



MONITORING YEAR 4 ANNUAL REPORT

Final

HOLMAN MILL MITIGATION SITE

Alamance County, NC

NCDEQ Contract 005795

DMS Project Number 96316

USACE Action ID Number 2015-00019

NCDWR Project Number 2014-0333

Data Collection Period: January - October 2019

Draft Submission Date: October 21, 2019

Final Submission Date: November 19, 2019

PREPARED FOR:



NC Department of Environmental Quality Division of Mitigation Services

1652 Mail Service Center

Raleigh, NC 27699-1652

Mitigation Project Name Holman Mill Stream Mitigation Project
 DMS ID 96316
 River Basin Cape Fear
 Cataloging Unit 03030002

County Alamance
 Date Project Instituted 2/21/2014
 Date Prepared 6/17/2019

USACE Action ID 2015-00019
 NCDWR Permit No 2014-0333

Credit Release Milestone	Stream Credits						Wetland Credits							
	Scheduled Releases (Stream)	Warm	Cool	Cold	Anticipated Release Year (Stream)	Actual Release Date (Stream)	Scheduled Releases (Forested)	Riparian Riverine	Riparian Non-riverine	Non-riparian	Scheduled Releases (Coastal)	Coastal	Anticipated Release Year (Wetland)	Actual Release Date (Wetland)
Potential Credits (Mitigation Plan)		3,915.200												
Potential Credits (As-Built Survey)		3,883.333												
1 (Site Establishment)	N/A				N/A	N/A	N/A				N/A		N/A	N/A
2 (Year 0 / As-Built)	30%	1,165.000			2016	11/4/2016	N/A				N/A		N/A	N/A
3 (Year 1 Monitoring)	10%	388.333			2017	4/3/2017	N/A				N/A		N/A	N/A
4 (Year 2 Monitoring)	10%	388.333			2018	4/25/2018	N/A				N/A		N/A	N/A
5 (Year 3 Monitoring)	10%	388.333			2019	4/26/2019	N/A				N/A		N/A	N/A
6 (Year 4 Monitoring)	5%				2020		N/A				N/A		N/A	N/A
7 (Year 5 Monitoring)	10%				2021		N/A				N/A		N/A	N/A
8 (Year 6 Monitoring)	5%				2022		N/A				N/A		N/A	N/A
9 (Year 7 Monitoring)	10%				2023		N/A				N/A		N/A	N/A
Stream Bankfull Standard	10%	388.333			2017	4/25/2018	N/A				N/A		N/A	N/A
Total Credits Released to Date		2,718.333												

NOTES:

CONTINGENCIES:

Contingencies (if any): None



Signature of Wilmington District Official Approving Credit Release

27 Sept 2019

Date

- 1 - For NCDMS, no credits are released during the first milestone
- 2 - For NCDMS projects, the second credit release milestone occurs automatically when the as-built report (baseline monitoring report) has been made available to the NCIRT by posting it to the NCDMS Portal, provided the following criteria have been met:
 - 1) Approval of the final Mitigation Plan
 - 2) Recordation of the preservation mechanism, as well as a title opinion acceptable to the USACE covering the property
 - 3) Completion of all physical and biological improvements to the mitigation site pursuant to the mitigation plan
 - 4) Receipt of necessary DA permit authorization or written DA approval for projects where DA permit issuance is not required
- 3 - A 10% reserve of credits is to be held back until the bankfull event performance standard has been met

PREPARED BY:



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EXECUTIVE SUMMARY

Wildlands Engineering, Inc. (Wildlands) completed a full delivery project at the Holman Mill Mitigation Site (Site) for the North Carolina Department of Environmental Quality Division of Mitigation Services (DMS) to restore and enhance a total of 8,717 linear feet (LF) of perennial and intermittent stream in Alamance County, NC. It is anticipated that the Site will generate 3,884 Stream Mitigation Units (SMUs) through the restoration and enhancement of six unnamed tributaries (UT to Pine Hill Branch, UT1, UT1A, UT2, UT2A, and UT2B). The project is located in the Cape Fear River Basin Hydrologic Unit Code (HUC) 03030002 (Cape Fear 02) near Snow Camp, NC (Figure 1) and is within the Cane Creek Targeted Local Watershed (TLW) (HUC 03030002050050). On-site streams flow into Cane Creek and eventually into the Haw River.

The Site is located within the Jordan Lake Water Supply Watershed, which has been designated as a Nutrient Sensitive Water. The TLW was identified in DMS's [Cape Fear River Basin Restoration Priorities 2009](#) (RBRP) report. The RBRP plan identifies agricultural operations and degraded water quality based on "fair" and "good-fair" benthic ratings as the impairments in the Cane Creek watershed. The RBRP report also identifies the successful completion of a number of stream and wetland projects within the Cane Creek watershed. The Site fully supports the Cataloging Unit (CU)-wide functional objectives stated in the 2011 Request for Proposals to reduce and control nutrient inputs, reduce and control sediment inputs, and protect and augment Significant Natural Heritage Areas in the Cape Fear 02 River Basin.

The mitigation project is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Site project area; others, such as pollutant removal and improved aquatic and terrestrial habitat, have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established with careful consideration of the goals and objectives described in the RBRP and to meet the DMS's mitigation needs, while maximizing the ecological and water quality uplift within the watershed. The following project specific goals established in the mitigation plan (Wildlands, 2015) are to:

- Reduce fecal coliform, nitrogen, and phosphorous inputs by removing cattle from streams and establishing and augmenting a forested riparian corridor to intercept and process sediment and nutrients before they reach the channel during storm events;
- Reduce sediment loads by stabilizing eroding stream banks;
- Return a network of streams to a stable form that is capable of supporting biological functions;
- Install instream structures to improve bed and bank stability, create fish and macroinvertebrate habitat, and help oxygenate streamflows; and
- Protect existing high quality streams and forested buffers.

The project is helping meet the goals for the watershed and providing numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the project area, others, such as pollutant removal and reduced sediment loading have farther-reaching effects. In addition, protected parcels downstream of the Site promote cumulative project benefits within the watershed.

The Site construction and as-built surveys were completed between January and April 2016. A conservation easement is in place on 32.4 acres of the riparian corridors to protect them in perpetuity.

