MONITORING YEAR 3 ANNUAL REPORT
Final

FOUST CREEK MITIGATION SITE
Alamance County, NC
NCDEQ Contract 004954
DMS Project Number 95715
USACE Action ID Number 2012-01908
NCDWR Project Number 13-1295

Data Collection Period: March 2017 - October 2017
Draft Submission Date: November 21, 2017
Final Submission Date: January 5, 2018

PREPARED FOR:

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

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January 5, 2018

Jeff Schaffer
N.C. Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RECEIVED
JAN 05 2017
DIVISION OF
MITIGATION SERVICES

RE: Task 8 – Draft Monitoring Year 3 Annual Report Comments
Foust Creek Mitigation Site (DMS #95715)
Cape Fear River Basin 03030002, Alamance County
Contract No. 004954

Dear Mr. Schaffer,

We have reviewed the comments on the Monitoring Year 3 Report for the above referenced project dated December 22, 2017 and have revised the report based on these comments. The revised documents are submitted with this letter. Below are responses to each of your comments. For your convenience, the comments are reprinted with our response in italics.

1) The digital data and drawings have been reviewed and determined to meet DMS requirements. However, DMS is calling to your attention that while Wildllands did provide reach breakdowns and mitigation approaches for each reach, in future submittals, please provide the reach lengths as required by contract.

   A GIS file with the stream reach lengths is provided in this submittal.

2) Add the USACE Action ID number (2012-01908) and NCDWR Project number (DWR#13-1295) to the cover page.

   The USACE Action ID number and NCDWR Project number have been added to the cover page.

3) This project was not one of those that the IRT required to revert to Mitigation Plan assets. Therefore, please revise the linear footage and credit numbers in the Executive Summary, Section 1 of the Project Overview and Table 1 to reflect the numbers from As-Built Baseline through MY2. The only numbers that should remain as stated in this report are those associated with the 0.1 ac/MU reduction in RW 6.

   The Executive Summary, Section 1 of the Project Overview, and Table 1 have been updated to reflect the linear footage and credit numbers used from As-Built Baseline through MY2.

4) Section 1.2.1: In this section, you state that "During MY3 (March 2017), a supplemental planting was performed in areas along the upper portion of Foust Creek Reach 2 that were determined to have low stem densities." You also state in this section that Plots 6 and 7 did not meet the interim success Criteria of 320 planted stems per acre. Table 9 shows plots 6 and 7 having planted stem densities of

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243 planted stems per acre." Please explain why these plots are not meeting, and in fact have fewer planted stems, after a supplemental planting effort.

In Section 1.2.1 an explanation was added describing why vegetation plots 6 and 7 are not meeting stem densities.

5) Table 4: Reach lengths need to be adjusted to the numbers from As-Built Baseline through MY2.

Table 4 numbers were adjusted to the numbers used from As-Built Baseline through MY2.

6) Figures 3.0, 3.1, 3.2 and 3.2: DMS unable to distinguish between Stream Restoration and Stream Restoration (Partial Credit) on the hardcopies in Appendix 2.

The color for Stream Restoration (Partial Credit) was changed to make it stand out on Figures 2, 3.0, 3.1, 3.2, and 3.3. This section of stream is only 14 feet long which makes it hard to see at a large scale.

7) Tables 5a. through 5d.: Reach lengths need to be adjusted to the numbers from As-Built Baseline through MY 2.

Table 5a through 5d reach length numbers were adjusted to the numbers used from As-Built Baseline through MY2.

8) Appendix 4: For any morphological tables, provide a footnote with the tables that describes the method by which Wildlands is calculating Bank Height Ratio and Entrenchment Ratio. In addition, please provide context to any observed changes in these calculated ratios in the report narrative. DMS has proposed a method for these calculations that can be found in the As Built baseline template guidance As-built Baseline Monitoring Report – June 2017 Page 22, specifically the paragraphs 8 and 9.

A footnote was added to morphological tables in Appendix 4 describing the method used to calculate Bank Height Ratio, and Entrenchment Ratio.

If you have any questions, please contact me by phone (919) 851-9986, or by email (jlorch@wildlandseng.com).

Sincerely,

Jason Lorch, *Monitoring Coordinator*

PREPARED BY:

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EXECUTIVE SUMMARY

Wildlands Engineering (Wildlands) completed a full delivery project for the North Carolina Department of Environmental Quality, Division of Mitigation Services (DMS) to restore and enhance a total of 5,500 linear feet (LF) of stream and rehabilitate and re-establish 4.96 acres of wetlands in Alamance County, NC. The Foust Creek Mitigation Site (Site) proposes to provide 4,770 Stream Mitigation Units (SMUs) and 3.91 Wetland Mitigation Units (WMUs). The project consists of Foust Creek, a second order perennial stream, and an unnamed, intermittent first order tributary to Foust Creek (UT1). At the downstream limits of the project the drainage area is 1,259 acres (1.97 square miles).

The Site is located in the southern portion of Alamance County, east of Snow Camp and approximately 15 miles southeast of the City of Burlington (Figure 1). It is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The Site is in the Jordan Lake Water Supply Watershed within the North Carolina Division of Water Resources (NCDWR) subbasin 03-06-04 of the Cape Fear River Basin and United States Geological Survey (USGS) Hydrologic Unit 03030002050050.

Prior to construction activities, both streams had been degraded by livestock access and agricultural practices. The primary objectives of the project were to promote wetland hydrology; restore a stream and wetland complex directly adjacent to a naturally occurring community; restore a stream system to promote hydrologic connectivity with the floodplains and wetlands; stabilize stream banks; promote instream habitat and aeration; restore riparian buffers; and further improve water quality through removing existing agricultural practices. Figure 2 and Table 1 present the restoration and enhancement design for the Site.

The following project goals were established to address the effects listed above from watershed and project site stressors:

- Reduce sediment inputs by removing cattle from streams and restoring degraded and eroding stream channels;
- Return a network of streams to a stable form that is capable of supporting biological functions;
- Reduce fecal coliform, nitrogen, and phosphorus inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor; and
- Protect existing high quality streams and forested buffers.

Stream and wetland restoration and enhancement construction efforts were completed in February 2015. Baseline as-built monitoring activities (MY0) were completed in February 2015. A conservation easement is in place on 22.11 acres of the stream and wetland riparian corridors to protect them in perpetuity.

Monitoring Year 3 (MY3) assessment and site visits were completed between the months of March and October 2017 to assess the conditions of the project. Overall, the Site has met the required vegetation, stream, and hydrology success criteria for MY3. The overall MY3 average planted stem density for the Site is 450 stems per acre which is greater than the year three interim density requirement of 320 stems per acre. Supplemental planting occurred during March 2017 in two areas, approximately one acre in size, that had low stem densities during MY2. All restored and enhanced streams are stable and functioning as designed and have recorded multiple bankfull events. The flow gage on UT1 met the hydrologic success criteria for MY3. Of the 10 groundwater monitoring wells on the Site, nine met the success criteria (water table within 12 inches of the ground surface for 8.5% of the growing season consecutively). Groundwater well nine has not met the success criteria through the first three

monitoring years. Therefore, during MY3 Wildlands has adjusted the wetland credits in Table 1 to remove the area represented by this well from credit.

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APPENDICES

Section 1: PROJECT OVERVIEW

The Foust Creek Mitigation Site; hereafter referred to as the Site, is located in southern Alamance County within the Cape Fear River Basin (USGS Hydrologic Unit 03030002) approximately 15 miles southeast of the City of Burlington. The Site is located upstream and downstream of the Snow Camp Road stream crossing immediately east of the town of Snow Camp. The Site is located in the Carolina Slate Belt of the Piedmont Physiographic Province (USGS, 1998). The project watershed consists primarily of agricultural lands and forest. The drainage area for the project site is 1,259 acres (1.97 square miles) at the lower end of Foust Creek.

The project stream reaches include Foust Creek and UT1 and were improved through stream restoration and enhancement level II approaches. Mitigation work within the Site included restoration and enhancement of 5,500 linear feet (LF) of perennial and intermittent stream channel and rehabilitation and re-establishment of 4.96 acres (ac) of riparian wetland. The stream and wetland areas were also planted with native vegetation to improve habitat and protect water quality. The Site proposes to provide 4,770 Stream Mitigation Units (SMUs) and 3.91 Wetland Mitigation Units (WMUs). The final mitigation plan was submitted and accepted by the North Carolina Department of Environmental Quality, Division of Mitigation Services (DMS) in February of 2014. Construction activities were completed by Fluvial Solutions in February 2015. The planting was completed by Bruton Natural Systems, Inc. in February 2015 and baseline monitoring (MY0) was conducted in January and February 2015. Annual monitoring will be conducted for seven years with the close-out anticipated to commence in 2022 given the success criteria are met. Appendix 1 provides more detailed project activity, history, contact information, and watershed/site background information for this project.

A conservation easement has been recorded and is in place along the stream and wetland riparian corridors to protect them in perpetuity; 22.11 ac (Deed Book 3278, Pages 935-944) within four parcels. Directions and a map of the Site are provided in Figure 1 and project components are illustrated in Figure 2.

1.1 Project Goals and Objectives

Prior to construction activities, both streams had been degraded by livestock access and agricultural practices. Impacts to the stream included direct access by livestock, trampling of the riparian vegetation and stream banks, channelization, eroding banks, floodplain ditching, and a lack of stabilizing riparian vegetation. The adjacent floodplain had been cleared for pasture and was grazed by livestock. The riparian vegetation was either absent, limited to the streambanks, or periodically disturbed. Table 4 in Appendix 1 and Tables 10a and 10b in Appendix 4 present the pre-restoration conditions in detail.

The Site was designed to meet the over-arching goals as described in the Mitigation Plan (Wildlands, 2014). The project is intended to provide numerous ecological benefits within the Cape Fear River Basin. While many of these benefits are limited to the Foust Creek Mitigation Site project area, others, such as pollutant removal and improved aquatic and terrestrial habitat, have more far-reaching effects. The following project specific goals established in the Mitigation Plan (Wildlands, 2014) include:

- Reduce sediment inputs by removing cattle from streams and restoring degraded and eroding stream channels;
- Return a network of streams to a stable form that is capable of supporting biological functions;

- Reduce fecal coliform, nitrogen, and phosphorus inputs through removing cattle from streams and establishing and augmenting a forested riparian corridor; and
- Protect existing high quality streams and forested buffers.

The project goals were addressed through the following project objectives:

- On-site nutrient inputs were decreased by removing cattle from streams, re-establishing floodplain connectivity, and filtering on-site runoff through buffer zones and wetlands. Off-site nutrient input is absorbed on-site by filtering flood flows through restored floodplain areas and riparian wetlands, where flood flow spreads through native vegetation. Vegetation uptakes excess nutrients.
- Stream bank erosion which contributes sediment load to the creeks was greatly reduced in the project area. Eroding stream banks were stabilized using bioengineering, natural channel design techniques, and grading to reduce bank angles and bank height. Storm flow containing grit and fine sediment is filtered through restored floodplain areas, where flow spreads through native vegetation. Spreading flood flows also reduce velocity and allow sediment to settle out. Sediment transport capacity of restored reaches was improved so that capacity balances more closely to load. Sediment load reduction will be monitored through assessing bank stability with cross section surveys and visual assessment through photo documentation which serves as an accepted surrogate for direct turbidity measurements.
- Restored riffle/pool sequences promote aeration of water and create deep water zones, helping to lower water temperature. Establishment and maintenance of riparian buffers creates long-term shading of the channel flow to minimize thermal heating. Lower water temperatures help maintain dissolved oxygen concentrations.
- In-stream structures were constructed to improve habitat diversity and trap detritus. Wood habitat structures were included in the stream as part of the restoration design. Such structures included log drops and rock structures that incorporate woody debris.
- Adjacent buffer and riparian habitats were restored with native vegetation as part of the project. Native vegetation provides cover and food for terrestrial creatures. Native plant species were planted and invasive species were treated. Eroding and unstable areas were also stabilized with vegetation as part of this project.
- The restored land is protected in perpetuity through a conservation easement.

The design streams and wetlands were restored to the appropriate type based on the surrounding landscape, climate, and natural vegetation communities but also with strong consideration to existing watershed conditions and trajectory. Specifically, the Site design was developed to restore a stream and wetland complex directly adjacent to a naturally occurring community to create riparian habitat and improve water quality. Other key factors addressed in the design were to create stable habitats, improve riparian buffers, and restore the natural migration patterns for fish spawning.

1.2 Monitoring Year 3 Data Assessment

Annual monitoring and quarterly site visits were conducted during monitoring year 3 (MY3) to assess the condition of the project. The stream and wetland mitigation success criteria for the Site follow the approved success criteria presented in the Foust Creek Mitigation Plan (Wildlands, 2014).

1.2.1 Vegetative Assessment

A total of 17 vegetation plots were established during the baseline monitoring within the project easement areas. All of the plots were installed using a standard 10 meter by 10 meter plot. The final vegetative success criteria will be the survival of 210 planted stems per acre in the riparian corridor along restored and enhanced reaches and within the wetland restoration areas at the end of the seven year monitoring period (MY7). The interim measure of vegetative success for the Site will be the survival of at least 320 planted stems per acre at the end of year three of the monitoring period (MY3) and at least 260 stems per acre at the end of the fifth year of monitoring (MY5). Planted vegetation must average 10 feet in height in each plot at the end of the seventh year of monitoring.

During MY3 (March 2017), a supplemental planting was performed in areas along the upper portion of Foust Creek Reach 2 that were determined to have low stem densities. These two areas totaled approximately one acre in size and were planted with 200 green ash and 200 black gum bareroots. Refer to the Integrated Current Condition Plan View Map (CCPV) in Appendix 2 for the area of supplemental planting.

The MY3 vegetative survey was completed in August 2017. The 2017 vegetation monitoring resulted in an average planted stem density of 450 planted stems per acre, which is greater than the interim requirement of 320 planted stems per acre required at MY3, but approximately 30% less than the baseline density of 647 planted stems per acre. When including volunteer stems, the average stems per acre is 907. This is well above the MY3 interim requirement of 320 stems per acre. There was an average of 11 planted stems per plot which is a slight decrease from 16 stems per plot in MY0. Fifteen of the 17 vegetation plots individually met success criteria for MY3 and are on track to meet the success criteria required for MY7 (Table 9, Appendix 3). Vegetation plots six and seven did not meet the interim success criteria of 320 planted stems per acre. However, when counting volunteer species both of these vegetation plots meet the interim success criteria. While supplemental planting occurred in the areas around vegetation plots six and seven at the beginning of MY3, these areas were planted at a low density due to the presence of volunteer species. These vegetation plots are expected to meet the final stem density requirement of 210 stems per acre at the end of MY7. Refer to Appendix 2 for vegetation plot photographs and the vegetation condition assessment table and Appendix 3 for vegetation data tables.

1.2.2 Vegetation Areas of Concern

Supplemental planting was performed around vegetation plots six and seven at the beginning of MY3 as described in section 1.2.1 above. These areas stay wet for most of the year and the planted trees have not become well established in the wet conditions. However, volunteer species including green ash, buttonbush, boxelder, and red maple are beginning to establish in these areas. These areas will continue to be monitored during subsequent monitoring years and a maintenance plan will be established if deemed necessary.

1.2.3 Stream Assessment

Morphological surveys for MY3 were conducted in March 2017. All streams within the Site are stable and met success criteria for MY3. In general, cross sections for all streams showed little to no change in bankfull area, maximum depth ratio, or width-to-depth ratio. Cross section surveys show that the bank height ratios remain at or very near 1.0. Entrenchment ratios vary slightly from year to year due to minor changes in bankfull widths. Small adjustments in width occur due to vegetation, sediment deposition, and many other factors. These minor changes do not indicate channel instability. Surveyed

riffle cross sections fell within the parameters defined for channels of the appropriate Rosgen stream type.

During MY1 cross section 2 on Foust Creek had experienced sediment deposition from high flow events. The cross section has maintained a consistent bankfull width, but had decreased in depth and area due to the sediment deposition during high flows. During MY2 and MY3 cross section 2 did not experience any deposition and returned to its original depth. Deposition in MY3 is primarily associated with point bar formation which is expected. This section of Foust Creek was designed with a very low slope and some deposition is expected. Most of this sediment has been transported during high flow events and is expected to continue in subsequent monitoring years. This area will be monitored for further signs of deposition in subsequent monitoring years. Refer to Appendix 2 for the visual stability assessment table, the CCPV, and reference photographs. Refer to Appendix 4 for the morphological data and plots.

1.2.4 Stream Areas of Concern

Depositional areas have been previously noted for Foust Creek at cross section 2. Deposition and sediment transport within this reach appear to have reached a point of equilibrium since MY1. Deposition within this area will continue to be monitored during subsequent monitoring years.

1.2.5 Hydrology Assessment

At the end of the seven year monitoring period, two or more bankfull events must have occurred in separate years within the restoration reaches. Multiple bankfull events were recorded on both Foust Creek and UT1 with crest gages and pressure transducers during MY3 data collection. Both Foust Creek and UT1 recorded bankfull events during MY1 and MY2, therefore the Site has met the required stream hydrology success criteria for the seven year monitoring period.

A pressure transducer was also installed on UT1 to measure stream flow. The pressure transducer was installed to show UT1 has adequate flow to be determined jurisdictional, and is not an ephemeral ditch. Baseflow must be present for at least some portion of the year (most likely in the winter/early spring) during years with normal rainfall conditions. UT1 showed consistent flow from the beginning of the year until early June (154 days out of 162 days). UT1 recorded flow for a maximum of 56 consecutive days and total of 165 days as of October 25, 2017. Therefore, UT1 has met the flow success criteria for MY3. Refer to Appendix 5 for hydrologic data.

1.2.6 Wetland Assessment

Ten groundwater monitoring gages were established during baseline monitoring within the wetland rehabilitation and re-establishment zones. All gages were installed at appropriate locations so that the data collected provided an indication of groundwater levels throughout the Site. To determine the growing season at the Site one soil temperature probe was installed. A barotroll logger (to measure barometric pressure used in the calculations of groundwater levels with well transducer data) and a rain gage were also installed on the Site. All monitoring gages were downloaded and maintained on an as needed basis. The success criteria for wetland hydrology is a free groundwater surface within 12 inches of the ground surface for 8.5 percent of the growing season, which is measured in consecutive days under typical precipitation conditions. During MY1 NRCS WETS Data was used to determine the growing season for the Site. After discussions with the United States Army Corps of Engineers (USACE), it was agreed to use on-site soil temperature data to determine the beginning of the growing season and use NRCS WETS data to determine the end of the growing season. The soil temperature probe will be used to determine the beginning of the growing season based on soil temperatures staying above 41 degrees

Fahrenheit at 12 inches below the ground surface. Refer to Appendix 2 for the groundwater gage locations and Appendix 5 for groundwater hydrology data and plots.

Of the ten groundwater monitoring wells on the Site, nine met the success criteria in MY3. The nine wells that met the success criteria generally exceeded the standard significantly. The measured hydroperiod ranged from 9.1% to 79.8% of the growing season consecutively.

Groundwater well 9 has not meet the success criteria during the first three monitoring years. After multiple field observations Wildlands has adjusted the wetland boundaries around groundwater well 9 based on soils, topography, and vegetation. Wetland mitigation credits were updated in Table 1 and Figures 2 and 3 show the new wetland boundaries.

1.2.7 Maintenance Plan

Wildlands will continue to monitor the upper portion of Foust Creek for deposition. A maintenance plan will be developed if it becomes apparent that deposition is an ongoing problem. No other maintenance plan is necessary at this time.

1.3 Monitoring Year 3 Summary

All streams within the Site are stable and functioning as designed. The deposition that was on Foust Creek at cross section 2 during MY1 has continued to flush out. This area will be monitored for any future issues. The average stem density for the Site is on track to meeting the MY7 success criteria; 15 of 17 vegetation plots meet the MY3 success criteria as noted in the CCPV map. The other two plots meet success criteria when volunteer trees were counted. Both streams on site have recorded at least one bankfull event and UT1 has recorded flow for a portion of the year. A total of 9 out of 10 groundwater gages met the wetland hydrology success criteria.

