

MONITORING YEAR 6 ANNUAL REPORT

Final

HENRY FORK MITIGATION SITE

Catawba County, NC
DEQ Contract No. 005782
DMS Project No. 96306
USACE No. 2014-00538
DWR No. 20140193

Catawba River Basin
HUC 03050103 Expanded Service Area

Data Collection Period: January – November 2021
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Final Submission Date: January 10, 2022

PREPARED FOR:



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January 10, 2022

Mr. Matthew Reid
Western Project Manager
Division of Mitigation Services
5 Ravenscroft Dr., Suite 102
Asheville, NC 28801

RE: **Response to MY6 Draft Report Comments**
Henry Fork Mitigation Project
DMS Project # 96306
Contract Number 005782
RFP Number 16-005298
Catawba River Basin – CU# 03050103 Expanded Service Area
Catawba County, North Carolina

Dear Mr. Reid:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Monitoring Year 6 report for the Henry Fork Mitigation Project. DMS' comments are noted below in **bold**. Wildlands' responses to those comments are noted in *italics*.

DMS' comment: 1.2.3 Vegetative Assessment: Please include a brief discussion regarding the average vegetation height in the three vegetation plots established in the potential wetland areas. The IRT indicated in an email dated December 18, 2020 (Appendix 6) that a vigor standard of 10' high by MY7 is expected. Does WEI think this standard will be met by MY7?

Wildlands' response: Text regarding the average vegetation height in the three vegetation plots in the potential wetland areas was added to Section 1.2.3. The average stem heights have also been added to the bottom of Table 9d. The average stem heights for each plot ranged from 3.4 to 4.9 feet, with an overall average of 4.3 feet. Wildlands is undecided if the standard will be met by MY7.

DMS' comment: 1.2.4 Wetland Assessment: GWG4 did not meet success criteria due to a malfunction. The data trend prior to the malfunction indicates that GWG4 would have likely met success criteria if not for the malfunction. DMS recommends downloading gage data prior to the 2022 credit release meeting if possible to provide an update.

Wildlands' response: Wildlands agrees that GWG4 would have likely met success criteria if not for the transducer malfunction. Wildlands will download the GWG4 data prior to the 2022 credit release meeting to provide an update.

DMS' comment: 1.2.5 Areas of Concern: The March 2021 supplemental planting effort included 135 bare roots, 85 tubling plants and 135 live stakes within the potential wetland addendum areas. Please provide a species/quantities list or table and include planting acreage.



Wildlands' response: A table has been added to Section 1.2.5 to specify the species and quantities of the supplemental planting effort in the potential wetland addendum areas. The approximate planting acreage has also been added to the text.

DMS' comment: 1.2.5 Areas of Concern: The frisbee golf footpath was discussed at the 2019 IRT site visit and it was decided the path must be discontinued by the time of closeout. DMS recommends working with the adjacent landowner to discontinue the path early in MY7. WEI would benefit by demonstrating that the path has been decommissioned and is no longer a conservation easement encroachment as the project moves to closeout. Historically, conservation easement encroachments can lead to delayed closeout, additional monitoring to prove encroachment is no longer a problem and stewardship transfer issues.

Wildlands' response: Wildlands PM has discussed this matter with the Wildlands' Principal for the project. Wildlands understands the concerns surrounding this use and the potential ramifications for closeout and will deal with this matter accordingly.

DMS' comment: CCPV: Please add locations of beaver dams that were removed, bank repair location and supplemental planting areas to CCPV.

Wildlands' response: The locations of beaver dams that were removed, bank repair, and supplemental planting areas have been added to the CCPV figures.

DMS' comment: Tables 5a-e and 6: Please add the date that the assessment work was completed to the top of each table. The IRT requested this information be included at the 2021 Credit Release Meeting.

Wildlands' response: The assessment dates have been added to the top of Tables 5a-e and 6.

DMS' comment: Stream Gage 2 – UT1 R2: Please add consecutive day bar at top of graph as shown on other gage plots.

Wildlands' response: The consecutive day bar has been added to the stream gage 2 plot for UT1 Reach 2.

Digital Files Review

DMS' comment: Please change the Year_observed field in the SAOC and VAOC feature classes to years observed (e.g. MY1, MY2, etc.) for clarity.

Wildlands' response: A field called "Year_present" has been added to SAOC and VAOC feature classes in CCPV GIS support files.

DMS' comment: The feature representing the scoured region along UT1 Reach 2 has a length of 10 ft relative to the 15 ft reported in Table 5b. Please ensure that feature and table lengths are consistent for final submittal.

Wildlands' response: The length reported in Table 5b has been updated to 10 ft so that it is consistent with the feature length in the CCPV.



DMS' comment: Please spatially identify the beaver dams that were removed in Summer 2021. The beaver dam features included in the Stream_AOC feature class appear to be from MY4.

Wildlands' response: The location of the beaver dams that were removed in Summer 2021 have been added to the CCPV maps and included in the CCPV GIS support files.

Enclosed please find two (2) hard copies and one (1) electronic copy on USB of the Final Monitoring Report. Please contact me at 828-545-3865 if you have any questions.

Sincerely,

A handwritten signature in black ink that reads "Jake McLean". The signature is written in a cursive style.

Jake McLean
Project Manager
jmclean@wildlandseng.com

EXECUTIVE SUMMARY

Wildlands Engineering Inc. (Wildlands) implemented a full delivery project at the Henry Fork Mitigation Site (Site) for the North Carolina Division of Mitigation Services (DMS) to restore 3,057 linear feet (LF) of perennial streams and enhance 2,626 LF of intermittent streams, enhance 0.68 acres of existing wetlands, rehabilitate 0.25 acres of existing wetlands, and re-establish 3.71 acres of wetlands in Catawba County, NC. The Site is expected to generate 4,807.667 stream mitigation units (SMUs) and 4.222 wetland mitigation units (WMUs) (Table 1). The Site is located near the City of Hickory in Catawba County, NC, in the Catawba River Basin eight-digit Cataloging Unit (CU) 03050102 and the 14-digit Hydrologic Unit Code (HUC) 03050102010030 (Figure 1).

The project's compensatory mitigation credits will be used in accordance with the In-Lieu Fee (ILF) Program Instrument dated July 28, 2010, the expanded service area as defined under the September 12, 2006 PACG memorandum, and/or DMS acceptance and regulatory permit conditions associated with DMS ILF requirements. Hydrologic Unit Code (HUC) 03050102010030, Lower Henry Fork, was identified as a Targeted Local Watershed (TLW) in the DMS 2007 Catawba River Basin Restoration Priority (RBRP) Plan. The project streams consist of four unnamed tributaries (UTs) to the Henry Fork River on the site of a former golf course, referred to herein as UT1, UT2, UT1A, and UT1B (Figure 2). The project also consists of several wetland restoration components, as well as buffer planting along Henry Fork. The project watershed consists of agricultural, forested, and residential land uses.

The project goals established in the Mitigation Plan (Wildlands, 2015) were completed with careful consideration of goals and objectives that were described in the RBRP and to meet DMS mitigation needs while maximizing the ecological and water quality uplift within the watershed. The established project goals include:

- Permanently protect the project site from harmful uses;
- Correct modifications to streams, wetlands, and buffers;
- Improve and re-establish hydrology and function of previously cleared wetlands;
- Reduce current erosion and sedimentation;
- Reduce nutrient inputs to streams and wetlands and downstream water bodies;
- Improve instream habitat; and
- Provide and improve terrestrial habitat and native floodplain forest.

The Site construction and as-built surveys were completed between November 2015 and March 2016. Monitoring Year (MY) 6 assessments and site visits were completed between January and November 2021. Per Inter-agency Review Team (IRT) guidelines, detailed monitoring and analysis of vegetation and channel morphology were omitted during MY6. Visual observations, hydrology data, and management practices are included in this report. To preserve the clarity and continuity of reporting structure, this report maintains section and appendix numbering from previous monitoring reports. Omitted sections are denoted in the table of contents.

Overall, the Site has met the required stream and vegetation success criteria for MY6. All restored and enhanced streams are stable and functioning as designed. All project streams recorded at least one bankfull event or greater in MY6. The bankfull performance standard was met for the Site in MY4. Vegetation within the planted riparian areas appear to be performing well with the majority of the acreage on track to meet the MY7 density requirement of 210 stems per acre. Thirteen of the fifteen groundwater monitoring gages installed on the Site met or exceeded the hydrologic success criteria for MY6. The MY6 visual assessments revealed a few areas of concern including pockets of invasive plant species, areas of low stem growth, and beaver activity. These areas will continue to be monitored and adaptive management will be performed as needed.



HENRY FORK MITIGATION SITE
Monitoring Year 6 Annual Report

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Section 1: PROJECT OVERVIEW

The Henry Fork Mitigation Site (Site) is located near the City of Hickory in Catawba County, NC, in the Catawba River Basin eight-digit Cataloging Unit (CU) 03050102 and the 14-digit Hydrologic Unit Code (HUC) 03050102010030 (Figure 1). Access to the Site is via Mountain View Road, approximately one mile southwest of Hickory, North Carolina. Situated in the Inner Piedmont Belt of the Piedmont Physiographic Province (USGS, 1998), the project watershed consists of agricultural, forested, and residential land uses. The drainage area for the Site is 178 acres (0.28 square miles).

The project streams consist of four unnamed tributaries (UTs) to the Henry Fork River on the site of a former golf course, referred to herein as UT1, UT2, UT1A, and UT1B. Stream restoration reaches included UT1 (Reach 1 and 2) and UT1B, together comprising 3,057 linear feet (LF) of perennial stream channel. Stream enhancement reaches included UT1A and UT2, together totaling 2,626 LF. Stream enhancement activities for UT1A and UT2 were the same as restoration reaches; however, the tributaries are intermittent and were credited as enhancement. The riparian areas of the tributaries and a 100-foot-wide buffer along the project side of Henry Fork, were planted with native vegetation to improve habitat and protect water quality. Wetland components included enhancement of 0.68 acres of existing wetlands, rehabilitation of 0.25 acres of existing wetlands and re-establishment of 3.71 acres of wetlands.

Construction activities were completed by Land Mechanic Designs, Inc. in March 2016. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in March 2016. A conservation easement has been recorded and is in place on 48.06 acres (Deed Book 03247, Page Number 0476-0488) within a tract owned by WEI-Henry Fork, LLC. The project is expected to generate 4,807.667 Stream Mitigation Units (SMUs) and 4.222 Wetland Mitigation Units (WMUs). Annual monitoring will be conducted for seven years. Close-out is anticipated to commence in 2023 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

Directions and a map of the Site are provided in Figure 1 and project components are illustrated for the Site in Figure 2.

1.1 Project Goals and Objectives

The Site will help meet the goals for the watershed outlined in the RBRP and provide numerous ecological benefits within the Catawba River Basin. While many of these benefits are limited to the Henry Fork project area, others, such as pollutant removal, reduced sediment loading, and improved aquatic and terrestrial habitat, have farther-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals established were completed with careful consideration of goals and objectives that were described in the RBRP and to meet the DMS mitigation needs while maximizing the ecological and water quality uplift within the watershed.

The following project specific goals established in the Mitigation Plan (Wildlands, 2015) include:

- Permanently protect the project site from harmful uses; and
- Correct modifications to streams, wetlands and buffers;
- Improve and re-establish hydrology and function of previously cleared wetlands;
- Reduce current erosion and sedimentation;
- Reduce nutrient inputs to streams and wetlands, and to downstream water bodies;
- Improve instream habitat; and



- Provide and improve terrestrial habitat and native floodplain forest.

The project goals were addressed through the following project objectives:

- Decommissioning the existing golf course and establishing a conservation easement on the Site will eliminate direct chemical fertilizer, pesticide, and herbicide inputs;
- Resizing and realigning channels to address stream dredging and ditching. Planting native woody species in riparian zones which have been maintained through mowing. By correcting these prior modifications, the channels and floodplains will provide a suite of hydrologic and biological function;
- Restoring appropriate stream dimensions and juxtaposition of streams and wetlands on the landscape. Wetlands will be enhanced through more frequent overbank flooding, and by reducing the drawdown effect that current ditched channels have on wetland hydrology; thereby, enhancing wetland connectivity to the local water table. The project will extend existing wetland zones into adjacent areas and support wetland functions;
- Removing historic overburden to uncover relic hydric soils. Roughen wetland re-establishment. Restore streams for wetland benefit. Each of these will bring local water table elevations closer to the ground surface. Create overbank flooding and depressional storage for overland and overbank flow retention. Decrease direct runoff, and increase infiltration;
- Planting a native vegetation community on the Site to revegetate the riparian buffers and wetlands. Conduct soil restoration through topsoil harvesting and reapplication and leaf litter harvesting and application from adjacent forested areas. This will return functions associated with buffers and forested floodplains, as well as enhance soil productivity and bring native biological activity and seed into the disturbed areas;
- Constructing diverse and stable channel form with varied stream bedform and installing habitat features, along with removing culverts. These will allow aquatic habitat quality and connectivity enhancement; and
- Placing a portion of the right bank Henry Fork floodplain under a conservation easement, and planting all stream buffers and wetlands with native species. Creating a 100-foot wide corridor of wooded riparian buffer along that top right bank area and re-establishing native plant communities and habitat connectivity within Site to adjoining natural areas along the river corridor.

1.2 Monitoring Year 6 Data Assessment

Annual monitoring was conducted between January and November 2021 to assess the condition of the project. The stream, vegetation, and hydrologic success criteria for the Site follows the approved success criteria presented in the Henry Fork Mitigation Plan (Wildlands, 2015).

1.2.1 Stream Assessment

MY6 is a reduced monitoring year that does not require morphological surveys; therefore, the stream assessment was not performed this year. Visual assessments reveal that project streams are functioning as designed. Refer to Appendix 2 for visual assessment tables, Current Conditions Plan View (CCPV) Figures 3.0-3.2, and reference photographs.

1.2.2 Stream Hydrology Assessment

At the end of the seven-year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. The bankfull performance standard was met for the project in MY4. During MY6, all stream reaches recorded at least one additional bankfull event.



In addition to monitoring bankfull events, intermittent streams (UT1A and UT2) must be monitored to demonstrate a minimum of 30 consecutive days of flow during periods of normal rainfall. In MY6, UT1A and UT2 both exceeded the success criteria for stream flow with 319 and 169 days documented, respectively. The presence of baseflow was also observed on these reaches during site visits; thereby, confirming the recorded stream gage data. Please refer to CCPV Figures 3.0-3.2 in Appendix 2 for stream gage locations and Appendix 5 for hydrology summary data and plots.

1.2.3 Vegetative Assessment

A total of 15 vegetation plots (VPs) were established during baseline monitoring within the project easement area using standard 10 by 10 meter plots. Vegetation plots are monitored in accordance with the guidelines and procedures developed by the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008). The final vegetative performance standard will be the survival of 210 planted stems per acre in the planted riparian and wetland corridor at the end of the required seven-year monitoring period. In addition, planted vegetation must average 10 feet in height in each plot at the end of the seven-year monitoring period.

MY6 is a reduced monitoring year that does not require detailed vegetation inventory and analysis. Therefore, the 15 vegetation plots (VPs) that were originally established during baseline monitoring were not assessed this year.

A wetland addendum letter was submitted to DMS on October 6, 2020 to identify potential wetland areas created by the project within the Site. See Section 1.2.5 for further discussion of the wetland addendum. In MY6, 3 vegetation plots were installed within the potential wetland areas as requested by the IRT in the comments to the wetland addendum. These additional wetland vegetation plots (WPs) will be used to evaluate stem density, species diversity, and height to determine if the potential wetland areas are meeting the vegetation success criteria for the Site. An assessment of the WPs was completed in September 2021 and resulted in an average stem density of 540 stems per acre and average height of 4.3 feet. All WPs are exceeding the final vegetative density performance standard for the Site but have not yet met the height performance standard.

Please refer to Appendix 2 for wetland vegetation plot photographs, CCPV Figures 3.0-3.2 for vegetation plot locations, and Appendix 3 for wetland vegetation data tables.

1.2.4 Wetland Assessment

Following construction, groundwater gages (GWGs) were distributed so the data collected would provide a reasonable indication of groundwater levels throughout the wetland components on the Site. Additional gages have been added to further refine this data. A gage was established in an adjacent reference wetland to compare to the hydrologic response within the restored wetland areas at the Site. A barotroll logger is used to calibrate groundwater gage pressure based on local atmospheric pressure. A new barotroll was installed onsite at the beginning of MY6 to replace the original barotroll that failed in MY5. The rainfall data is collected from an existing NC CRONOS station (Hickory 4.8 SW, NC). All monitoring gages were downloaded quarterly and are maintained as needed. A soil temperature gage was installed on Site in October 2016. Wildlands is using the soil temperature gage data to confirm the dates defined in the WETS table for Burke County, NC, if needed. The WETS growing season is not available for Catawba County and instead, the Burke County growing season (March 20 to November 11) is being used as criteria for hydrologic success. The growing season is defined by historic weather data collected at the Hickory Regional Airport in Burke County, approximately 3 miles as the crow flies from the Site. The final performance standard established for wetland hydrology will be a free groundwater surface within 12 inches of the ground surface for 20 consecutive days (8.5%) of the defined growing season under typical precipitation conditions.



There are fifteen GWGs currently installed on the Site. Seven of the groundwater hydrology gages (GWGs) were established during baseline monitoring within the wetland rehabilitation and re-establishment zones (GWGs 1 – 4 and 6 – 8). During the initial GWG installation, GWG 3 was installed in a seep where hydrology was much stronger than the surrounding area. Wildlands relocated GWG 3 in January 2017 (MY2) to an area more representative of the surrounding wetlands. Wildlands also installed two additional gages (GWG 5 and 9) within the wetland re-establishment areas during 2017 (MY2) to further assess wetland performance near GWGs not meeting criteria. The transducer for GWG 5 showed abnormal data patterns in MY3 and was replaced at the beginning of MY4 to ensure accurate water level data is being reported. In February and March 2019 (MY4), six additional GWGs were added to the Site. Three of the gages (GWG 10 – 12) were installed to better define the wetland re-establishment area within the right floodplain of UT1 Reach 2. The remaining three gages (GWG 13 – 15) were installed in locations adjacent to wetland enhancement areas to provide groundwater data to support the potential expansion of these wetland areas.

Of the fifteen GWGs, thirteen met the success criteria for MY6 with a range of 13% to 100% of the growing season. GWGs 5, 10, and 13 achieved the success criteria for 100% of the growing season with plots showing similar hydroperiods and indicating comparable groundwater hydrology in those areas. The remainder of the GWG hydroperiods were largely analogous to the reference gage. GWG 8 did not meet the success criteria for MY6 with a measured maximum 18 consecutive days during the growing season or two days short of the success criteria. The GWG 4 transducer malfunctioned between 3/12/2021 and 6/5/2021, and a new transducer was installed on 6/6/2021. Consequently, GWG 4 did not meet the success criteria with a measured maximum 14 consecutive days during the growing season. Monthly rainfall data in 2021 indicated higher than normal rainfall amounts in February and March. Lower than normal rainfall occurred in April, June, and September. Please refer to the CCPV Figures 3.0-3.2 in Appendix 2 for groundwater gage locations and Appendix 5 for groundwater hydrology summary data and plots.

1.2.5 Areas of Concern and Adaptive Management Plan

Vegetation

MY6 visual assessment reveal that more than 97% of the conservation easement is unaffected by invasive species populations. When present, these species include Japanese honeysuckle (*Lonicera japonica*), multiflora rose (*Rosa multiflora*), Chinese privet (*Ligustrum sinense*), Creeping primrose (*Ludwigia peploides*), Asian spiderwort (*Murdannia keisak*) and kudzu (*Pueraria montana*). Invasive species treatments occurred in March, June, and July 2021, and focused on small areas of multiflora rose, kudzu, and in-stream invasive exotic vegetation within UT1A and UT2. Populations of multiflora rose, creeping primrose, Asian spiderwort, and kudzu have been reduced by treatments to levels below the mapping threshold, therefore are not depicted on the CCPV Figures 3.0-3.2.

MY6 visual assessments show that woody vegetation has become well established on at least 94% of the planted riparian areas. Previously identified areas of low stem vigor/height along the floodplains of UT1 Reach 2 and UT2 are still present but appear to be improving with desired volunteer species including river birch (*Betula nigra*), sycamore (*Platanus occidentalis*), black willow (*Salix nigra*), tag alder (*Alnus serrulata*), and cottonwood (*Populus deltoides*) naturally starting to develop and herbaceous vegetation filling in previously observed bare areas.

In March 2021, a supplemental planting effort installed 135 bare roots, 85 tubling plants, and 135 livestakes within the potential wetland areas (0.661 acres) identified in the wetland addendum to increase woody stem density and species diversity. Woody transplants (river birch, box elder, tag alder, and black willow) from the adjacent project areas were also used where appropriate within the potential wetland areas.



Supplemental Planting List – March 2021			
Scientific Name	Common Name	Source	Quantity
<i>Cephalanthus occidentalis</i>	Button bush	Tubling	85
<i>Populus deltoides</i>	Cottonwood	Bare root	70
<i>Salix nigra</i>	Black willow	Bare root	30
<i>Salix nigra</i>	Black willow	Live stake	70
<i>Salix sericea</i>	Silky willow	Bare root	35
<i>Salix sericea</i>	Silky willow	Live stake	65

Streams

The on-site intermittent streams (UT1A and UT2) that received full restoration approach but are credited at a reduced enhancement ratio, have continued to maintain single channel morphology and function. In previous years, low flow and some vegetation within the channel had been noted along these reaches. A debris jam that was impeding some flow and causing aggradation within UT1A was removed in March 2021, and regular baseflow was observed throughout the rest of the year, as demonstrated by the stream gage plot for UT1A in Appendix 5. Similarly, minor aggradation previously noted along UT1 Reach 1 downstream of the wetland enhancement area, in the footprint of the old pond bed, has improved as woody vegetation along the banks has become established.

Isolated areas of bank scour along UT1 (near station 124+25) were repaired in October 2021 by regrading and replanting the banks with live stakes and established transplanting vegetation from the floodplain. Previous bank repair areas along UT1 (near station 106+00 and 124+75) appear stable and effective.

A few beaver dams were removed in summer 2021 throughout the lower portion of UT1 Reach 2. The period of prolonged inundation is demonstrated in the stream gage plot for UT1 in Appendix 5. Beaver dams were not observed during the fall 2021 site walk. Beavers remain present on the Site but the occurrence has decreased and negative effects have diminished. The now infrequent stream impoundments permit regular flow of tributaries (UT1A and UT2) into UT1, thus allowing floodplain vegetation to become established in previously inundated areas. Beaver activity will continue to be monitored and managed until closeout.

Wetland Addendum

As stated in section 1.2.4, three additional groundwater gages (GWG 13 – 15) were installed in February and March 2019 before the start of the MY4 growing season, for the purpose of providing groundwater data to document additional potential wetland areas. In September 2020, Wildlands staff determined that approximately 0.051 acres of the wetland re-establishment area, represented by GWG 8, is at risk of not meeting success criteria for wetland hydrology. A wetland addendum letter was submitted to DMS on October 6, 2020 to identify additional potential wetland areas that have been created by the project and formally request the inclusion of these created wetland areas for credit to offset those identified as at risk. Per the DMS credit release meeting in May 2021, a decision regarding the potential wetland areas will be made during the next IRT field review of the Site. Wildlands has incorporated the comments received by the IRT regarding the wetland addendum. As requested, Wildlands has supplementally planted the potential wetland areas with appropriate woody stems and established additional monitoring plots within these areas to determine if performance standards are being met. Please refer to Appendix 6 for the wetland addendum letter and subsequent IRT comments, CCPV Figures 3.0-3.2 in Appendix 2 for potential wetland locations, and Table 9d in Appendix 3 for vegetative monitoring plot results.



Conservation Easement

There is an approved narrow footpath through the easement near vegetation plot 5 for the purpose of frisbee golf that Wildlands has allowed on a conditional basis and is set to discontinue by the time of closeout. This has continued to be monitored to ensure that it does not violate easement terms or threaten stream assets. The minor mowing encroachments that were observed in MY1 and MY2 along the floodplain of UT1 Reach 1 have been resolved. While there has been a stop to the encroachment issues, the Site boundary and prior problem areas will continue to be monitored for easement enforcement.

Quarterly site visits will continue to be conducted to monitor and address areas of concern. If necessary, adaptive management will be implemented to improve the conditions of the Site. Please refer to Appendix 2 for CCPV Figures 3.0-3.2 for mapped areas of concern.

1.3 Monitoring Year 6 Summary

Overall, the Site has met the required stream and vegetation success criteria for MY6. All restored and enhanced streams are stable and functioning as designed. All project streams recorded at least one bankfull event or greater in MY6. The bankfull performance standard was met for the Site in MY4. Vegetation within the planted riparian areas appear to be performing well with the majority of the acreage on track to meet the MY7 density requirement of 210 stems per acre. Thirteen of the fifteen groundwater monitoring gages installed on the Site met or exceeded the hydrologic success criteria for MY6. The MY6 visual assessments revealed a few areas of concern including pockets of invasive plant species, areas of low stem growth, and beaver activity. These areas will continue to be monitored and adaptive management will be performed as needed.

Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on the DMS website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.



Section 2: METHODOLOGY

Geomorphic data were collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All Integrated Current Condition Mapping was recorded using either a Trimble or Topcon handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Crest gages were installed in surveyed riffle cross sections and monitored quarterly. Hydrologic monitoring instrument installation and monitoring methods are in accordance with the United States Army Corps of Engineers (USACE, 2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008).