Monitoring Year 4 (MY4) site visits and assessments were completed between the months of January and October 2019 to visually assess the conditions of the project and collect stream hydrology data. Per Interagency Review Team (IRT) guidelines, detailed monitoring and analysis of vegetation, substrate, and channel cross-sectional dimensions were not required during MY4. Visual observations, hydrology



data, and management practices are included in this report. To preserve the clarity and continuity of reporting structure, this report maintains section and appendix numbering from previous monitoring reports. Omitted sections are denoted in the table of contents.

Overall, Site performance for vegetation, stream geomorphology, and hydrology meet success criteria for MY4. Vegetation appears healthy and to be performing adequately to attain the interim success criteria at the end of MY5. Limited erosion was observed on UT2 Reach 4 between station 214+35 and 214+50. Visual observation indicated that stream channels have remained geomorphically stable and multiple bankfull events were recorded on all streams during MY4. Two low growth areas totaling 1.2 acres were replanted in December 2018. Several vegetative species throughout the Site were overgrowing planted trees, stunting their growth. A tree release took place in April 2019 on 3.1 acres. A 0.2-acre population of sweet gum was very dense and was removed in April 2019. The fencing that was damaged during Hurricane Florence was repaired in August 2019.



HOLMAN MILL MITIGATION SITE
Monitoring Year 4 Annual Report

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*Content omitted from Monitoring Year 4 Report

Section 1: PROJECT OVERVIEW

The Holman Mill Mitigation Site (Site) is located in southern Alamance County, southeast of Snow Camp off of Holman Mill Road (Figure 1). The Site is located within the Jordan Lake Water Supply Watershed (HUC 03030002050050) which has been designated as a Nutrient Sensitive Water. The Site is in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The project watershed consists primarily of agricultural and wooded land. The drainage area for the project site is 1,077 acres (1.68 square miles).

The project streams consist of six unnamed tributaries to Pine Hill Branch. Stream restoration reaches include UT1 (Reach 1 and 3), UT2 (Reach 3 and 4) and UT2A. Stream enhancement I (EI) and enhancement II (EII) reaches included UT1 (Reach 2 and 4), EII; UT2 (Reach 1), EII; UT2 (Reach 2), EI; UT2B, EII; UT1A, EII; and UT to Pine Hill Branch, EII. Mitigation work within the Site included restoration and enhancement of 8,717 linear feet (LF) of perennial and intermittent stream channels. The riparian areas were planted with native vegetation to improve habitat and protect water quality. The final mitigation plan was submitted and accepted by the DMS in May 2015. Construction activities were completed by Land Mechanic Designs, Inc. in March 2016. Planting and seeding activities were completed by Bruton Natural Systems, Inc. in March 2016. Baseline monitoring (MY0) was conducted between January 2016 and April 2016. Annual monitoring will occur for seven years with the close-out anticipated to commence in 2023 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for the Site.

A conservation easement (32.4 ac; Deed Book 3472, Page 968; Deed Book 3472, Page 951) has been recorded and is in place along the stream riparian corridors to protect them in perpetuity within two tracts; a tract owned by the Russell B. Hadley Revocable Trust and a tract owned by the M. Darryl Lindley Revocable Trust, respectively. The project is expected to provide 3,884 SMU's by closeout.

A project vicinity map and directions are provided in Figure 1 and project components are illustrated in Figure 2.

1.1 Project Goals and Objectives

Prior to construction activities, the streams and vegetative communities on the Site had been severely impacted due to direct livestock access to the streams and riparian zones. Table 4 in Appendix 1 and Tables 10a through 10c in Appendix 4 of the MY3 Report present the pre-restoration conditions in detail.

This Site is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Site, others such as pollutant removal and reduced sediment loading have more far-reaching effects. Expected improvements to water quality and ecological processes are outlined below as project goals and objectives. These project goals were established with careful consideration of goals and objectives that were described in the RBRP and to meet the DMS mitigation needs while maximizing the ecological and water quality uplift within the watershed.

The following project goals and related objectives established in the mitigation plan (Wildlands, 2015) included:

The primary project goals will be:

- Reduce fecal coliform, nitrogen, and phosphorous inputs by removing cattle from streams and establishing and augmenting a forested riparian corridor to intercept and process sediment and nutrients before they reach the channel during storm events;
- Reduce sediment loads by stabilizing eroding stream banks;

- Return a network of streams to a stable form that is capable of supporting biological functions;
- Install instream structures to improve bed and bank stability, create fish and macroinvertebrate habitat, and help oxygenate streamflows; and
- Protect existing high-quality streams and forested buffers.

Secondary project objectives are expected to include:

- Improving instream nutrient cycling by incorporating woody debris into constructed riffles and bank stabilization measures;
- Reducing thermal loadings through establishment of riparian shading;
- Reconnecting channels with floodplains to raise the local water table; and
- Create and implement a stream and riparian area restoration design that is both natural and aesthetically pleasing.

1.2 Monitoring Year 4 Data Assessment

Annual monitoring and quarterly site visits were conducted during MY4 to assess the condition of the project. The vegetation and stream success criteria for the Site follows the approved success criteria presented in the Holman Mill Mitigation Project Mitigation Plan (Wildlands, 2015).

1.2.1 Vegetative Assessment

Detailed vegetation inventory and analysis is not required during MY4. Visual assessment during MY4 indicated that vegetation is healthy and performing adequately to attain interim success criteria of 260 planted stems per acre and the end of MY5 and terminal success criteria of 210 planted stems per acre and averaging ten feet in height.

1.2.2 Vegetation Areas of Concern

Two areas of low stem density identified in MY3 were replanted in December 2018 totaling 1.2 acres (Figure 3.1-3.2). One area is along UT2 Reach 3, and the other is along UT to Pine Hill Branch upstream of its confluence with UT1. A mixture of one-gallon container and bare root green ash (*Fraxinus pennsylvanica*), sycamore (*Platanus occidentalis*), river birch (*Betula nigra*), swamp chestnut oak (*Quercus michauxii*), and willow oak (*Quercus phellos*) were planted at a density of 204 stems per acre. Visual monitoring will continue to assess the survivability of the supplemental planting.

A high-density area of sweetgum (*Liquidambar styraciflua*) along UT2 Reach 3 was identified in MY3 totaling 0.2 acres (Figure 3.2). This area was mechanically and chemically treated in April 2019 and will continued to be visually monitored for sweetgums.