Section 2: METHODOLOGY

Geomorphic data was collected following the standards outlined in The Stream Channel Reference Site: An Illustrated Guide to Field Techniques (Harrelson et al., 1994) and in the Stream Restoration: A Natural Channel Design Handbook (Doll et al., 2003). All data collected for the Integrated Current Condition Mapping was recorded using a Trimble handheld GPS with sub-meter accuracy and processed using Pathfinder and ArcGIS software. Crest gages and pressure transducers were installed in surveyed riffle cross sections and monitored quarterly. Hydrology attainment installation and monitoring methods are in accordance with the USACE (2003) standards. Vegetation monitoring protocols followed the Carolina Vegetation Survey-NCDMS Level 2 Protocol (Lee et al., 2008). Summary information and data related to the success of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the Mitigation Plan documents available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

Section 3: REFERENCES

Doll, B.A., Grabow, G.L., Hall, K.A., Halley, J., Harman, W.A., Jennings, G.D., and Wise, D.E. 2003. Stream Restoration A Natural Channel Design Handbook.

Harrelson, C.C., Rawlins, C.L., Potyondy, J.P. 1994. *Stream Channel Reference Sites: An Illustrated Guide to Field Technique.* Gen. Tech. Rep. RM-245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 61 p.

Lee, M.T., Peet, R.K., S.D., Wentworth, T.R. 2008. CVS-DMS Protocol for Recording Vegetation Version 4.2. Retrieved from http://cvs.bio.unc.edu/protocol/cvs-eep-protocol-v4.2-lev1-5.pdf.

Rosgen, D. L. 1994. A classification of natural rivers. *Catena* 22:169-199.

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

Rosgen, D.L. 1997. A Geomorphological Approach to Restoration of Incised Rivers. Proceedings of the Conference on Management of Landscapes Disturbed by Channel Incision. Center For Computational Hydroscience and Bioengineering, Oxford Campus, University of Mississippi, Pages 12-22.

United States Army Corps of Engineers (USACE). 2003. Stream Mitigation Guidelines. USACE, NCDEQ-DWR, USEPA, NCWRC.

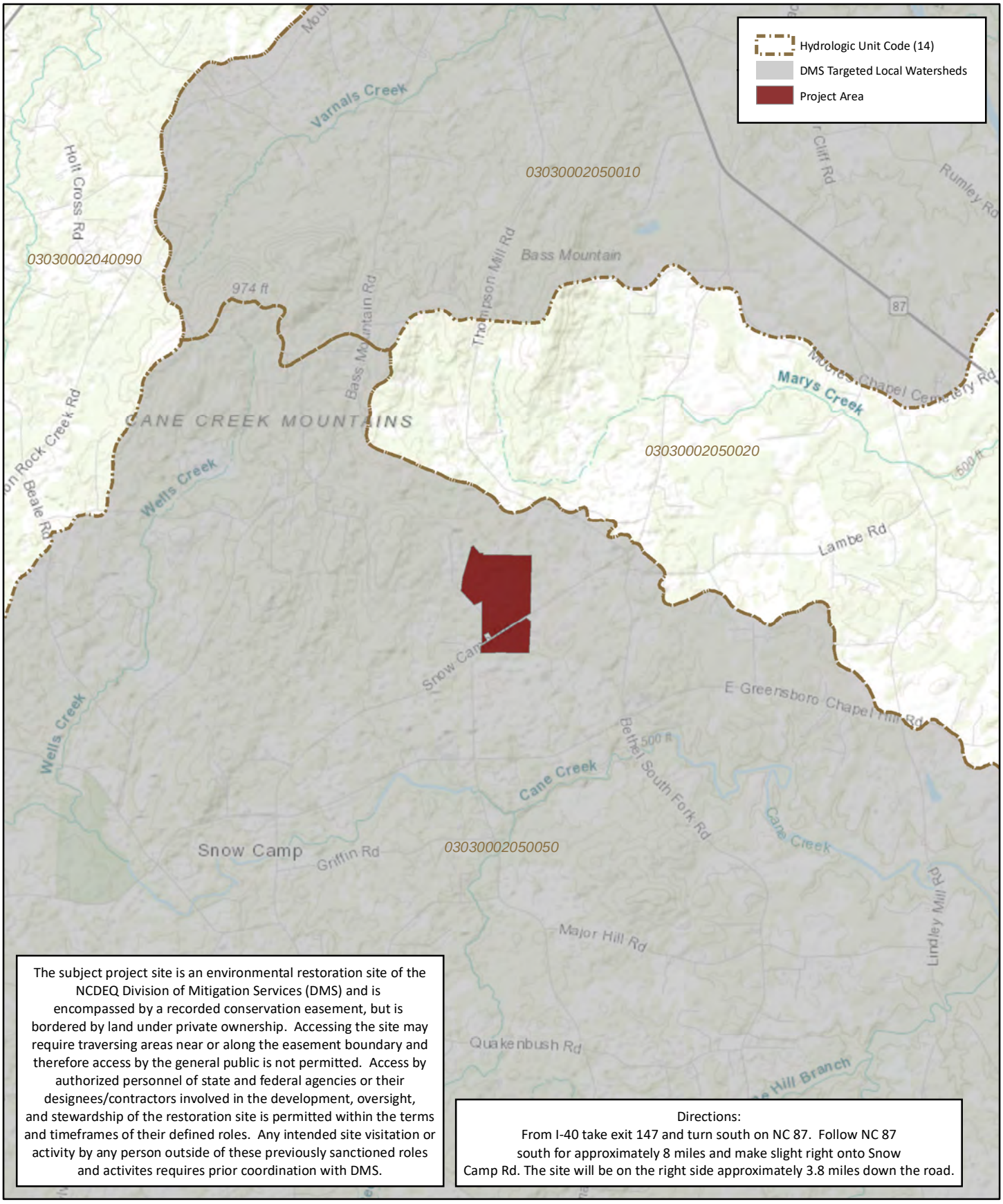
United States Department of Agriculture (USDA). 2002. Natural Resources Conservation Service, Climate Information for Alamance County, NC (1971-2000). WETS Station: Graham 2 ENE, NC3555.

United States Geological Survey (USGS). 1998. North Carolina Geology. http://www.geology.enr.state.nc.us/usgs/carolina.htm

Wildlands Engineering, Inc. 2014. Foust Creek Mitigation Plan. DMS, Raleigh, NC.

Wildlands Engineering, Inc. 2015. Foust Creek Mitigation Site Baseline Monitoring Document and As-Built Baseline Report. DMS, Raleigh, NC.

APPENDIX 1. General Tables and Figures



The subject project site is an environmental restoration site of the NCDEQ Division of Mitigation Services (DMS) and is encompassed by a recorded conservation easement, but is bordered by land under private ownership. Accessing the site may require traversing areas near or along the easement boundary and therefore access by the general public is not permitted. Access by authorized personnel of state and federal agencies or their designees/contractors involved in the development, oversight, and stewardship of the restoration site is permitted within the terms and timeframes of their defined roles. Any intended site visitation or activity by any person outside of these previously sanctioned roles and activites requires prior coordination with DMS.

Directions:
From I-40 take exit 147 and turn south on NC 87. Follow NC 87 south for approximately 8 miles and make slight right onto Snow Camp Rd. The site will be on the right side approximately 3.8 miles down the road.

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0 0.5 1 Miles

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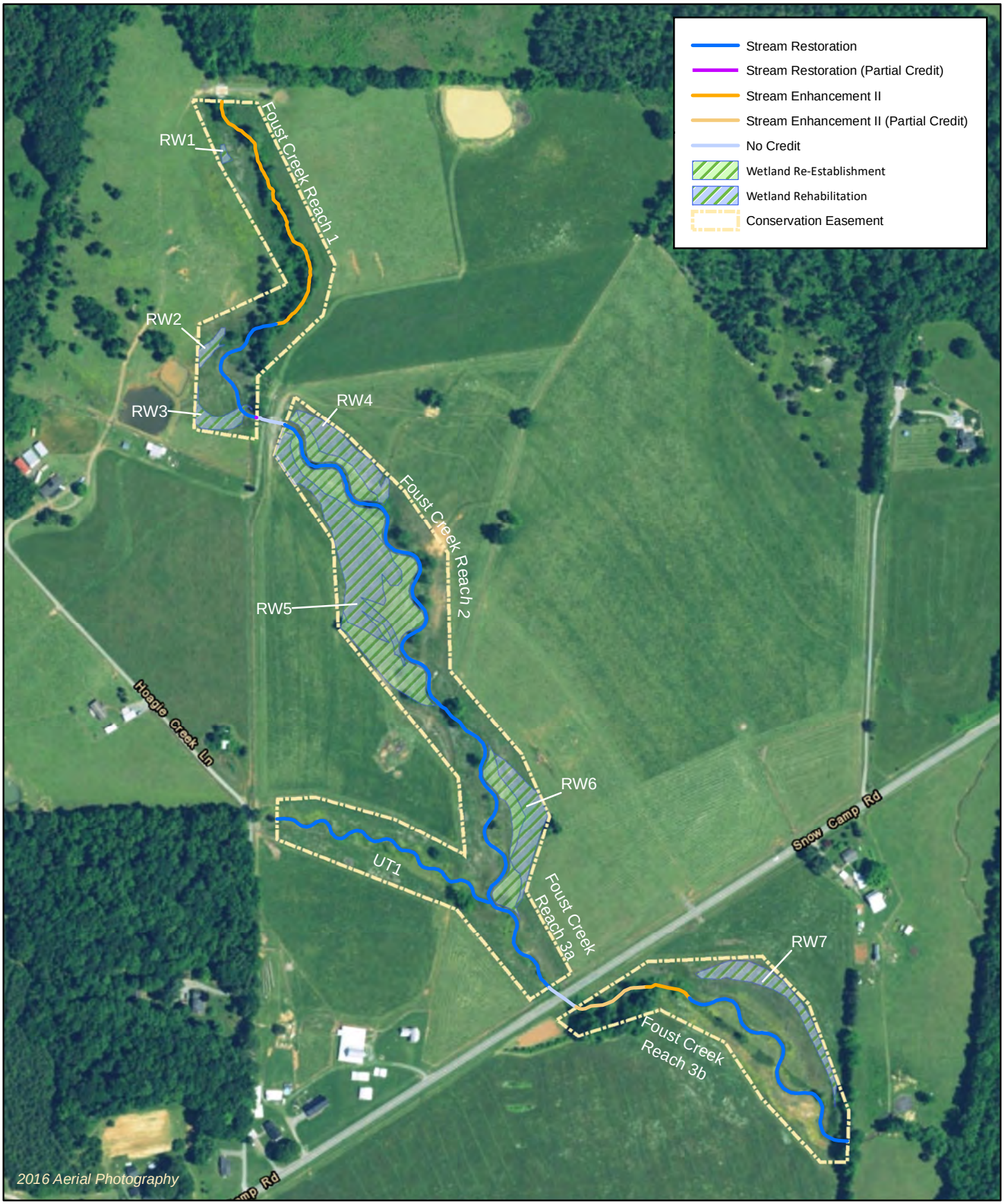
Figure 1 Project Vicinity Map
Foust Creek Mitigation Site
DMS Project No. 95715
Monitoring Year 3 - 2017
Alamance County, NC



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0 200 400 Feet

Figure 2 Project Component/ Asset Map
Foust Creek Mitigation Site
DMS Project No. 95715
Monitoring Year 3 - 2017
Alamance County, NC

Table 1. Project Components and Mitigation Credits
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Mitigation Credits

	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorous Nutrient Offset
Type	R	RE	R-E[1]	RE[1]	R-E[1]	RE[1]			
Totals	4,770	N/A	1.80*	2.11	N/A	N/A			

Project Components

Reach ID	As-Built Stationing/ Location	Existing Footage/ Acreage	Approach	Restoration or Restoration Equivalent	Restoration Footage/ Acreage	Mitigation Ratio	Credits (SMU/ WMU)
Streams							
Foust Creek – Reach 1	101+83 to 109+96	814	EII	Enhancement	813	2.5	325
Foust Creek – Reach 2	109+96 to 114+21 & 115+19 to 134+84	2,356	P1	Restoration	2,390	1	2,390
Foust Creek – Reach 2	114+21 to 114+35	31	P1	Restoration (Partial Credit)	14	2[2]	7
Foust Creek – Reach 2 (Easement Break)	114+35 to 115+19	91	P1	Restoration (No Credit)	84	---	---
Foust Creek – Reach 3A	134+84 to 138+01	307	P1/2	Restoration	317	1	317
Foust Creek – Reach 3B	139+01 to 140+89	187	EII	Enhancement (Partial Credit)	188	5[2]	38
Foust Creek – Reach 3B	140+89 to 142+31	142	EII	Enhancement	142	2.5	57
Foust Creek – Reach 3B	142+31 to 150+74	684	P1/2	Restoration	843	1	843
UT1 to Foust Creek	200+94 to 208+87	713	P1	Restoration	793	1	793
Wetlands							
Riparian Wetland RW1	---	0.03	---	Rehabilitation	0.03	1.5	0.02
Riparian Wetland RW2	---	0.08	---	Rehabilitation	0.08	1.5	0.05
Riparian Wetland RW3	---	0.16	---	Rehabilitation	0.16	1.5	0.11
Riparian Wetland RW4	---	0.45	---	Rehabilitation	0.45	1.5	0.30
Riparian Wetland RW4	---	0.21	---	Re-Establishment	0.21	1.0	0.21
Riparian Wetland RW5	---	1.46	---	Rehabilitation	1.46	1.5	0.97
Riparian Wetland RW5	---	1.18	---	Re-Establishment	1.18	1.0	1.18
Riparian Wetland RW6	---	0.52	---	Rehabilitation	0.52	1.5	0.35
Riparian Wetland RW6	---	0.51	---	Re-Establishment	0.41*	1.0	0.41*
Riparian Wetland RW7	---	0.46	---	Rehabilitation	0.46	1.5	0.31

Component Summation

Restoration Level	Stream (LF)	Riparian Wetland (acres)		Non-Riparian Wetland (acres)	Buffer (acres)	Upland (acres)
		Riverine	Non-Riverine			
Restoration	4,357	-	-	-	-	-
Enhancement		-	-	-	-	-
Enhancement I	-					
Enhancement II	1,143					
Creation		-	-	-		
Preservation	-	-	-	-		-
High Quality Preservation	-	-	-	-		-
Re-Establishment		1.80	-	-		
Rehabilitation		3.16	-	-		

N/A: not applicable

1. R-E = Wetland Re-Establishment and RE = Wetland Rehabilitation per NCDENR July 30, 2013 Memorandum titled:Consistency between Federal and State Wetland Mitigation Requirements

2. A portion of Foust Creek Reach 2 and Reach 3B does not have a full 50' buffer from top of bank to the conservation easement boundary on the river left side. Therefore, mitigation credit is only included at a rate of half the normal crediting giving the restoration or restoration equivalent type.

* Wetland RW6 Re-Establishment credit calculations were updated for Monitoring Year 3 based on the performance of groundwater well 9.

Table 2. Project Activity and Reporting History
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Activity or Report		Date Collection Complete	Completion or Scheduled Delivery
Mitigation Plan		October 2013-February 2014	February 2014
Final Design - Construction Plans		April 2014-August 2014	August 2014
Construction		October 2014-February 2015	February 2015
Temporary S&E mix applied to entire project area [1]		February 2015	February 2015
Permanent seed mix applied to reach/segments		February 2015	February 2015
Bare root and live stake plantings for reach/segments		February 2015	February 2015
Baseline Monitoring Document (Year 0)	Stream Survey	February 2015	May 2015
	Vegetation Survery	February 2015	
Year 1 Monitoring	Stream Survey	September 2015	December 2015
	Vegetation Survery	September 2015	
Year 2 Monitoring	Stream Survey	March 2016	December 2016
	Vegetation Survery	June 2016	
Supplemental Planting			March 2017
Year 3 Monitoring	Stream Survey	March 2017	December 2017
	Vegetation Survery	August 2017	
Year 4 Monitoring	Stream Survey	2018	December 2018
	Vegetation Survery	2018	
Year 5 Monitoring	Stream Survey	2019	December 2019
	Vegetation Survery	2019	
Year 6 Monitoring	Stream Survey	2020	December 2020
	Vegetation Survery	2020	
Year 7 Monitoring	Stream Survey	2021	December 2021
	Vegetation Survery	2021	

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

Table 3. Project Contacts Table
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Designer Angela Allen, PE	**Wildlands Engineering, Inc.** 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	**Fluvial Solutions** P.O. Box 28749 Raleigh, NC 27611
Planting Contractor	**Bruton Natural Systems, Inc** P.O. Box 1197 Fremont, NC 27830
Seeding Contractor	**Fluvial Solutions** P.O. Box 28749 Raleigh, NC 27611
Seed Mix Sources	**Green Resource, LLC**
Nursery Stock Suppliers **Bare Roots** **Live Stakes**	 **Dykes and Son Nursery** **Bruton Natural Systems, Inc**
Monitoring Performers Monitoring, POC	**Wildlands Engineering, Inc.** Jason Lorch 919.851.9986, ext. 107

Table 4. Project Information and Attributes
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Project Information	
Project Name	Foust Creek Mitigation Site
County	Alamance County
Project Area (acres)	22.1 acres
Project Coordinates (latitude and longitude)	35° 55' 0.12" N, 79° 24' 6.84" W
Project Watershed Summary Information	
Physiographic Province	Carolina Slate Belt of the Piedmont Physiographic Province
River Basin	Cape Fear River
USGS Hydrologic Unit 8-digit	03030002
USGS Hydrologic Unit 14-digit	03030002050050
DWR Sub-basin	03-06-04
Project Drainiage Area (acres)	1,259 acres
Project Drainage Area Percentage of Impervious Area	<1%
CGIA Land Use Classification	78% Forested/ Scrubland, 21% Agriculture/ Managed Herbaceous, <1% Open Water, <1% Watershed Impervious Cover, <1% Developed

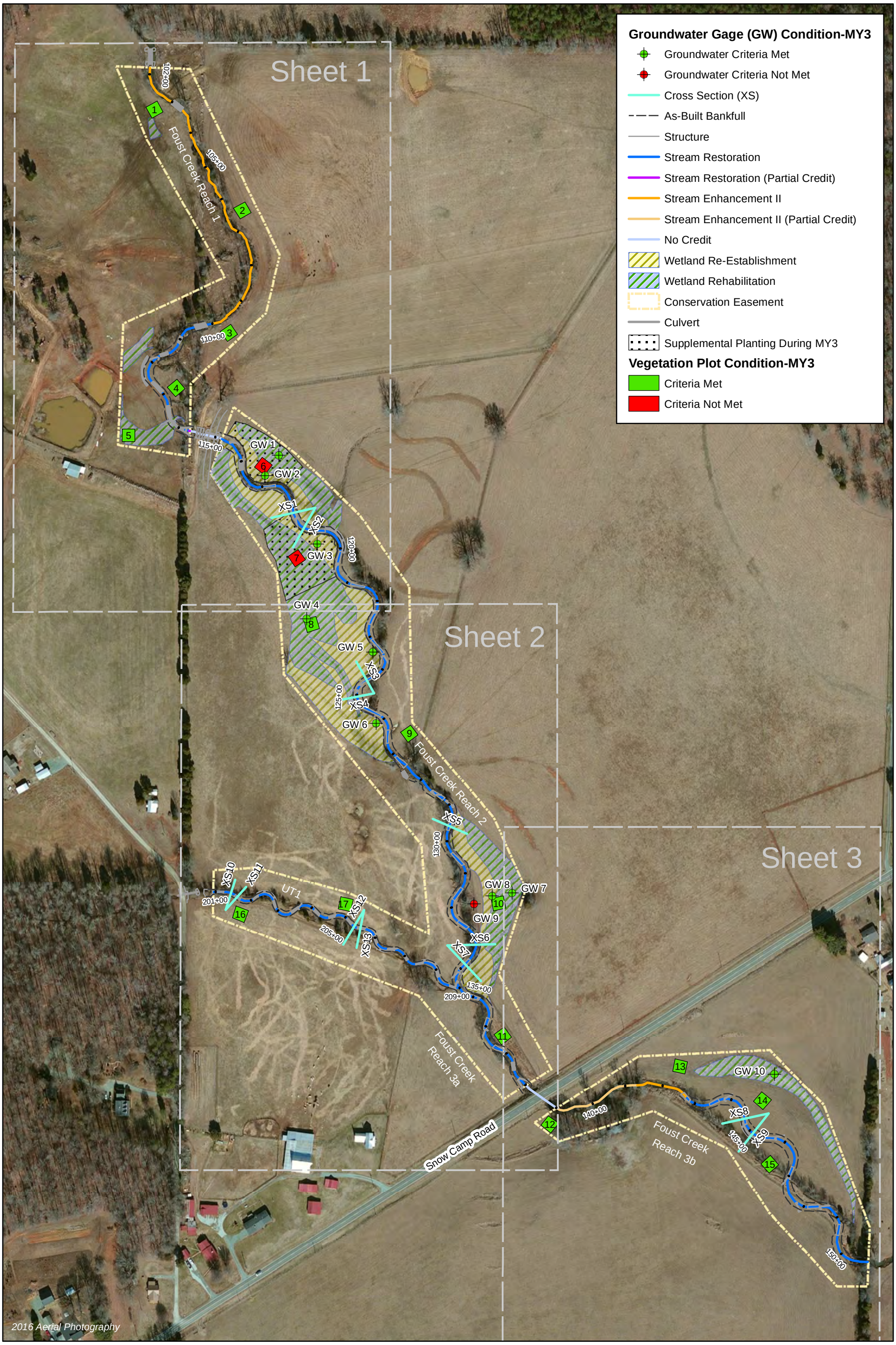
Reach Summary Informtation

Parameters	Foust Creek Reach 1	Foust Creek Reach 2	Foust Creek Reach 3	UT1
Length of reach (linear feet) - Post-Restoration	813	2,404	1,490	793
Drainage area (acres)	954	1,047	1,259	173
NCDWR stream identification score	41.5	41.5	44	28
NCDWR Water Quality Classification	WS-V	WS-V	WS-V	---
Morphological Desription (stream type)	P	P	P	I
Evolutionary trend (Simon's Model) - Pre- Restoration	III/IV	N/A	III/IV	III
Underlying mapped soils	Georgeville silty clay loam, Local alluvial land, Orange silt loam			
Drainage class	---	---	---	---
Soil Hydric status	---	---	---	---
Slope	---	---	---	---
FEMA classification	AE	AE	AE	---
Native vegetation community	Piedmont bottomland forest			
Percent composition exotic invasive vegetation - Post - Restoration	0%			

