MONITORING YEAR 1 ANNUAL REPORT

FINAL

HONEY MILL MITIGATION SITE

Surry County, NC
DEQ Contract No. 7619
DMS Project No. 100083

Yadkin River Basin HUC 03040101
USACE Action ID No. SAW-2018-01789
NCDEQ DWR#: 18-1271
RFP #: 16-00746
RFP Issuance Date: December 7, 2017

Data Collection Period: October 2021 – December 2021
FINAL Submission Date: February 18, 2022

PREPARED FOR:

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

February 18, 2022

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

RE: Draft Year 1 Monitoring Report
Honey Mill Mitigation Site, Surry County
Yadkin River CU 03040101
DMS Project ID No. 100083 / DEQ Contract #007619

Dear Mr. Phillips:

Wildlands Engineering, Inc. (Wildlands) has reviewed the Division of Mitigation Services (DMS) comments from the Draft Year 1 Monitoring Report for the Honey Mill Mitigation Site that were received on January 31, 2022. The report has been updated to reflect those comments. The Final MY1 Report is included. DMS' comments are listed below in **bold**. Wildlands' responses to DMS' comments are noted in *italics*.

DMS' comment: Add the RFP issuance date to the report cover.

Wildlands' response: The RFP issuance date of December 7, 2017, has been added to the report cover.

DMS' comment: Please reference the January 3rd approval for the 2.5 acres of proposed replanting in the executive summary. Consider adding an adaptive management section to the report to detail any additional efforts required to assess any concerns specific to this issue beyond routine stem counts. Will supplemental evaluation be conducted to validate the success of the replanted areas of are soil samples being submitted for laboratory analysis?

Wildlands' response: The date of approval has been added to the executive summary.

As stated in the MY1 report for Honey Mill's Mitigation Site, the 2.5 acres of supplemental planting will be conducted only within in wetland areas and/or areas of the floodplain which are trending much wetter than previously anticipated. The Site's planting list for implementation after construction did not contain a good mix of bareroot species tolerant to wet or saturated soil conditions, especially facultative species with a wetland indicator status of FACW or OBL. The determination for our proactive approach to supplementally plant with species more conducive to wetland and wetland type conditions was to address a planting oversight for the proposed areas, prevent potential stem mortality, and keep vegetation densities and vigor within the floodplain thriving. Therefore, Wildlands used professional judgement to determine the necessary course of action, rather than developing an adaptive management plan for replanting an area under the minimum replanting threshold or conducting laboratory soil analysis. Neither of which would likely provide any additional, necessary information than what was presented in the MY1 report.

Wildlands is not planning to provide any supplemental evaluation of the replanting areas. Currently, Wildlands conducts site-wide reviews of the project area, as well as vegetation plot monitoring throughout the open planted areas. With 5 permanent vegetation plots located within the replanted areas and 4 mobile plots that will be relocated throughout the open planted areas within the riparian corridor, the replanted areas will be sufficiently monitored. Additionally, when the NC IRT approved our

proposed species list, there was no mention of needing any additional monitoring nor providing an adaptive management plan.

DMS' comment: Please indicate in Section 1.4.2 if any previous invasive treatments were conducted in the areas of concern being treated this dormant season. Are the invasives resprouts, seedlings or areas not previously treated?

Wildlands' response: The following sentence has been added to section 1.4.2 for clarification: These areas of invasives are present in the existing forested areas have not been previously treated at this stage of the project. All areas of invasives are scheduled to be treated before the onset of the 2022 growing season.

DMS' comment: Please include an outline showing the approximate 2.5-acre replanting areas on the CCPV Figures.

Wildlands' response: Figures have been updated to show the wetland supplemental planting area.

DMS' comment: Add the date the visual assessments were conducted to the top of each visual assessment table.

Wildlands' response: The date has been added to all visual assessment tables.

Digital Support File Comments:

DMS' comment: Please submit the features that characterize the random vegetation plots in the digital deliverables.

Wildlands' response: Digital deliverables have been updated to add the random vegetation plot feature class.

DMS' comment: There were several issues noted with the vegetation table and supporting data:

1. Please ensure that the submitted input workbook for the veg tool supports the table included in the report. The differences between the data and report table occur with the random plots. This appears to be caused by blank height values in the submission. Please explain why there are blank height cells for random plots.

2. Be sure to include each year's random plot data in the random plot sheets so that the vegetation performance standards summary table includes these data.

3. Please do not change the color coding of the output- this color coding is based on the 2016 IRT guidance for vegetation performance standards and it is monitoring year specific.

4. Note that in the input template Nyssa Sylvatica and Nyssa sylvatica are both used since the drop-down list was overwritten. Please correct this so that only Nyssa sylvatica is included (e.g., lowercase species name).

Wildlands' response: Wildlands has re-entered the random vegetation plot data. The black height values were present to show that the stems were missing rather than confirmed dead. However, the raw data and summary table have been updated to show only the stems that were confirmed present in MY1 with height values. The raw data now matches the performance standards summary table. The color coding has been updated to the IRT guidance and the species have been updated using the dropdown list.

As requested, Wildlands has included two (2) hard copies of the final report, a full final .pdf copy of the report with the DMS comment letter and our response letter inserted after the cover page, and a full final electronic submittal of the support files. A copy of the DMS comment letter and our response letter

have been included inside the front cover of each report's hard copy, as well. Please let me know if you have any questions.

Sincerely,

Kristi Suggs
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EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream mitigation project at the Honey Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and enhanced a total of 8,683 linear feet (LF) of perennial and intermittent stream in Surry County, NC. The Site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed (TWL)and NC Division of Water Resources (DWR) Subbasin 03-07-03. The project is providing 4,793.432 cool stream mitigation units (SMUs) for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101110020.

The Site's immediate drainage area as well as the surrounding watershed has a long history of agricultural activity. The project excludes livestock, creates stable stream banks, converts pasture to forest, and implements BMPs to filter agricultural runoff. These actions address stressors by reducing fecal, nutrient, and sediment inputs to project streams, and ultimately to the Ararat River, and reconnect instream and terrestrial habitats on the Site to upstream and downstream resources. Approximately 20.2-acres of land has been placed under permanent conservation easement to protect the Site in perpetuity. The established project goals include:

- Improve stream channel stability,
- Treat concentrated agricultural run-off,
- Improve in-stream habitat,
- Restore and enhance native floodplain and wetland vegetation,
- Exclude livestock from streams, and
- Permanently protect the project site from harmful uses.

The Site's construction and as-built survey were completed between February - May 2021. Planting of the Site and installation of monitoring features occurred in late February 2021. Fencing installation was completed in May 2021. In Monitoring Year 1 (MY1), the Site has met the required stream success criteria. The average planted stem density is 379 stems/acre and is on track to meet the MY3 requirements. Seventy-nine percent of vegetation plots met criteria. The three vegetation plots with low stem densities are located in either wetland areas or areas trending wetter than anticipated; therefore, Wildlands proposed voluntarily replanting these areas within the restored riparian corridor (approximately 2.5 acres) with more wetland tolerant species to the IRT. The supplemental wetland planting was approved by the IRT January 3, 2021 and the correspondence is available in Appendix G. In addition to these areas, Wildlands will supplementally plant approximately 7.0 acres of the established riparian forest as initially outlined in the Site's Mitigation Plan (Wildlands, 2020) and subsequent MY0 IRT Comment Response Letter dated 12/7/21. All supplemental planting areas will be conducted in 2022, prior to the onset of the growing season. No bankfull events were documented during MY1. The MY1 visual assessment identified four invasive vegetation areas of concern within the wooded enhancement II reaches. These areas will be treated in MY2.

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Section 1: PROJECT OVERVIEW

1.1 Project Quantities and Credits

Wildlands Engineering, Inc. (Wildlands) implemented a full-delivery stream mitigation project at the Honey Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality (DEQ) Division of Mitigation Services (DMS). The project restored and enhanced a total of 8,683 linear feet (LF) of perennial and intermittent stream in Surry County, NC. The Site is located within the Rutledge, Stoney and Flat Shoal Creek – Ararat River targeted local watershed (TWL)and NC Division of Water Resources (DWR) Subbasin 03-07-03. A conservation easement has been recorded and is in place on 20.2 acres. The project is providing 4,793.432 cool stream mitigation units (SMUs) for the Yadkin River Basin Hydrologic Unit Code (HUC) 03040101110020. The Site contains eight unnamed tributaries (UTs) to Venable Creek (UT1, UT2, UT2A, UT2B, UT3, UT4, UT5, and UT6) and the mainstem of Venable Creek, which has been broken into four reaches and flows in a north easterly direction through the site. Multiple riparian wetlands exist on-site, however, no credit is being sought for project wetlands.

Please refer to Table 1 and Table 1.1 for project credits by stream and the credit summary table respectively. Annual monitoring will be conducted for seven years with close-out anticipated to commence in 2027 given the success criteria are met.

Table 1: Project Quantities and Credits

Project Components						
Project Stream	**Mitigation Plan Footage[1, 2, 3]**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**
Venable Creek Reach 1	91	91.000	Cool	EII	2.500	36.386
Venable Creek Reach 2	211	211.000	Cool	EI	1.500	140.566
Venable Creek Reach 3	1647	1,647.000	Cool	R	1.000	1,646.644
Venable Creek Reach 4	1958	1,958.000	Cool	EII	2.500	783.042
UT1	273	273.000	Cool	R	1.000	272.885
UT2 Reach 1	742	742.000	Cool	EII	4.000	185.462
UT2 Reach 2	342	332.000	Cool	R	1.000	342.364
UT2A	893	893.000	Cool	EII	4.000	223.310
UT2B	70	70.000	Cool	N/A	0.000	0.000
UT3 Reach 1	784	784.000	Cool	EII	3.000	261.279

Table 1: Project Quantities and Credits

Project Components						
Project Stream	**Mitigation Plan Footage[1, 2, 3]**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**
UT3 Reach 2	306	306.000	Cool	R	1.000	306.172
UT4	440	440.000	Cool	EII	3.000	146.780
UT5	518	518.000	Cool	EII	3.000	172.553
UT6 Reach 1	214	213.000	Cool	EII	3.000	71.242
UT6 Reach 2	205	205.000	Cool	R	1.000	204.747
					Total:	**4,793.432**

Notes:
1. Internal culvert crossing and external break excluded from the credited stream footage.
2. No direct Credit for BMP's.
3. UT6 originates within an overhead powerline easement. The conservation easement extends up to UT6's origin under the powerline, but proposed crediting does not begin until the stream exits the overhead easement.

Table 1.1: Credit Summary Table

Project Credits			
Restoration Level	**Stream**		
	Warm	**Cool**	**Cold**
Restoration	N/A	2,772.812	N/A
Enhancement I	N/A	140.566	N/A
Enhancement II	N/A	1,880.054	N/A
Preservation	N/A	N/A	N/A
Totals	**N/A**	**4,793.432**	**N/A**

1.2 Project Goals and Objectives

The Site is providing numerous ecological benefits within the Yadkin River Basin. The Site was selected based on its potential to support the objectives and goals of multiple conservation and watershed planning documents such as the 2009 Upper Yadkin River Basin Restoration Priorities (RBRP) and the 2015 North Carolina Wildlife Resource Communion's (NCWRC) Wildlife Action Plan (WAP). Table 2 below describes the project goals and how functional uplift at the site will be measured and monitored.

Table 2**: Goals, Performance Criteria, and Functional Improvements**

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Exclude livestock from stream channels.	Install livestock fencing on all or portions of the Site and/or permanently remove livestock from all or portions of the Site to exclude livestock from stream channels and riparian areas.	Reduced agricultural runoff and cattle trampling in streams.	There is no required performance standard for this metric.	Visually monitor fenced portions of site to ensure no cattle are entering the easement.	No cattle observed in easement.
Improve stability of stream channels.	Construct stream channels that will maintain stable cross-sections, patterns, and profiles over time.	Reduction in sediment inputs from bank erosion, reduction of shear stress, and improved overall hydraulic function.	Bank height ratios remain below 1.2 over the monitoring period. Visual assessments showing progression towards stability.	11 cross-section surveys in MY1, 2, 3, 5, & 7.	All cross sections have a BHR <1.2. Channels are stable have maintained the constructed riffle and pool sequence.
Reconnect channels with floodplains.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Dispersion of high flows on the floodplain.	Four bankfull events, occurring in separate years during the monitoring period.	Venable Creek R3 Crest Gage	No bankfull events recorded in MY1.
Improve instream habitat.	Install habitat features such as constructed riffles, cover logs, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Increase and diversify available habitats for macroinvertebrates, fish, and amphibians leading to colonization and increase in biodiversity over time.	There is no required performance standard for this metric.	N/A	N/A
Restore and enhance native floodplain and streambank vegetation.	Plant native tree and understory species in riparian zones and plant appropriate species on streambanks.	Reduction in floodplain sediment inputs from runoff, increased bank stability, increased LWD and organic material in streams	Survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7. Height requirement is 7	9 permanent vegetation plots, and 5 mobile vegetation plots in MY1, 2, 3, 5, & 7.	11/14 (79%) vegetation plots have met the MY3 success criteria of 320 stems per acre.

Table 2**: Goals, Performance Criteria, and Functional Improvements**

Goal	Objective/Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
			feet at MY5 and 10 feet at MY7.		
Treat concentrated agricultural runoff	Install agricultural BMPs in areas of concentrated agricultural runoff.	Treatment of runoff before it enters the stream channel.	There is no required performance standard for this metric.	N/A	N/A
Permanently protect the project Site from harmful uses.	Establish conservation easements on the Site.	Protect Site from encroachment on the riparian corridor and direct impact to streams and wetlands.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.	No easement encroachment was observed, except for 0.04 acres noted in MY0.

1.3 Project Attributes

The Site's immediate drainage area as well as the surrounding watershed has a long history of agricultural activity. Stream and wetland functional stressors for the Site were related to both historic and current land use practices. Major stream stressors for the Site pre-restoration included livestock trampling and fecal coliform inputs, lack of stabilizing stream bank and riparian vegetation, active erosion, and incision. The effects of these stressors resulted in channel instability, degraded water quality, and the loss of both aquatic and riparian habitat throughout the Site's watershed when compared to reference conditions.

The overall Site topography consists of steep, confined, and moderately confined valleys along the tributaries and flow into a more open and gradually sloped valley along the mainstem of Venable Creek. The project begins at a roadway culvert located at the intersection of Little Mountain Church Road and Venable Creek. The watersheds for UT3, UT4, and UT6 are roughly bound by Venable Farm Road to the west. All of the reach watersheds are encompassed by the Venable Creek watershed, which extends south past Little Mountain Church Road. The Site is typically defined by forested and agricultural land use with sporadic development of rural homes.

Pre-construction conditions are outlined in Table 3 below and Table 8 of Appendix C.

Table 3: Project Attributes

Project Information			
Project Name	Honey Mill Mitigation Site	**County**	Surry County
Project Area (acres)	20.2	**Project Coordinates**	36° 25' 43.03"N 80° 36' 39.01"W
Planted Acreage	5 acres (full planting) plus supplemental planting		

Table 3: Project Attributes

Project Watershed Summary Information			
Physiographic Province	Piedmont	**River Basin**	Yadkin River
USGS Hydrologic Unit 8-digit	3040101	**USGS Hydrologic Unit 14-digit**	03040101110020
Project Watershed Summary Information			
DWR Sub-basin	03-07-03	**2011 NLCD Land Use Classification**	Forest (65%), Cultivated (21%), Shrubland (5%), Urban (9%), Open Water (0%)
Project Drainage Area (acres)	705	**Project Drainage Area Percentage of Impervious Area**	0.8%

Reach Summary Information															
Parameters	**Venable Creek**				**UT1**	**UT2**		**UT2A**	**UT2B**	**UT3**		**UT4**	**UT5**	**UT6**	
	R1	**R2**	**R3**	**R4**		**R1**	**R2**			**R1**	**R2**			**R1**	**R2**
Length of reach (linear feet) - Post-Restoration	91	211	1,647	1,958	273	742	332	893	80	784	306	440	518	213	205
Valley confinement	Unconfined to Confined														
Drainage area (acres)	183	519	599	705	334	21	43	21	9	15	18	9	12	8	10
Perennial (P), Intermittent (I), Ephemeral (E)	P	P	P	P	P	I/ P	P	P	P	P	P	P	I/ P	P	P
NCDWR Water Quality Classification	Class C														
Morphological Description (stream type) - Pre-Restoration	N/A	E4	E/C4	N/A	E4b	N/A	C4b	N/A	N/A	N/A	E4b	N/A	N/A	N/A	A4
Morphological Description (stream type) - Post-Restoration	N/A	B4	C4	N/A	C4b	N/A	B4	N/A	N/A	N/A	C4b	N/A	N/A	N/A	A4
Evolutionary trend (Simon's Model) - Pre-Restoration	N/A	III	IV	N/A	III	N/A	IV->V	N/A	N/A	N/A	III	N/A	N/A	N/A	III

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States - Section 404	Yes	Yes	USACE Action ID #SAW-2018-01789
Waters of the United States - Section 401	Yes	Yes	DWR# 18-1271

Table 3: Project Attributes

Division of Land Quality (Erosion and Sediment Control)	Yes	Yes	NPDES Construction Stormwater General Permit NCG010000
Endangered Species Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Regulatory Considerations			
Historic Preservation Act	Yes	Yes	Categorical Exclusion Document in Mitigation Plan
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

1.4 Monitoring Year 1 Data Assessment

Annual monitoring for MY1 was conducted between October and December 2021, with hydrology data collected between January and December 2021. The stream, vegetation, and hydrologic success criteria for the Site follows the approved success criteria presented in the Honey Mill Mitigation Plan (Wildlands, 2020).