Section 3: REFERENCES

- Doll, B.A., Grabow, G.L., Hall, K.A., Halley, J., Harman, W.A., Jennings, G.D., and Wise, D.E. 2003. Stream Restoration A Natural Channel Design Handbook.
- Harrelson, C.C., Rawlins, C.L., Potyondy, J.P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique*. Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.
- Lee, M.T., Peet, R.K., S.D., Wentworth, T.R. 2008. CVS-EEP Protocol for Recording Vegetation Version 4.2. Retrieved from <http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-5.pdf>.
- North Carolina Climate Retrieval and Observations Network of the Southeast Database (NCCRONOS). 2021. State Climate Office of North Carolina. Version 2.7.2. Station ID Hickory 4.8 SW. Accessed November 2021.
- North Carolina Division of Mitigation Services (DMS), 2007. Catawba River Basin Restoration Priorities. <http://www.nceep.net/services/restplans/RBRPCatawba2007.pdf>
- North Carolina Division of Mitigation Services and Interagency Review Team Technical Workgroup. 2018. Standard Measurement of the BHR Monitoring Parameter. Raleigh, NC.
- Rosgen, D. L. 1994. A classification of natural rivers. *Catena* 22:169-199.
- Rosgen, D.L. 1996. Applied River Morphology. Pagosa Springs, CO: Wildland Hydrology Books.
- United States Army Corps of Engineers. 2003. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.
- United States Geological Survey. 1998. North Carolina Geology. <http://www.geology.enr.state.nc.us/usgs/carolina.htm>
- Wildlands Engineering, Inc (2015). Henry Fork Mitigation Site Mitigation Plan. NCEEP, Raleigh, NC.
- Wildlands Engineering, Inc (2016). Henry Fork Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. NCEEP, Raleigh, NC.



APPENDIX 1. General Figures and Tables

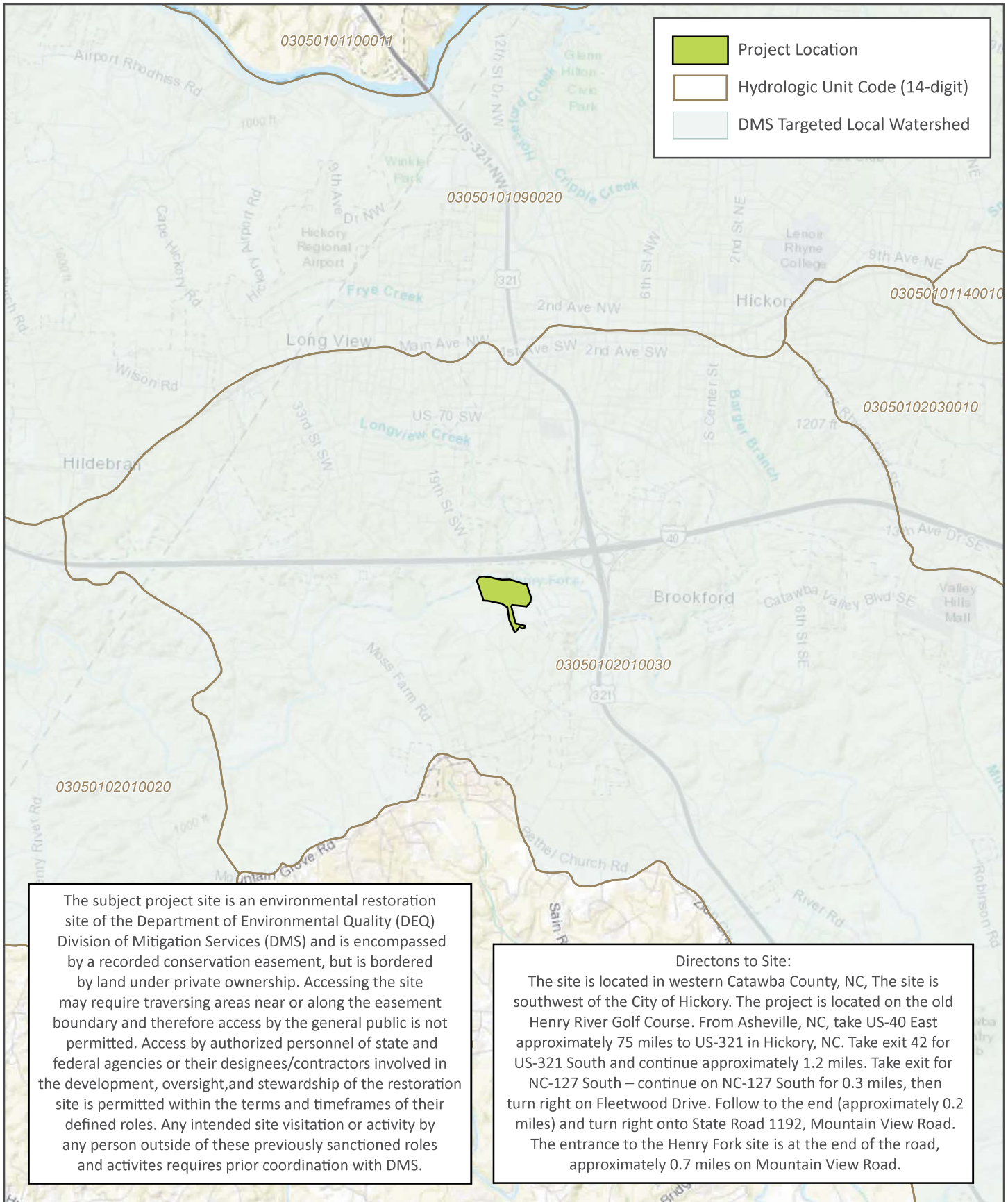


Figure 1 Vicinity Map
Henry Fork Mitigation Site
DMS Project No. 96306
Monitoring Year 6 - 2021
Catawba County, NC

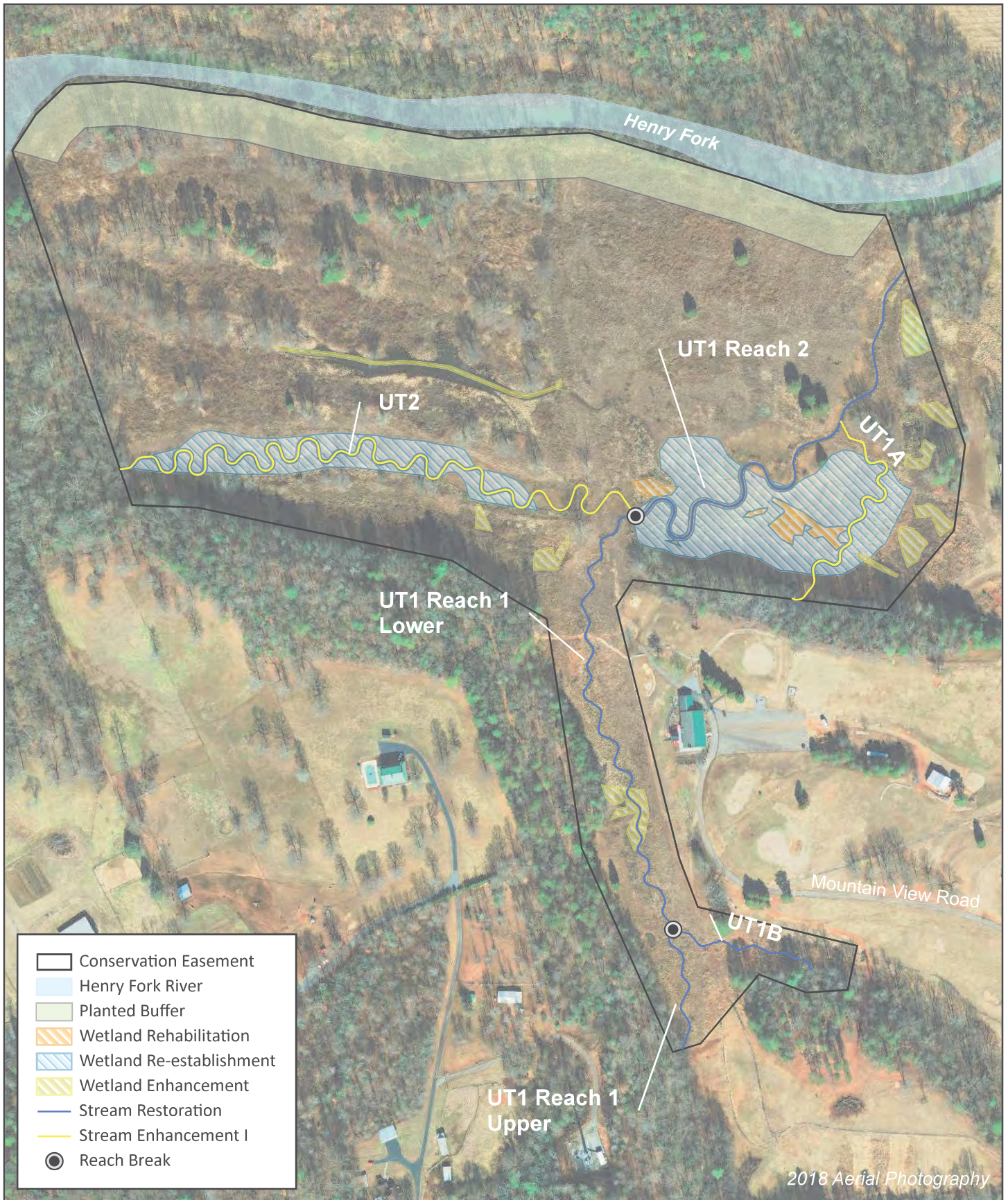


Figure 2 Project Component/Asset Map
 Henry fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



0 150 300 Feet



Table 1. Project Components and Mitigation Credits

Henry Fork Mitigation Site
 DMS Project No.96306
 Monitoring Year 6 - 2021

MITIGATION CREDITS									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	4,807.667	N/A	3.880	0.342	N/A	N/A	N/A	N/A	N/A
PROJECT COMPONENTS									
Reach ID	Proposed Stationing/ Location*	Existing Footage/ Acreage	Approach	Restoration (R) or Restoration Equivalent	Restoration Footage/Acreage*	Mitigation Ratio	Credits (SMU/WMU)*		
STREAMS									
UT1 Reach 1 Upper	100+00 to 103+02	1,392	P1	Restoration	302	1:1	302.000		
UT1 Reach 1 Lower	103+02 to 114+71		P1	Restoration	1,169	1:1	1,169.000		
UT1 Reach 2	114+71 to 126+99	1,499	P1/P2	Restoration	1,228	1:1	1,228.000		
UT1A	180+00 to 186+57	353	P1	Enhancement	657	1.5:1	438.000		
UT1B	150+00 to 153+58	478	P1	Restoration	358	1:1	358.000		
UT2	200+00 to 219+69	1,915	P1	Enhancement	1,969	1.5:1	1,312.667		
WETLANDS									
Wetland 1	Floodplain near UT1 Reach 2	N/A	Planting, hydrologic improvement	Re-establishment	2.48	1:1	2.480		
Wetland 2	Floodplain near UT2	N/A	Planting, hydrologic improvement	Re-establishment	1.23	1:1	1.230		
Wetland A	Floodplain between UT1 Reach 2 and UT1A	0.18	Planting, hydrologic improvement	Rehabilitation	0.18	1.5:1	0.120		
Wetland B	Floodplain between UT1 Reach 2 and UT1A	0.01	Planting, hydrologic improvement	Rehabilitation	0.013	1.5:1	0.009		
Wetland C	Floodplain between UT1 Reach 2 and UT1A	0.003	Planting, hydrologic improvement	Rehabilitation	0.003	1.5:1	0.002		
Wetland G	Floodplain near UT1A	0.02	Planting	Enhancement	0.02	2:1	0.009		
Wetland H	East hillslope near UT1A	0.06	Planting	Enhancement	0.06	2:1	0.028		
Wetland I	East hillslope near UT1A	0.08	Planting	Enhancement	0.08	2:1	0.039		
Wetland J	East hillslope near UT1 Reach 2	0.04	Planting	Enhancement	0.04	2:1	0.018		
Wetland K	East hillslope near UT1 Reach 2	0.06	Planting	Enhancement	0.06	2:1	0.028		
Wetland M	East hillslope near UT1 Reach 2	0.13	Planting	Enhancement	0.13	2:1	0.065		
Wetland N	Floodplain towards river from UT2	0.08	Planting	Enhancement	0.08	2:1	0.042		
Wetland P	Floodplain upslope of UT2	0.02	Planting	Enhancement	0.02	2:1	0.012		
Wetland Q	Floodplain upslope of UT2	0.07	Planting	Enhancement	0.07	2:1	0.035		
Wetland R	Floodplain in footprint of Pond 3 near head of UT1 Reach 2	0.06	Significant improvement to wetland functions	Rehabilitation	0.06	1.5:1	0.039		
Wetland S	UT1 Reach 1 Valley (Pond 1)	0.16	Planting	Enhancement	0.13	2:1	0.066		

COMPONENT SUMMATION						
Restoration Level	Stream (LF)	Riparian Wetland (acres)	Non-Riparian Wetland (acres)	Buffer (square feet)	Upland (acres)	
Restoration	3,057	N/A	N/A	N/A	N/A	
Enhancement I	2,626	N/A	N/A	N/A	N/A	
Wetland Re-Establishment	N/A	3.71	N/A	N/A	N/A	
Wetland Rehabilitation	N/A	0.25	N/A	N/A	N/A	
Wetland Enhancement	N/A	0.68	N/A	N/A	N/A	
Preservation	N/A	N/A	N/A	N/A	N/A	

* Stream credit calculations were originally calculated along the as-built thalweg and updated to be calculated along stream centerlines for Monitoring Year 2 after discussions with NC IRT.

Table 2. Project Activity and Reporting History

Henry Fork Mitigation Site
DMS Project No.96306
Monitoring Year 6 - 2021

Activity or Report	Data Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	August 2015	September 2015
Final Design - Construction Plans	October 2015	October 2015
Construction	November 2015 - March 2016	March 2016
Temporary S&E mix applied to entire project area ¹	March 2016	March 2016
Permanent seed mix applied to reach/segments ¹	March 2016	March 2016
Bare root and live stake plantings for reach/segments	March 2016	March 2016
Baseline Monitoring Document (Year 0)	Stream Survey	May 2016
	Vegetation Survey	
Year 1 Monitoring	Stream Survey	December 2016
	Vegetation Survey	
Year 1 Beaver dam removal on UT1 Reach 2	May-September 2016	
Year 1 Invasive Species Treatment	June & July 2016	
Year 2 Monitoring	Stream Survey	December 2017
	Vegetation Survey	
Year 2 Invasive Species Treatment	August 2017	
Year 3 Monitoring	Stream Survey	November 2018
	Vegetation Survey	
Year 3 Invasive Species Treatment	June & August 2018	
Year 4 Monitoring	Stream Survey	November 2019
	Vegetation Survey	
Year 4 Beaver dam removal on UT1 Reach 2	March 2019 - November 2019	
Year 4 Bank Repair on UT1 Reach 1	August 2019	
Year 4 Invasive Species Treatment	October 2019	
Year 5 Bank Repair on UT1 Reach 2	January 2020	
Year 5 Beaver Maintenance	February 2020	
Year 5 Supplemental Planting	March 2020	
Year 5 Monitoring	Stream Survey	November 2020
	Vegetation Survey	
Year 5 Invasive Species Treatment	July & September 2020	
Year 6 Monitoring	Stream Survey	November 2021
	Vegetation Survey	
Year 6 Supplemental Planting in wetland addendum areas	March 2021	
Year 6 Invasive Species Treatment	March, June & July 2021	
Year 6 Beaver Treatment	July 2021	
Year 6 Bank Repair on UT1 Reach 2	October 2021	
Year 7 Monitoring	Stream Survey	
	Vegetation Survey	

¹Seed and mulch is added as each section of construction is completed.
N/A - Not applicable

Table 3. Project Contact Table

Henry Fork Stream Mitigation Site
DMS Project No.96306
Monitoring Year 6 - 2021

Designer Jake McLean, PE	Wildlands Engineering, Inc. 167-B Haywood Rd. Asheville, NC 28806 828.774.5547
Construction Contractor	Land Mechanics Designs, Inc. 780 Landmark road Willow Spring, NC 27592
Planting Contractor	Bruton Natural Systems, Inc P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	Land Mechanics Designs, Inc. 780 Landmark road Willow Spring, NC 27592
Seed Mix Sources	Green Resource, LLC
Nursery Stock Suppliers	Dykes and Son Nursery
Bare Roots	Bruton Natural Systems, Inc
Live Stakes	Wetland Plants, Inc.
Plugs	
Monitoring Performers	Wildlands Engineering, Inc.
Monitoring, POC	Kristi Suggs 704.332.7754, ext. 110

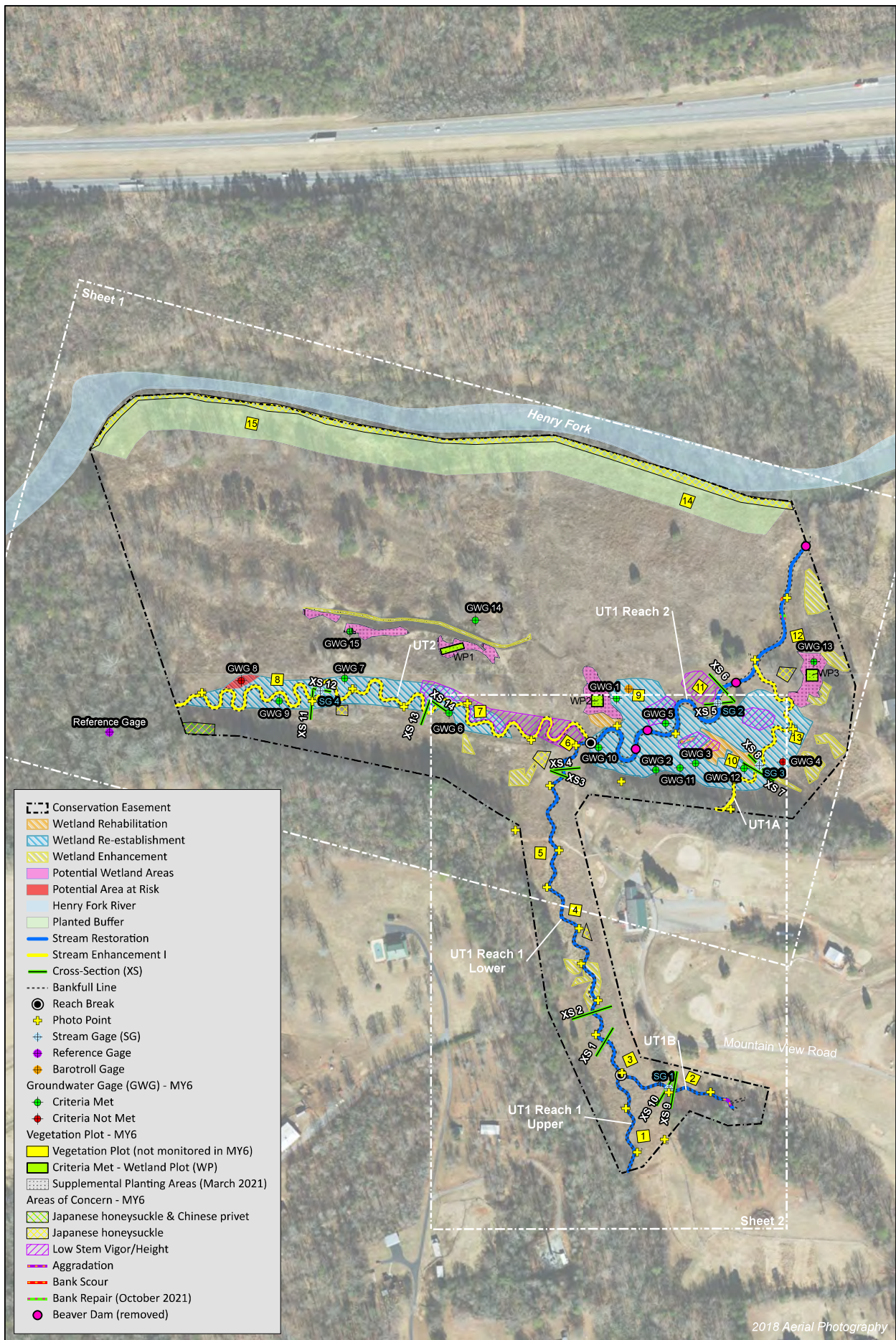
Table 4. Project Information and Attributes

Henry Fork Mitigation Site
 DMS Project No.96306
 Monitoring Year 6 - 2021

PROJECT INFORMATION					
Project Name	Henry Fork Mitigation Site				
County	Catawba County				
Project Area (acres)	48.06				
Project Coordinates (latitude and longitude)	35°42'12.98"N, 81°21'53.20"W				
PROJECT WATERSHED SUMMARY INFORMATION					
Physiographic Province	Inner Piedmont				
River Basin	Catawba				
USGS Hydrologic Unit 8-digit	03050102 (Expanded Service Area for 03050103)				
USGS Hydrologic Unit 14-digit	03050102010030				
DWR Sub-basin	03-08-35				
Project Drainage Area (acres)	178				
Project Drainage Area Percentage of Impervious Area	5%				
CGIA Land Use Classification	39% - Herbaceous/Pasture, 36% - Forested, 25% - Developed, >1% - Water				
REACH SUMMARY INFORMATION					
Parameters	UT1 Reach 1	UT1 Reach 2	UT1A	UT1B	UT2
Length of Reach (linear feet) - Post-Restoration	1,497	1,232	658	358	1,969
Drainage Area (acres)	106	129	23	31	49
NCDWR Stream Identification Score	39.5	32.5	27.25	31.25	27
NCDWR Water Quality Classification	C				
Morphological Description (stream type)	P	P	I	P	I
Evolutionary Trend (Simon's Model) - Pre-Restoration	III	IV/V	IV/V	III	IV/V
Underlying Mapped Soils	Codorus loam, Dan River loam, Hatboro Loam, Poplar Forest gravelly sandy loam 2-6% slopes, and Woolwine-Fairview complex				
Drainage Class	---	---	---	---	---
Soil Hydric Status	---	---	---	---	---
Slope	0.024-0.056	0.0043-0.017	0.0095-0.016	0.015-0.077	0.0032
FEMA Classification	N/A*				
Native Vegetation Community	Piedmont Alluvial Forest				
Percent Composition Exotic Invasive Vegetation -Post-Restoration	0%				
REGULATORY CONSIDERATIONS					
Regulation	Applicable?	Resolved?	Supporting Documentation		
Waters of the United States - Section 404	Yes	PCN prepared	USACE Nationwide Permit No.27 and DWQ 401 Water Quality Certification No. 3885.		
Waters of the United States - Section 401	Yes	PCN prepared			
Division of Land Quality (Dam Safety)	N/A	N/A	N/A		
Endangered Species Act	Yes	Yes	Henry Fork Mitigation Plan; Wildlands determined "no effect" on Catawba County listed endangered species. June 5, 2015 email correspondence from USFWS stated "not likely to adversely affect" northern long-eared bat.		
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 3/24/2014)		
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A		
FEMA Floodplain Compliance	Yes*	No impact application was prepared for local review. No post-project activities required.	Floodplain development permit issued by Catawba County.		
Essential Fisheries Habitat	No	N/A	N/A		

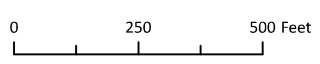
*The project site reaches do not have regulated floodplain mapping, but are located within the Henry Fork floodplain.