Regulatory Considerations

Regulation	Applicable?	Resolved?	Supporting Documentation
Waters of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No.27 and DWQ 401 Water Quality Certification No. 3885.
Waters of the United States - Section 401	Yes	Yes	
Division of Land Quality (Dam Safety)	No	N/A	N/A
Endangered Species Act	Yes	Yes	Foust Creek Mitigation Plan(2013); Wildlands determined "no effect" on Alamance County listed endangered species.
Historic Preservation Act	Yes	Yes	No historic resources were found to be impacted (letter from SHPO dated 1/9/13).
Coastal Zone Management Act (CZMA)/Coastal Area Management Act (CAMA)	No	N/A	N/A
FEMA Floodplain Compliance	Yes	Yes	Foust Creek is located within the floodway and flood fringe (FEMA Zone AE, FIRM panels 8788 and 8879).
Essential Fisheries Habitat	No	N/A	N/A

APPENDIX 2. Visual Assessment Data



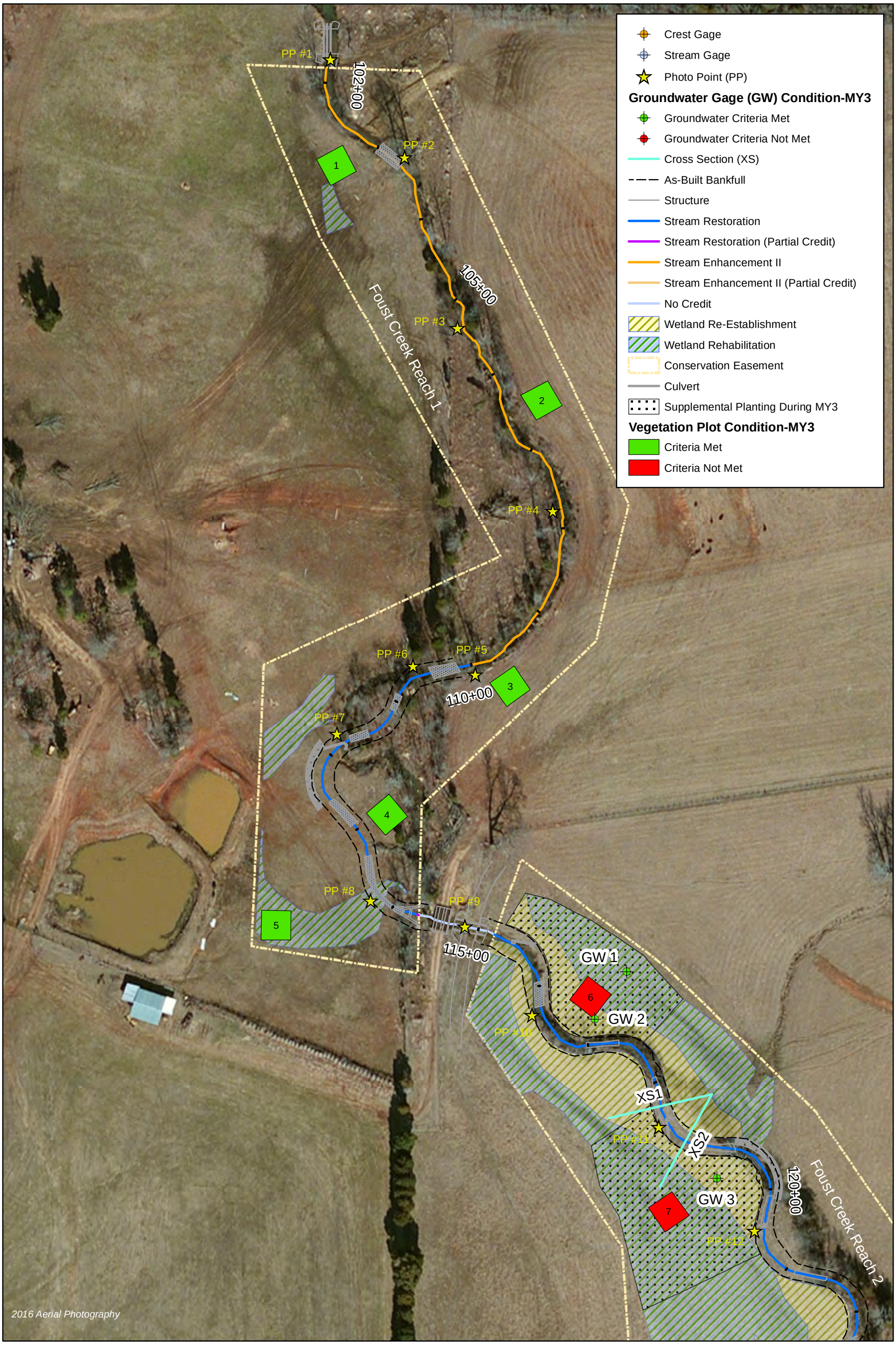
WILDLANDS ENGINEERING

0 125 250 375 500 Feet

N

Figure 3.0 Integrated Current Condition Plan View (Key)
Foust Creek Stream Restoration Site
DMS Project No. 95715
Monitoring Year 3 - 2017

Alamance County, NC



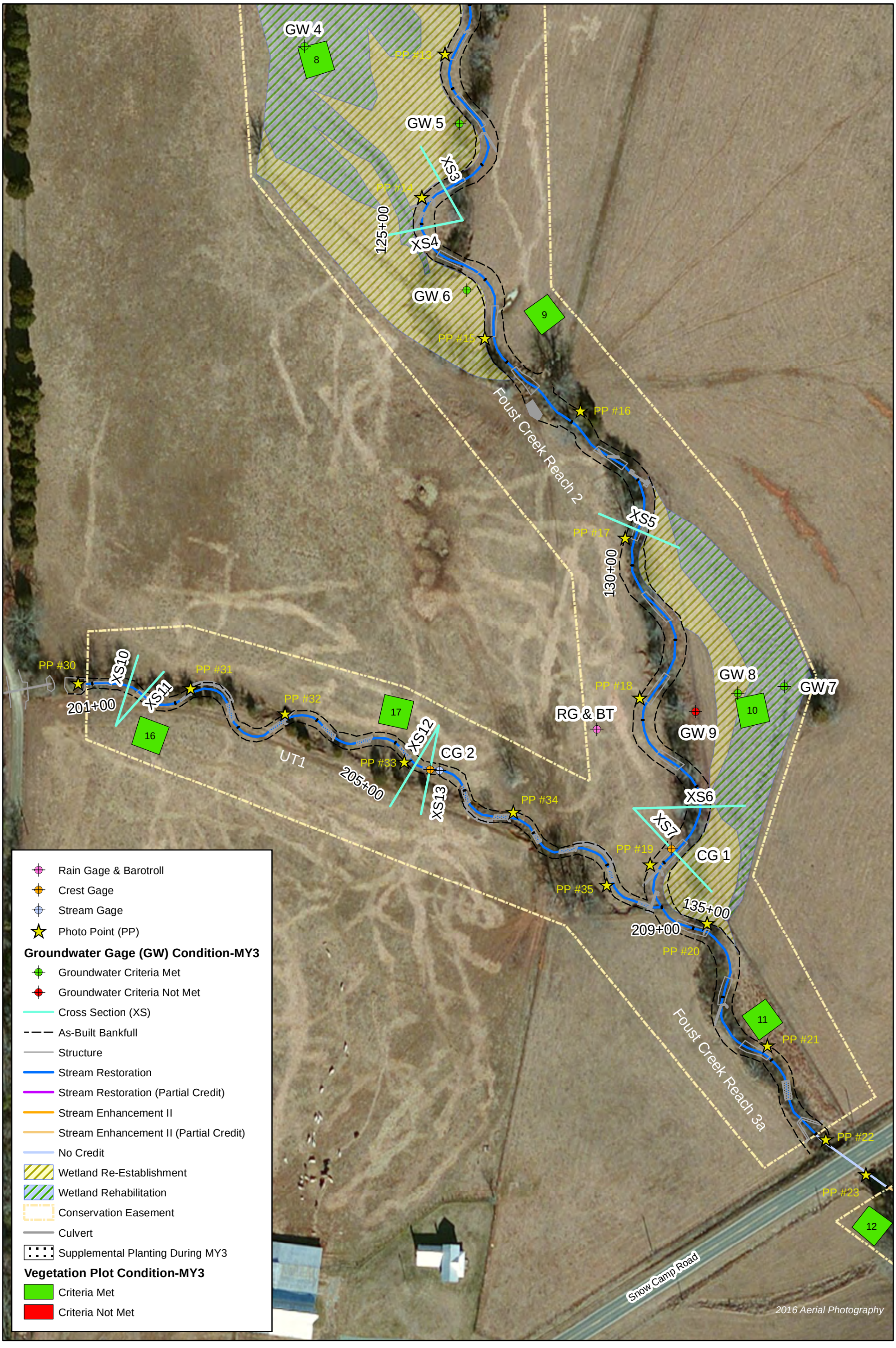
WILDLANDS ENGINEERING

0 50 100 150 200 Feet

N

Figure 3.1 Integrated Current Condition Plan View
(Sheet 1 of 3)
Foust Creek Stream Restoration Site
DMS Project No. 95715
Monitoring Year 3 - 2017

Alamance County, NC



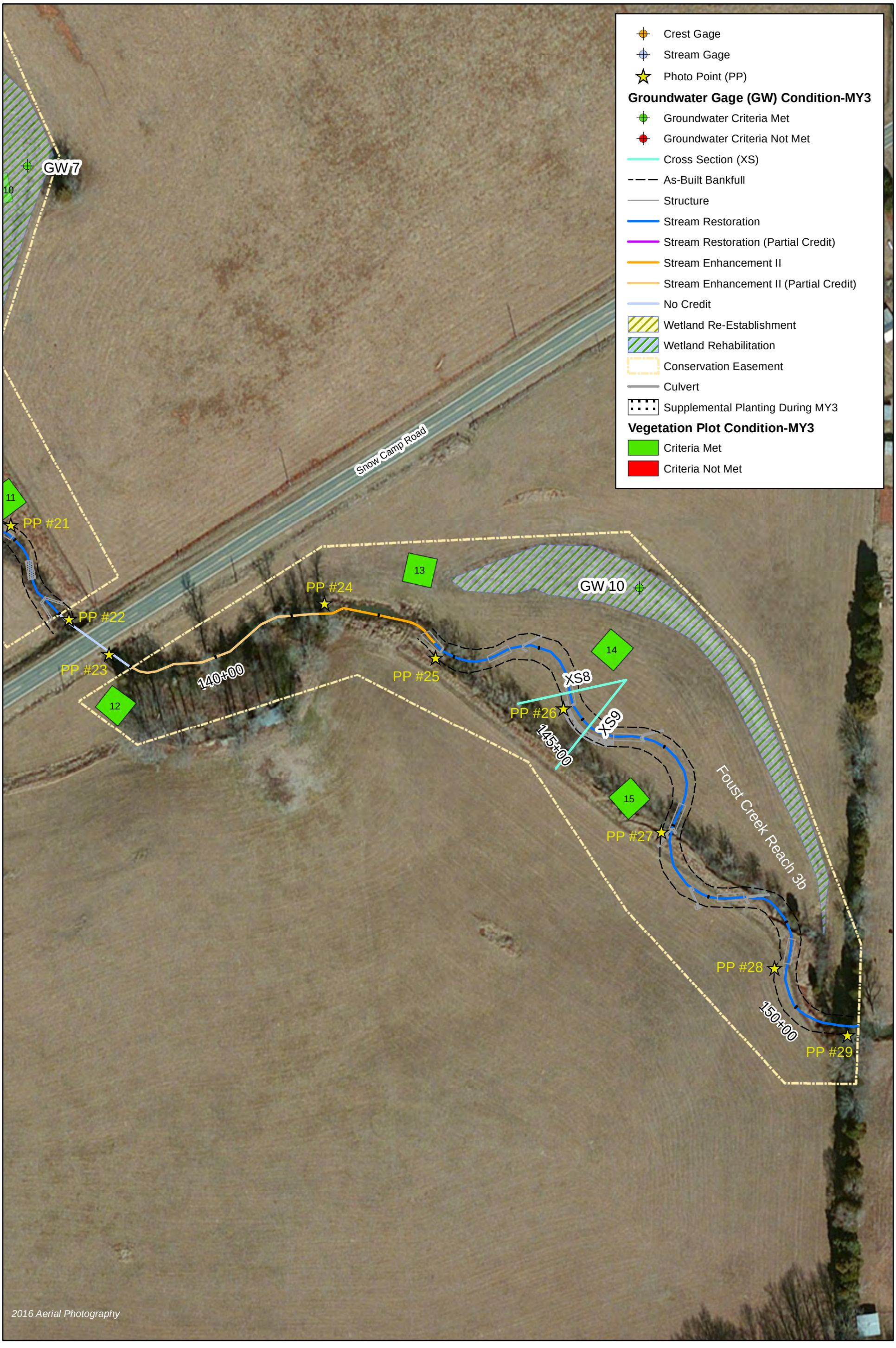
WILDLANDS ENGINEERING

0 50 100 150 200 Feet

N

Figure 3.2 Integrated Current Condition Plan View
(Sheet 2 of 3)
Foust Creek Stream Restoration Site
DMS Project No. 95715
Monitoring Year 3 - 2017

Alamance County, NC



WILDLANDS ENGINEERING

0 50 100 150 200 Feet

Figure 3.3 Integrated Current Condition Plan View
(Sheet 3 of 3)
Foust Creek Stream Restoration Site
DMS Project No. 95715
Monitoring Year 3 - 2017

Alamance County, NC

Table 5a. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Foust Creek Reach 1 (813 LF)

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

Table 5b. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Foust Creek Reach 2 (2,404 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	10	10			100%			
	3. Meander Pool Condition	Depth Sufficient	9	9			100%			
		Length Appropriate	9	9			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	9	9			100%			
		Thalweg centering at downstream of meander bend (Glide)	9	9			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				TOTALS	0	0	100%	n/a	n/a	n/a
3. Engineered 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	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%	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	1	1			100%			

Table 5c. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Foust Creek Reach 3 (1,490 LF)

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-Built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjust % for Stabilizing Woody Vegetation
1. Bed	1. Vertical Stability (Riffle and Run units)	Aggradation			0	0	100%			
		Degradation			0	0	100%			
	2. Riffle Condition	Texture/Substrate	11	11			100%			
	3. Meander Pool Condition	Depth Sufficient	11	11			100%			
		Length Appropriate	11	11			100%			
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)	11	11			100%			
		Thalweg centering at downstream of meander bend (Glide)	11	11			100%			
2. Bank	1. Scoured/Eroded	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%	n/a	n/a	n/a
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat			0	0	100%	n/a	n/a	n/a
	3. Mass Wasting	Bank slumping, caving, or collapse			0	0	100%	n/a	n/a	n/a
				TOTALS	0	0	100%	n/a	n/a	n/a
3. Engineered 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	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~Max Pool Depth : Bankfull Depth ≥ 1.6 Rootwads/logs providing some cover at baseflow	1	1			100%			

Table 5d. Visual Stream Morphology Stability Assessment Table

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

UT1 (793 LF)

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

Table 6. Vegetation Condition Assessment Table
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Planted Acreage **22**

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

Easement Acreage **22**

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

STREAM PHOTOGRAPHS
Foust Creek
Monitoring Year 3

PHOTO POINT 1 – looking downstream (3*/16/2017*)

PHOTO POINT 2 – looking upstream (3*/16/2017*)

PHOTO POINT 2 – looking downstream (3*/16/2017*)

PHOTO POINT 3 – looking upstream (3*/16/2017*)

PHOTO POINT 3 – looking downstream (3*/16/2017*)

	
PHOTO POINT 4 – looking upstream (3*/16/2017*)	**PHOTO POINT 4** – looking downstream (3*/16/2017*)
	
PHOTO POINT 5 – looking upstream (3*/16/2017*)	**PHOTO POINT 5** – looking downstream (3*/16/2017*)
	
PHOTO POINT 6 – looking upstream *(3/16/2017)*	**PHOTO POINT 6 –** looking downstream (3*/16/2017*)

	
PHOTO POINT 7 – looking upstream (3*/16/2017*)	**PHOTO POINT 7 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 8 – looking upstream (3*/16/2017*)	**PHOTO POINT 8 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 9 – looking upstream (3*/16/2017*)	**PHOTO POINT 9 –** looking downstream (3*/16/2017*)

	
PHOTO POINT 10 – looking upstream (3*/16/2017*)	**PHOTO POINT 10 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 11 – looking upstream (3*/16/2017*)	**PHOTO POINT 11 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 12 – looking upstream (3*/16/2017*)	**PHOTO POINT 12 –** looking downstream (3*/16/2017*)

	
PHOTO POINT 13 – looking upstream (3*/16/2017*)	**PHOTO POINT 13 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 14 – looking upstream (3*/16/2017*)	**PHOTO POINT 14 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 15 – looking upstream (3*/16/2017*)	**PHOTO POINT 15 –** looking downstream (3*/16/2017*)

	
PHOTO POINT 16 – looking upstream (3*/16/2017*)	**PHOTO POINT 16 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 17 – looking upstream (3*/16/2017*)	**PHOTO POINT 17 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 18 – looking upstream (3*/16/2017*)	**PHOTO POINT 18 –** looking downstream (3*/16/2017*)

PHOTO POINT 19 – looking upstream (3*/16/2017*)

PHOTO POINT 19 – looking downstream (3*/16/2017*)

PHOTO POINT 20 – looking upstream (3*/16/2017*)

PHOTO POINT 20 – looking downstream (3*/16/2017*)

PHOTO POINT 21 – looking upstream (3*/16/2017*)

PHOTO POINT 21 – looking downstream (3*/16/2017*)

PHOTO POINT 22 – looking upstream (3*/16/2017*)

PHOTO POINT 23 – looking downstream (3*/16/2017*)

PHOTO POINT 24 – looking upstream (3*/16/2017*)

PHOTO POINT 24 – looking downstream (3*/16/2017*)

PHOTO POINT 25 – looking upstream (3*/16/2017*)

PHOTO POINT 25 – looking downstream (3*/16/2017*)

	
PHOTO POINT 26 – looking upstream (3*/16/2017*)	**PHOTO POINT 26 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 27 – looking upstream (3*/16/2017*)	**PHOTO POINT 27 –** looking downstream (3*/16/2017*)
	
