Monitoring Report MY04

Cedar Branch Restoration Site
Monitoring Year 04
DMS Contract 6598
DMS Project Number 97009

DWR #: 20150904
USACE Action ID: 2003-21395
Randolph County, North Carolina

Prepared for:
NCDMS, 1652 Mail Service Center, Raleigh, NC 27699-1652

Monitoring Data Collected: 2021
Date Submitted: January 2022

Monitoring and Design Firm

Prepared by:

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KCI ASSOCIATES OF NORTH CAROLINA, PA

ENGINEERS • SCIENTISTS • SURVEYORS • CONSTRUCTION MANAGERS
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MEMORANDUM

Date: January 21, 2022

To: Matthew Reid, DMS Project Manager

From: Tim Morris, Project Manager
KCI Associates of North Carolina, PA

Subject: Cedar Branch Stream Restoration Site
MY-04 Monitoring Report Comments
Yadkin River Basin CU 03040103
Randolph County, North Carolina
NCDMS Project # 97009
Contract # 006598

Please find below our responses in italics to the MY-04 Monitoring Report comments from NCDMS received on January 3, 2022, for the Cedar Branch Stream Restoration Site.

Please update cover photo with representative photo from MY4. The current photo has been used since MY1.

- *Cover photo has been updated to a drone photo taken January 4, 2022.*

Please include additional information regarding the upcoming supplemental planting planned for the area between T1 and T1-1. Include size of planting area, type of material (bare root, containerized, etc.), number or planting density and proposed species. If proposed species differ from the approved mitigation plan, please note that in discussion.

- *Supplemental planting was done for the 0.4-acre area between T1 and T1-1 on January 4, 2022. There were 200 bare root trees planted, making the planting density 500 stems/acre. The proposed species (Liriodendron tulipifera, Quercus palustris, Quercus alba, Quercus falcata, and Diospyros virginiana) that were planted were all from the approved mitigation plan.*

Camera on T1-1 malfunctioned and only recorded 7 days according to report. Has all equipment been repaired/replaced and functioning correctly moving into MY5? Please add a short statement regarding the status of the monitoring equipment to this section.

- *The camera on T1-1 malfunctioned from January 1 to June 3 of 2021. The camera was replaced on June 3, 2021 and had a maximum of seven consecutive flow days and a total of 15 days of flow. The camera malfunctioned during the wetter part of the growing season and since the gauge on T1-1 was flowing for 87 consecutive days one can assume that the camera would have recorded flow days during that time if it had been working properly. All cameras and gauges will be working properly before the growing season for Monitoring Year 5.*

Discussion regarding stream flow states that "streams often flow at levels too small for gauges to record". How are gauges installed? Are they installed in pools and calibrated to the downstream head of riffle or are they installed in a riffle? Some providers include flow gauge installation diagrams which help to clear up any ambiguity regarding measurements. An example is provided below. Consider including this information in the final report or having it available at the 2022 credit release meeting.

- *The above is generally our standard operating procedure for installing stream flow gauges and is how the gauge on T3 is installed. Due to the small size of T1-1 and the upper portion of T1, however, it was not possible to find a pool that was adequately deep enough for this. Although the gauges are installed in pools, these pools will occasionally flow but at levels below what the gauge can record (~1.5" of water in the stream). These periods are small and infrequent, and so the word "often" has been changed to "occasionally."*

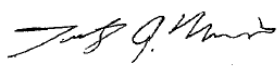
Table 5 and 6: Please include dates that stream and vegetation assessment field work was completed at the top of each table. The IRT has requested this information be included at the 2021 Credit Release Meeting.

- *These tables have been updated with the date field work was completed.*

Digital Deliverables: Please submit polygon features (e.g. shapefile, feature class) that characterize the low stem density area.

- *A polygon was created to represent the low stem density area.*

Sincerely,



Tim Morris
Project Manager

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PROJECT SUMMARY

The Cedar Branch Restoration Site (CBRS) was completed in April 2018 and restored a total of 7,047 linear feet of stream. The CBRS is a riparian system in the Lower Yadkin River Basin (03040103 8-digit cataloging unit) in Randolph County, North Carolina. The site's natural hydrologic regime had been substantially modified through the relocation and straightening of the existing stream channels, impacted by cattle access, and cleared of any riparian buffer. This completed project restored impacted agricultural lands to a stable stream ecosystem with a functional riparian buffer and floodplain access.

The CBRS is protected by a 20.6 acre permanent conservation easement, held by the State of North Carolina. The site is located approximately 2.8 miles west of Sophia, North Carolina. Specifically, the site is 0.5 mile west on Mt. Olive Church Road from its intersection with Edgar Road (SR-1526).

The North Carolina Ecosystem Enhancement Program (NCEEP) publication in 2009 identified HUC 03040103050040 (Caraway Creek) as a Targeted Local Watershed (TLW). The project is also located within the Upper Uwharrie Local Watershed Plan (LWP) study area. The goals and priorities for the CBRS are based on the information presented in the Lower Yadkin 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

The goals for the project are to:

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

The project goals will be addressed through the following objectives:

- Relocate a channelized stream to its historic landscape position.
- Install cross-sections 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.
- Plant the site with native trees and shrubs and an herbaceous seed mix.

To restore the site, the stream was re-meandered and the bankfull elevation was tied to the historic floodplain where feasible. This restoration is expected to create wetland pockets throughout the new floodplain and bankfull bench. The entire site was planted to establish a forested riparian buffer.

The monitoring components were installed in April 2018. Three groundwater monitoring wells were installed to monitor the development of wetlands in the floodplain along the EI portions of T1 and T3. Three automatically recording pressure transducer stream gauges that take a reading every 10 minutes were installed near the top of T1, T1-1, and T3 to document flow within those reaches. Cameras were installed in the vicinity of each of these gauges and set to record a short video once a day to provide additional verification of flow. An additional stream gauge was installed along UTCC to record the occurrence of bankfull events. Thirteen 10 m x 10 m permanent vegetation monitoring plots were established. The locations of the planted stems relative to the origin within these plots, as well as the species, were recorded and planted stems were grouped into size categories (0-10 cm, 10-50 cm, 50-100 cm, >137 cm). Any

volunteers found within the plots were also grouped into size categories by species, but separate from the planted stems. Twelve permanent photo reference points were established and will be taken annually. Fifteen permanent cross-sections (ten riffle cross-sections and five 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 will be repeated in future monitoring years, but the longitudinal profile will only be repeated if there are concerns about bed elevation adjustments. Reports will be submitted to DMS each year.

Vegetative success criteria for the site is 320 woody stems/acre after three years, 260 woody stems/acre after five years, and 210 woody stems/acre after seven years. A minimum of two bankfull events in separate years must also be recorded during the monitoring period. Bank height ratios should not exceed 1.2 and the entrenchment ratios should be 2.2 or greater. Visual assessments will also be used to identify problem areas.

MONITORING RESULTS

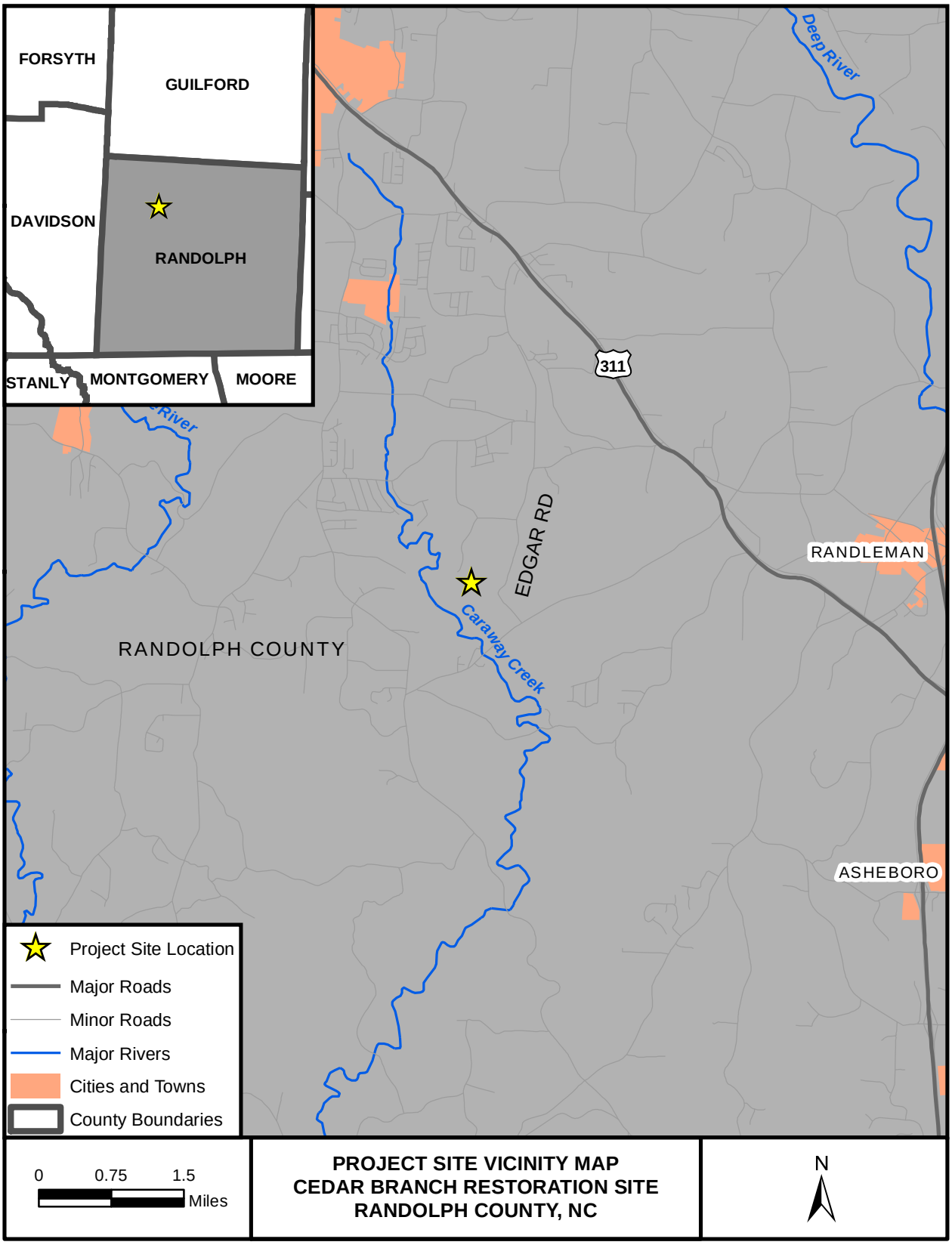
Vegetation monitoring was not conducted in year four, per the mitigation plan, but will resume in year five. Privet growing along T1 and UTCC was treated by cutting and spraying of stumps between July 13 and 16, 2021. Johnson grass that was growing within the easement along UTCC was also treated by spraying at this time. A supplemental planting of the area between T1 and T1-1 is planned for the coming winter.

In addition to traditional stream monitoring, there are areas of fringe wetlands that were restored and enhanced along the bankfull benches of some reaches that will be monitored for informational purposes. These areas do not have success criteria associated with them, but they help illustrate the overall success of the restoration site. According to the Randolph County Soil Survey, the growing season at the CBRS extends from March 24 to November 13 (235 days). Daily rainfall data were obtained from the NC State Climate Office for a local weather station in Asheboro, NC. In 2021, February, June, July, and October experienced above average rainfall, while January, March, August, and September experienced average rainfall. The months of April, May, and November experienced below average rainfall for the site. Overall, the area experienced average rainfall during the 2021 growing season. During the site's fourth growing season, the groundwater monitoring well on T1 achieved 57 days (24.1%) of continuous saturation within twelve inches of the soil surface, while the two wells on T3 achieved 65 days (27.6%) and 21 days (8.8%). Several species of hydrophytic vegetation was also noted growing along the floodplains of T1 and T3 including *Juncus effuses* (FACW), *Cyperus strigosus* (FACW), *Persicaria pensylvanica* (FACW), and *Persicaria sagittata* (OBL).