1.4.1 Vegetation Assessment

The overall planted density for the Site in MY1 was 379 stems/acre, exceeding the MY3 monitoring requirement of 320 stems per acre. The planted stem density in the permanent vegetation plots (VP) ranged from 202 stems/acre to 526 stems/acre. VP5 and VP6 exceed MY3 requirements, but by less than 10%. Permanent plots VP4 and VP9, with a planted stem density of 202 stems/ acre and 243 stems/acre respectively, did not meet the MY3 monitoring requirement. Both plots are located in areas where soil saturation is probably the contributing factor to the high mortality in the plots. VP4 is located in an existing wetland. VP9 was established in the floodplain of Venable Creek Reach 4 and its confluence with UT6, however, the implementation of priority I restoration along UT6 likely raised the water and resulted in wetter than expected floodplain conditions.

The overall MY0 planted density for mobile vegetation plots ranged from 81 stems/acre to 607 stems/acre. The mobile vegetation plot (MVP) 1, with a low planted stem density of 81 stems/ acre, was also located just outside of an existing wetland. This area is also trending wetter than anticipated, and wetland vegetation was outcompeting the planted stems in this area of the floodplain. All other mobile vegetation plots were on track meet the MY3 planted stem density requirements. Summary data are located in Appendix B and photographs of each plot are located in Appendix A.

1.4.2 Vegetation Areas of Concern and Management Activity

Invasive Species

There were four areas of established wooded areas with understory invasive species within the project area. These occupied less than 2% of the easement and are located within the mature forests along UT2 and at its confluence with UT2A, UT3, and UT6, as shown on Figures 1a - 1d. On UT3 and UT6, invasives consist of a low density of individual, mature stems of Chinese privet (*Ligustrum sinense*) mixed within the existing wooded areas. The areas on UT2, UT2A, and UT6 consist of a diffuse number of individual stems of multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), and Chinese privet throughout the mapped polygons, at a low density. These areas of invasives are present in the existing forested areas have not been previously treated at this stage of the project. All areas of invasives are scheduled to be treated before the onset of the 2022 growing season. See Table 5 in Appendix A.

Mapped Encroachment Areas per IRT Request

There are three areas of easement encroachment that were identified at baseline conditions. These areas are included on the Current Condition Plan View (CCPV) maps per the request of the IRT in the MY0 comments dated 12/7/21 in Appendix G. Two of the areas are located at the culvert crossing on UT2 and consist of the pipe extending into the easement upstream and downstream of the crossing. The other mapped encroachment area is a 10-foot-wide farm path that extends into the left floodplain boundary of the easement. Though all of the encroachments were documented and discussed during baseline conditions, the IRT has requested that they remain on the CCPV maps throughout the seven-year monitoring period.

Wetland Supplemental Planting

During the MY1 vegetation plot survey and visual assessment of the Site, Wildlands noted multiple areas within existing wetlands and areas the restored floodplain that are trending wetter than anticipated. While these areas are not currently areas of concern with either low stem density or poor vigor, Wildlands plans to supplementally plant with species more conducive to wetland and wetland type conditions. Wildlands is hoping that this early proactive action will offset areas of non-wetland species mortality, allow woody wetland species to become established early in the monitoring period, and keep vegetation densities and vigor within the floodplain thriving. Additionally, this will address low stem densities in permanent and mobile vegetation plots identified in MY1 and as previously discussed in Section 1.4.1.

As mapped on Figure 2.0 in Appendix F, the total area to be planted will consist of approximately 2.5 acres and include a mixture of six bareroot and three live stake species occupying approximately 12% of the easement area. Species and their quantities are shown in Table 14. Though a wetland planting list was not specifically included in the approved Honey Mill Mitigation Plan (Wildlands, 2020), six of the nine species were included as part of the riparian and stream bank planting plans with only three of the wetland species were not originally included. The additional species are Elderberry (*Sambucus canadensis*), Buttonbush (*Cephalanthus occidentalis*), and Tag Alder (*Alnus serrulata*). On December 12, 2021, Wildlands requested approval for these additional species in an email to the IRT. The species were approved in a reply email on January 3, 2022. Please see Appendix F for the full list of the proposed species and approval correspondence.

Shaded Supplemental Planting per IRT Request

During construction, several pockets of non-forested areas within the wooded buffer were identified throughout the Site but were limited to the enhancement reaches of UT3, UT4, and UT6 that were cleared as part of construction, rather than planting the open areas throughout Site's wooded buffer as

outlined in the Mitigation Plan (Wildlands, 2020). Though this was a modification, Wildlands took the approach of redistributing the same quantity of bare roots but at the higher density (12' vs. 25').

Since this modification was not approved, the IRT, as outlined in their comments for the MY0 report (2021), is requiring Wildlands to implement the original agreed upon planting plan or the credit ratios would be adjusted prior to the next credit release. Therefore, Wildlands will plant the remainder of the shaded buffer from the approved mitigation plan prior to the onset of the 2022 growing season. This will consist of approximately 7 acres and will include species from previously approved planting lists. The only substitution will be Slippery Elm (*Ulmus rubra*) for Tulip Poplar (*Liriodendron tulipifera*). See Appendix F for the planting list and densities, as well as the locations of the supplemental planting areas on the enhancement reaches demarcated in a red hatch.

1.4.3 Stream Assessment

Riffle cross-sections (XS) on the restoration reaches should be stable and show little change in bankfull area, maximum depth ratio, and width-to-depth ratio. All riffle cross-sections should fall within the parameters defined for the designated stream type. If any changes do occur, these changes will be evaluated to assess whether the stream channel is showing signs of instability. Indicators of instability include a vertically incising thalweg and/or eroding channel banks.

Morphological surveys for MY1 were conducted in December 2021. Cross-section survey results indicate that channel dimensions are stable and functioning as designed on all restoration reaches with minimal adjustments from MY0 to MY1. Minor changes occurring within riffles XS8 and XS11 include slight decreases in cross-sectional areas, mean depths, and decreased bank height ratios. These minor changes can be attributed to the establishment of herbaceous vegetation along the tops of banks, slight bed deposition, and the channel naturally narrowing through natural adjustments.

Pebble counts were conducted in March of 2021 during the MY0 data collection and were included in the as-built report (Wildlands, 2021). However, based on a DMS Technical Workgroup memo from 10/19/21 and concurrence received on 11/18/2021 from the DMS project manager for Honey Mill, pebble count collection is no longer required for the project from MY1 – MY7. Therefore, pebble counts will not be conducted during the remaining monitoring years unless requested by the IRT or deemed necessary based on best professional judgement. A copy of the DMS Technical Workgroup Memo and the email confirmation from the DMS project manager (Personal communication, Phillips 2021) are located in Appendix G.

1.4.4 Stream Hydrology Assessment

An automated pressure transducer was installed on Venable Creek Reach 3 to document bankfull events throughout the seven-year monitoring period. Henceforth, this device is referred to as a "crest gage (CG)." At the end of the seven-year monitoring period, four or more bankfull flow events must have occurred in separate years.

There were no recorded bankfull events during the first year of monitoring. The 30th and 70th percentile data were collected from the Mount Airy 2 W, WETS station for years 1971-2020. The Site received an annual precipitation of 35.67 inches which was an average amount of precipitation for this area. However, the precipitation totals were only 20% greater than the 30th percentile of 32.45 inches. In years with higher precipitation bankfull events are likely to occur. Please refer to Appendix D for hydrology summary data and gage plots.

1.4.5 Stream Areas of Concern and Management Activity

There were no stream areas of concern mapped during the final MY1 visual assessment on 12/7/21. The streams appear stable and functioning with vegetation developing on the channel banks, and no areas of scour or erosion were noted. The visual assessment tables are located in Appendix A.

1.5 Monitoring Year 2 Summary

Overall, the Site has met the required stream success criteria for MY1. The average planted stem density is 379 stems/acre, and the Site is on track to meet the MY3 requirement of 320 stems per acre. VP4, VP9, and MVP1 were all located in wetland areas within the floodplain and are individually not meeting stem density requirements. Wildlands recognizes that the approved mitigation plan planting list had many upland species; however, there are areas within the restored riparian corridor trending wetter than originally anticipated. Therefore, Wildlands is voluntary adding supplemental wetland species in these areas for a total of 2.5 acres. Wetland supplemental planting will be conducted before the onset of the 2022 growing season. Per the MY0 IRT Comment Response Letter dated 12/7/21, Wildlands will also plant the remainder of the shaded buffer from the approved mitigation plan, as described in Section 1.4.2. All supplemental plantings areas will be implemented prior to the onset of the 2022 growing season. Geomorphic surveys indicate that cross-section bankfull dimensions closely match the baseline monitoring with some minor adjustments, and streams are functioning as intended. No bankfull events were documented during MY1. The MY1 visual assessment identified a few invasive vegetation areas of concern in wooded enhancement II reaches, but no stream areas of concern were documented. Invasives are also scheduled to be treated before the onset of the 2022 growing season. Wildlands will continue to monitor these areas and adaptive management measures will be implemented as necessary to benefit the ecological health of the Site.

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 a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS. Stream gages were installed in riffles 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); however, vegetation data processing follows the NCDMS Vegetation Data Entry Tool and Vegetation Plot Data Table (NCDMS, 2020).

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, Cheryl C; Rawlins, C.L.; Potyondy, John 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.

North Carolina Division of Mitigation Services (NCDMS). 2020. Vegetation Data Entry Tool and Vegetation Plot Data Table. Raleigh, NC. https://ncdms.shinyapps.io/Veg_Table_Tool/

NCDMS. 2017. DMS Annual Monitoring Report Format, Data Requirements, and Content Guidance. June 2017, Raleigh, NC.

North Carolina Division of Mitigation Services and Interagency Review Team Technical Workgroup. 2018. Standard Measurement of the BHR Monitoring Parameter. Raleigh, NC.

North Carolina Division of Mitigation Services and Interagency Review Team Technical Workgroup. 2021. Pebble Count Data Requirements. Raleigh, NC.

NCDMS. 2009. Upper Yadkin Pee-Dee River Basin Restoration Priorities. Raleigh, NC.

North Carolina Wildlife Resources Commission. 2015. North Carolina Wildlife Action Plan. Raleigh, NC.

North Carolina Division of Water Resources (NCDWR), 2015. Surface Water Classifications. http://portal.ncdenr.org/web/wq/ps/csu/classifications.

Phillips, K. 2021. Email correspondence, pebble counts MY1-MY7. 18 November 2021.

Rosgen, D.L. 1996. Applied River Morphology. Pagosa Springs, CO: Wildland Hydrology Books.

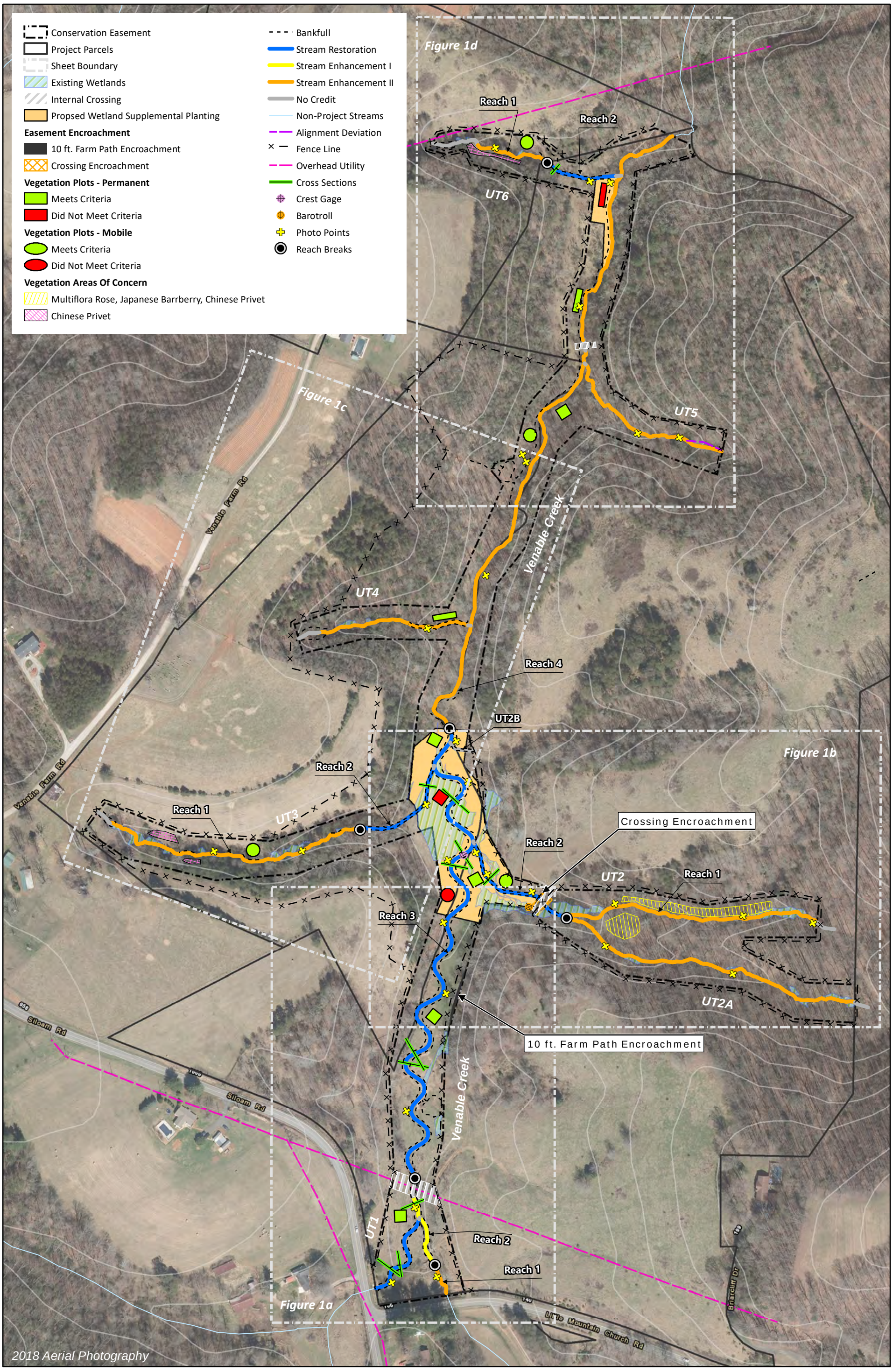
Simon, A. 1989. A model of channel response in disturbed alluvial channels. Earth Surface Processes and Landforms 14(1):11-26.

US Army Corps of Engineers (USACE)., October 2016. Stream Mitigation Guidelines. USACE, NCDENR-DWQ, USEPA, NCWRC.

United States Department of Agriculture (USDA), Natural Resource Conservation District (NRCS), 2020. WETS Station, Mount Airy 2 W, Surry County, NC. https://www.wcc.nrcs.usda.gov/climate/navigate_wets.html.

Wildlands Engineering, Inc (Wildlands), 2020. Honey Mill Mitigation Site Mitigation Plan. DMS, Raleigh, NC.

