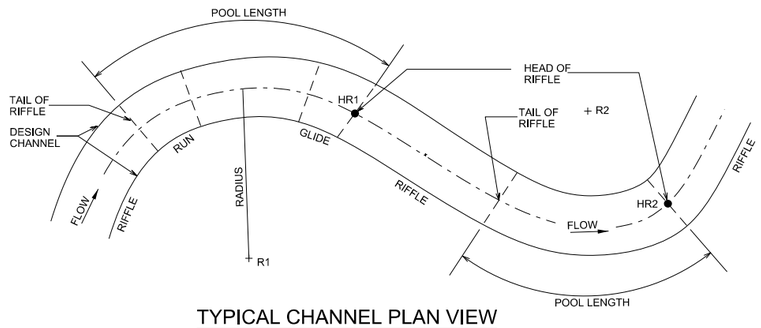
1/9/2024
StnkQtr_PSH_C-01b.dgn
Jarvis



TYPICAL CHANNEL PROFILE

NOTES:

1. POOL-TO-POOL SPACING IS MEASURED FROM CENTER OF POOL BEND TO CENTER OF POOL BEND.

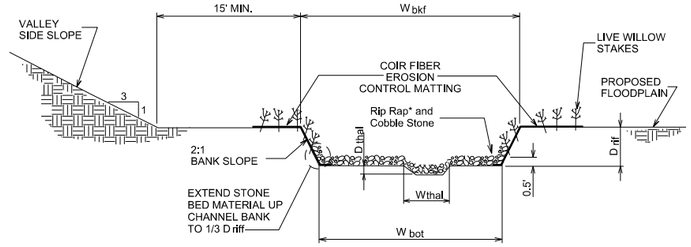


TYPICAL CHANNEL PLAN VIEW

CHANNEL PLAN VIEW NOTES:

1. THE CONTRACTOR SHALL LAYOUT THE CHANNEL ALIGNMENT BY LOCATING THE RADII AND SCRIBING THE CENTER LINE FOR EACH POOL BEND. THE CONNECTING TANGENT SECTIONS SHALL COMPLETE THE LAYOUT OF THE CHANNEL.

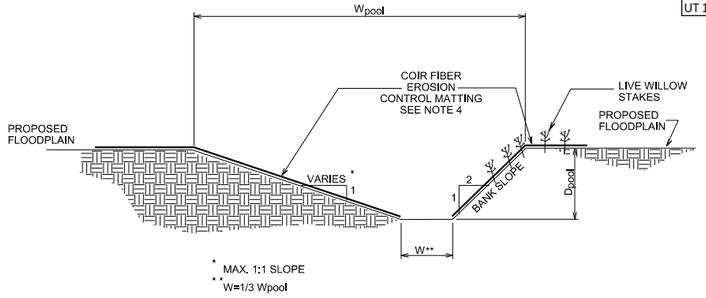
2. FIELD ADJUSTMENTS OF THE ALIGNMENT MAY BE REQUIRED TO SAVE TREES OR AVOID OBSTACLES. THE STAKE-OUT SHALL BE APPROVED BY THE CONSTRUCTION MANAGER BEFORE CONSTRUCTION OF THE CHANNEL.



TYPICAL RIFFLE CROSS-SECTION

THE TYPICAL CROSS SECTION IS TO BE SUITABLE FOR BOTH P1 AND P2 STREAM RESTORATION CONSTRUCTION. THIS IS A TYPICAL CROSS SECTION AND IS MEANT FOR THE CONTRACTOR TO TIE THE CHANNEL TO THE EXISTING FLOODPLAIN WITH A SUITABLE BANKFULL BENCH. UNDER P1 CONSTRUCTION THERE IS NO BENCH AS THE CHANNEL TIES TO THE FLOODPLAIN NATURALLY

* Riffle Rip Rap			
Reach	Rip Rap CL 'B' %	Rip Rap CL 'A' %	Rip Rap Cobble %
NPSQ	30	30	40
UT 1 Upstream	30	30	40
UT 1 Downstream	30	30	40
UT 5 Upstream	30	30	40
UT 5 Downstream	30	30	40
UT 6	0	40	60
UT 9	20	20	60
UT 12, UT 18, UT 19	0	40	60
UT 15 Upstream, UT 16, UT 20	0	40	60
UT 15 Downstream	0	40	60
UT 17	0	40	60



TYPICAL POOL CROSS-SECTION

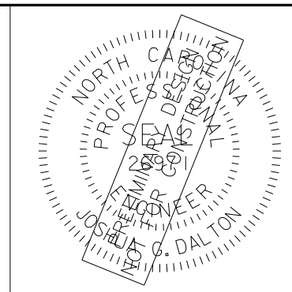
CHANNEL CONSTRUCTION NOTES:

1. MATERIAL EXCAVATED FROM CHANNEL AND FLOODPLAIN SHALL BE USED TO BACKFILL EXISTING CHANNEL.

2. BANK PROTECTION SHALL CONSIST OF NATURAL COIR FIBER MATTING.

3. THE CONTRACTOR SHALL SUPPLY BED MATERIAL FOR THE ENTIRE BED LENGTH OF EACH RIFFLE SECTION.

Cross Section Dimensions								
Stream Name	Stationing	W bkf (ft)	W bot (ft)	D riff (ft)	D thal (ft)	D pool (ft)	W pool (ft)	W thal (ft)
NPSQ		17.8	10.6	1.7	0.1	2.4	19.6	1.0
UT 1 Upstream	0+00 to 36+69	8.8	5.2	0.8	0.1	1.2	9.7	1.0
UT 1 Downstream	50+00 to 60+65	18.0	10.8	1.7	0.1	2.4	19.8	1.0
UT 5 Upstream	0+00 to 12+92.75	10.5	6.1	1.0	0.1	1.4	11.6	1.0
UT 5 Downstream	12+92.75 to 34+53.30	14.5	8.5	1.4	0.1	2.0	16.0	1.0
UT 6		7.4	4.6	0.6	0.1	1	8.1	1.0
UT 9		11	6.6	1	0.1	1.5	12.1	1.0
UT 12, UT 18, UT 19		4.6	2.6	0.4	0.1	0.6	5	1.0
UT 16, UT 20		5.8	3.4	0.5	0.1	0.8	6.4	1.0
UT 15 Upstream	0+00 to 8+73.36	5.8	3.4	0.5	0.1	0.8	6.4	1.0
UT 15 Downstream	8+73.36 to 14+03.79	7.8	4.6	0.7	0.1	1.1	8.6	1.0
UT 17		7.0	4.2	0.6	0.1	1	7.7	1



DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
PH: 919.859.2243
ENG FIRM LICENSE NO. C-890

Axiom Environmental, Inc.

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STINKING QUARTER
GUILFORD COUNTY, NC

TYPICALS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-02
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

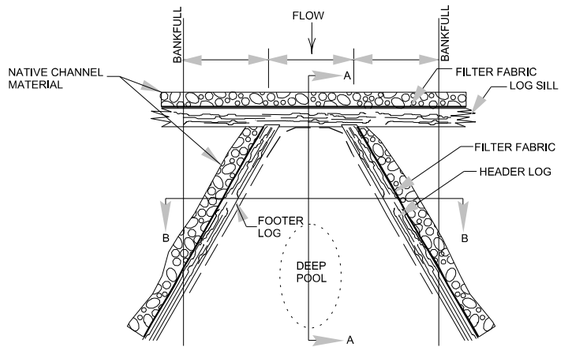
SHEET NO.
C-02

1/9/2024
Stnkqtr_psh_C-02.dgn
Jharvell

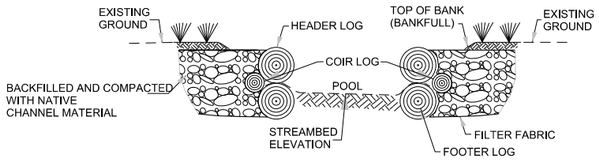
LOG CROSS VANE

SCALE:NTS

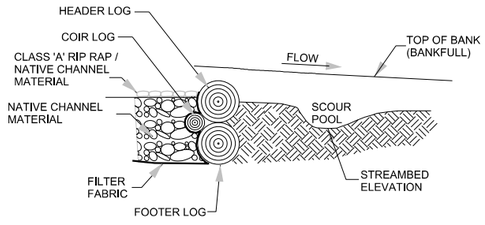
PLAN VIEW



NOTES:
1. HEADER AND FOOTER LOGS SHALL BE A MINIMUM OF 18" DIAMETER AND SHALL BE A HARDWOOD SPECIES. (FOOTER LOG MAY BE SUBSTITUTED WITH PINE)
2. A DOUBLE FOOTER LOG MAY BE REQUIRED IN SAND BED STREAMS.
3. ALL STONES ARE TO BE STRUCTURE STONES.
4. FILTER FABRIC SHALL BE PLACED ON THE UPSTREAM SIDE OF THE STRUCTURE TO PREVENT WASHOUT OF SEDIMENT THROUGH LOG GAPS. FILTER FABRIC SHALL EXTEND FROM THE BOTTOM OF THE FOOTER TO THE FINISHED GRADE ELEVATION AND SHALL BE PLACED THE ENTIRE LENGTH OF THE STRUCTURE.



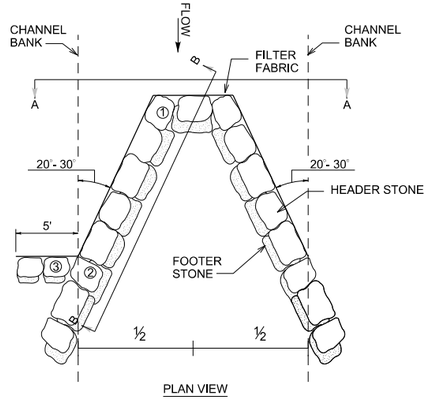
SECTION B-B



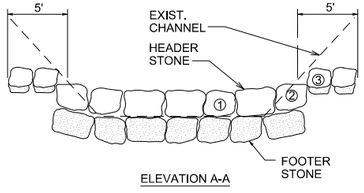
SECTION A-A

REACH	ARM LENGTH (FT.) *	CHANNEL DEPTH (FT.)
NPSQ	13	1.8
UT 1 (STA 0+00 to 36+69)	4	0.9
UT 1 (STA 50+00 to 60+65)	13	1.8
UT 5 (STA 0+00 to 12+65.5)	6	1.1
UT 5 (STA 12+92.8 to 34+53.3)	6	1.1
UT 6	2	0.7
UT 9	6	1.1
UT 12, UT 18, UT 19	1	0.5
UT 16, UT 20	2	0.6
UT 15 (STA 0+00 to 8+73.4)	2	0.6
UT 15 (STA 8+73.4 to 14+03.8)	3	0.8
UT 17	2	0.7

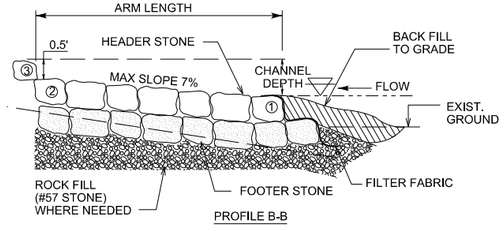
* FOR VANES ARM LENGTH, ADDITION 4-5' TO BE BURIED



PLAN VIEW



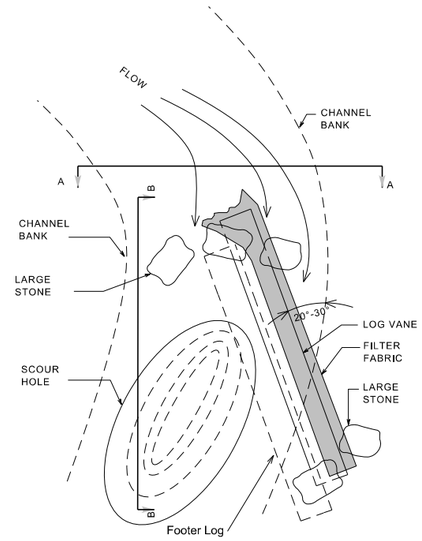
ELEVATION A-A



PROFILE B-B

NOTE:
HEADER AND FOOTER STONES ARE LARGE, ANGULAR BOULDERS MEASURING A MINIMUM OF 24" ALONG THE SHORTEST DIMENSION.

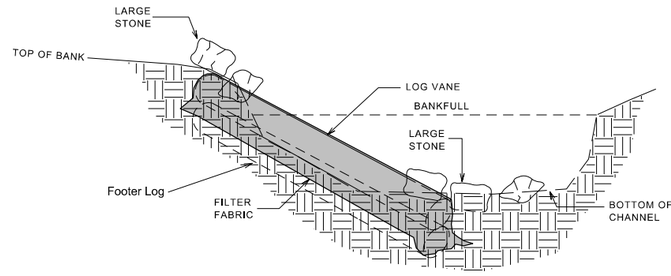
TYPICAL CROSS-VANE



NOTE:
FILTER FABRIC TOED IN AND DRAPED ON UPSTREAM SIDE OF LOG VANE PRIOR TO BACKFILL.

PLAN VIEW

SCALE: N.T.S.



CROSS-SECTION A-A

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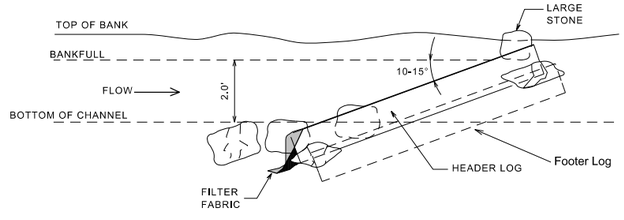

PROFILE B-B

SCALE: N.T.S.

NOTE:
FILTER FABRIC TOED IN AND DRAPED ON UPSTREAM SIDE OF LOG VANE PRIOR TO BACKFILL.

TYPICAL LOG VANE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23681 JOSEPH C. DALTON

DATE:

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STINKING QUARTER

GUILFORD COUNTY, NC

DETAILS

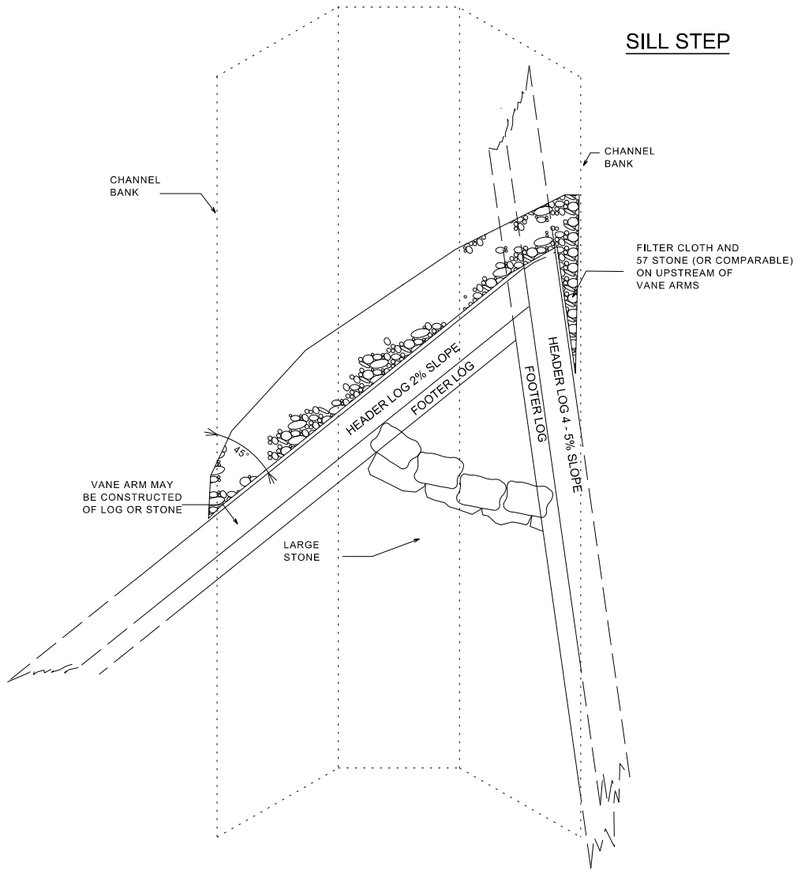
PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-02A
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	

SHEET NO.

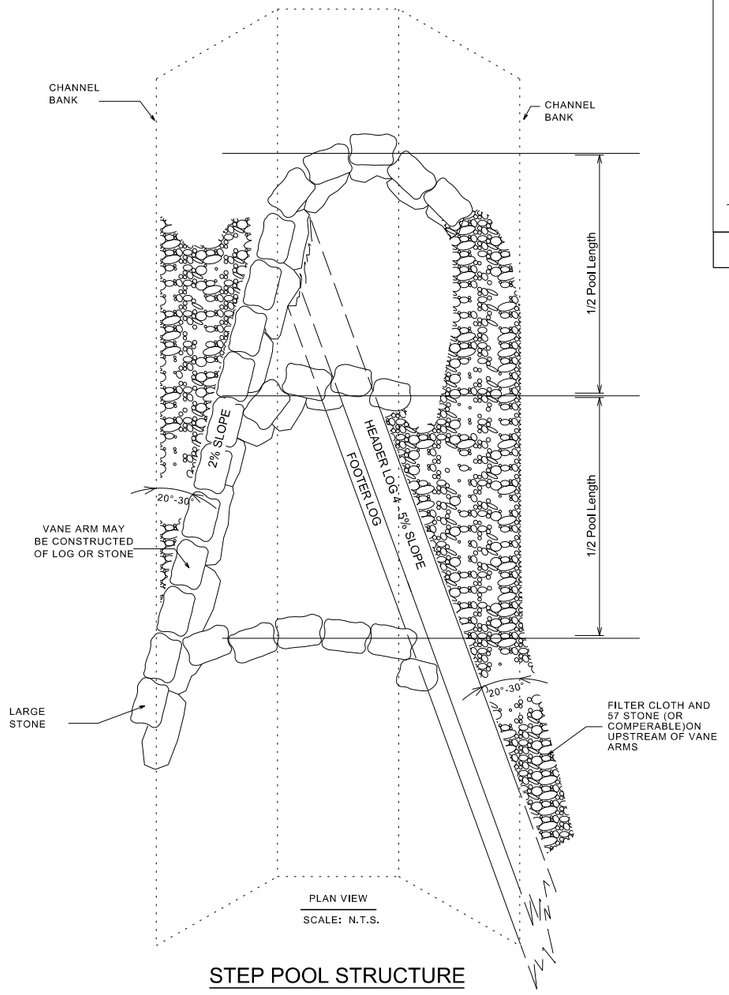
C-02A

1/9/2024
Stnkqtr_psh_C-02a.dgn
Joe Hall

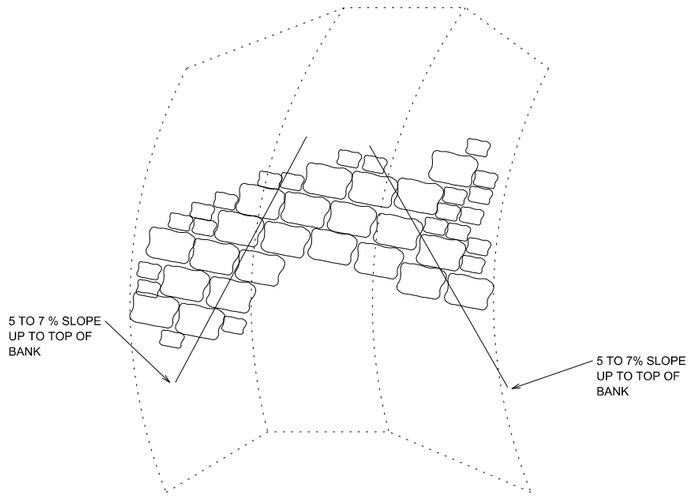
SILL STEP

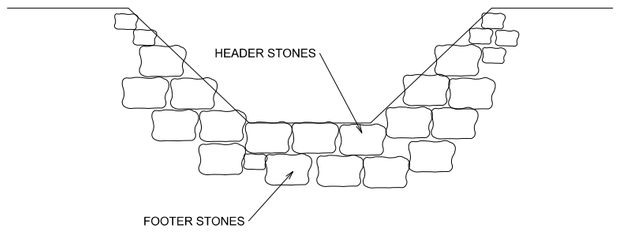


STEP POOL STRUCTURE



REINFORCED RIFFLE STEP





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON NOT FOR CONSTRUCTION PRELIMINARY DESIGN

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

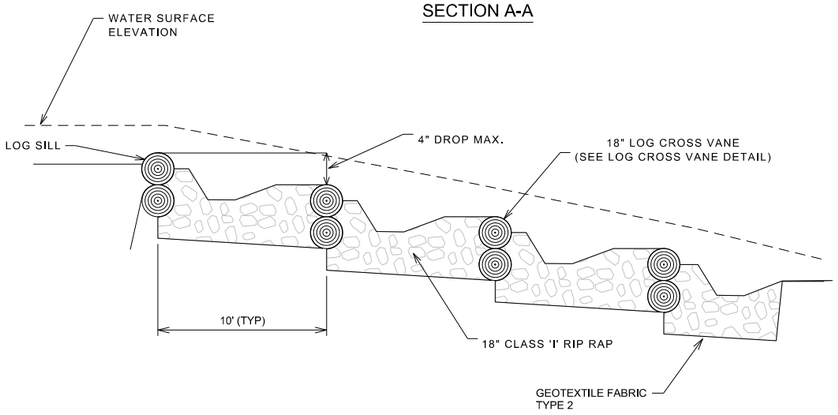
DETAILS

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-02B
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C–02B

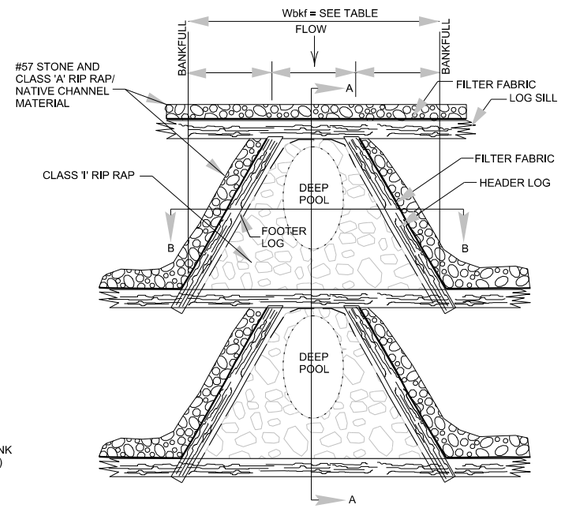
1/9/2024
Stnkqtr_psh_C-02b.dgn
jharvey

DROP STRUCTURE

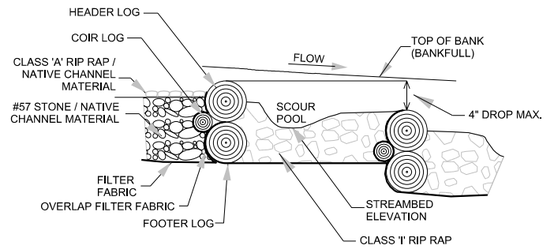
SECTION A-A



PLAN VIEW



STEP POOL ENLARGEMENT



STRUCTURE NOTES:
1. FILL CLASS '1' RIP RAP VOIDS WITH CLASS 'A' RIP RAP/ #57 STONE/ NATIVE CHANNEL MATERIAL MIXTURE.

NORTH CAROLINA PROFESSIONAL SEAL 23 JOSHUA G. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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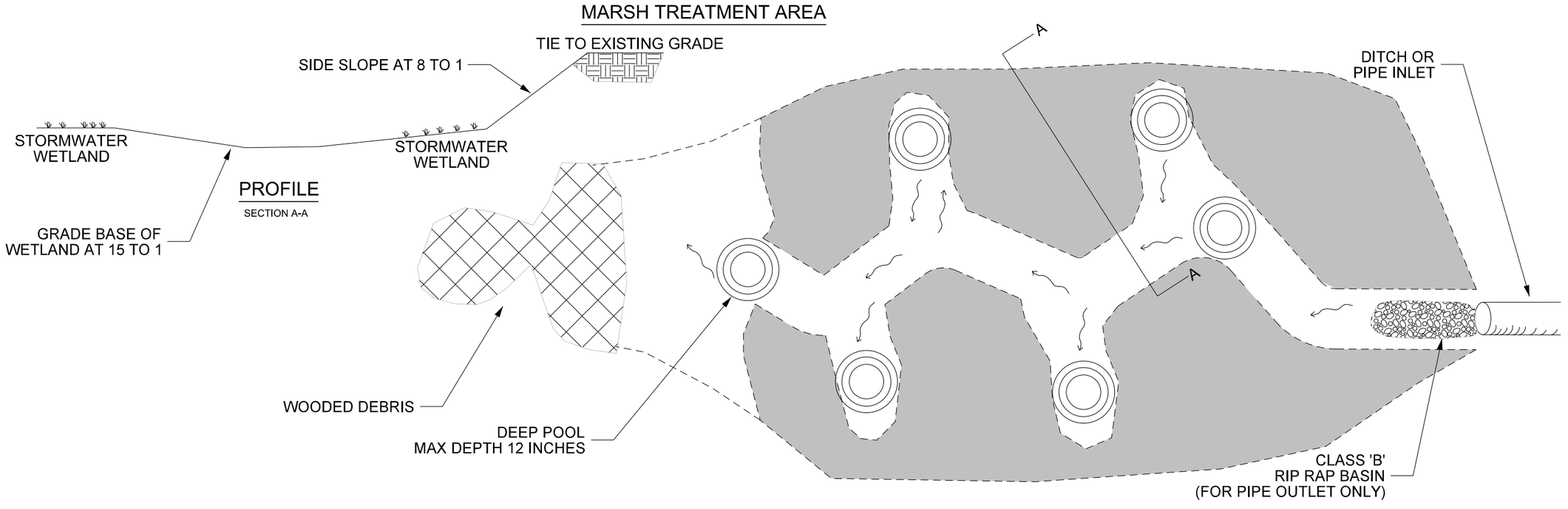
CROSS-SECTION DIMENSIONS		
REACH	Wbkf (ft.)	Distance between Drops
NPSQ	17.8	14.1'
UT 1	8.8	6.6'
UT 5 (STA 12+65.5)	10.5	11.2'
UT 5 (STA 34+06.8)	14.5	9.9'
UT 6	7.4	6.7'
UT 9	11.0	14.5'
UT 15	7.8	7.7'
UT 17	7.0	7.1
UT 19	4.6	7.2'

MARSH TREATMENT AREA



PROFILE
SECTION A-A

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
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STINKING QUARTER
GUILFORD COUNTY, NC

DETAILS

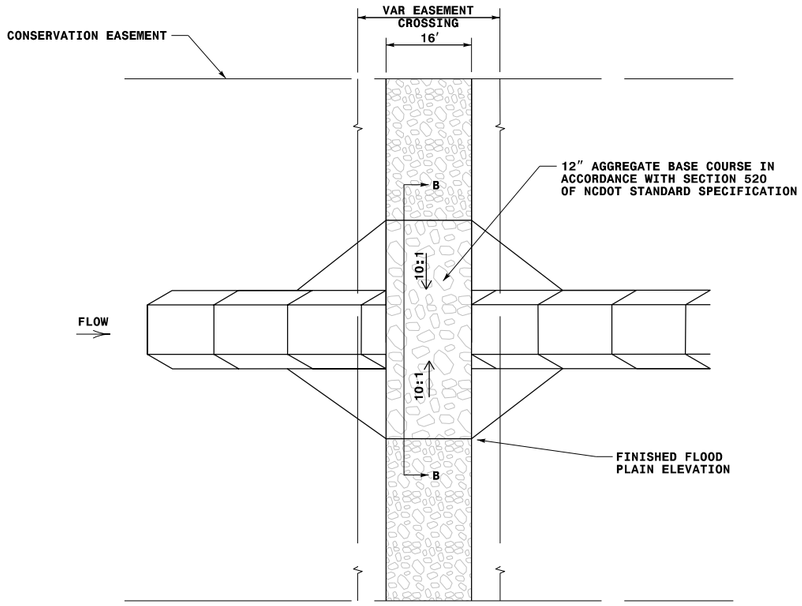
PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-02C
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–02C

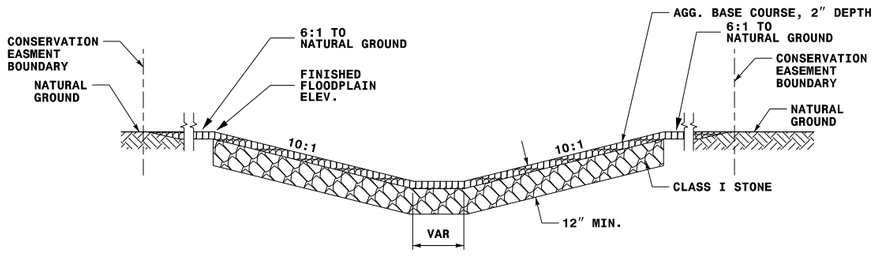
1/9/2024
StnkQtr_psh_C-02c.dgn
jharvey

PERMANENT CHANNEL FORD DETAIL

SCALE: N.T.S.



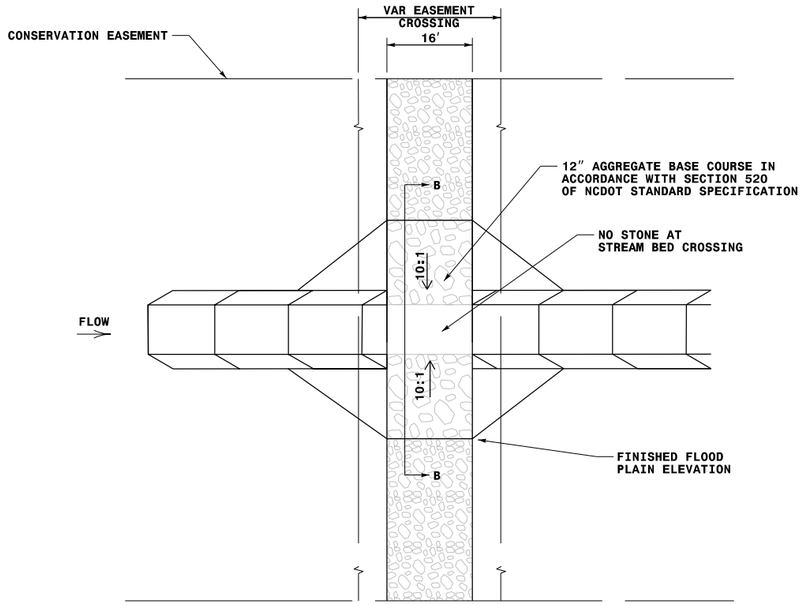
PLAN VIEW



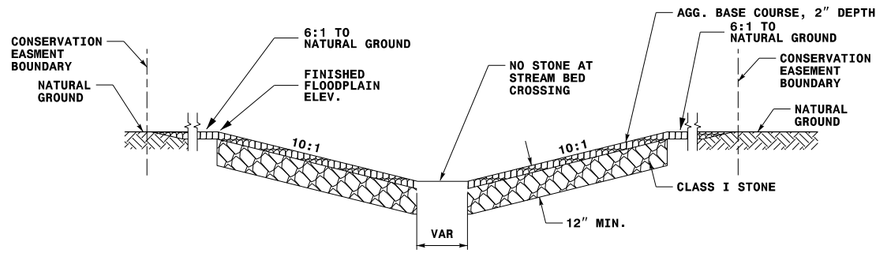
SECTION B-B

PERMANENT CATTLE CHANNEL FORD DETAIL

SCALE: N.T.S.



PLAN VIEW



SECTION B-B

NOTES:
1) KEEP FORD CROSS FALL WITHIN 1–2% OF STREAM GRADIENT.
2) FILL VOIDS BETWEEN CLASS 1 STONE WITH CLASS A TO CREATE DRIVEABLE SURFACE.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038023 JOSEPH C. DALTON FOR PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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RALEIGH, NORTH CAROLINA 27606
PH: 919.859.2243
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STINKING QUARTER
GUILFORD COUNTY, NC

DETAILS

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PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-02D
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	

SHEET NO.

C–02D

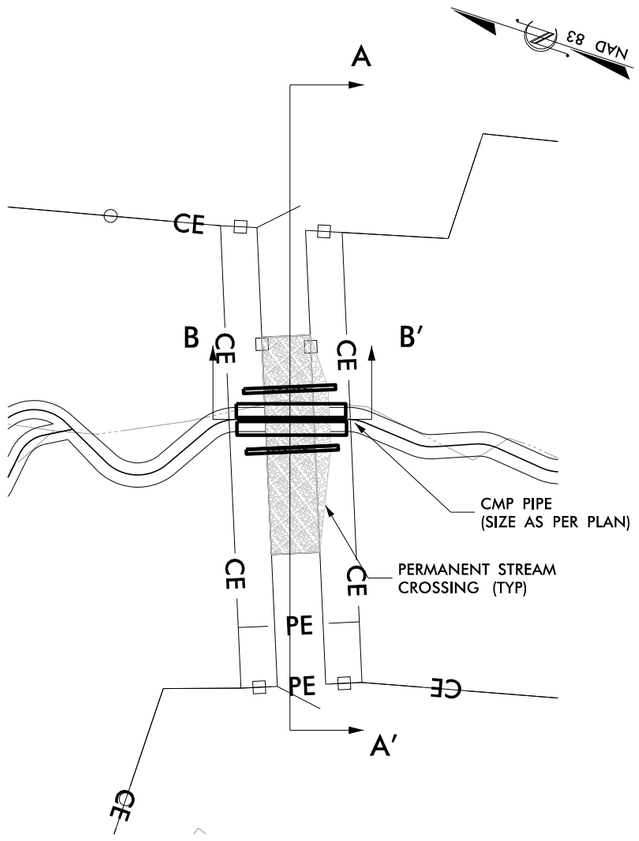
1/9/2024
Stnkqtr_psh_C-02d.dgn
Jonathan

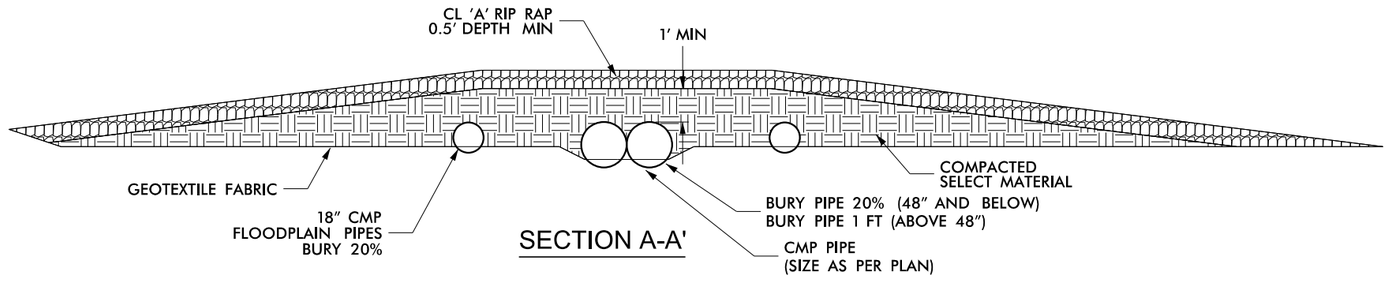
PERMANENT CROSSING

SCALE: N.T.S.

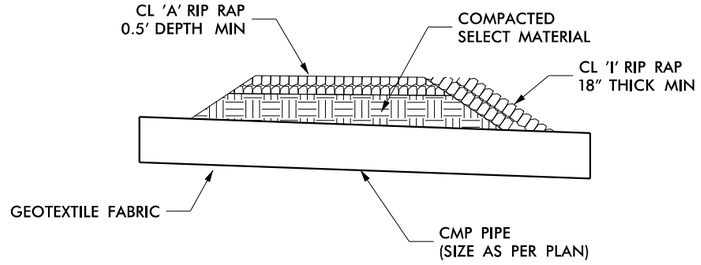
Permanent Pipe Crossings					
Centerline Station	Pipe Size	Pipe Length (feet)	Pipe Invert In (feet)	Pipe Invert Out (feet)	Bury Depth (feet)
UT 5 sta 13+45	2 at 54"	62	697.1	696.0	1.0
UT 15 sta 9+41	2 at 42"	36	672.4	671.5	0.7

NOTES:
1) INSTALL PERMANENT CROSSING WHILE CONSTRUCTION LOCATION WITHIN STREAM HAS BEEN DEWATERED.
2) IF UNABLE TO INSTALL WHILE LOCATION IS DRY, PLACE MATTING ON EXPOSED SOILS.
3) INSTALL 18" CMP FLOODPLAIN PIPES IN FLOODPLAIN AS INDICATED ON PLANS.





SECTION A-A'



SECTION B-B'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038905 JOSEPH R. HAMILTON DESIGN FOR CONSTRUCTION NOT FOR CONSTRUCTION TIMOTHY C. DALTON

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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RALEIGH, NORTH CAROLINA 27606
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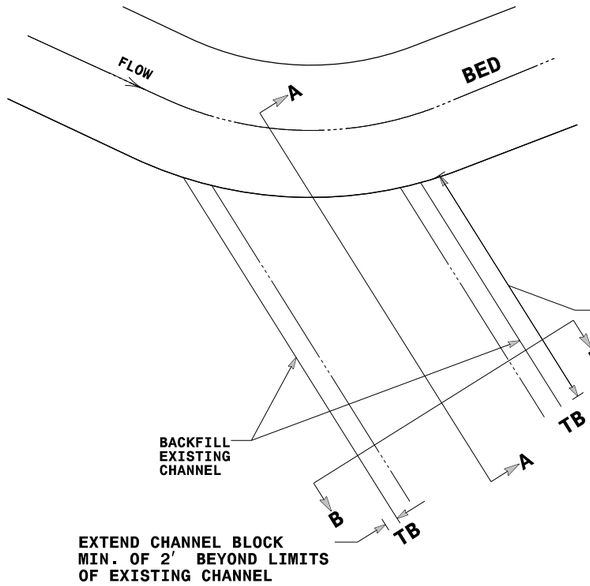
STINKING QUARTER
GUILFORD COUNTY, NC

DETAILS

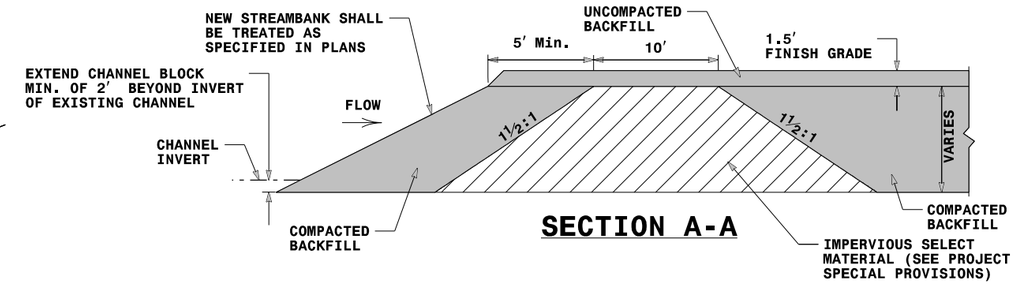
PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-02E
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–02E

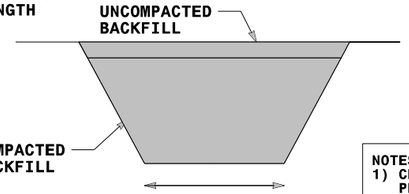
1/9/2024
StnkQtr_psh_C-02e.dgn
jharvey



PLAN VIEW



SECTION A-A

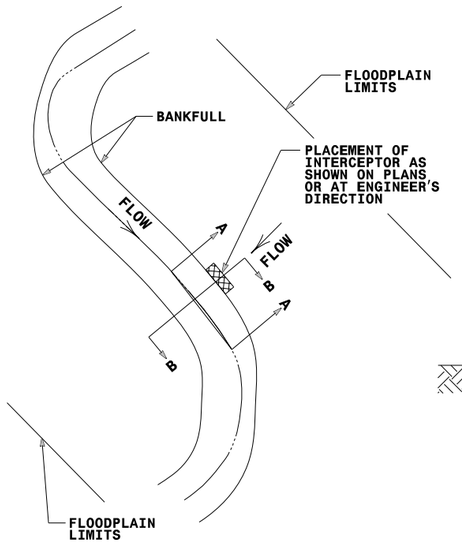


SECTION B-B

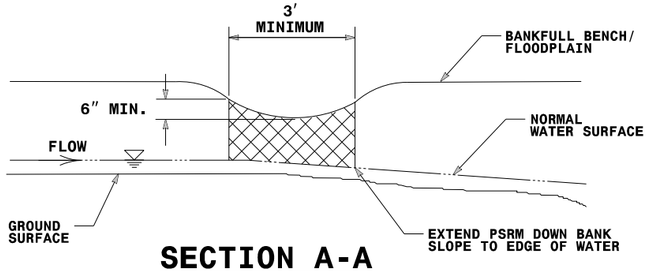
STREAM PLUG

NOT TO SCALE

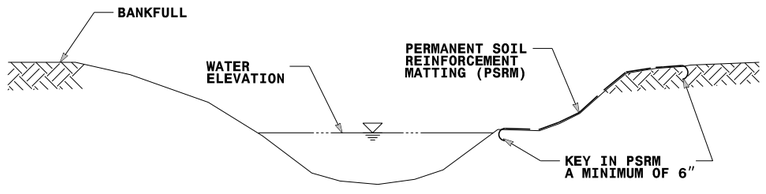
NOTES:
1) CHANNEL BLOCK SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
2) BLOCK SHOULD BE INSTALLED AT THE INTERFACE BETWEEN EXISTING CHANNEL AND PROPOSED CHANNEL.
3) BOTTOM OF BLOCK SHOULD BE A MINIMUM OF 2′ BELOW THE INVERT OF THE EXISTING CHANNEL.
4) BLOCK SHOULD EXTEND A MINIMUM OF 2′ BEYOND THE LIMITS OF THE EXISTING STREAM CHANNEL.
5) INSTALL EROSION CONTROL MATTING AND SEED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS IMMEDIATELY AFTER GRADING.
6) COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.



PLAN VIEW



SECTION A-A



SECTION B-B

FLOODPLAIN INTERCEPTOR DETAIL

NOT TO SCALE

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036487 JOSEPH G. DALTON
DESIGN
EXPIRES: 12/31/2024
NOT FOR CONSTRUCTION
DATE:
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
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STINKING QUARTER
GUILFORD COUNTY, NC
DETAILS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-02F
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

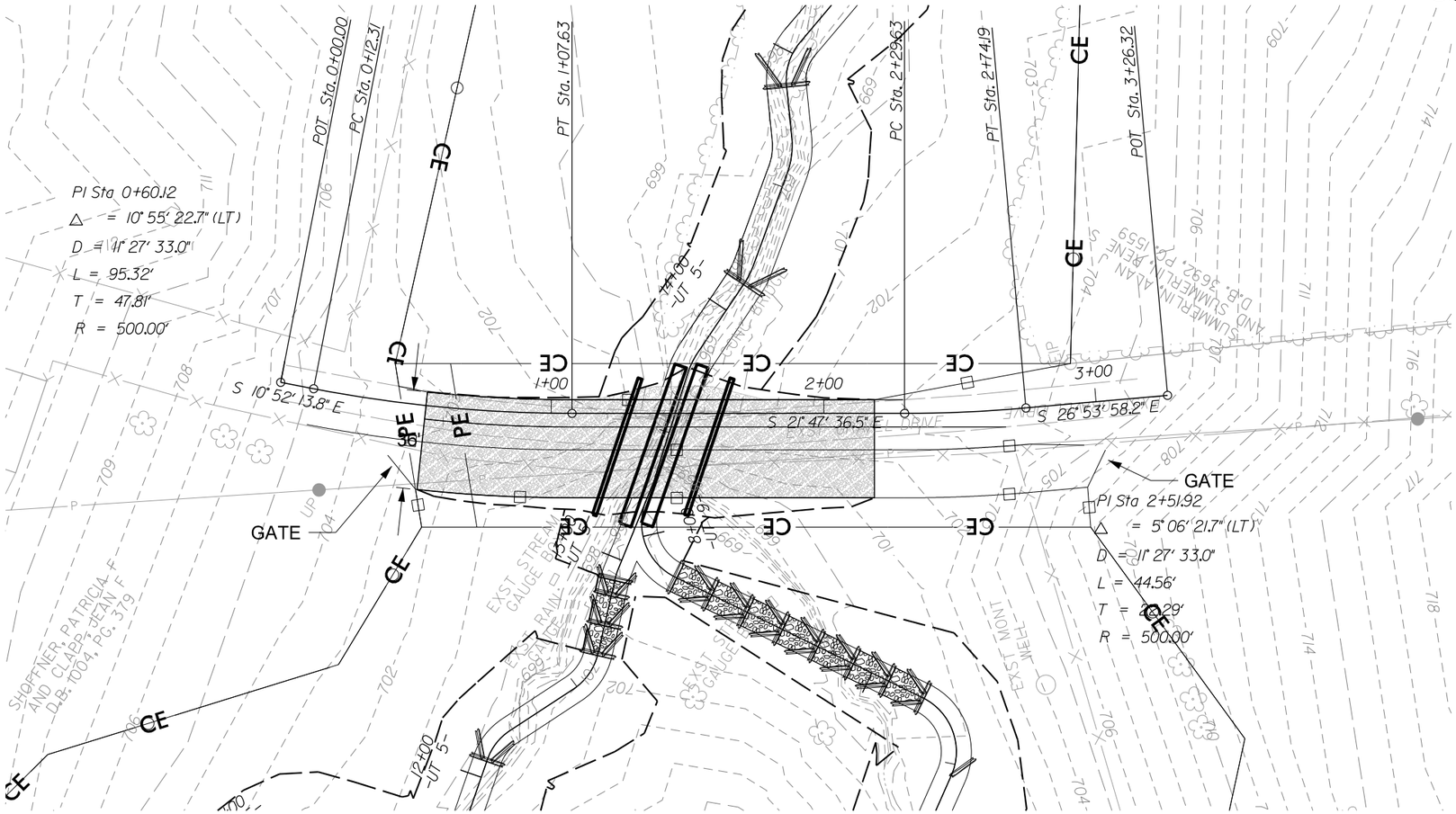
SHEET NO. C–02F

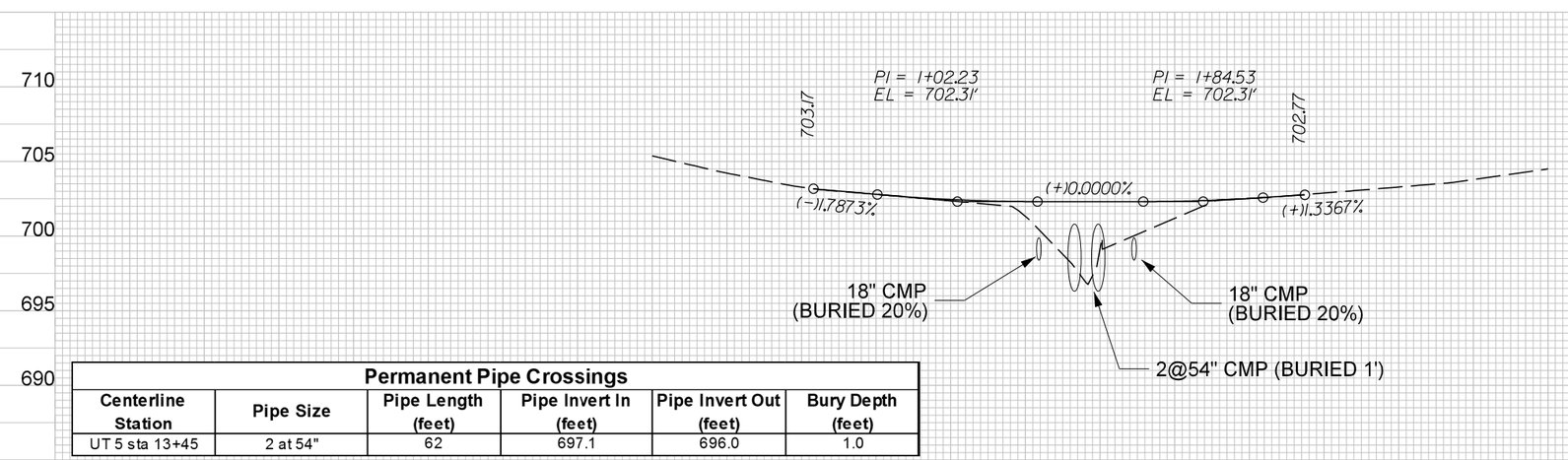
1/9/2024
StnkQtr_psh_C-02f.dgn
jarvey

DRIVEWAY REALIGNMENT

SCALE: 1" = 50'

NAD 83





Permanent Pipe Crossings

Centerline Station	Pipe Size	Pipe Length (feet)	Pipe Invert In (feet)	Pipe Invert Out (feet)	Bury Depth (feet)
UT 5 sta 13+45	2 at 54"	62	697.1	696.0	1.0

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27606 JOSEPH C. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

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STINKING QUARTER
GUILFORD COUNTY, NC

DRIVEWAY REALIGNMENT

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-02G
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	

SHEET NO.
C–02G

1/9/2024
Stnkqtr_psh_C-02g.dgn
Harvey

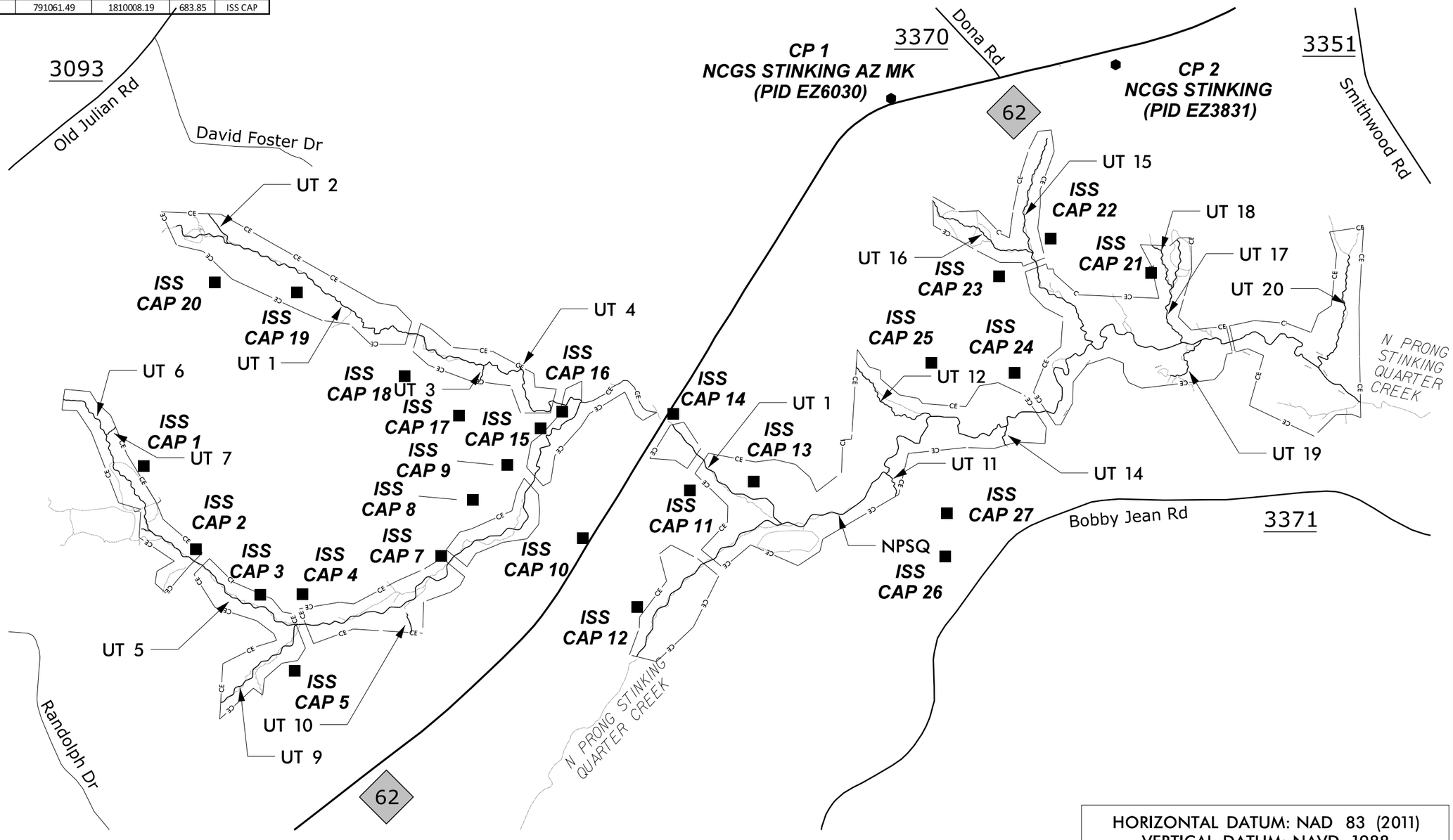
Stinking Quarter Control Points				
Pt ##	Northing	Easting	Elevation	Type
1	790702.77	1804259.58	726.38	ISS CAP
2	790154.95	1807601.24	714.70	ISS CAP
3	789855.26	1808023.43	711.93	ISS CAP
4	789859.73	1808302.22	712.25	ISS CAP
5	789357.01	1808250.46	715.59	ISS CAP
7	790110.79	1809215.04	701.63	ISS CAP
8	790478.24	1809419.68	706.27	ISS CAP
9	790708.51	1809647.28	699.83	ISS CAP
10	790227.42	1810142.02	712.62	ISS CAP
11	790543.08	1810847.84	693.15	ISS CAP
12	789775.78	1810500.76	688.52	ISS CAP
13	790600.99	1811267.55	675.62	ISS CAP
14	791045.50	1810737.87	681.60	ISS CAP
15	790950.42	1809865.89	689.07	ISS CAP
16	791061.49	1810008.19	683.85	ISS CAP

Stinking Quarter Control Points				
Pt ##	Northing	Easting	Elevation	Type
17	791034.67	1809329.47	721.70	ISS CAP
18	791291.11	1808973.31	723.58	ISS CAP
19	791841.81	1808265.09	714.03	ISS CAP
20	791908.82	1807724.46	738.33	ISS CAP
21	791969.81	1813878.49	675.87	ISS CAP
22	792198.01	1813217.75	691.11	ISS CAP
23	791950.87	1812878.86	695.84	ISS CAP
24	791314.50	1812980.46	671.61	ISS CAP
25	791379.51	1812433.49	692.51	ISS CAP
26	790108.77	1812526.35	701.03	ISS CAP
27	790392.93	1812534.74	702.28	ISS CAP
CP 1	793117.48	1812169.41		NCGS
CP 2	793339.51	1813645.45		NCGS

350' 175' 0 350' 700'
SCALE: 1" = 700'

NAD 83

SURVEY INFORMATION
EASEMENT PROVIDED BY:
K2 DESIGN GROUP, P.A.
5688 U.S. HIGHWAY 70 EAST
GOLDSBORO, NC 27534



HORIZONTAL DATUM: NAD 83 (2011)
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ENG FIRM LICENSE NO. C-890

Axiom Environmental, Inc.

STINKING QUARTER
GUILFORD COUNTY, NC

CONTROL POINTS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–03

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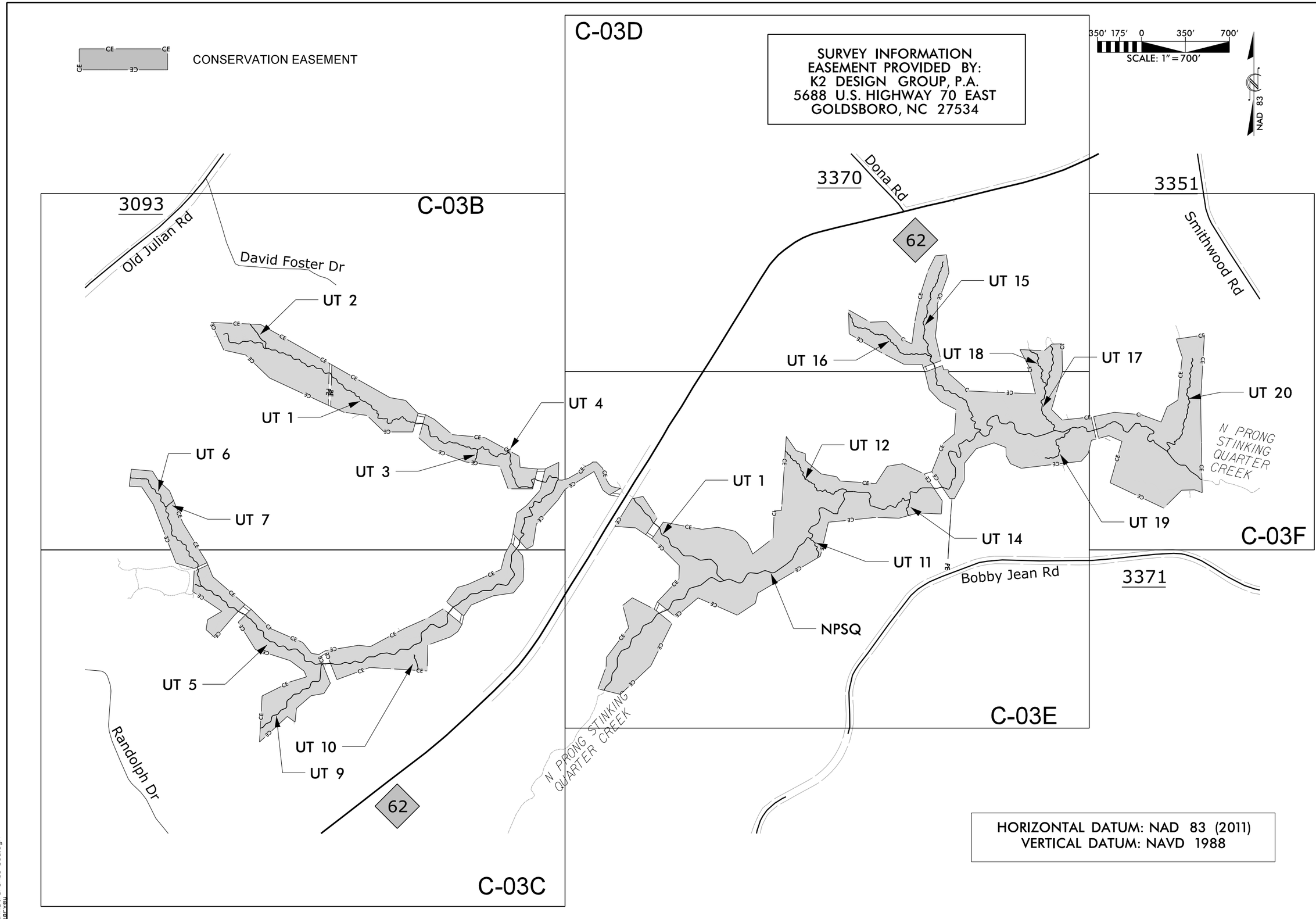

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STINKING QUARTER
GUILFORD COUNTY, NC

CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03A
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
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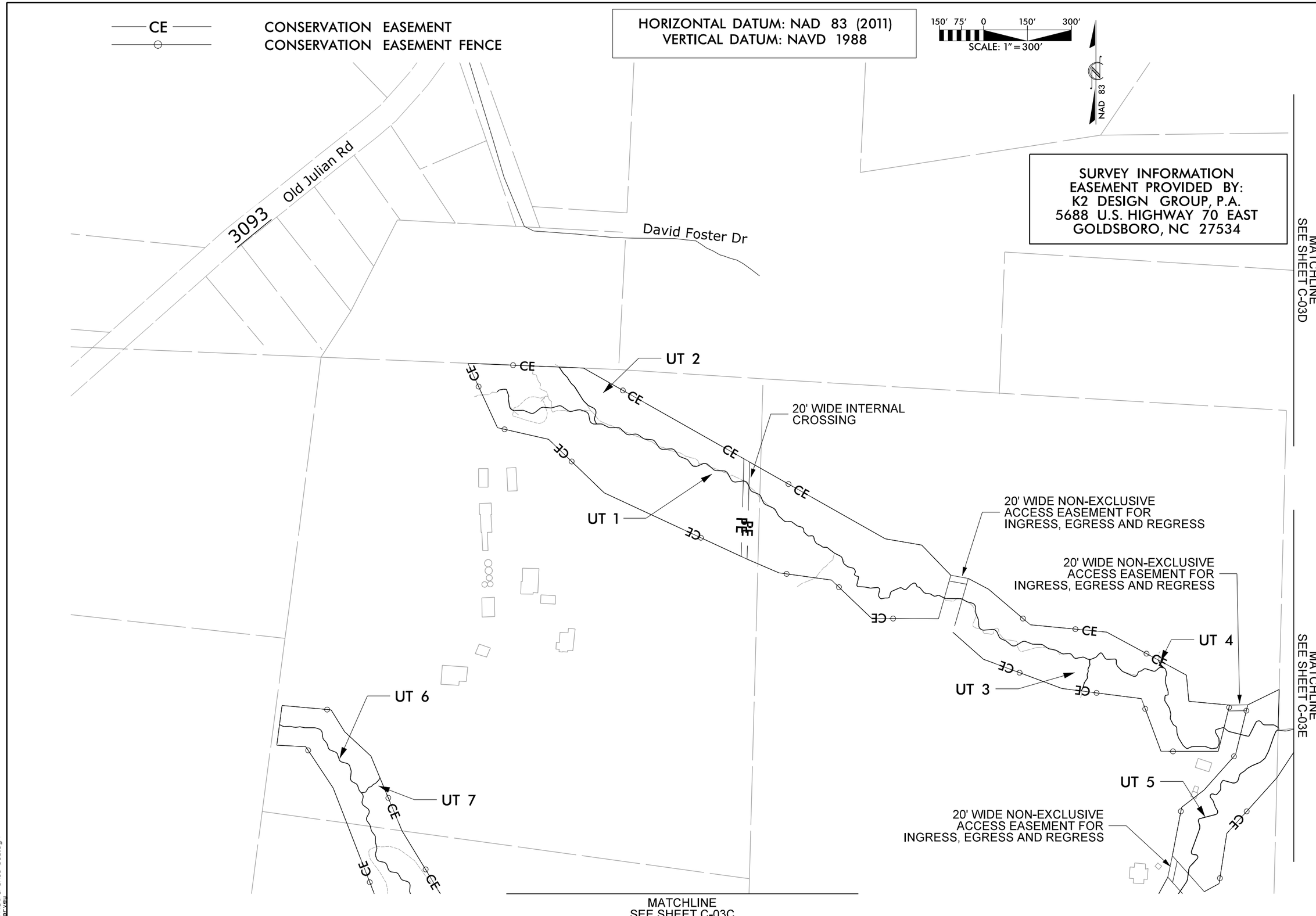

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STINKING QUARTER
GUILFORD COUNTY, NC

CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03B
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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SHEET NO.
C–03B

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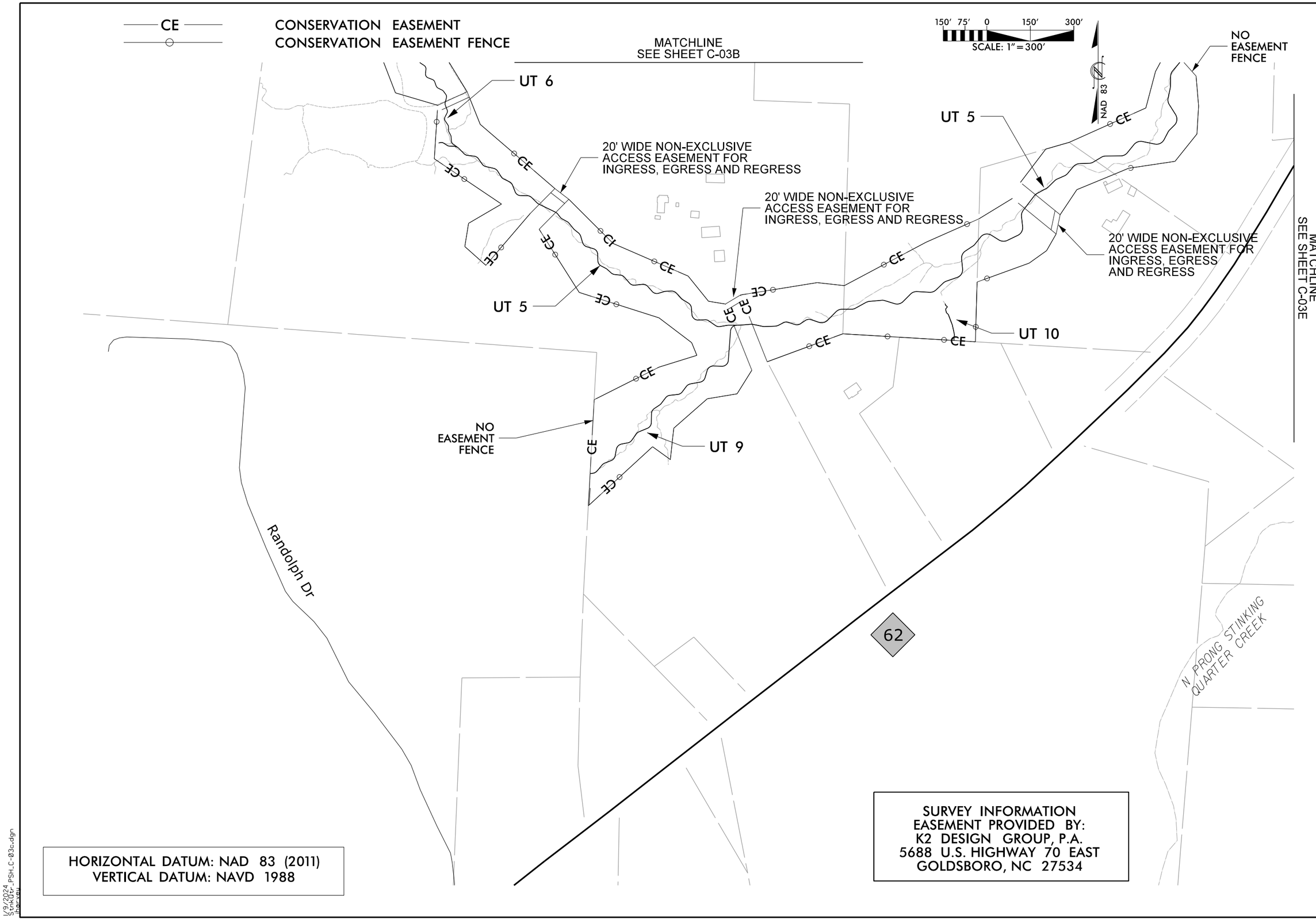

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STINKING QUARTER
GUILFORD COUNTY, NC

CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03C
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–03C

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jherveu

CE — CONSERVATION EASEMENT
CONSERVATION EASEMENT FENCE

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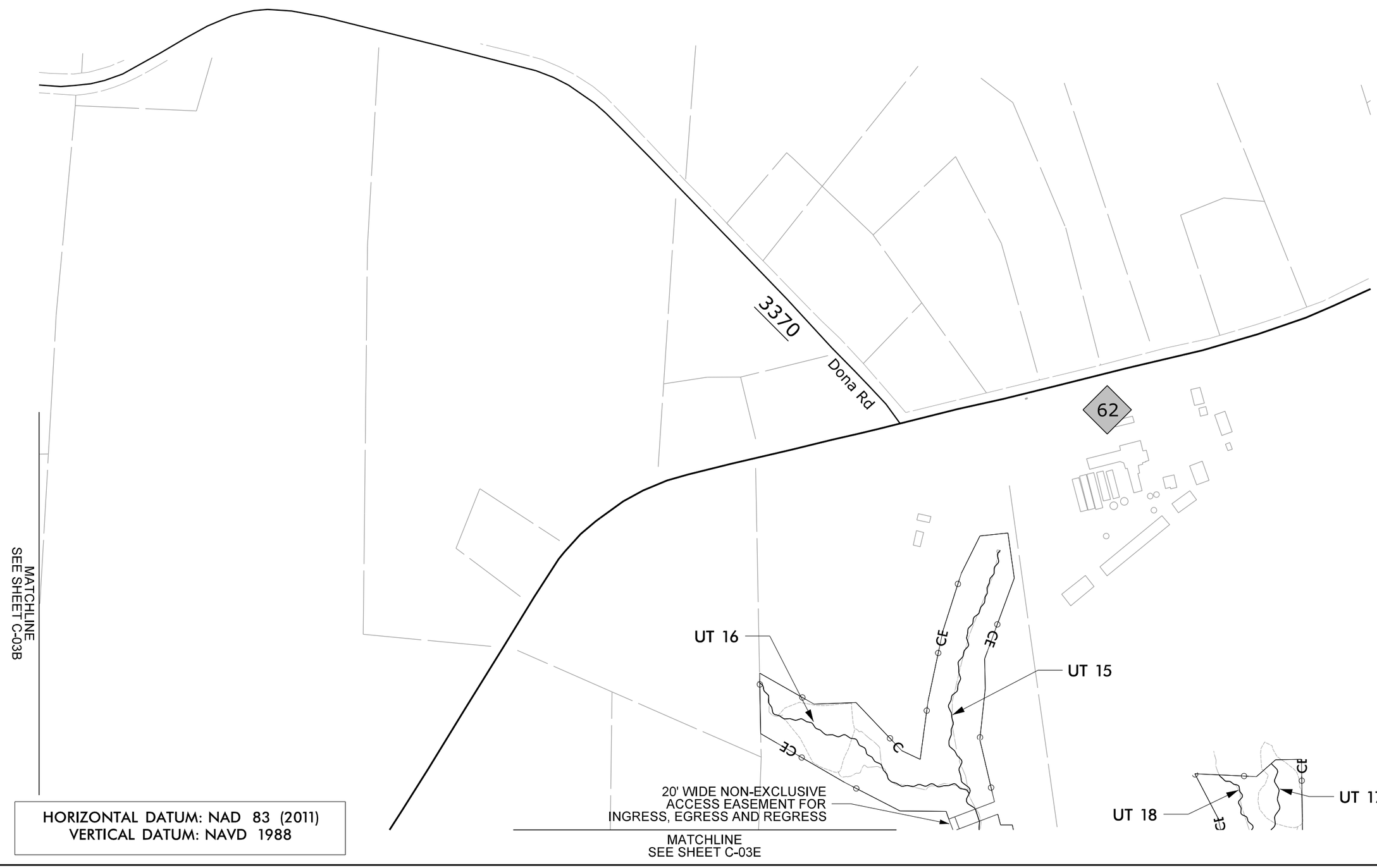
GOLDSBORO, NC 27534

150' 75' 0 150' 300'
SCALE: 1" = 300'

NAD 83



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STINKING QUARTER
GUILFORD COUNTY, NC

CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03D
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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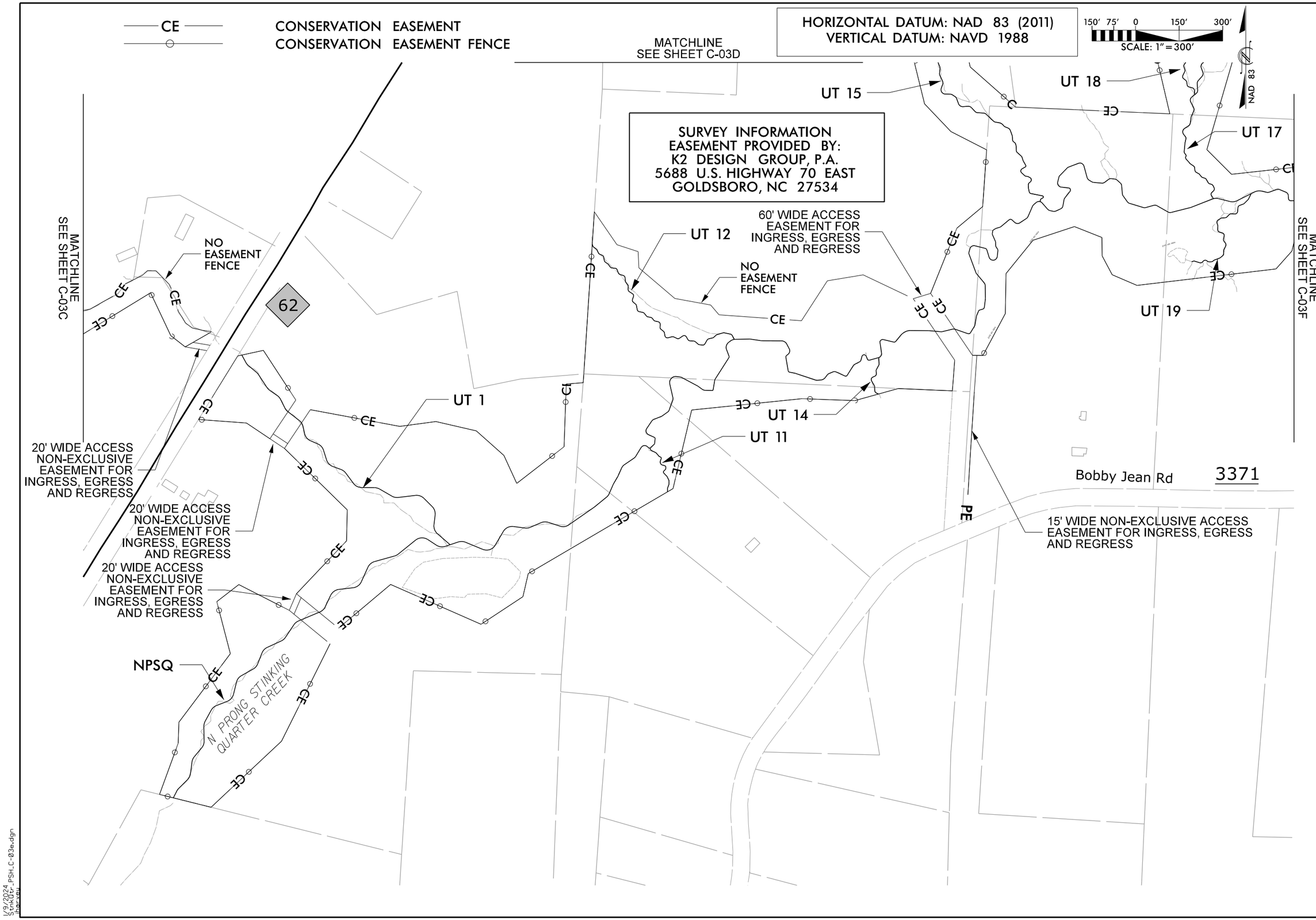

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CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03E
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–03E

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CONSERVATION EASEMENT FENCE

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150' 75' 0 150' 300'
SCALE: 1" = 300'

NAD 83

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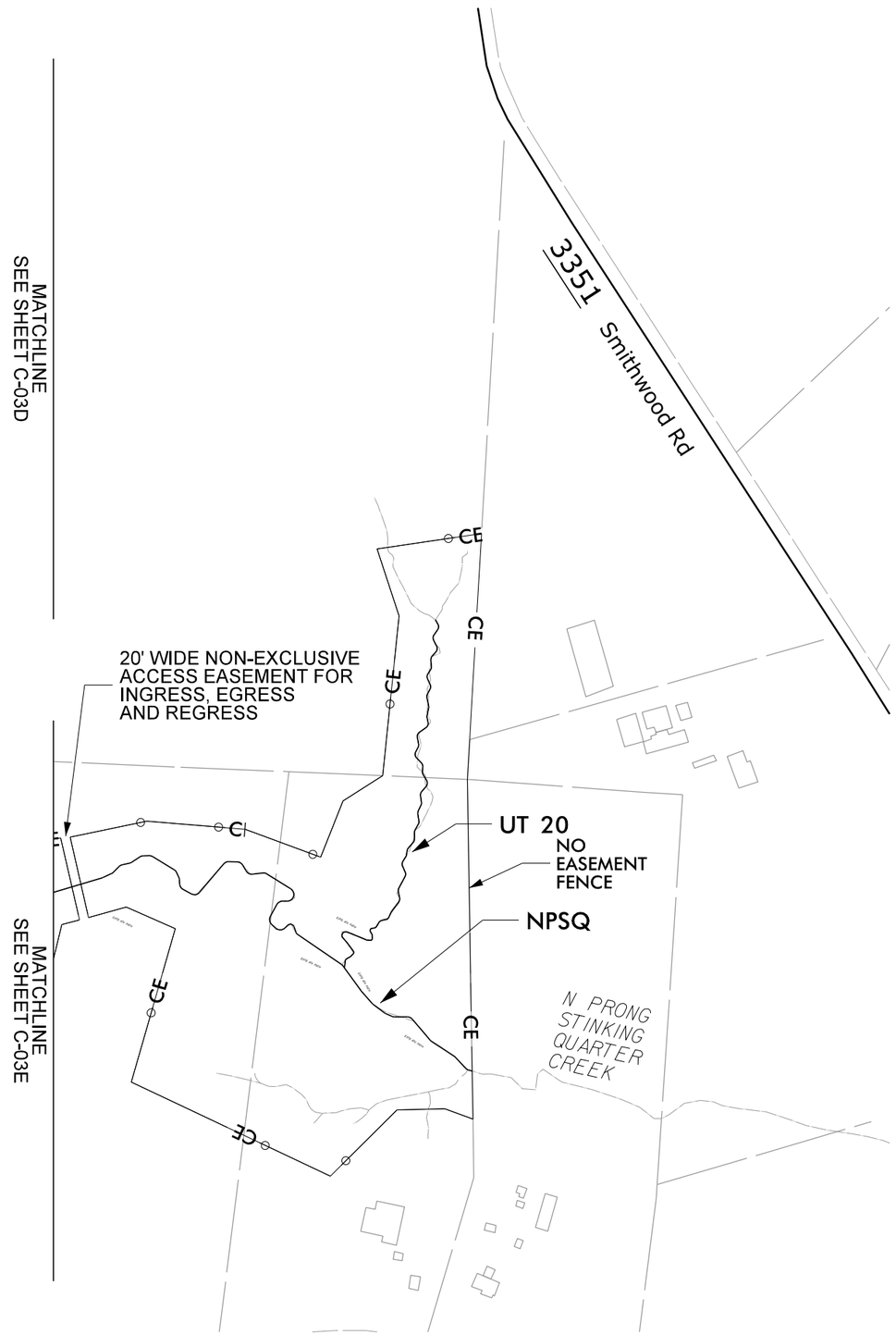

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STINKING QUARTER
GUILFORD COUNTY, NC

CONSERVATION EASEMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03F
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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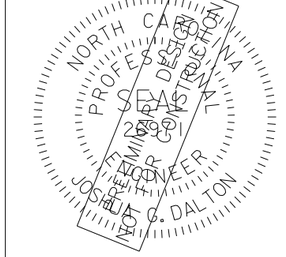
LIMITS OF DISTURBANCE

350′ 175′ 0 350′ 700′
SCALE: 1″ = 700′

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

NAD 83



DATE:

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3093
Old Julian Rd
David Foster Dr
3370
Dona Rd
Smithwood Rd
3351
Bobby Jean Rd
3371
Randolph Dr
UT 1
UT 2
UT 3
UT 4
UT 5
UT 6
UT 7
UT 9
UT 10
UT 11
UT 12
UT 14
UT 15
UT 16
UT 17
UT 18
UT 19
UT 20
NPSQ
N PRONG STINKING QUARTER CREEK

LIMITS OF DISTURBANCE: 106.70 AC

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GUILFORD COUNTY, NC

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DRAWING NAME:	STNKQTR PSH C-03G
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
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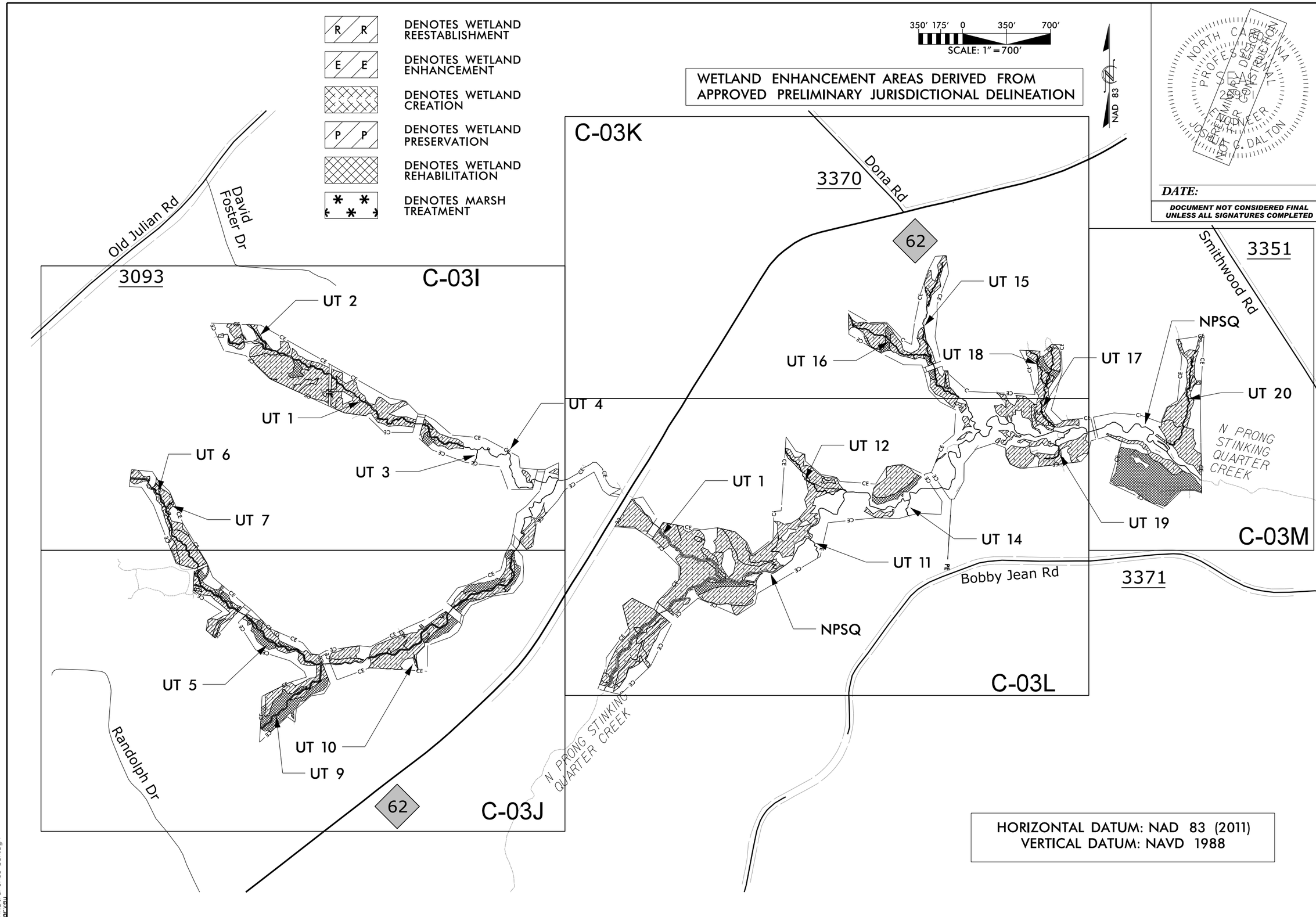

NORTH CAROLINA PROFESSIONAL SEAL 26991 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03H
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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jherveu

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VERTICAL DATUM: NAVD 1988

350' 75' 0 150' 300'
SCALE: 1" = 300'

NAD 83

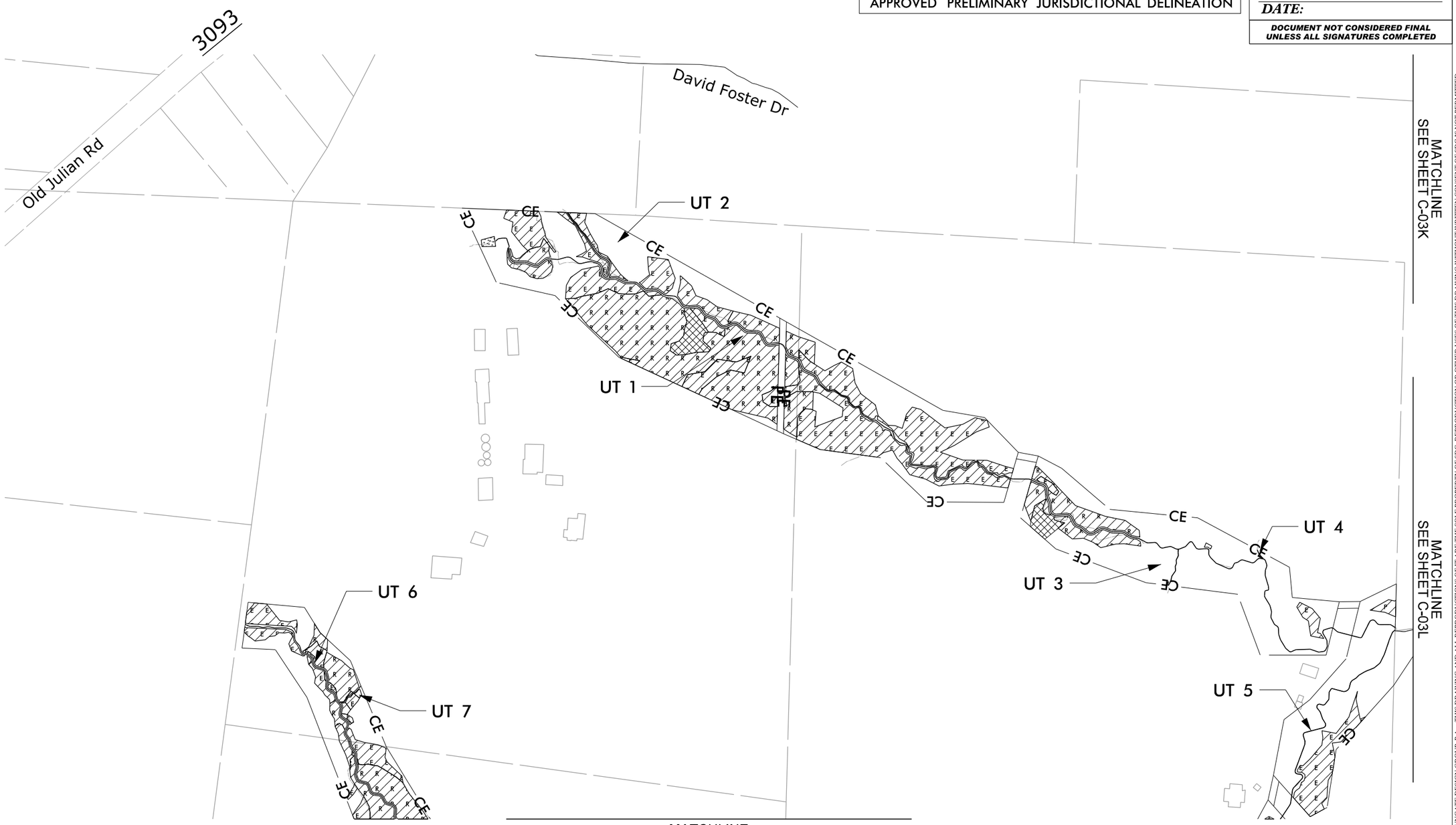
R R DENOTES WETLAND REESTABLISHMENT

E E DENOTES WETLAND ENHANCEMENT

P P DENOTES WETLAND PRESERVATION

DENOTES WETLAND REHABILITATION

WETLAND ENHANCEMENT AREAS DERIVED FROM APPROVED PRELIMINARY JURISDICTIONAL DELINEATION



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STINKING QUARTER
GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-031
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

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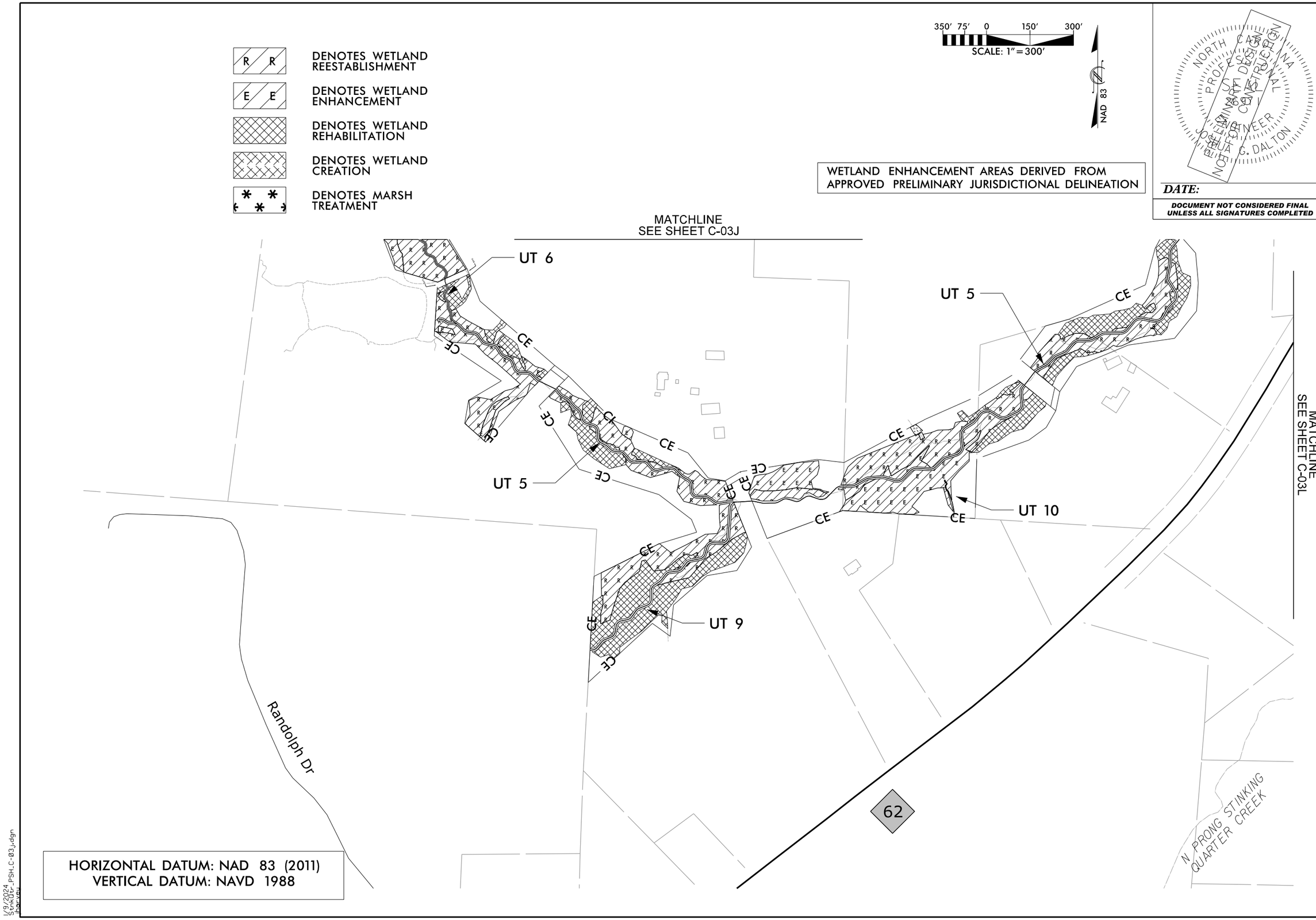

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DATE:

