Annual Monitoring Report

Mill Dam Creek Restoration Site
Yadkin River Basin - 03040101
Monitoring Year 03
DEQ Contract 6898
DMS Project Number 97136
DMS RFP No. 16-006706 (Date of Issue: October 21, 2015)

DWR #: 18-1349
USACE Action ID: 2016-01335
Yadkin County, North Carolina

Prepared for:
NC Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699

Data Collected: 2022
Date Submitted: January 2023

Monitoring and Design Firm

Prepared by:

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(919) 783-9214

Project Contact: Adam Spiller
Email: adam.spiller@kci.com

KCI ASSOCIATES OF NORTH CAROLINA, PA

ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS
4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 (919) 783-9214 (919) 783-9266 Fax

MEMORANDUM

Date: February 10, 2023
To: Matthew Reid, DMS Project Manager
From: Adam Spiller, Project Manager
KCI Associates of North Carolina, PA
Subject: Mill Dam Creek Stream Restoration Site
MY-03 Monitoring Report Comments
Yadkin River Basin CU 03040101
NCDMS Project # 97136
Contract # 6898

Please find below our responses in italics to the MY-03 Monitoring Report comments from NCDMS received on February 6, 2023, for the Mill Dam Creek Stream Restoration Site.

- Please ensure the Monitoring Phase Performance Bond has been updated and approved by Kristie Corson before invoicing for Task 9.
  KCI Response: The Performance Bond will be updated as necessary before Task 9 is invoiced.

- Title Page: Please add DMS RFP No. 16-006706 and Date of Issue: October 21, 2015.
  KCI Response: This change has been made.

- In an effort to identify and resolve property issues early during the monitoring period, please verify that the conservation easement boundary has been walked, marking and signage is up to spec, fencing is intact, and no encroachments have been identified.
  KCI Response: The easement was inspected during the visual assessment of the site that was completed on January 10, 2023. No issues were identified during this inspection.

- Monitoring Results: Recommend specifying XS#'s when discussing the XS entrenchment ratios instead of saying "Both of these cross sections…"
  KCI Response: This change has been made.

- Live stake supplemental planting is planned for February 2023. Please include an update in the MY4 report for this effort. Please include species list, numbers, etc.
  KCI Response: This information will be included in the MY04 report.

- Table 2 does not indicate that any invasive species work has been conducted on the site. Have any treatments occurred? Please update table with dates if applicable. Invasives were noted on the IRT site visit in August 2022 in areas that had not been cleared during construction.
  KCI Response: Invasive treatments were conducted on the site in 2021 and 2022. The dates of these treatments have been added to Table 2 and a brief discussion of the 2022 treatment has been added to the narrative section of the report.

- CCPV: Currently there are several reaches not shown on CCPV sheets. Can sheets 3 and 4 be modified to show all project reaches? Also, the legend conceals reaches on several sheets. Can this also be revised to clearly see the project?
  KCI Response: The CCPV has been reworked to correct these errors.

- Table 5 and 6: Please include dates that assessment occurred for each table.
  KCI Response: This change has been made.

- Table 5 does not indicate any structures are piping. Monitoring results section indicates no structures have failed, but some may be piping. Several structures were identified as piping at the IRT site visit in August 2022. Please review and revise as necessary.
  KCI Response:This change has been made.

- Table 10: MY3 cross-section data was not included in the table for the draft submittal. Please update for final.
  KCI Response: This error has been corrected.

- Cross-section plots 8 and 13: Recommend adding a note that the cross-section is located in an area that was repaired in MY1 (July 2021).
  KCI Response: This change has been made.

- Hydrographs: Please verify that the yellow line and pink line are labeled correctly for wetland gauge 1 and 2. It appears that the yellow line should be ground surface.
  KCI Response: The labels on these graphs have been corrected.

- Please include the meeting minutes from the August 15, 2022 IRT site visit in the appendix. *KCI Response: These have been included in Appendix F – Additional Information.*

Please contact me if you have any questions or would like clarification concerning these responses.

Sincerely,

Adam Spiller
Project Manager

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PROJECT SUMMARY

The Mill Dam Creek Restoration Site (MDCRS) was completed in March 2020 and restored and enhanced a total of 13,505 linear feet of stream. The MDCRS is a riparian system in the Upper Yadkin Pee-Dee River Basin (3040101 8-digit cataloging unit) in Yadkin County, North Carolina. The site's natural hydrologic regime had been substantially modified through the relocation and straightening of the existing stream channels, livestock impacts, and clearing of riparian buffer. This completed project will restore streams impacted by pasture and agriculture to a stable headwater ecosystem with a functional riparian buffer and floodplain access.

The MDCRS is protected by a 40.2 acre permanent conservation easement, held by the State of North Carolina. The site is located approximately 0.5 miles north of East Bend, NC. Specifically, the site is 0.2 mile north on Shady Grove Church Road (SR-1538) from its intersection with Shoals Road (SR-1546).

The North Carolina Ecosystem Enhancement Program (NCEEP) published the Upper Yadkin Pee-Dee River Basin Restoration Priorities (RBRP) in 2009. The project's 14 digit CU (03040101110070, Grassy Creek and Horne Creek) was identified as a Targeted Local Watershed (TLW) in the RBRP. The goals and priorities for the MDCRS are based on the information presented in the Upper Yadkin Pee-Dee River Basin Restoration Priorities: maintaining and enhancing water quality, restoring hydrology, and improving fish and wildlife habitat (NCEEP, 2009). The project will support the following basin priorities:

- Managing stormwater runoff
- Reducing fecal coliform inputs
- Improving/restoring riparian buffers
- Reducing sediment loading
- Improving stream stability
- Reducing nutrient loading
- Excluding livestock and implementing other agricultural BMP's
- Protecting high-resource value waters, including water supply watershed designated waters

The project is also located in the Ararat River Local Watershed Plan (LWP) study area. The Ararat River was designated a LWP Study Area due to poor water quality and aquatic habitat degradation issues, as well as the presence of good candidate sites for stream restoration in rural catchments (NCEEP, 2009). The stressors within the Ararat River LWP are erosion and sedimentation, missing or degraded riparian buffers, stormwater runoff, and nutrient and fecal coliform "hot spots" (NCEEP, 2013).

The goals for the project are to:

- Restore channelized and livestock-impacted streams to stable C and B type channels.
- Restore a forested riparian buffer to provide bank stability, filtration, and shading.

The project goals will be addressed through the following objectives:

- Relocate or stabilize channelized and/or incised streams to connect to a floodplain or floodprone area.
- Install a cross-section sized to the bankfull discharge.
- Create bedform diversity with pools, riffles, and habitat structures
- Fence out livestock to reduce nutrient, bacterial, and sediment impacts from adjacent grazing and farming practices to the project tributaries
- Plant the site with native trees and shrubs and an herbaceous seed mix.

Project construction was completed in December 2019 and project planting was completed in March 2020. The 13,505 linear feet of streams at MDCRS were enhanced and restored by re-meandering the stream and by tying the bankfull elevation to the historic floodplain where feasible. The entire site was planted to

establish a forested riparian buffer. The site was constructed as designed with only minor modifications from the design plan. These modifications generally consisted of slight adjustments in the alignment and spacing of riffles/pools due to bedrock encountered during construction. Several areas of additional bank stabilization were also installed. On February 6, 2020, shortly after construction was completed and before woody stems had been planted, the site received over 6 inches of rain in a 24 hour period. This storm caused significant damage to portions of the site and required repairs to be completed in March 2020. These repairs mainly involved repair of bank erosion through the installation of live lifts, removal of aggradation from the stream channel, and regrading areas of floodplain scour. Approximately 500 cubic yards of topsoil were also brought in and placed on the floodplain in areas of severe floodplain scour. Additional heavy precipitation events took place in the fall of 2020. These events cause isolated areas of bank erosion and the movement of a boulder sill. In July 2021, these areas were repaired by sloping back the eroding banks, reapplying coir matting, installing new live stakes, and repairing the damaged boulder sill on UTHC 4-1.

The monitoring components were installed in March/April 2020. Five automatically recording pressure transducer stream gauges that take a reading every 10 minutes were installed: one each in the upper third of T1A, T5A, and T8A to document flow within those reaches, and two on UTHC to record the occurrence of bankfull events. Cameras were installed in the vicinity of each of the flow gauges and set to record a short video once a day to provide additional verification of flow. Two automatically recording pressure transducer groundwater monitoring gauges were installed within pre-existing wetlands on the site to monitor wetland hydrology and ensure the existing wetlands on the site are not adversely affected by the restoration project. One of these gauges is located in the vicinity of the pre-existing wetland on the left bank of T7 and the other is located within the pre-existing wetland on the right bank of T8. To determine the success of the planted mitigation areas, eighteen 10 m x 10 m permanent vegetation monitoring plots were established. An additional twelve 10 m x 10 m random temporary vegetation monitoring plots are sampled during each monitoring year as well. The locations of the planted stems relative to the origin were recorded within the permanent plots and the species and height of each planted stem were recorded for all plots. Any volunteers found within the plots were grouped into size categories by species, but separate from the planted stems. Twelve permanent photo reference points were established and are taken annually. Thirty-two permanent cross-sections (24 riffle cross-sections and 8 pool cross-sections) were also established and a detailed longitudinal profile of the stream was taken. Wolman pebble counts were performed at all of the riffle cross-sections. The cross-section measurements are repeated in monitoring years 1, 2, 3, 5, and 7, but the longitudinal profile will only be repeated if there are concerns about bed elevation adjustments. Reports will be submitted to DMS each year.

SUCCESS CRITERIA

Vegetative success criteria for the stream mitigation is 260 woody stems/acre after five years, and 210 woody stems/acre after seven years. Trees in each plot must average seven feet in height at Year 5 and ten feet in height at Year 7. Volunteer species must be present for a minimum of two growing seasons and must be a species from the approved planting list to count toward vegetative success. A single species may not account for more than 50% of the required number of stems within any plot.

A minimum of four bankfull events must also be recorded during the monitoring period. All project streams must show a minimum of 30 continuous days of flow within a calendar year (assuming normal precipitation) A “normal” year is based on NRCS climatological data for Yadkin County with the 30th and 70th percentile thresholds as the range of normal, as documented in the USACE Technical Report “Accessing and Using Meteorological Data to Evaluate Wetland Hydrology, April 2000.”

Bank height ratios (BHR) should not exceed 1.2 and the entrenchment ratios (ER) should be 2.2 or greater. BHR and ER at any measured riffle cross-section should not change more than 10% from the previous

condition during any given monitoring interval (e.g. no more than 10% between years 1 and 2, 2 and 3, 3 and 5, or 5 and 7). Visual assessments will also be used to identify problem areas.

MONITORING RESULTS

The MY03 vegetation monitoring was conducted between August 1 and 4, 2022. All of the 30 vegetation monitoring plots had greater than 260 woody stems/acre. The average stem density across all the surveyed plots is 805 planted stems/acre. Including volunteers, the site averaged 1,209 stems/acre. A supplemental planting of the wetland located at the top of T3 was completed on October 25, 2021. Due to the prolonged periods of saturation in this area, as well as the rapid growth of the herbaceous vegetation in MY01, the majority of the planted woody stems in this wetland did not survive. Thirty one-gallon size containerized trees were planted within this area. Species were chosen that could best tolerate extended periods of saturation. Please see Appendix C – Vegetation Plot Data for a list of the species and quantities that were planted. Invasive species were treated on the site in July 2022. This treatment focused on Chinese privet growing in areas of existing woodline that were not cleared as part of construction.

The MY03 cross-sections survey took place between January 9 and 12, 2023. None of the 32 cross-sections had a bank height ratio greater than 1.2. Two of the 32 cross-sections have an entrenchment ratio less than 2.2. These two cross-sections are XS6 and X12 and both are located in enhancement reaches where the stream work that was completed consisted of cutting a floodplain bench along one bank. Neither reach shows signs of instability and these lower than desirable entrenchment ratios are remnants of the pre-project conditions. The heavy precipitation events that took place in 2020 have caused some cross-sections to shift from their baseline or MY01 alignment. Two notable examples of this are XS8 and XS13. Since the repairs that took place in MY02, these cross-sections have remained stable and not shifted any further. Further movement within these areas is not anticipated. There are two cross-sections that have shown significant adjustment between MY02 and MY03. These cross-sections (XS24 and 25) are both located on the lower section of T6. The stream bed at XS24 (riffle) had aggraded by approximately 0.4’ between baseline and MY01, but since then it has remained relatively stable while the stream banks have continued to aggrade. XS25 downcut by approximately 0.5’ between the baseline and MY01 surveys before starting to aggrade. Between MY01 and MY02, it aggraded by approximately 0.5’, returning to the baseline stream bed elevation. Between MY02 and MY03 it aggraded an additional 0.5’. T6 is a small stream with an un-stabilized section above the project reaches. Cattle have access to this un-stabilized reach and so it provides a major source of sediment to the project streams. These fluctuations in the bed and bank elevation are part of the natural processing of the heavy sediment load through the system. Despite the changes in elevation, the stream alignment has remained stable and there is no evidence of bank erosion through this reach. KCI will continue to monitor this area closely but does not believe that these changes represent a threat to project success.

During 2022, the stream gauge on UTHC-1 recorded 9 bankfull events, while the stream gauge on UTHC-3 recorded 5 bankfull events. All three of the reaches being monitored for flow demonstrated more than 30 consecutive days of flow during 2022. The gauge on T1A recorded a maximum of 34 consecutive days. The gauge on T5A recorded flow for 303 consecutive days (the entire period of record for 2022) and the gauge on T8A recorded a maximum of 217 consecutive days. The gauge data was further verified by the cameras on site. Based on the video recordings obtained from the cameras, T1A had a maximum of 104 consecutive days of flow, T5A had a maximum of 114 consecutive days of flow, and T8A had a maximum of 92 consecutive days of flow. The differences between the number of days of flow documented by the cameras versus the gauges is largely due to extended periods of time during which the cameras were obscured by vegetation during the growing season and periods of time when the stream flow was at levels too low for the gauges to record.

On August 15, 2022, the IRT met on-site to evaluate the site conditions and see the results of the July 2021 repairs. At this meeting the IRT requested that KCI add live stakes to the outer bend areas that were repaired. This work will be completed in February 2023. The IRT also requested that KCI keep an eye on the structures on site and the invasives. While no areas of thick invasives were noted, there were scattered individuals of Chinese privet, mainly in areas of the site that had existing woodlines. Similarly, none of the structures on site had failed, but a few were seen to be potentially starting to pipe. KCI will continue to monitor these areas to ensure they don't become a threat to project success.

Overall the site is functioning as designed with no major problem areas or threats to project success identified during MY03.

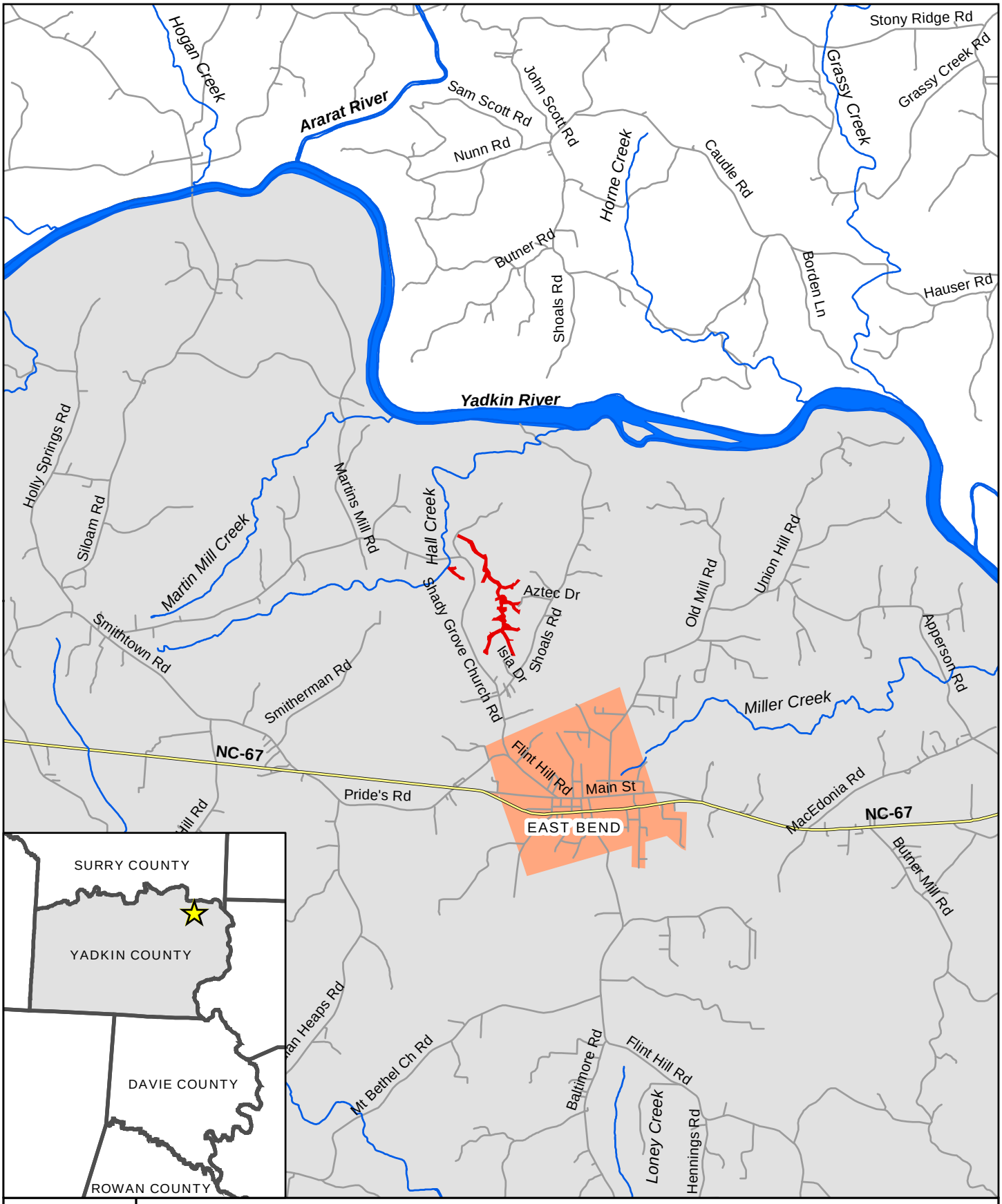
REFERENCES

NCDENR, Ecosystem Enhancement Program. 2009. Upper Yadkin Pee-Dee River Basin Restoration Priorities 2009. Raleigh, NC. https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Yadkin_River_Basin/2009%20Upper%20Yadkin%20RBRP_Final%20Final%2C%2026feb%2709.pdf

NCDEQ, Division of Mitigation Services. June 2017. "As-built Baseline Monitoring Report Format, Data and Content Requirement." https://files.nc.gov/ncdeq/Mitigation%20Services/Document%20Management%20Library/Guidance%20and%20Template%20Documents/6_AB_Baseline__Rep_Templ_June%202017.pdf

NCIRT. October 24, 2016. "Wilmington District Stream and Wetland Compensatory Mitigation Update." https://saw-reg.usace.army.mil/PN/2016/Wilmington-District-Mitigation-Update.pdf

USACE, Sprecher, S. W.; Warne, A. G. 2000. "Accessing and Using Meteorological Data to Evaluate Wetland Hydrology." https://ntrl.ntis.gov/NTRL/dashboard/searchResults/titleDetail/ADA378910.xhtml



KCI

Figure 1. Vicinity Map, Mill Dam Creek, Yadkin County, NC

Project Easement
Cities and Towns
Streams
Major Rivers
Roads
State Highway

N

0 0.5 1 Miles

APPENDIX A

Background Tables

Table 1. Project Components and Mitigation Credits
Mill Dam Creek Restoration Site, DMS Project #97136

Mitigation Credits										
	Stream		**Riparian Wetland**		**Non-riparian Wetland**		**Buffer**		**Nitrogen Nutrient Offset**	**Phosphorous Nutrient Offset**
Type	R	RE	R	RE	R	RE	R	RE		
Linear Feet/Acres	7,166	6,340								
Credits	7,166.000	3,124.666								
TOTAL CREDITS	**10,290.666**									

Project Components									
Project Component -or- Reach ID	**Stationing/ Location**	**Existing Footage/ Acreage**	**Restoration Footage or Acreage**	**Creditable Footage or Acreage**	**Restoration Level**	**Approach (PI, PII etc.)**	**Mitigation Ratio (X:1)**	**Mitigation Credits**	**Notes/Comments**
UTHC1 Top	10+00-22+81	1,333	1,281	1,249	R	P2 10+00-11+50, then P1	1	1,249.000	Crossing Exception STA 20+51 – 20+83
UTHC1 Bottom	22+81-27+39	541	457	438	R	P1, then P2 24+50-27+39	1	438.000	Crossing Exception STA 25+72 – 25+91
UTHC2	27+39-42+32	1,494	1,493	1,493	EI	N/A	1.5	995.333	
UTHC3	42+32-55+57	1,411	1,325	1,240	R	P1 except P2 42+32-44+00 and 53+50-55+57	1	1,240.000	Utility Exception STA54+07 – 54+49 Crossing Exception STA 55+14 – 55+57
UTHC4-1	55+57-58+53	1,840	297	297	EI	N/A	1.5	198.000	
UTHC4-2	58+53-63+75		521	521	EII	N/A	2.5	208.400	
UTHC4-3	63+75-68+55		481	419	EI	N/A	1.5	279.333	Crossing Exception STA 63+75 -64+37
UTHC4-4	68+55-73+97		542	497	EII	N/A	2.5	199.800	Utility Exception STA 68+55 – 69+00
T1	100+00-107+51	764	751	734	R	P2 100+00-101+80, then P1	1	734.000	Crossing Exception STA 104+00-104+16
T1A	150+00-157+95	746	795	795	R	P2	1	795.000	

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Restoration Footage or Acreage	Creditable Footage or Acreage	Restoration Level	Approach (PI, PII etc.)	Mitigation Ratio (X:1)	Mitigation Credits	Notes/Comments
T2-1	200+00-204+98	499	498	498	EII	N/A	2.5	199.200	
T2-2	204+98-207+63	232	265	265	R	P2	1	265.000	
T3	300+00-303+69	378	369	369	R	P1/P2	1	369.000	
T4	400+00-401+51	151	151	151	R	P1	1	151.000	
T5	1000+00-1012+13	1,205	1,213	1,182	EII	N/A	2.5	472.800	Crossing Exception STA 1003+59-1003+90
T5A	1200+00-1200+65	65	65	65	EII	N/A	2.5	26.000	
T5B	1300+00-1304+38	438	438	438	EII	N/A	2.5	175.200	
T6-1	600+00-603+22	325	322	259	EII	N/A	2.5	103.600	Crossing Exception STA 602+59 – 603+22
T6-2	603+22-609+80	621	658	658	R	P1	1	658.000	
T6A-1	650+00-650+60	60	60	60	EII	N/A	2.5	24.000	
T6A-2	650+60-651+61	97	101	101	R	P1	1	101.000	
T7-1	700+00-701+65	165	165	165	EII	N/A	2.5	66.000	
T7-2	701+65-705+13	335	348	348	R	P1	1	348.000	
T8-1	800+00-804+45	445	445	445	EII	N/A	2.5	178.000	
T8-2	804+45-808+94	486	448	426	R	P1	1	426.000	Crossing Exception STA 808+20 – 808+42
T8A	850+00-852+63	258	263	263	R	P1	1	263.000	
T9	900+00-901+29	133	129	129	R	P1, then P2 900+71-901+29	1	129.000	
TOTAL		**14,024**	**13,882**	**13,505**				**10,290.666**	

Component Summation					
Restoration Level	**Stream (linear feet)**	**Riparian Wetlands (Acres)**		**Non-Riparian Wetlands (Acres)**	**Buffer (square feet)**
		Riverine	Non-Riverine		
Restoration	7,166				
Enhancement					
Enhancement I	2,209				
Enhancement II	4,130				
Creation					
Preservation					
High Quality Preservation					

Table 2. Project Activity & Reporting History Mill Dam Creek Restoration Site, DMS Project #97136		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		Dec. 7, 2018
Final Design - Construction Plans		Jan. 14, 2019
Construction Grading Completed		Dec. 12, 2019
Repairs from Storm Damage		March 26, 2020
Planting Completed		March 26, 2020
Baseline Monitoring/Report	April 2020	May 2020
Vegetation Monitoring	*April 24, 2020*	
Stream Survey	*April 16, 2020*	
Year 1 Monitoring	December 2020	December 2020
Vegetation Monitoring	*October 28, 2020*	
Stream Survey	*December 22, 2020*	
Invasive Species Treatment		January 7, 2021
Repairs from Storm Damage		July 23, 2021
Year 2 Monitoring	November 2021	December 2021
Vegetation Monitoring	*July 22, 2021*	
Stream Survey	*July 22, 2021*	
Invasive Species Treatment		July 26, 2022
Year 3 Monitoring	January 2023	January 2023
Vegetation Monitoring	*August 4, 2022*	
Stream Survey	*January 12, 2023*	

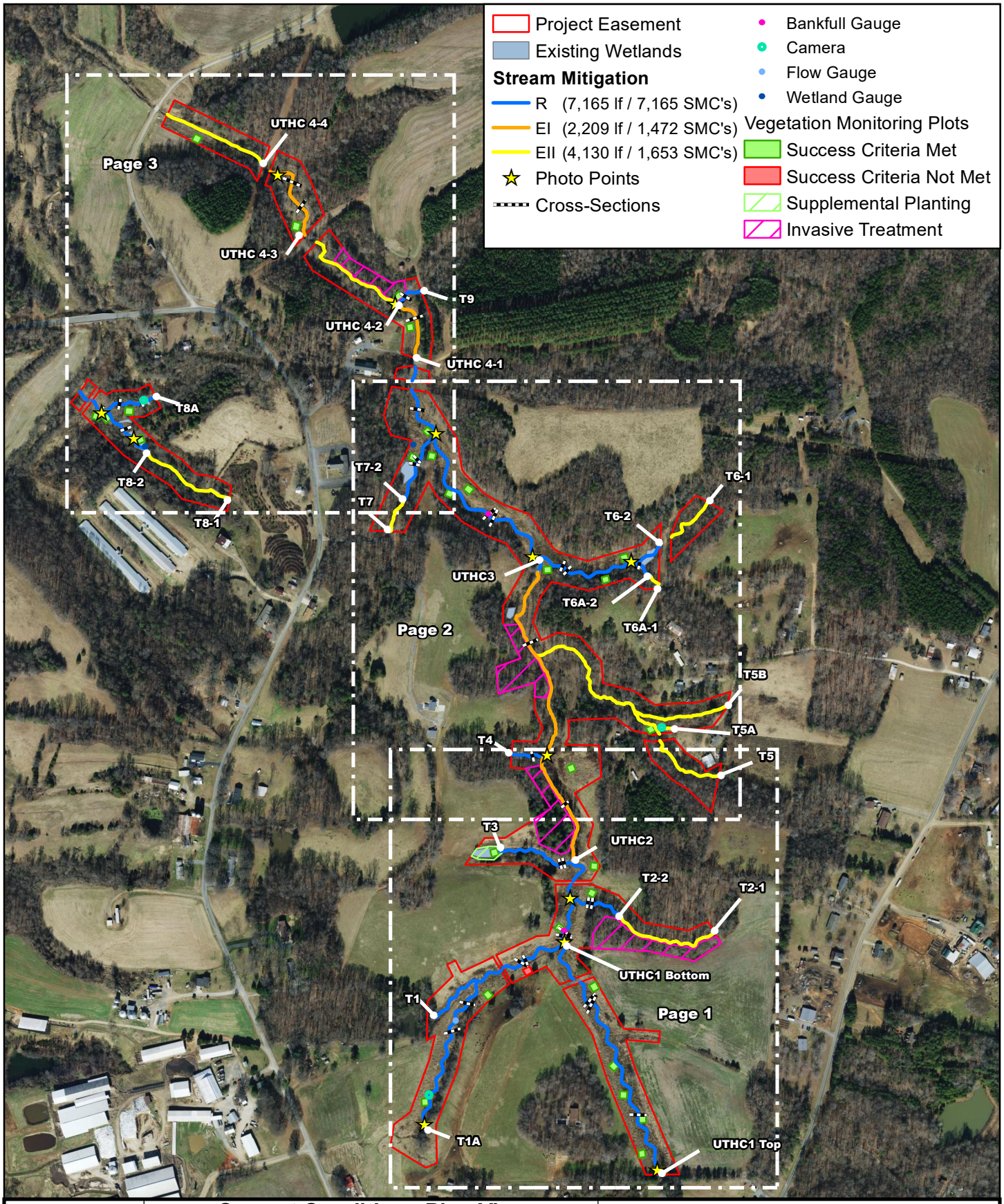
Table 3. Project Contacts Mill Dam Creek Restoration Site, DMS Project #97136	
Design Firm	KCI Associates of North Carolina 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266
Construction Contractor	Carolina Environmental Contracting, Inc. PO Box 1905 Mount Airy, NC 27030 Contact: Mr. Wayne Taylor Phone: (336)320-3849
Planting Contractor	Shenandoah Habitats 1983 Jefferson Highway Waynesboro, VA 22980 Contact: Mr. David Coleman Phone: (540) 941-0067
Monitoring Performers	
	KCI Associates of North Carolina 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Adam Spiller Phone: (919) 278-2514 Fax: (919) 783-9266

Table 4. Project Information Mill Dam Creek Restoration Site, DMS Project #97136			
Project Name	Mill Dam Creek Restoration Site		
County	Yadkin County		
Project Area	40.2 acres		
Project Coordinates (lat. and long.)	36.2390 °N, 80.5201°W		
Planted Acreage (acres of woody stems planted)	29.2 acres		
Project Watershed Summary Information			
Physiographic Province	Piedmont		
River Basin	Yadkin		
USGS Hydrologic Unit 8-digit	030401014	**USGS Hydrologic Unit 14-digit**	03010101110070
DWQ Sub-basin	03-07-02		
Project Drainage Area (acres)	400 acres		
Project Drainage Area Percentage of Impervious Area	3%		
CGIA Land Use Classification	Forest (45%), Pasture/Farmland (39%), Low-density Residential Development (15%), and Roads (1%)		
Existing Reach Summary Information			
Parameters	**All Reaches Combined**		
Length of reach (linear feet)	14,024		
Valley confinement	Partially confined to confined		
Drainage area (acres)	400 acres		
Perennial, Intermittent, Ephemeral	Intermittent – Perennial		
NCDWQ Water Quality Classification	C (Aquatic Life, Secondary Recreation)		
Rosgen Stream Classification (Existing / Proposed)	F4/G4/C4/B4		
Evolutionary trend (Simon)	Stage III		
FEMA classification	Zone AE at confluence of T8 and Hall Creek, otherwise none		
Existing Wetland Summary Information			
Parameters	**WA, WB, WE, WG, WK**	**WC**	**WH, WI , WJ**
Size of Wetland (acres)	0.23	0.10	0.10
Wetland Type	Riparian Non-riverine	Riparian Non-riverine	Riparian Non-riverine
Mapped Soil Series	Fairview	Fairview	Siloam
Drainage class	Well drained	Well drained	Well drained
Soil Hydric Status	Non-Hydric	Non-Hydric	Non-Hydric
Source of Hydrology	Groundwater	Groundwater	Groundwater
Restoration or Enhancement Method	N/A (Preservation)	Areas of erosion to stabilize	N/A (Preservation)

Regulatory Considerations			
Regulation	**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	NWP 27	Preliminary JD
Waters of the United States – Section 401	Yes	NWP 27	Preliminary JD
Endangered Species Act	Yes	Yes	USFWS
Historic Preservation Act	No	Yes	NCSHPO
Coastal Zone Management Act (CZMA)/ Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	No	Yes	N/A
Essential Fisheries Habitat	No	N/A	N/A

APPENDIX B

Visual Assessment Data



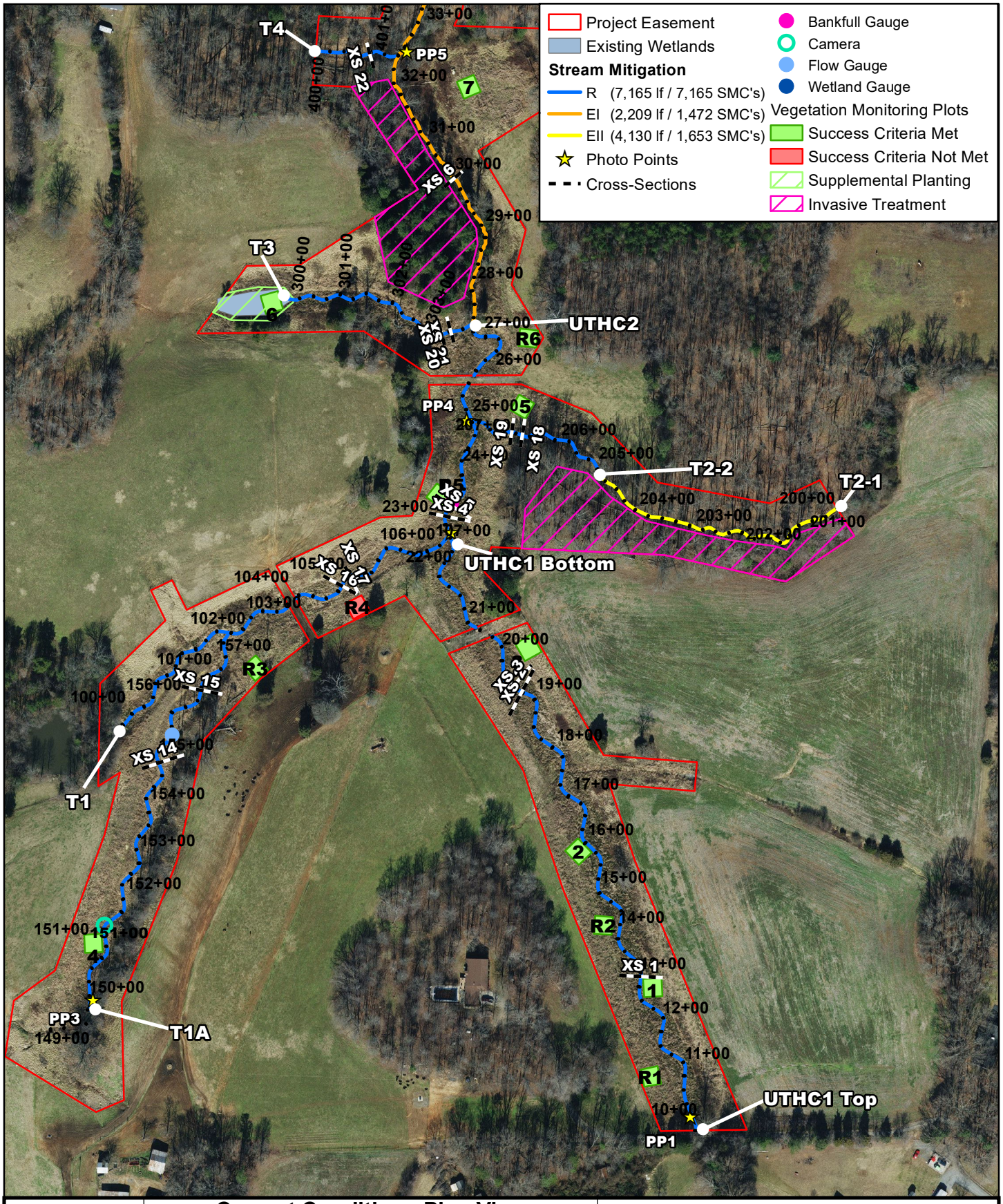
KCI

Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Overview Page

N

0 500 1,000 Feet

Image Source: NC OneMap Orthoimagery, 2015.