PHOTO POINT 28 – looking upstream (3*/16/2017*)	**PHOTO POINT 28 –** looking downstream (3*/16/2017*)

PHOTO POINT 29 – looking upstream (3*/16/2017*)

PHOTO POINT 29 – looking downstream (3*/16/2017*)

PHOTO POINT 30 – looking downstream (3*/16/2017*)

PHOTO POINT 31 – looking upstream (3*/16/2017*)

PHOTO POINT 31 – looking downstream (3*/16/2017*)

PHOTO POINT 32 – looking upstream (3*/16/2017*)

PHOTO POINT 32 – looking downstream (3*/16/2017*)

PHOTO POINT 33 – looking upstream (3*/16/2017*)

PHOTO POINT 33 – looking downstream (3*/16/2017*)

PHOTO POINT 34 – looking upstream (3*/16/2017*)

PHOTO POINT 34 – looking downstream (3*/16/2017*)

	
PHOTO POINT 35 – looking upstream (3*/16/2017*)	**PHOTO POINT 35 –** looking downstream (3*/16/2017*)

VEGETATION PHOTOGRAPHS
Foust Creek
Monitoring Year 3

VEG PLOT 1 *(8/3/2017)*

VEG PLOT 2 *(8/3/2017)*

VEG PLOT 3 *(8/3/2017)*

VEG PLOT 4 *(8/3/2017)*

VEG PLOT 5 *(8/3/2017)*

VEG PLOT 6 *(8/3/2017)*

VEG PLOT 7 *(8/3/2017)*

VEG PLOT 8 *(8/3/2017)*

VEG PLOT 9 *(8/3/2017)*

VEG PLOT 10 *(8/3/2017)*

VEG PLOT 11 *(8/3/2017)*

VEG PLOT 12 *(8/3/2017)*

VEG PLOT 13 *(8/3/2017)*

VEG PLOT 14 *(8/3/2017)*

VEG PLOT 15 *(8/3/2017)*

VEG PLOT 16 *(8/3/2017)*

VEG PLOT 17 (*8/3/2017)*

APPENDIX 3. Vegetation Plot Data

Table 7. Vegetation Plot Criteria Attainment

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Plot	Success Criteria Met (Y/N)	Tract Mean
1	Y	88%
2	Y	
3	Y	
4	Y	
5	Y	
6	N	
7	N	
8	Y	
9	Y	
10	Y	
11	Y	
12	Y	
13	Y	
14	Y	
15	Y	
16	Y	
17	Y	

Table 8. CVS Vegetation Plot Metadata

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Database name	Foust- Creek MY3- v2.3.1.mdb
Database location	F:\Projects\005-02135 Foust Creek\Monitoring\Monitoring Year 3\Vegetation Assessment
Computer name	JASON-PC
File size	71004160
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY	
Project Code	95715
project Name	Foust Creek Mitigation Site
Description	Stream and Wetland Mitigation
River Basin	Cape Fear
Sampled Plots	17

Table 9. Planted and Total Stem Counts

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

			Current Plot Data (MY3 2017)														
			95715-WEI-0001			95715-WEI-0002			95715-WEI-0003			95715-WEI-0004			95715-WEI-0005		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer negundo	boxelder	Tree															
Acer rubrum	red maple	Tree															
Alnus	alder	Shrub															
Alnus serrulata	hazel alder	Shrub															
Betula nigra	river birch	Tree				1	1	1	1	1	1	2	2	2			
Juniperus virginiana	eastern red cedar	Tree															
Cephalanthus occidentalis	common buttonbush	Shrub															1
Cornus amomum	silky dogwood	Shrub													1	1	1
Fraxinus pennsylvanica	green ash	Tree				1	1	1				1	1	1	7	7	7
Liquidambar styraciflua	sweetgum	Tree						7			16			4			
Liriodendron tulipifera	tuliptree	Tree										1	1	1			
Nyssa sylvatica	blackgum	Tree															
Pinus	pine	Tree															
Platanus occidentalis	American sycamore	Tree							2	2	2						
Quercus michauxii	swamp chestnut oak	Tree	9	9	9	3	3	3	2	2	2	4	4	4	2	2	2
Quercus phellos	willow oak	Tree	2	2	2	2	2	2	3	3	3			2			
Quercus rubra	northern red oak	Tree				6	6	6	1	1	1	2	2	2			
Ulmus	elm	Tree															
		Stem count	11	11	11	13	13	20	9	9	25	10	10	16	10	10	11
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	2	2	2	5	5	6	5	5	6	5	5	7	3	3	4
		Stems per ACRE	445	445	445	526	526	809	364	364	1012	405	405	647	405	405	445

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

			Current Plot Data (MY3 2017)														
			95715-WEI-0006			95715-WEI-0007			95715-WEI-0008			95715-WEI-0009			95715-WEI-0010		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer negundo	boxelder	Tree						2									
Acer rubrum	red maple	Tree						1			1						
Alnus	alder	Shrub															
Alnus serrulata	hazel alder	Shrub							1	1	1						
Betula nigra	river birch	Tree										4	4	4			
Juniperus virginiana	eastern red cedar	Tree															
Cephalanthus occidentalis	common buttonbush	Shrub			5												2
Cornus amomum	silky dogwood	Shrub				3	3	3	3	3	3				5	5	5
Fraxinus pennsylvanica	green ash	Tree	6	6	7	2	2	5	1	1	31			2			30
Liquidambar styraciflua	sweetgum	Tree									1			9			5
Liriodendron tulipifera	tuliptree	Tree															
Nyssa sylvatica	blackgum	Tree							2	2	2				1	1	1
Pinus	pine	Tree															
Platanus occidentalis	American sycamore	Tree															
Quercus michauxii	swamp chestnut oak	Tree				1	1	1	4	4	4	2	2	2			
Quercus phellos	willow oak	Tree										1	1	1	2	2	2
Quercus rubra	northern red oak	Tree										4	4	4			
Ulmus	elm	Tree												1			
		Stem count	6	6	12	6	6	12	11	11	43	11	11	23	8	8	45
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	1	1	2	3	3	5	5	5	7	4	4	7	3	3	6
		Stems per ACRE	243	243	486	243	243	486	445	445	1740	445	445	931	324	324	1821

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

			Current Plot Data (MY3 2017)														
			95715-WEI-0011			95715-WEI-0012			95715-WEI-0013			95715-WEI-0014			95715-WEI-0015		
Scientific Name	**Common Name**	**Species Type**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**	**PnoLS**	**P-all**	**T**
Acer negundo	boxelder	Tree															
Acer rubrum	red maple	Tree															
Alnus	alder	Shrub			15									1			
Alnus serrulata	hazel alder	Shrub															
Betula nigra	river birch	Tree	2	2	2	1	1	1				1	1	1			
Juniperus virginiana	eastern red cedar	Tree						2									
Cephalanthus occidentalis	common buttonbush	Shrub															
Cornus amomum	silky dogwood	Shrub															
Fraxinus pennsylvanica	green ash	Tree	4	4	4	2	2	3	8	8	10	8	8	11	6	6	6
Liquidambar styraciflua	sweetgum	Tree						12			5						10
Liriodendron tulipifera	tuliptree	Tree	1	1	1	3	3	3				2	2	2			
Nyssa sylvatica	blackgum	Tree															
Pinus	pine	Tree															1
Platanus occidentalis	American sycamore	Tree	5	5	5	7	7	7	7	7	7	4	4	9	5	5	5
Quercus michauxii	swamp chestnut oak	Tree															
Quercus phellos	willow oak	Tree													1	1	2
Quercus rubra	northern red oak	Tree	1	1	1	1	1	1							1	1	1
Ulmus	elm	Tree															
		Stem count	13	13	28	14	14	29	15	15	22	15	15	24	13	13	25
		size (ares)	1			1			1			1			1		
		size (ACRES)	0.02			0.02			0.02			0.02			0.02		
		Species count	5	5	6	5	5	7	2	2	3	4	4	5	4	4	6
		Stems per ACRE	526	526	1133	567	567	1174	607	607	890	607	607	971	526	526	1012

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

Table 9. Planted and Total Stem Counts

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

			Current Plot Data (MY3 2017)						Annual Means											
			95715-WEI-0016			95715-WEI-0017			MY3 (2017)			MY2 (2016)			MY1 (2015)			MY0 (2015)		
Scientific Name	Common Name	Species Type	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer negundo	boxelder	Tree									2									
Acer rubrum	red maple	Tree									2			1			1			
Alnus	alder	Shrub									16									
Alnus serrulata	hazel alder	Shrub							1	1	1	2	2	3	3	3	3	6	6	6
Betula nigra	river birch	Tree	2	2	2	2	2	2	16	16	16	20	20	20	28	28	31	35	35	35
Juniperus virginiana	eastern red cedar	Tree									2									
Cephalanthus occidentalis	common buttonbush	Shrub									8									
Cornus amomum	silky dogwood	Shrub							12	12	12	13	13	13	12	12	16	15	15	15
Fraxinus pennsylvanica	green ash	Tree	2	2	10	3	3	3	51	51	131	51	51	51	53	53	90	53	53	53
Liquidambar styraciflua	sweetgum	Tree			3						72			20			8			
Liriodendron tulipifera	tuliptree	Tree	1	1	1	1	1	1	9	9	9	9	9	9	10	10	10	24	24	24
Nyssa sylvatica	blackgum	Tree				1	1	1	4	4	4	6	6	7	10	10	10	10	10	10
Pinus	pine	Tree									1									
Platanus occidentalis	American sycamore	Tree	3	3	3	3	3	3	36	36	41	36	36	36	36	36	36	36	36	36
Quercus michauxii	swamp chestnut oak	Tree				1	1	1	28	28	28	35	35	35	36	36	36	37	37	37
Quercus phellos	willow oak	Tree	2	2	2	1	1	1	14	14	17	21	21	21	33	33	33	35	35	35
Quercus rubra	northern red oak	Tree	2	2	2				18	18	18	21	21	21	21	21	21	21	21	21
Ulmus	elm	Tree									1									
		Stem count	12	12	23	12	12	12	189	189	381	214	214	237	242	242	295	272	272	272
		size (ares)	1			1			17			17			17			17		
		size (ACRES)	0.02			0.02			0.42			0.42			0.42			0.42		
		Species count	6	6	7	7	7	7	10	10	18	10	10	12	10	10	12	10	10	10
		Stems per ACRE	486	486	931	486	486	486	450	450	907	509	509	564	576	576	702	647	647	647

Color Coding for Table

Exceeds requirements by 10%

Exceeds requirements, but by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Volunteer species included in total

PnoLS: Number of Planted stems excluding live stakes

P-all: Number of planted stems including live stakes,

T: Total Stems

APPENDIX 4. Morphological Summary Data and Plots

Table 10a. Baseline Stream Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Foust Creek

		PRE-RESTORATION CONDITION						REFERENCE REACH DATA														DESIGN						AS-BUILT/BASELINE					
Parameter	**Gage**	**Foust Creek-Reach 2**		**Foust Creek-Reach 3A**		**Foust Creek-Reach 3B**		**Onsite Reference Reach - Foust Creek**		**Spencer Creek 1**		**Spencer Creek 2**		**UT to Richland Creek- Reach 1**		**UT to Richland Creek- Reach 2**		**Dutchman's Creek**		**UT to Cane Creek**		**Foust Creek-Reach 2**		**Foust Creek-Reach 3A**		**Foust Creek-Reach 3B**		**Foust Creek-Reach 2**		**Foust Creek-Reach 3A**		**Foust Creek-Reach 3B**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle																																	
Bankfull Width (ft)		24.7		17.5		22.4		18.5	19.4	10.7	11.2	6.3	9.3	8.8	10.4	13.3	15.2	24.8	26.6	11.5	12.3	20.0		20.0		20.0		18.5	22.5	18.5	22.5	23.6	
Floodprone Width (ft)		180		114.2		276.1		49	62.5	60	>114	14	125	27.6	31.4	>50		4.4	49.7	311		50	400	50	400	50	400	150		150		150	
Bankfull Mean Depth		1.2		1.4		1.5		1.3	1.4	1.6	1.8	0.8	1.0	0.8	0.9	1.1	1.3	1.3	1.5	0.8	1.0	1.3		1.3		1.5		1.1	1.3	1.1	1.3	1.5	
Bankfull Max Depth		1.8		2.5		3		1.8	2.1	2.1	2.6	1	1.2	1.1	1.3	1.8	2.1	1.8	2.0	1.2	1.6	2.1		2.1		2.3		1.9	2.3	1.9	2.3	2.7	
Bankfull Cross Sectional Area (ft^2)	N/A	30		25.3		34.6		23.9	24.1	17.8	19.7	6.6	8.7	7.8	8.5	16.5	17.5	34.2	36.9	8.9	12.2	26.4		25.8		29.2		21.5	30.2	21.5	30.2	36.5	
Width/Depth Ratio		20.3		12.2		14.6		13.9	14.2	5.8	7.1	7.9	9.3	10	12.8	10.1	13.9	17.9	19.4	12.3	14.4	15.2		15.5		13.3		15.5	18.8	15.5	18.8	15.2	
Entrenchment Ratio[1]		7.3		6.5		12.3		2.6	3.4	5.5	>10.2	1.7	4.3	2.4	4.0	>2.5		1.9	1.9	>2.5		2.5	20.0	2.5	20.0	2.5	20.0	6.7	8.1	6.7	8.1	6.4	
Bank Height Ratio[2]		1.4		1.1		1.4		1.0		1.0		1.0	1.0	1.4	2.1	1.0		1.0	1.2	---		1.0		1.0		1.0		1.0		1.0		1.0	
D50 (mm)		1.20		7.60		11.00																						7.3	51.8	7.3	51.8	52.3	
Profile																																	
Riffle Length (ft)								---		---		---		---		---		---		---		---		---		---		19.0	52.2	19.0	52.2	24.2	34.4
Riffle Slope (ft/ft)		0.01		0.023		0.0151		0.015	0.035	0.013		0.0184	0.0343	0.0183	0.0355	0.0183	0.0355	---		0.0188	0.0704	0.0039	0.0329	0.0117	0.0423	0.0065	0.0752	0.0028	0.0530	0.0028	0.0530	0.0096	0.0300
Pool Length (ft)								---		---		---		---		---		---		---		---		---		---		42.5	96.1	42.5	96.1	56.3	101.2
Pool Max Depth (ft)	N/A	4.4		2.9		4		2.5	2.9	3.3		1.2	1.8	14.7	16	1.8	1.8	---		2.6		2.6	5.3	2.6	5.3	3.0	6.0	2.0	4.3	2.0	4.3	2.3	4.0
Pool Spacing (ft)		212.55		2.8	2.96	3.0	4.9	48.8	91.3	71		9	46	2.5	6.1	2.5	6.1	---		2.3	6.1	50	140	50	140	50	140	70	164	70	164	34	137
Pool Volume (ft^3)																																	
Pattern																																	
Channel Beltwidth (ft)		N/A		N/A		N/A		N/A		38	41	10	50	N/A		N/A		N/A		102		32	178	32	178	32	178	38	110	38	110	72	128
Radius of Curvature (ft)		N/A		N/A		N/A		N/A		11	15	12	85	N/A		N/A		N/A		23	38	41	58	41	58	43	57	51	69	51	69	55	67
Rc:Bankfull Width (ft/ft)	N/A	N/A		N/A		N/A		N/A		1.3	1.4	1.9	9.1	N/A		N/A		N/A		2.0	3.1	2.1	2.9	2.1	2.9	2.2	2.9	2.8	3.1	2.8	3.1	2.3	2.8
Meander Length (ft)		N/A		N/A		N/A		N/A		--	--	53	178	N/A		N/A		N/A		45.0	81.0	100	280	100	280	100	280	135	216	135	216	166	234
Meander Width Ratio		N/A		N/A		N/A		N/A		3.4	3.6	1.6	5.4	N/A		N/A		N/A		8.3	8.9	1.6	8.9	1.6	8.9	1.6	8.9	2.1	4.9	2.1	4.9	3.1	5.4
Substrate, Bed and Transport Parameters																																	
Ri%/Ru%/P%/G%/S%																																	
SC%/Sa%/G%/C%/B%/Be%																																	
d16/d35/d50/d84/d95/d100	N/A	0.2/0.5/1.2/11/65		0.3/3.2/7.6/110/160		0.1/4.4/11/19/47		---		---		---		---		---		---										SC/ 0.14/0.2/ 45.0/90.0/128.0		SC/ 0.14/0.2/ 45.0/90.0/128.0		SC/0.10/0.3 66.2/101.2/180.0	
Reach Shear Stress (Competency) lb/ft^2		0.53		0.83		0.26																0.4		0.71		0.86		0.39	0.47	0.39	0.47	0.70	
Max part size (mm) mobilized at bankfull																																	
Stream Power (Capacity) W/m^2																																	
Additional Reach Parameters																																	
Drainage Area (SM)		1.60		1.90		2.00		1.38		0.96		0.37		0.28		0.97		2.90		0.29		1.60		1.90		2.00		1.60		1.90		2.00	
Watershed Impervious Cover Estimate (%)		<1%		<1%		<1%		---		---		---		---		---		---		---		<1%		<1%		<1%		<1%		<1%		<1%	
Rosgen Classification		C5		C/E4		C/E4		C4		E4		E4		C/E4		C/E4		B4c		C/E4		C4		C4		C/E4		C5		C4		C/E4	
Bankfull Velocity (fps)		3.4		4.5		3.3		2.9	3.7	4.9	5.4	5.0	5.6	4.1	5.2	4.2	4.5	4.2	4.5	3.8		3.6		4.6		4.5		3.0	3.4	4.0		4.0	
Bankfull Discharge (cfs)		101		112		115		69.4	88.0	97		35		29.1	32.0	68.9	78.6	140.0	165.0	40		100.0		110.0		110.0		66.0	102.1	90.5		90.5	
Q-NFF regression		---		---		---																											
Q-USGS extrapolation	N/A	---		---		---																											
Q-Mannings		---		---		---																											
Valley Length (ft)		---		---		---		---		---		---		---		---		---		---		2,133		300		1,030							
Channel Thalweg Length (ft)		2,478		307		1,013		---		---		---		---		---		---		---		2,523		321		1,186		2,404		317		1,173	
Sinuosity		1.09		1.11		1.05		1.05		2.3		1.0	1.3	1.1		2.3		1.0		1.3		1.18		1.07		1.15		1.1		1.1		1.1	
Water Surface Slope (ft/ft)[2]		---		---		---		---		---		---		---		---		---		---		---		---		---		---		0.0058		0.0105		0.0056	
Bankfull Slope (ft/ft)		---		---		---		---		0.0047		0.019	0.022	0.013		0.018		0.009		0.015		0.007		0.008		0.005		0.0053		0.0085		0.0071	

(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 10b. Baseline Stream Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