Blackberry (*Rubus occidentalis*), Japanese honeysuckle (*Lonicera japonica*), and coralberry (*Symphoricarpos orbiculatus*) were observed overcrowding the planted trees throughout the Site and stunting their growth (Figure 3.1-3.2). A mechanical and chemical tree release was performed in April 2019 on 3.1 acres throughout the Site. Trees have thrived in the areas where the tree release was performed. Visual monitoring will continue to assess the health of the planted trees.

1.2.3 Stream Assessment

Detailed dimensional survey and analysis is not required for MY4. Visual monitoring indicated that the stream channel is performing as desired. No deposition or erosion exceeding approximate natural levels was observed. See Appendix 2 for stream photographs and visual assessment data.

During a site visit on September 26, 2019 dry channel conditions were observed at the Site. This is not unexpected for a small Slate Belt stream during drought conditions. Alamance County was experiencing moderate drought conditions at the time, according to the United States Drought Monitor (2019).



1.2.4 Stream Areas of Concern

Localized erosion was observed around one log sill affecting the downstream pool between stations 214+35 and 214+50 on UT2 Reach 4 (Figure 3.2). The length of channel affected by the scour is approximately 15 linear feet. This area will continue to be monitored and remedial action will be taken if necessary.

1.2.5 Hydrology Assessment

At the end of the seven-year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. Multiple bankfull events were recorded on all restoration reaches during MY4 and multiple bankfull events were recorded on each reach during MY1, MY2 and MY3, resulting in attainment of the stream hydrology assessment criteria. Refer to Appendix 5 for hydrologic data.

1.2.6 Maintenance Plan

As described above in Section 1.2.2 additional trees were planted during the winter of 2018 in two low stem density areas shown on the CCPV Maps (Figure 3.1-3.2). Blackberry, Japanese honeysuckle, coralberry, and sweetgum were mechanically and chemically treated on site. Visual monitoring will continue to assess the health and density of the planted trees throughout the Site.

A small section of the fencing along UT to Pine Hill Branch that was damaged during Hurricane Florence was repaired in August 2019. Since cattle did not have access to this portion of the Site, we waited for this area to dry out before accessing it with equipment to repair the fence.

1.3 Monitoring Year 4 Summary

Visual assessment indicated that all project streams are geomorphically stable and functioning as designed. A small localized area of erosion is occurring between stations 214+35 and 214+50 along UT2 Reach 4. The erosion is confined to one log sill and will be assessed during subsequent monitoring years. Survival and growth of planted trees appear to meet interim success criteria and supplemental planting was completed in December 2018 in two low growth areas. Tree release was completed in April 2019 for blackberry, Japanese honeysuckle, coralberry, and sweetgum and planted trees look healthy. Hydrology criteria has been attained for the duration of the project and multiple bankfull events were recorded again during MY4. The damaged fence along UT to Pine Hill Branch was repaired in August 2019.

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



Section 2: METHODOLOGY

Geomorphic data was 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. Crest gages and pressure transducers were installed in surveyed riffle cross sections and monitored quarterly. Hydrologic monitoring instrument installation and monitoring methods are in accordance with the United States Army Corps of Engineers (USACE, 2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-EEP Level 2 Protocol (Lee et al., 2008).

Section 3: REFERENCES

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APPENDIX 1. General Tables and Figures

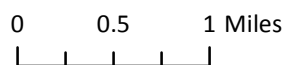
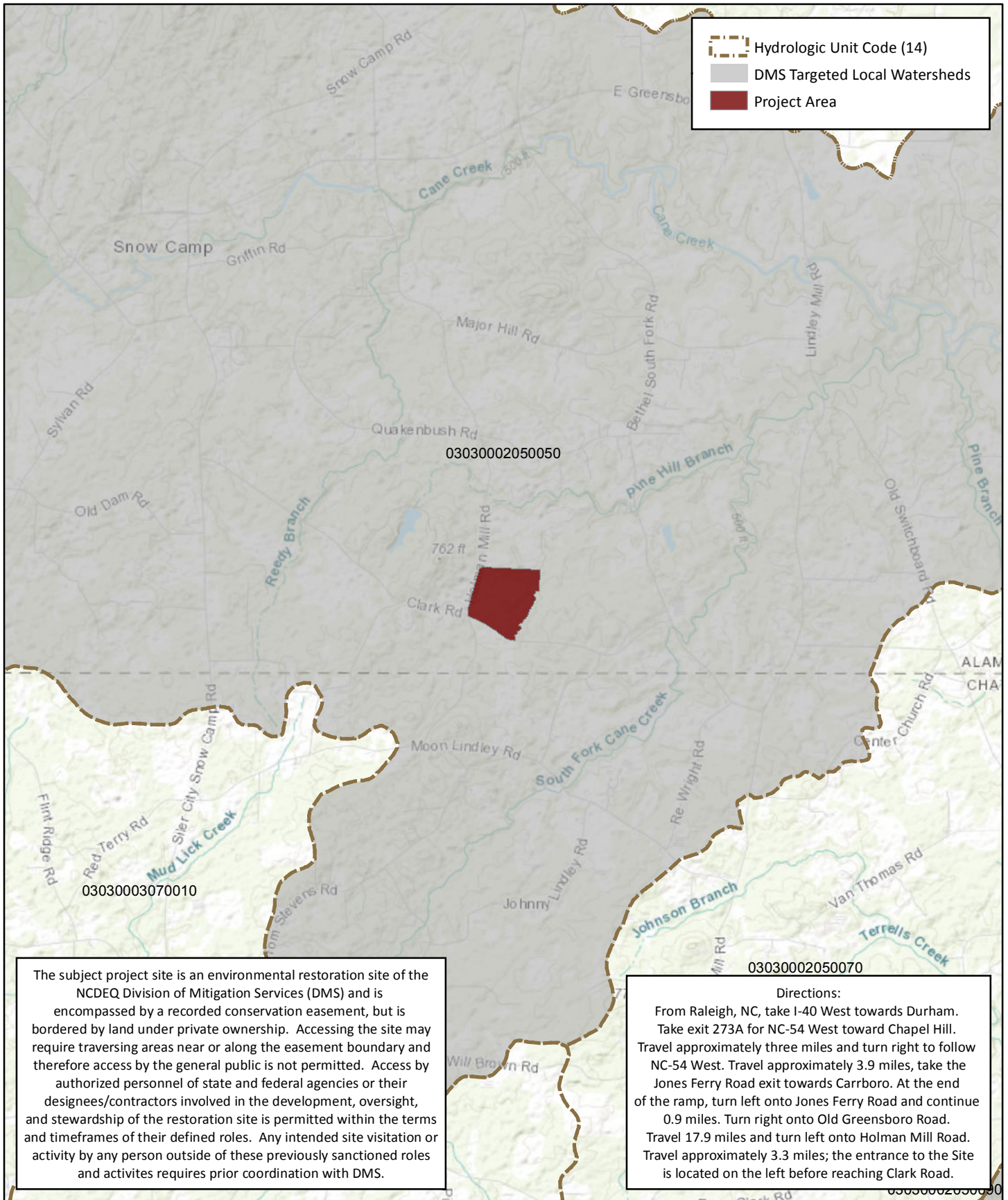