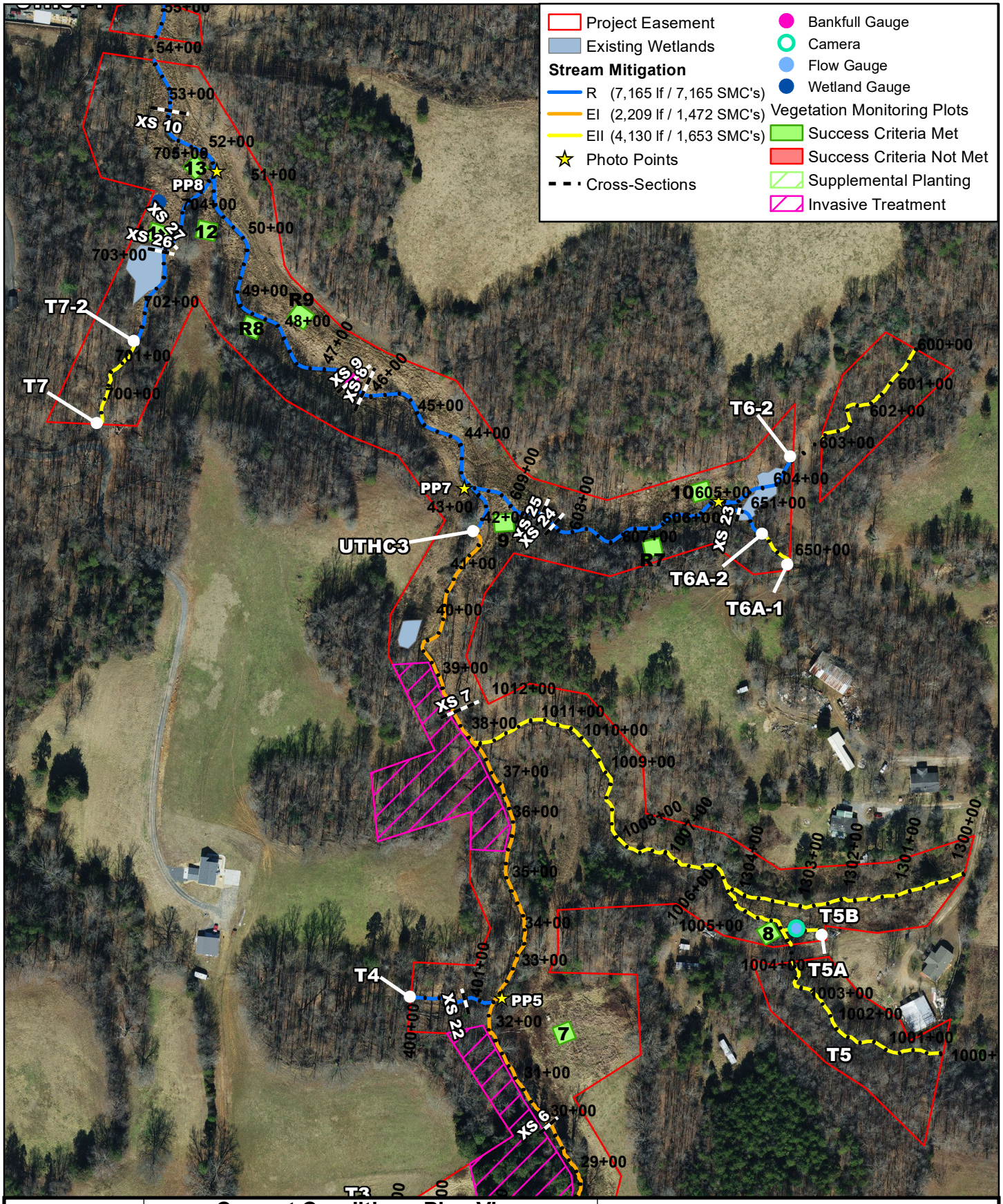
Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 1

KCI

N

0 175 350 Feet

Image Source: NC OneMap Orthoimagery, 2015.

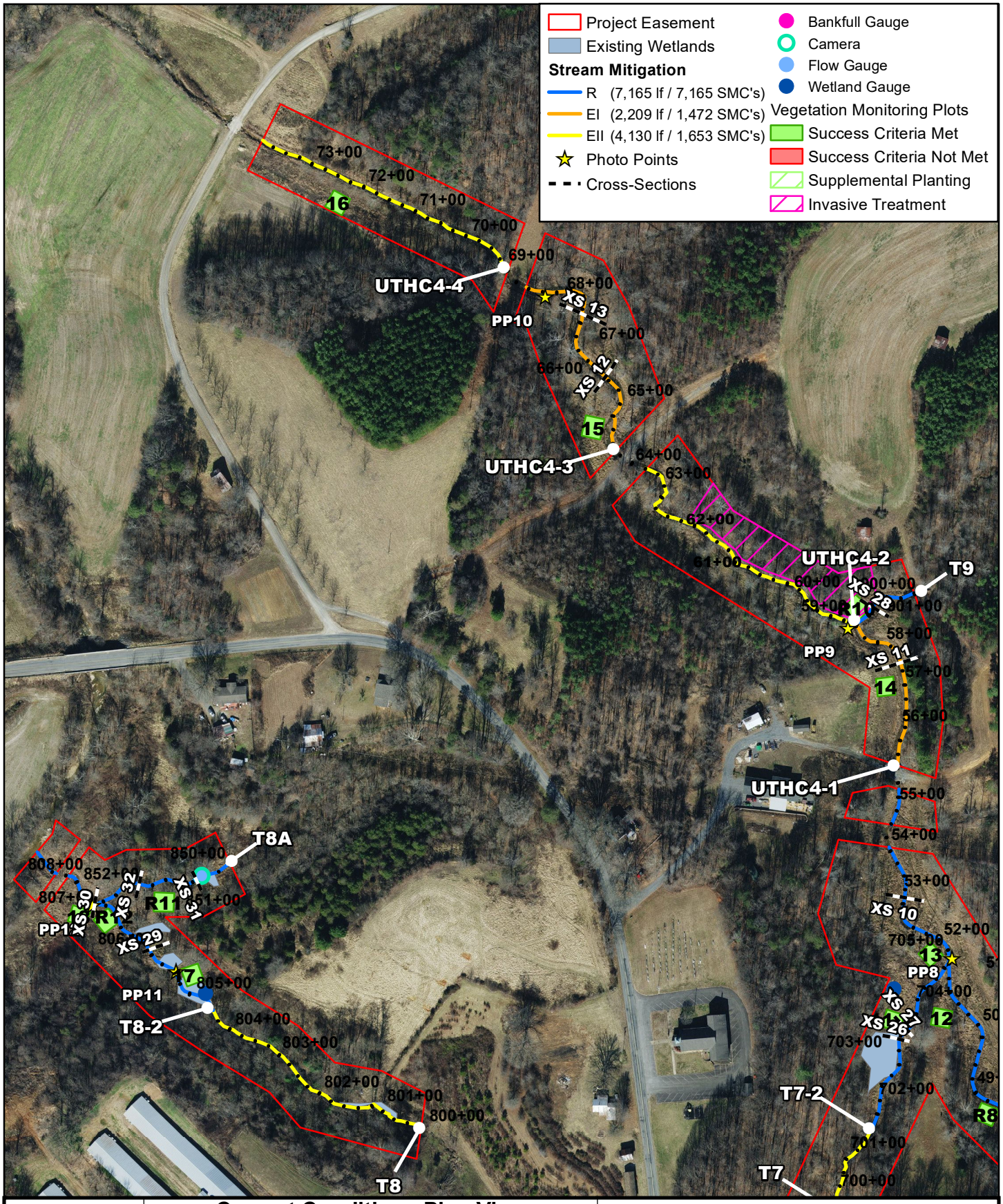


Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 2

N

0 175 350 Feet

Image Source: NC OneMap Orthoimagery, 2015.



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Current Conditions Plan View
Mill Dam Creek Restoration Site
DMS Project #97136
Yadkin County, NC
Page 3

N

0 175 350 Feet

Image Source: NC OneMap Orthoimagery, 2015.

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **UTHC1**

Assessed Length **1,739**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	30	30			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	29	29			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	29	29			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	29	29			100%
		2. Thalweg centering at downstream of meander (Glide)	29	29			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	22	22			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	22	22			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	22	22			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **UTHC2**

Assessed Length **1,494**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	8	8			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	8	8			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	8	8			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	8	8			100%
		2. Thalweg centering at downstream of meander (Glide)	8	8			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	0	0			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	0	0			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	0	0			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	0	0			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	0	0			

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **UTHC3**

Assessed Length **1,325**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	18	18			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	17	17			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	17	17			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	17	17			100%
		2. Thalweg centering at downstream of meander (Glide)	17	17			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	8	8			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	5	8			63%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **UTHC4-1**

Assessed Length **297**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	3	3			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	3	3			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	3	3			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	3	3			100%
		2. Thalweg centering at downstream of meander (Glide)	3	3			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**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%. (See guidance for this table in EEP monitoring guidance document)	2	2			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	2	2			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **UTHC4-3**

Assessed Length **419**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	4	4			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	3	3			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	3	3			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	3	3			100%
		2. Thalweg centering at downstream of meander (Glide)	3	3			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	1	1			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	1	1			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	1	1			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T1**

Assessed Length **751**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	16	16			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	16	16			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	16	16			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	16	16			100%
		2. Thalweg centering at downstream of meander (Glide)	16	16			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	8	8			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T1A**

Assessed Length **795**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	16	16			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	16	16			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	16	16			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	16	16			100%
		2. Thalweg centering at downstream of meander (Glide)	16	16			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	11	11			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	11	11			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	11	11			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	11	11			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	11	11			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T2-2**

Assessed Length **265**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	8	8			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	7	7			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	7	7			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	7	7			100%
		2. Thalweg centering at downstream of meander (Glide)	7	7			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	5	5			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	5	5			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	5	5			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	5	5			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	5	5			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T3**

Assessed Length **369**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	13	13			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	12	12			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	12	12			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	12	12			100%
		2. Thalweg centering at downstream of meander (Glide)	12	12			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	14	14			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	14	14			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	14	14			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	14	14			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	14	14			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T4**

Assessed Length **151**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	7	7			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	7	7			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	7	7			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	7	7			100%
		2. Thalweg centering at downstream of meander (Glide)	7	7			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	6	6			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	6	6			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	6	6			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T6-2**

Assessed Length **658**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	15	15			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	15	15			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	15	15			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	15	15			100%
		2. Thalweg centering at downstream of meander (Glide)	15	15			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	16	16			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	16	16			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	16	16			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	16	16			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	16	16			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T6A-2**

Assessed Length **101**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	3	3			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	3	3			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	3	3			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	3	3			100%
		2. Thalweg centering at downstream of meander (Glide)	3	3			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	6	6			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	6	6			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	6	6			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T7-2**

Assessed Length **348**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	6	6			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	6	6			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	6	6			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	6	6			100%
		2. Thalweg centering at downstream of meander (Glide)	6	6			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	4	4			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	4	4			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T8-2**

Assessed Length **448**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	10	10			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	10	10			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	10	10			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	10	10			100%
		2. Thalweg centering at downstream of meander (Glide)	10	10			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	12	12			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	12			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	12	12			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	12	12			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	12	12			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T8A**

Assessed Length **262**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	7	7			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	7	7			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	7	7			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	7	7			100%
		2. Thalweg centering at downstream of meander (Glide)	7	7			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	7			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	7	7			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	7	7			100%

Table 5 **Visual Stream Morphology Stability Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project #97136

Reach ID **T9**

Assessed Length **129**

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
1. Bed	1. **Vertical Stability** (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	4	4			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	3	3			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	3	3			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	3	3			100%
		2. Thalweg centering at downstream of meander (Glide)	3	3			100%
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%
	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%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%
				Totals	0	0	100%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	4	4			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	4	4			100%

Table 6 **Vegetation Condition Assessment** Assessment Date: 1/10/2023

Mill Dam Creek Stream Restoration Site, DMS Project # 97136

Planted Acreage **29.5**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. 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 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%
Easement Acreage	**20.6**					
Vegetation Category	**Definitions**	**Mapping Threshold**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Easement Acreage**
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

Photo Reference Photos

PP1 – MY00 – 4/17/20

PP1 – MY03 – 1/11/23

PP2 – MY00 – 4/17/20

PP2 – MY03 – 1/11/23

PP3 – MY00 – 4/17/20

PP3 – MY03 – 1/11/23

PP4 – MY00 – 4/17/20

PP4 – MY03 – 1/11/23

PP5 – MY00 – 4/17/20

PP5 – MY03 – 1/10/23

PP6 – MY00 – 4/16/20

PP6 – MY03 – 1/10/23

PP7 – MY00 – 4/16/20

PP7 – MY03 – 1/10/23

PP8 – MY00 – 4/16/20

PP8 – MY03 – 1/9/23

PP9 – MY00 – 4/17/20

PP9 – MY03 – 1/9/23

PP10 – MY00 – 4/17/20

PP10 – MY03 – 1/9/23

PP11 – MY00 – 4/16/20

PP11 – MY03 – 1/9/23

PP12 – MY00 – 4/16/20

PP12 – MY03 – 1/9/23

Vegetation Monitoring Plot Photos

Vegetation Plot 1 – MY00 – 4/17/20

Vegetation Plot 1 – MY03 – 8/4/22

Vegetation Plot 2 – MY00 – 4/17/20

Vegetation Plot 2 – MY03 – 8/4/22

Vegetation Plot 3 – MY00 – 4/17/20

Vegetation Plot 3 – MY03 – 8/4/22

Vegetation Plot 4 – MY00 – 4/17/20

Vegetation Plot 4 – MY03 – 8/4/22

Vegetation Plot 5 – MY00 – 4/17/20

Vegetation Plot 05 – MY03 – 8/3/22

Vegetation Plot 6 – MY00 – 4/17/20

Vegetation Plot 6 – MY03 – 8/3/22

Vegetation Plot 7 – MY00 – 4/17/20

Vegetation Plot 7 – MY03 – 8/3/22

Vegetation Plot 8 – MY00 – 4/17/20

Vegetation Plot 8 – MY03 – 8/2/22

Vegetation Plot 9 – MY00 – 4/16/20

Vegetation Plot 9 – MY03 – 8/2/22

Vegetation Plot 10 – MY00 – 4/16/20

Vegetation Plot 10 – MY03 – 8/2/22

Vegetation Plot 11 – MY00 – 4/16/20

Vegetation Plot 11 – MY03 – 8/3/22

Vegetation Plot 12 – MY00 – 4/16/20

Vegetation Plot 12 – MY03 – 8/3/22

Vegetation Plot 13 – MY00 – 4/16/20

Vegetation Plot 13 – MY03 – 8/3/22

Vegetation Plot 14 – MY00 – 4/17/20

Vegetation Plot 14 – MY03 – 8/2/22

Vegetation Plot 15 – MY00 – 4/17/20

Vegetation Plot 15 – MY03 – 8/2/22

Vegetation Plot 16 – MY00 – 4/17/20

Vegetation Plot 16 – MY03 – 8/2/22

Vegetation Plot 17 – MY00 – 4/16/20

Vegetation Plot 17 – MY03 – 8/4/22

Vegetation Plot 18 – MY00 – 4/16/20

Vegetation Plot 18 – MY03 – 8/4/22

Vegetation Plot R1 – MY03 – 8/4/22

Vegetation Plot R2 – MY03 – 8/4/22

Vegetation Plot R3 – MY03 – 8/4/22

Vegetation Plot R4 – MY03 – 8/3/22

Vegetation Plot R5 – MY03 – 8/3/22

Vegetation Plot R6 – MY03 – 8/3/22

Vegetation Plot R7 – MY03 – 8/2/22

Vegetation Plot R8 – MY03 – 8/3/22

Vegetation Plot R9 – MY03 – 8/3/22

Vegetation Plot R10 – MY03 – 8/2/22

Vegetation Plot R11 – MY03 – 8/4/22

Vegetation Plot R12 – MY03 – 8/4/22

APPENDIX C

Vegetation Plot Data

Table 7. Species and Quantity – 2021 Supplemental Planting Mill Dam Creek Restoration Site, DMS Project #97136		
Species	Quantity	Size
Eastern Sycamore (*Platanus occidentalis*)	5	1 gallon
River Birch (*Betula nigra*)	5	1 gallon
Buttonbush (*Cephalanthus occidentalis*)	5	1 gallon
Black Willow (*Salix nigra*)	5	1 gallon
Silky Dogwood (*Cornus amommum*)	5	1 gallon
Willow Oak (*Quercus phellos*)	3	1 gallon
Pin Oak (*Quercus palustris*)	2	1 gallon

Table 8. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY03 2022)															
	Plot 01		Plot 02		Plot 03		Plot 04		Plot 05		Plot 06		Plot 07		Plot 08	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Holly (*Ilex opaca*)																
American Hornbeam (*Carpinus caroliniana*)																
American Sycamore (*Platanus occidentalis*)	2	3	5	5	2	2	6	6	2	3	5	5	1	6	3	24
Black Cherry (*Prunus serotina*)														2		
Black Walnut (*Juglans nigra*)						3								1		
Black Willow (*Salix nigra*)																
Boxelder (*Acer negundo*)																
Buttonbush (*Cephalanthus occidentalis*)											1	1				
Eastern Red Cedar (*Juniperus virginiana*)																
Elderberry (*Sambucus canadensis*)																1
Flowering Dogwood (*Cornus florida*)																
Ironwood (*Ostrya virginiana*)																
Northern Red Oak (*Quercus rubra*)					1	1							1	1		1
Oak (*Quercus sp.*)																
Persimmon (*Diospyros virginiana*)		2														
Pin Oak (*Quercus palustris*)													11	11		
Red Maple (*Acer rubrum*)				2				8								1
River Birch (*Betula nigra*)	5	5	4	4			5	5	4	4	2	2	3	3	1	1
Sassafras (*Sassafras albidum*)																
Shortleaf Pine (*Pinus echinata*)																
Silky Dogwood (*Cornus amomum*)											2	2				1
Silver Willow (*Salix sericea*)																
Southern Red Oak (*Quercus falcata*)																
Swamp Chestnut Oak (*Quercus michauxii*)							1	1					1	1		
Tag alder (*Alnus serrulata*)																1
Tulip Poplar (*Liriodendron tulipifera*)	1	1			3	3	2	2	1	1			2	2	7	7
Water Oak (*Quercus nigra*)																
Witch Hazel (*Hamamelis virginiana*)																
White Oak (*Quercus alba*)													1	1		
Willow Oak (*Quercus phellos*)	7	7	11	11	6	6	5	5	11	11			1	1	8	8
Unknown																
Stem count	15	18	20	22	12	15	19	27	18	19	10	10	21	29	19	45
size (ares)	1		1		1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025	
Species count	4	5	3	4	4	5	5	6	4	4	4	4	8	10	4	9
Stems per ACRE	607	728	809	890	486	607	769	1,093	728	769	405	405	850	1,174	769	1,821

Table 8. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY03 2022)															
	Plot 09		Plot 10		Plot 11		Plot 12		Plot 13		Plot 14		Plot 15		Plot 16	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Holly (*Ilex opaca*)																
American Hornbeam (*Carpinus caroliniana*)																
American Sycamore (*Platanus occidentalis*)	1	11	6	9	1	1		2	2	7	6	12	8	31		
Black Cherry (*Prunus serotina*)																
Black Walnut (*Juglans nigra*)								2		2		1		3		
Black Willow (*Salix nigra*)					1	2			3	4						
Boxelder (*Acer negundo*)												5				
Buttonbush (*Cephalanthus occidentalis*)																
Eastern Red Cedar (*Juniperus virginiana*)								4								
Elderberry (*Sambucus canadensis*)																
Flowering Dogwood (*Cornus florida*)																
Ironwood (*Ostrya virginiana*)																
Northern Red Oak (*Quercus rubra*)																
Oak (*Quercus sp.*)																
Persimmon (*Diospyros virginiana*)		1							2	5					1	1
Pin Oak (*Quercus palustris*)	2	2							4	4						
Red Maple (*Acer rubrum*)																
River Birch (*Betula nigra*)	5	6	7	7					1	1			7	7	8	8
Sassafras (*Sassafras albidum*)								1								
Shortleaf Pine (*Pinus echinata*)								2								
Silky Dogwood (*Cornus amomum*)																
Silver Willow (*Salix sericea*)																
Southern Red Oak (*Quercus falcata*)																
Swamp Chestnut Oak (*Quercus michauxii*)											1	1	3	3	1	1
Tag alder (*Alnus serrulata*)												2				
Tulip Poplar (*Liriodendron tulipifera*)	1	1			3	3	8	10	2	2	5	5	1	3	1	1
Water Oak (*Quercus nigra*)								3								
Witch Hazel (*Hamamelis virginiana*)																
White Oak (*Quercus alba*)	1	1					4	4	1	1						
Willow Oak (*Quercus phellos*)	7	7	3	3	4	4	6	6	4	4	20	21	5	5	8	8
Unknown																
Stem count	17	29	16	19	9	10	18	34	19	30	32	47	24	52	19	19
size (ares)	1		1		1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025	
Species count	6	7	3	3	4	4	3	9	8	9	4	7	5	6	5	5
Stems per ACRE	688	1,174	647	769	364	405	728	1,376	769	1,214	1,295	1,902	971	2,104	769	769

Table 8. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY03 2022)															
	Plot 17		Plot 18		Plot R1		Plot R2		Plot R3		Plot R4		Plot R5		Plot R6	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Holly (*Ilex opaca*)																
American Hornbeam (*Carpinus caroliniana*)																
American Sycamore (*Platanus occidentalis*)	3	7	11	39	3	3	5	5	3	3	7	7	11	11	2	2
Black Cherry (*Prunus serotina*)																1
Black Walnut (*Juglans nigra*)		1		2										2		1
Black Willow (*Salix nigra*)																
Boxelder (*Acer negundo*)				8								1				
Buttonbush (*Cephalanthus occidentalis*)																
Eastern Red Cedar (*Juniperus virginiana*)														2		
Elderberry (*Sambucus canadensis*)																
Flowering Dogwood (*Cornus florida*)																
Ironwood (*Ostrya virginiana*)		8														
Northern Red Oak (*Quercus rubra*)																
Oak (*Quercus sp.*)																
Persimmon (*Diospyros virginiana*)													1	1		
Pin Oak (*Quercus palustris*)																
Red Maple (*Acer rubrum*)						14		5						5		
River Birch (*Betula nigra*)							5	5							3	3
Sassafras (*Sassafras albidum*)																
Shortleaf Pine (*Pinus echinata*)																6
Silky Dogwood (*Cornus amomum*)																
Silver Willow (*Salix sericea*)																
Southern Red Oak (*Quercus falcata*)																
Swamp Chestnut Oak (*Quercus michauxii*)					1	1	2	2	2	2					1	1
Tag alder (*Alnus serrulata*)																
Tulip Poplar (*Liriodendron tulipifera*)			5	6	1	1			3	3	1	1	1	1	3	3
Water Oak (*Quercus nigra*)																
Witch Hazel (*Hamamelis virginiana*)																
White Oak (*Quercus alba*)																
Willow Oak (*Quercus phellos*)	4	4	14	14	7	7	2	2	4	4	6	6	5	5	11	11
Unknown																
Stem count	7	20	30	69	12	26	14	19	12	12	14	15	18	27	20	28
size (ares)	1		1		1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025		0.025		0.025	
Species count	2	4	3	5	4	5	4	5	4	4	3	4	4	7	5	8
Stems per ACRE	283	809	1,214	2,792	486	1,052	567	769	486	486	567	607	728	1,093	809	1,133

Table 8. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Current Plot Data (MY03 2022)											
	Plot R7		Plot R8		Plot R9		Plot R10		Plot R11		Plot R12	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Holly (*Ilex opaca*)												
American Hornbeam (*Carpinus caroliniana*)												
American Sycamore (*Platanus occidentalis*)	28	28	2	2	9	9	7	7	7	7	15	15
Black Cherry (*Prunus serotina*)		3										
Black Walnut (*Juglans nigra*)				1				3		3		3
Black Willow (*Salix nigra*)			2	2	1	1	2	2				
Boxelder (*Acer negundo*)										49		
Buttonbush (*Cephalanthus occidentalis*)												
Eastern Red Cedar (*Juniperus virginiana*)												
Elderberry (*Sambucus canadensis*)												
Flowering Dogwood (*Cornus florida*)		3										
Ironwood (*Ostrya virginiana*)								3				
Northern Red Oak (*Quercus rubra*)												
Oak (*Quercus sp.*)												
Persimmon (*Diospyros virginiana*)												
Pin Oak (*Quercus palustris*)												
Red Maple (*Acer rubrum*)		1										
River Birch (*Betula nigra*)	7	7	3	3	6	6	10	10	5	5	26	26
Sassafras (*Sassafras albidum*)												
Shortleaf Pine (*Pinus echinata*)												
Silky Dogwood (*Cornus amomum*)											1	1
Silver Willow (*Salix sericea*)								2				
Southern Red Oak (*Quercus falcata*)												
Swamp Chestnut Oak (*Quercus michauxii*)	1	1			1	1			1	1		
Tag alder (*Alnus serrulata*)												
Tulip Poplar (*Liriodendron tulipifera*)	6	6	2	2			4	4	10	10	3	3
Water Oak (*Quercus nigra*)												
Witch Hazel (*Hamamelis virginiana*)								2				
White Oak (*Quercus alba*)												
Willow Oak (*Quercus phellos*)	5	5	3	3	2	2	4	4	4	4	5	5
Unknown												
Stem count	47	54	12	13	19	19	27	37	27	79	50	53
size (ares)	1		1		1		1		1		1	
size (ACRES)	0.025		0.025		0.025		0.025		0.025		0.025	
Species count	5	8	5	6	5	5	5	9	5	7	5	6
Stems per ACRE	1,902	2,185	486	526	769	769	1,093	1,497	1,093	3,197	2,023	2,145

Table 8. Stem Count by Plot and Species
Mill Dam Creek Restoration Site, DMS Project #97136

	Annual Means							
	MY03 (2022)		MY02 (2021)		MY01 (2020)		MY00 (2020)	
Species	Planted	Total	Planted	Total	Planted	Total	Planted	Total
American Holly (*Ilex opaca*)						1		
American Hornbeam (*Carpinus caroliniana*)						2		
American Sycamore (*Platanus occidentalis*)	163	272	204	232	159	207	88	88
Black Cherry (*Prunus serotina*)		6						
Black Walnut (*Juglans nigra*)		28		13		6		4
Black Willow (*Salix nigra*)	9	11	39	43	14	14	5	5
Boxelder (*Acer negundo*)		63		37		20		
Buttonbush (*Cephalanthus occidentalis*)	1	1						
Eastern Red Cedar (*Juniperus virginiana*)		6				1		
Elderberry (*Sambucus canadensis*)		1		1		2		
Flowering Dogwood (*Cornus florida*)		3						
Ironwood (*Ostrya virginiana*)		11						
Northern Red Oak (*Quercus rubra*)	2	3		1		1		1
Oak (*Quercus sp.*)							206	206
Persimmon (*Diospyros virginiana*)	4	10					1	1
Pin Oak (*Quercus palustris*)	17	17	22	22	20	20		
Red Maple (*Acer rubrum*)		36				8		
River Birch (*Betula nigra*)	117	118	76	76	83	85	107	107
Sassafras (*Sassafras albidum*)		1						
Shortleaf Pine (*Pinus echinata*)		8						
Silky Dogwood (*Cornus amomum*)	3	4						
Silver Willow (*Salix sericea*)		2						
Southern Red Oak (*Quercus falcata*)			1	1		5		
Swamp Chestnut Oak (*Quercus michauxii*)	16	16	14	14	15	15	20	20
Tag alder (*Alnus serrulata*)		3						
Tulip Poplar (*Liriodendron tulipifera*)	76	81	88	92	99	109	172	172
Water Oak (*Quercus nigra*)		3						
Witch Hazel (*Hamamelis virginiana*)		2						
White Oak (*Quercus alba*)	7	7	12	13	10	12		
Willow Oak (*Quercus phellos*)	182	183	180	180	220	223	30	30
Unknown							89	89
Stem count	597	896	636	725	620	731	718	723
size (ares)	30		30		30		30	
size (ACRES)	0.741		0.741		0.741		0.741	
Species count	12	26	9	13	8	17	9	11
Stems per ACRE	805	1,209	858	978	836	986	969	975

APPENDIX D

Stream Measurement and Geomorphology Data

Table 9a. UTHC-1 Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	5.8 – 10.6	9.0 – 10.0	6.5 – 9	6.0	7.6	8.9	3
Floodprone Width (ft)	9.0 – 27.3	13 – 21	50	59.1	64.6	68.3	3
Bankfull Mean Depth (ft)	0.4 – 0.8	1.1 – 1.2	0.5 – 0.7	0.6	0.7	0.7	3
Bankfull Max Depth (ft)	0.4 – 1.2	1.3 – 1.5	0.8 – 1.0	1.0	1.1	1.2	3
Bankfull Cross-Sectional Area (ft^2)	2.8 – 4.5	10.4 – 10.7	3.4 – 6.1	4.5	5.1	5.5	3
Width/Depth Ratio	7.6 – 28.2	8 – 10	12.4 – 13.4	8.2	11.6	14.4	3
Entrenchment Ratio	1.2 – 2.6	1.3 – 2.3	5.6 – 7.7	6.6	8.7	11.0	3
Bank Height Ratio	1.0 – 10.4	1.0	1.0	1.0	1.0	1.0	3
Pattern							
Channel Beltwidth (ft)	*	45	26 – 61	26 – 61			
Radius of Curvature (ft)	*	13 – 42	18 – 27	18 – 27			
Rc:Bankfull width (ft/ft)	*	1.3 – 4.4	2.0 – 4.1	2.0 – 4.1			
Meander Wavelength (ft)	*	93 – 136	54 – 125	54 – 125			
Meander Width Ratio	*	4.5 – 5.0	4.0 – 7.5	4.0 – 7.5			
Riffle Length (ft)	*			4.2	27.2	40.9	30
Riffle Slope (ft/ft)	0.024 – 0.033	0.013 – 0.028	0.018 – 0.046	0.011	0.024	0.059	30
Pool Length (ft)	*			9.8	61.1	161.9	28
Pool Spacing (ft)	*	30 – 59	48 – 70	31.3	59.3	118.6	27
SC% / Sa% / G% / C% / B% /Be%	2/18/51/28/0/0			1/19/51/26/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	1.3/18/37/97/130	Gravel	Gravel	1.3/9.7/31/91/147			
Channel length (ft)	1,874		1,739	1,739			
Drainage Area (acres)	114	Variable	114	114			
Rosgen Classification	F4	B4c	C4	C4			
Sinuosity	1.2	1.2	1.2	1.2			
Water Surface Slope (ft/ft)	0.021	0.013	0.025	0.026			