UT1

		PRE-RESTORATION		REFERENCE REACH DATA														DESIGN		AS-BUILT/ BASELINE	
Parameter	**Gage**	**UT1**		**Onsite Reference Reach - Foust Creek**		**Spencer Creek 1**		**Spencer Creek 2**		**UT to Richland Creek- Reach 1**		**UT to Richland Creek- Reach 2**		**Dutchman's Creek**		**UT to Cane Creek**		**UT1**		**UT1**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**
Dimension and Substrate - Riffle																					
Bankfull Width (ft)		8.6		18.5	19.4	10.7	11.2	6.3	9.3	8.8	10.4	13.3	15.2	24.8	26.6	11.5	12.3	11.0		10.8	12.6
Floodprone Width (ft)		104.3		49	62.5	60	>114	14	125	27.6	31.4	>50		4.4	49.7	311		27.5	220	150	150
Bankfull Mean Depth		1.0		1.3	1.4	1.6	1.8	0.8	1.0	0.8	0.9	1.1	1.3	1.3	1.5	0.8	1.0	0.8		0.6	0.8
Bankfull Max Depth		1.8		1.8	2.1	2.1	2.6	1.0	1.2	1.1	1.3	1.8	2.1	1.8	2.0	1.2	1.6	1.3		1.3	1.5
Bankfull Cross Sectional Area (ft^2)	N/A	8.7		23.9	24.1	17.8	19.7	6.6	8.7	7.8	8.5	16.5	17.5	34.2	36.9	8.9	12.2	8.8		7.7	8.1
Width/Depth Ratio		8.5		13.9	14.2	5.8	7.1	7.9	9.3	10.0	12.8	10.1	13.9	17.9	19.4	12.3	14.4	13.8		14.2	20.4
Entrenchment Ratio[1]		12.2		2.6	3.4	5.5	>10.2	1.7	4.3	2.4	4.0	>2.5		1.9	1.9	>2.5		2.5	20.0	11.9	13.9
Bank Height Ratio[2]		1.4		1.0		1.0		1.0	1.0	1.4	2.1	1.0		1.0	1.2	---		1.0		1.0	1.0
D50 (mm)		0.40																		18.2	35.7
Profile																					
Riffle Length (ft)				---		---		---		---		---		---		---		---		11.5	21.6
Riffle Slope (ft/ft)		---		0.015	0.035	0.013		0.0184	0.0343	0.0183	0.0355	0.0183	0.0355	---		0.0188	0.0704	0.0065	0.0799	0.0088	0.0583
Pool Length (ft)	N/A			---		---		---		---		---		---		---		---		18.5	51.0
Pool Max Depth (ft)		2.6		2.5	2.9	3.3		1.2	1.8	14.7	16.0	1.8	1.8	---		2.6		1.6	3.2	1.9	2.0
Pool Spacing (ft)		---		48.8	91.3	71		9	46	2.5	6.1	2.5	6.1	---		2.3	6.1	28	77	33	82
Pool Volume (ft^3)																					
Pattern																					
Channel Beltwidth (ft)		N/A		N/A		38	41	10	50	N/A		N/A		N/A		102		17.6	97.9	21	44
Radius of Curvature (ft)		N/A		N/A		11	15	12	85	N/A		N/A		N/A		23	38	21	34	30	36
Rc:Bankfull Width (ft/ft)	N/A	N/A		N/A		1.3	1.4	1.9	9.1	N/A		N/A		N/A		2.0	3.1	1.9	3.1	2.7	2.8
Meander Length (ft)		N/A		N/A		--	--	53	178	N/A		N/A		N/A		45.0	81.0	55	154	79	120
Meander Width Ratio		N/A		N/A		3.4	3.6	1.6	5.4	N/A		N/A		N/A		8.3	8.9	1.6	8.9	1.9	3.5
Substrate, Bed and Transport Parameters																					
Ri%/Ru%/P%/G%/S%																					
SC%/Sa%/G%/C%/B%/Be%																					
d16/d35/d50/d84/d95/d100	N/A	0.1/0.1/0.4/14/24		---		---		---		---		---		---		---				0.07/0.39/11.4/ 55.6/90.0/256.0	
Reach Shear Stress (Competency) lb/ft^2		0.42																0.58		0.29	0.36
Max part size (mm) mobilized at bankfull																					
Stream Power (Capacity) W/m^2																					
Additional Reach Parameters																					
Drainage Area (SM)		0.30		1.38		0.96		0.37		0.28		0.97		2.90		0.29		0.30		0.30	
Watershed Impervious Cover Estimate (%)		<1%		---		---		---		---		---		---		---		<1%		<1%	
Rosgen Classification		E5		C4		E4		E4		C/E4		C/E4		B4c		C/E4		C/E4		C/E4	
Bankfull Velocity (fps)		3.6		2.9	3.7	4.9	5.4	5.0	5.6	4.1	5.2	4.2	4.5	4.2	4.5	3.8		3.5		2.3	2.7
Bankfull Discharge (cfs)		31		69.4	88.0	97		35		29.1	32.0	68.9	78.6	140.0	165.0	40		30.0		18.1	21.8
Q-NFF regression		---																			
Q-USGS extrapolation	N/A	---																			
Q-Mannings		---																			
Valley Length (ft)		---		---		---		---		---		---		---		---		702			
Channel Thalweg Length (ft)		713		---		---		---		---		---		---		---		788		793	
Sinuosity		1.11		1.05		2.3		1.0	1.3	1.1		2.3		1.0		1.3		1.15		1.13	
Water Surface Slope ($ft/ft)^2$		---		---		---		---		---		---		---		---		---		0.0079	
Bankfull Slope (ft/ft)		---		---		0.0047		0.019	0.022	0.013		0.018		0.009		0.015		0.005	0.011	0.006	0.0125

(---): Data was not provided
N/A: Not Applicable
[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 11. Morphology and Hydraulic Summary (Dimensional Parameters - Cross Section)
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

	Foust Creek - Reach 2																											
	Cross Section 1 (Riffle)								Cross Section 2 (Pool)								Cross Section 3 (Riffle)								Cross Section 4 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	561.7	561.7	561.7	561.7					561.6	561.6	561.6	561.6					558.4	558.4	558.4	558.4					558.2	558.2	558.2	558.2				
Bankfull Width (ft)	20.6	19.7	20.0	19.1					21.5	20.8	20.8	20.5					18.5	17.7	17.6	16.7					24.9	23.6	23.5	21.5				
Floodprone Width (ft)	150	150	150	150					N/A	N/A	N/A	N/A					150	150	150	150					N/A	N/A	N/A	N/A				
Bankfull Mean Depth (ft)	1.1	1.0	1.0	0.9					1.2	0.9	0.9	0.9					1.2	1.0	1.0	0.9					1.0	0.9	0.9	0.9				
Bankfull Max Depth (ft)	1.9	1.8	1.8	1.7					2.5	1.9	2.4	2.4					1.9	1.9	1.9	1.8					2.1	2.0	2.0	2.0				
Bankfull Cross Sectional Area (ft^2)	22.7	20.5	20.5	17.5					26.7	18.5	19.0	18.0					21.5	17.7	16.8	15.1					24.4	20.7	20.2	18.7				
Width/Depth Ratio	18.8	19.0	19.4	20.8					17.4	23.4	22.7	23.2					16.0	17.7	18.5	18.4					25.4	26.8	27.2	24.9				
Entrenchment Ratio[1]	7.3	7.6	7.5	7.9					N/A	N/A	N/A	N/A					8.1	8.5	8.5	9.0					N/A	N/A	N/A	N/A				
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0	1.0					N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					N/A	N/A	N/A	N/A				
	Foust Creek - Reach 2																								Foust Creek - Reach 3							
	Cross Section 5 (Riffle)								Cross Section 6 (Pool)								Cross Section 7 (Riffle)								Cross Section 8 (Riffle)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	555.7	555.7	555.7	555.7					553.5	553.5	553.5	553.5					552.9	552.9	552.9	552.9					547.9	547.9	547.9	547.9				
Bankfull Width (ft)	20.7	22.0	22.0	22.0					25.8	25.7	26.5	26.0					22.5	22.2	22.1	22.1					23.6	22.7	23.2	22.3				
Floodprone Width (ft)	150	150	150	150					N/A	N/A	N/A	N/A					150	150	150	150					150	150	150	150				
Bankfull Mean Depth (ft)	1.3	1.2	1.2	1.2					1.6	1.5	1.4	1.4					1.3	1.3	1.3	1.2					1.5	1.4	1.4	1.4				
Bankfull Max Depth (ft)	2.1	2.3	2.2	2.2					3.0	3.0	3.4	3.4					2.3	2.1	2.2	2.1					2.7	2.5	2.5	2.4				
Bankfull Cross Sectional Area (ft^2)	27.6	27.0	26.6	26.2					41.7	37.4	37.6	37.6					30.2	28.8	28.2	26.4					36.5	32.1	31.9	30.5				
Width/Depth Ratio	15.5	17.9	18.2	18.4					15.9	17.7	18.7	18.0					16.8	17.0	17.3	18.5					15.2	16.0	16.9	16.3				
Entrenchment Ratio[1]	7.2	6.8	6.8	6.8					N/A	N/A	N/A	N/A					6.7	6.8	6.8	6.8					6.4	6.6	6.5	6.7				
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0	1.0					N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					1.0	1.0	1.0	1.0				
	Foust Creek - Reach 3								UT1																			
	Cross Section 9 (Pool)								Cross Section 10 (Pool)								Cross Section 11 (Riffle)								Cross Section 12 (Pool)							
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
based on fixed bankfull elevation	547.4	547.4	547.4	547.4					562.4	562.4	562.4	562.4					562.1	562.1	562.1	562.1					557.5	557.5	557.5	557.5				
Bankfull Width (ft)	25.6	25.0	24.9	24.4					18.0	15.9	15.7	15.6					10.8	10.2	10.2	10.2					14.5	14.6	14.1	14.0				
Floodprone Width (ft)	N/A	N/A	N/A	N/A					N/A	N/A	N/A	N/A					150	150	150	150					N/A	N/A	N/A	N/A				
Bankfull Mean Depth (ft)	2.1	1.8	2.1	2.1					1.1	1.1	1.1	1.1					0.8	0.7	0.7	0.7					0.8	0.7	0.8	0.7				
Bankfull Max Depth (ft)	3.6	3.7	3.9	3.9					2.3	2.1	2.1	2.2					1.3	1.3	1.4	1.4					1.6	1.5	1.7	1.7				
Bankfull Cross Sectional Area (ft^2)	53.5	46.1	51.9	50.5					20.0	17.0	17.2	16.9					8.1	7.4	7.6	7.5					11.5	10.6	10.7	10.5				
Width/Depth Ratio	12.3	13.5	11.9	11.8					16.2	14.8	14.4	14.5					14.2	14.1	13.6	13.8					18.4	19.9	18.6	18.7				
Entrenchment Ratio[1]	N/A	N/A	N/A	N/A					N/A	N/A	N/A	N/A					13.9	14.6	14.8	14.8					N/A	N/A	N/A	N/A				
Bankfull Bank Height Ratio[2]	N/A	N/A	N/A	N/A					N/A	N/A	N/A	N/A					1.0	1.0	1.0	1.0					N/A	N/A	N/A	N/A				
	UT1																											
	Cross Section 13 (Riffle)																											
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**																				
based on fixed bankfull elevation	557.4	557.4	557.4	557.4																								
Bankfull Width (ft)	12.6	12.0	11.7	11.6																								
Floodprone Width (ft)	150	150	150	150																								
Bankfull Mean Depth (ft)	0.6	0.6	0.6	0.6																								
Bankfull Max Depth (ft)	1.5	1.1	1.2	1.1																								
Bankfull Cross Sectional Area (ft^2)	7.7	7.0	6.8	6.4																								
Width/Depth Ratio	20.4	20.6	20.2	20.8																								
Entrenchment Ratio[1]	11.9	12.5	12.8	12.9																								
Bankfull Bank Height Ratio[2]	1.0	1.0	1.0	1.0																								

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 12a. Monitoring Data - Stream Reach Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Foust Creek - Reach 2

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	18.5	22.5	17.7	22.2	17.6	22.1	16.7	22.1								
Floodprone Width (ft)	150		150		150		150									
Bankfull Mean Depth	1.1	1.3	1.0	1.3	1.0	1.3	0.9	1.2								
Bankfull Max Depth	1.9	2.3	1.8	2.3	1.8	2.2	1.7	2.2								
Bankfull Cross Sectional Area (ft^2)	21.5	30.2	17.7	28.8	16.8	28.2	15.1	26.4								
Width/Depth Ratio	15.5	18.8	17.0	19.0	17.3	19.4	18.4	20.8								
Entrenchment Ratio[1]	6.7	8.1	6.8	8.5	6.8	8.5	6.8	9.0								
Bank Height Ratio[2]	1.0		1.0		1.0		1.0									
D50 (mm)	7.3	51.8	7.7	41.3	13.5	49.9	27.6	73.4								
Profile																
Riffle Length (ft)	19.0	52.2														
Riffle Slope (ft/ft)	0.0028	0.0530														
Pool Length (ft)	42.5	96.1														
Pool Max Depth (ft)	2.0	4.3														
Pool Spacing (ft)	70	164														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	38	110														
Radius of Curvature (ft)	51	69														
Rc:Bankfull Width (ft/ft)	2.8	3.1														
Meander Wave Length (ft)	135	216														
Meander Width Ratio	2.1	4.9														
Additional Reach Parameters																
Rosgen Classification	C5															
Channel Thalweg Length (ft)	2,404															
Sinuosity (ft)	1.1															
Water Surface Slope (ft/ft)	0.0058															
Bankfull Slope (ft/ft)	0.0053															
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100	SC/0.14/0.2/45.0/90.0/128.0		SC/0.71/5.6/101.2/362/>2048		SC/1.47/11.0/75.9/146.7/512.0		0.13/0.71/13.3/109.1/160.7/256									
% of Reach with Eroding Banks	0%		0%		0%		0%									

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 12b. Monitoring Data - Stream Reach Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Foust Creek - Reach 3A

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	18.5	22.5	17.7	22.2	17.6	22.1	16.7	22.1								
Floodprone Width (ft)	150		150		150		150									
Bankfull Mean Depth	1.1	1.3	1.0	1.3	1.0	1.3	0.9	1.2								
Bankfull Max Depth	1.9	2.3	1.8	2.3	1.8	2.2	1.7	2.2								
Bankfull Cross Sectional Area (ft^2)	21.5	30.2	17.7	28.8	16.8	28.2	15.1	26.4								
Width/Depth Ratio	15.5	18.8	17.0	19.0	17.3	19.4	18.4	20.8								
Entrenchment Ratio[1]	6.7	8.1	6.8	8.5	6.8	8.5	6.8	9.0								
Bank Height Ratio[2]	1.0		1.0		1.0		1.0									
D50 (mm)	7.3	51.8	7.7	41.3	13.5	49.9	27.6	73.4								
Profile																
Riffle Length (ft)	19.0	52.2														
Riffle Slope (ft/ft)	0.0028	0.0530														
Pool Length (ft)	42.5	96.1														
Pool Max Depth (ft)	2.0	4.3														
Pool Spacing (ft)	70	164														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	38	110														
Radius of Curvature (ft)	51	69														
Rc:Bankfull Width (ft/ft)	2.8	3.1														
Meander Wave Length (ft)	135	216														
Meander Width Ratio	2.1	4.9														
Additional Reach Parameters																
Rosgen Classification	C4															
Channel Thalweg Length (ft)	317															
Sinuosity (ft)	1.1															
Water Surface Slope (ft/ft)	0.0105															
Bankfull Slope (ft/ft)	0.0085															
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100	SC/0.14/0.2/45.0/90.0/128.0		SC/0.71/5.6/101.2/362/>2048		SC/1.47/11.0/75.9/146.7/512.0		0.13/0.71/13.3/109.1/160.7/256									
% of Reach with Eroding Banks	0%		0%		0%		0%									

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 12c. Monitoring Data - Stream Reach Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

Foust Creek - Reach 3B

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	23.6		22.7		23.2		22.3									
Floodprone Width (ft)	150		150		150		150									
Bankfull Mean Depth	1.5		1.4		1.4		1.4									
Bankfull Max Depth	2.7		2.5		2.5		2.4									
Bankfull Cross Sectional Area (ft^2)	36.5		32.1		31.9		30.5									
Width/Depth Ratio	15.2		16.0		16.9		16.3									
Entrenchment Ratio[1]	6.4		6.6		6.5		6.7									
Bank Height Ratio[2]	1.0		1.0		1.0		1.0									
D50 (mm)	52.3		28.1		32.0		48.3									
Profile																
Riffle Length (ft)	24.24	34.42														
Riffle Slope (ft/ft)	0.0096	0.0300														
Pool Length (ft)	56.3	101.2														
Pool Max Depth (ft)	2.3	4.0														
Pool Spacing (ft)	34	137														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	72	128														
Radius of Curvature (ft)	55	67														
Rc:Bankfull Width (ft/ft)	2.3	2.8														
Meander Wave Length (ft)	166	234														
Meander Width Ratio	3.1	5.4														
Additional Reach Parameters																
Rosgen Classification	C/E4															
Channel Thalweg Length (ft)	1,173															
Sinuosity (ft)	1.1															
Water Surface Slope (ft/ft)	0.0056															
Bankfull Slope (ft/ft)	0.0071															
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100	SC/0.10/0.3/66.2/101.2/180.0		SC/SC/5.6/69.7/120.7/256.0		0.63/2.50/7.4/55.6/90.0/512.0		.17/1.41/15.3/120.1/180/>2048									
% of Reach with Eroding Banks	0%		0%		0%		0%									

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Table 12d. Monitoring Data - Stream Reach Data Summary
Foust Creek Mitigation Site (DMS Project No. 95715)
Monitoring Year 3 - 2017

UT1

Parameter	As-Built/Baseline		MY1		MY2		MY3		MY4		MY5		MY6		MY7	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Dimension and Substrate - Riffle																
Bankfull Width (ft)	10.8	12.6	10.2	12.0	10.2	11.7	10.2	11.6								
Floodprone Width (ft)	150		150		150		150									
Bankfull Mean Depth	0.6	0.8	0.6	0.7	0.6	0.7	0.6	0.7								
Bankfull Max Depth	1.3	1.5	1.1	1.3	1.2	1.4	1.1	1.4								
Bankfull Cross Sectional Area (ft^2)	7.7	8.1	7.0	7.4	6.8	7.6	6.4	7.5								
Width/Depth Ratio	14.2	20.4	14.1	20.6	13.6	20.2	13.8	20.8								
Entrenchment Ratio[1]	11.9	13.9	12.5	14.6	12.8	14.8	12.9	14.8								
Bank Height Ratio[2]	1.0		1.0		1.0		1.0									
D50 (mm)	18.2	35.7	17.6	21.3	15.0	30.9	32.0	37.9								
Profile																
Riffle Length (ft)	11.5	21.6														
Riffle Slope (ft/ft)	0.0088	0.0583														
Pool Length (ft)	18.5	51.0														
Pool Max Depth (ft)	1.9	2.0														
Pool Spacing (ft)	33	82														
Pool Volume (ft^3)																
Pattern																
Channel Beltwidth (ft)	21	44														
Radius of Curvature (ft)	30	36														
Rc:Bankfull Width (ft/ft)	2.7	2.8														
Meander Wave Length (ft)	79	120														
Meander Width Ratio	1.9	3.5														
Additional Reach Parameters																
Rosgen Classification	C/E4															
Channel Thalweg Length (ft)	793															
Sinuosity (ft)	1.1															
Water Surface Slope (ft/ft)	0.0079															
Bankfull Slope (ft/ft)	0.006															
Ri%/Ru%/P%/G%/S%																
SC%/Sa%/G%/C%/B%/Be%																
d16/d35/d50/d84/d95/d100	0.07/0.39/11.4/55.6/90.0/256.0		0.16/3.26/6.7/45.0/143.4/512.0		SC\SC\12.2\66.5\107.3\180.0		SC\SC\0.4\59.2\104.7\180.0									
% of Reach with Eroding Banks	0%		0%		0%		0%									

[1]Entrenchment Ratio is the flood prone width divided by the bankfull width.

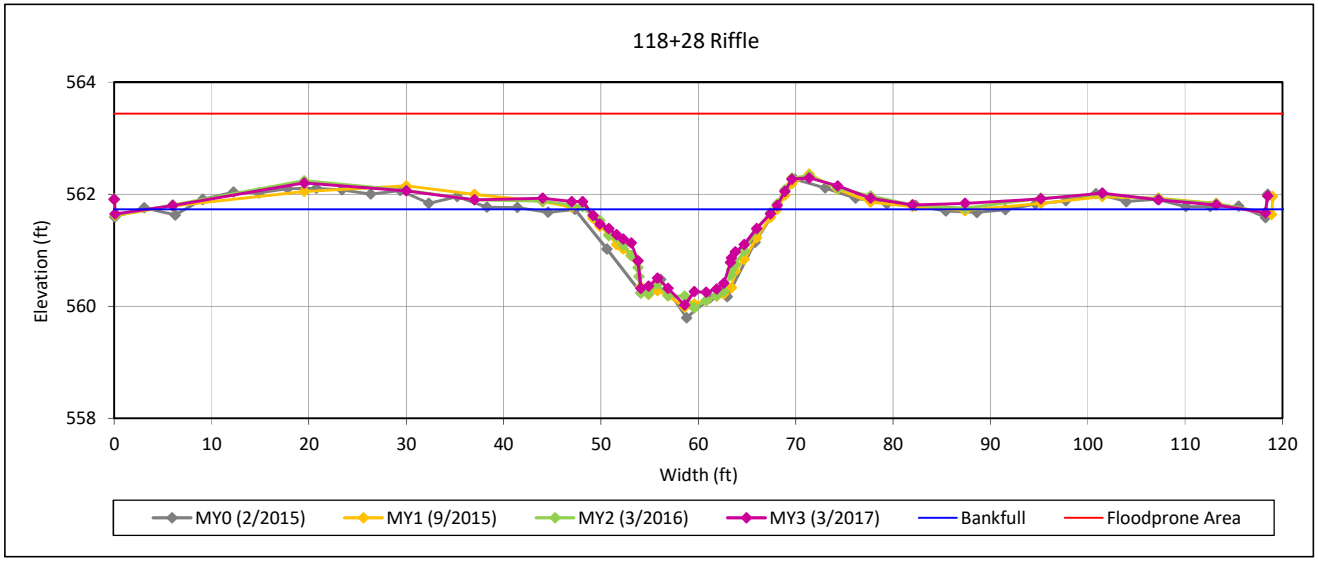
[2]Bank Height Ratio is the bank height divided by the max depth of the bankfull channel.