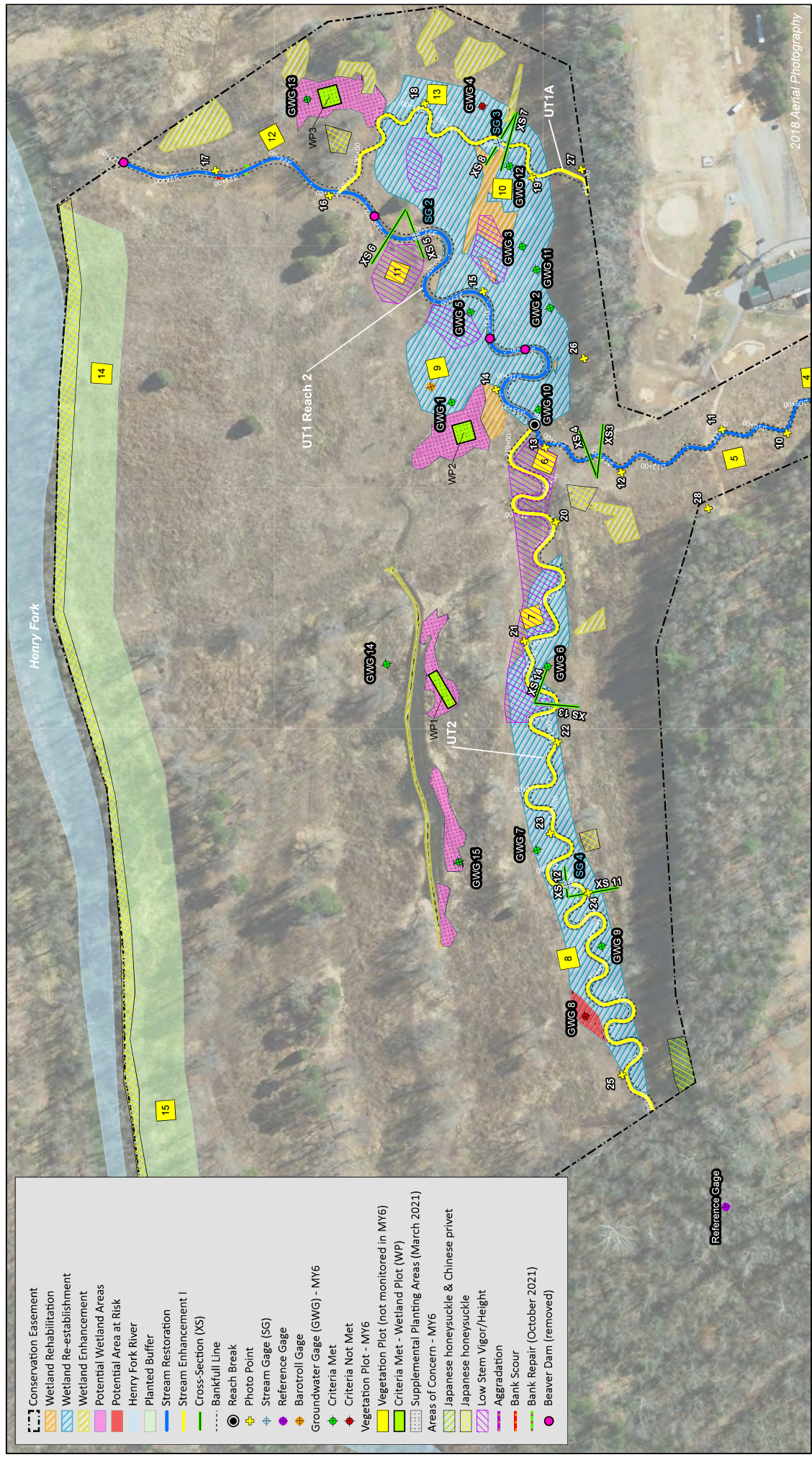
APPENDIX 2. Visual Assessment Data



- Conservation Easement
- Wetland Rehabilitation
- Wetland Re-establishment
- Wetland Enhancement
- Potential Wetland Areas
- Potential Area at Risk
- Henry Fork River
- Planted Buffer
- Stream Restoration
- Stream Enhancement I
- Cross-Section (XS)
- Bankfull Line
- Reach Break
- Photo Point
- Stream Gage (SG)
- Reference Gage
- Barotroll Gage
- Groundwater Gage (GWG) - MY6
 - Criteria Met
 - Criteria Not Met
- Vegetation Plot - MY6
 - Vegetation Plot (not monitored in MY6)
 - Criteria Met - Wetland Plot (WP)
- Supplemental Planting Areas (March 2021)
 - Japanese honeysuckle & Chinese privet
 - Japanese honeysuckle
 - Low Stem Vigor/Height
 - Aggradation
 - Bank Scour
 - Bank Repair (October 2021)
 - Beaver Dam (removed)

Figure 3.0 Current Condition Plan View (KEY)
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021





2018 Aerial Photography

Figure 3.1 Current Condition Plan View (Sheet 1)
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021

Catawba County, NC

- Conservation Easement
- Wetland Rehabilitation
- Wetland Re-establishment
- Wetland Enhancement
- Potential Wetland Areas
- Potential Area at Risk
- Henry Fork River
- Planted Buffer
- Stream Restoration
- Stream Enhancement I
- Cross-Section (XS)
- Bankfull Line
- Reach Break
- Photo Point
- Stream Gage (SG)
- Reference Gage
- Barotroll Gage
- Groundwater Gage (GWG) - MY6
- Criteria Met
- Criteria Not Met
- Vegetation Plot - MY6
- Vegetation Plot (not monitored in MY6)
- Criteria Met - Wetland Plot (WP)
- Supplemental Planting Areas (March 2021)
- Areas of Concern - MY6
- Japanese honeysuckle & Chinese privet
- Japanese honeysuckle
- Low Stem Vigor/Height
- Aggradation
- Bank Scour
- Bank Repair (October 2021)
- Beaver Dam (removed)



Reference Gage

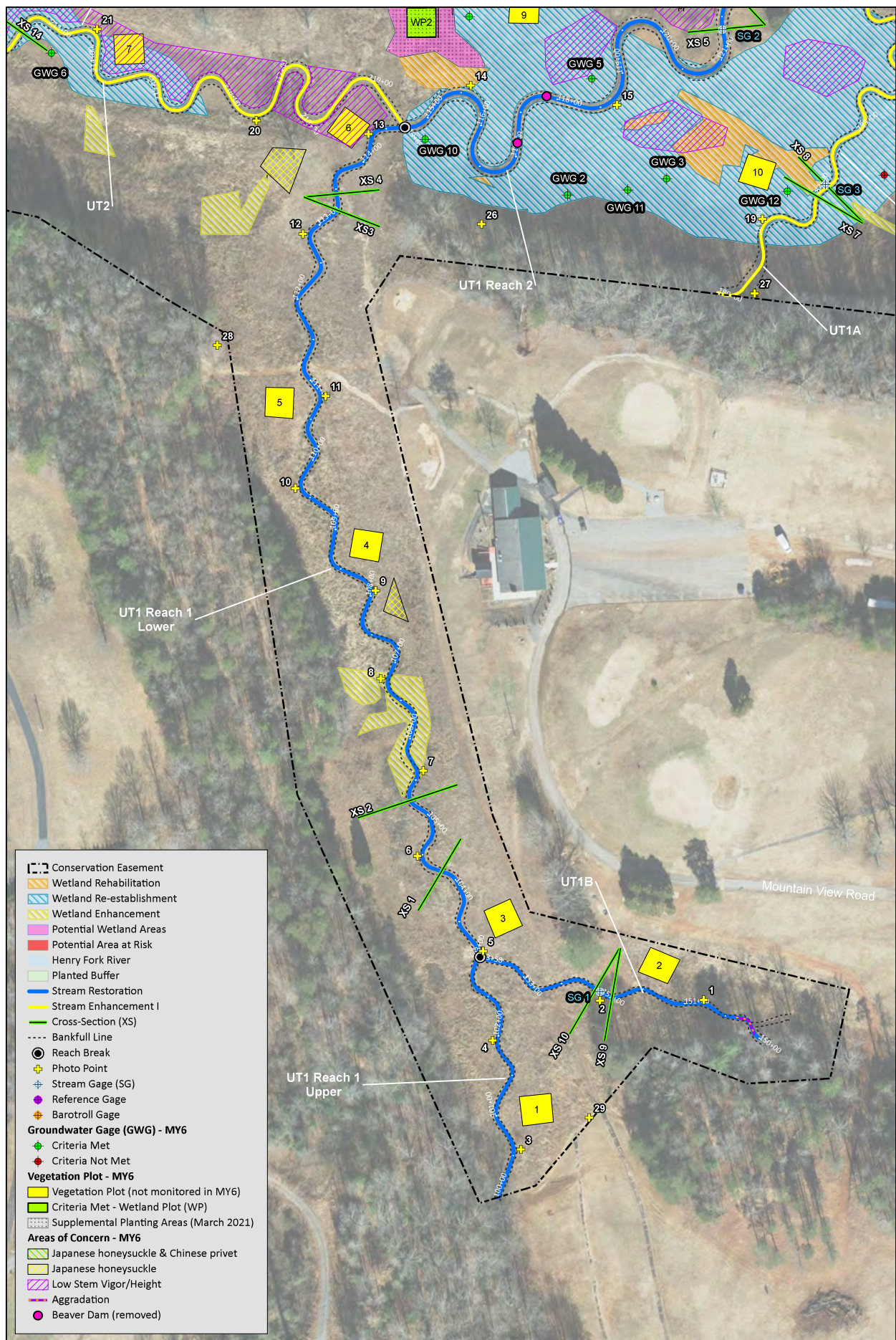


Figure 3.2 Current Condition Plan View (Sheet 2)
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021

Table 5a. Visual Stream Morphology Stability Assessment Table

Henry Fork Mitigation Site
DWS Project No. 96306
Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
UT1 Reach 1
1,497 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	37	39			95%			
		Depth Sufficient	33	33			100%			
3. Meander Pool Condition	Length Appropriate	33	33			100%				
	Thalweg centering at upstream of meander bend (Run)	33	33			100%				
4. Thalweg Position	Thalweg centering at downstream of meander bend (Glide)	33	33			100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
		Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals										
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	81	81			100%			
		Grade control structures exhibiting maintenance of grade across the sill.	70	70			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	81	81			100%			
		Bank erosion within the structures extent of influence does not exceed 15%.	81	81			100%			
4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	46	46			100%				

¹Excludes constructed shallows since they are evaluated in section 1.

Table 5b. Visual Stream Morphology Stability Assessment Table

Henry Fork Mitigation Site
DWS Project No. 96306
Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
UT1 Reach 2 1,232 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number In As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	14	14			100%			
		Depth Sufficient	15	15			100%			
3. Meander Pool Condition	Length Appropriate	15	15			100%				
	Thalweg centering at upstream of meander bend (Run)	15	15			100%				
4. Thalweg Position	Thalweg centering at downstream of meander bend (Glide)	15	15			100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			1	10	99.6%	n/a	n/a	n/a
		Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals										
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	12	12			100%			
		Grade control structures exhibiting maintenance of grade across the sill.	9	9			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	9	9			100%			
		Bank erosion within the structures extent of influence does not exceed 15%.	12	12			100%			
4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	6	6			100%				

¹Excludes constructed shallows since they are evaluated in section 1.

Table 5c. Visual Stream Morphology Stability Assessment Table

Henry Fork Mitigation Site
DWS Project No. 96306
Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
UT1A 658 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number In As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	14	14			100%			
		Depth Sufficient	13	13			100%			
3. Meander Pool Condition	Length Appropriate	13	13			100%				
	Thalweg centering at upstream of meander bend (Run)	13	13			100%				
4. Thalweg Position	Thalweg centering at downstream of meander bend (Glide)	13	13			100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
		Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals										
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	6	6			100%			
		Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	3	3			100%			
		Bank erosion within the structures extent of influence does not exceed 15%.	6	6			100%			
4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	6	6			100%				

¹Excludes constructed shallows since they are evaluated in section 1.

Table 5d. Visual Stream Morphology Stability Assessment Table

Henry Fork Mitigation Site
DWS Project No. 96306
Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
UT1B 358 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number In As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			1	30	92%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	10	11			91%			
		Depth Sufficient	7	8			88%			
3. Meander Pool Condition	Length Appropriate	8	8			100%				
	Thalweg centering at upstream of meander bend (Run)	8	8			100%				
4. Thalweg Position	Thalweg centering at downstream of meander bend (Glide)	8	8			100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
		Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals										
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	27	27			100%			
		Grade control structures exhibiting maintenance of grade across the sill.	24	24			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	27	27			100%			
		Bank erosion within the structures extent of influence does not exceed 15%.	27	27			100%			
4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	12	12			100%				

¹Excludes constructed shallows since they are evaluated in section 1.

Table 5e. Visual Stream Morphology Stability Assessment Table

Henry Fork Mitigation Site
 DWS Project No. 96306
 Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
 UTZ 1,969 LF

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number In As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	35	35			100%			
		Depth Sufficient	32	32			100%			
3. Meander Pool Condition	Length Appropriate	32	32			100%				
	Thalweg centering at upstream of meander bend (Run)	32	32			100%				
4. Thalweg Position	Thalweg centering at downstream of meander bend (Glide)	32	32			100%				
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
		Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	n/a	n/a	n/a
Totals										
3. Engineered Structures ¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	3	3			100%			
		Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
		Bank erosion within the structures extent of influence does not exceed 15%.	3	3			100%			
4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	3	3			100%				

¹Excludes constructed riffles since they are evaluated in section 1.

Table 6. Vegetation Condition Assessment Table

Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021

Date of visual assessments: January 2021, September 2021
 Planted Acreage 15

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.01	0	0.00	0.00%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.01	0	0.00	0.00%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.1	7	0.88	6.03%
		Total	0	0.00	0.0%
		Cumulative Total	7	0.88	6.0%

Easement Acreage 48

Vegetation Category	Definitions	Mapping Threshold (SF)	Number of Polygons	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Areas of points (if too small to render as polygons at map scale).	1,000	6	1.04	2.2%
Easement Encroachment Areas	Areas of points (if too small to render as polygons at map scale).	none	0	0	0.0%

Stream Photographs



Photo Point 1 – view upstream UT1B (5/25/2021)



Photo Point 1 – view downstream UT1B (5/25/2021)



Photo Point 2 – view upstream UT1B (5/25/2021)



Photo Point 2 – view downstream UT1B (5/25/2021)



Photo Point 3 – view upstream UT1 R1 Upper (5/25/2021)



Photo Point 3 – view downstream UT1 R1 Upper (5/25/2021)



Photo Point 4 – view upstream UT1 R1 Upper (5/25/2021)



Photo Point 4 – view downstream UT1 R1 Upper (5/25/2021)



Photo Point 5 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 5 – view downstream UT1 R1 Lower (5/25/2021)



Photo Point 5 – view upstream of UT1B (5/25/2021)



Photo Point 6 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 6 – view downstream UT1 R1 Lower (5/25/2021)



Photo Point 7 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 7 – view downstream UT1 R1 Lower (5/25/2021)

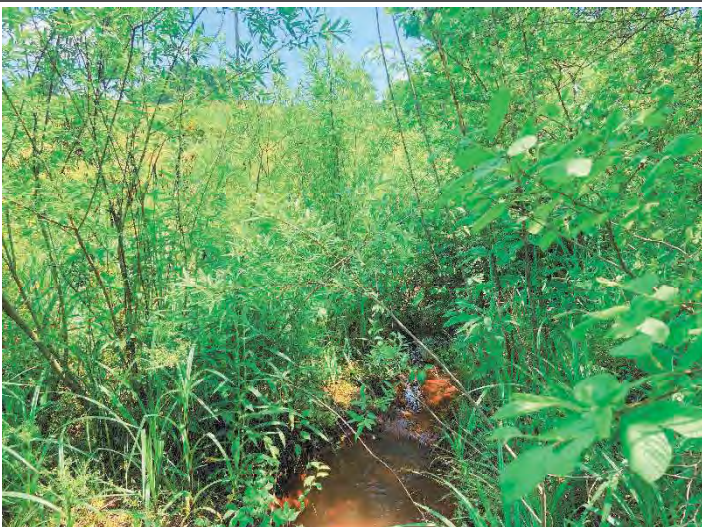


Photo Point 8 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 8 – view downstream UT1 R1 Lower (5/25/2021)



Photo Point 9 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 9 – view downstream UT1 R1 Lower (5/25/2021)



Photo Point 10 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 10 –view downstream UT1 R1 Lower (5/25/2021)



Photo Point 11 – view upstream UT1 R1 Lower (5/25/2021)

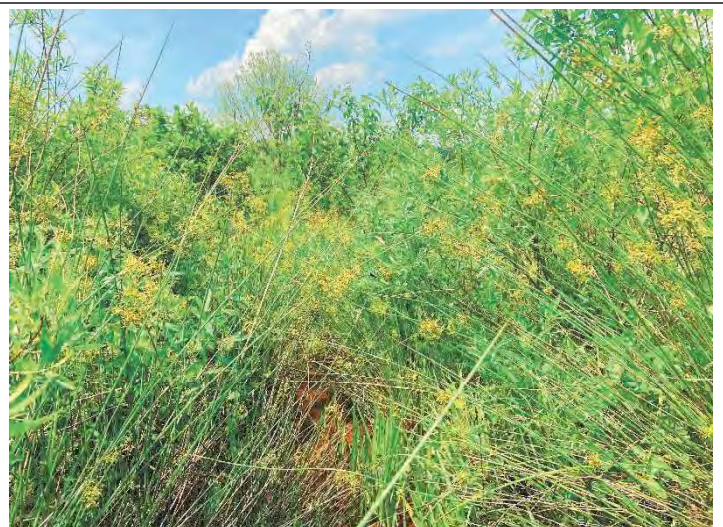


Photo Point 11 –view downstream UT1 R1 Lower (5/25/2021)



Photo Point 12 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 12 –view downstream UT1 R1 Lower (5/25/2021)



Photo Point 13 – view upstream UT1 R1 Lower (5/25/2021)



Photo Point 13 –view downstream UT1 R1 Lower (5/25/2021)

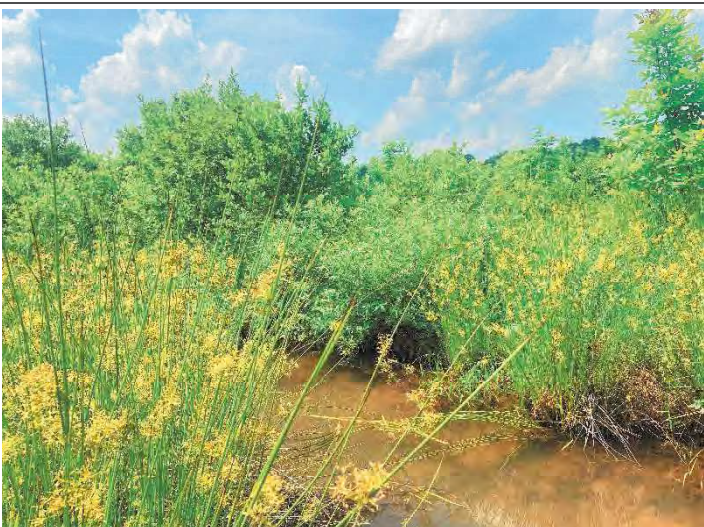


Photo Point 14 – view upstream UT1 R2 (5/25/2021)

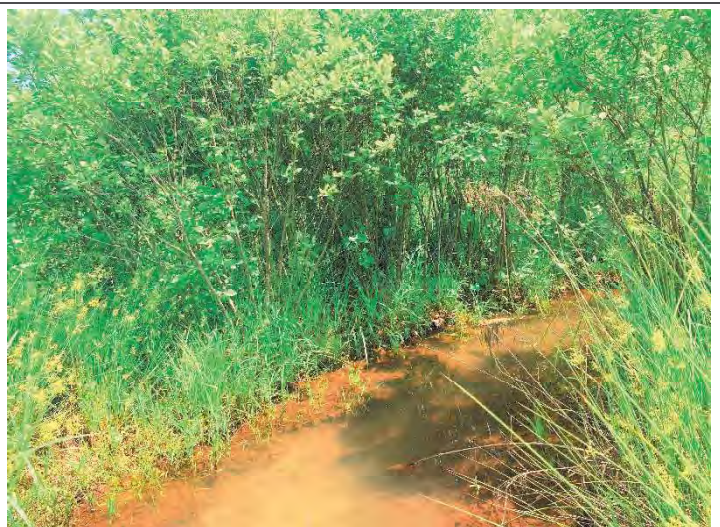


Photo Point 14 – view downstream UT1 R2 (5/25/2021)



Photo Point 15 – view upstream UT1 R2 (5/25/2021)



Photo Point 15 – view downstream UT1 R2 (5/25/2021)



Photo Point 16 – view upstream UT1 R2 (5/25/2021)



Photo Point 16 – view downstream UT1 R2 (5/25/2021)



Photo Point 17 – view upstream UT1 R2 (5/25/2021)



Photo Point 17 – view downstream UT1 R2 (5/25/2021)



Photo Point 18 – view upstream UT1A (5/25/2021)



Photo Point 18 – view downstream UT1A (5/25/2021)



Photo Point 19 – view upstream UT1A (5/25/2021)



Photo Point 19 – view downstream UT1A (5/25/2021)



Photo Point 20 – view upstream UT2 (5/25/2021)



Photo Point 20 – view downstream UT2 (5/25/2021)



Photo Point 21 – view upstream UT2 (5/25/2021)



Photo Point 21 – view downstream UT2 (5/25/2021)



Photo Point 22 – view upstream UT2 (5/25/2021)



Photo Point 22 – view downstream UT2 (5/25/2021)



Photo Point 23 – view upstream UT2 (5/25/2021)



Photo Point 23 – view downstream UT2 (5/25/2021)



Photo Point 24 – view upstream UT2 (5/25/2021)



Photo Point 24 – view downstream UT2 (5/25/2021)



Photo Point 25 – view upstream UT2 (5/25/2021)



Photo Point 25 – view downstream UT2 (5/25/2021)



Photo Point 26 – view upstream UT1 R2 (5/25/2021)



Photo Point 26 – view downstream UT1 R2 (5/25/2021)



Photo Point 26 – UT1 R2 floodplain overview (5/25/2021)



Photo Point 27 – view upstream UT1 R2 floodplain (5/25/2021)



Photo Point 27 – view downstream UT1 R2 floodplain(5/25/2021)



Photo Point 28 – UT1 R1 Lower floodplain overview (5/25/2021)



Photo Point 28 – UT2 floodplain overview (5/25/2021)



Photo Point 29 – UT1 R1 Upper floodplain overview (5/25/2021)

Wetland Vegetation Photographs



Wetland Vegetation Plot 1 - (9/02/2021)



Wetland Vegetation Plot 2 - (9/02/2021)



Wetland Vegetation Plot 3 - (9/02/2021)

APPENDIX 3. Vegetation Plot Data

Table 9d. Planted and Total Stem Counts - Wetland Vegetation Plots

Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021

Wetland Vegetation Plots

Scientific Name	Common Name	Species Type	Current Plot Data (MY6 2021)				Wetland Plot 3	MY6 (2021) Mean
			Wetland Plot 1	Wetland Plot 2	Wetland Plot 3	Wetland Plot 4		
<i>Acer negundo</i>	Box Elder	Tree	3	2			5	
<i>Acer rubrum</i>	Red Maple	Tree	4				4	
<i>Alnus serrulata</i>	Tag Alder	Shrub Tree		2	4		6	
<i>Betula nigra</i>	River Birch	Tree		1	5		6	
<i>Platanus occidentalis</i>	Sycamore	Tree		7			7	
<i>Populus deltoides</i>	Cottonwood	Tree	3				3	
<i>Quercus phellos</i>	Willow Oak	Tree		1			1	
<i>Salix nigra</i>	Black Willow	Tree	1	5	2		8	
	Stem count		11	18	11		40	
	size (ares)		1	1	1		3	
	size (ACRES)		0.02471	0.02471	0.02471		0.07413	
	Species count		4	6	3		8	
	Stems per ACRE		445	728	445		540	
	Average Stem Height (ft)		3.4	4.6	4.9		4.3	

Color for Density

- Exceeds requirements by 10%
- Exceeds requirements, but by less than 10%
- Fails to meet requirements, by less than 10%
- Fails to meet requirements by more than 10%
- Volunteer species included in total

T: Total stems

APPENDIX 4. Morphological Summary Data and Plots
Morphological surveys and analysis not required in Monitoring Year 6

APPENDIX 5. Hydrology Summary Data and Plots

Table 13. Verification of Bankfull Events

Henry Fork Mitigation Site

DMS Project No. 96306

Monitoring Year 6 - 2021

Reach	MY	Date of Occurrence	Method
UT1 Reach 2	MY2	4/24/2017	Crest & Stream Gage
		10/8/2017	Crest & Stream Gage
	MY3	2/7/2018	Stream Gage
		4/25/2018	
		5/29/2018	
		9/16/2018	
		10/11/2018	
		10/26/2018	
	MY4	6/9/2019	
		10/31/2019	
	MY5	5/21/2020	
		6/19/2020	
		8/15/2020	
		9/2/2020	
		9/17/2020	
		9/25/2020	
		10/11/2020	
		11/12/2020	
	MY6	2/15/2021	
		3/25/2021	
8/17/2021			
UT1A	MY1	Unknown	
	MY2	4/24/2017	Crest & Stream Gage
		10/8/2017	Crest & Stream Gage
	MY3	10/11/2018	Stream Gage
	MY4	6/9/2019	
		10/31/2019	
	MY5	4/13/2020	
		6/19/2020	
		8/15/2020	
		11/12/2020	
MY6	3/26/2021		
	8/17/2021		
UT1B	MY2	10/8/2017	Crest & Stream Gage
	MY4	6/9/2019	Stream Gage
		8/24/2019	
		10/31/2019	
	MY5	6/19/2020	
		8/15/2020	
11/12/2020			
MY6	3/25/2021		
UT2	MY2	4/24/2017	Crest & Stream Gage
	MY3	2/7/2018	Stream Gage
		5/29/2018	
	MY4	6/9/2019	
		10/31/2019	
	MY5	1/12/2020	
		1/24/2020	
		3/25/2020	
		4/30/2020	
		5/21/2020	
		6/19/2020	
		8/15/2020	
		9/2/2020	
		9/18/2020	
		9/25/2020	
		10/11/2020	
		11/12/2020	
		MY6	
	1/31/2021		
	2/12/2021 - 2/18/2021 ¹		
	2/26/2021		
	3/18/2021		
	3/26/2021		
3/31/2021			
5/3/2021			
	8/17/2021		

¹Multiple bankfull events recorded

Table 14. Wetland Gage Attainment Summary

Henry Fork Mitigation Site

DMS Project No. 96306

Monitoring Year 6 - 2021

Summary of Groundwater Gage Results for Monitoring Years 1 through 7							
Gage	Success Criteria Achieved ² /Max Consecutive Days During Growing Season ¹ (Percentage)						
	Year 1 (2016)	Year 2 (2017)	Year 3 (2018)	Year 4 (2019)	Year 5 (2020)	Year 6 (2021)	Year 7 (2022)
Reference	No/18 Days (8%)	Yes/59 Days (25%)	Yes/79 Days (34%)	Yes/61 Days (26%)	Yes/63 Days (27%)	Yes/59 Days (25%)	
GWG 1	No/0 Days (0%)	Yes/23 Days (10%)	Yes/48 Days (20%)	Yes/42 Days (18%)	Yes/27 Days (11%)	Yes/30 Days (13%)	
GWG 2	Yes/ 29 Days (12.3%)	No/7 Days (3%)	No/12 Days (5%)	Yes/39 Days (17%)	Yes/49 Days (21%)	Yes/33 Days (14%)	
GWG 3 ⁴	Yes/236 Days (100%)	No/3 Days (1%)	No/5 Days (2%)	Yes/35 Days (15%)	Yes/49 Days (21%)	Yes/31 Days (13%)	
GWG 4	No/3 Days (1.3%)	Yes/25 Days (11%)	Yes/46 Days (20%)	Yes/68 Days (29%)	Yes/64 Days (27%)	No/14 Days (6%)	
GWG 5 ³	N/A	Yes/189 Days (80%)	Yes/102 Days (43%)	Yes/236 Days (100%)	Yes/202 Days (85%)	Yes/237 Days (100%)	
GWG 6	Yes/79 Days (33.5%)	Yes/89 Days (38%)	Yes/96 Days (41%)	Yes/76 Days (32%)	Yes/116 Days (49%)	Yes/65 Days (27%)	
GWG 7	No/7 Days (3.0%)	Yes/21 Days (9%)	Yes/44 Days (19%)	Yes/44 Days (19%)	Yes/89 Days (38%)	Yes/31 Days (13%)	
GWG 8	No/1 Days (0.4%)	No/14 Days (6%)	No/11 Days (5%)	No/19 Days (8%)	No/14 Days (6%)	No/18 Days (8%)	
GWG 9 ³	N/A	No/13 Days (6%)	Yes/20 Days (9%)	Yes/68 Days (29%)	Yes/90 Days (38%)	Yes/65 Days (27%)	
GWG 10 ⁵	N/A	N/A	N/A	Yes/236 Days (100%)	Yes/202 Days (85%)	Yes/237 Days (100%)	
GWG 11 ⁵	N/A	N/A	N/A	Yes/61 Days (26%)	Yes/113 Days (48%)	Yes/63 Days (27%)	
GWG 12 ⁵	N/A	N/A	N/A	Yes/36 Days (15%)	Yes/61 Days (26%)	Yes/30 Days (13%)	
GWG 13 ⁵	N/A	N/A	N/A	Yes/236 Days (100%)	Yes/202 Days (85%)	Yes/237 Days (100%)	
GWG 14 ⁶	N/A	N/A	N/A	Yes/67 Days (28%)	Yes/89 Days (38%)	Yes/41 Days (17%)	
GWG 15 ⁶	N/A	N/A	N/A	Yes/45 Days (19%)	Yes/89 Days (38%)	Yes/33 Days (14%)	

N/A, not applicable

¹Growing season dates March 20 - November 11

²Success criteria is 20 consecutive days (8.5%) of the growing season.