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

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STINKING QUARTER
GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03J
DATE: 1/9/2024
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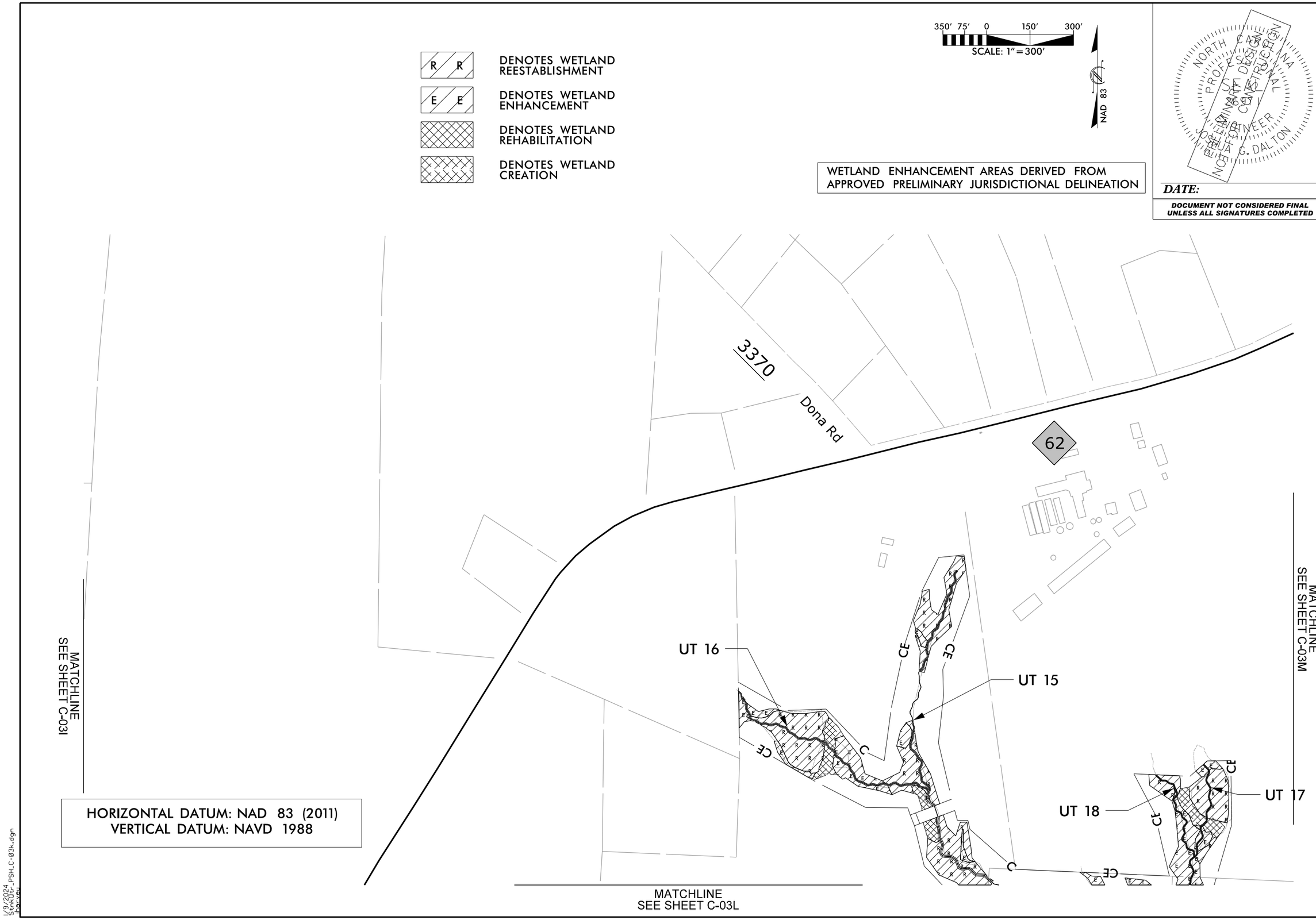

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GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03K
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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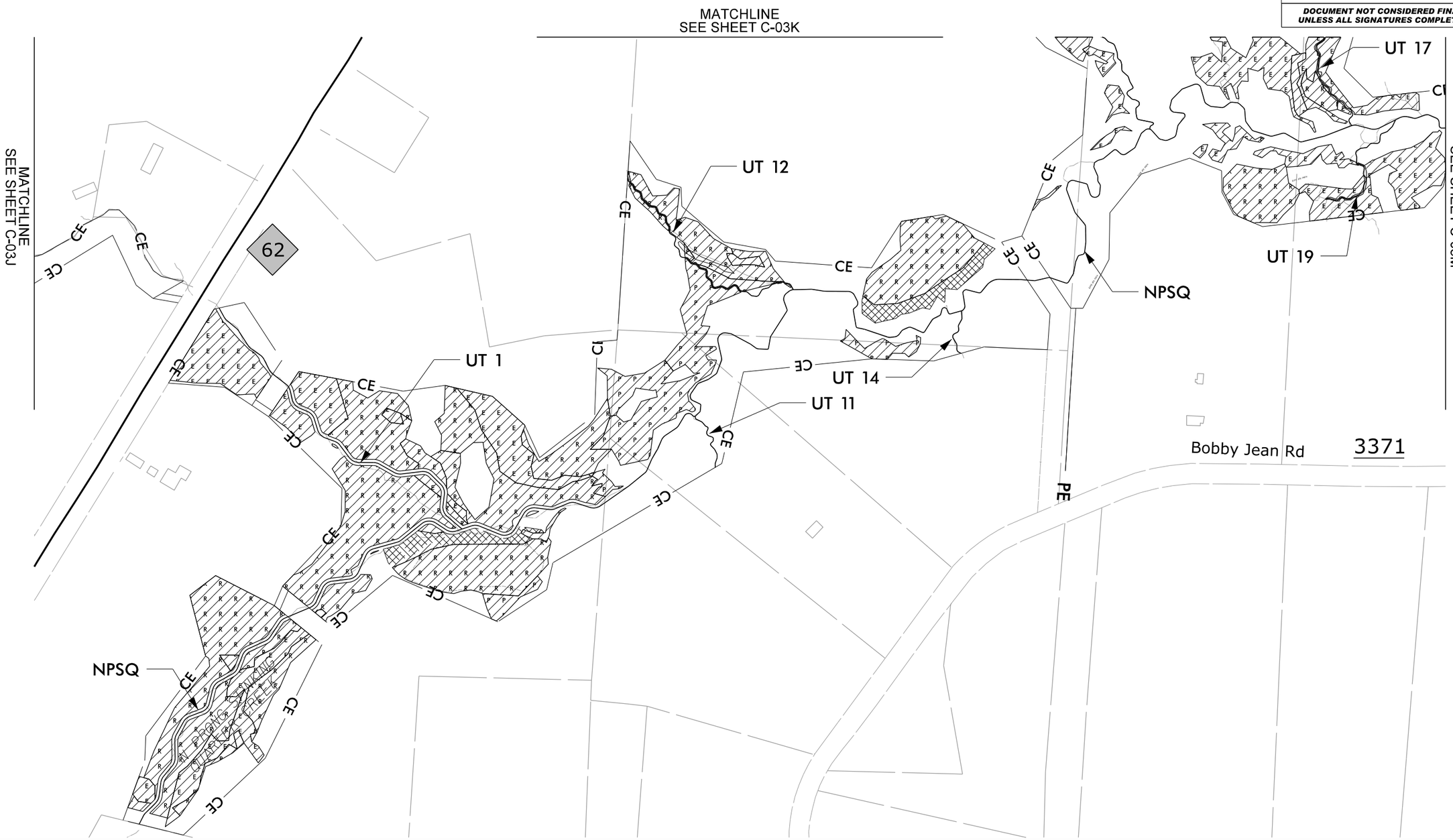
R R	DENOTES WETLAND REESTABLISHMENT
E E	DENOTES WETLAND ENHANCEMENT
	DENOTES WETLAND CREATION
P P	DENOTES WETLAND PRESERVATION
	DENOTES WETLAND REHABILITATION

350' 75' 0 150' 300'
SCALE: 1" = 300'

NAD 83

WETLAND ENHANCEMENT AREAS DERIVED FROM APPROVED PRELIMINARY JURISDICTIONAL DELINEATION



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DATE:

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GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03L
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

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jharvey

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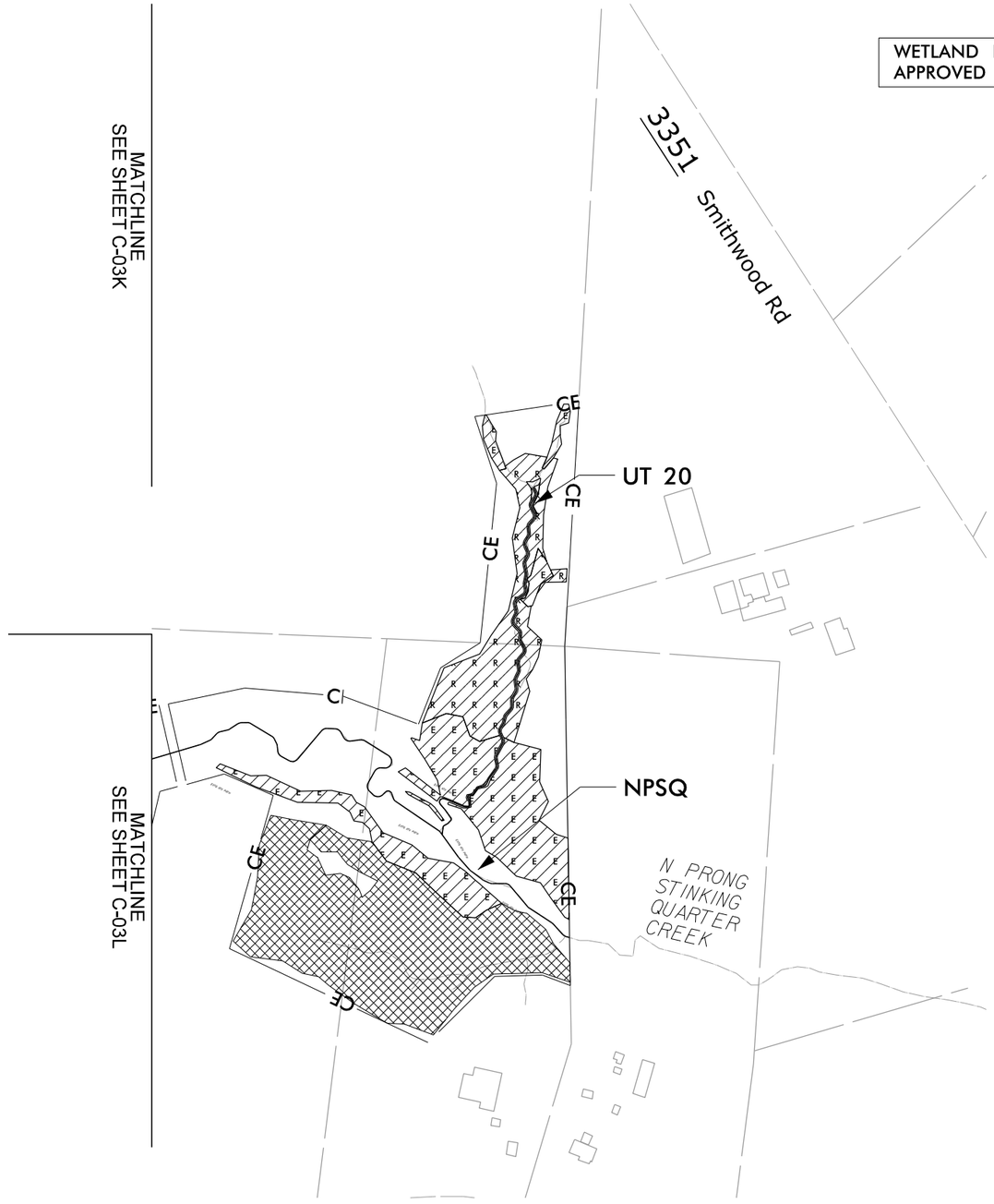
VERTICAL DATUM: NAVD 1988

350' 75' 0 150' 300'
SCALE: 1" = 300'

NAD 83

WETLAND ENHANCEMENT AREAS DERIVED FROM APPROVED PRELIMINARY JURISDICTIONAL DELINEATION



R R DENOTES WETLAND REESTABLISHMENT

E E DENOTES WETLAND ENHANCEMENT

DENOTES WETLAND REHABILITATION

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GUILFORD COUNTY, NC

WETLAND REESTABLISHMENT

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-03M
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–03M

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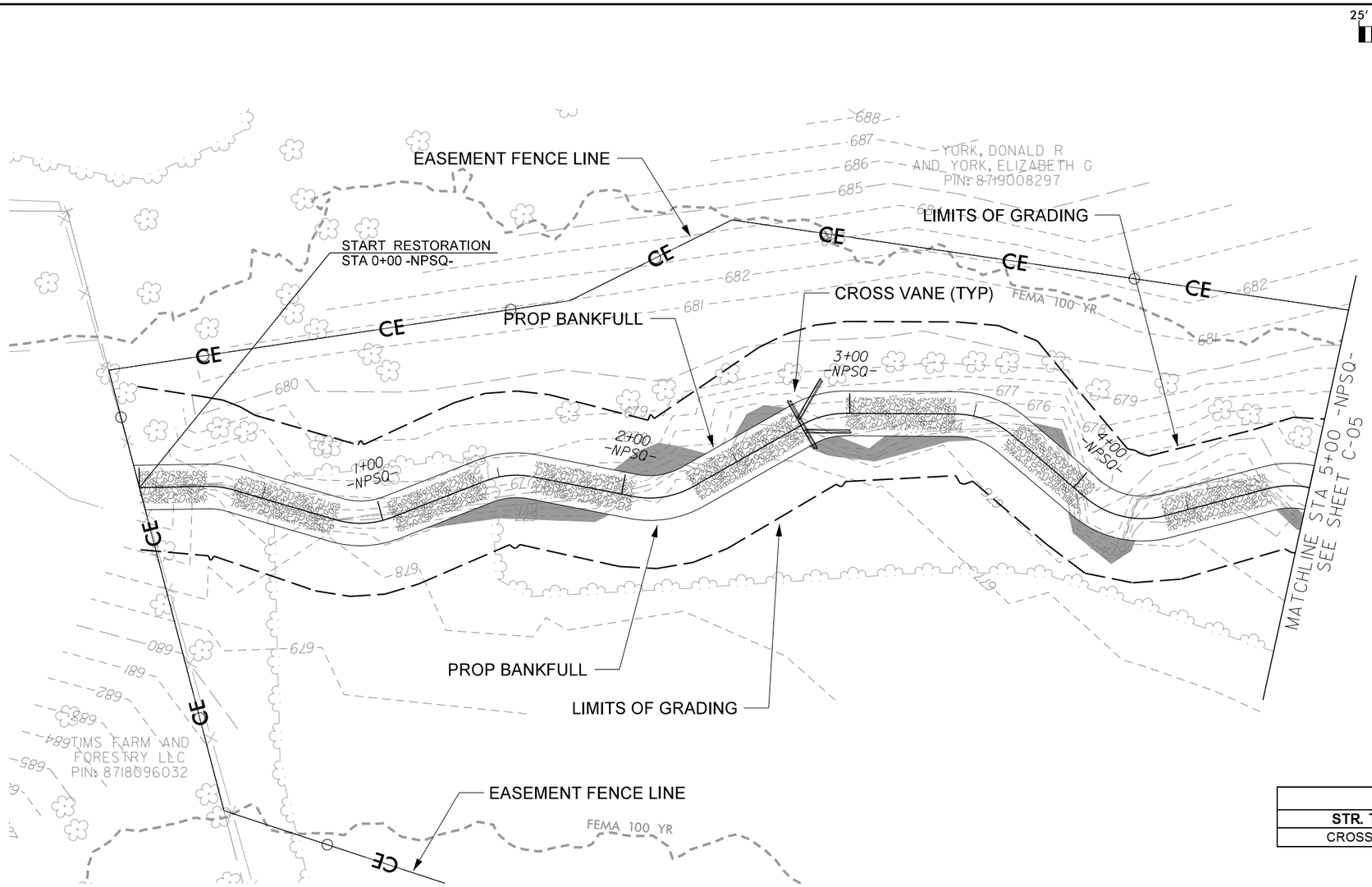

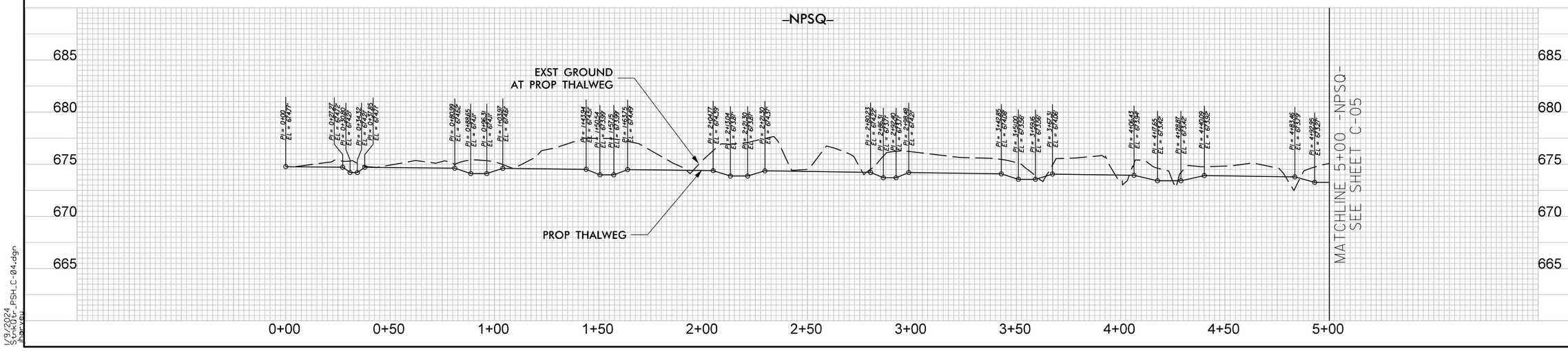

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

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PROFESSIONAL
ENGINEER
SEAL
032847
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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,695.18	1,810,603.37	674.22

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-04
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-04

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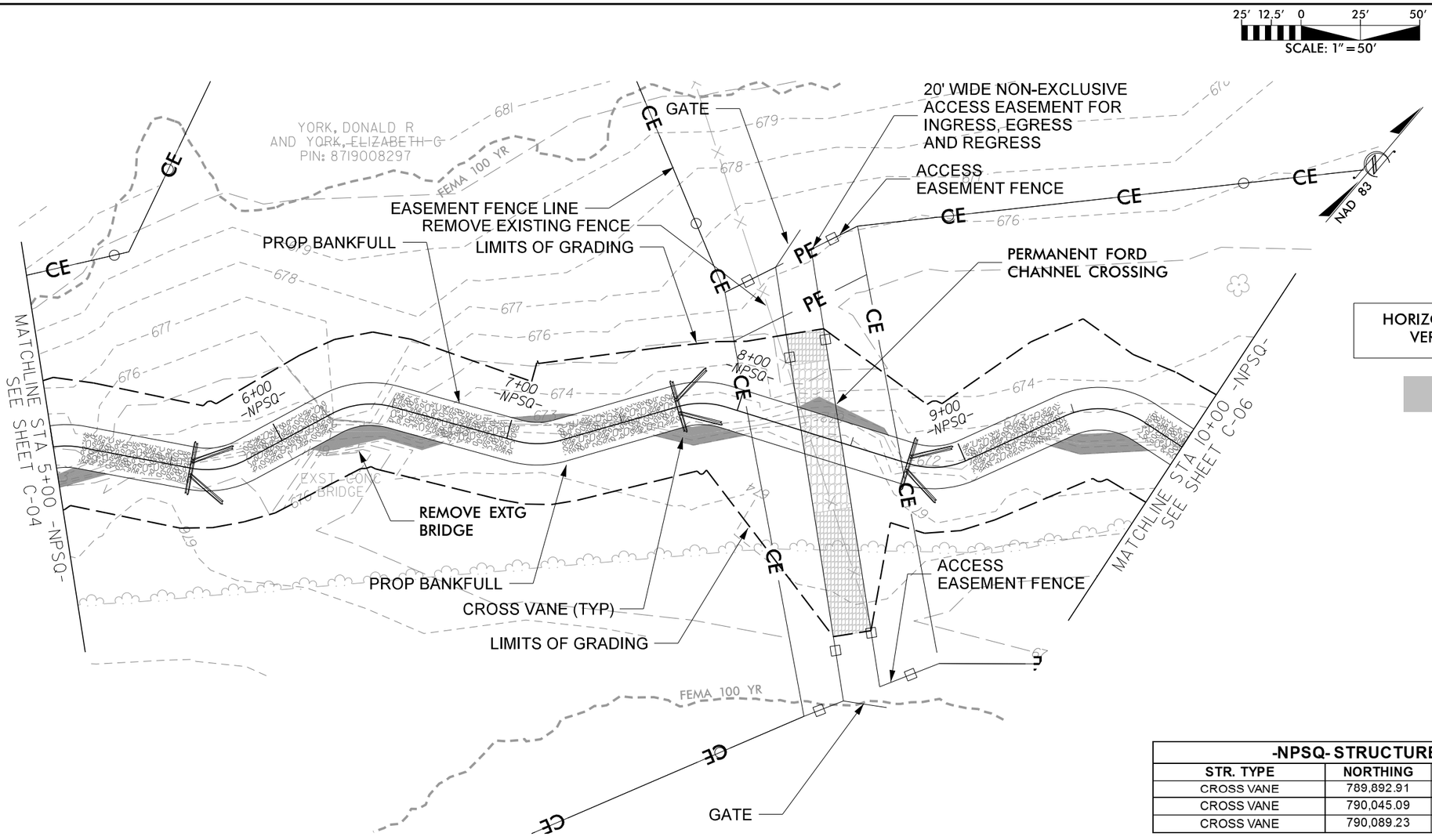
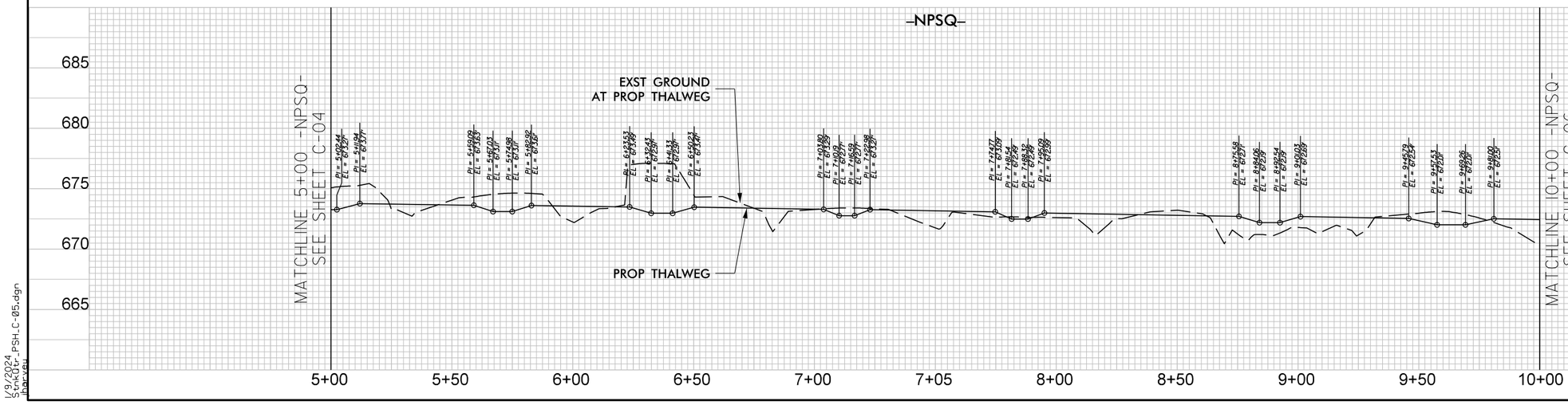
Stnkqtr_PSH_C-04.dgn
Jarod



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,892.91	1,810,773.44	673.63
CROSS VANE	790,045.09	1,810,913.39	673.09
CROSS VANE	790,089.23	1,811,002.96	672.71



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036161 JOSEPH C. DALTON FOR CONSTRUCTION NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

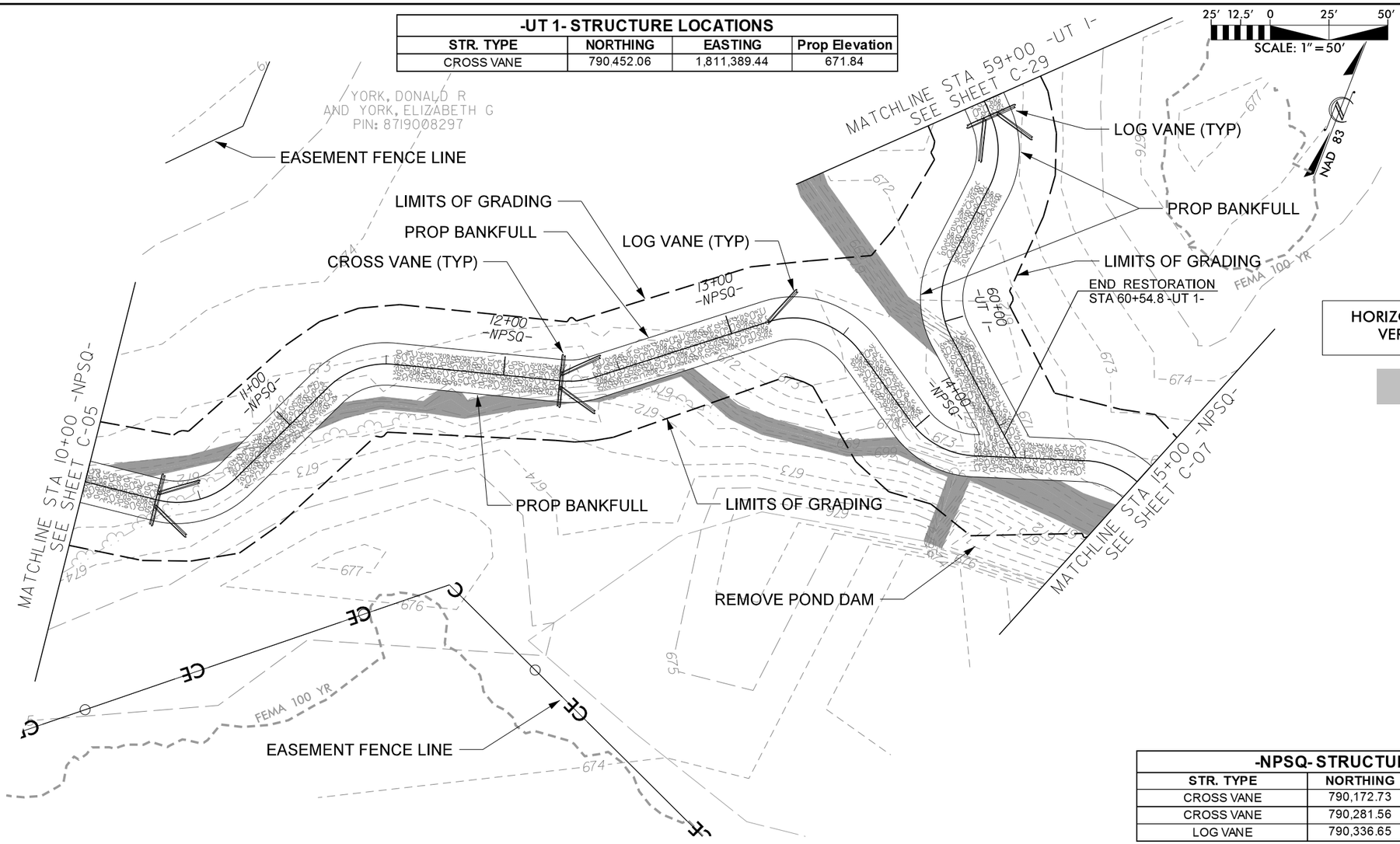
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-05
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

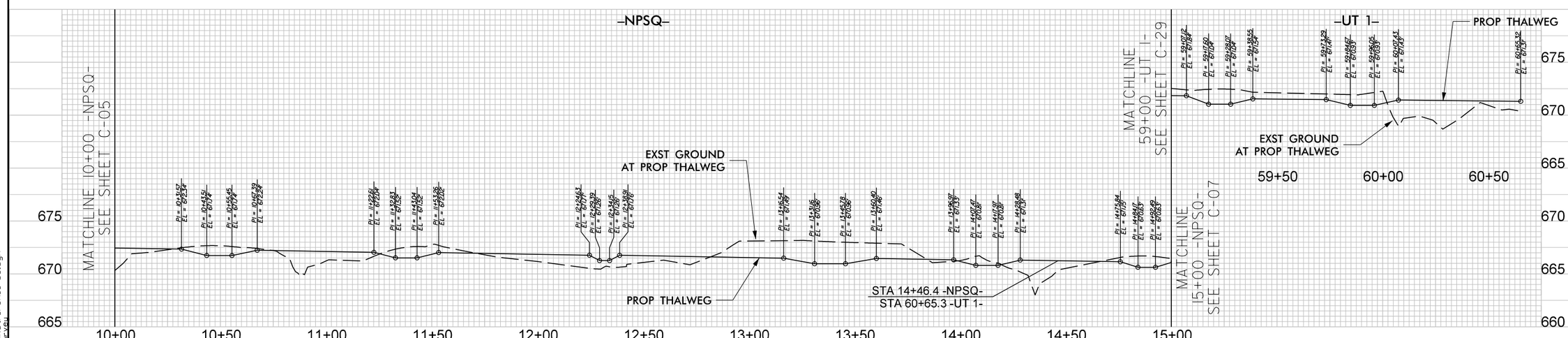
SHEET NO. C–05

1/9/2024
StnkQtr_PSH_C-05.dgn
Jarvis

-UT 1- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,452.06	1,811,389.44	671.84



-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,172.73	1,811,117.71	672.34
CROSS VANE	790,281.56	1,811,259.53	671.77
LOG VANE	790,336.65	1,811,332.66	671.49



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047887 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-06
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-06

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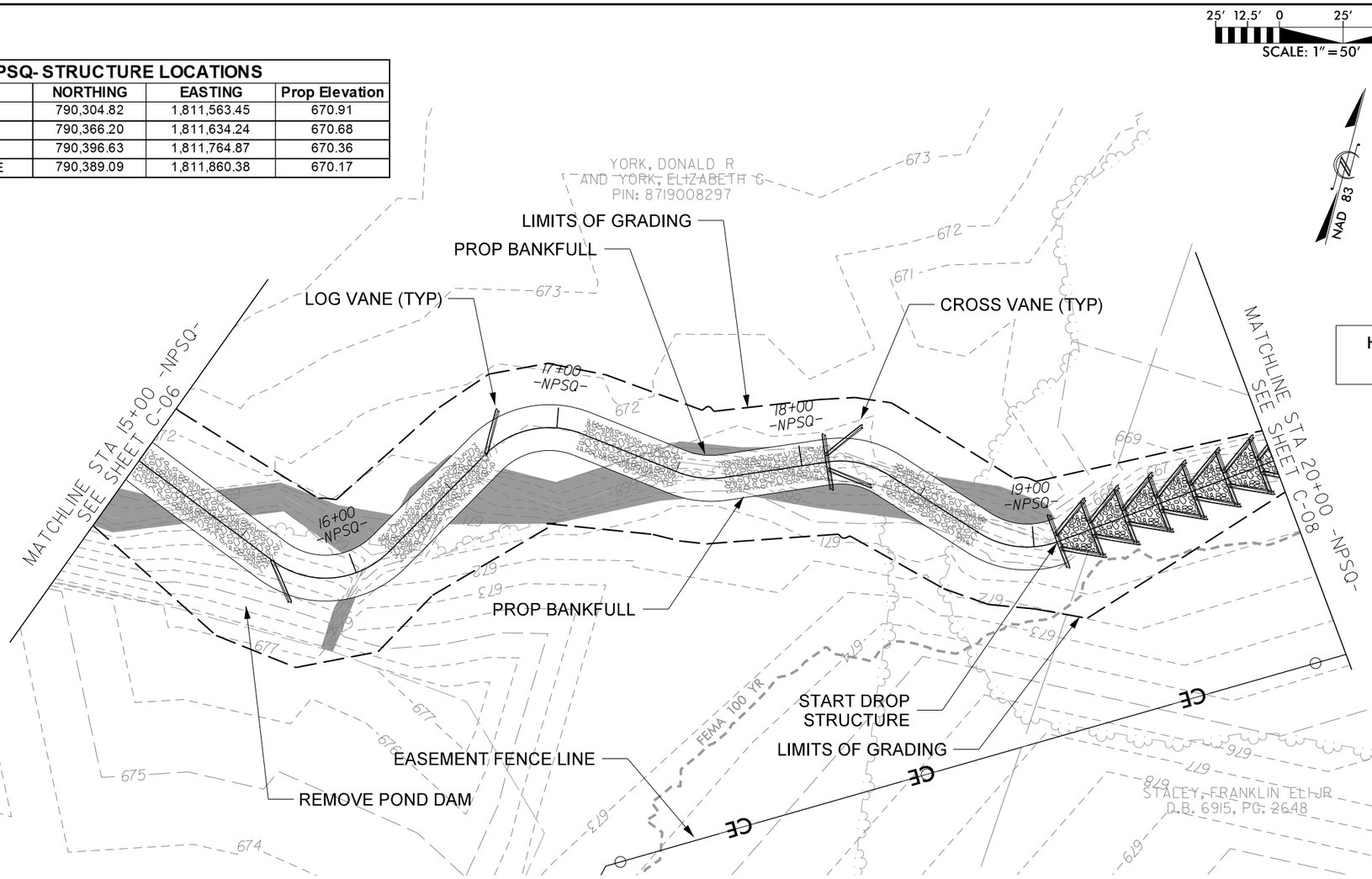
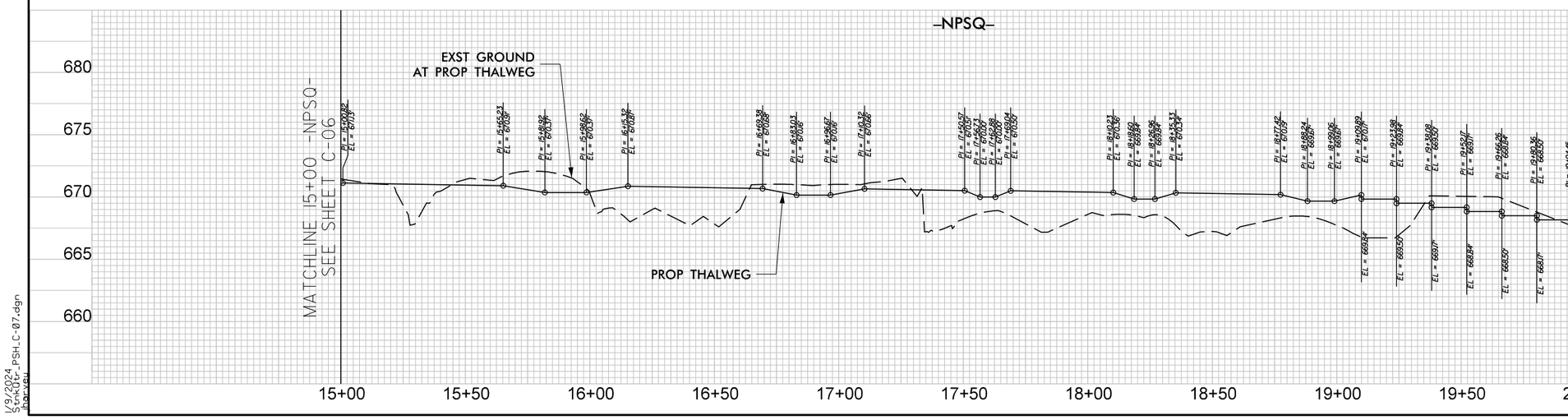
StnkQtr_PSH_C-06.dgn
jharvey

-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
LOG VANE	790,304.82	1,811,563.45	670.91
LOG VANE	790,366.20	1,811,634.24	670.68
CROSS VANE	790,396.63	1,811,764.87	670.36
DROP STRUCTURE	790,389.09	1,811,860.38	670.17





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28801 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

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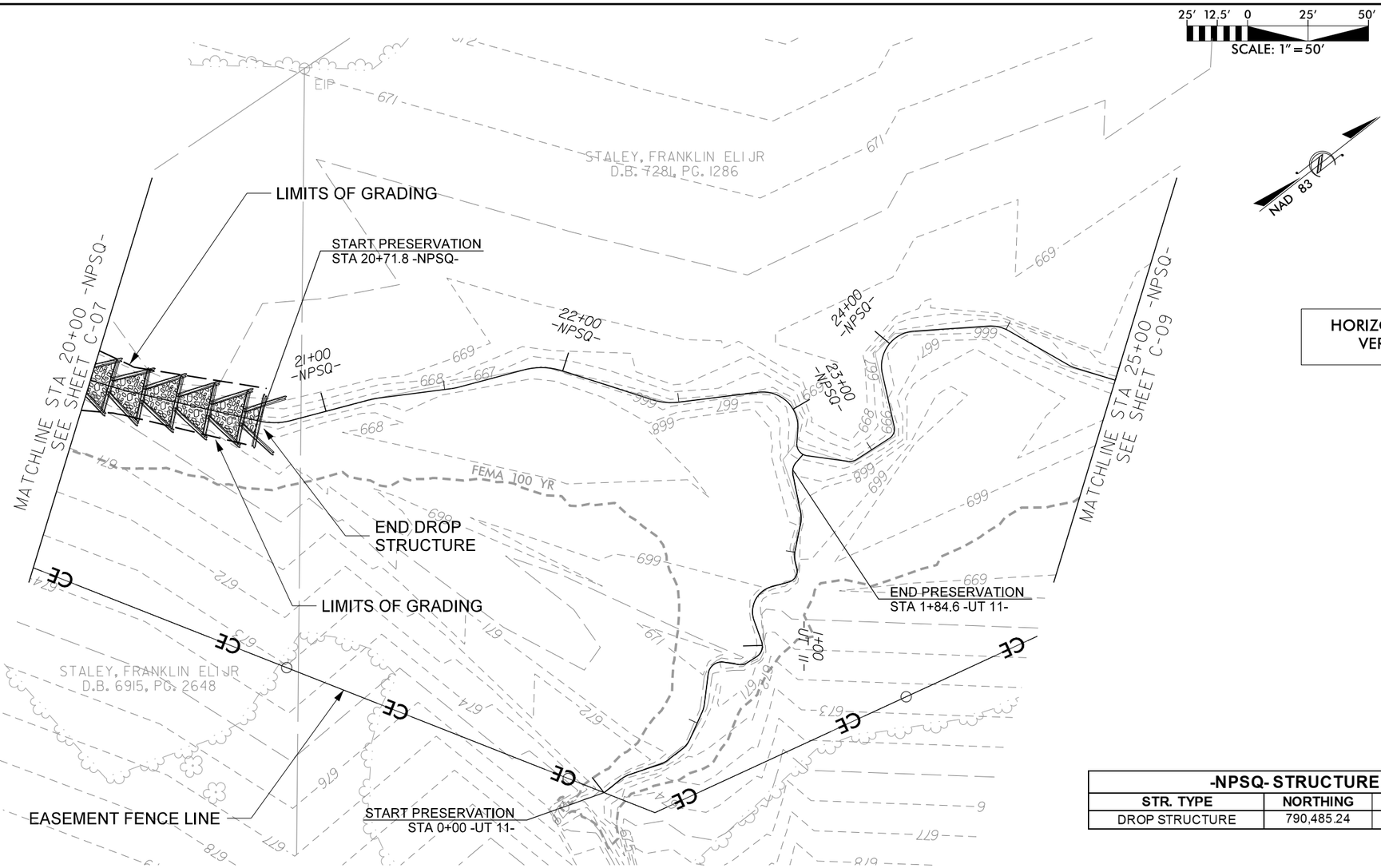
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

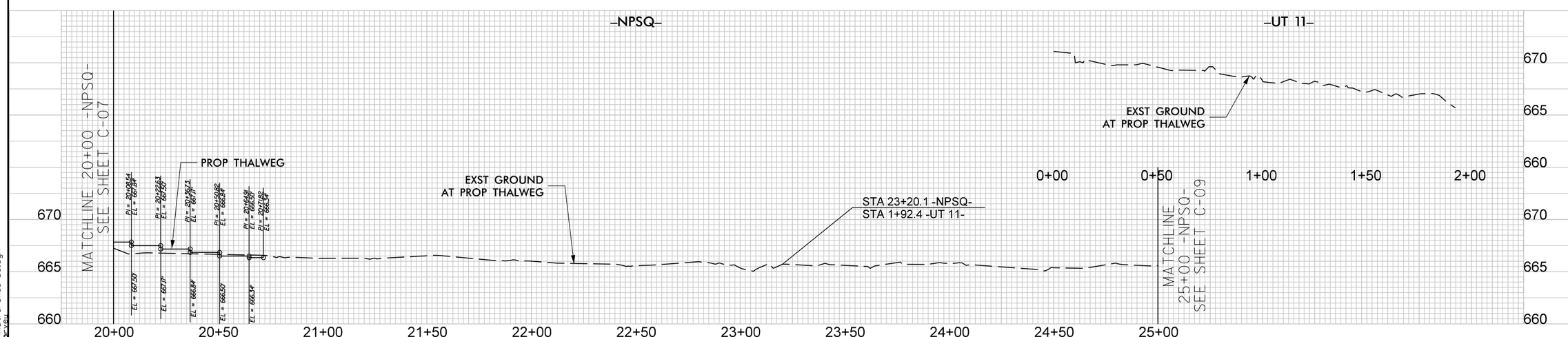
PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-07
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–07

1/9/2024
Stnkqtr_PSH_C-07.dgn
jharvey



-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
DROP STRUCTURE	790,485.24	1,811,990.56	666.34



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038487 JOSEPH C. DALTON PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER

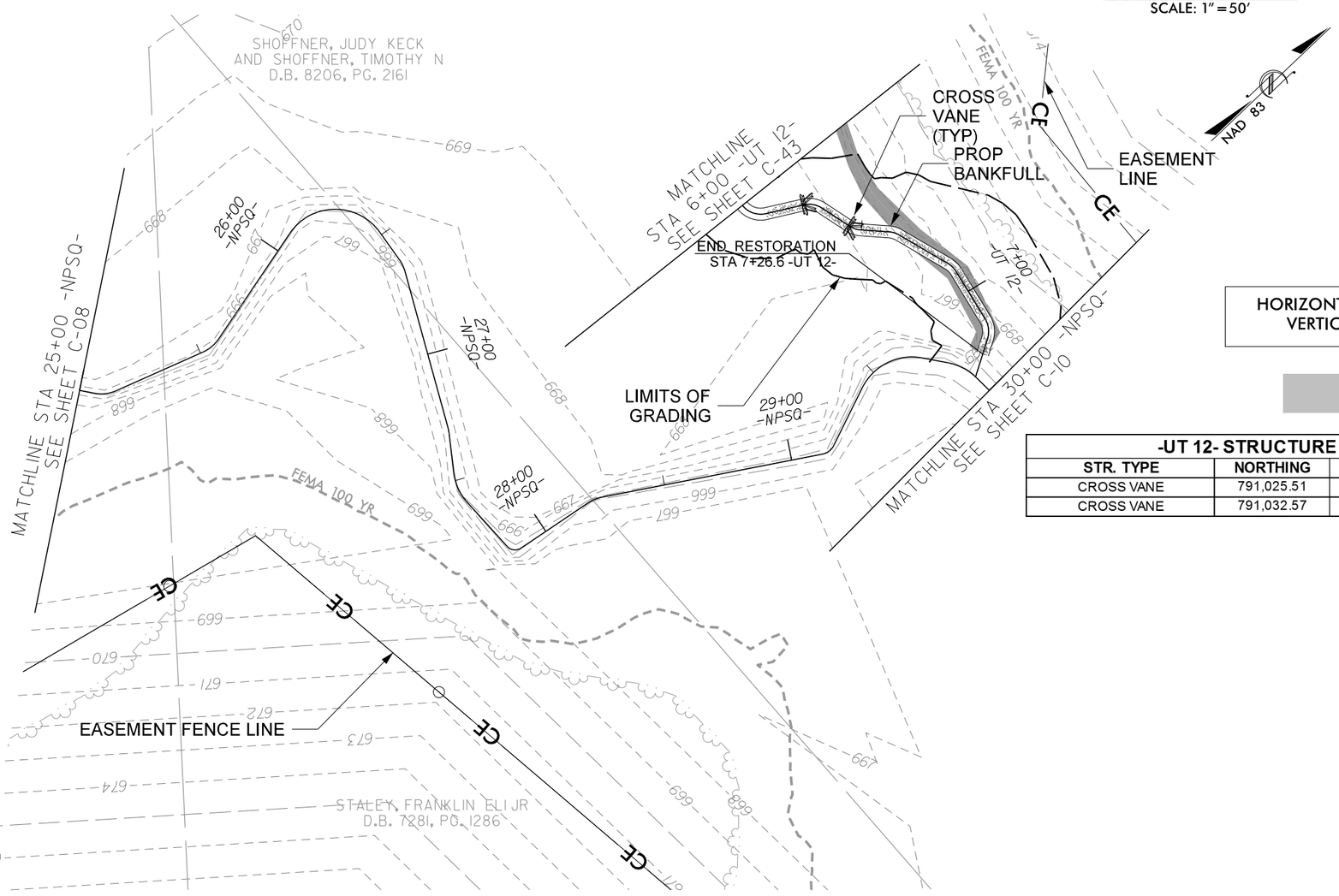
GUILFORD COUNTY, NC

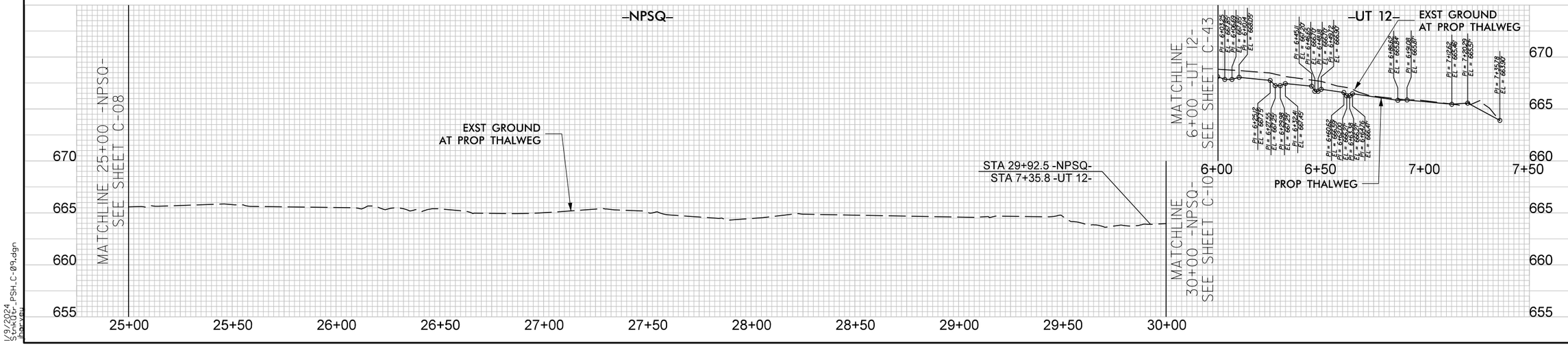
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-08
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-08

1/9/2024
Stnkqtr_PSH_C-08.dgn
Harvey





-UT 12- STRUCTURE LOCATIONS

STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,025.51	1,812,336.37	667.75
CROSS VANE	791,032.57	1,812,354.47	667.20

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038463 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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TEL: 919.851.9985
ENG FIRM LICENSE NO. C-3950

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-09
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-09

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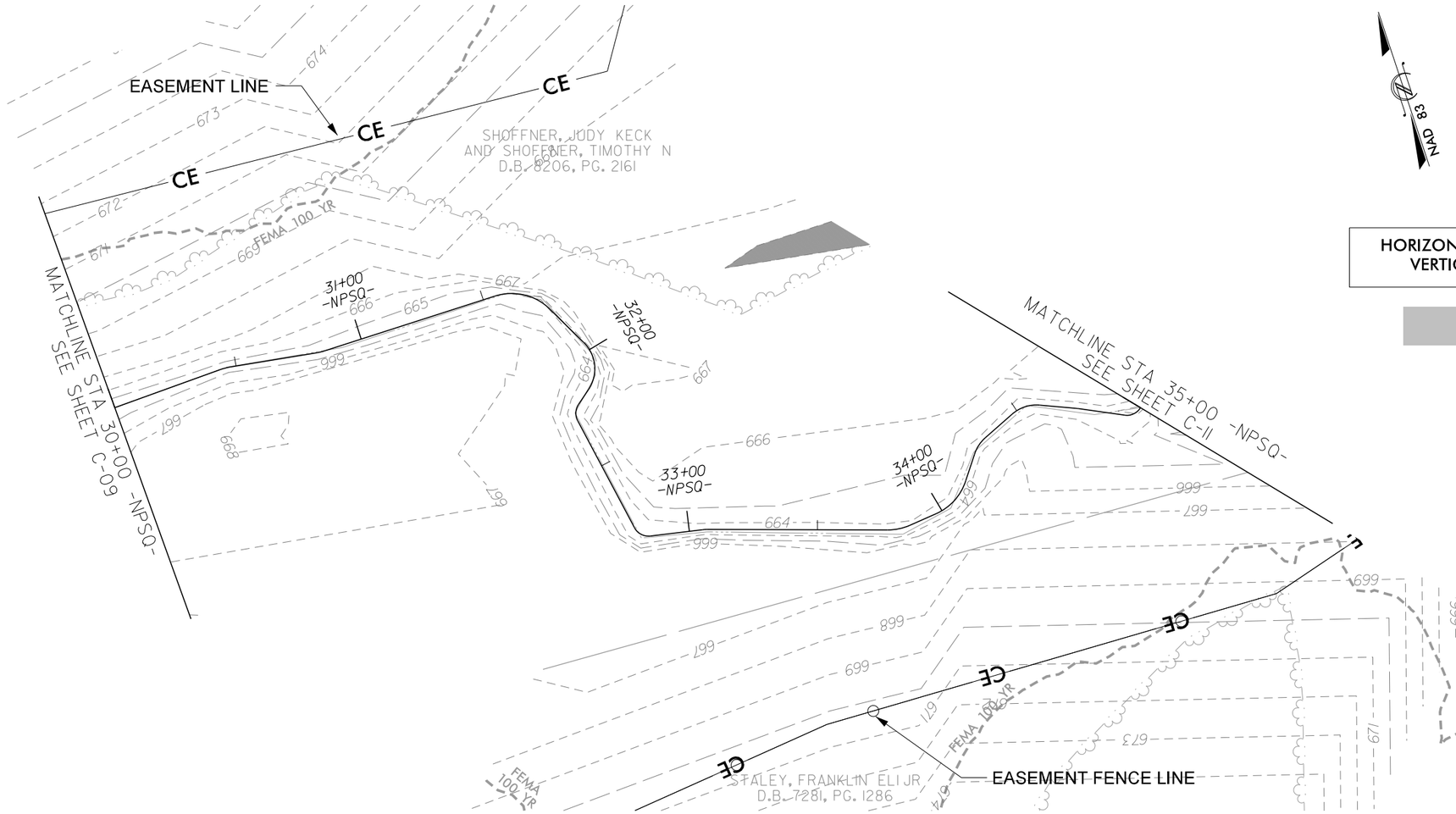
1/9/2024
STNKQTR_PSH_C-09.dgn
Jarvis

25' 12.5' 0 25' 50'

SCALE: 1" = 50'



NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28403 JOSEPH C. DALTON

PRELIMINARY NOT FOR CONSTRUCTION

DATE:

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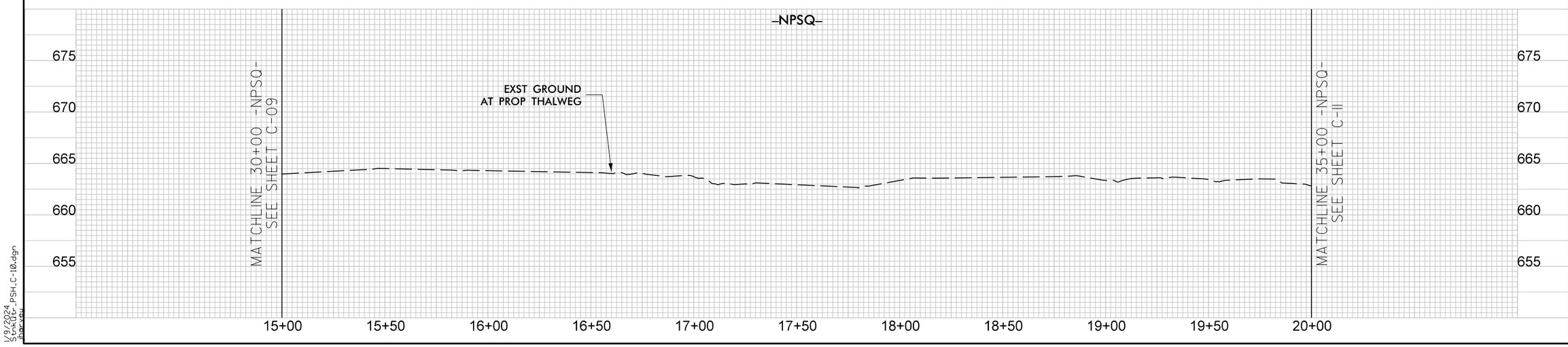
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL



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STINKING QUARTER

GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-10
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C-10

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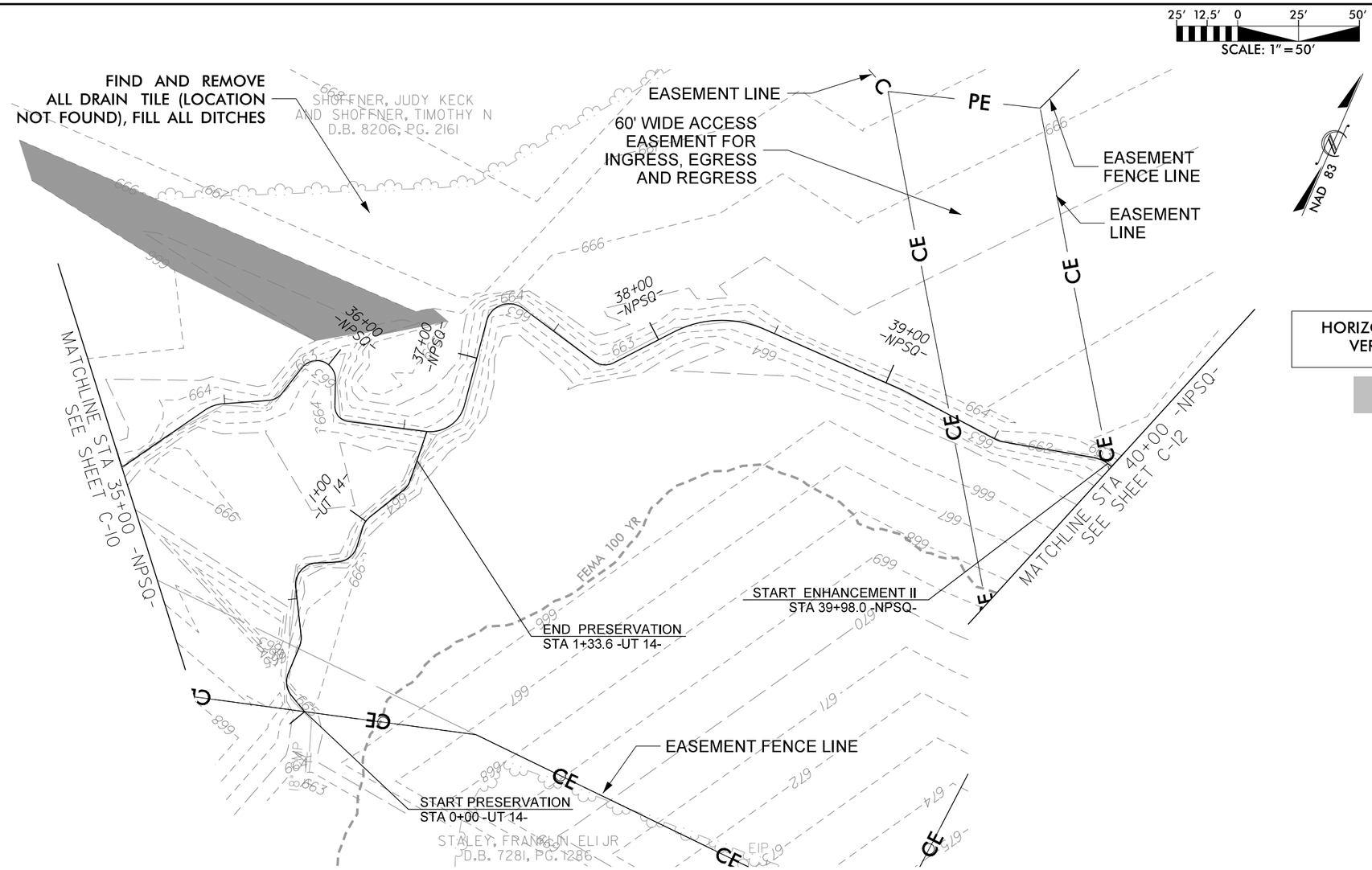
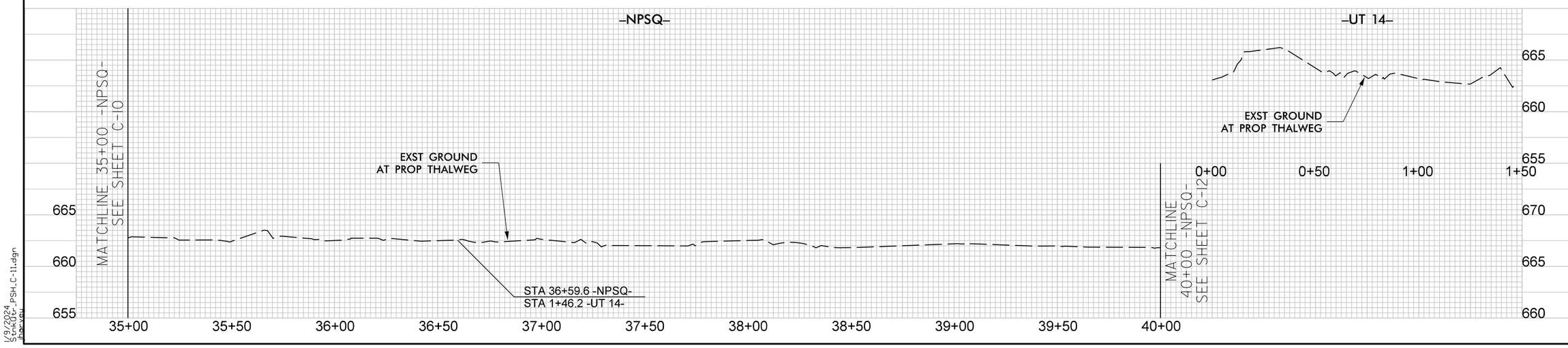
Stnkqtr_PSH_C-10.dgn
Harvey





HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036856 JOSEPH C. DALTON — PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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TEL: 919.852.1003
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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-11
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-11

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1/9/2024
Stnkqtr_PSH_C-11.dgn
Jrharvey

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

SHOFFNER, JUDY KECK AND SHOFFNER, TIMOTHY M
D.B. 8206, PG. 2161

EASEMENT FENCE LINE

MATCHLINE STA 40+00 -NPSQ-
SEE SHEET C-11

MATCHLINE STA 45+00 -NPSQ-
SEE SHEET C-13

EASEMENT LINE

60' WIDE ACCESS EASEMENT FOR INGRESS, EGRESS AND REGRESS

15' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS AND REGRESS

HARMON, SHERRI S AND HARMON, TONY PAUL
D.B. 7159, PG. 2627

41+00 -NPSQ-
42+00 -NPSQ-
43+00 -NPSQ-
44+00 -NPSQ-

FEMA 100 YR
EXTG ATV PATH
EIP

-NPSQ-

EXST GROUND AT PROP THALWEG

675
670
665
660
655

40+00 40+50 41+00 41+50 42+00 42+50 43+00 43+50 44+00 44+50 45+00

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-12
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–12

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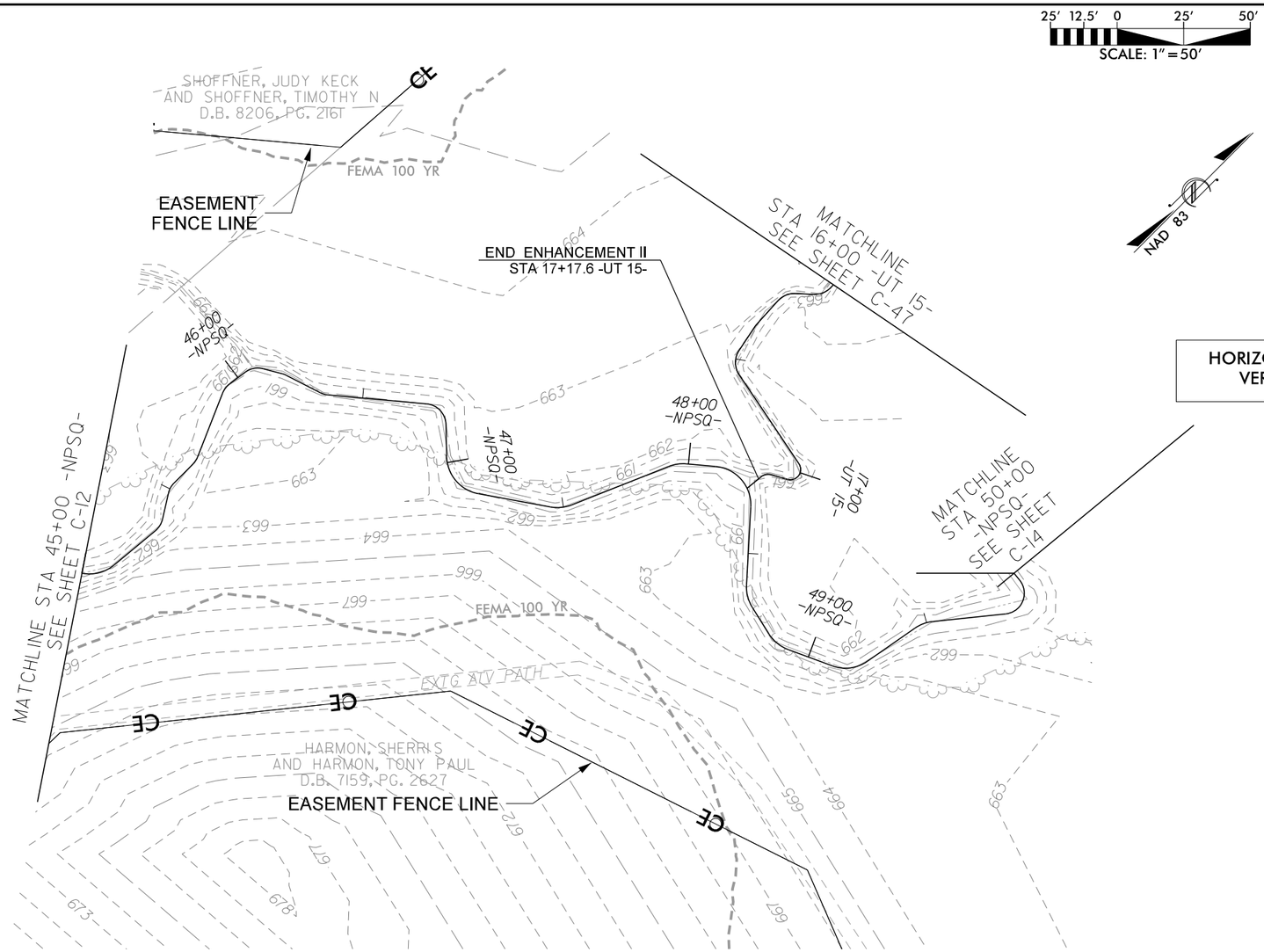
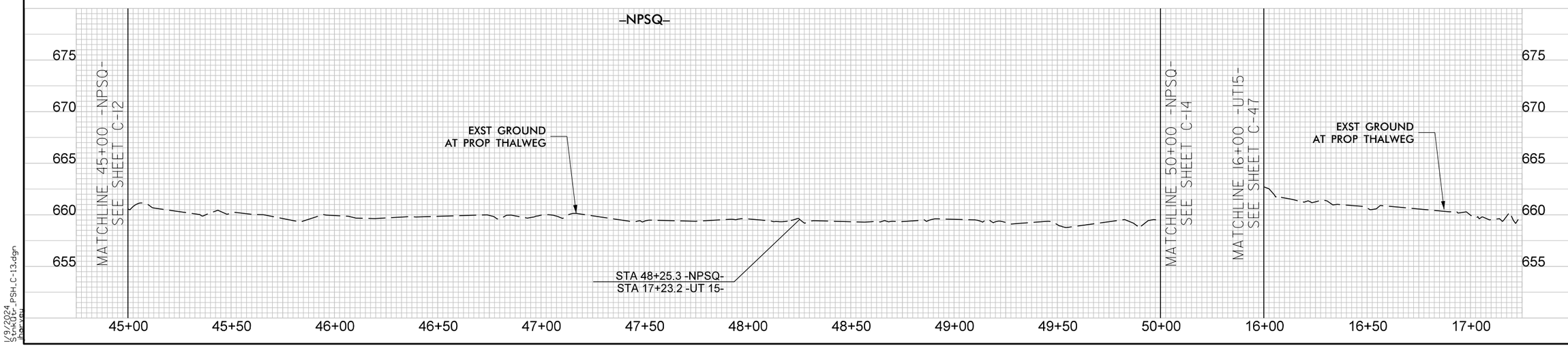
StnkQtr_PSH_C-12.dgn
Jarvis





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-13
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C-13**

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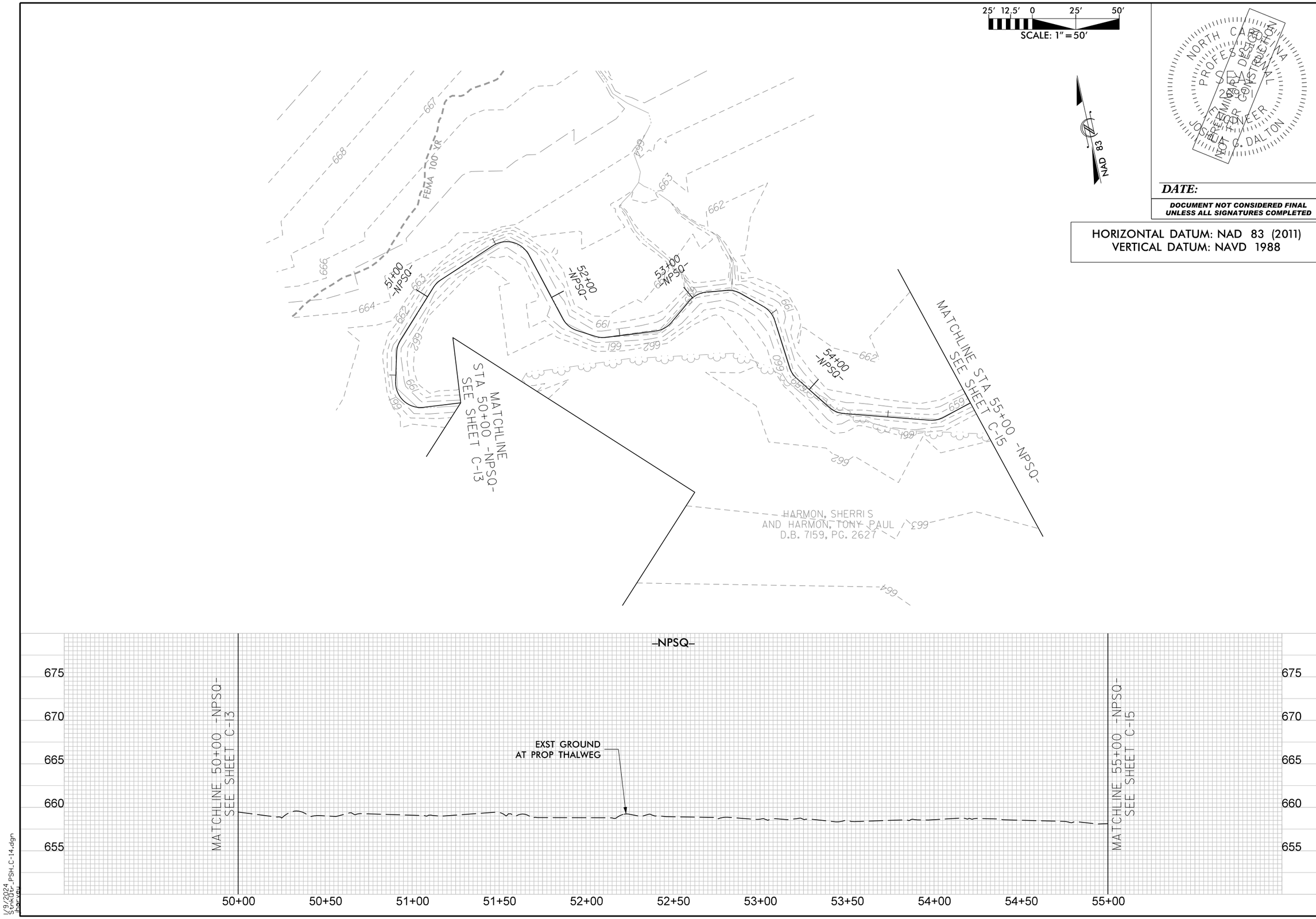
Stnkqtr_PSH_C-13.dgn
jharvell



NORTH CAROLINA PROFESSIONAL SEAL 29911 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-14
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-14

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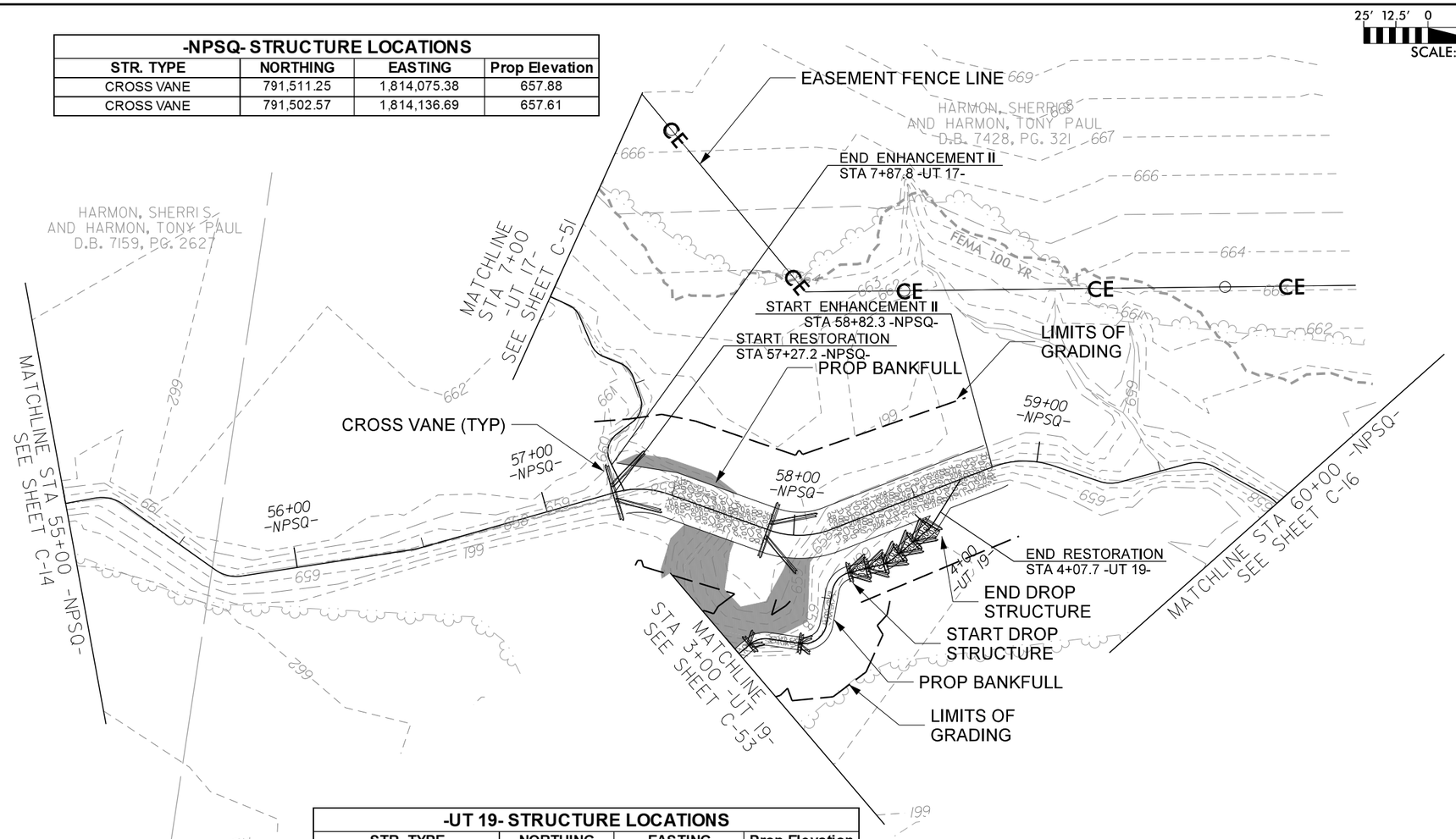
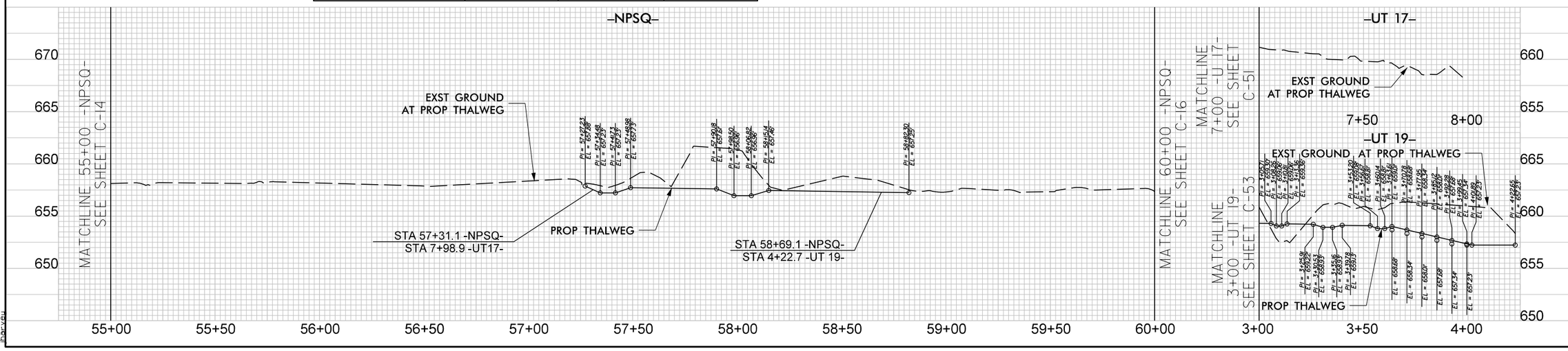
1/9/2024
StnkQtr_PSH_C-14.dgn
jharvey

-NPSQ- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,511.25	1,814,075.38	657.88
CROSS VANE	791,502.57	1,814,136.69	657.61



-UT 19- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,457.59	1,814,133.78	659.30
CROSS VANE	791,459.74	1,814,153.21	659.22
DROP STRUCTURE	791,489.22	1,814,169.63	659.01
DROP STRUCTURE	791,510.92	1,814,199.97	657.23



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON
NOT FOR CONSTRUCTION PRELIMINARY DESIGN

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-15
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-15

1/9/2024
Stnkqtr_PSH_C-15.dgn
jharkey

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

HARMON, SHERRI S
AND HARMON, TONY PAUL
D.B. 7428, PG. 321

GATE

20' WIDE ACCESS EASEMENT FOR INGRESS, EGRESS AND REGRESS

EASEMENT FENCE LINE

MATCHLINE STA 60+00 -NPSQ-
SEE SHEET C-15

MATCHLINE STA 65+00 -NPSQ-
SEE SHEET C-17

FEMA 100 YR

61+00 -NPSQ-

62+00 -NPSQ-

63+00 -NPSQ-

64+00 -NPSQ-

PERMANENT CATTLE CHANNEL FORD CROSSING

EXTG ATV PATH

GATE

EASEMENT FENCE LINE

-NPSQ-

EXST GROUND AT PROP THALWEG

670
665
660
655
650

60+00 60+50 61+00 61+50 62+00 62+50 63+00 63+50 64+00 64+50 65+00

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23681 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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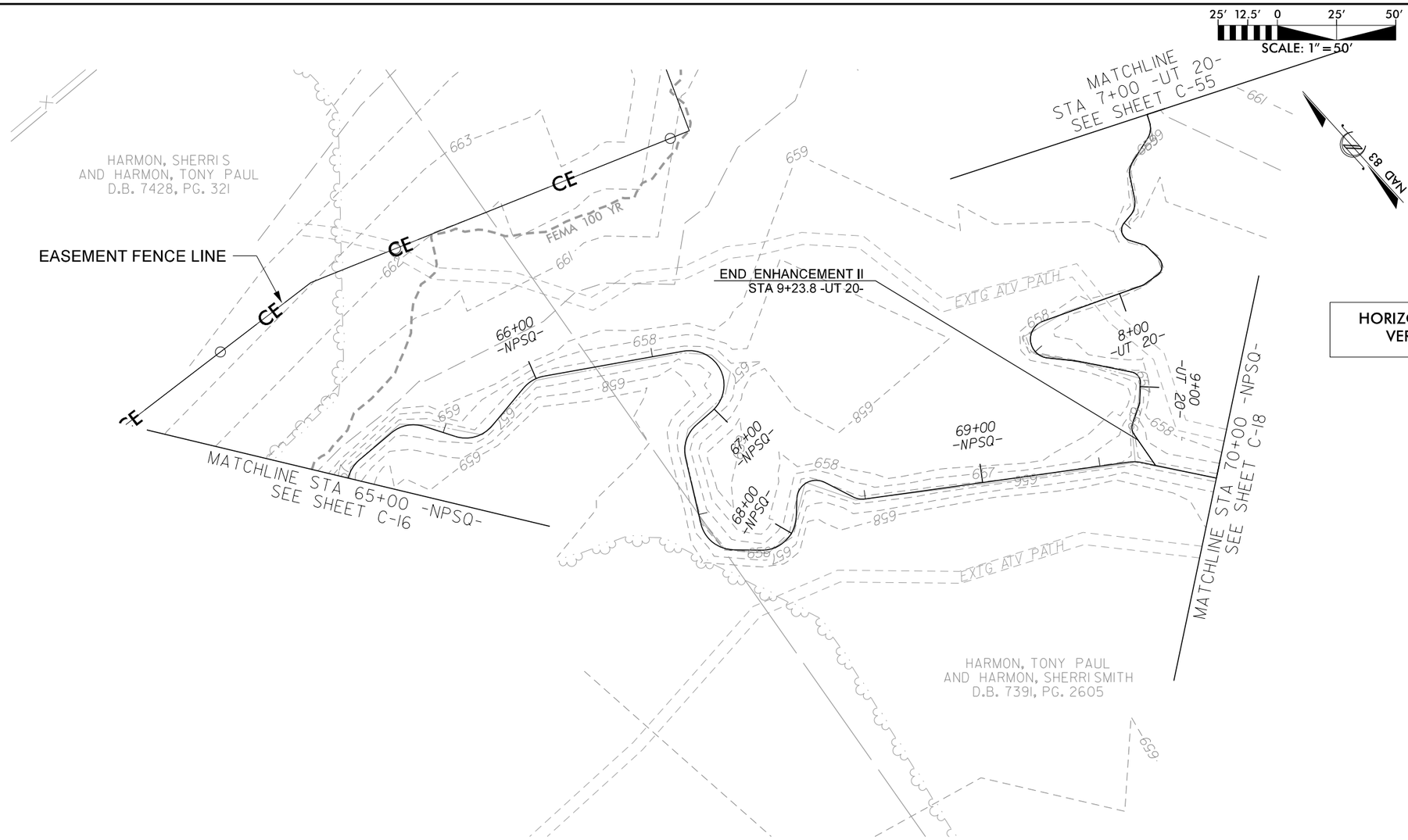
STINKING QUARTER
GUILFORD COUNTY, NC

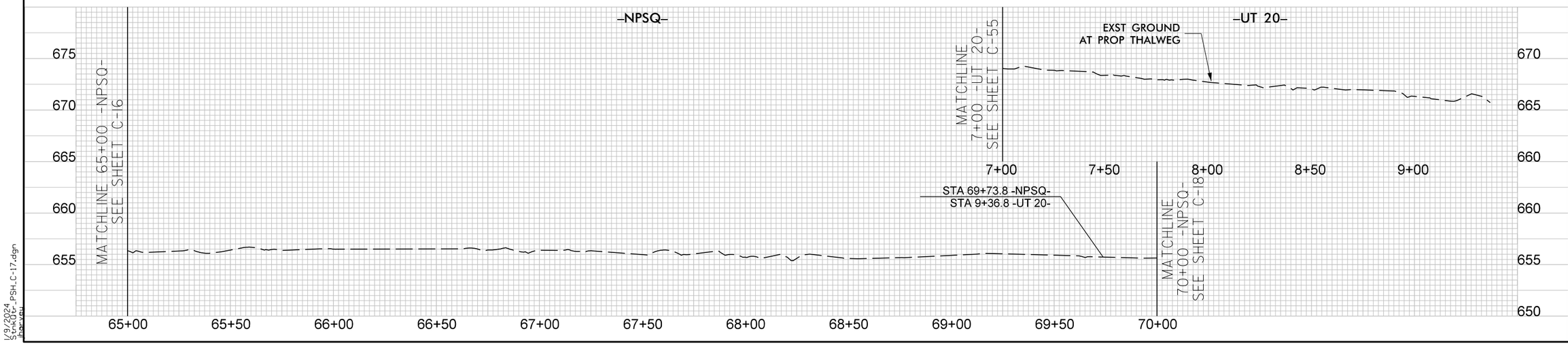
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-16
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C-16

1/9/2024
Stnkqtr_PSH_C-16.dgn
Marvel





HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27886 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-17
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-17

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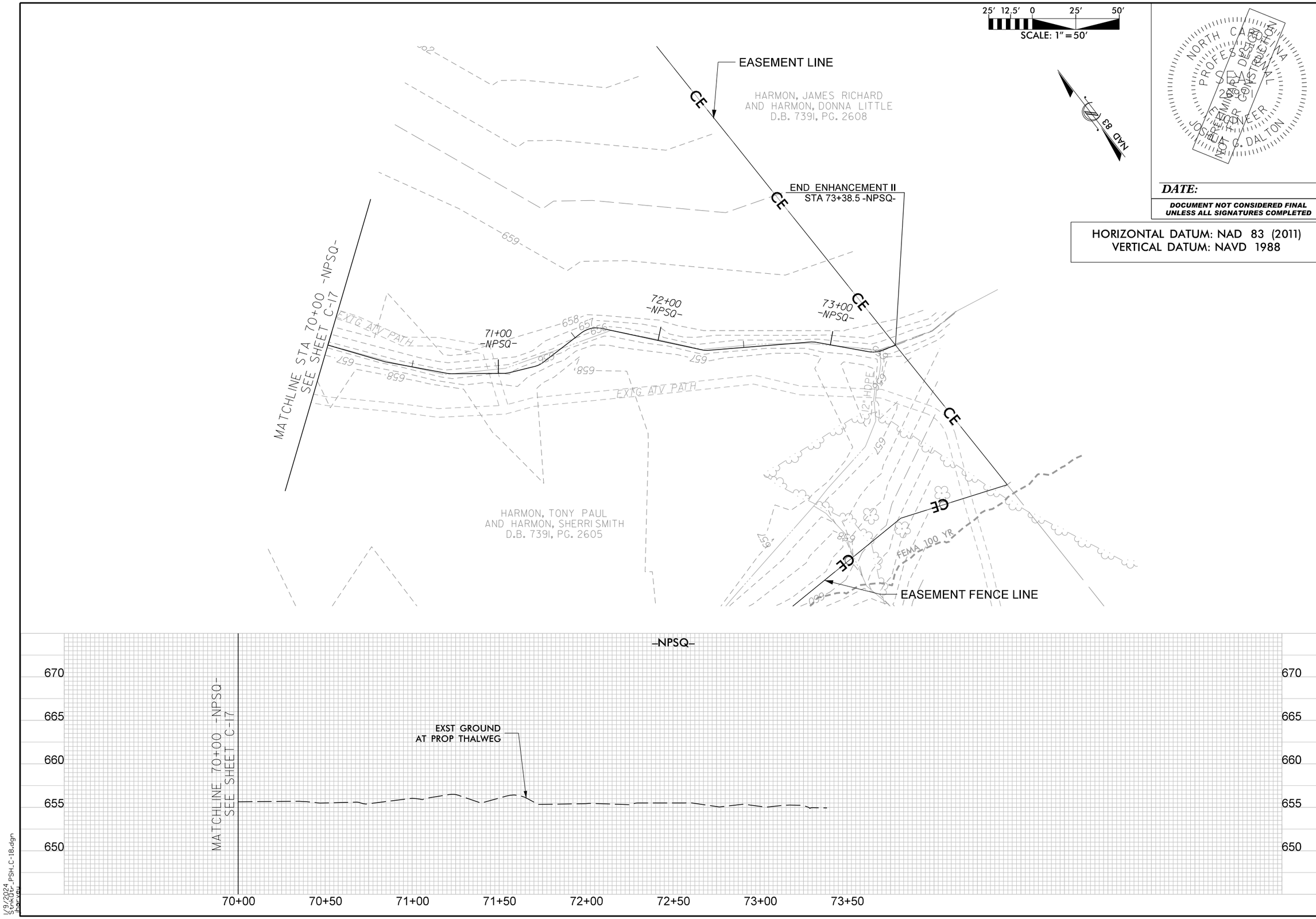
Joe Yeu



NORTH CAROLINA PROFESSIONAL SEAL 29 ENGINEER JOSHUA G. DALTON
NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-18
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–18

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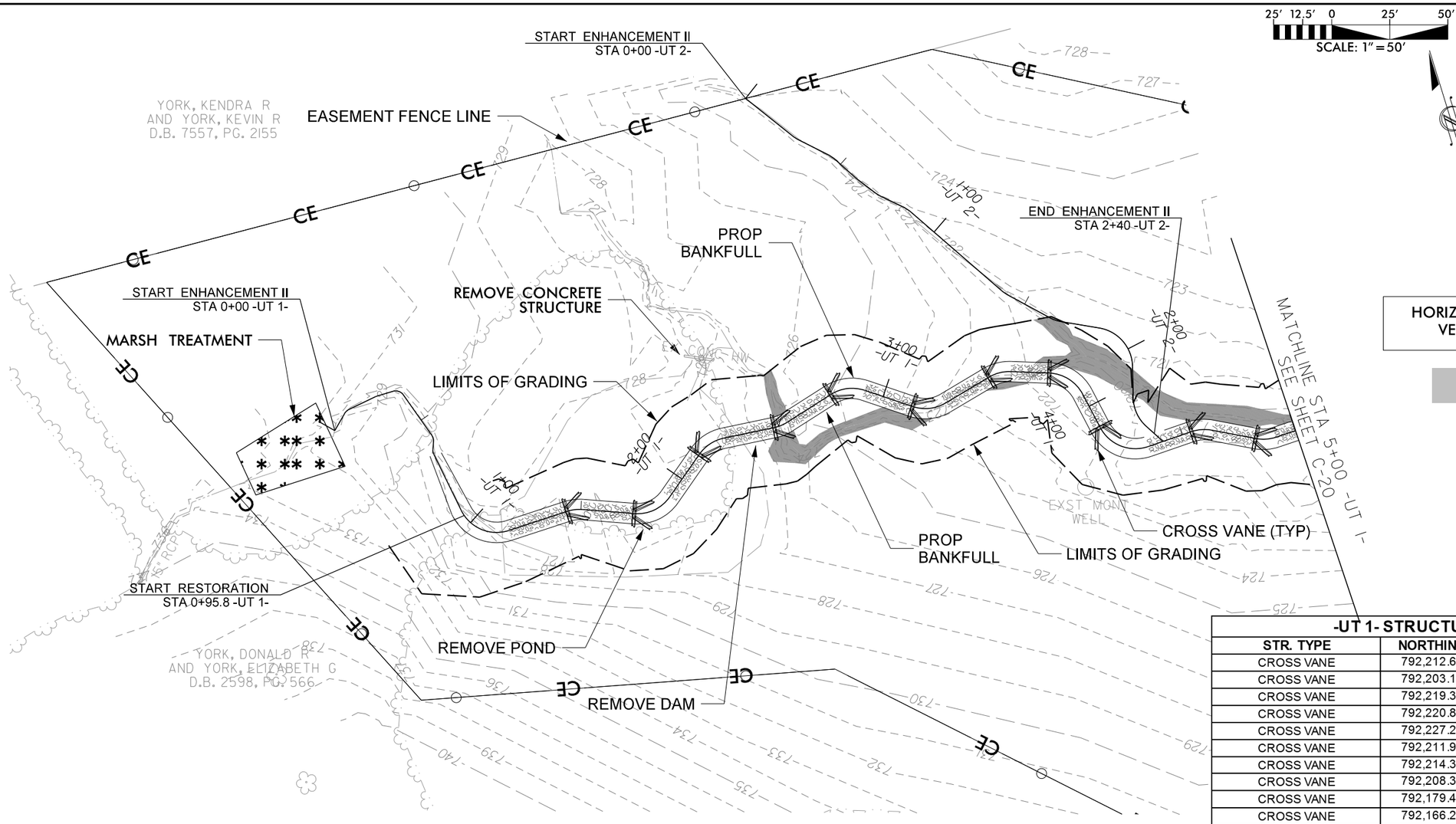
StnkQtr_PSH_C-18.dgn
jharvey

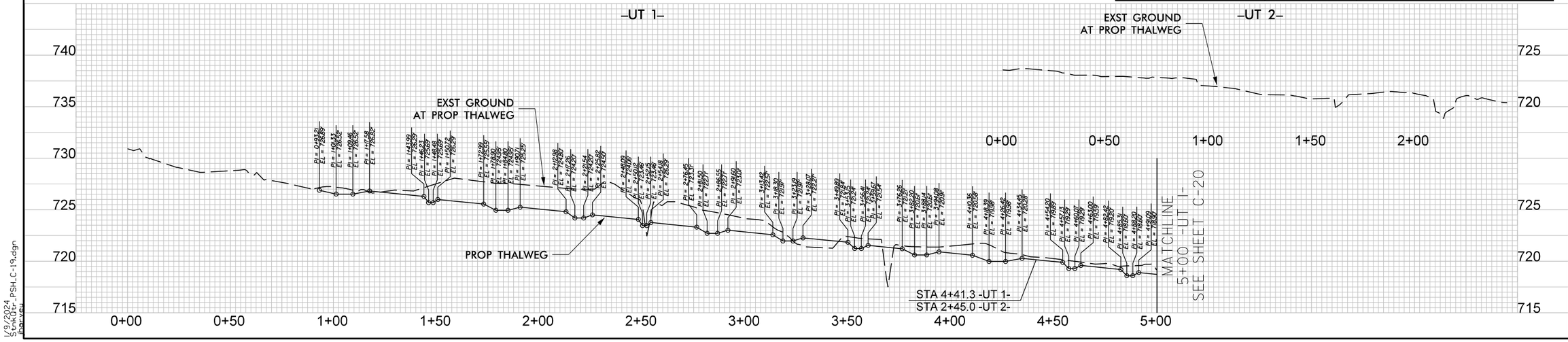


HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 1- STRUCTURE LOCATIONS

STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,212.60	1,807,558.26	726.29
CROSS VANE	792,203.17	1,807,585.53	725.55
CROSS VANE	792,219.32	1,807,619.82	724.80
CROSS VANE	792,220.84	1,807,654.02	724.06
CROSS VANE	792,227.26	1,807,681.54	723.31
CROSS VANE	792,211.92	1,807,713.67	722.57
CROSS VANE	792,214.34	1,807,748.81	721.84
CROSS VANE	792,208.37	1,807,774.11	721.21
CROSS VANE	792,179.46	1,807,788.19	720.58
CROSS VANE	792,166.23	1,807,825.18	719.89
CROSS VANE	792,155.20	1,807,850.83	719.20