Figure 1 Project Vicinity Map
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019
 Alamance County, NC

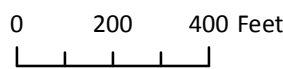
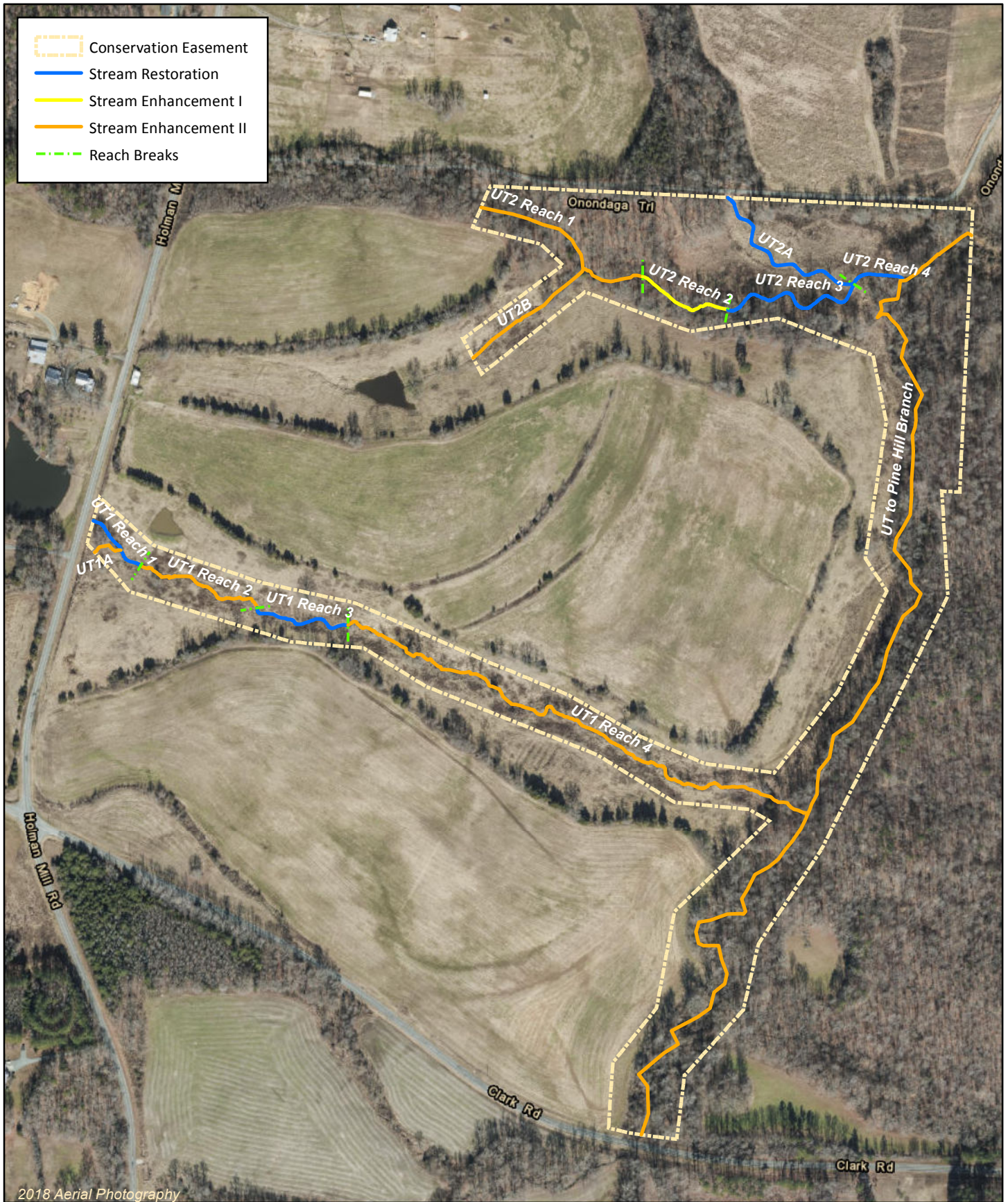


Figure 2 Project Component/ Asset Map
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019
 Alamance County, NC

Table 1. Project Components and Mitigation Credits
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019

MITIGATION CREDITS									
	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	3,884	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
PROJECT COMPONENTS									
Reach ID	As-Built Stationing / Location	Existing Footage / Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage / Acreage	Mitigation Ratio	Credits (SMU / WMU)		
STREAMS									
UT to Pine Hill Branch	600+00 - 635+26	3,526	EII	Restoration	3,526	5	705		
UT1 Reach 1	100+00 - 102+08	215	P1	Restoration	208	1	208		
UT1 Reach 2	102+08 - 106+31	433	EII	Restoration	423	2.5	169		
UT1 Reach 3	106+31 - 109+40	331	P1	Restoration	309	1	309		
UT1 Reach 4	109+40 - 125+98	1,687	EII	Restoration	1,658	2.5	663		
UT1A	400+00 - 400+94	84	EII	Restoration	94	2.5	38		
UT2A	300+00 - 305+40	468	P1	Restoration	540	1	540		
UT2 Reach 1	200+00 - 205+88	588	EII	Restoration	588	2.5	235		
UT2 Reach2	205+88 - 208+81	298	E1	Restoration	293	1.5	195		
UT2 Reach 3	208+81 - 213+63	396	P1	Restoration	482	1	482		
UT2 Reach 4	213+63 - 215+30	242	P1	Restoration	167	1	167		
UT2B	500+00 - 504+29	429	EII	Restoration	429	2.5	172		
COMPONENT SUMMATION									
Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (acres)	Upland (acres)			
		Riverine	Non-Riverine						
Restoration	1,706	-	-	-	-	-			
Enhancement		-	-	-	-	-			
Enhancement I	293								
Enhancement II	6,718								
Creation		-	-	-					
Preservation		-	-	-					
High Quality Preservation		-	-	-					