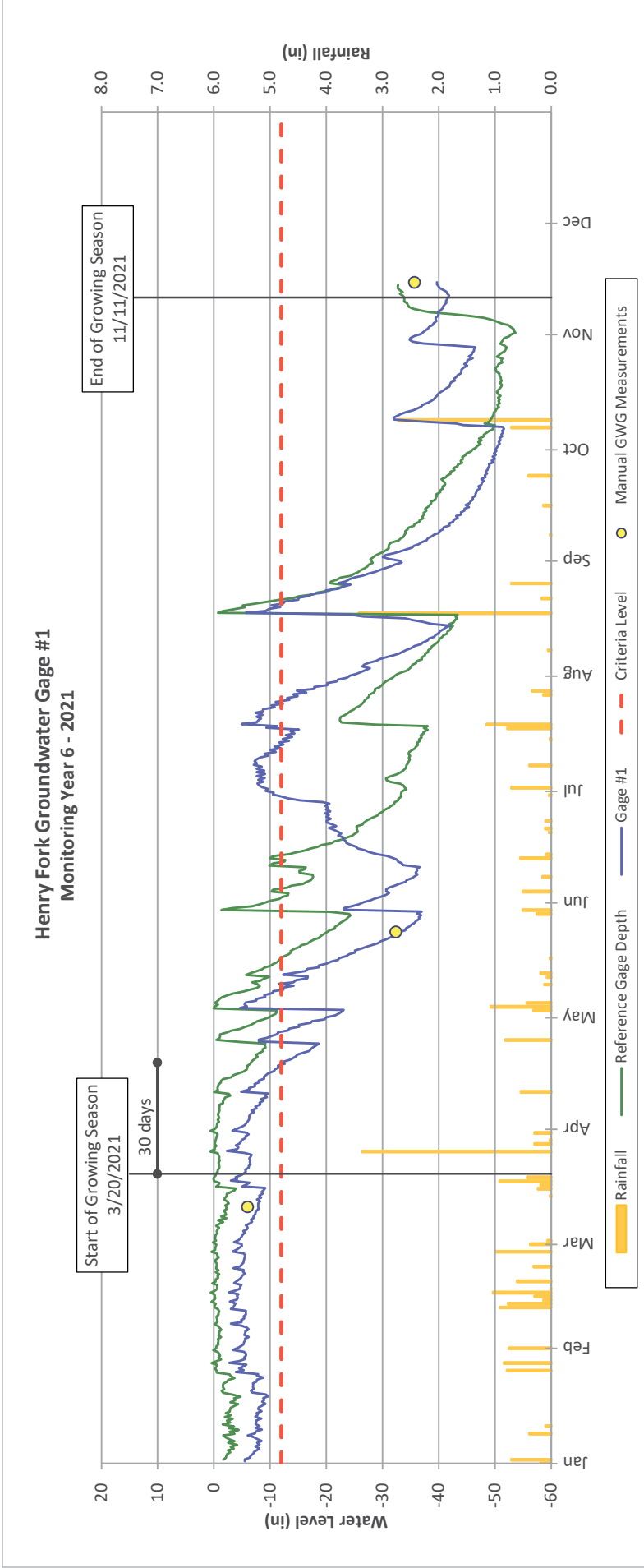
³GWGs 5 and 9 were installed on April 7, 2017.

⁴GWG 3 was relocated in January 2017.

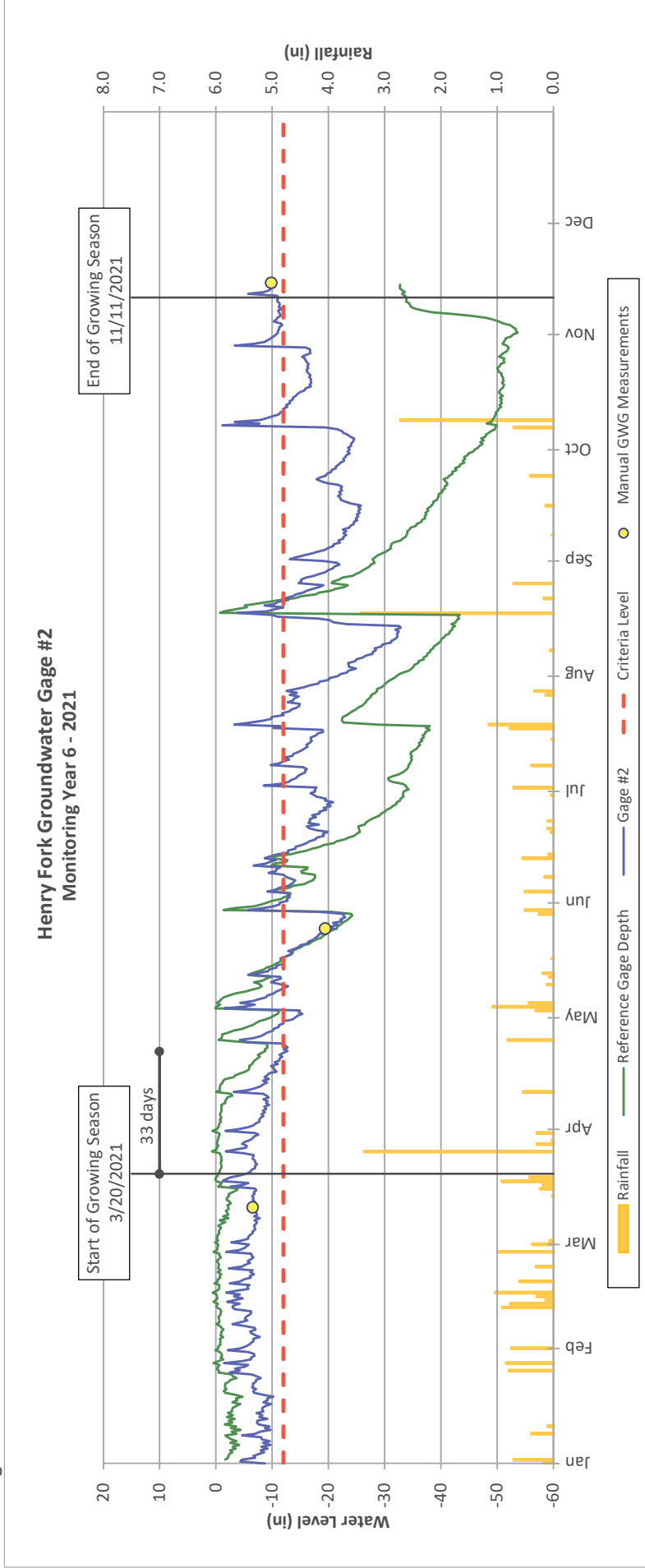
⁵GWGs 10 -13 were installed on February 20, 2019.

⁶GWGs 14-15 were installed on March 7, 2019.

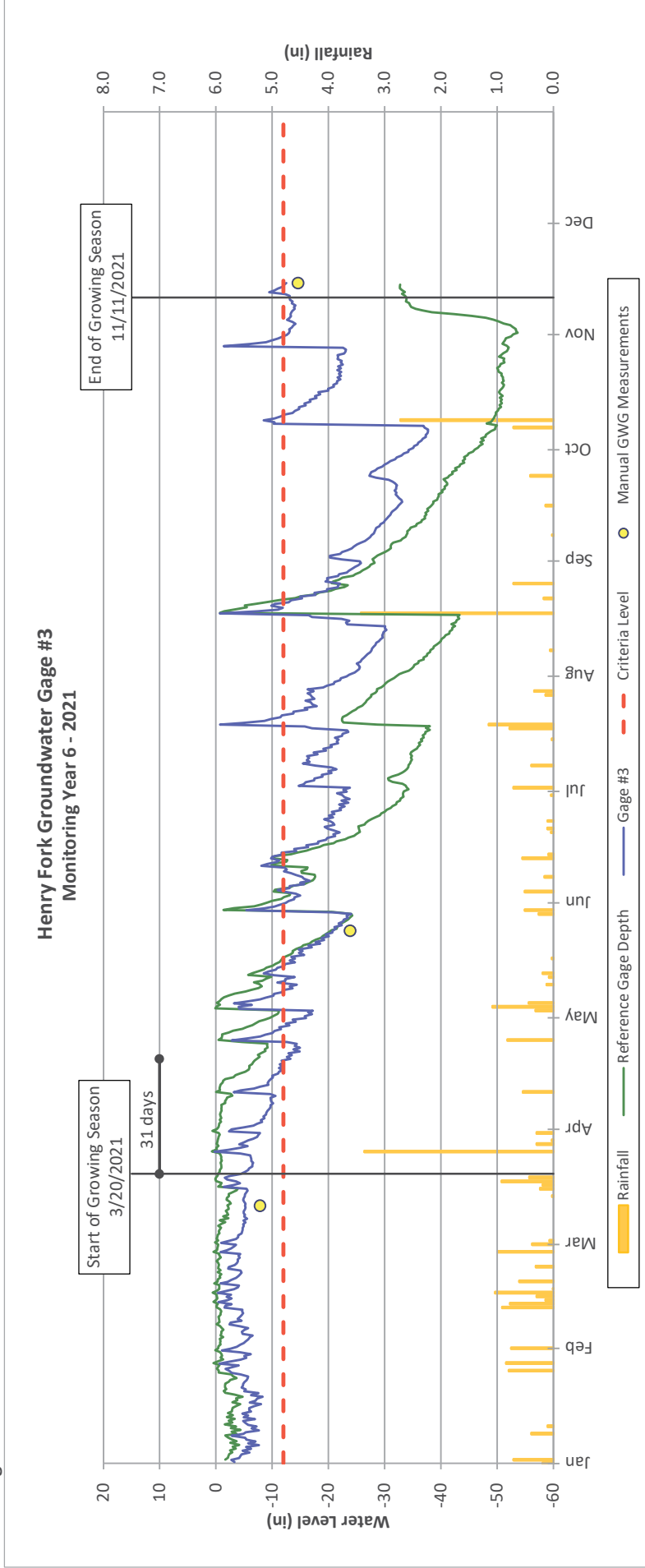
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



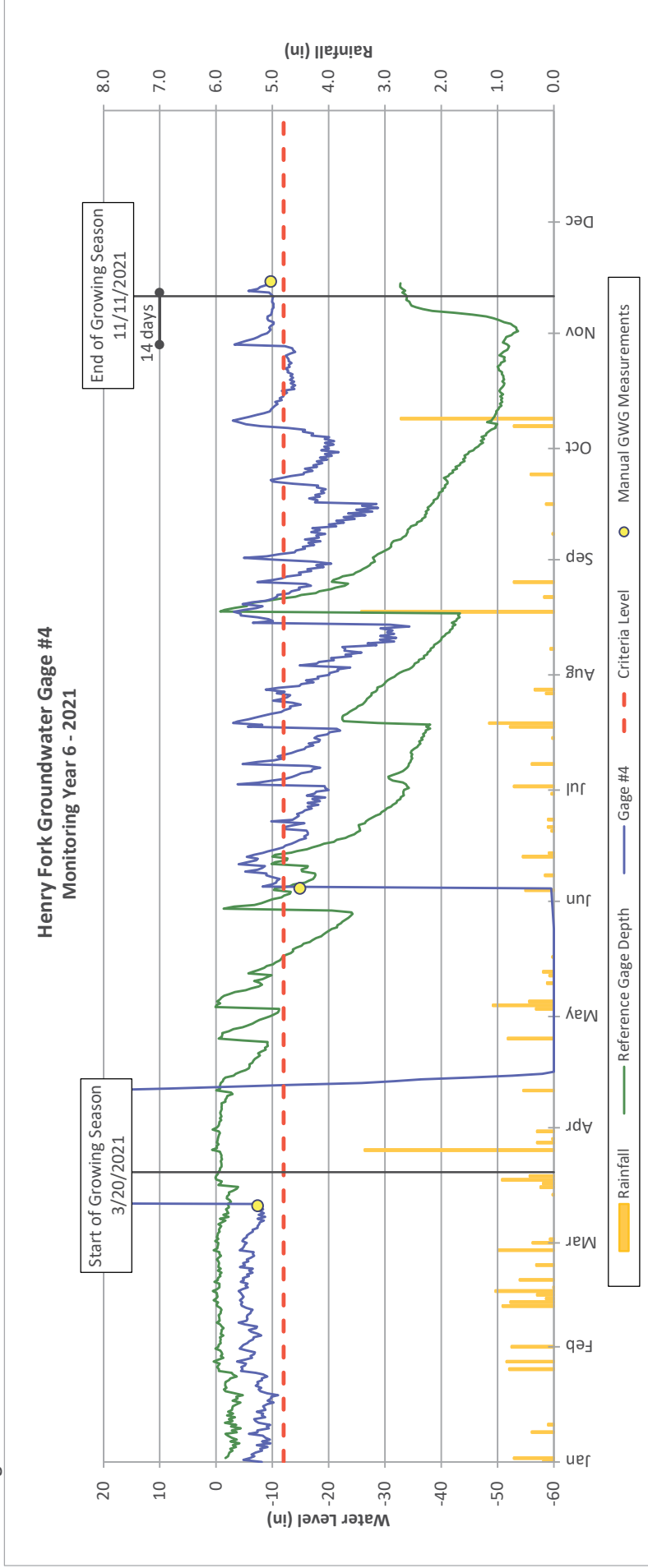
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



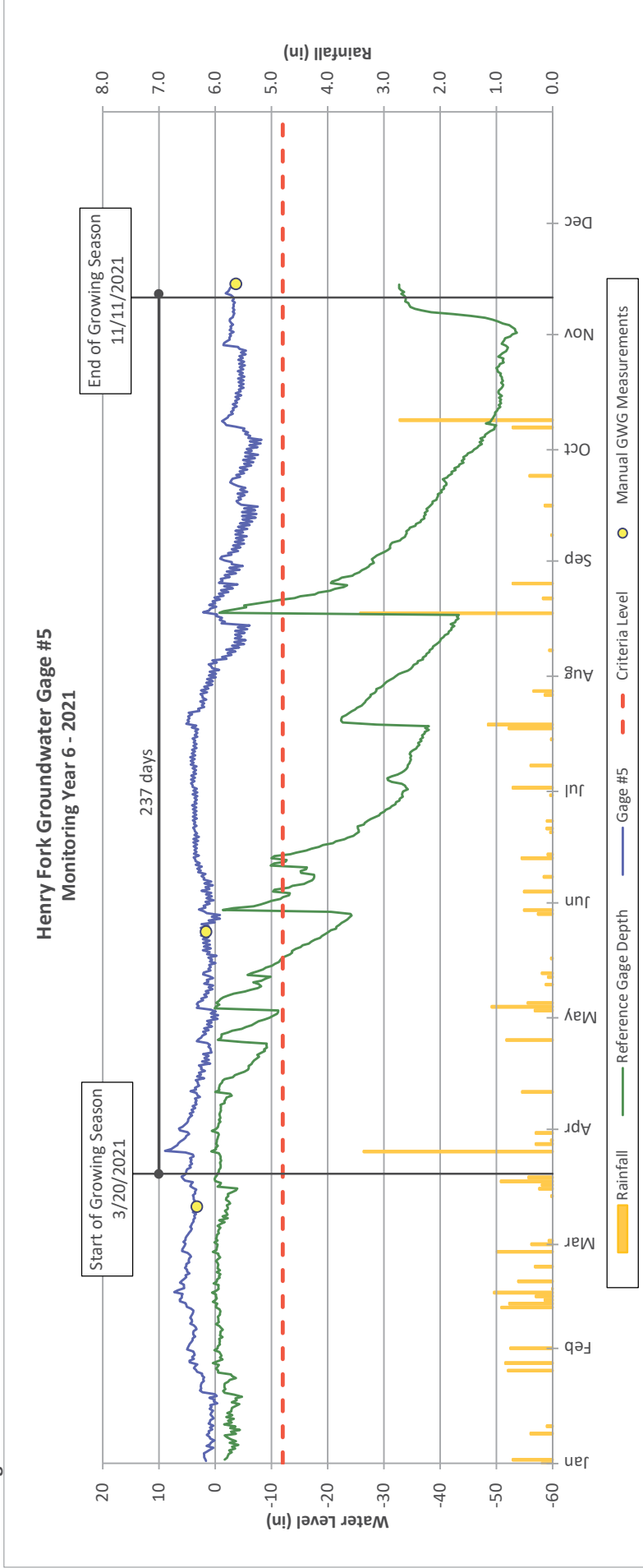
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



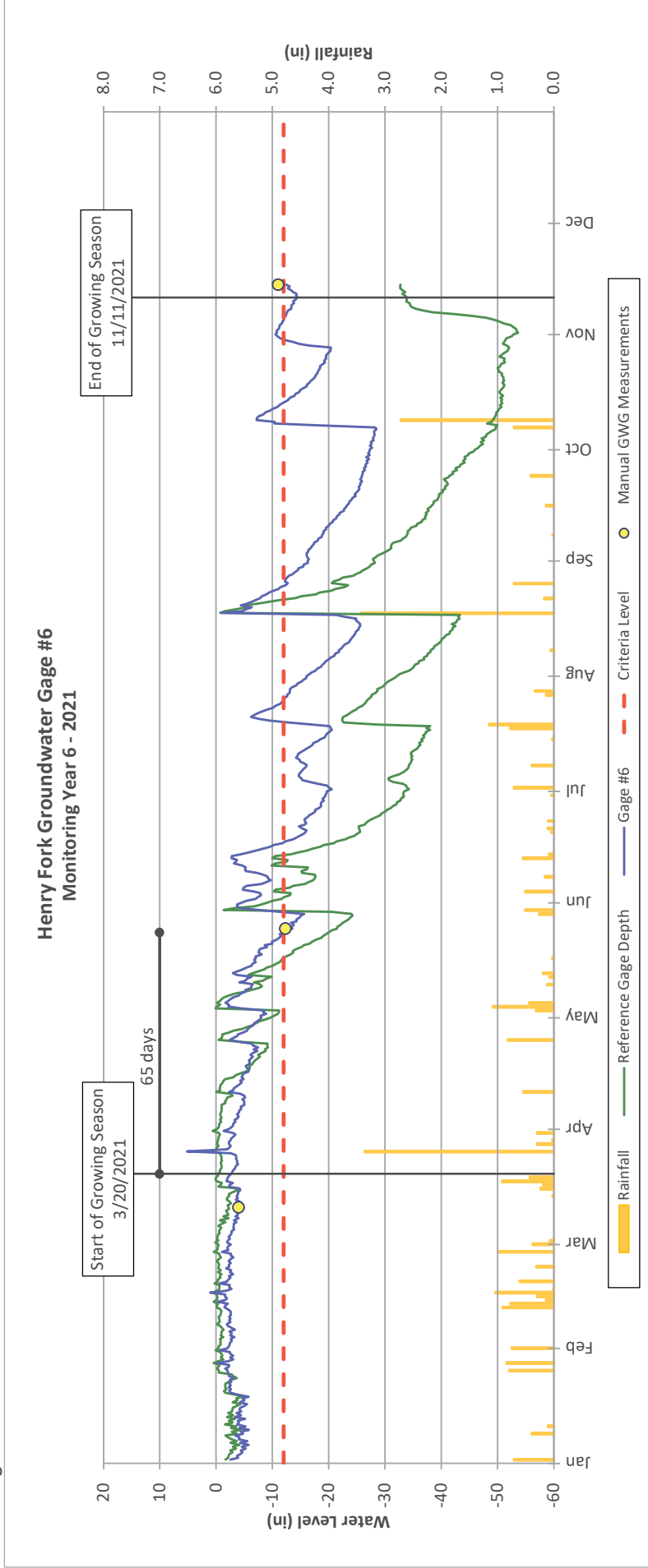
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



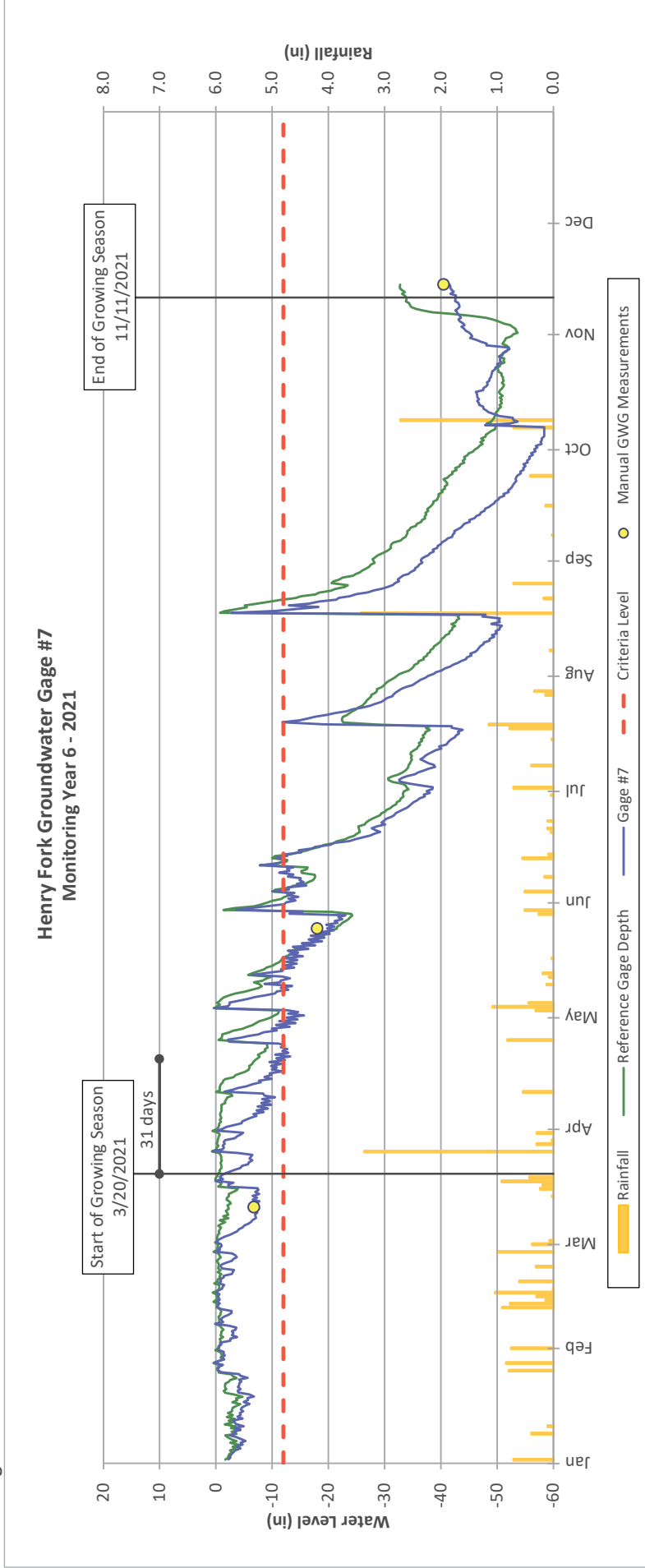
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



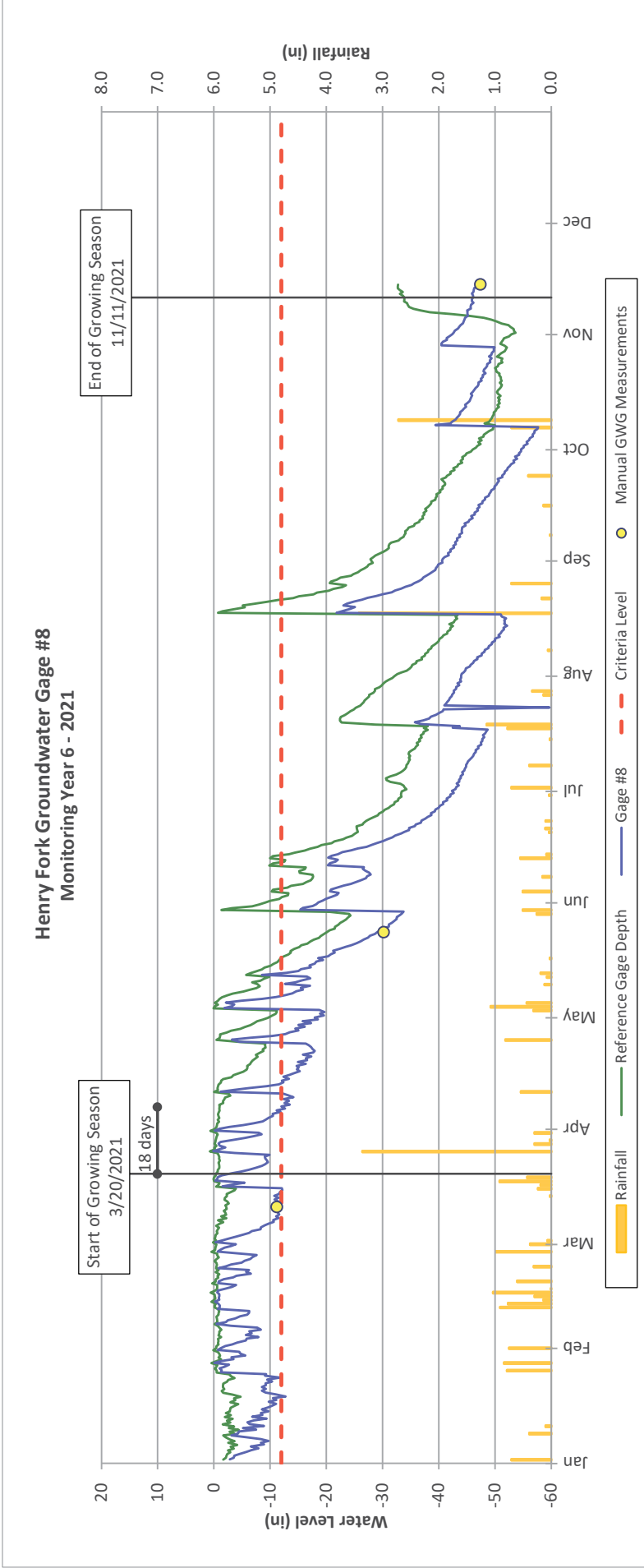
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