The stream gauge on UTCC recorded 7 bankfull events in 2021. All three stream flow gauges recorded at least 30 consecutive days of flow. T1 recorded a maximum of 242 consecutive days of flow, while T1-1 recorded a maximum of 87 days and T3 recorded a maximum of 86 days. The gauge data was further backed up by the cameras on site. Due to moisture getting into the cameras at the beginning of the year, the camera on T1 didn't begin recording until March 25, and the cameras on T1-1 and T3 didn't begin recording until June 3. Despite this 2 out of the 3 cameras managed to record flow for more than 30 consecutive days. The camera on T1 showed flow for a maximum of 178 consecutive days, while the camera on T3 showed flow for a maximum of 61 consecutive days. The camera on T1-1 only capture flow for a maximum of 7 consecutive days. This camera was not recording during the time that the gauge recorded 87 consecutive days of flow. The difference in the number of days obtained from the cameras as compared to those obtained from the gauges is largely due to fact that the streams occasionally flow at levels too small for the gauges to record and the cameras are occasionally obscured by vegetation.

The longitudinal profile was not surveyed for the fourth-year monitoring because there were no concerns about bed elevation adjustments. The cross-section survey was also not conducted for the fourth-monitoring year, as stipulated in the Mitigation Plan. Cross-sections will be surveyed again in monitoring year five.

Figure 1. Project Site Vicinity Map



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Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. *Soil Survey of Randolph County, North Carolina*. 2006

APPENDIX A

Background Tables

Table 1. Project Components and Mitigation Credits
Cedar Branch Restoration Site, DMS Project #97009

Mitigation Credits

	Stream		Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R	RE	R	RE			
Linear Feet/Acres	5,230	1,813							
Credits†	5,234	966							
TOTAL CREDITS	6,200								

Project Components

Project Component -or- Reach ID	Stationing/ Location	Existing Footage/ Acreage	Approach (PI, PII etc.)	Restoration -or- Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio
Tributary 1	50+00 to 55+50	550	Enhancement II	220	550	2.5:1
	55+50 to 58+24	257	Enhancement I	183	274	1.5:1
	58+24 to 61+17	229	Restoration	294	293	1:1
Tributary 1-1	70+00 to 73+13	313	Enhancement II	125	313	2.5:1
Tributary 2	80+00 to 80+49	46	Enhancement II	20	49	2.5:1
	80+49 to 81+27	77	Restoration	78	78	1:1
Tributary 3	90+00 to 96+27	624	Enhancement I	418	627	1.5:1
	96+27 to 101-57	517	Restoration	530	530	1:1
Tributary 3-1	150+00 to 150+78	68	Restoration	78	78	1:1
Tributary 4*	250+00 to 257+42	677	Restoration	692	692	1:1
Tributary 5**	300+00 to 300+95	64	N/A	0	(95)	N/A
UTCC*	10+00 to 46+09	3,246	Restoration	3,562	3,559	1:1

Component Summation

Restoration Level	Stream (linear feet)	Riparian Wetlands (Acres)		Non-Riparian Wetlands (Acres)	Buffer (square feet)	Upland (Acres)
		Riverine	Non-Riverine			
Restoration	5,234 lf					
Enhancement						
Enhancement I	901					
Enhancement II	912					
TOTAL CREDITS	6,200					

R= Restoration RE= Restoration Equivalent of Creation or Enhancement
*=Crossings have been removed from creditable linear footage for all project streams.
**=Tributary 5 does not have any mitigation credit, but is included to show its stationing as part of the mitigation project.
†=Changes made during construction resulted in the loss of 4 lf of stream, but per IRT review, this did not result in a loss of credits. Please see Appendix F for additional information.

Table 2. Project Activity & Reporting History Cedar Branch Restoration Sites, DMS Project #97009		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan		May 2017
Final Design - Construction Plans		March 8, 2017
Construction Grading Completed		March 28, 2018
Planting Completed		April 6, 2018
Baseline Monitoring/Report	April 2018	May 2018
Vegetation Monitoring	*April 10, 2018*	
Stream Survey	*April 11, 2018*	
Year 1 Monitoring	January 2019	January 2019
Vegetation Monitoring	*November 5, 2018*	
Stream Survey	*January 14, 2019*	
Crossing Repair(outside easement)	May 2019	
Year 2 Monitoring	July 2019	December 2019
Vegetation Monitoring	*July 9, 2019*	
Stream Survey	*June 26, 2019*	
Year 3 Monitoring	July 2020	December 2020
Vegetation Monitoring	*July 31, 2020*	
Stream Survey	*June 30, 2020*	
Invasive Treatment		July 16, 2021
Year 4 Monitoring	November 2021	December 2021
Vegetation Monitoring	*N/A*	
Stream Survey	*N/A*	

Table 3. Project Contacts **Cedar Branch Restoration Site, DMS Project #97009**	
Design Firm	KCI Associates of North Carolina 4505 Falls of Neuse Road Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512 Fax: (919) 783-9266
Construction Contractor	KCI Environmental Technologies and Construction 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Contact: Mr. Tim Morris Phone: (919) 278-2512
Planting Contractor	Conservation Services Inc. 1620 N. Delphine Ave. 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

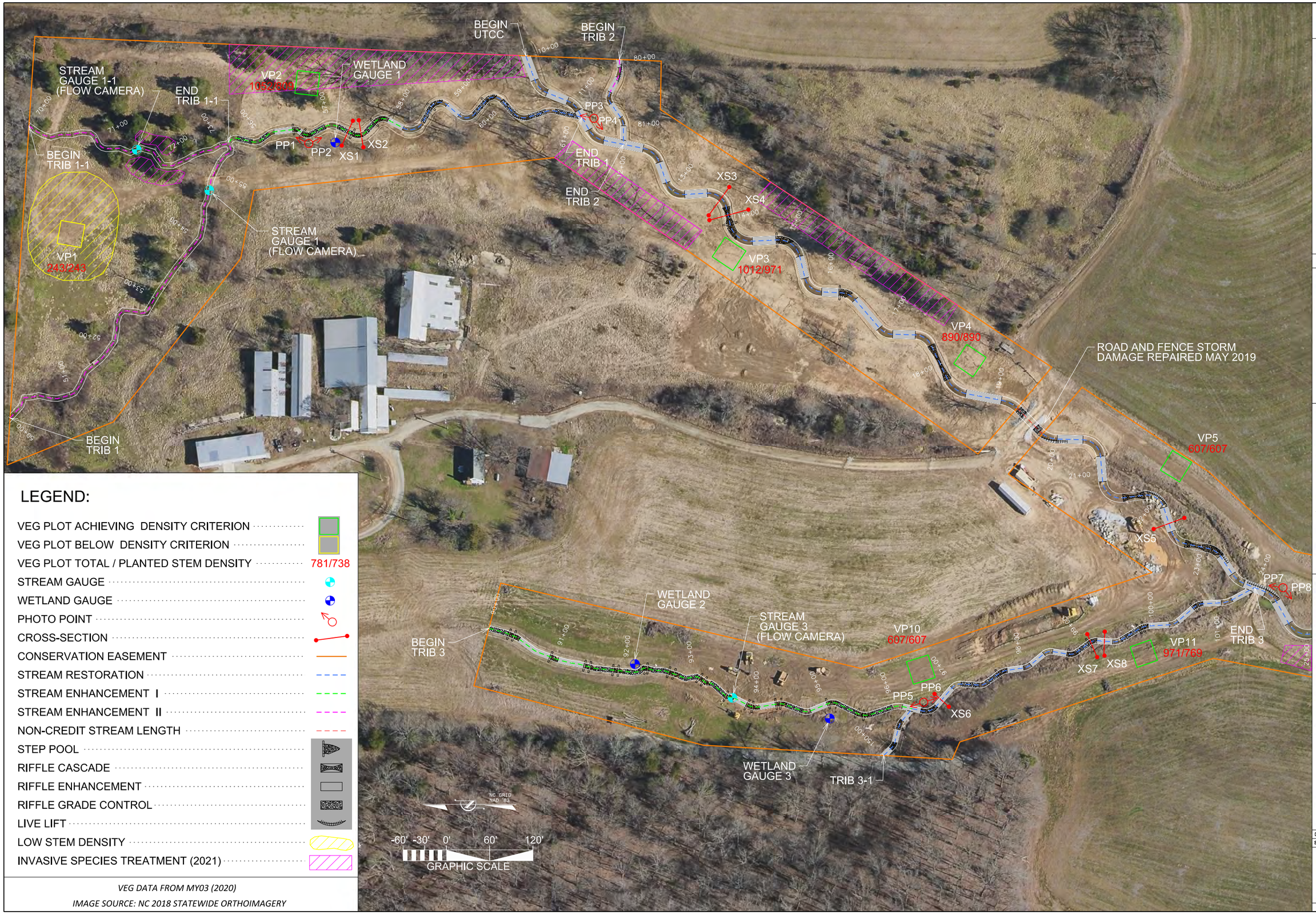
Table 4. Project Information **Cedar Branch Restoration Site, DMS Project #97009**						
Project Name	Cedar Branch Restoration Site					
County	Randolph County					
Project Area (acres)	21.3 acres					
Project Coordinates (lat. and long.)	35.823878° N, -79.90855° W					
Project Watershed Summary Information						
Physiographic Province	Piedmont					
River Basin	Yadkin					
USGS Hydrologic Unit 8-digit	03040103		**USGS Hydrologic Unit 14-digit**		03040103050040	
DWQ Sub-basin	13-2-3					
Project Drainage Area (acres)	294 acres					
Project Drainage Area Percentage of Impervious Area	4%					
CGIA Land Use Classification	Managed Herbaceous Cover 59% (173 ac), Mixed Hardwoods/Conifers 34% (100 ac), Low Density Developed 5% (15 ac), Transportation 2% (6 ac)					
Existing Reach Summary Information						
Parameters	**UTCC**	**T1, T1-1**	**T2**	**T3, T3-1**	**T4**	**T5**
Length of reach (linear feet)	3,038	1,349	124	1,209	627	61
Drainage area (acres)	88 acres	30 acres	18 acres	28 acres	30 acres	31 acres
NCDWQ Water Quality Classification	C	C	C	C	C	C
Rosgen Classification	G4c-E4	G4	G4	E4	G4	C4b
Evolutionary trend	Channelized, Stage III	Channelized, Stage III	Channelized, Stage III	Channelized, Stage III	Channelized, Stage III	Stable
Mapped Soil Series	Mecklenburg Clay Loam	Wynott-Enon Complex	Mecklenburg Clay Loam	Mecklenburg Clay Loam	Mecklenburg Clay Loam	Mecklenburg Clay Loam
Drainage class	Well drained	Well drained	Well drained	Well drained	Well drained	Well drained
Soil Hydric status	Hydric	Hydric	Hydric	Hydric	Hydric	Hydric
Slope	1.5%	3.1%	3.1%	3.7%	3.1%	2.7%
FEMA classification	Zone X	Zone X	Zone X	Zone X	Zone X	Zone X
Existing vegetation community	Pasture, Headwater Forest	Pasture, Headwater Forest	Headwater Forest	Pasture	Pasture	Headwater Forest

Existing Wetland Summary Information		
Parameters		
Size of Wetland (acres)	0.02 (WA)	0.03 (WB and WC)
Wetland Type	Bottomland Hardwood Forest	Bottomland Hardwood Forest
Mapped Soil Series	Wynott-Enon Complex	Mecklenburg clay loam
Drainage class	Well Drained	Well Drained
Soil Hydric Status	Hydric	Hydric
Source of Hydrology	Stream Floodplain	Hillside Seepage and Stream Floodplain
Hydrologic Impairment	Ditching and Grazing	Ditching and Grazing
Existing vegetation community	Forested Wetland (Headwater Forest)	Emergent Wetland (Non-Tidal Freshwater Marsh)

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

APPENDIX B

Visual Assessment Data



LEGEND:

- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 781/738
- STREAM GAUGE
- WETLAND GAUGE
- PHOTO POINT
- CROSS-SECTION
- CONSERVATION EASEMENT
- STREAM RESTORATION
- STREAM ENHANCEMENT I
- STREAM ENHANCEMENT II
- NON-CREDIT STREAM LENGTH
- STEP POOL
- RIFFLE CASCADE
- RIFFLE ENHANCEMENT
- RIFFLE GRADE CONTROL
- LIVE LIFT
- LOW STEM DENSITY
- INVASIVE SPECIES TREATMENT (2021)

VEG DATA FROM MY03 (2020)

IMAGE SOURCE: NC 2018 STATEWIDE ORTHOIMAGERY

REVISIONS

NCDEQ – DIVISION OF MITIGATION SERVICES

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RALEIGH, NORTH CAROLINA 27609