Table 2. Project Activity and Reporting History

Holman Mill Mitigation Site
 DMS Project No. 96316
Monitoring Year 4 - 2019

Activity or Report	Date Collection Complete	Completion or Scheduled Delivery
Mitigation Plan	April 2014 - April 2015	May 2015
Final Design - Construction Plans	May 2015 - October 2015	October 2015
Construction	January 2016 - March 2016	March 2016
Temporary S&E mix applied to entire project area ¹	March 2016	March 2016
Permanent seed mix applied to reach/segments ¹	March 2016	March 2016
Bare root and live stake plantings for reach/segments	March 2016	March 2016
Baseline Monitoring Document (Year 0)	Stream Survey	March 2016
	Vegetation Survey	March 2016
Year 1 Monitoring	Stream Survey	September 2016
	Vegetation Survey	September 2016
Year 2 Monitoring	Stream Survey	March 2017
	Vegetation Survey	August 2017
Year 3 Monitoring	Stream Survey	March 2018
	Vegetation Survey	August 2018
Replanting		December 2018
Sweetgum Removal		April 2019
Tree Release		April 2019
Fence Repaired		August 2019
Year 4 Monitoring	Stream Survey	Not Required
	Vegetation Survey	Not Required
Year 5 Monitoring	Stream Survey	2020
	Vegetation Survey	2020
Year 6 Monitoring	Stream Survey	2021
	Vegetation Survey	2021
Year 7 Monitoring	Stream Survey	2022
	Vegetation Survey	2022

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

Table 3. Project Contact Table

Holman Mill Mitigation Site
 DMS Project No. 96316
Monitoring Year 4 - 2019

Designer Angela Allen, PE	Wildlands Engineering, Inc. 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986, ext. 106
Construction Contractor	Land Mechanic Designs, Inc. 126 Circle G Lane Willow Spring, NC 27592
Planting Contractor	Bruton Natural Systems, Inc P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	Land Mechanic Designs, Inc. 126 Circle G Lane Willow Spring, NC 27592
Seed Mix Sources	Green Resource, LLC
Nursery Stock Suppliers	Dykes and Son Nursery
Bare Roots	Bruton Natural Systems, Inc
Live Stakes	Wildlands Engineering, Inc. Jason Lorch 919.851.9986, ext. 107
Monitoring Performers Monitoring, POC	

Table 4. Project Information and Attributes

Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019

PROJECT INFORMATION						
Project Name	Holman Mill Mitigation Site					
County	Alamance County					
Project Area (acres)	32.4 Acres					
Project Coordinates (latitude and longitude)	35°51'310.12"N, 79°23'16.00"W					
PROJECT WATERSHED SUMMARY INFORMATION						
Physiographic Province	Carolina Slate Belt of the Piedmont Physiographic Province					
River Basin	Cape Fear River					
USGS Hydrologic Unit 8-digit	03030002					
USGS Hydrologic Unit 14-digit	03030002050050					
DWR Sub-basin	03-06-04					
Project Drainage Area (acres)	1,077					
Project Drainage Area Percentage of Impervious Area	3%					
CGIA Land Use Classification	49% Forested/Scrubland, 42% Agriculture/Managed Herbaceous, 4% Pasture, 3% Watershed Impervious Cover, 2% Residential, <1% Open Water					
REACH SUMMARY INFORMATION						
Parameters	UT to Pine Hill Branch	UT1	UT1A	UT2	UT2A	UT2B
Length of reach (linear feet) - Post-Restoration	3,526	2,598	94	1,530	540	429
Drainage area (acres)	1,077	102	20	130	47	18
NCDWR stream identification score	44.5	33.5/30.5	25.5	35	36.75	26.5
NCDWR Water Quality Classification	N/A					
Morphological Description (stream type)	P	P	I	P	P	I
Evolutionary trend (Simon's Model) - Pre- Restoration	I	II	NA	III/IV	III/IV	NA
Underlying mapped soils	Georgeville silty clay loam, Local alluvial land, Herndon silt loam, Goldston Channery silt loam					
Drainage class	---	---	---	---	---	---
Soil Hydric status	---	---	---	---	---	---
Slope	---	---	---	---	---	---
FEMA classification	AE	AE	---	AE	AE	---
Native vegetation community	Piedmont bottomland forest, Bottomland hardwood forest					
Percent composition exotic invasive vegetation - Post-Restoration	0%					
REGULATORY CONSIDERATIONS						
Regulation	Applicable?	Resolved?	Supporting Documentation			
Waters of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No.27 and DWQ			
Waters of the United States - Section 401	Yes	Yes	401 Water Quality Certification No. 3885.			
Division of Land Quality (Dam Safety)	No	N/A	N/A			
Endangered Species Act	Yes	Yes	Holman Mill Mitigation Plan (2015); Wildlands determined "no effect" on Alamance County listed endangered species.			
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 3/24/14).			
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A			
FEMA Floodplain Compliance	Yes	Yes	UT to Pine Hill Branch and portions of UT2 and UT2A are located within the floodway and flood fringe (FEMA Zone AE, FIRM panel 8786).			
Essential Fisheries Habitat	No	N/A	N/A			

APPENDIX 2. Visual Assessment Data



2018 Aerial Photography

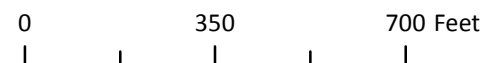


Figure 3.0 Integrated Current Condition Plan View (Key)
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019
 Alamance County, NC



Figure 3.1 Integrated Current Condition Plan View
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019



2018 Aerial Photography

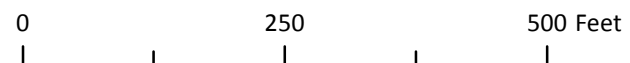


Figure 3.2 Integrated Current Condition Plan View
 Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019

Table 5a. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT1

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	14	14			100%			
	3. Meander Pool Condition	Depth Sufficient	13	13			100%			
		Length Appropriate	13	13			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	12	12			100%			
		Thalweg centering at downstream of meander bend (Glide)	13	13			100%			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	10	10			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	10	10			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	10	10			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	10	10			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	10	10			100%			