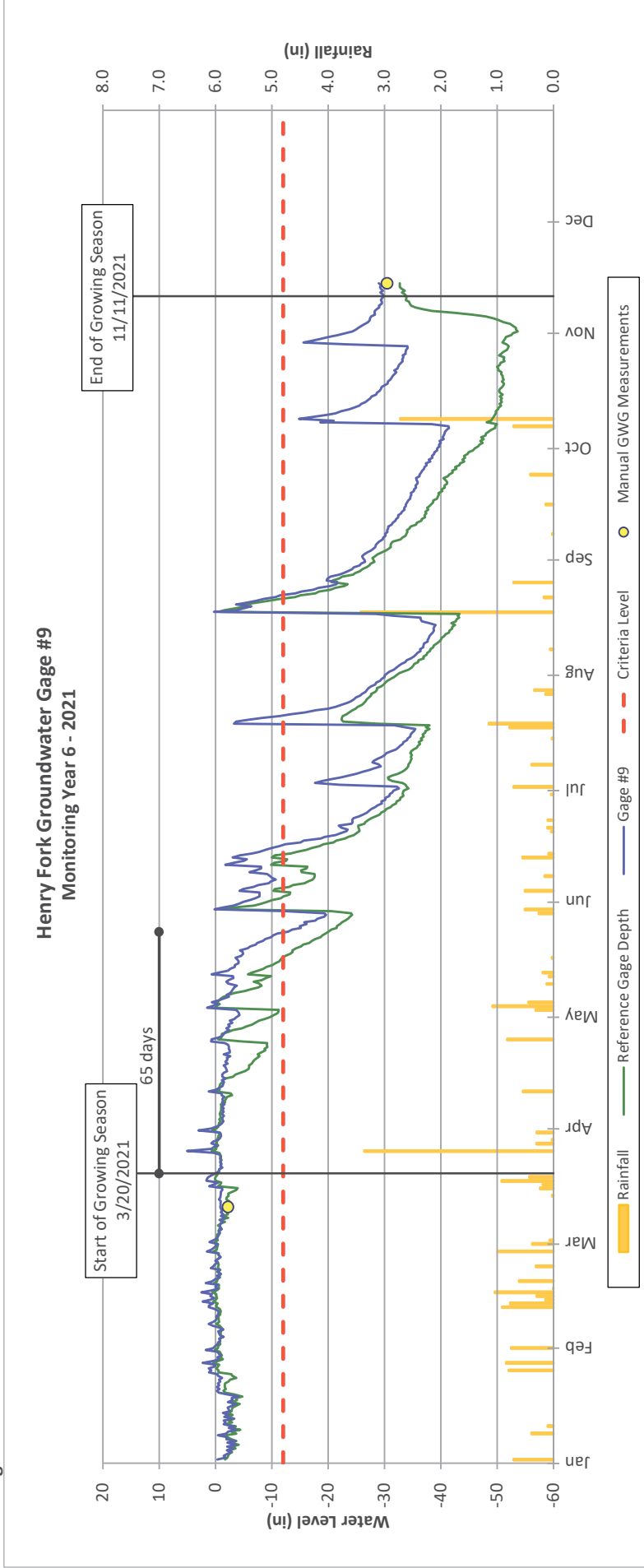
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



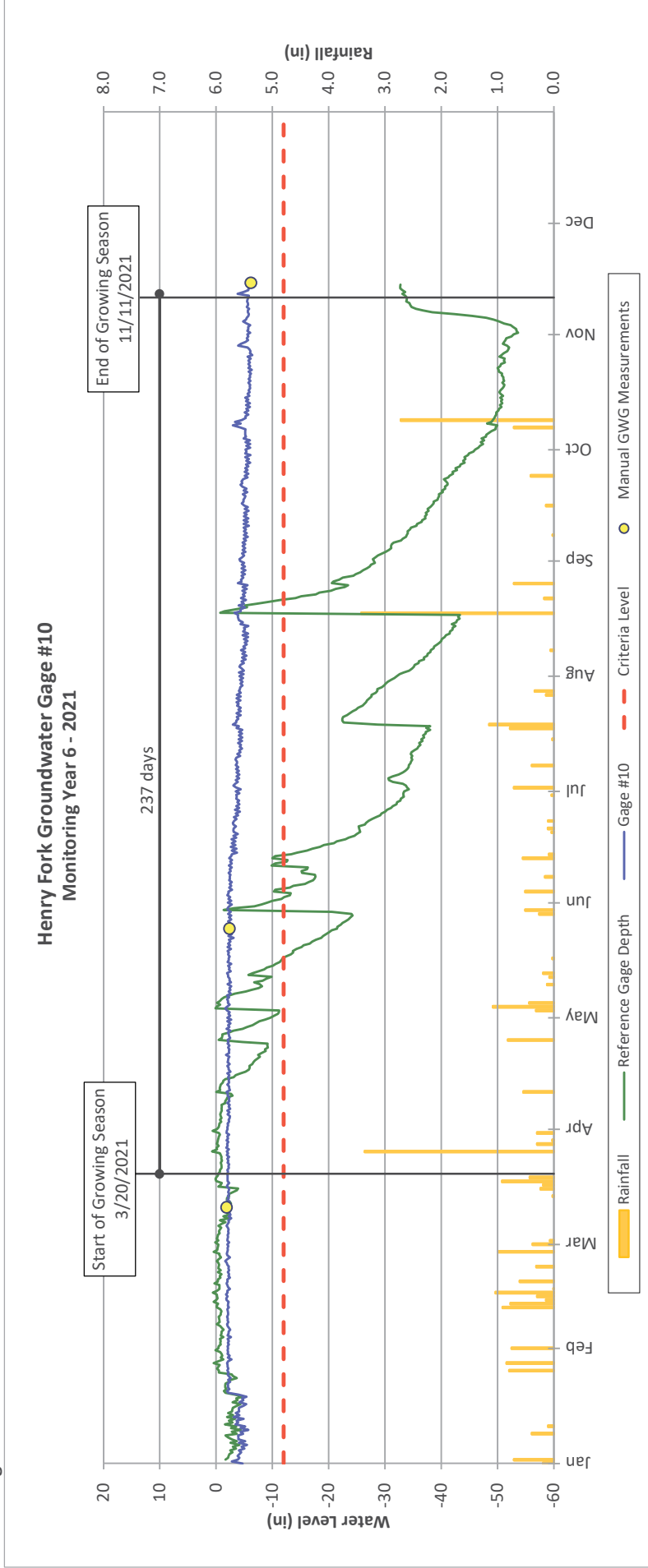
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



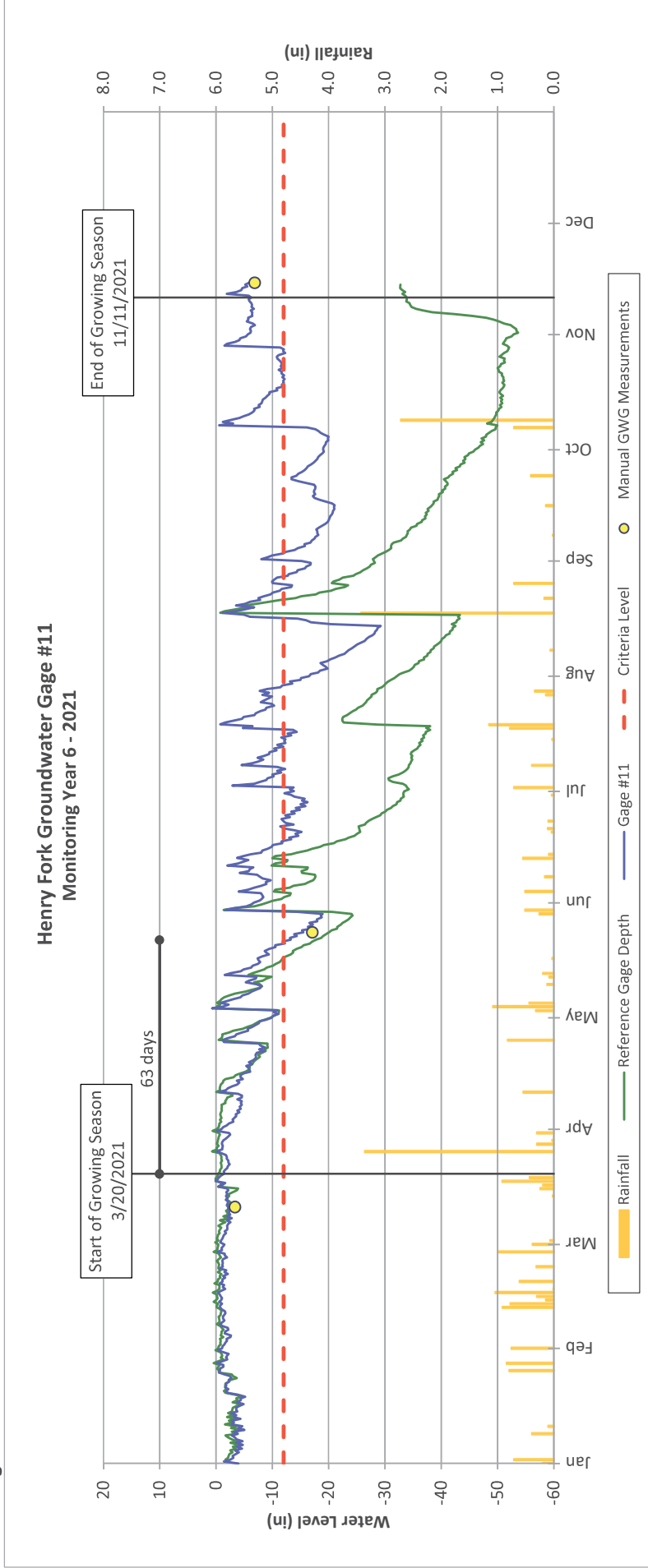
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



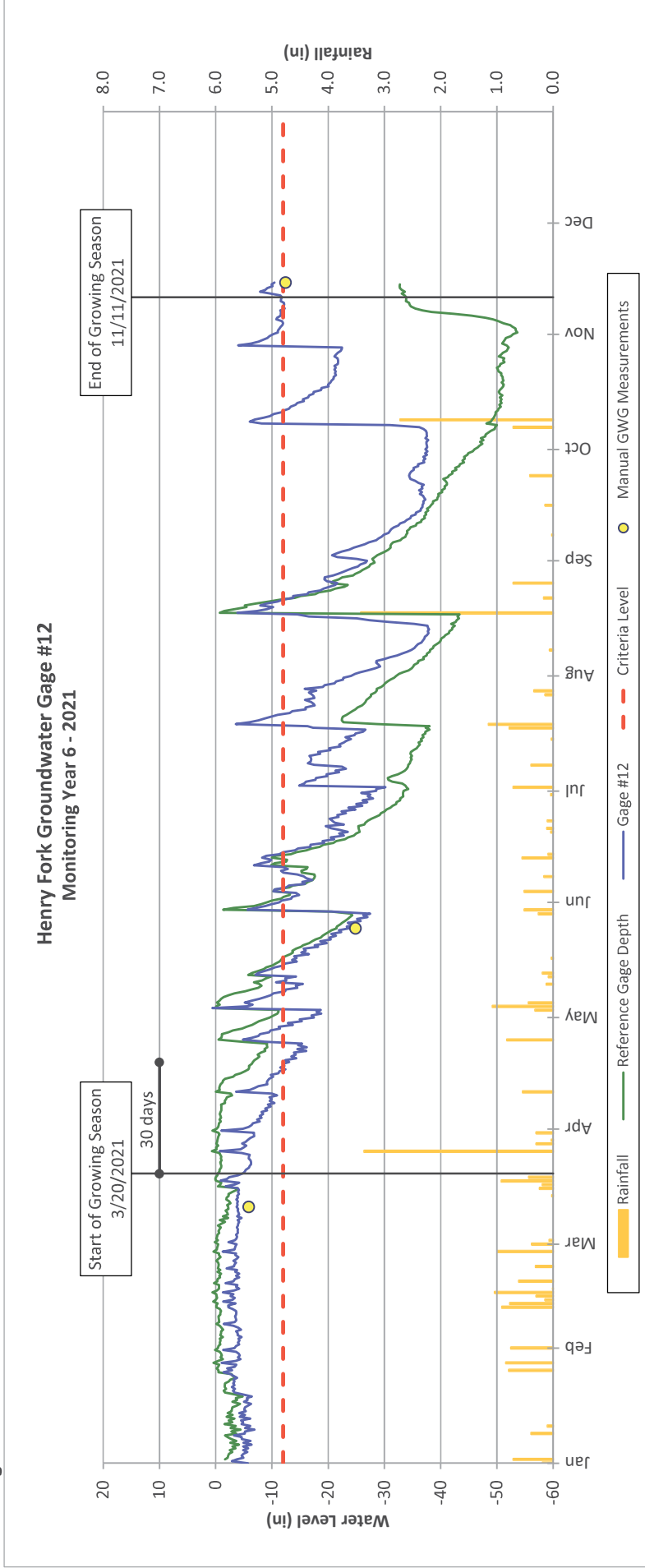
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 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



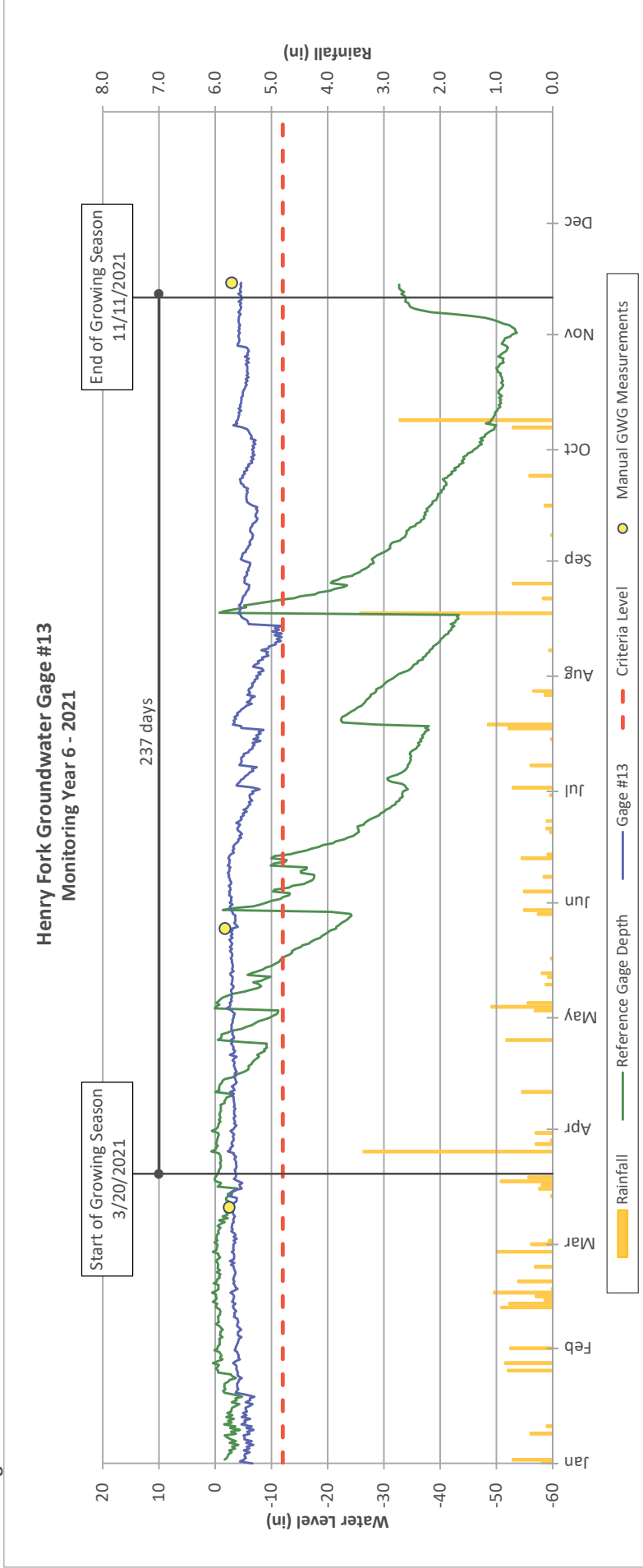
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



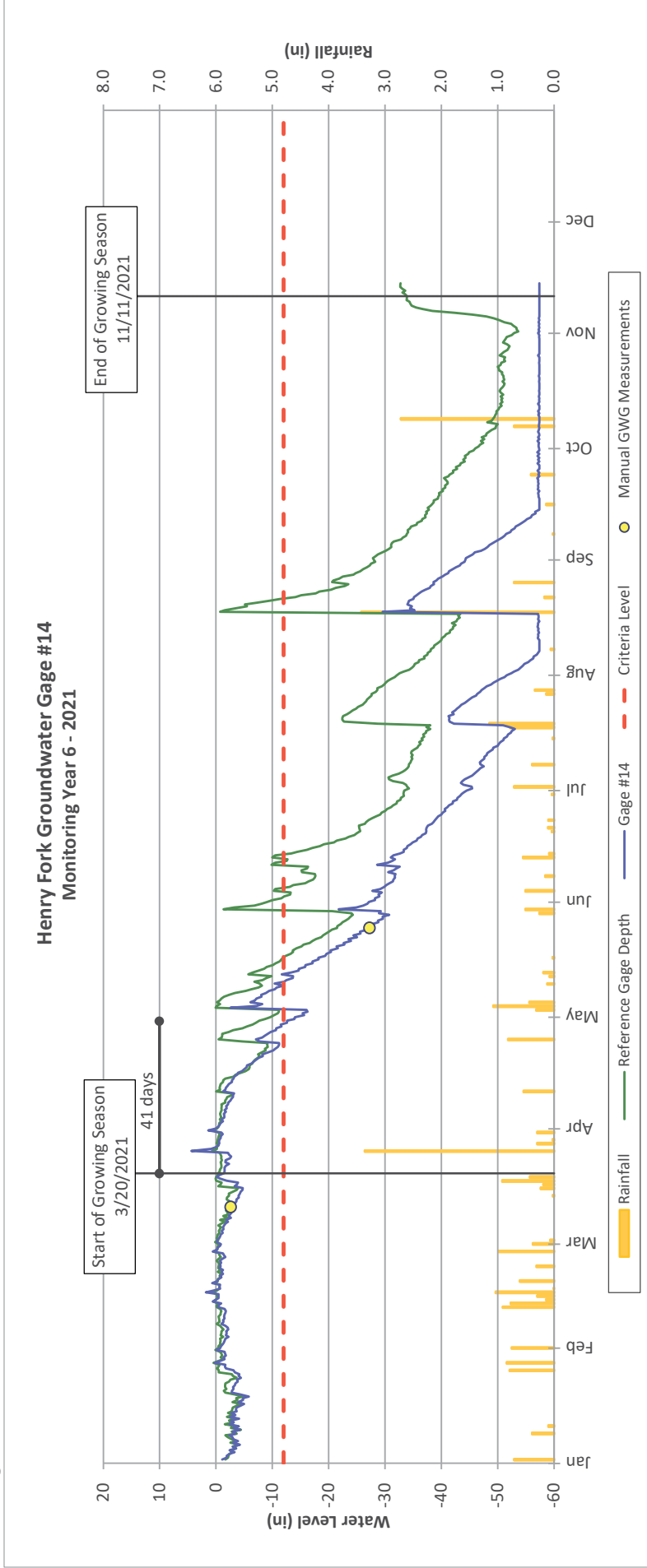
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



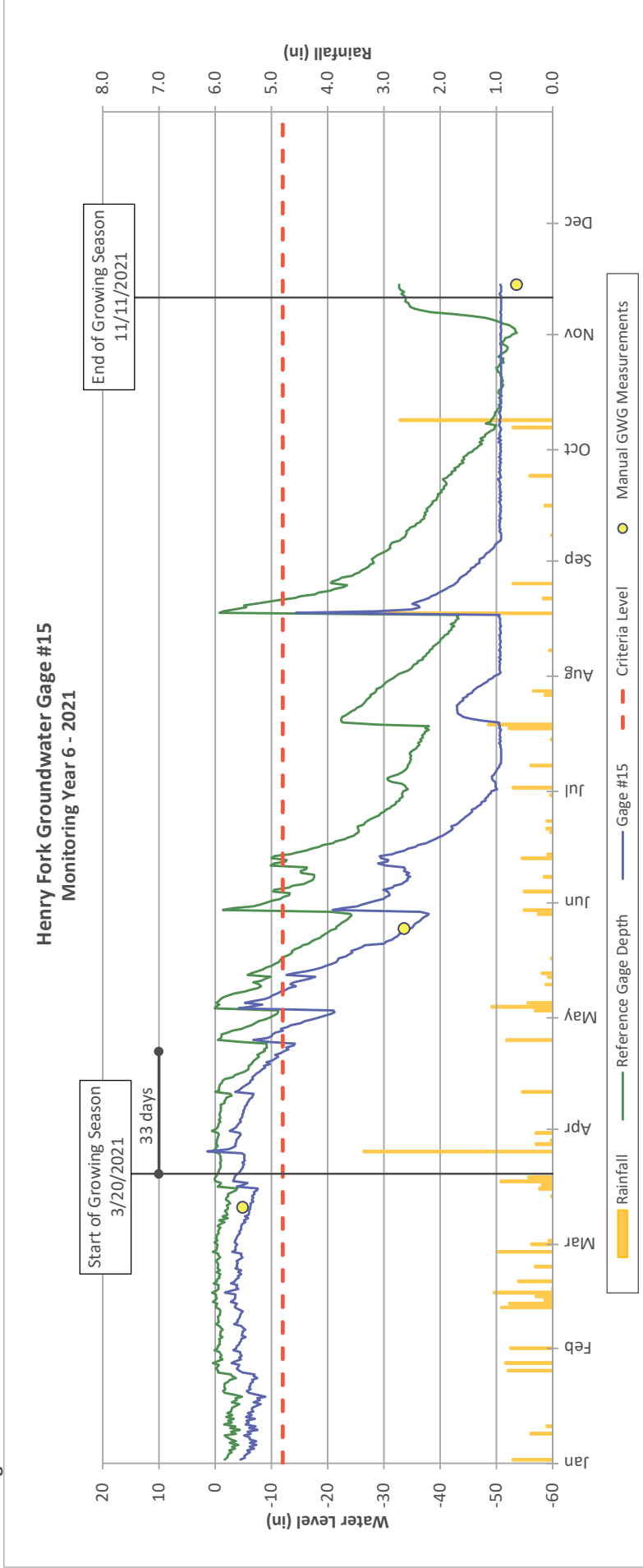
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



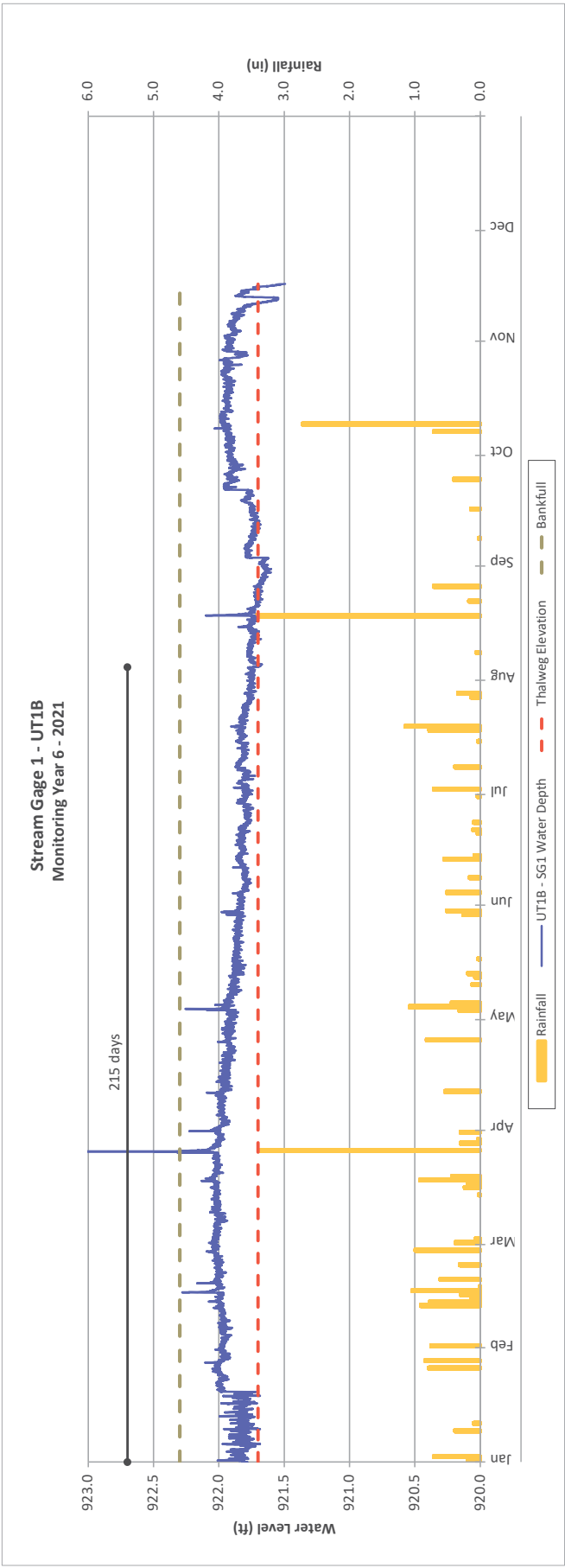
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