DATE:

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON NOT FOR CONSTRUCTION PRELIMINARY DESIGN

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-19
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C–19**

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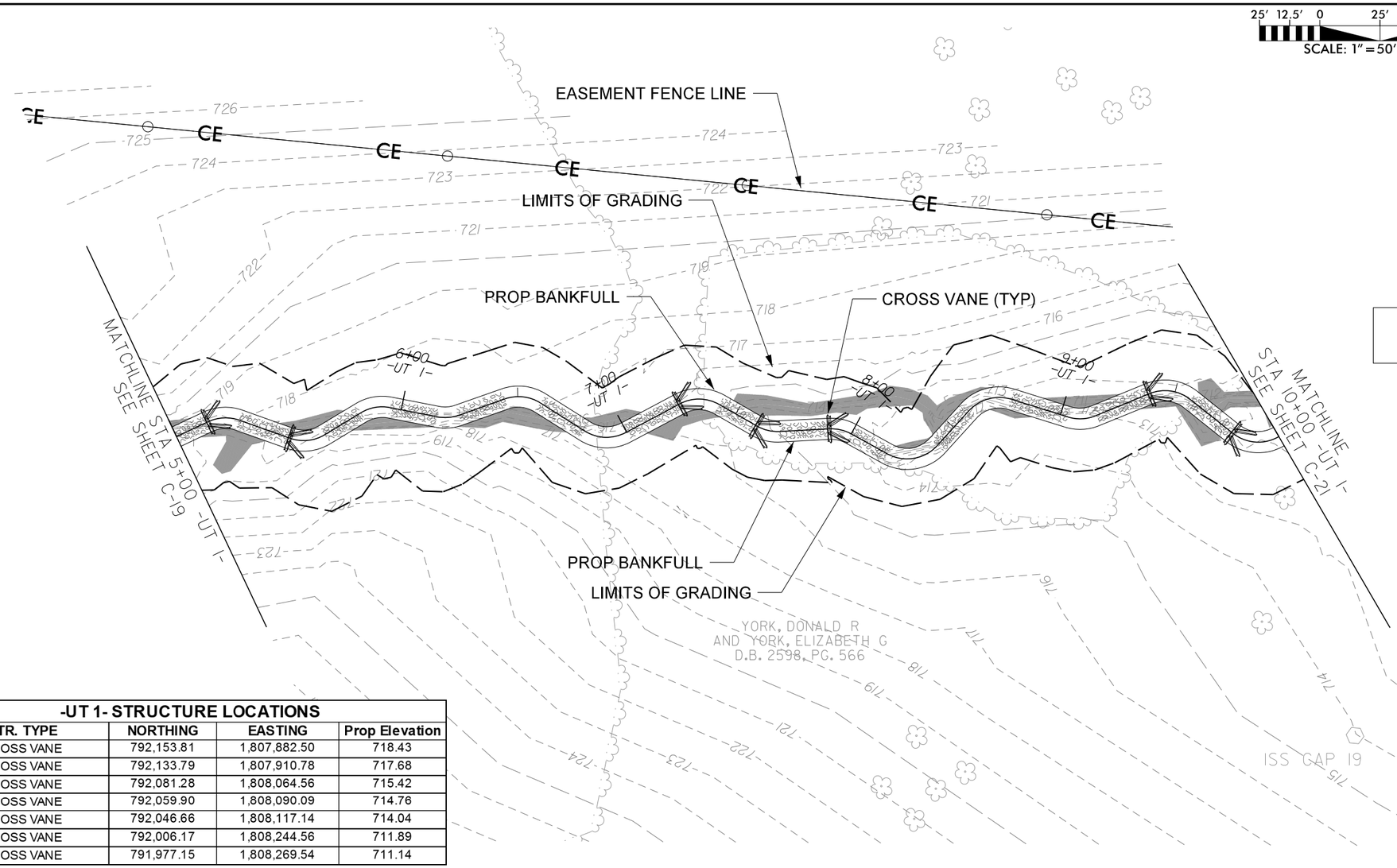
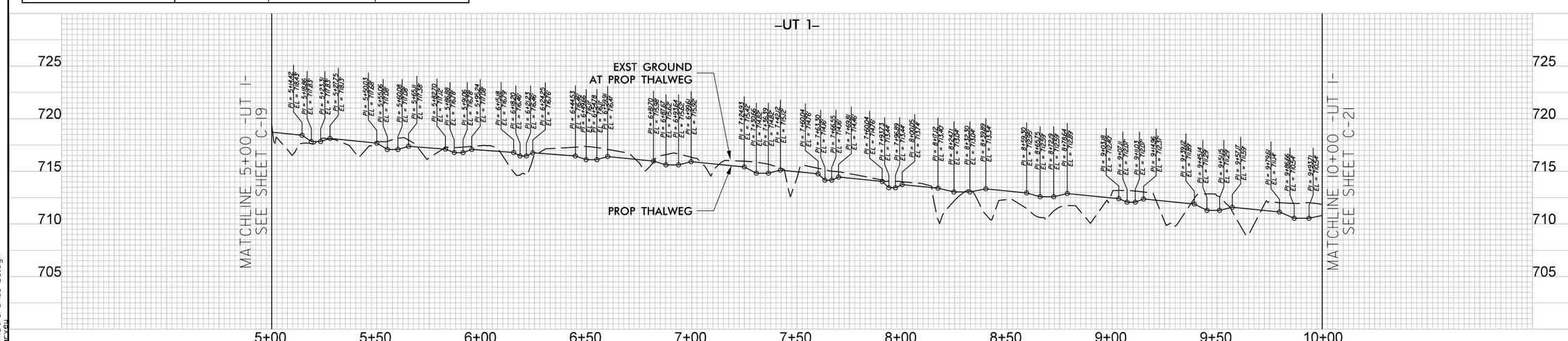
Stnkqtr_PSH_C-19.dgn
Jon Hall



-UT 1- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,153.81	1,807,882.50	718.43
CROSS VANE	792,133.79	1,807,910.78	717.68
CROSS VANE	792,081.28	1,808,064.56	715.42
CROSS VANE	792,059.90	1,808,090.09	714.76
CROSS VANE	792,046.66	1,808,117.14	714.04
CROSS VANE	792,006.17	1,808,244.56	711.89
CROSS VANE	791,977.15	1,808,269.54	711.14



NORTH CAROLINA PROFESSIONAL SEAL 29 ENGINEER JOSHUA G. DALTON

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

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GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH C-20
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–20

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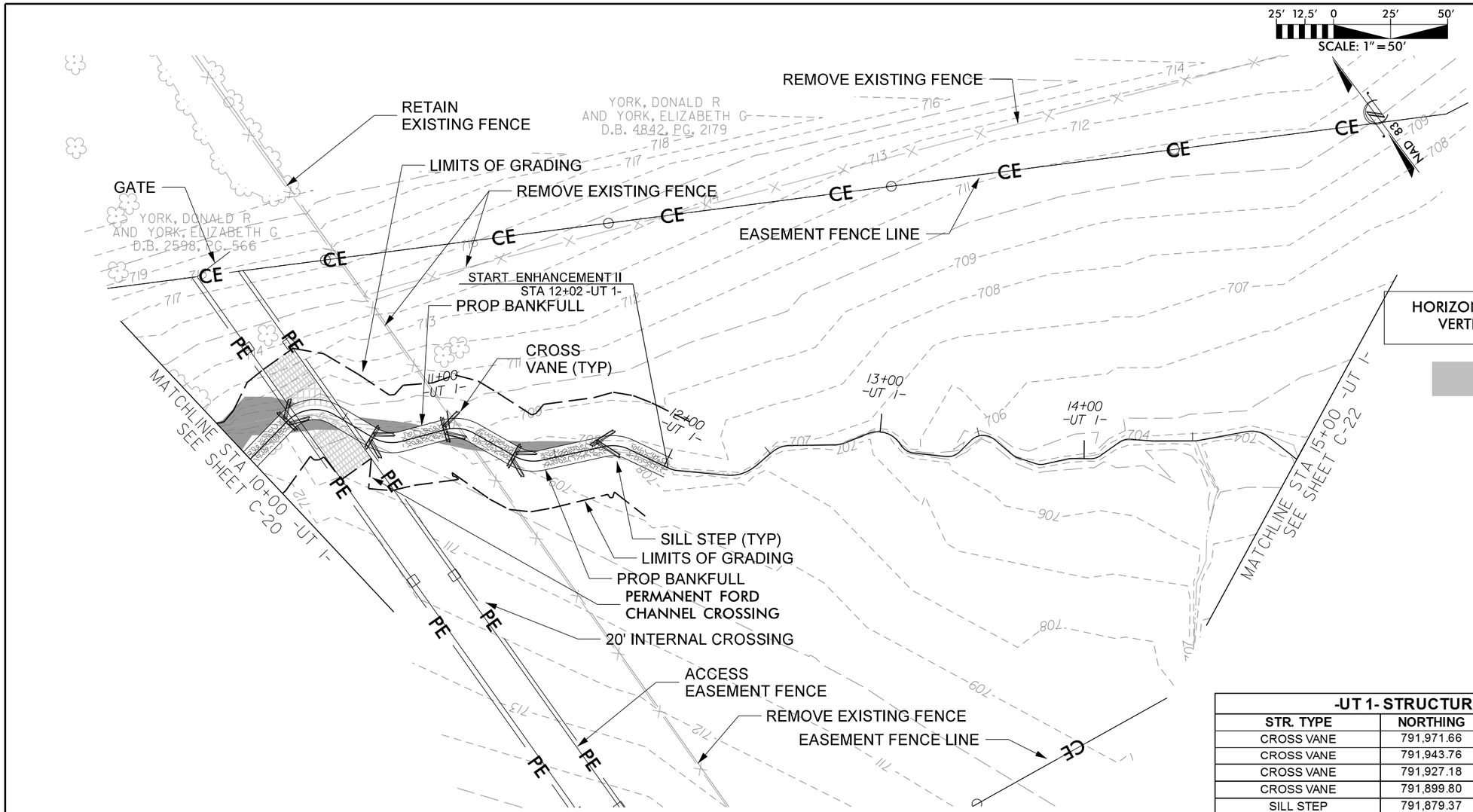
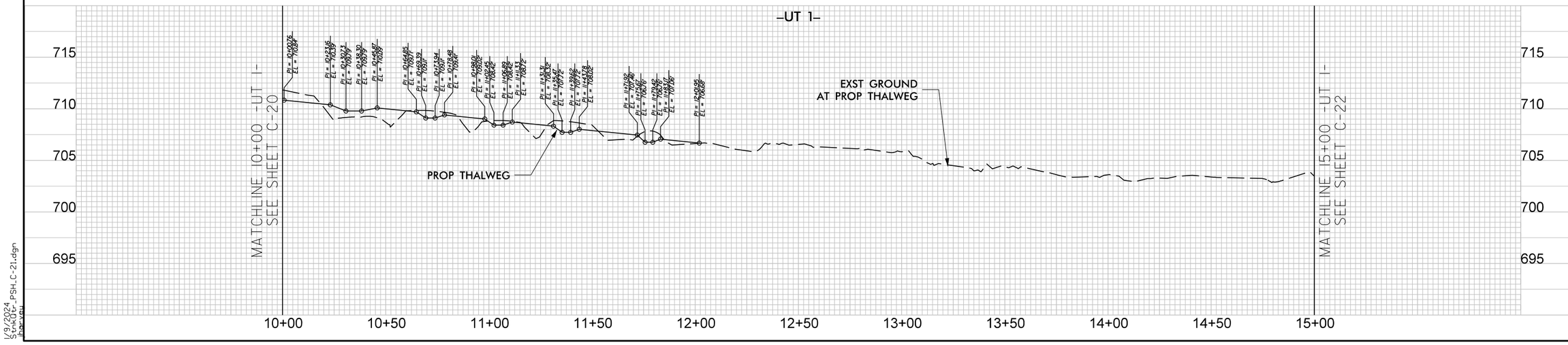
StnkQtr_PSH_C-20.dgn
jharvey



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 1- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,971.66	1,808,309.36	710.39
CROSS VANE	791,943.76	1,808,334.91	709.71
CROSS VANE	791,927.18	1,808,362.48	709.02
CROSS VANE	791,899.80	1,808,379.71	708.32
SILL STEP	791,879.37	1,808,413.82	707.46



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22881 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-21
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-21

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Stnkqtr_PSH_C-21.dgn
jharkey

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

RETAIN EXISTING FENCE
REMOVE EXISTING FENCE
EASEMENT FENCE LINE
REMOVE EXISTING FENCE
ACCESS EASEMENT FENCE
EASEMENT FENCE LINE
CE

YORK, DONALD R
AND YORK, ELIZABETH G
D.B. 4842, PG. 2179

MATCHLINE STA 15+00 -UT 1-
SEE SHEET C-21

MATCHLINE STA 20+00 -UT 1-
SEE SHEET C-23

16+00 -UT 1-
17+00 -UT 1-
18+00 -UT 1-
19+00 -UT 1-

-UT 1-

EXST GROUND
AT PROP THALWEG

MATCHLINE 15+00 -UT 1-
SEE SHEET C-21

MATCHLINE 20+00 -UT 1-
SEE SHEET C-23

710
705
700
695
690

15+00 15+50 16+00 16+50 17+00 17+50 18+00 18+50 19+00 19+50 20+00

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 027181 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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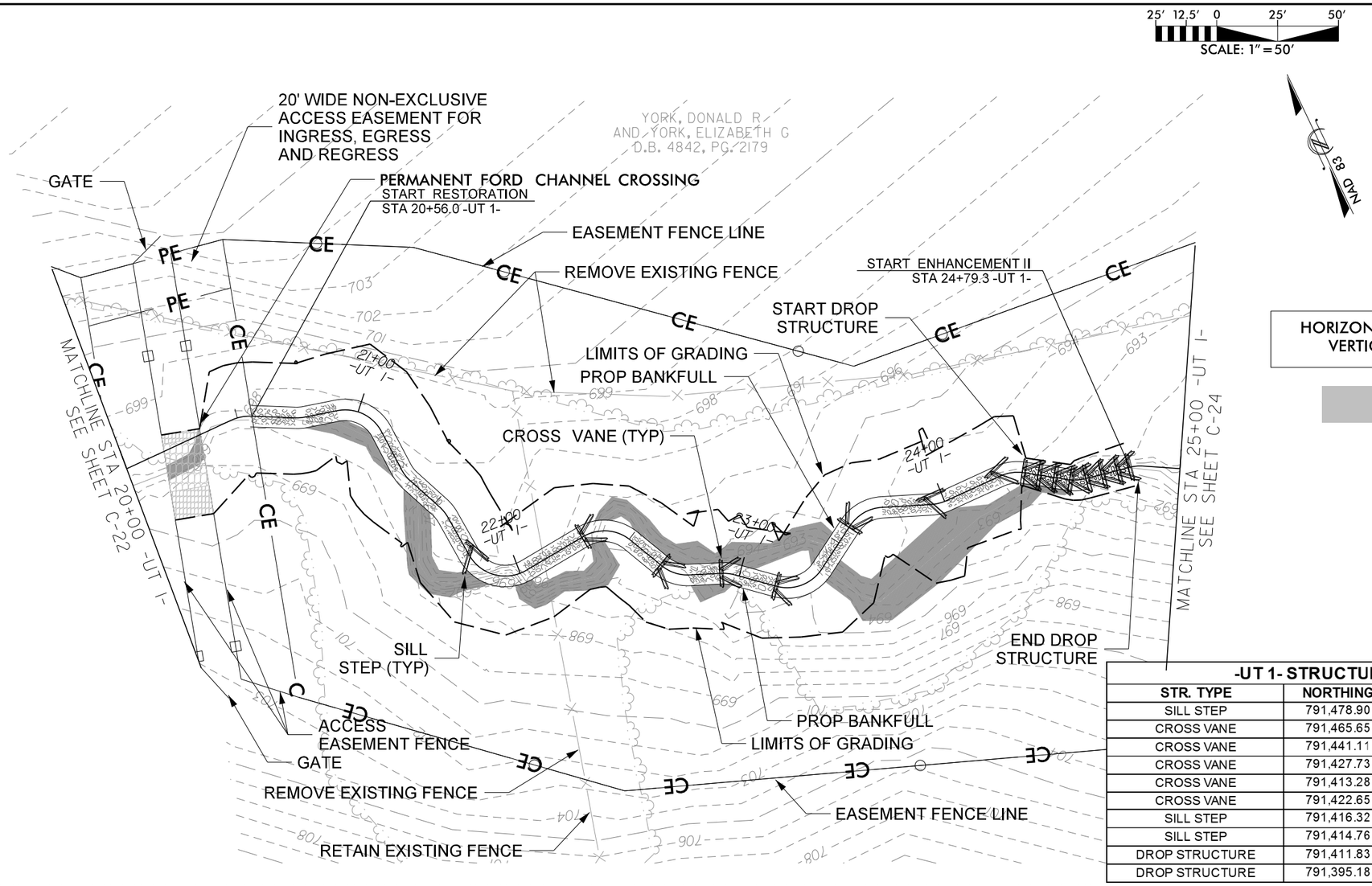
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-22
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-22

1/9/2024
StnkQtr_PSH_C-22.dgn
Harvey

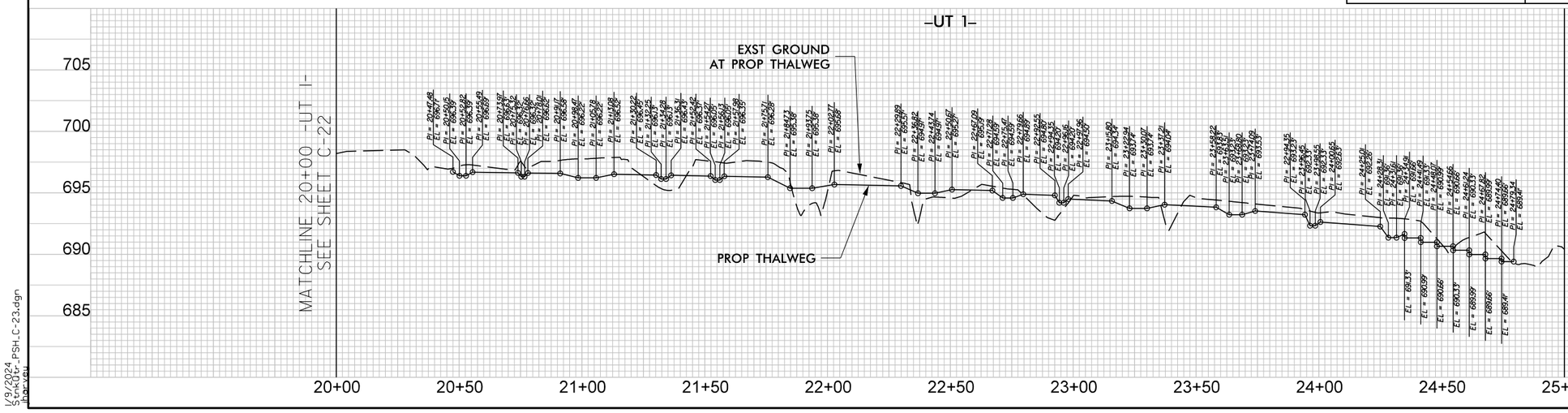


HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 1- STRUCTURE LOCATIONS

STR. TYPE	NORTHING	EASTING	Prop Elevation
SILL STEP	791,478.90	1,809,114.39	696.28
CROSS VANE	791,465.65	1,809,159.91	695.57
CROSS VANE	791,441.11	1,809,183.84	695.19
CROSS VANE	791,427.73	1,809,204.65	694.80
CROSS VANE	791,413.28	1,809,222.78	694.34
CROSS VANE	791,422.65	1,809,260.66	693.83
SILL STEP	791,416.32	1,809,294.68	693.23
SILL STEP	791,414.76	1,809,325.18	692.26
DROP STRUCTURE	791,411.83	1,809,334.49	691.66
DROP STRUCTURE	791,395.18	1,809,374.81	689.41



DATE:

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22861 JOSEPH C. DALTON NOT FOR CONSTRUCTION

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-23
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C–23**

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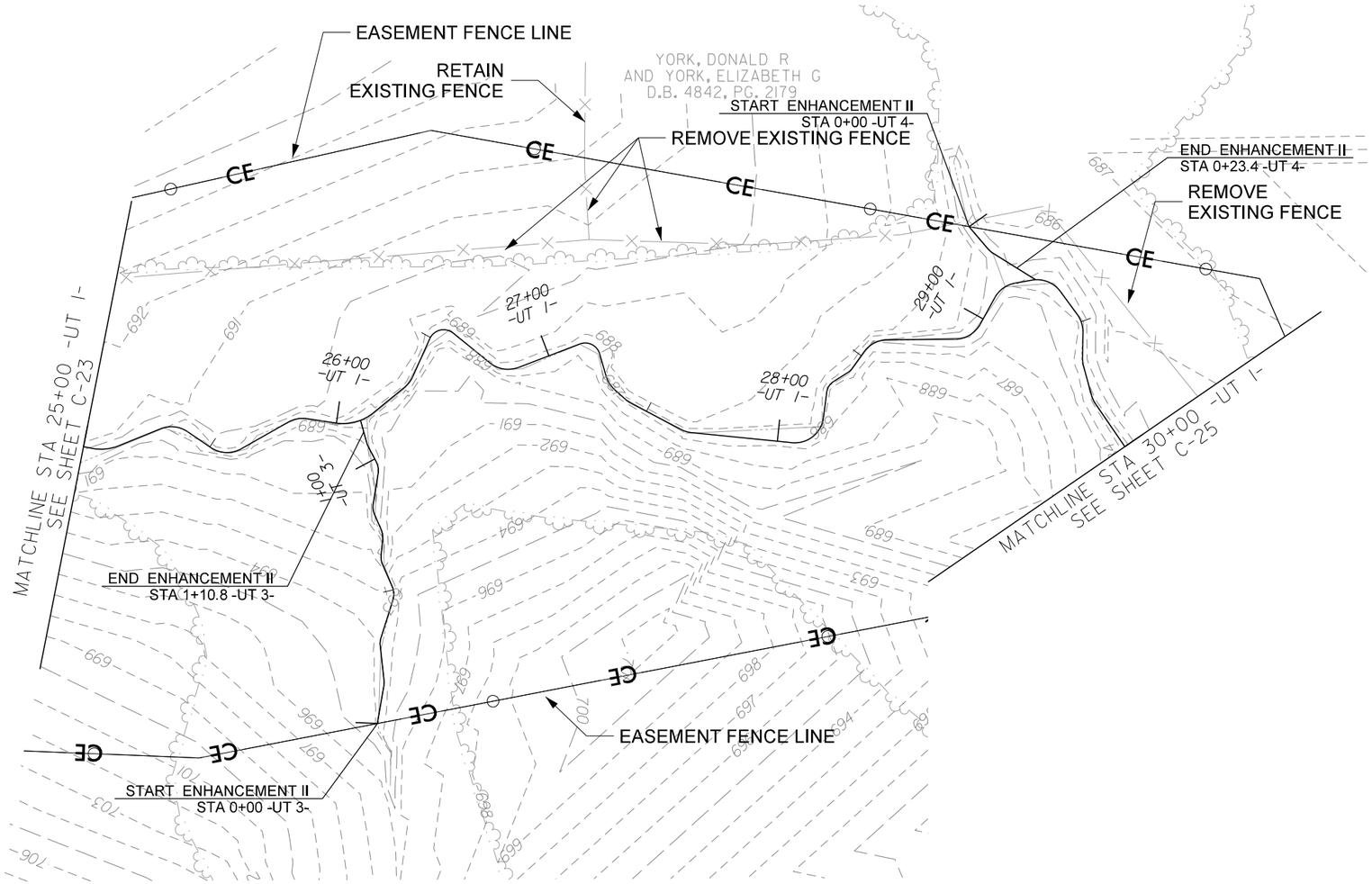
STNKQTR_PSH_C-23.dgn
Jackson



25′ 12.5′ 0 25′ 50′
SCALE: 1″ = 50′

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON
FOR PRELIMINARY DESIGN REVIEW ONLY NOT FOR CONSTRUCTION

DATE:

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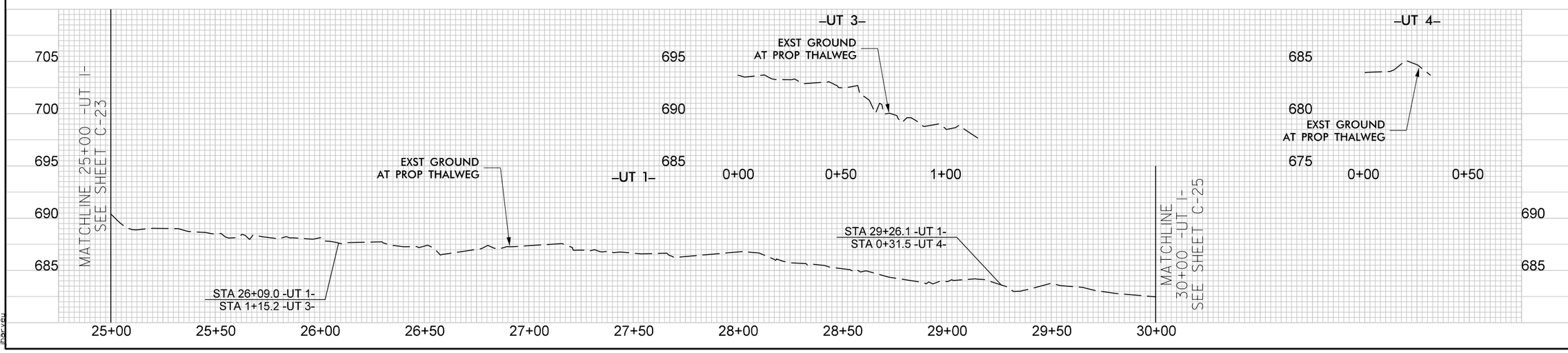
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988



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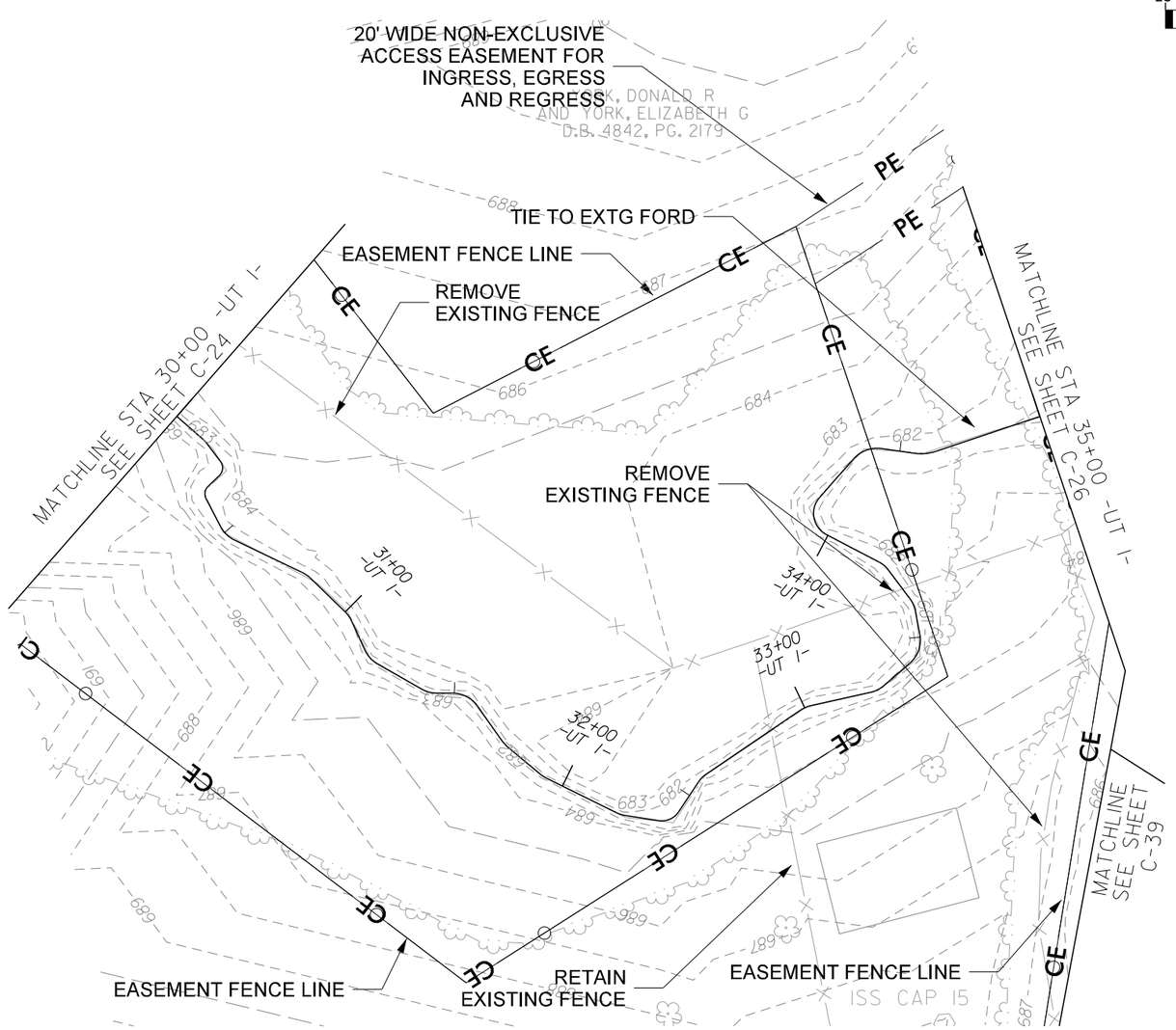
STINKING QUARTER
GUILFORD COUNTY, NC

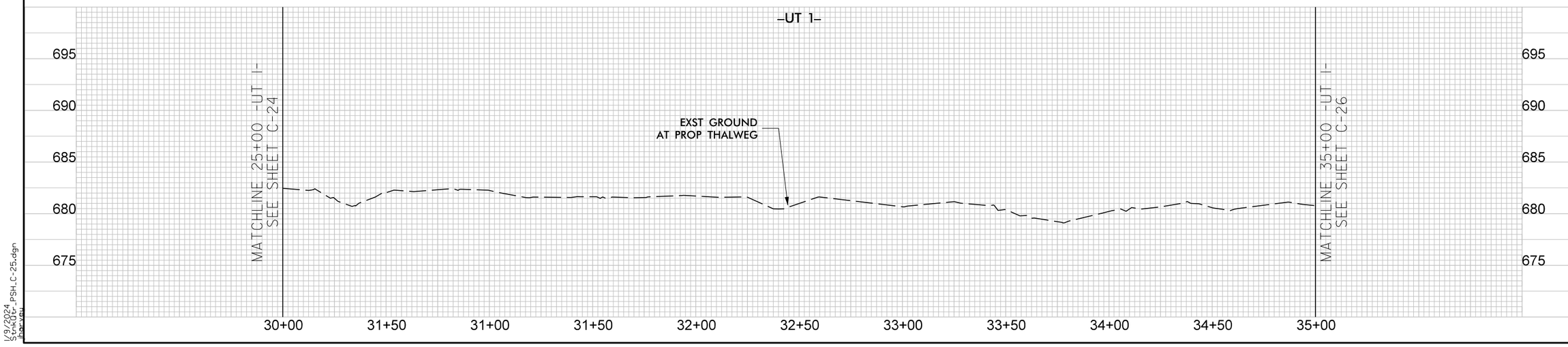
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-24
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–24

1/9/2024
StnkQtr_PSH_C-24.dgn
jharvell





25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028681 JOSEPH C. DALTON
FOR REVIEW PURPOSES ONLY NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

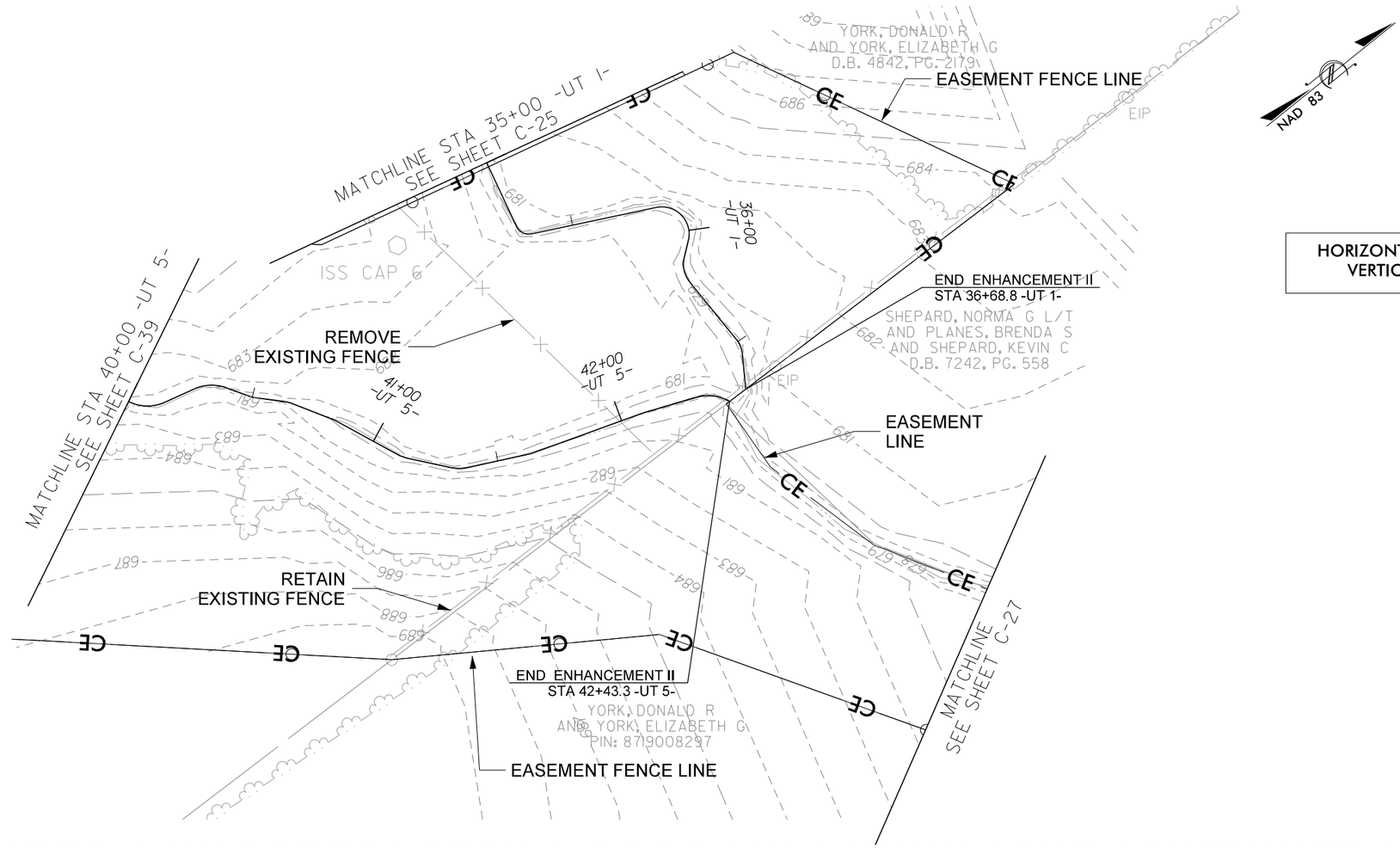
PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-25
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

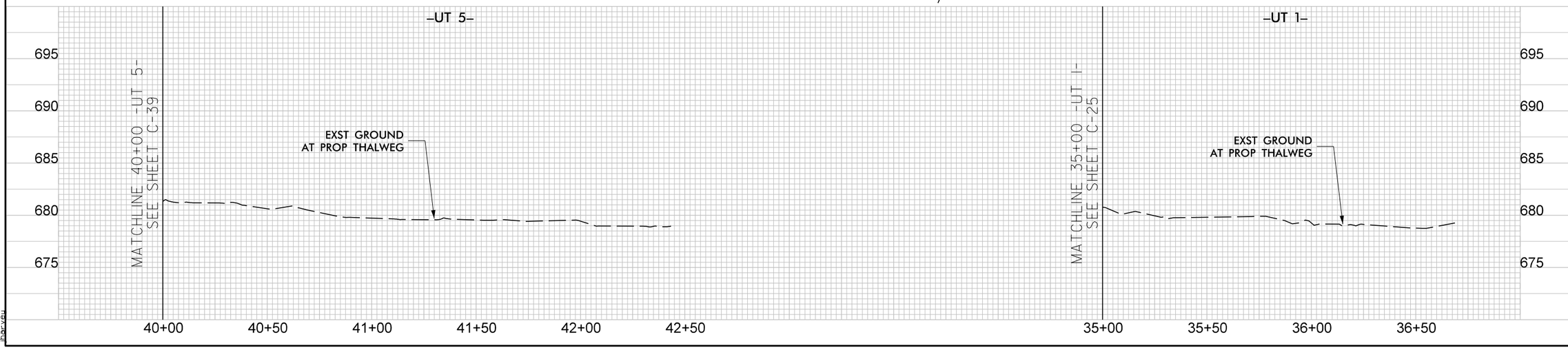
SHEET NO.
C–25

1/9/2024
Stnkqtr_PSH_C-25.dgn
jharvey

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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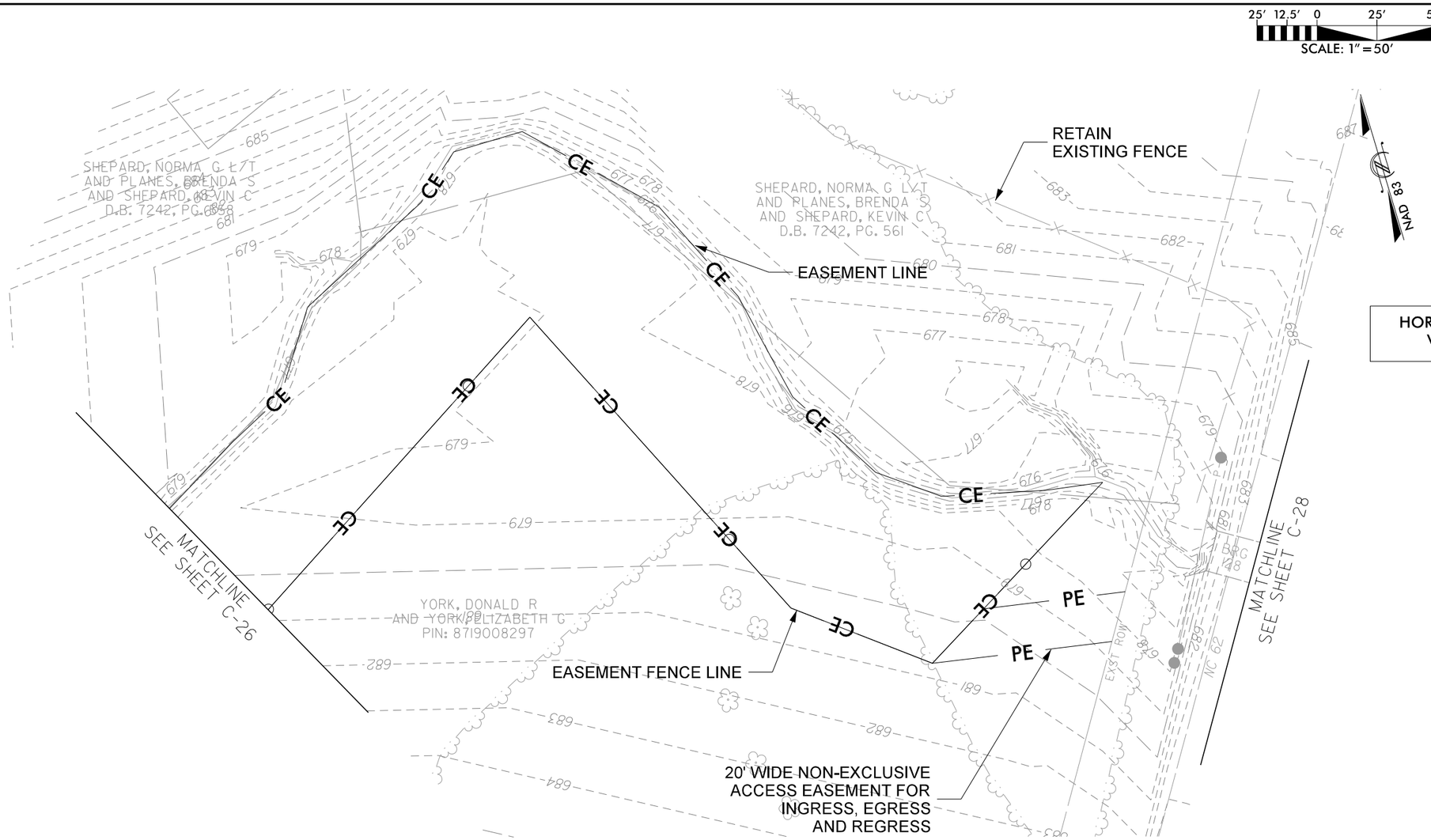
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-26
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–26

1/9/2024
Stnkqtr_PSH_C-26.dgn
Default



NORTH CAROLINA PROFESSIONAL SEAL 29911 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

Axiom Environmental, Inc.

STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-27
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–27

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1/9/2024
StnkQtr_PSH_C-27.dgn
jharvey

-UT 1- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,748.59	1,810,931.71	673.11
CROSS VANE	790,612.50	1,811,025.69	672.83

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

EASEMENT FENCE LINE
RETAIN EXISTING FENCE
RETAIN EXISTING FENCE
EASEMENT FENCE LINE
START ENHANCEMENT II STA 50+00 -UT 1-
REMOVE EXISTING FENCE
GATE
LIMITS OF GRADING
PERMANENT FORD CHANNEL CROSSING
CROSS VANE (TYP)
START RESTORATION STA 53+16.1 -UT 1-
PROP BANKFULL
FEMA 100 YR
MATCHLINE SEE SHEET C-27
MATCHLINE STA 55+00 -UT 1- SEE SHEET C-29
LIMITS OF GRADING
PROP BANKFULL
ACCESS EASEMENT FENCE
EASEMENT FENCE LINE
EASEMENT LINE
GATE
20' WIDE NON-EXCLUSIVE ACCESS EASEMENT FOR INGRESS, EGRESS AND REGRESS
YORK DONALD R AND YORK ELIZABETH C PIN: 8719008297
EASEMENT FENCE LINE
50+00 -UT 1-
51+00 -UT 1-
52+00 -UT 1-
53+00 -UT 1-
54+00 -UT 1-
CE
PE
EAST ROAD
SSS CAP
NC 62

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28161 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

-UT 1-

EXST GROUND AT PROP THALWEG
PROP THALWEG
MATCHLINE 55+00 -UT 1- SEE SHEET C-29

685
680
675
670
665

50+00 50+50 51+00 51+50 52+00 52+50 53+00 53+50 54+00 54+50 55+00

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STINKING QUARTER
GUILFORD COUNTY, NC

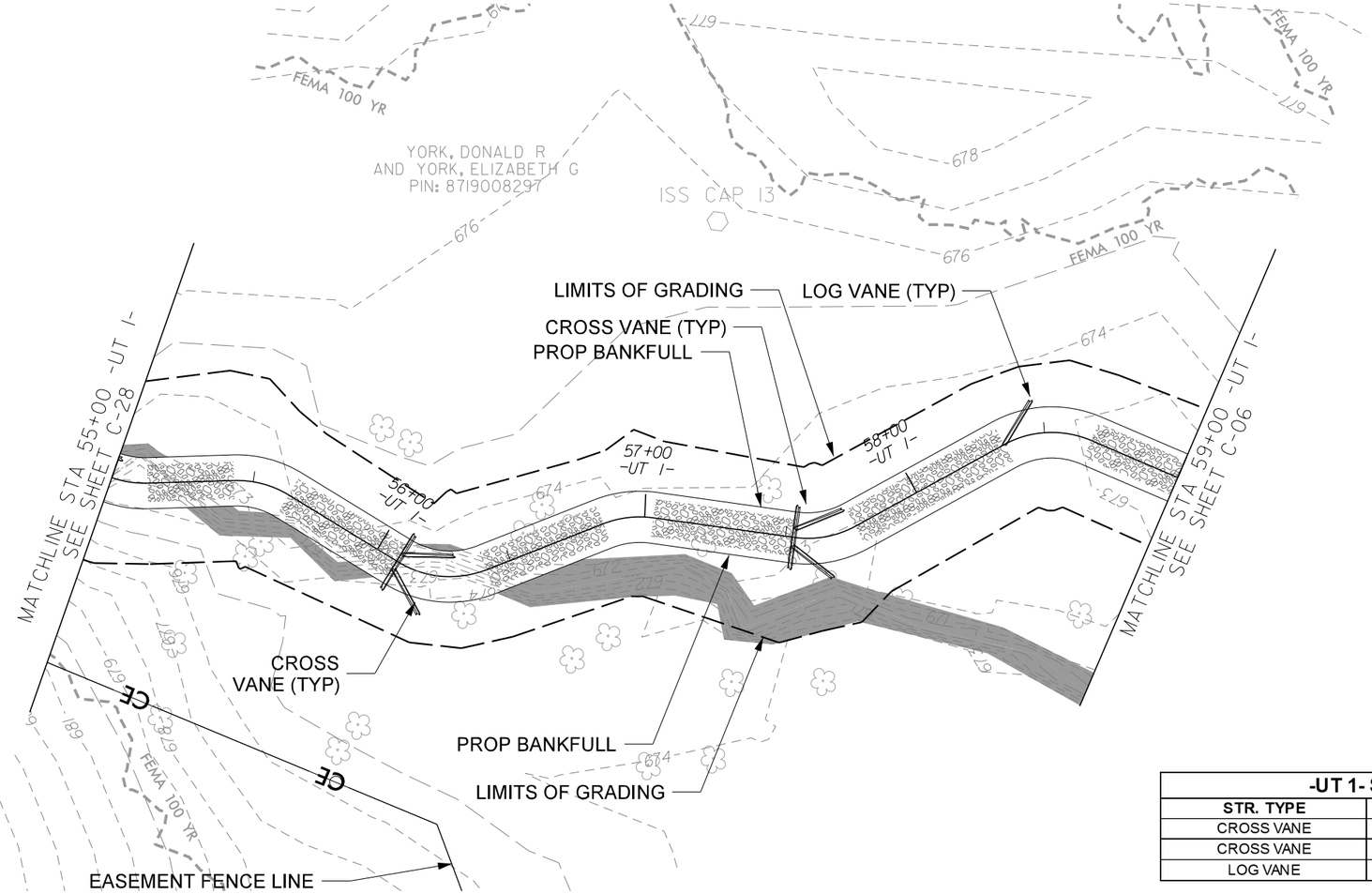
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-28
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C-28**

1/9/2024
Stnkqtr_PSH_C-28.dgn
Jonathan Hall

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

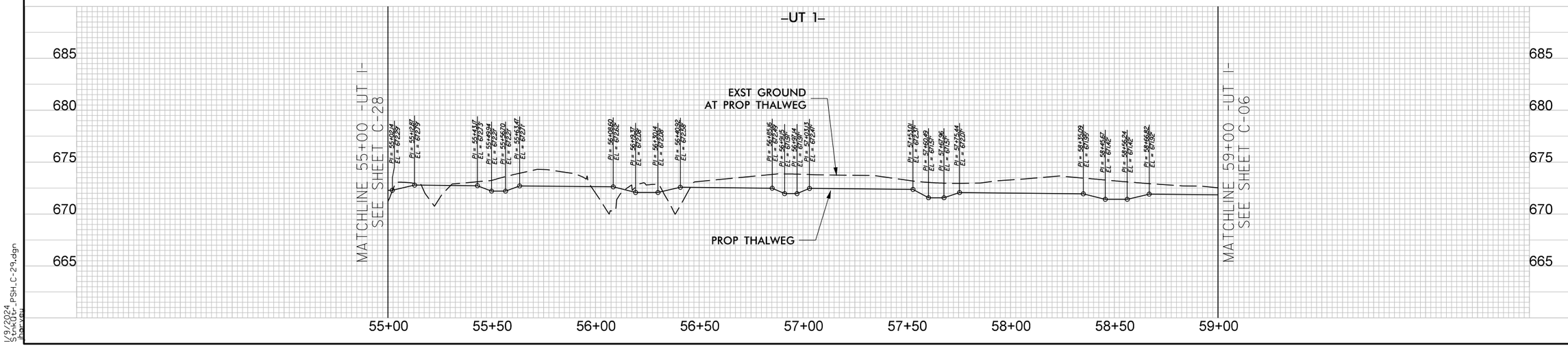


NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 1- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,531.51	1,811,118.63	672.62
CROSS VANE	790,487.75	1,811,251.15	672.37
LOG VANE	790,490.57	1,811,331.97	671.95



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038021 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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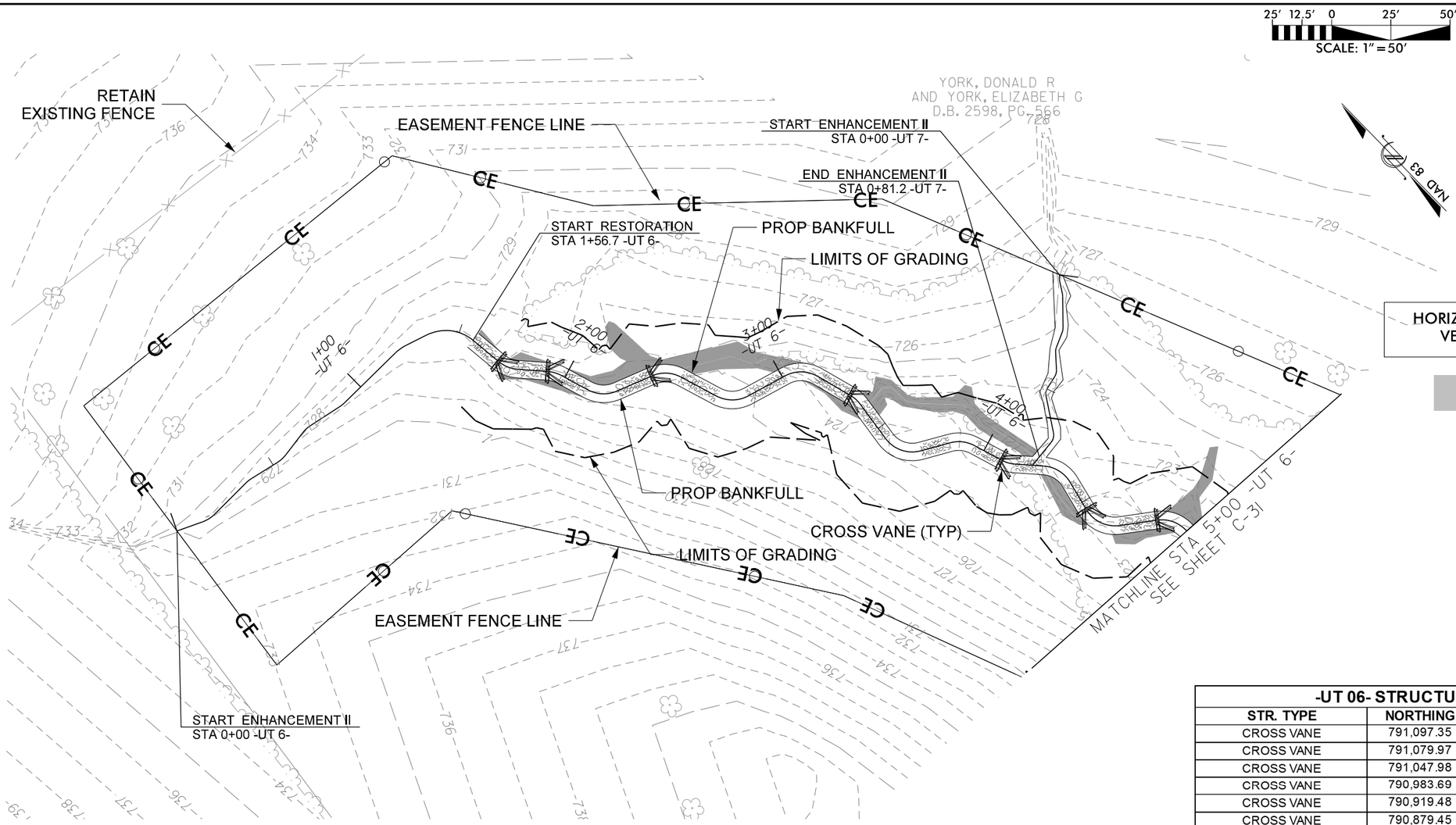
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

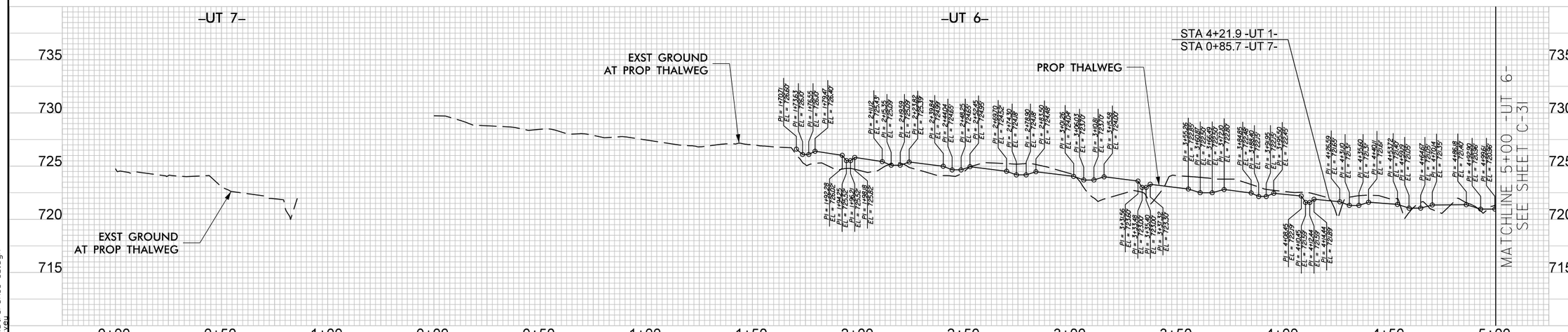
PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-29
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–29

1/9/2024
Stnkqtr_PSH_C-29.dgn
Jharrell



-UT 06- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,097.35	1,806,878.44	726.60
CROSS VANE	791,079.97	1,806,890.39	726.02
CROSS VANE	791,047.98	1,806,920.58	724.99
CROSS VANE	790,983.69	1,806,974.95	723.60
CROSS VANE	790,919.48	1,807,001.63	722.19
CROSS VANE	790,879.45	1,807,012.79	721.40
CROSS VANE	790,855.46	1,807,031.13	721.37



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON

DESIGN FIRM P-0339 FOR CONSTRUCTION NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-30
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C–30**

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1/9/2024
Stnkqtr_PSH_C-30.dgn
jharvell

-UT 6- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,763.59	1,807,055.61	720.62
CROSS VANE	790,702.35	1,807,058.46	720.13
CROSS VANE	790,684.16	1,807,061.99	719.73
CROSS VANE	790,671.93	1,807,086.43	719.54
CROSS VANE	790,648.13	1,807,101.85	719.09
CROSS VANE	790,637.22	1,807,126.60	718.65
CROSS VANE	790,616.95	1,807,144.39	718.20
CROSS VANE	790,606.57	1,807,165.77	717.77

-UT 6- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,574.80	1,807,174.72	717.29
CROSS VANE	790,554.61	1,807,192.90	716.86
CROSS VANE	790,525.88	1,807,197.91	716.40
CROSS VANE	790,505.68	1,807,221.75	715.94
CROSS VANE	790,484.33	1,807,234.30	715.50
CROSS VANE	790,469.58	1,807,254.75	715.05
CROSS VANE	790,454.61	1,807,267.72	714.62
CROSS VANE	790,426.20	1,807,265.59	714.15
CROSS VANE	790,401.11	1,807,272.30	713.67
CROSS VANE	790,377.30	1,807,265.04	713.23

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON DESIGN ENGINEER FOR CONSTRUCTION NOT FOR CONSTRUCTION

DATE:

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YORK, DONALD R AND YORK, ELIZABETH G D.B. 2598, PG. 566

ISS CAP

RETAIN EXISTING FENCE
EASEMENT FENCE LINE
REMOVE EXISTING FENCE
REMOVE EXISTING FENCE
PROP BANKFULL
LIMITS OF GRADING
CROSS VANE (TYP)
PERMANENT FORD CHANNEL CROSSING
20' INTERAL CROSSING
ACCESS EASEMENT FENCE
GATE
REMOVE POND DAM
FILL EXISTING CHANNEL
LIMITS OF GRADING
PROP BANKFULL
GATE
REMOVE EXISTING FENCE
RETAIN EXISTING FENCE
EASEMENT FENCE LINE

MATCHLINE STA 5+00 -UT 6- SEE SHEET C-30

MATCHLINE STA 11+00 -UT 6- SEE SHEET C-32

6+00 -UT 6-
7+00 -UT 6-
8+00 -UT 6-
9+00 -UT 6-
10+00 -UT 6-

SHOFFNER, PATRICIA F AND CLAPP, JEAN F D.B. 1004, PG. 379

-UT 6-

EXST GROUND AT PROP THALWEG

PROP THALWEG

730
725
720
715
710

5+00 5+50 6+00 6+50 7+00 7+50 8+00 8+50 9+00 9+50 10+00 10+50 11+00

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-31
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-31

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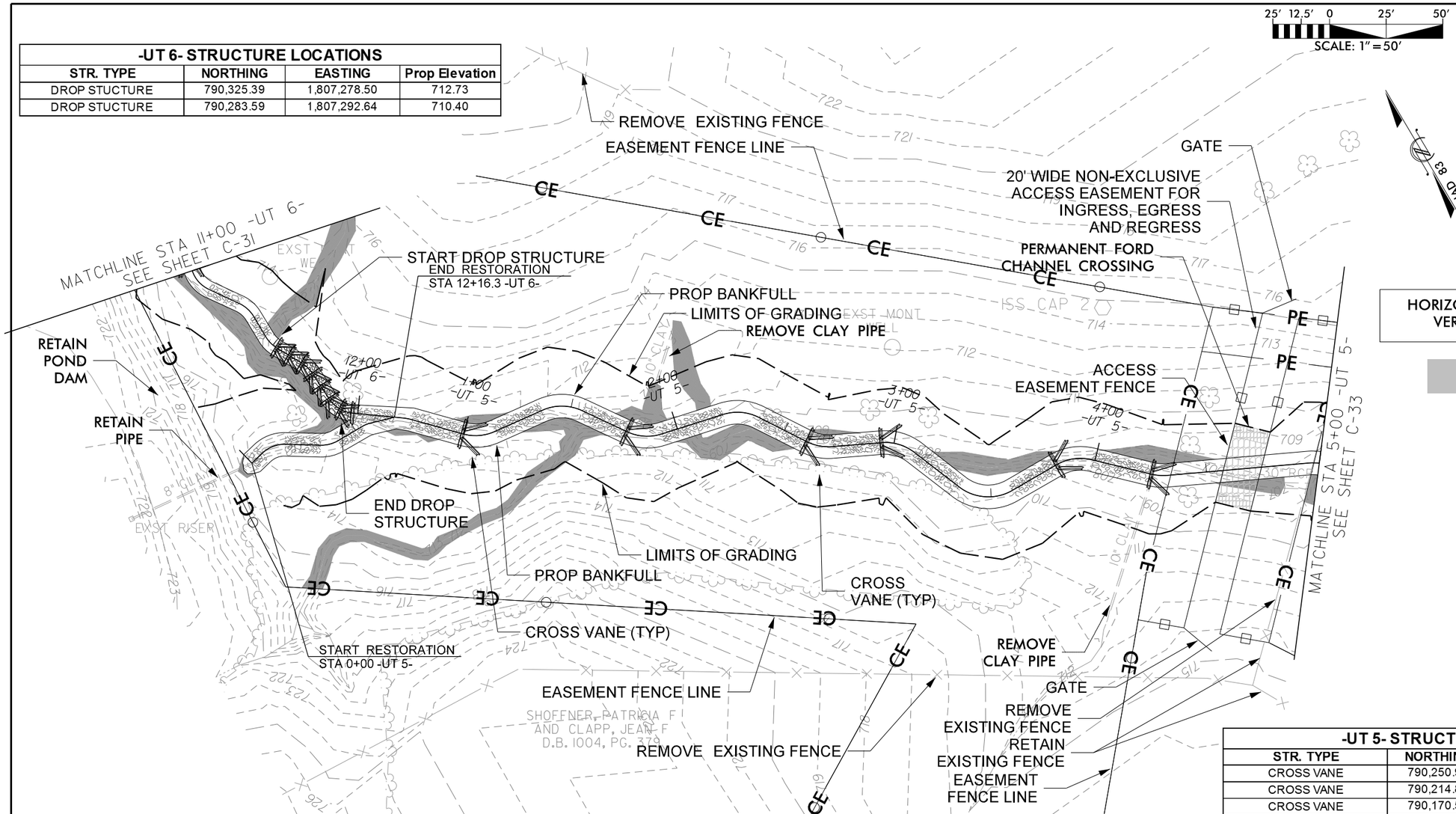
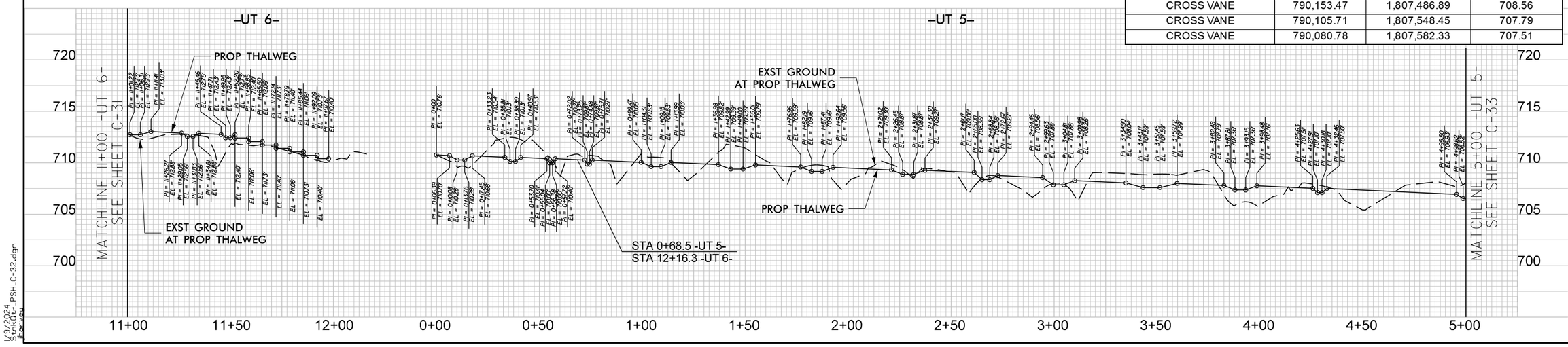
1/9/2024
Stnkqtr_PSH_C-31.dgn
jgarrett

-UT 6- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
DROP STUCTURE	790,325.39	1,807,278.50	712.73
DROP STUCTURE	790,283.59	1,807,292.64	710.40



-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,250.96	1,807,329.75	710.05
CROSS VANE	790,214.82	1,807,392.66	709.59
CROSS VANE	790,170.57	1,807,458.82	709.06
CROSS VANE	790,153.47	1,807,486.89	708.56
CROSS VANE	790,105.71	1,807,548.45	707.79
CROSS VANE	790,080.78	1,807,582.33	707.51



NORTH CAROLINA PROFESSIONAL SEAL 26911 ENGINEER JOSHUA G. DALTON

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

SUNGATE DESIGN GROUP, P.A.
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TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-32
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-32

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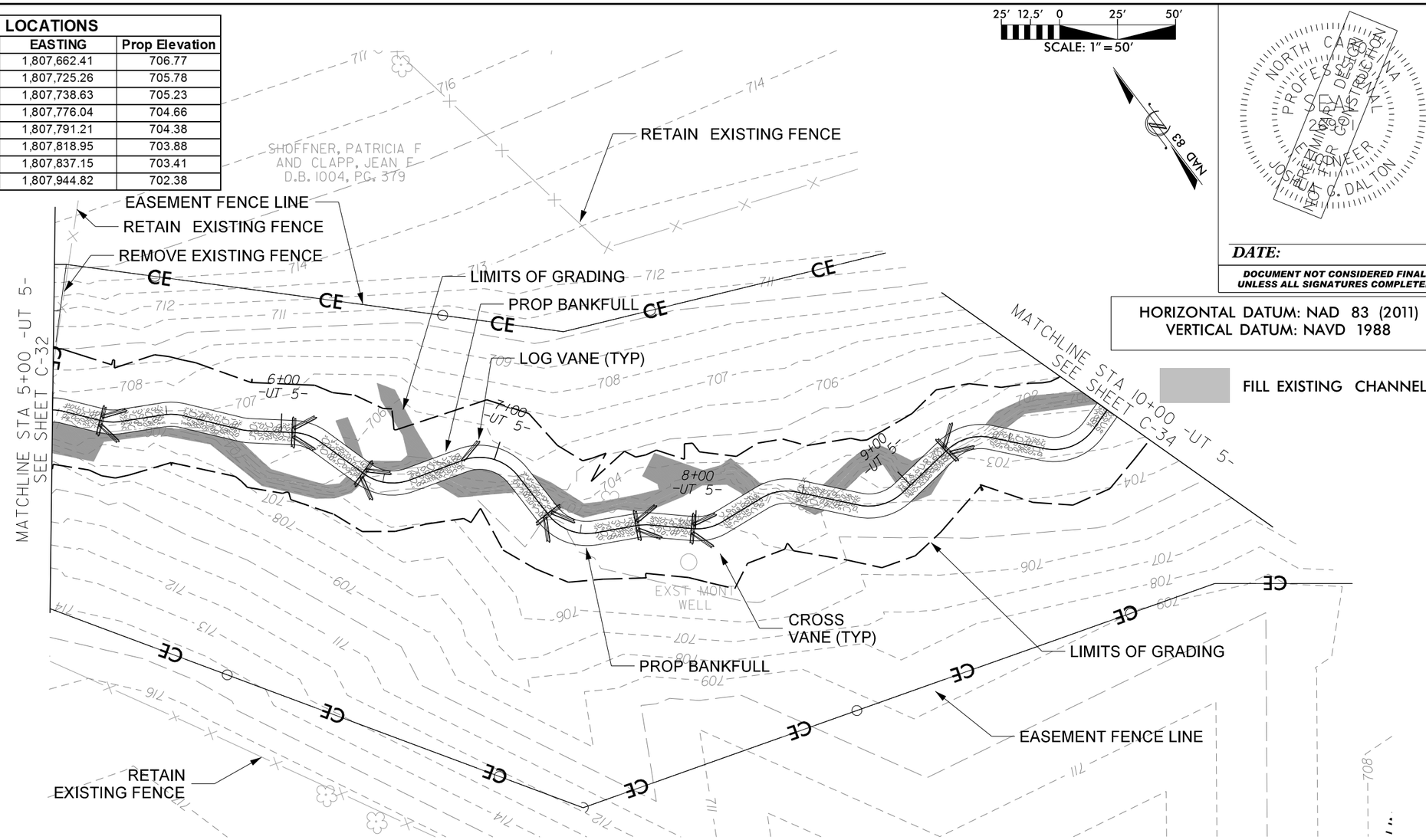
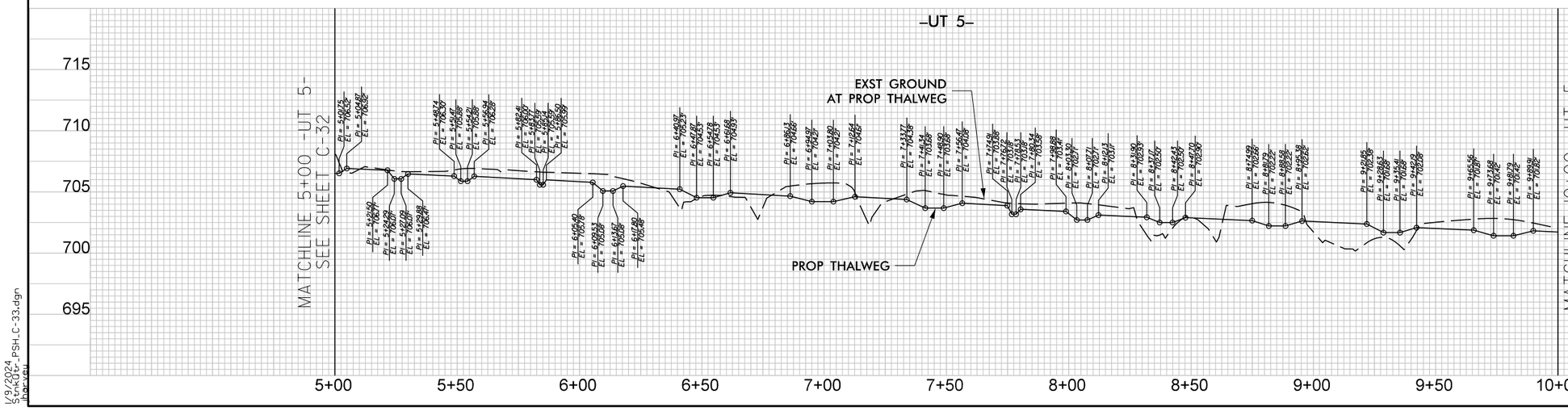
1/9/2024
StnkQtr_PSH_C-32.dgn
jharvey

-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,030.85	1,807,662.41	706.77
CROSS VANE	789,976.73	1,807,725.26	705.78
CROSS VANE	789,944.33	1,807,738.63	705.23
LOG VANE	789,923.13	1,807,776.04	704.66
CROSS VANE	789,882.18	1,807,791.21	704.38
CROSS VANE	789,855.34	1,807,818.95	703.88
CROSS VANE	789,839.81	1,807,837.15	703.41
CROSS VANE	789,800.57	1,807,944.82	702.38





HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038161 JOSEPH C. DALTON PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

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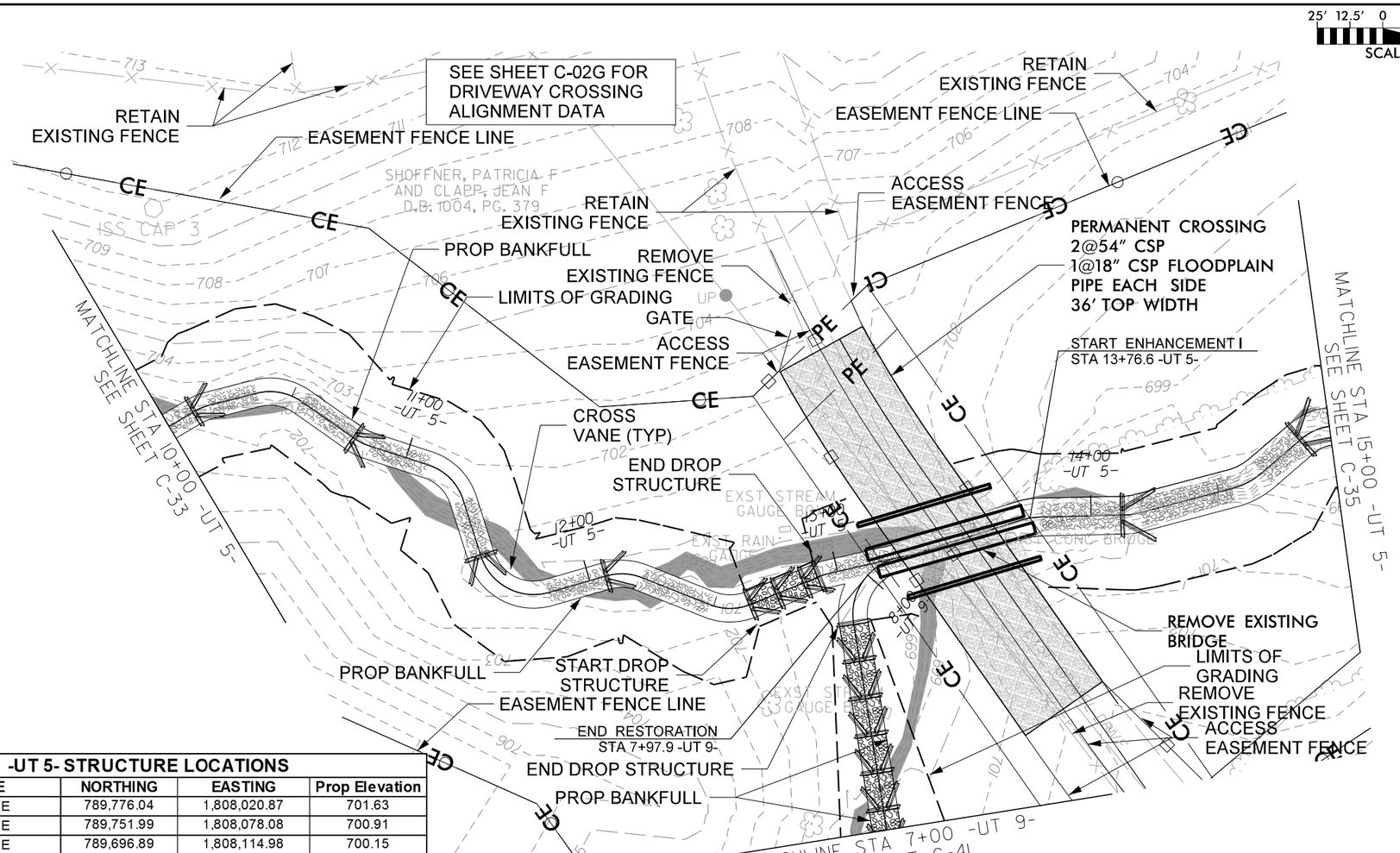
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-33
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

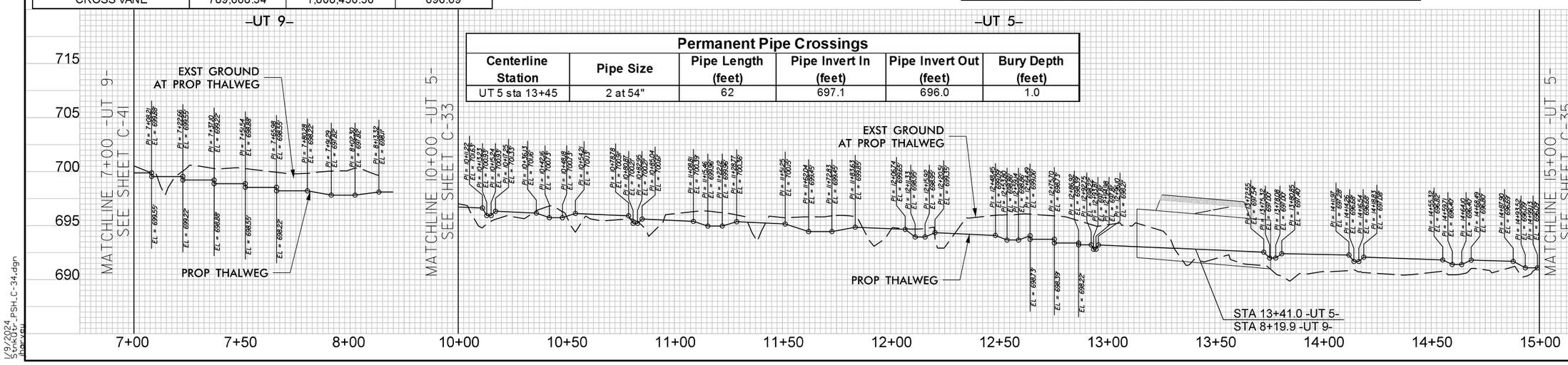
SHEET NO. C–33

1/9/2024
StnkQtr_PSH_C-33.dgn
Harvey



-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,776.04	1,808,020.87	701.63
CROSS VANE	789,751.99	1,808,078.08	700.91
CROSS VANE	789,696.89	1,808,114.98	700.15
CROSS VANE	789,678.59	1,808,159.99	699.65
DROP STRUCTURE	789,655.34	1,808,211.16	699.06
DROP STRUCTURE	789,659.70	1,808,239.08	698.22
CROSS VANE	789,655.93	1,808,357.43	697.28
CROSS VANE	789,668.54	1,808,430.56	696.69

-UT 9- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
DROP STRUCTURE	789,635.60	1,808,259.04	698.22



Permanent Pipe Crossings					
Centerline Station	Pipe Size	Pipe Length (feet)	Pipe Invert In (feet)	Pipe Invert Out (feet)	Bury Depth (feet)
UT 5 sta 13+45	2 at 54"	62	697.1	696.0	1.0

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 029361 JOSEPH C. DALTON — FOR PRELIMINARY DESIGN REVIEW ONLY — NOT FOR CONSTRUCTION

DATE:

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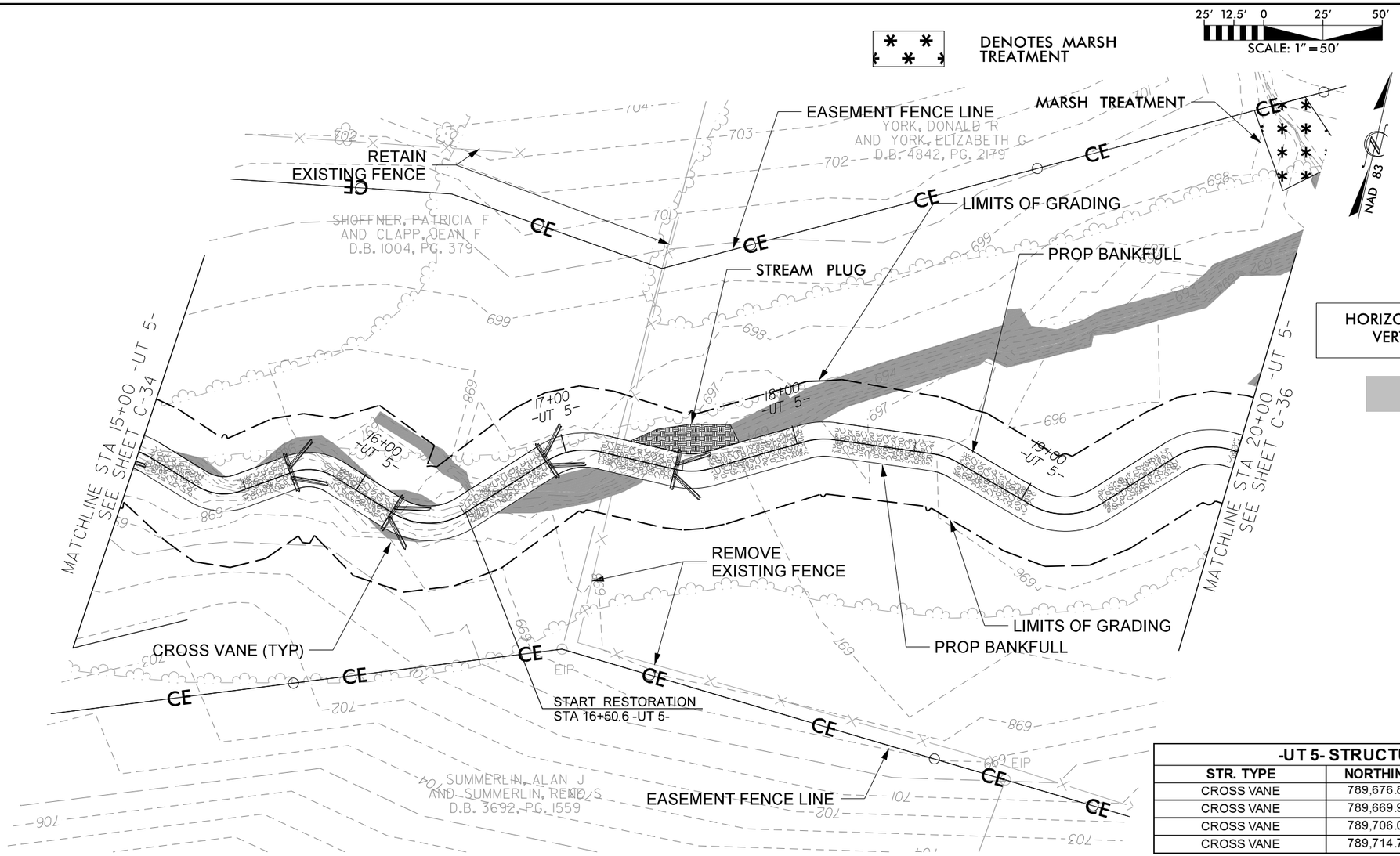
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-34
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-34

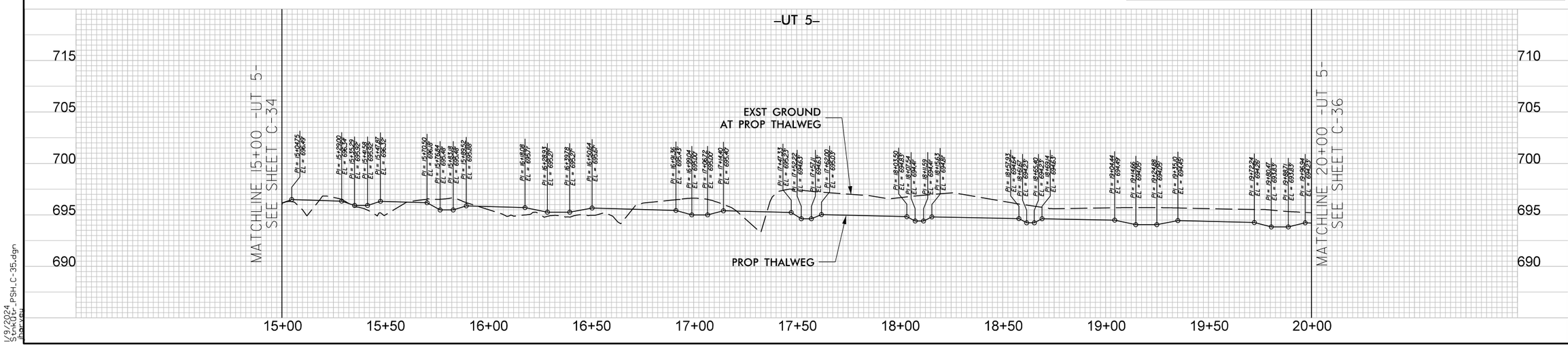
1/9/2024
StnkQtr_PSH_C-34.dgn
Layout



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,676.86	1,808,506.98	696.18
CROSS VANE	789,669.91	1,808,552.25	695.71
CROSS VANE	789,706.06	1,808,610.84	695.43
CROSS VANE	789,714.71	1,808,664.47	695.23



NORTH CAROLINA PROFESSIONAL SEAL 26 ENGINEER JOSHUA G. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH C-35
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-35

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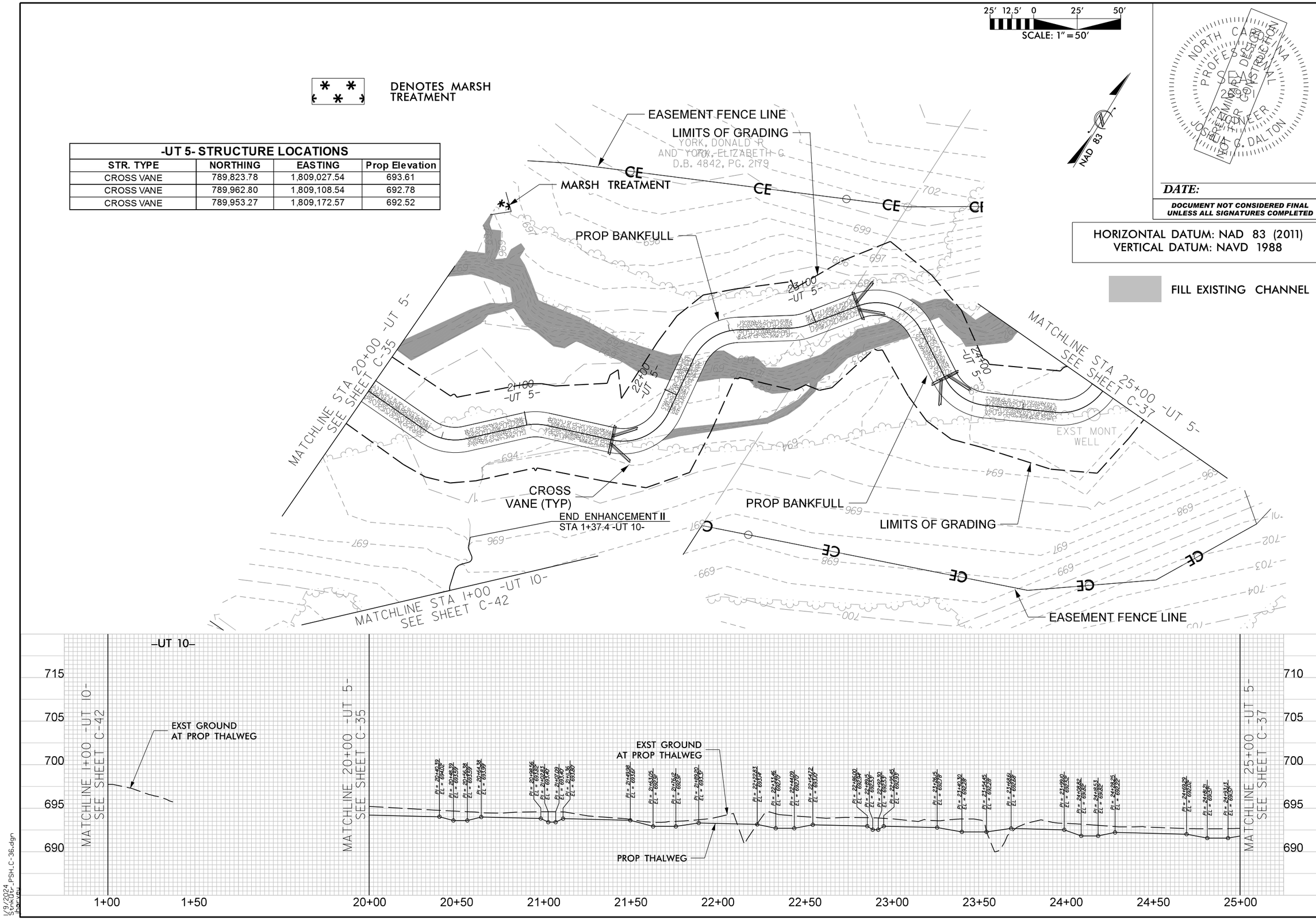
1/9/2024
StnkQtr_PSH_C-35.dgn
jharvey

-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,823.78	1,809,027.54	693.61
CROSS VANE	789,962.80	1,809,108.54	692.78
CROSS VANE	789,953.27	1,809,172.57	692.52



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL SEAL 29 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-36
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-36

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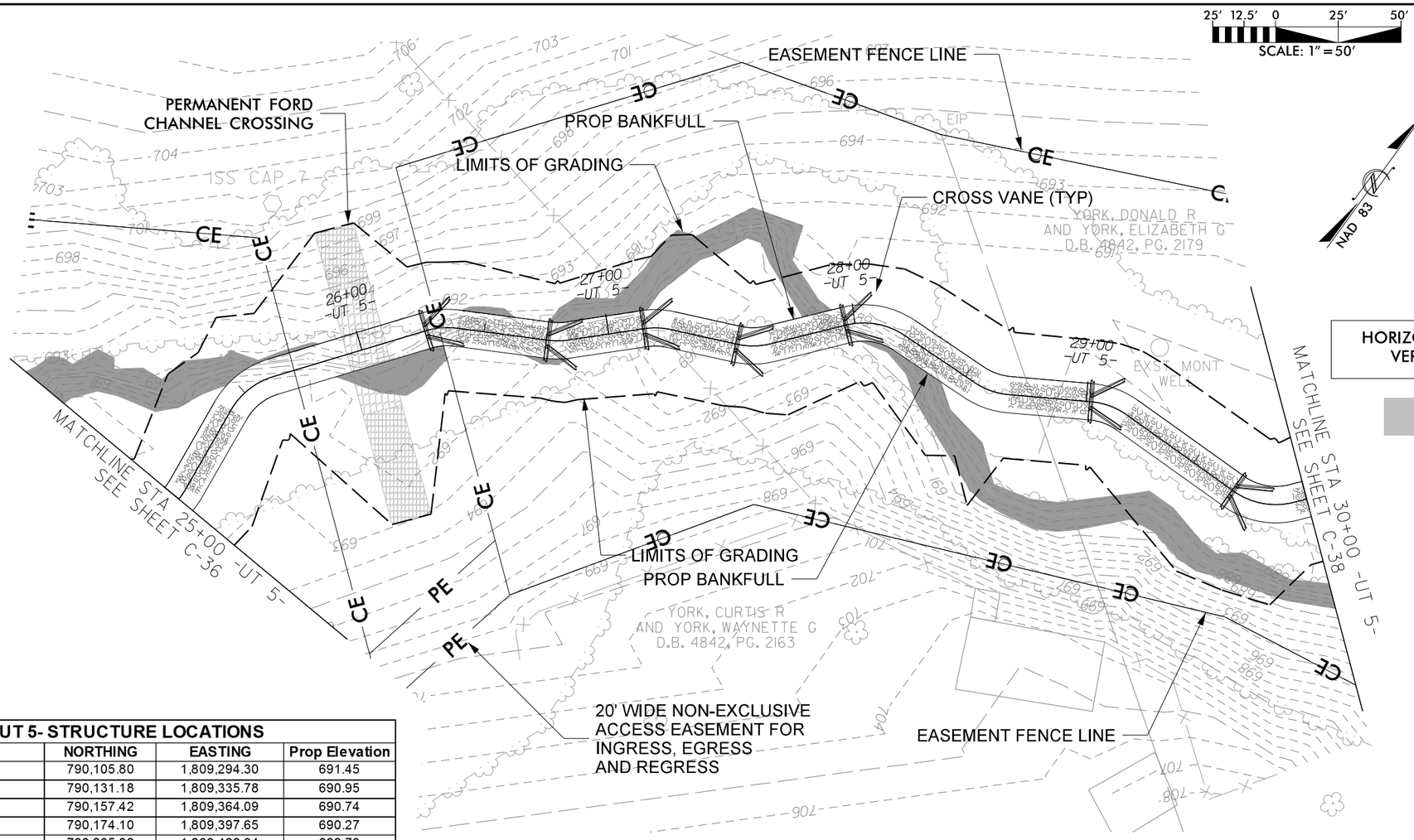
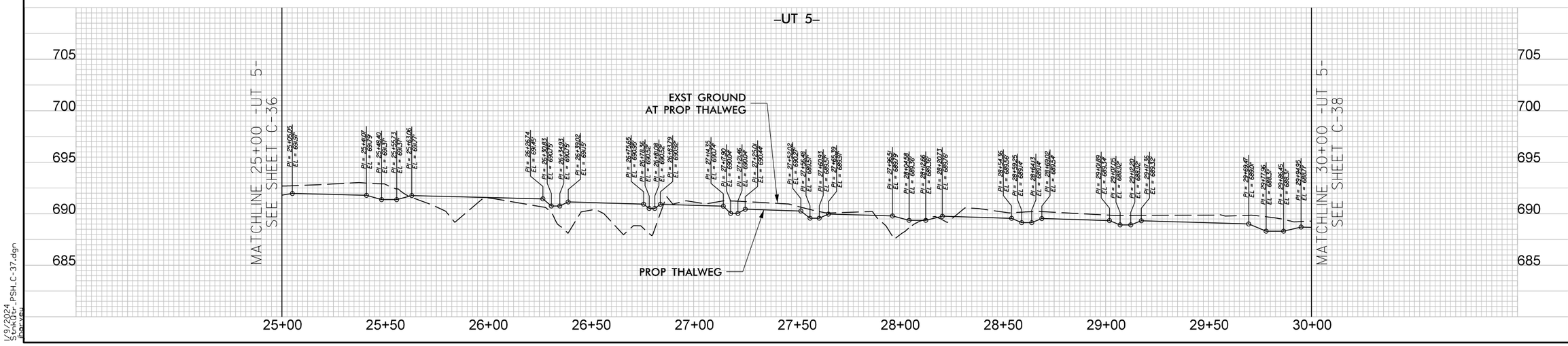
1/9/2024
StnkQtr_PSH_C-36.dgn
jharvey