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

Table 5b. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT1A

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	3	3			100%			
	3. Meander Pool Condition	Depth Sufficient	n/a	n/a			n/a			
		Length Appropriate	n/a	n/a			n/a			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	n/a	n/a			n/a			
		Thalweg centering at downstream of meander bend (Glide)	n/a	n/a			n/a			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

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

Table 5c. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT2

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	13	14			93%			
	3. Meander Pool Condition	Depth Sufficient	10	10			100%			
		Length Appropriate	10	10			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	13	13			100%			
		Thalweg centering at downstream of meander bend (Glide)	13	13			100%			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			1	15	99%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
Totals					0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	3	3			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	3	3			100%			

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

Table 5d. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT2A

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	11	11			100%			
	3. Meander Pool Condition	Depth Sufficient	10	10			100%			
		Length Appropriate	10	10			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	11	11			100%			
		Thalweg centering at downstream of meander bend (Glide)	10	10			100%			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	2	2			100%			

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

Table 5e. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT2B

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	n/a	n/a			n/a			
	3. Meander Pool Condition	Depth Sufficient	n/a	n/a			n/a			
		Length Appropriate	n/a	n/a			n/a			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	n/a	n/a			n/a			
		Thalweg centering at downstream of meander bend (Glide)	n/a	n/a			n/a			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

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

Table 5f. Visual Stream Morphology Stability Assessment Table

Holman Mill Mitigation Project
 DMS Project No. 96316
 Monitoring Year 4 - 2019

UT to Pine Hill Branch

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run Units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	n/a	n/a			n/a			
	3. Meander Pool Condition	Depth Sufficient	n/a	n/a			n/a			
		Length Appropriate	n/a	n/a			n/a			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	n/a	n/a			n/a			
		Thalweg centering at downstream of meander bend (Glide)	n/a	n/a			n/a			
Totals					0	0	100%	n/a	n/a	n/a
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
3. Engineered Structures¹	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	n/a	n/a			n/a			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	n/a	n/a			n/a			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	n/a	n/a			n/a			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	n/a	n/a			n/a			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow.	n/a	n/a			n/a			

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

Table 6. Vegetation Condition Assessment Table

Holman Mill Mitigation Project

DMS Project No. 96316

Monitoring Year 4 - 2019

Planted Acreage 14

Vegetation Category	Definitions	Mapping Threshold (Ac)	Number of Polygons	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material	0.1	0	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1	0	0.0	0%
Total			0	0.0	0%
Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 Ac	0	0	0%
Cumulative Total			0	0.0	0%

Easement Acreage 32.4

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

Stream Photographs



PHOTO POINT 1 UT1A – looking upstream (6/13/2019)



PHOTO POINT 1 UT1A – looking downstream (6/13/2019)



PHOTO POINT 2 UT1A – looking upstream (6/13/2019)



PHOTO POINT 2 UT1A – looking downstream (6/13/2019)



PHOTO POINT 3 UT1 – looking upstream (6/13/2019)



PHOTO POINT 3 UT1 – looking downstream (6/13/2019)



PHOTO POINT 4 UT1 – looking upstream (05/23/2019)



PHOTO POINT 4 UT1 – looking downstream (05/23/2019)



PHOTO POINT 5 UT1 – looking upstream (05/23/2019)



PHOTO POINT 5 UT1 – looking downstream (05/23/2019)



PHOTO POINT 6 UT1 – looking upstream (05/23/2019)



PHOTO POINT 6 UT1 – looking downstream (05/23/2019)



PHOTO POINT 7 UT1 – looking upstream (05/23/2019)



PHOTO POINT 7 UT1 – looking downstream (05/23/2019)



PHOTO POINT 8 UT1 – looking upstream (05/23/2019)



PHOTO POINT 8 UT1 – looking downstream (05/23/2019)



PHOTO POINT 9 UT1 – looking upstream (05/23/2019)



PHOTO POINT 9 UT1 – looking downstream (05/23/2019)



PHOTO POINT 10 UT1 – looking upstream (05/23/2019)



PHOTO POINT 10 UT1 – looking downstream (05/23/2019)



PHOTO POINT 11 UT1 – looking upstream (05/23/2019)



PHOTO POINT 11 UT1 – looking downstream (05/23/2019)



PHOTO POINT 12 UT1 – looking upstream (05/23/2019)



PHOTO POINT 12 UT1 – looking downstream (05/23/2019)



PHOTO POINT 13 UT1 – looking upstream (05/23/2019)



PHOTO POINT 13 UT1 – looking downstream (05/23/2019)



PHOTO POINT 14 UT1 – looking upstream (05/23/2019)



PHOTO POINT 14 UT1 – looking downstream (05/23/2019)



PHOTO POINT 15 UT1 – looking upstream (05/23/2019)



PHOTO POINT 15 UT1 – looking downstream (05/23/2019)



PHOTO POINT 16 UT1 – looking upstream (05/23/2019)



PHOTO POINT 16 UT1 – looking downstream (05/23/2019)



PHOTO POINT 17 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 17 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 18 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 18 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 19 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 19 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 20 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 20 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 21 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 21 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 22 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 22 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 23 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 23 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 24 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 24 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 25 UT - PHB – looking upstream (05/23/2019)



PHOTO POINT 25 UT - PHB – looking downstream (05/23/2019)



PHOTO POINT 26 UT - PHB – looking upstream (05/21/2019)



PHOTO POINT 26 UT - PHB – looking downstream (05/21/2019)



PHOTO POINT 27 UT - PHB – looking upstream (05/21/2019)



PHOTO POINT 27 UT - PHB – looking downstream (05/21/2019)



PHOTO POINT 28 UT - PHB – looking upstream (05/21/2019)



PHOTO POINT 28 UT - PHB – looking downstream (05/21/2019)



PHOTO POINT 29 UT - PHB – looking upstream (05/21/2019)



PHOTO POINT 29 UT - PHB – looking downstream (05/21/2019)



PHOTO POINT 30 UT2B – looking upstream (05/21/2019)



PHOTO POINT 30 UT2B – looking downstream (05/21/2019)



PHOTO POINT 31 UT2B – looking upstream (05/21/2019)



PHOTO POINT 31 UT2B – looking downstream (05/21/2019)



PHOTO POINT 32 UT2B – looking upstream (6/13/2019)