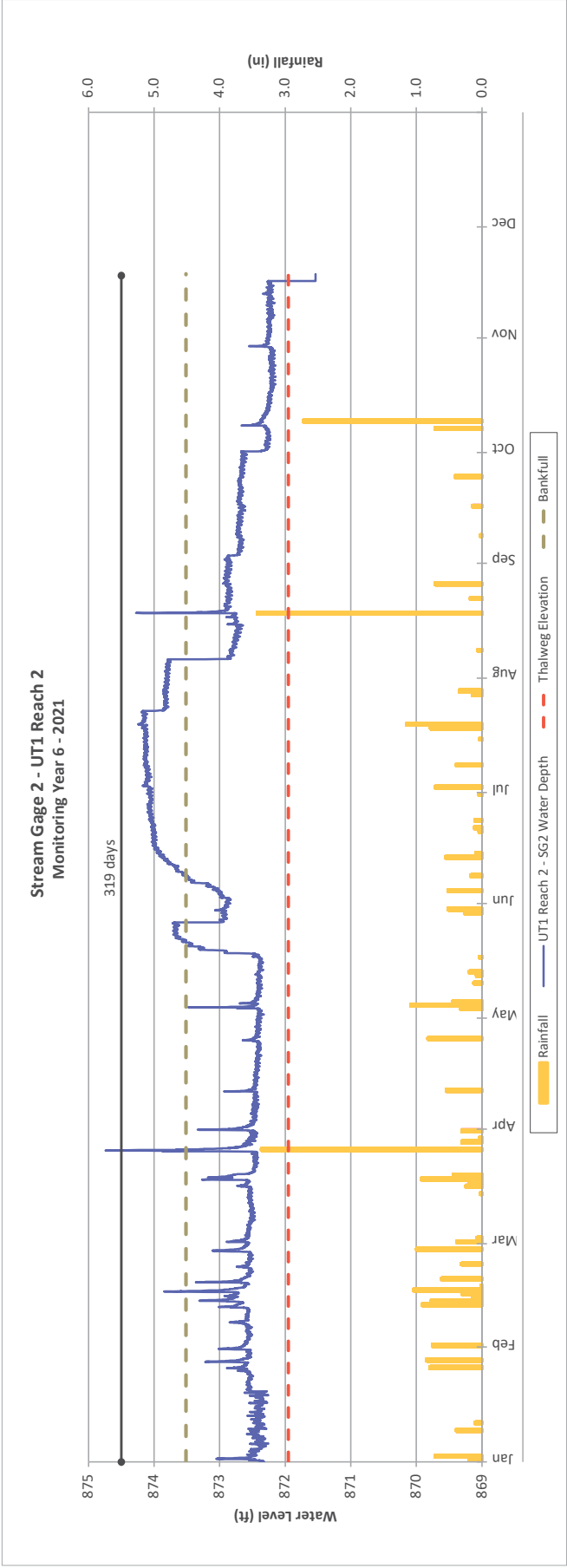
Groundwater Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



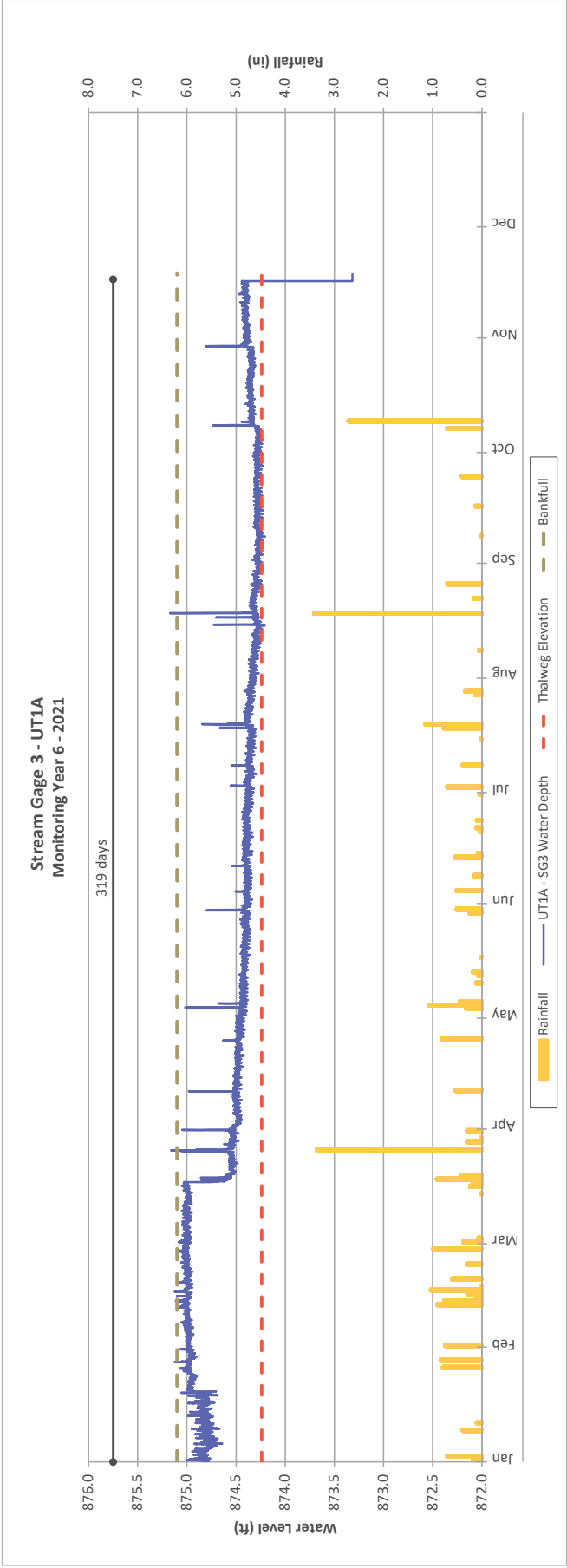
Stream Gage Plots
Henry Fork Mitigation Site
DMS Project No. 96306
Monitoring Year 6 - 2021



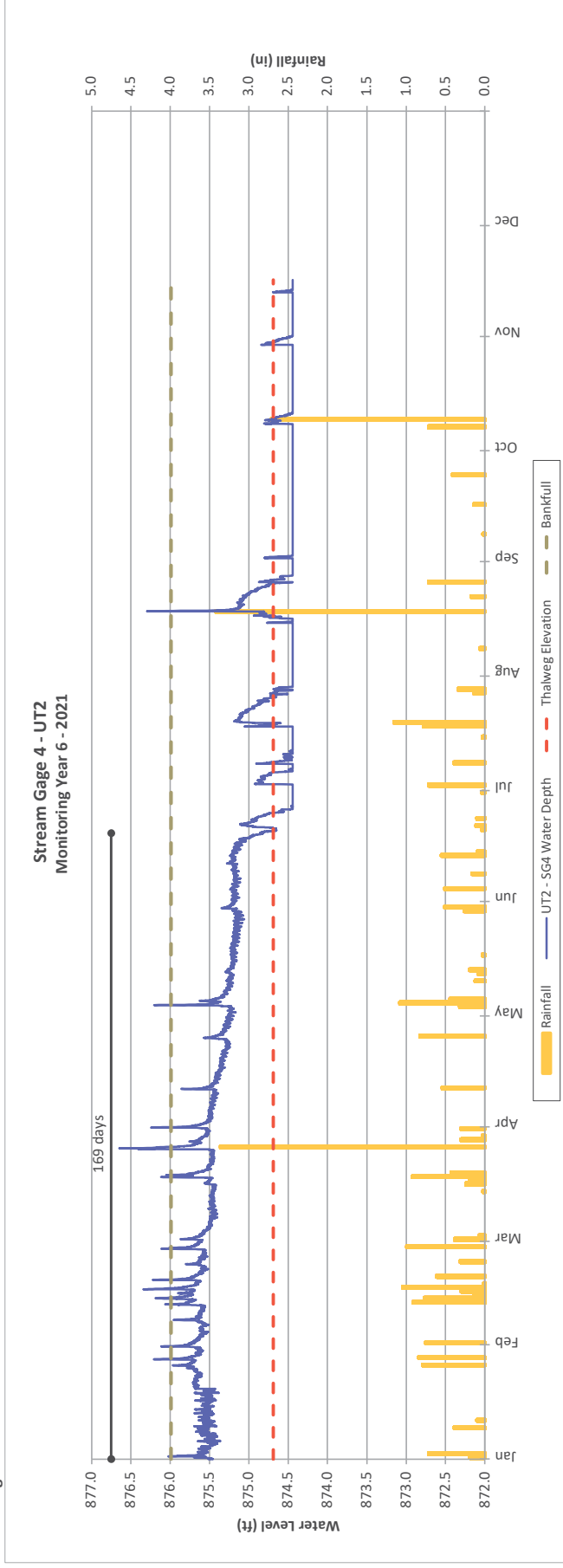
Stream Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



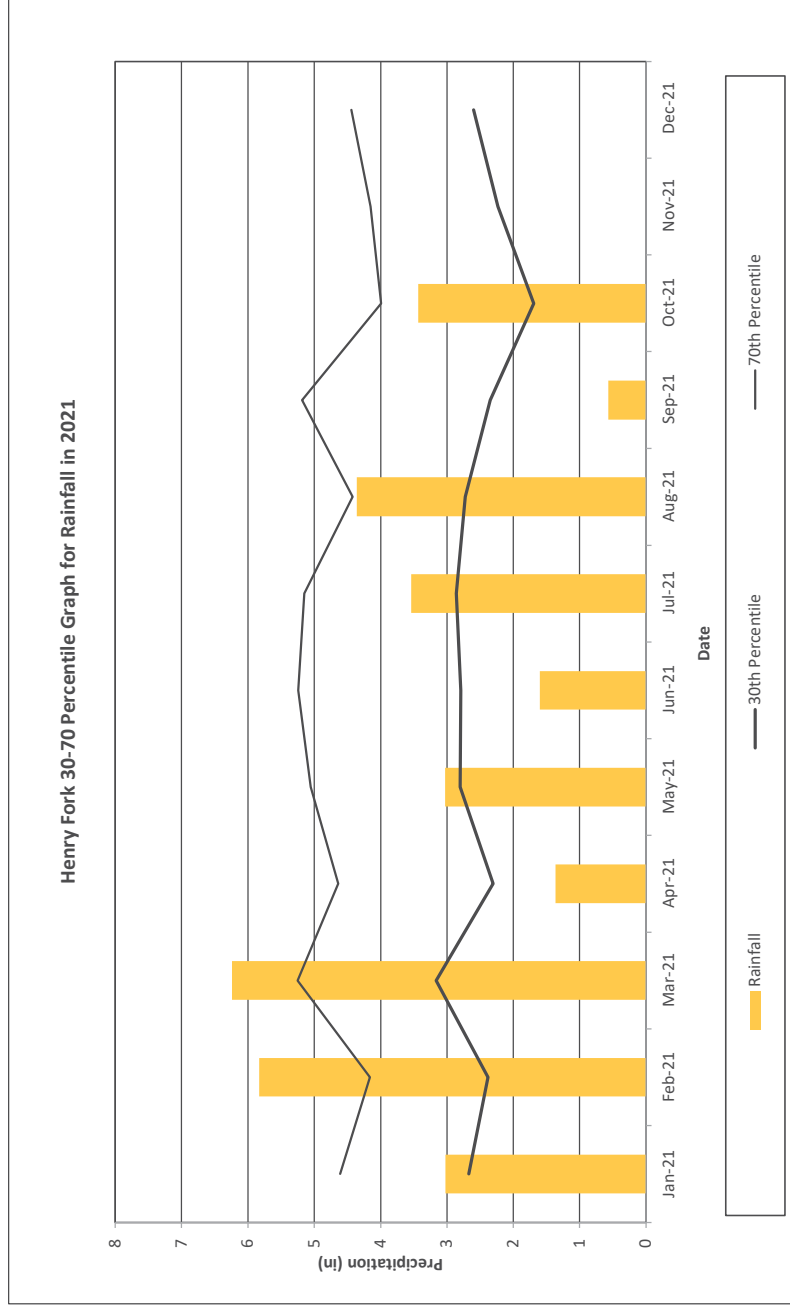
Stream Gage Plots
Henry Fork Mitigation Site
DMS Project No. 96306
Monitoring Year 6 - 2021



Stream Gage Plots
 Henry Fork Mitigation Site
 DMS Project No. 96306
 Monitoring Year 6 - 2021



Monthly Rainfall Data
 Henry Fork Mitigation Site
 DMS Project No. 96306
Monitoring Year 6 - 2021



¹ 2021 rainfall collected by NC CRONOS Station Hickory 4.8 SW, NC

² 30th and 70th percentile rainfall data collected from WETS station Conover Oxford Shoal, NC

APPENDIX 6. Wetland Addendum



October 6, 2020

Mr. Matthew Reid
NCDEQ Division of Mitigation Services
5 Ravenscroft Drive
Suite 102
Asheville, NC 28801

Subject: Wetland Addendum
Henry Fork Mitigation Site
DMS Project No. 96303
DEQ Contract No. 005782
Catawba River Basin – HUC 03050103 Expanded Service Area
Catawba County, North Carolina

Dear Mr. Reid,

Wildlands Engineering, Inc. (Wildlands) conducted a wetland assessment in 2020, Monitoring Year (MY) 5 of 7, to identify additional potential wetland areas on the Henry Fork Mitigation Site (Site) that have been created by this project. Additional supplemental data including a potential wetland area table, map figure, groundwater gage plots, photo log, and wetland data sheets have been included with this addendum letter.

Background

In anticipation of additional wetlands created on the Site after construction, section 8.2 (Wetland Mitigation Credits) of the Henry Fork Mitigation Plan states: "DMS reserves the right to request additional wetland credits created by the project. Wetland credits will be proposed based upon additional gauge data and/or wetland delineation." Therefore, in February and March 2019 (MY4), three groundwater gages were installed in locations adjacent to credited wetland areas to provide groundwater data to support the potential expansion of wetland areas on the Site. The purpose of delineating these extra areas is to offset any wetland credits that may be at risk of losing credit. Wildlands is not, however, seeking additional wetland credit above the original asset table amount.

Wildlands defends and maintains a 7.2% (17 consecutive day) success criteria in the IRT approved Mitigation Plan but the USACE commented that a 8.5% (20 consecutive day) success criteria would be required. Wildlands updated the success criteria in the MY0 report. The final performance standard established for wetland hydrology will be a free groundwater surface within 12 inches of the ground surface for 20 consecutive days (8.5%) of the 236 day growing season (March 20 through November 11) under typical precipitation conditions.

Data Collection and Analysis

As stated above, three additional groundwater gages (GWG 13 – 15) were installed in February and March 2019 before the start of MY4 growing season, for the purpose of providing groundwater data to

document additional wetland areas. On June 23, 2020, Wildlands personnel performed a Site investigation to identify additional potential wetland areas on the Site. Five areas (Wetlands AA through EE) were delineated and mapped using global positioning system (GPS) data collection and three wetland data points (DP1 – 3) were collected. Please refer to the attached hydrologic data for groundwater gage plots and summary table of the success criteria for each gage on Site.

Wetlands AA, BB, and CC are located south of Wetland N enhancement area. Before construction and as a former golf course, this area was identified as a ditch with a linear wetland that fed into intermittent stream channel UT2. During construction, the outlet of the ditch was plugged thus raising the groundwater level and creating conditions for anaerobic wetland processes to occur. GWG 15 was installed in MY4 to be representative of the low area and to document hydrologic conditions for the proposed wetland areas south of wetland N. For two consecutive years, GWG 15 has achieved the wetland hydrologic success criteria established for the Site. Wetland data point 1 (DP1) documents the hydrology, vegetation, and soil conditions representative of Wetlands AA, BB, and CC.

Wetland DD is located in the footprint of a former golf course inline pond bed (pond 3) that was filled during construction. Before construction, UT1 flowed through pond 3 before making its way to the Henry Fork river. The restoration of UT1 realigned the stream channel and took pond 3 offline. The restored hydrology of UT1 has allowed for frequent overbank flooding of riparian wetland areas, thus expanding the hydrologic function into this area. GWG 1 was installed during the MY0 baseline data collection and is in close proximity to Wetland DD. GWG 1 has achieved the wetland hydrologic success criteria for the Site in MY2 through MY5 thus far. Wetland data point 2 (DP2) documents the hydrology, vegetation, and soil conditions representative of Wetland DD.

Wetland EE is located in and around the pre-construction footprint of UT1 near the previous UT1A confluence, adjacent to Wetlands J and K enhancement areas. The restoration of UT1A has increased the floodplain access from overbank flooding and resulted in a gain in wetland function well beyond the mapped wetland re-establishment area (Wetland 1). GWG 13 was installed in MY4 and has achieved wetland hydrologic success criteria for the past two years. Wetland data point 3 (DP3) was collected near GWG 13 and details the conditions of Wetland EE.

Wetland Credits

The combined area from Wetland AA through EE totals 0.661 acres. Pre-construction, these five areas were not wetlands and were not identified as such in the approved Jurisdictional Determination for the Site. Also, the additional wetland areas (AA – EE) were not identified as having hydric soils in the LSS soil report from the Mitigation Plan. Therefore, a creation credit ratio of 3:1 is proposed for all five wetland areas where a rise in groundwater elevations have created conditions necessary to support wetland conditions and promote wetland functions. In total, an additional 0.220 riparian wetland mitigation units (WMUs) are available to offset any wetland credits that may be determined to be at risk of losing credit. Please refer to the attached summary table of the additional wetland areas on the Site.

Conclusion

This wetland addendum summarizes the data collection and analysis of five proposed wetlands (Wetland AA – EE) that have been identified on the Site after construction was complete. Following DMS and IRT approval of this wetland addendum, Wildland's will document the additional wetland areas in

this year's annual monitoring report. It will be stated in the report that these additional areas are only to be used as offset if any existing wetland credits are found to be at risk.

Feel free to contact me at 828-545-3865 if you have any questions.

Thank you,

Jake McLean

Project Manager

jmclean@wildlandseng.com

Additional Potential Wetland Areas

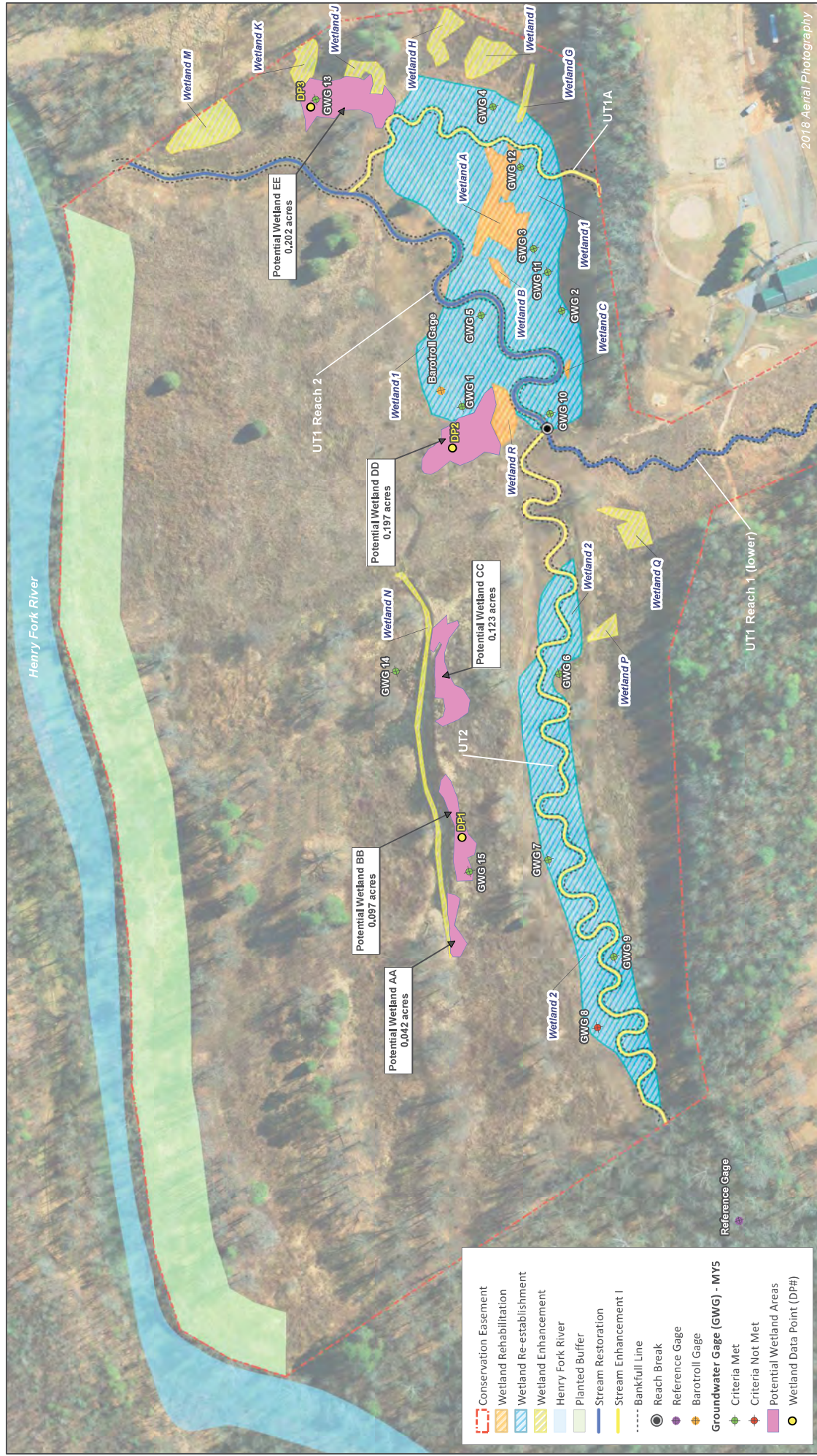
Henry Fork Mitigation Site

DMS Project No.96306

Monitoring Year 5 - 2020

Wetland ID	Location	Existing Acreage	Approach	Restoration (R) or Restoration Equivalent (RE)	Restoration Acreage	Mitigation Ratio	Credits (WMU)
Wetland AA	Floodplain towards river from UT2	N/A	Creation of wetland functions that support hydrologic, vegetative, and wetland soils	Creation	0.042	3:1	0.014
Wetland BB	Floodplain towards river from UT2	N/A		Creation	0.097	3:1	0.032
Wetland CC	Floodplain towards river from UT2	N/A		Creation	0.123	3:1	0.041
Wetland DD	Floodplain in footprint of Pond 3 near head of UT1 Reach 2	N/A		Creation	0.197	3:1	0.066
Wetland EE	East hillslope near UT1 Reach 2	N/A		Creation	0.202	3:1	0.067
Total					0.661		0.220

Map Figure



2018 Aerial Photography

Henry Fork Mitigation Site
Wetland Addendum
DMS Project No. 96306
Monitoring Year 5 - 2020
Catawba County, NC



Wetland Data Sheets

Project/Site: Henry Fork Mitigation Site City/County: Catawba County Sampling Date: 6-23-20
 Applicant/Owner: Wildlands Engineering, Inc State: NC Sampling Point: DP1
 Investigator(s): Jordan Hessler & Mimi Caddell Section, Township, Range: N/A
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.703299 Long: -81.366247 Datum: NAD83
 Soil Map Unit Name: Codorus Loam (CsA) & Hatboro Loam (HaA) NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: Vegetation and Hydrology indicators are strong in this area.	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input checked="" type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> Water Table Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> Saturation Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 Ground water gage #15 is near data point 1. See gage data attached.

Remarks:
 2.25" rain event 4 days prior to site visit.

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

Sampling Point: DP1

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Liquidambar styraciflua</u>	<u>20</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Acer negundo</u>	<u>10</u>	<u>Yes</u>	<u>FAC</u>
3. <u>Acer rubrum</u>	<u>5</u>	<u>No</u>	<u>FAC</u>
4. <u>Betula nigra</u>	<u>5</u>	<u>No</u>	<u>FACW</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>40</u> =Total Cover		
	50% of total cover: <u>20</u>	20% of total cover: <u>8</u>	

Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Acer rubrum</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>
2. <u>Acer negundo</u>	<u>5</u>	<u>Yes</u>	<u>FAC</u>
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
	<u>10</u> =Total Cover		
	50% of total cover: <u>5</u>	20% of total cover: <u>2</u>	

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u>	<u>30</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Carex longii</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>
3. <u>Carex lupulina</u>	<u>30</u>	<u>Yes</u>	<u>OBL</u>
4. <u>Solidago spp.</u>	<u>5</u>	<u>No</u>	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	<u>95</u> =Total Cover		
	50% of total cover: <u>48</u>	20% of total cover: <u>19</u>	

Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ =Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 7 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>60</u>	x 1 = <u>60</u>
FACW species <u>35</u>	x 2 = <u>70</u>
FAC species <u>45</u>	x 3 = <u>135</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>140</u> (A)	<u>265</u> (B)
Prevalence Index = B/A = <u>1.89</u>	

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0¹
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present?

Yes No _____

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	7.5YR 4/3	80	10YR 5/2	20	D	M	Loamy/Clayey	
8-14	7.5YR 4/3	50	10YR 5/2	50	D	M	Loamy/Clayey	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)

- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Mucky Mineral (F1) **(MLRA 136)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 122, 136)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Soils look to be transitioning to wetland soils.

Project/Site: Henry Fork Mitigation Site City/County: Catawba County Sampling Date: 6-23-20
 Applicant/Owner: Wildlands Engineering, Inc State: NC Sampling Point: DP2
 Investigator(s): Jordan Hessler & Mimi Caddell Section, Township, Range: N/A
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.702921 Long: -81.364125 Datum: NAD83
 Soil Map Unit Name: Codorus Loam (CsA) & Hatboro Loam (HaA) NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland?	Yes <u>X</u> No <u> </u>
Hydric Soil Present?	Yes <u>X</u> No <u> </u>		
Wetland Hydrology Present?	Yes <u>X</u> No <u> </u>		
Remarks:			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators</u> (minimum of one is required; check all that apply)	<u>Secondary Indicators</u> (minimum of two required)
<input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)

Field Observations: Surface Water Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>5</u> Water Table Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> Saturation Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 Ground water gage #1 is near data point 2. See gage data attached

Remarks:
 2.25" rain event 4 days prior to site visit.