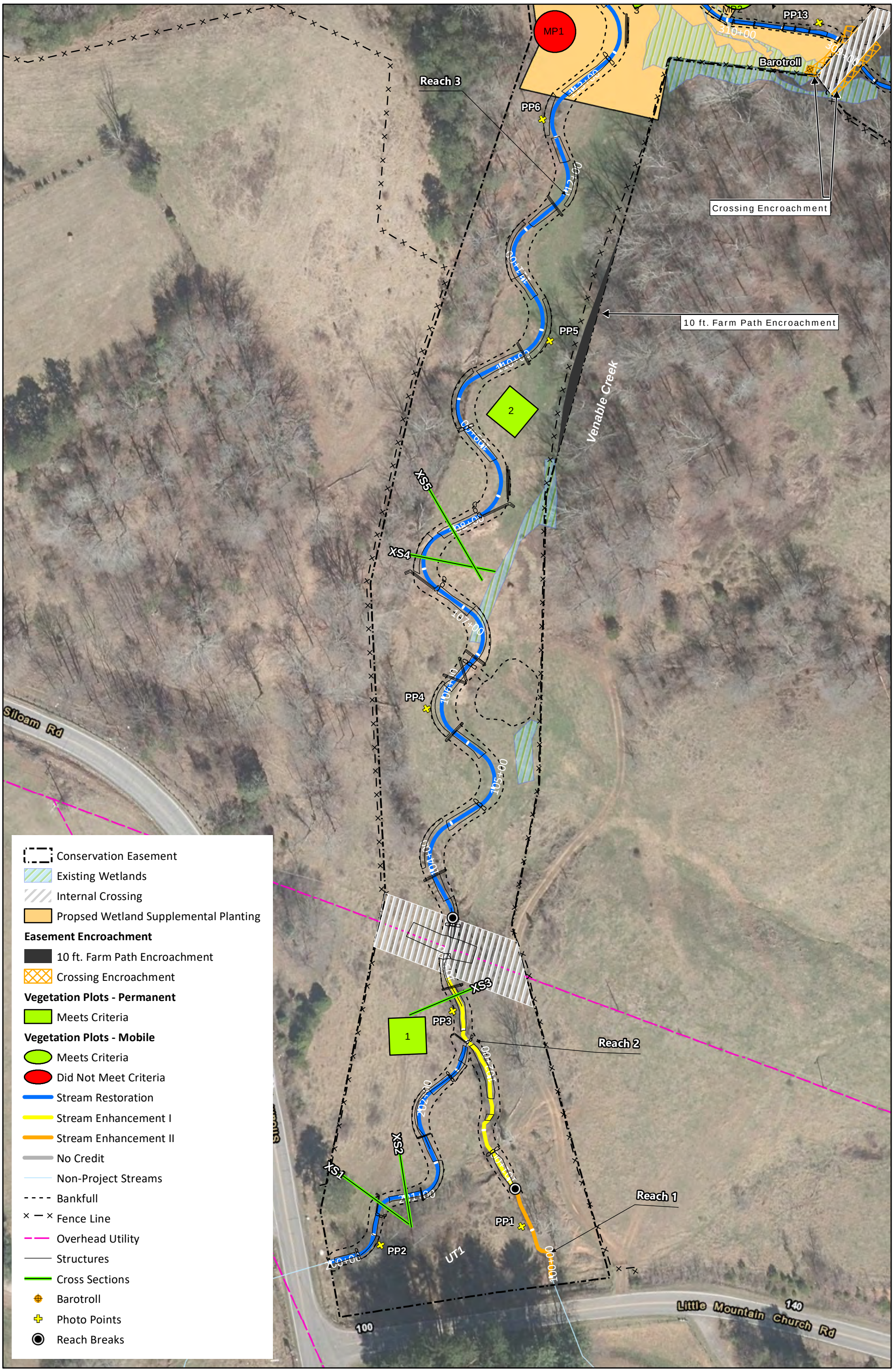
Wildlands Engineering, Inc (Wildlands), 2021. Honey Mill Mitigation Site As-built Baseline Monitoring Report. DMS, Raleigh, NC.



WILDLANDS ENGINEERING

0 250 500 Feet

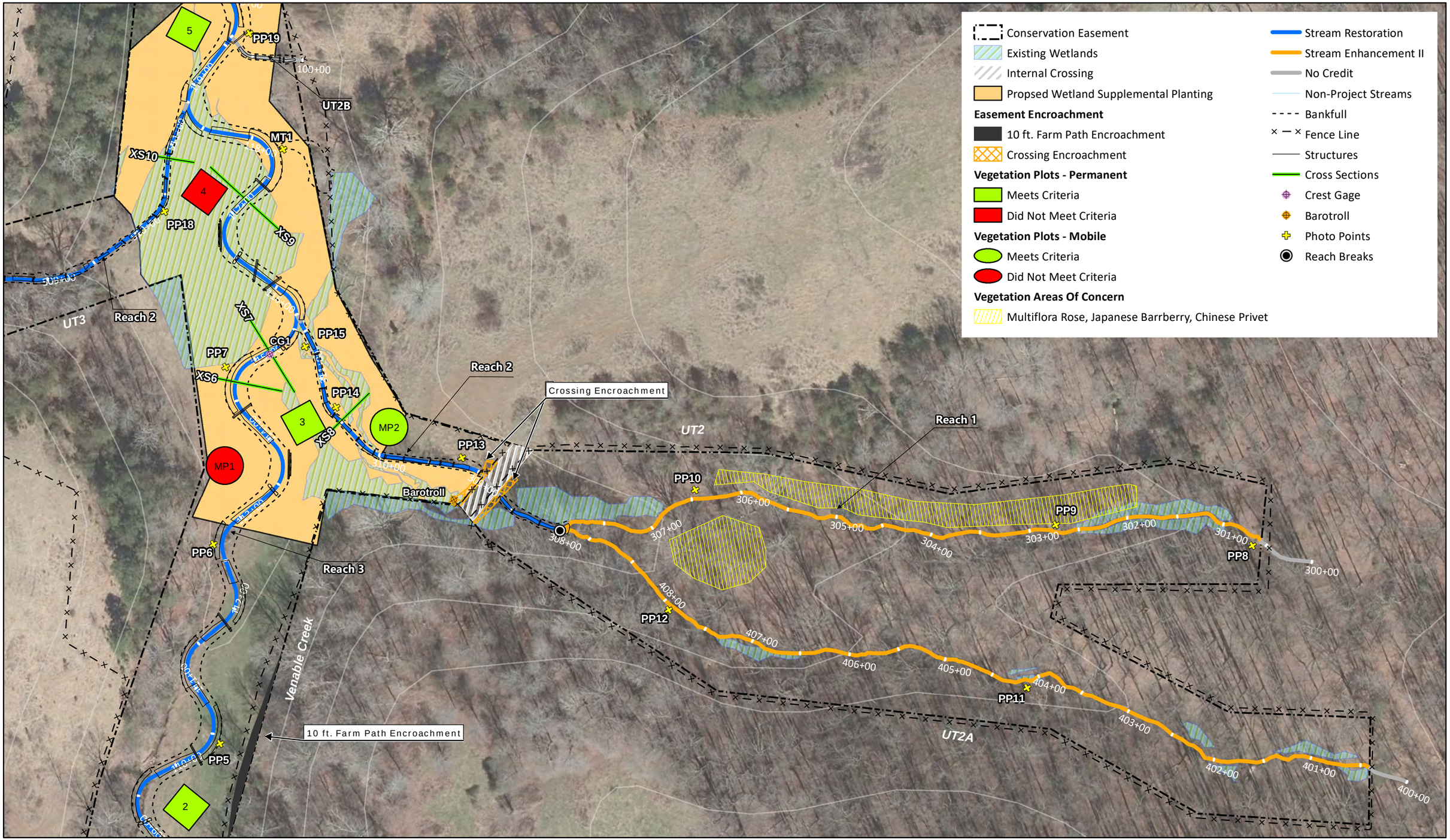
Figure 1. Current Condition Plan View Key
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC



WILDLANDS ENGINEERING

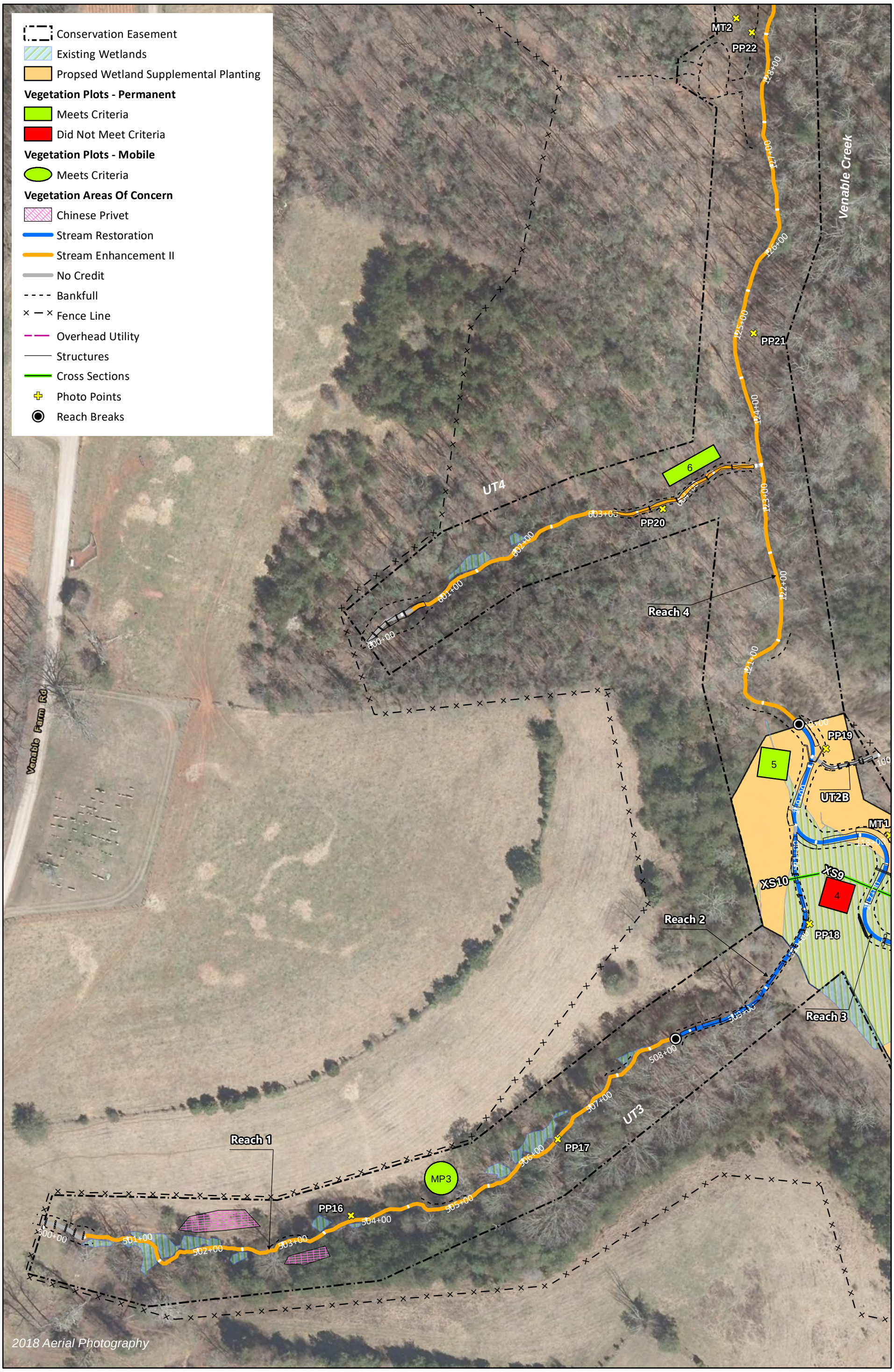
0 80 160 Feet

Figure 1a. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC



WILDLANDS ENGINEERING

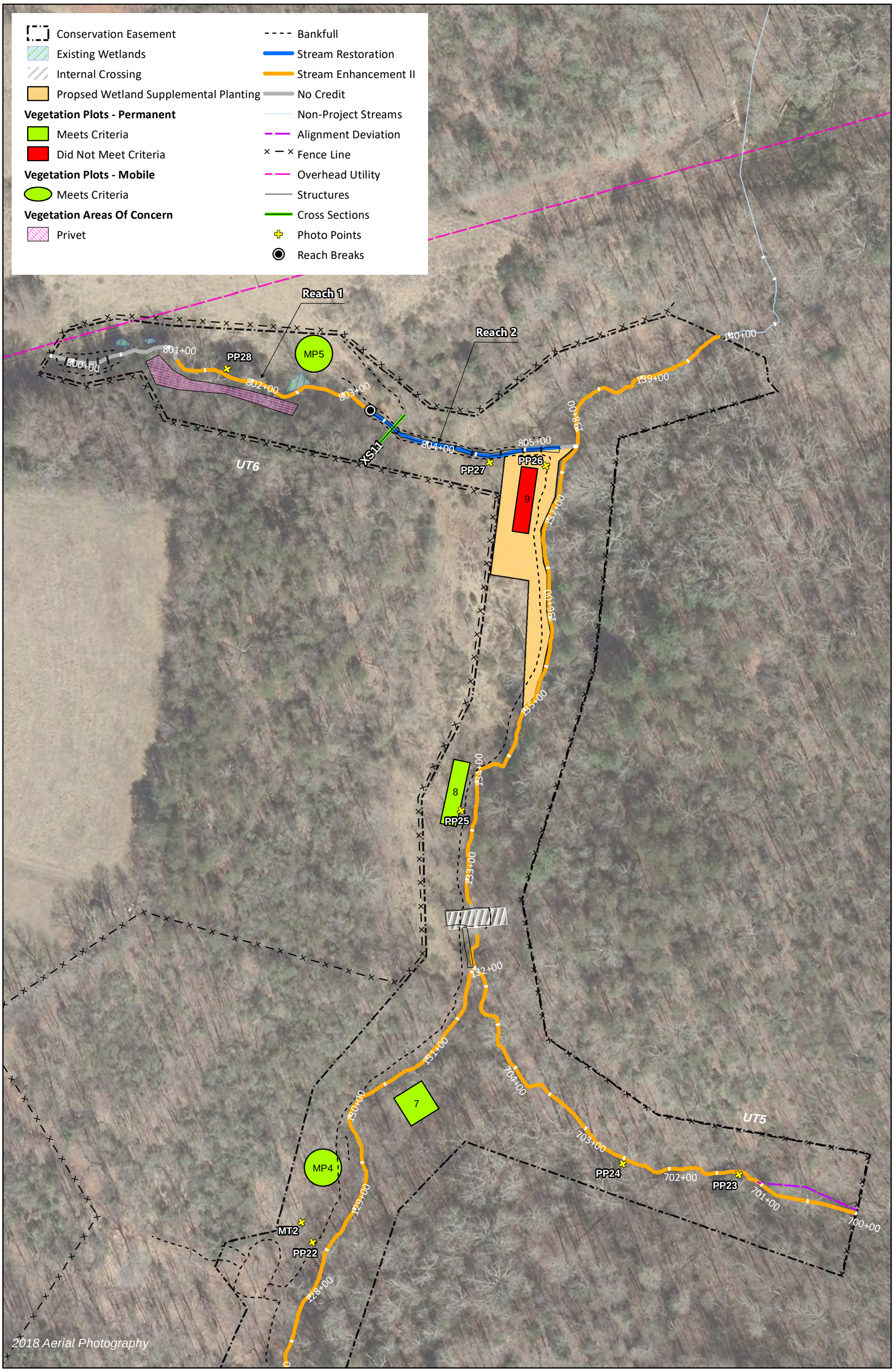
Figure 1b. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC



WILDLANDS ENGINEERING

0 100 200 Feet

Figure 1c. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC



WILDLANDS ENGINEERING

0 90 180 Feet

Figure 1d. Current Condition Plan View
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021
Surry County, NC

APPENDIX A. Visual Assessment Data

Table 4a. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Date of visual assessment: December 7, 2021
Venable Creek R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	141
					Assessed Bank Length	282
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	5	5		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1		100%

Date of visual assessment: December 7, 2021
Venable Creek R3

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	1,647
					Assessed Bank Length	3,294
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	15	15		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	18	18		100%

Table 4b. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Date of visual assessment: December 7, 2021
UT1

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	273
					Assessed Bank Length	546
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	6	6		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	4	4		100%

Date of visual assessment: December 7, 2021
UT2 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	342
					Assessed Bank Length	1,014
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	15	15		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	1	1		100%

Table 4c. Visual Stream Morphology Stability Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Date of visual assessment: December 7, 2021
UT3 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	306
					Assessed Bank Length	612
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
					Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	11	11		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	5	5		100%

Date of visual assessment: December 7, 2021
UT6 R2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	205
					Assessed Bank Length	410
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
					Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	6	6		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	N/A	N/A		N/A

Table 5. Vegetation Condition Assessment Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Date of visual assessment: December 7, 2021
Planted Acreage 4.97

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10	0	0%
		Total	**0**	**0%**
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10	0	0%
		Cumulative Total	**0.0**	**0%**

Date of visual assessment: December 7, 2021
Easement Acreage 20.20

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Invasive species included in summation above should be identified in report summary.	0.10	0.42	2%
Easement Encroachment Areas[1]	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0.04 ac (0.2%)	

[1]The listed encroachment areas were documented at baseline conditions. See section 1.4.2. No new areaas of encroachment were documented in MY1.