CEDAR BRANCH STREAM RESTORATION SITE MONITORING YEAR 4

RANDOLPH COUNTY, NORTH CAROLINA

DATE: NOV 2021

SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

LEGEND:

- VEG PLOT ACHIEVING DENSITY CRITERION
- VEG PLOT BELOW DENSITY CRITERION
- VEG PLOT TOTAL / PLANTED STEM DENSITY — 781/738
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- RIFFLE GRADE CONTROL
- LIVE LIFT
- LOW STEM DENSITY
- INVASIVE SPECIES TREATMENT (2021)

VEG DATA FROM MY03 (2020)

IMAGE SOURCE: NC 2018 STATEWIDE ORTHOIMAGERY

NC GRID
NAD '83

-60' -30' 0' 60' 120'

GRAPHIC SCALE

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NCDEQ – DIVISION OF MITIGATION SERVICES

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RALEIGH, NORTH CAROLINA 27609

CEDAR BRANCH
STREAM RESTORATION SITE
MONITORING YEAR 4

RANDOLPH COUNTY, NORTH CAROLINA

DATE: NOV 2021

SCALE: GRAPHIC

CURRENT CONDITION PLAN VIEW

Table 5 **Visual Stream Morphology Stability Assessment** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project#97009

Reach ID **UTCC**

Assessed Length **3,559**

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	48	48			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	47	47			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	47	47			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	48	48			100%
		2. Thalweg centering at downstream of meander (Glide)	47	47			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.	36	36			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	36	36			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	36	36			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)	36	36			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	36	36			100%

Table 5 **Visual Stream Morphology Stability Assessment** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project#97009

Reach ID **T1**

Assessed Length **1,117**

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	14	14			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	14	14			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	14	14			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	14	14			100%
		2. Thalweg centering at downstream of meander (Glide)	14	14			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** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project#97009

Reach ID **T2**

Assessed Length **127**

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)	4	4			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.	0	0			N/A
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	0	0			N/A
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	0	0			N/A
	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			N/A
	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			N/A

Table 5 **Visual Stream Morphology Stability Assessment** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project#97009

Reach ID **T3**

Assessed Length **1,157**

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	27	27			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	37	37			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	37	37			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	27	27			100%
		2. Thalweg centering at downstream of meander (Glide)	37	37			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.	28	28			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	28	28			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	28	28			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)	28	28			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	28	28			100%

Table 5 **Visual Stream Morphology Stability Assessment** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project#97009

Reach ID **T4**

Assessed Length **692**

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	19	19			100%
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth ≥ 1.6)	22	22			100%
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	22	22			100%
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	19	19			100%
		2. Thalweg centering at downstream of meander (Glide)	22	22			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.	13	13			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	13	13			100%
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	13	13			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)	13	13			100%
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	13	13			100%

Table 6 **Vegetation Condition Assessment** Date of field visual assessment: 11/17/2021

Cedar Branch Stream Restoration Site, DMS Project# 97009

Planted Acreage **20.6**

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	1	0.36	1.7%
			Total	1	0.36	1.7%
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	1	0.36	1.7%
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 – MY-00 – 4/18/18

PP1 – MY-04 – 9/27/21

PP2 – MY-00 – 4/18/18

PP2 – MY-04 – 9/27/21

PP3– MY-00 – 4/18/18

PP3 – MY-04 – 9/27/21

PP4 – MY-00 – 4/18/18

PP4 – MY-04 – 9/27/21

PP5 – MY-00 – 4/18/18

PP5 – MY-04 – 9/27/21

PP6– MY-00 – 4/18/18

PP6– MY-04 – 9/27/21

PP7 – MY-00 – 4/18/18

PP7 – MY-04 – 9/27/21

PP8 – MY-00 – 4/18/18

PP8 – MY-04 – 9/27/21

PP9– MY-00 – 4/18/18

PP9– MY-04 – 9/27/21

PP10 – MY-00 – 4/18/18

PP10 – MY-04 – 9/27/21

PP11 – MY-00 – 4/18/18

PP11 – MY-04 – 9/27/21

PP12– MY-00 – 4/18/18

PP12– MY-04 – 9/27/21

APPENDIX C

Vegetation Plot Data

Table 7. Stem Count by Plot and Species
Cedar Branch Restoration Site, DMS Project #97009

	Annual Means							
	MY03 (2020)		MY02 (2019)		MY01 (2018)		MY00 (2018)	
Species	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**	**Planted**	**Total**
American Elm (*Ulmus americana*)		1		1				
Baccharis (*Baccharis hamifolia*)		1						
Black Walnut (*Juglans nigra*)		1		1				
Black Willow (*Salix nigra*)		3		3		1		
Eastern Sycamore (*Platanus occidentalis*)	46	48	46	48	46	46		
Green Ash (*Fraxinus pennsylvanica*)	37	37	37	37	36	38		
Oak (*Quercus sp.*)							30	30
Persimmon (*Diospyros virginiana)*	12	13	12	13	8	8		
Pin Oak (*Quercus palustris*)	5	5	5	5	5	5		
River Birch (Betula nigra)	16	16	16	16	16	16	6	6
Silver Willow (*Salix sericea*)		1		1		1		
Smooth Sumac (*Rhus glabra*)						1		
Swamp Chestnut Oak (*Quercus michauxii*)	52	52	52	52	68	68		
Sweet Gum (*Liquidambar styraciflua*)		2						
Tulip Poplar (*Liriodendron tulipifera*)	19	21	19	21	31	31	13	13
White Oak (*Quercus alba*)	20	20	20	20				
Willow Oak (*Quercus phellos*)	30	30	30	30	31	31	1	1
Unknown							280	280
Stem count	237	251	237	248	241	246	330	330
size (ares)	13		13		13		13	
size (ACRES)	0.32		0.32		0.32		0.32	
Species count	9	15	9	13	8	11	5	5
Stems per ACRE	738	781	738	772	750	766	1027	1027

APPENDIX D

Stream Measurement and Geomorphology Data

Table 8. UTCC Baseline Stream Data Summary
Cedar Branch Restoration Site, DMS Project #97009

Parameter	Pre-Existing Condition					Reference Reach(es) Data					Design			As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	UTCC-1	UTCC-2	UTCC-3	Min	Mean	Max	n
Bankfull Width (ft)	7.8	10.5	10.1	13.9	4	9.0	13.3	13.1	17.7	6	11.7	13.2	15.0	11.7	13.4	15.2	5
Floodprone Width (ft)	9.6	31.7	33.5	50.0	4	13.1	55.6	50.0	100.0	6	90	100	105	>40	>40	>50	5
Bankfull Mean Depth (ft)	1.2	1.4	1.4	1.7	4	0.9	1.2	1.2	1.5	6	1.0	1.0	1.1	0.8	1.0	1.1	5
Bankfull Max Depth (ft)	1.7	2.2	2.2	2.8	4	1.3	1.7	1.7	2.0	6	1.5	1.5	1.7	1.4	1.6	1.8	5
Bankfull Cross-Sectional Area (ft^2)	11.3	14.6	15.1	16.9	4	10.4	16.4	14.0	24.7	6	11.3	13.2	16.9	9.6	12.8	15.8	5
Width/Depth Ratio	5.3	7.6	6.9	11.4	4	7.6	11.1	11.5	13.4	6	12.1	13.2	13.2	10.8	14.3	18.1	5
Entrenchment Ratio	1.2	2.9	2.6	5.0	4	1.3	3.8	3.9	5.9	6	>2.2	>2.2	>2.2	2.9	3.6	4.8	5
Bank Height Ratio	1.0	1.9	2.0	2.5	4	1.0	1.0	1.0	1.0	6	1.0	1.0	1.0	1.0	1.0	1.0	5
Pattern																	
Channel Beltwidth (ft)	*					45					41-54	46-58	53-74	41	54	74	47
Radius of Curvature (ft)	*					13-42					25-35	30-35	35-45	25	34	45	47
Rc:Bankfull width (ft/ft)	*					1.3-4.4					2.1-3.0	2.3-2.7	2.3-3.0	2.1	2.6	3.0	47
Meander Wavelength (ft)	*					93-136					101-150	115-155	153-180	101	142	180	47
Meander Width Ratio	*					4.5-5.0					3.5-4.6	3.5-4.4	3.5-4.9	3.5	4.1	4.9	47
Profile																	
Riffle Length (ft)														4.6	34.7	57.4	48
Riffle Slope (ft/ft)	0.021	0.032	0.03	0.048	4	0.013-0.028					0.020-0.037	0.020-0.035	0.020-0.035	0.039	0.023	0.053	48
Pool Length (ft)	*					3-25					19-42	20-49	36-61	4.3	28.5	55.0	47
Pool Spacing (ft)	*					30-59					50-83	67-91	79-105	37.3	77.5	124.0	47
Substrate and Transport Parameters																	
SC% / Sa% / G% / C% / B% /Be%	0%/23%/63%/13%/1%/0%					0.3%/19%/66%/14%/0.7%/0%								3%/6%/67%/23%/0%/0%			
d16 / d35 / d50 / d84 / d95 (mm)	1.5/5.4/16/55/90					1.7/6.4/19/56/93								10/27/37/78/113			
Channel length (ft)	3,246										1,400	512	1,650	3,562			
Drainage Area (SM)	0.45					0.13-0.49					0.22	0.28	0.41	0.41			
Rosgen Classification	G4c-E4					B4c					C4	C4	C4	C4			
Sinuosity	1.0					1.2					1.2	1.2	1.2	1.2			
Water Surface Slope (ft/ft)	0.015					0.013					0.013	0.013	0.013	0.013			

*No data shown due to channelization/lack of bed diversity

Table 8. T1 Baseline Stream Data Summary
Cedar Branch Restoration Site, DMS Project #97009

Parameter	Pre-Existing Condition					Reference Reach(es) Data (UTCC)					Design				As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Mean	Max	n	Min	Mean	Max	n
Bankfull Width (ft)	5.8					9.0	13.3	13.1	17.7	6	7.8				8.9			
Floodprone Width (ft)	9.0					13.1	55.6	50.0	100.0	6	50				>40			
Bankfull Mean Depth (ft)	0.9					0.9	1.2	1.2	1.5	6	0.6				0.5			
Bankfull Max Depth (ft)	1.2					1.3	1.7	1.7	2.0	6	1.0				1.0			
Bankfull Cross-Sectional Area (ft^2)	5.0					10.4	16.4	14.0	24.7	6	5.0				4.6			
Width/Depth Ratio	6.7					7.6	11.1	11.5	13.4	6	12.1				17.0			
Entrenchment Ratio	1.5					1.3	3.8	3.9	5.9	6	>2.2				4.2			
Bank Height Ratio	2.3					1.0	1.0	1.0	1.0	6	1.0				1.0			
Pattern																		
Channel Beltwidth (ft)	*					45					29-36				29	33	36	14
Radius of Curvature (ft)	*					13-42					15-25				15	20	25	14
Rc:Bankfull width (ft/ft)	*					1.3-4.4					1.9-3.2				1.9	2.6	3.2	14
Meander Wavelength (ft)	*					93-136					72-80				72	76	80	14
Meander Width Ratio	*					4.5-5.0					3.7-4.6				3.7	4.2	4.6	14
Profile																		
Riffle Length (ft)															3.6	20.9	32.9	14
Riffle Slope (ft/ft)	0.018					0.013-0.028					0.025-0.040				0.019	0.042	0.076	14
Pool Length (ft)	*					3-25					8-25				5.1	11.8	20.1	14
Pool Spacing (ft)	*					30-59					42-51				17.1	40.1	58.5	14
Substrate and Transport Parameters																		
SC% / Sa% / G% / C% / B% /Be%	0%/15%/75%/10%/0%/0%					0.3%/19%/66%/14%/0.7%/0%									1%/14%/79%/6%/0%/0%			
d16 / d35 / d50 / d84 / d95 (mm)	2.1/5/12/50/98					1.7/6.4/19/56/93									2.7/15/24/47/77			
Channel length (ft)	1,036										1,118				1,118			
Drainage Area (SM)	0.05					0.13-0.49					0.05				0.05			
Rosgen Classification	G4					B4c					C4b				C4b			
Sinuosity	1.0					1.2					1.3				1.3			
Water Surface Slope (ft/ft)	0.031					0.013					0.025				0.025			

*No data shown due to channelization/lack of bed diversity

Table 8. T2 Baseline Stream Data Summary
Cedar Branch Restoration Site, DMS Project #97009