-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	790,105.80	1,809,294.30	691.45
CROSS VANE	790,131.18	1,809,335.78	690.95
CROSS VANE	790,157.42	1,809,364.09	690.74
CROSS VANE	790,174.10	1,809,397.65	690.27
CROSS VANE	790,205.82	1,809,428.34	689.79
CROSS VANE	790,238.35	1,809,525.17	689.34
CROSS VANE	790,242.88	1,809,592.00	689.01



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22681 JOSEPH C. DALTON
PRELIMINARY PLANS NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
PH: 919.851.9986
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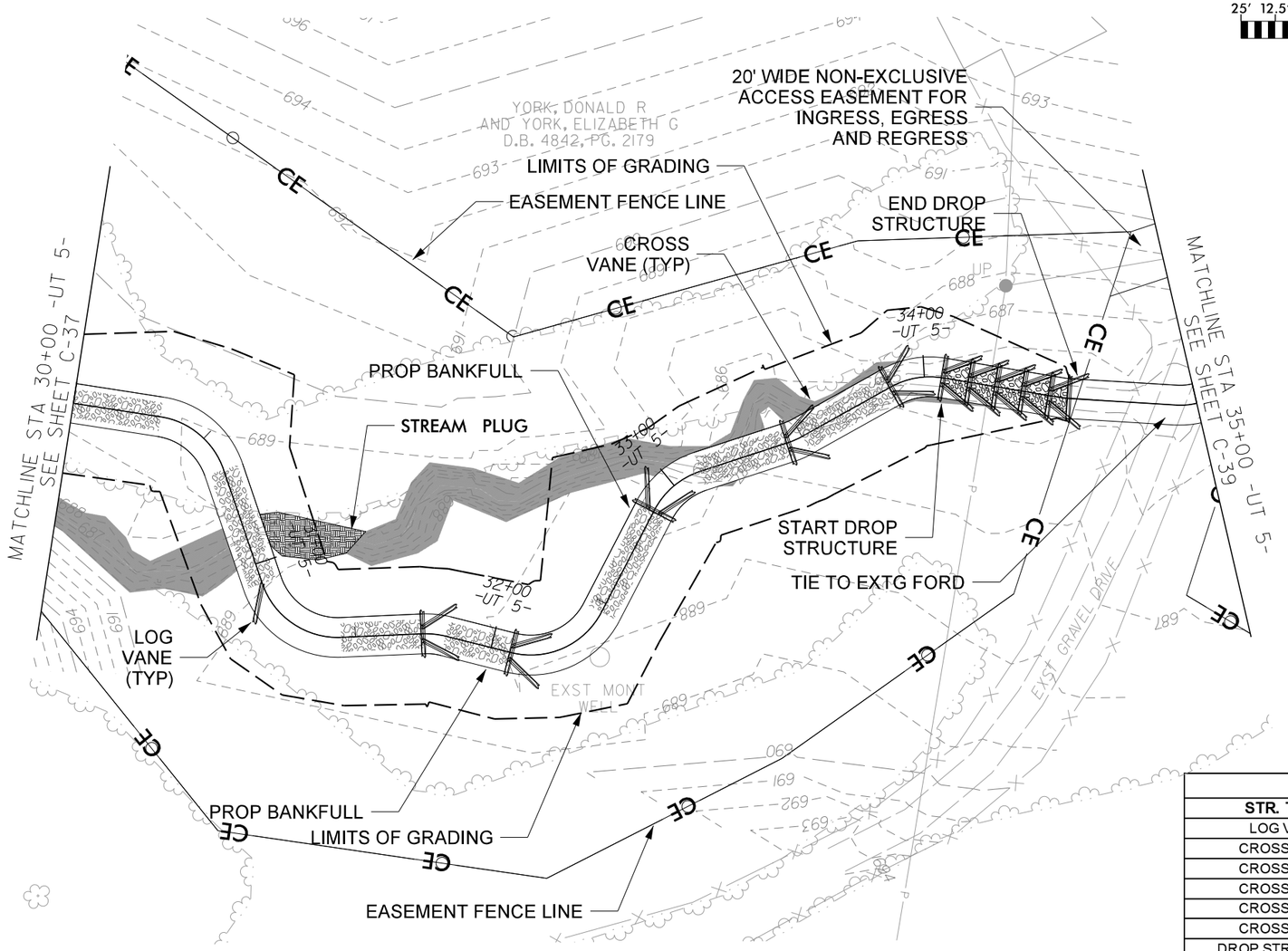
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-37
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–37

1/9/2024
StnkQtr_PSH_C-37.dgn
jharvey



25' 12.5' 0 25' 50'

SCALE: 1" = 50'

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038161 JOSEPH C. DALTON NOT FOR CONSTRUCTION

DATE:

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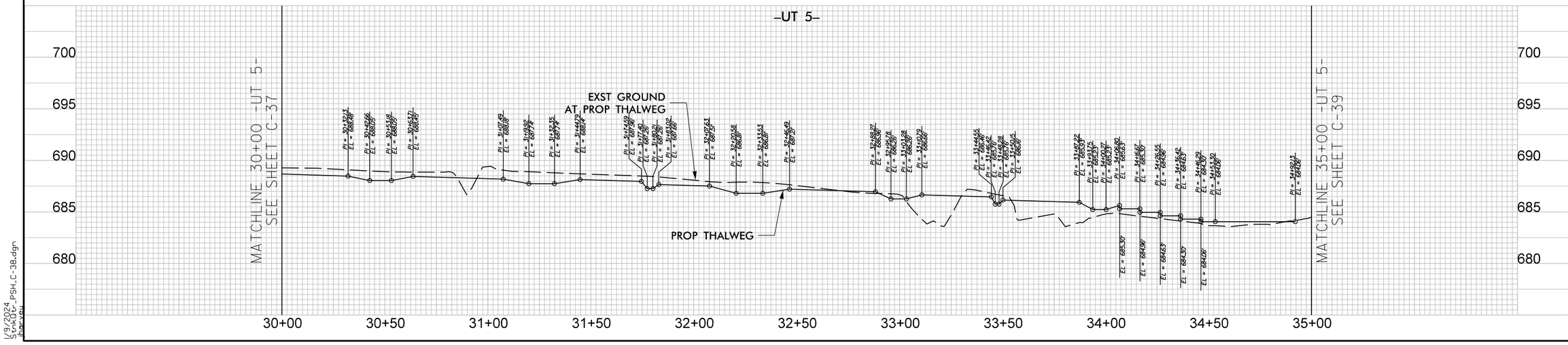
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 5- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
LOG VANE	790,283.54	1,809,708.95	688.18
CROSS VANE	790,324.67	1,809,754.39	687.96
CROSS VANE	790,348.96	1,809,776.66	687.51
CROSS VANE	790,420.14	1,809,758.34	686.96
CROSS VANE	790,474.75	1,809,761.79	686.46
CROSS VANE	790,517.36	1,809,763.29	685.93
DROP STRUCTURE	790,535.34	1,809,770.06	685.63
DROP STRUCTURE	790,571.07	1,809,799.80	684.06



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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-38
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-38

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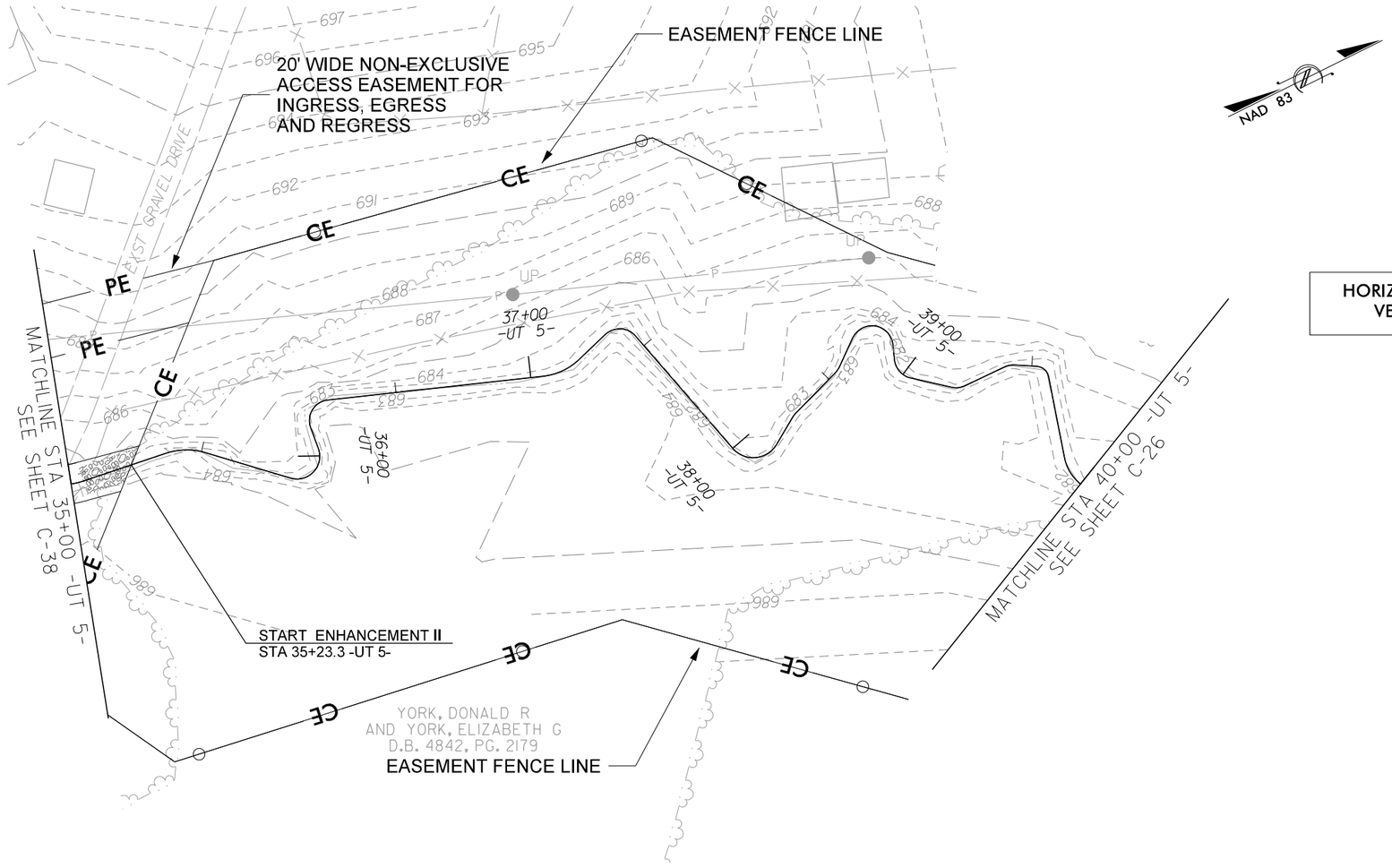
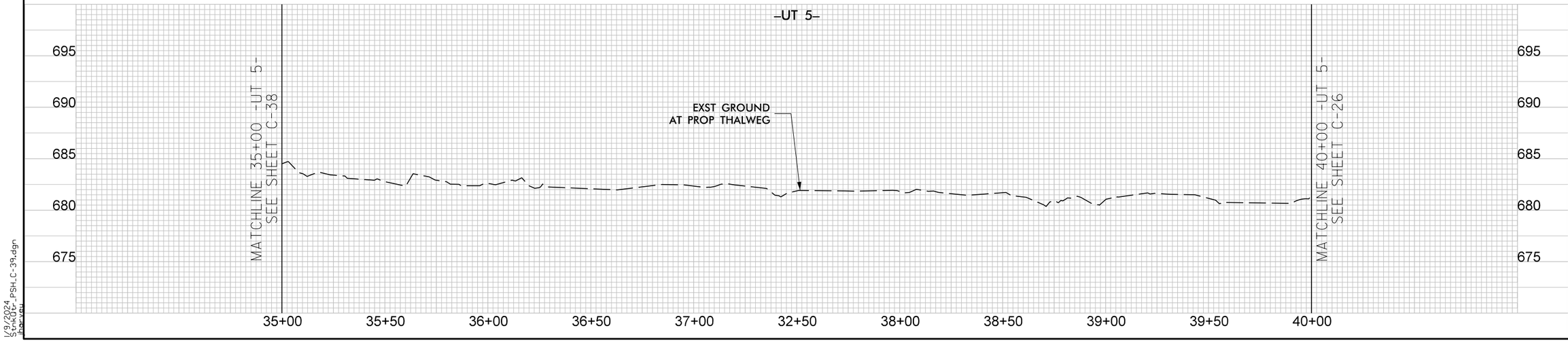
StnkQtr_PSH_C-38.dgn
jharvey





NORTH CAROLINA PROFESSIONAL SEAL 32 ENGINEER JOSHUA G. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH C-39
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-39

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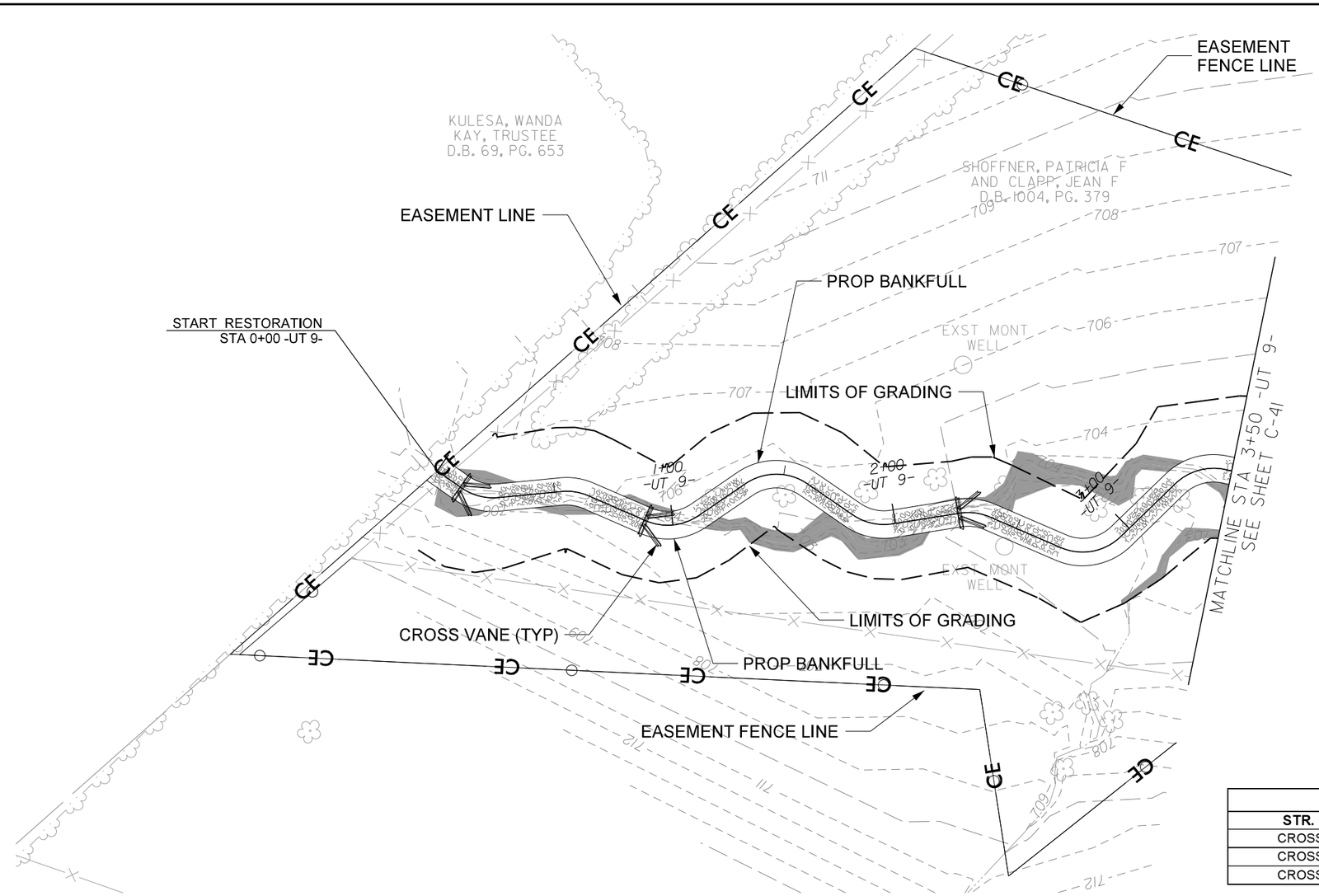
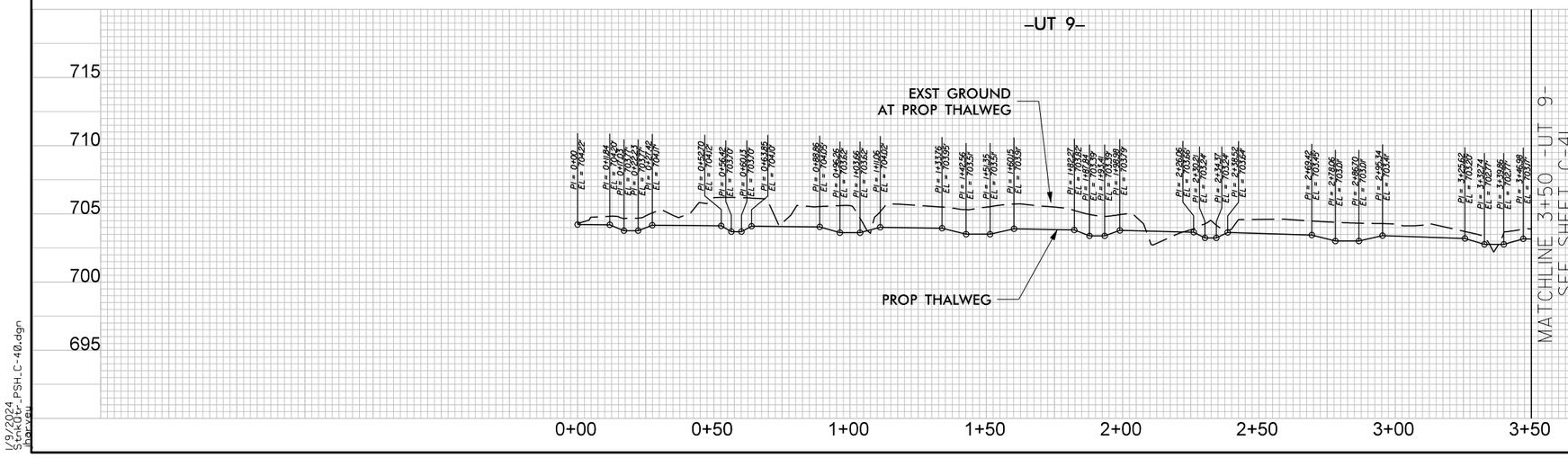
jharvey



25′ 12.5′ 0 25′ 50′

SCALE: 1″ = 50′

-UT 9- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,150.65	1,807,776.17	704.20
CROSS VANE	789,193.84	1,807,837.34	704.05
CROSS VANE	789,285.31	1,807,923.56	703.66



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 047220 JOSEPH C. DALTON NOT FOR CONSTRUCTION PRELIMINARY DESIGN

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-40
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C-40

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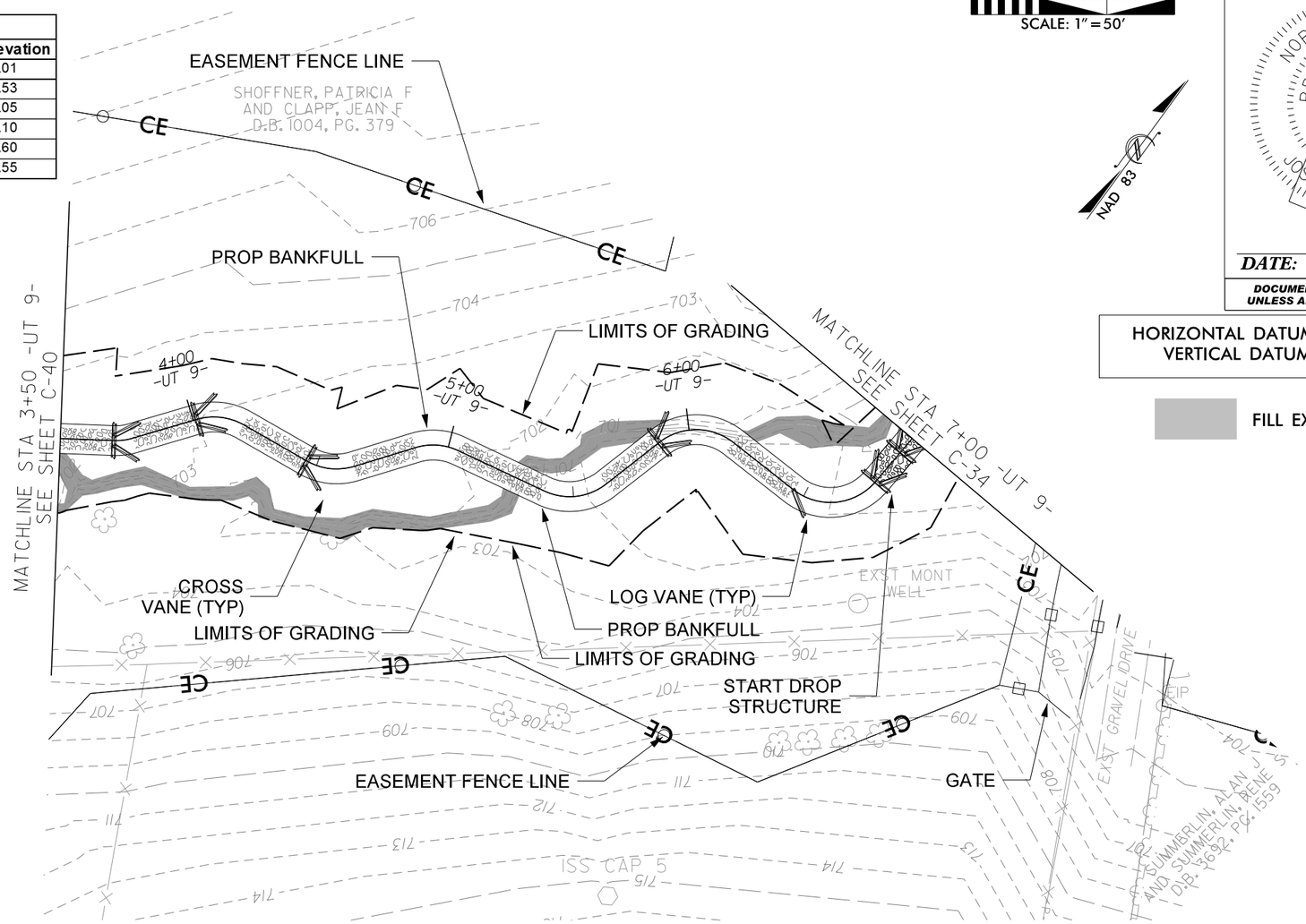
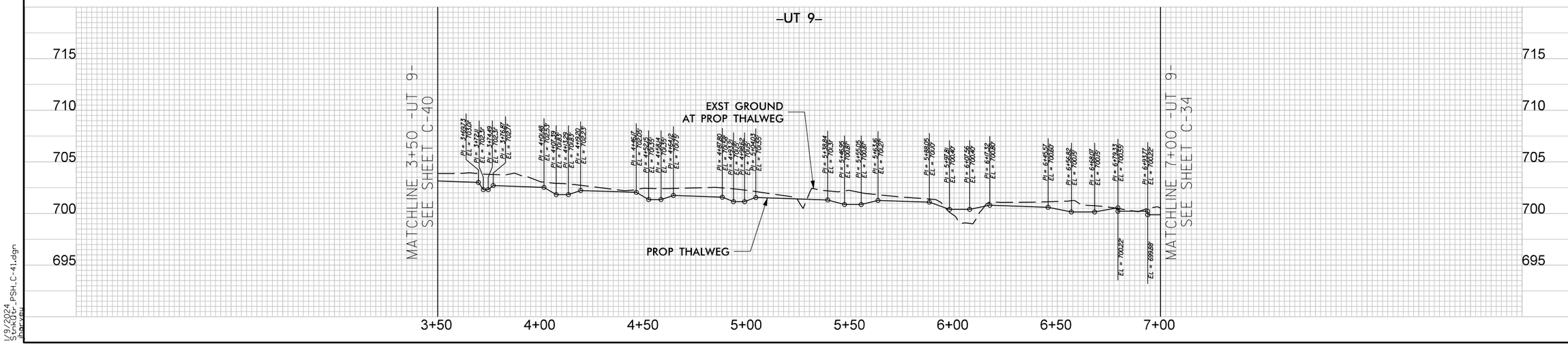
1/9/2024
StnkQtr_PSH_C-40.dgn
Jrh, Jgd

-UT 9- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	789,385.70	1,808,004.56	703.01
CROSS VANE	789,410.07	1,808,024.75	702.53
CROSS VANE	789,421.47	1,808,066.58	702.05
CROSS VANE	789,503.47	1,808,167.50	701.10
LOG VANE	789,518.39	1,808,217.71	700.60
DROP STRUCTURE	789,538.76	1,808,240.46	700.55





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 27821 JOSEPH C. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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GUILFORD COUNTY, NC

PLAN AND PROFILE

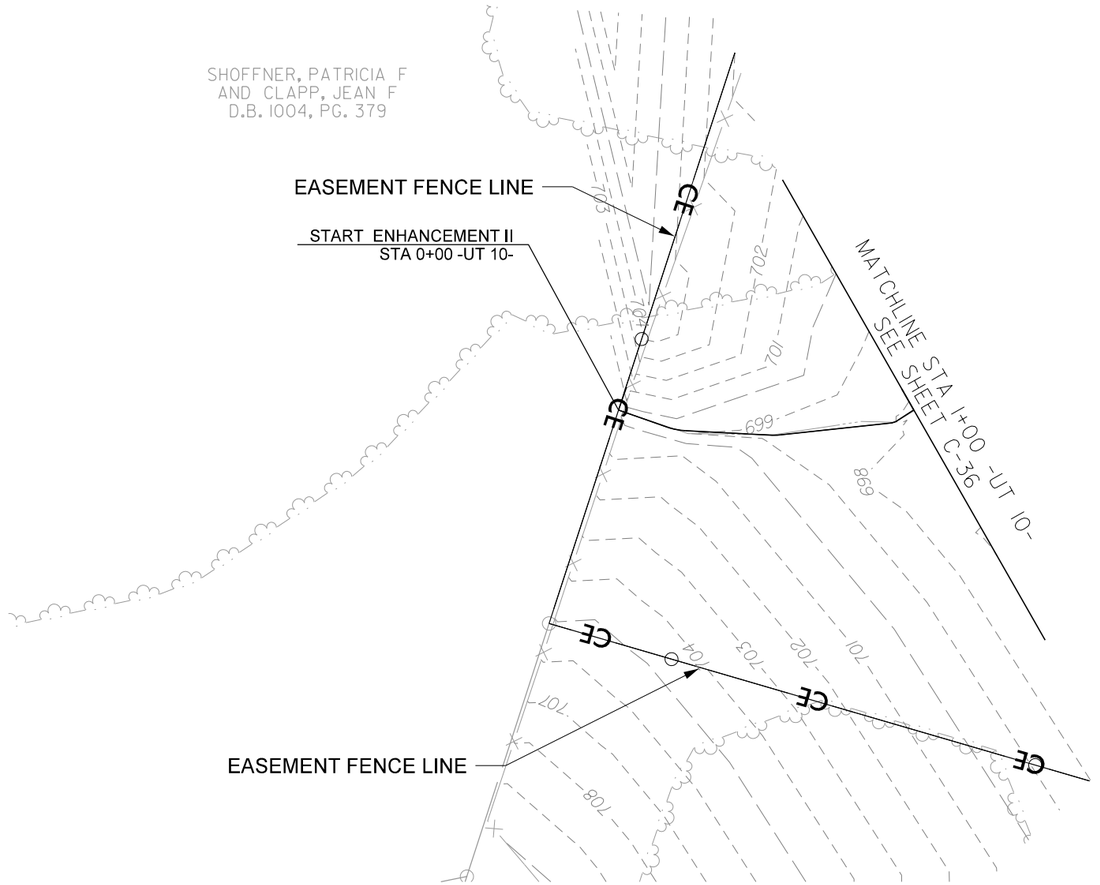
PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-41
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C-41

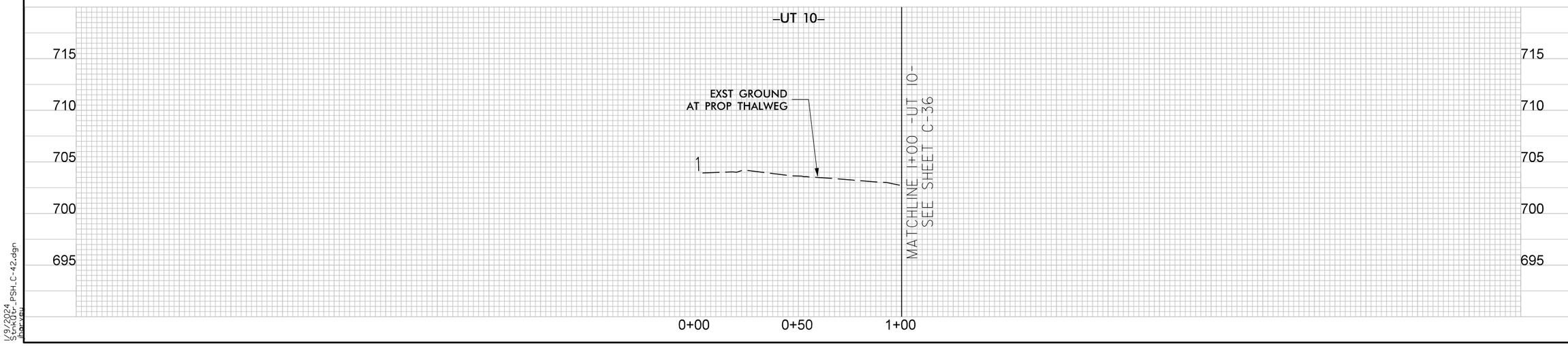
1/9/2024
Stnkqtr_PSH_C-41.dgn
Joe Dalton

25' 12.5' 0 25' 50'

SCALE: 1" = 50'

NAD 83





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 28403 JOSEPH C. DALTON

PRELIMINARY NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER

GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-42
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C-42

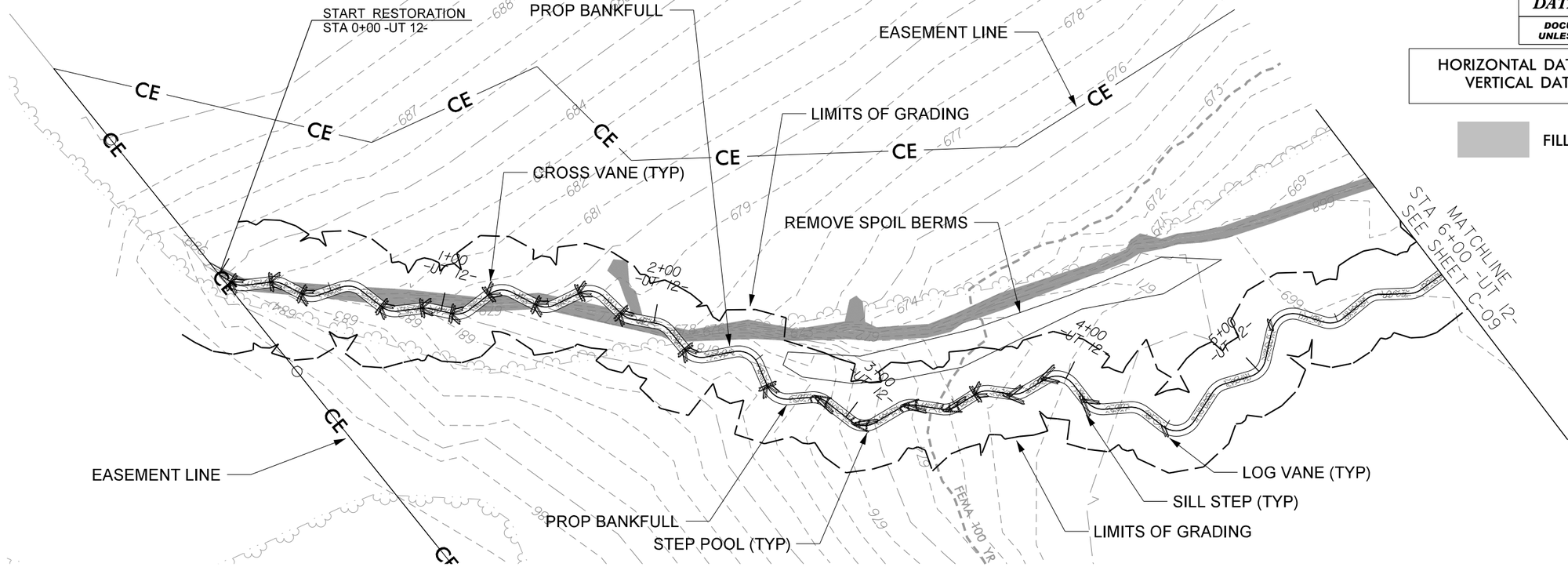
1/9/2024
Stnkqtr_PSH_C-42.dgn
Darren

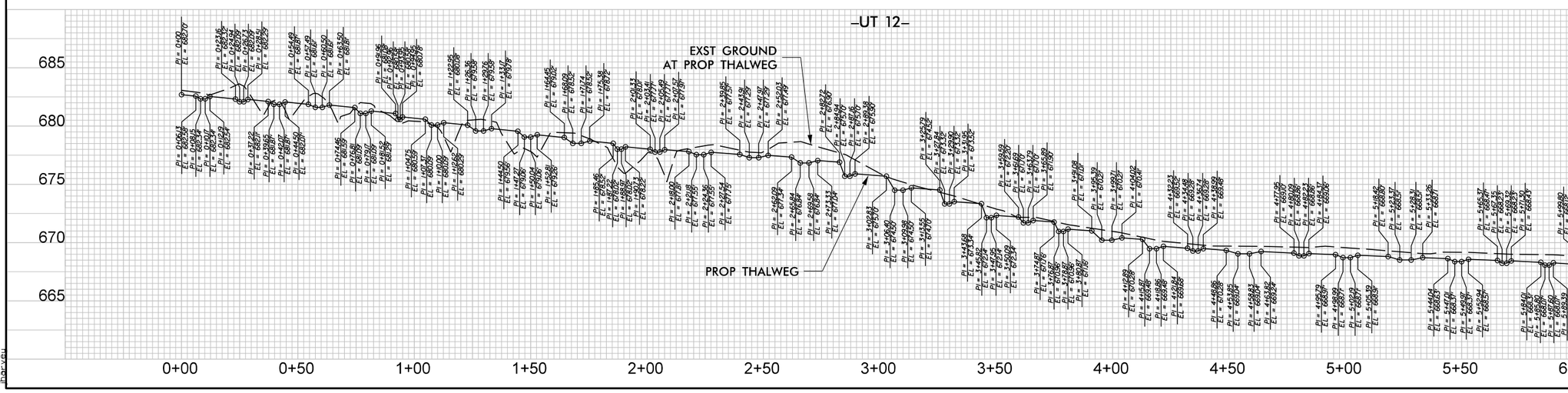
-UT 12- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,350.05	1,811,942.35	682.58
CROSS VANE	791,338.79	1,811,954.68	682.32
CROSS VANE	791,326.43	1,811,960.90	682.11
CROSS VANE	791,299.71	1,811,982.03	681.59
CROSS VANE	791,287.76	1,811,994.13	681.08
CROSS VANE	791,277.64	1,812,001.88	680.59
CROSS VANE	791,273.02	1,812,018.80	680.08
CROSS VANE	791,256.53	1,812,030.42	679.56
CROSS VANE	791,247.66	1,812,047.41	679.02
CROSS VANE	791,229.56	1,812,054.43	678.52
CROSS VANE	791,199.99	1,812,064.02	677.81

-UT 12- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,165.34	1,812,079.17	677.34
STEP POOL	791,149.50	1,812,089.57	676.90
STEP POOL	791,130.68	1,812,095.23	675.70
STEP POOL	791,120.89	1,812,114.22	674.52
STEP POOL	791,108.61	1,812,126.74	673.34
CROSS VANE	791,103.71	1,812,141.49	672.20
SILL STEP	791,093.67	1,812,152.54	671.76
SILL STEP	791,088.45	1,812,167.54	671.01
SILL STEP	791,070.08	1,812,173.88	670.28
LOG VANE	791,040.48	1,812,190.56	669.33

25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83





NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038160 JOSEPH C. DALTON FOR CONSTRUCTION NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-43
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-43

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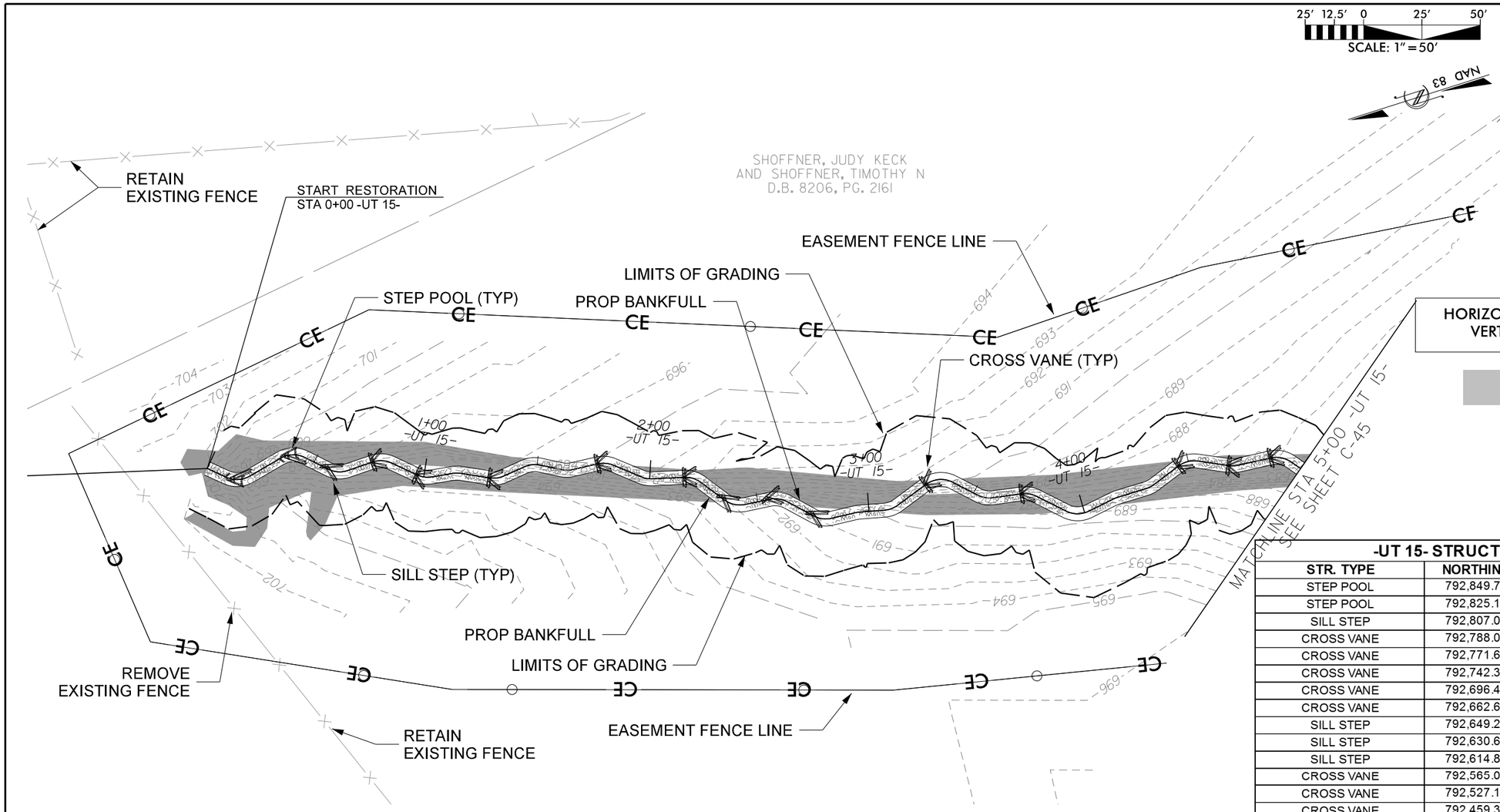
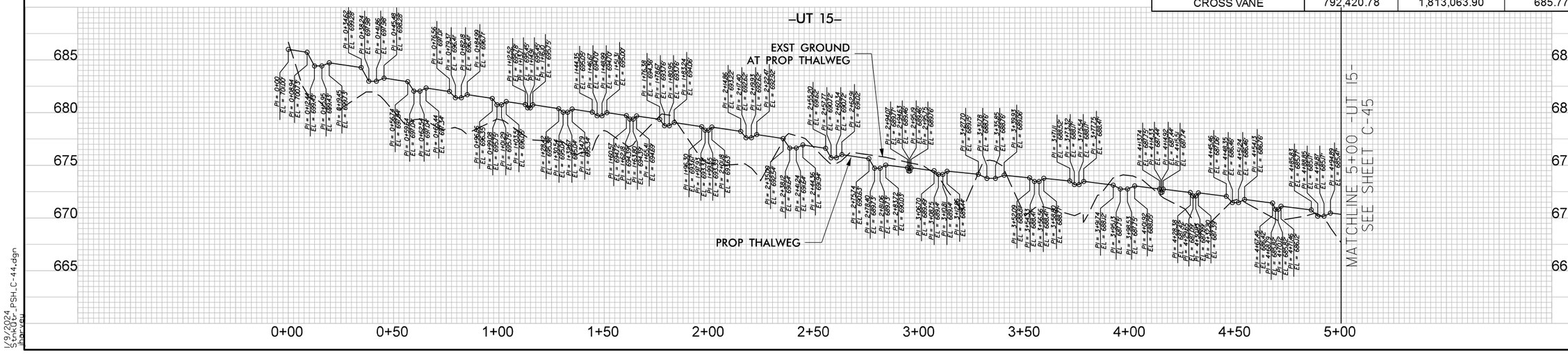
jharvell



-UT 15- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
STEP POOL	792,849.75	1,813,191.46	700.73
STEP POOL	792,825.17	1,813,192.17	699.28
SILL STEP	792,807.04	1,813,181.51	697.94
CROSS VANE	792,788.03	1,813,178.67	697.01
CROSS VANE	792,771.61	1,813,167.71	696.35
CROSS VANE	792,742.36	1,813,157.06	695.38
CROSS VANE	792,696.41	1,813,148.77	694.36
CROSS VANE	792,662.69	1,813,132.01	693.22
SILL STEP	792,649.27	1,813,117.58	692.54
SILL STEP	792,630.63	1,813,111.95	691.62
SILL STEP	792,614.89	1,813,099.45	690.63
CROSS VANE	792,565.07	1,813,097.76	689.15
CROSS VANE	792,527.11	1,813,081.51	688.52
CROSS VANE	792,459.35	1,813,072.51	687.06
CROSS VANE	792,438.93	1,813,066.21	686.42
CROSS VANE	792,420.78	1,813,063.90	685.77



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038360 JOSEPH C. DALTON
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GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-44
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

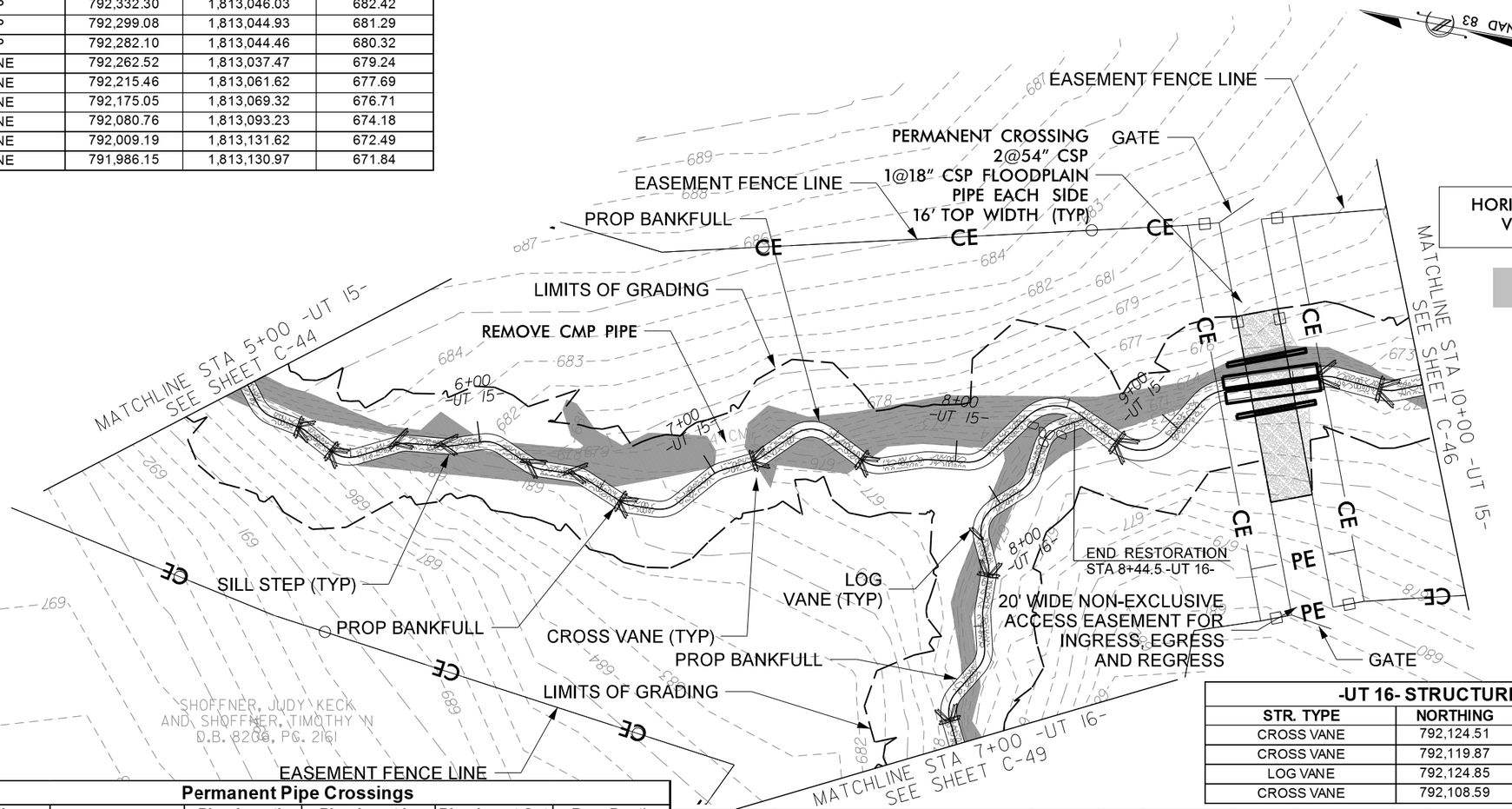
SHEET NO.
C-44

1/9/2024
Stnkqtr_PSH_C-44.dgn
Joe Dalton

-UT 15- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,387.89	1,813,043.28	684.81
CROSS VANE	792,374.01	1,813,036.52	684.21
SILL STEP	792,349.46	1,813,043.65	683.42
SILL STEP	792,332.30	1,813,046.03	682.42
SILL STEP	792,299.08	1,813,044.93	681.29
SILL STEP	792,282.10	1,813,044.46	680.32
CROSS VANE	792,262.52	1,813,037.47	679.24
CROSS VANE	792,215.46	1,813,061.62	677.69
CROSS VANE	792,175.05	1,813,069.32	676.71
CROSS VANE	792,080.76	1,813,093.23	674.18
CROSS VANE	792,009.19	1,813,131.62	672.49
CROSS VANE	791,986.15	1,813,130.97	671.84

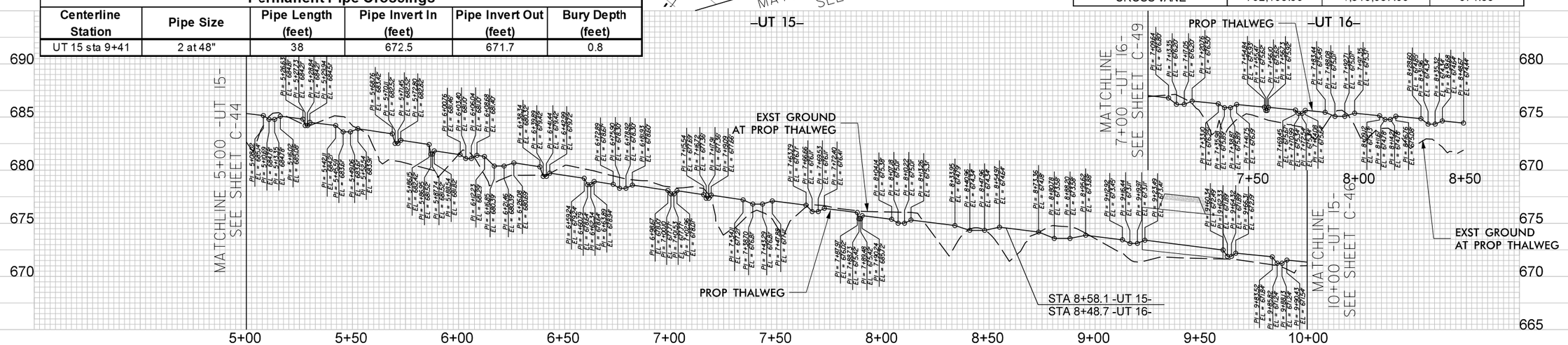
25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83



-UT 16- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,124.51	1,812,978.12	676.80
CROSS VANE	792,119.87	1,813,034.95	675.67
LOG VANE	792,124.85	1,813,047.92	675.45
CROSS VANE	792,108.59	1,813,087.00	674.85

Permanent Pipe Crossings					
Centerline Station	Pipe Size	Pipe Length (feet)	Pipe Invert In (feet)	Pipe Invert Out (feet)	Bury Depth (feet)
UT 15 sta 9+41	2 at 48"	38	672.5	671.7	0.8



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23881 JOSEPH C. DALTON FOR CONSTRUCTION NOT FOR REVIEW

DATE:

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GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-45
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-45

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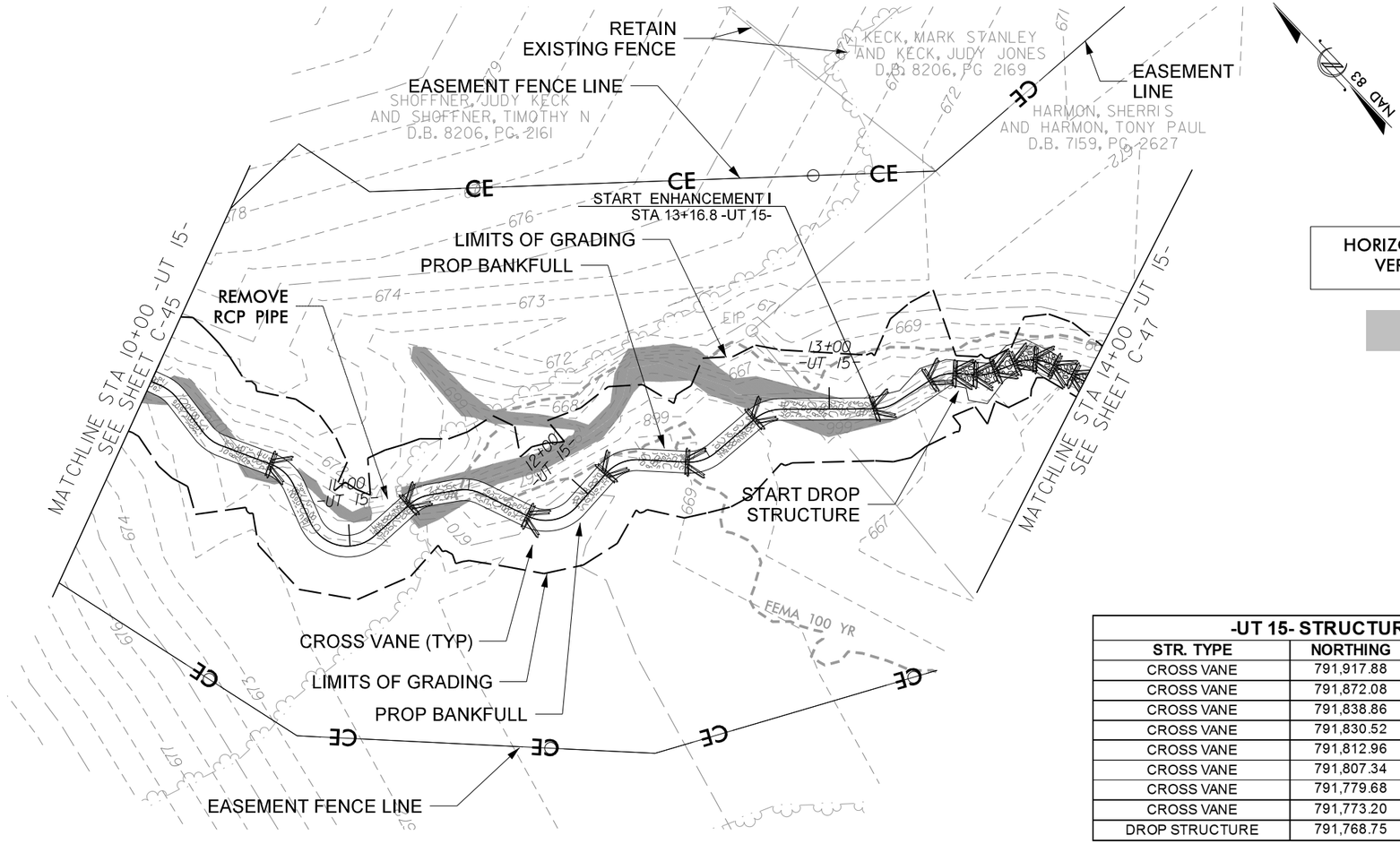
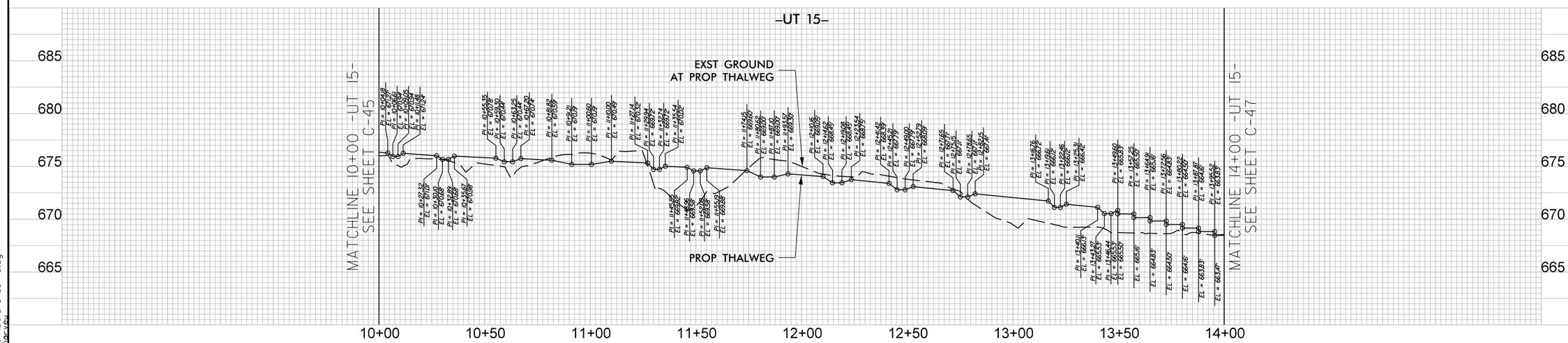
1/9/2024
StnkQtr_PSH_C-45.dgn
Harvey





25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 15- STRUCTURE LOCATIONS

STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,917.88	1,813,146.48	670.78
CROSS VANE	791,872.08	1,813,173.12	670.32
CROSS VANE	791,838.86	1,813,201.94	669.60
CROSS VANE	791,830.52	1,813,233.74	669.05
CROSS VANE	791,812.96	1,813,258.16	668.39
CROSS VANE	791,807.34	1,813,287.09	667.71
CROSS VANE	791,779.68	1,813,321.82	666.72
CROSS VANE	791,773.20	1,813,343.91	666.13
DROP STRUCTURE	791,768.75	1,813,352.11	665.83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23681 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-46
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-46

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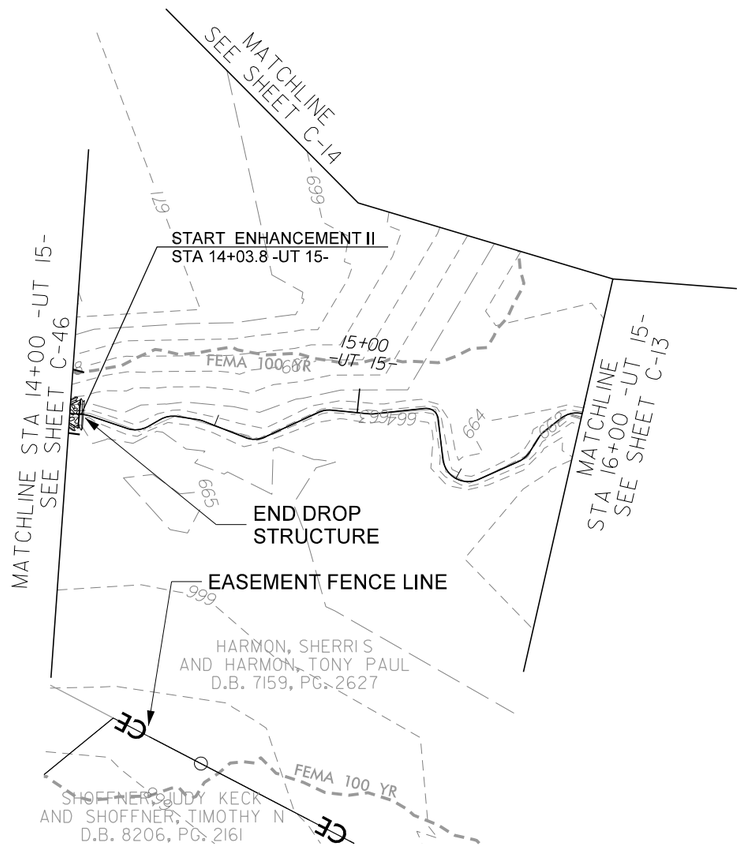
1/9/2024
Stnkqtr_PSH_C-46.dgn
jharvell



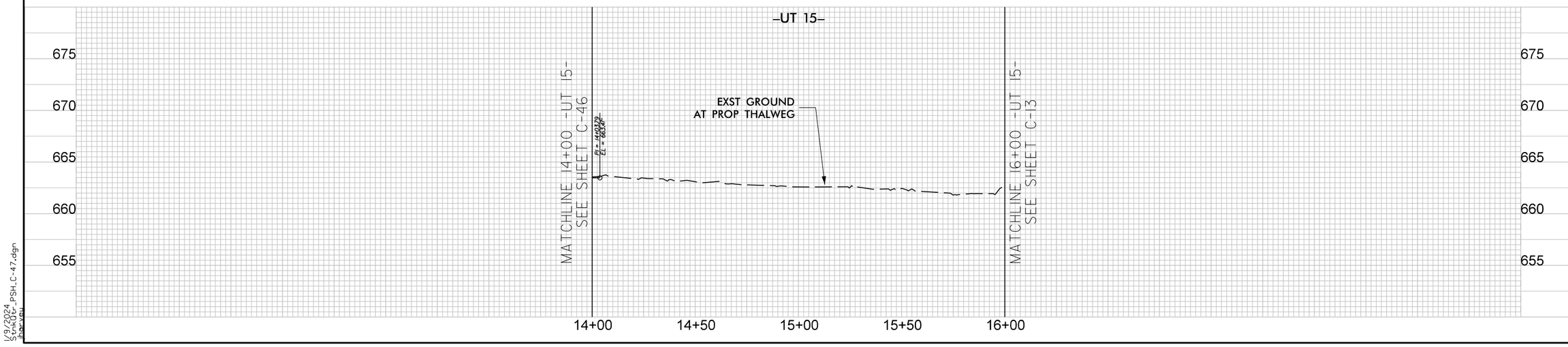
25′ 12.5′ 0 25′ 50′

SCALE: 1″ = 50′

NAD 83

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

-UT 15- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
DROP STRUCTURE	791,730.29	1,813,386.00	663.47



DATE:

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22681 JOSEPH C. DALTON — PRELIMINARY NOT FOR CONSTRUCTION

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: 919.859.2243
ENG FIRM LICENSE NO. C-890

Axiom Environmental, Inc.

STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-47
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C–47

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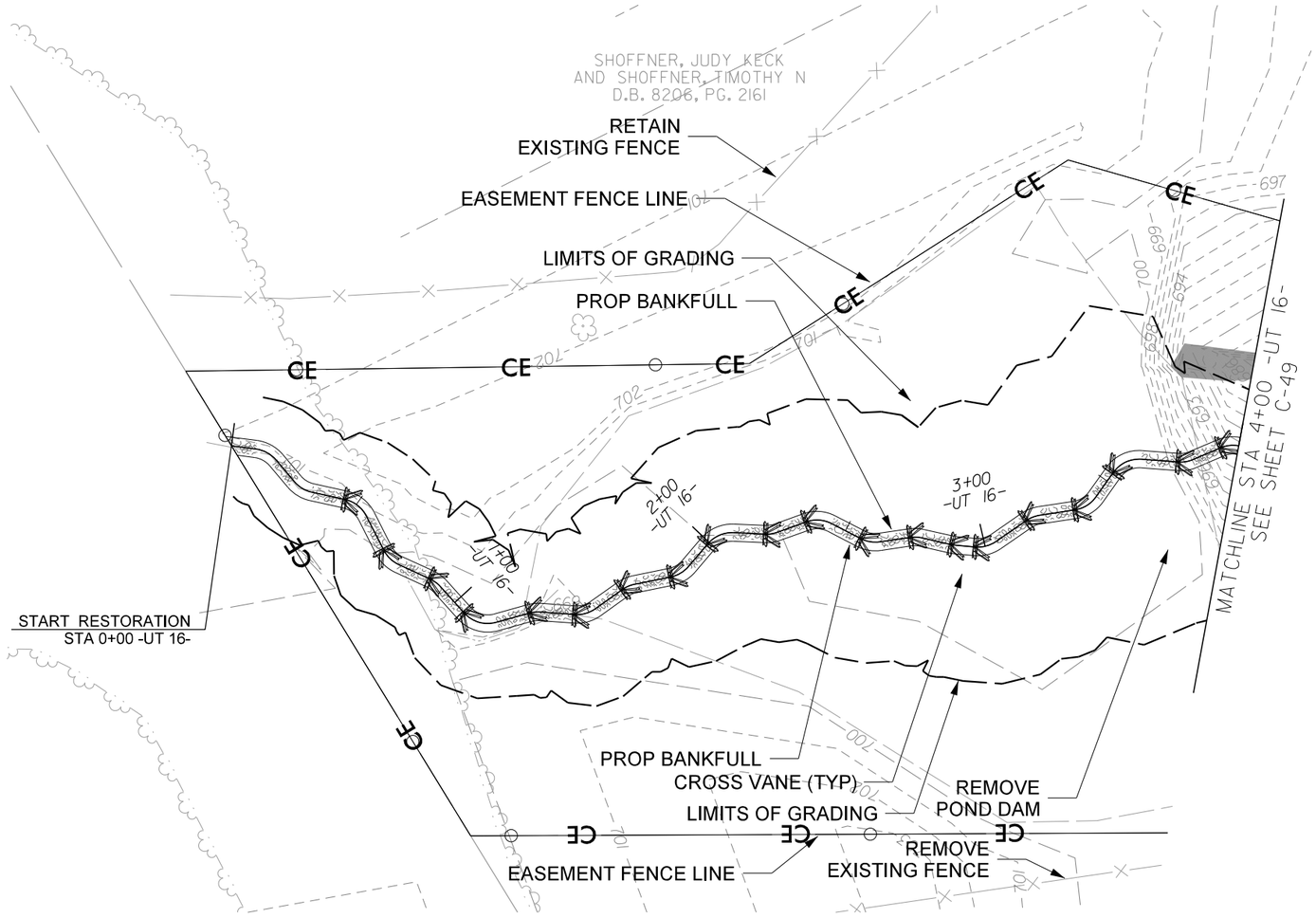
Jrah.ydu



25′ 12.5′ 0 25′ 50′

SCALE: 1″ = 50′

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038861 JOSEPH C. DALTON — PRELIMINARY DESIGN — NOT FOR CONSTRUCTION

DATE:

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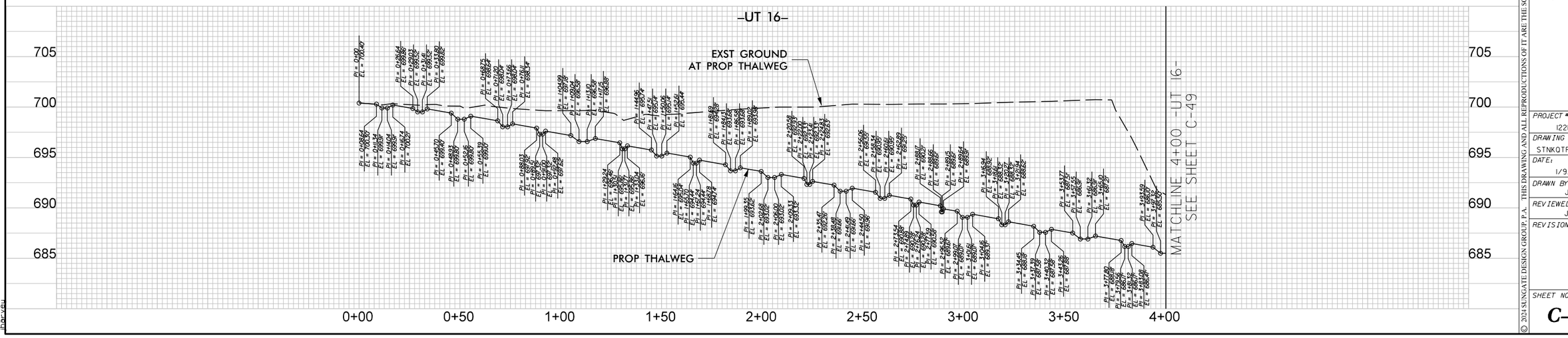
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 16- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,405.69	1,812,469.12	699.40
CROSS VANE	792,383.64	1,812,471.81	698.64
CROSS VANE	792,366.92	1,812,480.60	697.92
CROSS VANE	792,350.61	1,812,484.88	697.18
CROSS VANE	792,339.09	1,812,504.49	696.46
CROSS VANE	792,330.70	1,812,517.72	695.74
CROSS VANE	792,329.80	1,812,536.46	695.04
CROSS VANE	792,325.03	1,812,553.22	694.28
CROSS VANE	792,328.43	1,812,570.18	693.62
CROSS VANE	792,321.19	1,812,589.20	692.93
CROSS VANE	792,317.66	1,812,603.59	692.26
CROSS VANE	792,302.96	1,812,617.03	691.55
CROSS VANE	792,294.65	1,812,632.05	690.88
CROSS VANE	792,285.24	1,812,643.16	690.21
CROSS VANE	792,280.31	1,812,649.89	689.67
CROSS VANE	792,279.24	1,812,669.85	688.92
CROSS VANE	792,273.84	1,812,686.36	688.18
CROSS VANE	792,278.31	1,812,704.53	687.51
CROSS VANE	792,270.01	1,812,725.73	686.77
CROSS VANE	792,266.76	1,812,741.03	686.10



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Axiom Environmental, Inc.

STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH C-48
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	C–48

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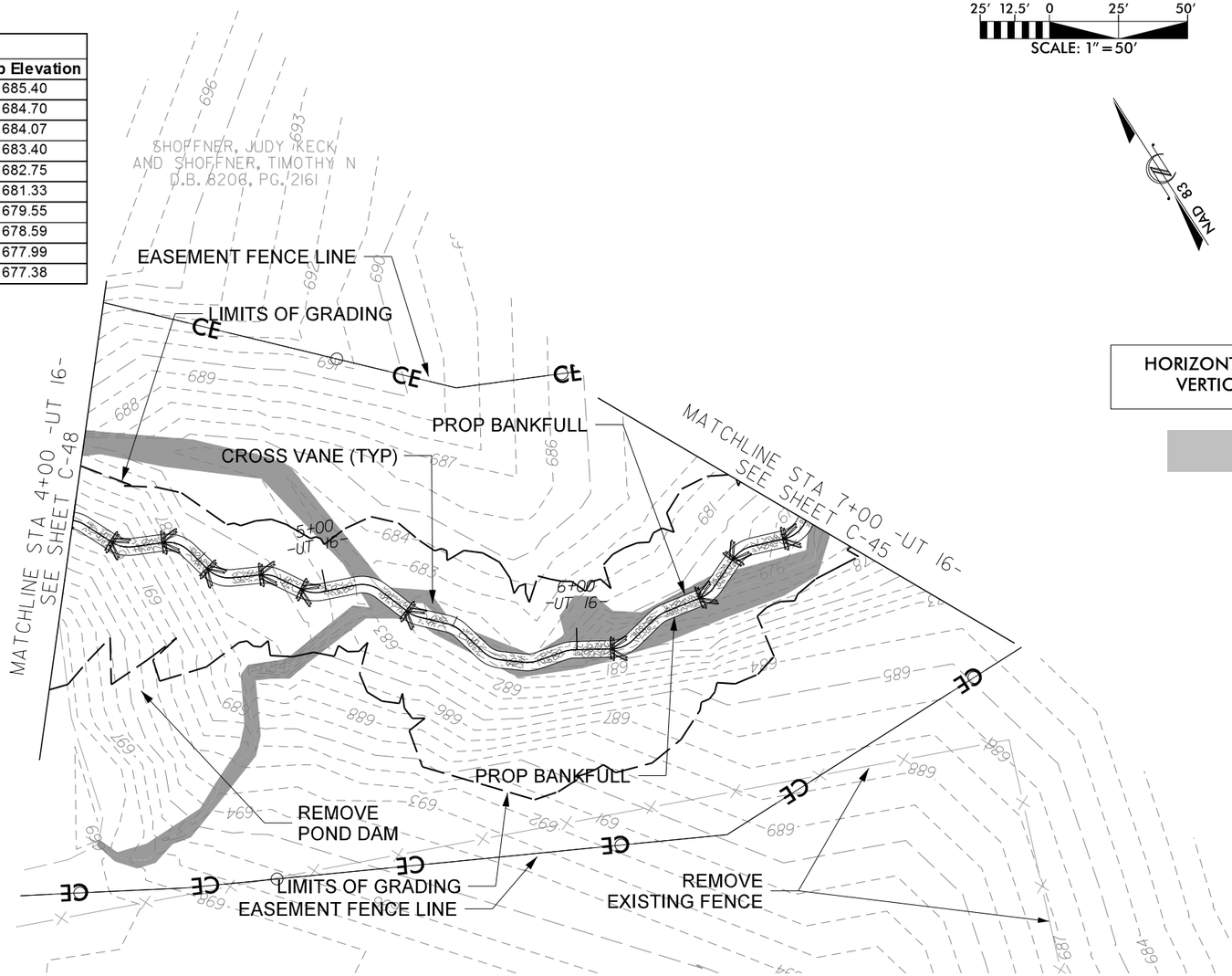
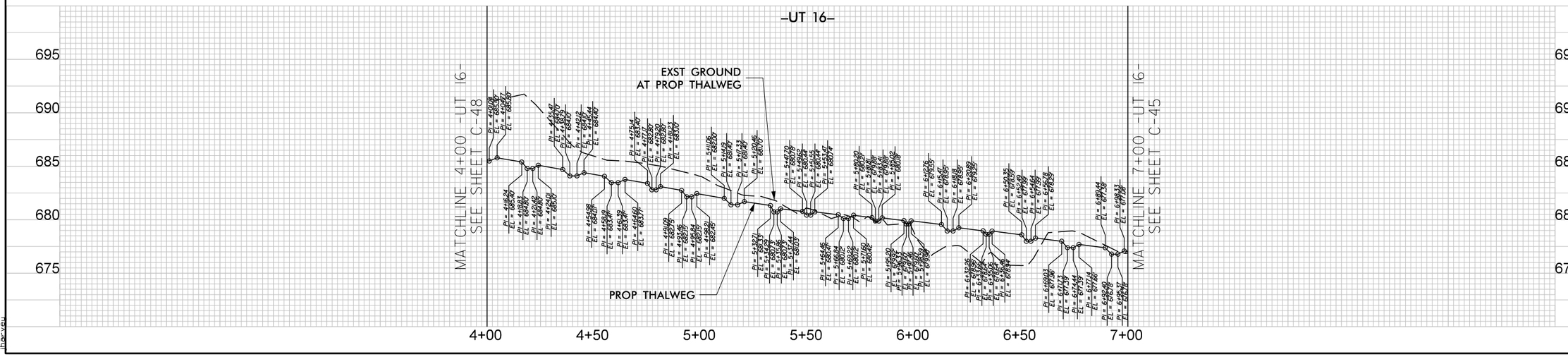
Stnkqtr_PSH_C-48.dgn
jharvell

-UT 16- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,249.93	1,812,754.35	685.40
CROSS VANE	792,239.62	1,812,770.05	684.70
CROSS VANE	792,222.82	1,812,778.22	684.07
CROSS VANE	792,210.69	1,812,793.34	683.40
CROSS VANE	792,198.17	1,812,802.86	682.75
CROSS VANE	792,170.81	1,812,830.55	681.33
CROSS VANE	792,119.30	1,812,885.45	679.55
CROSS VANE	792,117.46	1,812,922.25	678.59
CROSS VANE	792,122.83	1,812,939.87	677.99
CROSS VANE	792,118.91	1,812,959.38	677.38





25′ 12.5′ 0 25′ 50′
SCALE: 1″ = 50′

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
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TEL: 919.851.1415
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STINKING QUARTER

GUILFORD COUNTY, NC

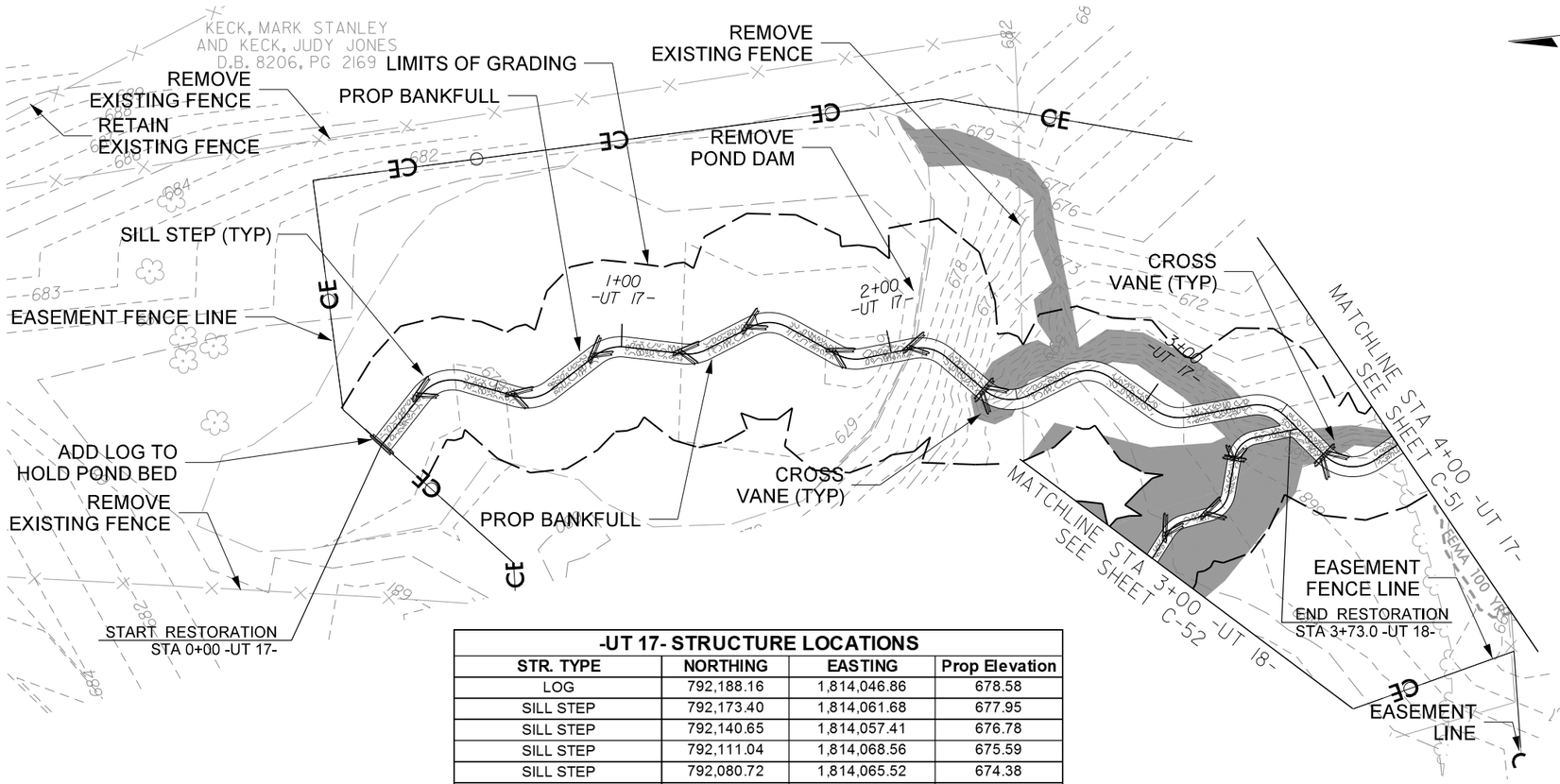
PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-49
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

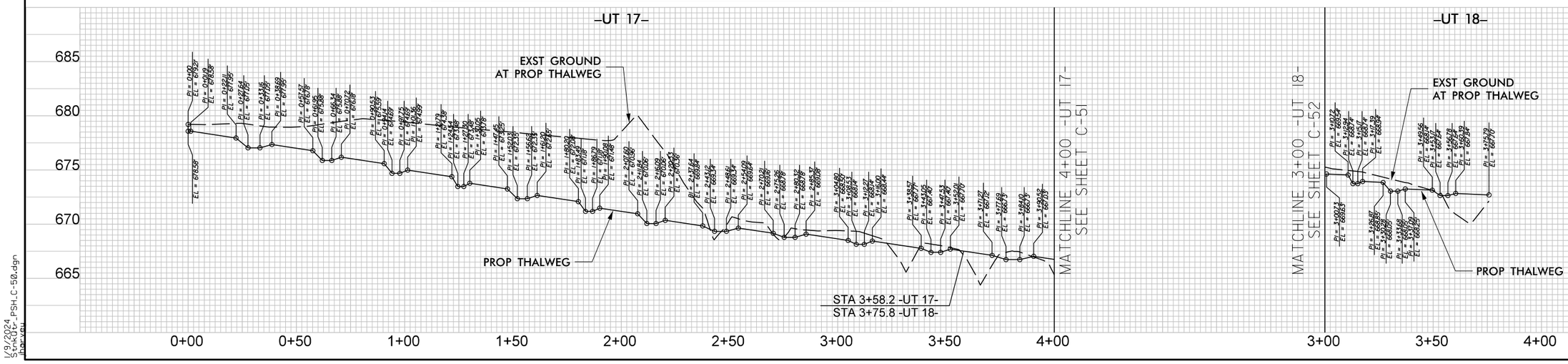
SHEET NO. C-49

1/9/2024
Stnkqtr_PSH_C-49.dgn
Harveu

-UT 18- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
SILL STEP	791,919.50	1,813,984.09	669.54
SILL STEP	791,904.48	1,813,988.78	668.85
CROSS VANE	791,893.71	1,814,007.14	668.14



-UT 17- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
LOG	792,188.16	1,814,046.86	678.58
SILL STEP	792,173.40	1,814,061.68	677.95
SILL STEP	792,140.65	1,814,057.41	676.78
SILL STEP	792,111.04	1,814,068.56	675.59
SILL STEP	792,080.72	1,814,065.52	674.38
SILL STEP	792,056.31	1,814,072.14	673.25
SILL STEP	792,027.79	1,814,059.31	672.08
SILL STEP	792,001.01	1,814,058.17	670.96
CROSS VANE	791,977.82	1,814,040.97	669.84
CROSS VANE	791,862.30	1,814,004.69	667.12



25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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STINKING QUARTER

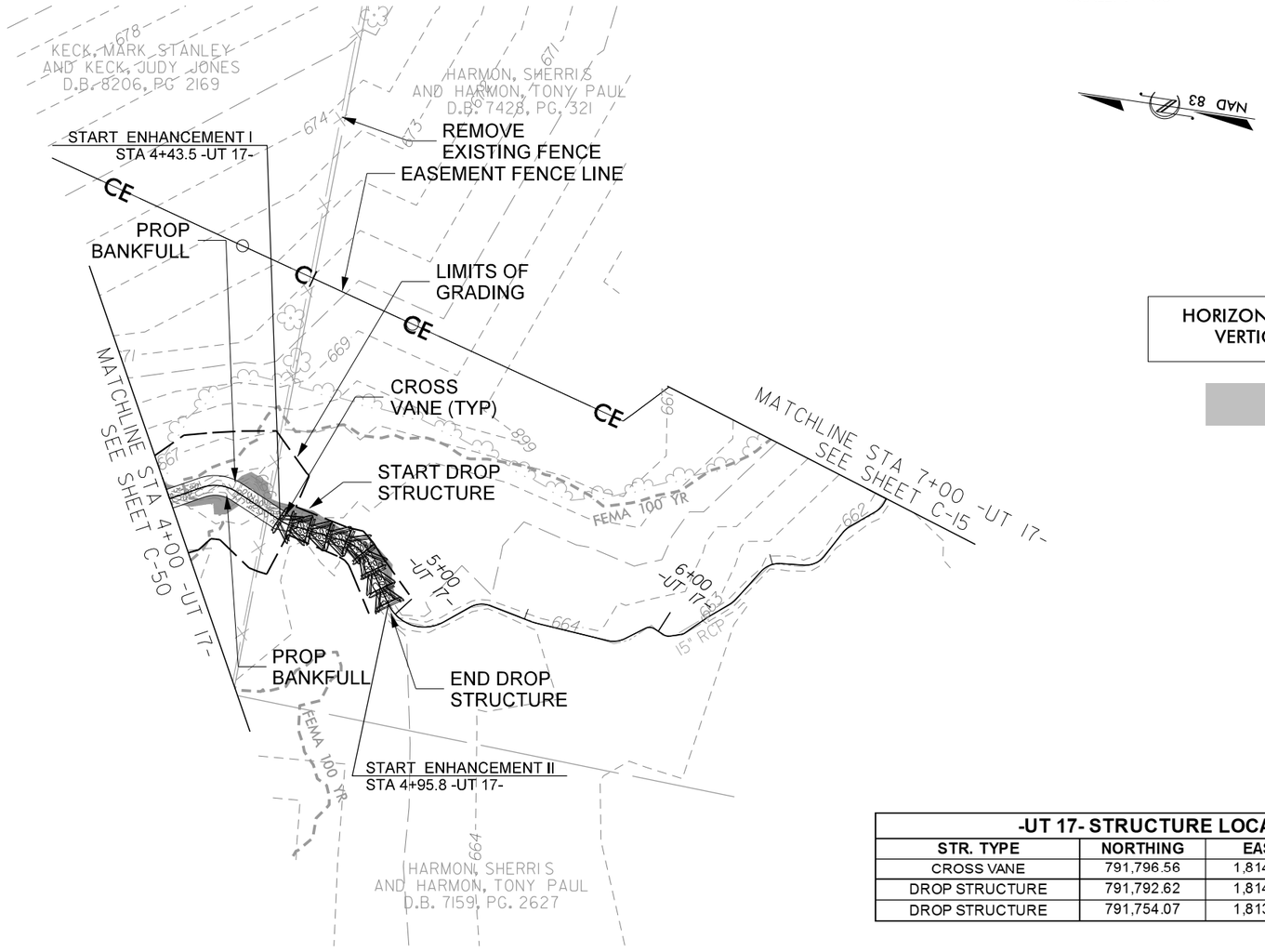
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-50
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C–50

1/9/2024
Stnkqtr_PSH_C-50.dgn
jharvell



NORTH CAROLINA PROFESSIONAL SEAL 29911 ENGINEER JOSHUA G. DALTON
NOT FOR CONSTRUCTION

DATE:

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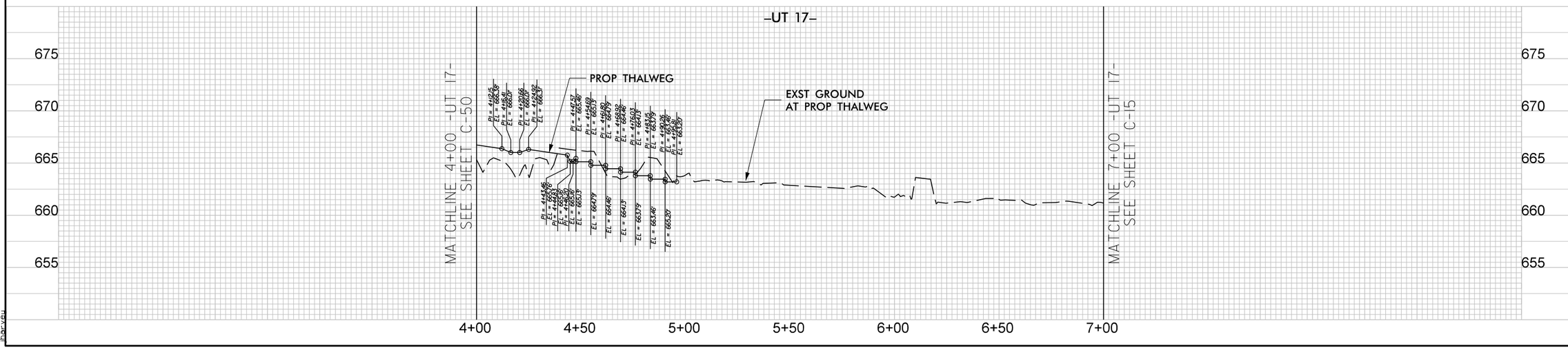
HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 17- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,796.56	1,814,003.61	665.76
DROP STRUCTURE	791,792.62	1,814,002.46	665.46
DROP STRUCTURE	791,754.07	1,813,979.82	663.20



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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH C-51
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-51

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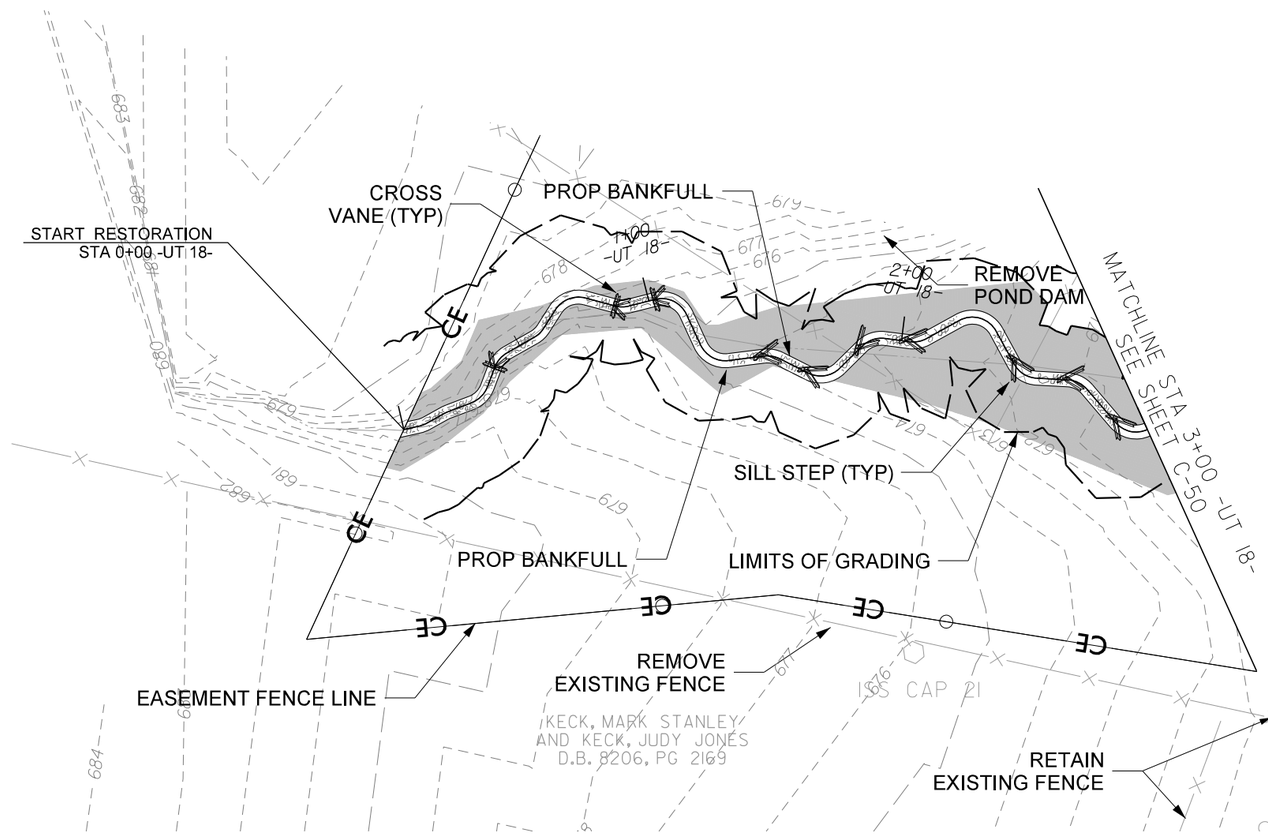
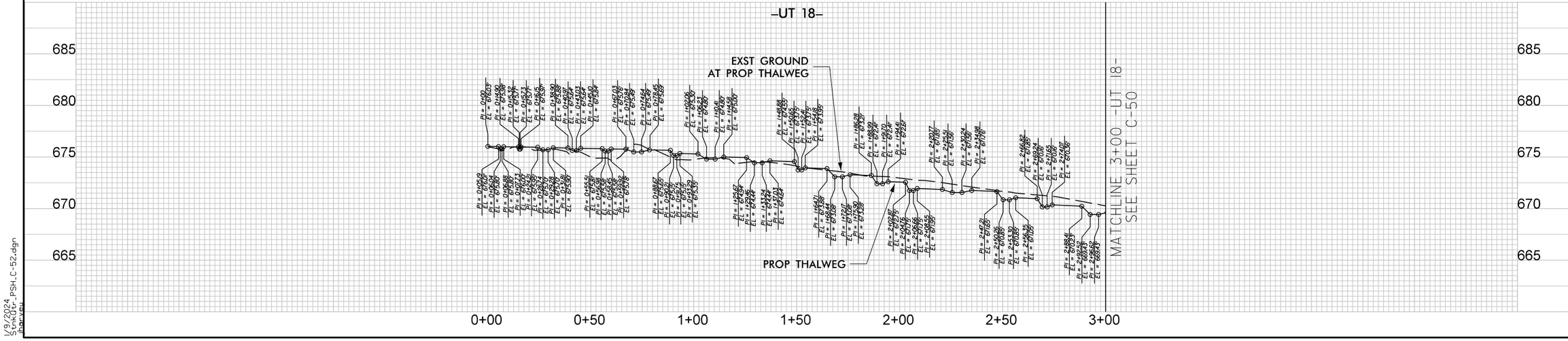
jharvey





25' 12.5' 0 25' 50'
SCALE: 1" = 50'