STREAM PHOTOGRAPHS

PHOTO POINT 1 Venable Creek R1 – upstream *(12/7/2021)*

PHOTO POINT 1 Venable Creek R1 – downstream *(12/7/2021)*

PHOTO POINT 2 UT1 – upstream *(12/7/2021)*

PHOTO POINT 2 UT1 – downstream *(12/7/2021)*

PHOTO POINT 3 Venable Creek R2 – upstream *(12/7/2021)*

PHOTO POINT 3 Venable Creek R2 – downstream *(12/7/2021)*

PHOTO POINT 4 Venable Creek R3 – upstream *(12/7/2021)*

PHOTO POINT 4 Venable Creek R3 – downstream *(12/7/2021)*

PHOTO POINT 5 Venable Creek R3 – upstream *(12/7/2021)*

PHOTO POINT 5 Venable Creek R3 – downstream *(12/7/2021)*

PHOTO POINT 6 Venable Creek R3 – upstream *(12/7/2021)*

PHOTO POINT 6 Venable Creek R3 – downstream *(12/7/2021)*

PHOTO POINT 7 Venable Creek R3 – upstream *(12/7/2021)*

PHOTO POINT 7 Venable Creek R3 – downstream *(12/7/2021)*

PHOTO POINT 8 UT2 R1 Headcut – upstream *(12/7/2021)*

PHOTO POINT 8 UT2 R1 – downstream *(12/7/2021)*

PHOTO POINT 9 UT2 R1 – upstream *(12/7/2021)*

PHOTO POINT 9 UT2 R1 – downstream *(12/7/2021)*

	
PHOTO POINT 10 UT2 R1 – upstream *(12/7/2021)*	**PHOTO POINT 10 UT2 R1 –** downstream *(12/7/2021)*
	
PHOTO POINT 11 UT2A – upstream *(12/7/2021)*	**PHOTO POINT 11 UT2A –** downstream *(12/7/2021)*
	
PHOTO POINT 12 UT2A – upstream *(12/7/2021)*	**PHOTO POINT 12 UT2A –** downstream *(12/7/2021)*

	
PHOTO POINT 13 UT2 R2 – upstream *(12/7/2021)*	**PHOTO POINT 13 UT2 R2 –** downstream *(12/7/2021)*
	
PHOTO POINT 14 UT2 R2 – upstream *(12/7/2021)*	**PHOTO POINT 14 UT2 R2 –** downstream *(12/7/2021)*
	
PHOTO POINT 15 UT2 R2 – upstream *(12/7/2021)*	**PHOTO POINT 15 UT2 R2 –** downstream *(12/7/2021)*

	
PHOTO POINT 16 UT3 R1 – upstream *(12/7/2021)*	**PHOTO POINT 16 UT3 R1 –** downstream *(12/7/2021)*
	
PHOTO POINT 17 UT3 R1 – upstream *(12/7/2021)*	**PHOTO POINT 17 UT3 R1–** downstream *(12/7/2021)*
	
PHOTO POINT 18 UT3 R2 – upstream *(12/7/2021)*	**PHOTO POINT 18 UT3 R2 –** downstream *(12/7/2021)*

PHOTO POINT 19 Venable Creek R3 – upstream *(12/7/2021)*

PHOTO POINT 19 Venable Creek R3 – downstream *(12/7/2021)*

PHOTO POINT 20 UT4 – upstream *(12/7/2021)*

PHOTO POINT 20 UT4 – downstream *(12/7/2021)*

PHOTO POINT 21 Venable Creek R4 – upstream *(12/7/2021)*

PHOTO POINT 21 Venable Creek R4 – downstream *(12/7/2021)*

PHOTO POINT 22 Venable Creek R4 – upstream *(12/7/2021)*

PHOTO POINT 22 Venable Creek R4 – downstream *(12/7/2021)*

PHOTO POINT 23 UT5 Headcut – upstream *(12/7/2021)*

PHOTO POINT 23 UT5 – downstream *(12/7/2021)*

PHOTO POINT 24 UT5 – upstream *(12/7/2021)*

PHOTO POINT 24 UT5 – downstream *(12/7/2021)*

	
PHOTO POINT 25 Venable Creek R4 – upstream *(12/7/2021)*	**PHOTO POINT 25 Venable Creek R4 –** downstream *(12/7/2021)*
	
PHOTO POINT 26 Venable Creek R4 – upstream *(12/7/2021)*	**PHOTO POINT 26 Venable Creek R4 –** downstream *(12/7/2021)*
	
PHOTO POINT 27 UT6 R2 – upstream *(12/7/2021)*	**PHOTO POINT 27 UT6 R2 –** downstream *(12/7/2021)*

	
PHOTO POINT 28 UT6 R1 – upstream *(12/7/2021)*	**PHOTO POINT 28 UT6 R1 –** downstream *(12/7/2021)*

MATURE TREE PHOTOGRAPHS

	
Mature Tree Photo Point 1 (Northeast) – Venable Creek Reach 3 *(012/07/2021)*	**Mature Tree Photo Point 2 (Northeast)** – Venable Creek Reach 4 *(12/07/2021)*

PERMANENT VEGETATION PLOT PHOTOGRAPHS

PERMANENT VEGETATION PLOT 1 *(10/25/2021)*

PERMANENT VEGETATION PLOT 2 *(10/25/2021)*

PERMANENT VEGETATION PLOT 3 *(10/25/2021)*

PERMANENT VEGETATION PLOT 4 *(10/25/2021)*

PERMANENT VEGETATION PLOT 5 *(10/25/2021)*

PERMANET VEGETATION PLOT 6 *(10/25/2021)*

PERMANENT VEGETATION PLOT 7 *(10/25/2021)*

PERMANENT VEGETATION PLOT 8 *(10/25/2021)*

PERMANENT VEGETATION PLOT 9 *(10/25/2021)*

MOBILE VEGETATION PLOT PHOTOGRAPHS

MOBILE VEGETATION PLOT 1 *(10/25/2021)*

MOBILE VEGETATION PLOT 2 *(10/25/2021)*

MOBILE VEGETATION PLOT 3 *(10/25/2021)*

MOBILE VEGETATION PLOT 4 *(10/25/2021)*

MOBILE VEGETATION PLOT 5 *(10/25/2021)*

APPENDIX B. Vegetation Plot Data

Table 6. Vegetation Performance Standards Summary Table

Honey Mill Mitigation Site

DMS Project No. 100083

Monitoring Year 1 - 2021

Vegetation Performance Standards Summary Table												
	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	486	2	7	0	405	2	8	0	364	3	5	0
Monitoring Year 0	567	2	8	0	526	2	10	0	445	2	6	0
	Veg Plot 4 F				Veg Plot 5 F				Veg Plot 6 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	202	2	4	0	324	2	7	0	324	2	6	0
Monitoring Year 0	567	2	9	0	364	2	8	0	607	2	10	0
	Veg Plot 7 F				Veg Plot 8 F				Veg Plot 9 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	526	2	9	0	486	2	8	0	243	2	4	0
Monitoring Year 0	526	2	9	0	607	2	9	0	405	2	9	0
	Veg Plot Group 1 R				Veg Plot Group 2 R				Veg Plot Group 3 R			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	81	2	2	0	445	2	10	0	405	2	5	0
Monitoring Year 0	445	2	7	0	567	2	11	0	445	2	8	0
	Veg Plot Group 4 R				Veg Plot Group 5 R							
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2												
Monitoring Year 1	405	2	4	0	607	2	8	0				
Monitoring Year 0	567	2	10	0	688	2	8	0				

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Table 7a. Vegetation Plot Data

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Planted Acreage	5
Date of Initial Plant	2021-03-01
Date(s) of Supplemental Plant(s)	
Date(s) Mowing	
Date of Current Survey	2021-10-25
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	1	1	1	1				
	Asimina triloba	pawpaw	Tree	FAC			1	1				
	Carpinus caroliniana	American hornbeam	Tree	FAC								
	Carya cordiformis	bitternut hickory	Tree	FACU			1	1	3	3	1	1
	Diospyros virginiana	common persimmon	Tree	FAC	3	3	2	2	2	2		
	Fagus grandifolia	American beech	Tree	FACU								
	Hamamelis virginiana	American witchhazel	Tree	FACU	1	1						
	Lindera benzoin	northern spicebush	Tree	FAC								
	Liriodendron tulipifera	tuliptree	Tree	FACU			1	1				
	Morus rubra	red mulberry	Tree	FACU	3	3			1	1		
	Nyssa sylvatica	blackgum	Tree	FAC								
	Oxydendrum arboreum	sourwood	Shrub	UPL								
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	2	2	2	2	2	2
	Prunus serotina	black cherry	Tree	FACU								
	Quercus alba	white oak	Tree	FACU	1	1			1	1		
	Quercus rubra	northern red oak	Tree	FACU	2	2	1	1			1	1
	Ulmus rubra	slippery elm	Tree	FAC			1	1			1	1
Sum	Performance Standard				12	12	10	10	9	9	5	5
Mitigation Plan Performance Standard	Current Year Stem Count					12		10		9		5
	Stems/Acre					486		405		364		202
	Species Count					7		8		5		4
	Dominant Species Composition (%)					25		20		33		40
	Average Plot Height (ft.)					2		2		3		2
	% Invasives					0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					12		10		9		5
	Stems/Acre					486		405		364		202
	Species Count					7		8		5		4
	Dominant Species Composition (%)					25		20		33		40
	Average Plot Height (ft.)					2		2		3		2
	% Invasives					0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7b. Vegetation Plot Data
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Planted Acreage	5
Date of Initial Plant	2021-03-01
Date(s) of Supplemental Plant(s)	
Date(s) Mowing	
Date of Current Survey	2021-10-25
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC	1	1	1	1						
	Asimina triloba	pawpaw	Tree	FAC										
	Carpinus caroliniana	American hornbeam	Tree	FAC					1	1	1	1	1	1
	Carya cordiformis	bitternut hickory	Tree	FACU	1	1								
	Diospyros virginiana	common persimmon	Tree	FAC	1	1			1	1			2	2
	Fagus grandifolia	American beech	Tree	FACU					1	1				
	Hamamelis virginiana	American witchhazel	Tree	FACU			1	1	1	1	2	2		
	Lindera benzoin	northern spicebush	Tree	FAC							1	1		
	Liriodendron tulipifera	tuliptree	Tree	FACU	1	1	1	1	2	2	1	1		
	Morus rubra	red mulberry	Tree	FACU	1	1	1	1	2	2	1	1	1	1
	Nyssa sylvatica	blackgum	Tree	FAC					2	2	2	2		
	Oxydendrum arboreum	sourwood	Shrub	UPL										
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	2	2	2	2	1	1	1	2
	Prunus serotina	black cherry	Tree	FACU										
	Quercus alba	white oak	Tree	FACU	2	2	2	2						
	Quercus rubra	northern red oak	Tree	FACU					1	1	3	3		
	Ulmus rubra	slippery elm	Tree	FAC										
Sum	Performance Standard				8	8	8	8	13	13	12	12	5	6
Mitigation Plan Performance Standard	Current Year Stem Count					8		8		13		12		6
	Stems/Acre					324		324		526		486		243
	Species Count					7		6		9		9		4
	Dominant Species Composition (%)					25		25		15		17		33
	Average Plot Height (ft.)					2		2		2		2		2
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					8		8		13		12		6
	Stems/Acre					324		324		526		486		243
	Species Count					7		6		9		9		4
	Dominant Species Composition (%)					25		25		15		17		33
	Average Plot Height (ft.)					2		2		2		2		2
	% Invasives					0		0		0		0		0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7c. Vegetation Plot Data

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Planted Acreage	5
Date of Initial Plant	2021-03-01
Date(s) of Supplemental Plant(s)	
Date(s) Mowing	
Date of Current Survey	2021-10-25
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 R Total	Veg Plot 2 R Total	Veg Plot 3 R Total	Veg Plot 4 R Total	Veg Plot 5 R Total
Species Included in Approved Mitigation Plan	Acer negundo	boxelder	Tree	FAC		1			
	Asimina triloba	pawpaw	Tree	FAC	1		1		
	Carpinus caroliniana	American hornbeam	Tree	FAC		1			
	Carya cordiformis	bitternut hickory	Tree	FACU					
	Diospyros virginiana	common persimmon	Tree	FAC		1		2	2
	Fagus grandifolia	American beech	Tree	FACU					1
	Hamamelis virginiana	American witchhazel	Tree	FACU					
	Lindera benzoin	northern spicebush	Tree	FAC			3	1	
	Liriodendron tulipifera	tuliptree	Tree	FACU			1		1
	Morus rubra	red mulberry	Tree	FACU		1			1
	Nyssa sylvatica	blackgum	Tree	FAC		1			
	Oxydendrum arboreum	sourwood	Shrub	UPL		1			
	Platanus occidentalis	American sycamore	Tree	FACW			4	2	3
	Prunus serotina	black cherry	Tree	FACU		1			
	Quercus alba	white oak	Tree	FACU		1	1		2
	Quercus rubra	northern red oak	Tree	FACU	1	2		5	4
	Ulmus rubra	slippery elm	Tree	FAC		1			1
Sum	Performance Standard				2	11	10	10	15
Mitigation Plan Performance Standard	Current Year Stem Count				2	11	10	10	15
	Stems/Acre				81	445	405	405	607
	Species Count				2	10	5	4	8
	Dominant Species Composition (%)				50	18	40	50	27
	Average Plot Height (ft.)				2	2	2	2	2
	% Invasives				0	0	0	0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count				2	11	10	10	15
	Stems/Acre				81	445	405	405	607
	Species Count				2	10	5	4	8
	Dominant Species Composition (%)				50	18	40	50	27
	Average Plot Height (ft.)				2	2	2	2	2
	% Invasives				0	0	0	0	0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

APPENDIX C. Stream Geomorphology Data

Table 8. Baseline Stream Data Summary
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

	Pre-Existing Condition																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	10.6		1	10.5	10.8	2	8.7		1	4.0		1	4.2		1	2.1		1
Floodprone Width (ft)	46		1	90	113	2	69		1	11		1	27		1	8		1
Bankfull Mean Depth (ft)	1.5		1	1.6	1.7	2	1.1		1	0.3		1	0.9		1	0.8		1
Bankfull Max Depth (ft)	2.0		1	2.2	2.3	2	1.6		1	0.4		1	1.1		1	1.1		1
Bankfull Cross-sectional Area (ft^2)	15.6		1	16.9	18.1	2	9.8		1	1.2		1	3.8		1	1.6		1
Width/Depth Ratio	7.2		1	6.1	6.9	2	7.6		1	12.7		1	4.7		1	2.7		1
Entrenchment Ratio[1]	4.3		1	8.6	10.5	2	7.9		1	2.7		1	6.4		1	3.7		1
Bank Height Ratio	1.6		1	1.3	1.6	2	1.4		1	1.0		1	1.5		1	2.6		1
Max part size (mm) mobilized at bankfull	40.6		1	13.3		2	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	E4			E/C4			E4b			C4b			E4b			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.14			1.04			1.18			1.47			1.01		
Bankfull/Channel Slope (ft/ft)[2]	0.0190			0.0136			0.0212			0.0352			0.0369			0.0870		
	Design																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	15.6		1	11.5		1	5.6		1	4.9		1	3.7		1
Floodprone Width (ft)	30		1	34		1	25		1	11		1	10		1	5		1
Bankfull Mean Depth (ft)	1.1		1	1.1		1	1.0		1	0.5		1	0.4		1	0.3		1
Bankfull Max Depth (ft)	---		1	---		1	---		1	---		1	---		1	---		1
Bankfull Cross-sectional Area (ft^2)	16.4		1	17.3		1	11.1		1	2.6		1	1.9		1	1.2		1
Width/Depth Ratio	13.8		1	14.1		1	11.8		1	12.1		1	12.3		1	11.2		1
Entrenchment Ratio[1]	2.0+		1	2.2+		1	2.2+		1	2.0+		1	2.0+		1	1.4+		1
Bank Height Ratio	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1	1.0-1.1		1
Max part size (mm) mobilized at bankfull	---		1	---		1	9.5		1	24.1		1	3.1		1	8.5		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	75			83			52			10			6			4		
Sinuosity	1.08			1.29			1.14			1.02			1.02			1.00		
Bankfull/Channel Slope (ft/ft)[2]	0.0230			0.0140			0.0210			0.0380			0.0340			0.0822		
	As-Built/ Baseline																	
Parameter	**Venable Creek R2**			**Venable Creek R3**			**UT1**			**UT2 R2**			**UT3 R2**			**UT6 R2**		
	Min	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**	**Min**	**Max**	**n**
Dimension and Substrate - Riffle																		
Bankfull Width (ft)	15.0		1	14.6	15.8	3	12.1		1	9.3		1	6.2		1	6.6		1
Floodprone Width (ft)	68		1	93	104	3	75		1	57		1	51		1	33		1
Bankfull Mean Depth (ft)	1.3		1	1.1	1.2	3	0.9		1	0.5		1	0.5		1	0.4		1
Bankfull Max Depth (ft)	2.1		1	1.8	2.0	3	1.6		1	0.8		1	0.7		1	0.7		1
Bankfull Cross-sectional Area (ft^2)[1]	20.2		1	16.0	19.4	3	11.0		1	4.8		1	2.8		1	3.0		1
Width/Depth Ratio	11.1		1	12.8	14.2	3	13.4		1	17.8		1	13.5		1	15.0		1
Entrenchment Ratio[1]	4.5		1	6.0	6.7	3	6.2		1	6.1		1	8.2		1	5.0		1
Bank Height Ratio	1.0		1	1.0		3	1.0		1	1.0		1	1.0		1	1.0		1
Max part size (mm) mobilized at bankfull	17.1		1	24.7		3	14.8		1	19.0		1	14.8		1	17.7		1
Rosgen Classification	B4			C4			C4b			B4			B4			A4		
Bankfull Discharge (cfs)	142			78	100	3	54			24			12			19		
Sinuosity	1.03			1.31			1.20			1.05			1.05			1.05		
Bankfull/Channel Slope (ft/ft)[2]	0.0245			0.0152			0.0232			0.0440			0.0387			0.0869		