Parameter	Pre-Existing Condition					Reference Reach(es) Data (UTCC)					Design				As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Mean	Max	n	Min	Mean	Max	n
Bankfull Width (ft)	**					9.0	13.3	13.1	17.7	6	7.8				**			
Floodprone Width (ft)	**					13.1	55.6	50.0	100.0	6	30				**			
Bankfull Mean Depth (ft)	**					0.9	1.2	1.2	1.5	6	0.6				**			
Bankfull Max Depth (ft)	**					1.3	1.7	1.7	2.0	6	1.0				**			
Bankfull Cross-Sectional Area (ft^2)	**					10.4	16.4	14.0	24.7	6	5.0				**			
Width/Depth Ratio	**					7.6	11.1	11.5	13.4	6	12.1				**			
Entrenchment Ratio	**					1.3	3.8	3.9	5.9	6	>2.2				**			
Bank Height Ratio	**					1.0	1.0	1.0	1.0	6	1.0				**			
Pattern																		
Channel Beltwidth (ft)	*					45					N/A				**			
Radius of Curvature (ft)	*					13-42					15-25				**			
Rc:Bankfull width (ft/ft)	*					1.3-4.4					1.9-3.2				**			
Meander Wavelength (ft)	*					93-136					N/A				**			
Meander Width Ratio	*					4.5-5.0					N/A				**			
Profile																		
Riffle Length (ft)	**														9.4	20.0	24.9	4
Riffle Slope (ft/ft)	**					0.013-0.028					0.026-0.027				0.023	0.025	0.027	4
Pool Length (ft)	**					3-25					12-17				6.4	8.1	9.0	3
Pool Spacing (ft)	**					30-59					38				36.4	37.8	39.1	3
Substrate and Transport Parameters																		
SC% / Sa% / G% / C% / B% /Be%	**					0.3%/19%/66%/14%/0.7%/0%									**			
d16 / d35 / d50 / d84 / d95 (mm)	**					1.7/6.4/19/56/93									**			
Channel length (ft)	123										127				127			
Drainage Area (SM)	0.03					0.13-0.49					0.03				0.03			
Rosgen Classification	G4					B4c					C4				C4			
Sinuosity	1.0					1.2					N/A				N/A			
Water Surface Slope (ft/ft)	0.031					0.013					0.017				0.016			

*No data shown due to channelization/lack of bed diversity

Table 8. T3 Baseline Stream Data Summary
Cedar Branch Restoration Site, DMS Project #97009

Parameter	Pre-Existing Condition					Reference Reach(es) Data (UTCC)					Design				As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Mean	Max	n	Min	Mean	Max	n
Bankfull Width (ft)	4.7	5.4		6.0	2	9.0	13.3	13.1	17.7	6	7.8				5.9	5.9	6.0	2
Floodprone Width (ft)	11.3	13.5		15.7	2	13.1	55.6	50.0	100.0	6	30				>25	>25	>25	2
Bankfull Mean Depth (ft)	0.8	0.8		0.8	2	0.9	1.2	1.2	1.5	6	0.6				0.4	0.5	0.5	2
Bankfull Max Depth (ft)	1.3	1.3		1.3	2	1.3	1.7	1.7	2.0	6	1.0				0.7	0.8	0.8	2
Bankfull Cross-Sectional Area (ft^2)	3.9	4.5		5.0	2	10.4	16.4	14.0	24.7	6	5.0				2.5	2.8	3.1	2
Width/Depth Ratio	5.6	6.4		7.1	2	7.6	11.1	11.5	13.4	6	12.1				11.4	12.6	13.8	2
Entrenchment Ratio	1.3	2.4		3.4	2	1.3	3.8	3.9	5.9	6	>2.2				4.4	4.7	5.1	2
Bank Height Ratio	1.6	2.1		2.6	2	1.0	1.0	1.0	1.0	6	1.0				1.0	1.0	1.0	2
Pattern																		
Channel Beltwidth (ft)	*					45					N/A							
Radius of Curvature (ft)	*					13-42					15-25							
Rc:Bankfull width (ft/ft)	*					1.3-4.4					1.9-3.2							
Meander Wavelength (ft)	*					93-136					N/A							
Meander Width Ratio	*					4.5-5.0					N/A							
Profile																		
Riffle Length (ft)															19.7	28.1	68.8	26
Riffle Slope (ft/ft)	0.046	0.067		0.087	2	0.013-0.028					0.025-0.042				0.021	0.034	0.063	26
Pool Length (ft)	*					3-25					11-22				3.6	7.3	11.3	35
Pool Spacing (ft)	*					30-59					32-55				6.8	30.5	85.9	35
Substrate and Transport Parameters																		
SC% / Sa% / G% / C% / B% /Be%	0%/31%/63%/6%/0%/0%					0.3%/19%/66%/14%/0.7%/0%									6%/0%/75%/19%/0%/0%			
d16 / d35 / d50 / d84 / d95 (mm)	1.0/2.4/6.5/33/73					1.7/6.4/19/56/93									18/32/41/71/105			
Channel length (ft)	1,141										1,157				1,157			
Drainage Area (SM)	0.04					0.13-0.49					0.04				0.04			
Rosgen Classification	E4					B4c					C4b				C4b			
Sinuosity	1.0					1.2					N/A				N/A			
Water Surface Slope (ft/ft)	0.037					0.013					0.035				0.035			

*No data shown due to channelization/lack of bed diversity

Table 8. T4 Baseline Stream Data Summary
Cedar Branch Restoration Site, DMS Project #97009

Parameter	Pre-Existing Condition					Reference Reach(es) Data (UTCC)					Design				As-built			
Dimension - Riffle	Min	Mean	Med	Max	n	Min	Mean	Med	Max	n	Min	Mean	Max	n	Min	Mean	Max	n
Bankfull Width (ft)	6.5					9.0	13.3	13.1	17.7	6	7.8				6.7	6.8	6.9	2
Floodprone Width (ft)	7.8					13.1	55.6	50.0	100.0	6	30				>30	>30	>30	2
Bankfull Mean Depth (ft)	0.8					0.9	1.2	1.2	1.5	6	0.6				0.5	0.5	0.5	2
Bankfull Max Depth (ft)	1.0					1.3	1.7	1.7	2.0	6	1.0				0.8	0.8	0.8	2
Bankfull Cross-Sectional Area (ft^2)	5.0					10.4	16.4	14.0	24.7	6	5.0				3.3	3.4	3.5	2
Width/Depth Ratio	8.5					7.6	11.1	11.5	13.4	6	12.1				12.7	13.6	14.6	2
Entrenchment Ratio	1.2					1.3	3.8	3.9	5.9	6	>2.2				4.7	4.9	5.1	2
Bank Height Ratio	4.5					1.0	1.0	1.0	1.0	6	1.0				1.0	1.0	1.0	2
Pattern																		
Channel Beltwidth (ft)	*					45					N/A							
Radius of Curvature (ft)	*					13-42					15-25							
Rc:Bankfull width (ft/ft)	*					1.3-4.4					1.9-3.2							
Meander Wavelength (ft)	*					93-136					N/A							
Meander Width Ratio	*					4.5-5.0					N/A							
Profile																		
Riffle Length (ft)															5.5	21.5	42.1	19
Riffle Slope (ft/ft)	0.038					0.013-0.028					0.030-0.040				0.017	0.040	0.121	19
Pool Length (ft)	*					3-25					13-19				4.0	8.5	12.7	21
Pool Spacing (ft)	*					30-59					34-48				5.5	32.3	55.1	21
Substrate and Transport Parameters																		
SC% / Sa% / G% / C% / B% /Be%	0%/23%/72%/5%/0%/0%					0.3%/19%/66%/14%/0.7%/0%									3%/0%/73%/24%/0%/0%			
d16 / d35 / d50 / d84 / d95 (mm)	1.6/4.0/6.4/35/67					1.7/6.4/19/56/93									28/37/44/78/115			
Channel length (ft)	677										692				692			
Drainage Area (SM)	0.05					0.13-0.49					0.05				0.05			
Rosgen Classification	G4					B4c					C4b				C4b			
Sinuosity	1.0					1.2					N/A				N/A			
Water Surface Slope (ft/ft)	0.031					0.013					0.028				0.028			

*No data shown due to channelization/lack of bed diversity

Table 9. Cross-Section Morphology Data Tables
Cedar Branch Stream Restoration Site, DMS Project #97009

Dimension and Substrate	Cross-Section 1 (Riffle) Station 57+19, T1							Cross-Section 2 (Pool) Station 57+44, T1							Cross-Section 3 (Pool) Station 13+58, UTCC						
Baseline Bankfull Elevation:	666.60							665.93							657.32						
	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+
Bankfull Width (ft)	8.9	8.3	8.6	9.8				11.8	13.5	12.9	13.4				13.5	13.6	13.8	15.0			
Floodprone Width (ft)	>40	>40	>40	>40				-	-	-	-				-	-	-	-			
Bankfull Mean Depth (ft)	0.5	0.6	0.5	0.5				1.1	1.0	1.0	0.9				1.5	1.5	1.5	1.3			
Bankfull Max Depth (ft)	1.0	1.0	1.0	1.1				2.1	2.0	2.0	2.1				2.8	2.8	2.9	2.8			
Bankfull Cross-Sectional Area (ft^2)	4.6	4.6	4.6	4.6				13.4	13.4	13.4	13.4				20.2	20.2	20.2	20.2			
Total Cross-Sectional Area (ft^2)	4.6	4.3	4.4	3.9				13.4	11.8	12.2	9.8				20.2	20.0	20.2	20.1			
Bankfull Width/Depth Ratio	17.0	14.8	15.9	20.7				-	-	-	-				-	-	-	-			
Bankfull Entrenchment Ratio	4.2	4.6	4.0	3.8				-	-	-	-				-	-	-	-			
Bankfull Bank Height Ratio	1.0	0.9	1.0	1.0				-	-	-	-				-	-	-	-			
d50 (mm)	24	18	2.5	41				-	-	-	-				-	-	-	-			
	Cross-Section 4 (Riffle) Station 13+85, UTCC							Cross-Section 5 (Riffle) Station 22+44, UTCC							Cross-Section 6 (Riffle) Station 96+69, T3						
Baseline Bankfull Elevation:	666.93							656.55							656.12						
	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+
Bankfull Width (ft)	12.1	12.5	12.7	12.0				14.5	14.3	14.1	14.8				6.0	6.5	5.8	6.7			
Floodprone Width (ft)	>50	>50	>50	>50				>45	>45	>45	>45				>30	>30	>30	>30			
Bankfull Mean Depth (ft)	1.0	1.0	1.0	1.1				1.1	1.1	1.1	1.1				0.5	0.5	0.5	0.5			
Bankfull Max Depth (ft)	1.7	1.7	1.8	1.7				1.7	1.9	1.9	1.8				0.8	1.0	1.0	1.0			
Bankfull Cross-Sectional Area (ft^2)	12.6	12.6	12.6	12.6				15.8	15.8	15.8	15.8				3.1	3.1	3.1	3.1			
Total Cross-Sectional Area (ft^2)	12.6	13.8	12.6	13.3				15.8	15.7	16.6	14.6				3.1	3.2	3.0	3.2			
Bankfull Width/Depth Ratio	11.6	12.3	12.7	11.4				13.3	13.0	12.6	13.9				11.7	13.7	10.8	14.4			
Bankfull Entrenchment Ratio	4.6	4.5	4.1	4.7				3.1	3.2	3.2	3.1				4.4	4.1	4.6	3.9			
Bankfull Bank Height Ratio	1.0	1.0	0.9	0.9				1.0	1.0	1.0	1.0				1.0	0.9	0.9	0.9			
d50 (mm)	33	49	40	18				31	40	69	26				41	41	54	15			

Bank Height Ratios are calculated based on the baseline (MY0) cross-sectional area as described in the Standard Measurement of the BHR Monitoring Parameter document provided by the NCIRT and NCDMS (9/2018). The remainder of the cross-section parameters are calculated based on the current year's low bank height.