* : no data shown due to channelization / lack of bed diversity

Table 9b. UTHC3 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	8.5 – 14.1	9.0 – 10.0	12	10.9	11.3	11.7	2
Floodprone Width (ft)	17.1	13 – 21	68	69.4	72.6	75.8	2
Bankfull Mean Depth (ft)	0.8 – 1.6	1.1 – 1.2	0.9	1.0	1.1	1.1	2
Bankfull Max Depth (ft)	1.1 – 2.0	1.3 – 1.5	1.5	1.4	1.5	1.7	2
Bankfull Cross-Sectional Area (ft^2)	8.5 – 12.5	10.4 – 10.7	11.4	10.6	12.0	13.3	2
Width/Depth Ratio	17	8 – 10	12.7	10.2	10.7	11.1	2
Entrenchment Ratio	1.2	1.3 – 2.3	5.7	5.9	6.5	7.0	2
Bank Height Ratio	3.2	1.0	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*	45	39 – 57	39 – 57			
Radius of Curvature (ft)	*	13 – 42	24 – 36	24 – 36			
Rc:Bankfull width (ft/ft)	*	1.3 – 4.4	24 – 36	24 – 36			
Meander Wavelength (ft)	*	93 – 136	111 – 173	111 – 173			
Meander Width Ratio	*	4.5 – 5.0	3.3 – 4.8	3.3 – 4.8			
Profile							
Riffle Length (ft)	*			18.2	46.0	85.8	18
Riffle Slope (ft/ft)	0.015	0.013 – 0.028	0.0007 – 0.032	0.003	0.015	0.040	18
Pool Length (ft)	*			15.9	26.6	49.1	17
Pool Spacing (ft)	*	30 – 59	52 – 101	48.8	75.5	113.5	16
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	3/15/57/19/0/6			0/13/48/37/1/0			
d16 / d35 / d50 / d84 / d95 (mm)	2.7/15/26/40/92	Gravel	Gravel	2.5/23/48/125/165			
Channel length (ft)	1,411		1,325	1,325			
Drainage Area (acres)	297	Variable	297	297			
Rosgen Classification	F4	B4c	C4	C4			
Sinuosity	1.2	1.2	1.2	1.2			
Water Surface Slope (ft/ft)	0.014	0.013	0.015	0.015			

* : no data shown due to channelization / lack of bed diversity

Table 9c. T1 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension – Riffle							
Bankfull Width (ft)	4.1 – 7.5		6.5	6.5			
Floodprone Width (ft)	6.0 – 32.8		35	48.4			
Bankfull Mean Depth (ft)	0.5 – 0.7		0.5	0.6			
Bankfull Max Depth (ft)	0.8 – 1.0		0.8	1.2			
Bankfull Cross-Sectional Area (ft^2)	2.7 – 3.8		3.4	3.9			
Width/Depth Ratio	6.2 – 14.9	12 – 18	12.4	10.9			
Entrenchment Ratio	1.5 – 4.4	2.2+	5.4	7.5			
Bank Height Ratio	1.0 – 4.5	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		23 – 41	23 – 41			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.2 – 3.4	2.2 – 3.4			
Meander Wavelength (ft)	*		60 – 83	60 – 83			
Meander Width Ratio	*		3.5 – 6.3	3.5 – 6.3			
Profile							
Riffle Length (ft)	*			7.8	22.0	42.2	16
Riffle Slope (ft/ft)	0.019 – 0.028		0.015 – 0.60	0.002	0.022	0.035	16
Pool Length (ft)	*			3.5	12.6	20.1	16
Pool Spacing (ft)	*		25 – 63	24.4	41.3	58.4	15
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	31/21/44/4/1/0			2/15/66/17/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.13/0.37/3/38/66	Gravel	Gravel	1.9/8.8/22/67/94			
Channel length (ft)	764		751	751			
Drainage Area (acres)	43	Variable	43	43			
Rosgen Classification	B4, C4, G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.026	N/A	0.026	0.025			

* : no data shown due to channelization / lack of bed diversity

Table 9d. T1A Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data (SF)	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	7.1		5.5	5.4	5.6	5.8	2
Floodprone Width (ft)	7.7		35	44.5	49.4	54.4	2
Bankfull Mean Depth (ft)	0.4		0.5	0.3	0.4	0.4	2
Bankfull Max Depth (ft)	0.5		0.7	0.7	0.7	0.7	2
Bankfull Cross-Sectional Area (ft^2)	2.8		2.5	1.8	2.1	2.3	2
Width/Depth Ratio	18.2	12 – 18	12.1	14.1	15.0	15.9	2
Entrenchment Ratio	1.1	2.2+	6.4	7.7	8.9	10.1	2
Bank Height Ratio	19.6	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		20 – 28	20 – 28			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.3 – 3.4	2.3 – 3.4			
Meander Wavelength (ft)	*		72 – 84	72 – 84			
Meander Width Ratio	*		3.6 – 5.1	3.6 – 5.1			
Profile							
Riffle Length (ft)				1.4	20.7	51.8	16
Riffle Slope (ft/ft)	0.025		0.020 – 0.062	0.000	0.025	0.046	16
Pool Length (ft)				4.9	14.7	27.2	16
Pool Spacing (ft)	*		32 – 58	32.8	44.7	65.8	15
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	31/51/12/6/0/0			5/19/62/14/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.072/0.13/2.9/71	Gravel	Gravel	0.7/5.8/20/59/99			
Channel length (ft)	746		795	795			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	F4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.022	N/A	0.030	0.030			

* : no data shown due to channelization / lack of bed diversity

Table 9e. T2-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.1		4.5	4.7			
Floodprone Width (ft)	4		22	24.1			
Bankfull Mean Depth (ft)	0.5		0.4	0.5			
Bankfull Max Depth (ft)	0.8		0.6	0.9			
Bankfull Cross-Sectional Area (ft^2)	1.5		1.7	2.3			
Width/Depth Ratio	6.3	12 – 18	12.0	9.9			
Entrenchment Ratio	1.3	2.2+	4.9	5.1			
Bank Height Ratio	3.3	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				1.6	13.2	40.9	8
Riffle Slope (ft/ft)	0.04		0.024-0.063	0.023	0.049	0.099	8
Pool Length (ft)				3.6	14.8	31.4	7
Pool Spacing (ft)	*		21 – 34	24.1	37.8	55.6	6
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	11/14/63/13/0/0			14/30/27/30/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.26/13/21/58/84	Gravel	Gravel	0.1/0.7/6/87/130			
Channel length (ft)	232		265	265			
Drainage Area (acres)	16	Variable	16	16			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.038	N/A	0.042	0.040			

* : no data shown due to channelization / lack of bed diversity

Table 9f. T3 Baseline Stream Data Summary **Mill Dam Creek Restoration Site, DMS Project #97136**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.5		4.5	4.7			
Floodprone Width (ft)	4.2		18	19.2			
Bankfull Mean Depth (ft)	0.3		0.4	0.4			
Bankfull Max Depth (ft)	0.4		0.6	0.7			
Bankfull Cross-Sectional Area (ft^2)	1.1		1.7	1.9			
Width/Depth Ratio	11.3	12 – 18	12.0	11.6			
Entrenchment Ratio	1.2	2.2+	4.0	4.1			
Bank Height Ratio	3.3	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				2.2	13.3	25.7	13
Riffle Slope (ft/ft)	0.058		0.051 – 0.074	0.032	0.058	0.125	13
Pool Length (ft)				3.4	9.5	20.7	12
Pool Spacing (ft)	*		20 – 30	22.8	28.2	46.7	11
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	28/5/38/27/4			6/11/71/13/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/3.1/25/130/240	Gravel	Gravel	1.7/7.8/28/61/84			
Channel length (ft)	378		369	369			
Drainage Area (acres)	7	Variable	7	7			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.059	N/A	0.059	0.057			

* : no data shown due to channelization / lack of bed diversity

Table 9g. T4 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	2.5		4.5	4.0			
Floodprone Width (ft)	4.7		16	18.7			
Bankfull Mean Depth (ft)	0.3		0.6	0.5			
Bankfull Max Depth (ft)	0.4		0.6	0.8			
Bankfull Cross-Sectional Area (ft^2)	0.7		1.7	1.9			
Width/Depth Ratio	9.4	12 – 18	12.0	8.3			
Entrenchment Ratio	1.9	2.2+	3.6	4.7			
Bank Height Ratio	6.9	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				7.9	13.4	22.2	7
Riffle Slope (ft/ft)	0.1		0.102 – 0.103	0.039	0.11	0.23	7
Pool Length (ft)				3.2	5.4	11.0	7
Pool Spacing (ft)	*		24 – 27	9.5	19.5	26.5	6
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	12/65/13/8/2/0			0/15/77/8/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.11/0.16/0.21/4.3/120	Gravel	Gravel	2.2/9.6/15/48/76			
Channel length (ft)	151		151	151			
Drainage Area (acres)	3	Variable	3	3			
Rosgen Classification	B4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.0	1.0			
Water Surface Slope (ft/ft)	0.089	N/A	0.113	0.109			

* : no data shown due to channelization / lack of bed diversity

Table 9h. T6-2 Baseline Stream Data Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	4.4		5.5	5.6			
Floodprone Width (ft)	5.4		24	27.4			
Bankfull Mean Depth (ft)	0.6		0.5	0.5			
Bankfull Max Depth (ft)	0.7		0.7	1.0			
Bankfull Cross-Sectional Area (ft^2)	2.6		2.5	2.6			
Width/Depth Ratio	7.5	12 – 18	12.1	11.9			
Entrenchment Ratio	1.1	2.2+	4.4	4.9			
Bank Height Ratio	4.4	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				15.4	25.1	37.9	15
Riffle Slope (ft/ft)	0.02		0.020 – 0.063	0.007	0.033	0.070	15
Pool Length (ft)				5.9	14.1	22.7	15
Pool Spacing (ft)	*		32 – 47	28.8	42.9	50.9	14
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	7/33/60/0/0/0			1/16/53/30/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.19/1.6/4.1/13/27	Gravel	Gravel	1.7/16/38/93/140			
Channel length (ft)	621		658	658			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.041	N/A	0.034	0.037			

* : no data shown due to channelization / lack of bed diversity

Table 9i. T6A-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	**		4.5	4.4			
Floodprone Width (ft)	**		24	25.3			
Bankfull Mean Depth (ft)	**		0.4	0.4			
Bankfull Max Depth (ft)	**		0.6	0.6			
Bankfull Cross-Sectional Area (ft^2)	**		1.7	1.7			
Width/Depth Ratio	**	12 – 18	12.0	11.0			
Entrenchment Ratio	**	2.2+	5.3	5.8			
Bank Height Ratio	**	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	**		N/A	N/A			
Radius of Curvature (ft)	**		N/A	N/A			
Rc:Bankfull width (ft/ft)	**		N/A	N/A			
Meander Wavelength (ft)	**		N/A	N/A			
Meander Width Ratio	**		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)	**			9.3	14.8	24.0	3
Riffle Slope (ft/ft)	**		0.087 – 0.099	0.056	0.091	0.118	3
Pool Length (ft)	**			14.2	16.7	19.5	3
Pool Spacing (ft)	**		22 – 23	29.4	30.0	30.6	2
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	**			0/14/70/16/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	**	Gravel	Gravel	2.6/25/36/64/85			
Channel length (ft)	97		101	101			
Drainage Area (acres)	9	Variable	9	9			
Rosgen Classification	**	B4c	C4b	C4b			
Sinuosity	**	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	**	N/A	0.091	0.095			

** Existing conditions are ponded

Table 9j. T7-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	3.2		6.5	10.1			
Floodprone Width (ft)	4.6		28	47.4			
Bankfull Mean Depth (ft)	0.8		0.5	0.4			
Bankfull Max Depth (ft)	1.1		0.8	1.0			
Bankfull Cross-Sectional Area (ft^2)	2.4		3.4	4.3			
Width/Depth Ratio	4.1	12 – 18	12.4	23.9			
Entrenchment Ratio	1.4	2.2+	4.3	4.7			
Bank Height Ratio	1.7	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		20 – 24	20 – 24			
Radius of Curvature (ft)	*		15 – 22	15 – 22			
Rc:Bankfull width (ft/ft)	*		2.3 – 3.4	2.3 – 3.4			
Meander Wavelength (ft)	*		85 – 88	85 – 88			
Meander Width Ratio	*		3.1 – 3.7	3.1 – 3.7			
Profile				Min	Mean	Max	n
Riffle Length (ft)				4.5	32.4	68.1	6
Riffle Slope (ft/ft)	0.032		0.017 – 0.043	0.015	0.025	0.029	6
Pool Length (ft)				4.9	12.5	19.7	6
Pool Spacing (ft)	*		36 – 57	45.7	54.6	86.6	5
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	3/18/62/16/1/0			0/20/62/17/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	1.2/7.9/22/66/89	Gravel	Gravel	0.8/8.5/17/67/110			
Channel length (ft)	335		348	348			
Drainage Area (acres)	41	Variable	41	41			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.033	N/A	0.024	0.022			

* : no data shown due to channelization / lack of bed diversity

Table 9k. T8-2 Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	3.6		5.5	5.5	5.6	5.7	2
Floodprone Width (ft)	4.1		25	34.8	39.1	43.4	2
Bankfull Mean Depth (ft)	0.7		0.5	0.6	0.6	0.6	2
Bankfull Max Depth (ft)	0.9		0.7	1.0	1.0	1.0	2
Bankfull Cross-Sectional Area (ft^2)	2.4		2.5	3.2	3.3	3.4	2
Width/Depth Ratio	5.5	12 – 18	12.1	9.1	9.6	10.1	2
Entrenchment Ratio	1.1	2.2+	4.4	6.3	7.0	7.6	2
Bank Height Ratio	2.5	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile							
Riffle Length (ft)				9.3	23.3	31.9	10
Riffle Slope (ft/ft)	0.041		0.043 – 0.050	0.033	0.048	0.063	10
Pool Length (ft)				7.9	13.4	16.6	10
Pool Spacing (ft)	*		32 - 45	34.1	42.2	53.6	9
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	18/27/40/14/0/0			4/17/52/27/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.13/2.2/8.5/81/140	Gravel	Gravel	0.7/14/37/95/135			
Channel length (ft)	486		448	448			
Drainage Area (acres)	21	Variable	21	21			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.044	N/A	0.045	0.048			

* : no data shown due to channelization / lack of bed diversity

Table 9l. T8A Baseline Stream Data Summary Mill Dam Creek Restoration Site, DMS Project #97136							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle				Min	Mean	Max	n
Bankfull Width (ft)	3.1		4.5	4.7	5.7	6.6	2
Floodprone Width (ft)	4.1		20	21.6	44.7	67.9	2
Bankfull Mean Depth (ft)	0.3		0.4	0.4	0.5	0.5	2
Bankfull Max Depth (ft)	0.9		0.6	0.9	1.0	1.1	2
Bankfull Cross-Sectional Area (ft^2)	1.0		1.7	2.6	2.7	2.9	2
Width/Depth Ratio	5.5	12 – 18	12.0	8.6	11.9	15.2	2
Entrenchment Ratio	1.1	2.2+	4.4	4.6	7.4	10.3	2
Bank Height Ratio	2.7	1.0 – 1.1	1.0	1.0	1.0	1.0	2
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile							
Riffle Length (ft)				12.3	22.7	42.7	7
Riffle Slope (ft/ft)	0.044		0.019 – 0.062	0.027	0.053	0.10	7
Pool Length (ft)				6.3	12.4	22.4	6
Pool Spacing (ft)	*		28 – 38	27.7	40.3	66.1	5
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	100/0/0/0/0/0			4/17/54/25/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.062/0.062/0.062/0.062	Gravel	Gravel	1.8/23/32/84/135			
Channel length (ft)	258		262	262			
Drainage Area (acres)	7	Variable	7	7			
Rosgen Classification	G4	B4c	C4b	C4b			
Sinuosity	1.1	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.052	N/A	0.044	0.047			

* : no data shown due to channelization / lack of bed diversity

Table 9m. T9 Baseline Stream Data Summary **Mill Dam Creek Restoration Site, DMS Project #97136**							
Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built			
Dimension - Riffle							
Bankfull Width (ft)	2.9		5.5	4.1			
Floodprone Width (ft)	5.5		22	29.6			
Bankfull Mean Depth (ft)	0.7		0.5	0.7			
Bankfull Max Depth (ft)	0.9		0.7	0.9			
Bankfull Cross-Sectional Area (ft^2)	2.0		2.5	2.8			
Width/Depth Ratio	4.3	12 – 18	12.1	6.0			
Entrenchment Ratio	1.9	2.2+	4.0	7.2			
Bank Height Ratio	1.7	1.0 – 1.1	1.0	1.0			
Pattern							
Channel Beltwidth (ft)	*		N/A	N/A			
Radius of Curvature (ft)	*		N/A	N/A			
Rc:Bankfull width (ft/ft)	*		N/A	N/A			
Meander Wavelength (ft)	*		N/A	N/A			
Meander Width Ratio	*		N/A	N/A			
Profile				Min	Mean	Max	n
Riffle Length (ft)				10.5	22.8	31.7	4
Riffle Slope (ft/ft)	0.031		0.037	0.033	0.039	0.056	4
Pool Length (ft)				3.9	6.2	7.7	3
Pool Spacing (ft)	*		34 – 36	37.02	39.1	41.1	2
Substrate and Transport Parameters							
SC% / Sa% / G% / C% / B% /Be%	26/66/8/0/0/0			3/7/59/31/0/0			
d16 / d35 / d50 / d84 / d95 (mm)	0.062/0.13/0.15/0.23/3.7	Gravel	Gravel	12/32/42/90/150			
Channel length (ft)	133		129	129			
Drainage Area (acres)	29	Variable	29	29			
Rosgen Classification	B4	B4c	C4b	C4b			
Sinuosity	1.0	1.1 – 1.3	1.1	1.1			
Water Surface Slope (ft/ft)	0.039	N/A	0.042	0.038			

* : no data shown due to channelization / lack of bed diversity

Table 10. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Dimension and Substrate	Cross-Section 1 (Riffle) Station 13+50, UTHC-1							Cross-Section 2 (Riffle) Station 19+25, UTHC-1							Cross-Section 3 (Pool) Station 19+50, UTHC-1						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	948.8	948.8	948.9	948.9				931.0	930.9	930.7	930.9				930.3	930.1	930.0	930.2			
Bankfull Width (ft)	6.0	6.6	6.1	7.1				8.0	7.0	7.8	7.7				8.4	7.8	8.2	17.3			
Floodprone Width (ft)	66.3	66.6	67.4	67.1				68.3	70.7	69.6	68.6				---	---	---	---			
Bankfull Mean Depth (ft)	0.7	0.7	0.7	0.6				0.7	0.8	0.7	0.7				0.9	0.9	0.9	0.4			
Bankfull Max Depth (ft)	1.2	1.2	1.3	1.3				1.2	1.4	1.3	1.1				1.7	1.7	1.7	1.6			
Cross-Sectional Area (ft2) based on AB BKF area	4.5	4.5	4.5	4.5				5.3	5.3	5.3	5.3				7.4	7.4	7.4	7.4			
Cross-Sectional Area (ft2) based on AB BKF elevation	4.5	4.4	3.8	3.8				5.3	6.1	8.3	5.9				7.4	9.5	10.1	10.4			
Bankfull Width/Depth Ratio	8.2	9.6	8.3	11.4				12.1	9.2	11.6	11.4				---	---	---	---			
Bankfull Entrenchment Ratio	11.0	10.1	11.0	9.4				8.6	10.1	8.9	8.9				---	---	---	---			
Bankfull Bank Height Ratio	1.0	1.0	1.0	0.9				1.0	0.9	0.9	1.0				---	---	---	---			
d50 (mm)	48	48	37.0	---				24	40	22.0	---				---	---	---	---			
	Cross-Section 4 (Pool) Station 23+17, UTHC-1							Cross-Section 5 (Riffle) Station 23+32, UTHC-1							Cross-Section 6 (Riffle) Station 30+20, UTHC-2						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	923.0	922.9	923.0	923.0				922.8	922.9	922.9	922.9				908.7	908.7	908.7	908.7			
Bankfull Width (ft)	13.1	12.1	12.0	12.5				8.9	8.6	9.6	9.0				22.6	22.8	23.0	22.8			
Floodprone Width (ft)	---	---	---	---				59.1	57.6	57.9	58.8				43.0	43.0	41.1	43.1			
Bankfull Mean Depth (ft)	1.2	1.3	1.3	1.2				0.6	0.6	0.6	0.6				2.5	2.4	2.4	2.4			
Bankfull Max Depth (ft)	2.2	2.4	2.3	2.3				1.0	0.9	0.9	1.0				3.7	3.6	3.7	3.5			
Cross-Sectional Area (ft2) based on AB BKF area	15.4	15.4	15.4	15.4				5.5	5.5	5.5	5.5				55.5	55.5	55.5	55.5			
Cross-Sectional Area (ft2) based on AB BKF elevation	15.4	16.8	16.6	16.4				5.5	4.9	4.7	5.0				55.5	55.9	54.9	56.5			
Bankfull Width/Depth Ratio	---	---	---	---				14.4	13.2	16.5	14.6				9.2	9.3	9.5	9.4			
Bankfull Entrenchment Ratio	---	---	---	---				6.6	6.7	6.0	6.5				1.9	1.9	1.8	1.9			
Bankfull Bank Height Ratio	---	---	---	---				1.0	0.8	0.9	0.9				1.0	1.0	1.0	1.0			
d50 (mm)	---	---	---	---				21	38	58	---				19	31	33.0	---			
	Cross-Section 7 (Riffle) Station 38+52, UTHC-2							Cross-Section 8 (Pool) Station 46+20, UTHC-3							Cross-Section 9 (Riffle) Station 46+48, UTHC-3						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	883.7	883.7	883.8	883.8				871.2	871.2	870.3	870.4				871.0	870.9	871.0	871.3			
Bankfull Width (ft)	12.9	11.8	11.6	13.5				10.4	10.4	10.9	11.3				10.9	11.2	11.9	12.5			
Floodprone Width (ft)	37.6	38.4	37.6	38.3				---	---	---	---				75.8	76.1	76.0	72.6			
Bankfull Mean Depth (ft)	1.3	1.4	1.4	1.2				2.0	2.0	1.9	1.8				1.0	1.0	0.9	0.9			
Bankfull Max Depth (ft)	2.0	2.2	2.1	2.1				3.8	3.8	2.8	3.1				1.4	1.6	1.6	1.7			
Cross-Sectional Area (ft2) based on AB BKF area	16.7	16.7	16.7	16.7				20.8	20.8	20.8	20.8				10.6	10.6	10.6	10.6			
Cross-Sectional Area (ft2) based on AB BKF elevation	16.7	16.6	15.8	15.8				20.8	20.8	31.9	30.3				10.6	11.4	10.9	6.8			
Bankfull Width/Depth Ratio	9.9	8.3	8.0	10.9				---	---	---	---				11.1	11.7	13.2	14.6			
Bankfull Entrenchment Ratio	2.9	3.3	3.3	2.8				---	---	---	---				7.0	6.8	6.4	5.8			
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0				---	---	---	---				1.0	1.0	1.0	0.9			
d50 (mm)	19	55	66	---				---	---	---	---				50	64	58	---			

Table 10. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Dimension and Substrate	Cross-Section 10 (Riffle) Station 53+10, UTHC-3							Cross-Section 11 (Riffle) Station 57+40, UTHC-4							Cross-Section 12 (Riffle) Station 65+80, UTHC-6						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	861.6	861.7	861.8	861.6				853.8	853.9	853.8	853.9				845.4	845.4	845.4	845.5			
Bankfull Width (ft)	11.7	14.0	11.5	12.8				11.9	12.1	12.7	12.0				17.6	19.0	20.0	18.9			
Floodprone Width (ft)	69.4	69.5	69.3	70.0				43.2	43.8	44.2	44.2				30.7	17.7	19.8	27.9			
Bankfull Mean Depth (ft)	1.1	1.0	1.2	1.0				1.4	1.4	1.4	1.4				1.7	1.6	1.5	1.6			
Bankfull Max Depth (ft)	1.7	1.7	1.8	1.8				2.2	2.3	2.4	2.2				2.8	2.6	2.6	2.7			
Cross-Sectional Area (ft2) based on AB BKF area	13.3	13.3	13.3	13.3				17.3	17.3	17.3	17.2				30.2	29.7	30.2	30.2			
Cross-Sectional Area (ft2) based on AB BKF elevation	13.3	12.1	10.9	12.6				17.3	16.0	17.2	16.1				30.2	29.7	28.9	28.6			
Bankfull Width/Depth Ratio	10.2	14.7	9.9	12.2				8.2	8.5	9.4	8.4				10.3	12.2	13.2	11.9			
Bankfull Entrenchment Ratio	5.9	5.0	6.0	5.5				3.6	3.6	3.5	3.7				1.7	0.9	1.0	1.5			
Bankfull Bank Height Ratio	1.0	1.0	0.9	0.9				1.1	1.0	1.0	1.0				3.2	1.0	0.9	0.9			
d50 (mm)	45	51	47	---				19	72	52	---				20	65	39	---			
	Cross-Section 13 (Riffle) Station 67+20, UTHC-6							Cross-Section 14 (Riffle) Station 155+00, T1A							Cross-Section 15 (Riffle) Station 156+20, T1A						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	847.4	847.2	847.2	847.3				943.6	943.6	943.6	943.6				938.9	939.1	939.0	939.0			
Bankfull Width (ft)	24.9	27.3	27.2	27.8				5.4	4.8	4.7	7.2				5.8	5.5	6.1	5.6			
Floodprone Width (ft)	67.7	68.1	68.8	68.3				54.4	54.3	54.7	54.6				44.5	46.4	46.4	44.4			
Bankfull Mean Depth (ft)	1.6	1.4	1.4	1.4				0.3	0.4	0.4	0.3				0.4	0.4	0.4	0.4			
Bankfull Max Depth (ft)	2.6	3.2	3.1	3.0				0.7	0.8	0.7	0.6				0.7	0.7	0.7	0.6			
Cross-Sectional Area (ft2) based on AB BKF area	38.7	38.7	38.7	38.7				1.8	1.8	1.8	1.8				2.3	2.3	2.3	2.3			
Cross-Sectional Area (ft2) based on AB BKF elevation	38.7	42.1	42.3	39.8				1.8	1.9	1.8	1.9				2.3	1.7	1.9	1.9			
Bankfull Width/Depth Ratio	16.0	19.3	19.1	20.0				15.9	12.5	12.4	28.7				14.1	12.9	15.6	13.5			
Bankfull Entrenchment Ratio	2.7	2.5	2.5	2.5				10.1	11.4	11.5	7.6				7.7	8.4	7.7	7.9			
Bankfull Bank Height Ratio	1.0	0.9	1.1	1.0				1.0	1.0	0.9	0.8				1.0	0.8	1.0	1.0			
d50 (mm)	21	37	47	---				24	29	32	---				16	19	48	---			
	Cross-Section 16 (Riffle) Station 104+80, T1							Cross-Section 17 (Pool) Station 105+10, T1							Cross-Section 18 (Riffle) Station 206+60, T2						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	929.2	929.2	929.2	929.4				928.4	928.4	928.4	928.6				923.4	923.4	923.4	923.5			
Bankfull Width (ft)	6.5	8.6	7.0	6.8				8.7	7.8	8.4	6.0				4.7	5.8	5.9	6.1			
Floodprone Width (ft)	48.4	49.6	47.7	48.8				---	---	---	---				24.1	24.6	24.5	24.4			
Bankfull Mean Depth (ft)	0.6	0.4	0.6	0.6				1.0	1.1	1.0	1.4				0.5	0.4	0.4	0.4			
Bankfull Max Depth (ft)	1.2	1.3	1.0	1.0				2.3	2.1	2.0	2.1				0.9	0.9	0.9	0.8			
Cross-Sectional Area (ft2) based on AB BKF area	3.9	3.9	3.9	3.9				8.3	8.3	8.3	8.3				2.3	2.3	2.3	2.3			
Cross-Sectional Area (ft2) based on AB BKF elevation	3.9	3.7	3.4	2.5				8.3	8.4	7.7	6.9				2.3	1.9	1.9	1.7			
Bankfull Width/Depth Ratio	10.9	19.3	12.6	11.9				---	---	---	---				9.9	14.7	15.6	16.4			
Bankfull Entrenchment Ratio	7.5	5.7	6.8	7.2				---	---	---	---				5.1	4.3	4.1	4.0			
Bankfull Bank Height Ratio	1.0	0.9	0.9	0.9				---	---	---	---				1.0	0.8	1.0	1.0			
d50 (mm)	22	27	9.4	---				---	---	---	---				6.4	69	21	---			

Table 10. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

Dimension and Substrate	Cross-Section 19 (Pool) Station 206+80, T2							Cross-Section 20 (Riffle) Station 302+80, T3							Cross-Section 21 (Pool) Station 303+30 T3						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	922.6	922.6	922.7	922.6				918.0	918.1	917.9	918.0				916.6	916.6	916.6	916.7			
Bankfull Width (ft)	6.7	6.6	6.2	6.4				9.9	7.8	10.8	6.9				7.8	7.2	6.8	9.3			
Floodprone Width (ft)	---	---	---	---				21.8	21.1	20.7	21.5				---	---	---	---			
Bankfull Mean Depth (ft)	0.8	0.8	0.9	0.9				0.4	0.5	0.3	0.5				1.0	1.1	1.1	0.8			
Bankfull Max Depth (ft)	1.7	1.9	1.8	1.6				1.0	1.0	0.9	1.0				1.9	1.8	1.7	1.6			
Cross-Sectional Area (ft2) based on AB BKF area	5.6	5.6	5.7	5.6				3.6	3.6	3.6	3.6				7.7	7.7	7.3	7.7			
Cross-Sectional Area (ft2) based on AB BKF elevation	5.6	5.2	5.2	5.2				1.9	1.3	2.0	1.8				7.7	8.1	7.4	6.8			
Bankfull Width/Depth Ratio	---	---	---	---				27.2	16.9	32.2	13.4				---	---	---	---			
Bankfull Entrenchment Ratio	---	---	---	---				2.2	2.7	1.9	3.1				---	---	---	---			
Bankfull Bank Height Ratio	---	---	---	---				1.0	0.9	0.9	0.9				---	---	---	---			
d50 (mm)	---	---	---	---				28	26	20	---				---	---	---	---			
	Cross-Section 22 (Riffle) Station 400+90, T4							Cross-Section 23 (Riffle) Station 651+25, T6A							Cross-Section 24 (Riffle) Station 608+15, T6						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	906.2	906.2	906.3	906.0				894.3	894.3	894.6	894.5				877.9	878.4	878.4	878.7			
Bankfull Width (ft)	4.0	4.4	8.7	2.9				4.4	3.5	3.2	3.9				5.6	3.8	3.5	3.9			
Floodprone Width (ft)	18.7	19.2	19.3	18.1				25.3	29.8	32.0	29.7				27.4	43.8	46.5	49.8			
Bankfull Mean Depth (ft)	0.5	0.4	0.2	0.7				0.4	0.5	0.5	0.4				0.5	0.7	0.8	0.7			
Bankfull Max Depth (ft)	0.8	0.9	0.8	0.9				0.6	0.9	1.1	0.9				1.0	1.0	1.0	1.1			
Cross-Sectional Area (ft2) based on AB BKF area	1.9	1.9	1.9	1.9				1.7	1.7	1.7	1.7				2.6	2.6	2.6	2.6			
Cross-Sectional Area (ft2) based on AB BKF elevation	1.9	1.9	0.9	2.5				1.7	1.8	1.1	1.1				2.6	0.8	0.9	0.4			
Bankfull Width/Depth Ratio	8.3	10.0	38.7	4.3				11.0	7.1	5.9	8.7				11.9	5.5	4.6	5.8			
Bankfull Entrenchment Ratio	4.7	4.4	2.2	6.3				5.8	8.5	10.0	7.7				4.9	11.6	13.4	12.8			
Bankfull Bank Height Ratio	1.0	0.5	0.9	1.1				1.0	1.1	1.0	1.1				1.0	0.6	0.7	0.8			
d50 (mm)	15	12	15	---				36	35	32	---				38	15	12	---			
	Cross-Section 25 (Pool) Station 608+40, T6							Cross-Section 26 (Pool) Station 703+40, T7							Cross-Section 27 (Riffle) Station 703+70, T7						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	877.6	877.7	878.1	878.8				868.2	868.0	868.1	868.2				867.5	867.6	867.8	867.7			
Bankfull Width (ft)	8.4	5.1	6.3	3.8				7.2	6.0	6.2	6.2				10.1	7.3	5.7	7.2			
Floodprone Width (ft)	---	---	---	---				---	---	---	---				47.4	47.0	44.0	43.5			
Bankfull Mean Depth (ft)	0.6	1.0	0.8	1.3				0.6	0.8	0.7	0.7				0.4	0.6	0.8	0.6			
Bankfull Max Depth (ft)	1.1	1.6	1.7	1.8				1.2	1.4	1.3	1.4				1.0	1.0	1.2	1.1			
Cross-Sectional Area (ft2) based on AB BKF area	5.1	5.1	5.1	5.1				4.6	4.6	4.6	4.6				4.3	4.3	4.3	4.3			
Cross-Sectional Area (ft2) based on AB BKF elevation	5.1	4.4	2.6	0.8				4.6	5.8	5.1	4.7				4.3	3.5	2.8	3.1			
Bankfull Width/Depth Ratio	---	---	---	---				---	---	---	---				23.9	12.4	7.5	12.1			
Bankfull Entrenchment Ratio	---	---	---	---				---	---	---	---				4.7	6.5	7.8	6.1			
Bankfull Bank Height Ratio	---	---	---	---				---	---	---	---				1.0	0.9	0.9	1.0			
d50 (mm)	---	---	---	---				---	---	---	---				17	22	28	---			