1. ER for the baseline/monitoring parameters are based on the width of the cross-sect
2. Channel slope is calculated from the surface of the channel bed rather than water surface.
(---): Data was not provided, N/A: Not Applicable

Table 9. Morphology and Hydraulic Summary (Dimensional Parameters - Cross-Section)
Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

	UT1 Cross-Section 1 Pool								UT1 Cross-Section 2 Riffle								Venable Creek R2 Cross-Section 3 Riffle							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1039.7	1039.7							1039.2	1039.3							1034.6	1034.7						
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A							1.0	1.0							1.0	1.0						
Thalweg Elevation (ft)	1037.6	1037.5							1037.6	1037.7							1032.5	1032.6						
LTOB[2] Elevation (ft)	1039.7	1039.7							1039.2	1039.3							1034.6	1034.7						
LTOB[2] Max Depth (ft)	2.1	2.2							1.6	1.6							2.1	2.1						
LTOB[2] Cross Sectional Area (ft^2)	18.1	16.7							11.0	11.1							20.2	19.3						
	Venable Creek R3 Cross-Section 4 Pool								**Venable Creek R3 Cross-Section 5 Riffle**								**Venable Creek R3 Cross-Section 6 Pool**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1024.7	1024.8							1024.1	1024.0							1016.3	1016.3						
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A							1.0	1.0							N/A	N/A						
Thalweg Elevation (ft)	1024.7	1021.6							1022.3	1022.2							1013.1	1013.0						
LTOB[2] Elevation (ft)	1021.4	1024.8							1024.1	1024.0							1016.3	1016.3						
LTOB[2] Max Depth (ft)	3.3	3.2							1.8	1.9							3.2	3.3						
LTOB[2] Cross Sectional Area (ft^2)	33.4	33.6							17.1	18.1							33.3	35.0						
	Venable Creek R3 Cross-Section 7 Riffle								**UT2 R2 Cross-Section 8 Riffle**								**Venable Creek R3 Cross Section 9 Riffle**							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1015.9	1015.9							1020.0	1020.4							1011.6	1011.6						
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	1.0							1.0	0.7							1.0	1.0						
Thalweg Elevation (ft)	1013.9	1013.9							1019.1	1019.4							1009.8	1009.8						
LTOB[2] Elevation (ft)	1015.9	1015.9							1020.0	1020.1							1011.6	1011.7						
LTOB[2] Max Depth (ft)	2.0	2.0							0.8	0.7							1.8	1.9						
LTOB[2] Cross Sectional Area (ft^2)	19.4	18.5							4.8	2.9							16.0	16.8						
	UT3 R2 Cross Section 10 Riffle								**UT6 R2 Cross-Section 11 Riffle**															
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**								
Bankfull Elevation (ft) - Based on AB-Bankfull[1] Area	1011.9	1012.0							998.6	998.7														
Bank Height Ratio - Based on AB Bankfull[1] Area	1.0	0.9							1.0	0.8														
Thalweg Elevation (ft)	1011.2	1011.2							997.9	998.1														
LTOB[2] Elevation (ft)	1011.9	1011.9							998.6	998.6														
LTOB[2] Max Depth (ft)	0.7	0.7							0.7	0.5														
LTOB[2] Cross Sectional Area (ft^2)	2.8	2.4							3.0	1.9														

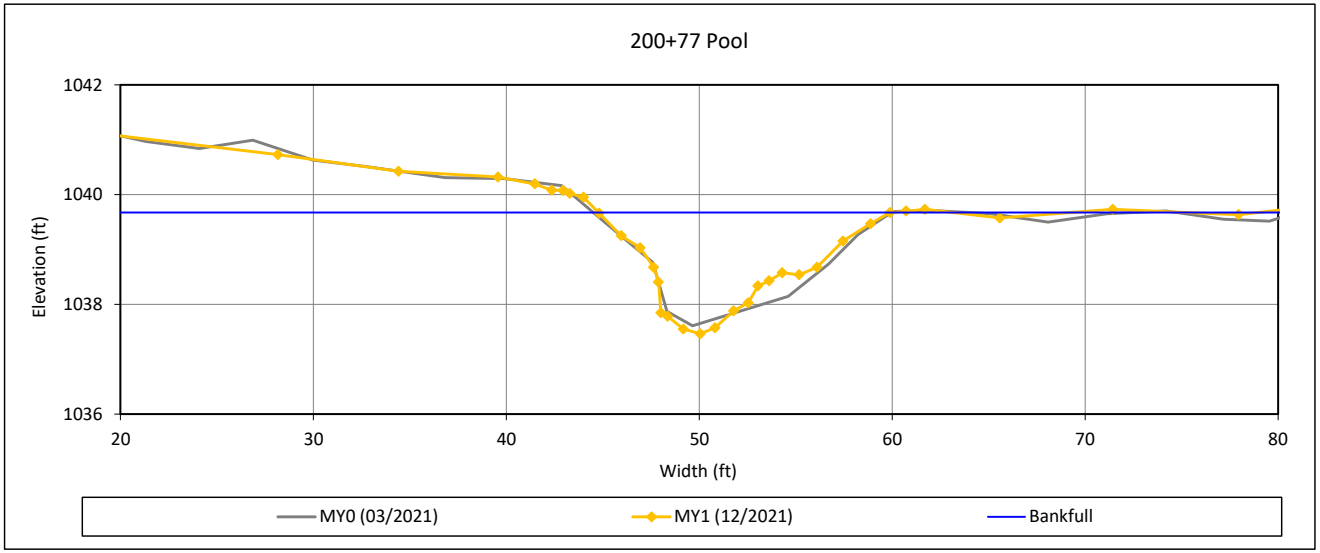
[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent year's bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 1-UT1



Bankfull Dimensions	
16.7	x-section area (ft.sq.)
15.1	width (ft)
1.1	mean depth (ft)
2.2	max depth (ft)
16.2	wetted perimeter (ft)
1.0	hydraulic radius (ft)
13.6	width-depth ratio

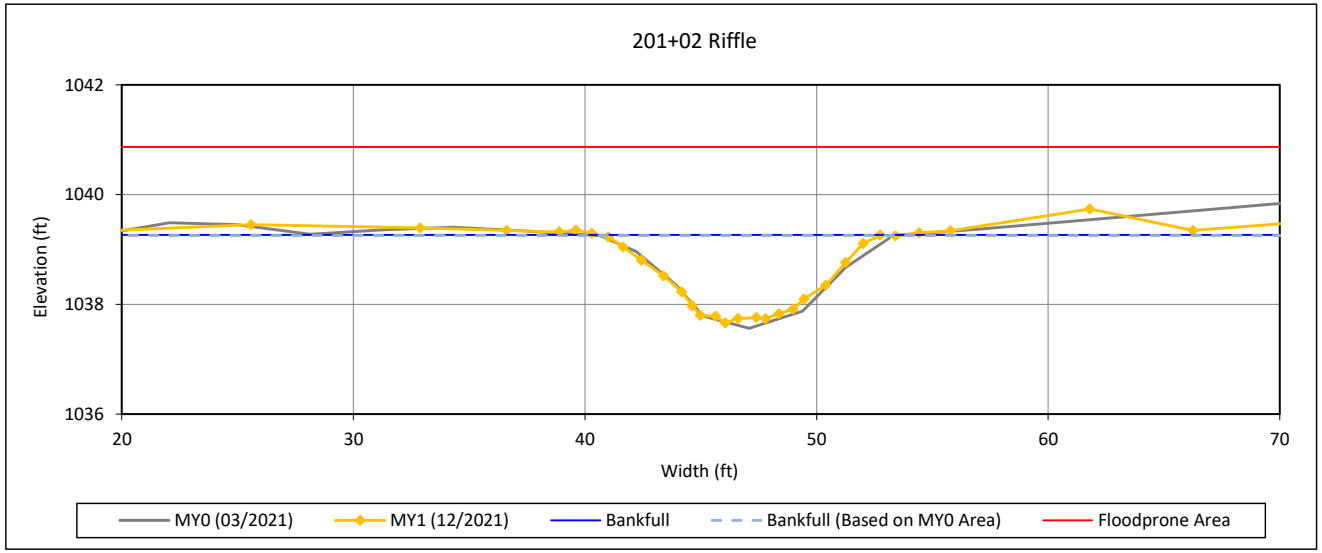
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 2-UT1



Bankfull Dimensions	
11.1	x-section area (ft.sq.)
12.1	width (ft)
0.9	mean depth (ft)
1.6	max depth (ft)
12.6	wetted perimeter (ft)
0.9	hydraulic radius (ft)
13.2	width-depth ratio
75.3	W flood prone area (ft)
6.2	entrenchment ratio
1.0	low bank height ratio

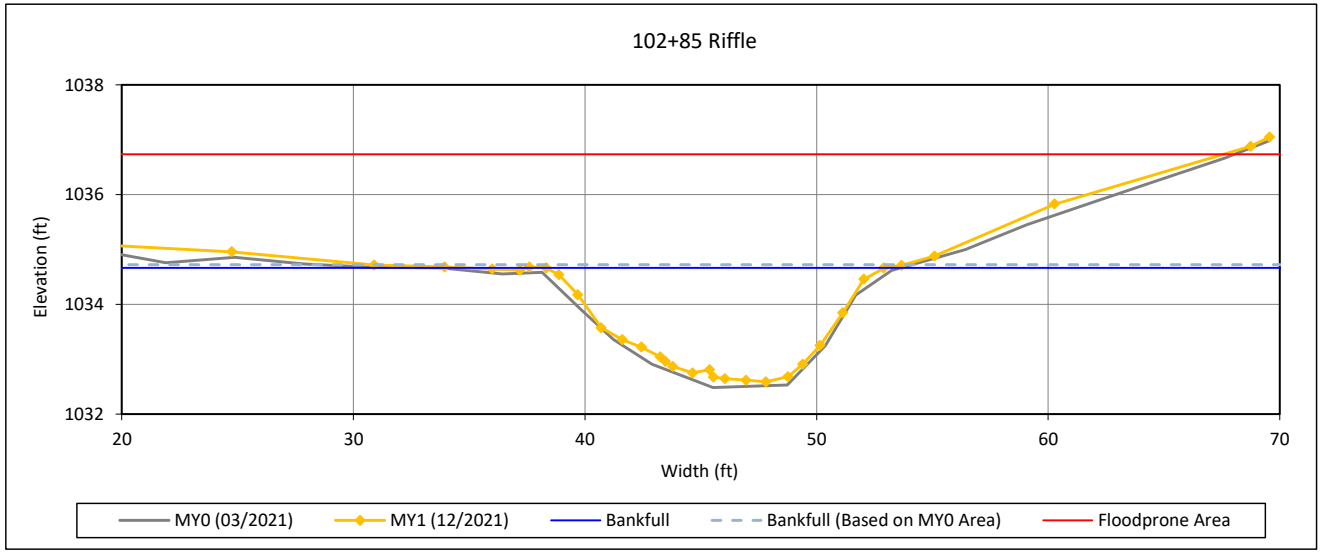
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 3-Venable Creek R2



Bankfull Dimensions	
19.3	x-section area (ft.sq.)
14.5	width (ft)
1.3	mean depth (ft)
2.1	max depth (ft)
15.4	wetted perimeter (ft)
1.3	hydraulic radius (ft)
11.0	width-depth ratio
67.6	W flood prone area (ft)
4.6	entrenchment ratio
1.0	low bank height ratio

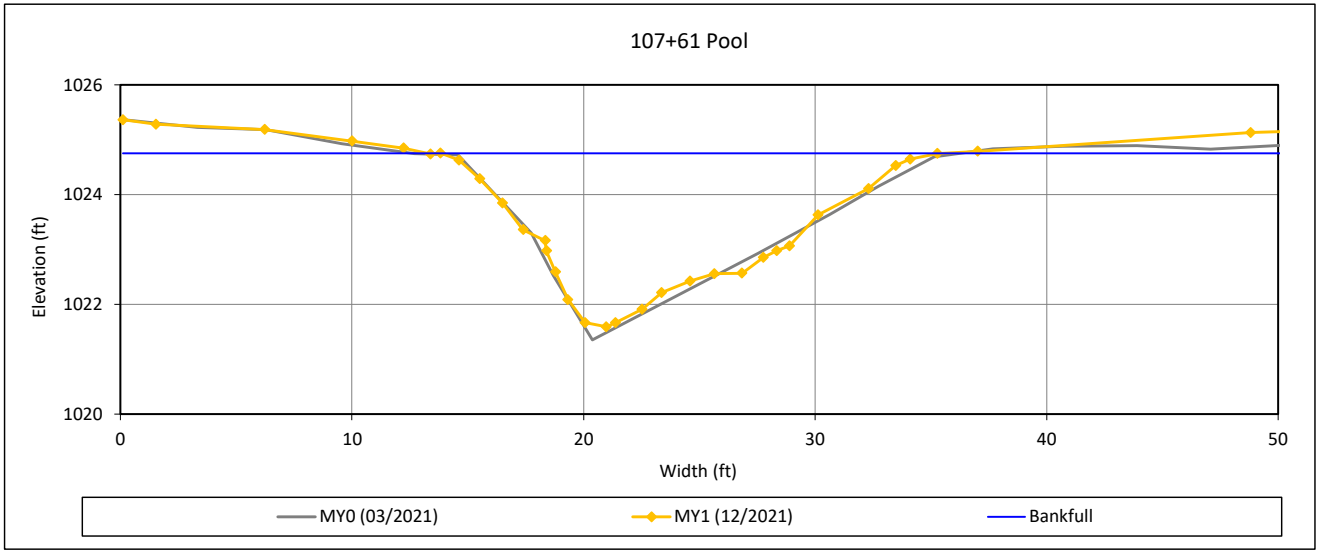
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 4-Venable Creek R3



Bankfull Dimensions	
33.6	x-section area (ft.sq.)
21.4	width (ft)
1.6	mean depth (ft)
3.2	max depth (ft)
22.8	wetted perimeter (ft)
1.5	hydraulic radius (ft)
13.6	width-depth ratio

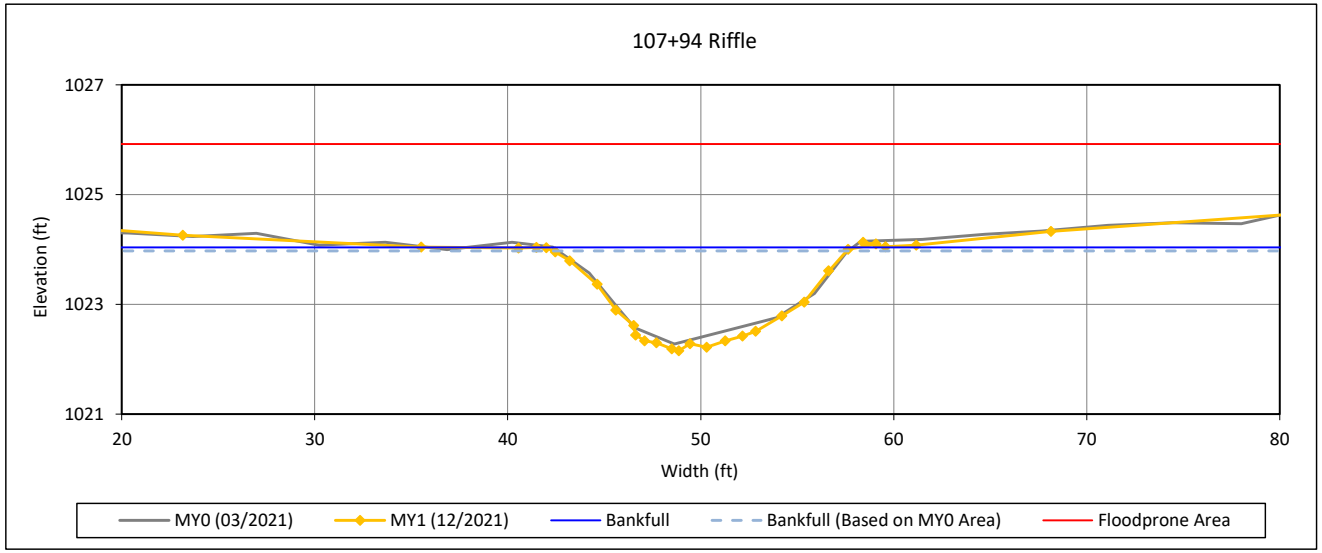
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 5-Venable Creek R3



Bankfull Dimensions	
18.1	x-section area (ft.sq.)
16.7	width (ft)
1.1	mean depth (ft)
1.9	max depth (ft)
17.3	wetted perimeter (ft)
1.0	hydraulic radius (ft)
15.3	width-depth ratio
103.7	W flood prone area (ft)
6.2	entrenchment ratio
1.0	low bank height ratio