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

Sampling Point: DP2

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Alnus serrulata</u>	<u>10</u>	<u>Yes</u>	<u>OBL</u>
2. <u>Betula nigra</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>
3. <u>Platanus occidentalis</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>20</u> = Total Cover		
	50% of total cover: <u>10</u>	20% of total cover: <u>4</u>	

Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Leersia oryzoides</u>	<u>60</u>	<u>Yes</u>	<u>OBL</u>
2. <u>Carex lupulina</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
3. <u>Juncus effusus</u>	<u>10</u>	<u>No</u>	<u>FACW</u>
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	<u>80</u> = Total Cover		
	50% of total cover: <u>40</u>	20% of total cover: <u>16</u>	

Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>80</u>	x 1 = <u>80</u>
FACW species <u>20</u>	x 2 = <u>40</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>100</u> (A)	<u>120</u> (B)
Prevalence Index = B/A = <u>1.20</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-6	10YR 4/3	70	7.5YR 4/6	30	C	M	Loamy/Clayey	Prominent redox concentrations
6-14	7.5YR 3/4	90	10YR 4/2	10	D	M	Loamy/Clayey	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- Histosol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- 2 cm Muck (A10) **(LRR N)**
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7)

- Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- Thin Dark Surface (S9) **(MLRA 147, 148)**
- Loamy Mucky Mineral (F1) **(MLRA 136)**
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)
- Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- Umbric Surface (F13) **(MLRA 122, 136)**
- Piedmont Floodplain Soils (F19) **(MLRA 148)**
- Red Parent Material (F21) **(MLRA 127, 147, 148)**

Indicators for Problematic Hydric Soils³:

- 2 cm Muck (A10) **(MLRA 147)**
- Coast Prairie Redox (A16) **(MLRA 147, 148)**
- Piedmont Floodplain Soils (F19) **(MLRA 136, 147)**
- Red Parent Material (F21) **(outside MLRA 127, 147, 148)**
- Very Shallow Dark Surface (F22)
- Other (Explain in Remarks)

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:
 Abrupt change in soil color at 6".

Project/Site: Henry Fork Mitigation Site City/County: Catawba County Sampling Date: 6-23-20
 Applicant/Owner: Wildlands Engineering, Inc State: NC Sampling Point: DP3
 Investigator(s): Jordan Hessler & Mimi Caddell Section, Township, Range: N/A
 Landform (hillside, terrace, etc.): floodplain Local relief (concave, convex, none): Concave Slope (%): 0-1
 Subregion (LRR or MLRA): LRR P, MLRA 136 Lat: 35.703183 Long: -81.362086 Datum: NAD83
 Soil Map Unit Name: Hatboro Loam (HaA) NWI classification: N/A
 Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)
 Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes X No
 Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes <u>X</u> No <u> </u> Hydric Soil Present? Yes <u>X</u> No <u> </u> Wetland Hydrology Present? Yes <u>X</u> No <u> </u>	Is the Sampled Area within a Wetland? Yes <u>X</u> No <u> </u>
Remarks: 	

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> <input checked="" type="checkbox"/> Surface Water (A1) <input type="checkbox"/> True Aquatic Plants (B14) <input checked="" type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input checked="" type="checkbox"/> Saturation (A3) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Water Marks (B1) <input checked="" type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13)	<u>Secondary Indicators (minimum of two required)</u> <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Microtopographic Relief (D4) <input checked="" type="checkbox"/> FAC-Neutral Test (D5)
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Field Observations: Surface Water Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>2</u> Water Table Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> Saturation Present? Yes <u>x</u> No <u> </u> Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes <u>X</u> No <u> </u>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
 Ground water gage #13 is near data point 3. See gage data attached

Remarks:
 2.25" rain event 4 days prior to site visit.

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

Sampling Point: DP3

Tree Stratum (Plot size: <u>30</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Salix nigra</u>	<u>10</u>	<u>Yes</u>	<u>OBL</u>
2. <u>Betula nigra</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>
3. <u>Alnus serrulata</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>
4. <u>Platanus occidentalis</u>	<u>5</u>	<u>Yes</u>	<u>FACW</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
	<u>25</u> = Total Cover		
	50% of total cover: <u>13</u>	20% of total cover: <u>5</u>	

Sapling/Shrub Stratum (Plot size: <u>15</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Herb Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. <u>Juncus effusus</u>	<u>60</u>	<u>Yes</u>	<u>FACW</u>
2. <u>Carex lupulina</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
3. <u>Sagittaria latifolia</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
4. <u>Typha latifolia</u>	<u>10</u>	<u>No</u>	<u>OBL</u>
5. _____	_____	_____	_____
6. _____	_____	_____	_____
7. _____	_____	_____	_____
8. _____	_____	_____	_____
9. _____	_____	_____	_____
10. _____	_____	_____	_____
11. _____	_____	_____	_____
	<u>90</u> = Total Cover		
	50% of total cover: <u>45</u>	20% of total cover: <u>18</u>	

Woody Vine Stratum (Plot size: <u>5</u>)	Absolute % Cover	Dominant Species?	Indicator Status
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____
5. _____	_____	_____	_____
	_____ = Total Cover		
	50% of total cover: _____	20% of total cover: _____	

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>40</u>	x 1 = <u>40</u>
FACW species <u>75</u>	x 2 = <u>150</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>0</u>	x 4 = <u>0</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>115</u> (A)	<u>190</u> (B)
Prevalence Index = B/A = <u>1.65</u>	

Hydrophytic Vegetation Indicators:

 1 - Rapid Test for Hydrophytic Vegetation

X 2 - Dominance Test is >50%

X 3 - Prevalence Index is ≤3.0¹

 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

 Problematic Hydrophytic Vegetation¹ (Explain)

¹Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Definitions of Four Vegetation Strata:

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

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

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

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

Hydrophytic Vegetation Present? Yes X No

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: DP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type ¹	Loc ²		
0-8	10YR 4/1	95	7.5YR 4/6	5	RM	M	Loamy/Clayey	Mica flakes mixed in
8-14	2.5YR 3/1	100					Loamy/Clayey	

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

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Polyvalue Below Surface (S8) (MLRA 147, 148)	<input type="checkbox"/> 2 cm Muck (A10) (MLRA 147)			
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Thin Dark Surface (S9) (MLRA 147, 148)	<input type="checkbox"/> Coast Prairie Redox (A16)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1) (MLRA 136)	<input type="checkbox"/> (MLRA 147, 148)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Piedmont Floodplain Soils (F19)			
<input type="checkbox"/> Stratified Layers (A5)	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> (MLRA 136, 147)			
<input type="checkbox"/> 2 cm Muck (A10) (LRR N)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (F21)			
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> (outside MLRA 127, 147, 148)			
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Very Shallow Dark Surface (F22)			
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Iron-Manganese Masses (F12) (LRR N, MLRA 136)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> Umbric Surface (F13) (MLRA 122, 136)				
<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 148)				
<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Red Parent Material (F21) (MLRA 127, 147, 148)				
<input type="checkbox"/> Dark Surface (S7)					

³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
---	---

Remarks:

Wetland Photographs



Potential Wetland AA – northern view (6/23/2020)



DP1/Potential Wetland BB – eastern view (6/23/2020)



Potential Wetland CC – western view (6/23/2020)



DP2/Potential Wetland DD – northern view (6/23/2020)



Potential Wetland DD – southern view (6/23/2020)



DP3/GWG 13/Potential Wetland EE – southwest view



Potential Wetland EE – southern view (6/23/2020)

From Mitigation Plan:
Jurisdictional Determination
Hydric Soil Evaluation September 9, 2013 (Proposal Phase)
Hydric Soil Investigation May 13, 2014 (Design Phase)

**U.S. ARMY CORPS OF ENGINEERS
WILMINGTON DISTRICT**

Action ID: 2014-00538 County: Catawba U.S.G.S. Quad: Hickory

NOTIFICATION OF JURISDICTIONAL DETERMINATION

Property Owner: WEI – Henry Fork, LLC / Attn.: Shawn Wilkerson
Address: 1430 South Mint Street, Suite 104
Charlotte, NC 28203
Telephone Number: 704-332-3306

Size (acres): 48 Nearest Town: Hickory
Nearest Waterway: UTs to Henry Fork and Henry Fork Coordinates: 35.703751 N, 81.364880 W
River Basin/ HUC: South Fork Catawba (03050102)

Location description: The site is located on a tract of land (parcel ID 279108883819) which was a part of the former Henry River Golf Course at 2575 Mountain View Road in Hickory, Catawba County North Carolina.

Indicate Which of the Following Apply:

A. Preliminary Determination

Based on preliminary information, there may be wetlands on the above described property. We strongly suggest you have this property inspected to determine the extent of Department of the Army (DA) jurisdiction. To be considered final, a jurisdictional determination must be verified by the Corps. This preliminary determination is not an appealable action under the Regulatory Program Administrative Appeal Process (Reference 33 CFR Part 331). 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.

B. Approved Determination

There are Navigable Waters of the United States within the above described property subject to the permit requirements of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. 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 waters of the U.S. including wetlands on the above described 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 strongly suggest you have the wetlands on your property delineated. Due to the size of your property and/or our present workload, the Corps may not be able to accomplish this wetland delineation in a timely manner. For a more timely delineation, you may wish to obtain a consultant. To be considered final, any delineation must be verified by the Corps.

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

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

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

The property is located in one of the 20 Coastal Counties subject to regulation under the Coastal Area Management Act (CAMA). You should contact the Division of Coastal Management to determine their requirements.

RECEIVED SEP 02 2014

The Wilmington District is committed to providing the highest level of support to the public. To help us ensure we continue to do so, please complete our Customer Satisfaction Survey, located online at <http://regulatory.usacesurvey.com/>.

Copy furnished:

Wildlands Engineering, Inc., Attn.: Ian Eckardt, 1430 South Mint Street, Suite 104, Charlotte, NC 28205

NCDENR – Ecosystem Enhancement Program, Attn.: Paul Wiesner, 5 Ravenscroft Drive, Suite 102, Asheville, NC 28801

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:

**District Engineer, Wilmington Regulatory Division,
Attn: David Brown
828-271-7980**

If you only have questions regarding the appeal process you may also contact:

**Mr. Jason Steele, Administrative Appeal Review Officer
CESAD-PDO
U.S. Army Corps of Engineers, South Atlantic Division
60 Forsyth Street, Room 10M15
Atlanta, Georgia 30303-8801
Phone: (404) 562-5137**

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

Signature of appellant or agent.

Date: _____

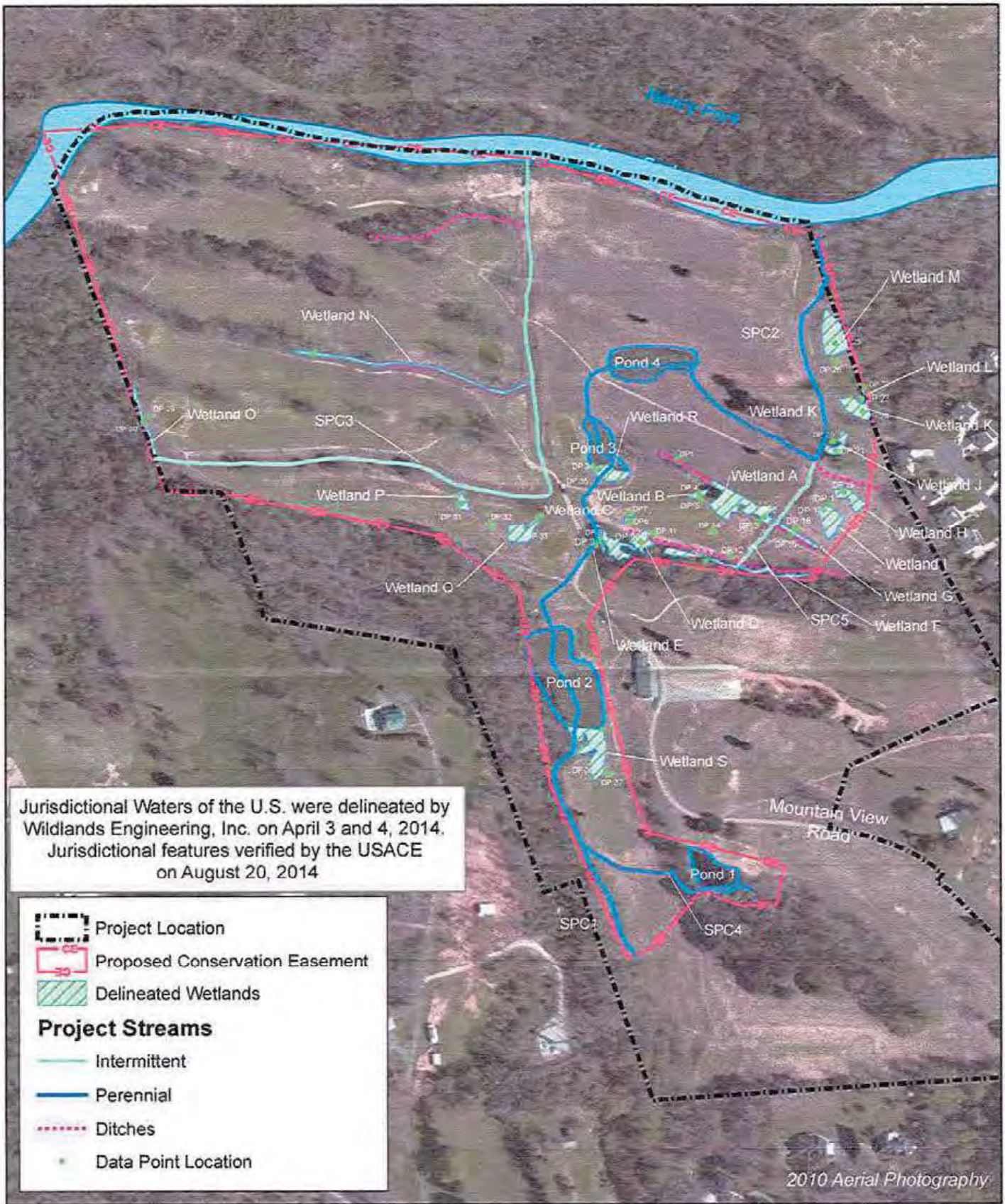
Telephone number: _____

For appeals on Initial Proffered Permits send this form to:

District Engineer, Wilmington Regulatory Division, Attn.: David Brown, 69 Darlington Avenue, Wilmington, North Carolina 28403

For Permit denials, Proffered Permits and approved Jurisdictional Determinations send this form to:

**Division Engineer, Commander, U.S. Army Engineer Division, South Atlantic, Attn: Mr. Jason Steele, Administrative Appeal Officer, CESAD-PDO, 60 Forsyth Street, Room 10M15, Atlanta, Georgia 30303-8801
Phone: (404) 562-5137**



0 150 300 Feet



Figure 3 Site Map
 Henry Fork Stream & Wetland Mitigation Site
 Catawba River Basin
 (03050103 Expanded Service Area)
 Catawba County, NC

**Table 1. Henry Fork Stream and Wetland Mitigation Project
Summary of On-Site Jurisdictional Waters**

Jurisdictional Feature	Classification	Length (LF)*	Acreage	Watershed (ac)	NCDWQ Stream Scores	USACE Stream Scores
UT1	Perennial RPW	3,071	-	130	39.5/32.5	54/44
UT1A	Intermittent RPW	353	-	23	27.25	49
UT1B	Perennial RPW	491	-	31	31.25	49
UT2	Intermittent RPW	1,945	-	66	27	43
Wetland A	Headwater Forest	-	0.182	-	-	-
Wetland B	Headwater Forest	-	0.013	-	-	-
Wetland C	Headwater Forest	-	0.003	-	-	-
Wetland D	Headwater Forest	-	0.094	-	-	-
Wetland E	Headwater Forest	-	0.004	-	-	-
Wetland F	Headwater Forest	-	0.067	-	-	-
Wetland G	Headwater Forest	-	0.021	-	-	-
Wetland H	Headwater Forest	-	0.056	-	-	-
Wetland I	Headwater Forest	-	0.078	-	-	-
Wetland J	Headwater Forest	-	0.036	-	-	-
Wetland K	Headwater Forest	-	0.062	-	-	-
Wetland L	Headwater Forest	-	0.003	-	-	-
Wetland M	Headwater Forest	-	0.131	-	-	-
Wetland N	Headwater Forest	-	0.084	-	-	-
Wetland O	Headwater Forest	-	0.028	-	-	-
Wetland P	Headwater Forest	-	0.023	-	-	-
Wetland Q	Headwater Forest	-	0.069	-	-	-
Wetland R	Non-tidal Freshwater Marsh	-	0.059	-	-	-
Wetland S	Non-tidal Freshwater Marsh	-	0.159	-	-	-
Pond 1**	-	-	0.20	-	-	-
Pond 2**	-	-	0.81	-	-	-
Pond 3**	-	-	0.20	-	-	-
Pond 4**	-	-	0.37	-	-	-

*Linear footage includes stream length through ponds.
**Ponds are manmade impoundments and prior discussion with Corps indicates that they will be treated as streams for quantification of impacts.

HYDRIC SOIL EVALUATION
FOR THE PROPOSED HENRY RIVER MITIGATION SITE
CATAWBA COUNTY, NORTH CAROLINA

Prepared for:

Wildlands Engineering, Inc.

Prepared by:

Jason A. Payne
NC Licensed Soil Scientist #1308



September 9, 2013

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PURPOSE OF REPORT

This report has been prepared to assist Wildlands Engineering during planning and design for the proposed mitigation site located at the Henry River Golf Course in Catawba County, NC. A detailed evaluation was conducted to characterize soils across the site, with a focus on identifying hydric soils.

SITE LOCATION

The site is located on an approximately 90-acre property, southwest of the intersection of Highway 321 and Interstate 40, at 2575 Mountain View Road (Parcel# 279108883819), in Hickory, NC. The evaluation area is situated in the floodplain of, and south of the Henry Fork River, north of the terminus of Mountain View Road.

METHODOLOGY

The hydric soil evaluation began with a cursory review of NRCS soils maps, recent aerial photos and a USGS topographic map for the area. The site analysis was performed on July 25, 2013. Soil auger borings were advanced throughout the study area. The hydric soil status at each location was noted, and is based upon the NRCS Field Indicators of Hydric Soils in the United States - A Guide for Identifying and Delineating Hydric Soils (Version 7.0, 2010). During the site evaluation, each soil boring was assigned to one of four different soil types or units:

- Soil Unit 1 (S1) – Hydric, relatively undisturbed
- Soil Unit 2 (S2) – Hydric soil that has been buried, with hydric indicators in the fill material
- Soil Unit 3 (S3) – Hydric soil that has been buried. Fill material is non-hydric
- Soil Unit 4 (S4) – Non-hydric soil (no evidence of buried hydric soil)

Following the site investigation, field data were compiled to prepare the hydric soil map for the project.

FINDINGS

Evidence of anthropogenic site manipulation is abundant throughout the study area. One finds much evidence of ditching and/or channelization of streams across the site. Additionally, fill material has been placed over a majority of the floodplain area during past construction for the golf course. The soil beneath is generally undisturbed.

The Soil Units are briefly discussed below and representative soil profile descriptions using the USDA - NRCS standard nomenclature are appended for hydric soil areas S1, S2 & S3. The attached “Henry River Project Hydric Soils Evaluation” map illustrates the approximate location of soil borings and soil map units across the site. Two, separate hydric soil areas were mapped during the evaluation. The western hydric soil area occupies approximately 1.49-acres, and consists only of S2

and S3 borings. The eastern hydric soil area occupies 3.03-acres, and consists of S1, S2 and S3 borings.

Soil Unit 1 (S1) – Hydric Soil

Soils in this area had no fill material and generally had typical diagnostic soil horizons. While several hydric soil indicators were present, indicator F3 was the most common.

Indicator F3 - Depleted Matrix. A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:

- a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or
- b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

This soil typically had a silt loam textured surface horizon that ranged from 4 to 8 inches with oxidized rhizospheres present. The subsurface textures were generally clay loam, grading to silty clay, with a matrix color of chroma 2 or less.

Soil Unit 2 (S2) – Hydric Fill Over Hydric Soil

Soil Unit 2 had fill material deposited during construction of the golf course. The soil beneath the fill was relatively undisturbed. Depth of fill was variable, but ranged from 6-to-12-inches. The buried soil had a loam textured surface horizon underlain by either loam, clay loam, or sandy clay loam subsurface horizons and met hydric indicator F3 Depleted Matrix.

Here, the effects of hydrologic manipulation on the site are less pronounced and fill material has been on-site long enough to develop hydric indicators. While some of the fill material may have been hydric in origin (deposited from adjoining wetland or dredge from the ditches), most fill material was sourced from upland areas. There was evidence of active reduction and oxidation reactions in all borings. The soil either met indicator F3 Depleted Matrix or F6;

Indicator F6 - Redox Dark Surface. A layer that is at least 10 cm (4 inches) thick, is entirely within the upper 30 cm (12 inches) of the mineral soil, and has:

- a. Matrix value of 3 or less and chroma of 1 or less and 2 percent or more distinct or prominent redox concentration occurring as soft masses or pore lining, or
- b. Matrix value of 3 or less and chroma of 2 or less and 5 percent or more distinct or prominent redox concentrations occurring as soft masses or pore linings.

Soil Unit 3 (S3) – Non-Hydric Fill Over Hydric Soil

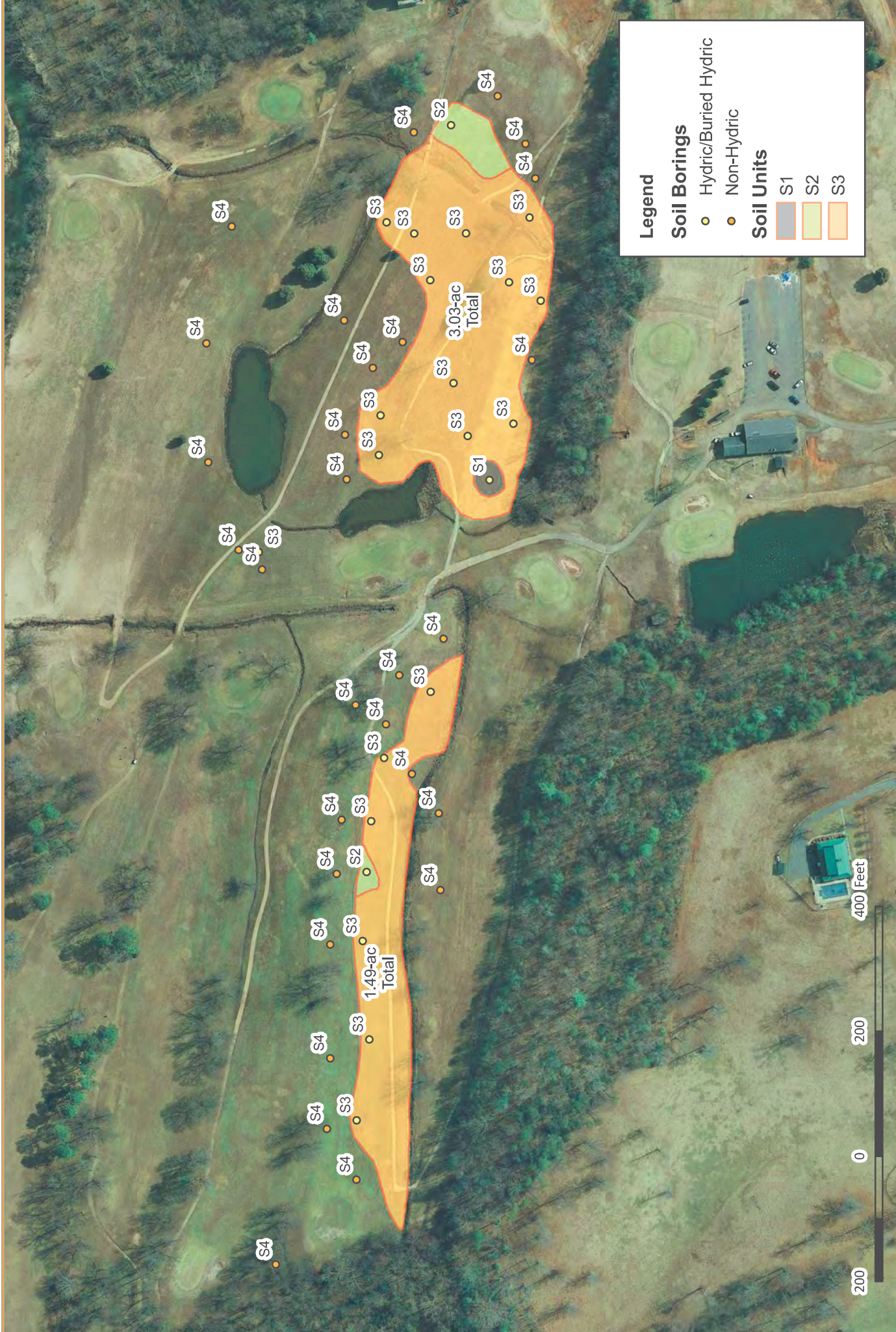
Soil Unit 3 clearly had fill material deposited during construction of the golf course. The soil beneath the fill was relatively undisturbed. Depth of fill was quite variable, but ranges from 12-to-26-inches. The buried soil had a silty clay loam surface horizon underlain by clay, silty clay or clay loam subsurface horizons. These areas met hydric indicator F3 - Depleted Matrix. While there was some evidence of recent reduction and oxidations reactions within some fill, it did not meet any of the hydric indicators.

Soil Unit 4 (S4) – No Evidence of Buried Hydric Soil

Most of Soil Unit 4 evidenced fill material, but in all cases neither the fill material nor the original soil met any hydric soil indicators within a depth reasonable for remediation. For example, some borings exhibited fill depths of greater than 36-inches, and were terminated. Since these areas contained mostly fill material without hydric soil indicators, a representative soil profile description was omitted.