NAD 83

NORTH CAROLINA PROFESSIONAL SEAL 23 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 18- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,133.44	1,813,913.49	675.88
CROSS VANE	792,104.26	1,813,947.10	675.65
CROSS VANE	792,092.98	1,813,954.06	675.30
CROSS VANE	792,073.36	1,813,945.85	674.94
SILL STEP	792,052.48	1,813,950.38	674.55
SILL STEP	792,036.88	1,813,950.69	673.88
SILL STEP	792,023.82	1,813,965.66	673.21
SILL STEP	792,009.72	1,813,972.99	672.55
SILL STEP	791,975.20	1,813,979.17	671.65
SILL STEP	791,956.68	1,813,981.02	670.96
SILL STEP	791,936.89	1,813,973.95	670.23

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH C-52
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-52

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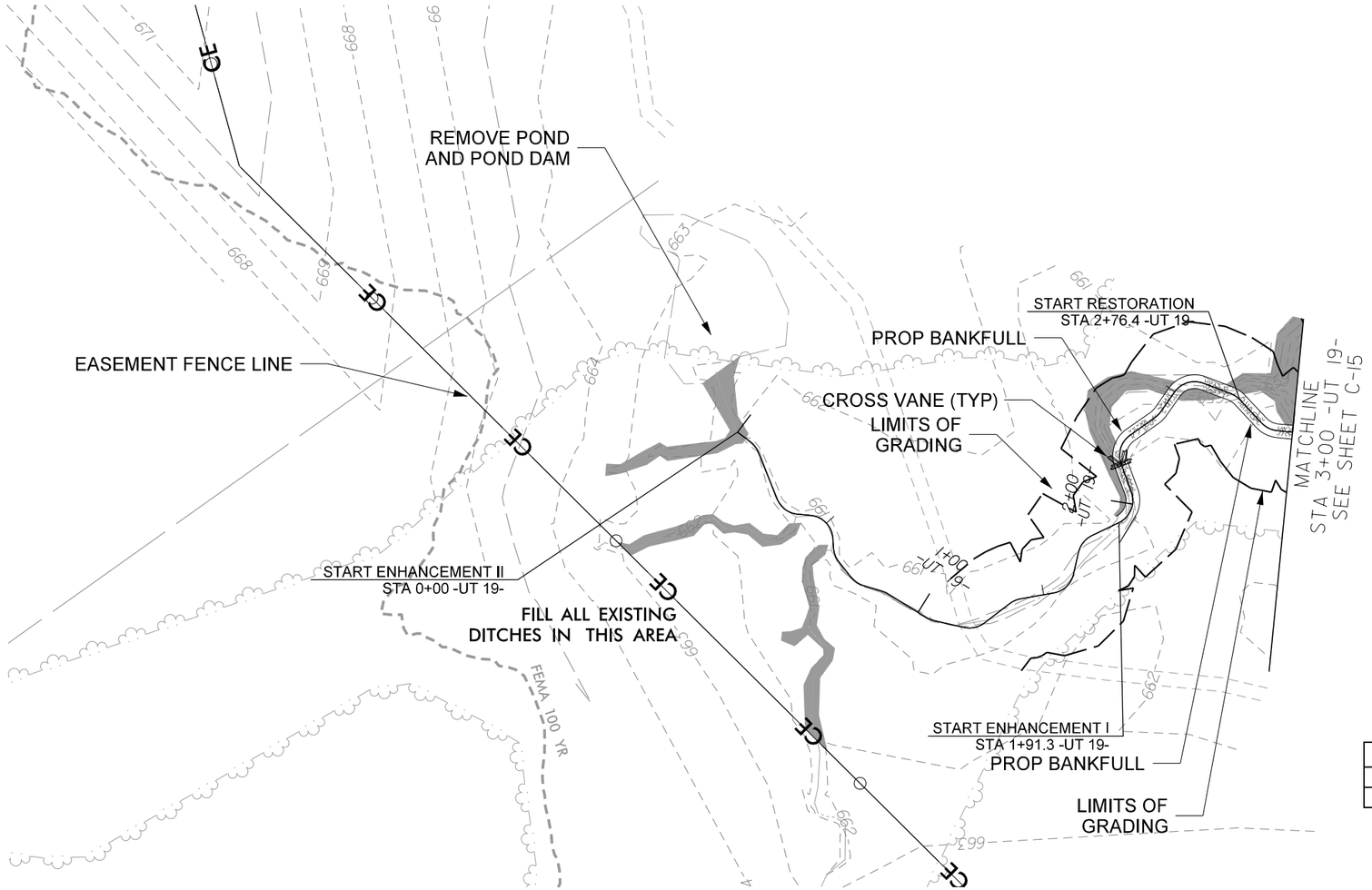
jharvey



25′ 12.5′ 0 25′ 50′

SCALE: 1″ = 50′

NAD 83

NORTH CAROLINA
PROFESSIONAL ENGINEER SEAL 22
JOSEPH C. DALTON
NOT FOR CONSTRUCTION
PRELIMINARY

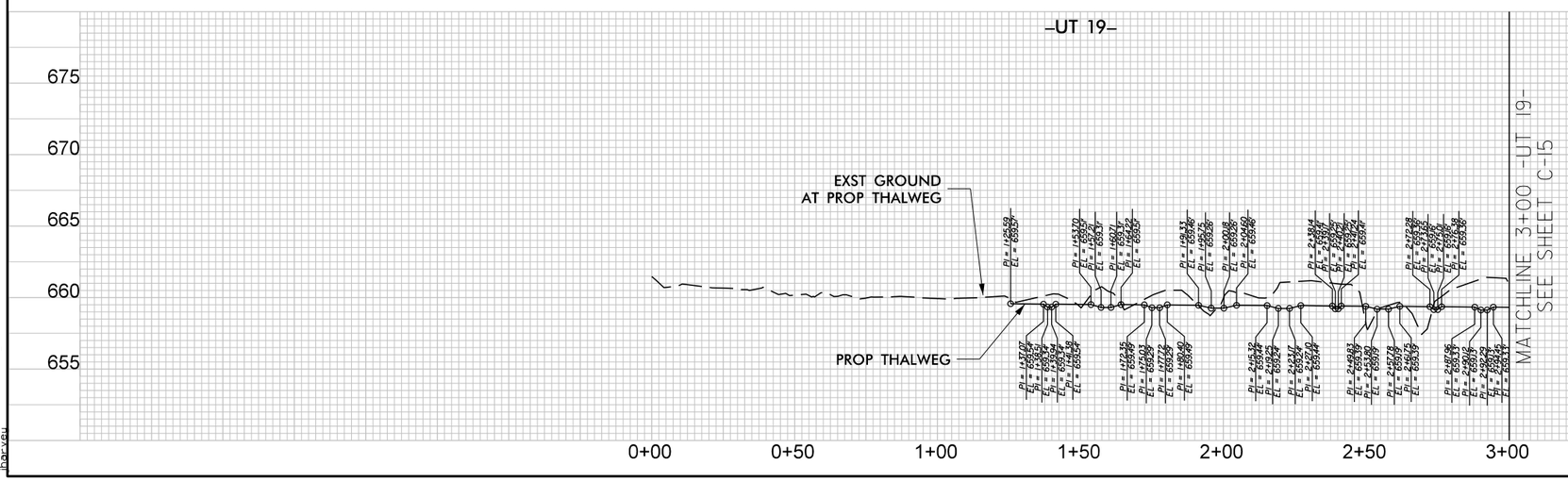
DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 19- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,397.51	1,814,100.17	659.44



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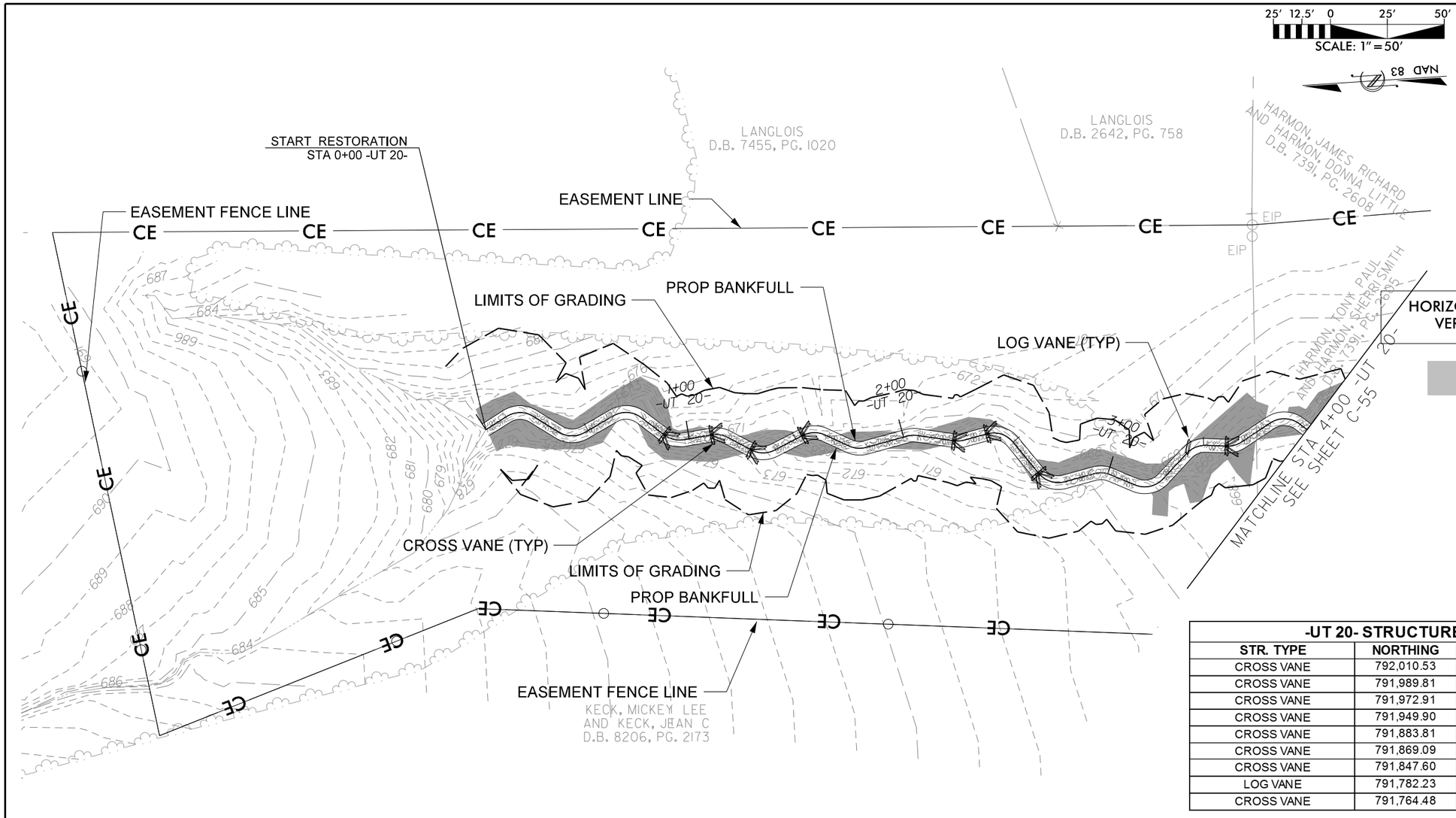
STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-53
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
C–53

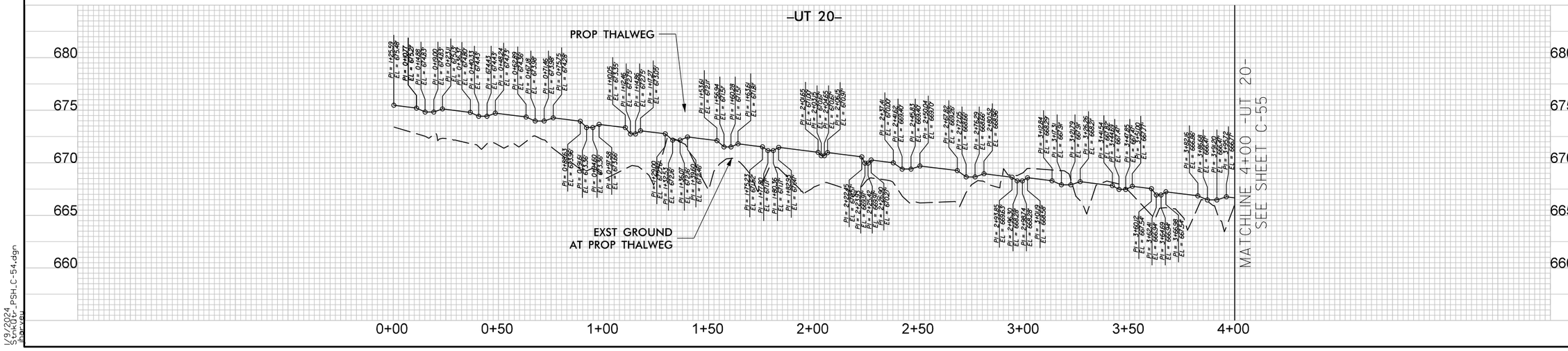
1/9/2024
Stnkqtr_PSH_C-53.dgn
jharvell



HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 20- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	792,010.53	1,815,167.62	673.96
CROSS VANE	791,989.81	1,815,166.36	673.35
CROSS VANE	791,972.91	1,815,158.66	672.76.
CROSS VANE	791,949.90	1,815,163.59	672.11
CROSS VANE	791,883.81	1,815,157.07	670.57
CROSS VANE	791,869.09	1,815,159.14	670.00
CROSS VANE	791,847.60	1,815,140.33	669.26
LOG VANE	791,782.23	1,815,144.99	667.82
CROSS VANE	791,764.48	1,815,147.04	667.54



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22 JOSEPH C. DALTON

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-54
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **C-54**

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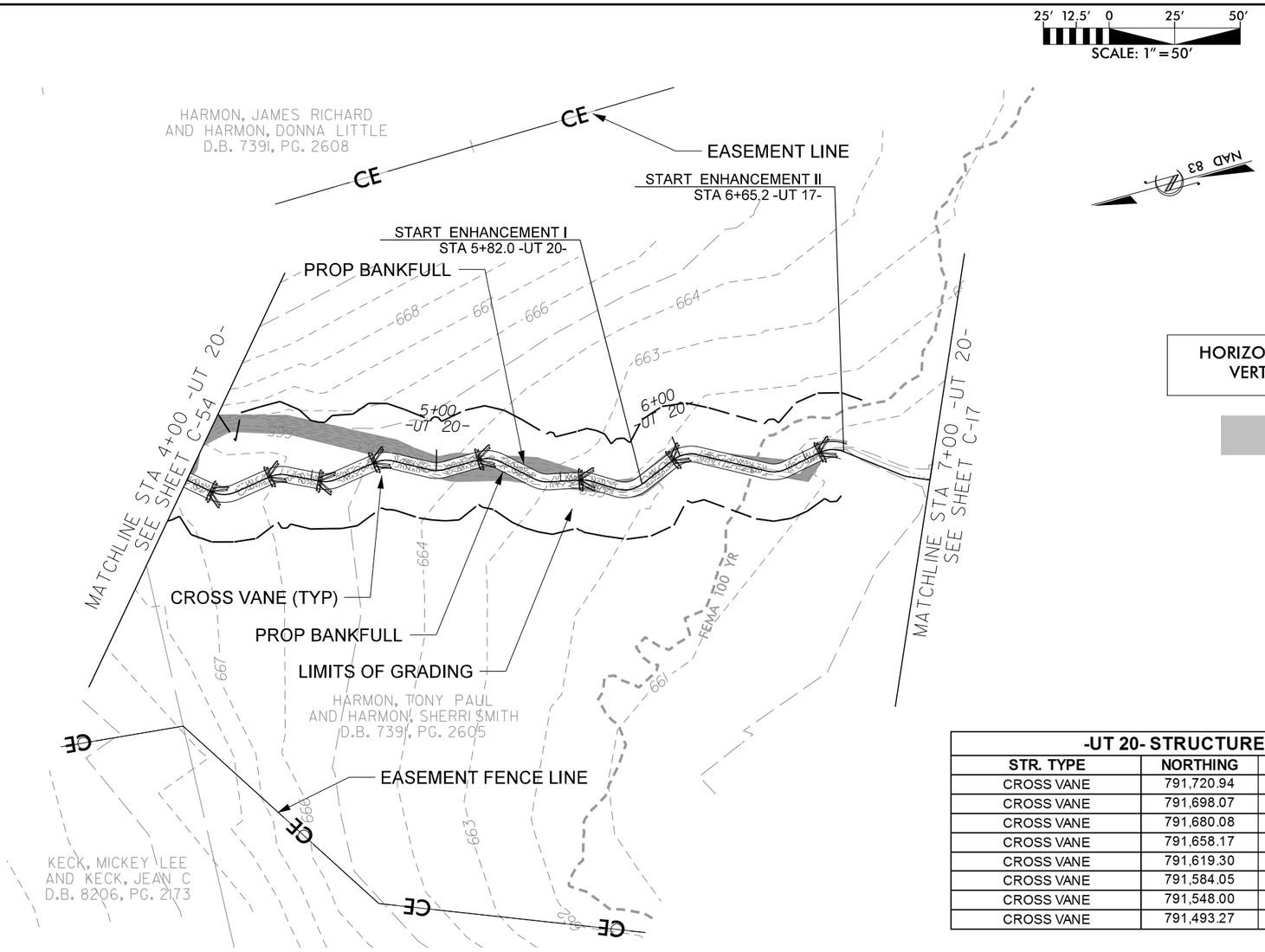
jharvell



NORTH CAROLINA PROFESSIONAL SEAL 26 ENGINEER JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

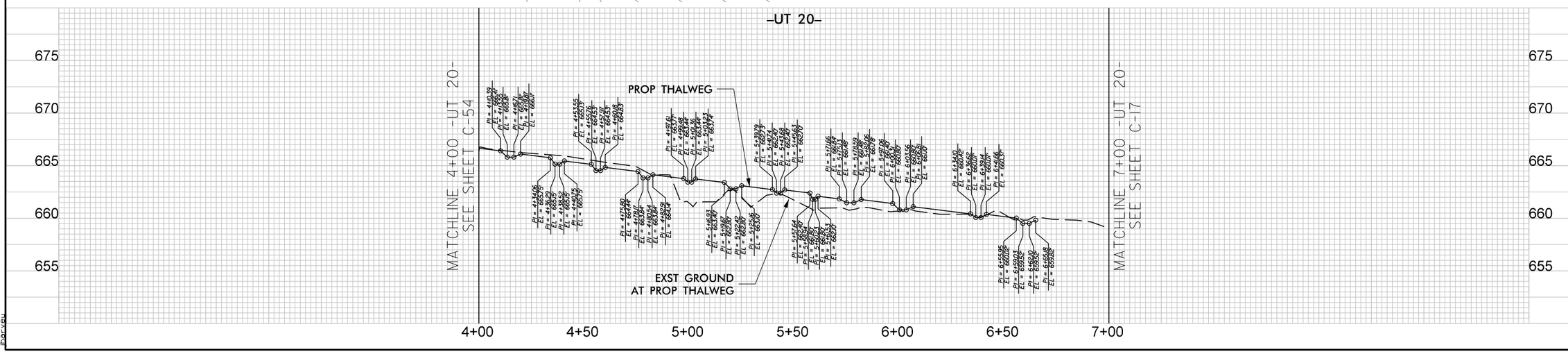
DATE:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

FILL EXISTING CHANNEL

-UT 20- STRUCTURE LOCATIONS			
STR. TYPE	NORTHING	EASTING	Prop Elevation
CROSS VANE	791,720.94	1,815,145.24	666.41
CROSS VANE	791,698.07	1,815,144.85	665.75
CROSS VANE	791,680.08	1,815,138.21	665.13
CROSS VANE	791,658.17	1,815,139.49	664.44
CROSS VANE	791,619.30	1,815,130.02	663.40
CROSS VANE	791,584.05	1,815,112.25	662.40
CROSS VANE	791,548.00	1,815,110.23	661.40
CROSS VANE	791,493.27	1,815,098.16	660.02



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TEL (919) 859-2243
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Axiom Environmental, Inc.

STINKING QUARTER
GUILFORD COUNTY, NC

PLAN AND PROFILE

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH C-55
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. C-55

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jharvey

CONSTRUCTION SEQUENCE

Construction Notes:

1. Staging areas, stockpile areas, construction entrances and access roads will be identified and located according to the Erosion Control Plans and landowner agreements. Variances will be allowed assuming both the Contractor and Designer verbally agree.

2. Construction entrance #1 (as shown on sheet E-03E) from Secondary Road 3093 (Old Julian Rd) will be installed for access to UT1, UT2, UT3, UT4, UT5, UT6, UT7, UT 9 and UT10.
   Construction entrance #2 (as shown on sheet E-03E) from NC 62 (south end of project) will be installed for access to NPSQ and UT1.
   Construction entrance #3 (as shown on sheet E-03E) from NC 62 (north end of project) will be installed for access to UT12, UT 14, UT15, UT16, UT 17, UT18, UT19 and UT20.
   Construction entrance #4 (as shown on sheet E-03E) from Secondary Road 3371 (Bobby Jean Rd) will be installed for access to NPSQ, UT19 and UT20.

3. The Contractor will install silt fencing, as noted on the Erosion Control Plans, at applicable staging and stockpile areas.

4. The proposed stream alignment and structure locations will be staked for each reach (see note 2 above). Staking will be restricted to riffle elevations only in order to establish and maintain grade for the entire system. Pools will be excavated once structures are installed.

5. The Contractor will begin stockpiling materials in a designated staging area(s). General details associated with all sections include:

   a. Sediment bags will be used to filter the groundwater and placed within areas of newly excavated channel that are offline from the existing flow. These bags will be utilized as the contractor or designer deem necessary.
   b. Temporary and permanent seed mixes, including applicable mulching, will be applied to the streambanks and disturbed areas at the end of each working day as definable sections are completed. Erosion control matting will be installed on top of the seed and straw in accordance with the Erosion Control Construction Sequence.
   c. Excavated material that is stockpiled will follow erosion and sediment control guidelines as they relate to material storage and stockpiling.
   d. All remaining disturbed areas are to be seeded and covered according to the Erosion Control Construction Sequence.
   e. Riprap aprons will be constructed to impede any erosion of the channel and streambanks by the water diverted from the pump-around procedure.

6. Boulders and materials used for stream structures will be delivered through the primary construction entrance and stockpiled in the appropriate area.

7. This project will require pumping water around the channels during construction. Work will generally proceed from upstream to downstream.

8. Adjust haul roads and associated silt fence as necessary when permanent stream crossings are installed.

1. The Contractor will excavate the proposed channel and modify portions of the existing channel based on riffle elevations in sections no greater than 300' in length at a time (except where longer sections are necessary to maintain constructability) in an upstream to downstream fashion. Impervious dikes will be installed upstream and downstream of the current work section before work on the section is initiated unless noted otherwise (see Table 1.-Working Sections below for suggested work section stations and progression). Water will be diverted around the current work section through the use of a pump and temporary flexible hose. The current work section will be dewatered using an additional pump and a sediment bag. Work sections that involve the construction of a confluence of two reaches may require the use of two pump-around operations. Structures will be installed according to the details presented in the Construction Plans. Excavate only a portion of the channel that can be completed and stabilized within the same day. All excavated material will be placed in an appropriate stockpile area. Pools will be established once structures and channel alignments have been completed locally. Permanent stream crossings will be installed while the working section containing the crossing has been dewatered.

   Grading of some portions of the proposed floodplain may need to be delayed until after work in subsequent sections has been completed, especially near confluences. Haul roads and temporary silt fence may also need to be removed before the proposed floodplain can be completed and/or unused existing channel can be filled.

Table 1. - Working Sections

Order of Progress	Pump Station #	Reach	Begin Station	End Station	Construction Notes
1	P-1	**UT 1**	0+90	4+00	
2	P-2	**UT 1**	4+00	7+00	
3	P-3	**UT 1**	7+00	10+00	
4	P-4	**UT 1**	10+00	10+98	Ford Crossing
5	P-5	**UT 1**	10+98	12+00	
6	P-6	**UT 1**	20+01	21+13	Ford Crossing
7	P-7	**UT 1**	21+13	24+01	
8	P-8	**UT 1**	24+01	25+00	
9	P-9	**UT 6**	1+57	4+50	
10	P-10	**UT 6**	4+50	7+50	
11	P-11	**UT 6**	7+50	10+27	
12	P-12	**UT 6**	10+27	11+00	Ford Crossing
13	P-13	**UT 6**	11+00	12+50	
		UT 5	0+00	1+50	Confluence with -UT 5-
14	P-14	**UT 5**	1+55	4+00	
15	P-15	**UT 5**	4+00	5+49	Ford Crossing
16	P-16	**UT 5**	5+49	8+50	
17	P-17	**UT 5**	8+50	11+50	
18	P-18	**UT 5**	11+50	12+48	

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DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL NOTES

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH-E-02
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–02

1/9/2024
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Joe Dalton

Table 1. - Working Sections					
Order of Progress	Pump Station #	Reach	Begin Station	End Station	Construction Notes
19	P-19	**UT 9**	0+00	3+00	
20	P-20	**UT 9**	3+00	5+88	
21	P-21	**UT 9**	5+88	7+80	
22	P-22	**UT 9**	7+80	8+13	Confluence with -UT 5
		UT 5	12+48	14+00	Pipe Crossing Driveway
23	P-23	**UT 5**	14+00	16+91	
24	P-24	**UT 5**	16+91	20+00	
25	P-25	**UT 5**	20+00	23+00	
26	P-26	**UT 5**	23+00	25+41	
27	P-27	**UT 5**	25+41	26+50	Ford Crossing
28	P-28	**UT 5**	26+50	29+50	
29	P-29	**UT 5**	29+50	32+50	
30	P-30	**UT 5**	32+50	35+20	
31	P-31	**NPSQ**	0+00	3+00	
32	P-32	**NPSQ**	3+00	6+00	
33	P-33	**NPSQ**	6+00	8+00	
34	P-34	**NPSQ**	8+00	9+01	Ford Crossing
35	P-35	**NPSQ**	9+01	12+00	
36	P-36	**NPSQ**	12+00	13+97	
37	P-37	**UT 1**	52+50	53+20	
38	P-38	**UT 1**	53+20	57+20	
39	P-39	**UT 1**	57+20	60+00	
40	P-40	**UT 1**	60+00	60+55	
		NPSQ	13+97	16+15	Confluence with -NPSQ-
41	P-41	**NPSQ**	16+15	18+77	
42	P-42	**NPSQ**	18+77	21+00	
43	P-43	**UT 12**	0+00	3+00	
44	P-44	**UT 12**	3+00	6+00	
45	P-45	**UT 12**	6+00	7+36	Confluence with -NPSQ-
46	P-46	**UT 15**	0+00	3+00	
47	P-47	**UT 15**	3+00	6+00	
48	P-48	**UT 15**	6+00	8+00	
49	P-49	**UT 16**	0+00	2+97	
50	P-50	**UT 16**	2+97	6+00	
51	P-51	**UT 16**	6+00	8+00	
52	P-52	**UT 16**	8+00	8+50	
		UT 15	8+00	9+00	Confluence with -UT 15-
53	P-53	**UT 15**	9+00	10+00	Pipe Crossing
54	P-54	**UT 15**	10+00	14+00	
55	P-55	**UT 17**	0+00	3+00	
56	P-56	**UT 18**	0+00	3+00	
57	P-57	**UT 18**	3+00	3+75	
		UT 17	3+00	4+25	Confluence with -UT 17-
58	P-58	**UT 17**	4+25	5+00	
59	P-59	**UT 19**	1+85	3+50	
60	P-60	**UT 19**	3+50	4+22	
		NPSQ	57+11	59+01	Confluence with -NPSQ-
61	P-63	**NPSQ**	60+70	61+25	Ford Crossing
62	P-63	**UT-20**	0+00	3+01	
63	P-63	**UT-20**	3.01	5+97	
64	P-64	**UT-20**	5+97	6+70	

CONSTRUCTION SEQUENCE (CONTINUED)

1. Ponds shall be dewatered prior to dam removal using the following methods:

    a. For ponds with an outlet structure, open the outlet structure to dewater the pond at a rate that does not cause excessive erosion downstream of the dam.

    b. For ponds without an outlet structure or that require supplemental drawdown, use a pump and temporary flexible hose to dewater the pond into the downstream channel. A rip rap dissipation pad shall be used at the outlet of the temporary flexible hose. Dewater at a rate that does not cause excessive erosion downstream of the discharge point.

2. At the end of each working day, the Contractor will be responsible for the application of seed and straw, as applicable, to newly established streambanks and disturbed areas. Erosion control matting will be installed on top of the seed and straw in accordance with the Erosion Control Construction Sequence.

Post-Construction
After all channel work has been completed:

1. All remaining disturbed areas are to be seeded and mulched in accordance with the Erosion Control Construction Sequence.

2. Live staking can begin on all completed sections of channel (NPSQ and UT1 thru UT20) in accordance with the Planting Plans.

3. Once channel construction and seeding has been complete, bare-rooted seedlings will be installed.

4. All haul road locations to be restored to pre-construction conditions.

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DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL NOTES

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH-E-02A
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–02A

1/9/2024
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Jon Hall

SEEDING SCHEDULE

TEMPORARY HERBACEOUS SEED

Common Name	Scientific Name	Application Rate	Application Dates
Grain Rye [A]	*Secale cereale*	120 lbs. per acre (2.75 lbs. per 1,000 ft^2)	August - December
Brown Top Millet [B]	*Panicum ramosum*	40 lbs. per acre (1.0 lbs. per 1,000 ft^2)	May – September
German Millet [B]	*Setaria italica*	40 lbs. per acre (0.92 lbs. per 1,000 ft^2)	April - August

Mulch

Small grain mulch must be applied at a rate of 2 tons/acre to all seeded areas.

NORTH CAROLINA PROFESSIONAL SEAL 38 ENGINEER JOSHUA G. DALTON

PRELIMINARY DESIGN NOT FOR CONSTRUCTION

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL NOTES

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REVIEWED BY: JGD
REVISIONS:

SHEET NO. E–02B

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jharvey

GROUND STABILIZATION AND MATERIALS HANDLING PRACTICES FOR COMPLIANCE WITH THE NCG01 CONSTRUCTION GENERAL PERMIT

Implementing the details and specifications on this plan sheet will result in the construction activity being considered compliant with the Ground Stabilization and Materials Handling sections of the NCG01 Construction General Permit (Sections E and F, respectively). The permittee shall comply with the Erosion and Sediment Control plan approved by the delegated authority having jurisdiction. All details and specifications shown on this sheet may not apply depending on site conditions and the delegated authority having jurisdiction.

SECTION E: GROUND STABILIZATION

Required Ground Stabilization Timeframes

Site Area Description	Stabilize within this many calendar days after ceasing land disturbance	Timeframe variations
(a) Perimeter dikes, swales, ditches, and perimeter slopes	7	None
(b) High Quality Water (HQW) Zones	7	None
(c) Slopes steeper than 3:1	7	If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed
(d) Slopes 3:1 to 4:1	14	-7 days for slopes greater than 50' in length and with slopes steeper than 4:1 -7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed
(e) Areas with slopes flatter than 4:1	14	-7 days for perimeter dikes, swales, ditches, perimeter slopes and HQW Zones -10 days for Falls Lake Watershed unless there is zero slope

Note: After the permanent cessation of construction activities, any areas with temporary ground stabilization shall be converted to permanent ground stabilization as soon as practicable but in no case longer than 90 calendar days after the last land disturbing activity. Temporary ground stabilization shall be maintained in a manner to render the surface stable against accelerated erosion until permanent ground stabilization is achieved.

GROUND STABILIZATION SPECIFICATION

Stabilize the ground sufficiently so that rain will not dislodge the soil. Use one of the techniques in the table below:

Temporary Stabilization	Permanent Stabilization
• Temporary grass seed covered with straw or other mulches and tackifiers • Hydroseeding • Rolled erosion control products with or without temporary grass seed • Appropriately applied straw or other mulch • Plastic sheeting	• Permanent grass seed covered with straw or other mulches and tackifiers • Geotextile fabrics such as permanent soil reinforcement matting • Hydroseeding • Shrubs or other permanent plantings covered with mulch • Uniform and evenly distributed ground cover sufficient to restrain erosion • Structural methods such as concrete, asphalt or retaining walls • Rolled erosion control products with grass seed

POLYACRYLAMIDES (PAMS) AND FLOCCULANTS

1. Select flocculants that are appropriate for the soils being exposed during construction, selecting from the *NC DWR List of Approved PAMS/Flocculants*.
2. Apply flocculants at or before the inlets to Erosion and Sediment Control Measures.
3. Apply flocculants at the concentrations specified in the *NC DWR List of Approved PAMS/Flocculants* and in accordance with the manufacturer's instructions.
4. Provide ponding area for containment of treated Stormwater before discharging offsite.
5. Store flocculants in leak-proof containers that are kept under storm-resistant cover or surrounded by secondary containment structures.

EQUIPMENT AND VEHICLE MAINTENANCE

1. Maintain vehicles and equipment to prevent discharge of fluids.
2. Provide drip pans under any stored equipment.
3. Identify leaks and repair as soon as feasible, or remove leaking equipment from the project.
4. Collect all spent fluids, store in separate containers and properly dispose as hazardous waste (recycle when possible).
5. Remove leaking vehicles and construction equipment from service until the problem has been corrected.
6. Bring used fuels, lubricants, coolants, hydraulic fluids and other petroleum products to a recycling or disposal center that handles these materials.

LITTER, BUILDING MATERIAL AND LAND CLEARING WASTE

1. Never bury or burn waste. Place litter and debris in approved waste containers.
2. Provide a sufficient number and size of waste containers (e.g dumpster, trash receptacle) on site to contain construction and domestic wastes.
3. Locate waste containers at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
4. Locate waste containers on areas that do not receive substantial amounts of runoff from upland areas and does not drain directly to a storm drain, stream or wetland.
5. Cover waste containers at the end of each workday and before storm events or provide secondary containment. Repair or replace damaged waste containers.
6. Anchor all lightweight items in waste containers during times of high winds.
7. Empty waste containers as needed to prevent overflow. Clean up immediately if containers overflow.
8. Dispose waste off-site at an approved disposal facility.
9. On business days, clean up and dispose of waste in designated waste containers.

PAINT AND OTHER LIQUID WASTE

1. Do not dump paint and other liquid waste into storm drains, streams or wetlands.
2. Locate paint washouts at least 50 feet away from storm drain inlets and surface waters unless no other alternatives are reasonably available.
3. Contain liquid wastes in a controlled area.
4. Containment must be labeled, sized and placed appropriately for the needs of site.
5. Prevent the discharge of soaps, solvents, detergents and other liquid wastes from construction sites.

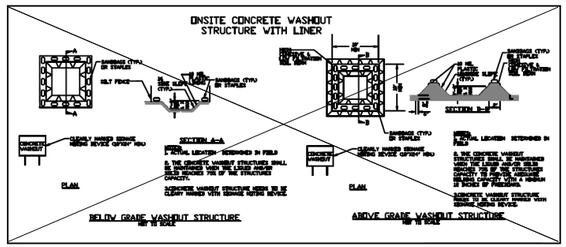
PORTABLE TOILETS

1. Install portable toilets on level ground, at least 50 feet away from storm drains, streams or wetlands unless there is no alternative reasonably available. If 50 foot offset is not attainable, provide relocation of portable toilet behind silt fence or place on a gravel pad and surround with sand bags.
2. Provide staking or anchoring of portable toilets during periods of high winds or in high foot traffic areas.
3. Monitor portable toilets for leaking and properly dispose of any leaked material. Utilize a licensed sanitary waste hauler to remove leaking portable toilets and replace with properly operating unit.

EARTHEN STOCKPILE MANAGEMENT

1. Show stockpile locations on plans. Locate earthen-material stockpile areas at least 50 feet away from storm drain inlets, sediment basins, perimeter sediment controls and surface waters unless it can be shown no other alternatives are reasonably available.
2. Protect stockpile with silt fence installed along toe of slope with a minimum offset of five feet from the toe of stockpile.
3. Provide stable stone access point when feasible.
4. Stabilize stockpile within the timeframes provided on this sheet and in accordance with the approved plan and any additional requirements. Soil stabilization is defined as vegetative, physical or chemical coverage techniques that will restrain accelerated erosion on disturbed soils for temporary or permanent control needs.

NORTH CAROLINA *Environmental Quality*



CONCRETE WASHOUTS

1. Do not discharge concrete or cement slurry from the site.
2. Dispose of, or recycle settled, hardened concrete residue in accordance with local and state solid waste regulations and at an approved facility.
3. Manage washout from mortar mixers in accordance with the above item and in addition place the mixer and associated materials on impervious barrier and within lot perimeter silt fence.
4. Install temporary concrete washouts per local requirements, where applicable. If an alternate method or product is to be used, contact your approval authority for review and approval. If local standard details are not available, use one of the two types of temporary concrete washouts provided on this detail.
5. Do not use concrete washouts for dewatering or storing defective curb or sidewalk sections. Stormwater accumulated within the washout may not be pumped into or discharged to the storm drain system or receiving surface waters. Liquid waste must be pumped out and removed from project.
6. Locate washouts at least 50 feet from storm drain inlets and surface waters unless it can be shown that no other alternatives are reasonably available. At a minimum, install protection of storm drain inlet(s) closest to the washout which could receive spills or overflow.
7. Locate washouts in an easily accessible area, on level ground and install a stone entrance pad in front of the washout. Additional controls may be required by the approving authority.
8. Install at least one sign directing concrete trucks to the washout within the project limits. Post signage on the washout itself to identify this location.
9. Remove leavings from the washout when at approximately 75% capacity to limit overflow events. Replace the tarp, sand bags or other temporary structural components when no longer functional. When utilizing alternative or proprietary products, follow manufacturer's instructions.
10. At the completion of the concrete work, remove remaining leavings and dispose of in an approved disposal facility. Fill pit, if applicable, and stabilize any disturbance caused by removal of washout.

HERBICIDES, PESTICIDES AND RODENTICIDES

1. Store and apply herbicides, pesticides and rodenticides in accordance with label restrictions.
2. Store herbicides, pesticides and rodenticides in their original containers with the label, which lists directions for use, ingredients and first aid steps in case of accidental poisoning.
3. Do not store herbicides, pesticides and rodenticides in areas where flooding is possible or where they may spill or leak into wells, stormwater drains, ground water or surface water. If a spill occurs, clean area immediately.
4. Do not stockpile these materials onsite.

HAZARDOUS AND TOXIC WASTE

1. Create designated hazardous waste collection areas on-site.
2. Place hazardous waste containers under cover or in secondary containment.
3. Do not store hazardous chemicals, drums or bagged materials directly on the ground.

NCG01 GROUND STABILIZATION AND MATERIALS HANDLING

EFFECTIVE: 04/01/19

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 038777 JOSEPH C. DALTON — PRELIMINARY PLANS — NOT FOR CONSTRUCTION

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL NOTES

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Jon Hall

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION A: SELF-INSPECTION

Self-inspections are required during normal business hours in accordance with the table below. When adverse weather or site conditions would cause the safety of the inspection personnel to be in jeopardy, the inspection may be delayed until the next business day on which it is safe to perform the inspection. In addition, when a storm event of equal to or greater than 1.0 inch occurs outside of normal business hours, the self-inspection shall be performed upon the commencement of the next business day. Any time when inspections were delayed shall be noted in the Inspection Record.

Inspect	Frequency (during normal business hours)	Inspection records must include:
(1) Rain gauge maintained in good working order	Daily	Daily rainfall amounts. If no daily rain gauge observations are made during weekend or holiday periods, and no individual day rainfall information is available, record the cumulative rain measurement for those un-attended days (anc this will determine if a site inspection is needed). Days on which no rainfall occurred shall be recorded as "zero." The permittee may use another rain-monitoring device approved by the Division.
(2) E&SC Measures	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the measures inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Indication of whether the measures were operating properly, 5. Description of maintenance needs for the measure, 6. Description, evidence, and date of corrective actions taken.
(3) Stormwater discharge outfalls (SDCs)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	1. Identification of the discharge outfalls inspected, 2. Date and time of the inspection, 3. Name of the person performing the inspection, 4. Evidence of indicators of stormwater pollution such as oil sheen, floating or suspended solids or discoloration, 5. Indication of visible sediment leaving the site, 6. Description, evidence, and date of corrective actions taken.
(4) Perimeter of site	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If visible sedimentation is found outside site limits, then a record of the following shall be made: 1. Actions taken to clean up or stabilize the sediment that has left the site limits, 2. Description, evidence, and date of corrective actions taken, and 3. An explanation as to the actions taken to control future releases
(5) Streams or wetlands onsite or offsite (where accessible)	At least once per 7 calendar days and within 24 hours of a rain event ≥ 1.0 inch in 24 hours	If the stream or wetland has increased visible sedimentation or a stream has visible increased turbidity from the construction activity, then a record of the following shall be made: 1. Description, evidence and date of corrective actions taken, and 2. Records of the required reports to the appropriate Division Regional Office per Part III, Section C, Item (2)(a) of this permit.
(6) Ground stabilization measures	After each phase of grading	1. The phase of grading (installation of perimeter E&SC measures, clearing and grubbing, installation of storm drainage facilities, completion of all land-disturbing activity, construction or redevelopment, permanent ground cover). 2. Documentation that the required ground stabilization measures have been provided within the required timeframe or an assurance that they will be provided as soon as possible.

NOTE: The rain inspection resets the required 7 calendar day inspection requirement.

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION B: RECORDKEEPING

1. E&SC Plan Documentation

The approved E&SC plan as well as any approved deviation shall be kept on the site. The approved E&SC plan must be kept up-to-date throughout the coverage under this permit. The following items pertaining to the E&SC plan shall be kept on site and available for inspection at all times during normal business hours.

Item to Document	Documentation Requirements
(a) Each E&SC measure has been installed and does not significantly deviate from the locations, dimensions and relative elevations shown on the approved E&SC plan.	Initial and date each E&SC measure on a copy of the approved E&SC plan or complete, date and sign an inspection report that lists each E&SC measure shown on the approved E&SC plan. This documentation is required upon the initial installation of the E&SC measures or if the E&SC measures are modified after initial installation.
(b) A phase of grading has been completed.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate completion of the construction phase.
(c) Ground cover is located and installed in accordance with the approved E&SC plan.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate compliance with approved ground cover specifications.
(d) The maintenance and repair requirements for all E&SC measures have been performed.	Complete, date and sign an inspection report.
(e) Corrective actions have been taken to E&SC measures.	Initial and date a copy of the approved E&SC plan or complete, date and sign an inspection report to indicate the completion of the corrective action.

2. Additional Documentation to be Kept on Site

In addition to the E&SC plan documents above, the following items shall be kept on the site and available for inspectors at all times during normal business hours, unless the Division provides a site-specific exemption based on unique site conditions that make this requirement not practical:

(a) This General Permit as well as the Certificate of Coverage, after it is received.

(b) Records of inspections made during the previous twelve months. The permittee shall record the required observations on the Inspection Record Form provided by the Division or a similar inspection form that includes all the required elements. Use of electronically-available records in lieu of the required paper copies will be allowed if shown to provide equal access and utility as the hard-copy records.

3. Documentation to be Retained for Three Years

All data used to complete the e-NOI and all inspection records shall be maintained for a period of three years after project completion and made available upon request. [40 CFR 122.41]

PART III
SELF-INSPECTION, RECORDKEEPING AND REPORTING

SECTION C: REPORTING

1. Occurrences that Must be Reported

Permittees shall report the following occurrences:

(a) Visible sediment deposition in a stream or wetland.

(b) Oil spills if:
- They are 25 gallons or more,
- They are less than 25 gallons but cannot be cleaned up within 24 hours,
- They cause sheen on surface waters (regardless of volume), or
- They are within 100 feet of surface waters (regardless of volume).

(c) Releases of hazardous substances in excess of reportable quantities under Section 311 of the Clean Water Act (Ref: 40 CFR 110.3 and 40 CFR 117.3) or Section 102 of CERCLA (Ref: 40 CFR 302.4) or G.S. 143-215.85.

(d) Anticipated bypasses and unanticipated bypasses.

(e) Noncompliance with the conditions of this permit that may endanger health or the environment.

2. Reporting Timeframes and Other Requirements

After a permittee becomes aware of an occurrence that must be reported, he shall contact the appropriate Division regional office within the timeframes and in accordance with the other requirements listed below. Occurrences outside normal business hours may also be reported to the Department's Environmental Emergency Center personnel at (800) 858-0368.

Occurrence	Reporting Timeframes (After Discovery) and Other Requirements
(a) Visible sediment deposition in a stream or wetland	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the sediment and actions taken to address the cause of the deposition. Division staff may waive the requirement for a written report on a case-by-case basis. • If the stream is named on the NC 303(d) list as impaired for sediment-related causes, the permittee may be required to perform additional monitoring, inspections or apply more stringent practices if staff determine that additional requirements are needed to assure compliance with the federal or state impaired-waters conditions.
(b) Oil spills and release of hazardous substances per Item 1(b)-(c) above	• ***Within 24 hours***, an oral or electronic notification. The notification shall include information about the date, time, nature, volume and location of the spill or release.
(c) Anticipated bypasses [40 CFR 122.41(m)(3)]	• ***A report at least ten days before the date of the bypass, if possible***. The report shall include an evaluation of the anticipated quality and effect of the bypass.
(d) Unanticipated bypasses [40 CFR 122.41(m)(3)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that includes an evaluation of the quality and effect of the bypass.
(e) Noncompliance with the conditions of this permit that may endanger health or the environment[40 CFR 122.41(l)(7)]	• ***Within 24 hours***, an oral or electronic notification. • ***Within 7 calendar days***, a report that contains a description of the noncompliance, and its causes; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time noncompliance is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. [40 CFR 122.41(l)(6). • Division staff may waive the requirement for a written report on a case-by-case basis.

PART II, SECTION G, ITEM (4)
DRAW DOWN OF SEDIMENT BASINS FOR MAINTENANCE OR CLOSE OUT

Sediment basins and traps that receive runoff from drainage areas of one acre or more shall use outlet structures that withdraw water from the surface when these devices need to be drawn down for maintenance or close out unless this is infeasible. The circumstances in which it is not feasible to withdraw water from the surface shall be rare (for example, times with extended cold weather). Non-surface withdrawals from sediment basins shall be allowed only when all of the following criteria have been met:

(a) The E&SC plan authority has been provided with documentation of the non-surface withdrawal and the specific time periods or conditions in which it will occur. The non-surface withdrawal shall not commence until the E&SC plan authority has approved these items,
(b) The non-surface withdrawal has been reported as an anticipated bypass in accordance with Part III, Section C, Item (2)(c) and (d) of this permit,
(c) Dewatering discharges are treated with controls to minimize discharges of pollutants from stormwater that is removed from the sediment basin. Examples of appropriate controls include properly sited, designed and maintained dewatering tanks, weir tanks, and filtration systems,
(d) Vegetated, upland areas of the sites or a properly designed stone pad is used to the extent feasible at the outlet of the dewatering treatment devices described in Item (c) above,
(e) Velocity dissipation devices such as check dams, sediment traps, and riprap are provided at the discharge points of all dewatering devices, and
(f) Sediment removed from the dewatering treatment devices described in Item (c) above is disposed of in a manner that does not cause deposition of sediment into waters of the United States.

NORTH CAROLINA Environmental Quality

NCG01 SELF-INSPECTION, RECORDKEEPING AND REPORTING | EFFECTIVE: 04/01/19

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 032487 DESIGN J. GRANT DALTON CONSTRUCTION

RELEASED FOR INTERIM REVIEW PURPOSES ONLY NOT FOR CONSTRUCTION

DATE:

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SUNGATE DESIGN GROUP, P.A.
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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL NOTES

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH-E-02E
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–02E

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1/9/2024
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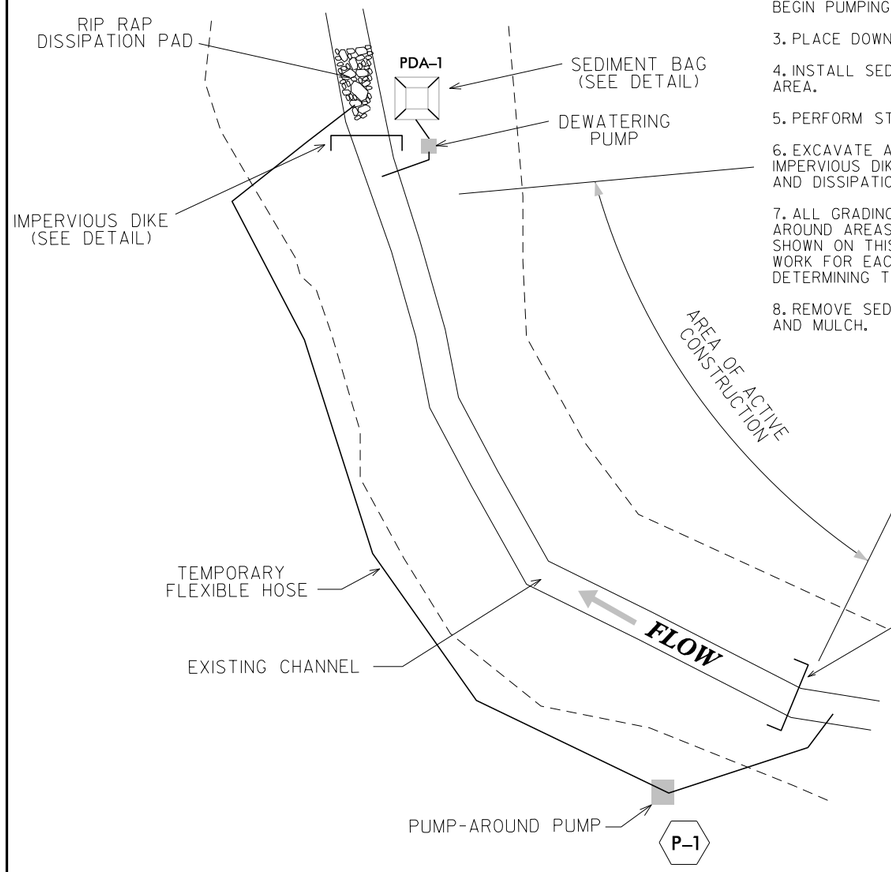
Harvey



CONSTRUCTION SEQUENCE FOR TYPICAL PUMP-AROUND:

1. INSTALL UPSTREAM PUMP AND TEMPORARY FLEXIBLE HOSE.

2. PLACE UPSTREAM IMPERVIOUS DIKE, DOWNSTREAM RIP RAP DISSIPATION PAD, AND BEGIN PUMPING OPERATIONS FOR STREAM DIVERSION.

3. PLACE DOWNSTREAM IMPERVIOUS DIKE.

4. INSTALL SEDIMENT BAG AND ASSOCIATED PUMP. DEWATER THE ENTRAPPED AREA.

5. PERFORM STREAM RESTORATION WORK IN ACCORDANCE WITH THE PLANS.

6. EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES. REMOVE IMPERVIOUS DIKES, PUMPS, TEMPORARY FLEXIBLE HOSE, AND DISSIPATION PAD (BEGIN WITH DOWNSTREAM IMPERVIOUS DIKE FIRST).

7. ALL GRADING AND STABILIZATION MUST BE COMPLETED WITHIN THE PUMP AROUND AREAS BETWEEN THE IMPERVIOUS DIKES. THE IMPERVIOUS LOCATIONS AS SHOWN ON THIS SHEET ONLY REPRESENT THE UPPER AND LOWER EXTENT OF WORK FOR EACH STREAM SEGMENT. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE LOCATION OF THE IMPERVIOUS DIKES.

8. REMOVE SEDIMENT BAG(S) AND BACKFILL. STABILIZE DISTURBED AREA WITH SEED AND MULCH.

NOTES:

1. ALL EXCAVATION SHALL BE PERFORMED IN ONLY DRY OR ISOLATED SECTIONS OF CHANNEL

2. IMPERVIOUS DIKES ARE TO BE USED TO ISOLATE WORK FROM STREAM FLOW WHEN NECESSARY

3. ALL GRADED STREAM BANKS SHALL BE SEEDED, MULCHED, AND MATTED AT THE END OF EACH WORKING DAY. ALL OTHER GRADED AREAS SHALL BE SEEDED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

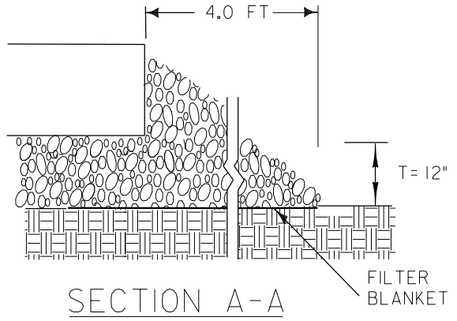
4. MAINTENANCE OF STREAM FLOW OPERATIONS SHALL BE INCIDENTAL TO THE WORK, THIS INCLUDES POLYETHYLENE SHEETING, DIVERSION PIPES, PUMPS, AND HOSES.

5. PUMPS AND HOSES SHALL BE OF A SUFFICIENT SIZE AND NUMBER TO DEWATER THE WORK AREA.

6. RIP RAP DISSIPATION PAD TO BE INSTALLED DOWNSTREAM OF LOWER IMPERVIOUS DIKE

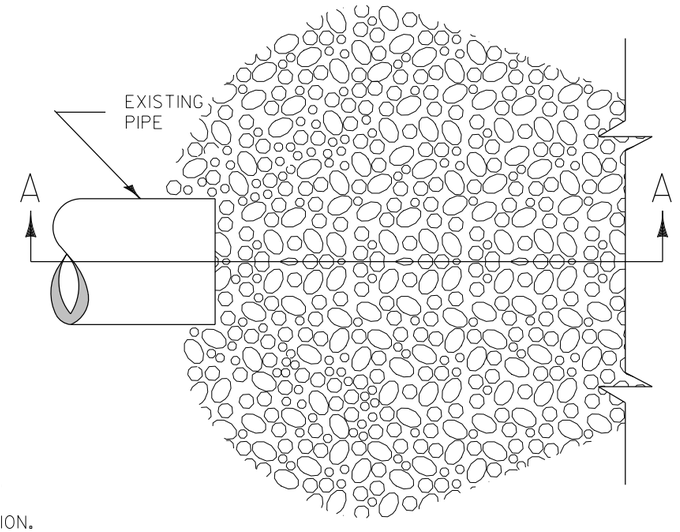
TYPICAL PUMP-AROUND OPERATION

RIPRAP DISSIPATION PAD



SECTION A-A

PLAN VIEW

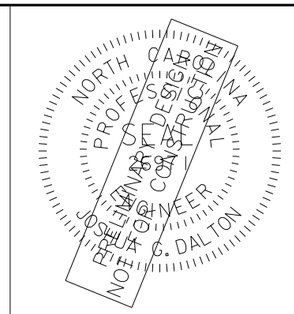


NOTES:

1. La IS THE LENGTH OF THE RIPRAP APRON.
2. T = THICKNESS
3. IN A WELL-DEFINED CHANNEL EXTEND THE APRON UP THE CHANNEL BANKS TO THE TOP OF THE BANK.
4. A FILTER BLANKET OR FILTER FABRIC SHOULD BE INSTALLED BETWEEN THE RIPRAP AND SOIL FOUNDATION.

RIP RAP DISIPATION PAD SPECIFICATIONS

ASSUMED HOSE SIZE (IN)	PERMANENT (Y/N)	LENGTH La (FT)	WIDTH Wo (FT)	STONE SIZE d50 (IN)	STONE CLASS	THICKNESS (IN)
4"	N	4.0	1.0	3	A	12



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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL DETAILS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-03
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. ***E-03***

1/9/2024
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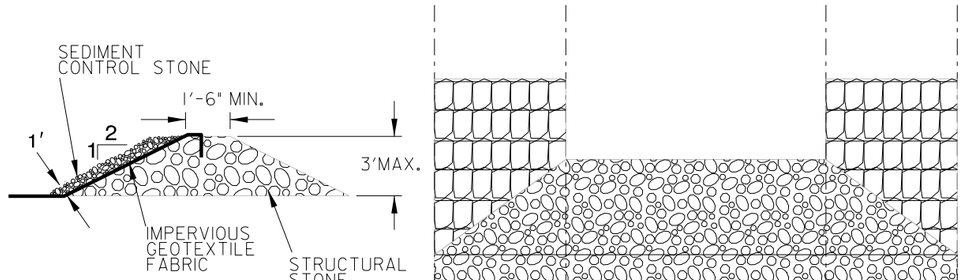
jharvey

IMPERVIOUS DIKE



CROSS SECTION VIEW

NOTES:

1. USE CLASS B STONE FOR STRUCTURAL STONE.

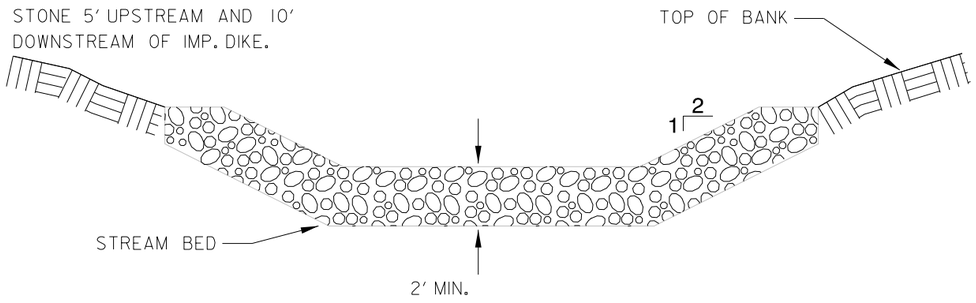
2. USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL.

3. CONSTRUCT DAM A MAXIMUM OF 1 FT. ABOVE NORMAL FLOW DEPTH.

4. TOE IN IMPERVIOUS MATERIAL

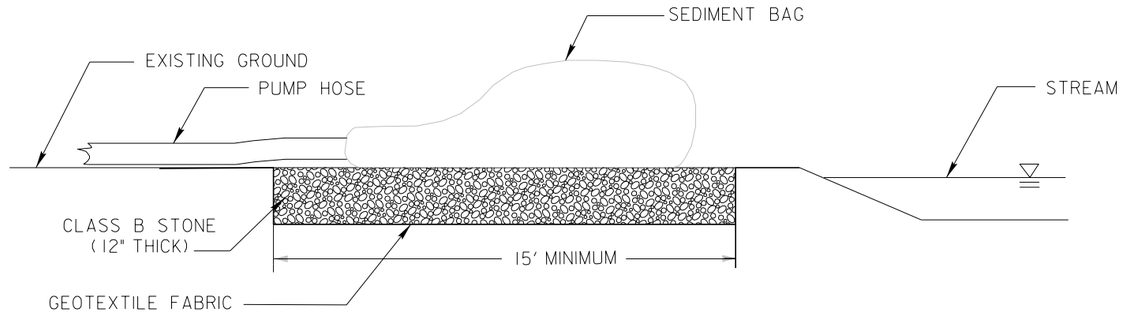
5. LINE BANKS WITH CLASS B STONE 5' UPSTREAM AND 10' DOWNSTREAM OF IMP. DIKE.

TOP VIEW



FRONT VIEW

SEDIMENT BAG



INSTALLATION:

1. INSTALL SEDIMENT BAG ON A SLOPE SO INCOMING WATER FLOWS DOWNHILL THROUGH BAG WITHOUT CREATING MORE EROSION. TO INCREASE THE EFFICIENCY OF FILTRATION, PLACE THE BAG ON A GRAVEL BED IN ORDER TO MAXIMIZE WATER FLOW THROUGH THE SURFACE AREA OF THE BAG.

2. BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE. FLOW RATES WILL VARY DEPENDING ON THE SIZE OF SEDIMENT BAG, THE TYPE AND AMOUNT OF SEDIMENT DISCHARGED INTO THE BAG, THE TYPE OF GROUND, ROCK OR OTHER SUBSTANCE UNDER THE BAG AND THE DEGREE OF THE SLOPE ON WHICH THE BAG LIES. UNDER MOST CIRCUMSTANCES THE SEDIMENT BAG WILL ACCOMMODATE FLOW RATES OF 1100 GALLONS PER MINUTE. USE OF EXCESSIVE FLOW RATES OR OVERFILLING WITH SEDIMENT WILL CAUSE THE BAG TO RUPTURE OR FAILURE OF THE HOSE ATTACHMENT STRAPS.

3. DISPOSE OF SEDIMENT BAG AS DIRECTED BY THE SITE DESIGNER. IF ALLOWED, BAG MAY BE CUT OPEN AND THE CONTENTS SEEDED AFTER REMOVING VISIBLE FABRIC.

4. REFER TO DETAIL REGARDING GEOTEXTILE FABRIC ATTRIBUTES.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 036887 JOSEPH C. DALTON

DATE:

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GUILFORD COUNTY, NC

EROSION CONTROL DETAILS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-03A
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E-03A**

1/9/2024
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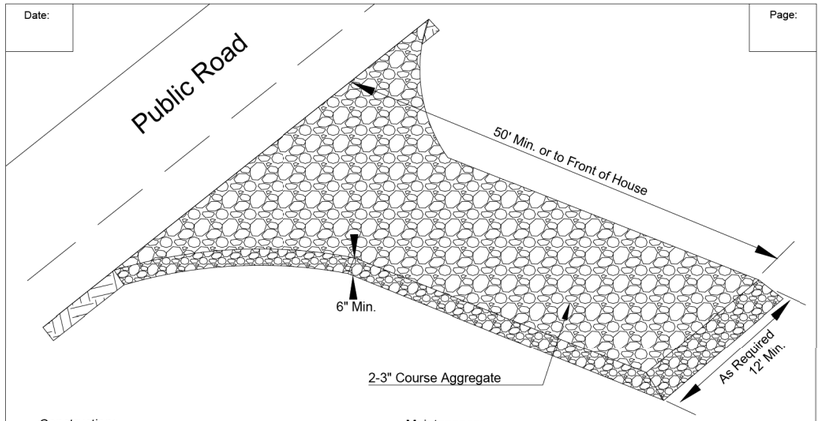
Date: Page:



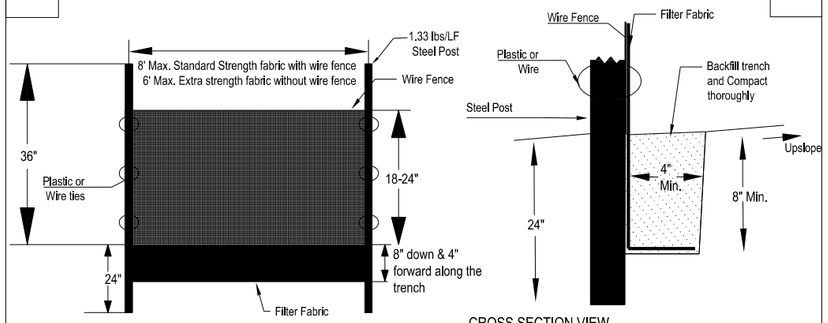
Construction:
1. Clear the entrance and exit area of all vegetation, roots, and other objectionable material and properly grade it.
2. Place the gravel to the specific grade and dimensions shown on the plans, and smooth it.
3. Provide drainage to carry water to a sediment trap or other suitable outlet.
4. Use geotextile fabrics in order to improve stability of the foundation in locations subject to seepage or high water table.

Maintenance:
1. Per NCG-01 inspect at least once a week and after each 1 inch or greater rainfall; make any required repairs immediately.
2. Maintain the gravel pad in a condition to prevent mud or sediment from leaving the construction site. This may require periodic topdressing with 2 inch stone.
3. Immediately remove all objectionable materials spilled, washed or tracked onto public roadways.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE:11/12/2020

CONSTRUCTION ENTRANCE / EXIT

DATE: PAGE:



CROSS SECTION VIEW
SCALE: N.T.S.

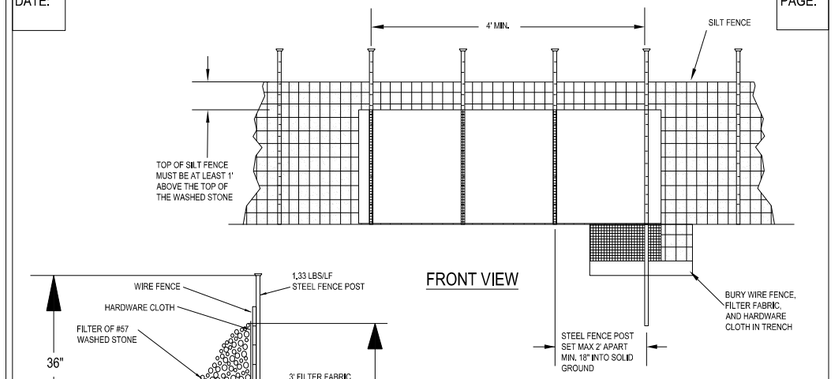
Construction:
1. Construct the sediment barrier of standard strength or extra strength synthetic filter fabrics.
2. Ensure that the height of the sediment fence does not exceed 24 inches above the ground. (Higher fences may impound volumes of water sufficient to cause failure of the structure)
3. Construct the filter fabric from a continuous roll cut to the length of the barrier to avoid joints. When joints are necessary, securely fasten the filter cloth only at a support post with 4 feet minimum overlap to the next post.
4. Support standard strength filter fabric by wire mesh fastened securely to the upslope side of the posts. Extend the wire mesh support to the bottom of the trench. Fasten the wire reinforcement, then fabric on the upslope side of the fence post. Wire or plastic zip ties should have a minimum 50 pound tensile strength.
5. When a wire mesh support fence is used, space posts a maximum of 8 feet apart. Supports should be driven securely into the ground a minimum of 24 inches.
6. Extra strength filter fabric with 6 foot post spacing does not require a wire mesh support fence. Securely fasten the filter fabric directly to posts. Wire or plastic zip ties should have a minimum of 50 pound tensile strength.
7. Excavate the trench approximately 4 inches wide and 8 inches deep along the proposed line of the posts and upslope from the barrier.
8. Place 12 inches of fabric along the bottom and side of the trench.
9. Backfill the trench with soil placed over the filter fabric and compact. Thorough compaction of the backfill is critical to silt fence performance.
10. Do not attach filter fabric to existing trees.

Maintenance:
1. Inspect sediment fences at least once a week and after each 1 inch or greater rainfall. Make any required repairs immediately.
2. Should the fabric of a sediment fence collapse, tear, decompose, or become ineffective, replace it promptly.
3. Remove sediment deposits as necessary to provide adequate storage volume for the next rain and reduce pressure on the fence. Take care to avoid undermining the fence during cleanouts.
4. Remove all fencing materials and unstable sediment deposits and bring the area to grade and stabilize it after the contributing drainage area has been properly stabilized.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

SILT FENCE

DATE: PAGE:



SECTION VIEW

NOTES:
1. Hardware cloth and gravel should overlay the silt fence at least 12 inches.
2. Stone outlets should be placed on low elevation areas of silt fence and based on field conditions.

MAINTENANCE:
1. Per NCG-01, inspect outlet at lest once a week and after each 1 inch or greater rainfall event. Complete any required repairs immediately.
2. Freshen stone when sediment accumulation exceeds 6 inches.
3. Keep mesh free of debris to provide adequate flow.
4. Remove sediment when half of stone outlet is covered.
5. Replace stone as needed to facilitate de-watering.

NORTH CAROLINA Environmental Quality
EFFECTIVE DATE: 11/12/2020

SILT FENCE OUTLET

NORTH CAROLINA PROFESSIONAL SOIL DESIGNER JOSEPH G. DALTON PRELIMINARY PLAT FOR CONSTRUCTION NOT FOR CONSTRUCTION

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL DETAILS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-03B
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E-03B

1/9/2024
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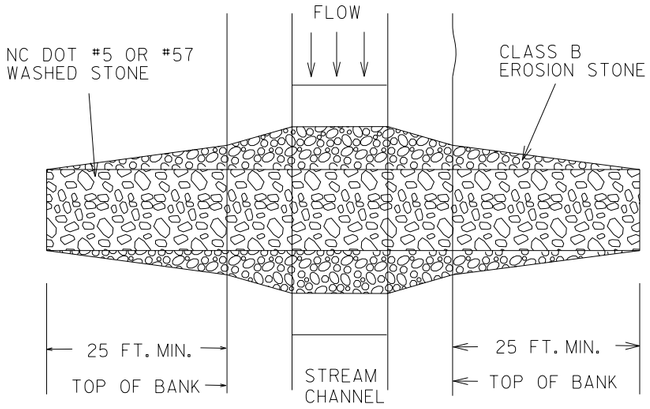
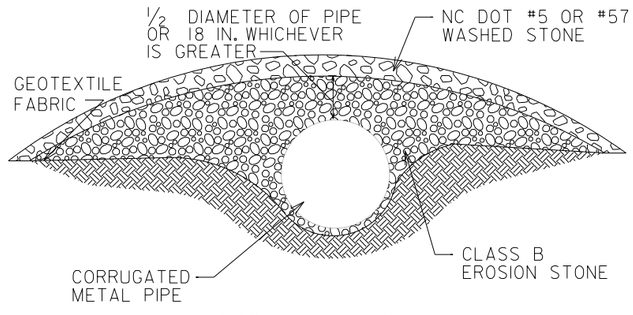
Harvey

TEMPORARY CULVERTED STREAM CROSSING

NOTE: FOR USE IN EXISTING CHANNELS ONLY.
NOT FOR USE IN RESTORED STREAMS.

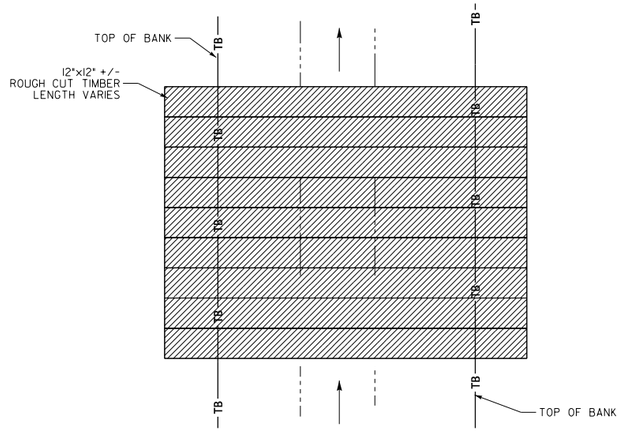


PLAN VIEW



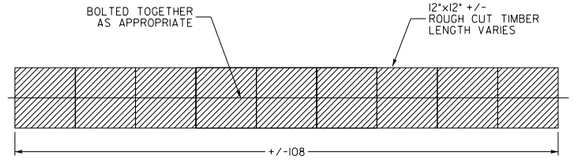
PROFILE VIEW

LOG MAT BRIDGE

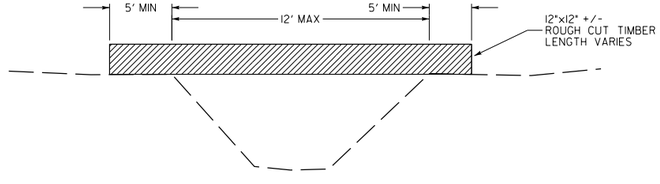


PLAN VIEW

NOTE:
DETAIL PROVIDED FOR INFORMATIONAL PURPOSES. USE OF LOG MAT BRIDGE IS AT CONTRACTORS DISCRETION.



SECTION THROUGH
LOG MAT BRIDGE



CROSS SECTION VIEW

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26681 JOSEPH G. DALTON

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL DETAILS

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH E-03C
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	***E-03C***

1/9/2024
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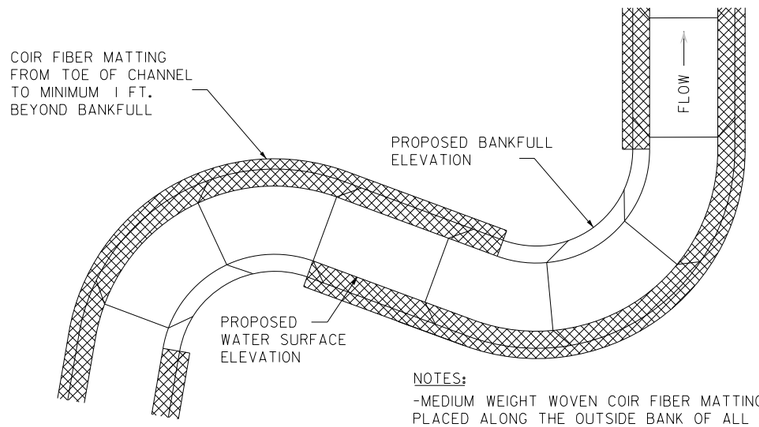
Jonathan

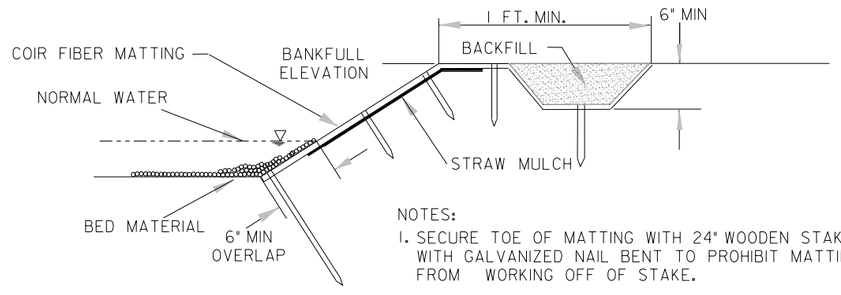
TYPICAL MATTING LOCATION



NOTES:

-MEDIUM WEIGHT WOVEN COIR FIBER MATTING SHALL BE PLACED ALONG THE OUTSIDE BANK OF ALL BENDS AND ALONG BOTH SIDES OFTHE CHANNEL IN TANGENT AREAS.
-FIELD ADJUSTMENTS TO MATTING LOCATION MAY BE MADE AT THE DESIGNERS OR CONTRACTORS DISCRETION AS NECESSARY.

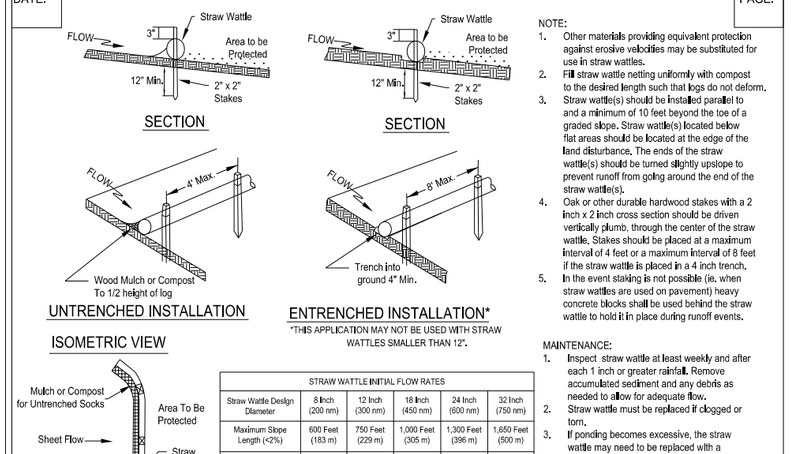
COIR MATTING CROSS SECTION



NOTES:

1. SECURE TOE OF MATTING WITH 24" WOODEN STAKES WITH GALVANIZED NAIL BENT TO PROHIBIT MATTING FROM WORKING OFF OF STAKE.
2. USE 12" WOODEN STAKES ON 5' CENTERS OR AS DIRECTED BY MANUFACTURER'S RECOMMENDATIONS.
3. MINIMUM 1' WIDE, 6" DEEP TRENCH OVER TOP OF BANK WITH MATTING LAID FLAT AND STAKED. TRENCH TO BE BACKFILLED WITH EXCAVATED MATERIAL.

DATE: PAGE:



*THIS APPLICATION MAY NOT BE USED WITH STRAW WATTLES SMALLER THAN 12".

STRAW WATTLE INITIAL FLOW RATES						
Straw Wattle Design Diameter	8 Inch (200 nm)	12 Inch (300 nm)	18 Inch (450 nm)	24 Inch (600 nm)	32 Inch (750 nm)
Maximum Slope Length (<2%)	600 Feet (183 m)	750 Feet (229 m)	1,000 Feet (305 m)	1,300 Feet (396 m)	1,650 Feet (500 m)
Hydraulic Flow Through Rate	7,5 gpm/ft (94 l/m/m)	11,3 gpm/ft (141 l/m/m)	15,0 gpm/ft (188 l/m/m)	22,5 gpm/ft (281 l/m/m)	30,0 gpm/ft (374 l/m/m)

NOTE:
1. Other materials providing equivalent protection against erosive velocities may be substituted for use in straw wattles.
2. Fill straw wattle netting uniformly with compost to the desired length such that logs do not deform.
3. Straw wattle(s) should be installed parallel to and a minimum of 10 feet beyond the toe of a graded slope. Straw wattle(s) located below flat areas should be located at the edge of the land disturbance. The ends of the straw wattle(s) should be turned slightly upslope to prevent runoff from going around the end of the straw wattle(s).
4. Oak or other durable hardwood stakes with a 2 inch x 2 inch cross section should be driven vertically plumb, through the center of the straw wattle. Stakes should be placed at a maximum interval of 4 feet or a maximum interval of 8 feet if the straw wattle is placed in a 4 inch trench.
5. In the event staking is not possible (ie. when straw wattles are used on pavement) heavy concrete blocks shall be used behind the straw wattle to hold it in place during runoff events.

MAINTENANCE:
1. Inspect straw wattle at least weekly and after each 1 inch or greater rainfall. Remove accumulated sediment and any debris as needed to allow for adequate flow.
2. Straw wattle must be replaced if clogged or torn.
3. If ponding becomes excessive, the straw wattle may need to be replaced with a larger diameter or a different measure.
4. Reinstall if damaged or dislodged.
5. Straw wattles shall be inspected until land disturbance is compete and the area above the measure has been permanently stabilized.

EFFECTIVE DATE: 11/12/2020

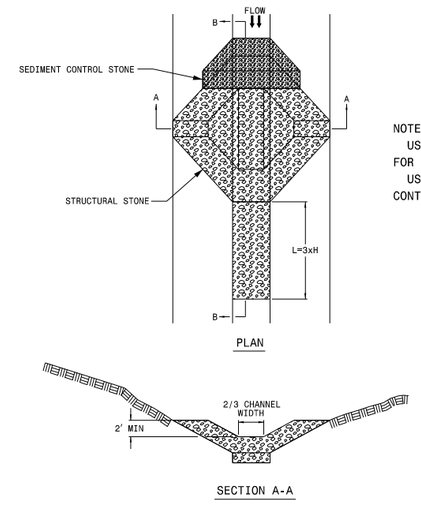
STRAW WATTLE FOR PERIMETER AND INLET PROTECTION

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE 'A'

SHEET 1 OF 1
1633.01



NOTE
USE CLASS 'B' EROSION CONTROL STONE FOR STRUCTURAL STONE.
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

TEMPORARY ROCK SILT CHECK TYPE 'A'

SHEET 1 OF 1
1633.01

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 048 JOSEPH G. DALTON
I, JOSEPH G. DALTON, A REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NORTH CAROLINA, HEREBY CERTIFY THAT I HAVE SUPERVISED THE DESIGN OF THE ATTACHED PLANS AND THAT THEY ARE NOT FOR CONSTRUCTION.