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 1- Foust Creek Reach 2



Bankfull Dimensions	
17.5	x-section area (ft.sq.)
19.1	width (ft)
0.9	mean depth (ft)
1.7	max depth (ft)
19.7	wetted parimeter (ft)
0.9	hyd radi (ft)
20.8	width-depth ratio
150.0	W flood prone area (ft)
7.9	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

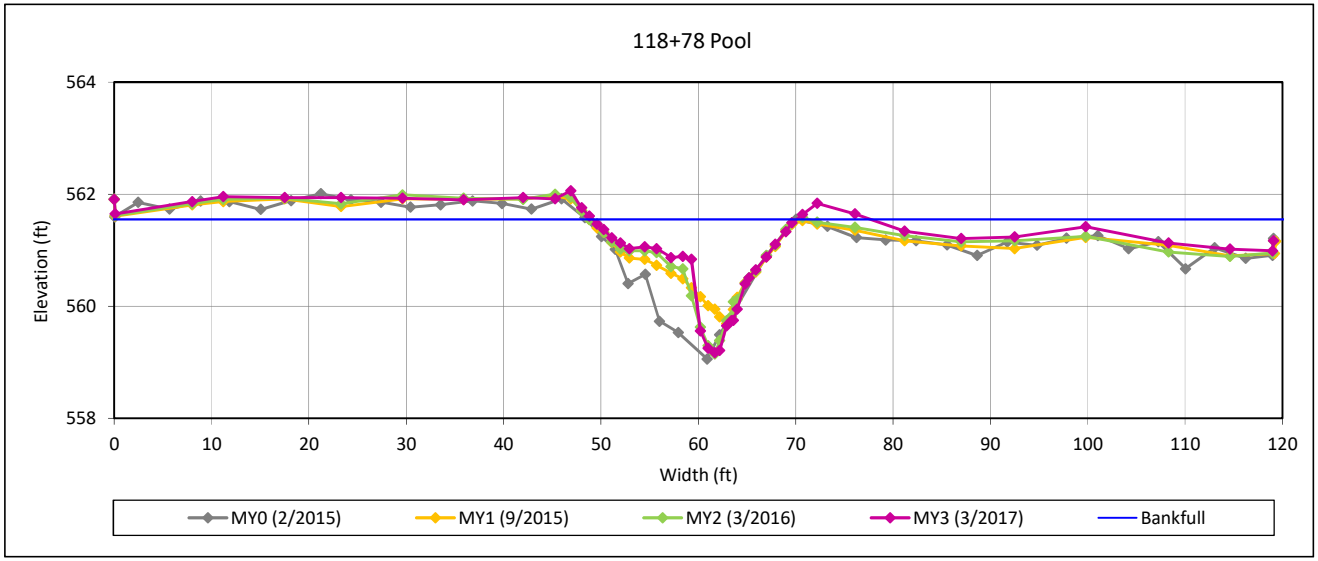
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 2- Foust Creek Reach 2



Bankfull Dimensions	
18.0	x-section area (ft.sq.)
20.5	width (ft)
0.9	mean depth (ft)
2.4	max depth (ft)
21.7	wetted parimeter (ft)
0.8	hyd radi (ft)
23.2	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

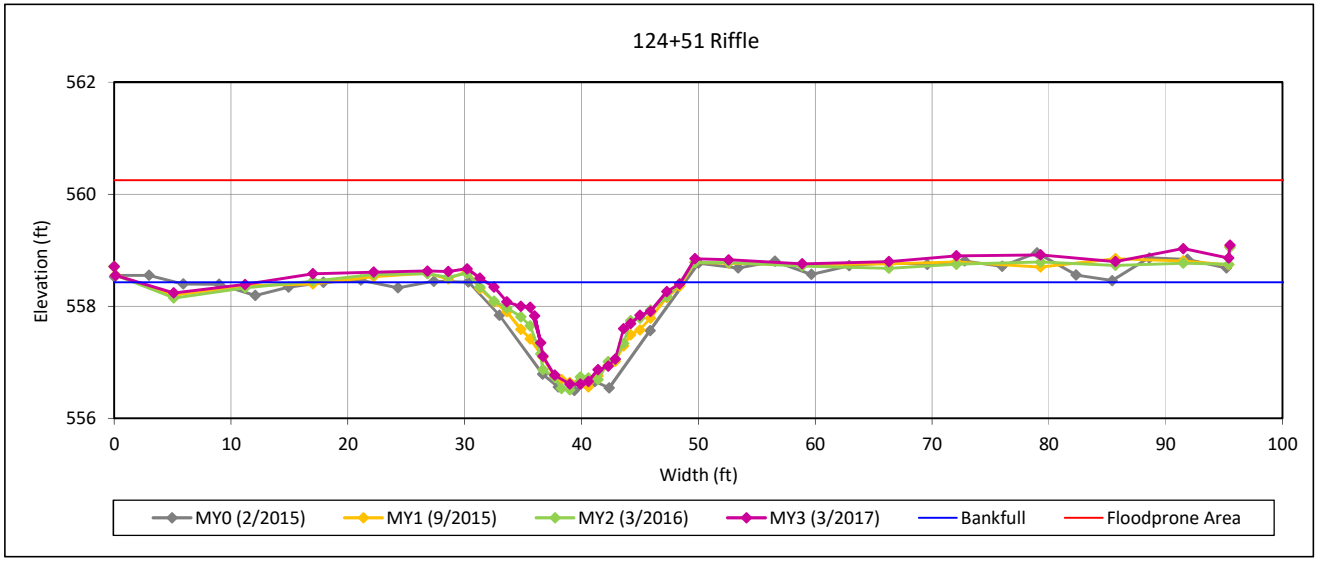
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 3- Foust Creek Reach 2



Bankfull Dimensions	
15.1	x-section area (ft.sq.)
16.7	width (ft)
0.9	mean depth (ft)
1.8	max depth (ft)
18.8	wetted parimeter (ft)
0.8	hyd radi (ft)
18.4	width-depth ratio
150.0	W flood prone area (ft)
9.0	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

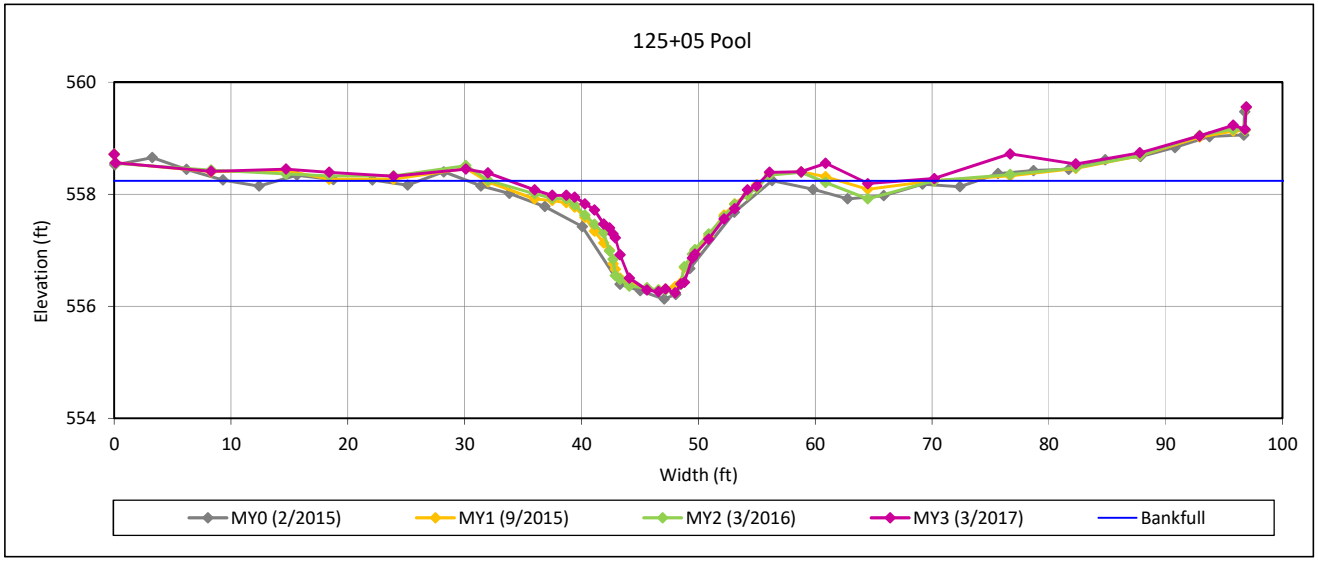
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 4- Foust Creek Reach 2



Bankfull Dimensions	
18.7	x-section area (ft.sq.)
21.5	width (ft)
0.9	mean depth (ft)
2.0	max depth (ft)
22.2	wetted parimeter (ft)
0.8	hyd radi (ft)
24.9	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

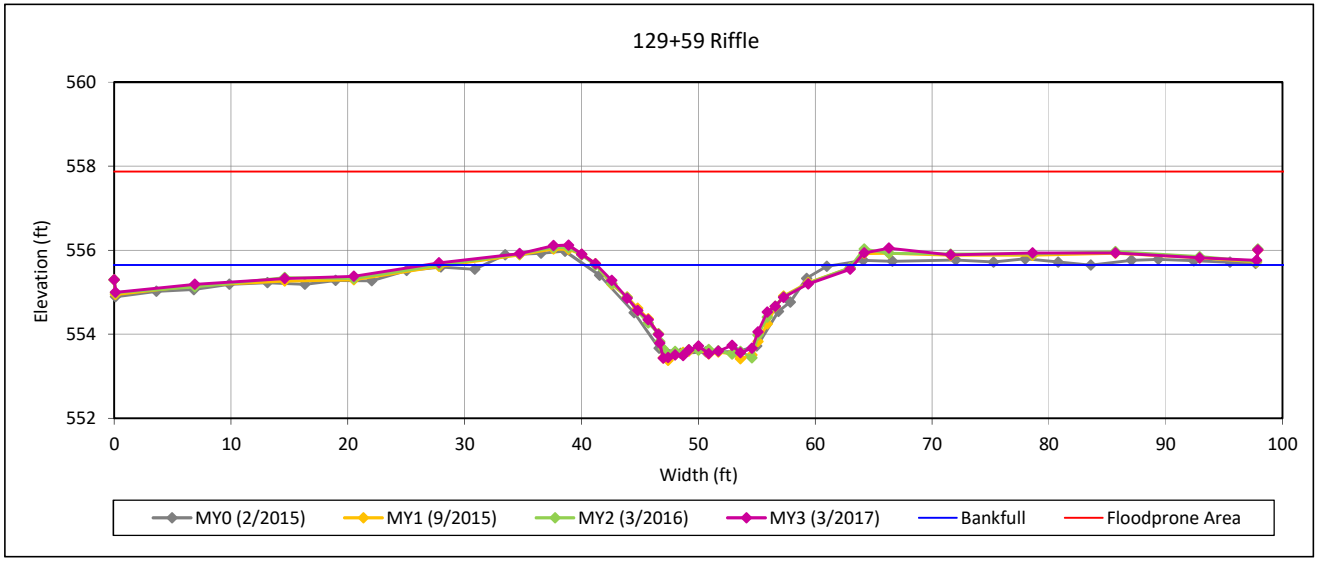
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 5- Foust Creek Reach 2



Bankfull Dimensions	
26.2	x-section area (ft.sq.)
22.0	width (ft)
1.2	mean depth (ft)
2.2	max depth (ft)
23.0	wetted parimeter (ft)
1.1	hyd radi (ft)
18.4	width-depth ratio
150.0	W flood prone area (ft)
6.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

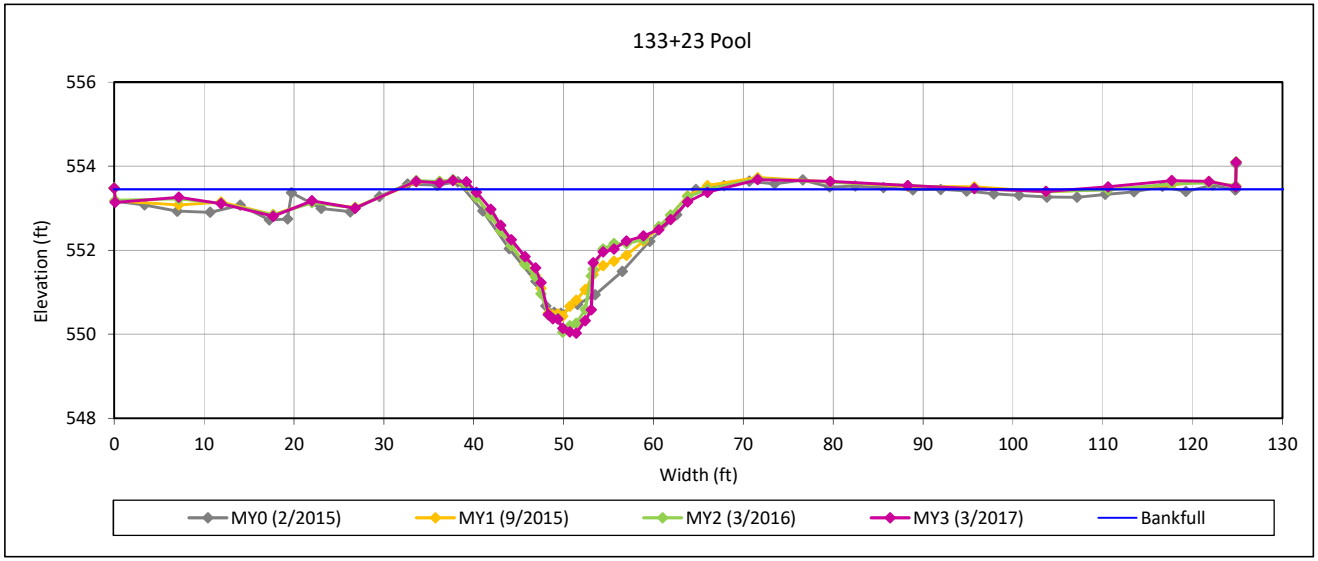
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 6- Foust Creek Reach 2



Bankfull Dimensions	
37.6	x-section area (ft.sq.)
26.0	width (ft)
1.4	mean depth (ft)
3.4	max depth (ft)
27.9	wetted parimeter (ft)
1.3	hyd radi (ft)
18.0	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

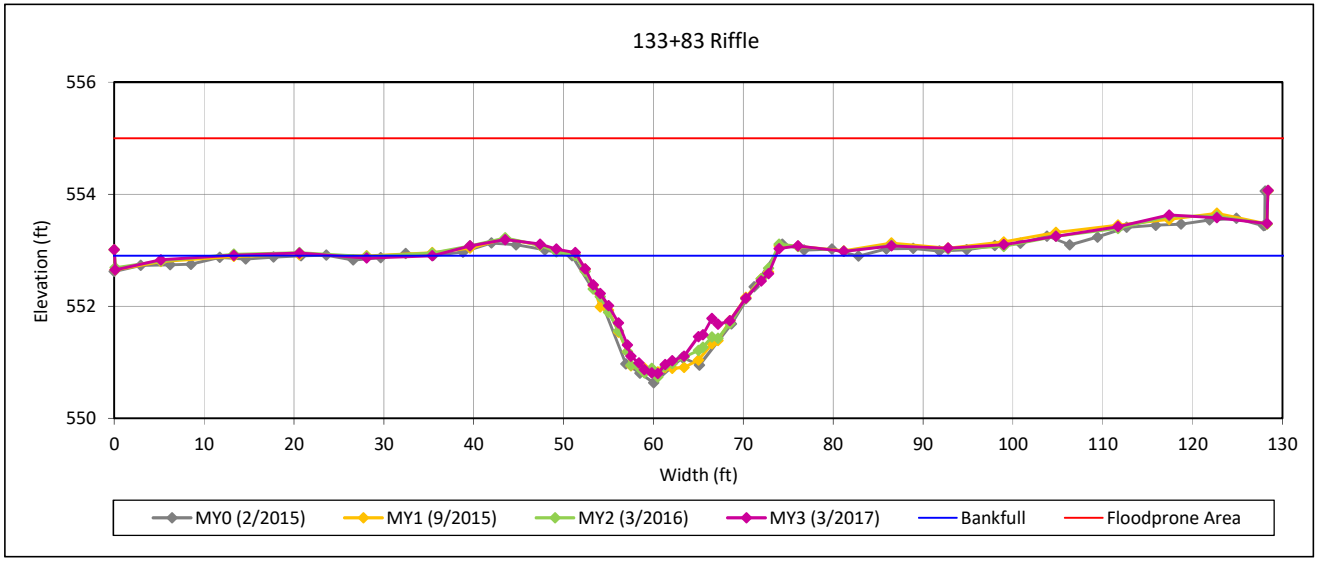
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 7- Foust Creek Reach 2



Bankfull Dimensions	
26.4	x-section area (ft.sq.)
22.1	width (ft)
1.2	mean depth (ft)
2.1	max depth (ft)
22.7	wetted parimeter (ft)
1.2	hyd radi (ft)
18.5	width-depth ratio
150.0	W flood prone area (ft)
6.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

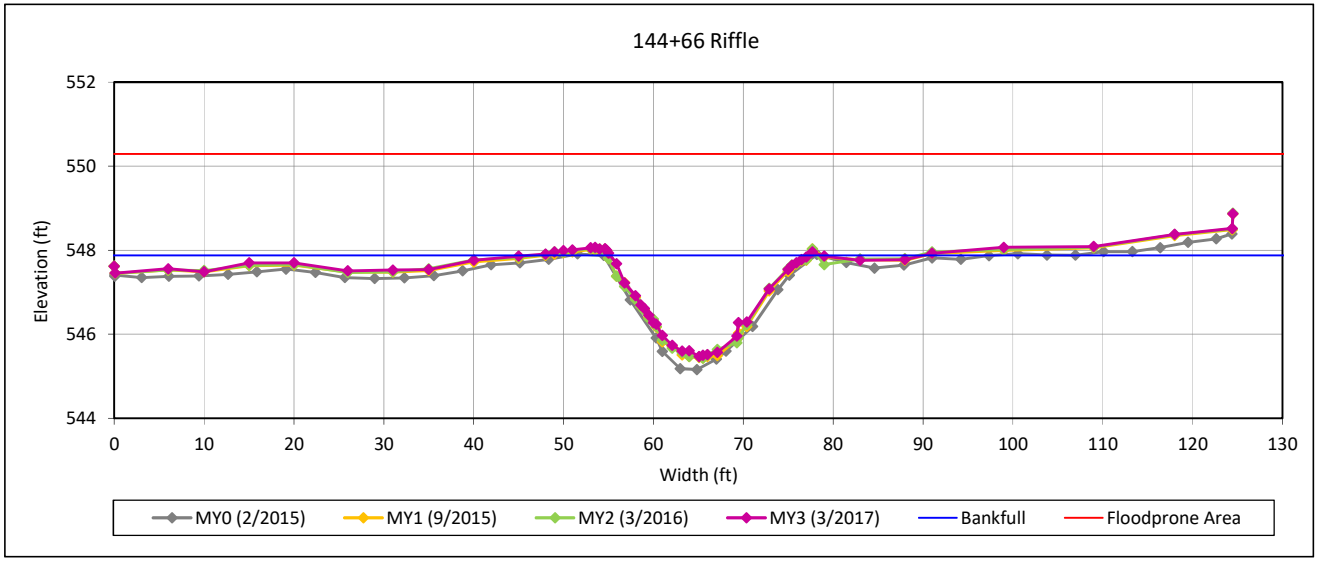
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 8- Foust Creek Reach 3B