Table 9. Cross-Section Morphology Data Tables
Cedar Branch Stream Restoration Site, DMS Project #97009

Dimension and Substrate	Cross-Section 7 (Pool) Station 99+07, T3							Cross-Section 8 (Riffle) Station 99+25, T3							Cross-Section 9 (Riffle) Station 26+17, UTCC						
Baseline Bankfull Elevation:	666.60							665.93							657.32						
	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+
Bankfull Width (ft)	10.3	8.9	8.5	9.1				6.0	5.6	6.1	5.4				13.2	13.0	13.8	13.6			
Floodprone Width (ft)	-	-	-	-				>30	>30	>30	>30				>40	>40	>40	>40			
Bankfull Mean Depth (ft)	0.7	0.8	0.8	0.8				0.4	0.4	0.4	0.5				1.0	1.0	0.9	1.0			
Bankfull Max Depth (ft)	1.8	1.6	1.7	1.7				0.7	0.9	0.9	0.8				1.8	1.8	2.0	1.9			
Bankfull Cross-Sectional Area (ft^2)	6.9	6.9	6.9	6.9				2.5	2.5	2.5	2.5				13.0	13.0	13.0	13.0			
Total Cross-Sectional Area (ft^2)	6.9	8.7	7.2	7.6				2.5	2.7	2.7	2.3				13.0	12.0	12.7	12.1			
Bankfull Width/Depth Ratio	-	-	-	-				14.1	12.6	14.8	11.5				13.3	12.9	14.7	14.3			
Bankfull Entrenchment Ratio	-	-	-	-				5.0	5.4	4.9	5.7				3.4	3.5	3.2	3.3			
Bankfull Bank Height Ratio	-	-	-	-				1.0	1.1	1.0	1.0				1.0	0.9	1.0	0.9			
d50 (mm)	-	-	-	-				40	18	29	10				57	50	48	34			
	Cross-Section 10 (Riffle) Station 252+25, T4							Cross-Section 11 (Pool) Station 225+97, T4							Cross-Section 12 (Riffle) Station 226+04, T4						
Baseline Bankfull Elevation:	666.93							656.55							656.12						
	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+
Bankfull Width (ft)	7.0	8.7	7.2	7.9				10.2	9.6	10.0	9.9				6.7	6.9	7.0	7.3			
Floodprone Width (ft)	>30	>30	>30	>35				-	-	-	-				>30	>30	>30	>30			
Bankfull Mean Depth (ft)	0.5	0.4	0.5	0.4				1.1	1.1	1.1	1.1				0.5	0.5	0.5	0.5			
Bankfull Max Depth (ft)	0.8	1.0	1.0	1.0				2.1	2.0	2.0	2.1				0.8	0.8	0.9	0.8			
Bankfull Cross-Sectional Area (ft^2)	3.3	3.3	3.3	3.3				10.8	10.8	10.8	10.8				3.5	3.5	3.5	3.5			
Total Cross-Sectional Area (ft^2)	3.3	3.0	2.4	2.4				10.8	11.9	11.6	11.6				3.5	3.8	3.1	2.7			
Bankfull Width/Depth Ratio	14.9	23.0	15.7	18.9				-	-	-	-				12.9	13.6	14.1	15.3			
Bankfull Entrenchment Ratio	5.1	4.1	5.0	4.5				-	-	-	-				4.7	4.6	4.5	4.3			
Bankfull Bank Height Ratio	1.0	0.9	1.0	1.0				-	-	-	-				1.0	1.0	1.0	1.0			
d50 (mm)	42	36	6	6				-	-	-	-				45	32	22	24			

Bank Height Ratios are calculated based on the baseline (MY0) cross-sectional area as described in the Standard Measurement of the BHR Monitoring Parameter document provided by the NCIRT and NCDMS (9/2018). The remainder of the cross-section parameters are calculated based on the current year's low bank height.

Table 9. Cross-Section Morphology Data Tables
Cedar Branch Stream Restoration Site, DMS Project #97009

Dimension and Substrate	Cross-Section 13 (Riffle) Station 35+12, UTCC							Cross-Section 14 (Riffle) Station 41+94, UTCC							Cross-Section 15 (Pool) Station 42+58, UTCC						
Baseline Bankfull Elevation:	645.24							637.94							637.43						
	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+	Base	MY1	MY2	MY3	MY5	MY7	MY+
Bankfull Width (ft)	12.7	13.8	13.1	12.5				15.3	13.9	13.8	14.3				22.5	20.7	21.4	20.8			
Floodprone Width (ft)	>50	>50	>50	>50				>40	>40	>40	>40				-	-	-	-			
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.8				0.8	0.9	0.9	0.9				1.6	1.7	1.7	1.7			
Bankfull Max Depth (ft)	1.4	1.4	1.5	1.5				1.7	1.7	1.7	1.7				3.4	3.3	3.2	3.2			
Bankfull Cross-Sectional Area (ft^2)	9.6	9.6	9.6	9.6				12.8	12.8	12.8	12.8				35.8	35.8	35.8	35.8			
Total Cross-Sectional Area (ft^2)	9.6	7.9	7.8	8.5				12.8	12.6	14.3	12.2				35.8	32.8	36.2	32.8			
Bankfull Width/Depth Ratio	16.7	19.8	17.8	16.3				18.3	15.1	14.8	16.0				-	-	-	-			
Bankfull Entrenchment Ratio	3.8	3.5	3.7	3.9				2.8	3.1	3.1	3.0				-	-	-	-			
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.0				1.0	1.1	1.0	1.2				-	-	-	-			
d50 (mm)	16	13	61	13				61	51	42	23				-	-	-	-			

Bank Height Ratios are calculated based on the baseline (MY0) cross-sectional area as described in the Standard Measurement of the BHR Monitoring Parameter document provided by the NCIRT and NCDMS (9/2018). The remainder of the cross-section parameters are calculated based on the current year's low bank height.

APPENDIX E

Hydrologic Data

Cedar Branch Restoration Site
30-70 Percentile Graph
WETS Station Name: Asheboro, NC

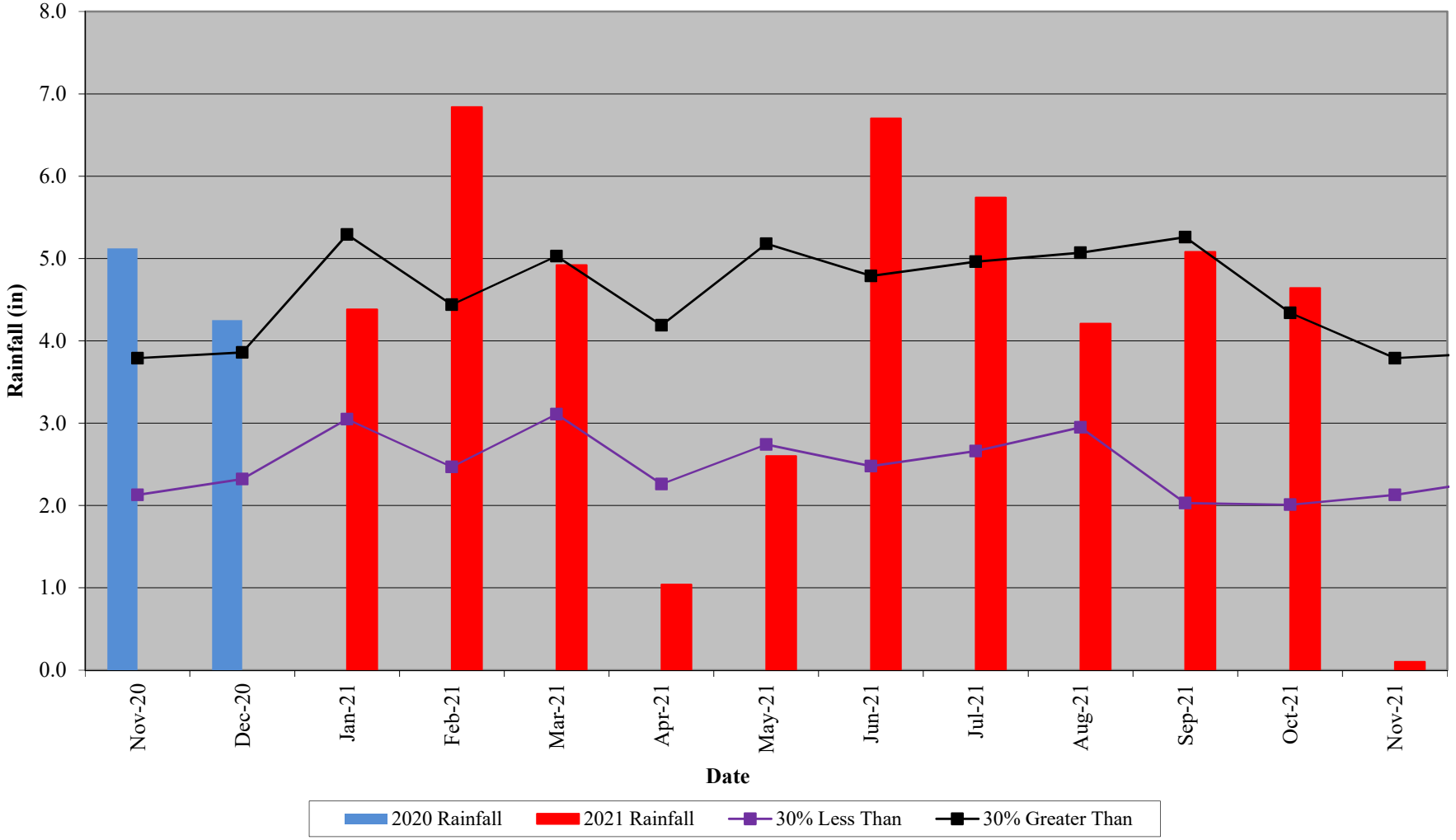


Table 10. Verification of Bankfull Events Cedar Branch Restoration Site, DMS Project #97009		
Date of Occurrence	**Method**	**Photo Number**
April 26, 2018	Onsite stream gauge	
August 3, 2018	Onsite stream gauge	
August 7, 2018	Onsite stream gauge	
August 22, 2018	Onsite stream gauge	
November 4, 2018	Photos taken on site	
January 13, 2019	Onsite stream gauge	
January 20, 2019	Onsite stream gauge	
January 24, 2019	Onsite stream gauge	
February 18, 2019	Onsite stream gauge	
February 22, 2019	Onsite stream gauge	
April 8, 2019	Onsite stream gauge	
April 12, 2019	Onsite stream gauge	
April 13, 2019	Onsite stream gauge	
June 7, 2019	Onsite stream gauge	
June 9, 2019	Onsite stream gauge	
June 13, 2019	Onsite stream gauge	
October 31, 2019	Onsite stream gauge	
November 23, 2019	Onsite stream gauge	
December 1, 2019	Onsite stream gauge	
December 13, 2019	Onsite stream gauge	
January 3, 2020	Onsite stream gauge	
January 14, 2020	Photos taken on site	
January 24, 2020	Onsite stream gauge	
February 6, 2020	Onsite stream gauge	
February 13, 2020	Onsite stream gauge	
March 25, 2020	Onsite stream gauge	
April 13, 2020	Onsite stream gauge	
April 30, 2020	Onsite stream gauge	
May, 21, 2020	Onsite stream gauge	
May 24, 2020	Onsite stream gauge	
May 27, 2020	Onsite stream gauge	
June 19, 2020	Onsite stream gauge	
September 13, 2020	Onsite stream gauge	
October 6, 2020	Onsite stream gauge	
November 7, 2020	Onsite stream gauge	
November 30, 2020	Onsite stream gauge	
December 14, 2020	Onsite stream gauge	
January 28, 2021	Onsite stream gauge	
January 31, 2021	Onsite stream gauge	
February 15, 2021	Onsite stream gauge	
March 26, 2021	Onsite stream gauge	
March 31, 2021	Onsite stream gauge	
June 10, 2021	Onsite stream gauge	
July 14, 2021	Onsite stream gauge	
September 22, 2021	Onsite stream gauge	1