Table 10. Cross Section Dimensional Morphology Summary
Mill Dam Creek Restoration Site, DMS Project #97136

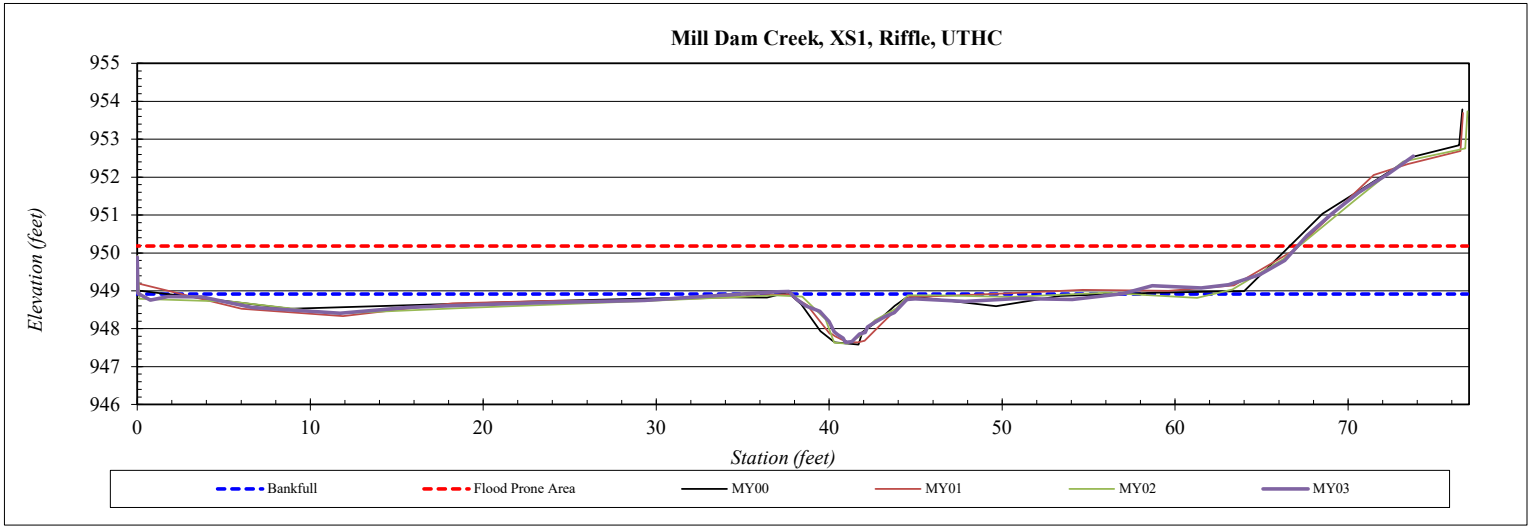
Dimension and Substrate	Cross-Section 28 (Riffle) Station 900+80, T9							Cross-Section 29 (Riffle) Station 806+10, T8							Cross-Section 30 (Riffle) Station 807+45, T8						
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07	
Bankfull Elevation (ft) based on AB BKF area	853.0	853.3	853.3	853.3				849.8	849.9	850.0	849.9				842.8	842.8	842.9	842.8			
Bankfull Width (ft)	4.1	4.7	5.3	8.1				5.5	5.5	5.4	6.7				5.7	5.8	7.1	8.2			
Floodprone Width (ft)	29.6	31.9	31.6	31.3				34.8	43.8	40.6	37.3				43.4	42.0	42.5	42.7			
Bankfull Mean Depth (ft)	0.7	0.6	0.5	0.3				0.6	0.6	0.6	0.5				0.6	0.6	0.5	0.4			
Bankfull Max Depth (ft)	0.9	1.2	1.1	1.0				1.0	1.2	1.1	1.0				1.0	1.0	1.1	0.9			
Cross-Sectional Area (ft2) based on AB BKF area	2.8	2.8	2.8	2.8				3.4	3.4	3.4	3.4				3.2	3.2	3.2	3.2			
Cross-Sectional Area (ft2) based on AB BKF elevation	2.8	1.5	1.5	1.3				3.4	2.9	2.6	2.9				3.2	3.4	3.0	3.2			
Bankfull Width/Depth Ratio	6.0	7.9	9.9	23.1				9.1	9.0	8.5	13.1				10.1	10.5	15.5	21.1			
Bankfull Entrenchment Ratio	7.2	6.7	6.0	3.9				6.3	7.9	7.6	5.6				7.6	7.2	6.0	5.2			
Bankfull Bank Height Ratio	1.0	1.0	0.8	0.8				1.0	0.9	0.9	0.9				1.0	1.0	1.0	0.9			
d50 (mm)	42	6.7	9.3	---				36	68	83	---				37	16	55	---			
	Cross-Section 31 (Riffle) Station 850+60, T8A							Cross-Section 32 (Riffle) Station 851+75, T8A													
	MY00	MY01	MY02	MY03	MY05	MY07		MY00	MY01	MY02	MY03	MY05	MY07								
Bankfull Elevation (ft) based on AB BKF area	850.8	850.9	850.8	850.7				845.8	845.6	845.7	845.6										
Bankfull Width (ft)	4.7	5.2	5.7	4.6				4.8	4.1	4.5	4.2										
Floodprone Width (ft)	21.6	21.8	22.0	19.7				49.3	49.4	49.3	49.2										
Bankfull Mean Depth (ft)	0.5	0.5	0.5	0.6				0.4	0.5	0.5	0.5										
Bankfull Max Depth (ft)	1.1	1.1	1.2	0.9				0.9	1.0	1.0	0.9										
Cross-Sectional Area (ft2) based on AB BKF area	2.6	2.6	2.6	2.6				2.1	2.1	2.1	2.1										
Cross-Sectional Area (ft2) based on AB BKF elevation	2.6	2.3	2.6	3.0				2.1	2.8	2.5	3.5										
Bankfull Width/Depth Ratio	8.6	10.7	12.6	8.1				11.4	8.2	10.0	8.5										
Bankfull Entrenchment Ratio	4.6	4.2	3.9	4.3				10.2	12.0	10.9	11.8										
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.1				1.0	1.2	1.0	1.1										
d50 (mm)	54	5	6.6	---				10	54	37	---										

Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS1
Drainage Area (sq mi):	0.18
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	949.89	61.5	949.07
0.0	948.94	63.1	949.16
0.8	948.76	64.9	949.43
1.8	948.85	66.3	949.80
3.7	948.84	67.6	950.46
6.6	948.56	69.1	951.03
11.7	948.41	70.6	951.60
15.6	948.56	72.4	952.10
19.3	948.63	73.8	952.56
24.0	948.70		
29.3	948.75		
34.0	948.89		
37.0	948.98		
37.7	948.98		
38.1	948.78		
38.7	948.60		
39.5	948.46		
40.0	948.19		
40.3	947.92		
40.5	947.84		
40.8	947.75		
40.9	947.64		
41.3	947.65		
41.8	947.86		
42.1	947.90		
42.2	948.04		
42.6	948.16		
43.2	948.32		
43.8	948.42		
44.5	948.77		
45.0	948.79		
47.9	948.72		
50.9	948.80		
54.1	948.77		
57.0	948.92		
58.7	949.14		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	948.91
Bankfull Cross-Sectional Area:	4.5
Total Cross-Sectional Area:	3.8
Bankfull Width:	7.1
Flood Prone Area Elevation:	950.18
Flood Prone Width:	67.1
Max Depth at Bankfull:	1.3
Mean Depth at Bankfull:	0.6
W / D Ratio:	11.4
Entrenchment Ratio:	9.4
Bank Height Ratio:	0.9
Thalweg Elevation:	947.64

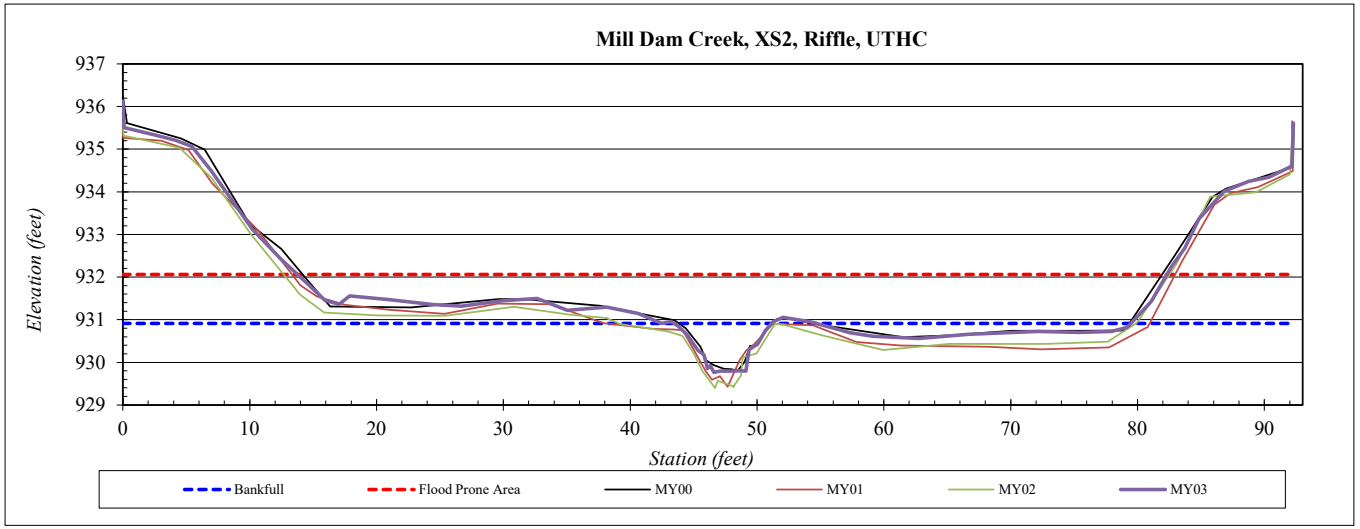


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS2
Drainage Area (sq mi):	0.18
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	936.12	50.7	930.75
0.1	935.51	51.3	930.95
2.5	935.34	52.0	931.06
4.2	935.21	54.2	930.95
5.4	935.07	57.3	930.69
7.0	934.48	59.1	930.61
8.5	933.86	62.7	930.56
10.2	933.12	66.7	930.66
12.4	932.43	72.1	930.73
14.6	931.83	75.4	930.70
15.9	931.46	78.0	930.73
17.0	931.37	79.2	930.82
17.9	931.56	81.1	931.43
21.1	931.47	82.6	932.23
24.5	931.35	83.7	932.68
26.7	931.32	84.9	933.37
29.9	931.44	86.8	934.01
32.7	931.50	88.7	934.25
35.0	931.22	90.4	934.34
38.2	931.30	92.2	934.61
40.7	931.14	92.3	935.61
42.5	930.91		
43.2	930.96		
43.8	930.85		
44.5	930.65		
45.3	930.28		
45.8	930.18		
46.1	929.85		
46.3	929.92		
46.6	929.76		
47.1	929.80		
47.8	929.80		
48.7	929.80		
49.1	929.79		
49.4	930.30		
50.1	930.43		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	930.91
Bankfull Cross-Sectional Area:	5.3
Total Cross-Sectional Area:	5.9
Bankfull Width:	7.7
Flood Prone Area Elevation:	932.06
Flood Prone Width:	68.6
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.7
W / D Ratio:	11.4
Entrenchment Ratio:	8.9
Bank Height Ratio:	1.0
Thalweg Elevation:	929.76

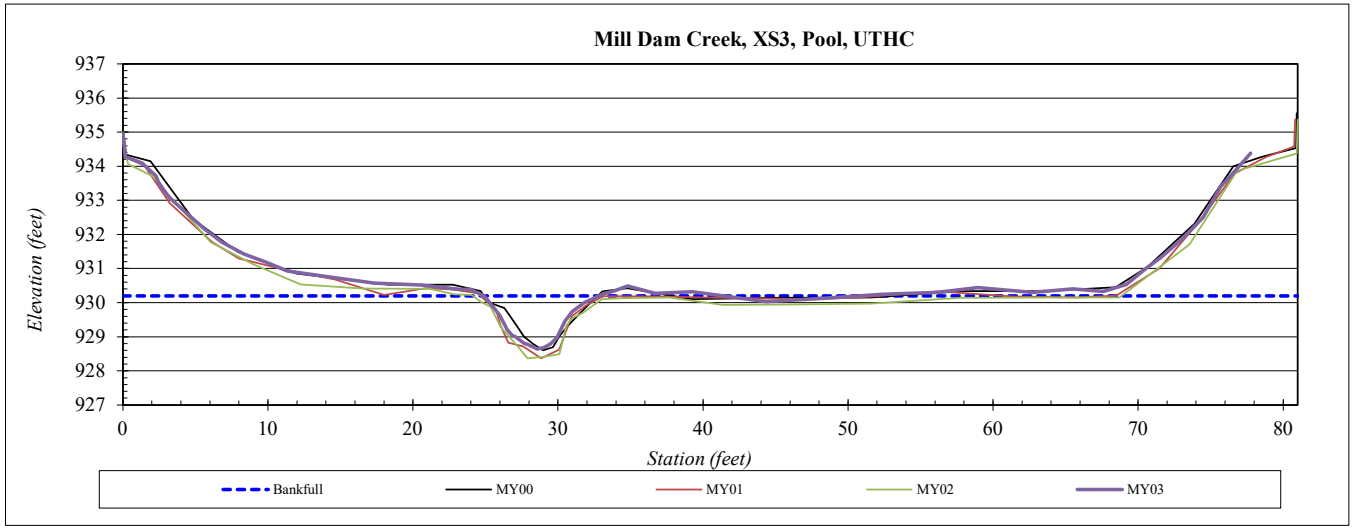


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS3
Drainage Area (sq mi):	0.18
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	934.975	48.5	930.13
0.2	934.28	52.3	930.24
1.3	934.10	56.1	930.30
2.3	933.71	58.9	930.44
2.4	933.53	62.7	930.30
3.2	933.09	65.5	930.41
4.5	932.60	67.6	930.33
5.7	932.15	69.2	930.53
6.8	931.78	70.4	930.97
8.3	931.43	71.5	931.31
9.9	931.17	73.0	931.84
11.3	930.93	74.5	932.51
13.9	930.77	75.7	933.40
17.3	930.57	77.0	934.01
20.6	930.51	77.8	934.38
23.3	930.39		
24.0	930.39		
25.0	930.18		
26.0	929.64		
26.5	929.20		
26.8	929.04		
27.1	929.00		
27.6	928.82		
28.0	928.75		
28.6	928.64		
29.1	928.69		
29.5	928.80		
29.9	928.97		
30.5	929.46		
31.0	929.74		
31.8	930.00		
33.1	930.26		
33.9	930.34		
34.8	930.49		
36.7	930.27		
39.3	930.32		
44.4	930.03		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	930.20
Bankfull Cross-Sectional Area:	7.4
Total Cross-Sectional Area:	10.4
Bankfull Width:	17.3
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.4
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	928.64

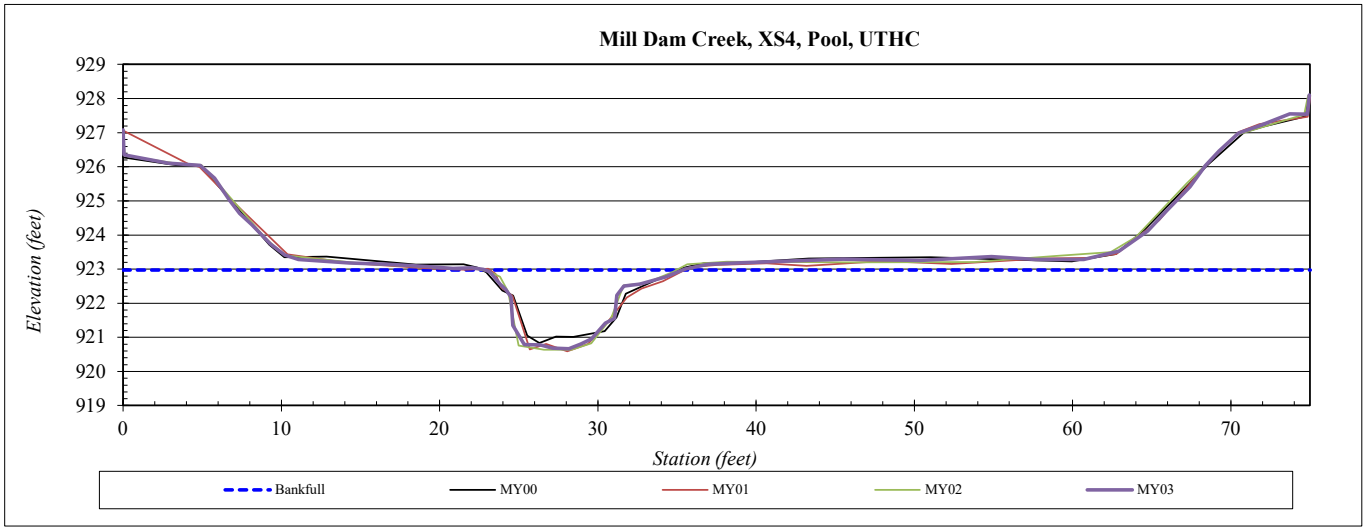


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS4
Drainage Area (sq mi):	0.18
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	927.08	41.4	923.22
0.1	926.36	45.5	923.30
2.8	926.11	50.3	923.26
4.9	926.04	54.9	923.37
5.8	925.67	57.7	923.29
6.7	925.03	60.7	923.28
7.3	924.64	62.9	923.53
8.1	924.31	64.8	924.12
9.3	923.74	65.9	924.70
10.2	923.42	67.4	925.42
11.1	923.28	68.4	926.03
14.3	923.18	69.3	926.46
16.7	923.14	70.5	926.99
19.2	923.08	71.8	927.20
20.8	923.02	73.7	927.56
22.0	923.04	74.8	927.54
22.8	922.99	75.0	928.105
23.2	922.92		
23.8	922.56		
24.2	922.40		
24.5	922.19		
24.6	921.35		
25.3	920.79		
26.4	920.78		
27.1	920.69		
28.2	920.67		
28.9	920.80		
29.6	920.96		
30.5	921.42		
31.1	921.56		
31.2	922.24		
31.6	922.50		
32.7	922.56		
34.3	922.77		
35.5	923.00		
37.0	923.15		
38.7	923.18		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	922.97
Bankfull Cross-Sectional Area:	15.4
Total Cross-Sectional Area:	16.4
Bankfull Width:	12.5
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.3
Mean Depth at Bankfull:	1.2
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	920.67

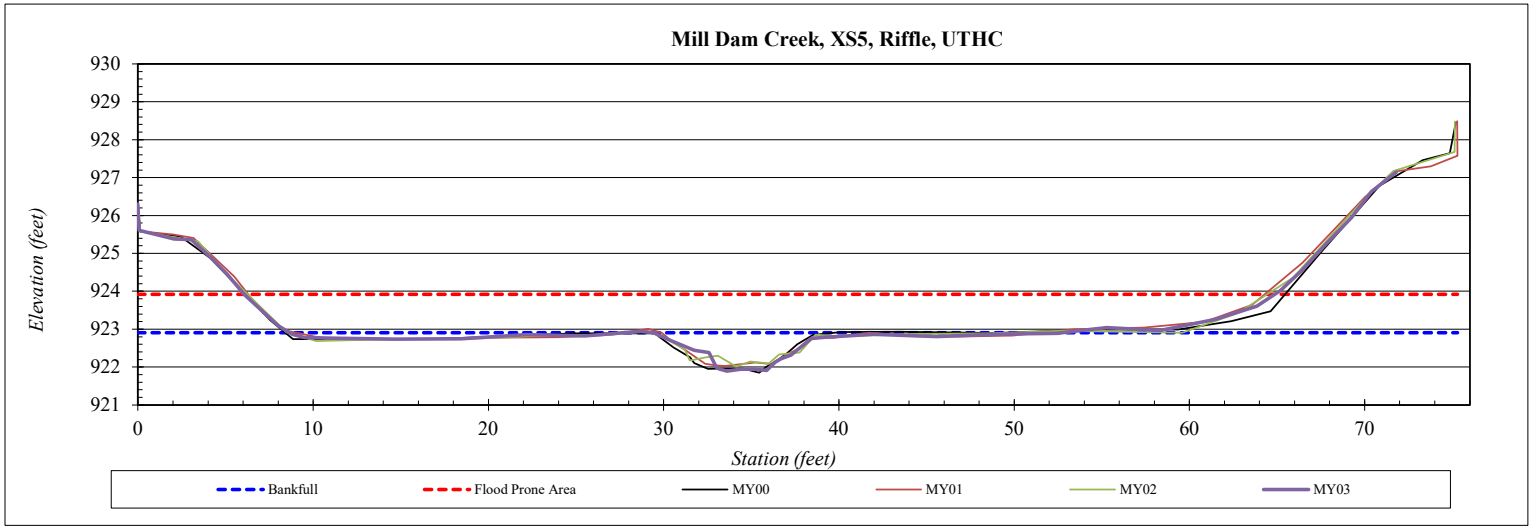


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS5
Drainage Area (sq mi):	0.18
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	926.30	55.3	923.04
0.1	925.61	58.3	922.97
2.0	925.38	61.5	923.26
3.0	925.37	63.8	923.60
4.2	924.89	65.2	924.02
5.1	924.45	66.4	924.55
6.1	923.91	67.8	925.26
7.1	923.46	69.2	925.95
8.0	923.09	70.4	926.63
8.8	922.86	71.8	927.15
9.5	922.78		
11.1	922.76		
14.7	922.74		
18.4	922.75		
22.1	922.85		
25.5	922.82		
27.7	922.91		
28.7	922.94		
29.4	922.91		
30.3	922.71		
31.7	922.44		
32.6	922.38		
33.0	922.00		
33.1	921.96		
33.6	921.90		
34.4	921.95		
35.2	921.94		
35.9	921.91		
36.4	922.13		
36.7	922.23		
37.3	922.32		
38.4	922.76		
39.3	922.79		
41.9	922.86		
45.6	922.81		
49.4	922.87		
52.4	922.89		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	922.91
Bankfull Cross-Sectional Area:	5.5
Total Cross-Sectional Area:	5.0
Bankfull Width:	9.0
Flood Prone Area Elevation:	923.92
Flood Prone Width:	58.8
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	14.6
Entrenchment Ratio:	6.5
Bank Height Ratio:	0.9
Thalweg Elevation:	921.90

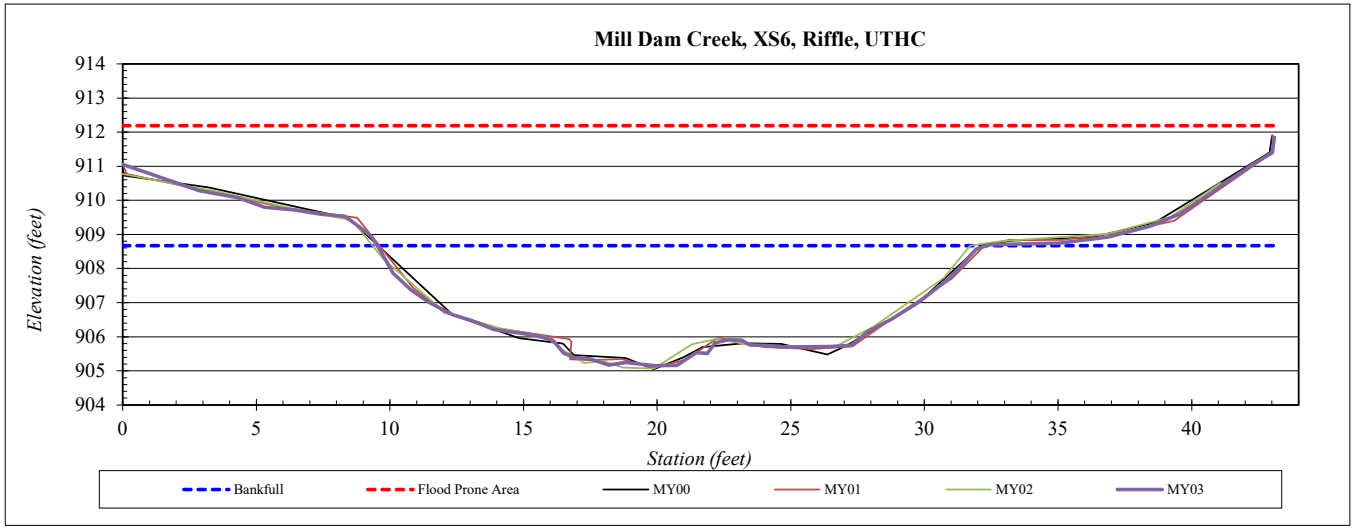


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS6
Drainage Area (sq mi):	0.22
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	911.06	27.3	905.75
2.9	910.29	27.9	906.15
4.3	910.07	28.8	906.51
5.3	909.80	29.8	907.01
6.4	909.72	31.0	907.73
7.4	909.59	31.9	908.57
8.3	909.53	32.4	908.70
8.9	909.20	33.4	908.71
9.3	908.95	35.0	908.74
9.6	908.53	36.9	908.92
10.1	907.87	38.5	909.24
10.8	907.36	39.5	909.59
11.5	907.01	40.3	909.99
12.4	906.65	41.5	910.64
13.1	906.46	42.3	911.03
13.9	906.21	43.0	911.41
14.3	906.16	43.1	911.85
15.4	906.05		
16.1	905.89		
16.5	905.52		
16.9	905.40		
17.5	905.35		
18.2	905.17		
18.8	905.24		
19.9	905.15		
20.7	905.16		
21.5	905.53		
21.9	905.51		
22.2	905.82		
22.6	905.92		
23.2	905.90		
23.5	905.76		
24.1	905.74		
24.5	905.71		
24.9	905.69		
25.6	905.71		
26.5	905.71		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	908.67
Bankfull Cross-Sectional Area:	55.5
Total Cross-Sectional Area:	56.5
Bankfull Width:	22.8
Flood Prone Area Elevation:	912.18
Flood Prone Width:	43.1
Max Depth at Bankfull:	3.5
Mean Depth at Bankfull:	2.4
W / D Ratio:	9.4
Entrenchment Ratio:	1.9
Bank Height Ratio:	1.0
Thalweg Elevation:	905.15

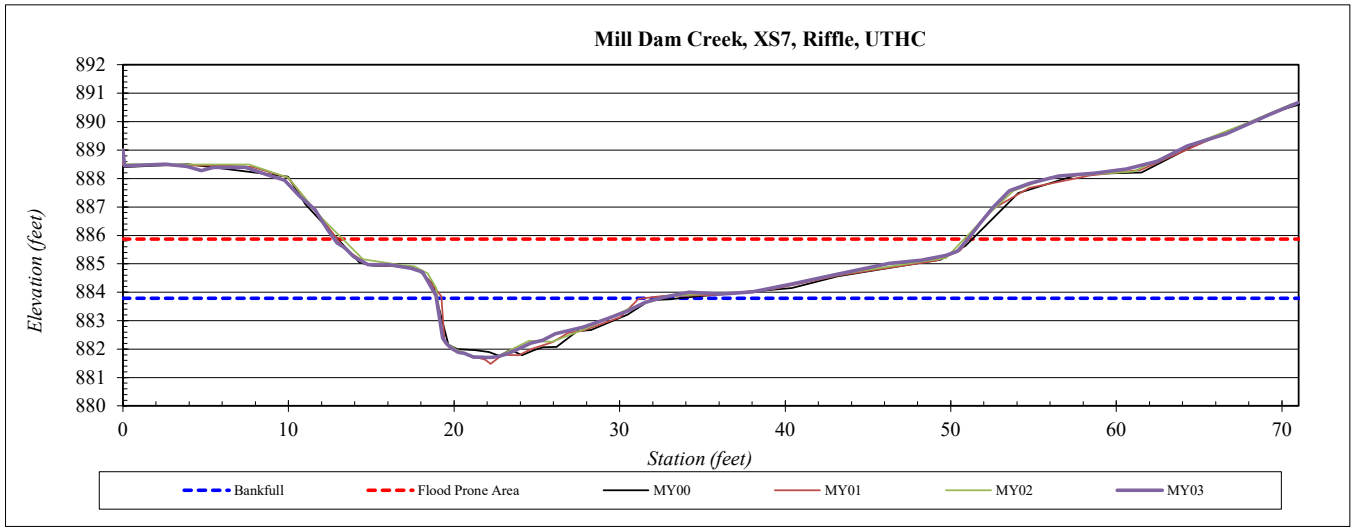


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS7
Drainage Area (sq mi):	0.22
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	889.00	30.4	883.33
0.1	888.44	31.5	883.64
2.6	888.50	32.6	883.82
3.9	888.42	34.2	884.00
4.7	888.28	36.1	883.93
5.5	888.39	38.0	884.01
7.4	888.39	40.4	884.29
8.7	888.14	43.2	884.65
9.8	887.94	46.3	885.01
10.6	887.41	48.2	885.13
11.6	886.91	49.7	885.30
12.3	886.21	50.4	885.44
12.9	885.74	51.2	885.96
13.4	885.56	51.8	886.43
13.9	885.25	52.6	887.01
14.8	884.97	53.5	887.57
16.0	884.97	54.7	887.83
17.4	884.85	56.5	888.09
18.1	884.71	58.7	888.19
18.9	883.89	60.6	888.34
19.3	882.40	62.5	888.60
19.6	882.17	64.3	889.15
19.9	882.01	66.6	889.57
20.3	881.89	69.3	890.26
20.6	881.86	71.0	890.665
21.2	881.72		
21.7	881.72		
22.2	881.70		
22.8	881.78		
23.4	881.86		
23.7	881.96		
24.1	882.06		
24.6	882.21		
25.4	882.32		
26.1	882.53		
27.8	882.78		
29.2	883.06		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	883.79
Bankfull Cross-Sectional Area:	16.7
Total Cross-Sectional Area:	15.8
Bankfull Width:	13.5
Flood Prone Area Elevation:	885.87
Flood Prone Width:	38.3
Max Depth at Bankfull:	2.1
Mean Depth at Bankfull:	1.2
W / D Ratio:	10.9
Entrenchment Ratio:	2.8
Bank Height Ratio:	1.0
Thalweg Elevation:	881.70

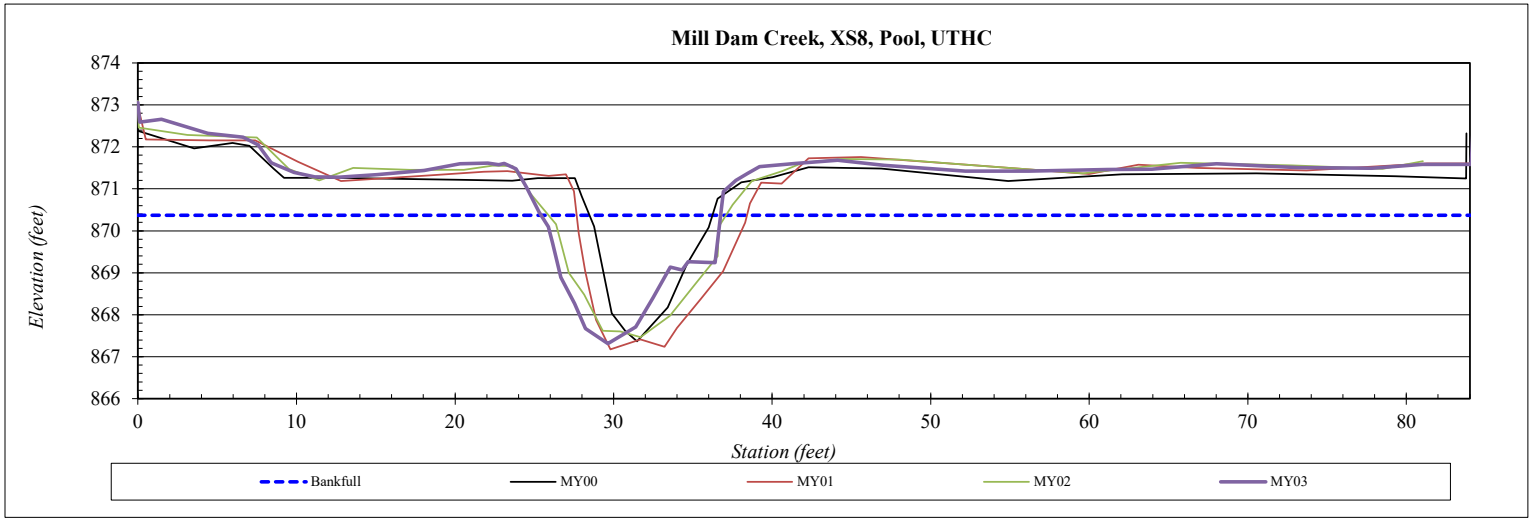


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS8
Drainage Area (sq mi):	1.07
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	873.06	44.1	871.68
0.1	872.59	47.1	871.56
1.5	872.66	52.2	871.42
4.4	872.32	56.2	871.43
6.6	872.23	61.2	871.46
7.6	872.04	63.9	871.47
8.4	871.62	68.0	871.60
9.8	871.39	73.2	871.51
11.1	871.29	77.8	871.49
12.7	871.28	81.0	871.58
15.1	871.34	84.1	871.58
18.1	871.44	84.2	872.31
20.3	871.60		
22.1	871.61		
22.8	871.58		
23.1	871.61		
23.8	871.48		
24.5	871.03		
25.3	870.45		
25.9	870.09		
26.1	869.72		
26.7	868.89		
27.5	868.26		
28.2	867.67		
29.6	867.32		
31.4	867.71		
32.5	868.41		
33.6	869.13		
34.3	869.07		
34.7	869.26		
35.7	869.25		
36.4	869.25		
36.9	870.94		
37.7	871.20		
38.5	871.37		
39.2	871.53		
41.5	871.61		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	870.37
Bankfull Cross-Sectional Area:	20.8
Total Cross-Sectional Area:	30.3
Bankfull Width:	11.3
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	3.1
Mean Depth at Bankfull:	1.8
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	867.32



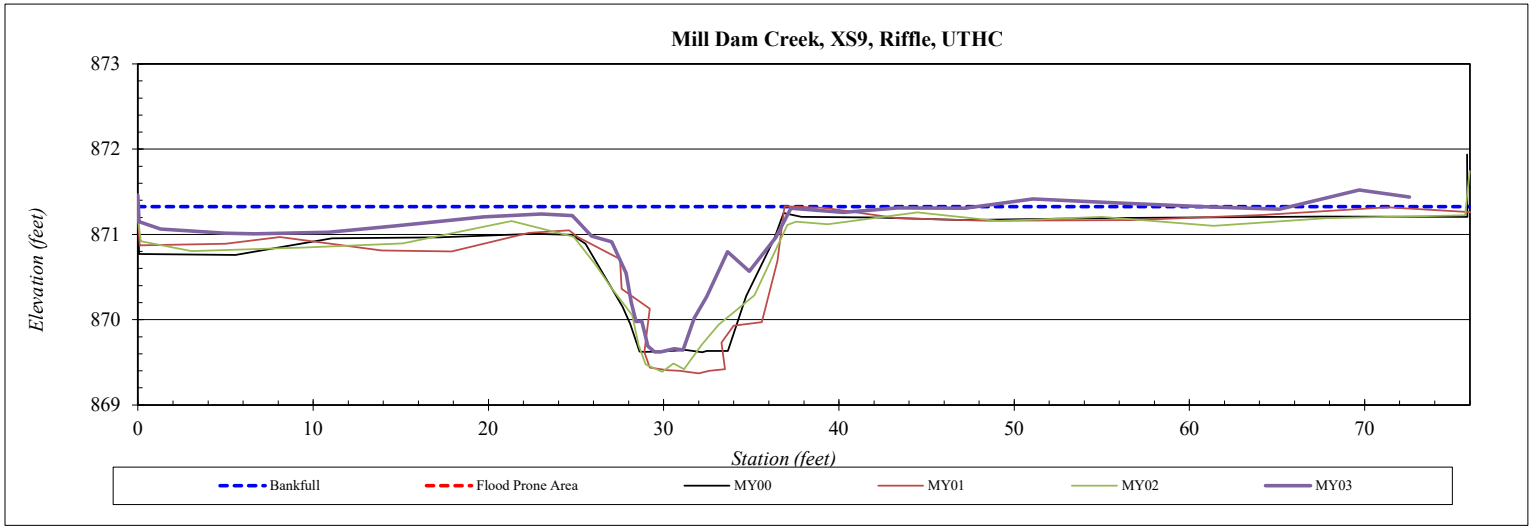
*Cross-section located in an area that was repaired in MY1 (July 2021).

Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS9
Drainage Area (sq mi):	0.46
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0	871.46
0.1	871.15
1.3	871.06
5.0	871.01
6.6	871.01
10.9	871.02
14.7	871.10
19.7	871.21
23.0	871.24
24.8	871.22
25.9	870.98
27.0	870.92
27.9	870.55
28.1	870.20
28.4	869.98
28.7	869.98
29.1	869.69
29.5	869.62
29.8	869.62
30.6	869.66
31.1	869.64
31.7	870.02
32.5	870.27
33.6	870.80
34.9	870.57
36.4	870.97
37.3	871.31
38.2	871.29
40.2	871.26
43.4	871.31
47.2	871.31
51.1	871.42
56.1	871.37
61.2	871.32
65.1	871.30
69.7	871.52
72.6	871.44

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	871.32
Bankfull Cross-Sectional Area:	10.6
Total Cross-Sectional Area:	6.8
Bankfull Width:	12.5
Flood Prone Area Elevation:	873.03
Flood Prone Width:	72.6
Max Depth at Bankfull:	1.7
Mean Depth at Bankfull:	0.9
W / D Ratio:	14.6
Entrenchment Ratio:	5.8
Bank Height Ratio:	0.9
Thalweg Elevation:	869.62

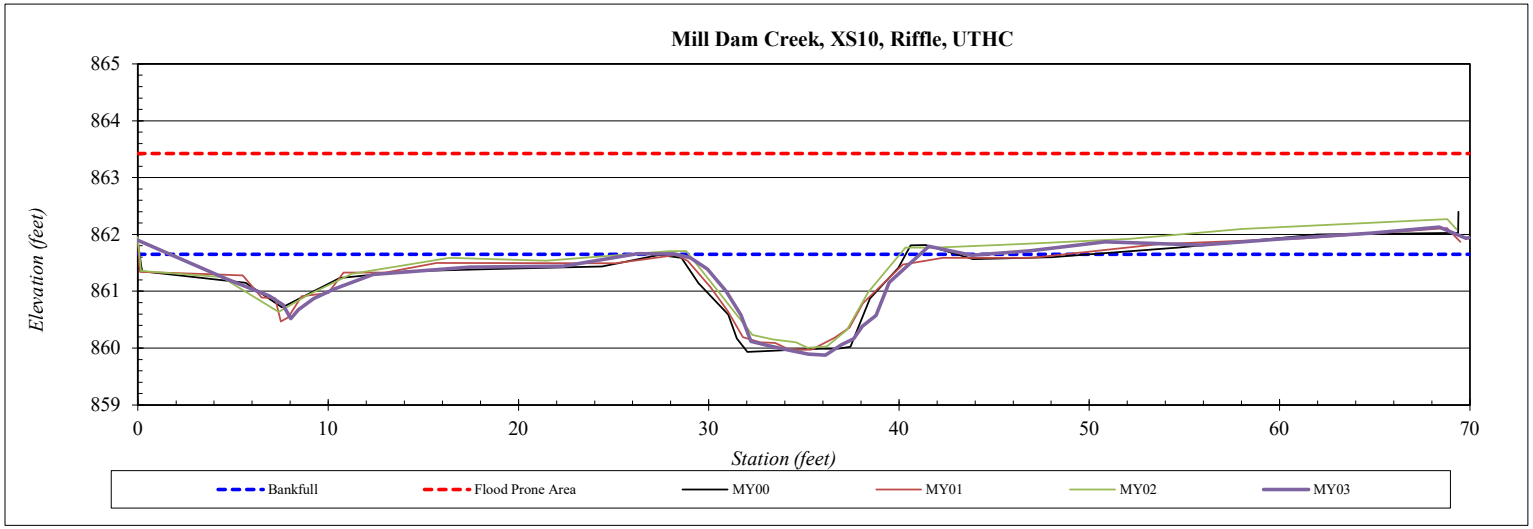


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS10
Drainage Area (sq mi):	0.46
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0	861.899
4.7	861.21
6.9	860.92
7.6	860.76
8.0	860.52
8.4	860.68
9.2	860.87
10.3	861.04
12.3	861.29
17.4	861.43
22.4	861.44
26.2	861.66
28.2	861.66
29.0	861.59
29.9	861.39
30.9	861.00
31.7	860.58
32.2	860.12
33.2	860.04
34.2	859.96
35.2	859.89
36.1	859.88
37.0	860.06
37.6	860.17
38.1	860.38
38.8	860.58
39.5	861.16
41.6	861.79
43.8	861.63
46.9	861.71
50.8	861.87
55.9	861.81
60.1	861.92
64.8	862.02
68.4	862.13
69.8	861.93
70.0	861.94

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	861.65
Bankfull Cross-Sectional Area:	13.3
Total Cross-Sectional Area:	12.6
Bankfull Width:	12.8
Flood Prone Area Elevation:	863.42
Flood Prone Width:	70.0
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	1.0
W / D Ratio:	12.2
Entrenchment Ratio:	5.5
Bank Height Ratio:	0.9
Thalweg Elevation:	859.88

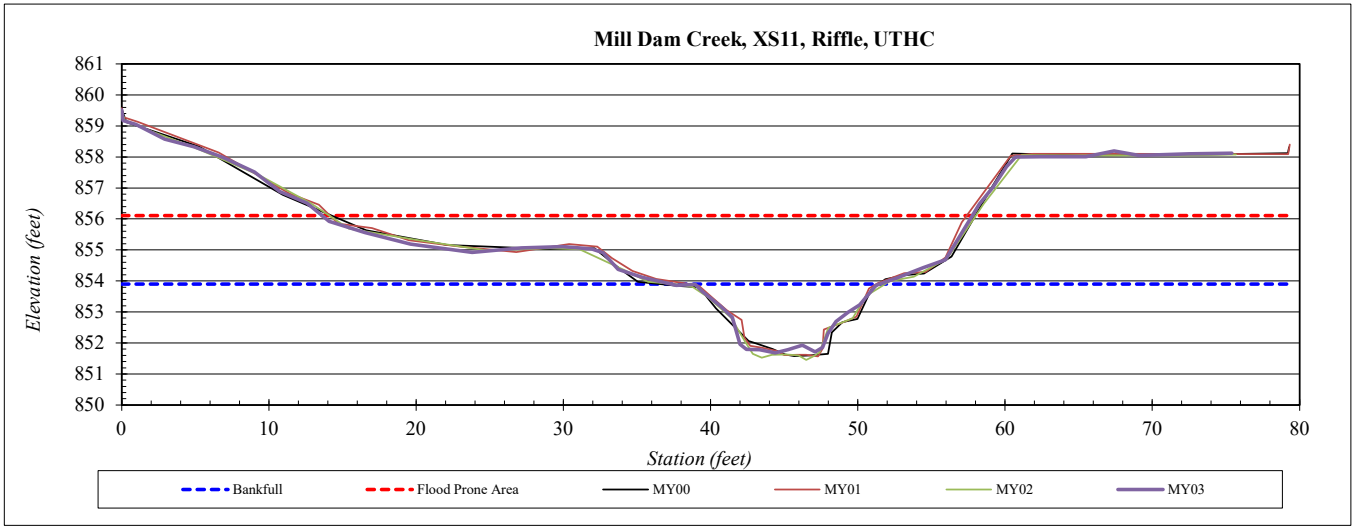


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS11
Drainage Area (sq mi):	0.46
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0	859.51	52.6	854.09
0.1	859.17	54.4	854.43
1.0	859.05	56.0	854.68
2.9	858.58	57.2	855.63
4.9	858.33	58.3	856.48
6.9	857.99	59.2	857.01
9.0	857.52	60.1	857.69
10.7	856.89	60.7	858.00
12.6	856.52	62.5	858.01
14.1	855.92	65.5	858.01
16.5	855.57	67.4	858.20
19.6	855.19	69.1	858.04
23.8	854.92	72.5	858.10
27.1	855.07	75.4	858.12
30.0	855.11		
31.9	855.04		
32.7	854.91		
33.7	854.38		
35.4	854.12		
37.7	853.86		
39.0	853.89		
39.4	853.66		
40.7	853.19		
41.5	852.82		
42.0	851.96		
42.4	851.79		
43.3	851.78		
44.4	851.68		
45.3	851.78		
46.2	851.93		
47.1	851.72		
47.6	851.86		
48.0	852.31		
48.5	852.69		
49.3	852.99		
50.1	853.23		
51.2	853.86		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	853.90
Bankfull Cross-Sectional Area:	17.2
Total Cross-Sectional Area:	16.1
Bankfull Width:	12.0
Flood Prone Area Elevation:	856.11
Flood Prone Width:	44.2
Max Depth at Bankfull:	2.2
Mean Depth at Bankfull:	1.4
W / D Ratio:	8.4
Entrenchment Ratio:	3.7
Bank Height Ratio:	1.0
Thalweg Elevation:	851.68

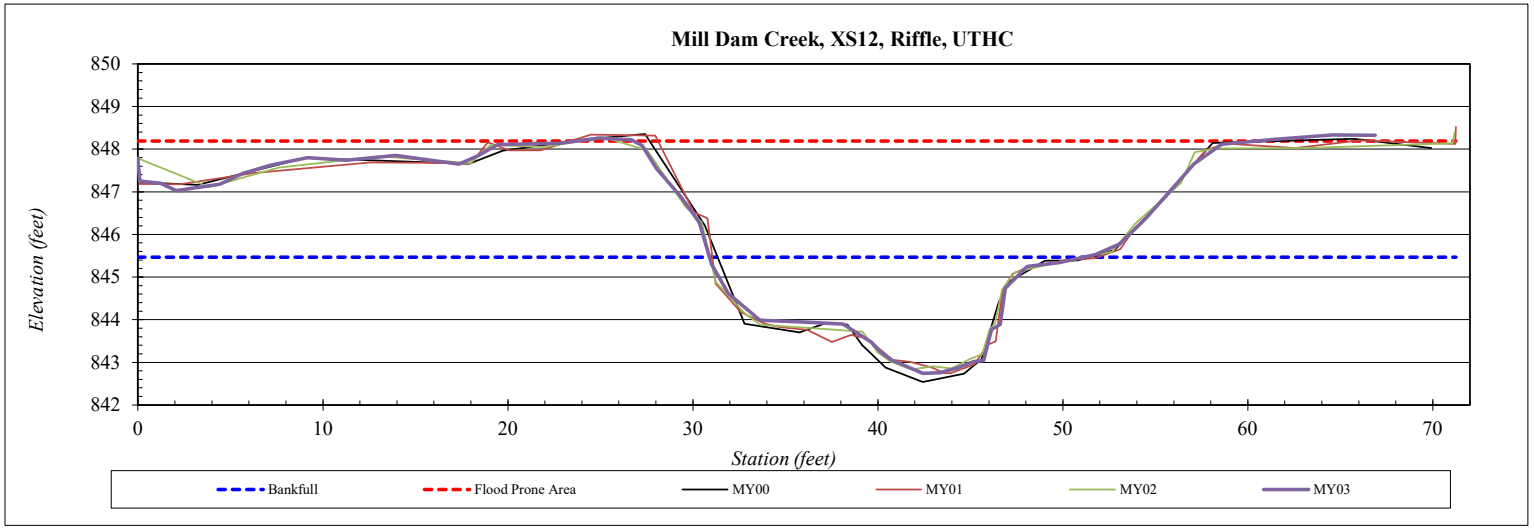


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS12
Drainage Area (sq mi):	0.61
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	847.79	48.1	845.25
0.1	847.25	49.8	845.34
1.2	847.20	51.8	845.53
2.1	847.03	53.1	845.78
4.4	847.18	54.4	846.36
5.7	847.43	55.8	847.04
7.2	847.63	57.1	847.65
9.2	847.80	58.6	848.11
11.3	847.74	61.4	848.23
13.9	847.85	64.6	848.33
17.4	847.65	66.9	848.32
18.3	847.84		
19.4	848.11		
22.9	848.14		
24.9	848.26		
26.7	848.22		
27.2	848.09		
28.0	847.54		
29.4	846.88		
30.3	846.27		
31.0	845.30		
31.9	844.62		
33.6	843.99		
35.8	843.95		
38.1	843.90		
39.7	843.47		
40.2	843.23		
40.8	843.05		
42.0	842.82		
42.4	842.74		
43.4	842.75		
44.3	842.87		
45.2	843.02		
45.7	843.04		
46.1	843.77		
46.6	843.89		
46.9	844.74		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	845.47
Bankfull Cross-Sectional Area:	30.2
Total Cross-Sectional Area:	28.6
Bankfull Width:	18.9
Flood Prone Area Elevation:	848.19
Flood Prone Width:	27.9
Max Depth at Bankfull:	2.7
Mean Depth at Bankfull:	1.6
W / D Ratio:	11.9
Entrenchment Ratio:	1.5
Bank Height Ratio:	0.9
Thalweg Elevation:	842.74

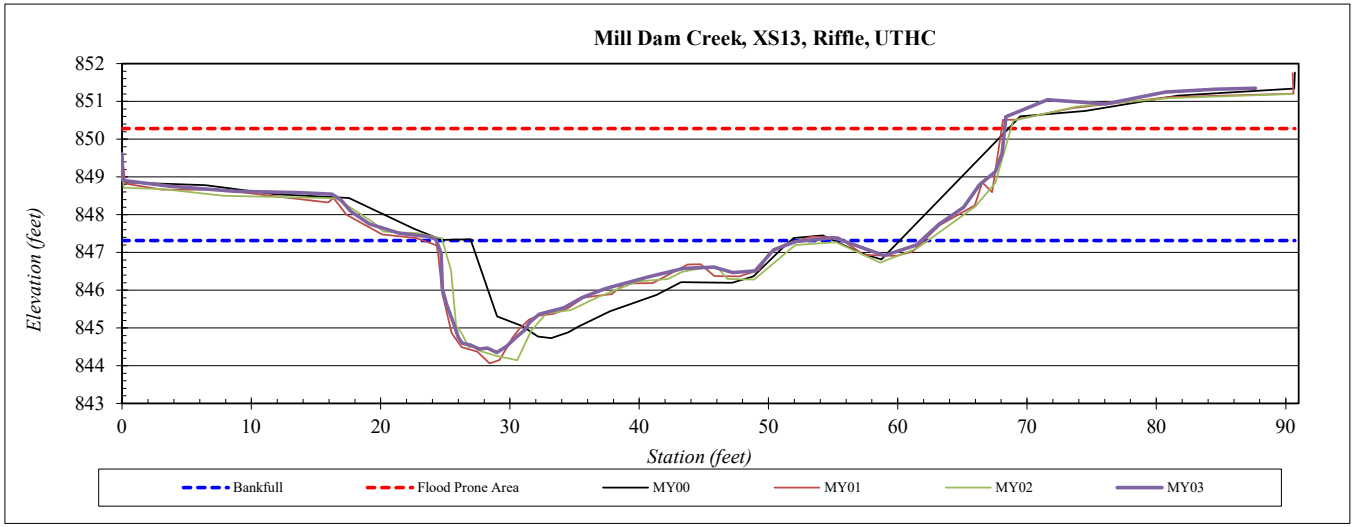


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS13
Drainage Area (sq mi):	0.04
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation		
0.0	849.62	55.1	847.39
0.0	848.91	59.0	846.92
3.7	848.76	61.4	847.20
8.7	848.62	63.2	847.75
13.5	848.59	65.1	848.20
16.2	848.54	66.3	848.80
16.9	848.40	67.5	849.14
17.7	848.08	68.1	849.62
19.1	847.76	68.4	850.60
21.4	847.51	69.9	850.81
23.5	847.43	71.6	851.05
24.2	847.36	76.1	850.93
24.7	846.98	80.7	851.25
24.8	846.04	84.6	851.32
25.1	845.63	87.7	851.35
25.7	845.05		
26.0	844.75		
26.3	844.59		
27.0	844.55		
27.6	844.44		
28.2	844.47		
29.0	844.35		
29.7	844.51		
30.5	844.77		
31.1	844.94		
31.5	845.15		
32.3	845.37		
34.2	845.54		
35.6	845.81		
37.4	846.04		
40.8	846.35		
43.4	846.58		
45.8	846.61		
47.2	846.47		
49.0	846.51		
50.4	847.07		
52.1	847.29		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	847.31
Bankfull Cross-Sectional Area:	38.7
Total Cross-Sectional Area:	39.8
Bankfull Width:	27.8
Flood Prone Area Elevation:	850.28
Flood Prone Width:	68.3
Max Depth at Bankfull:	3.0
Mean Depth at Bankfull:	1.4
W / D Ratio:	20.0
Entrenchment Ratio:	2.5
Bank Height Ratio:	1.0
Thalweg Elevation:	844.35



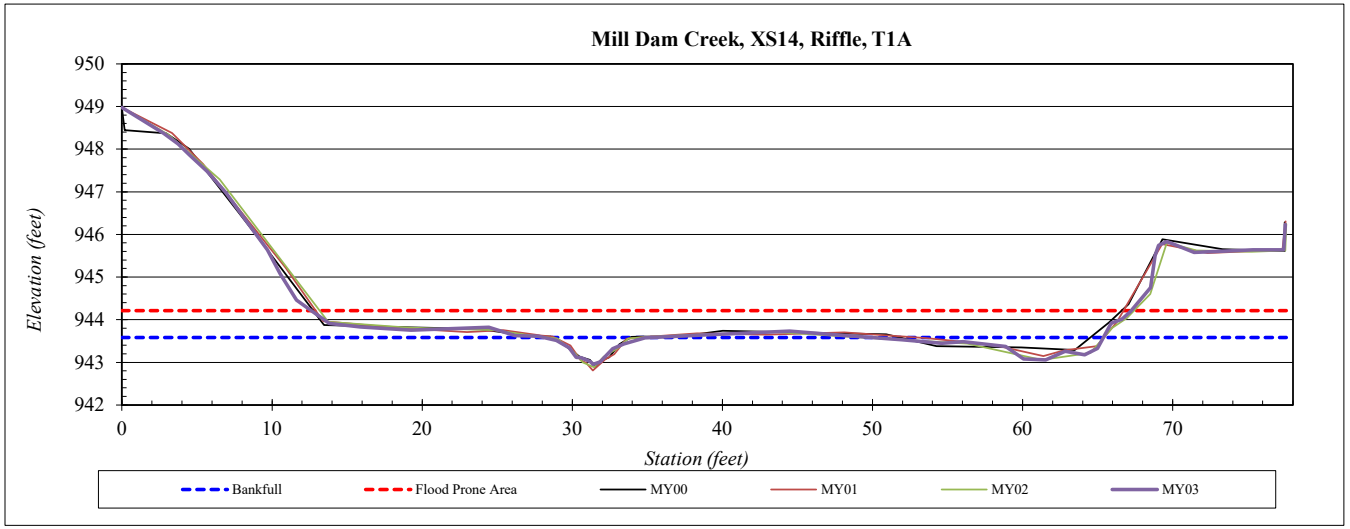
*Cross-section located in an area that was repaired in MY1 (July 2021).

Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS14
Drainage Area (sq mi):	0.04
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	948.98	62.8	943.26
2.8	948.37	64.1	943.18
3.7	948.13	65.0	943.33
4.5	947.87	65.9	943.92
5.7	947.48	66.6	944.01
6.9	946.99	67.2	944.19
8.1	946.42	68.5	944.75
9.7	945.64	68.8	945.50
10.5	945.08	69.1	945.74
11.6	944.46	69.6	945.83
12.5	944.25	71.4	945.58
13.8	943.91	73.5	945.61
15.9	943.83	75.4	945.64
19.3	943.76	77.4	945.64
24.4	943.82	77.5	946.23
26.2	943.63		
27.7	943.61		
28.9	943.52		
29.8	943.34		
30.3	943.12		
30.6	943.11		
31.0	943.05		
31.2	943.01		
31.4	942.95		
31.9	943.02		
32.7	943.32		
33.4	943.43		
34.8	943.58		
38.8	943.64		
44.5	943.73		
47.7	943.64		
52.0	943.53		
54.6	943.45		
56.0	943.49		
58.9	943.37		
60.1	943.08		
61.5	943.05		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	943.58
Bankfull Cross-Sectional Area:	1.8
Total Cross-Sectional Area:	1.9
Bankfull Width:	7.2
Flood Prone Area Elevation:	944.21
Flood Prone Width:	54.6
Max Depth at Bankfull:	0.6
Mean Depth at Bankfull:	0.3
W / D Ratio:	28.7
Entrenchment Ratio:	7.6
Bank Height Ratio:	0.8
Thalweg Elevation:	942.95

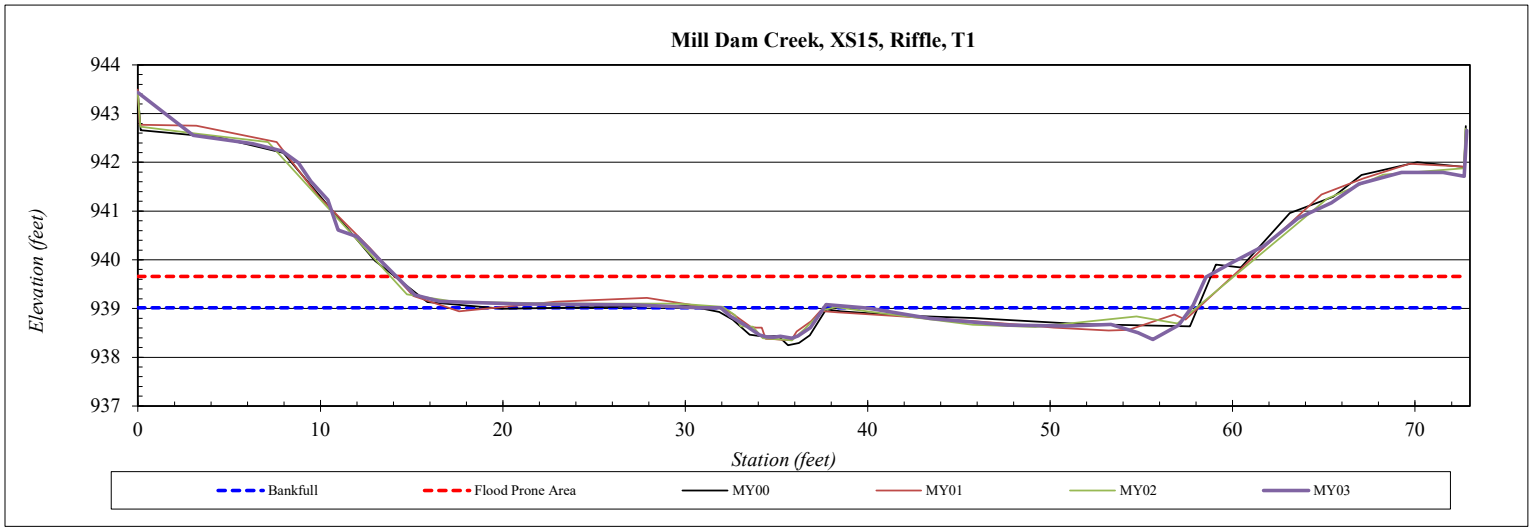


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS15
Drainage Area (sq mi):	0.07
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	943.44	61.7	940.29
3.0	942.56	63.6	940.86
6.3	942.38	65.4	941.17
7.9	942.23	66.9	941.55
8.8	941.99	69.3	941.79
9.5	941.61	71.5	941.79
10.4	941.23	72.7	941.71
11.0	940.61	72.8	942.66
12.0	940.47		
13.2	940.00		
15.2	939.28		
16.6	939.15		
20.8	939.09		
27.3	939.07		
30.8	939.02		
32.0	939.02		
32.5	938.84		
33.3	938.65		
34.1	938.46		
34.4	938.42		
34.8	938.41		
35.2	938.43		
35.8	938.39		
36.2	938.44		
36.9	938.61		
37.7	939.08		
40.0	939.01		
43.4	938.80		
47.7	938.66		
50.8	938.64		
53.3	938.67		
54.8	938.50		
55.6	938.37		
57.1	938.66		
57.8	939.07		
58.5	939.65		
59.9	939.93		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	939.01
Bankfull Cross-Sectional Area:	2.3
Total Cross-Sectional Area:	1.9
Bankfull Width:	5.6
Flood Prone Area Elevation:	939.66
Flood Prone Width:	44.4
Max Depth at Bankfull:	0.6
Mean Depth at Bankfull:	0.4
W / D Ratio:	13.5
Entrenchment Ratio:	7.9
Bank Height Ratio:	1.0
Thalweg Elevation:	938.37

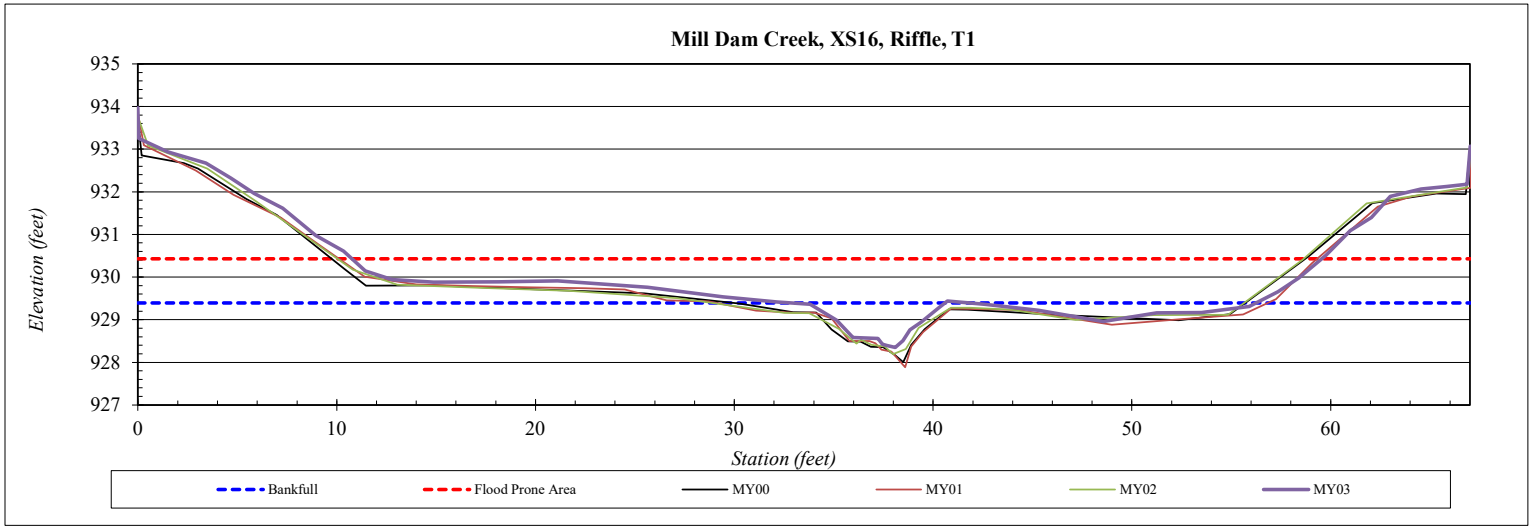


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS16
Drainage Area (sq mi):	0.07
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	933.97	59.8	930.51
0.0	933.25	61.0	931.09
1.5	932.93	62.1	931.40
3.4	932.67	63.0	931.89
4.7	932.32	64.6	932.06
5.9	931.96	65.8	932.13
7.3	931.62	66.9	932.17
8.9	930.98	67.0	933.07
10.3	930.61		
11.4	930.15		
12.8	929.94		
14.9	929.88		
18.2	929.89		
21.1	929.91		
25.6	929.76		
29.4	929.54		
32.2	929.41		
33.8	929.36		
35.2	928.99		
36.0	928.58		
37.2	928.56		
37.5	928.42		
37.7	928.40		
38.1	928.35		
38.5	928.51		
38.8	928.76		
39.4	928.94		
40.3	929.27		
40.7	929.44		
42.6	929.36		
45.3	929.22		
48.6	928.96		
51.2	929.16		
53.5	929.17		
55.9	929.31		
57.3	929.65		
58.4	929.98		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	929.39
Bankfull Cross-Sectional Area:	3.9
Total Cross-Sectional Area:	2.5
Bankfull Width:	6.8
Flood Prone Area Elevation:	930.43
Flood Prone Width:	48.8
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.6
W / D Ratio:	11.9
Entrenchment Ratio:	7.2
Bank Height Ratio:	0.9
Thalweg Elevation:	928.35