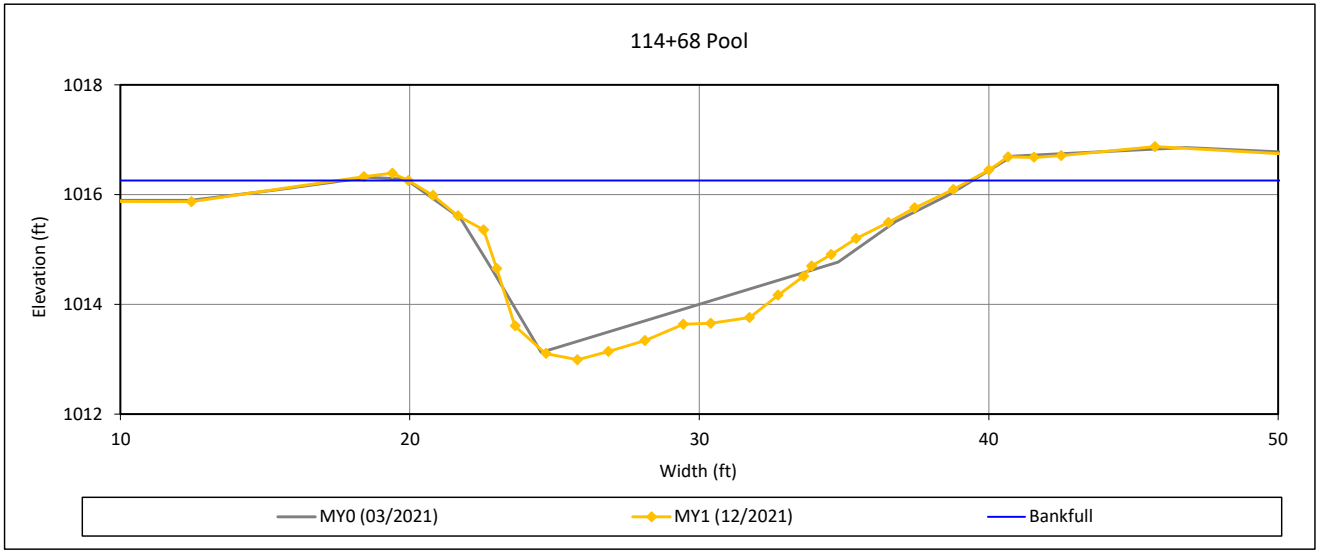
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 6-Venable Creek R3



Bankfull Dimensions	
35.0	x-section area (ft.sq.)
19.4	width (ft)
1.8	mean depth (ft)
3.3	max depth (ft)
21.1	wetted perimeter (ft)
1.7	hydraulic radius (ft)
10.8	width-depth ratio

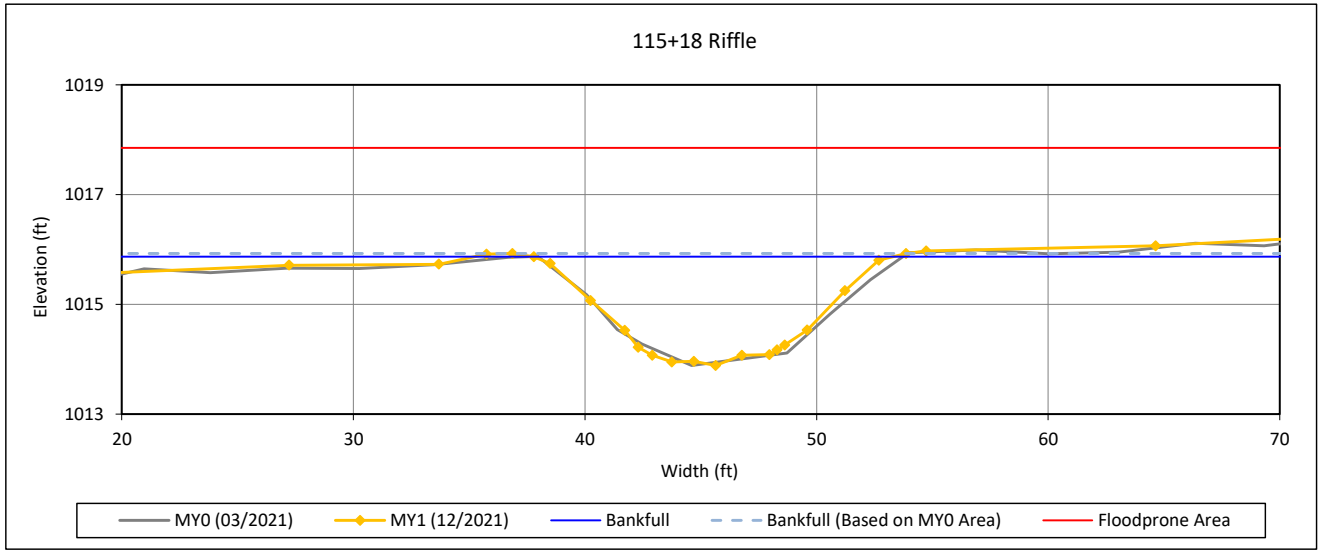
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 7-Venable Creek R3



Bankfull Dimensions	
18.5	x-section area (ft.sq.)
15.5	width (ft)
1.2	mean depth (ft)
2.0	max depth (ft)
16.2	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.0	width-depth ratio
93.6	W flood prone area (ft)
6.0	entrenchment ratio
1.0	low bank height ratio

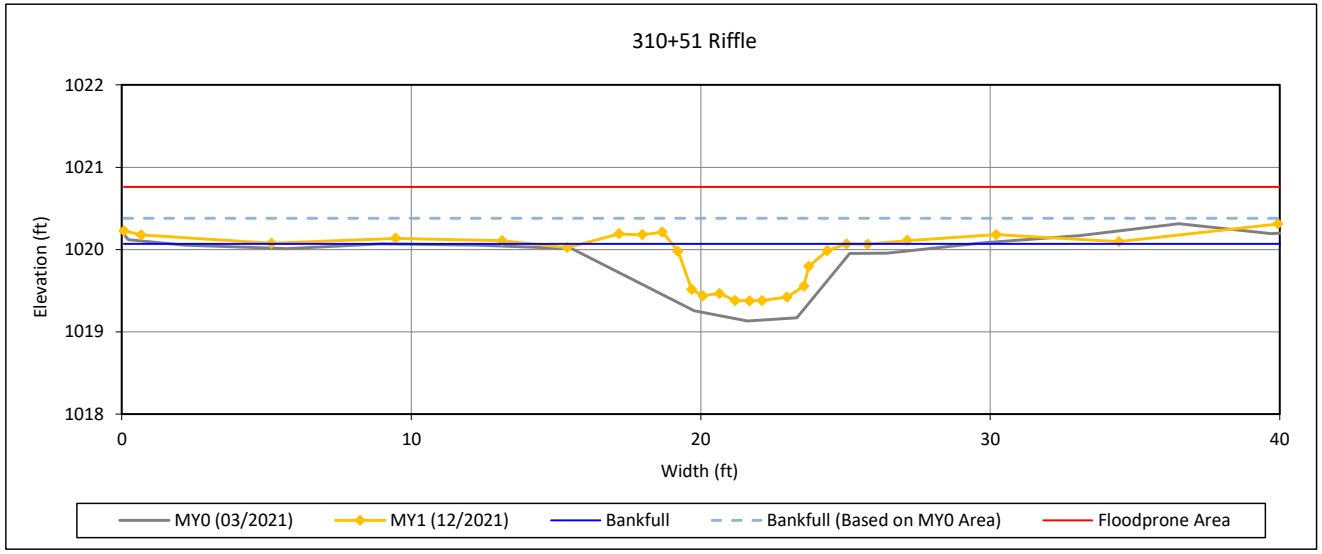
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 8-UT2 R2



Bankfull Dimensions	
2.9	x-section area (ft.sq.)
6.0	width (ft)
0.5	mean depth (ft)
0.7	max depth (ft)
6.4	wetted perimeter (ft)
0.4	hydraulic radius (ft)
12.7	width-depth ratio
54.5	W flood prone area (ft)
9.0	entrenchment ratio
0.7	low bank height ratio

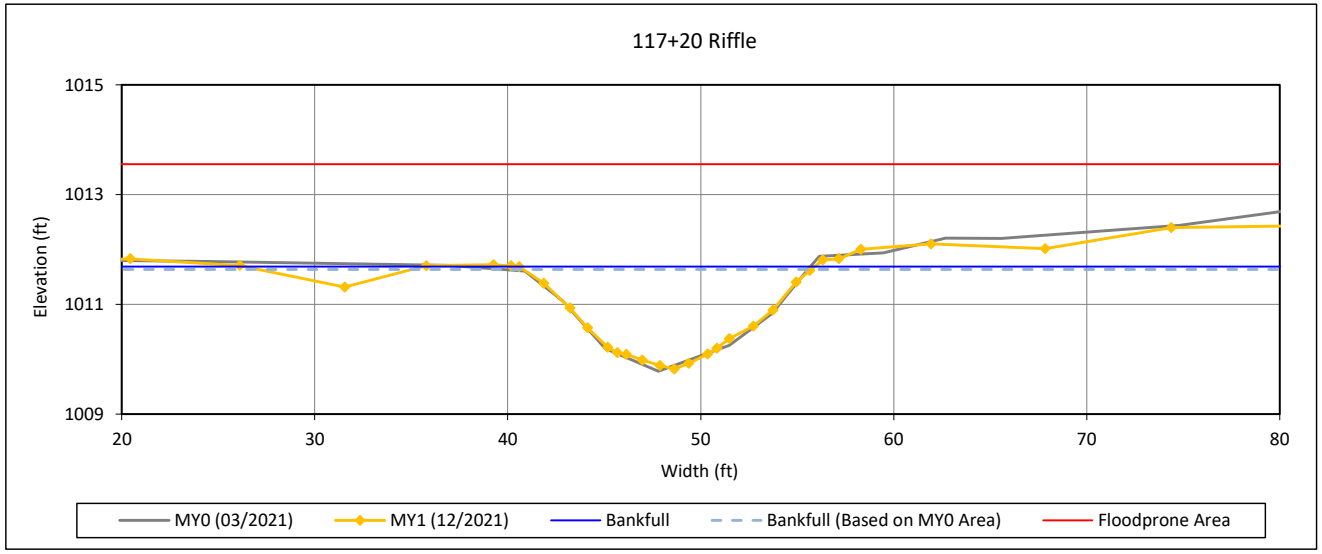
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 9-Venable Creek R3



Bankfull Dimensions	
16.8	x-section area (ft.sq.)
15.3	width (ft)
1.1	mean depth (ft)
1.9	max depth (ft)
15.8	wetted perimeter (ft)
1.1	hydraulic radius (ft)
13.9	width-depth ratio
101.8	W flood prone area (ft)
6.7	entrenchment ratio
1.0	low bank height ratio

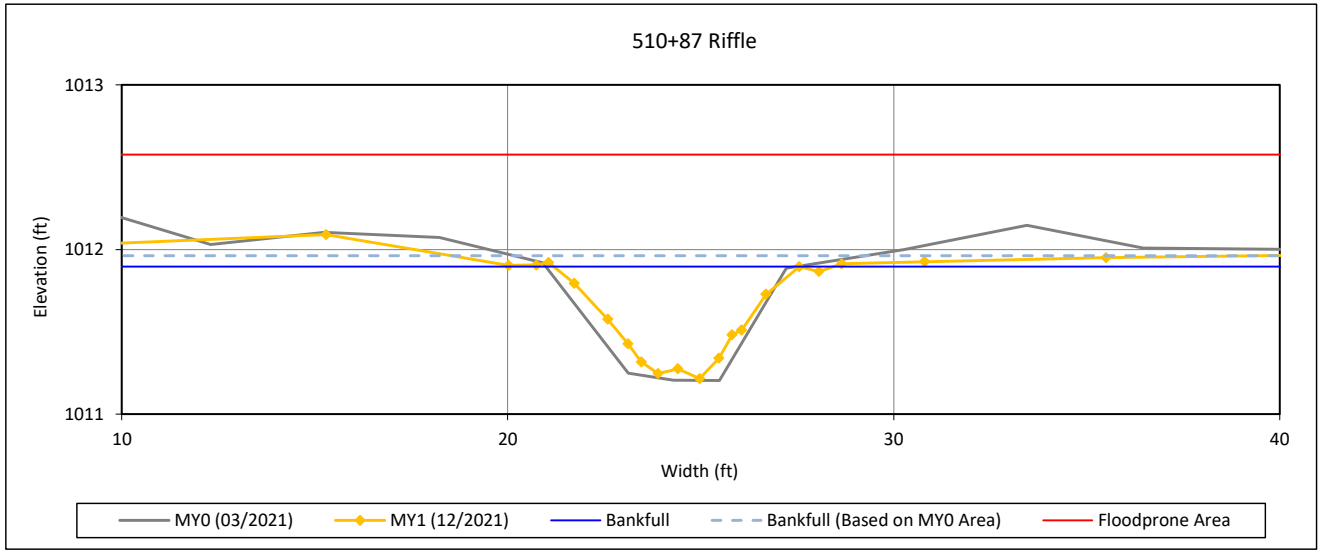
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 10-UT3 R2



Bankfull Dimensions	
2.4	x-section area (ft.sq.)
6.4	width (ft)
0.4	mean depth (ft)
0.7	max depth (ft)
6.5	wetted perimeter (ft)
0.4	hydraulic radius (ft)
17.0	width-depth ratio
50.5	W flood prone area (ft)
7.9	entrenchment ratio
0.9	low bank height ratio

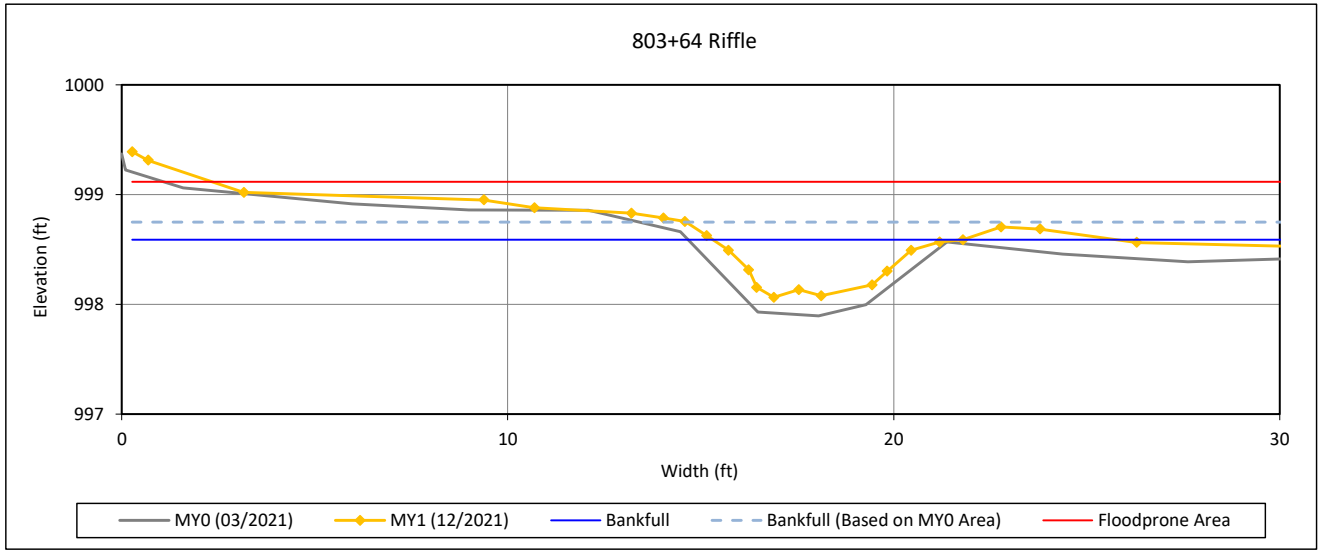
Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

Cross-Section Plots

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Cross-Section 11-UT6 R2



Bankfull Dimensions	
1.9	x-section area (ft.sq.)
6.5	width (ft)
0.3	mean depth (ft)
0.5	max depth (ft)
6.6	wetted perimeter (ft)
0.3	hydraulic radius (ft)
21.9	width-depth ratio
33.6	W flood prone area (ft)
5.2	entrenchment ratio
0.8	low bank height ratio

Survey Date: 12/2021
Field Crew: Wildlands Engineering

View Downstream

APPENDIX D. Hydrology Data

Table 10. Bankfull Events

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Reach	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Venable Creek R3	None						