DATE:

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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION CONTROL DETAILS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-03D
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E-03D

1/9/2024
StnkQtr_PSH_E-03D.dgn
JRH/KBH

LOD — LIMITS OF DISTURBANCE

HAUL ROAD

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

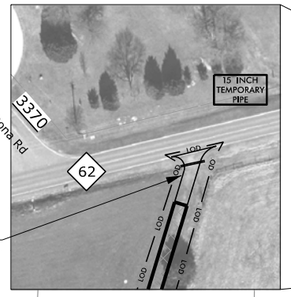
350' 175' 0 350' 700'
SCALE: 1" = 700'

NAD 83



GRAVEL CONSTRUCTION ENTRANCE

CONSTRUCTION ENTRANCE 1 (nts)



GRAVEL CONSTRUCTION ENTRANCE

CONSTRUCTION ENTRANCE 2 (nts)

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23681 JOSEPH C. DALTON NOT FOR CONSTRUCTION PRELIMINARY DESIGN

DATE:

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3093 Old Julian Rd

David Foster Dr

3370 Dona Rd

62

3351 Smithwood Rd

E-11 UT 2

E-12

E-13 UT 4

UT 1

E-14

E-15 UT 1

STAGING AREA

UT 6

UT 7

E-16

STAGING AREA

BORROW AREA

STAGING AREA

E-17

E-18

UT 10

UT 9

E-19

E-20

E-21

GRAVEL CONSTRUCTION ENTRANCE

UT 5

E-22

UT 15

WASTE AREA

STAGING & BORROW AREA

LOG MAT BRIDGE

E-24

E-25

STAGING & WASTE AREA

UT 16

UT 18

UT 17

UT 20

E-23

UT 12

E-08

E-09

E-10

UT 14

STAGING AREA

UT 19

E-07

UT 11

E-06

Bobby Jean Rd

3371

NPSQ STAGING AREA

E-05

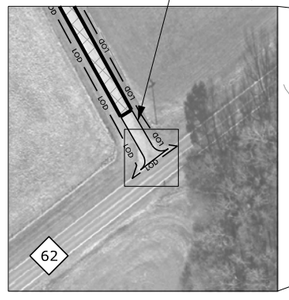
E-04

BORROW AREA

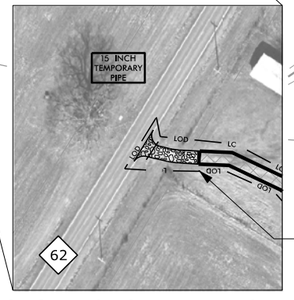
N PRONG STINKING QUARTER CREEK

Randolph Dr

62



CONSTRUCTION ENTRANCE 5 (nts)



GRAVEL CONSTRUCTION ENTRANCE

CONSTRUCTION ENTRANCE 3 (nts)



GRAVEL CONSTRUCTION ENTRANCE

CONSTRUCTION ENTRANCE 4 (nts)

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STINKING QUARTER
GUILFORD COUNTY, NC

HAUL ROADS

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-03E
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **E-03E**

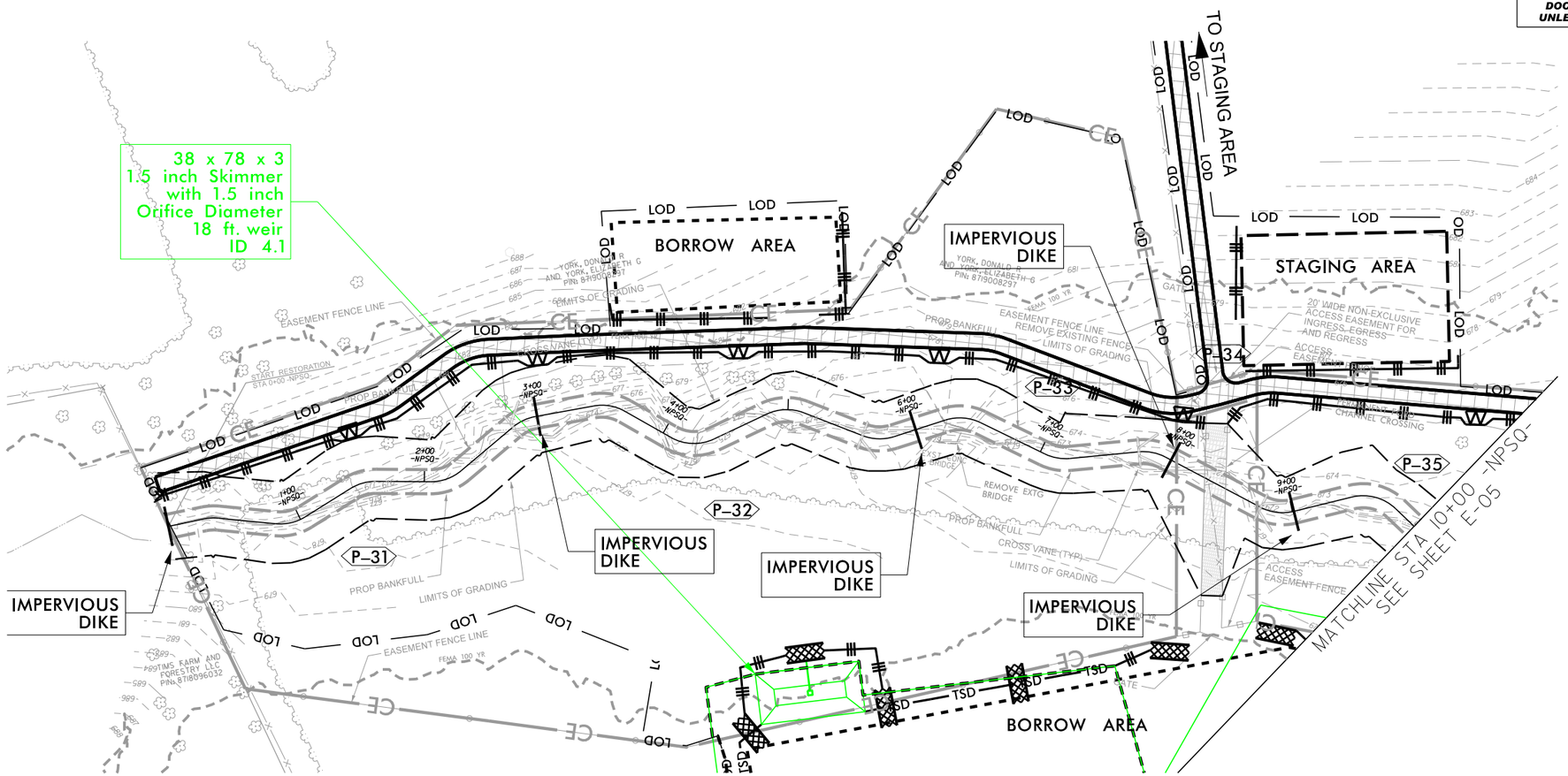
1/9/2024
Stnkqtr_PSH_E-03E.dgn
Jonathan Hall

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



NORTH CAROLINA PROFESSIONAL ENGINEER
PRELIMINARY DESIGN
NOT FOR CONSTRUCTION
JOSHUA G. DALTON

DATE:

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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-04
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E-04

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jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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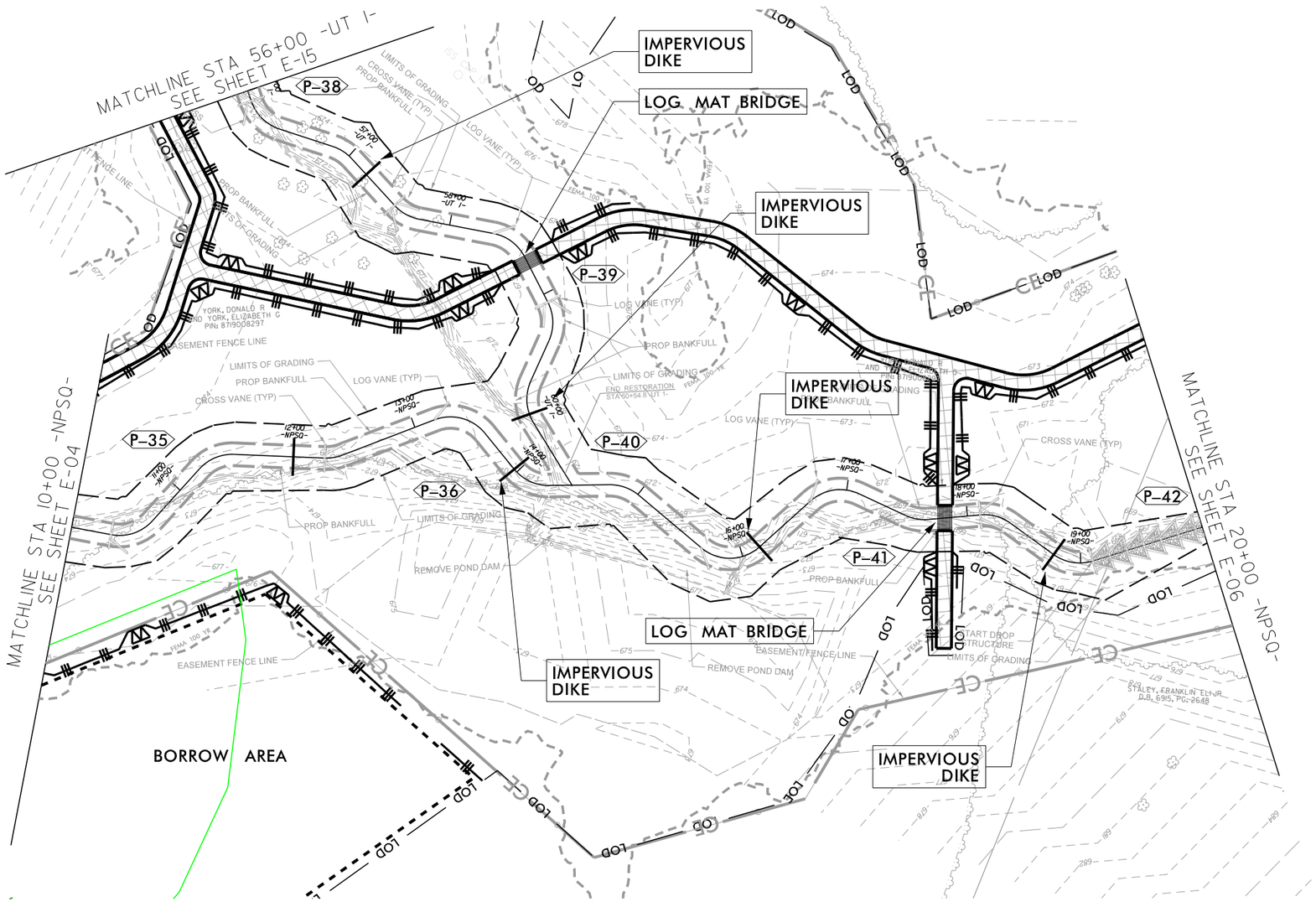
SCALE: 1" = 100'

NAD 83



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DATE:

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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
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DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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jherveu

— LOD — LIMITS OF DISTURBANCE

TEMPORARY SILT FENCE

HAUL ROAD

SPECIAL SEDIMENT CONTROL FENCE BREAK

SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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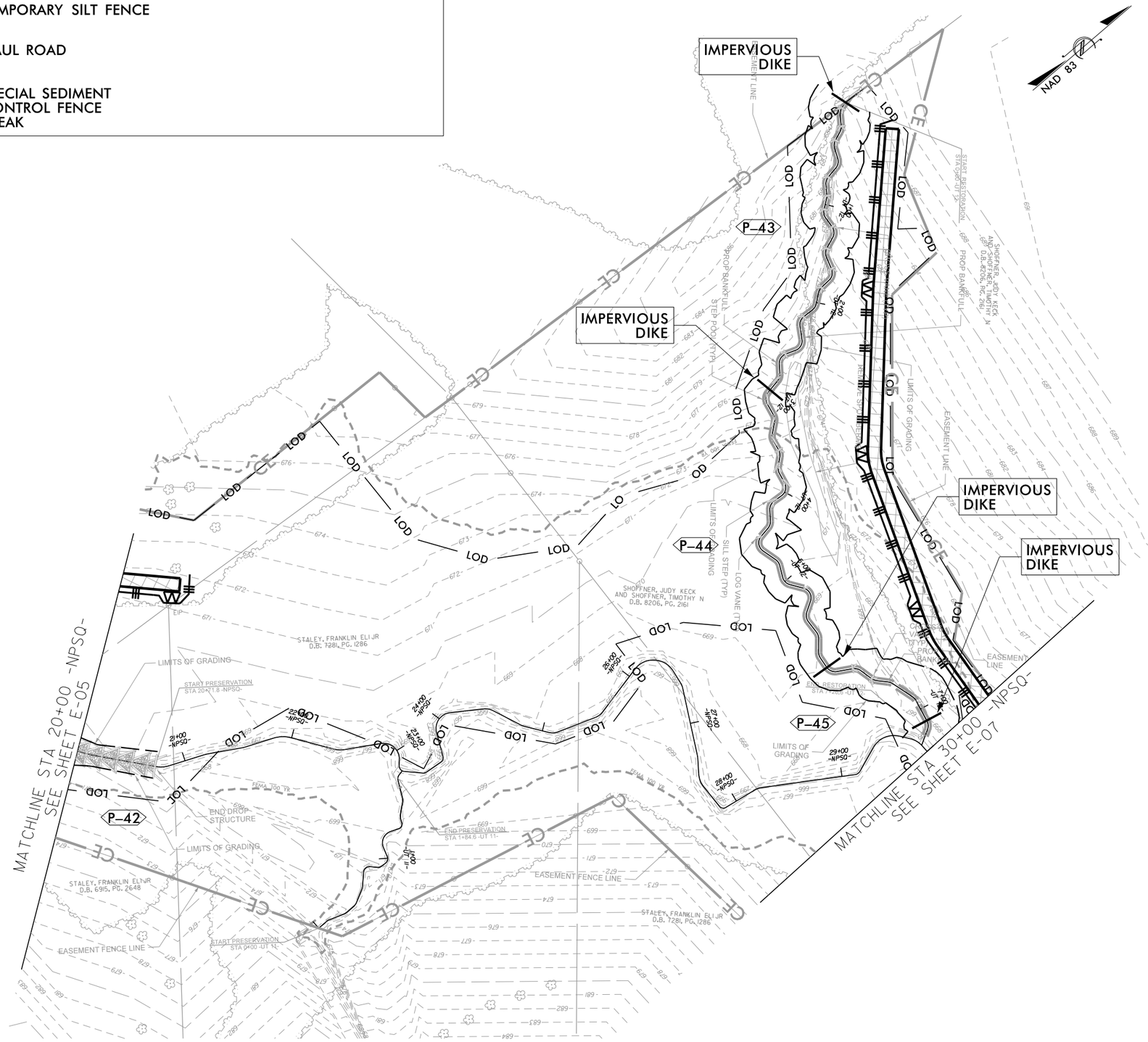
SCALE: 1" = 100'



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JOSEPH G. DALTON
NOT FOR BIDDING OR CONSTRUCTION PURPOSES

DATE:

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STINKING QUARTER

GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-06
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E-06

1/9/2024
Stnkqtr_PSH_E-06.dgn
Harsell

— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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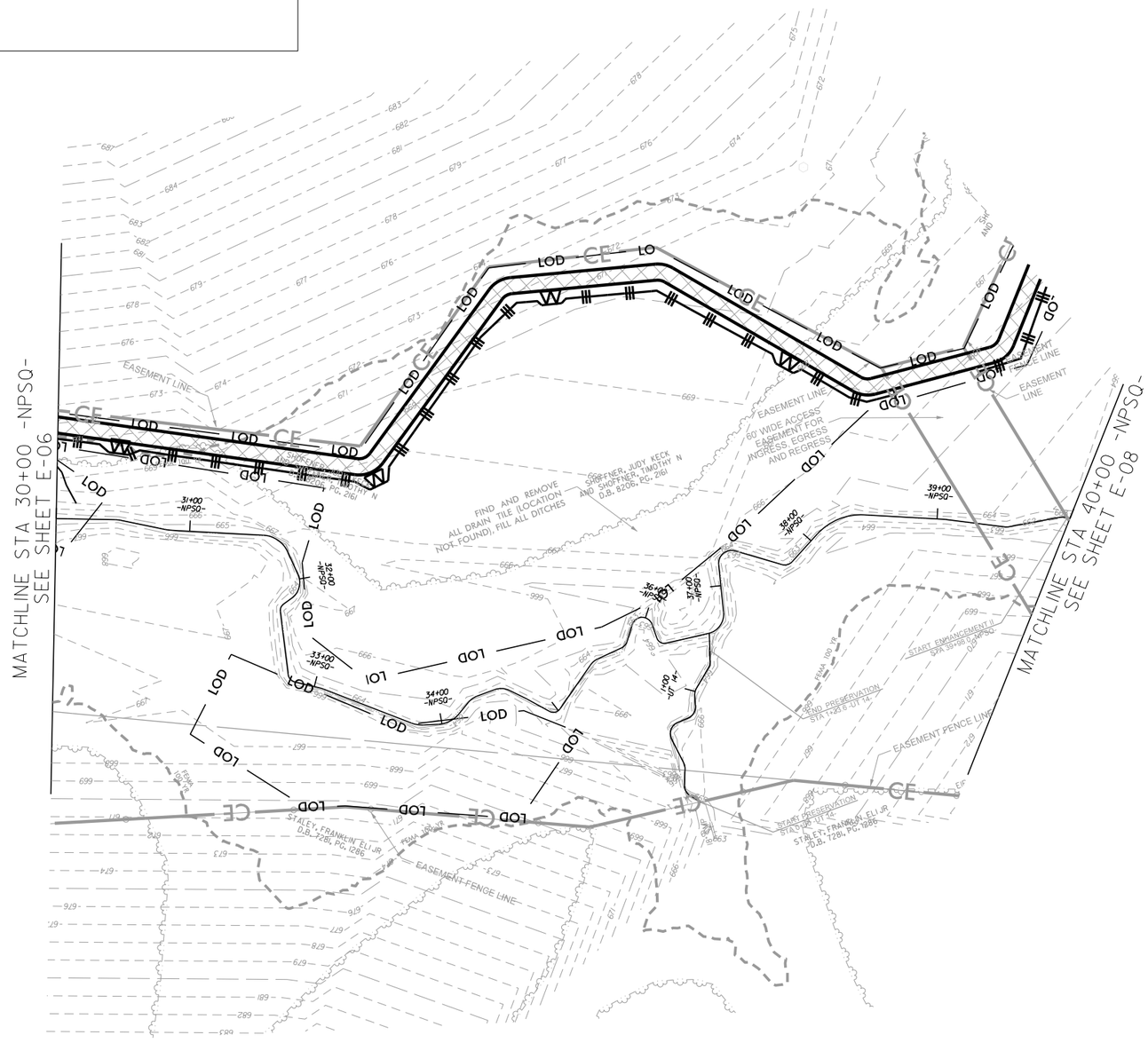
SCALE: 1" = 100'

NAD 83



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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-07
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–07

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jharvey

— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-08
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–08

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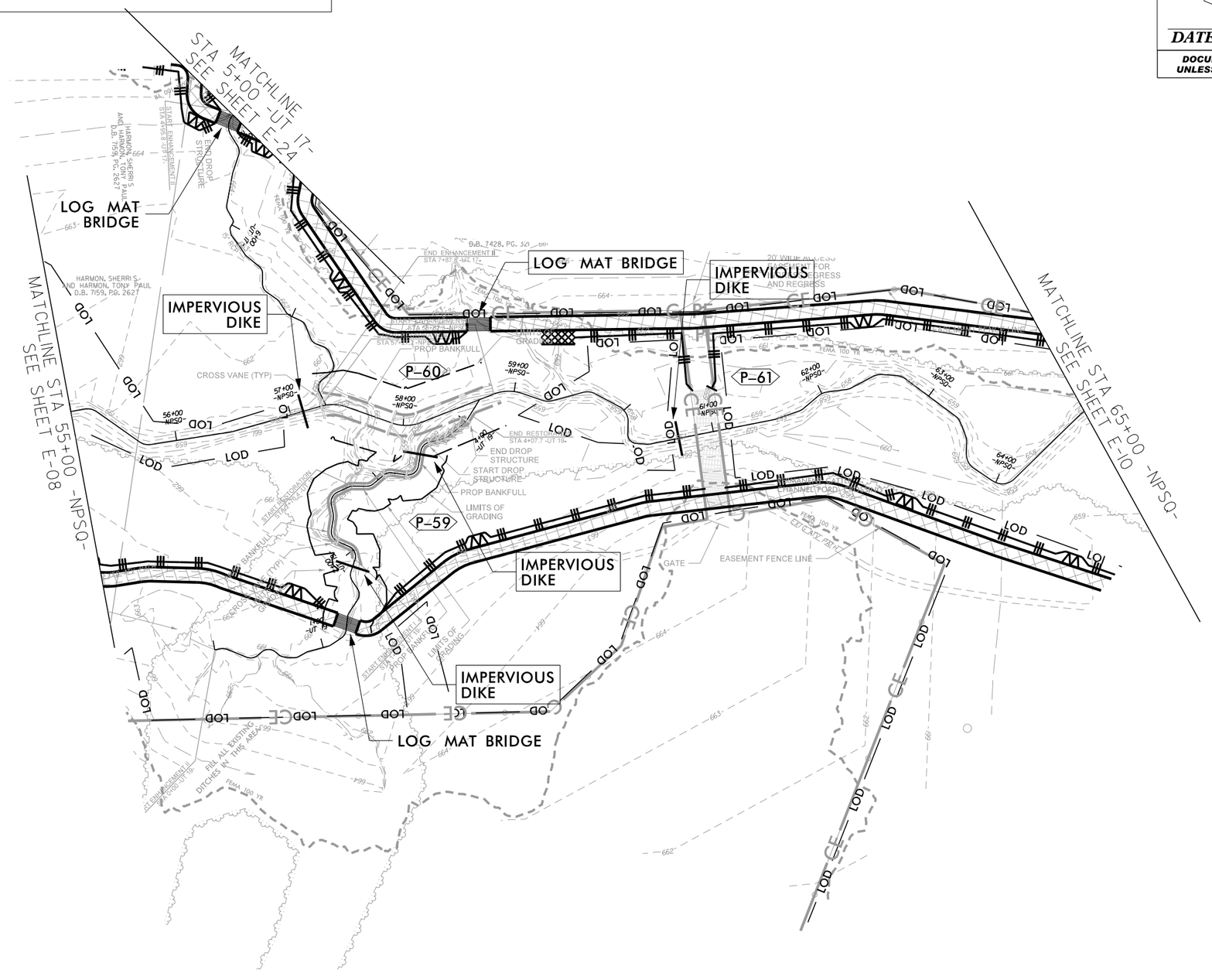
jharvey

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'



NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 36 JOSHUA G. DALTON PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

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PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-09
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–09

1/9/2024
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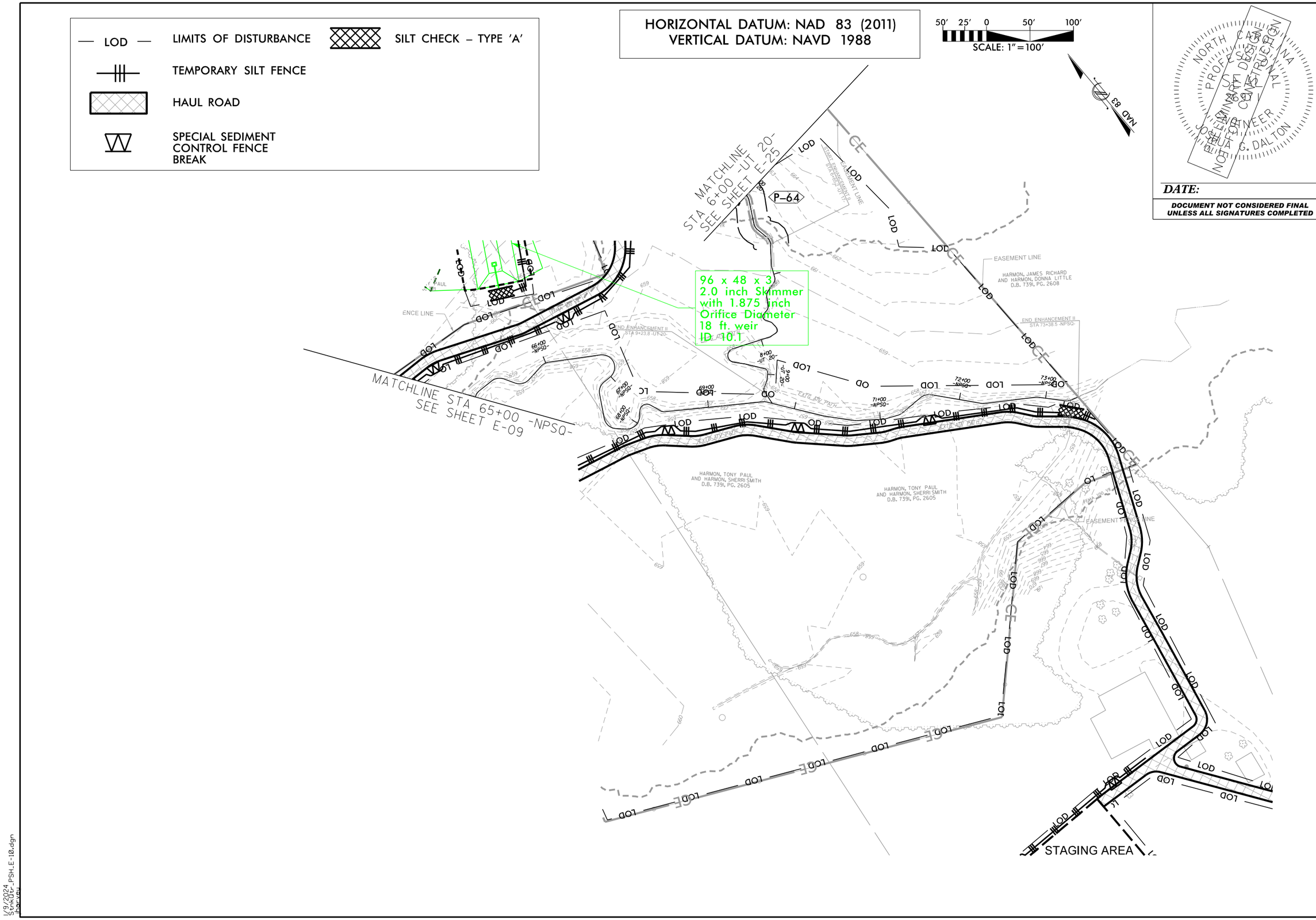
jharvey



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL PRELIMINARY DESIGN NOT FOR CONSTRUCTION JOSHUA G. DALTON

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT #: 1221-21017
DRAWING NAME: STNKQTR PSH E-10
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

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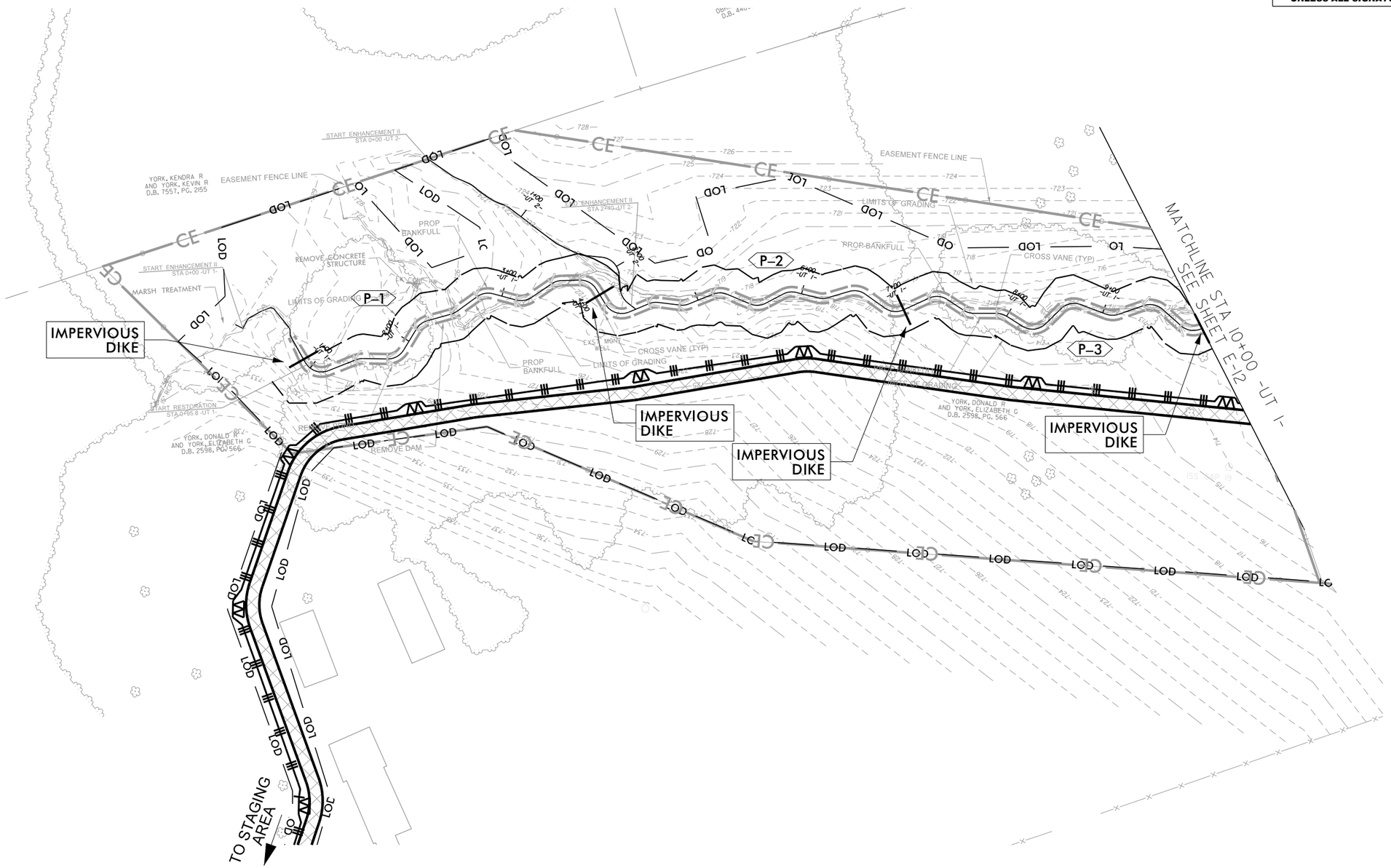
jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL PRELIMINARY DESIGN NOT FOR CONSTRUCTION JOSHUA G. DALTON

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-11
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. E-11

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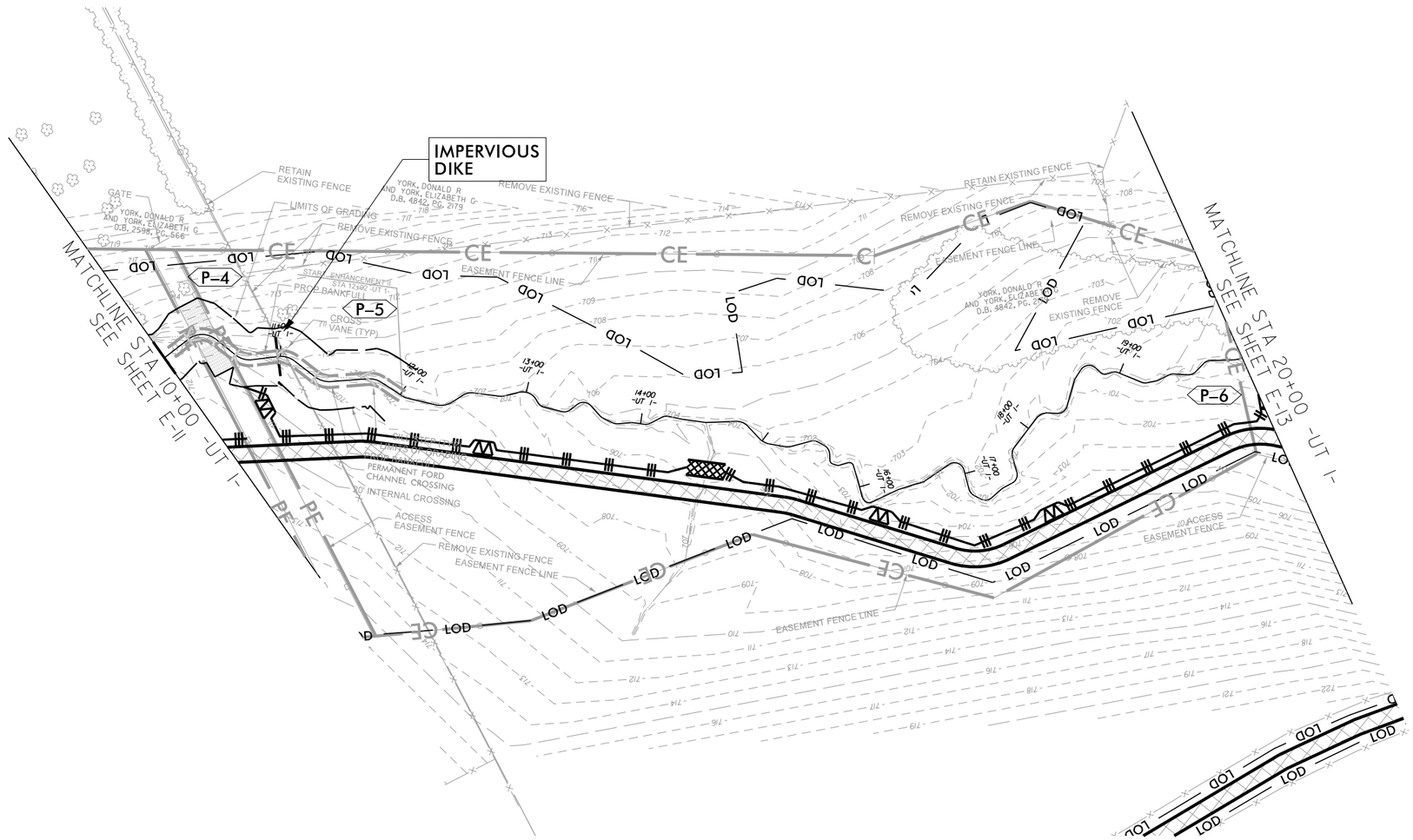
jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



NORTH CAROLINA PROFESSIONAL SEAL PRELIMINARY DESIGN NOT FOR CONSTRUCTION JOSHUA G. DALTON

DATE:

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH E-12
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	E–12

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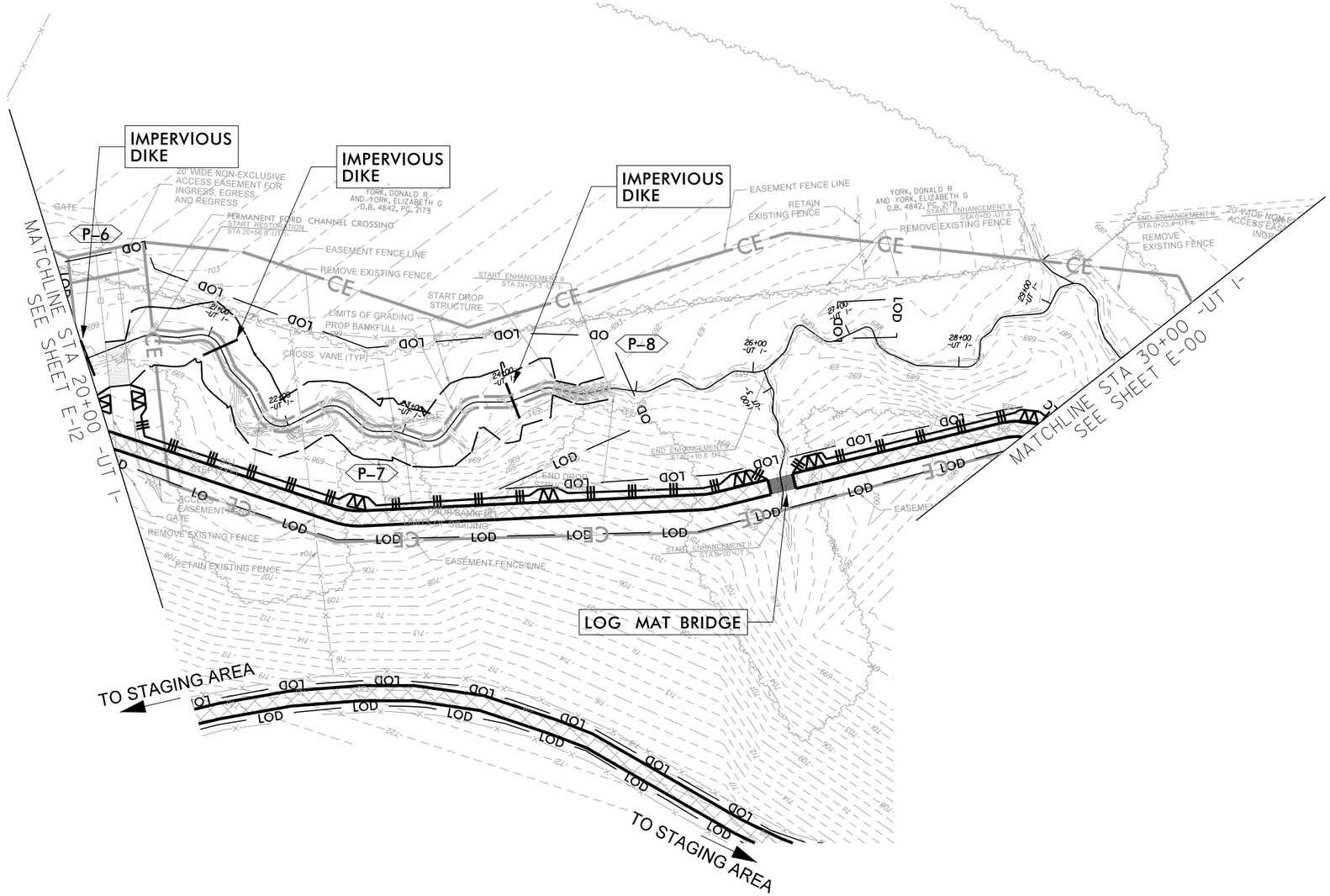
jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 26911 JOSHUA G. DALTON
PRELIMINARY DESIGN NOT FOR CONSTRUCTION

DATE:

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TEL (919) 859-2243
ENG FIRM LICENSE NO. C-890

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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-13
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–13

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jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 36472 JOSEPH G. DALTON
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NOT RELEASED FOR CONSTRUCTION

DATE:

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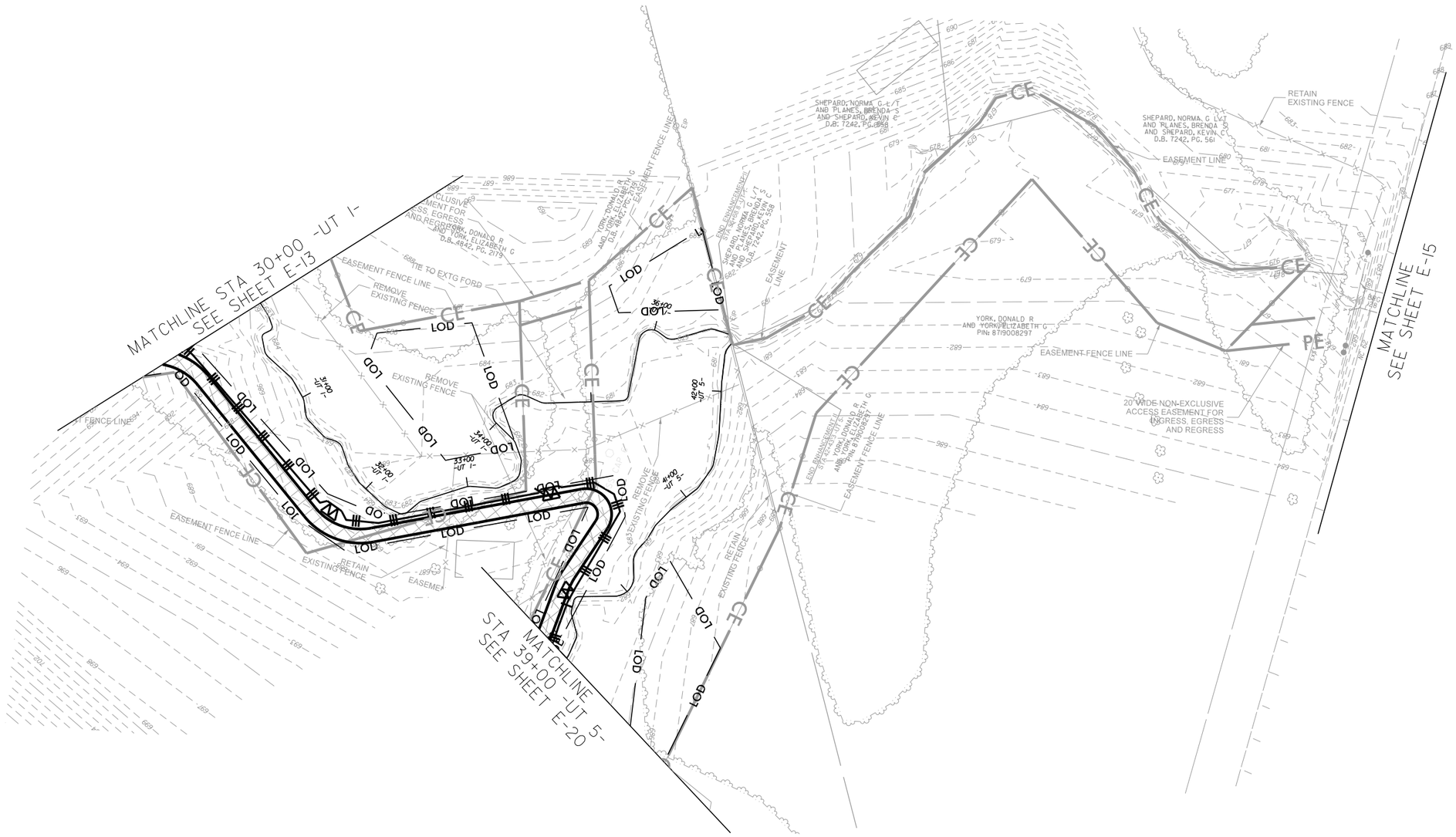

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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH E-14
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
REVISIONS:	
SHEET NO.	***E–14***

1/9/2024
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Harvey

— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-15
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. E–15

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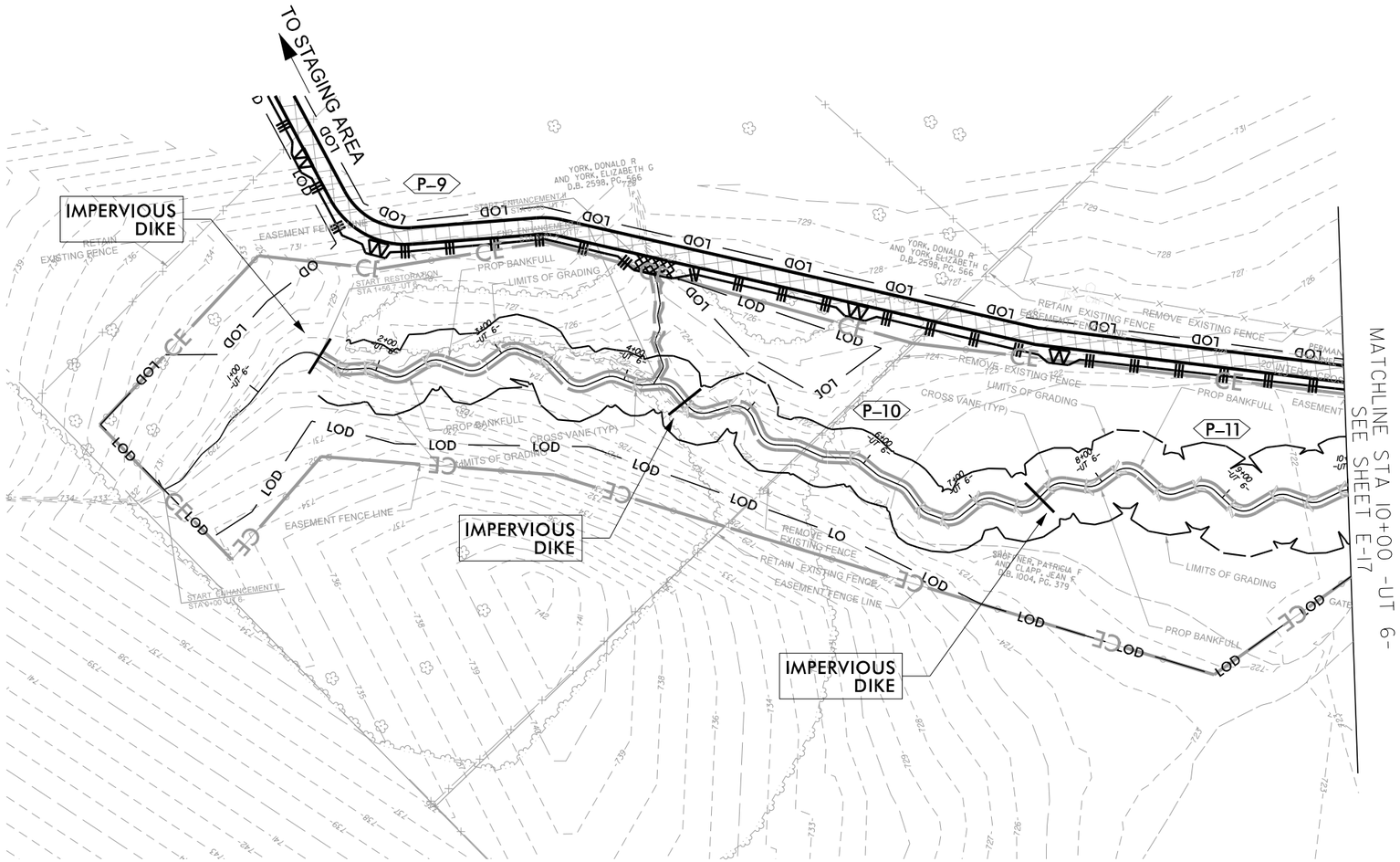
— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



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STINKING QUARTER
GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-16
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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— LOD — LIMITS OF DISTURBANCE

TEMPORARY SILT FENCE

HAUL ROAD

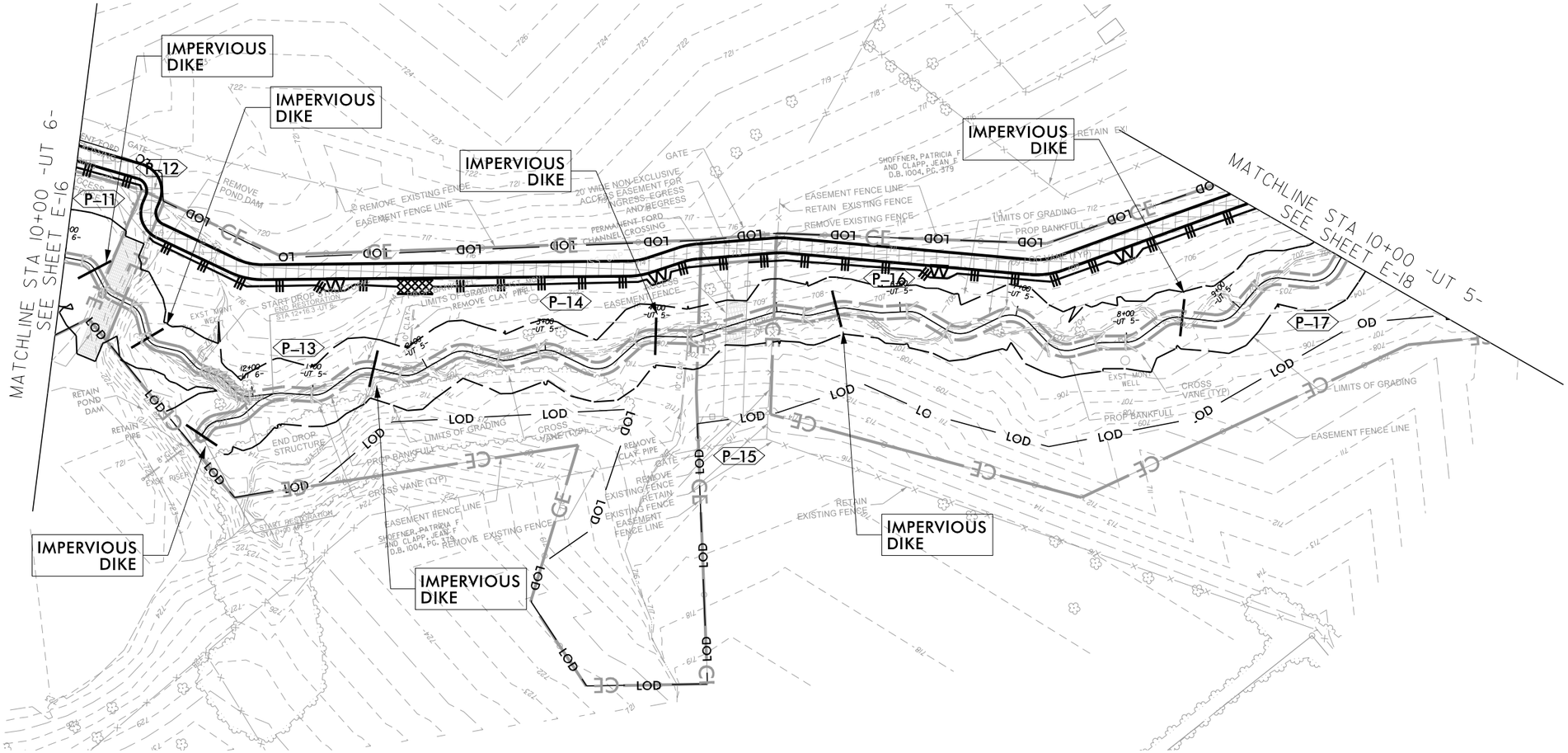
SPECIAL SEDIMENT CONTROL FENCE BREAK

SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-17
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. ***E–17***

— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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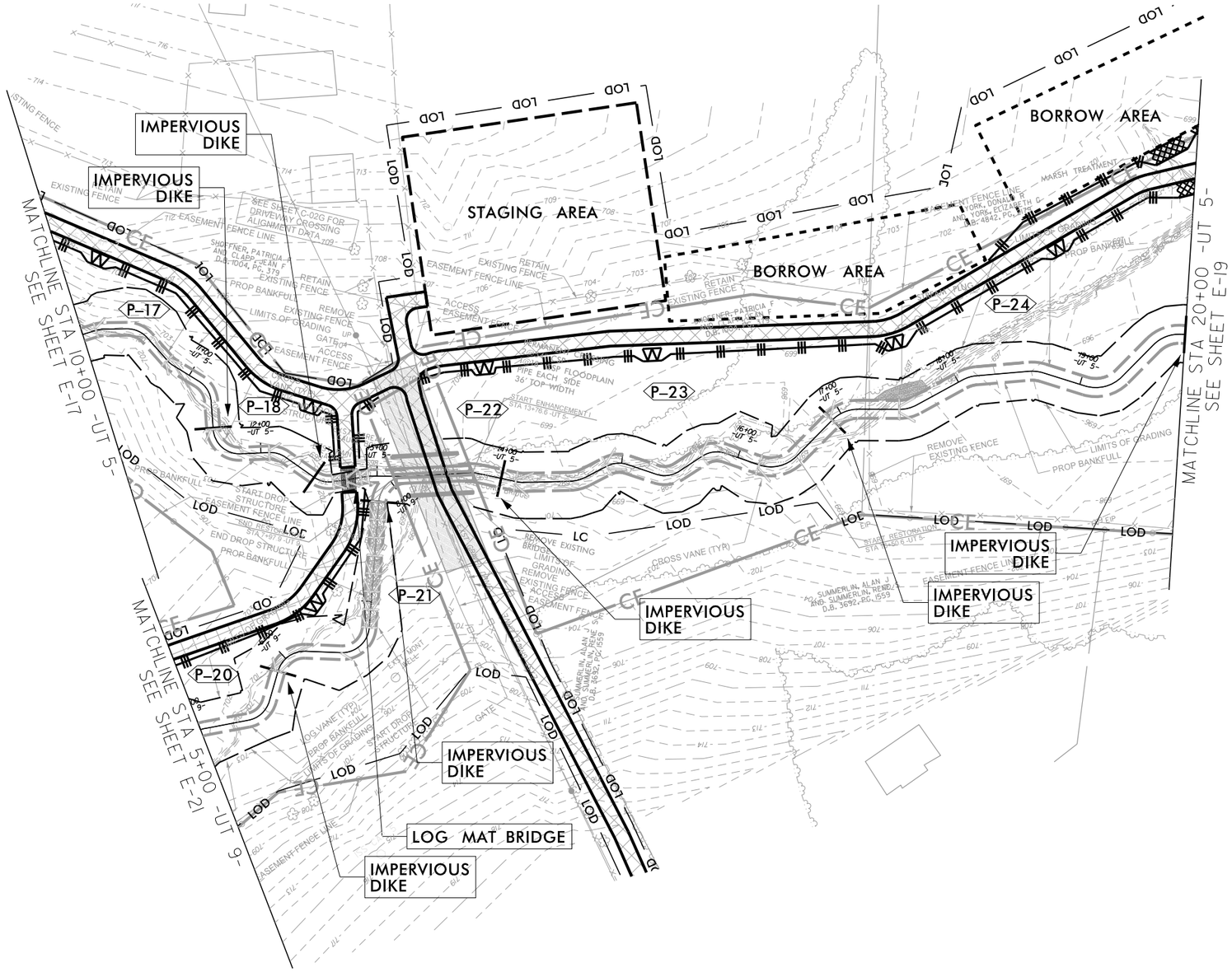
NAD 83



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
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DATE: 1/9/2024
DRAWN BY: JRH
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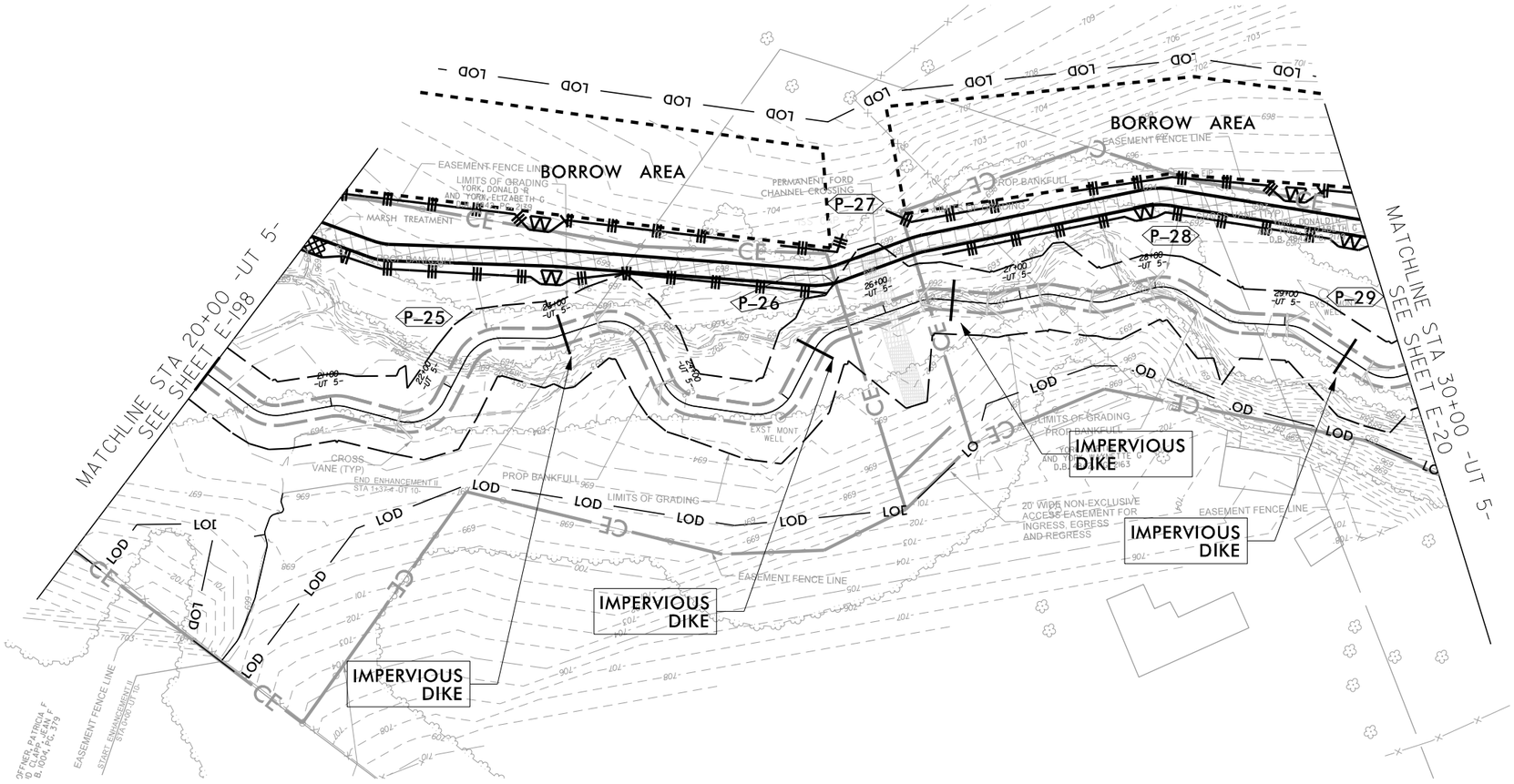
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # :	1221-21017
DRAWING NAME:	STNKQTR PSH E-19
DATE:	1/9/2024
DRAWN BY:	JRH
REVIEWED BY:	JGD
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— LOD — LIMITS OF DISTURBANCE

TEMPORARY SILT FENCE

HAUL ROAD

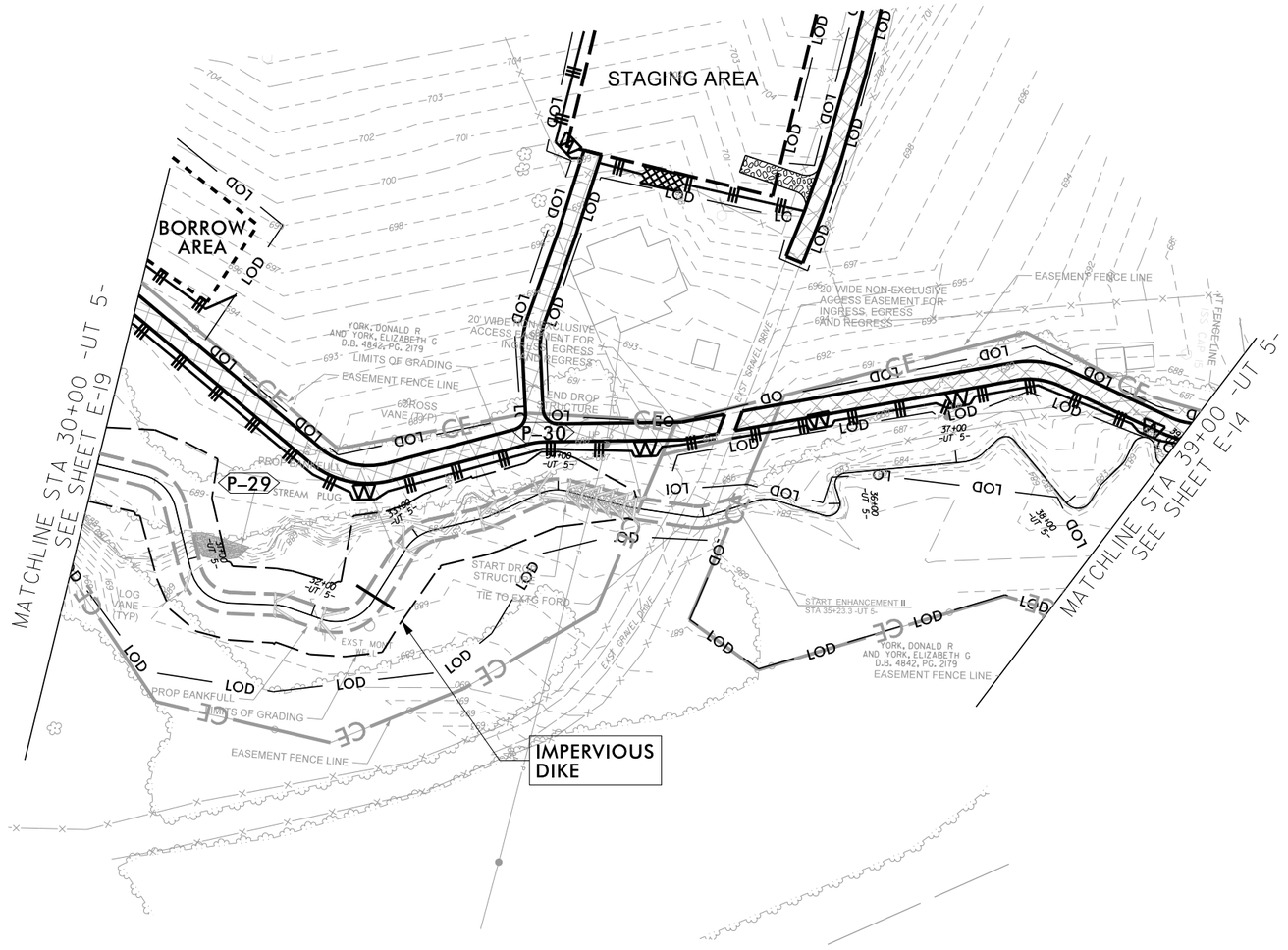
SPECIAL SEDIMENT CONTROL FENCE BREAK

SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83



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PRELIMINARY PLANS
JOSEPH G. DALTON
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
036911
SUNGATE DESIGN GROUP, P.A.

DATE:

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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-20
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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E–20

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— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
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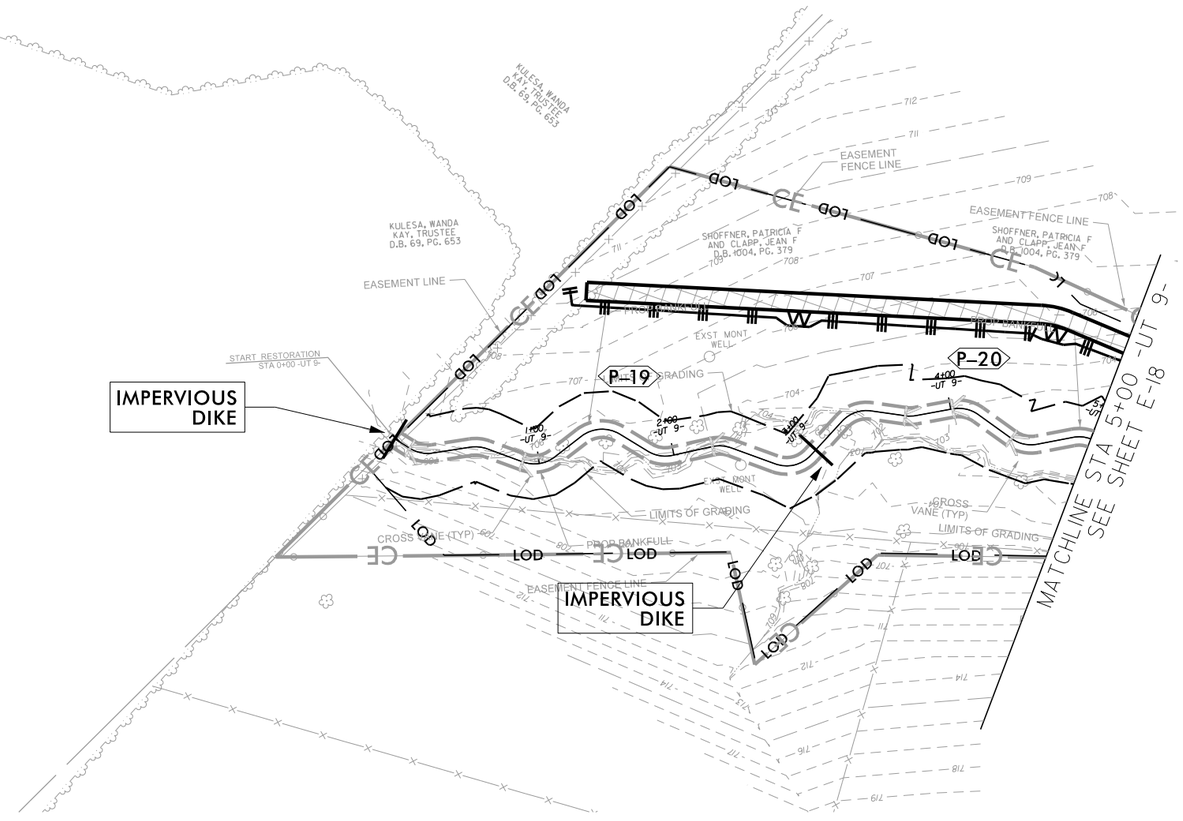
NAD 83



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-21
DATE: 1/9/2024
DRAWN BY: JRH
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E-21

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HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50′ 25′ 0 50′ 100′
SCALE: 1″ = 100′

NAD 83

WASTE AREA*

IMPERVIOUS DIKE

* WASTE AREA BLENDED TO EXISTING TOPGRAPHY

MATCHLINE SEE SHEET E-23 STA 10+00 -UT 15-

P–46 P–47 P–48 P–49 P–50 P–51 P–52 P–53

IMPERVIOUS DIKE

STAGING AREA
WASTE AREA*

* WASTE AREA BLENDED TO EXISTING TOPGRAPHY

IMPERVIOUS DIKE

IMPERVIOUS DIKE

IMPERVIOUS DIKE

IMPERVIOUS DIKE

IMPERVIOUS DIKE

IMPERVIOUS DIKE

IMPERVIOUS DIKE

RETAIN EXISTING FENCE
START RESTORATION STA 0+00 -UT 15-
STEP POOL (TYP)
LIMITS OF GRADING
PROP BANKFULL
EASEMENT FENCE LINE
SILL STEP (TYP)
REMOVE EXISTING FENCE
REMOVE POND DAM
REMOVE EXISTING FENCE
CROSS VANE (TYP)
LOG VANE (TYP)
GATE
EXISTING GRAVEL ACCESS DRIVE
PROP GRAVEL ACCESS DRIVE
SHOFFNER, JUDY KECK AND SHOFFNER, TIMOTHY D.B. 8206, PG. 2161

— LOD — LIMITS OF DISTURBANCE
TEMPORARY SILT FENCE
HAUL ROAD
SPECIAL SEDIMENT CONTROL FENCE BREAK
SILT CHECK – TYPE 'A'

1/9/2024
StnkQtr_PSH_E-22.dgn
jharvell

NOT FOR CONSTRUCTION
PRELIMINARY PLAT
SUBJECT TO REVISION
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 36911 JOSEPH G. DALTON

DATE:

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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-22
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–22

— LOD — LIMITS OF DISTURBANCE

TEMPORARY SILT FENCE

HAUL ROAD

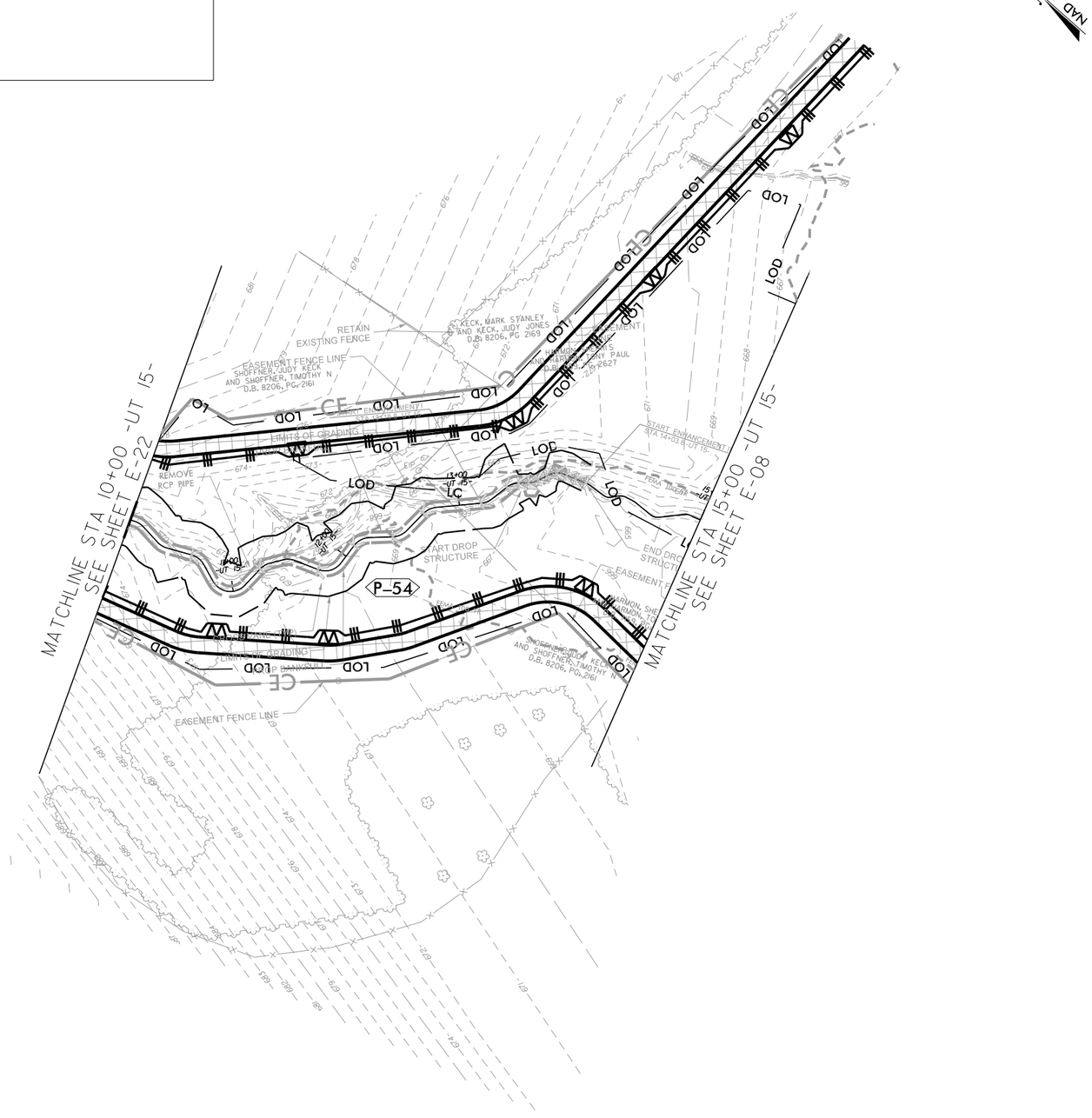
SPECIAL SEDIMENT CONTROL FENCE BREAK

SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83



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PRELIMINARY PLANS
JOHN G. DALTON
NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
036722
ENGINEERING DESIGN

DATE:

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STINKING QUARTER

GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-23
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO.
E–23

1/9/2024
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jharvey

— LOD —	LIMITS OF DISTURBANCE		SILT CHECK – TYPE 'A'
	TEMPORARY SILT FENCE		
	HAUL ROAD		
	SPECIAL SEDIMENT CONTROL FENCE BREAK		

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

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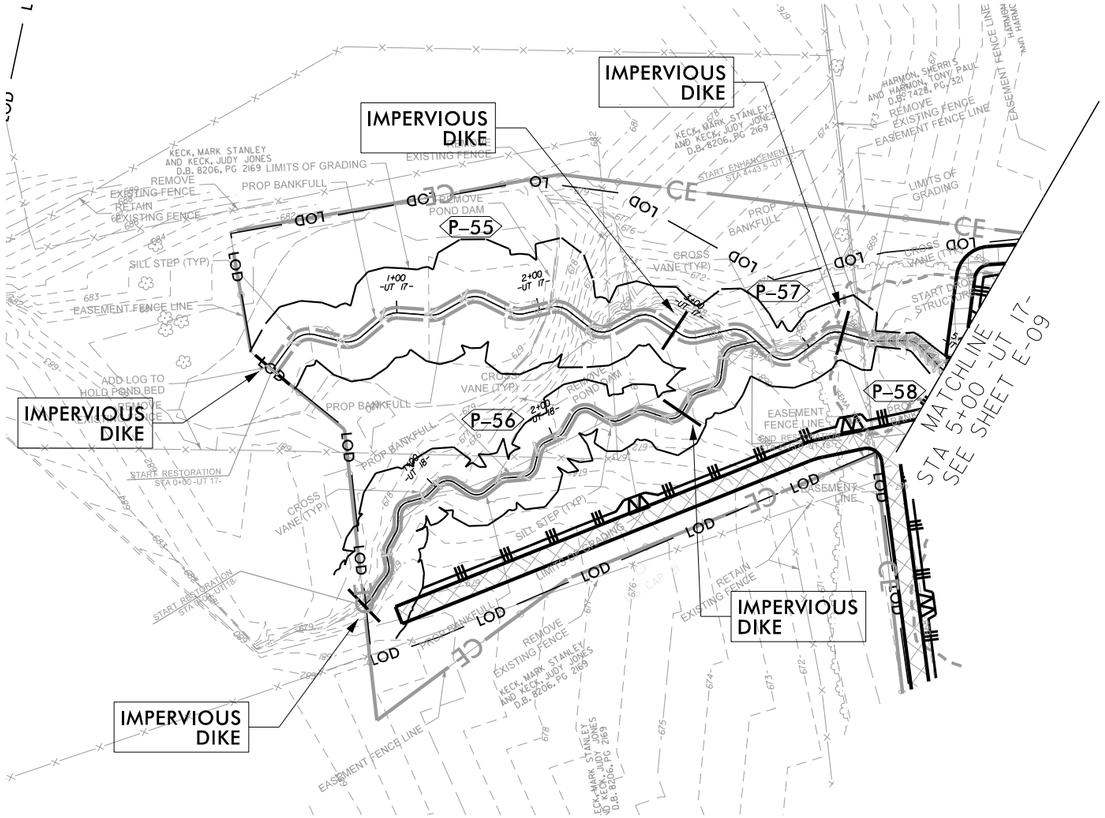
NAD 83



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GUILFORD COUNTY, NC

EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-24
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

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E–24

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jharvey

— LOD —	LIMITS OF DISTURBANCE
	TEMPORARY SILT FENCE
	HAUL ROAD
	SPECIAL SEDIMENT CONTROL FENCE BREAK
	SILT CHECK – TYPE 'A'

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

50' 25' 0 50' 100'
SCALE: 1" = 100'

NAD 83

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL PRELIMINARY DESIGN NOT FOR CONSTRUCTION JOSHUA G. DALTON

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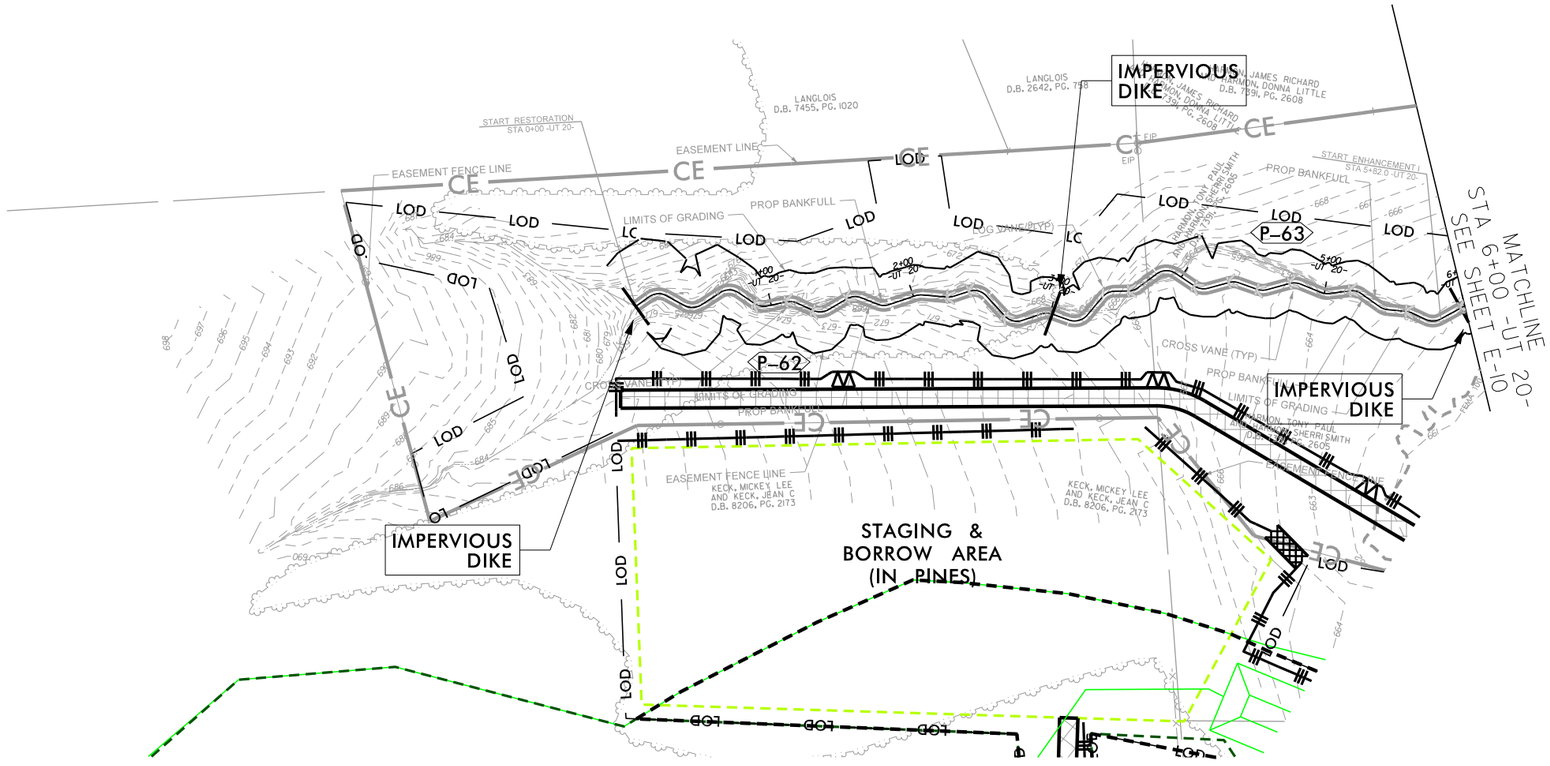

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EROSION AND SEDIMENT CONTROL

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH E-25
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
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jharvey

Table 18 – Planting Plan

Vegetation Association			Piedmont/Mountain Bottomland Forest*		Dry-Mesic Oak-Hickory Forest*		Stream-side Assemblage*		TOTAL
Area (acres)			50.7		10.4		12.8		73.9
Species	Stratum	Ind.	#	%	#	%	#	%	#
Tag Alder (*Alnus serrulata*)	Under story	OBL					6,000	17%	***6,000***
River birch (*Betula nigra*)	Canopy	FACW	2,400	7%			2,000	6%	***4,400***
Bitternut hickory (*Carya cordiformis*)	Canopy	FACU	600	2%	400	6%			***1,000***
Hornbeam (*Carpinus caroliniana*)	Under story	FAC	1,000	3%			5,000	14%	***6,000***
Hackberry (*Celtis*	Canopy	FACW	2,000	6%			1,000	3%	***3,000***
Red bud (*Cercis canadensis*)	Under story	FACU			500	7%			***500***
Buttonbush (*C. occidentalis*)	Under story	OBL					6,000	17%	***6,000***
Silky dogwood (*Cornus amomum*)	Under story	FACW	1,500	4%			6,000	17%	***7,500***
Persimmon (*Diospyros virginiana*)	Under story	FAC	2,000	6%	800	11%			***2,800***
Green ash (*Fraxinus*	Canopy	FACW	1,500	4%			1,000	3%	***2,500***
Tulip poplar (*Liriodendron tulipifera*)	Canopy	FACU	3,000	9%	800	11%	1,000	3%	***4,800***
Red mulberry (*Morus rubra*)	Under story	FACU	1,500	4%	500	7%	1,000	3%	***3,000***
Black gum (*Nyssa sylvatica*)	Canopy	FAC	3,500	10%	800	11%	1,000	3%	***5,300***
Sycamore (*Platanus occidentalis*)	Canopy	FACW	3,500	10%			2,000	6%	***5,500***
Water oak (*Quercus*	Canopy	FAC	3,000	9%	800	11%			***3,800***
White oak (*Quercus*	Canopy	FACU	1,000	3%	500	7%	800	2%	***2,300***
Red oak (*Quercus*	Canopy	FACU			1,000	14%			***1,000***
Willow oak (*Quercus phellos*)	Canopy	FAC	3,000	9%	500	7%	2,000	6%	***5,500***
Shumard oak (*Quercus shumardii*)	Canopy	FAC	3,000	9%	500	7%			***3,500***
American elm (*Ulmus americana*)	Canopy	FACW	2,000	6%					***2,000***
TOTAL			34,500	100%	7,100	100%	34,800	100%	76,400

* Planted at a density of 680 stems/acre. ** Planted at a density of 2720 stems/acre.

350′ 175′ 0 350′ 700′
SCALE: 1″ = 700′

HORIZONTAL DATUM: NAD 83 (2011)
VERTICAL DATUM: NAVD 1988

NAD 83

STREAMSIDE ASSEMBLAGE
BOTTOMLAND HARDWOOD FOREST
SLOPE FOREST

3093 Old Julian Rd
David Foster Dr
3370 Dona Rd
3351 Smithwood Rd
62
N PRONG STINKING QUARTER CREEK
Bobby Jean Rd 3371
Randolph Dr
62

PLANTING DETAILS
SEEDLING / LINER BAREROOT PLANTING DETAIL

HEALING IN

1. Locate a heeling-in site in a shady, well protected area.
2. Excavate a flat bottom trench 12 inches deep and provide drainage.
3. Backfill the trench with 2 inches well rotted sawdust. Place a 2 inch layer of well rotted sawdust at a sloping angle at one end of the trench.
4. Place a single layer of plants against the sloping end so that the root collar is at ground level.
5. Place a 2 inch layer of well rotted sawdust over the roots maintaining a sloping angle.
6. Repeat layers of plants and sawdust as necessary and water thoroughly.

DIBBLE PLANTING METHOD
USING THE KBC PLANTING BAR

1- Insert planting bar as shown and pull handle toward planter.
2- Remove planting bar and place seedling at correct depth.
3. Insert planting bar 2 inches toward planter from seedling.
4. Pull handle of bar toward planter. Firmly soil at bottom.
5. Push handle forward firming soil at top.
6. Leave compaction hole open. Water thoroughly.

PLANTING NOTES:

PLANTING BAG
During planting, seedlings shall be kept in a moist planting bag or other container to prevent the root systems from drying.

KBC PLANTING BAR
The KBC bar shall have a blade with a triangular cross section, and shall be 36 inches long, 4 inches wide, and 1 inch thick at center.

ROOT PRUNING
All seedlings shall be root pruned, if necessary, so that no roots extend more than 10 inches below the root collar.

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL: (919) 859-2243
ENG FIRM LICENSE NO. C-990

Ardorn Environmental, Inc.

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STINKING QUARTER
GUILFORD COUNTY, NC

PLANTING

PROJECT # : 1221-21017
DRAWING NAME: STNKQTR PSH P-01
DATE: 1/9/2024
DRAWN BY: JRH
REVIEWED BY: JGD
REVISIONS:

SHEET NO. **P-01**

1/9/2024
StnkQtr_PSH_P-01.dgn
harvey

Appendix N. DMS Buffer Mitigation Plan – Riparian Buffer / Nutrient Offset

DMS BUFFER MITIGATION PLAN
STINKING QUARTER

Guilford County, North Carolina

DMS Project ID No. 100193
Full Delivery Contract No. 200201-01
USACE Action ID No. SAW-2021-00347
DWR Project No. 20210395
RFP No. 16-20200201 (Issued: 5/15/2020)

Cape Fear River Basin
Cataloging Unit 03030002



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Prepared for:

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF MITIGATION SERVICES
1652 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1652

July 2023

Restoration Systems, LLC
1101 Haynes St. Suite 211
Raleigh, North Carolina
Ph: (919) 755-9490
Fx: (919) 755-9492

Response to DMS Comments
Draft Stinking Quarter Buffer Mitigation Plan
DMS Project ID No. 100193
Full Delivery Contract No. 200201-01

DMS Comments Received (Black Text) & Responses (Blue Text)

1. Table 4 – Recommend changing the "Resolved?" column to "No" for Section 404/401 since those permits have not yet been issued.
   The "Resolved" column was changed to "No" for Section 404 and 401.

2. Throughout the document (specifically Section 1.2, Section 1.3, Section 4.1) there are references to this being a "nutrient offset project." We recommend removing references to nutrient offset in this manner since no nutrient offset credit is requested. Discussion of nutrient offset should be limited to viability for convertibility.
   References to "nutrient offset project" were removed throughout the document.

3. Table 11 – When we insert your numbers into the latest buffer table and into our CRM database, there are some minor inconsistencies, specifically in the preservation numbers (see figure below for our numbers to compare to your own). Please ensure you are using the latest table and are only entering whole numbers into the Area columns.
   In the initial submittal, decimals were included in the area columns. Areas were rounded to the nearest whole number, and credit amounts now match the table provided by DMS.

4. Figures 6 through 9 have some parcel lines that bisect the conservation easement in multiple locations incorrectly colored the same red as the conservation easement boundary line. Please correct.
   The figures were updated to depict the unsegmented easement boundary.

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DMS BUFFER MITIGATION PLAN
STINKING QUARTER

August 11, 2023

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ATTACHMENTS

Attachment A. Figures
- Figure 1. Site Location & Hydrologic Unit Map
- Figure 2. Soil Survey of Guilford County
- Figure 3. US Geological Survey Topo Quad
- Figure 4, 4A-D. Existing Conditions – 1998 Land Use
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- Figure 6. 6A-D. Existing Conditions – Current Land Use
- Figure 7, 7A-D. Restoration and Planting Plan
- Figure 8, 8A-D. Riparian Buffer Mitigation Credit Determination
- Figure 9, 9A-D. Monitoring Plan

Attachment B. Agency Letters/Correspondence
- DWR Stream Determination Letter, January 13, 2023
- DWR Site Viability Letter, July 21, 2023

Attachment C. Existing Conditions Photos

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RIPARIAN BUFFER & NUTRIENT OFFSET MITIGATION PLAN

Stinking Quarter

Guilford County, NC – Cape Fear River Basin

1.0 Mitigation Project Summary

1.1 Introduction

The Stinking Quarter Riparian Buffer & Nutrient Mitigation Site (hereafter referred to as the "Site") is proposed to the NC Division of Mitigation Services (NCDMS). Located in Guilford County, North Carolina, the Project encompasses 107.6 acres utilized for agricultural row crops, pasture, hay fields, and forest. The Project will restore the riparian areas along North Prong Stinking Quarter Creek and twenty (20) unnamed tributaries to Stinking Quarter Creek and, subsequently, the Cape Fear River. The is designed in accordance with State Rule 15A NCAC 02B .0295 (Consolidated Buffer Mitigation Rule – CMB Rule) to Jordan Lake Riparian Buffer Credits (RBC) and 15A NCAC 02B .0703 (Nutrient Offset Credit Trading Rule) to Jordan Lake Nutrient Offset Credits (NOC) for impacts within the United States Geological Survey (USGS) Cataloging Unit 03030002. The Project will provide 1,034,642.441 RBCs (Available RBC). Additionally, 525,431.734 RBCs can potentially be converted to 19,831.994 lbs of nitrogen and 1,135.463 lbs of phosphorous NOCs at the request of NCDMS.

The Site is located approximately 1-mile northeast of Julian, 5 miles northwest of Liberty, and is adjacent to Highway 62 (Attachment A, Figure 1). The land is currently and has been historically used for agriculture, with forest located along the downstream portions of Site features and within the greater floodplain of Stinking Quarter. The Site is within the Cape Fear River Basin 14-digit USGS Cataloging Units 03030002-040070 and (North Carolina Division of Water Resources [NCDWR] Sub-basin Number 03-06-03).

The riparian areas will be restored in concurrence with the Stinking Quarter Stream and Wetland Mitigation Site (NCDMS Project ID 100193, Contract No. 200201-01) and will involve restoring riparian buffers adjacent to restored streams to help reduce non-point source contaminant discharges to downstream waters of Jordan Lake. All tributaries were assessed by NCDWR (Sue Homewood) during an onsite visit on December 9th, 2022, for Applicability to the Jordan Lake Buffer Rules (DWR Stream Determination Letter, Attachment B). Riparian areas were assessed by DWR (Katie Merritt) during an onsite visit on March 28, 2023, to determine viability for buffer mitigation (DWR Site Viability Letter, Attachment B). The entire document is attached to the Stinking Quarter Stream and Wetland Mitigation Plan as Appendix E.

The Site will be protected with a permanent conservation easement. Riparian restoration, enhancement, and preservation area widths adjacent to restored streams will extend out to a maximum of 200 feet from the top of stream banks with a minimum width of 30 from the top of banks. Riparian buffer enhancement and preservation credits generated on this Site are allowed pursuant to 15A NCAC 02B .0295 (o). No riparian restoration areas less than 20 feet wide from the Top of Bank (TOB) can generate riparian buffer credit. Riparian buffer mitigation credit will not be generated in areas that are generating wetland mitigation credit. Figures 8A-D (Attachment A) and Section 3.2 provide details of the riparian buffer mitigation determination on the Site.

1.2 Project Goals

The Cape Fear River Basin Restoration Priorities (RBRP) report (NCEEP 2009) documents that all land uses and discharges of wastewater and stormwater in subbasin 03-06-03 potentially contribute nutrients to B. Everett Jordan Lake. B. Everett Jordan Lake provides low-flow augmentation, flood control, recreation, fish and wildlife habitat, and water supply. The lake is impaired for aquatic life due to excessive levels of

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chlorophyll a in violation of current standards in all segments of the reservoir. In addition, the Site has a supplemental water quality classification of Nutrient Sensitive Waters, which include areas with water quality problems associated with excessive plant growth resulting from nutrient enrichment. The proposed mitigation activities will reduce sediment and nutrient levels and improve water quality within the Site and downstream watersheds.

The primary goals of the proposed riparian buffer project are to provide ecological and water quality enhancements to the Cape Fear River Basin by restoring the riparian area to create a functional riparian corridor. The Site is not located within a watershed planning unit but addresses watershed goals outlined by the Cape Fear River Basin Restoration Priorities (RBRP) report (NCEEP 2009). Table 1 summarizes the RBRP goals and provides site-specific objectives to address the RBRP goals. Specific enhancements to water quality and ecological processes are outlined in Table 1.

Table 1. Ecological and Water Quality Goals

Goal	Objective
Decrease nutrient levels draining to B. Everett Jordan Lake	Nutrient input will be decreased by filtering runoff from the agricultural fields through restored riparian buffer zones. The off-site nutrient input will also be absorbed on-site by filtering flood flows through restored floodplain areas, where flood flows can disperse through native vegetation.

Ecological and water quality goals will be achieved by restoring 13.11 acres of forested riparian buffer, enhancing 22.85 acres of forested riparian buffer, and preserving 9.91 acres of existing riparian forest.

Proposed activities include:

- The cessation of agricultural production on the Site
- The cessation of vegetation maintenance along Site tributaries
- Planting a diverse woody riparian buffer comprised of native hardwoods and a permanent herbaceous seed mix that supports native diversity, including pollinators and wildlife.
- Protect Site tributaries, riparian buffers, adjacent floodplains, and the FEMA flood zone with a perpetual conservation easement

Mitigation activities outlined in this proposal are designed to provide the Division with 1,034,642.441 RBC. Mitigation totals are calculated per State Rule 15A NCAC 02B .0295 (Consolidated Mitigation Buffer Rule). Site tributaries drain to North Prong Stinking Quarter Creek in a FEMA-regulated floodplain. RBC generated from Site activities is summarized in Table 2; a complete credit determination table is provided in Table 10.

Table 2. Riparian Buffer Mitigation Credit Summary

TOTAL AREA OF BUFFER MITIGATION (TABM)		
Mitigation Totals	**Square Feet**	**Credits**
Restoration:	573,275	525,431.734
Enhancement:	995,265	466,934.364
Preservation:	431,664	42,276.344
Total Riparian Buffer:	2,000,204	1,034,642.441

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1.3 Existing Site Conditions

The proposed riparian buffer project includes approximately 107.6 acres of open agricultural fields along N. Prong Stinking Quarter Creek and twenty (20) of its unnamed tributaries. The agricultural fields are currently used for livestock, hay, and row crop production. Historically, the farmer regularly applied fertilizers and herbicides to the fields. Land use and general Site conditions have stayed the same since the site photos in Attachment C were taken.

Site tributaries ("features") 1, 15, 19, and 20 originate on-site. All others originate off-site. All tributaries drain to North Prong Stinking Quarter Creek.

Table 3. Project Activity and Reporting History

Task	Anticipated Completion Date	Actual Completion Date
Mitigation Plan	Q4 2023	
Initial Planting Date	Q1 2025	
Baseline Report Date	Q1 2025	
MY1 Report Date	December 2025	
MY2 Report Date	December 2026	
MY3 Report Date	December 2027	
MY4 Report Date	December 2028	
MY5 Report Date	December 2029	

Table 4. Project Attribute Table

Project Information			
Project Name	Stinking Quarter		
County	Guilford		
Project Area (acres)	107.6		
Project Coordinates (latitude and longitude)	35.9200, -79.6371		
Project Watershed Summary Information			
Physiographic Province	Southern Outer Piedmont		
River Basin	Cape Fear		
USGS Hydrologic Unit 8-digit	3030002	USGS Hydrologic Unit 14-digit	03030002040070
DWR Sub-basin	03-06-03		
Project Drainage Area, Total Outfall	1951.3 acres		
Project Drainage Area Percentage of Impervious Area	<5%		

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	No	Section 401 Certification
Waters of the United States – Section 401	Yes	No	Section 404 Permit
Endangered Species Act	Yes	Yes	CE Document (App E)
Historic Preservation Act	Yes	Yes	CE Document (App E)
Coastal Zone Management Act [CZMA/Coastal Area Management Act (CAMA)]	No	--	NA
FEMA Floodplain Compliance	Yes	No	DMS FEMA Checklist (App F)
Essential Fisheries Habitat	No	--	NA

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Table 5. Project Contacts Table

Role	Firm
Full Delivery Provider, Planting Contractor, General Contractor	Restoration Systems 1101 Haynes Street, Suite 211 Raleigh, North Carolina 27604 Raymond Holz: 919-755-9490
Designer & Monitoring	Axiom Environmental, Inc. 218 Snow Avenue Raleigh, NC 27603 Grant Lewis: 919-215-1693
Engineer	Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606 Josh Dalton: 919-859-2243
Surveyor	k2 Design Group - John Rudolph (L-4194) 5688 U.S. Hwy. 70 East Goldsboro, NC 27534 919-394-2547

DWR performed an on-site visit to determine applicability to the Neuse River Buffer Rules (15A NCAC 02B .0233), viability to provide riparian buffer credits based on the Consolidated Buffer Mitigation Rules(15A NCAC 02B .0295), and viability to provide nutrient offset credits based on the Nutrient Offset Credit Trading Rule (15A NCAC 02B .0703) on December 9th, 2022 and March 28, 2023. A copy of both the "On-Site Origin Determination for Applicability to the Jordan Lake Buffer Rules (15A NCAC 2B .0267)" and "Site Viability for Buffer Mitigation and Nutrient Offset – Stinking Quarter Site" are provided in Attachment B. A Summary of their determinations, specific to Parcel Features, is summarized in Table 6 and correlated with stream segments as labeled in Attachment A. There have been no changes to land use in the project area since DWR's site visit.

Table 6: Project Features

DWR Feature ID	In Field Classification	Subject to Buffer Rules	Riparian Buffer Viability	Nutrient Offset Viability
North Prong Stinking Quarter Creek	Perennial Stream	Subject	Yes	Yes
UT 1 above pond	Intermittent Stream	Not Subject	Yes	Yes
In-line Ag Pond on UT 1	Pond	Not Subject	Yes	Yes
UT 1 below the pond	Perennial Stream	Subject	Yes	No
UT 2	Intermittent Stream	Subject	Yes	Yes
UT 3	Intermittent Stream	Not Subject	Yes	Yes
UT 5	Perennial Stream	Subject	Yes	Yes
UT 6 above Pond	Intermittent Stream	Subject	Yes	Yes
In-line Ag Pond on UT 6	Pond	Not Subject	Yes	Yes
UT 6 below the pond	Perennial Stream	Subject	Yes	Yes
UT 7	Intermittent Stream	Not Subject	Yes	No
UT 9	Perennial Stream	Subject	Yes	Yes
UT 10	Ephemeral Stream	Not Subject	No	No
UT 11	Perennial Stream	Not Subject	Yes	No

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Table 6: Project Features (Continued)

DWR Feature ID	In Field Classification	Subject to Buffer Rules	Riparian Buffer Viability	Nutrient Offset Viability
UT 12	Perennial Stream	Not Subject	Yes	Yes
UT 14	Perennial Stream	Not Subject	Yes	No
UT 15	Intermittent Stream	Not Subject	Yes	Yes
UT 16	Perennial Stream	Subject	Yes	Yes
In-line Ag Pond on UT 16	Pond	Not Subject	Yes	Yes
UT 17	Perennial Stream	Subject	Yes	Yes
In-line Ag Pond on UT 17	Pond	Not Subject	Yes	Yes
UT 18*	Linear Wetland	Not Subject	Yes	Yes
UT 19	Intermittent Stream	Not Subject	Yes	No
UT 20	Intermittent Stream	Not Subject	Yes	Yes

* visual observation of feature upstream of project limits appears that it may be an intermittent stream

1.4 Watershed Characterization

The Site is located within USGS HUC 03030002 and DWR Subbasin 03-06-06. Site hydrology drains to warm waters of North Prong Stinking Quarter Creek and its unnamed tributaries (Stream Index Number 16-19-8-1), which has been assigned a Best Usage Classification of **WS-V, NSW** (NCDWR 2013). North Prong Stinking Quarter Creek is listed on the North Carolina Department of Environment and Natural Resources (NCDENR) final 2022 303(d) list (NCDEQ 2022).

The Site topography, as indicated on the Climax and Kimesville, NC USGS 7.5-minute topographic quadrangle, shows gently sloped areas throughout the Site (Figure 2, Attachment A). Land uses draining to the project reaches are primarily agriculture with some existing forest.

1.5 Soils

Soils that occur within the Site, according to the *Web Soil Survey* (USDA 2021), are described in Table 7.

Table 7: Project Soil Types and Descriptions

Map Unit Symbol	Map Unit Name (Classification)	Hydric Status	Description
ApB and ApC	Appling sandy loam (*Typic Kanhapludults*)	Non-hydric	This series consists of very deep, well drained, moderately permeable soils on ridges and side slopes of the Piedmont uplands. The parent material is residuum weathered from felsic igneous and metamorphic rock. Depth to the seasonal high-water table is more than 6 feet.
CcC and CeB2	Cecil sandy loam and sandy clay loam (*Typic Kanhapludults*)	Non-hydric	This series consists of very deep, well drained moderately permeable soils on ridges and side slopes of the Piedmont uplands. The parent material is residuum weathered from felsic, igneous and high-grade metamorphic rock. Depth to the seasonal high-water table is more than 6 feet.
ChA	Chewacla loam (*Fluvaquentic Dystrudepts*)	Non-hydric but may contain hydric inclusions	This series consists of frequently flooded, somewhat poorly drained soils found on floodplains with 0-2 percent slopes. The parent material is loamy alluvium derived from igneous and metamorphic rock. Depth to the water table is 6-24 inches and depth to restrictive features is more than 80 inches.

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1.6 Geology

The Site is located within the Southern Outer Piedmont, which consists of heated and deformed (metamorphic) volcanic rocks, specifically metamudstone and Meta-Argillite. This area was located around a series of oceanic volcanic islands about 650-550 million years ago. Ash and rock from the volcanoes formed the parent material that, through extensive metamorphism, change the sediments into slates, phyllites, schists, and quartzites.

Specifically, the Site extends across two intrusive rock types, including 1) metamorphosed Gabbro and Diorite, which is foliated to massive, and 2) Granitic Rock that is well metamorphosed, magacrystic, and well foliated. Gabbro includes large bodies of dark-colored iron and magnesium-rich rocks that intruded within the Inner Piedmont belts. Diorite is an intermediate between that of mafic gabbro and felsic granite, which is principally composed of silicate minerals also intruded in the area. These rocks were deposited by several large molten masses that intruded the overlying rocks. In the process, the original large magma bodies separated, producing smaller related masses.

Several areas of the Site exhibit bedrock contact; however, contact is confined to incised stream channels that will be backfilled or areas of stream enhancement (level II). The proposed stream channels will be tied into the bedrock were feasible to hinder headcut migration through the Site. The Site is an alluvial valley characterized by relatively deep deposits; therefore, bedrock is not expected to hinder channel excavation. However, if bedrock contact is made during construction, the channel will be adjusted and noted on as-built red-line drawings.

1.7 Existing Vegetative Communities

Existing vegetation within the Site consists of active agriculture fields, including row crops, livestock production, and hay fields with narrow streamside thickets, as shown in the attached site photos (Attachment C). Existing forests develop and expand as Site features enter the N. Prong Stinking Quarter floodplain.

1.8 Threatened and Endangered Species

Listed federally protected species are summarized in Table 8, with potential habitat and a preliminary biological conclusion for each.

Table 8: Threatened and Endangered Species

Common Name (Scientific Name)	Federal Status	Habitat at Site	Biological Conclusion	Summary
Schweinitz's Sunflower (*Helianthus schweinitzii*)	Endangered	Yes	No Effect	Habitat exists in or near the project boundaries.
Small Whorled Pogonia (*Isotria medeoloides*)	Threatened	Yes	No Effect	Habitat exists in or near the project boundaries.

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Schweinitz's Sunflower

Schweinitz's sunflower is found along roadside rights-of-way, maintained power lines and other utility rights-of-way, edges of thickets and old pastures, clearings and edges of upland oak-pine-hickory woods and Piedmont longleaf pine forests, and other sunny or semi-sunny habitats where disturbances (e.g., mowing, clearing, grazing, blow downs, storms, frequent fire) help create open or partially open areas for sunlight. It is intolerant of full shade and excessive competition from other vegetation. Schweinitz's sunflower occurs in various soil series; it is generally found growing on shallow sandy soils with high gravel

content; shallow, poor, clayey hardpans; or shallow rocky soils, especially those derived from mafic rocks. Habitat for this species exists within the Site.

A Site-wide survey was conducted at the Site on October 27, 2020. For the survey, a known population nearby was visited and observed by an Axiom biologist on October 27, 2020. Systematic surveys were then performed within all areas of suitable habitat within the Site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Schweinitz's sunflower.

Small Whorled Pogonia

Small whorled pogonia can be limited by shade. The species seems to require small light gaps or canopy breaks and generally grows in areas with sparse to moderate ground cover. Too many other plants in an area can be harmful to this plant. This orchid typically grows under canopies that are relatively open or near features that create long-persisting breaks in the forest canopy, such as a road or a stream. It grows in mixed-deciduous or mixed-deciduous/coniferous forests, generally in second or third-growth successional stages. The soils in which it lives are usually acidic, moist, and have very few nutrients. Habitat for this species exists within the Site.

A Site-wide survey was conducted at the Site on May 25, 2021. Systematic surveys were then performed within all areas of suitable habitat within the Site and no individuals were identified. This project is therefore anticipated to have **No Effect** on Small whorled pogonia.

1.9 Cultural Resources and Significant Natural Heritage Areas

"Cultural resources" refers to prehistoric or historic archaeological sites, structures, or artifact deposits over 50 years old. "Significant" cultural resources are those that are eligible or potentially eligible for inclusion in the National Register of Historic Places. Evaluations of site significance are made with reference to the eligibility criteria of the National Register (36 CFR 60) and in consultation with the North Carolina State Historic Preservation Office (SHPO).

Field visits were conducted at the Site in April and August 2019 and again in April through August 2020 to ascertain the presence of structures or other features that may be eligible for inclusion on the National Register of Historic Places. No structures were identified within the proposed easement boundaries. SHPO concurrence for the project has been received and is included in Appendix E of the Stream and Wetland Restoration Plan (Categorical Exclusion).