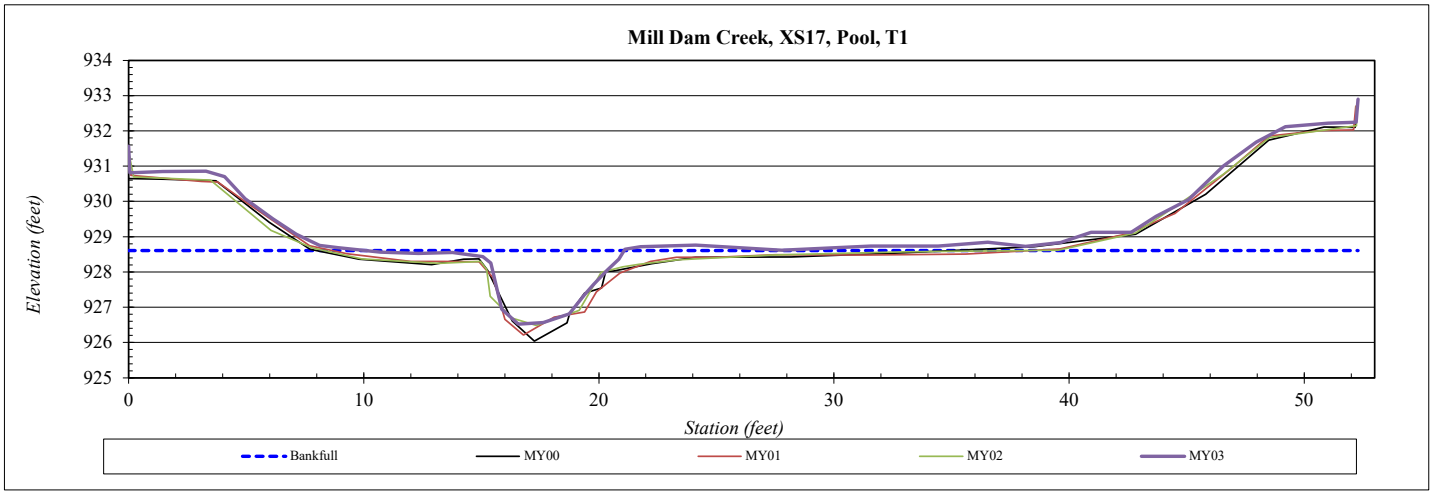


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS17
Drainage Area (sq mi):	0.07
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	931.57	48.0	931.68
0.1	930.81	49.2	932.11
1.5	930.85	51.0	932.22
3.3	930.86	52.2	932.25
4.1	930.70	52.3	932.90
5.0	930.08		
6.1	929.50		
7.1	929.07		
8.1	928.75		
8.9	928.69		
10.7	928.56		
12.3	928.52		
13.8	928.56		
15.1	928.44		
15.4	928.25		
15.9	926.95		
16.6	926.52		
17.6	926.56		
18.7	926.81		
19.4	927.35		
19.8	927.65		
20.4	928.05		
20.8	928.36		
21.1	928.64		
21.8	928.71		
24.1	928.76		
27.8	928.62		
31.6	928.74		
34.4	928.73		
36.5	928.84		
38.1	928.72		
39.6	928.84		
40.9	929.13		
42.6	929.13		
43.7	929.58		
45.1	930.05		
46.6	931.00		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	928.61
Bankfull Cross-Sectional Area:	8.3
Total Cross-Sectional Area:	6.9
Bankfull Width:	6.0
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	2.1
Mean Depth at Bankfull:	1.4
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	926.52

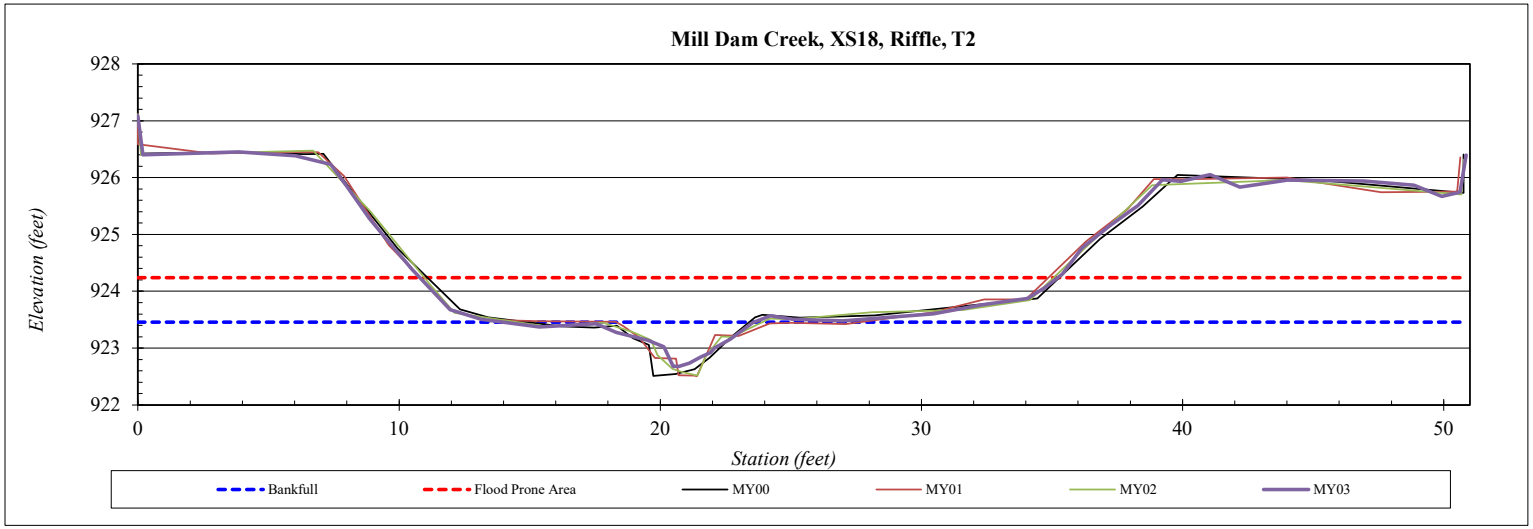


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS18
Drainage Area (sq mi):	0.02
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	927.09	41.1	926.05
0.2	926.40	42.2	925.83
3.9	926.45	44.0	925.96
6.0	926.39	46.9	925.94
7.4	926.23	48.9	925.87
8.0	925.83	49.9	925.67
8.9	925.29	50.6	925.74
9.5	924.93	50.9	926.39
10.5	924.38		
12.0	923.68		
13.1	923.51		
15.4	923.37		
17.5	923.43		
18.3	923.28		
19.5	923.14		
20.1	923.03		
20.5	922.68		
20.7	922.68		
21.1	922.74		
21.6	922.84		
21.9	922.92		
22.1	923.00		
22.7	923.16		
23.5	923.44		
24.2	923.57		
25.1	923.51		
27.0	923.48		
30.5	923.60		
32.3	923.76		
34.1	923.87		
34.7	924.07		
35.4	924.30		
36.2	924.77		
37.2	925.15		
38.3	925.51		
39.2	925.96		
39.9	925.94		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	923.46
Bankfull Cross-Sectional Area:	2.3
Total Cross-Sectional Area:	1.7
Bankfull Width:	6.1
Flood Prone Area Elevation:	924.24
Flood Prone Width:	24.4
Max Depth at Bankfull:	0.8
Mean Depth at Bankfull:	0.4
W / D Ratio:	16.4
Entrenchment Ratio:	4.0
Bank Height Ratio:	1.0
Thalweg Elevation:	922.68

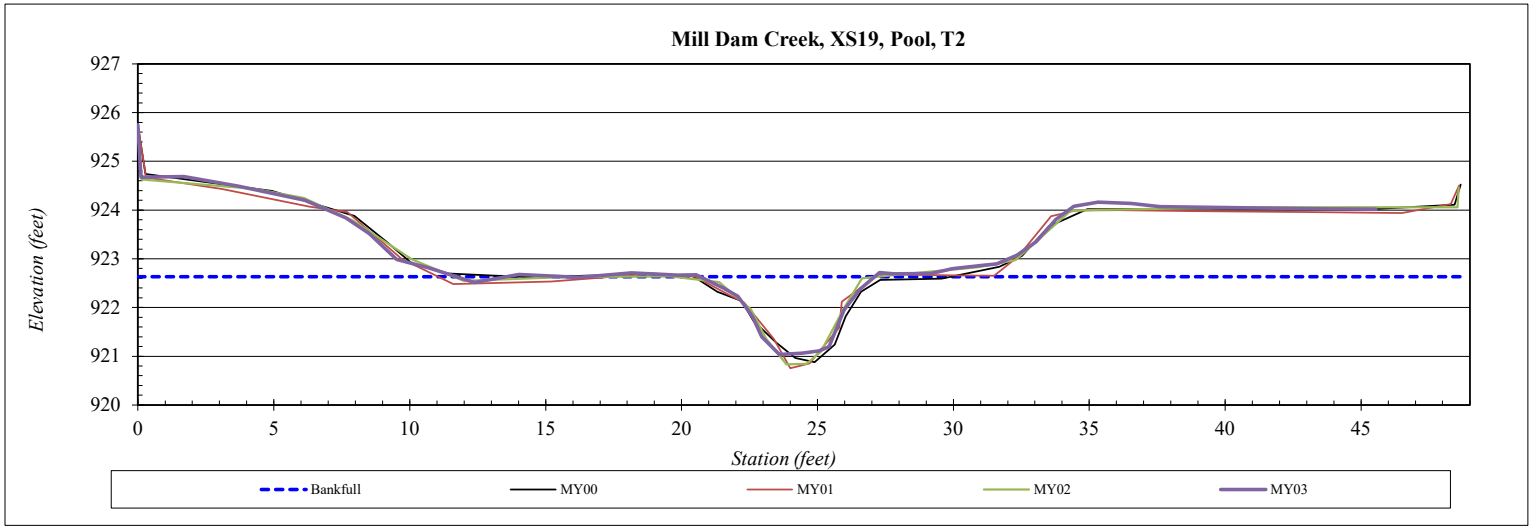


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS19
Drainage Area (sq mi):	0.02
Date:	1/11/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	925.75	36.5	924.14
0.1	924.68	37.6	924.07
1.7	924.69	41.0	924.05
3.7	924.49	43.7	924.03
6.1	924.20	45.5	924.02
7.6	923.84		
8.5	923.52		
9.5	922.98		
10.7	922.81		
12.4	922.51		
14.0	922.68		
16.2	922.62		
18.2	922.71		
19.9	922.67		
20.5	922.67		
21.5	922.40		
22.1	922.23		
22.4	921.98		
22.6	921.81		
22.9	921.40		
23.6	921.04		
24.4	921.06		
25.0	921.11		
25.4	921.19		
26.0	921.95		
26.6	922.38		
27.3	922.72		
27.8	922.69		
29.2	922.70		
30.0	922.80		
31.1	922.87		
31.6	922.89		
32.3	923.07		
33.0	923.35		
33.8	923.81		
34.4	924.08		
35.3	924.16		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	922.63
Bankfull Cross-Sectional Area:	5.6
Total Cross-Sectional Area:	5.2
Bankfull Width:	6.4
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.9
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	921.04

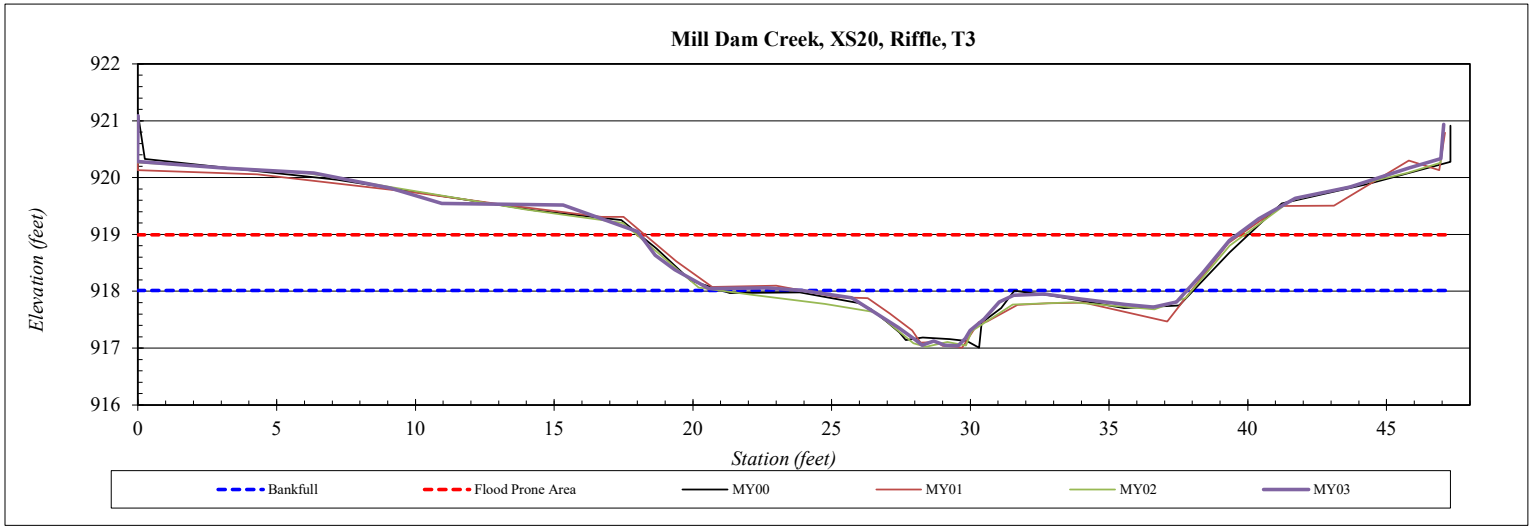


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS20
Drainage Area (sq mi):	0.01
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	921.09	47.1	920.93
0.0	920.28		
3.2	920.16		
6.3	920.08		
9.1	919.82		
11.0	919.55		
15.3	919.52		
18.0	919.05		
18.6	918.63		
19.4	918.38		
20.6	918.05		
22.7	918.06		
23.9	918.02		
25.7	917.89		
27.4	917.36		
28.0	917.14		
28.3	917.05		
28.7	917.13		
29.1	917.05		
29.5	917.04		
29.8	917.17		
30.0	917.31		
30.5	917.52		
31.0	917.81		
31.6	917.93		
32.7	917.95		
34.0	917.86		
35.6	917.77		
36.6	917.72		
37.4	917.81		
38.4	918.32		
39.3	918.89		
40.4	919.27		
41.7	919.64		
43.7	919.83		
45.8	920.17		
47.0	920.33		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	918.01
Bankfull Cross-Sectional Area:	3.6
Total Cross-Sectional Area:	1.8
Bankfull Width:	6.9
Flood Prone Area Elevation:	918.99
Flood Prone Width:	21.5
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.5
W / D Ratio:	13.4
Entrenchment Ratio:	3.1
Bank Height Ratio:	0.9
Thalweg Elevation:	917.04

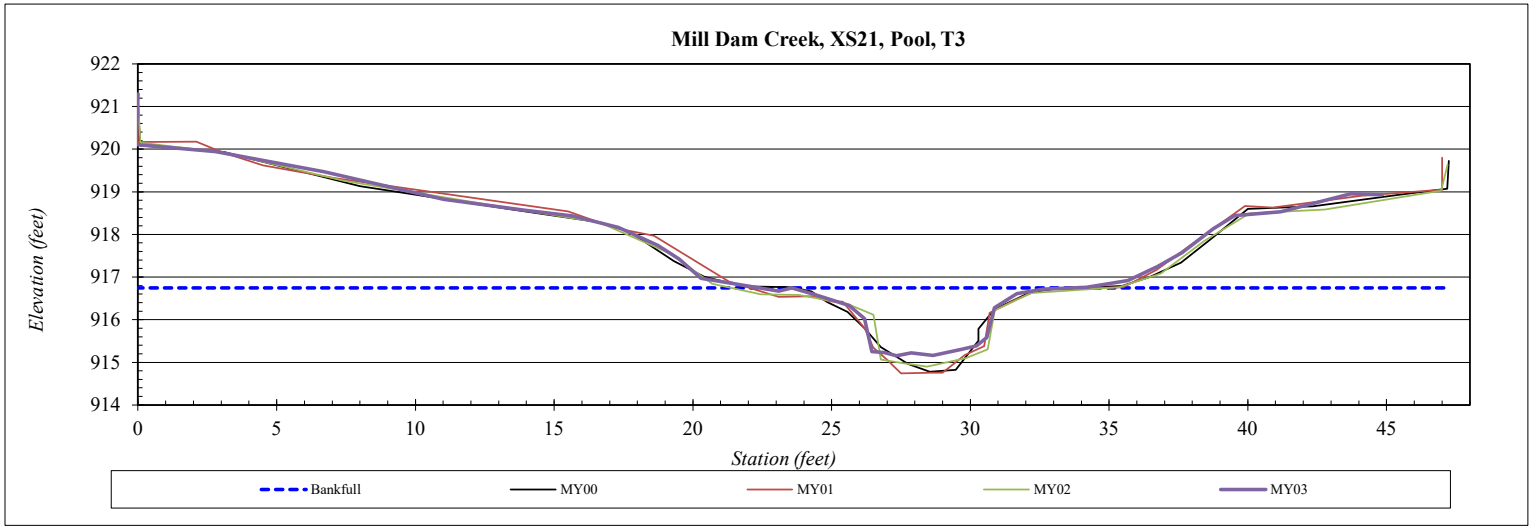


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS21
Drainage Area (sq mi):	0.01
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	921.29
-0.1	920.11
2.8	919.95
6.7	919.47
11.0	918.83
13.9	918.57
15.7	918.44
17.3	918.16
18.7	917.74
19.5	917.42
20.3	916.97
21.4	916.85
23.1	916.67
23.6	916.75
24.4	916.59
25.6	916.33
26.2	916.03
26.4	915.25
26.9	915.23
27.3	915.15
27.9	915.23
28.7	915.16
29.7	915.31
30.2	915.39
30.6	915.58
30.9	916.28
31.7	916.61
32.6	916.72
34.2	916.76
35.7	916.92
36.8	917.25
37.6	917.57
38.8	918.14
39.5	918.44
41.2	918.53
43.7	918.95
44.8	918.93

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	916.74
Bankfull Cross-Sectional Area:	7.7
Total Cross-Sectional Area:	6.8
Bankfull Width:	9.3
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.6
Mean Depth at Bankfull:	0.8
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	915.15

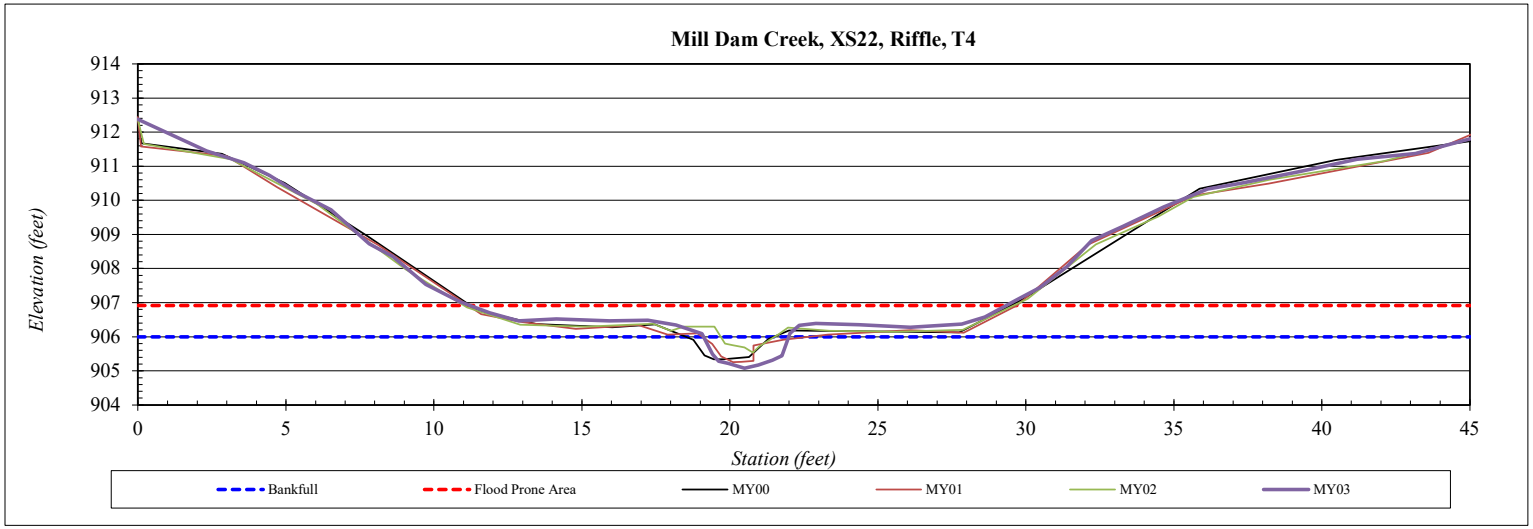


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS22
Drainage Area (sq mi):	0.01
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation	Station	Elevation
0.0	912.37	36.1	910.33
2.3	911.44	37.3	910.51
3.6	911.10	39.2	910.84
4.4	910.74	41.2	911.21
5.3	910.25	43.2	911.37
6.5	909.72	45.0	911.81
7.8	908.73	46.1	912.16
8.6	908.35	46.7	912.49
9.7	907.53	47.3	912.77
10.9	907.02	47.3	913.70
11.9	906.70		
12.9	906.47		
14.1	906.52		
15.9	906.47		
17.2	906.49		
18.2	906.34		
19.1	906.09		
19.4	905.49		
19.6	905.28		
20.0	905.22		
20.5	905.08		
21.0	905.17		
21.4	905.31		
21.8	905.44		
22.0	906.10		
22.3	906.34		
22.9	906.39		
24.4	906.35		
26.1	906.28		
27.8	906.37		
28.6	906.58		
29.7	907.09		
30.5	907.44		
31.4	908.05		
32.2	908.82		
33.3	909.24		
34.7	909.81		

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	906.00
Bankfull Cross-Sectional Area:	1.9
Total Cross-Sectional Area:	2.5
Bankfull Width:	2.9
Flood Prone Area Elevation:	906.91
Flood Prone Width:	18.1
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.7
W / D Ratio:	4.3
Entrenchment Ratio:	6.3
Bank Height Ratio:	1.1
Thalweg Elevation:	905.08

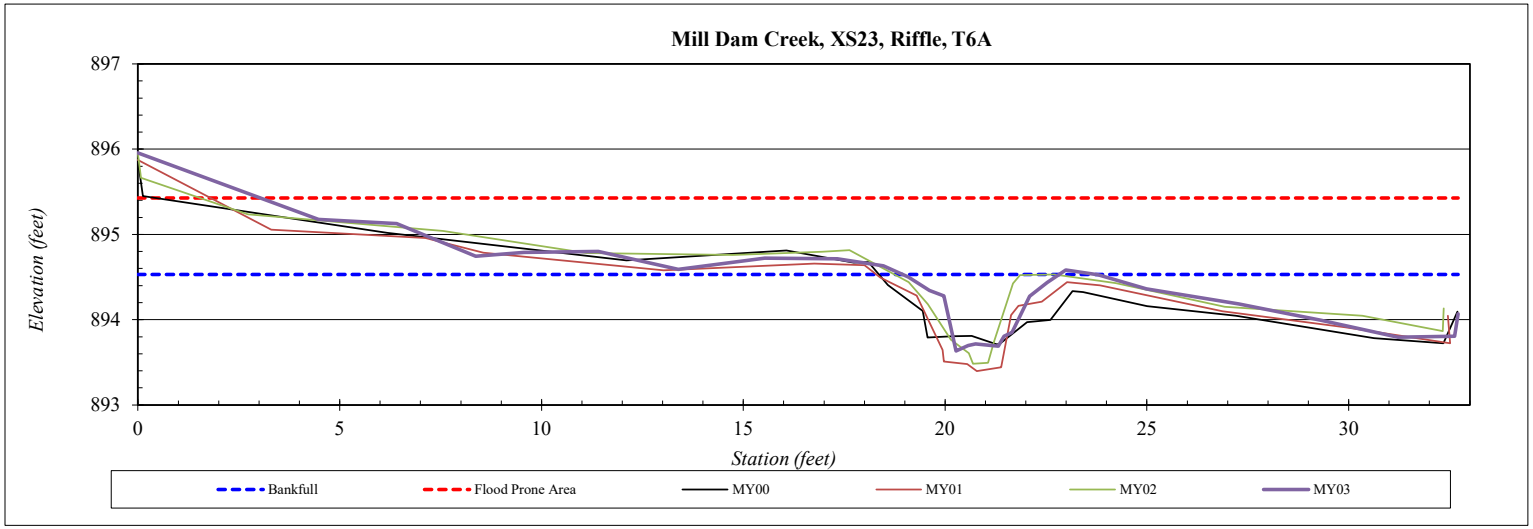


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS23
Drainage Area (sq mi):	0.01
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	895.96
4.5	895.18
6.4	895.13
8.4	894.75
9.6	894.79
11.4	894.80
13.4	894.59
15.5	894.72
17.3	894.71
18.5	894.63
19.1	894.50
19.6	894.34
20.0	894.28
20.3	893.63
20.6	893.70
20.8	893.72
21.0	893.71
21.3	893.69
21.5	893.81
21.7	893.85
22.1	894.27
22.5	894.44
23.0	894.58
23.8	894.53
25.0	894.36
27.3	894.19
29.3	893.99
31.2	893.79
32.6	893.81
32.7	894.07

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	894.53
Bankfull Cross-Sectional Area:	1.7
Total Cross-Sectional Area:	1.1
Bankfull Width:	3.9
Flood Prone Area Elevation:	895.43
Flood Prone Width:	29.7
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.4
W / D Ratio:	8.7
Entrenchment Ratio:	7.7
Bank Height Ratio:	1.1
Thalweg Elevation:	893.63

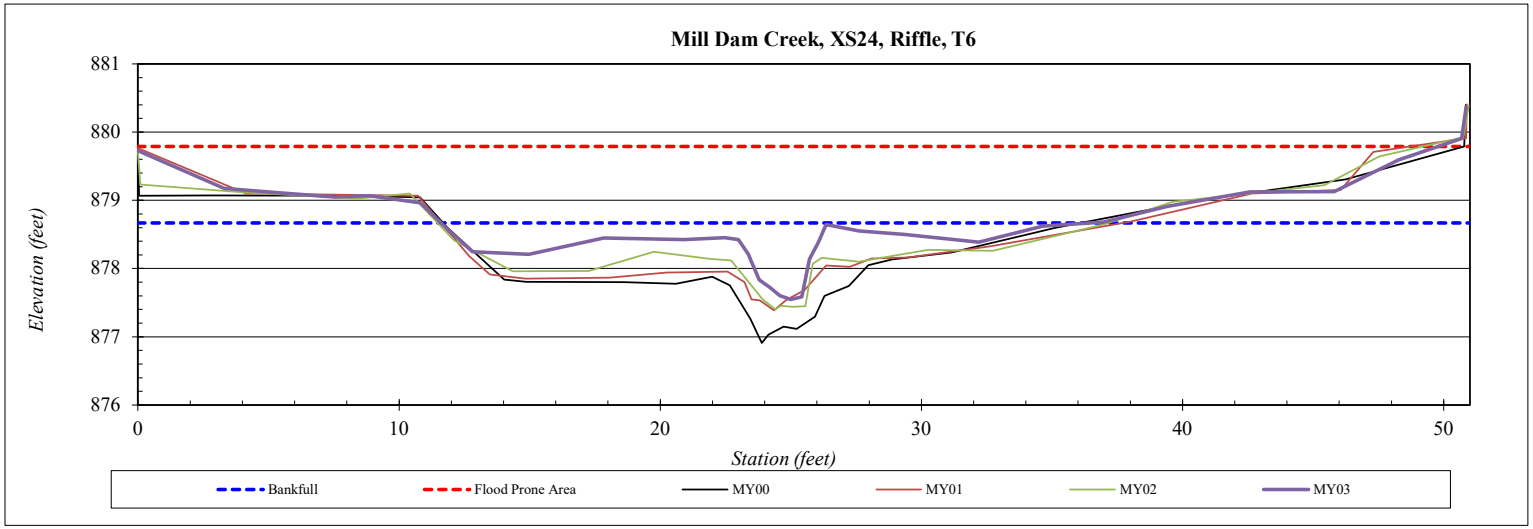


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS24
Drainage Area (sq mi):	0.07
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	879.73
3.3	879.18
5.3	879.11
7.5	879.05
8.8	879.07
10.8	878.96
11.9	878.55
12.8	878.25
15.0	878.21
17.8	878.45
20.9	878.42
22.5	878.45
23.0	878.42
23.4	878.21
23.8	877.84
24.2	877.72
24.6	877.60
25.0	877.55
25.4	877.58
25.7	878.14
26.1	878.39
26.3	878.64
27.6	878.55
29.4	878.50
32.2	878.39
34.7	878.62
37.0	878.68
39.4	878.91
42.6	879.12
45.8	879.13
48.3	879.59
50.7	879.91
50.9	880.37

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	878.67
Bankfull Cross-Sectional Area:	2.6
Total Cross-Sectional Area:	0.4
Bankfull Width:	3.9
Flood Prone Area Elevation:	879.79
Flood Prone Width:	49.8
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.7
W / D Ratio:	5.8
Entrenchment Ratio:	12.8
Bank Height Ratio:	0.8
Thalweg Elevation:	877.55

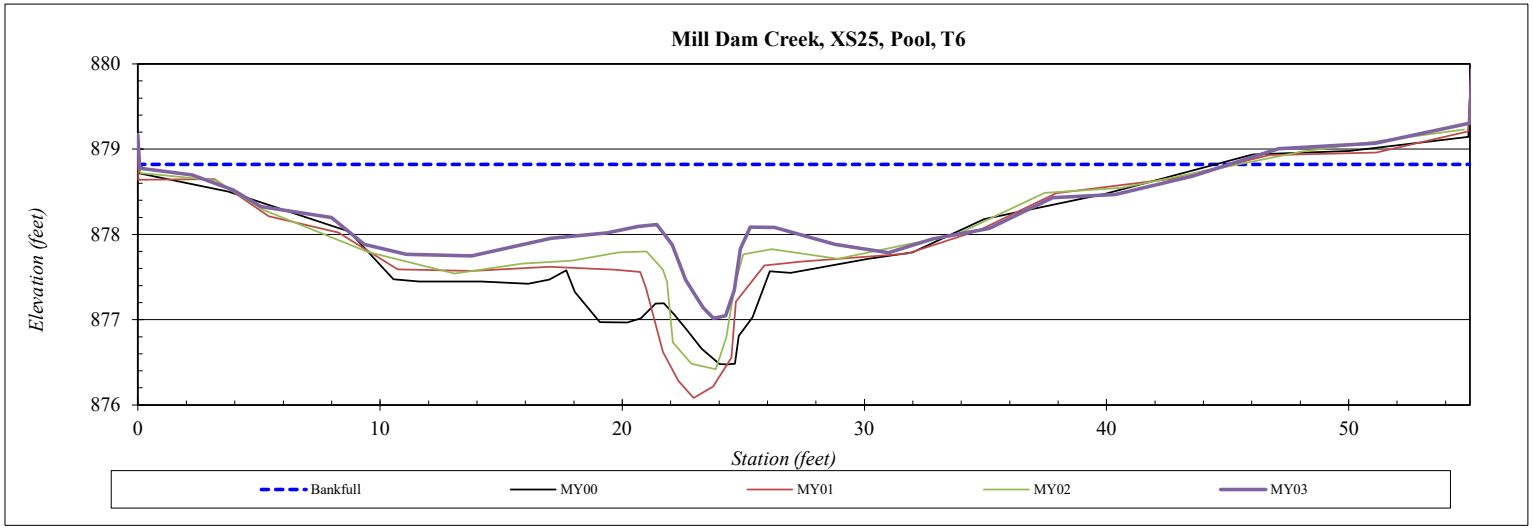


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS25
Drainage Area (sq mi):	0.07
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	879.17
0.1	878.78
2.2	878.70
3.9	878.52
5.1	878.33
8.0	878.20
9.3	877.88
11.1	877.77
13.8	877.75
17.1	877.96
19.4	878.02
20.7	878.10
21.4	878.12
22.1	877.88
22.6	877.47
23.0	877.28
23.3	877.14
23.8	877.02
24.3	877.05
24.6	877.35
24.9	877.83
25.3	878.09
26.3	878.08
28.8	877.88
31.0	877.79
32.8	877.95
35.2	878.07
37.8	878.43
40.4	878.47
43.5	878.68
47.1	879.01
51.1	879.07
55.0	879.31
55.1	879.94

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	878.82
Bankfull Cross-Sectional Area:	5.1
Total Cross-Sectional Area:	0.8
Bankfull Width:	3.8
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.8
Mean Depth at Bankfull:	1.3
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	877.02