Bankfull Dimensions	
30.5	x-section area (ft.sq.)
22.3	width (ft)
1.4	mean depth (ft)
2.4	max depth (ft)
23.1	wetted parimeter (ft)
1.3	hyd radi (ft)
16.3	width-depth ratio
150.0	W flood prone area (ft)
6.7	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

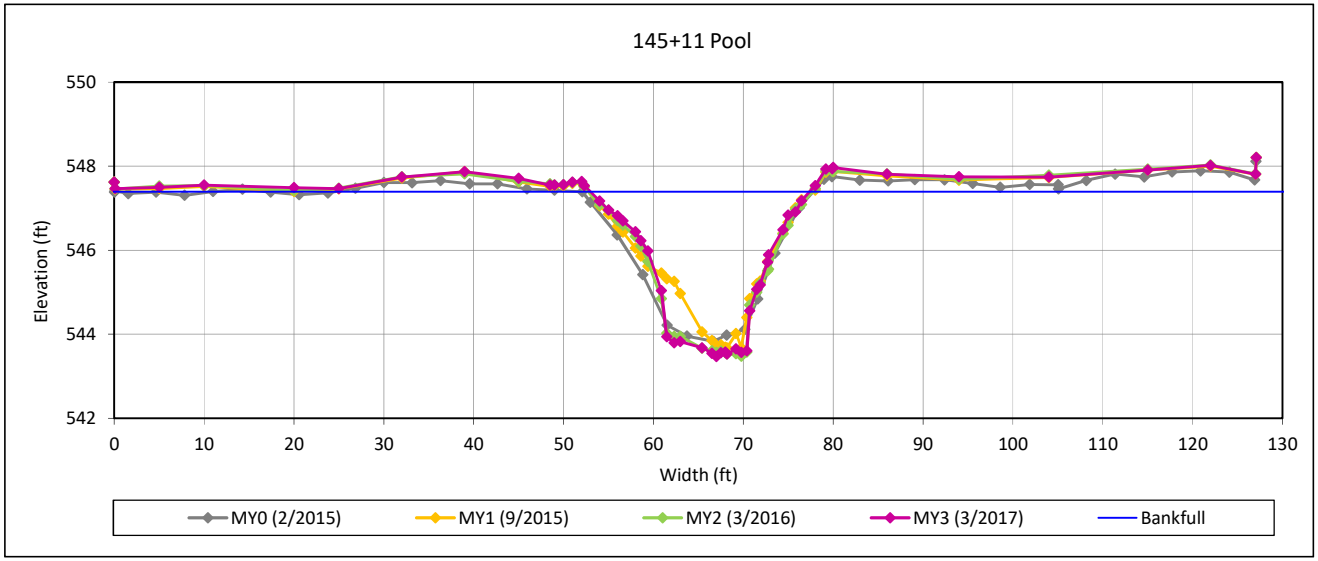
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 9- Foust Creek Reach 3B



Bankfull Dimensions	
50.5	x-section area (ft.sq.)
24.4	width (ft)
2.1	mean depth (ft)
3.9	max depth (ft)
26.9	wetted parimeter (ft)
1.9	hyd radi (ft)
11.8	width-depth ratio

Survey Date: 3/2017
Field Crew: Wildlands Engineering

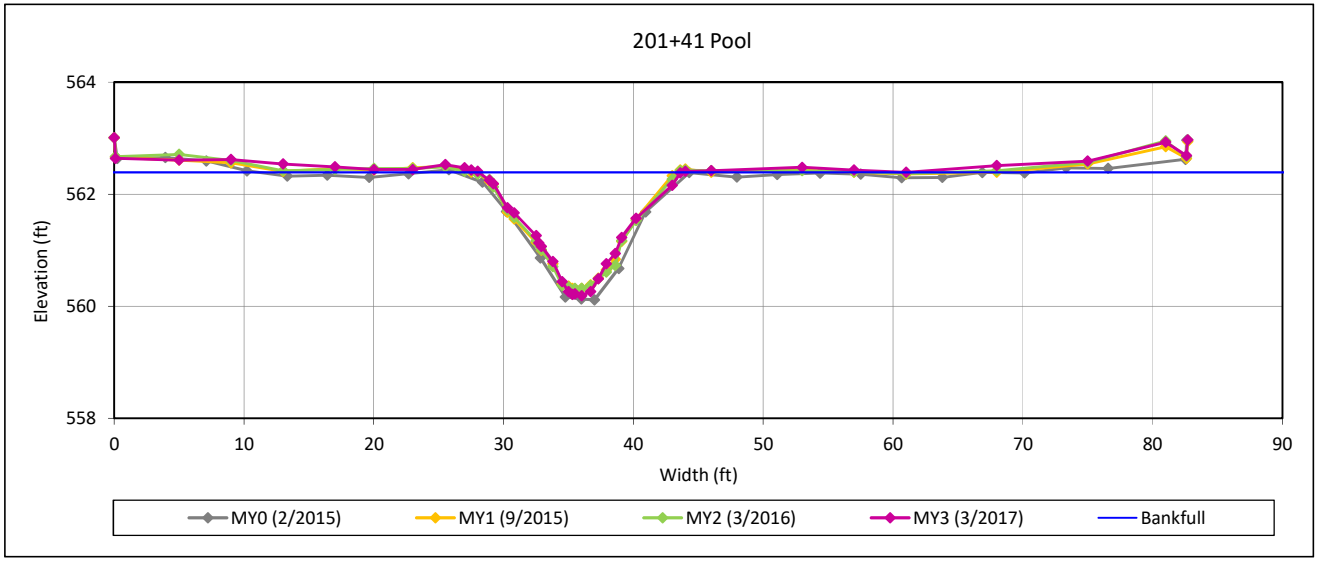
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 10-UT1



Bankfull Dimensions

16.9	x-section area (ft.sq.)
15.6	width (ft)
1.1	mean depth (ft)
2.2	max depth (ft)
16.3	wetted parimeter (ft)
1.0	hyd radi (ft)
14.5	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

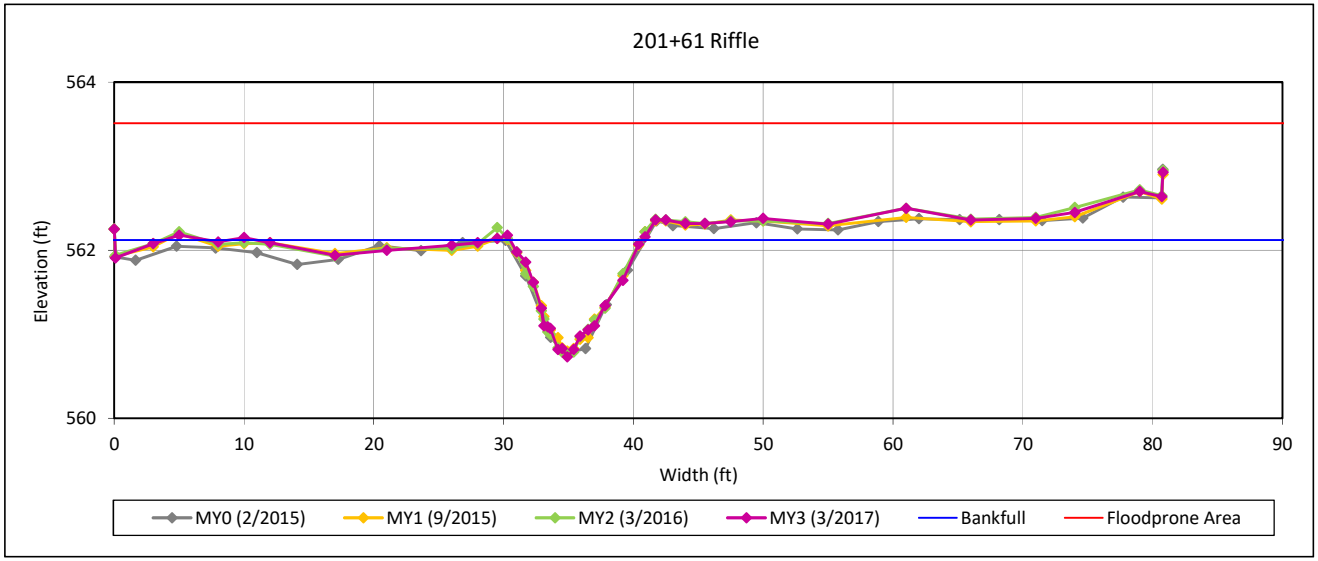
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 11-UT1



Bankfull Dimensions	
7.5	x-section area (ft.sq.)
10.2	width (ft)
0.7	mean depth (ft)
1.4	max depth (ft)
10.7	wetted parimeter (ft)
0.7	hyd radi (ft)
13.8	width-depth ratio
150.0	W flood prone area (ft)
14.8	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

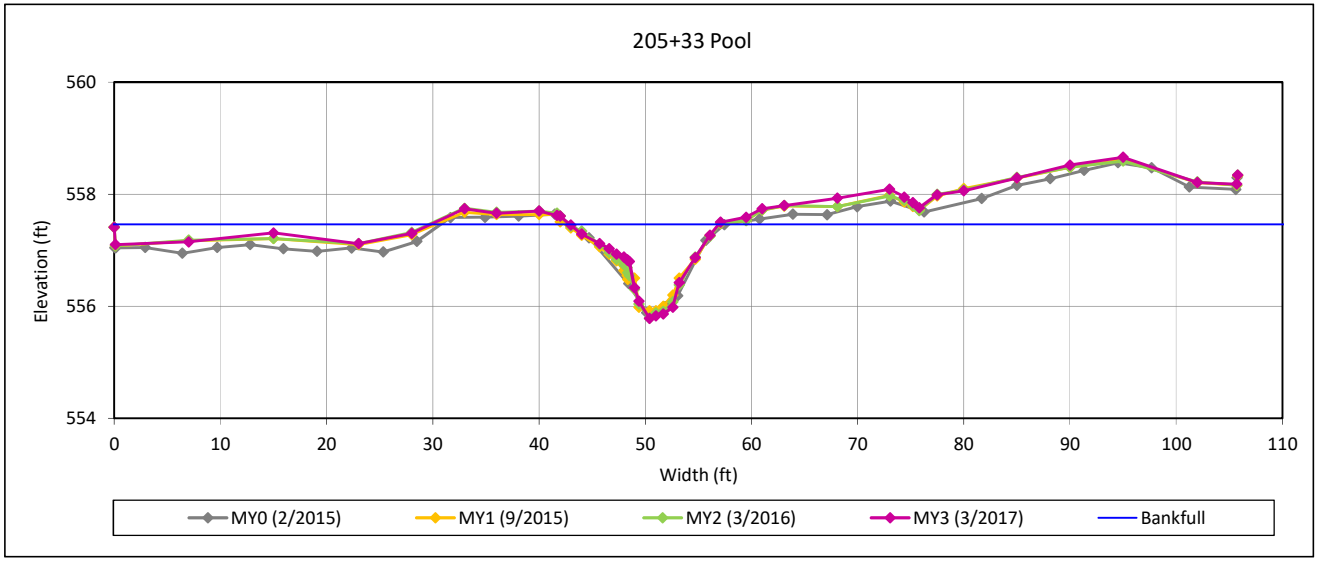
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 12-UT1



Bankfull Dimensions	
10.5	x-section area (ft.sq.)
14.0	width (ft)
0.7	mean depth (ft)
1.7	max depth (ft)
14.6	wetted parimeter (ft)
0.7	hyd radi (ft)
18.7	width-depth ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

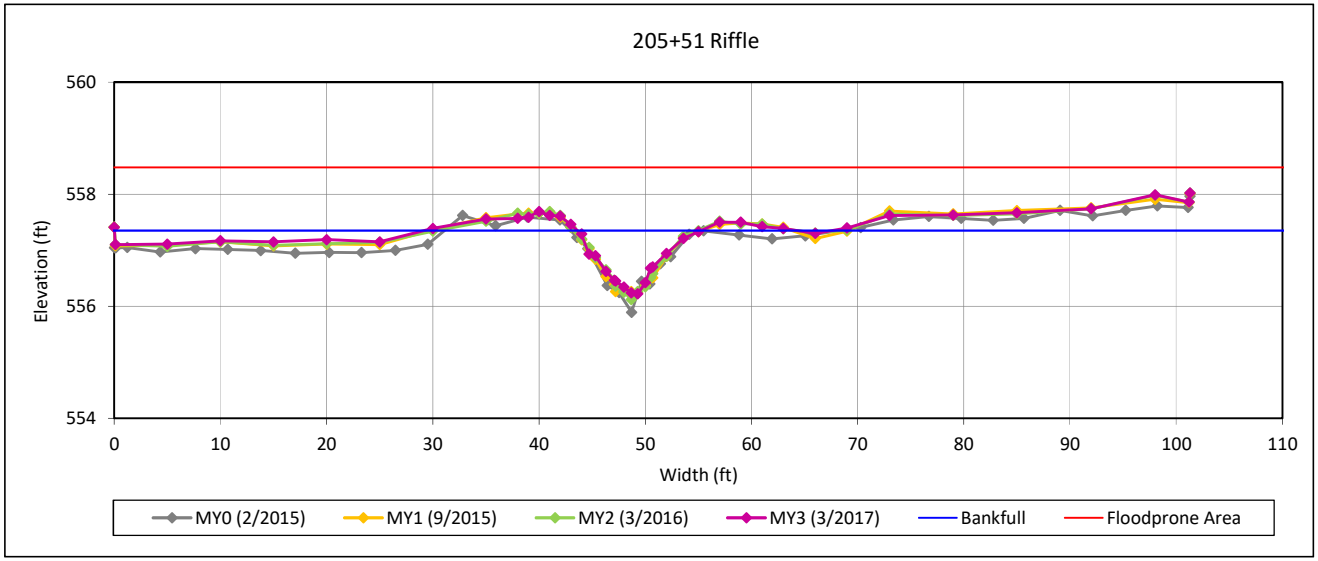
View Downstream

Cross Section Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Cross Section 13-UT1



Bankfull Dimensions	
6.4	x-section area (ft.sq.)
11.6	width (ft)
0.6	mean depth (ft)
1.1	max depth (ft)
11.9	wetted parimeter (ft)
0.5	hyd radi (ft)
20.8	width-depth ratio
150.0	W flood prone area (ft)
12.9	entrenchment ratio
1.0	low bank height ratio

Survey Date: 3/2017

Field Crew: Wildlands Engineering

View Downstream

Reachwide and Cross Section Pebble Count Plots

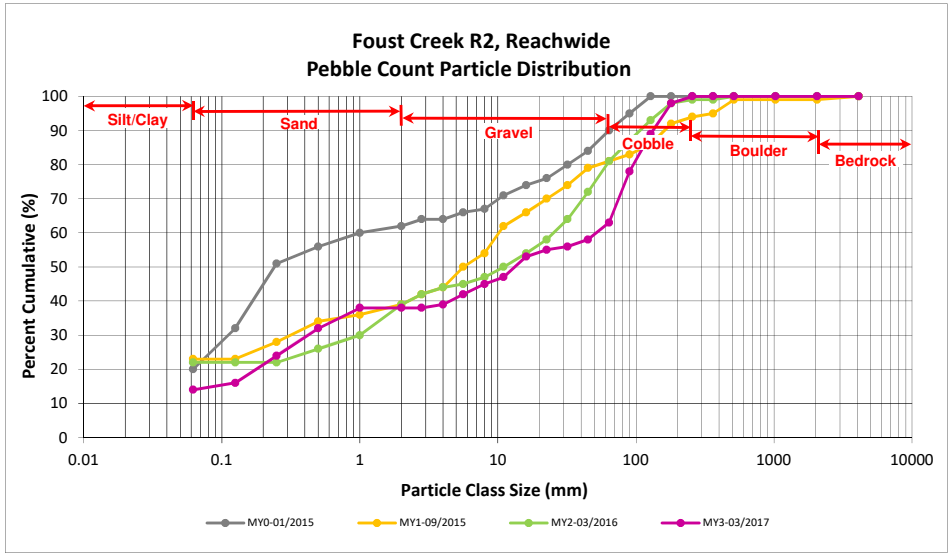
Foust Creek Mitigation Site (DMS Project No. 95715)

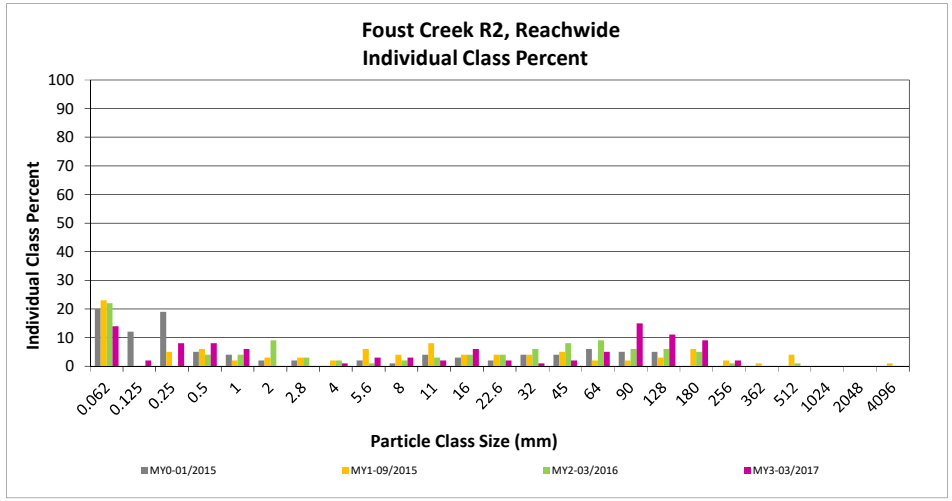
Monitoring Year 3 - 2017

Foust Creek R2, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	1	13	14	14	14
SAND	Very fine	0.062	0.125		2	2	2	16
	Fine	0.125	0.250		8	8	8	24
	Medium	0.25	0.50		8	8	8	32
	Coarse	0.5	1.0	3	3	6	6	38
	Very Coarse	1.0	2.0					38
GRAVEL	Very Fine	2.0	2.8					38
	Very Fine	2.8	4.0	1		1	1	39
	Fine	4.0	5.6	2	1	3	3	42
	Fine	5.6	8.0	2	1	3	3	45
	Medium	8.0	11.0	1	1	2	2	47
	Medium	11.0	16.0	4	2	6	6	53
	Coarse	16.0	22.6	1	1	2	2	55
	Coarse	22.6	32	1		1	1	56
	Very Coarse	32	45	2		2	2	58
	Very Coarse	45	64	5		5	5	63
COBBLE	Small	64	90	15		15	15	78
	Small	90	128	11		11	11	89
	Large	128	180	9		9	9	98
	Large	180	256	2		2	2	100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**60**	**40**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.13
D_{35} =	0.71
D_{50} =	13.3
D_{84} =	109.1
D_{95} =	160.7
D_{100} =	256.0





Reachwide and Cross Section Pebble Count Plots

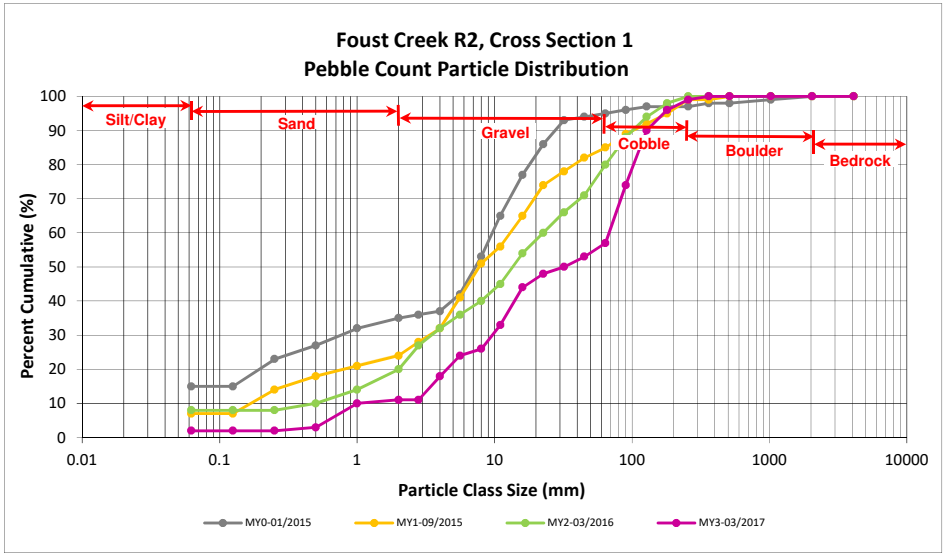
Foust Creek Mitigation Site (DMS Project No. 95715)