1.10 FEMA Floodplain Compliance

The following FEMA Flood Insurance Rate Maps were inspected for the project: Rate Map 3710870900J, Panel 8709, effective 6/18/2007, Rate Map 3710871800K, Panel 8708, effective 1/2/2008, Rate Map 3710871800K, Panel 8718, effective 1/2/2008, Rate Map 3710871900J, Panel 8719, effective 6/18/2007. FEMA mapping indicates that North Prong Stinking Quarter Creek and tributaries crossing the floodplain are located within a Zone AE flood area. Therefore, a HEC-RAS analysis will be completed on the existing and proposed conditions of North Prong Stinking Quarter Creek and its tributaries to assess hydraulic performance. As per North Carolina Floodplain Mapping requirements, a Conditional Letter of Map Revision (CLOMR) may need to be prepared for the Site.

Given the sloping nature of the Site, relatively confined valleys, and the landowner's possession of land adjacent to and immediately upstream of the project boundary, the risk of hydrologic trespass is relatively small. The Site's lower reaches will be modeled using a HEC RAS analysis for the CLOMAR, during which adjustments may be made to reduce hydrologic trespass, if necessary; however, these adjustments are not expected.

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1.11 Site Location, Site Constraints, and Access

The Site is in rural Guilford County, near the town of Julian (Attachment A, Figure 1). The Site is accessible for construction, monitoring, and long-term stewardship from HWY 62 (Attachment A, Figures 6A-D). An access road and associated access easement will be detailed in the final conservation easement survey and recorded at the Guilford County Register of Deeds. DOT right of ways, powerlines, and associated easements will be excluded from the conservation easement.

1.12 Existing Utility Lines

A powerline perpendicularly crosses UT 5 in the lower restoration reach, just upstream from the downstream-most crossing. This powerline will be moved into the easement break.

1.13 Other Environmental Conditions

An Environmental Data Resources, Inc (EDR) Radius Map Report with Geocheck was ordered for the Site on March 2021. Neither the target nor adjacent properties were listed in any Federal, State, or Tribal environmental databases searched by EDR. The executive summary of the EDR report is included in Appendix E of the Stinking Quarter Stream and Wetland Mitigation Plan.

2.0 Site Protection Instrument

The Site will be transferred to the NCDEQ Stewardship Program. This party shall serve as the conservation easement holder and long-term property steward. It will conduct periodic inspections 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 Statute 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.

3.0 Mitigation Work Plan

The Project will restore agriculturally impacted land in the Site footprint to a forested riparian corridor, protected in perpetuity, improving the ecological function of the area. The project design will ensure that no adverse impacts on wetlands or riparian buffers occur. Attachment A, Figures 7A-D, illustrates the conceptual design for the Site.

3.1 Site Preparation

This site is also being proposed as a stream and wetland mitigation project; therefore, the restoration of riparian areas will be accomplished through the goals and methods outlined by the Stinking Quarter Stream and Wetland Mitigation Plan. All applicable federal, state, and local documentation, permits, and/or authorizations will be acquired as part of implementing the above-mentioned mitigation plan. Primary goals focus on 1) improving water quality, 2) enhancing flood attenuation and hydrology, 3) improving aquatic resources, and 4) restoring riparian habitat. Proposed mitigation activities will provide floodplain connectivity, floodplain resistance, stream stability, sediment transport, surface and subsurface storage and retention, in-stream habitat, riparian habitat and structure, thermal regulation, floodplain biogeochemical processing, and pollutant filtration, as well as remove sources of pollutants. The riparian area will be restored through the revegetation of native plant communities.

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All riparian restoration activities will commence in concurrence with the stream mitigation activities and not before. Therefore, the mitigation area where riparian restoration is being performed may be altered slightly depending on the approval of the Stream Mitigation Plan. The riparian restoration areas will be surveyed, and information will be provided in the As-Built report. Areas where existing mature vegetation will potentially be negatively impacted by stream restoration activities, are not eligible for riparian buffer restoration credit; however, these areas are eligible for riparian buffer enhancement via cattle exclusion credit and planting (Figures 8A-D, Attachment A).

3.2 Riparian Area Restoration Activities

Riparian area restoration will involve planting appropriate native tree species along the riparian corridor throughout the proposed Site boundaries (73.9 acres). Vegetation management and herbicide applications may be needed over the first few years of tree establishment in the riparian restoration areas to prevent encroachment of undesirable species that may out-compete the planted native vegetation. Tree species planted across the Site are anticipated to include a mixture of the species listed in Table 9. Species availability may result in the substitution of regionally appropriate native species. A minimum of 4 species of trees and shrubs collectively will be planted. Final species composition and density will be detailed in the As-built Report.

Table 9: Proposed Hardwood Bare Root Planting Plan by Species*

Common Name	*Scientific Name*	% of Total Planted Trees	Canopy Type
Tag Alder	*Alnus serrulata*	8%	Shrub
River birch	*Betula nigra*	6%	Canopy
Bitternut Hickory	*Carya cordiformis*	1%	Canopy
Hornbeam	*Carpinus caroliniana*	8%	Midstory
Hackberry	*Celtis laevigata*	4%	Canopy
Red Bud	*Cercis canadensis*	1%	Midstory
Buttonbush	*Cephalanthus occidentalis*	8%	Shrub
Silky Dogwood	*Cornus amomum*	10%	Shrub
Persimmon	*Diospyros virginiana*	4%	Midstory
Green Ash	*Fraxinus pennsylvanica*	3%	Canopy
Tulip poplar	*Liriodendron tulipifera*	6%	Canopy
Red Mulberry	*Morus rubra*	4%	Midstory
Black gum	*Nyssa sylvatica*	7%	Canopy
Sycamore	*Platanus occidentalis*	7%	Canopy
Water oak	*Quercus nigra*	5%	Canopy
White oak	*Quercus alba*	3%	Canopy
Red oak	*Quercus rubra*	1%	Canopy
Willow oak	*Quercus phellos*	7%	Canopy
Shumard oak	*Quercus shumardii*	5%	Canopy
American elm	*Ulmus americana*	3%	Canopy

*Note: Species availability may result in the substitution of regionally appropriate native species.

Trees will be planted at a density sufficient to meet the performance standards outlined in Rule 15A NCAC 02B .0295 of 260 planted trees per acre at the end of five years of monitoring. In addition, no one tree species will be greater than 50% of the established stems. An appropriate seed mix of annual and

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perennial species will also be applied to provide temporary and permanent ground cover for soil stabilization and reduction of sediment loss during rain events in areas without existing herbaceous cover. Planting is tentatively scheduled for February 2024.

4.0 Monitoring Plan

4.1 Monitoring Protocol

Permanent vegetation monitoring plots will be installed and evaluated within the riparian buffer restoration areas to measure the survival of the planted trees. The plots will be randomly placed throughout the planted riparian areas. A total of twenty-three (23) plots (2.04% of the restoration/enhancement via planting credit generating area) will be established within the riparian restoration areas (Figures 9A-D). The size of individual quadrants will be 100 square meters.

Vegetation assessments will be conducted and follow the *Carolina Vegetation Survey (CVS) Level 2 Protocol for Recording Vegetation* (Lee 2008). A reference photo will be taken from the origin point of each plot and provided in the annual reports. All planted stems will be marked with flagging tape and recorded.

Planting is scheduled for February 2025. The first annual monitoring activities will commence at the end of the first growing season, at least five months after planting has been completed, and no earlier than the fall season. Species composition, height, and survival rates will be evaluated on an annual basis by plot. The total number of volunteer woody stems will also be documented and reported. The measure of vegetative success for the Site will be the survival of at least four native hardwood tree species, where no one species is greater than 50% of the established planted stems and an established density of at least 260 planted trees per acre at the end of monitoring year five. Appropriate and desirable native volunteer species may be included in the Site's density to meet the performance standards with DWR approval.

4.2 Reporting

Restoration Systems shall submit the annual monitoring report to NCDMS by December 31 of each year for five consecutive years. Table 10 outlines monitoring requirements for this project; monitoring parameter descriptions follow.

Table 10: Monitoring Parameter Descriptions

Required	Parameter	Quantity	Frequency	Notes
Yes	Vegetation	Twenty-three (23) plots located across all restored buffer zones.	Annual	Vegetation will be monitored for five years or until performance standards are met. Visual monitoring of the site will be done all five years. Analysis of vegetation will be recorded using level 2 CVS Monitoring protocol.
Yes	Project Boundary	NA	Annual	Locations of fence damage, vegetation damage, boundary encroachments, etc., will be mapped.

4.3 Performance Standards

Performance standards were established to verify that the vegetation component supports community elements necessary for forest development through the riparian buffer in accordance with North Carolina Division of Water Resources Administrative Code 15A NCAC 02B.0295 (Mitigation Program Requirements for Protection and Maintenance of Riparian Buffers). Performance standards are dependent upon the

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density and growth of at least four native hardwood tree species where no one species is greater than 50% of the stems. After five years of monitoring, an average density of 260 woody stems per acre, including planted shrubs, must be surviving. 15A NCAC 02b .0295 (2)(E) dictates that monitoring for planted stems would also include the health of planted stems. Level 2 CVS monitoring protocol requires vigor, a determinant of health, to be recorded. If requested, RS will make available during the monitoring years planted stem health, e.g., vigor.

4.4 Vegetation Contingency

If vegetation performance standards are not achieved based on average density calculations from combined plots over the entire restoration area, supplemental planting may be performed with tree species approved by regulatory agencies. Supplemental planting will be completed as needed until the achievement of vegetation performance standards.

5.0 Financial Assurances and Long-Term Management

5.1 Financial Assurances

Pursuant to Section IV H and Appendix III of the NCDEQ DMS (formerly Ecosystem Enhancement Program) In-Lieu Fee Instrument dated July 28, 2010, the North Carolina Department of Environmental Quality (NCDEQ) has provided the USACE-Wilmington District with a formal commitment to fund projects to satisfy mitigation requirements assumed by NCDEQ DMS. This commitment provides financial assurance for all mitigation projects implemented by the program.

5.2 Long Term Management Plan

The Site will be transferred to the NCDEQ Stewardship Program. This party shall serve as conservation easement holder and long-term steward for the property. It will conduct periodic inspections 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 Statute GS 113A-232(d)(3). Interest gained by the endowment fund may be used for the purpose of stewardship, monitoring, stewardship administration, and land transaction costs, if applicable.

The Stewardship Program will periodically install signage to identify boundary markings, as needed. Any livestock or associated fencing or permanent crossings will be the responsibility of the underlying property owner to maintain.

6.0 Mitigation Potential

Of the approximately 107.6 acres protected under the conservation easement, 45.867 acres (1,997,991 sq. ft.) are anticipated to provide RBCs (Figures 8A-D, Attachment A). Riparian area restoration, with a minimum of 50 feet from the top of bank (TOB), out 200 feet from the TOB, can be converted to NOC. The RBC/NOC calculation was derived based on Restoration Systems' conceptual design for maximum ecological uplift. The management objectives, mitigation type, and proposed credits are presented in a complete DWR Mitigation Credit Table on the following page (Table 9).

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7.0 References

Lee, M.T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Level 1-2 Plot Version 4.2. Ecosystem Enhancement Program, North Carolina Department of Environment and Natural Resources.

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North Carolina Division of Water Resources (NCDWR). 2013. River Basin Classification Schedule: Cape Fear (online). Available: https://files.nc.gov/ncdeq/Water%20Quality/Planning/CSU/Surface%20Water/River%20Basin%20Water%20Quality%20Classifications%20as%20of%20Dec%209%202013/CapeFear_Hydro_order.pdf (September 10, 2019).

North Carolina Ecosystem Enhancement Program (NCEEP 2009). Cape Fear River Basin Restoration Priorities 2009 (online). Available: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Cape_Fear_River_Basin/RBRP%20CapeFear%202009%20Revised%20032013.pdf (May 14, 2021).

United States Department of Agriculture (USDA). 2021. Web Soil Survey (online). Available: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx [April 21, 2020].

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Table 11. Stinking Quarter, NC-DWR Project # 2021-0395, Project Credits

Cape Fear - Jordan Haw 03030002040070	Project Area
28.90375	N Credit Conversion Ratio (ft^2/pound)
504.83277	P Credit Conversion Ratio (ft^2/pound)

Credit Type	Location	Subject? (enter NO if ephemeral or ditch [1])	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (ft^2)	Total (Creditable) Area of Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Convertible to Riparian Buffer?	Riparian Buffer Credits	Convertible to Nutrient Offset?	Delivered Nutrient Offset: N (lbs)	Delivered Nutrient Offset: P (lbs)
Buffer	Rural	Yes	I / P	Restoration	20-29	UT16	34	34	1	75%	1.33333	Yes	25.500	No	—	—
Buffer	Rural	No	I / P	Restoration	20-29	UT15	22	22	1	75%	1.33333	Yes	16.500	No	—	—
Buffer	Rural	Yes	I / P	Restoration	0-100	NPSQ, UT1, UT5, UT6, UT9, UT16, UT17	374,570	374,570	1	100%	1.00000	Yes	374,570.000	Yes	12,959.218	741.968
Buffer	Rural	No	I / P	Restoration	0-100	UT3, UT12, UT15, UT18, UT20	127,262	127,262	1	100%	1.00000	Yes	127,262.000	Yes	4,402.958	252.087
Buffer	Rural	Yes	I / P	Restoration	101-200	NPSQ, UT1, UT5, UT6, UT9, UT16, UT17	55,909	55,909	1	33%	3.03030	Yes	18,449.988	Yes	1,934.316	110.748
Buffer	Rural	No	I / P	Restoration	101-200	UT12, UT20	15,478	15,478	1	33%	3.03030	Yes	5,107.745	Yes	535.501	30.660
Buffer	Rural	Yes	I / P	Enhancement	20-29	UT5, UT16	1,457	1,457	2	75%	2.66667	Yes	546.374	No	—	—
Buffer	Rural	No	I / P	Enhancement	20-29	UT7	33	33	2	75%	2.66667	Yes	12.375	No	—	—
Buffer	Rural	Yes	I / P	Enhancement	0-100	NPSQ, UT1, UT5, UT6, UT9, UT16, UT17	527,107	527,107	2	100%	2.00000	Yes	263,553.500	No	—	—
Buffer	Rural	No	I / P	Enhancement	0-100	UT1, UT3, UT7, UT19, UT20	54,498	54,498	2	100%	2.00000	Yes	27,249.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement	101-200	NPSQ, UT1, UT5, UT9, UT16, UT17	58,317	58,317	2	33%	6.06061	Yes	9,622.299	No	—	—
Buffer	Rural	No	I / P	Enhancement	101-200	UT19	348	348	2	33%	6.06061	Yes	57.420	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	20-29	UT5, UT16	1,756	1,756	2	75%	2.66667	Yes	658.499	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	0-100	NPSQ, UT1, UT2, UT5, UT6	248,871	248,871	2	100%	2.00000	Yes	124,435.500	No	—	—
Buffer	Rural	No	I / P	Enhancement via Cattle Exclusion	0-100	UT1, UT20	71,118	71,118	2	100%	2.00000	Yes	35,559.000	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	101-200	NPSQ, UT1, UT5	24,887	24,887	2	33%	6.06061	Yes	4,106.352	No	—	—
Buffer	Rural	Yes	I / P	Enhancement via Cattle Exclusion	101-200	UT1, UT20	6,873	6,873	2	33%	6.06061	Yes	1,134.044	No	—	—
													—		—	—
													—		—	—
						Totals (ft2):	1,568,540	1,568,540					992,366.097		19,831.994	1,135.463
						Total Buffer (ft2):	1,568,540	1,568,540								
						Total Nutrient Offset (ft2):	0	N/A								
						Total Ephemeral Area (ft^2) for Credit:	0	0								
						Total Eligible Ephemeral Area (ft^2):	500,051	0.0%	Ephemeral Reaches as % TABM							
Enter Preservation Credits Below						Total Eligible for Preservation (ft^2):	522,847	20.6%	Preservation as % TABM							

Credit Type	Location	Subject?	Feature Type	Mitigation Activity	Min-Max Buffer Width (ft)	Feature Name	Total Area (sf)	Total (Creditable) Area for Buffer Mitigation (ft^2)	Initial Credit Ratio (x:1)	% Full Credit	Final Credit Ratio (x:1)	Riparian Buffer Credits
	Rural	Yes	I / P		20-29	NPSQ	506	506	10	75%	13.33333	37.950
	Rural	No	I / P		20-29	UT11, UT12	499	499	5	75%	6.66667	74.850
	Rural	Yes	I / P		0-100	NPSQ, UT16	262,989	262,989	10	100%	10.00000	26,298.900
	Rural	No	I / P		0-100	UT11, UT12, UT14	60,634	60,634	5	100%	5.00000	12,126.800
	Rural	Yes	I / P		101-200	NPSQ	100,804	100,804	10	33%	30.30303	3,326.532
	Rural	No	I / P		101-200	UT12	6,232	6,232	5	33%	15.15152	411.312
												—
												—
												—
						Preservation Area Subtotals (ft^2):	431,664	431,664				

TOTAL AREA OF BUFFER MITIGATION (TABM)			
Mitigation Totals		Square Feet	Credits
Restoration:		573,275	525,431.734
Enhancement:		995,265	466,934.364
Preservation:		431,664	42,276.344
Total Riparian Buffer:		2,000,204	1,034,642.441
TOTAL NUTRIENT OFFSET MITIGATION			
Mitigation Totals		Square Feet	Credits
Nutrient Offset:	Nitrogen:	0	0.000
	Phosphorus:		0.000

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

last updated 08/03/2020

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Attachment A. Figures

Figure 1. Site Location & Hydrologic Unit Map
Figure 2. Soil Survey of Guilford County
Figure 3. US Geological Survey Topo Quad
Figure 4, 4A-D. Existing Conditions – 1998 Land Use
Figure 5, 5A-D. Existing Conditions – 2009 Land Use
Figure 6. 6A-D. Existing Conditions – Current Land Use
Figure 7, 7A-D. Restoration and Planting Plan
Figure 8, 8A-D. Riparian Buffer Mitigation Credit Determination
Figure 9, 9A-D. Monitoring Plan

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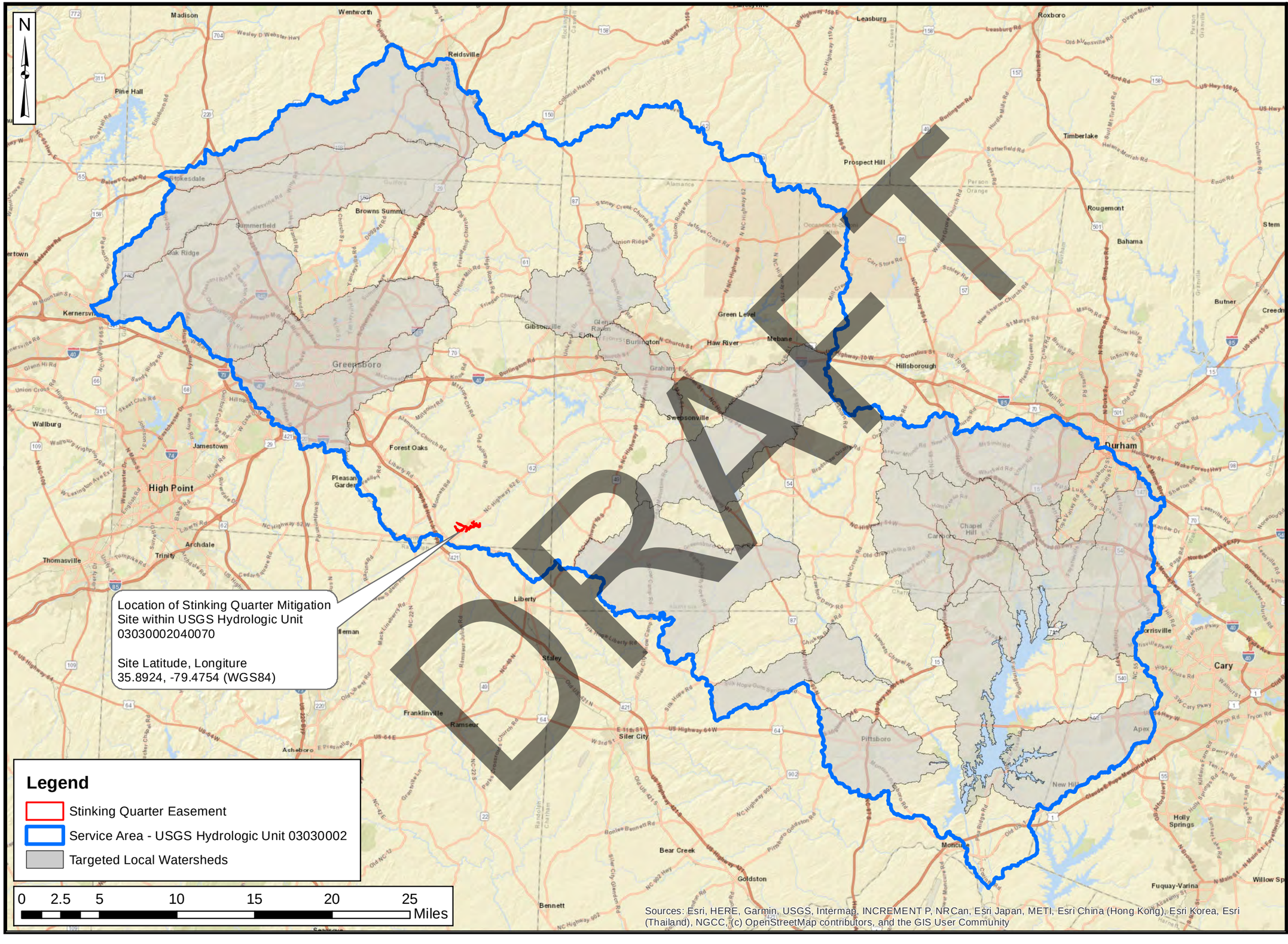


Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

SITE LOCATION & HYDROLOGIC UNIT MAP

Drawn by: WGL

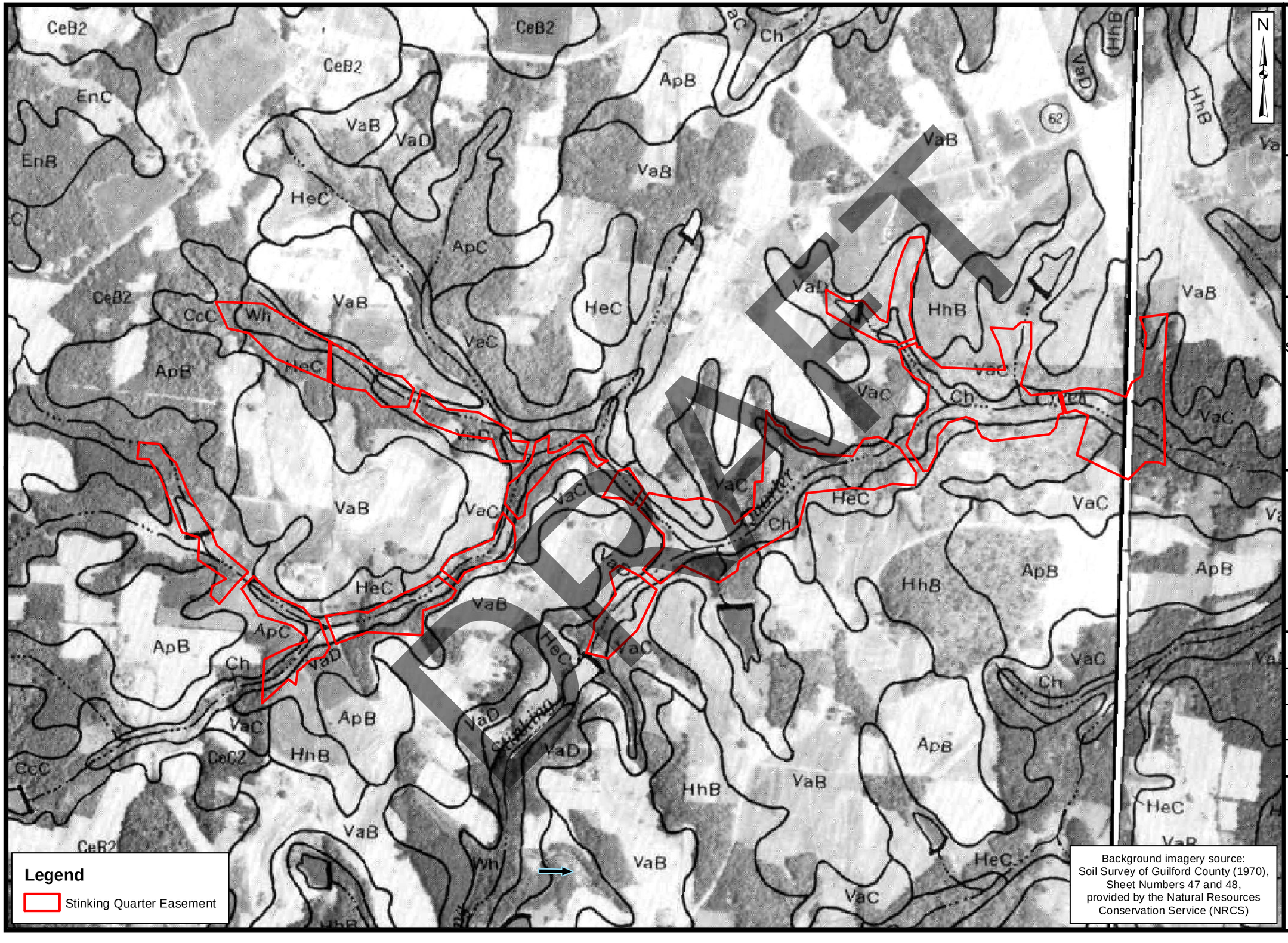
Date: MAR 2023

Scale: 1:370,000

Project No.: 21-012

FIGURE

1



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DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

SOIL SURVEY OF GUILFORD COUNTY

Drawn by: KRJ

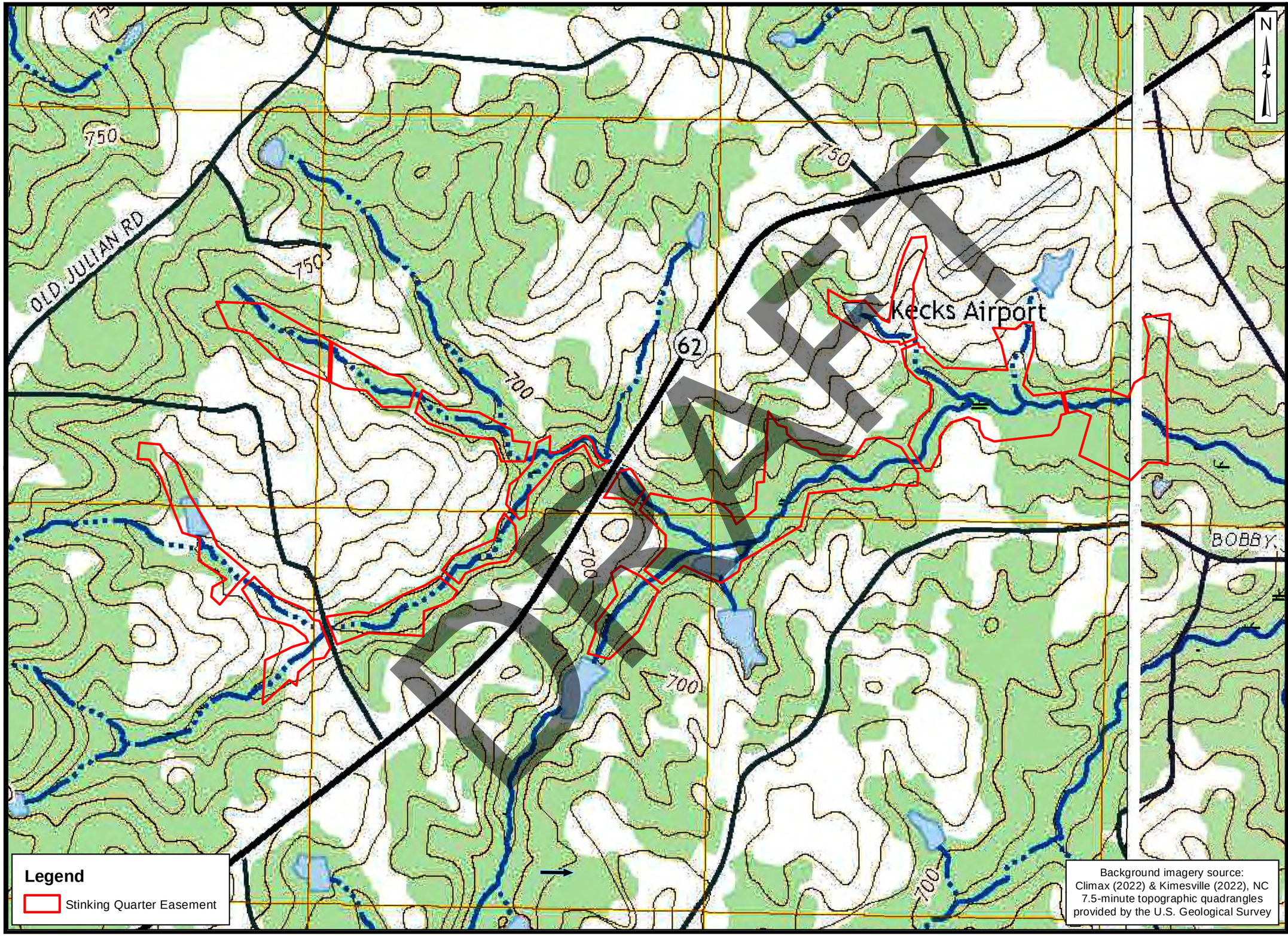
Date: MAY 2023

Scale: 1:9000

Project No.: 21-012

FIGURE

2



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DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

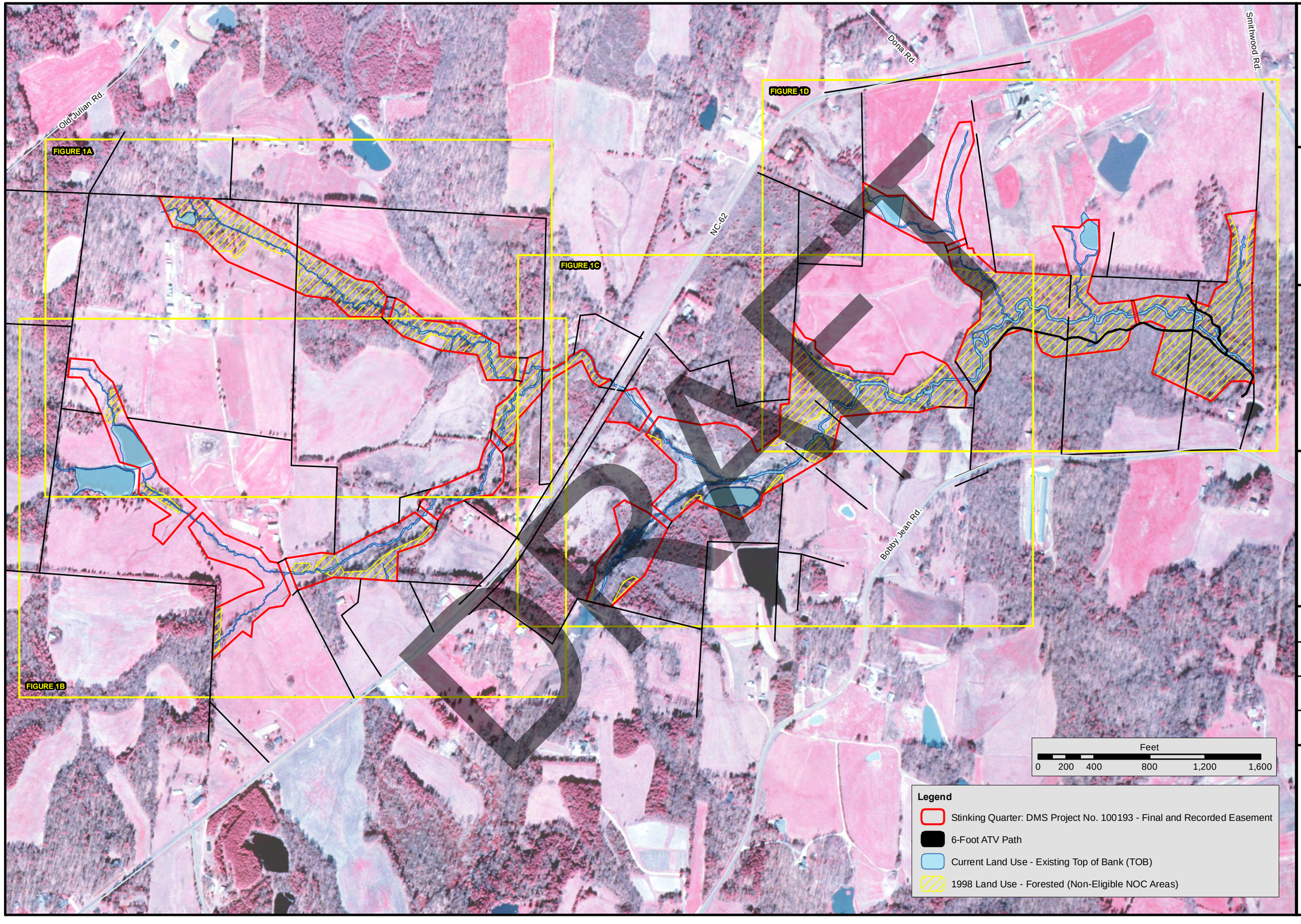
Title:

US GEOLOGICAL SURVEY TOPO QUAD

Drawn by:	KRJ
Date:	MAY 2023
Scale:	1:9000
Project No.:	21-012

FIGURE

3



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Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

1998 LAND USE

Imagery Date: January 01, 1999

Drawn by: RJH

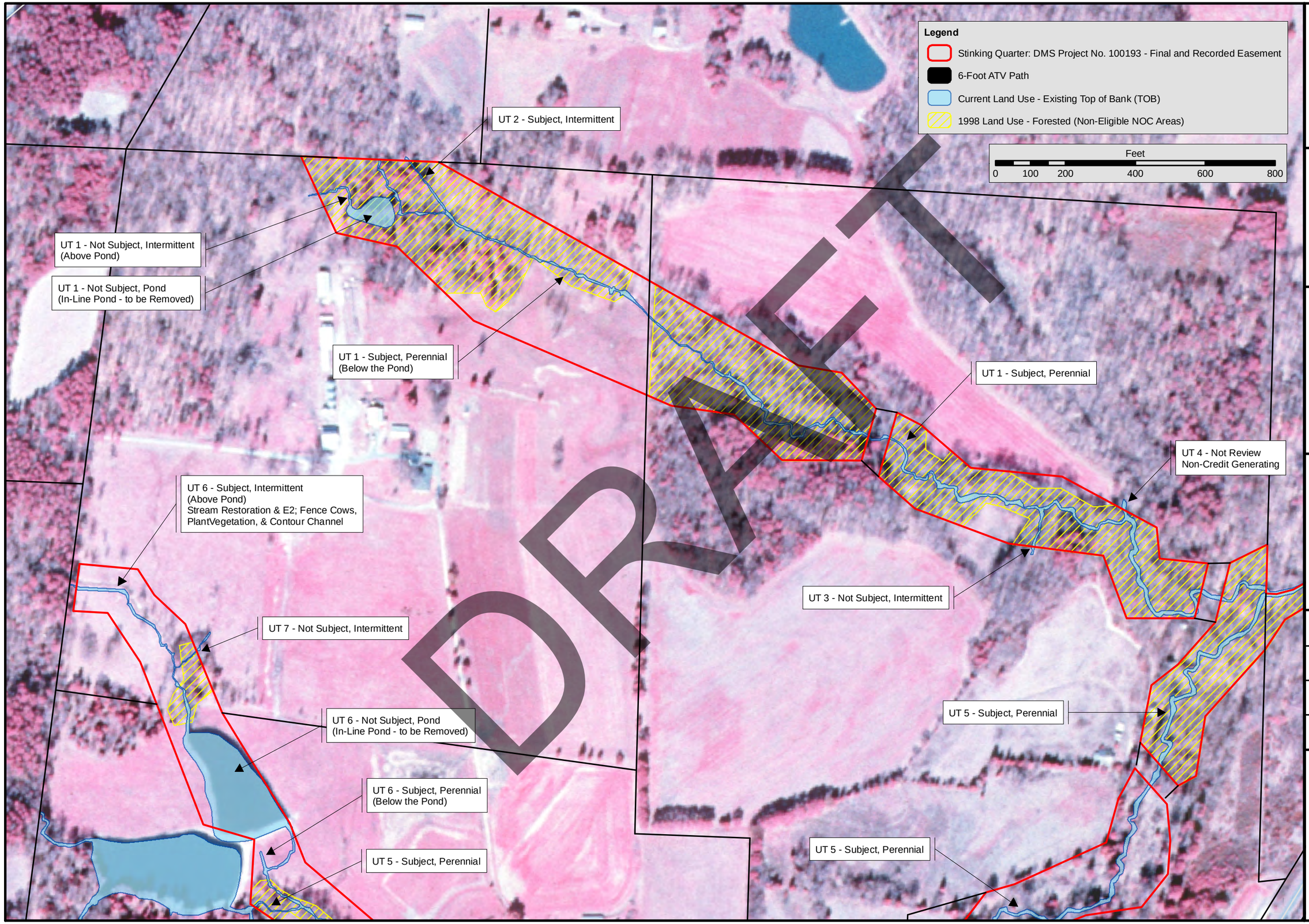
Date: APRIL 2023

Scale: 1:7,500

Project No.: 100193

FIGURE

4



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DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

1998 LAND USE

Imagery Date: January 01, 1999

Drawn by: RJH

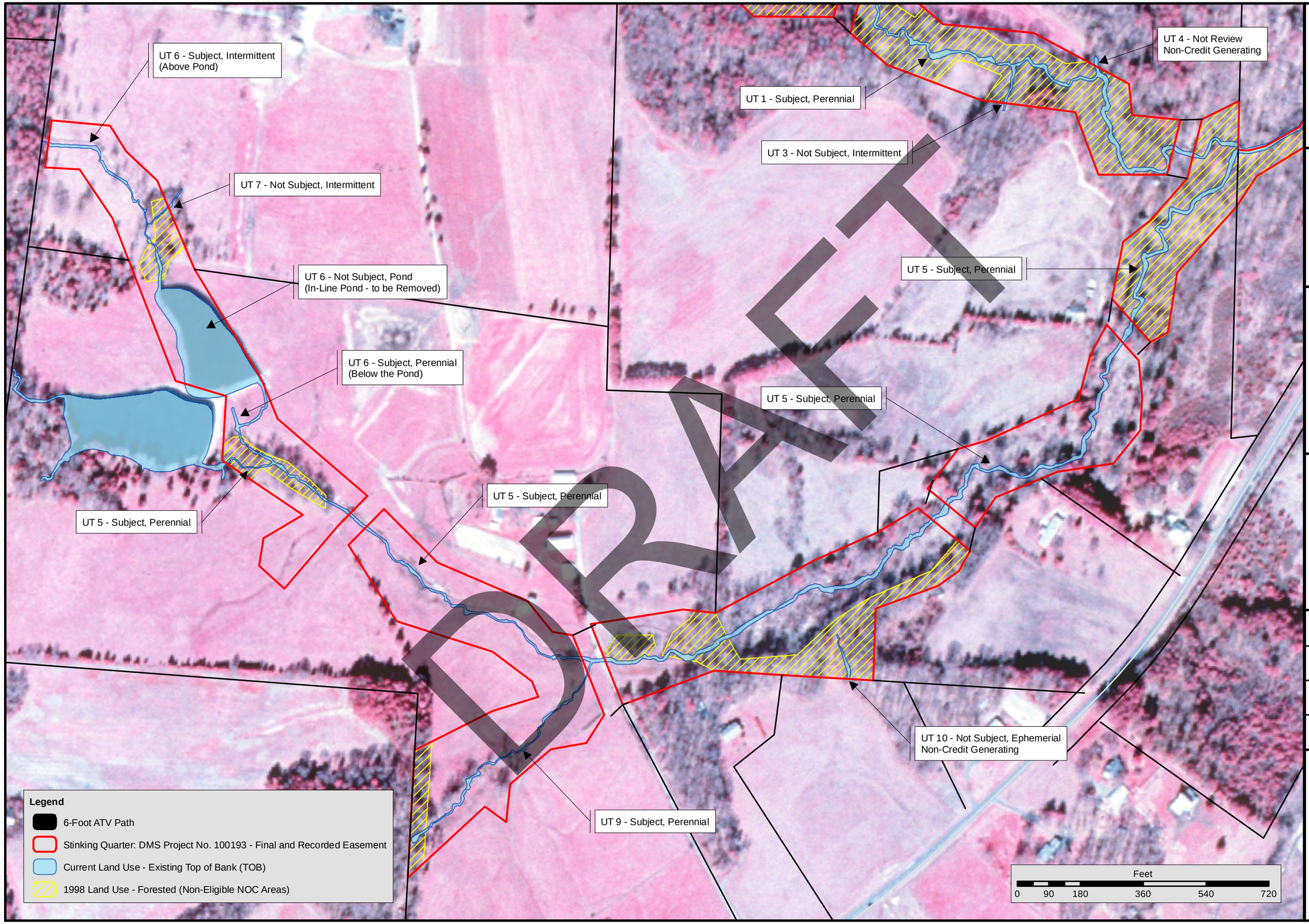
Date: APRIL 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

4A



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DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

1998 LAND USE

Imagery Date: January 01, 1999

Drawn by: RJH

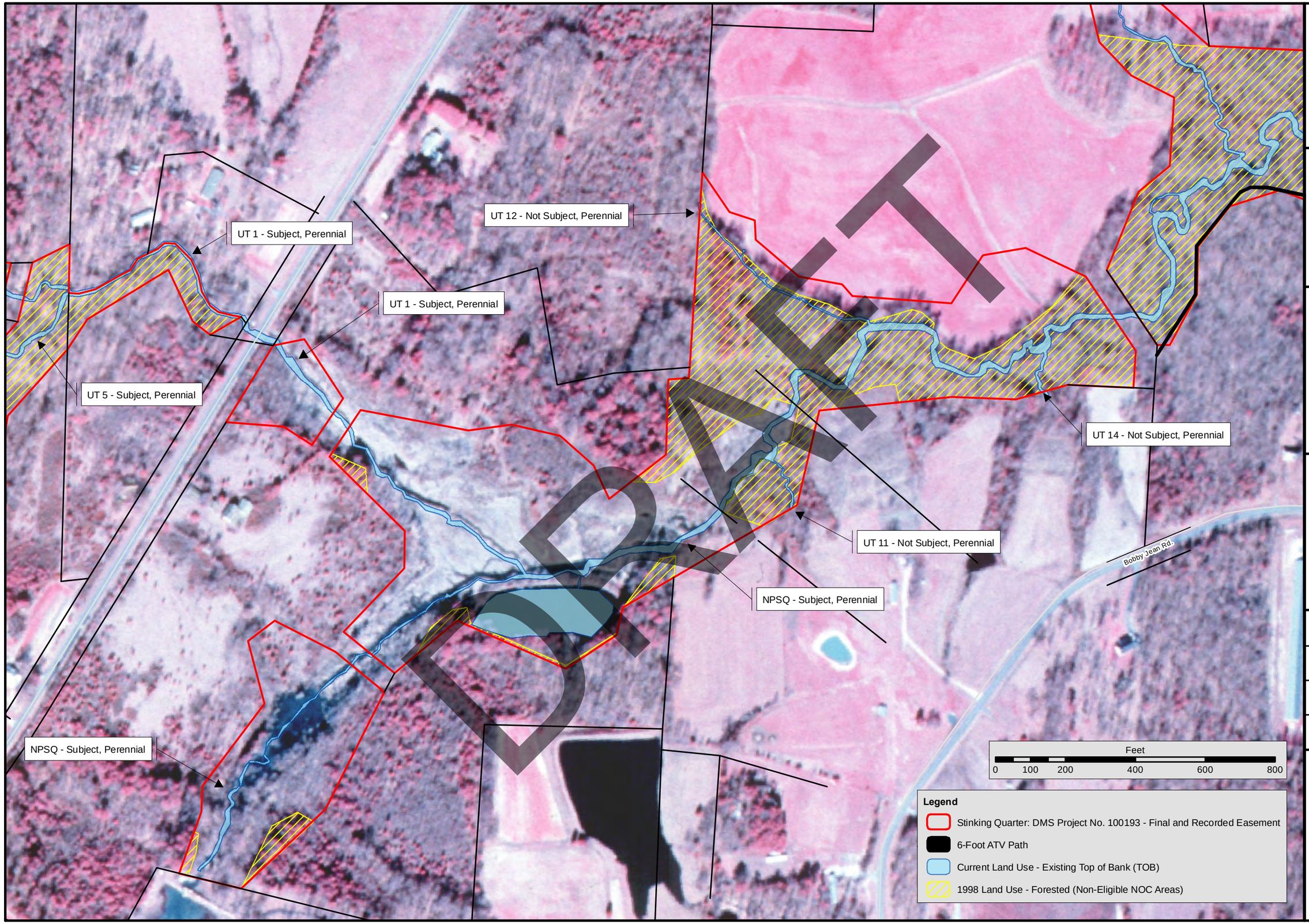
Date: APRIL 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

4B



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401 & Buffer Permitting Branch

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STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

1998 LAND USE

Imagery Date: January 01, 1999

Drawn by: RJH

Date: APRIL 2023

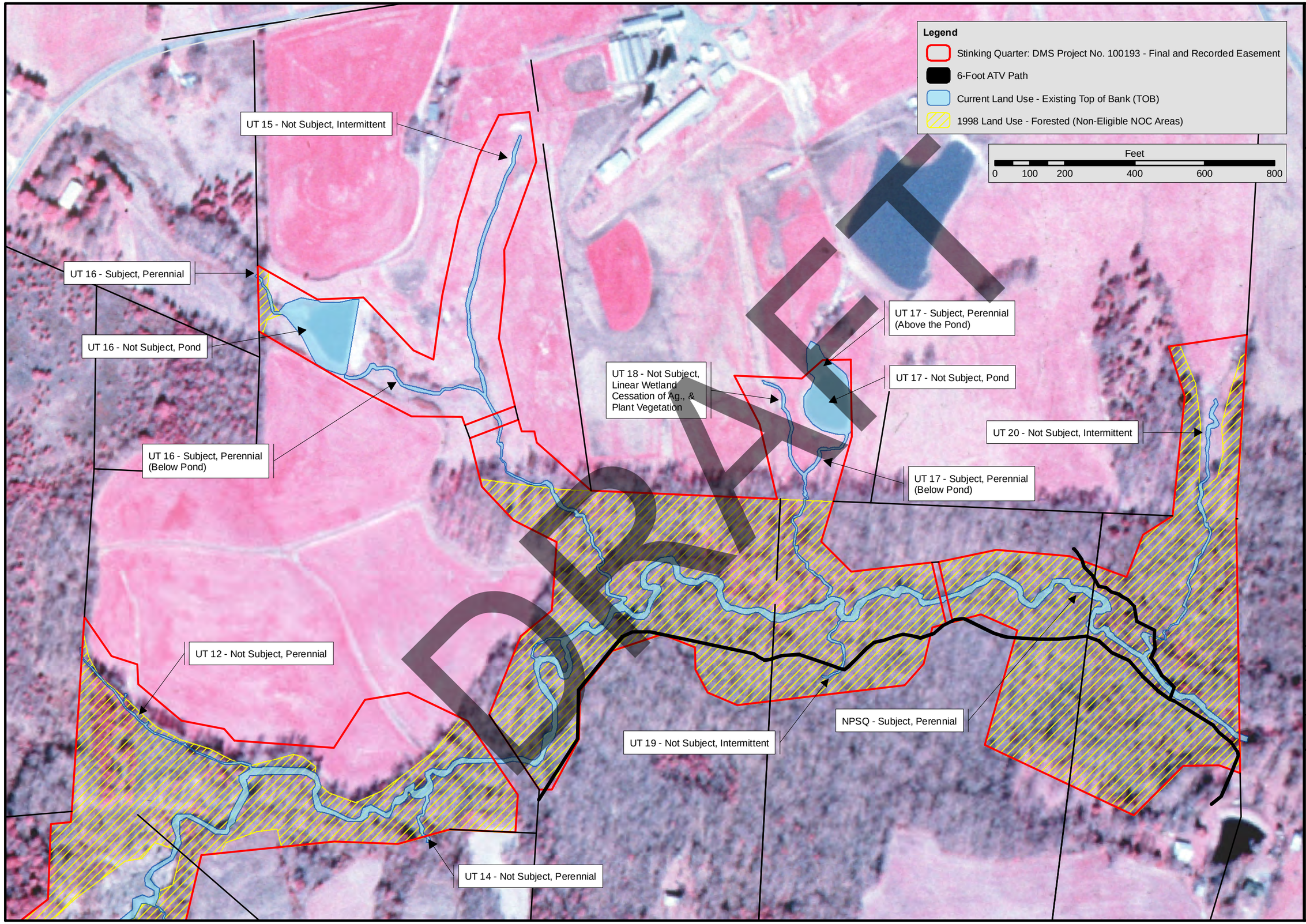
Scale: 1:3,000

Project No.: 100193

FIGURE

4C

N



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Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

1998 LAND USE

Imagery Date: January 01, 1999

Drawn by: RJH

Date: APRIL 2023

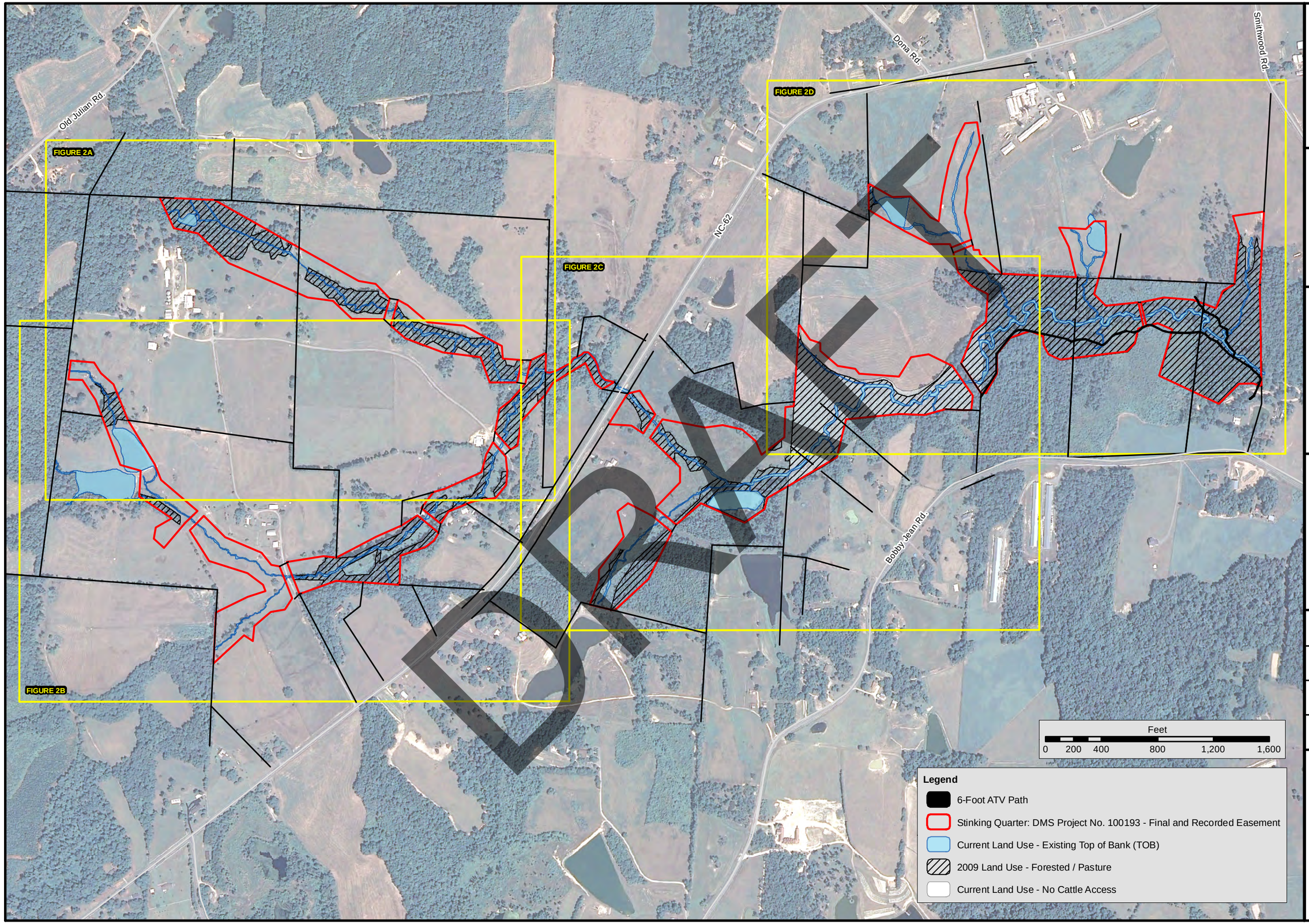
Scale: 1:3,000

Project No.: 100193

FIGURE

4D

N



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Project:

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DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

2009 LAND USE

Imagery Date: 2009

Drawn by: RJH

Date: APRIL 2023

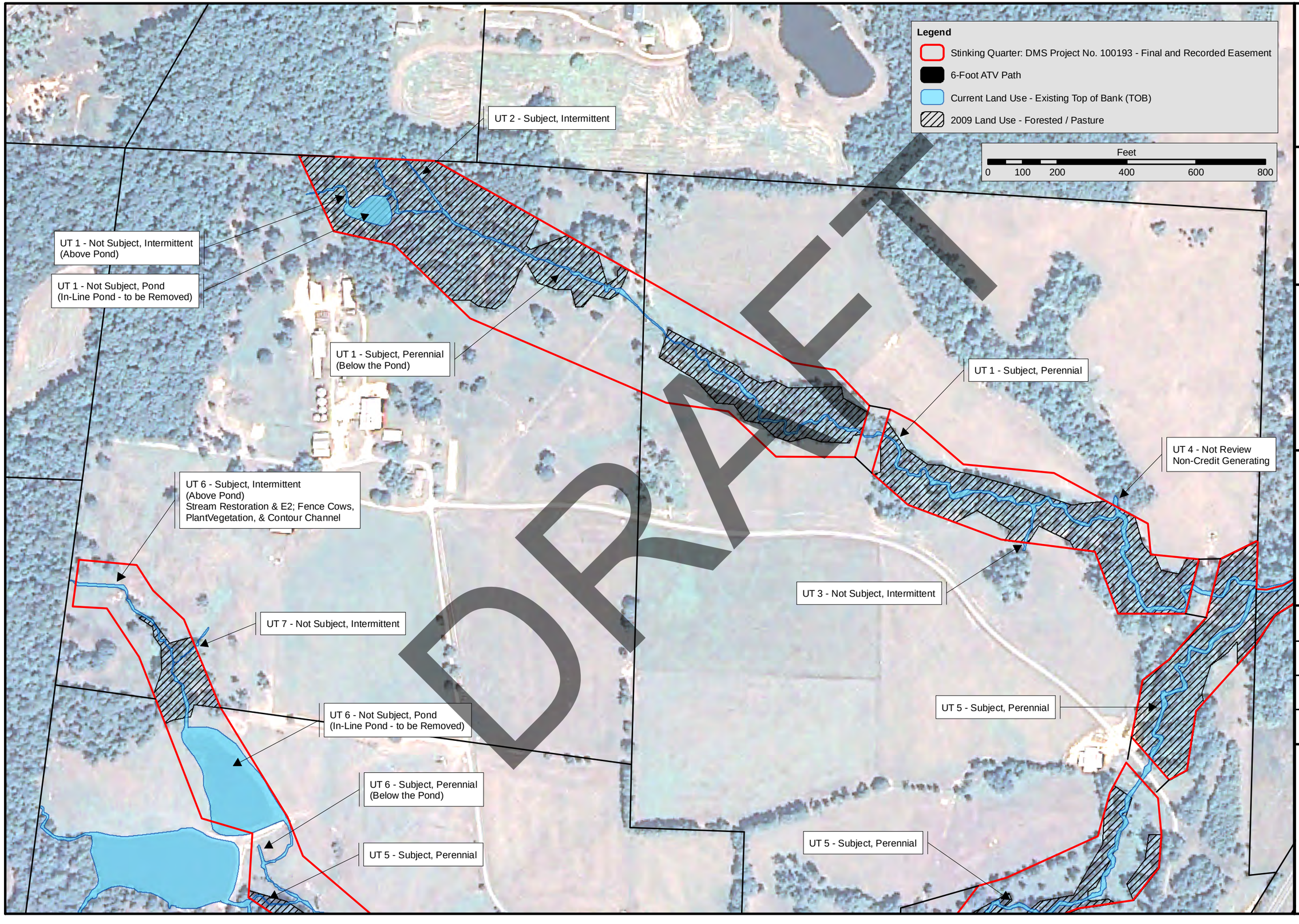
Scale: 1:7,500

Project No.: 100193

FIGURE

5

N



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Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

2009 LAND USE

Imagery Date: 2009

Drawn by: RJH

Date: APRIL 2023

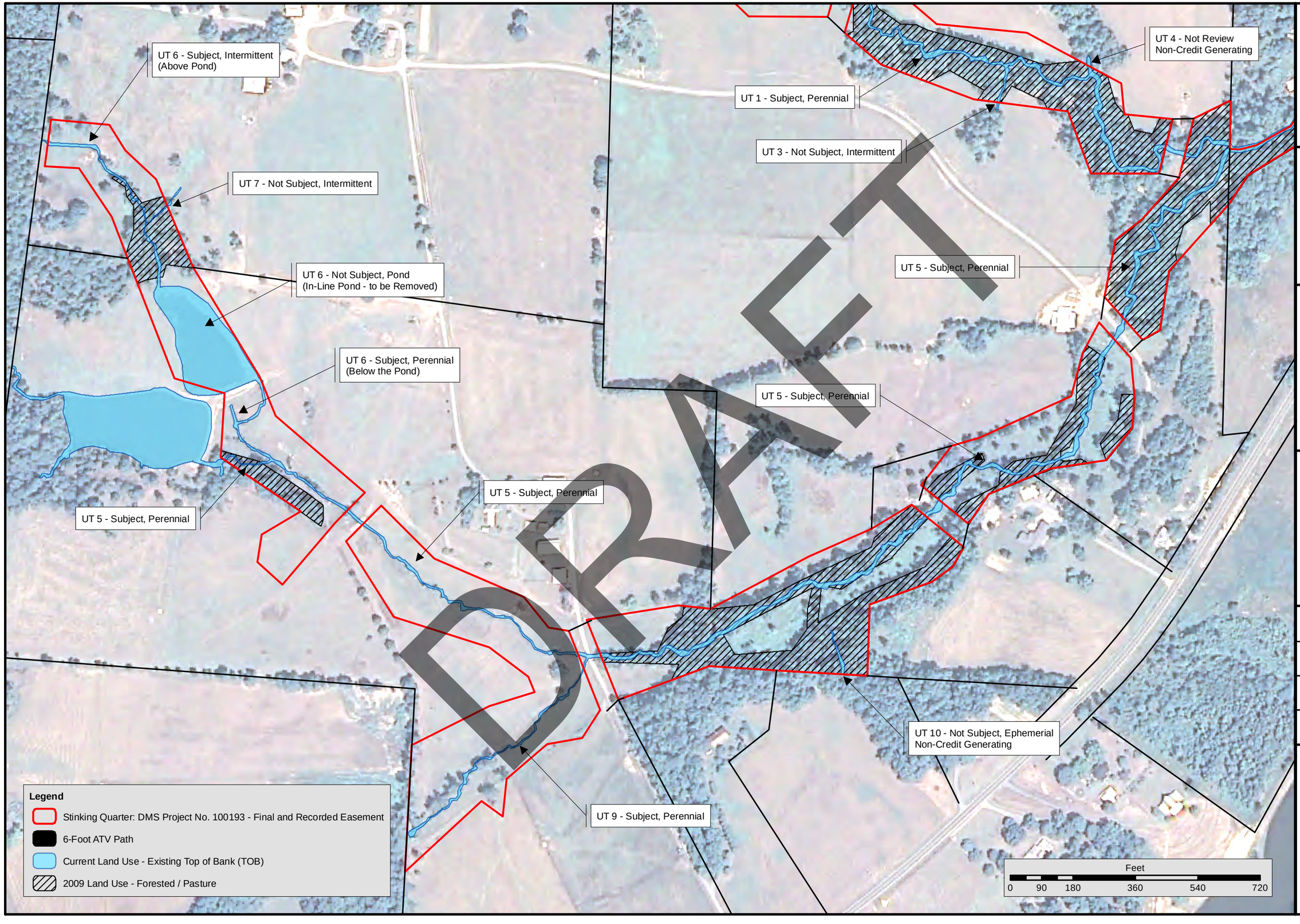
Scale: 1:3,000

Project No.: 100193

FIGURE

5A

N



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Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

2009 LAND USE

Imagery Date: 2009

Drawn by: RJH

Date: APRIL 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

5B

UT 1 - Subject, Perennial

UT 12 - Not Subject, Perennial

UT 1 - Subject, Perennial

UT 5 - Subject, Perennial

UT 14 - Not Subject, Perennial

UT 11 - Not Subject, Perennial

NPSQ - Subject, Perennial

NPSQ - Subject, Perennial

Bobby Jean Rd

DRAFT

Feet
0 100 200 400 600 800

Legend

- Stinking Quarter: DMS Project No. 100193 - Final and Recorded Easement
- 6-Foot ATV Path
- Current Land Use - Existing Top of Bank (TOB)
- 2009 Land Use - Forested / Pasture
- Current Land Use - No Cattle Access

RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

2009 LAND USE

Imagery Date: 2009

Drawn by: RJH

Date: APRIL 2023

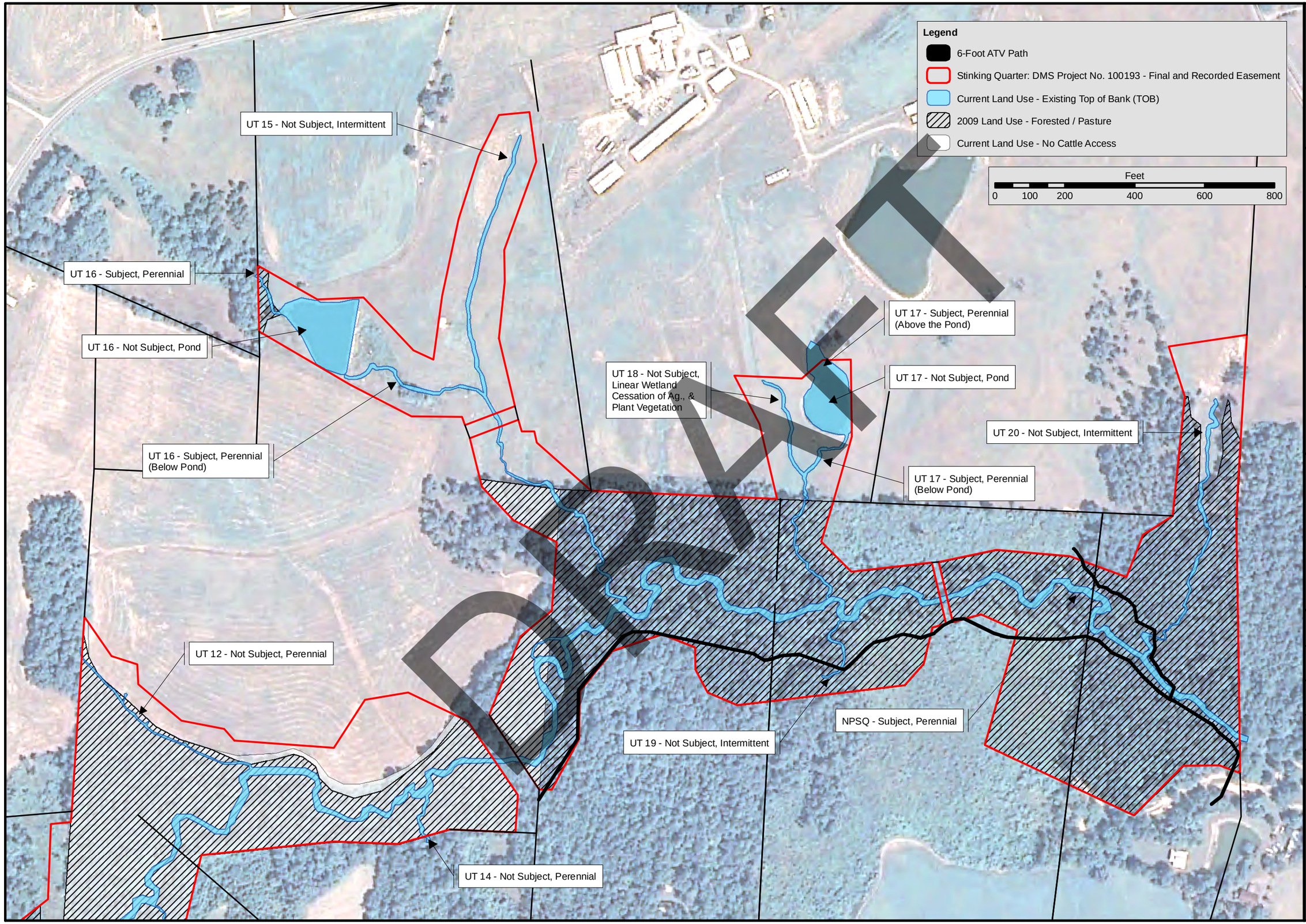
Scale: 1:3,000

Project No.: 100193

FIGURE

5C

N



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

2009 LAND USE

Imagery Date: 2009

Drawn by: RJH

Date: APRIL 2023

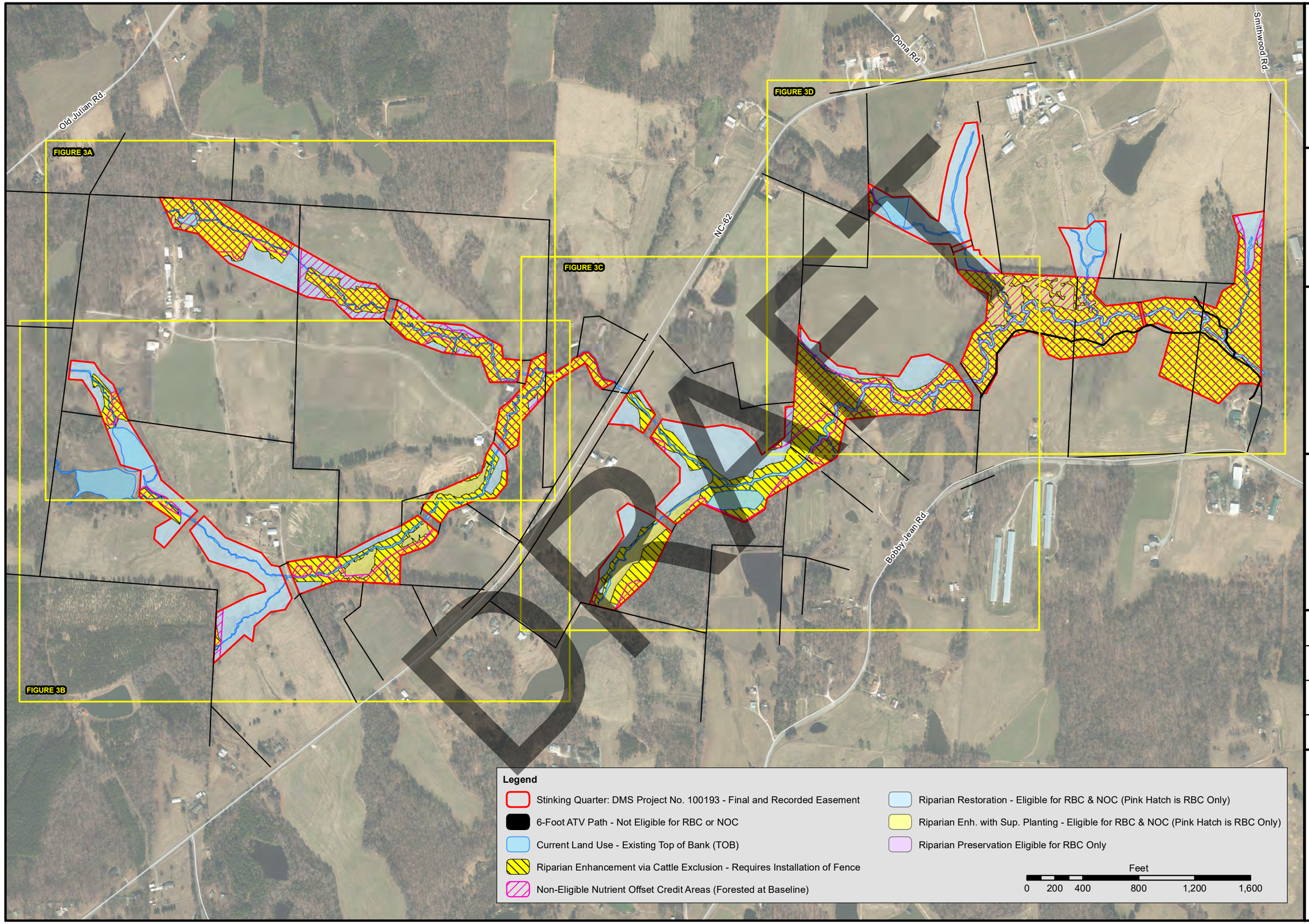
Scale: 1:3,000

Project No.: 100193

FIGURE

5D

N



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of
Water Resources

401 & Buffer
Permitting
Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

CURRENT LAND USE

Imagery Date: 2022-02-09

Drawn by: RJH

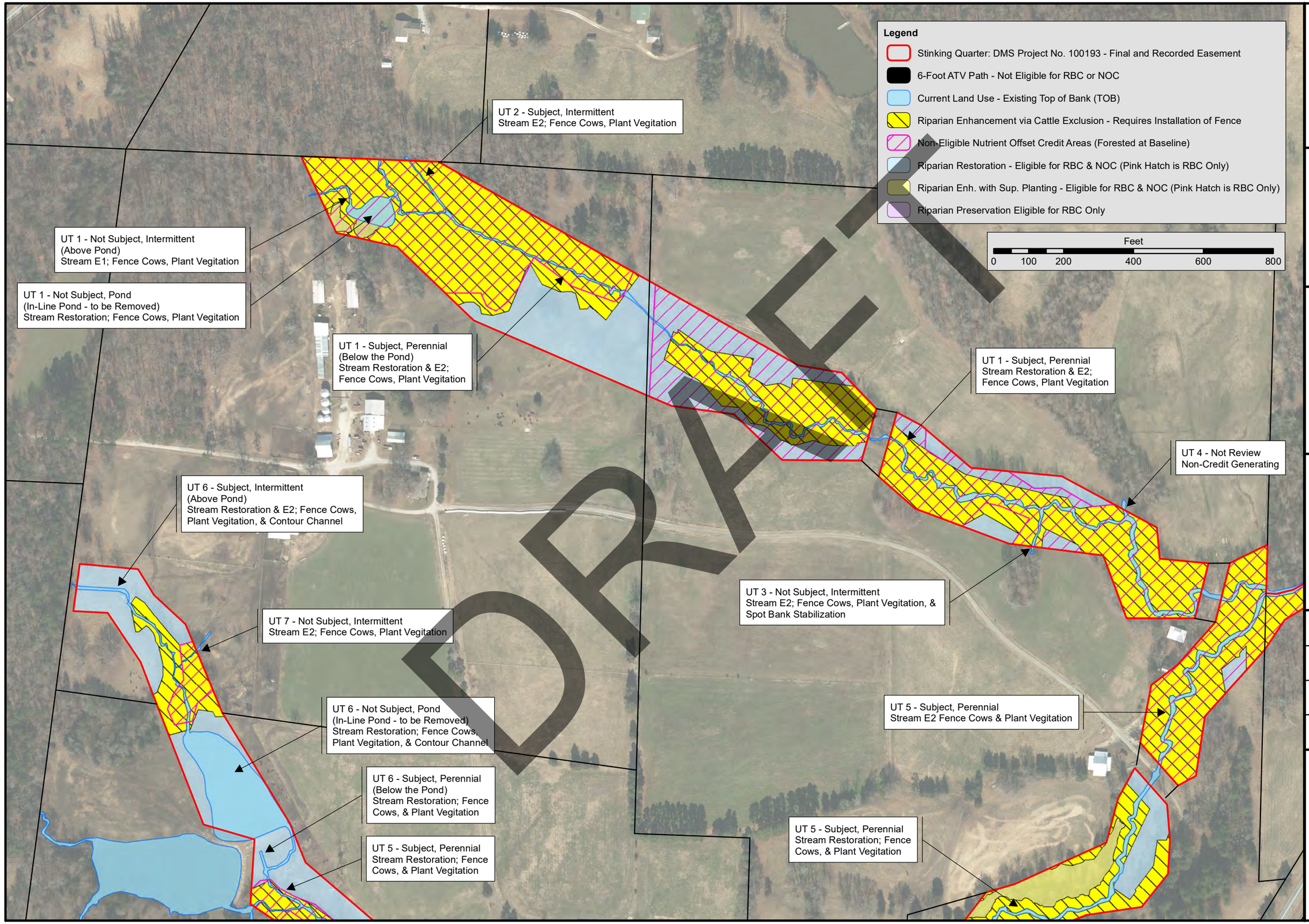
Date: JULY 2023

Scale: 1:7,500

Project No.: 100193

FIGURE

6



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of
Water Resources

401 & Buffer
Permitting
Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

CURRENT LAND USE

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

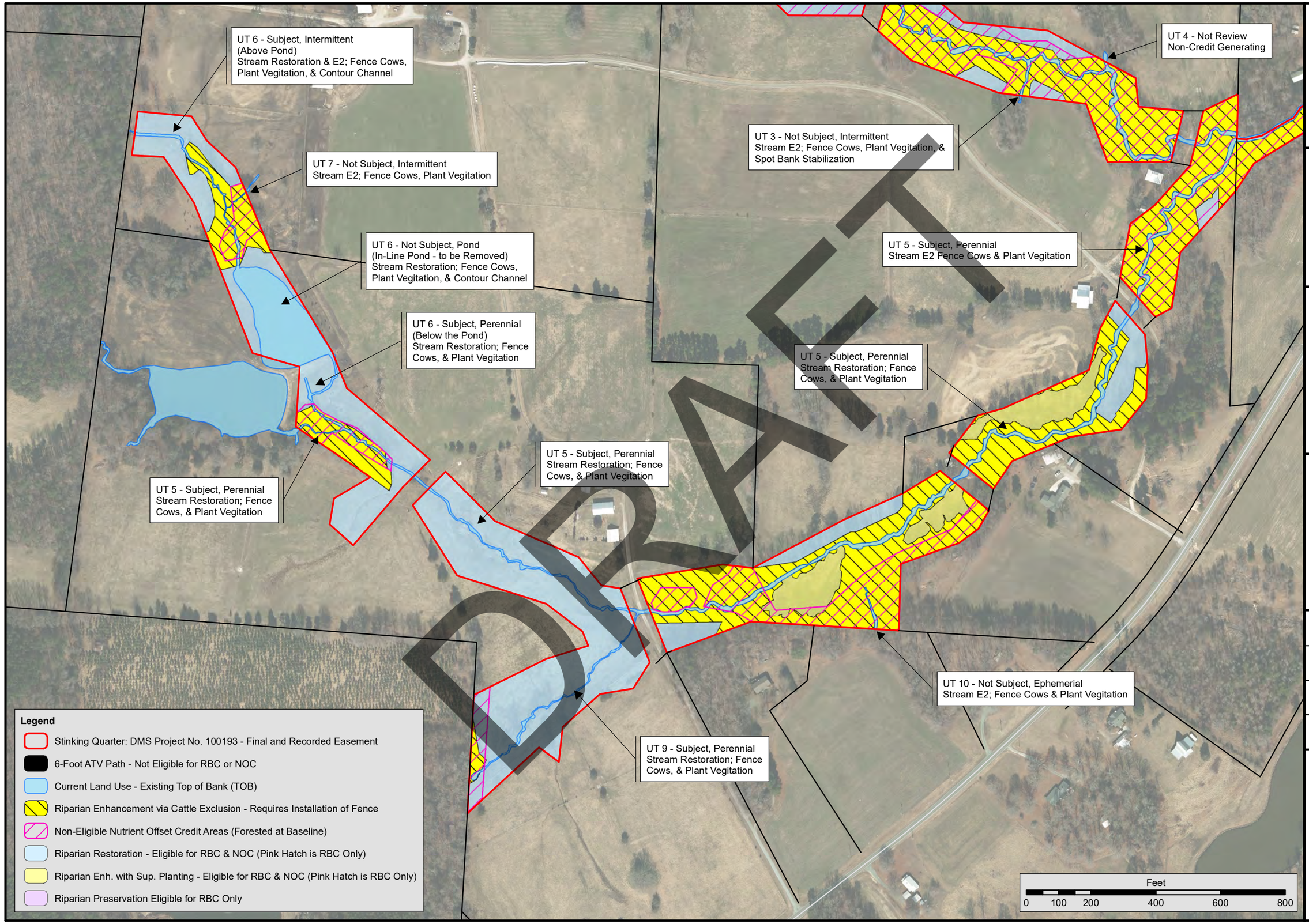
Scale: 1:3,000

Project No.: 100193

FIGURE

6A

N



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of
Water Resources

401 & Buffer
Permitting
Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

CURRENT LAND USE

Imagery Date: 2022-02-09

Drawn by: RJH

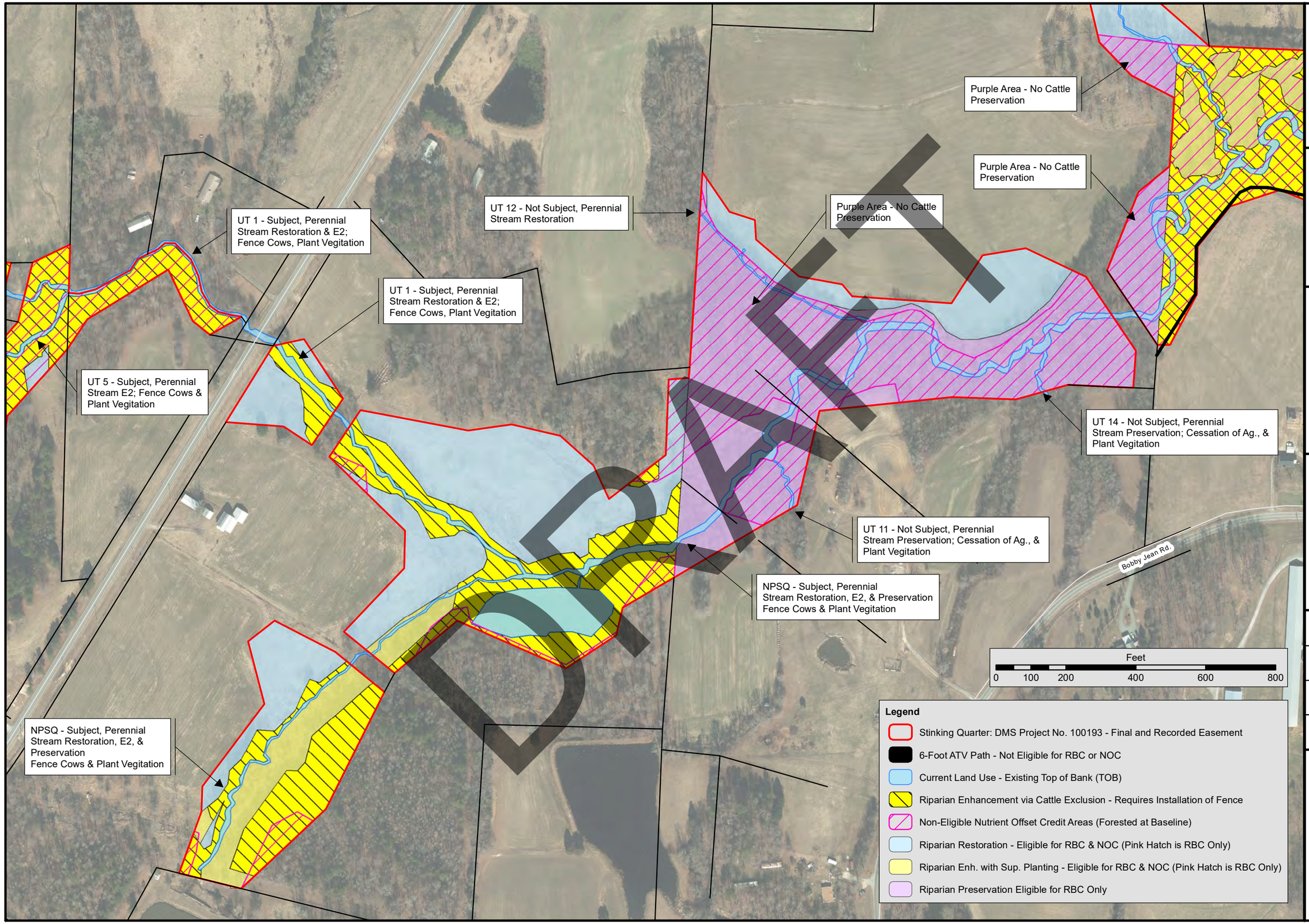
Date: JULY 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

6B



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

CURRENT LAND USE

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

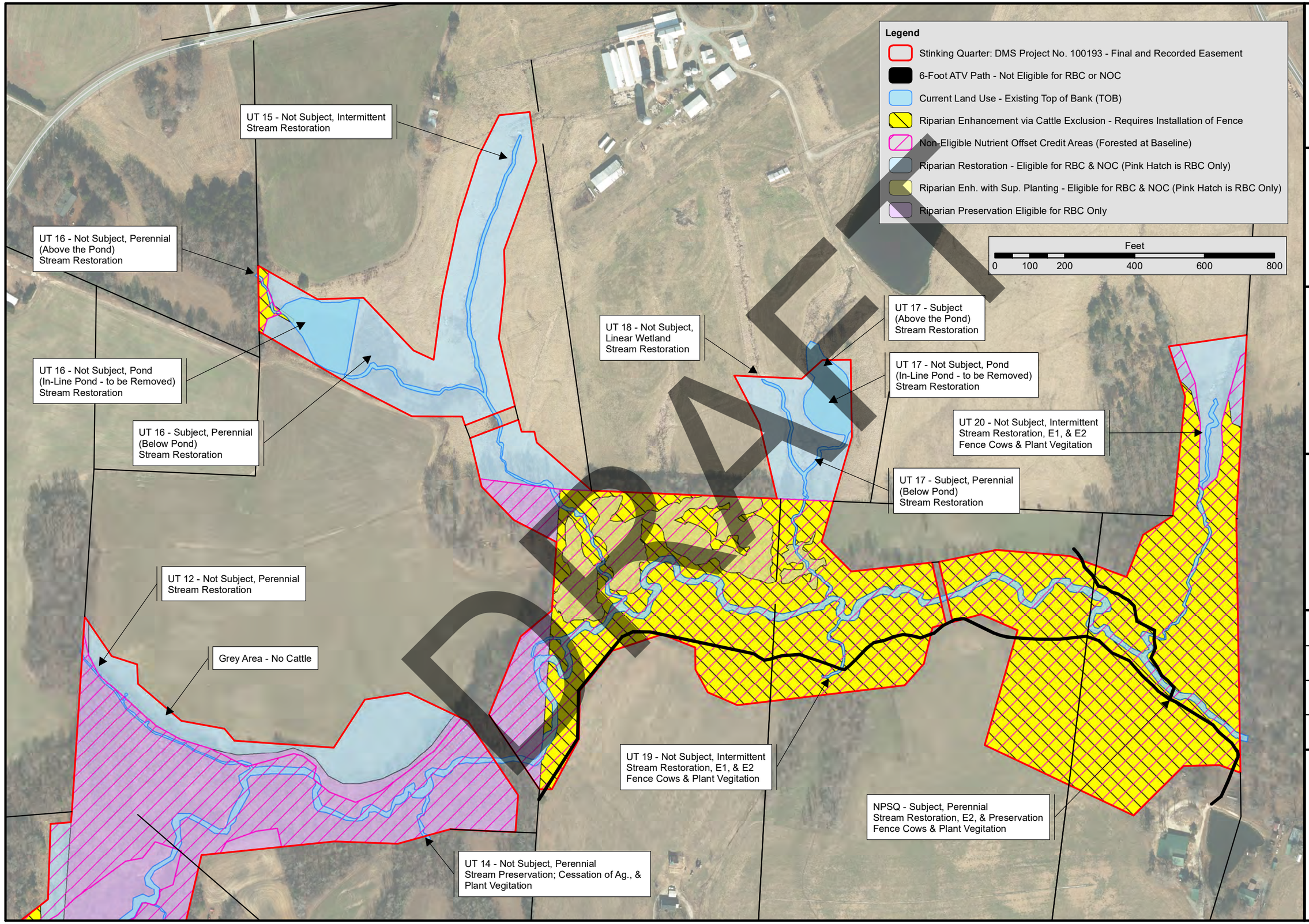
Scale: 1:3,000

Project No.: 100193

FIGURE

6C

N



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of Water Resources

401 & Buffer Permitting Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

EXISTING CONDITIONS

CURRENT LAND USE

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

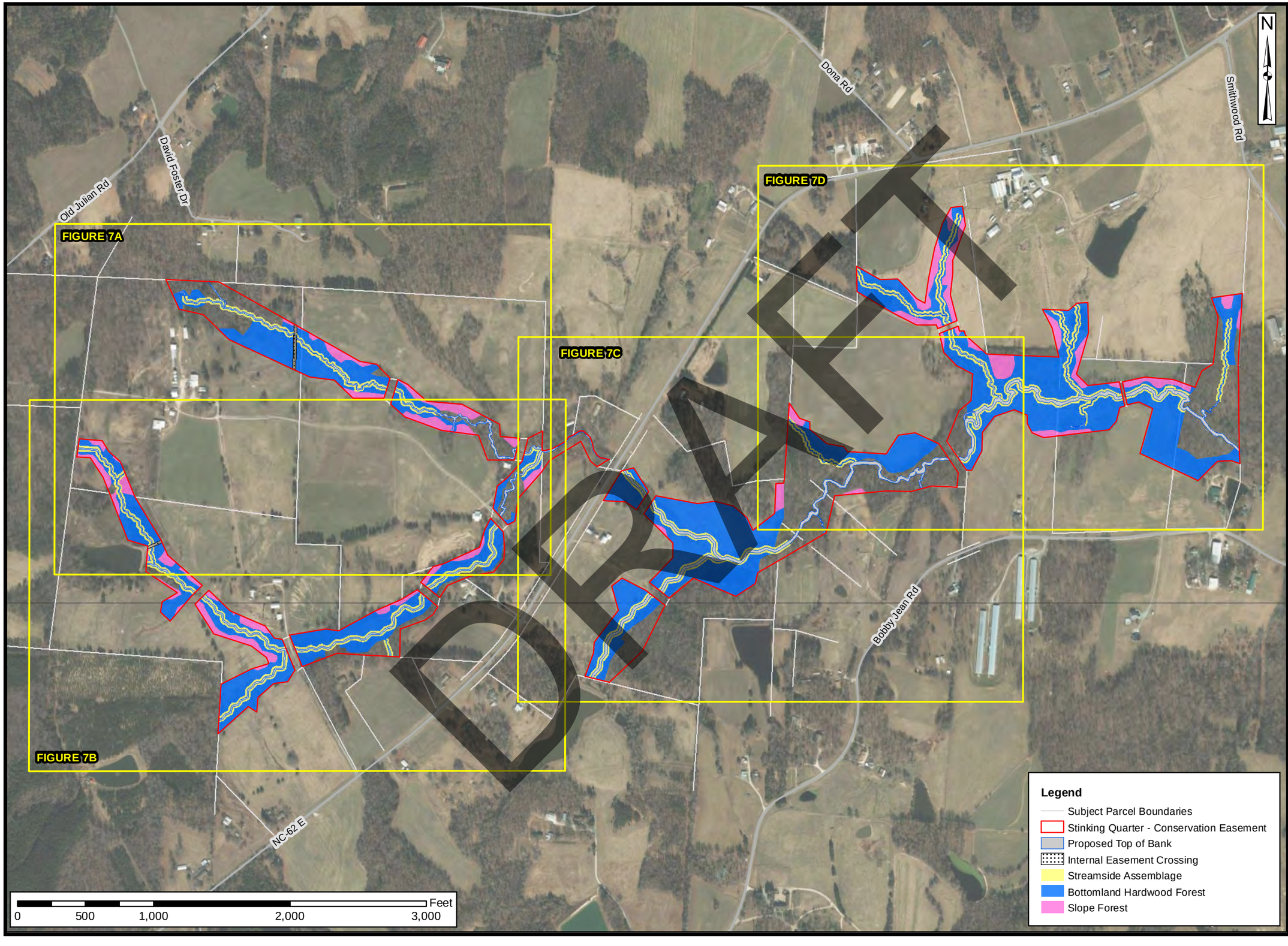
Scale: 1:3,000

Project No.: 100193

FIGURE

6D

N



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RESTORATION AND PLANTING PLAN

Drawn by: KRJ

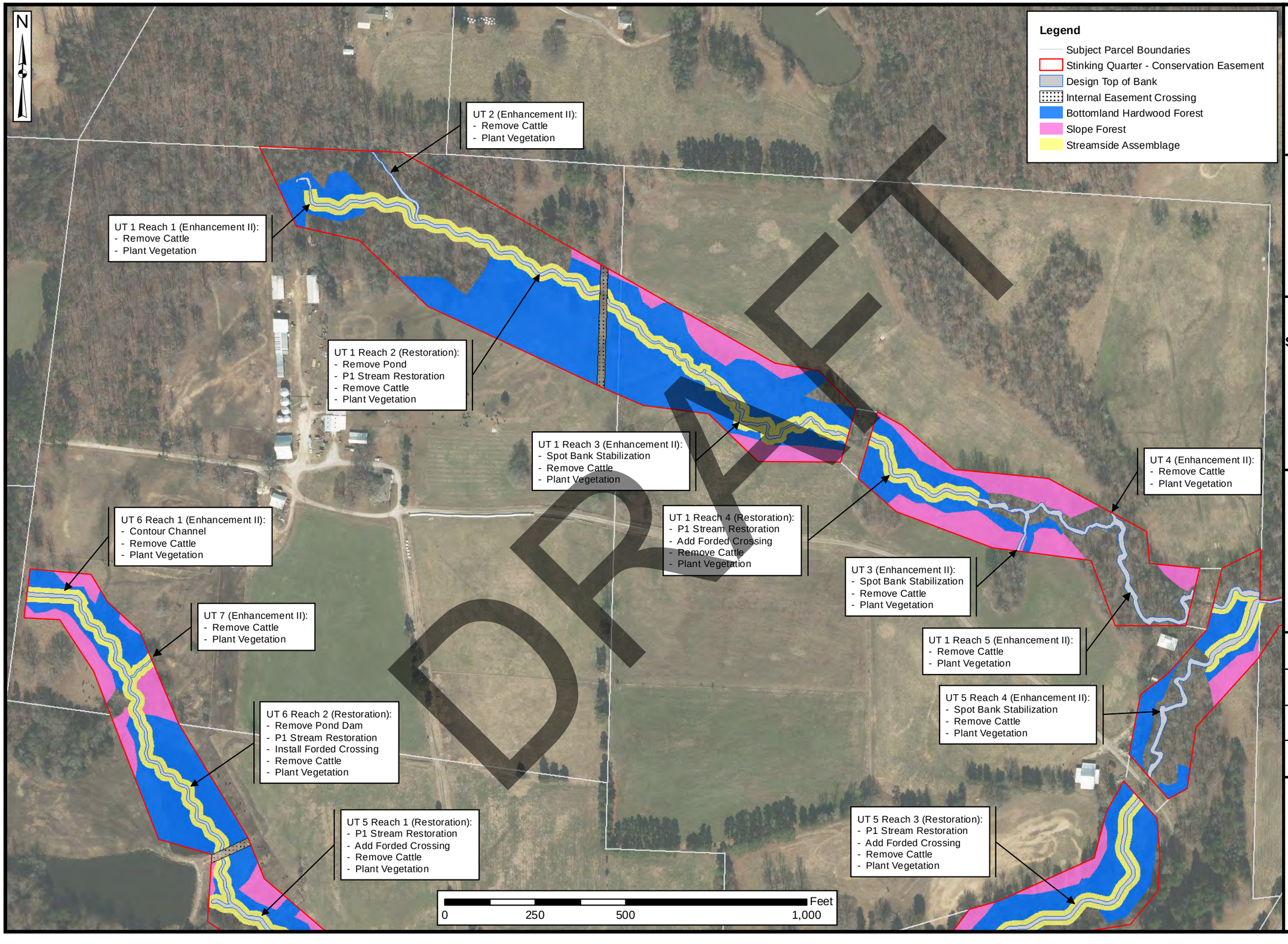
Date: JUN 2023

Scale: 1:8000

Project No.: 21-012

FIGURE

7



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RESTORATION AND PLANTING PLAN