Table 11. Rainfall Summary

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

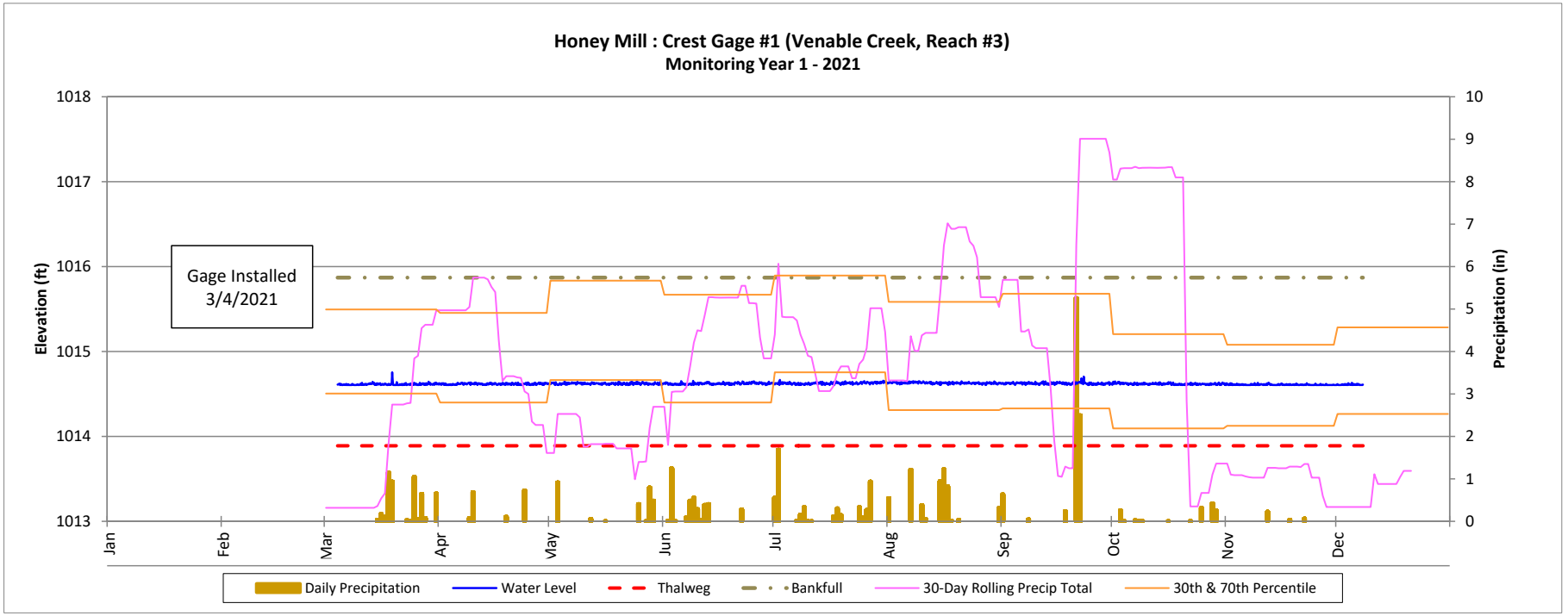
	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Annual Precip Total (Inches)	35.67						
WETS 30th Percentile (Inches)	32.45						
WETS 70th Percentile (Inches)	58.85						
Type of Year[1]	Average						

30th and 70th percentile rainfall data collected from WETS Station: MOUNT AIRY 2 W, NC for years 1971-2020

[1] Type of year refers to amount of rainfall in the current year compared to the average percentiles i.e. Below Average, Average, Above Average.

Recorded Bankfull Events

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021



APPENDIX E. Project Timeline and Contact Info

Table 12. Project Activity and Reporting History

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Activity or Report		Data Collection Complete	Completion or Delivery
404 Permit		September 2020	October 2020
Mitigation Plan		August 2019 - October 2020	October 2020
Final Design - Construction Plans		September 2020	September 2020
Construction		November 2020 - February 2021	February 2021
Temporary S&E mix applied to entire project area[1]		February 2021	February 2021
Permanent seed mix applied to reach/segments[1]		February 2021	February 2021
Bare root and live stake plantings for reach/segments		March 2021	March 2021
Baseline Monitoring (Year 0)	Stream Survey	March - June 2021	June 2021
	Vegetation Survey	March 2021	
	Remediation	N/A	N/A
	Encroachment	March- October 2021	October 2021
Year 1 Monitoring	Stream Survey	December 2021	January 2022
	Vegetation Survey		
	Remediation	N/A	N/A
	Encroachment		
Year 2 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 3 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 4 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 5 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 6 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		
Year 7 Monitoring	Stream Survey		
	Vegetation Survey		
	Remediation		
	Encroachment		

[1]Seed and mulch is added as each section of construction is completed.

Table 13. Project Contact Table

Honey Mill Mitigation Site
DMS Project No. 100083
Monitoring Year 1 - 2021

Designers Aaron Earley, PE, CFM	**Wildlands Engineering, Inc.** 1430 South Mint Street, Suite 104 Charlotte, NC 28203 704.332.7754
Construction Contractors	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Planting Contractor	**Bruton Natural Systems, Inc.** PO Box 1197 Fremont, NC 27830
Seeding Contractor	**Main Stream Earthworks, Inc.** 631 Camp Dan Valley Rd Reidsville, NC 27320
Seed Mix Sources	**Green Resource LLC**
Nursery Stock Suppliers	
Bare Roots Live Stakes	**Bruton Natural Systems, Inc.**
Herbaceous Plugs	**Wetland Plants Inc.**
Monitoring Performers	**Wildlands Engineering, Inc.**
Monitoring, POC	Kristi Suggs (704) 332.7754 x.110

APPENDIX F. Supplemental Planting Documentation

Kristi Suggs

From: Aaron Earley
Sent: Monday, January 3, 2022 2:06 PM
To: Joe Lovenshimer; Sam Kirk; Kristi Suggs
Subject: Fw: Notice of Initial Credit Release/ NCDMS Honey Mill Mitigation Site/ SAW-2018-01789/ Surry County

Follow Up Flag: Flag for follow up
Flag Status: Completed

See below for plant list approval.

From: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>
Sent: Monday, January 3, 2022 1:20 PM
To: Aaron Earley <aearley@wildlandseng.com>
Cc: Wiesner, Paul <paul.wiesner@ncdenr.gov>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>; erin.davis@ncdenr.gov <erin.davis@ncdenr.gov>; Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>
Subject: RE: Notice of Initial Credit Release/ NCDMS Honey Mill Mitigation Site/ SAW-2018-01789/ Surry County

Aaron,
Thanks for following up on this. This list looks fine.

Happy New Year,
Kim

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

-----Original Message-----
From: Aaron Earley <aearley@wildlandseng.com>
Sent: Wednesday, December 22, 2021 10:40 AM
To: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Wiesner, Paul <paul.wiesner@ncdenr.gov>
Cc: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; 'Wilson, Travis W. (travis.wilson@ncwildlife.org)' <travis.wilson@ncwildlife.org>;

andrea.leslie@ncwildlife.org; 'Bowers, Todd (bowers.todd@epa.gov)' <bowers.todd@epa.gov>; Merritt, Katie <katie.merritt@ncdenr.gov>; Youngman, Holland J <holland_youngman@fws.gov>; Beth.Harmon@ncdenr.gov; Allen, Melonie (melonie.allen@ncdenr.gov) <melonie.allen@ncdenr.gov>; Shawn Wilkerson <swilkerson@wildlandseng.com>; Crumbley, Tyler A CIV USARMY CESAW (USA) <Tyler.A.Crumbley2@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>; Stanfill, Jim <jim.stanfill@ncdenr.gov>; Hajnos, Edward A <edward.hajnos@ncdenr.gov>; Horton, Jeffrey <jeffrey.horton@ncdenr.gov>; Kristi Suggs <ksuggs@wildlandseng.com>; Joe Lovenshimer <jlovenshimer@wildlandseng.com>
Subject: [Non-DoD Source] RE: Notice of Initial Credit Release/ NCDMS Honey Mill Mitigation Site/ SAW-2018-01789/ Surry County

Attached is a pdf that contains proposed planting lists for shaded and wetland areas at Honey Mill. The shaded supplemental planting list is the same as the approved mitigation plan with the exception of substituting slippery elm for tulip poplar. There was not a separate wetland planting list in the approved mitigation. The list contains species that we propose to plant in wet areas on the project site. Please let us know if you have any questions or comments. We will be ordering the plants soon in order to get them on the ground this planting season.

Happy holidays!

Aaron Earley, PE, CFM

Wildlands Engineering, Inc.

From: Aaron Earley
Sent: Tuesday, December 7, 2021 2:08 PM
To: Browning, Kimberly D CIV USARMY CESAW (USA) <Kimberly.D.Browning@usace.army.mil>; Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>; Wiesner, Paul <paul.wiesner@ncdenr.gov>
Cc: Tugwell, Todd J CIV USARMY CESAW (USA) <Todd.J.Tugwell@usace.army.mil>; Haywood, Casey M CIV USARMY CESAW (USA) <Casey.M.Haywood@usace.army.mil>; Davis, Erin B <erin.davis@ncdenr.gov>; 'Wilson, Travis W. (travis.wilson@ncwildlife.org)' <travis.wilson@ncwildlife.org>; andrea.leslie@ncwildlife.org; 'Bowers, Todd (bowers.todd@epa.gov)' <bowers.todd@epa.gov>; Merritt, Katie <katie.merritt@ncdenr.gov>; Youngman, Holland J <holland_youngman@fws.gov>; Beth.Harmon@ncdenr.gov; Allen, Melonie (melonie.allen@ncdenr.gov) <melonie.allen@ncdenr.gov>; Shawn Wilkerson <swilkerson@wildlandseng.com>; Crumbley, Tyler A CIV USARMY CESAW (USA) <Tyler.A.Crumbley2@usace.army.mil>; Jones, M Scott (Scott) CIV USARMY CESAW (USA) <Scott.Jones@usace.army.mil>; Stanfill, Jim <jim.stanfill@ncdenr.gov>; Hajnos, Edward A <edward.hajnos@ncdenr.gov>; Horton, Jeffrey <jeffrey.horton@ncdenr.gov>; Kristi Suggs <ksuggs@wildlandseng.com>
Subject: RE: Notice of Initial Credit Release/ NCDMS Honey Mill Mitigation Site/ SAW-2018-01789/ Surry County

Revised Shaded Supplemental Planting List

Species	Common Name	Max Spacing (ft)	Indiv. Spacing (ft)	Min. Caliper Size	Stratum	Percentage	Wetland Indicator Code
Platanus occidentalis	Sycamore	25	12-25	0.25" - 1.0"	Canopy	12%	FACW
Carya cordiformis	Bitternut Hickory	25	12-25	0.25" - 1.0"	Canopy	7%	FACU
~~*Liriodendron tulipifera*~~	~~Tulip Poplar~~	~~25~~	~~12-25~~	~~0.25" - 1.0"~~	~~Canopy~~	~~7%~~	~~FACU~~
*Carpinus caroliniana**	Ironwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	FAC
Diospyros virginiana	Persimmon	25	12-25	0.25" - 1.0"	Canopy	11%	FAC
*Morus rubra**	Red Mulberry	25	12-25	0.25" - 1.0"	Subcanopy	7%	FACU
Nyssa sylvatica	Black Gum	25	12-25	0.25" - 1.0"	Canopy	7%	FAC
*Eunoymus americanus**	American Strawberry Bush	25	12-25	0.25" - 1.0"	Shrub	0%	FAC
*Calycanthus floridus**	Sweetshrub	25	12-25	0.25" - 1.0"	Shrub	0%	FACU
*Hamamelis virginiana**	Witch Hazel	25	12-25	0.25" - 1.0"	Subcanopy	9%	FACU
Quercus rubra	Northern Red Oak	25	12-25	0.25" - 1.0"	Canopy	11%	FACU
Fagus grandifolia	American Beech	25	12-25	0.25" - 1.0"	Canopy	7%	FACU
Quercus alba	White Oak	25	12-25	0.25" - 1.0"	Canopy	7%	FACU
*Lindera benzoin**	Spicebush	25	12-25	0.25" - 1.0"	Subcanopy	6%	FAC
*Cornus florida**	Flowering Dogwood	25	12-25	0.25" - 1.0"	Subcanopy	4%	FACU
*Ozydendron arboreum**	Sourwood	25	12-25	0.25" - 1.0"	Subcanopy	0%	UPL
*Ilex opaca**	American Holly	25	12-25	0.25" - 1.0"	Subcanopy	0%	FACU
Ulmus rubra	Slippery Elm	25	12-25	0.25" - 1.0"	Subcanopy	100%	FACU

* Subcanopy species - not held to monitoring height requirements

Proposed Wetland Planting List

Species	Common Name	Max Spacing (ft)	Indiv. Spacing (ft)	Min. Caliper	Stratum	Percentage	Wetland Indicator Code
Platanus occidentalis	Sycamore	12	6-12	0.25"	Canopy	15%	FACW
Ulmus americana	American Elm	12	6-12	0.25"	Canopy	10%	FACW
*Sambucus canadensis**	Elderberry	12	6-12	0.25"	Subconopy	10%	FAC
Acer negundo	Boxelder	12	6-12	0.25"	Canopy	10%	FAC
*Cephalanthus occidentalis**	Buttonbush	12	6-12	0.25"	Shrub	5%	OBL
*Alnus serrulata**	Tag Alder	12	6-12	0.25"	Subconopy	10%	OBL
Live Stake							
Salix nigra	Black Willow	12	6-12	0.5" cal.	Canopy	20%	OBL
*Salix sericea**	Silky Willow	12	6-12	0.5" cal.	Subconopy	12%	OBL
*Cornus amomum**	Silky dogwood	12	6-12	0.5" cal.	Subconopy	8%	FACW

* Subcanopy or shrub species - not held to monitoring height requirements

Table 14. Proposed Wetland Supplemental Planting
Honey Mill Mitigation Site
DMS Project No. 100083

Wetland Planting Zone								
Species	**Common Name**	**Max Spacing (ft)**	**Indiv. Spacing (ft)**	**Min. Caliper**	**Stratum**	**Percentage**	**Approved in Mitigation Plan? (Y/N)**	**Wetland Indicator Code**
Platanus occidentalis	Sycamore	12	6-12	0.25"	Canopy	15%	Y	FACW
Ulmus americana	American Elm	12	6-12	0.25"	Canopy	10%	N	FACW
*Sambucus canadensis**	Elderberry	12	6-12	0.25"	Subconopy	10%	Y	FAC
Acer negundo	Boxelder	12	6-12	0.25"	Canopy	10%	Y	FAC
*Cephalanthus occidentalis**	Buttonbush	12	6-12	0.25"	Shrub	5%	N	OBL
*Alnus serrulata**	Tag Alder	12	6-12	0.25"	Subconopy	10%	N	OBL
Live Stakes								
Salix nigra	Black Willow	12	6-12	0.5" cal.	Canopy	20%	Y	OBL
*Salix sericea**	Silky Willow	12	6-12	0.5" cal.	Subconopy	12%	Y	OBL
*Cornus amomum**	Silky dogwood	12	6-12	0.5" cal.	Subconopy	8%	Y	FACW
* Subcanopy or shrub species - not held to monitoring height requirements								

Conservation Easement
Project Parcels
Existing Wetlands
Internal Crossing
Vegetation Plot Meets Criteria
Vegetation Plot Does Not Meet Criteria
Vegetation Plot Meets Criteria
Vegetation Plot Does Not Meet Criteria
Propsed Wetland Supplemental Planting
Non-Project Streams
Restoration
Enhancement I
Enhancement II
No Credit
Bankfull
Alignment Deviation
Overhead Utility
Topographical Contour (20')
Cross Sections
Crest Gage
Barotroll
Photo Points
Reach Breaks

Reach 1
Reach 2
UT6
UT5
Venable Creek
UT4
Reach 4
UT2B
Reach 2
Reach 1
UT3
Reach 2
UT2
Reach 1
Reach 3
UT2A
Venable Creek
UT1
Reach 2
Reach 1
2018 Aerial Photography

WILDLANDS ENGINEERING

0 250 500 Feet

Figure 2.0 Proposed Wetland Supplemental Planting
Honey Mill Mitigation Site
DMS Project No. 100083

Surry County, NC

Table 15. Proposed Shaded Supplemental Planting

Honey Mill Mitigation Site

DMS Project No. 100083

Shaded Bare Roots								
Species	**Common Name**	**Max Spacing (ft)**	**Indiv. Spacning (ft)**	**Min. Caliper Size**	**Stratum**	**Percentage**	**Approved in Mitigation Plan? (Y/N)**	**Wetland Indicator Code**
Platanus occidentalis	Sycamore	25	12-25	0.25" - 1.0"	Canopy	10%	Y	FACW
Carya cordiformis	Bitternut Hickory	25	12-25	0.25" - 1.0"	Canopy	5%	Y	FACU
*Ulmus rubra***	Slippery Elm	25	12-25	0.25" - 1.0"	Canopy	5%	N	FAC
*Carpinus caroliniana**	Ironwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	FAC
Diospyros virginiana	Persimmon	25	12-25	0.25" - 1.0"	Canopy	10%	Y	FAC
*Morus rubra**	Red Mulberry	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	FACU
Nyssa sylvatica	Black Gum	25	12-25	0.25" - 1.0"	Canopy	5%	Y	FAC
*Eunoymus americanus**	American Strawberry Bush	25	12-25	0.25" - 1.0"	Shrub	5%	Y	FAC
*Calycanthus floridus**	Sweetshrub	25	12-25	0.25" - 1.0"	Shrub	5%	Y	FACU
*Hamamelis virginiana**	Witch Hazel	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	FACU
Quercus rubra	Northern Red Oak	25	12-25	0.25" - 1.0"	Canopy	5%	Y	FACU
Fagus grandifolia	American Beech	25	12-25	0.25" - 1.0"	Canopy	7%	Y	FACU
Quercus alba	White Oak	25	12-25	0.25" - 1.0"	Canopy	8%	Y	FACU
*Lindera benzoin**	Spicebush	25	12-25	0.25" - 1.0"	Shrub	5%	Y	FAC
*Cornus florida**	Flowering Dogwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	FACU
*Ozydendron arboreum**	Sourwood	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	UPL
*Ilex opaca**	American Holly	25	12-25	0.25" - 1.0"	Subcanopy	5%	Y	FACU
* Subcanopy species - not held to monitoring height requirements								
** The only change from the as-built planting list is Slippery Elm is being substituted for Tulip Poplar.								