CONCLUSION

This report presents information that may be used as reference for planning and design for the proposed work at the Henry River Mitigation site. Specifically, soil borings provide evidence of areas where hydric soils are either present or present below fill material. Soil units for each of these areas were delineated on the attached map. The site hydrology has been altered by ditching and/or channelization of streams and the addition of the fill material. Subsequently, opportunities exist for wetland restoration. These findings represent a professional opinion based on Hydric Soil Investigation and knowledge of the current regulations regarding wetland mitigation in North Carolina and national criteria for determining hydric soil.



Legend

Soil Borings

- Hydric/Buried Hydric
- Non-Hydric

Soil Units

- S1
- S2
- S3



State Plane North Carolina, NAD 1983; This map is for informational purposes and was not prepared for, and is not suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information. This is not a survey.

Henry River Project
Hydric Soils Evaluation
Catawba County, NC

September 9, 2013

Prepared by: Jason A. Payne, RF, LSS

HYDRIC SOIL INVESTIGATION

Henry Fork Mitigation Site

Catawba County, North Carolina

Prepared for:

Wildlands Engineering, Inc.
5605 Chapel Hill Road, Suite 122
Raleigh, NC 27607

Prepared by:



410-B Millstone Drive
Hillsborough, NC 27278

Michael G. Wood



May 13, 2014

INTRODUCTION

Wildlands Engineering, Inc. is considering mitigating a section of the Henry Fork project site in the Catawba River Basin (03050101). The site is accessed off Mountain View Road (SR 1192) in Hickory, Catawba County, NC. The Catena Group, Inc. (Catena) was retained to perform a detailed soil investigation that would, in part, determine the depth of fill material that was previously observed during a preliminary soil and site.

METHODOLOGY

The field investigation was performed on April 29, 2014. Seventy-two (72) hand-turned auger borings were advanced throughout the study area on a seventy-five ft by seventy-five ft grid (Figure 1). Each soil boring was marked in the field with a red pin flag noting the boring number, soil unit number, and either depth of fill material or depth boring was terminated. Hydric soil status was based upon the NRCS Field Indicators of Hydric Soils in the Unities States - A Guide for Identifying and Delineating Hydric Soils (Version 7.0, 2010).

RESULTS

There is clear evidence of human manipulation throughout the study area. In addition to ditching and/or channelization of streams, fill material has been placed over the majority of the study area. Six Soil Units were created based on data collected from soil borings and are described below and summarized in Table 1. Table 2 lists the classification and fill depth when applicable for each soil boring (appended).

Soil Unit 1. Soil Unit 1 had a typical surface diagnostic horizon that met hydric soil indicator F3.

F3 Depleted Matrix. A layer that has a depleted matrix with 60 percent or more chroma of 2 or less and that has a minimum thickness of either:

- a. 5 cm (2 inches) if the 5 cm is entirely within the upper 15 cm (6 inches) of the soil, or 5 cm (6 inches), or
- b. 15 cm (6 inches), starting within 25 cm (10 inches) of the soil surface.

Soil Unit 2. Soil Unit 2 consists of non-hydric soil that appeared to be undisturbed.

Soil Unit 3. Soil Unit 3 clearly has overburden material deposited as a result of human manipulation. The soil material below the overburden was relatively undisturbed and met hydric indicator F3 Depleted Matrix. The overburden was classified as hydric and met hydric indicator F3 Depleted Matrix.

Soil Unit 4. Soil Unit 4 clearly has overburden material deposited as a result of human manipulation. The soil material below the overburden was relatively undisturbed other than a compressed soil structure and a truncated profile, remnants of past surface manipulations. This material still appeared to be hydric and met indicator F3 Depleted Matrix. The overburden did not meet any hydric soil

indicator. A typical soil profile for Soil Unit 4 is appended. Soil Unit 4 comprised the majority of the study site.

Soil Unit 5. Soil Unit 5 clearly has overburden material deposited as a result of human manipulation. The overburden material and the soil beneath did not meet any hydric soil indicator.

Soil Unit 6. Soil Unit 6 clear has overburden material deposited as a result of human manipulation. The surface of the overburden material currently meets hydric indicator F3 Depleted Matrix. The material below the surface did not currently meet any hydric soil indicator.

Table 1. Summary of Soil Boring Classification and Hydric Indicator (if applicable).

Soil Unit	Classification	Hydric Indicator
1	Undisturbed Hydric Soil	F3
2	Undisturbed Non-Hydric Soil	n/a
3	Hydric Overburden/Buried Hydric Soil	F3
4	Non-Hydric Overburden/Buried Hydric Soil	F3
5	Non-Hydric Overburden/Buried Non-Hydric Soil	n/a
6	Hydric Overburden/Non-Hydric Soil	F3

CONCLUSION

Seventy-two (72) soil borings were advanced throughout the study area. Borings were placed into one of six Soil Units. The depth of fill material was noted at each boring when applicable. It is anticipated that Priority 1 stream restoration, combined with limited soil manipulation, has the potential to re-establish approximately 5.6 acres of wetlands (Figure 1).

The findings presented herein represent Catena’s professional opinion based on our Hydric Soil Investigation and knowledge of the current regulations regarding wetland mitigation in North Carolina and national criteria for determining hydric soil.

Table 2. Classification of Each Soil Boring and Depth of Fill Material (if applicable).

Boring No.	Soil Unit	Depth of Fill	Boring No.	Soil Unit	Depth of Fill
1	5	N/A	49	2	N/A
2	4	34	50	3	22
3	4	24	51	4	14
4	4	26	52	4	38
5	4	24	53	4	36
6	4	34	54	4	31
7	4	32	55	4	32
8	4	34	56	2	N/A
9	4	27	57	4	27
10	4	13	58	4	15
11	4	18	59	4	8
12	4	16	60	5	N/A
13	4	20	61	5	N/A
14	4	18	62	4	28
15	4	19	63	4	25
16	4	19	64	4	17
17	4	13	65	4	27
18	4	21	66	4	30
19	4	27	67	4	20
20	4	23	68	3	17
31	4	16	69	4	12
32	4	15	70	5	N/A
33	4	24	71	6	N/A
34	5	40	72	4	28
35	4	24	73	5	N/A
37	4	45	74	5	N/A
38	4	29	75	5	N/A
39	2	N/A	76	5	N/A
40	2	N/A	77	4	22
41	2	N/A	78	5	N/A
42	2	N/A	79	5	N/A
44	4	38	80	2	N/A
45	4	38	81	1	N/A
46	2	N/A	82	5	N/A
47	2	N/A	83	5	N/A
48	2	N/A	84	5	N/A

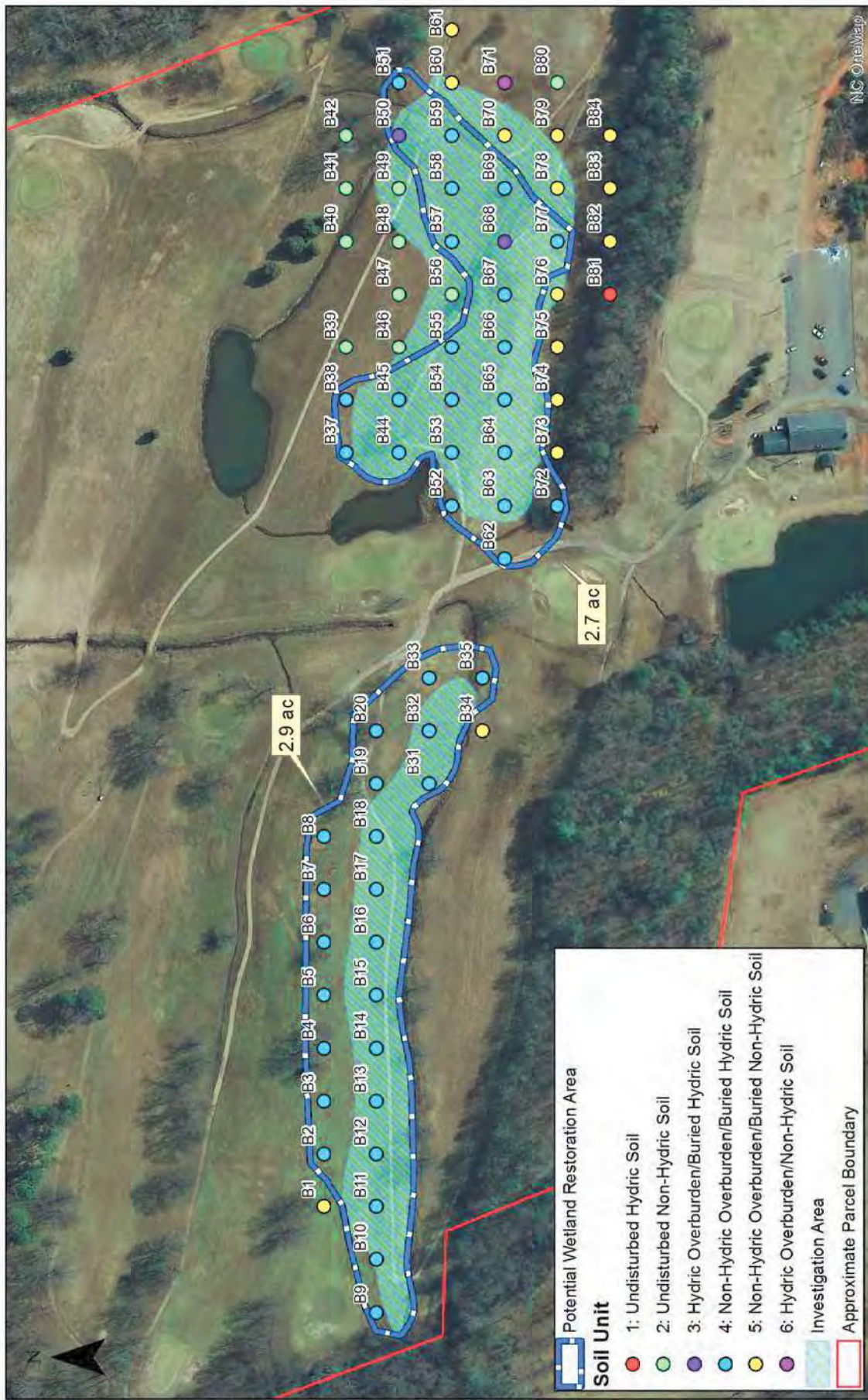
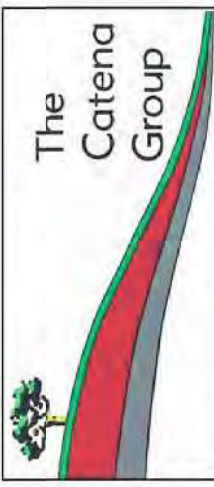


Figure 1

Date:	May 2014
Scale:	0 50 100 Feet
Job No.:	4172

Proposed Henry Fork Mitigation Site
 Hydric Soil Investigation
 Catawba County, North Carolina



Potential Wetland Restoration Area

Soil Unit

- 1: Undisturbed Hydric Soil
- 2: Undisturbed Non-Hydric Soil
- 3: Hydric Overburden/Buried Hydric Soil
- 4: Non-Hydric Overburden/Buried Hydric Soil
- 5: Non-Hydric Overburden/Buried Non-Hydric Soil
- 6: Hydric Overburden/Non-Hydric Soil

Investigation Area

Approximate Parcel Boundary

Jake McLean

To: Browning, Kimberly D CIV USARMY CESAW (USA); Wiesner, Paul
Cc: Reid, Matthew; Eric Neuhaus; Shawn Wilkerson; Allen, Melonie; Haywood, Casey M CIV (USA); Tugwell, Todd J CIV USARMY CESAW (USA); Davis, Erin B; Bowers, Todd; Wilson, Travis W.; Munzer, Olivia; Mimi Caddell; Kristi Suggs
Subject: RE: Request for more information/ DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project/ SAW- 2014-00538/Catawba County
Attachments: Supplemental Data - at risk wetland assets.pdf; Henry Fork - Wetland Supplement WLE 12.10.20 Response to IRT Comments from 10.30.20.pdf

Hi Everyone,

I apologize for the delay in getting this response out. Please find our responses below in red text, and a copy of this email response attached in pdf for your files. We will require additional time to collect vegetation data and do planting to supplement these areas, but I'm hoping that based on this response we can get some feedback on our proposed approach to guide us in moving forward with this. Although our perceived wetland credit risk is low based on current data (see attached pdf), we understand that the IRT has viewed prior credit establishment on the site through a holistic lens based on the unique nature of this site. Furthermore, we understand that in order to agree to additional crediting on this site, this should include just effort to enhance ecological uplift and provide associated documentation. If you feel that the efforts proposed below are not commensurate with the credit being requested, we are amenable to revisit the ratio requested or the efforts proposed.

Thanks,
Jake

From: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>
Sent: Friday, October 30, 2020 1:59 PM
To: Wiesner, Paul <paul.wiesner@ncdenr.gov>
Cc: Jake McLean <jmclean@wildlandseng.com>; Reid, Matthew <matthew.reid@ncdenr.gov>; Eric Neuhaus <eneuhaus@wildlandseng.com>; Shawn Wilkerson <swilkerson@wildlandseng.com>; Allen, Melonie <melonie.allen@ncdenr.gov>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; Bowers, Todd <bowers.todd@epa.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>; Munzer, Olivia <olivia.munzer@ncwildlife.org>
Subject: Request for more information/ DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project/ SAW- 2014-00538/Catawba County

Good afternoon Paul,

The 15-day comment review period for the NCDMS Henry Fork Mitigation Plan Addendum (SAW-2014-00538) closed on October 28, 2020. Per Section 332.8(o)(9) of the 2008 Mitigation Rule, this review followed the streamlined review process. All comments received during the review process are below.

USACE Comments, Todd Tugwell and Kim Browning:

The Corps requests vegetation data for these proposed wetland areas prior to approving their addition to the wetland assets. **Some areas have woody stems (both planted and volunteer) while some do not. We propose to map areas of existing high and low density stem counts within the proposed wetlands, and to plant areas of low density during this dormant season at a rate of 600 stems/acre. We propose to set up 3 vegetation plots to track density and vigor in the proposed wetlands over the remaining monitoring term - we will do this in a way that includes representation of both existing and new stems. We also propose to visually monitor the success of new plantings. New plantings are proposed**

to consist of wetland and deer-tolerant livestock which will limit diversity (and transplants from adjacent areas where available to supplement and diversify species). We have observations of low success with planting bareroot or potted trees that have already been rooted in a drier hydrologic regime and we have had significant vegetation setbacks and losses from deer on this site. If deemed acceptable, vegetation data will be provided prior to the credit release meeting in April, 2021.

Only two of the five areas proposed have gauges in them. This is concerning because the IRT requested these gauges back in March 2016 if WEI thought the wetland boundaries were going to be different from the approved mitigation plan. We understand these were requested early on and have no response to counter this concern - gages 13, 14, and 15 were installed as soon as we determined we desired to make this request. We feel that GWG1 is representative of Wetland DD and that GWG's 14 & 15 are representative of Wetlands AA, BB, and CC.

Wetland EE appears to be relatively permanently impounded according to the gauge data, which raises concern whether this area may be too wet to support trees.

The hydrologic regime of Wetland EE in 2019 was impacted by beaver impoundments - beaver were subsequently trapped and removed. Related to tree growth - it is true that the variation in topography in all of these wetlands influences the type of vegetation and habitat supported in each of these areas - some being old irrigation ponds or having ditch remnants that are emergent in character. Intermittent impoundment by beaver and riverine flooding have also influenced current vegetation. We proposed to attempt to establish woody vegetation in all of the wetlands, but recognize that some of the areas may not support this. We can accept that no credit may be offered for wetlands that do not support woody vegetation.

Prior to approving this addendum we request veg data for the proposed areas, and we would like a map that shows the areas that are at-risk/not meeting success. Vegetation data will be collected and provided along with other data specified above. The map showing at-risk areas determined by gage analysis and wetland delineation is attached.

EPA, Todd Bowers:

At this time I have no specific comments on the proposed addendum for the site to provide 0.220 riparian wetland mitigation units to only be used if proposed wetlands at the mitigation site do not meet the thresholds or performance standards for success in the current mitigation plan. The created potential wetlands appear to be providing the appropriate function based on the groundwater gauge data (GWG 13 and 15) and the vigorous vegetation growth shown in the attached photos.

As stated, the WMUs generated by this supplemental request would only be used to offset credits approved in the mitigation plan that are not granted due to failure to meet performance.

WRC, Travis Wilson:

Looking at the mapped locations as well as the photos it looks like the vegetation is comprised of emergent and pioneering species. All wetlands on this site were classified as Headwater forest. If these wetlands are going to be classified the same they should follow the same planting plan and vegetative success criteria.

As discussed above, there are pockets of deeper water with prolonged inundation. We propose to plant woody species from the livestock planting plan this winter in areas that have not already revegetated with desired species (river birch, box elder, alders). Refer to proposed vegetative success monitoring in the response to Corps comments. Further, we have treatment of cattails visible in the photos scheduled for next year. We request that vegetation criteria be relaxed to the point of demonstrating successful establishment and progression of woody species in these areas rather than achieving full term criteria by the currently scheduled close-out date.

DWR, Erin Davis:

Are all of the proposed wetland creation areas outside of the original planted project area? I question whether they would meet the standard veg density performance standard. One of the areas is sweetgum dominated.

Yes, most of the areas are outside of the planted area. We propose to perform the monitoring as stated above. There are dense riverbirch and alder thickets in some of the proposed wetland areas, but I don't believe that any areas are sweetgum monocultures. We have treated some such monocultures on the site within and adjacent to planted areas and will consider the same treatment in these creation areas where warranted. We do feel that with the difficulty of deer browsing on this site that establishment of canopy through pioneering species with an eye towards later forest succession may be better than no canopy.

Please reach out if you have any questions.

Thanks

Kim

Kim Browning

Mitigation Project Manager, Regulatory Division | U.S. Army Corps of Engineers

-----Original Message-----

From: Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>

Sent: Tuesday, October 13, 2020 12:34 PM

To: Tugwell, Todd J CIV USARMY CESA W (USA) <Todd.J.Tugwell@usace.army.mil>; Browning, Kimberly D CIV USARMY CESA W (USA) <Kimberly.D.Browning@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; Haywood, Casey M CIV (USA) <Casey.M.Haywood@usace.army.mil>; Smith, Ronnie D CIV USARMY CESA W (USA)

<Ronnie.D.Smith@usace.army.mil>; McLendon, C S CIV USARMY CESA W (USA) <Scott.C.McLendon@usace.army.mil>;

Bowers, Todd <bowers.todd@epa.gov>; Wilson, Travis W. <travis.wilson@ncwildlife.org>; Munzer, Olivia

<olivia.munzer@ncwildlife.org>; Byron Hamstead <byron_Hamstead@fws.gov>

Cc: Jake McLean <jmclean@wildlandseng.com>; Reid, Matthew <matthew.reid@ncdenr.gov>; Wiesner, Paul

<paul.wiesner@ncdenr.gov>; Eric Neuhaus <eneuhaus@wildlandseng.com>; Shawn Wilkerson

<swilkerson@wildlandseng.com>; Allen, Melonie <melonie.allen@ncdenr.gov>

Subject: Notice of NCDEQ - DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project (DMS# 96306) - (SAW- 2014-00538) (DWR#20140193) - Catawba 03050102_Catawba County

Good afternoon IRT,

The below referenced Mitigation Plan Addendum Request review has been requested by NCDMS. Per Section 332.8(o)(9) of the 2008 Mitigation Rule, this review follows the streamlined review process, which requires an IRT review period of 15 calendar days from this email notification. Please provide any comments by 5 PM on the 15-day comment deadline shown below. Comments provided after the 15-day comment deadline (shown below) may not be considered.

At the conclusion of this comment period, a copy of all comments will be provided to NCDMS and the NCIRT along with District Engineer's intent to approve or disapprove this AMP.

Wildlands Engineering, Inc. (WEI) has prepared a Mitigation Plan Addendum for the Henry Fork Mitigation Site (DMS# 96306). WEI has identified five additional wetland areas that have developed following site construction. These five wetland areas were not identified in the approved Jurisdictional Determination (USACE) and they were not identified as having hydric soils in the LSS soils report from the IRT approved Mitigation Plan. As a result, WEI is proposing a creation credit ratio of 3:1 for the additional 0.661 acres for a total of 0.220 Riparian WMUs.

WEI is not seeking additional wetland credit above the approved Mitigation Plan and the DMS credit ledger will not be updated. The purpose of proposing these additional areas for credit is to offset any wetland credits that may be at risk of losing credit at project closeout. These additional areas have been monitored since March 2019 (MY4) and will continue to be monitored through project closeout. Upon IRT review and approval of this wetland addendum, Wildland's will document the additional wetland areas in this year's annual monitoring report (MY5) and through project closeout.

The site is currently in MY5 (2020) and is scheduled to close in 2023.

Digital copies were uploaded to the IRT SharePoint page (10/6/2020) and DWR's Laser Fiche system (10/6/2020) for IRT review. A copy is also attached.

15-Day Comment Start: October 13, 2020

15-Day Comment Deadline: October 28, 2020 45-Day DE Decision: November 27, 2020

Project information is as follows:

Henry Fork Mitigation Site

DMS Project # 96306

Institution Date: 2/15/2014

RFP 16-005298 (Issued: 6/6/2013)

Catawba River Basin

Cataloging Unit 03050103 Expanded Service Area

Catawba County, North Carolina

USACE Action ID: SAW- 2014-00538

DWR#: 20140193

Proposed Mitigation Project Credits:

4,807.667 SMU (cool)

4.222 WMU (riparian)

Full Delivery Provider: Wildlands Engineering Inc. – Contact: Jake McLean, jmclean@wildlandseng.com <<mailto:jmclean@wildlandseng.com>> , (828) 774-5547

NCDEQ - DMS Project Manager: Matthew Reid, matthew.reid@ncdenr.gov <<mailto:matthew.reid@ncdenr.gov>> , (828) 231-7912

The Mitigation Plan Addendum has been uploaded to the IRT/ NCDEQ SharePoint Mitigation Plan Review page and can be accessed here:

IRT SharePoint page:

Blocked<https://nconnect.sharepoint.com/sites/IRT-DMS/SitePages/Home.aspx>

HenryFrk_96306_MPAAddendum_2020.pdf

Blocked<https://nconnect.sharepoint.com/sites/IRT-DMS/IRT%20Upload%20Documents%20Here/Forms/AllItems.aspx?id=%2Fsites%2FIRT%2DDMS%2FIRT%20Upload%20Documents%20Here%2FHenry%20Fork%20%2896306%29%2FHenryFrk%5F96306%5FMPAAddendum%5F2020%2Epdf&parent=%2Fsites%2FIRT%2DDMS%2FIRT%20Upload%20Documents%20Here%2FHenry%20Fork%20%2896306%29>
<Blocked<https://nconnect.sharepoint.com/sites/IRT-DMS/IRT%20Upload%20Documents%20Here/Forms/AllItems.aspx?id=%2Fsites%2FIRT%2DDMS%2FIRT%20Upload%20Documents%20Here%2FHenry%20Fork%20%2896306%29%2FHenryFrk%5F96306%5FMPAAddendum%5F2020%2Epdf&parent=%2Fsites%2FIRT%2DDMS%2FIRT%20Upload%20Documents%20Here%2FHenry%20Fork%20%2896306%29>>

Please contact the Mitigation Office if you have questions.

V/r,

Casey Haywood

Mitigation Specialist, Regulatory Division | U.S. Army Corps of Engineers

3331 Heritage Trade Dr, Ste. 105 | Wake Forest, NC 27587 |

BUILDING STRONG®

Jake McLean

From: Jake McLean
Sent: Friday, December 18, 2020 8:41 AM
To: 'Browning, Kimberly D CIV USARMY CESA W (USA)'
Cc: Mimi Caddell
Subject: RE: DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project/ SAW- 2014-00538/Catawba County

Ok, thanks.

-----Original Message-----

From: Browning, Kimberly D CIV USARMY CESA W (USA) <Kimberly.D.Browning@usace.army.mil>
Sent: Friday, December 18, 2020 8:38 AM
To: Jake McLean <jmclean@wildlandseng.com>
Subject: RE: DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project/ SAW- 2014-00538/Catawba County

Good morning Jake,

The IRT agrees that Wildlands should be held to the vigor standard that is expected at close-out; so 10' high by MY7. It looks like you plan to replant livestakes, which might make it harder, but that is your choice; to earn full credit, this seems like a reasonable requirement. It also looked like there were a lot of pioneer species there already (like sweetgum and red maple) but it was hard to tell from the pictures. We'd like to review the veg data when it's available. Feel free to reach out if you have questions, Kim

Kim Browning
Mitigation Project Manager, Regulatory Division | U.S. Army Corps of Engineers

-----Original Message-----

From: Jake McLean <jmclean@wildlandseng.com>
Sent: Friday, December 18, 2020 8:10 AM
To: Browning, Kimberly D CIV USARMY CESA W (USA) <Kimberly.D.Browning@usace.army.mil>
Subject: [Non-DoD Source] RE: DMS Mitigation Plan Addendum Request: Henry Fork Stream and Wetland Mitigation Project/ SAW- 2014-00538/Catawba County

Thanks Kim. We intended below to request that vigor be compared against year 1 & 2 standards ("successful...progression" of the proposed plantings). Is the IRT allowing for this to be the standard, or are you indicating that year 6 & 7 vigor standards must be met for full credit? Just wanting to clarify.

From response:

"We request that vegetation criteria be relaxed to the point of demonstrating successful establishment and progression of woody species in these areas rather than achieving full term criteria by the currently scheduled close-out date."

Best,
Jake

-----Original Message-----

From: Browning, Kimberly D CIV USARMY CESA W (USA) <Kimberly.D.Browning@usace.army.mil>
Sent: Thursday, December 17, 2020 3:29 PM
To: Jake McLean <jmclean@wildlandseng.com>; Wiesner, Paul <paul.wiesner@ncdenr.gov>