Photo 1. Wrack lines above bankfull, 9/27/21

Cedar Branch Restoration Site
Hydrograph
Stream Gauge UTCC

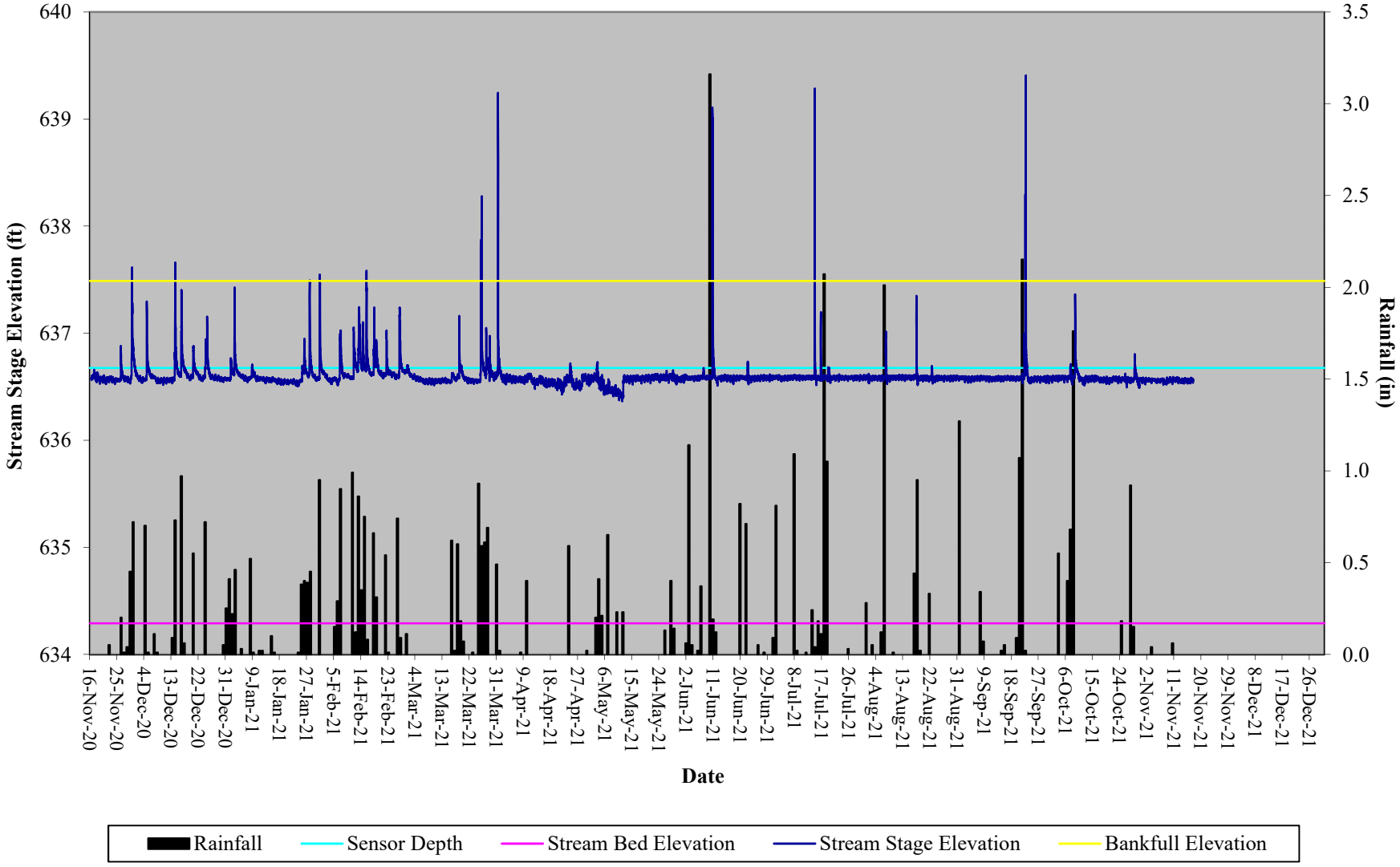
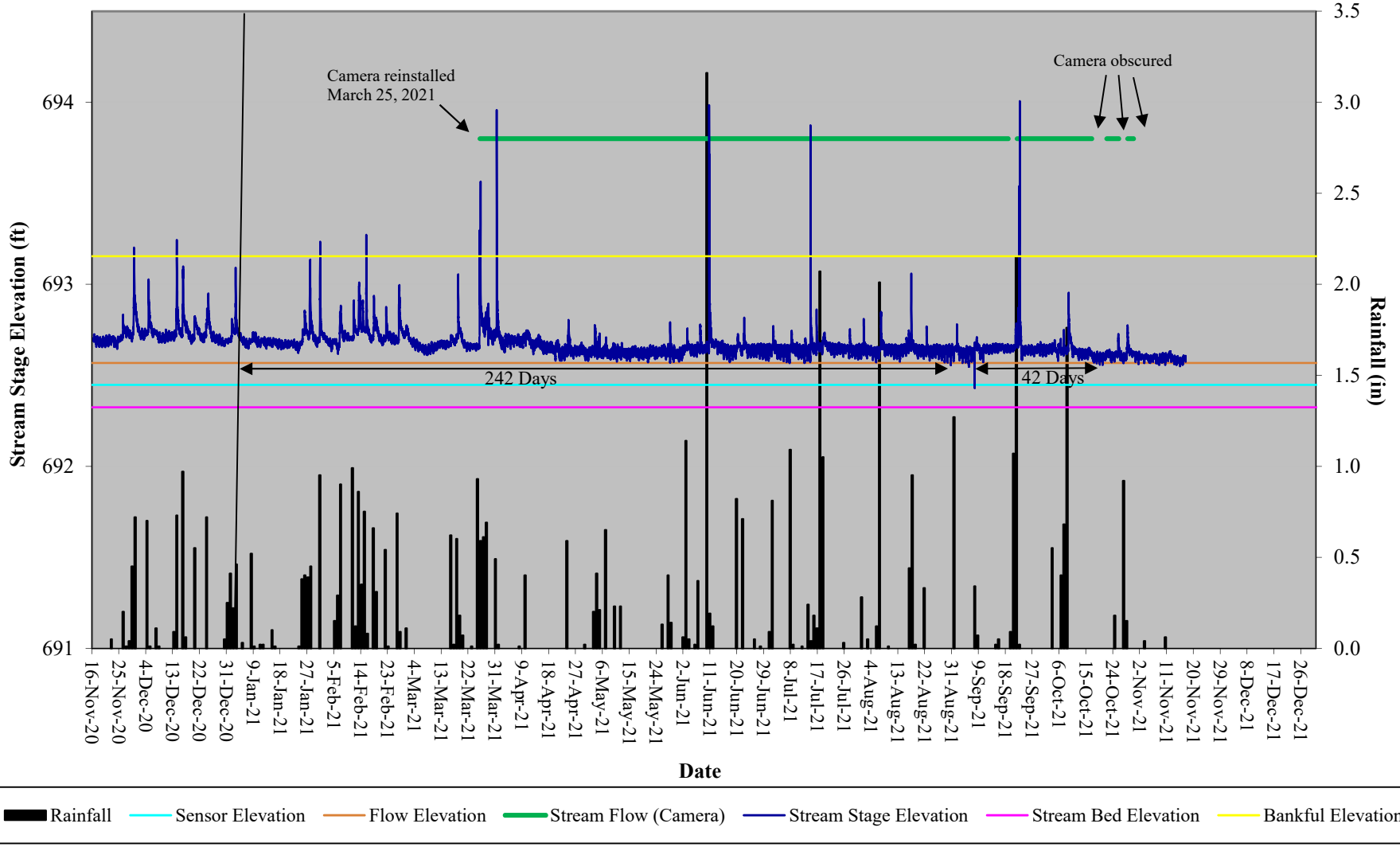


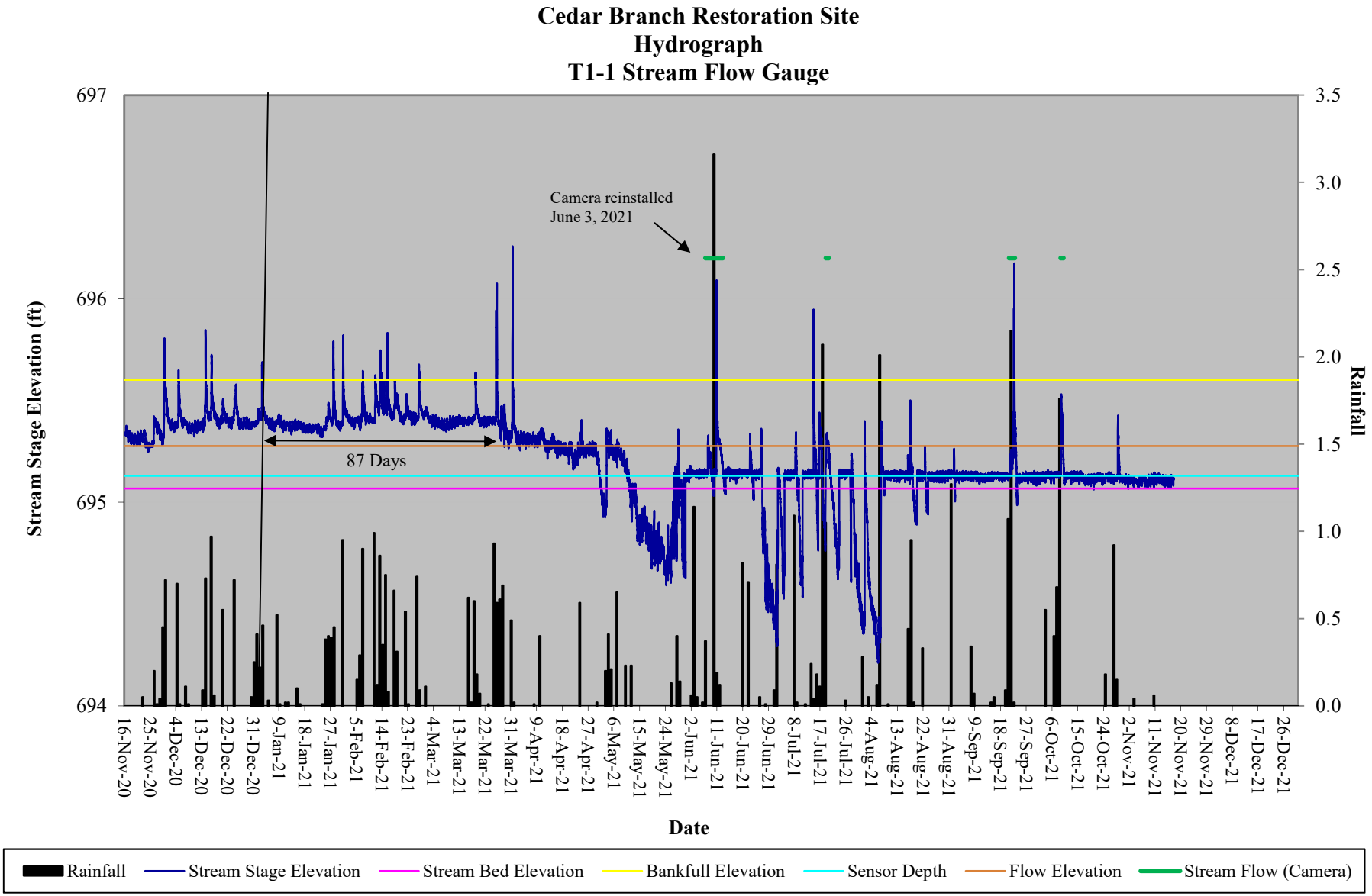
Table 11. Verification of Stream Flow Cedar Branch Restoration Site, DMS Project #97009				
	Gauge		Camera	
Reach	**Dates Achieving**	**Maximum Consecutive Days**	**Dates Achieving**	**Maximum Consecutive Days**
T1	January 1 – August 30; September 7 – October 18	242	March 26 – September 19	178
T1-1	January 1 – March 28	87	N/A	7
T3	January 1 – March 27; August 2 – September 2	86	June 3 – July 5; July 15 - September 13	61

Table 12. Stream Flow Criteria Attainment Cedar Branch Restoration Site, DMS Project #97009							
	Greater than 30 Days of Flow/Max Consecutive Days						
Reach	**MY-01 2018**	**MY-02 2019**	**MY-03 2020**	**MY-04 2021**	**MY-05 2022**	**MY-06 2023**	**MY-07 2024**
T1 (Gauge)	Yes/60	Yes/46	Yes/142	Yes/242			
T1 (Camera)	Yes/102	Yes/260	Yes/189	Yes/178			
T1-1 (Gauge)	No/16	Yes/66	Yes/65	Yes/87			
T1-1 (Camera)	No/7*	Yes/105	Yes/63	No/7*			
T3 (Gauge)	Yes/83	Yes/187	Yes/65	Yes/86			
T3 (Camera)	Yes/93	Yes/252	Yes/174	Yes/61			