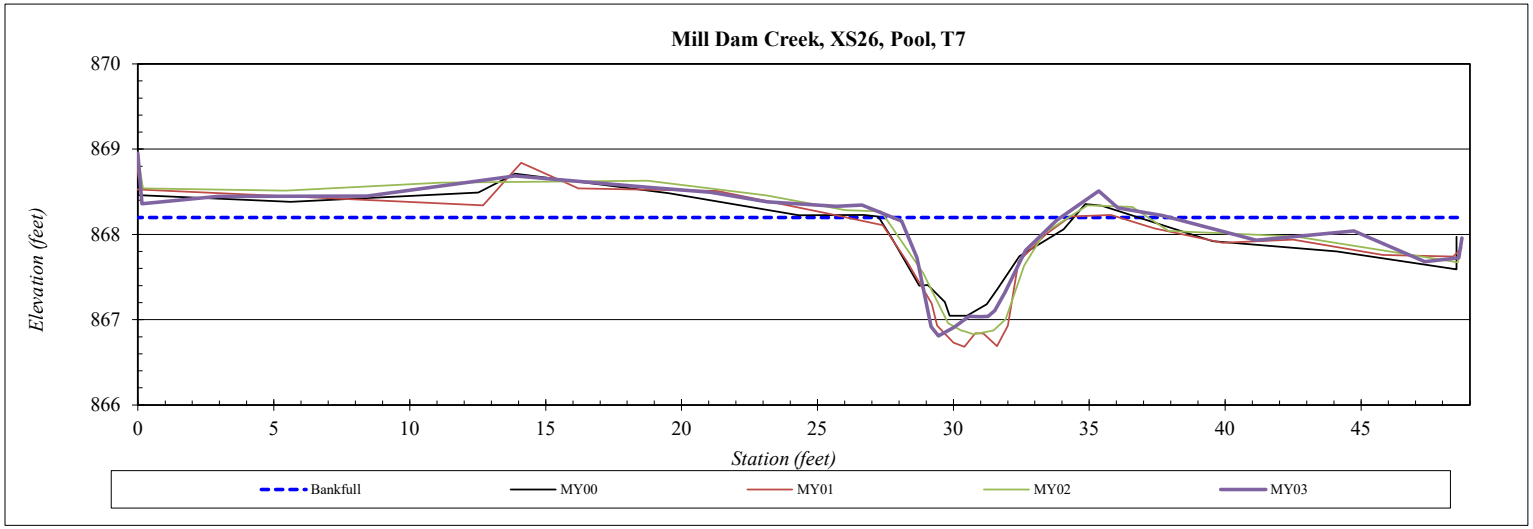


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS26
Drainage Area (sq mi):	0.07
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	868.95
0.1	868.36
2.9	868.45
8.4	868.45
13.9	868.69
18.8	868.55
21.1	868.49
23.2	868.38
25.7	868.33
26.6	868.34
28.1	868.16
28.7	867.72
29.2	866.92
29.5	866.81
30.0	866.91
30.6	867.04
31.0	867.04
31.3	867.04
31.5	867.11
31.9	867.32
32.7	867.81
33.8	868.16
35.4	868.51
36.1	868.31
37.7	868.22
41.1	867.93
44.7	868.04
47.3	867.68
48.6	867.73
48.7	867.96

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	868.20
Bankfull Cross-Sectional Area:	4.6
Total Cross-Sectional Area:	4.7
Bankfull Width:	6.2
Flood Prone Area Elevation:	---
Flood Prone Width:	---
Max Depth at Bankfull:	1.4
Mean Depth at Bankfull:	0.7
W / D Ratio:	---
Entrenchment Ratio:	---
Bank Height Ratio:	---
Thalweg Elevation:	866.81

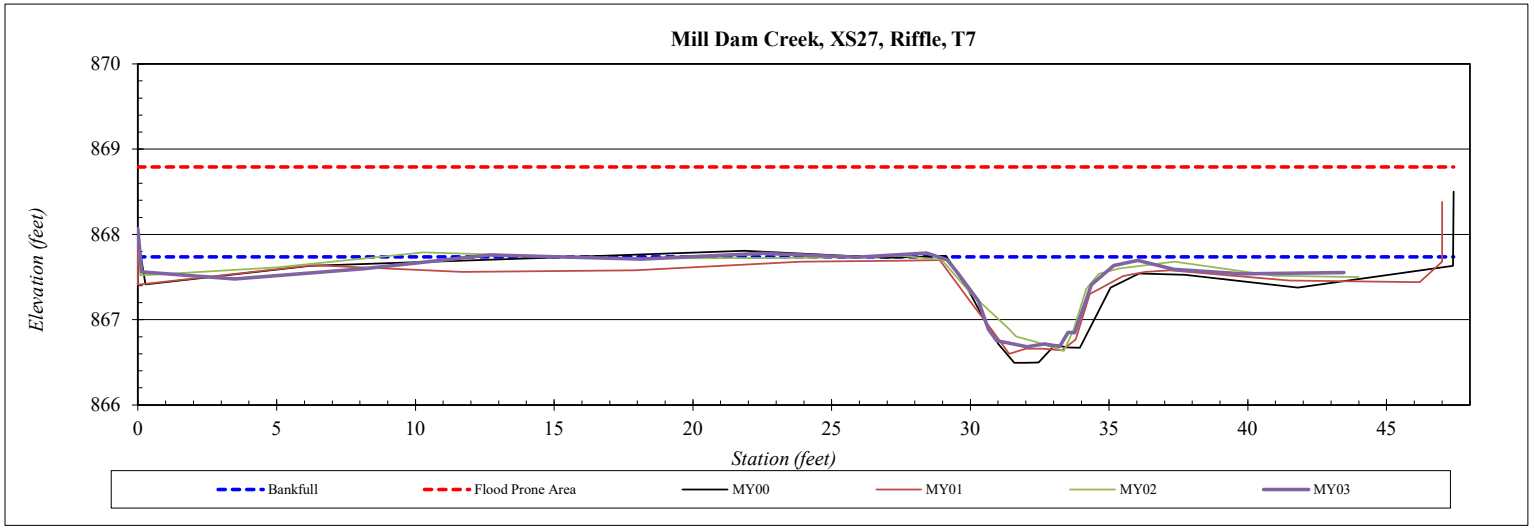


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS27
Drainage Area (sq mi):	0.07
Date:	1/10/2023
Field Crew:	KB, JS

Station	Elevation
0.0	868.07
0.1	867.56
3.5	867.48
8.1	867.60
12.7	867.76
18.1	867.71
22.5	867.78
25.9	867.73
28.4	867.78
29.2	867.70
29.5	867.55
30.3	867.22
30.6	866.89
30.9	866.75
31.5	866.72
32.0	866.68
32.7	866.72
33.2	866.69
33.5	866.85
33.8	866.85
34.4	867.41
35.2	867.64
36.0	867.70
37.3	867.59
39.8	867.54
43.5	867.55

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	867.74
Bankfull Cross-Sectional Area:	4.3
Total Cross-Sectional Area:	3.1
Bankfull Width:	7.2
Flood Prone Area Elevation:	868.79
Flood Prone Width:	43.5
Max Depth at Bankfull:	1.1
Mean Depth at Bankfull:	0.6
W / D Ratio:	12.1
Entrenchment Ratio:	6.1
Bank Height Ratio:	1.0
Thalweg Elevation:	866.68

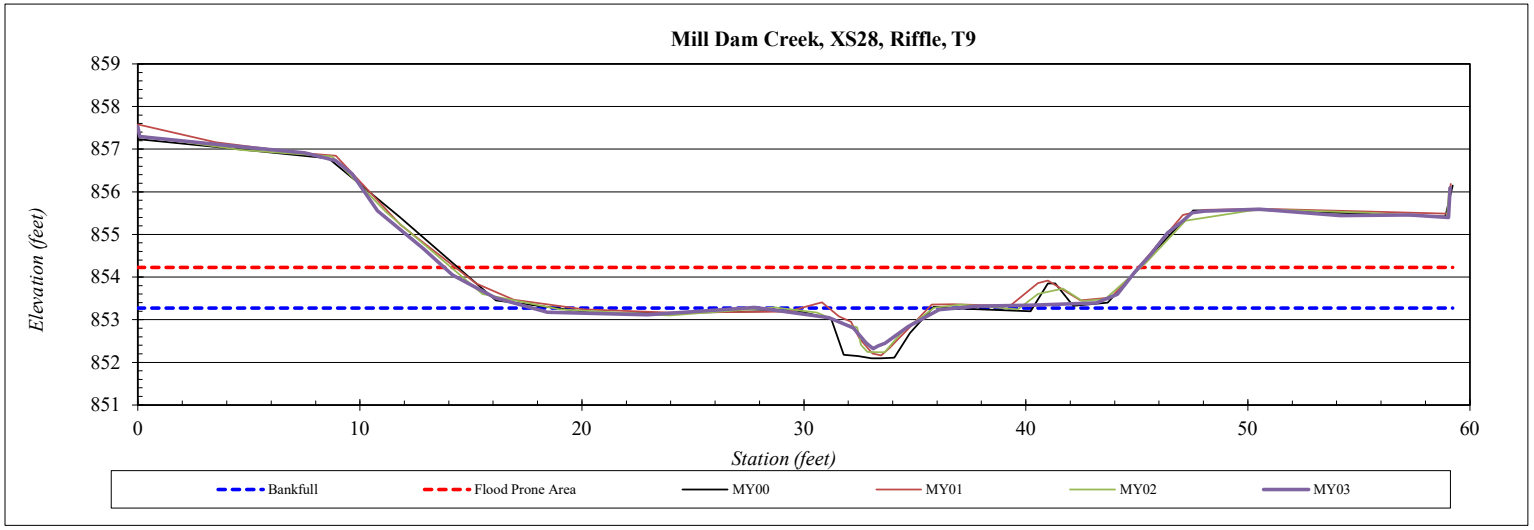


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS28
Drainage Area (sq mi):	0.04
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0.0	857.53
0.1	857.30
3.9	857.10
7.5	856.91
8.9	856.73
9.7	856.42
10.8	855.56
12.8	854.68
14.2	854.05
16.1	853.51
18.4	853.17
22.9	853.11
27.8	853.29
31.1	853.05
32.2	852.81
32.8	852.46
33.1	852.32
33.4	852.39
33.7	852.45
34.7	852.83
36.1	853.24
37.8	853.32
40.2	853.34
43.2	853.39
44.1	853.60
44.9	854.12
45.6	854.53
46.4	855.03
47.0	855.31
47.5	855.51
48.1	855.55
50.5	855.59
54.2	855.44
57.3	855.46
59.0	855.40
59.1	856.09

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	853.27
Bankfull Cross-Sectional Area:	2.8
Total Cross-Sectional Area:	1.3
Bankfull Width:	8.1
Flood Prone Area Elevation:	854.22
Flood Prone Width:	31.3
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.3
W / D Ratio:	23.1
Entrenchment Ratio:	3.9
Bank Height Ratio:	0.8
Thalweg Elevation:	852.32

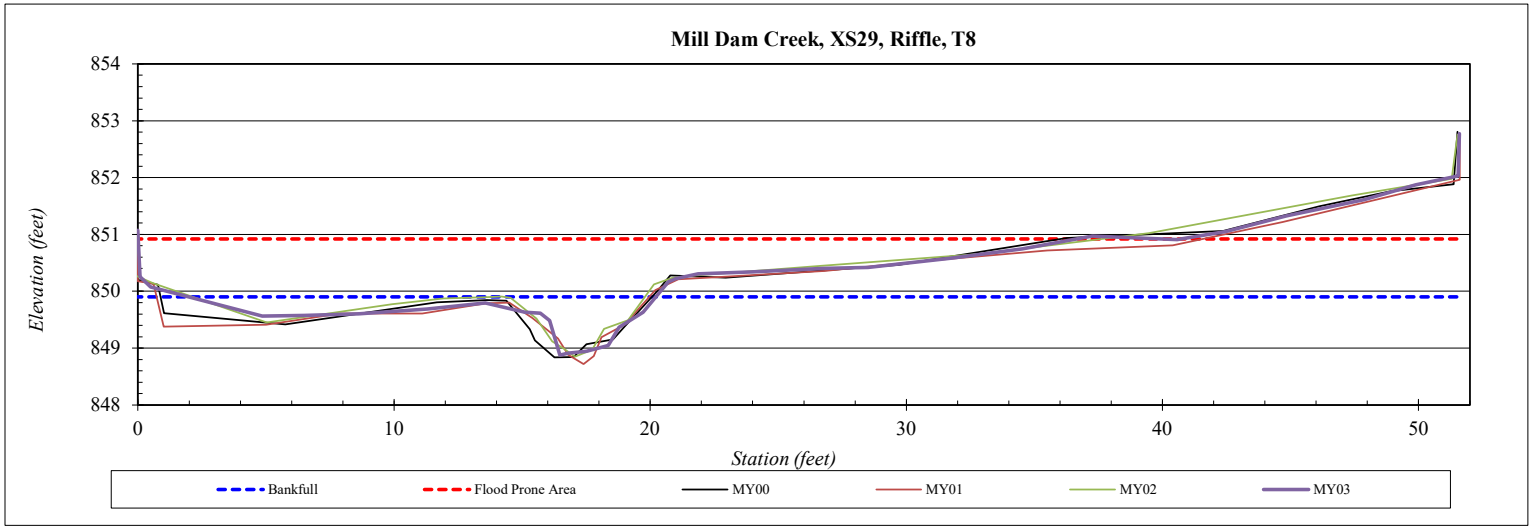


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS29
Drainage Area (sq mi):	0.03
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0.0	851.07
0.1	850.25
0.5	850.08
4.8	849.56
6.5	849.58
8.6	849.60
11.3	849.69
13.6	849.80
15.1	849.63
15.7	849.61
16.1	849.49
16.5	848.88
16.8	848.91
17.5	848.94
18.4	849.04
18.8	849.37
19.7	849.63
20.7	850.17
21.0	850.23
21.9	850.30
24.0	850.34
26.8	850.40
28.5	850.42
31.8	850.58
34.5	850.75
37.3	850.97
40.6	850.91
42.5	851.05
44.8	851.33
47.9	851.61
49.9	851.87
51.5	852.03
51.6	852.77

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	849.90
Bankfull Cross-Sectional Area:	3.4
Total Cross-Sectional Area:	2.9
Bankfull Width:	6.7
Flood Prone Area Elevation:	850.92
Flood Prone Width:	37.3
Max Depth at Bankfull:	1.0
Mean Depth at Bankfull:	0.5
W / D Ratio:	13.1
Entrenchment Ratio:	5.6
Bank Height Ratio:	0.9
Thalweg Elevation:	848.88

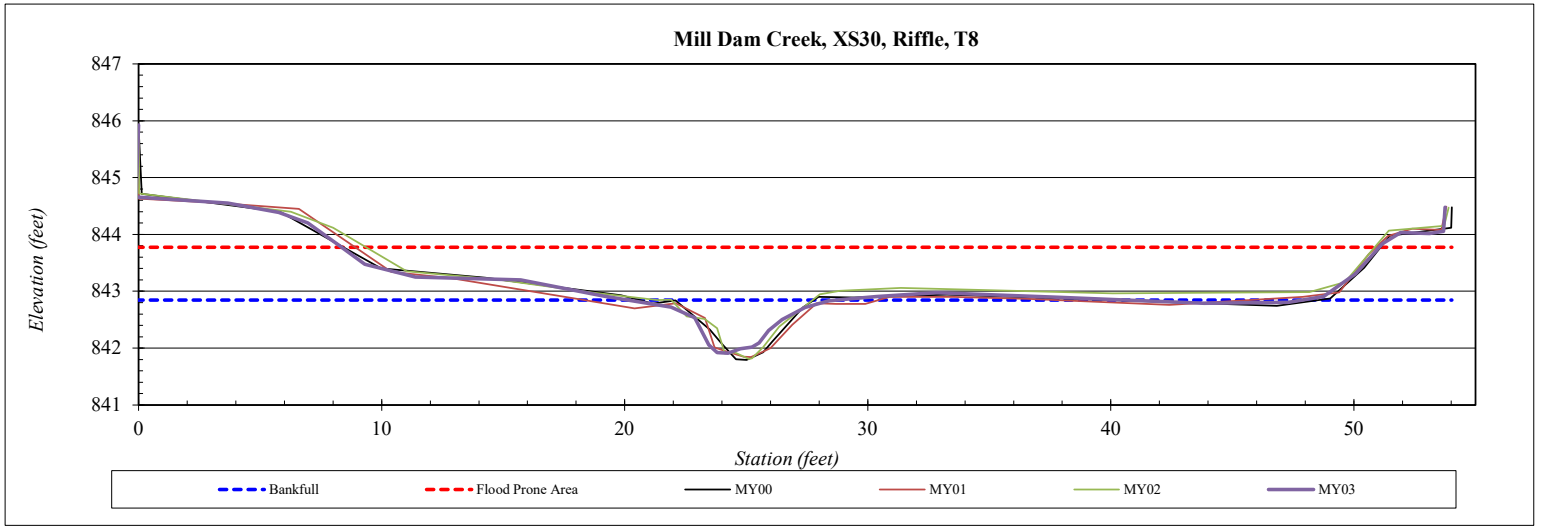


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS30
Drainage Area (sq mi):	0.03
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0.0	845.92
-0.1	844.66
3.7	844.55
5.8	844.39
7.0	844.20
8.2	843.82
9.3	843.48
11.4	843.25
15.7	843.20
19.2	842.91
21.9	842.72
22.9	842.54
23.5	842.06
23.8	841.92
24.3	841.91
24.8	841.99
25.2	842.02
25.5	842.09
25.9	842.31
26.5	842.50
27.4	842.72
28.4	842.83
30.4	842.91
32.8	842.98
37.7	842.90
43.8	842.79
47.3	842.81
48.8	842.91
50.1	843.31
51.2	843.84
51.9	844.03
53.1	844.02
53.7	844.05
53.7	844.48

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	842.84
Bankfull Cross-Sectional Area:	3.2
Total Cross-Sectional Area:	3.2
Bankfull Width:	8.2
Flood Prone Area Elevation:	843.77
Flood Prone Width:	42.7
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.4
W / D Ratio:	21.1
Entrenchment Ratio:	5.2
Bank Height Ratio:	0.9
Thalweg Elevation:	841.91

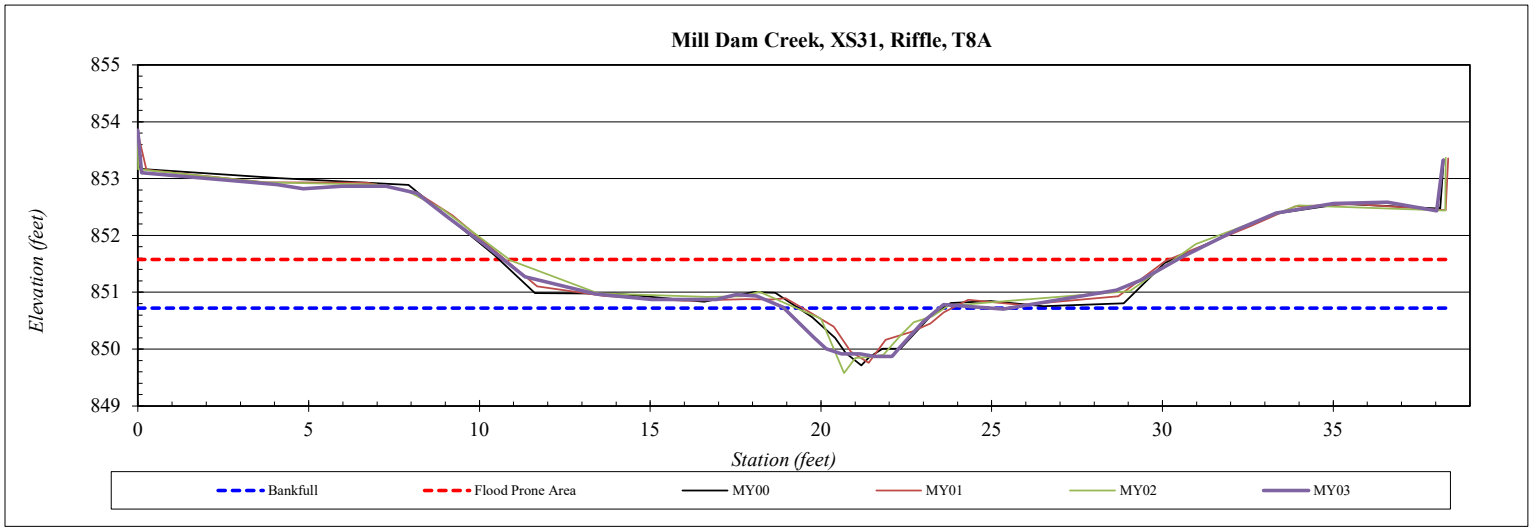


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS31
Drainage Area (sq mi):	0.01
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0.0	853.85
0.1	853.10
3.2	852.94
4.1	852.90
4.8	852.82
6.0	852.86
7.3	852.87
8.2	852.74
9.1	852.31
10.1	851.85
11.3	851.28
13.4	850.97
15.0	850.87
16.9	850.87
17.5	850.96
18.1	850.94
18.9	850.74
19.8	850.21
20.1	850.01
20.6	849.92
21.1	849.92
21.6	849.87
22.1	849.87
22.3	850.03
23.0	850.48
23.6	850.78
25.3	850.70
28.6	851.04
29.4	851.22
30.5	851.60
32.2	852.10
33.3	852.39
35.0	852.56
36.6	852.59
38.0	852.43
38.2	853.32

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	850.72
Bankfull Cross-Sectional Area:	2.6
Total Cross-Sectional Area:	3.0
Bankfull Width:	4.6
Flood Prone Area Elevation:	851.57
Flood Prone Width:	19.7
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.6
W / D Ratio:	8.1
Entrenchment Ratio:	4.3
Bank Height Ratio:	1.1
Thalweg Elevation:	849.87

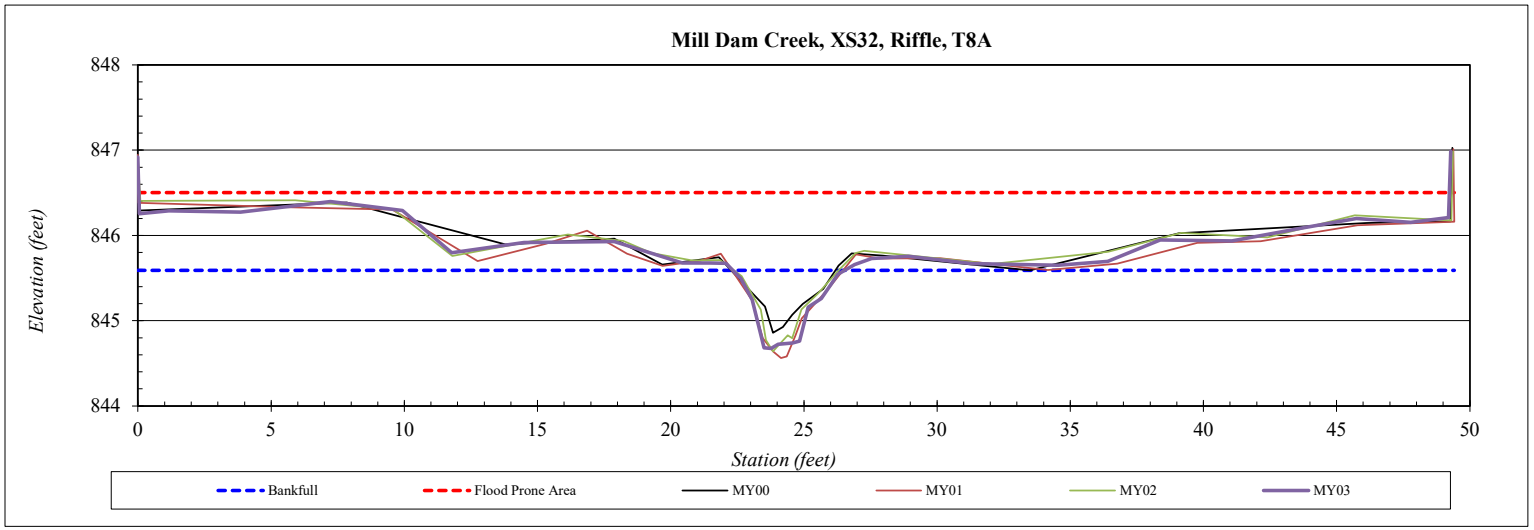


Cross-Section Plots

River Basin:	Yadkin River
Site:	Mill Dam Creek
XS ID	XS32
Drainage Area (sq mi):	0.01
Date:	1/9/2023
Field Crew:	KB, JS

Station	Elevation
0.0	846.918
0.1	846.26
1.2	846.29
3.9	846.27
7.2	846.40
9.9	846.29
11.8	845.80
14.5	845.92
17.9	845.93
20.4	845.68
21.5	845.68
22.1	845.67
22.6	845.49
23.1	845.25
23.5	844.68
23.8	844.68
24.0	844.72
24.6	844.74
24.8	844.76
25.2	845.16
25.7	845.26
26.3	845.55
26.9	845.66
27.5	845.73
28.9	845.76
31.3	845.67
34.5	845.65
36.4	845.70
38.4	845.95
41.1	845.94
43.8	846.09
45.7	846.20
47.8	846.15
49.2	846.21
49.3	846.98

SUMMARY DATA	
Bankfull Elevation (ft) - Based on AB-Bankfull Area	845.59
Bankfull Cross-Sectional Area:	2.1
Total Cross-Sectional Area:	3.5
Bankfull Width:	4.2
Flood Prone Area Elevation:	846.50
Flood Prone Width:	49.2
Max Depth at Bankfull:	0.9
Mean Depth at Bankfull:	0.5
W / D Ratio:	8.5
Entrenchment Ratio:	11.8
Bank Height Ratio:	1.1
Thalweg Elevation:	844.68



APPENDIX E

Hydrologic Data

Mill Dam Creek Restoration Site
30-70 Percentile Graph
WETS Station Name: Yadkinville 6E, NC

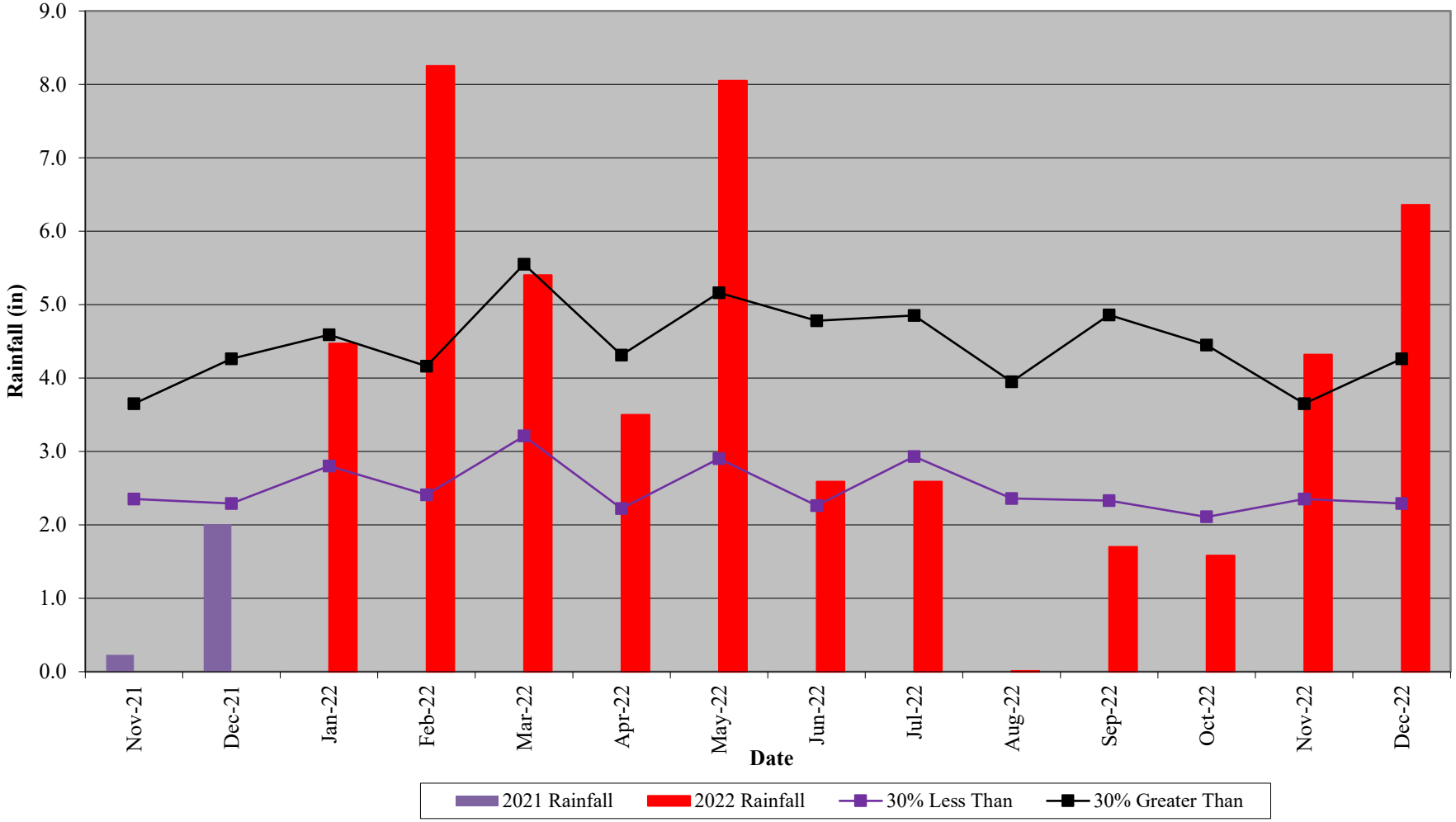
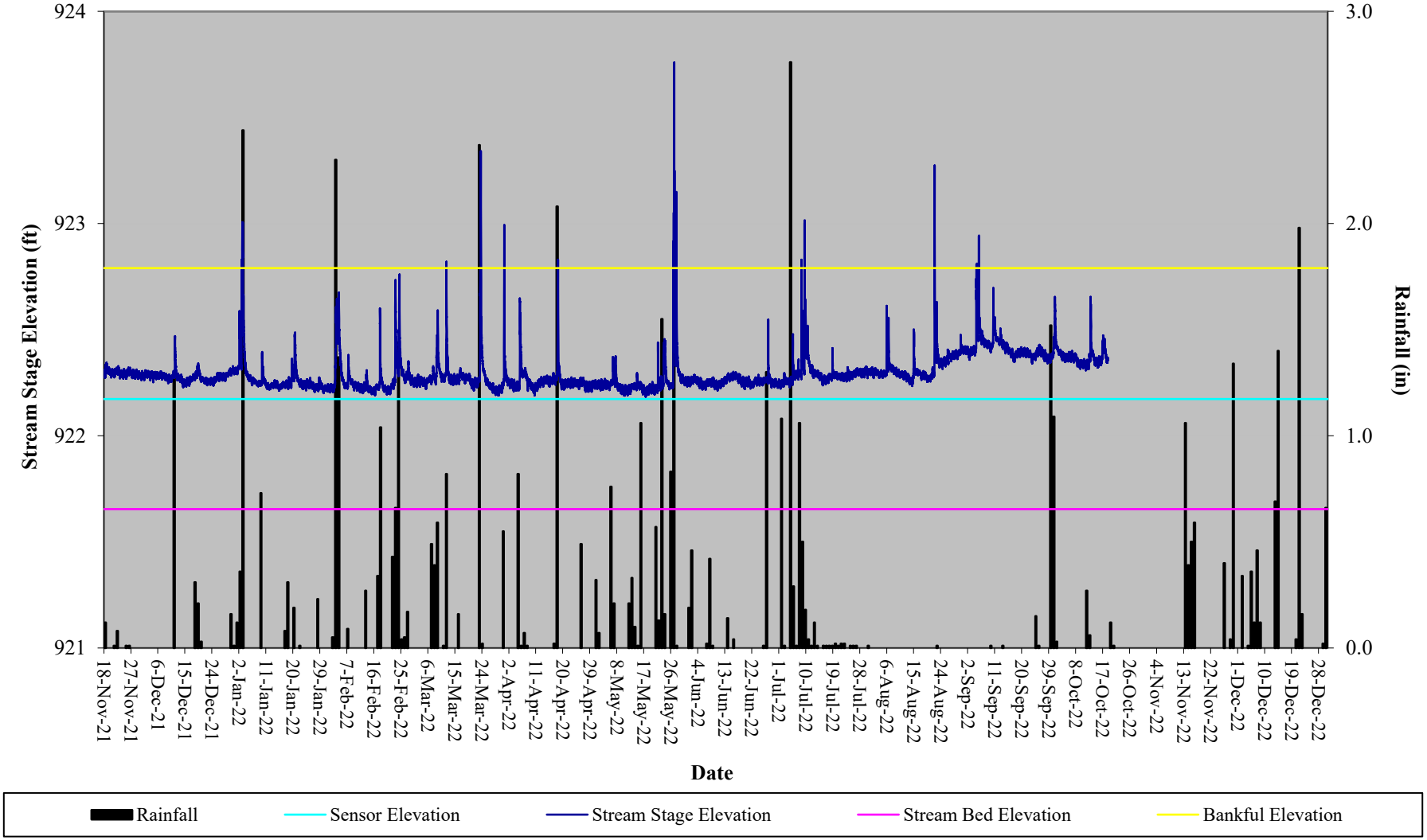