Drawn by: KRJ

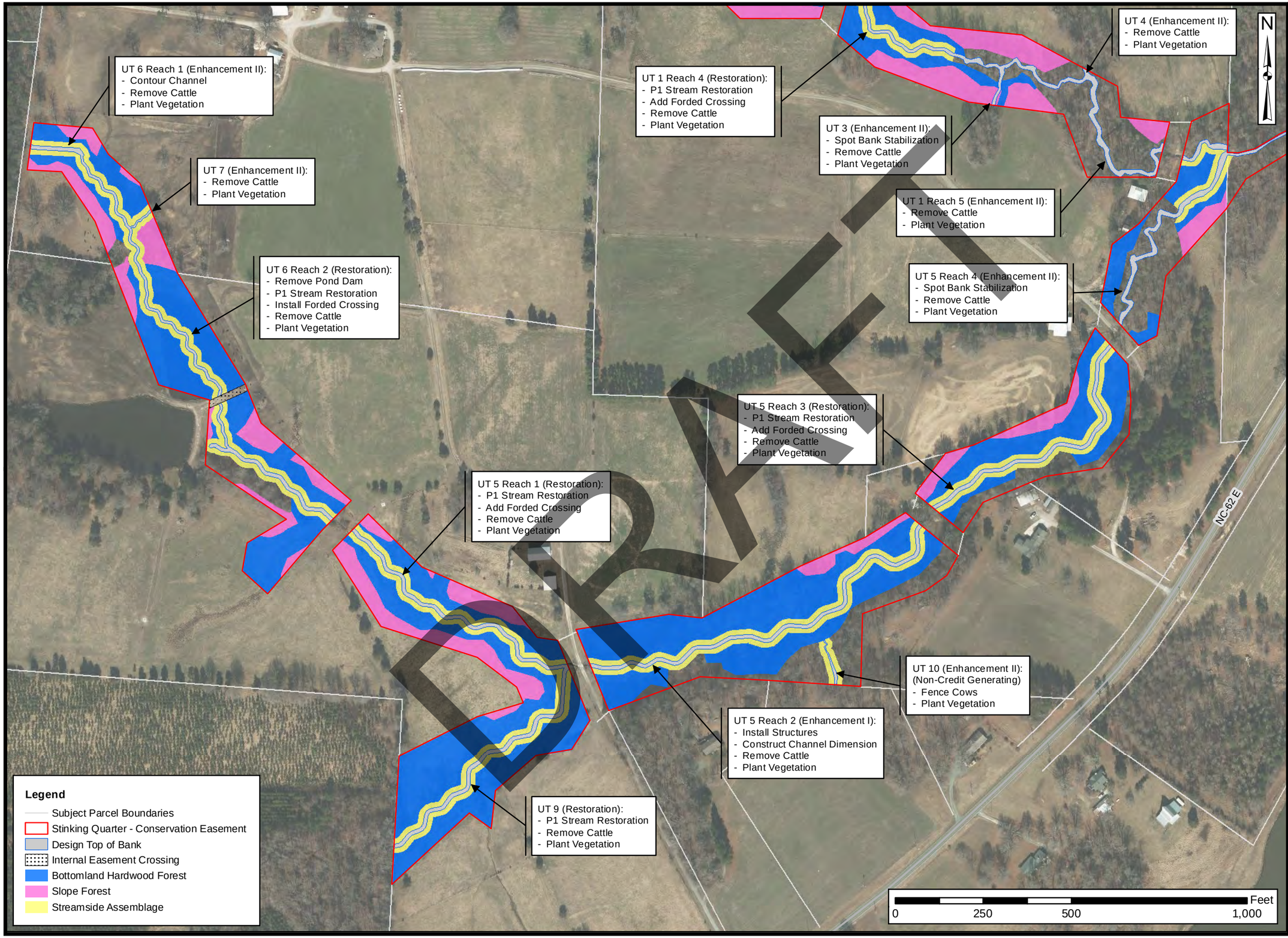
Date: JUN 2023

Scale: 1:3000

Project No.: 21-012

FIGURE

7A



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Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RESTORATION AND PLANTING PLAN

Drawn by: KRJ

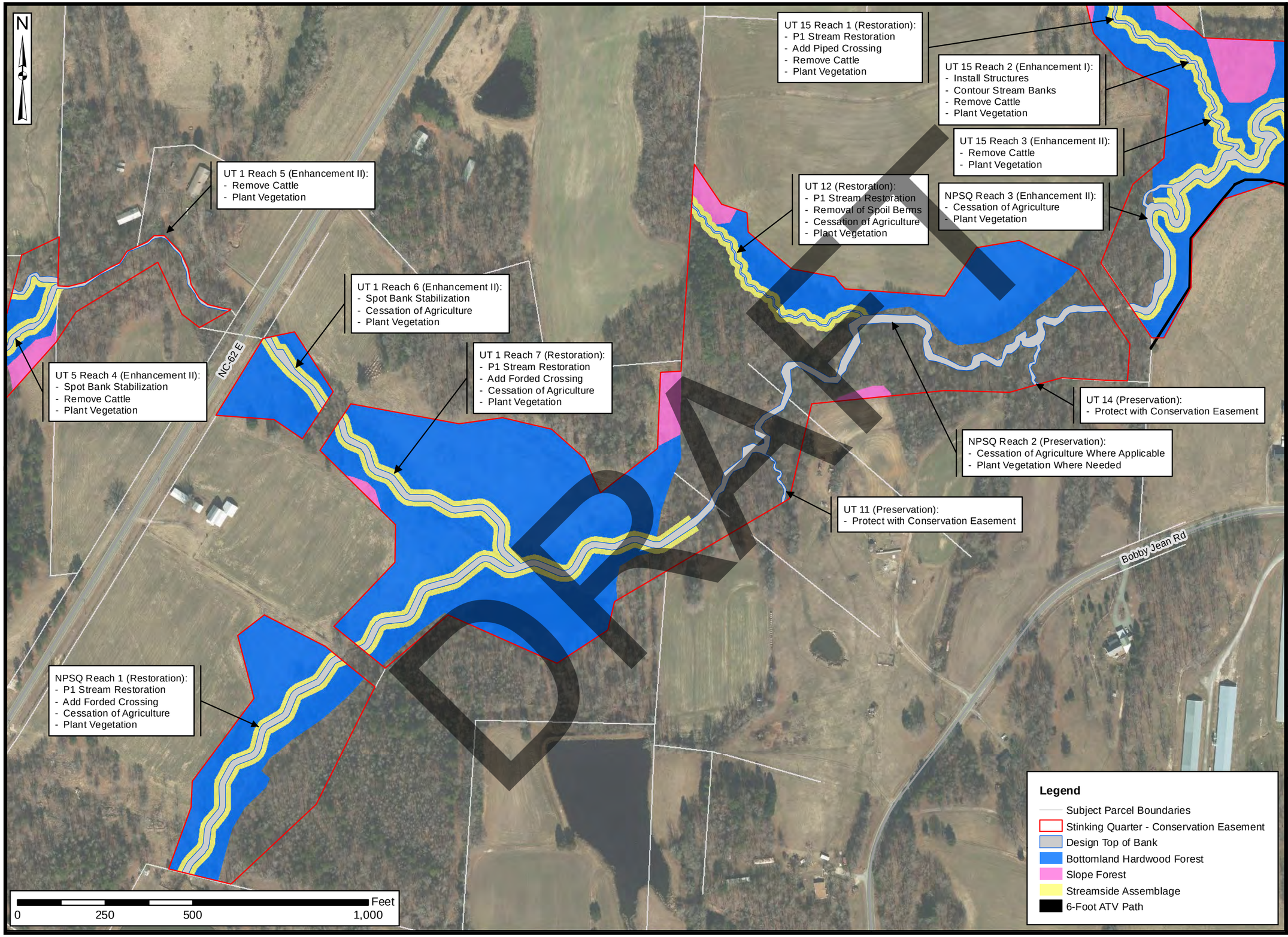
Date: JUN 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

7B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RESTORATION AND PLANTING PLAN

Drawn by: KRJ

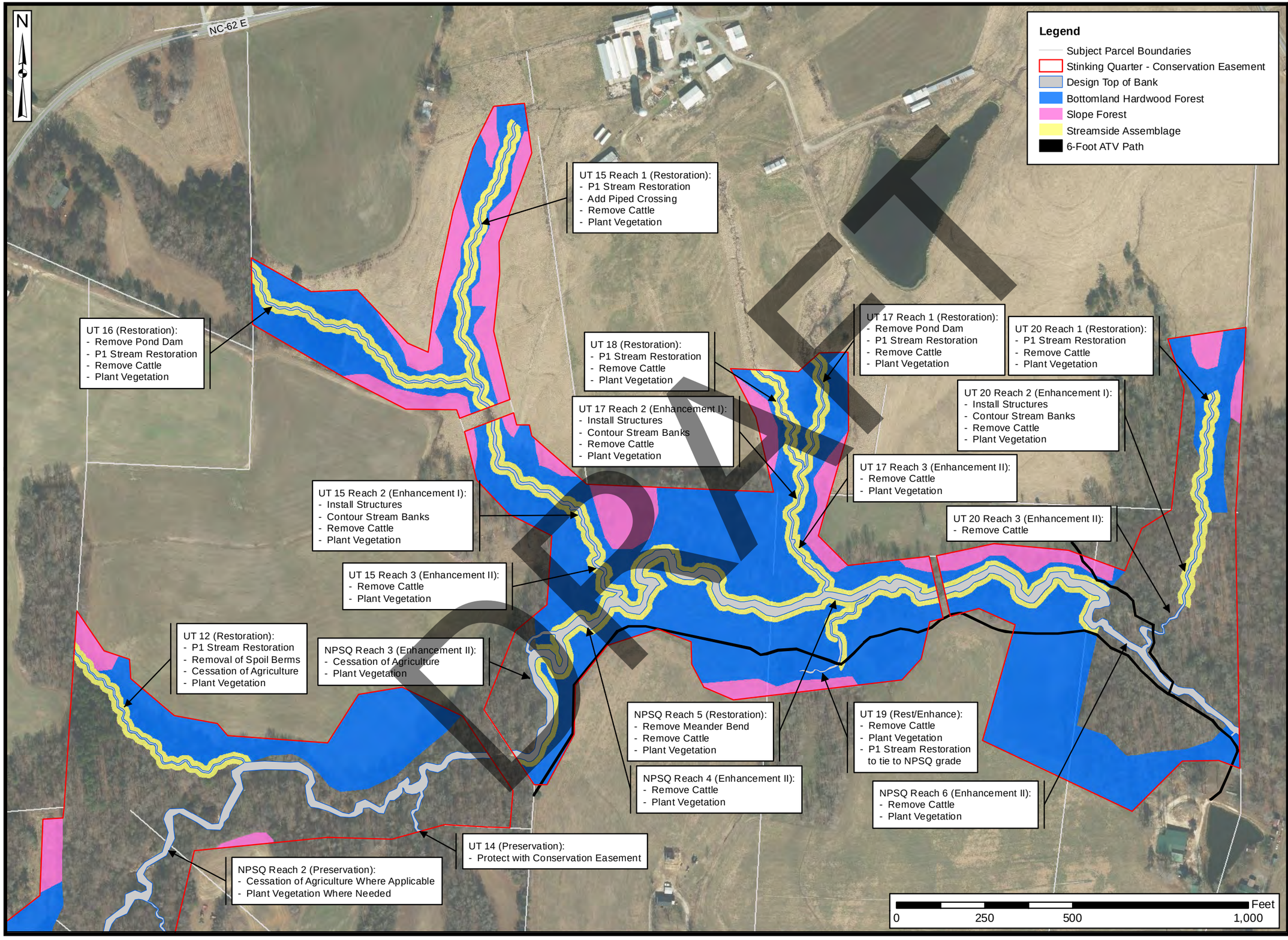
Date: JUN 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

7C



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RESTORATION AND PLANTING PLAN

Drawn by: KRJ

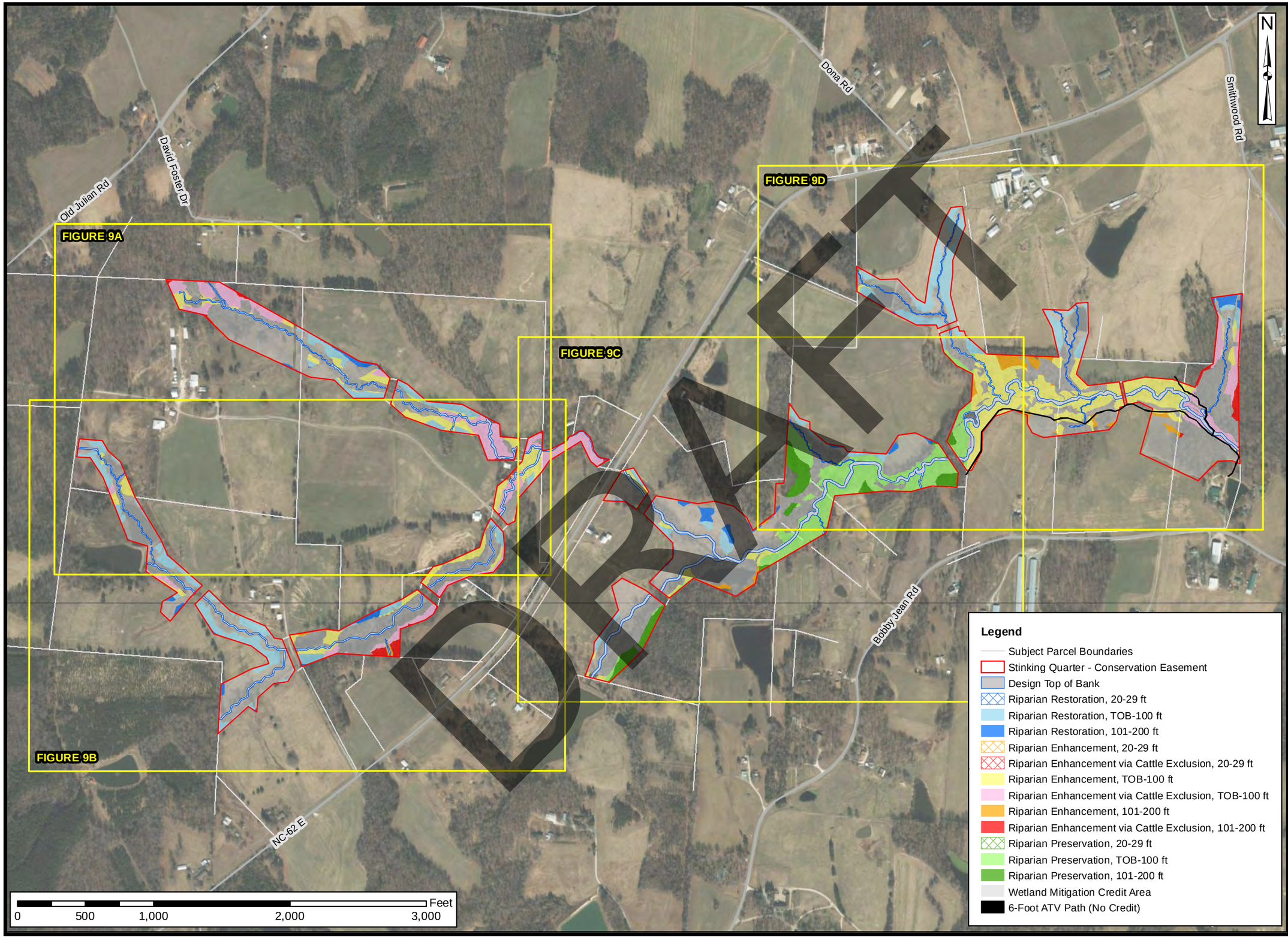
Date: JUN 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

7D



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER MITIGATION CREDIT DETERMINATION

Drawn by: KRJ

Date: JUL 2023

Scale: 1:8000

Project No.: 21-012

FIGURE

8

N

UT 2 - Subject, Intermittent

UT 1 - Not Subject, Intermittent

UT 1 - Subject, Perennial

UT 1 - Subject, Perennial

UT 4 - Not Reviewed
Non-Credit Generating

UT 3 - Not Subject, Intermittent

UT 6 - Subject, Intermittent

UT 7 - Not Subject, Intermittent

UT 6 - Subject, Perennial

UT 5 - Subject, Perennial

Feet
0 250 500 1,000

Legend

- Subject Parcel Boundaries
- Stinking Quarter - Conservation Easement
- Design Top of Bank
- Riparian Restoration, 20-29 ft
- Riparian Restoration, TOB-100 ft
- Riparian Restoration, 101-200 ft
- Riparian Enhancement, 20-29 ft
- Riparian Enhancement via Cattle Exclusion, 20-29 ft
- Riparian Enhancement, TOB-100 ft
- Riparian Enhancement via Cattle Exclusion, TOB-100 ft
- Riparian Enhancement, 101-200 ft
- Riparian Enhancement via Cattle Exclusion, 101-200 ft
- Riparian Preservation, 20-29 ft
- Riparian Preservation, TOB-100 ft
- Riparian Preservation, 101-200 ft
- Wetland Mitigation Credit Area
- Internal Easement Crossing
- Top of Bank to 20 ft
- Top of Bank to 30 ft
- Top of Bank to 50 ft
- Top of Bank to 100 ft
- Top of Bank to 200 ft

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Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER MITIGATION CREDIT DETERMINATION

Drawn by: KRJ

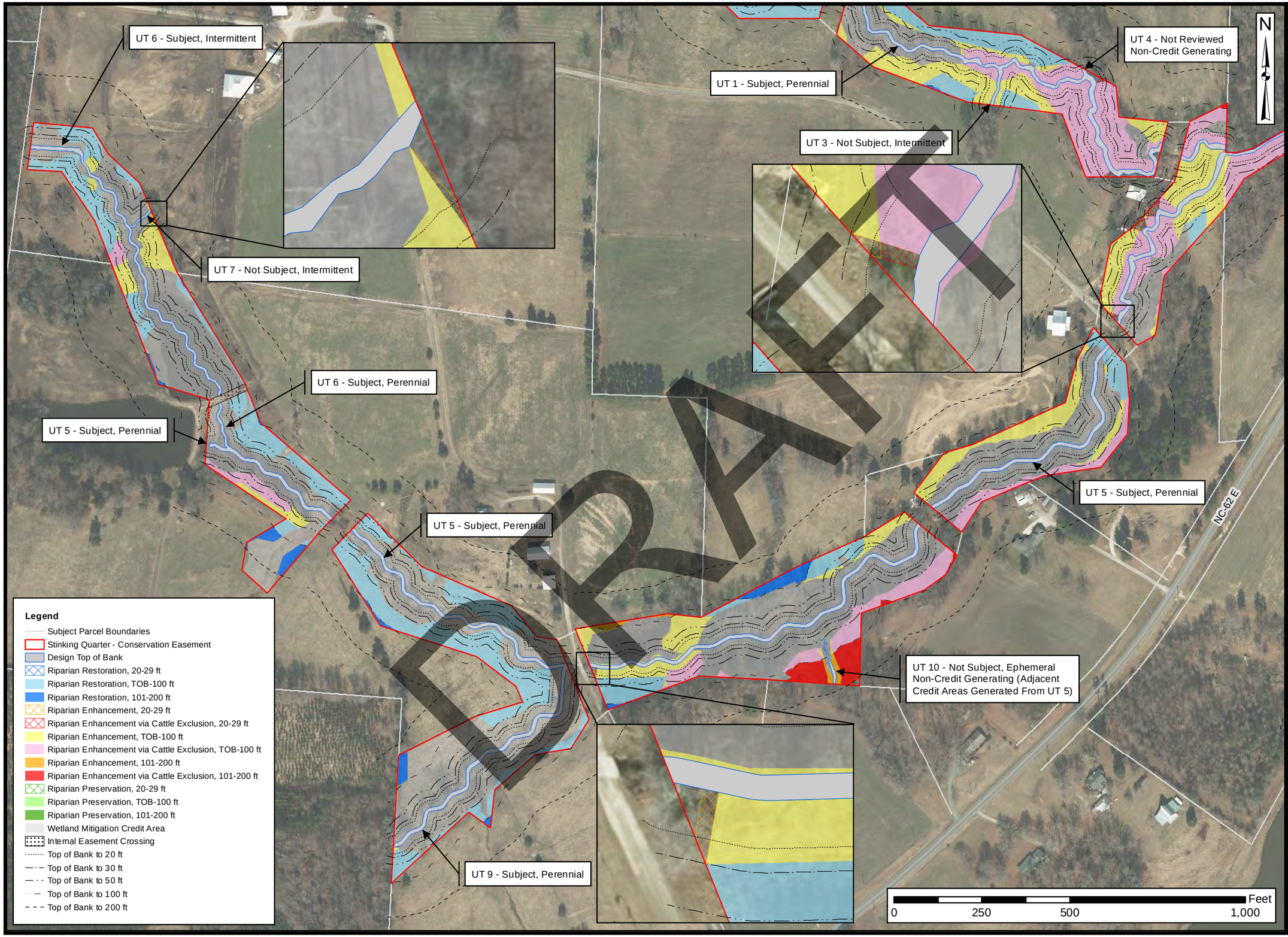
Date: JUL 2023

Scale: 1:3000

Project No.: 21-012

FIGURE

8A



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER MITIGATION CREDIT DETERMINATION

Drawn by: KRJ

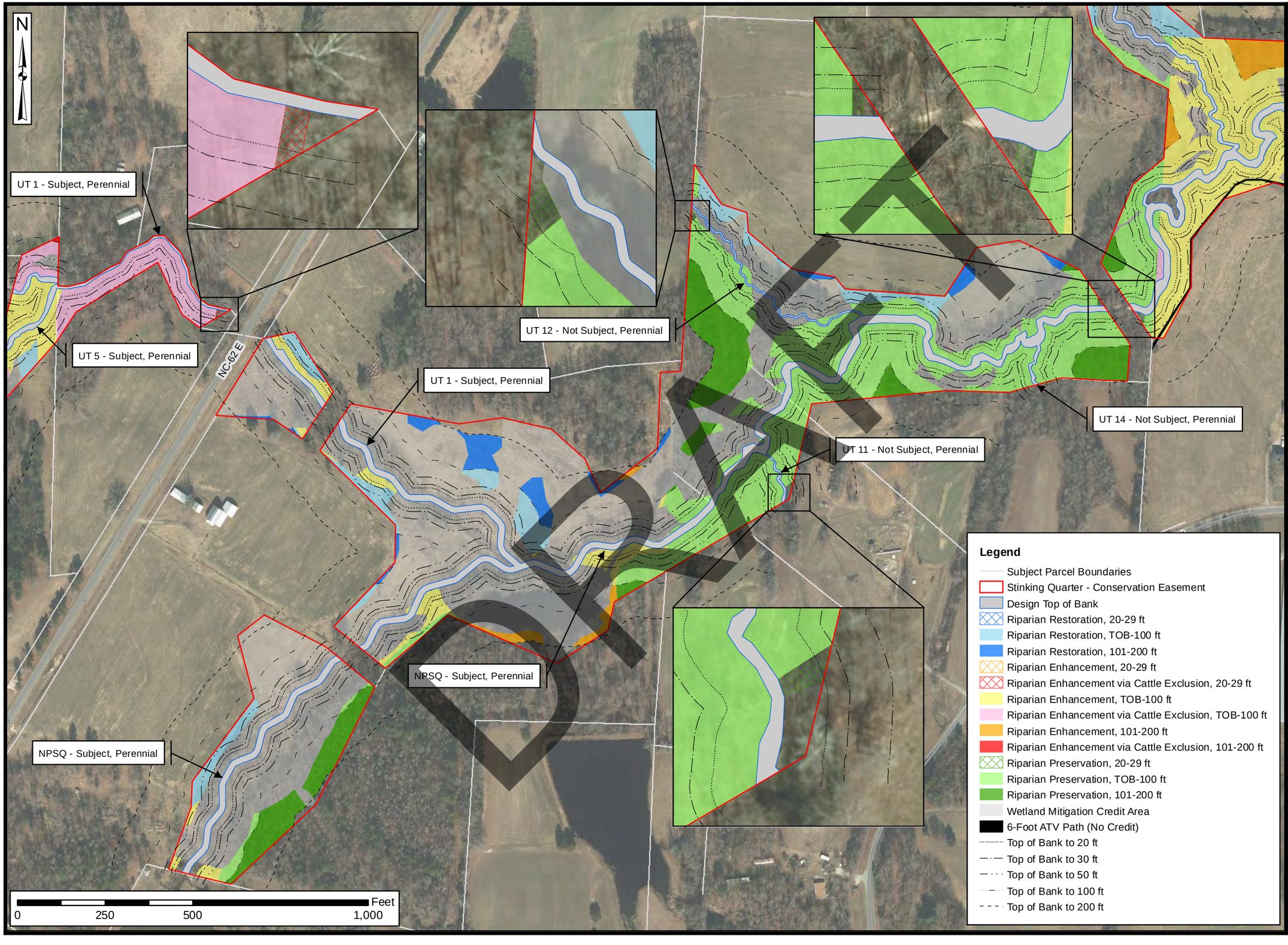
Date: JUL 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

8B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER MITIGATION CREDIT DETERMINATION

Drawn by: KRJ

Date: JUL 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

8C

N

NC-62 E

UT 15 - Not Subject, Intermittent

UT 16 - Subject, Perennial

UT 17 - Subject, Perennial

UT 18 - Not Subject, Intermittent

UT 20 - Not Subject, Intermittent

NPSQ - Subject, Perennial

UT 12 - Not Subject, Perennial

NPSQ - Subject, Perennial

UT 14 - Not Subject, Perennial

UT 19 - Not Subject, Intermittent
Credit Generated Only Within UT 19
Drainage Area (See Detail Pane)

NPSQ - Subject, Perennial

0 250 500 1,000 Feet

Legend

- Subject Parcel Boundaries
- Stinking Quarter - Conservation Easement
- Design Top of Bank
- Riparian Restoration, 20-29 ft
- Riparian Restoration, TOB-100 ft
- Riparian Restoration, 101-200 ft
- Riparian Enhancement, 20-29 ft
- Riparian Enhancement via Cattle Exclusion, 20-29 ft
- Riparian Enhancement, TOB-100 ft
- Riparian Enhancement via Cattle Exclusion, TOB-100 ft
- Riparian Enhancement, 101-200 ft
- Riparian Enhancement via Cattle Exclusion, 101-200 ft
- Riparian Preservation, 20-29 ft
- Riparian Preservation, TOB-100 ft
- Riparian Preservation, 101-200 ft
- Wetland Mitigation Credit Area
- 6-Foot ATV Path (No Credit)
- UT 19 Drainage Area
- Top of Bank to 20 ft
- Top of Bank to 30 ft
- Top of Bank to 50 ft
- Top of Bank to 100 ft
- Top of Bank to 200 ft

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Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER MITIGATION CREDIT DETERMINATION

Drawn by: KRJ

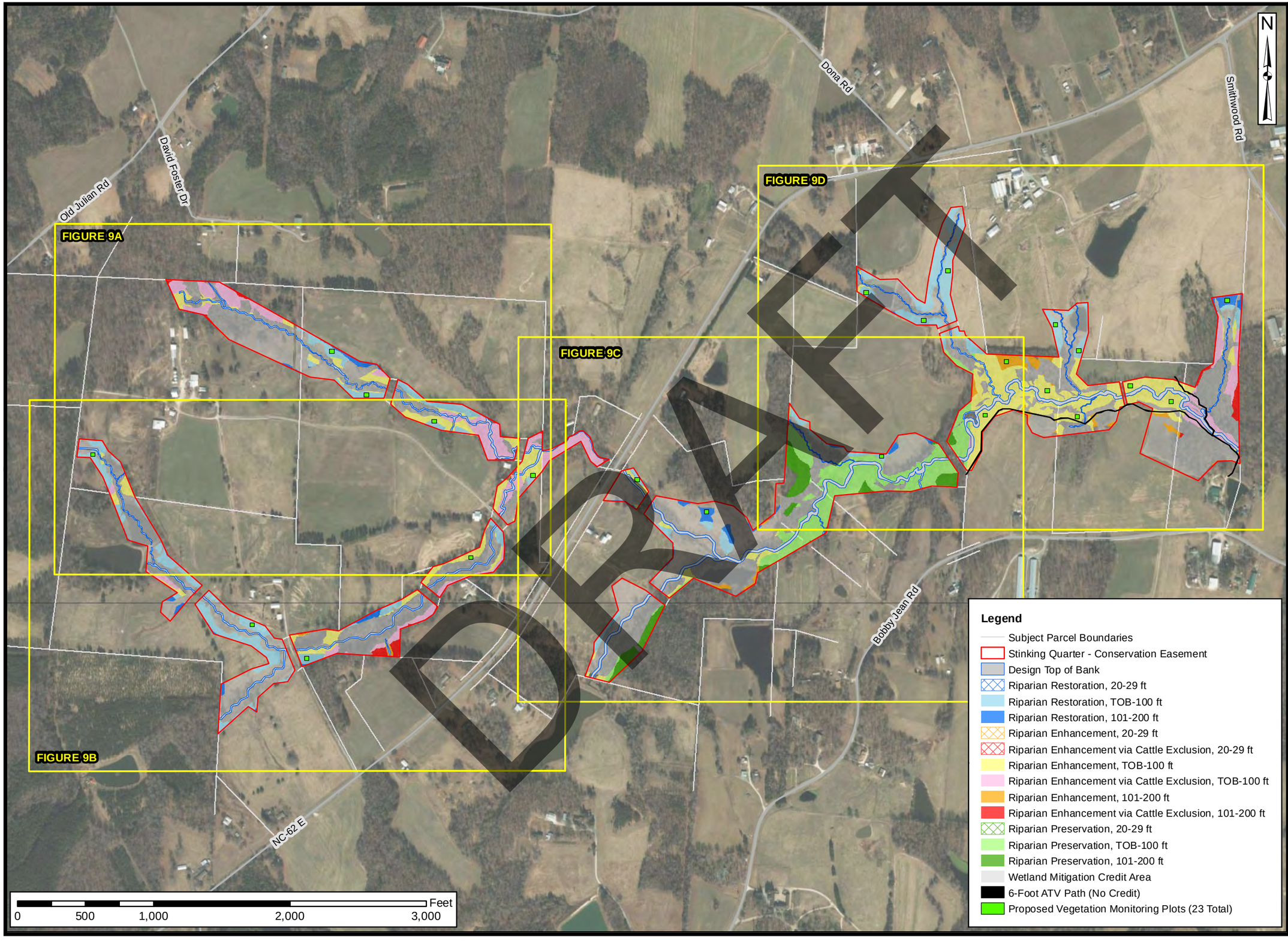
Date: JUL 2023

Scale: 1:8000

Project No.: 21-012

FIGURE

8D



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

MONITORING PLAN

Drawn by: KRJ

Date: JUL 2023

Scale: 1:8000

Project No.: 21-012

FIGURE

9

N

UT 2 - Subject, Intermittent

UT 1 - Not Subject, Intermittent

UT 1 - Subject, Perennial

UT 1 - Subject, Perennial

UT 4 - Not Reviewed
Non-Credit Generating

UT 3 - Not Subject, Intermittent

UT 6 - Subject, Intermittent

UT 7 - Not Subject, Intermittent

UT 6 - Subject, Perennial

UT 5 - Subject, Perennial

1
2
3
4
5
8

0 250 500 1,000 Feet

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Legend

- Subject Parcel Boundaries
- Stinking Quarter - Conservation Easement
- Design Top of Bank
- Riparian Restoration, 20-29 ft
- Riparian Restoration, TOB-100 ft
- Riparian Restoration, 101-200 ft
- Riparian Enhancement, 20-29 ft
- Riparian Enhancement via Cattle Exclusion, 20-29 ft
- Riparian Enhancement, TOB-100 ft
- Riparian Enhancement via Cattle Exclusion, TOB-100 ft
- Riparian Enhancement, 101-200 ft
- Riparian Enhancement via Cattle Exclusion, 101-200 ft
- Riparian Preservation, 20-29 ft
- Riparian Preservation, TOB-100 ft
- Riparian Preservation, 101-200 ft
- Wetland Mitigation Credit Area
- Internal Easement Crossing
- Top of Bank to 20 ft
- Top of Bank to 30 ft
- Top of Bank to 50 ft
- Top of Bank to 100 ft
- Top of Bank to 200 ft
- Proposed Vegetation Monitoring Plots (23 Total)

Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

MONITORING PLAN

Drawn by: KRJ

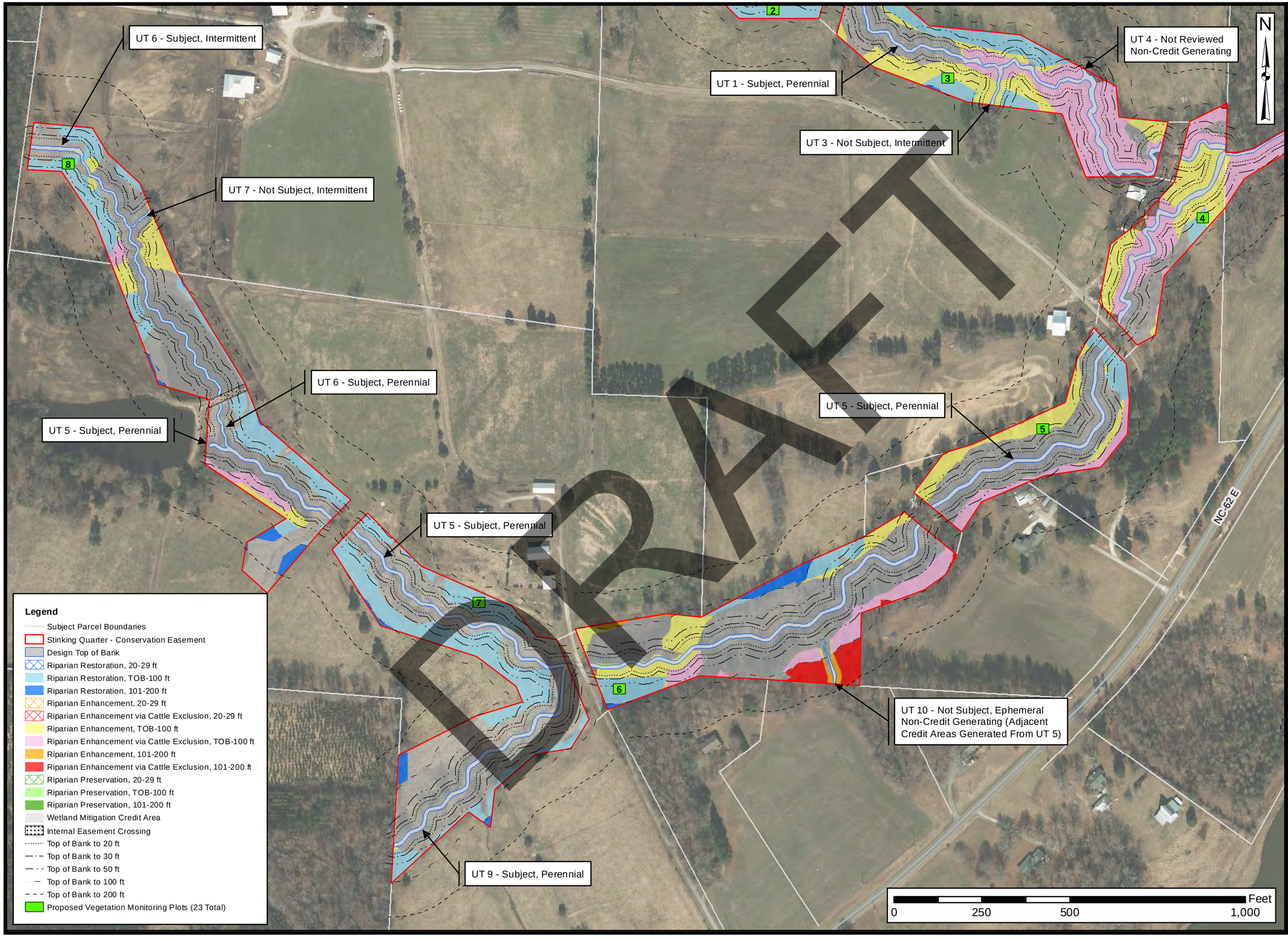
Date: JUL 2023

Scale: 1:3000

Project No.: 21-012

FIGURE

9A



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

MONITORING PLAN

Drawn by: KRJ

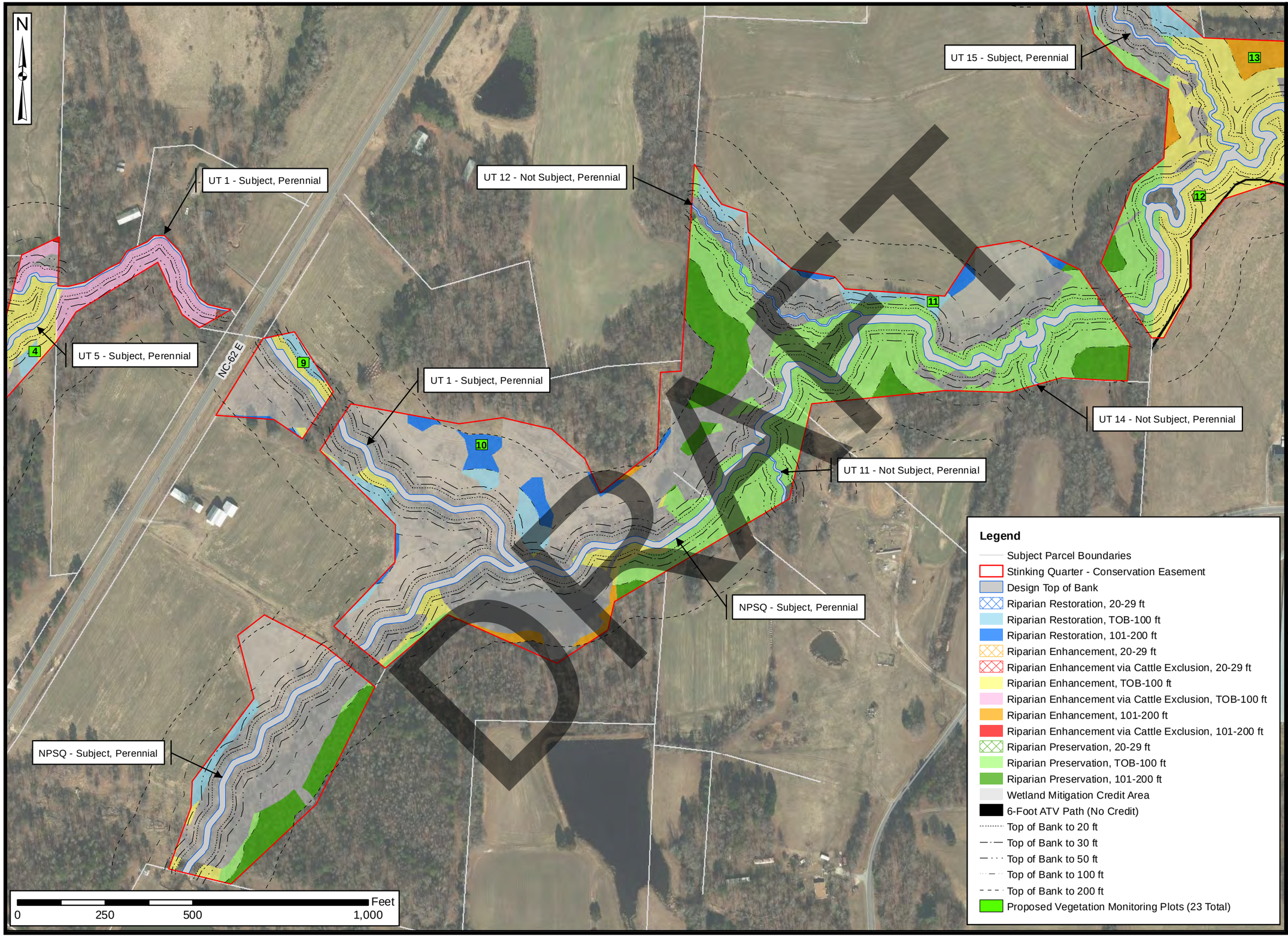
Date: JUL 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

9B



Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

MONITORING PLAN

Drawn by: KRJ

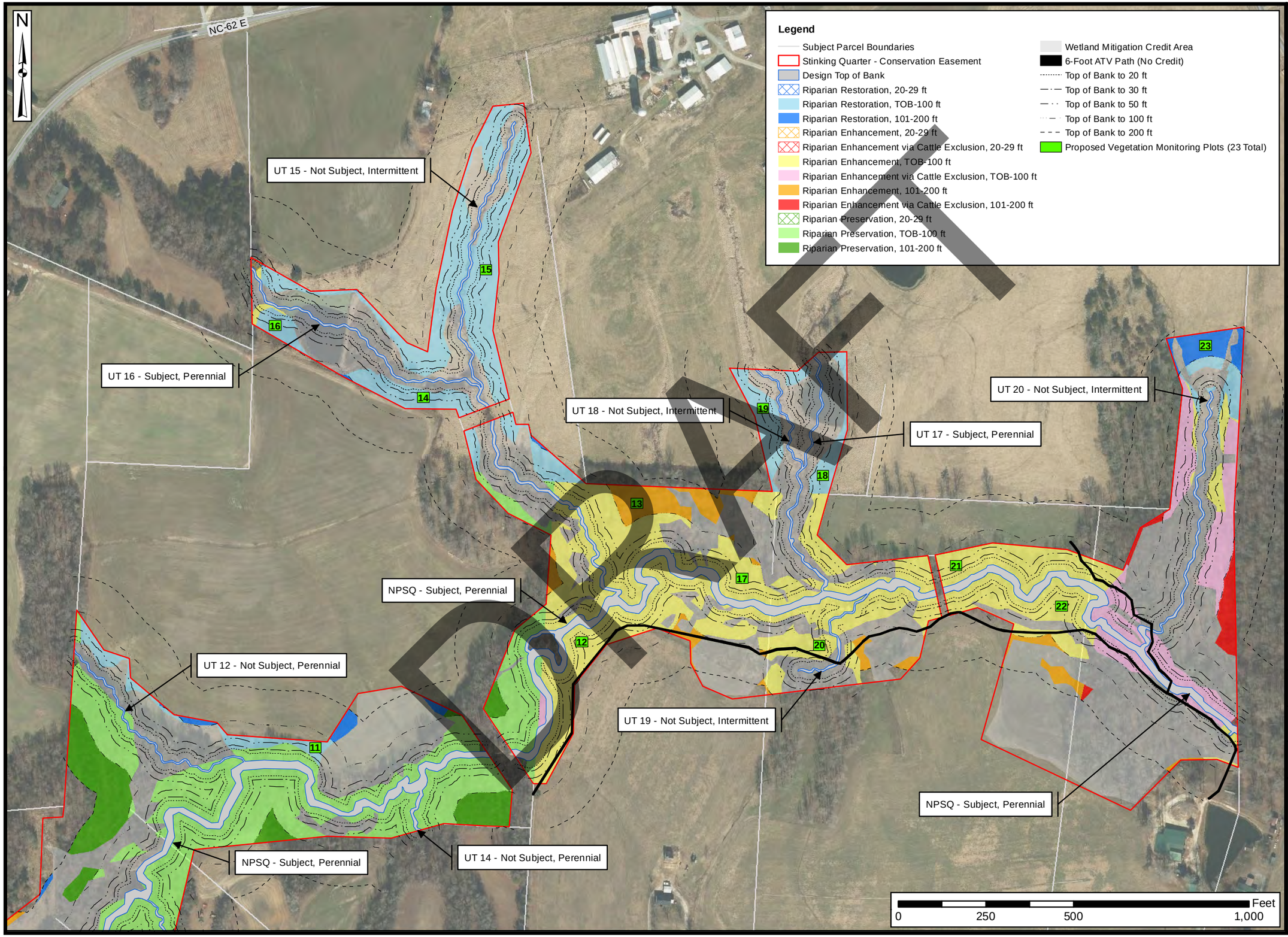
Date: JUL 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

9C



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Axiom Environmental, Inc.

Prepared for:

RESTORATION SYSTEMS | LLC

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

MONITORING PLAN

Drawn by: KRJ

Date: JUL 2023

Scale: 1:3100

Project No.: 21-012

FIGURE

9D

Attachment B. Agency Letters/Correspondence

DWR Stream Determination Letter, January 13, 2023
DWR Site Viability Letter, July 21, 2023

DRAFT

ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

January 13, 2023

Raymond Holz
Restoration Systems LLC
Delivered via email to: rholz@restorationsystem.com

Subject: On-Site Determination for Applicability to the Jordan Lake Buffer Rules (15A NCAC 2B .0267)

Subject Property: Stinking Quarter Mitigation Site, Guilford County

Dear Mr. Holz:

On December 9, 2022, at your request, Seren Homer and I conducted an on-site determination to review features located on the subject project for stream determinations with regards to the above noted state regulations.

The attached Site Maps depict the channels that were reviewed during the site visit. The channels that were reviewed and their subjectivity to the above cited rules are described in the table below. Please note that these regulations may be subject to change in the future.

Feature Identifier	Type of Feature	Start Point location	Jordan Lake Buffer Rules Subjectivity
North Prong Stinking Quarter Creek	Perennial Stream	Enters project from offsite	Subject
UT 1 above pond	Intermittent Stream	35.925157, -79.650229	Not Subject
In line Ag Pond on UT1	Pond	N/A	Not Subject
UT 1 below pond	Perennial Stream	N/A	Subject
UT 2	Intermittent Stream	Enters project from offsite	Subject
UT 3	Intermittent Stream	Enters project from offsite	Not Subject
UT 5	Perennial Stream	Enters project from offsite	Subject
UT 6 above pond	Intermittent Stream	Enters project from offsite	Subject
In line Ag Pond on UT6	Pond	N/A	Not Subject
UT 6 below pond	Perennial Stream	N/A	Subject
UT 7	Intermittent Stream	Enters project from offsite	Not Subject
UT 9	Perennial Stream	Enters project from offsite	Subject
UT 10	Ephemeral Stream	Enters project from offsite	Not Subject
UT 11	Perennial Stream	Enters project from offsite	Not Subject
UT 12	Perennial Stream	Enters project from offsite	Not Subject

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UT 13	Perennial Stream	Enters project from offsite	Not Subject
UT 15	Intermittent Stream	35.925796, -79.631356	Not Subject
UT 16	Perennial Stream	Enters project from offsite	Subject
In line Ag Pond on UT16	Pond	N/A	Not Subject
UT 17	Perennial Stream	Enters project from offsite	Subject
In line Ag Pond on UT17	Pond	N/A	Not Subject
UT 18*	Linear Wetland	Enters project from offsite	Not Subject
UT 19	Intermittent Stream	35.922566, -79.628174	Not Subject
UT 20	Intermittent Stream	35.924754, -79.624280	Not Subject

*visual observation of feature upstream of project limits appears that it may be an intermittent stream

The owner (or future owners) should notify the Division (and other relevant agencies) of this decision in any future correspondences concerning this property. This on-site determination shall expire five (5) years from the date of this letter.

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

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

Sincerely,

DocuSigned by:
Sue Homewood
456ED631098F411...

Sue Homewood
Winston-Salem Regional Office

Enclosures: USGS Topo Map
RS Site Maps – DWR initialed/dated

Electronic Cc: Donald R. York & Elizabeth G. York (landowner)

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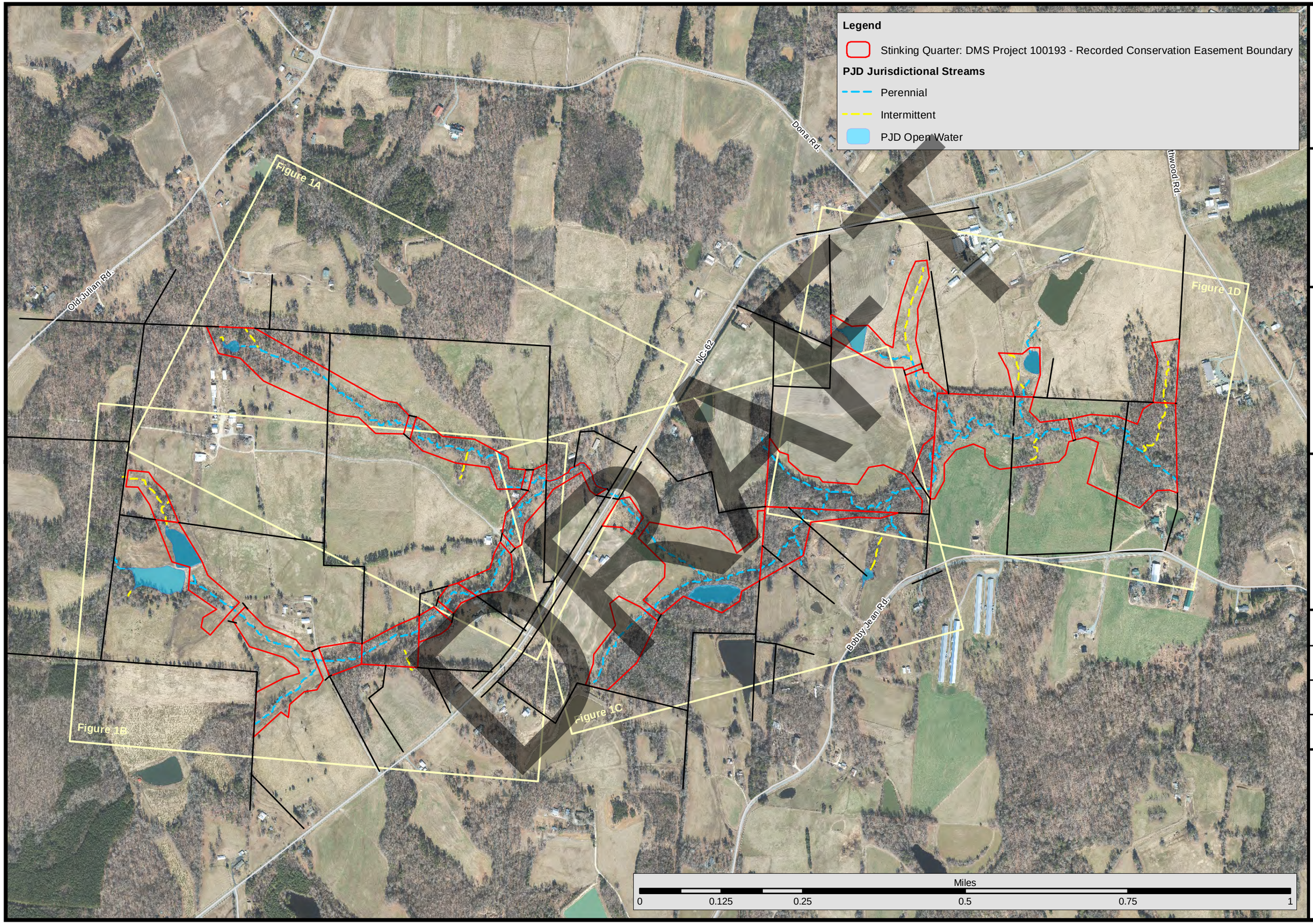
Curtis R. York & Waynette G. York (landowner)
Patricia F. Shoffner & Jean F. Clapp (landowner)
Franklin Eli Staley, Jr. (landowner)
Judy Keck & Timothy N. Shoffner (landowner)
Mark Stanley & Judy Jones Keck (landowner)
Mickey Lee & Jean C. Keck (landowner)
Sherri S. & Tony Paul Harmon (landowner)
Katie Merritt, DWR
DWR, Winston-Salem Regional Office

DRAFT



RESTORATION SYSTEMS | LLC

Prepared for:

NC DEQ
Division of Water Resources

401 & Isolated Wetlands/Waters Program & 401 Stormwater

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

Guilford County, NC

Title:

RIPARIAN BUFFER

PROJECT OVERVIEW

2018 Imagery

Drawn by: RJH

Date: AUG 2022

Scale: 1: 8,500

Project No.: 20-001.05

FIGURE

1

N

DS SH

1/13/2023

Legend

Stinking Quarter: DMS Project 100193 - Recorded Conservation Easement Boundary

PJD Jurisdictional Streams

Perennial

Intermittent

PJD Open Water

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RIPARIAN BUFFER

PROJECT
OVERVIEW

2018 Imagery

Drawn by: RJH

Date: AUG 2022

Scale: 1: 3,500

Project No.: 20-001.05

FIGURE

1A

DS SH

1/13/2023

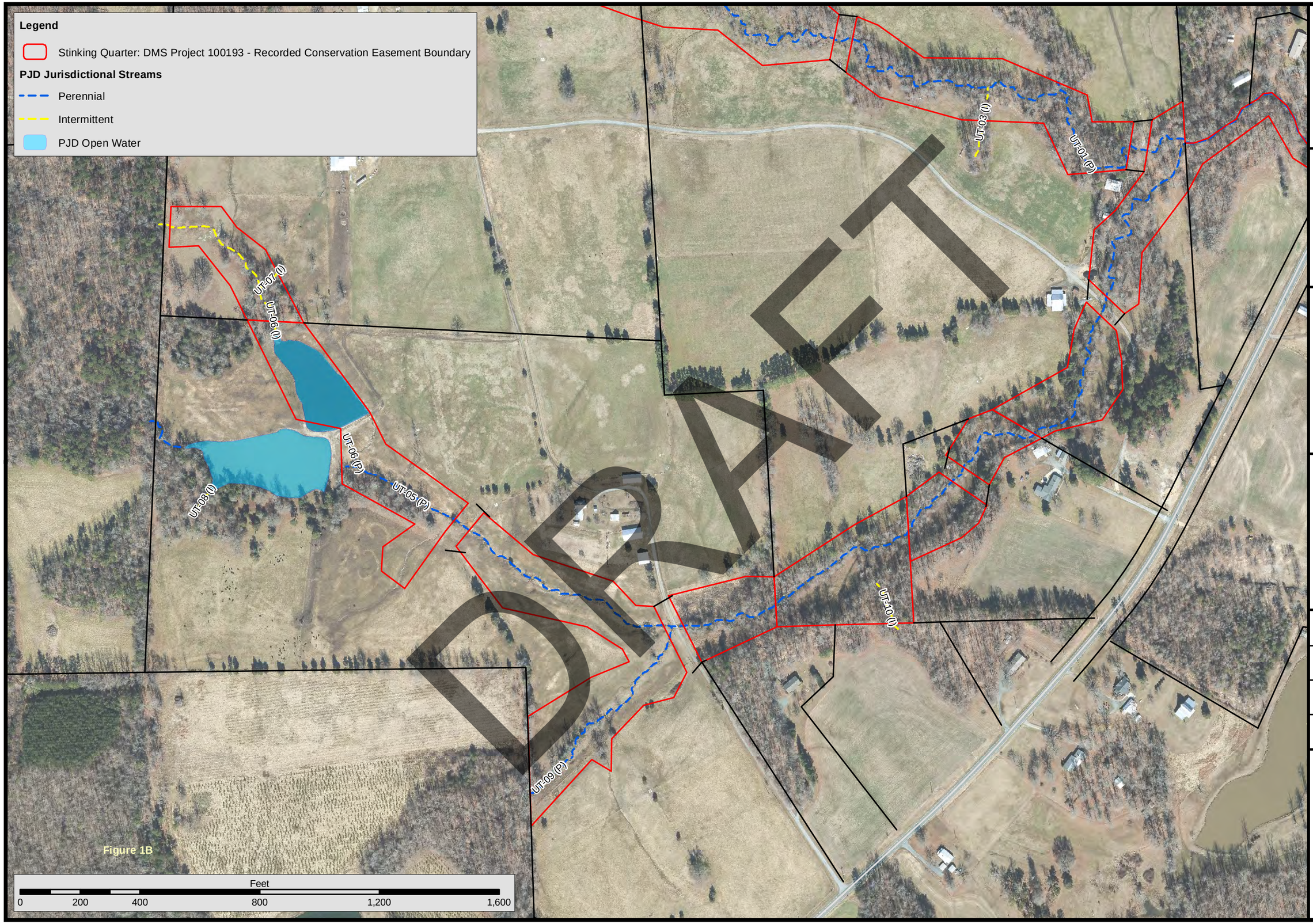

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FIGURE

1B

N

DS SH

1/13/2023

Legend

Stinking Quarter: DMS Project 100193 - Recorded Conservation Easement Boundary

PJD Jurisdictional Streams

Perennial

Intermittent

PJD Open Water

NC-62

UT-05 (P)

UT-01 (P)

UT-16 (P)

UT-15 (I)

UT-15 (P)

UT-12 (P)

UT-11 (P)

UT-13 (P)

UT-14 (P)

UT-13 (I)

NP-SQ (P)

Bobby Jean Rd.

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Figure 1C

Feet

0 200 400 800 1,200 1,600

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PROJECT
OVERVIEW

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Scale: 1: 3,500

Project No.: 20-001.05

FIGURE

1C

N

DS SH 1/13/2023

Legend

Stinking Quarter: DMS Project 100193 - Recorded Conservation Easement Boundary

PJD Jurisdictional Streams

Perennial

Intermittent

PJD Open Water

Figure 1C

UT-15 (I)

UT-16 (P)

UT-15 (P)

UT-18 (I)

UT-20 (I)

UT-17 (P)

UT-19 (I)

UT-12 (P)

NP SQ (P)

UT-13 (P)

UT-14 (P)

Feet

0 200 400 800 1,200 1,600

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Guilford County, NC

Title:

RIPARIAN BUFFER

PROJECT
OVERVIEW

2018 Imagery

Drawn by: RJH

Date: AUG 2022

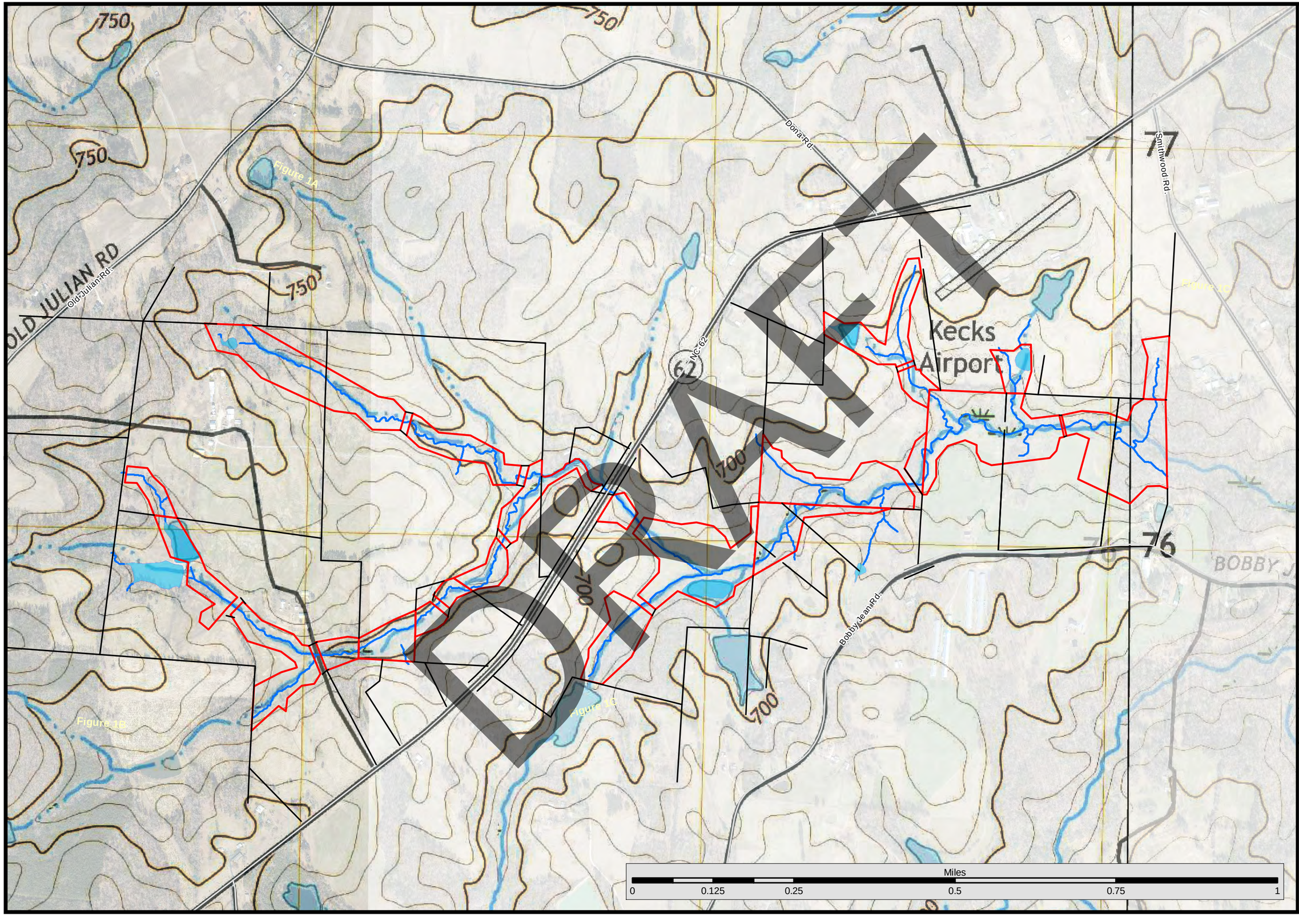
Scale: 1: 3,500

Project No.: 20-001.05

FIGURE

1D

DS SH 1/13/2023



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PROJECT
OVERVIEW

2018 Imagery

Drawn by: RJH

Date: AUG 2022

Scale: 1: 8,500

Project No.: 20-001.05

FIGURE

2

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ROY COOPER
Governor
ELIZABETH S. BISER
Secretary
RICHARD E. ROGERS, JR.
Director

NORTH CAROLINA
Environmental Quality

July 21, 2023

Raymond Holz
Restoration Systems, LLC
(via electronic mail: Raymond.Holz@davey.com)

Re: Site Viability for Buffer Mitigation & Nutrient Offset – Stinking Quarter Site
Near 35.9200, -79.6371 located off 2259 NC-62 in Julian, NC
Haw River Sub-watershed
Guilford County

Dear Mr. Holz,

On February 8, 2023, Katie Merritt, with the Division of Water Resources (DWR), received a request from you on behalf of Restoration Systems, LLC (RS) for a site visit near the above-referenced site in the Haw River Sub-watershed of Jordan Lake. The site visit was to determine the potential for riparian buffer mitigation and nutrient offset within a proposed conservation easement boundary, which is more accurately depicted in the attached maps labeled "Figure 3A, Figure 3B, Figure 3C and Figure 3D (Figures) prepared by RS and initialed by Katie Merritt. The proposed easement boundary in the Figures, includes all riparian areas intended to be proposed as part of the mitigation site. This site is also being proposed as a stream and wetland mitigation site and therefore stream bank instability or presence of erosional rills within riparian areas were not addressed. On March 28, 2023, Ms. Merritt performed a site assessment of the subject site. Staff with RS were also present.

Ms. Merritt's evaluation of the features onsite and their associated mitigation determination for the riparian areas are provided in the table below. This evaluation was made from Top of Bank (TOB) and landward 200' from each feature for buffer mitigation pursuant to 15A NCAC 02B .0295 (effective November 1, 2015) and for nutrient offset credits pursuant to 15A NCAC 02B .0703 using 15A NCAC 02B .0295 to define the mitigation type determinations.

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Feature	Classification onsite	Subject to Buffer Rule[1]	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	Nutrient Offset Viable[3]	Mitigation Type Determination w/in riparian areas[4,5]
All existing ponds (to be removed)	In-line Ag ponds	No	Pond footprints are all non-forested. Riparian areas adjacent to ponds are assessed for the feature that feeds each pond	Yes	Yes (pond bed footprint only)	Pond Bed Footprint- **Restoration Site** per 15A NCAC 02B .0295 (o)(3)
1	Stream	No	Combination of non-forested and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (o)(3) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
2	Stream	Yes	Forested pasture	Yes[7]	No	Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6)
3	Stream	No	Combination of non-forested and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (o)(3) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
5	Stream	Yes	Combination of non-forested, partially forested, and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested & partially forested pasture only) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) Partially forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (n) & requires supplemental planting *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
6	Stream	Yes	Combination of non-forested and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits

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Feature	Classification onsite	Subject to Buffer Rule[1]	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	Nutrient Offset Viable[3]	Mitigation Type Determination w/in riparian areas[4,5]
7	Stream	No	Combination of non-forested and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (o)(3) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
9	Stream	Yes	Combination of non-forested, partially forested, and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested & partially forested pasture only) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) Partially forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (n) & requires supplemental planting *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
10	Ephemeral	No	Forested pasture	No	No	directly hydrologically connected to a wetland
11	Stream	No	Mature forest, not in pasture	Yes[2]	No	**Preservation Site** per 15A NCAC 02B .0295 (o)(4)
12	Stream	No	Mostly mature forest along right bank with non-forested pasture on left bank	Yes[2]	Yes (non-forested pasture only)	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (o)(3) Forested areas - **Preservation Site** per 15A NCAC 02B .0295 (o)(4)
14	Stream	No	Mature forest, not in pasture	Yes[2]	No	**Preservation Site** per 15A NCAC 02B .0295 (o)(4)
15	Stream	No	Non-forested pasture	Yes	Yes	**Restoration site** per 15A NCAC 02B .0295 (o)(3)
16	Stream	Yes	Mostly non-forested pasture but some forested pasture areas upstream	Yes[7]	Yes (non-forested pasture only)	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6)

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Feature	Classification onsite	Subject to Buffer Rule[1]	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	Nutrient Offset Viable[3]	Mitigation Type Determination w/in riparian areas[4,5]
17	Stream	Yes	Combination of non-forested, partially forested, and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture only) *See further note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) Partially forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (n) & requires supplemental planting *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits
18	Linear wetland (will be restored to a stream)	No	Non-forested pasture	Yes *see note	Yes *see note	Non-forested Pasture - **Restoration site** per 15A NCAC 02B .0295 (o)(3) *Stream restoration is required for this feature to be eligible to generate credits.
19	Stream	No	Forested pasture	Yes[7]	No	Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6)
20	Stream	No	Combination of non-forested and forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures.	Yes[7]	Yes (non-forested pasture) *See further note	Non-forested Pasture – **Restoration Site** per 15A NCAC 02B .0295 (o)(3) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits

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Feature	~~Classification onsite~~	Subject to Buffer Rule[1]	Riparian Land uses adjacent to Feature (0-200')	Buffer Credit Viable	Nutrient Offset Viable[3]	Mitigation Type Determination w/in riparian areas[4,5]
NPSQ	Stream	Yes	Combination of non-forested, partially forested & forested pasture. Some areas were forested during the baseline period for the Jordan Lake Nutrient Strategy. See pink hatched areas on Figures. Some forested areas with no cattle presence	Yes[2,7]	Yes (non-forested pasture) *See further note	Non-forested Pasture – **Restoration Site** per 15A NCAC 02B .0295 (n) Forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (o)(6) Partially forested pasture - **Enhancement Site** per 15A NCAC 02B .0295 (n) & requires supplemental planting Forested non-pasture **- Preservation Site** per 15A NCAC 02B .0295 (o)(5) *riparian areas that were forested @ baseline (see Figures) – not eligible for nutrient offset credits

[1]Subjectivity calls for the features were determined by DWR in correspondence dated January 13, 2023 (DWR# -no ID) using the 1:24,000 scale quadrangle topographic map prepared by USGS and the most recent printed version of the soil survey map prepared by the NRCS .

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

[3]*NC Division of Water Resources - Methodology and Calculations for determining Nutrient Reductions associated with Riparian Buffer Establishment.* Credits are calculated differently in the Jordan Lake Watershed. Phosphorus may be calculated separately.

[4] Determinations made for this Site are determined based on the proposal provided in maps and figures submitted with the request.

[5] All features proposed for buffer mitigation or nutrient offset, must have a planted conservation easement established that includes the tops of channel banks when being measured perpendicular and landward from the banks, even if no credit is viable within that riparian area. Easement breaks that disconnect the continuity of riparian restoration/enhancement/preservation result in no credit viable beyond the break.

[6]The area of the mitigation site on ephemeral channels shall comprise no more than 25 percent (25%) of the total area of buffer mitigation per 15A NCAC 02B .0295 (o)(7).

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

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Determinations provided in the table above were made using a proposed easement boundary showing proposed mitigation areas shown in Figures 3, 3A, 3B, 3C and 3D. The figures representing the proposal for the site are attached to this letter and initialed by Ms. Merritt on July 21, 2023. Substantial changes to the proposed easement boundary or stream/wetland mitigation plans as well as any site constraints identified in this letter, could affect the Site's potential to generate buffer mitigation and nutrient offset credits.

This letter does not constitute an approval of this Site to generate buffer and nutrient offset credits. Pursuant to 15A NCAC 02B .0295, a mitigation proposal and a mitigation plan shall be submitted to DWR for written approval **prior** to conducting any mitigation activities in riparian areas and/or surface waters for buffer mitigation credit. Pursuant to 15A NCAC 02B .0703, a proposal regarding a proposed nutrient load-reducing measure for nutrient offset credit shall be submitted to DWR for approval prior to any mitigation activities in riparian areas and/or surface waters.

All vegetative plantings, performance criteria and other mitigation requirements for riparian restoration, enhancement and preservation must follow the requirements in 15A NCAC 02B .0295 to

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be eligible for buffer and/or nutrient offset mitigation credits. For any areas depicted as not being viable for nutrient offset credit above, one could propose a different measure, along with supporting calculations and sufficient detail to support estimates of load reduction, for review by the DWR to determine viability for nutrient offset in accordance with 15A NCAC 02B .0703.

This viability assessment will expire on July 21, 2025 or upon approval of a mitigation plan by the DWR, whichever comes first. This letter should be provided in any nutrient offset, buffer, stream or wetland mitigation plan for this Site.

Please contact Katie Merritt at katie.merritt@deq.nc.gov if you have any questions regarding this correspondence.

Sincerely,

DocuSigned by:
Stephanie Goss
755ABF0CD80B428...

Stephanie Goss, Supervisor
401 and Buffer Permitting Branch

SG/kym

Attachments: Figure 3, Figure 3A, Figure 3B, Figure 3C, Figure 3D

cc: File Copy (Katie Merritt)

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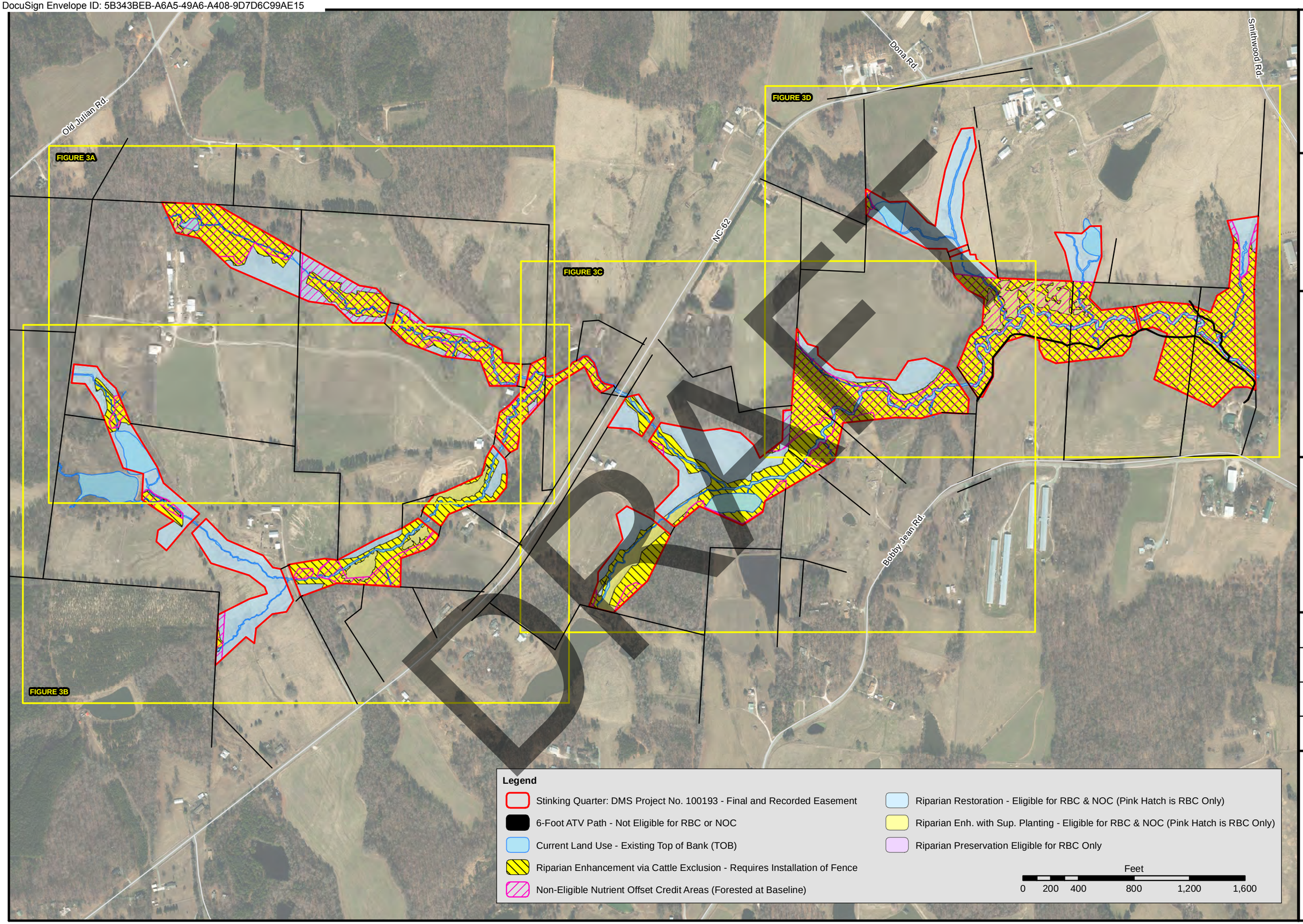

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Permitting
Branch

Project:

STINKING QUARTER
DMS# 100193
DWR# 2021-0395
SAW 2021-00347

GUILFORD COUNTY

Title:

SITE OVERVIEW

CURRENT LANDUSE
&
PROPOSED CREDIT

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

Scale: 1:7,500

Project No.: 100193

FIGURE

3

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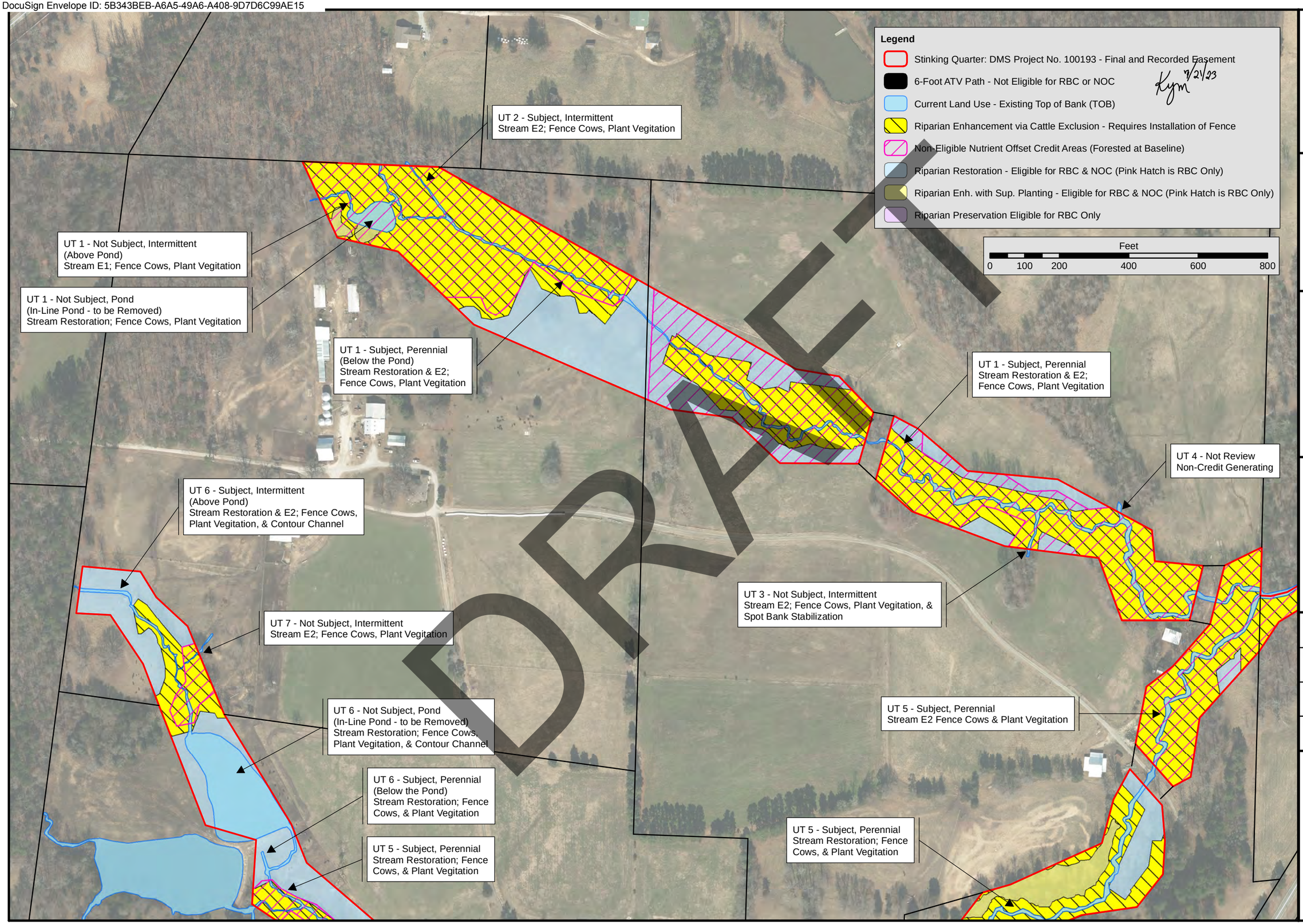

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SITE OVERVIEW

CURRENT LANDUSE
&
PROPOSED CREDIT

Imagery Date: 2022-02-09

Drawn by:	RJH
Date:	JULY 2023
Scale:	1:3,000
Project No.:	100193

FIGURE

3A

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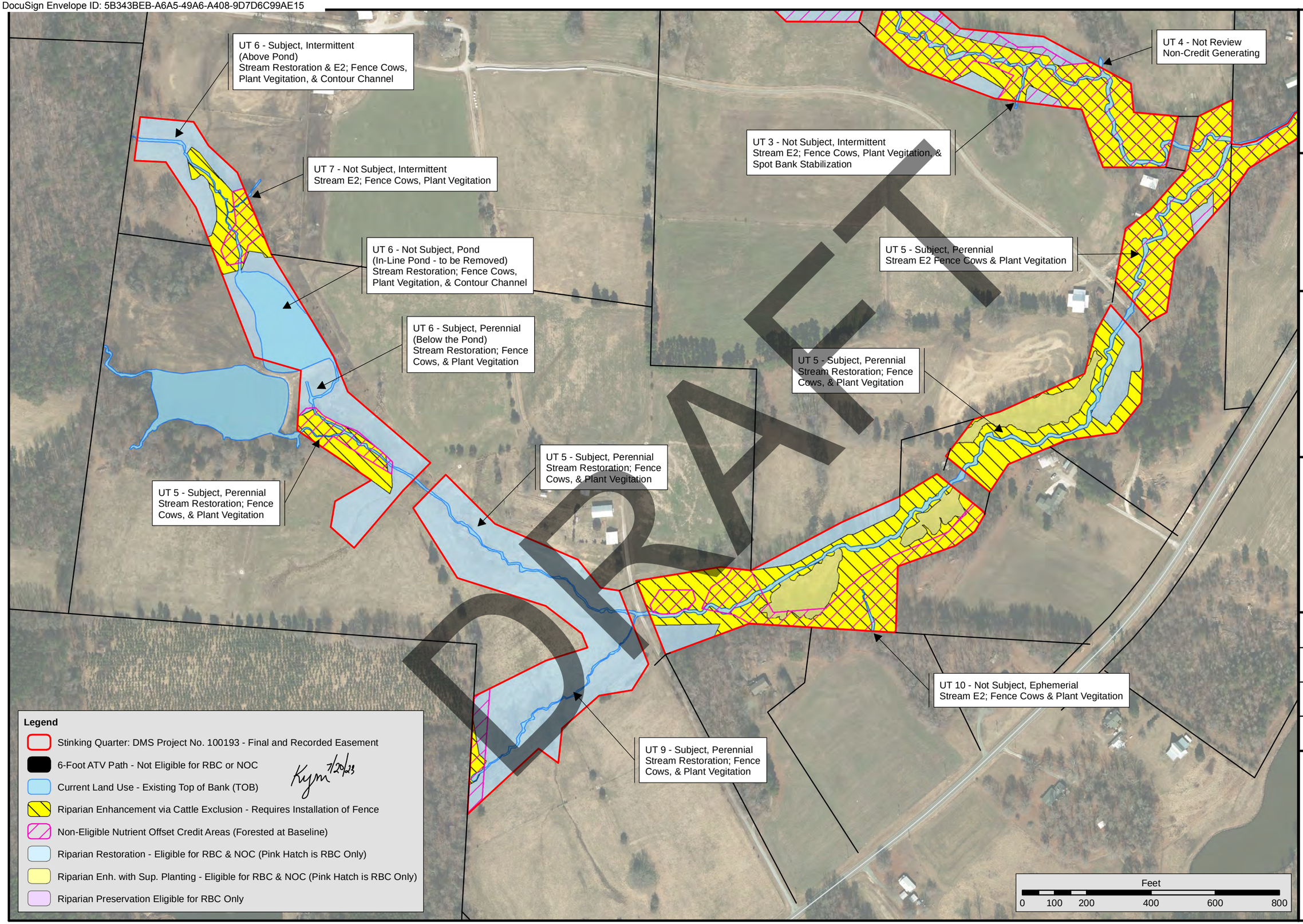

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CURRENT LANDUSE
&
PROPOSED CREDIT

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

3B

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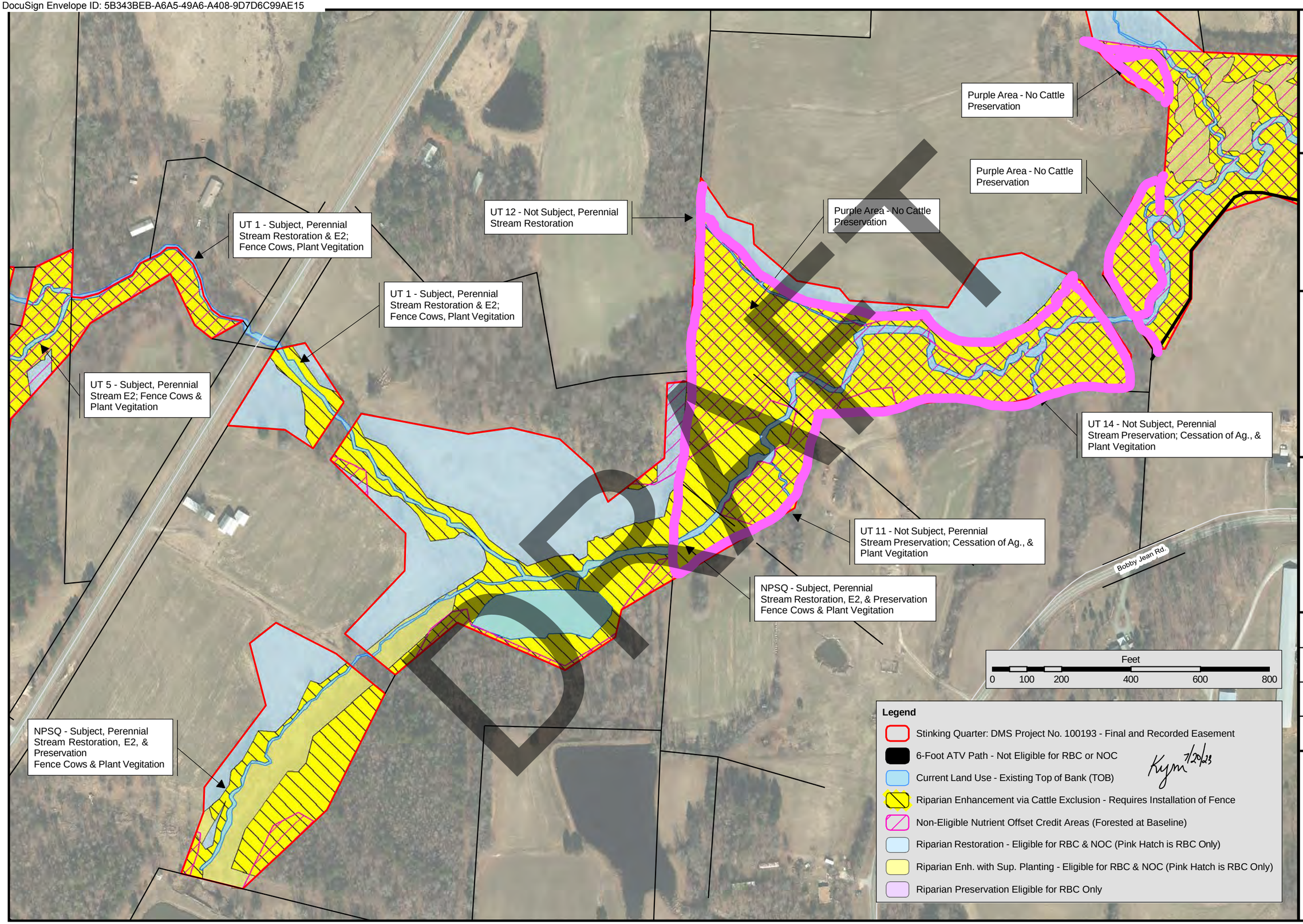

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401 & Buffer Permitting Branch

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STINKING QUARTER
DMS# 100193
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GUILFORD COUNTY

Title:

SITE OVERVIEW

CURRENT LANDUSE & PROPOSED CREDIT

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

3C

N

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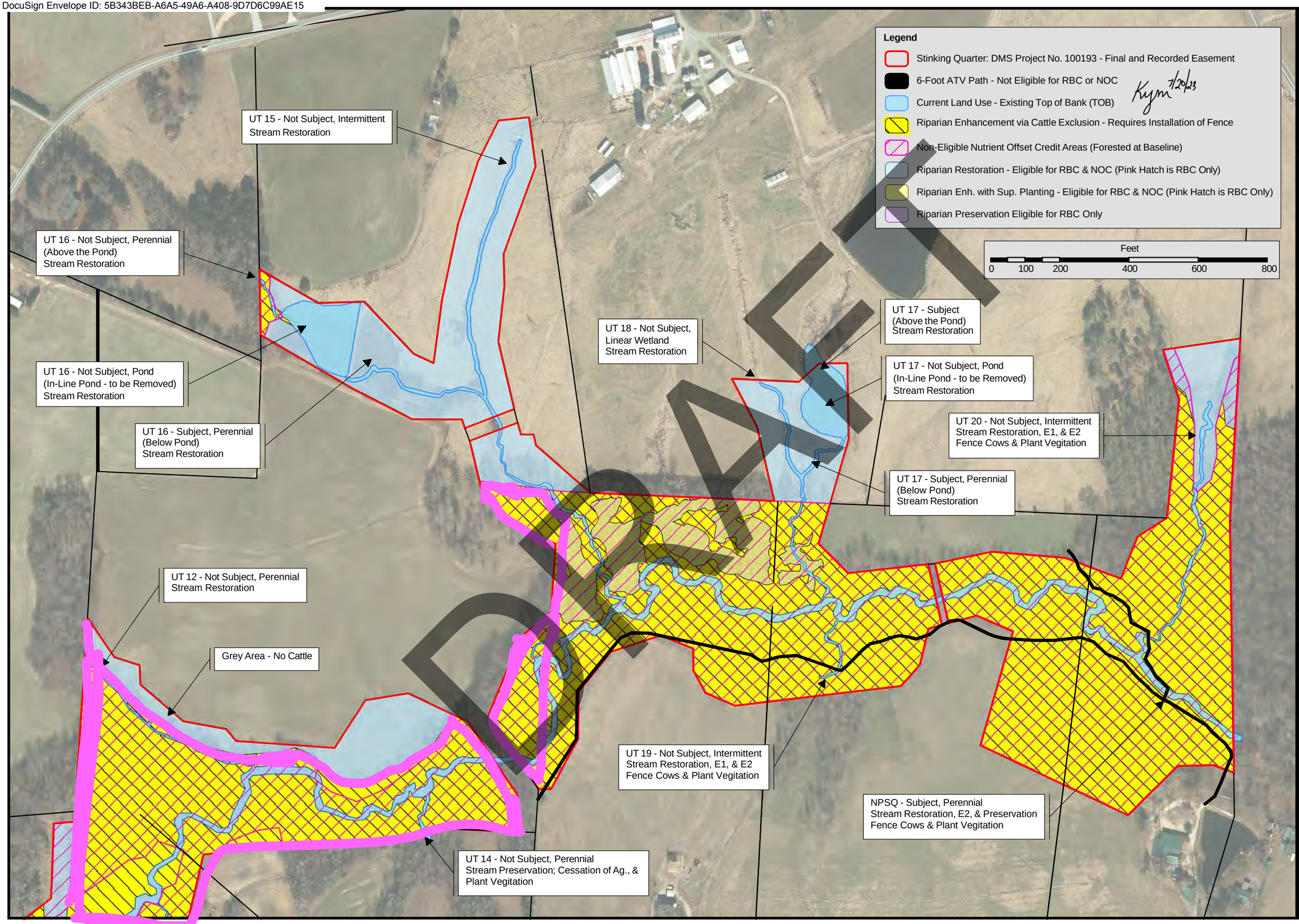

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GUILFORD COUNTY

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SITE OVERVIEW

CURRENT LANDUSE & PROPOSED CREDIT

Imagery Date: 2022-02-09

Drawn by: RJH

Date: JULY 2023

Scale: 1:3,000

Project No.: 100193

FIGURE

3D

N

Attachment C. Existing Conditions Photos

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 1: North Prong Stinking Quarter Creek Upstream Reach



Photo 2: North Prong Stinking Quarter Creek Preservation Reach

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Stinking Quarter
Existing Conditions Photos



Photo 3: North Prong Stinking Quarter Creek Downstream Reach



Photo 4: North Prong Stinking Quarter Creek Downstream Reach

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 5: UT 1 Upstream Reach



Photo 6: UT 1 Downstream Reach

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 7: UT 2



Photo 8: UT 3

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 9: UT 5 Upstream Reach



Photo 10: UT 5 Downstream Reach

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 11: UT 6



Photo 12: UT 7

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 13: UT 9



Photo 14: UT 11

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 15: UT 12



Photo 16: UT 14

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 17: UT 15 Upstream Reach



Photo 18: UT 15 Downstream Reach

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 19: UT 16



Photo 20: UT 17 Upstream Reach

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 21: UT 17 Downstream Reach



Photo 22: UT 18

DRAFT

Stinking Quarter
Existing Conditions Photos



Photo 23: UT 19



Photo 24: UT 20

DRAFT