PHOTO POINT 32 UT2B – looking downstream (6/13/2019)

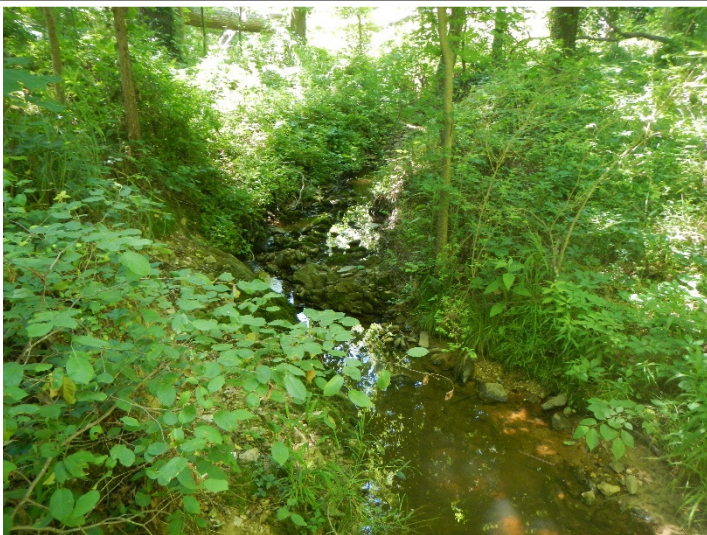


PHOTO POINT 33 UT2 – looking upstream (05/21/2019)



PHOTO POINT 33 UT2 – looking downstream (05/21/2019)



PHOTO POINT 34 UT2 – looking upstream (05/21/2019)



PHOTO POINT 34 UT2 – looking downstream (05/21/2019)



PHOTO POINT 35 UT2 – looking upstream (05/21/2019)



PHOTO POINT 35 UT2 – looking downstream (05/21/2019)



PHOTO POINT 36 UT2 – looking upstream (05/21/2019)



PHOTO POINT 36 UT2 – looking downstream (05/21/2019)



PHOTO POINT 37 UT2 – looking upstream (05/21/2019)



PHOTO POINT 37 UT2 – looking downstream (05/21/2019)



PHOTO POINT 38 UT2 – looking upstream (05/21/2019)



PHOTO POINT 38 UT2 – looking downstream (05/21/2019)

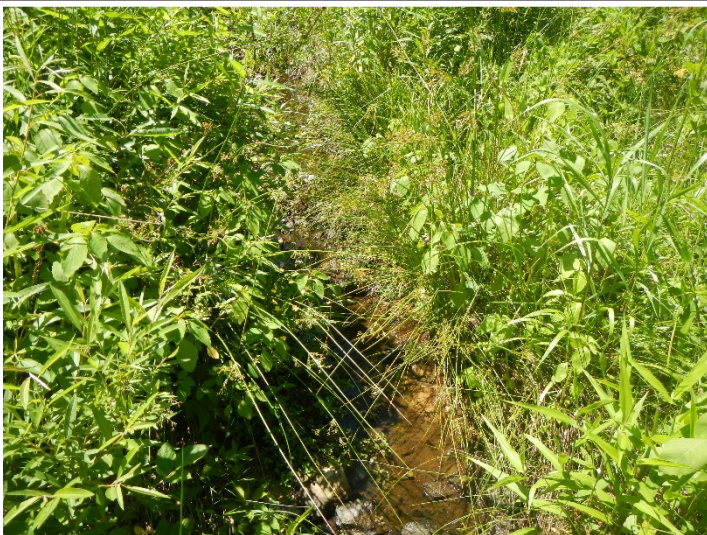


PHOTO POINT 39 UT2 – looking upstream (05/21/2019)



PHOTO POINT 39 – looking downstream (05/21/2019)



PHOTO POINT 40 UT2 – looking upstream (05/21/2019)



PHOTO POINT 40 UT2 – looking downstream (05/21/2019)



PHOTO POINT 41 UT2 – looking upstream (05/21/2019)



PHOTO POINT 41 UT2 – looking downstream (05/21/2019)



PHOTO POINT 42 UT2A – looking upstream (6/13/2019)



PHOTO POINT 42 UT2A – looking downstream (6/13/2019)



PHOTO POINT 43 UT2A – looking upstream (05/21/2019)



PHOTO POINT 43 UT2A – looking downstream (05/21/2019)



PHOTO POINT 44 UT2A – looking upstream (05/21/2019)



PHOTO POINT 44 UT2A – looking downstream (05/21/2019)



PHOTO POINT 45 UT2A – looking upstream (05/21/2019)

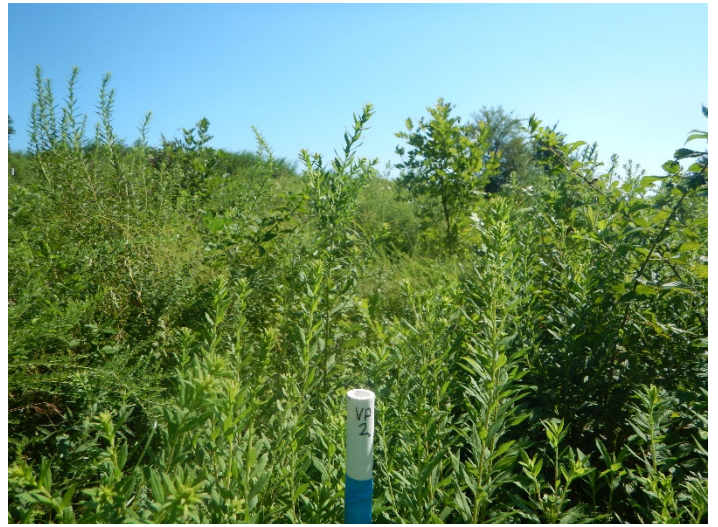


PHOTO POINT 45 UT2A – looking downstream (05/21/2019)

Vegetation Photographs



Vegetation Plot 1 (08/07/2019)



Vegetation Plot 2 (08/07/2019)



Vegetation Plot 3 (08/07/2019)