Table 11. Verification of Bankfull Events Mill Dam Creek Restoration Site, DMS Project #97136			
Monitoring Year	**Date of Occurrence**	**Method**	**Reach**
MY01	January 24, 2020	Onsite stream gauge	UTHC1
	February 6, 2020	Onsite stream gauge	UTHC1, UTHC3
	February 11, 2020	Onsite stream gauge	UTHC1
	February 13, 2020	Onsite stream gauge	UTHC1
	March 24, 2020	Onsite stream gauge	UTHC1
	April 13, 2020	Onsite stream gauge	UTHC1, UTHC3
	April 25, 2020	Onsite stream gauge	UTHC1
	April 29, 2020	Onsite stream gauge	UTHC1, UTHC3
	May 21, 2020	Onsite stream gauge	UTHC1, UTHC3
	May 27, 2020	Onsite stream gauge	UTHC1, UTHC3
	December 16, 2020	Photos taken on-site	UTHC1, UTHC3, T1, T2, T6, T8
	December 16, 2020	Onsite stream gauge	UTHC1
MY02	January 1, 2021	Onsite stream gauge	UTHC1, UTHC3
	January 27, 2021	Onsite stream gauge	UTHC1
	February 13, 2021	Onsite stream gauge	UTHC1
	February 15, 2021	Onsite stream gauge	UTHC1, UTHC3
	February 18, 2021	Onsite stream gauge	UTHC1
	March 19, 2021	Onsite stream gauge	UTHC1
	March 25, 2021	Onsite stream gauge	UTHC1
	July 2, 2021	Onsite stream gauge	UTHC1, UTHC3
	August 16, 2021	Onsite stream gauge	UTHC1, UTHC3
	August 18, 2021	Onsite stream gauge	UTHC1, UTHC3
	September 21, 2021	Onsite stream gauge	UTHC1, UTHC3
MY03	January 3, 2022	Onsite stream gauge	UTHC1
	March 12, 2022	Onsite stream gauge	UTHC1
	March 23, 2022	Onsite stream gauge	UTHC1, UTHC3
	March 31, 2022	Onsite stream gauge	UTHC1
	April 18, 2022	Onsite stream gauge	UTHC1
	May 27, 2022	Onsite stream gauge	UTHC1, UTHC3
	July 9, 2022	Onsite stream gauge	UTHC1, UTHC3
	August 22, 2022	Onsite stream gauge	UTHC1, UTHC3
	September 5, 2022	Onsite stream gauge	UTHC1, UTHC3

Mill Dam Creek Restoration Site
Hydrograph
UTHC-1 Stream Gauge



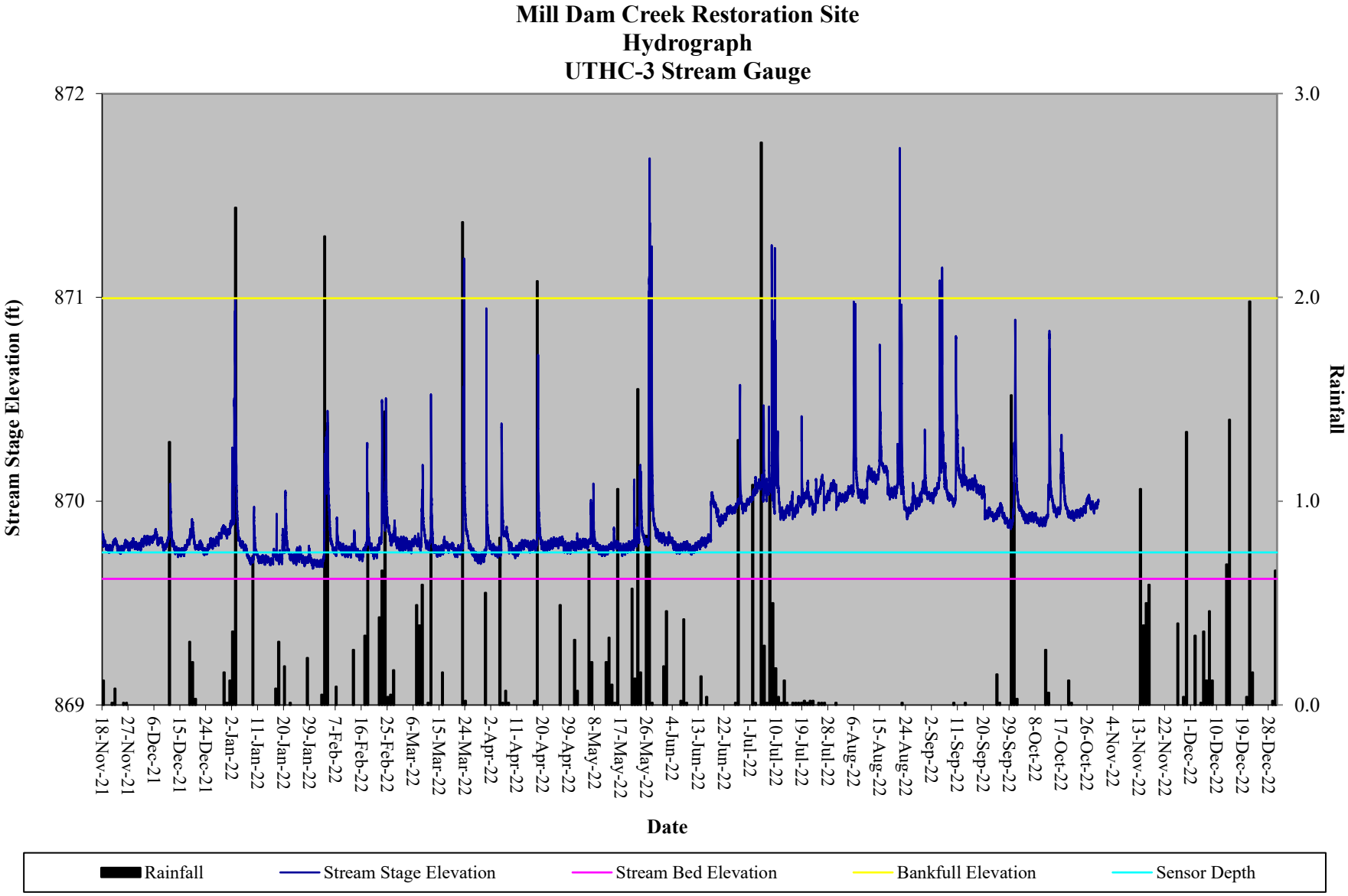
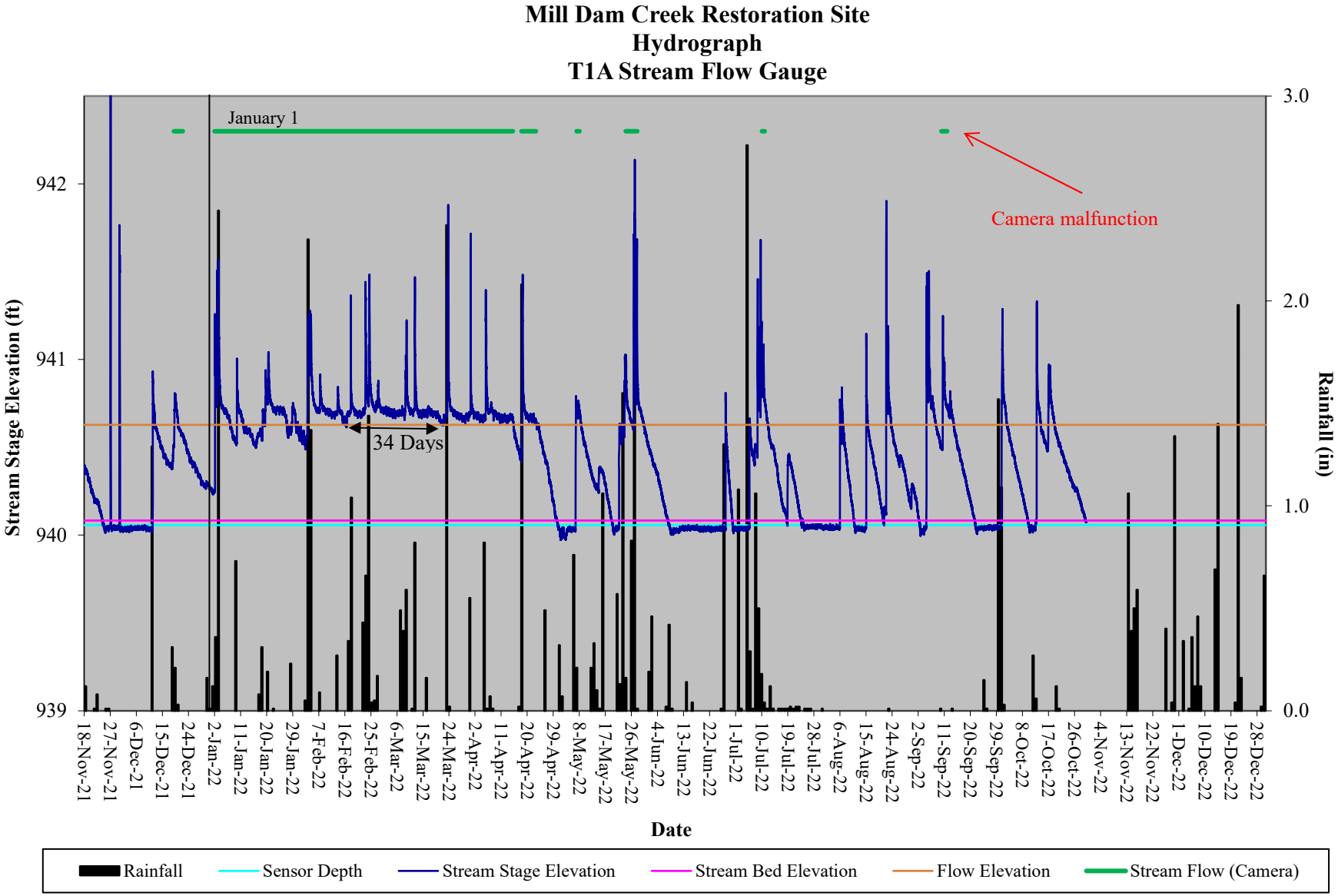
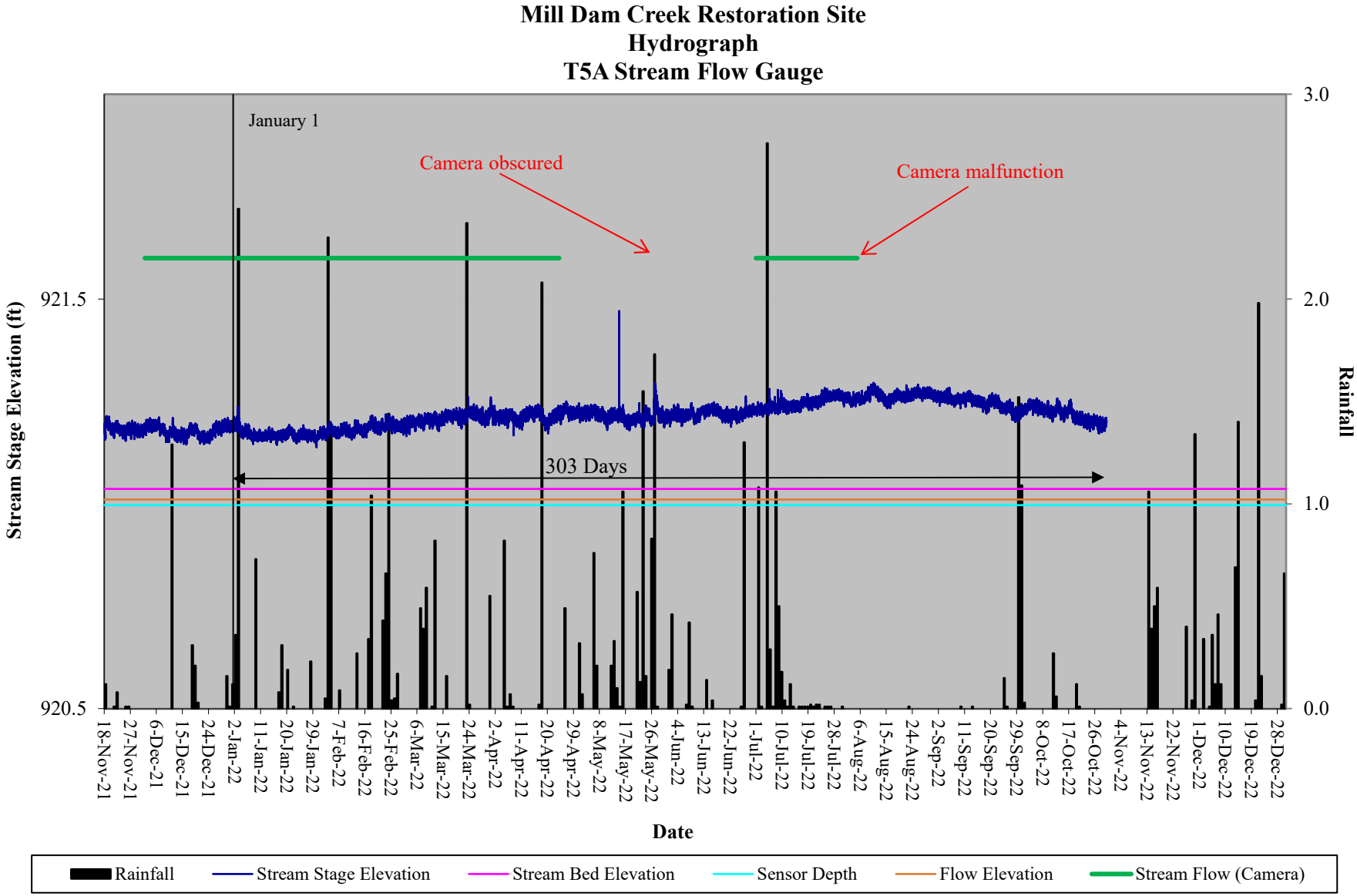

Mill Dam Creek Restoration Site
Hydrograph
UTHC-3 Stream Gauge
Stream Stage Elevation (ft)
872
871
870
869
Rainfall
3.0
2.0
1.0
0.0
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Date
Rainfall
Stream Stage Elevation
Stream Bed Elevation
Bankfull Elevation
Sensor Depth

Table 12. Verification of Stream Flow Mill Dam Creek Restoration Site, DMS Project #97136				
	Gauge		Camera	
Reach	Dates Achieving	Maximum Consecutive Days	Dates Achieving	Maximum Consecutive Days
T1A	February 16 – March 21	34	January 2 – April 15	104
T5A	January 1 – October 29	303	January 1 – April 24 July 1 – August 5	114
T8A	January 1 – August 5; August 13 – September 27; September 29 – October 30	217	January 17 – April 18	92

Table 13. Stream Flow Criteria Attainment Mill Dam Creek Restoration Site, DMS Project #97136							
	Greater than 30 Days of Flow/Max Consecutive Days						
Reach	MY-01 2020	MY-02 2021	MY-03 2022	MY-04 2023	MY-05 2024	MY-06 2025	MY-07 2026
T1A (Gauge)	Yes/68	Yes/121	Yes/34				
T1A (Camera)	Yes/44	Yes/55	Yes/104				
T5A (Gauge)	Yes/152	Yes/322	Yes/303				
T5A (Camera)	Yes/70	Yes/116	Yes/114				
T8A (Gauge)	Yes/152	Yes/167	Yes/217				
T8A (Camera)	Yes/84	Yes/180	Yes/92				


Mill Dam Creek Restoration Site
Hydrograph
T1A Stream Flow Gauge
January 1
Camera malfunction
34 Days
Stream Stage Elevation (ft)
Rainfall (in)
942
941
940
939
3.0
2.0
1.0
0.0
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Date
Rainfall
Sensor Depth
Stream Stage Elevation
Stream Bed Elevation
Flow Elevation
Stream Flow (Camera)


Mill Dam Creek Restoration Site
Hydrograph
T5A Stream Flow Gauge
January 1
Camera obscured
Camera malfunction
303 Days
Stream Stage Elevation (ft)
921.5
920.5
3.0
2.0
1.0
0.0
Rainfall
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Date
Rainfall
Stream Stage Elevation
Stream Bed Elevation
Sensor Depth
Flow Elevation
Stream Flow (Camera)

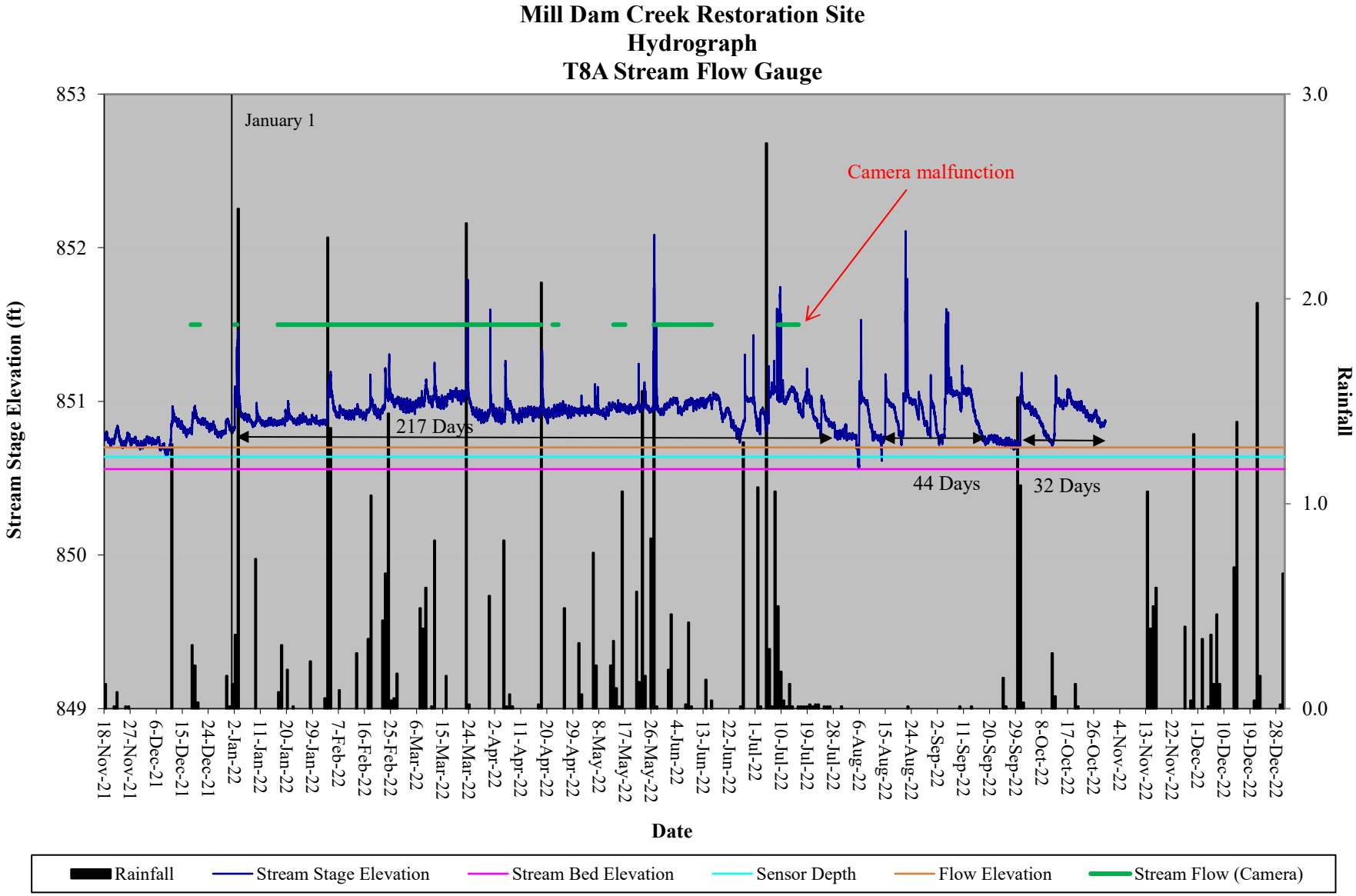
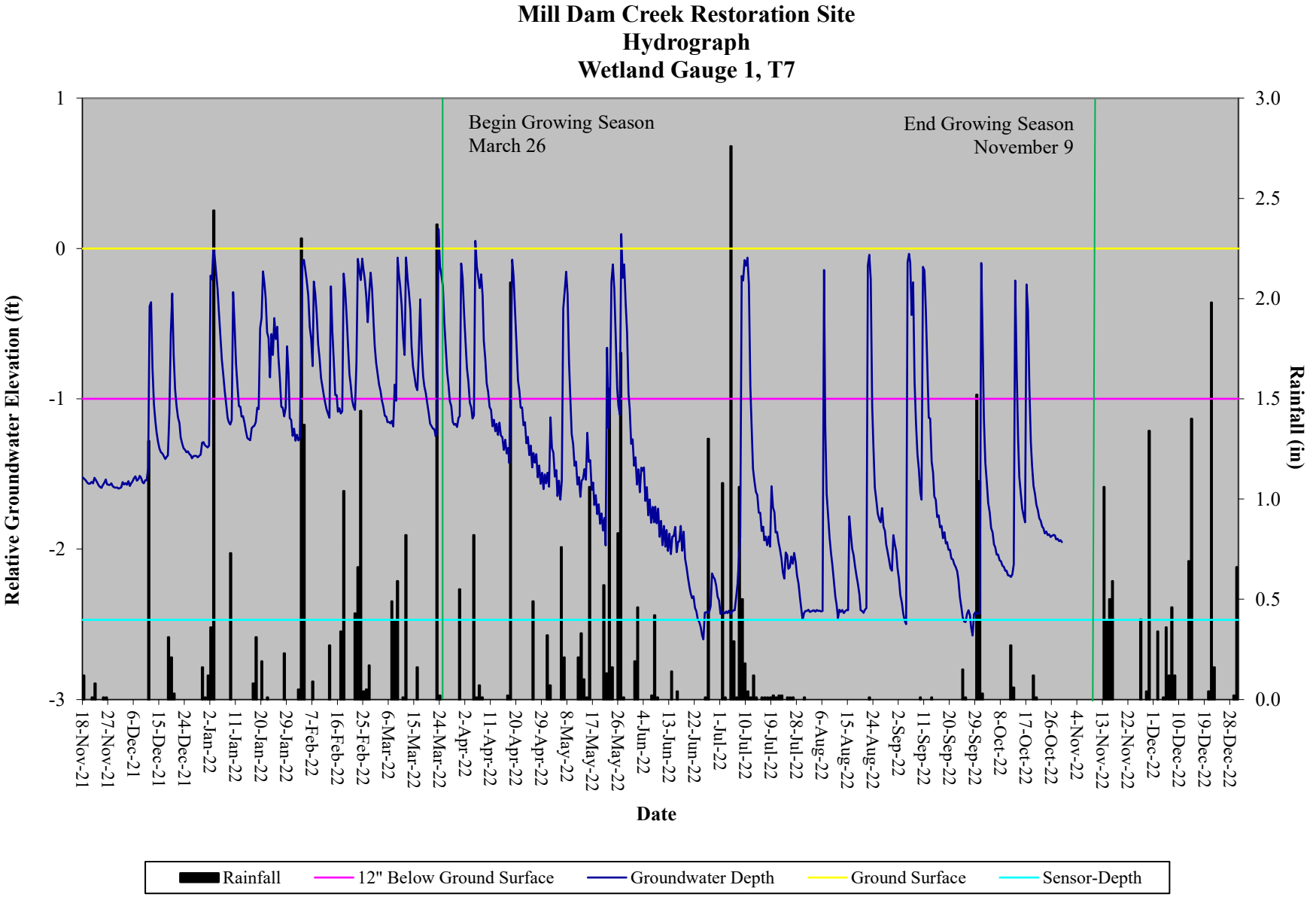
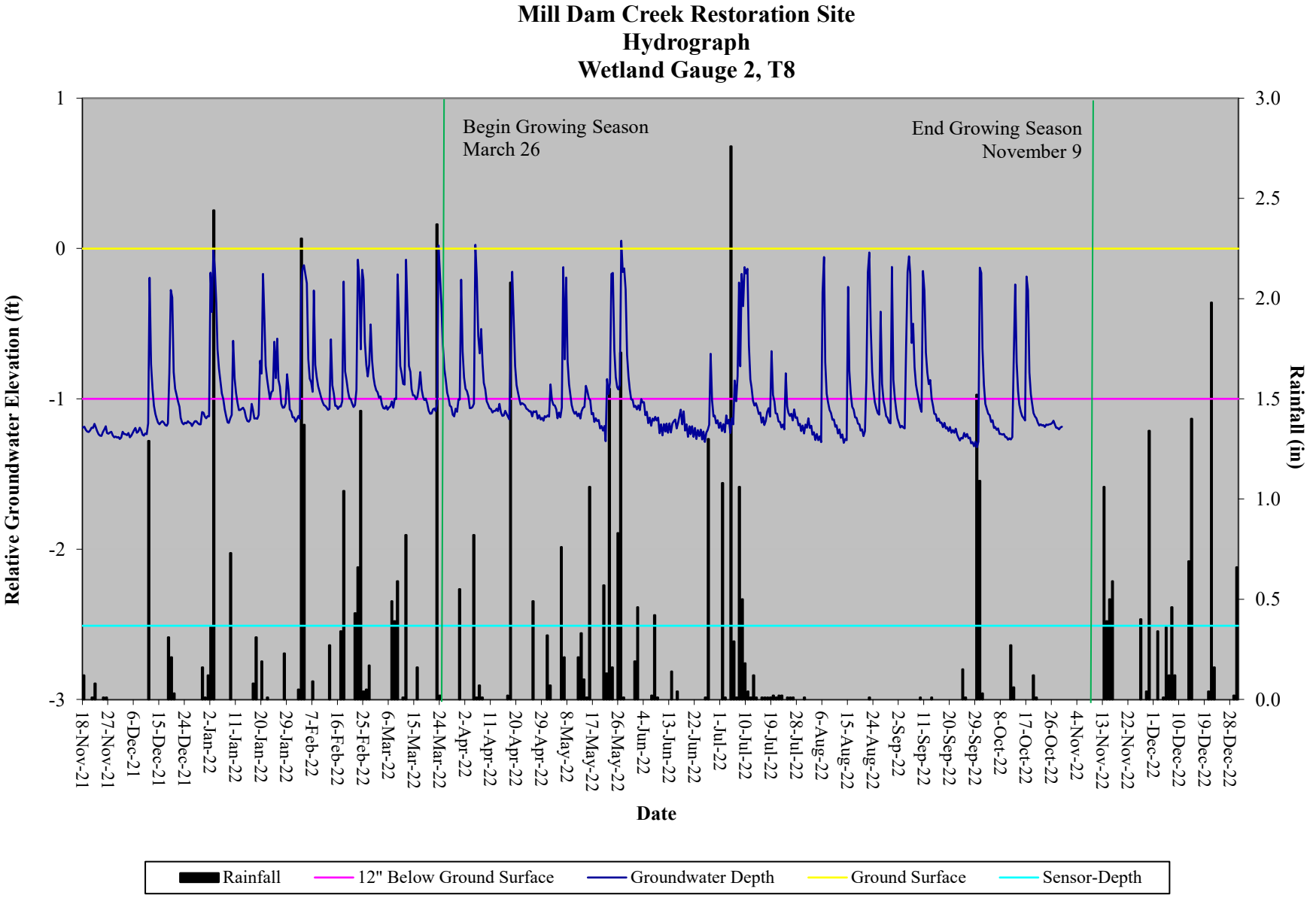

Mill Dam Creek Restoration Site
Hydrograph
T8A Stream Flow Gauge
Stream Stage Elevation (ft)
Rainfall
Date
January 1
Camera malfunction
217 Days
44 Days
32 Days
853
852
851
850
849
3.0
2.0
1.0
0.0
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Rainfall
Stream Stage Elevation
Stream Bed Elevation
Sensor Depth
Flow Elevation
Stream Flow (Camera)

Table 14. Wetland Hydrology Verification Mill Dam Creek Restoration Site, DMS Project #97136								
		Max Consecutive Days During Growing Season (Percentage)						
		MY-01 2020	**MY-02 2021**	**MY-03 2022**	**MY-04 2023**	**MY-05 2024**	**MY-06 2025**	**MY-07 2026**
Gauge #	**Location**	Normal Rainfall	Normal Rainfall	Below Average Rainfall				
Gauge 1	T7	45 (19.7%)	57 (24.8%)	5 (2.2%)				
Gauge 2	T8	Gauge malfunction	37 (15.6%)	9 (3.6%)				


Mill Dam Creek Restoration Site
Hydrograph
Wetland Gauge 1, T7
Begin Growing Season
March 26
End Growing Season
November 9
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
1
0
-1
-2
-3
3.0
2.5
2.0
1.5
1.0
0.5
0.0
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Rainfall
12" Below Ground Surface
Groundwater Depth
Ground Surface
Sensor-Depth


Mill Dam Creek Restoration Site
Hydrograph
Wetland Gauge 2, T8
Begin Growing Season
March 26
End Growing Season
November 9
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
1
0
-1
-2
-3
3.0
2.5
2.0
1.5
1.0
0.5
0.0
18-Nov-21
27-Nov-21
6-Dec-21
15-Dec-21
24-Dec-21
2-Jan-22
11-Jan-22
20-Jan-22
29-Jan-22
7-Feb-22
16-Feb-22
25-Feb-22
6-Mar-22
15-Mar-22
24-Mar-22
2-Apr-22
11-Apr-22
20-Apr-22
29-Apr-22
8-May-22
17-May-22
26-May-22
4-Jun-22
13-Jun-22
22-Jun-22
1-Jul-22
10-Jul-22
19-Jul-22
28-Jul-22
6-Aug-22
15-Aug-22
24-Aug-22
2-Sep-22
11-Sep-22
20-Sep-22
29-Sep-22
8-Oct-22
17-Oct-22
26-Oct-22
4-Nov-22
13-Nov-22
22-Nov-22
1-Dec-22
10-Dec-22
19-Dec-22
28-Dec-22
Rainfall
12" Below Ground Surface
Groundwater Depth
Ground Surface
Sensor-Depth

APPENDIX F

Additional Information

KCI ASSOCIATES OF NC

ISO 9001:2015 CERTIFIED

ENGINEERS • PLANNERS • SCIENTISTS • CONSTRUCTION MANAGERS

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To: Matthew Reid, DMS PM
Todd Tugwell, USACE

FROM: Adam Spiller, KCI

DATE: August 15, 2022

SUBJECT: Mill Dam Creek Stream Restoration Project
IRT Site Meeting

KCI Project Number - 201601703
Yadkin River Basin - 03040101
DEQ Contract 6898
DMS Project Number 97136
DWR #: 18-1349
USACE Action ID: 2016-01335

Attendees:

Paul Wiesner, DMS	Tommy Seelinger, KCI
Melonie Allen, DMS	Erin Davis, DWR
Matthew Reid, DMS	Kim Browning, USACE
Adam Spiller, KCI	David McHenry, WRC
Kevin O'Briant, KCI	

In IRT field review meeting was conducted for the above referenced project on August 15, 2022, starting around 1:30pm. The site was damp from a previous rain and the weather was mild and slightly overcast. The group walked most of the restoration portions of T6 and UTHC3. We also drove to the top of the site where we walked T1A and T1. The comments from the site walk are listed below.

- Pay attention to invasives. There were no areas of thick invasives, but there were some scattered in the easement around the areas of the site that had not been cleared for construction.
- In some portions of the buffer, the sycamores are the most notable tree. Watch the diversity data from the veg plots and supplement if necessary.
- Take photos of the crossings, from the stream and include those in future monitoring reports.
- Overall, the site is well vegetated with thick herbaceous vegetation. Some areas of Priority 2 restoration have less vegetation on the floodplain/benches. Watch those areas for future vegetation vigor.

- A couple of structures were found to be piping. Pay attention to those to make sure the structures are still maintaining function and not degrading.
- Some of the previously repaired areas from flood damage were lacking in live stakes. KCI will add live stakes to those areas during this upcoming dormant season.
- There was a previous encroachment area near the bottom of T1, where the landowner had driven inside the easement as short cut between two gates instead of going outside of the easement. We checked this area during the site walk and it did not appear that this was still an issue, but we will continue to pay attention to this area and document any future encroachments.

These comments were all discussed at the site walk and this meeting memo will be included in the MY03 monitoring report. Generally, the site was viewed positively, with the stream and buffers all looking healthy and functioning.

The meeting ended around 3pm.