*camera malfunction

Cedar Branch Restoration Site
Hydrograph
T1 Stream Flow Gauge




Cedar Branch Restoration Site
Hydrograph
T1-1 Stream Flow Gauge
Stream Stage Elevation (ft)
Rainfall
Date
Camera reinstalled
June 3, 2021
87 Days
697
696
695
694
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Nov-20
25-Nov-20
4-Dec-20
13-Dec-20
22-Dec-20
31-Dec-20
9-Jan-21
18-Jan-21
27-Jan-21
5-Feb-21
14-Feb-21
23-Feb-21
4-Mar-21
13-Mar-21
22-Mar-21
31-Mar-21
9-Apr-21
18-Apr-21
27-Apr-21
6-May-21
15-May-21
24-May-21
2-Jun-21
11-Jun-21
20-Jun-21
29-Jun-21
8-Jul-21
17-Jul-21
26-Jul-21
4-Aug-21
13-Aug-21
22-Aug-21
31-Aug-21
9-Sep-21
18-Sep-21
27-Sep-21
6-Oct-21
15-Oct-21
24-Oct-21
2-Nov-21
11-Nov-21
20-Nov-21
29-Nov-21
8-Dec-21
17-Dec-21
26-Dec-21
Rainfall
Stream Stage Elevation
Stream Bed Elevation
Bankfull Elevation
Sensor Depth
Flow Elevation
Stream Flow (Camera)

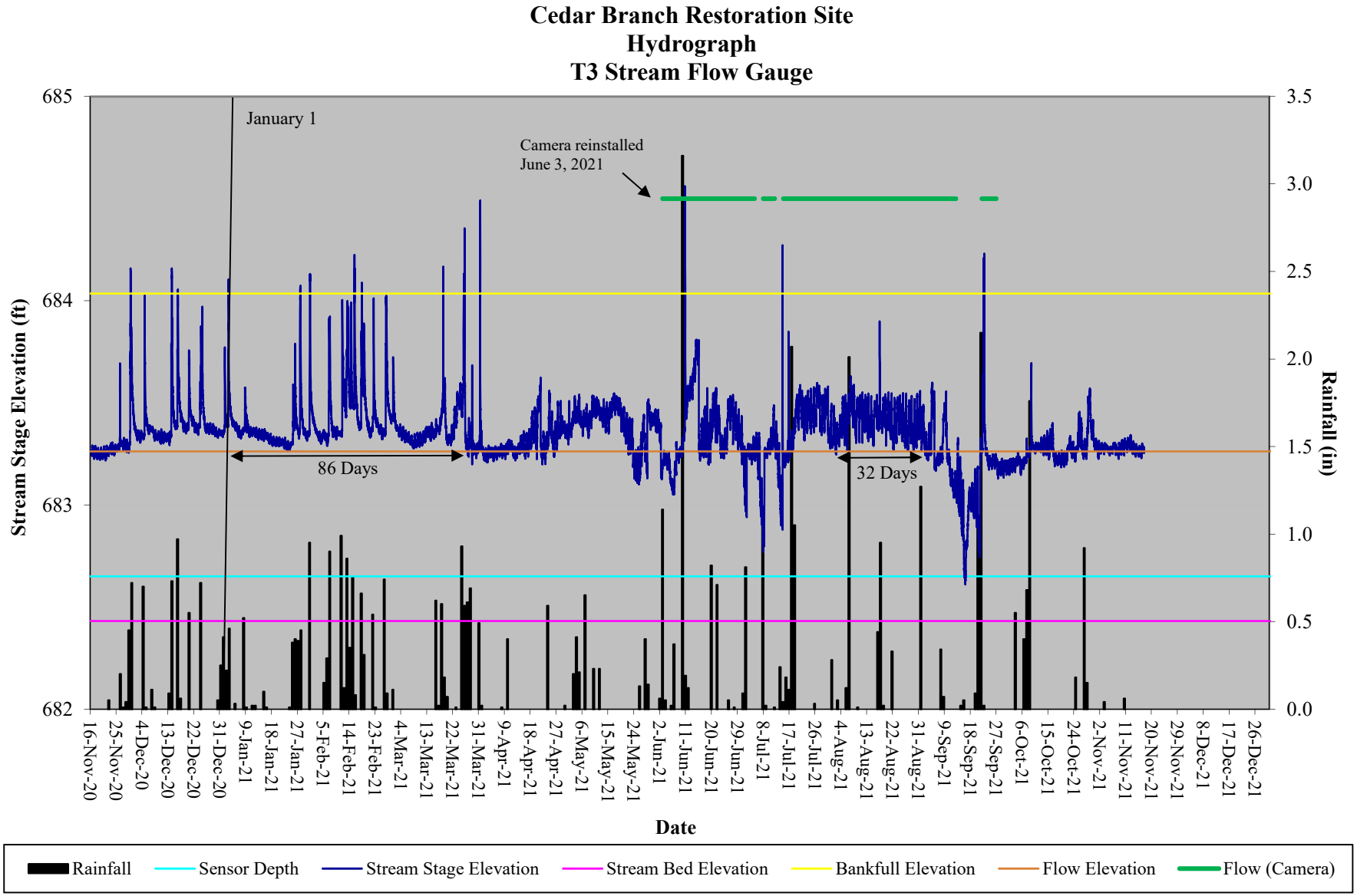
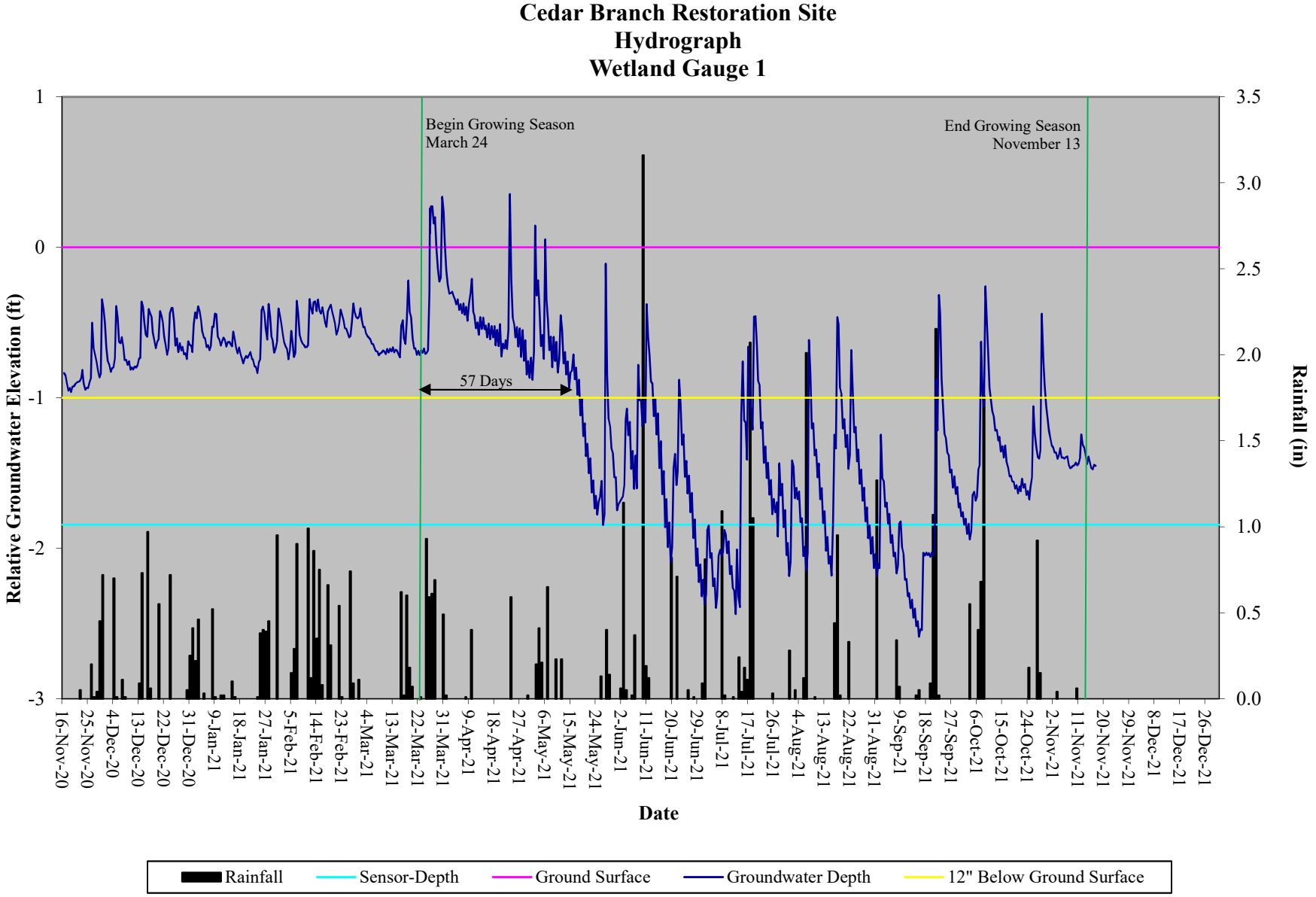
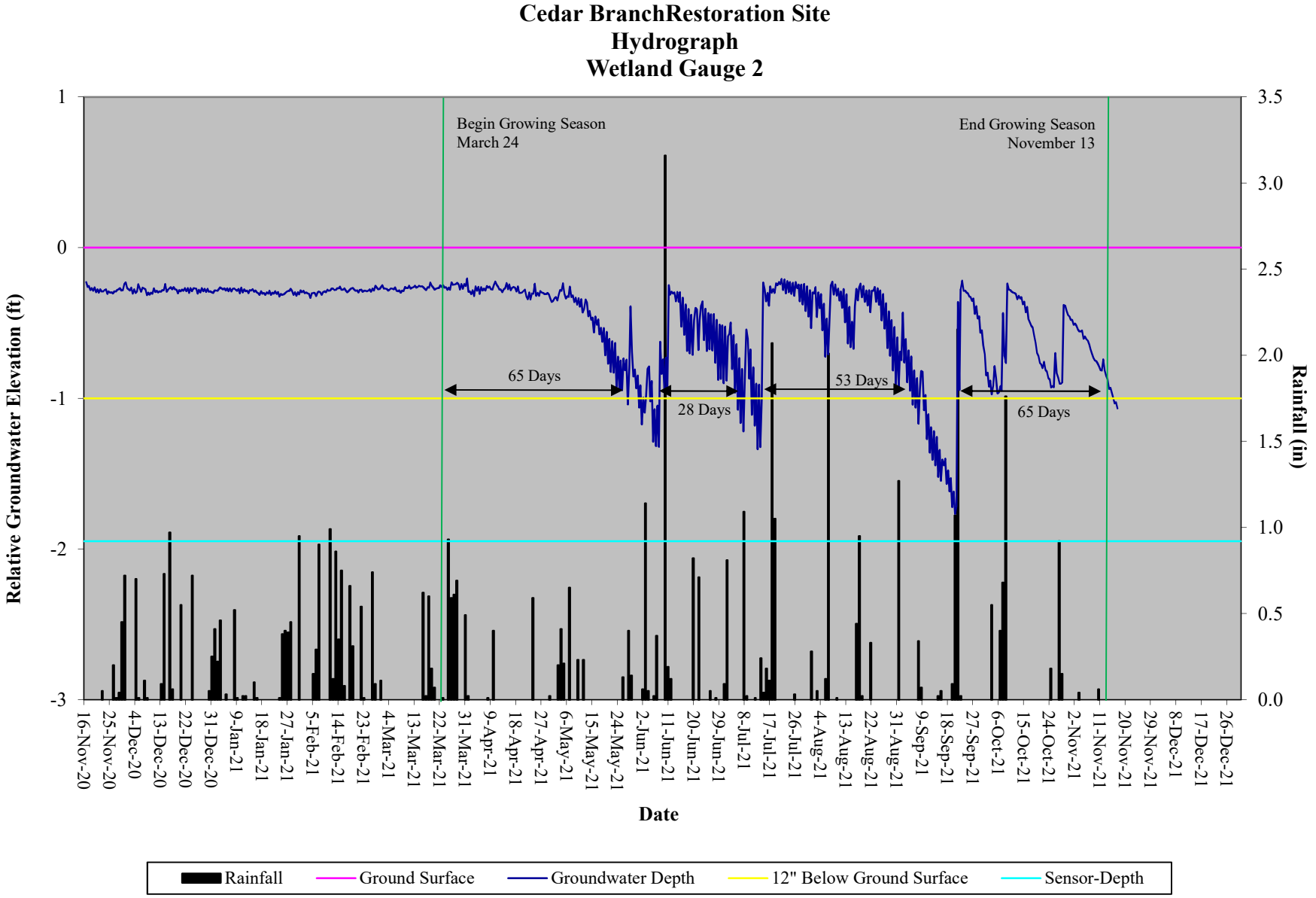
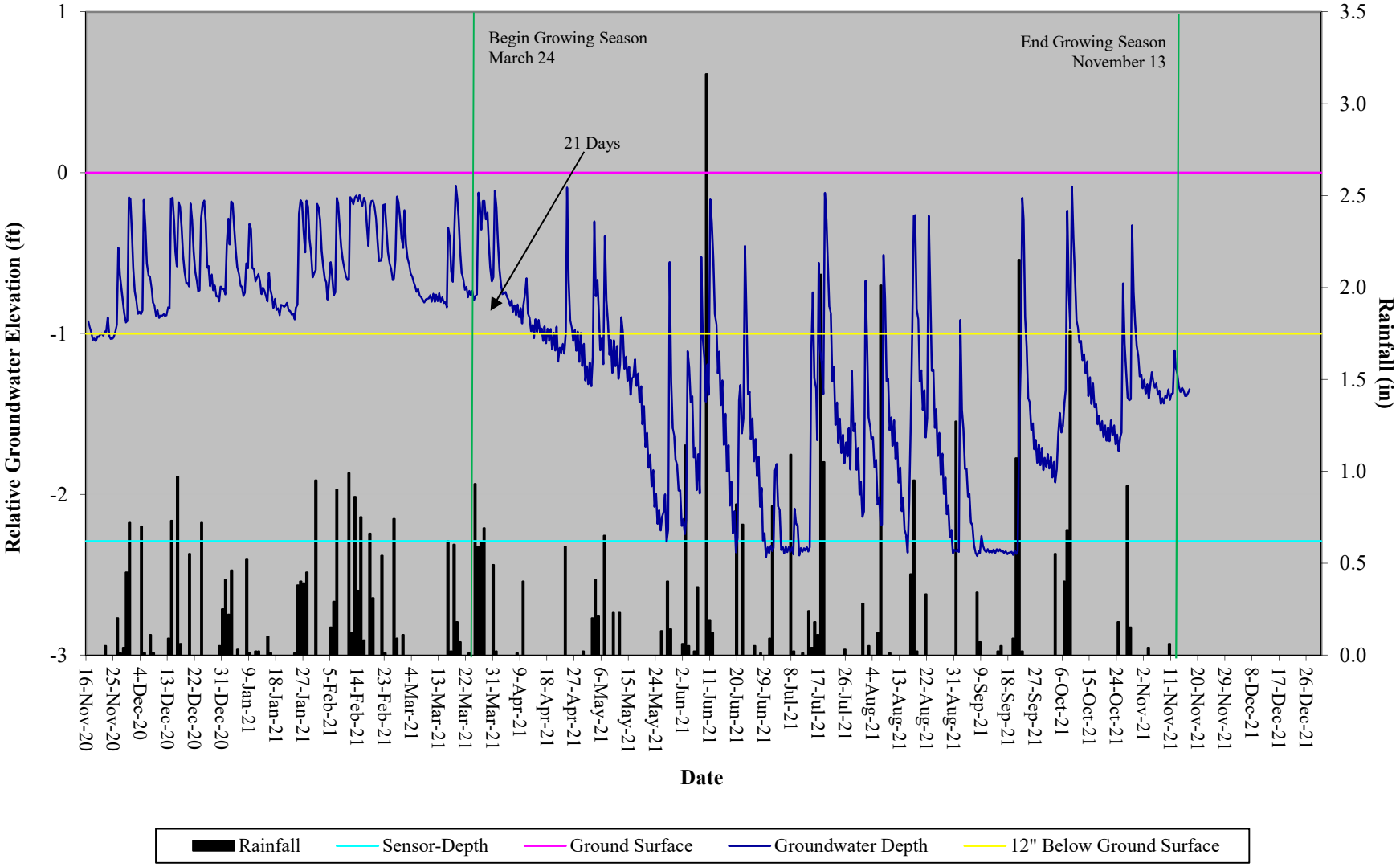