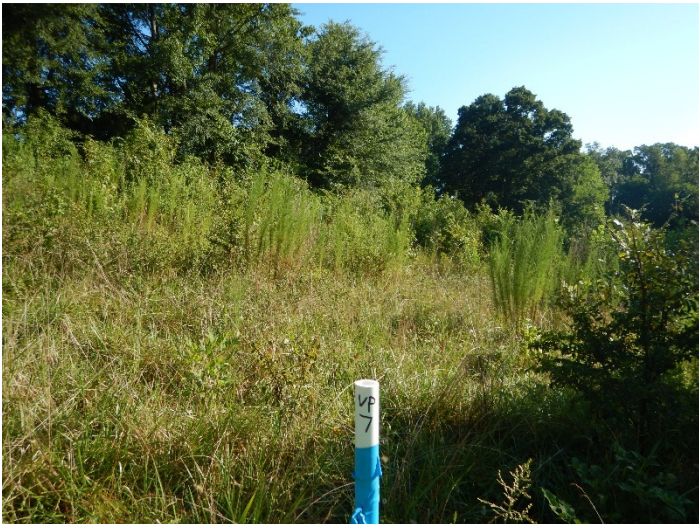
Vegetation Plot 4 (08/07/2019)



Vegetation Plot 5 (08/07/2019)



Vegetation Plot 6 (08/07/2019)



Vegetation Plot 7 (08/07/2019)



Vegetation Plot 8 (08/07/2019)



Vegetation Plot 9 (08/07/2019)



Vegetation Plot 10 (08/07/2019)



Vegetation Plot 11 (08/07/2019)



Vegetation Plot 12 (08/07/2019)

APPENDIX 3. Vegetation Plot Data

Vegetation inventory and analysis not required during MY4

APPENDIX 4. Morphological Summary Data and Plots

Morphological survey and analysis not required during MY4

APPENDIX 5. Hydrology Summary Data

Table 13. Verification of Bankfull Events

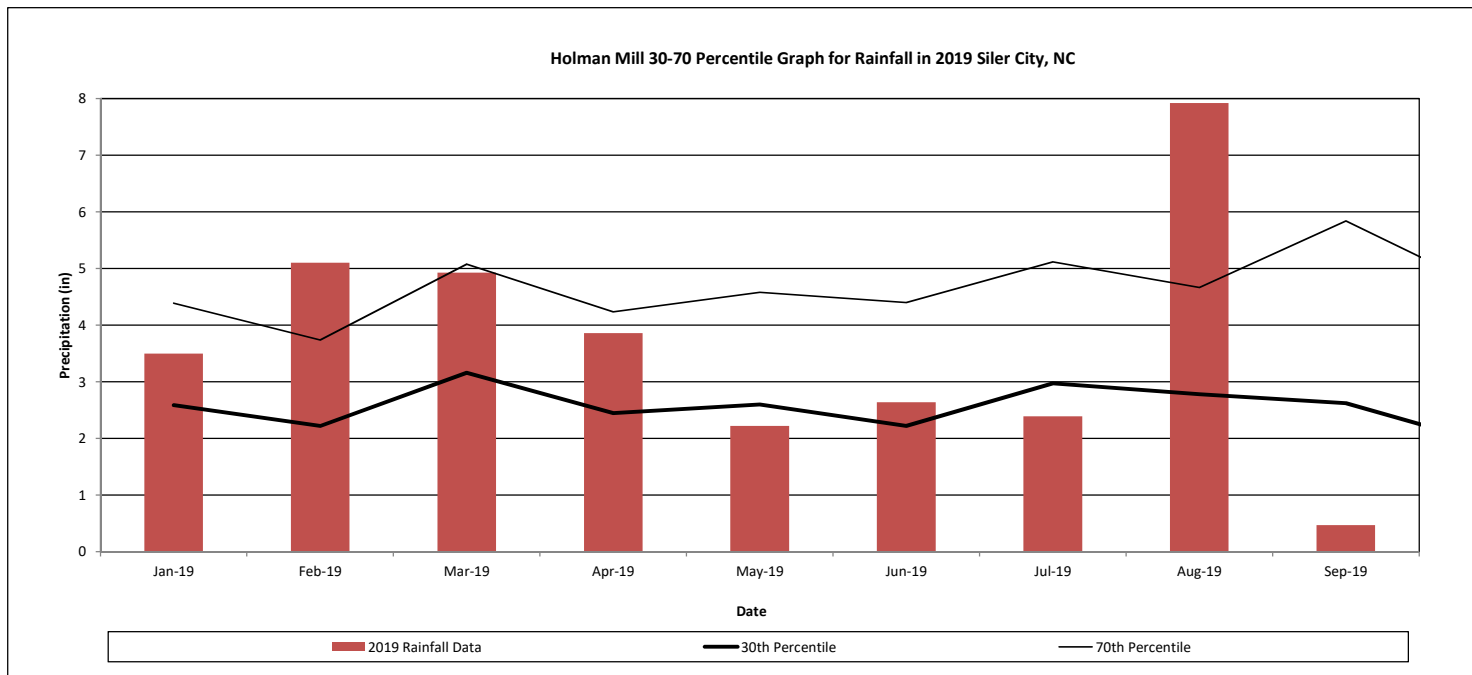
Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019

Reach	MY1		MY2		MY3		MY4		Method
	Date of Data Collection	Date of Occurrence	Date of Data Collection	Date of Occurrence	Date of Data Collection	Date of Occurrence	Date of Data Collection	Date of Occurrence	
UT1	9/6/2016	7/31/2016	3/8/2017	4/24/2017	8/6/2018	8/8/2018	9/26/2019	3/21/2019	Crest Gage/ Pressure Transducer
	10/11/2016	10/8/2016	10/17/2017	6/20/2017	10/19/2018	9/17/2018*		4/13/2019	
UT2	9/6/2016	7/31/2016	3/8/2017	4/24/2017	8/6/2018	8/8/2018	9/26/2019	3/21/2019	
	10/11/2016	10/8/2016	10/17/2017	6/20/2017	10/19/2018	9/17/2018*		4/13/2019	
UT2A	9/6/2016	7/31/2016	3/8/2017	4/24/2017	8/6/2018	8/8/2018	9/26/2019	3/21/2019	
	10/11/2016	10/8/2016	10/17/2017	6/20/2017	10/19/2018	9/17/2018*		4/13/2019	

*Hurricane Florence

Monthly Rainfall Data

Holman Mill Mitigation Site
 DMS Project No. 96316
 Monitoring Year 4 - 2019



¹ 2019 monthly rainfall from USDA Station SILER CITY (317924)

² 30th and 70th percentile rainfall data collected from weather station Siler City 2 N, NC7924 (USDA, 2018).