December 15, 2021

SHEET 2.4

SHEET 2.7

SHEET 2.3

SHEET 2.6

SHEET 2.5

VENABLE FARM ROAD

SILOAM ROAD

LITTLE MOUNTAIN CHURCH ROAD

VENABLE CREEK

N/F
CHARLES E. BROWNE &
LU ANN V. BROWN
D.B. 525, PG. 330
P.I.N. 5927-49-7075

N/F
CHARLES E. BROWNE &
LU ANN VENABLE BROWN
D.B. 1209, PG. 520 (TRACT 2)
P.I.N. 5927-00-59-9301

N/F
LU ANN VENABLE BROWNE
D.B. 327, PG. 641
PIN: 5928-50-7069

N/F
MONTY K. VENABLE ET AL.
D.B. 205, PG. 495
PIN: 5928-60-5518

N/F
MONTY K. VENABLE ET AL.
D.B. 313, PG. 722
PIN: 5927-68-4669

N/F
LU ANN V. BROWN
D.B. 1209, PG. 520 (TRACT 1)
PIN: 5928-70-6435

UT1
UT2
UT2A
UT3
UT4
UT5
UT6

LOD
CE
OUE

0' 150' 300' 450'
(HORIZONTAL)

N

WILDLANDS ENGINEERING
1430 South Mint Street, Suite 104
Charlotte, NC 28203
Tel: 704.332.7754
License No. F-0831

NORTH CAROLINA PROFESSIONAL SEAL 029340 ENGINEER AARON S. EARLEY
7-2-21

Honey Mill Mitigation Site Record Drawings
Surry County, North Carolina

Planting Overview
Planting

Revisions:

Date: June 18, 2021
Job Number: 005-02123
Project Engineer: ASE
Drawn By: HCC
Checked By: JCK

Sheet 2.2

X:\Shared\Projects\005-02178 Honey Mill\Monitoring\Baseline Monitoring\Plans\02178 - Planting.dwg

APPENDIX G. Correspondence

December 7, 2021

Ms. Kim Browning
Mitigation Project Manager
United States Army Corps of Engineers
69 Darlington Avenue
Wilmington, NC 28403-1343

Subject: Monitoring Year 0 Report Comments
Honey Mill Mitigation Site, Surry County
Yadkin River Basin HUC 03040101
DMS Project ID #100083
USACE #SAW-2018-01789

Dear Ms. Browning:

Thank you for your October 29, 2021 comment email for the Honey Mill Mitigation Site Monitoring Year 0 report. We will make the necessary revisions to the documents and take action at the site as described in our responses below. All revisions have been incorporated into the MY1 report.

USACE Comments, Kim Browning:

1. USACE concurs with DWR's comments, particularly #3. The Mitigation Goals and Objectives in the final mitigation plan state that existing forested riparian buffers will be enhanced and protected. The project implementation portion of the final mit plan states that along each restoration and enhancement reach, cattle will be excluded, and open areas of the buffer will be planted. Removing supplemental planting is a modification to what was agreed upon and changes the overall functional return. The IRT requires that the originally agreed upon planting plan be implemented or credit ratios on UT2, UT2A and UT5 will be adjusted prior to the next credit release.

WILDLANDS RESPONSE: During construction, several pockets of non-forested areas within the wooded buffer were identified. Wildlands took the approach of redistributing the bare roots to focus on these areas using denser spacing (12' vs. 25'). The total number of bare roots planted matched the quantity in the mitigation plan. While we understand that this is a modification to the approved mitigation plan, the approach we took addressed several open areas within the established wooded buffer. Wildlands will plant all areas initially identified in the IRT approved mitigation plan during the upcoming 2021/2022 dormant season.

2. The legend on Figure 3 shows the same symbols for permanent and mobile veg plots.

WILDLANDS RESPONSE: The legend on Figure 3 will be revised to differentiate the types of veg plots.

3. The 10-ft farm path should be shown on the figures in future monitoring reports.

WILDLANDS RESPONSE: The farm path will be shown on all future monitoring reports.

4. Do the allowable activities in the easement exceptions allow for maintenance of the farm path? The IRT would have preferred for the farm path to be excluded from the easement.

WILDLANDS RESPONSE:: While we understand that ideally the path should be outside the easement, Wildlands agreed with DMS in this instance to leave the path in the easement as an exception. The easement exemptions do allow for maintenance of the farm path. The landowner is aware of the limits of the path within the easement.

The farm path located inside the conservation easement and the crossing that extends outside of the internal crossing cutout were reviewed by DMS, NC DEQ Stewardship and NC SPO. Both areas were added to the DEQ Stewardship GIS infrastructure geodatabase and were documented in the DEQ Stewardship project file. The landowner will be able to maintain the crossing and farm path as constructed. The landowner should notify DEQ Stewardship prior to conducting maintenance work inside the conservation easement.

NCDWR Comments, Erin Davis:

1. Section 1.3.2 (UT5) – The narrative states that pre-construction the downstream channel's flow disconnected from the original stream alignment and during construction the disconnected portion of channel was abandoned and backfilled and the flow was reconnected with its natural flow path. Why was this not shown as a deviation on the Sheet 1.33 redline?

WILDLANDS RESPONSE: Wildlands realizes the description of UT5 in section 1.3.2 is misleading and will revise it for clarity.

2. Section 5.1.6 – Please elaborate on the data point based alignment change for the upstream portion of UT5 (Enhancement II reach).

WILDLANDS RESPONSE: The alignment along the upstream portion of UT5 wasn't actually changed. It is in the original location as mapped on the preliminary jurisdictional delineation (pJD). The alignment shown in design plans was incorrect, but unfortunately this discrepancy wasn't caught until the record drawings were being created. At the time, Wildlands redrew the alignment based on the pJD and decided to show it as a red line because it deviated from the design plans.

3. Section 5.1.7 – The statement, "Some areas of supplemental planting were removed at the engineer's discretion", is not a valid justification for altering the planting plan that was submitted and approved in the Final Mitigation Plan. It appears that no supplemental planting was completed in the riparian buffers along UT2, UT2A, UT5. Additionally, only half of the riparian buffers along UT3, UT4, UT6 and sections of Venable Creek were supplemental planted. Based on the redline drawings this appears to be a substantial modification to the approved Plan. Please provide a percent area of the Shaded Supplemental Planting Zone that was not planted. DWR is recommending that supplemental plantings in these areas be implemented in accordance with the approved Plan during the next dormant season or adjustments to credit ratios be considered.

WILDLANDS RESPONSE: Please refer to USACE comment 1 response.

4. Section 5.1.8 – For the section of fence line removal, what was the adjacent land use changed to?

WILDLANDS RESPONSE: Cattle were removed from that parcel and land use is now open agricultural field. The fence was not installed so that the landowner could timber outside the easement. The landowner understands that if cattle are reintroduced in the future, fence must be installed.

5. Section 5.2.2 – Are there any long term management concerns with having the culvert extend beyond the internal crossing? Will it require additional coordination with Stewardship on any pipe maintenance/replacement?

WILDLANDS RESPONSE: A letter was mailed to the landowner explaining the allowable limits of culvert maintenance. The farm path located inside the conservation easement and the crossing that extends outside of the internal crossing cutout were reviewed by DMS, NC DEQ Stewardship and NC SPO. Both areas were added to the DEQ Stewardship GIS infrastructure geodatabase and were documented in the DEQ Stewardship project file. The landowner will be able to maintain the crossing and farm path as constructed. The landowner should notify DEQ Stewardship prior to conducting maintenance work inside the conservation easement.

6. Sheet 1.8 – Please confirm that the pre-construction profile as shown resulted in no changes with ford crossing installation.

WILDLANDS RESPONSE: Wildlands was on-site during construction and ensured that the ford was installed at grade.

7. Table 9 – It's very nice to see a good species diversity across all of the veg plots.

WILDLANDS RESPONSE: Noted.

USEPA Comments, Todd Bowers:

1. I noted all (very few) redline changes in the plan diagrams and concur with all changes. My only comment is that structures update in red for the plan views should also appear in the stream profile to help illustrate differences in the planned or designed grade and the actual grade of either the thalweg or banks.

WILDLANDS RESPONSE: Wildlands does not normally show structure invert elevations or structure type deviations on the record drawing profile. We do show significant changes in the profile as red in the record drawings. Since the structures were installed within acceptable tolerances, no elevation deviations were shown on the profile.

2. Figures 3.3, 3.4 and Sheet 1.5: What happened to the fence that seems to end around UT2B and begins again around the top of UT5? It appears open ended but is this suitable even with the change in land use (livestock removal) of the adjacent (former) pasture?

WILDLANDS RESPONSE: Please refer to NCDWR comment 4 response.

3. Very pleased to see additional land fenced off on the north side of Venable Creek to provide more buffer between the pasture and the riparian zone within the conservation easement.

WILDLANDS RESPONSE: Noted.

4. Encroachment of CE due to requested landowner access road noted with no corrective action needed.

WILDLANDS RESPONSE: Noted.

5. Planting followed the plan very closely with just a few minor substitutions; all appear suitable and maintains a diverse mix of species and habits.

WILDLANDS RESPONSE: Noted.

6. UT2B does not appear on the Planting Plan sheets 2.2 and 2.5.

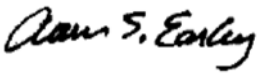
WILDLANDS RESPONSE: See response to USACE comment 1 above.

7. All the photos of the streams, veg plots, and mature trees are excellent.

WILDLANDS RESPONSE: Noted.

Please contact me at 704-332-7754 extension 109 if you have any questions.

Thank you,



Aaron Earley, PE, CFM
Senior Water Resources Engineer

To: DMS Technical Workgroup, DMS operations staff

From: Periann Russell, Division of Mitigation Services (DMS)

RE: Pebble count data requirements

Date: October 19, 2021

The DMS Technical Work Group met September 29, 2021 to discuss Interagency Review Team (IRT) and DMS requirements for collecting pebble count data as part of monitoring (MY0-MYx). Agreement was reached between all attending parties that pebble count data will not be required during the monitoring period for all future projects.

Sediment data and particle distribution will still be required for the mitigation plan as part of the proposed design explanation and justification.

Pebble counts and/or particle distributions currently being conducted by providers for annual monitoring may be discontinued at the discretion of the DMS project manager. If particle distribution was listed as a performance standard in the project mitigation plan, the provider is required to communicate the intent to cease data collection with the DMS project manager. The absence of pebble count data in future monitoring reports where pebble count data was listed as part of monitoring in the mitigation plan must be documented in the monitoring report. The September 29, 2021 Technical Work Group meeting may be cited as the source of the new policy.

The IRT reserves the right to request pebble count data/particle distributions if deemed necessary during the monitoring period.

Jeff Turner

From: Kristi Suggs
Sent: Tuesday, November 23, 2021 1:08 PM
To: Jeff Turner
Subject: FW: [External] FW: Pebble Count Data Requirements

Please see below.

Kristi Suggs | *Senior Environmental Scientist*
O: 704.332.7754 x110 **M**: 704.579.4828

Wildlands Engineering, Inc.
1430 S. Mint St, Suite 104
Charlotte, NC 28203

From: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>
Sent: Thursday, November 18, 2021 3:56 PM
To: Kristi Suggs <ksuggs@wildlandseng.com>
Cc: Mimi Caddell <mcaddell@wildlandseng.com>
Subject: RE: [External] FW: Pebble Count Data Requirements

Kristi,

You may implement the new pebble count policy on any of the projects that I manage in accordance with the policy and your own professional judgement. Please feel free to utilize pebble count data for any site that you determine would benefit from the analysis. Some sites may have specific performance criteria or other factors where pebble counts could be required.

Let me know if you have any questions,

Kelly Phillips
Project Manager
NCDEQ Division of Mitigation Services

919-723-7565
kelly.phillips@ncdenr.gov

610 East Center Avenue
Suite 301
Mooresville, NC 28115

From: Kristi Suggs <ksuggs@wildlandseng.com>
Sent: Wednesday, October 27, 2021 1:26 PM
To: Phillips, Kelly D <Kelly.Phillips@ncdenr.gov>

Cc: Mimi Caddell <mcaddell@wildlandseng.com>
Subject: [External] FW: Pebble Count Data Requirements

Kelly,

Jason Lorch in our Raleigh Office forwarded this meeting memo to me. It says that conducting pebble counts for DMS monitoring (MY0 – MY7) projects is no longer needed as long as it has been okayed by the DMS PM. Moving forward, are you going to allow us to stop doing them on your projects? Please let me know. Thank you!

Kristi

Kristi Suggs | *Senior Environmental Scientist*
O: 704.332.7754 x110 **M**: 704.579.4828

Wildlands Engineering, Inc.
1430 S. Mint St, Suite 104
Charlotte, NC 28203

From: Jason Lorch <jlorch@wildlandseng.com>
Sent: Monday, October 25, 2021 9:05 AM
To: Kristi Suggs <ksuggs@wildlandseng.com>
Subject: FW: Pebble Count Data Requirements

FYI!

Jason Lorch, GISP | *Senior Environmental Scientist*
O: 919.851.9986 x107 **M**: 919.413.1214

Wildlands Engineering, Inc.
312 West Millbrook Road, Suite 225
Raleigh, NC 27609

From: Russell, Periann <periann.russell@ncdenr.gov>
Sent: Thursday, October 21, 2021 10:05 AM
To: King, Scott <Scott.King@mbakerintl.com>; Catherine Manner <catherine@waterlandsolutions.com>; Tugwell, Todd J CIV USARMY CESAW (US) <Todd.J.Tugwell@usace.army.mil>; adam.spiller@kci.com; Brad Breslow <bbreslow@res.us>; Davis, Erin B <erin.davis@ncdenr.gov>; gginn@wolfcreekeng.com; grant lewis <glewis@axiomenvironmental.org>; Jeff Keaton <jkeaton@wildlandseng.com>; katie mckeithan <Katie.McKeithan@mbakerintl.com>; Kayne Van Stell <kayne@waterlandsolutions.com>; Kevin Tweedy <ktweedy@eprusa.net>; Reid, Matthew <matthew.reid@ncdenr.gov>; Ryan Smith <rsmith@lmgroup.net>; Melia, Gregory <gregory.melia@ncdenr.gov>; Allen, Melonie <melonie.allen@ncdenr.gov>; Famularo, Joseph T <Joseph.Famularo@ncdenr.gov>; Rich@mogmit.com; Bryan Dick <Bryan.Dick@freese.com>; Ryan Medric <rmedric@res.us>; Kim Browning <Kimberly.D.Browning@usace.army.mil>; Kayne Van Stell <kayne@waterlandsolutions.com>; Worth Creech <worth@restorationsystems.com>; Jason Lorch <jlorch@wildlandseng.com>
Cc: Crocker, Lindsay <Lindsay.Crocker@ncdenr.gov>; Wiesner, Paul <paul.wiesner@ncdenr.gov>; Tsomides, Harry <harry.tsomides@ncdenr.gov>; Reid, Matthew <matthew.reid@ncdenr.gov>; Dow, Jeremiah J <jeremiah.dow@ncdenr.gov>; Horton, Jeffrey <jeffrey.horton@ncdenr.gov>; Ullman, Kirsten J

<Kirsten.Ullman@NCDENR.gov>; Ackerman, Anjie <anjie.ackerman@ncdenr.gov>; Blackwell, Jamie D <james.blackwell@ncdenr.gov>; Xu, Lin <lin.xu@ncdenr.gov>; Mir, Danielle <Danielle.Mir@ncdenr.gov>; Corson, Kristie <kristie.corson@ncdenr.gov>; Russell, Periann <periann.russell@ncdenr.gov>; Sparks, Kimberly L <Kim.sparks@ncdenr.gov>
Subject: Pebble Count Data Requirements

Please review the attached memo documenting the agreed upon policy for pebble count data requirements.
Please reply (me only) to this email if accept that this memo represents (or misrepresents) our discussion on Sept 29.
Thank you.

Periann Russell
Geomorphologist
Division of Mitigation Services, Science and Analysis
NC Department of Environmental Quality

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Physical: 217 West Jones Street Raleigh, NC 27603