Cedar Branch Restoration Site
Hydrograph
T3 Stream Flow Gauge
January 1
Camera reinstalled
June 3, 2021
86 Days
32 Days
Stream Stage Elevation (ft)
Rainfall (in)
Date
685
684
683
682
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Nov-20
25-Nov-20
4-Dec-20
13-Dec-20
22-Dec-20
31-Dec-20
9-Jan-21
18-Jan-21
27-Jan-21
5-Feb-21
14-Feb-21
23-Feb-21
4-Mar-21
13-Mar-21
22-Mar-21
31-Mar-21
9-Apr-21
18-Apr-21
27-Apr-21
6-May-21
15-May-21
24-May-21
2-Jun-21
11-Jun-21
20-Jun-21
29-Jun-21
8-Jul-21
17-Jul-21
26-Jul-21
4-Aug-21
13-Aug-21
22-Aug-21
31-Aug-21
9-Sep-21
18-Sep-21
27-Sep-21
6-Oct-21
15-Oct-21
24-Oct-21
2-Nov-21
11-Nov-21
20-Nov-21
29-Nov-21
8-Dec-21
17-Dec-21
26-Dec-21
Rainfall
Sensor Depth
Stream Stage Elevation
Stream Bed Elevation
Bankfull Elevation
Flow Elevation
Flow (Camera)

Table 13. Wetland Hydrology Verification Cedar Branch Restoration Site, DMS Project #97009								
		Max Consecutive Days During Growing Season (Percentage)						
Gauge #	**Location**	**MY-01 2018**	**MY-02 2019**	**MY-03 2020**	**MY-04 2021**	**MY-05 2022**	**MY-06 2023**	**MY-07 2024**
Gauge 1	T1	64 (27.4%)	63 (26.7%)	55 (23.3%)	57 (24.1%)			
Gauge 2	T3	104 (44.4%)	148 (63.2%)	119 (50.9%)	65 (27.6%)			
Gauge 3	T3	21 (9.0%)	26 (10.9%)	13 (5.3%)	21 (9.0%)			


Cedar Branch Restoration Site
Hydrograph
Wetland Gauge 1
Begin Growing Season
March 24
End Growing Season
November 13
57 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
1
0
-1
-2
-3
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Nov-20
25-Nov-20
4-Dec-20
13-Dec-20
22-Dec-20
31-Dec-20
9-Jan-21
18-Jan-21
27-Jan-21
5-Feb-21
14-Feb-21
23-Feb-21
4-Mar-21
13-Mar-21
22-Mar-21
31-Mar-21
9-Apr-21
18-Apr-21
27-Apr-21
6-May-21
15-May-21
24-May-21
2-Jun-21
11-Jun-21
20-Jun-21
29-Jun-21
8-Jul-21
17-Jul-21
26-Jul-21
4-Aug-21
13-Aug-21
22-Aug-21
31-Aug-21
9-Sep-21
18-Sep-21
27-Sep-21
6-Oct-21
15-Oct-21
24-Oct-21
2-Nov-21
11-Nov-21
20-Nov-21
29-Nov-21
8-Dec-21
17-Dec-21
26-Dec-21
Rainfall
Sensor-Depth
Ground Surface
Groundwater Depth
12" Below Ground Surface


Cedar BranchRestoration Site
Hydrograph
Wetland Gauge 2
Begin Growing Season
March 24
End Growing Season
November 13
65 Days
28 Days
53 Days
65 Days
Relative Groundwater Elevation (ft)
Rainfall (in)
Date
1
0
-1
-2
-3
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
16-Nov-20
25-Nov-20
4-Dec-20
13-Dec-20
22-Dec-20
31-Dec-20
9-Jan-21
18-Jan-21
27-Jan-21
5-Feb-21
14-Feb-21
23-Feb-21
4-Mar-21
13-Mar-21
22-Mar-21
31-Mar-21
9-Apr-21
18-Apr-21
27-Apr-21
6-May-21
15-May-21
24-May-21
2-Jun-21
11-Jun-21
20-Jun-21
29-Jun-21
8-Jul-21
17-Jul-21
26-Jul-21
4-Aug-21
13-Aug-21
22-Aug-21
31-Aug-21
9-Sep-21
18-Sep-21
27-Sep-21
6-Oct-21
15-Oct-21
24-Oct-21
2-Nov-21
11-Nov-21
20-Nov-21
29-Nov-21
8-Dec-21
17-Dec-21
26-Dec-21
Rainfall
Ground Surface
Groundwater Depth
12" Below Ground Surface
Sensor-Depth

Cedar Branch Restoration Site
Hydrograph
Wetland Gauge 3



APPENDIX F

Additional Information

Tommy Seelinger

From: Tim Morris
Sent: Friday, August 03, 2018 2:55 PM
To: Tommy Seelinger
Subject: FW: Discrepancy Between As-Built and Mitigation Plan

-----Original Message-----
From: Hughes, Andrea W CIV USARMY CESAW (US) [mailto:Andrea.W.Hughes@usace.army.mil]
Sent: Monday, July 2, 2018 2:45 PM
To: Tim Morris <Tim.Morris@kci.com>
Subject: RE: Discrepancy Between As-Built and Mitigation Plan

For 4 credits? Don't worry about it since it's a reduction. We have too much on our desks right now.

Andrea W. Hughes
Mitigation Project Manager
Regulatory Division, Wilmington District
11405 Falls of Neuse Road
Wake Forest, North Carolina 27587
Phone: (843) 566-3857

-----Original Message-----
From: Tim Morris [mailto:Tim.Morris@kci.com]
Sent: Monday, July 02, 2018 2:43 PM
To: Hughes, Andrea W CIV USARMY CESAW (US) <Andrea.W.Hughes@usace.army.mil>
Subject: [Non-DoD Source] RE: Discrepancy Between As-Built and Mitigation Plan

reduction

-----Original Message-----
From: Hughes, Andrea W CIV USARMY CESAW (US) [mailto:Andrea.W.Hughes@usace.army.mil]
Sent: Monday, July 2, 2018 2:37 PM
To: Tim Morris <Tim.Morris@kci.com>
Subject: RE: Discrepancy Between As-Built and Mitigation Plan

Jeff S is familiar. You have to do a cover page requesting a modification of the credits and include documentation to support your request with the as-built. You are requesting an increase of 4 credits or reduction?

Andrea W. Hughes
Mitigation Project Manager
Regulatory Division, Wilmington District
11405 Falls of Neuse Road
Wake Forest, North Carolina 27587
Phone: (843) 566-3857

-----Original Message-----
From: Tim Morris [mailto:Tim.Morris@kci.com]
Sent: Monday, July 02, 2018 2:19 PM
To: Hughes, Andrea W CIV USARMY CESAW (US) <Andrea.W.Hughes@usace.army.mil>
Subject: [Non-DoD Source] RE: Discrepancy Between As-Built and Mitigation Plan

How do we make that request?

-----Original Message-----
From: Hughes, Andrea W CIV USARMY CESAW (US) [mailto:Andrea.W.Hughes@usace.army.mil]
Sent: Monday, July 2, 2018 2:15 PM
To: Tim Morris <Tim.Morris@kci.com>
Subject: RE: Discrepancy Between As-Built and Mitigation Plan

If you are asking for a change to the mitigation credits proposed in the mitigation plan that was approved, then yes, it is a modification request.

Andrea W. Hughes
Mitigation Project Manager
Regulatory Division, Wilmington District
11405 Falls of Neuse Road
Wake Forest, North Carolina 27587
Phone: (843) 566-3857

-----Original Message-----
From: Tim Morris [mailto:Tim.Morris@kci.com]
Sent: Monday, July 02, 2018 1:59 PM
To: Hughes, Andrea W CIV USARMY CESAW (US) <Andrea.W.Hughes@usace.army.mil>
Subject: [Non-DoD Source] Discrepancy Between As-Built and Mitigation Plan

Andrea - We have a 4 credit disparity (deficit) between our as-built plan and mitigation plan credit numbers on the Cedar Branch job. This is primarily due to two areas where we were avoiding a couple of specimen trees. Will we have to do some kind of formal amendment to our mitigation plan to recognize this discrepancy?