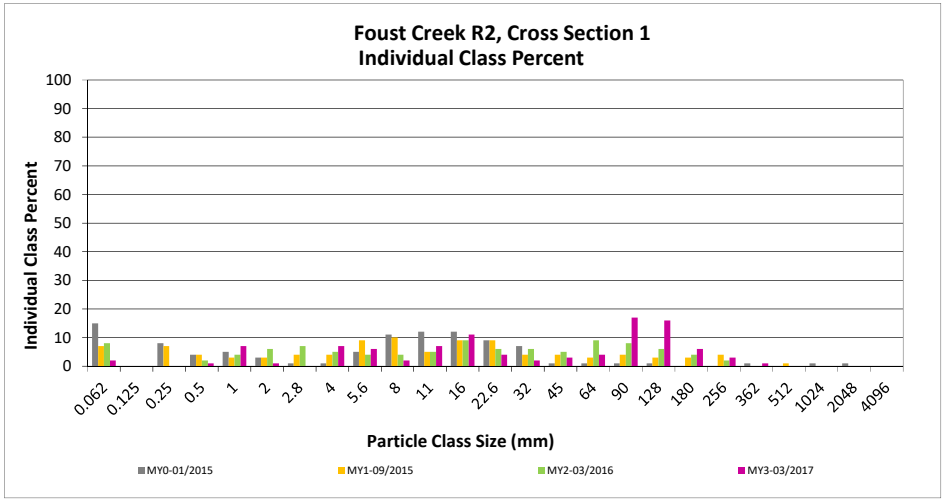
Monitoring Year 3 - 2017

Foust Creek R2, Cross Section 1

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	2	2
SAND	Very fine	0.062	0.125			2
	Fine	0.125	0.250			2
	Medium	0.25	0.50	1	1	3
	Coarse	0.5	1.0	7	7	10
	Very Coarse	1.0	2.0	1	1	11
GRAVEL	Very Fine	2.0	2.8			11
	Very Fine	2.8	4.0	7	7	18
	Fine	4.0	5.6	6	6	24
	Fine	5.6	8.0	2	2	26
	Medium	8.0	11.0	7	7	33
	Medium	11.0	16.0	11	11	44
	Coarse	16.0	22.6	4	4	48
	Coarse	22.6	32	2	2	50
	Very Coarse	32	45	3	3	53
	Very Coarse	45	64	4	4	57
COBBLE	Small	64	90	17	17	74
	Small	90	128	16	16	90
	Large	128	180	6	6	96
	Large	180	256	3	3	99
BOULDER	Small	256	362	1	1	100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 1	
Channel materials (mm)	
D_{16} =	3.61
D_{35} =	11.78
D_{50} =	32.0
D_{84} =	112.2
D_{95} =	170.1
D_{100} =	362.0





Reachwide and Cross Section Pebble Count Plots

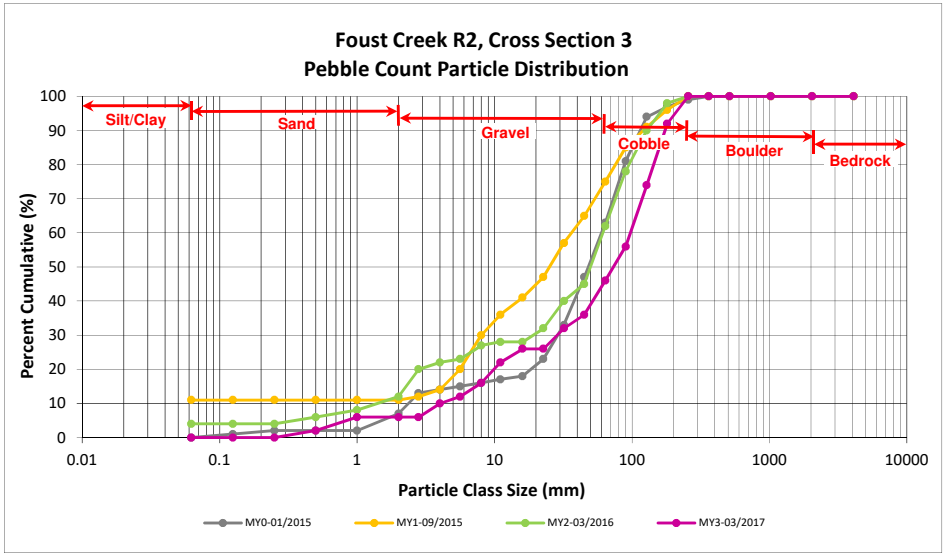
Foust Creek Mitigation Site (DMS Project No. 95715)

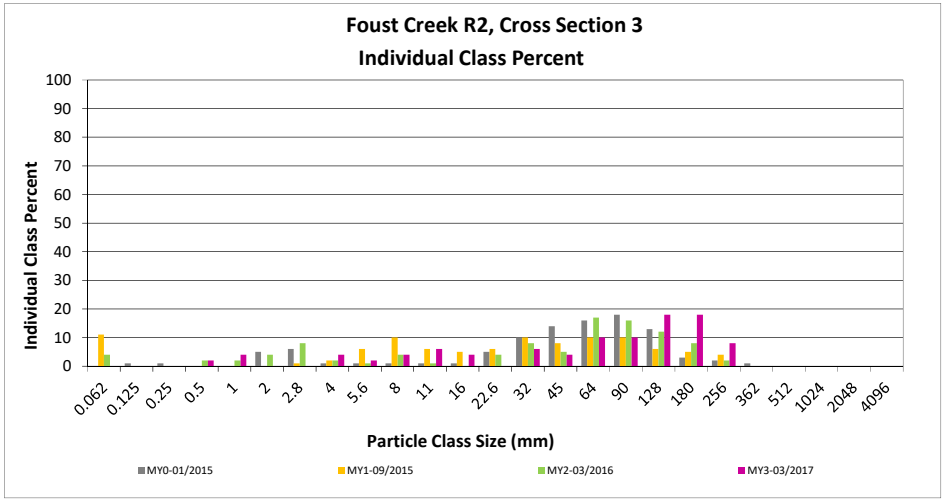
Monitoring Year 3 - 2017

Foust Creek R2, Cross Section 3

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50	2	2	2
	Coarse	0.5	1.0	4	4	6
	Very Coarse	1.0	2.0			6
GRAVEL	Very Fine	2.0	2.8			6
	Very Fine	2.8	4.0	4	4	10
	Fine	4.0	5.6	2	2	12
	Fine	5.6	8.0	4	4	16
	Medium	8.0	11.0	6	6	22
	Medium	11.0	16.0	4	4	26
	Coarse	16.0	22.6			26
	Coarse	22.6	32	6	6	32
	Very Coarse	32	45	4	4	36
	Very Coarse	45	64	10	10	46
COBBLE	Small	64	90	10	10	56
	Small	90	128	18	18	74
	Large	128	180	18	18	92
	Large	180	256	8	8	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 3	
Channel materials (mm)	
D_{16} =	8.00
D_{35} =	41.32
D_{50} =	73.4
D_{84} =	154.7
D_{95} =	205.4
D_{100} =	256.0





Reachwide and Cross Section Pebble Count Plots

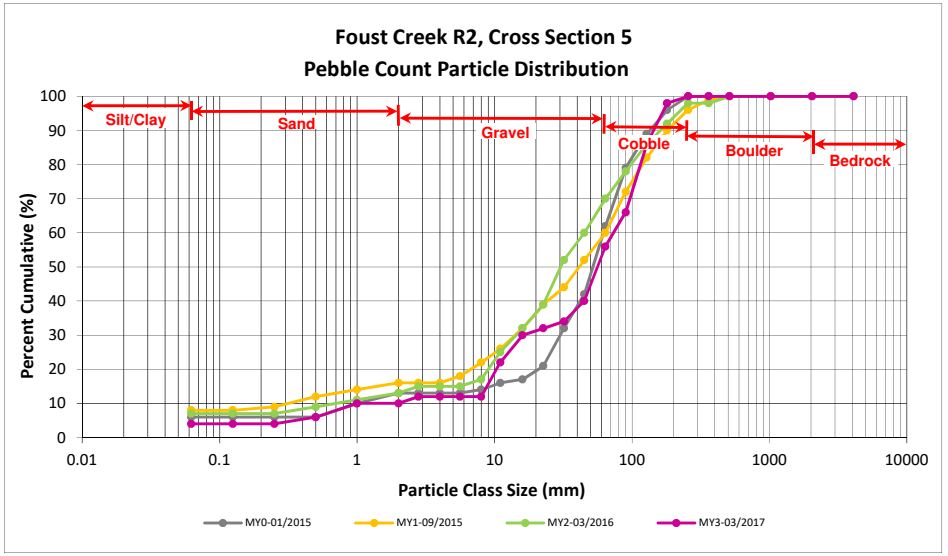
Foust Creek Mitigation Site (DMS Project No. 95715)

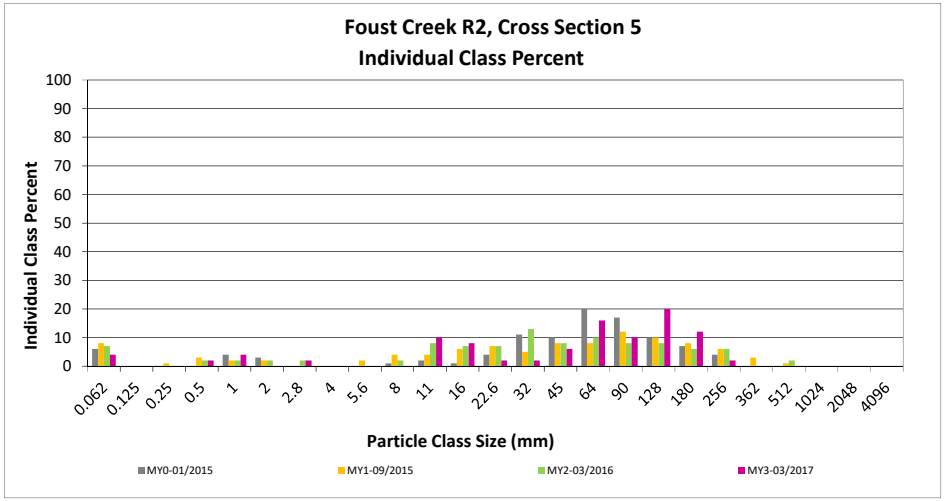
Monitoring Year 3 - 2017

Foust Creek R2, Cross Section 5

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250			4
	Medium	0.25	0.50	2	2	6
	Coarse	0.5	1.0	4	4	10
	Very Coarse	1.0	2.0			10
GRAVEL	Very Fine	2.0	2.8	2	2	12
	Very Fine	2.8	4.0			12
	Fine	4.0	5.6			12
	Fine	5.6	8.0			12
	Medium	8.0	11.0	10	10	22
	Medium	11.0	16.0	8	8	30
	Coarse	16.0	22.6	2	2	32
	Coarse	22.6	32	2	2	34
	Very Coarse	32	45	6	6	40
	Very Coarse	45	64	16	16	56
COBBLE	Small	64	90	10	10	66
	Small	90	128	20	20	86
	Large	128	180	12	12	98
	Large	180	256	2	2	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 5	
Channel materials (mm)	
D_{16} =	9.09
D_{35} =	33.87
D_{50} =	56.1
D_{84} =	123.6
D_{95} =	165.3
D_{100} =	256.0





Reachwide and Cross Section Pebble Count Plots

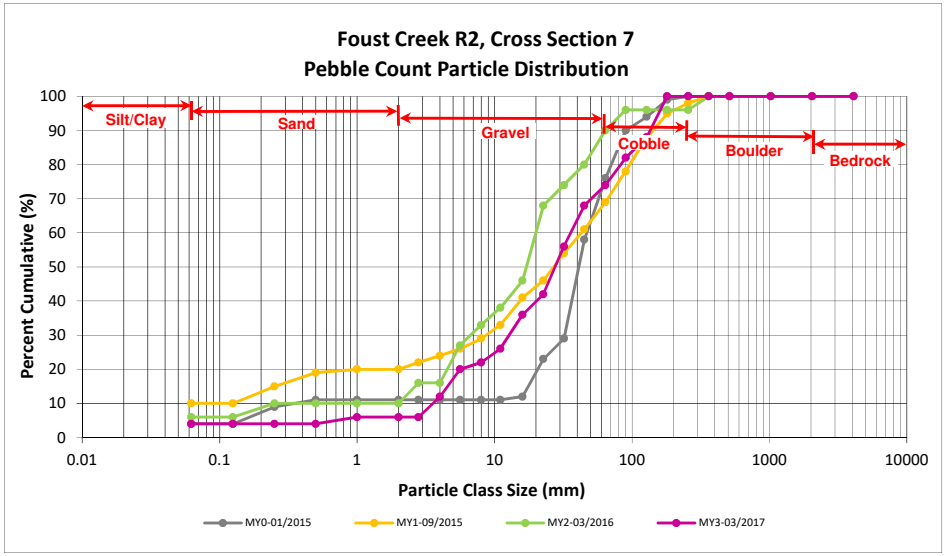
Foust Creek Mitigation Site (DMS Project No. 95715)

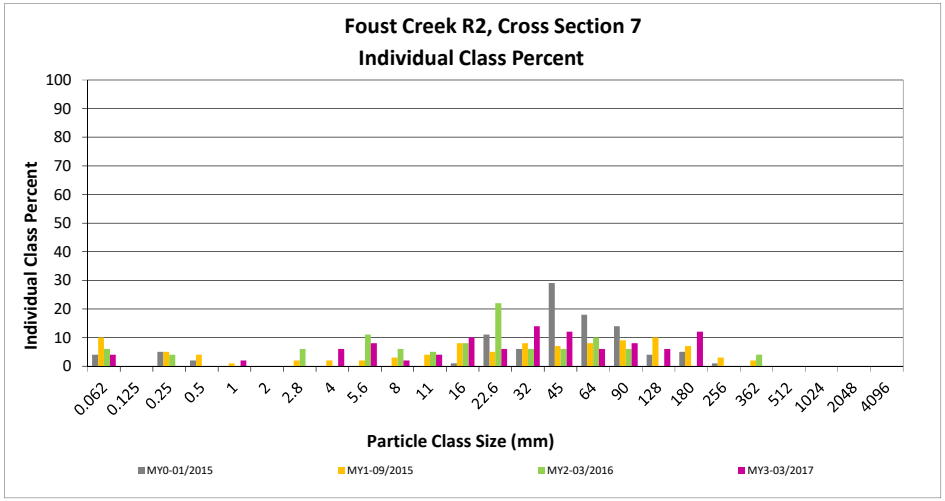
Monitoring Year 3 - 2017

Foust Creek R2, Cross Section 7

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250			4
	Medium	0.25	0.50			4
	Coarse	0.5	1.0	2	2	6
	Very Coarse	1.0	2.0			6
GRAVEL	Very Fine	2.0	2.8			6
	Very Fine	2.8	4.0	6	6	12
	Fine	4.0	5.6	8	8	20
	Fine	5.6	8.0	2	2	22
	Medium	8.0	11.0	4	4	26
	Medium	11.0	16.0	10	10	36
	Coarse	16.0	22.6	6	6	42
	Coarse	22.6	32	14	14	56
	Very Coarse	32	45	12	12	68
	Very Coarse	45	64	6	6	74
COBBLE	Small	64	90	8	8	82
	Small	90	128	6	6	88
	Large	128	180	12	12	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 7	
Channel materials (mm)	
D_{16} =	4.73
D_{35} =	15.41
D_{50} =	27.6
D_{84} =	101.2
D_{95} =	156.2
D_{100} =	180.0





Reachwide and Cross Section Pebble Count Plots

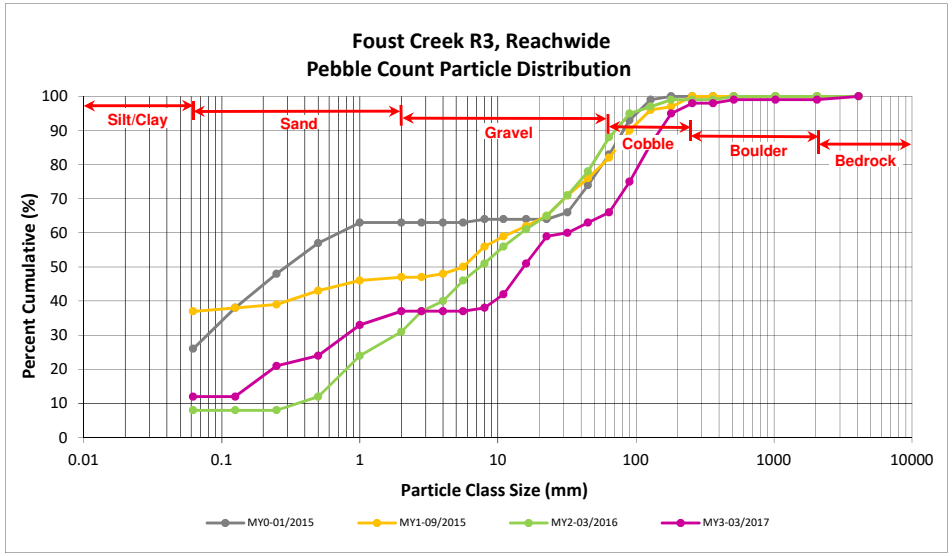
Foust Creek Mitigation Site (DMS Project No. 95715)

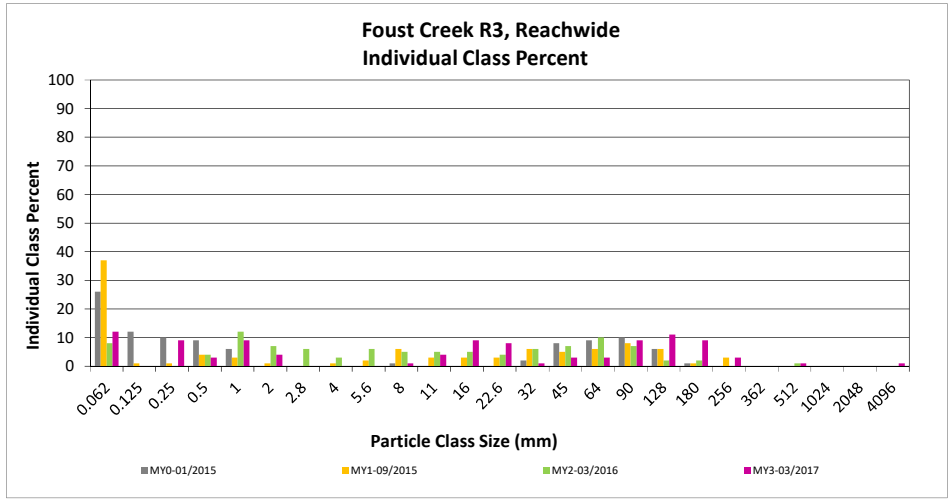
Monitoring Year 3 - 2017

Foust Creek R3, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	2	10	12	12	12
SAND	Very fine	0.062	0.125					12
	Fine	0.125	0.250		9	9	9	21
	Medium	0.25	0.50		3	3	3	24
	Coarse	0.5	1.0		9	9	9	33
	Very Coarse	1.0	2.0	1	3	4	4	37
GRAVEL	Very Fine	2.0	2.8					37
	Very Fine	2.8	4.0					37
	Fine	4.0	5.6					37
	Fine	5.6	8.0	1		1	1	38
	Medium	8.0	11.0	1	3	4	4	42
	Medium	11.0	16.0	6	3	9	9	51
	Coarse	16.0	22.6	8		8	8	59
	Coarse	22.6	32	1		1	1	60
	Very Coarse	32	45	3		3	3	63
	Very Coarse	45	64	3		3	3	66
COBBLE	Small	64	90	9		9	9	75
	Small	90	128	11		11	11	86
	Large	128	180	9		9	9	95
	Large	180	256	3		3	3	98
BOULDER	Small	256	362					98
	Small	362	512	1		1	1	99
	Medium	512	1024					99
	Large/Very Large	1024	2048					99
BEDROCK	Bedrock	2048	>2048	1		1	1	100
			Total	**60**	**40**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	0.17
D_{35} =	1.41
D_{50} =	15.3
D_{84} =	120.1
D_{95} =	180.0
D_{100} =	>2048





Reachwide and Cross Section Pebble Count Plots

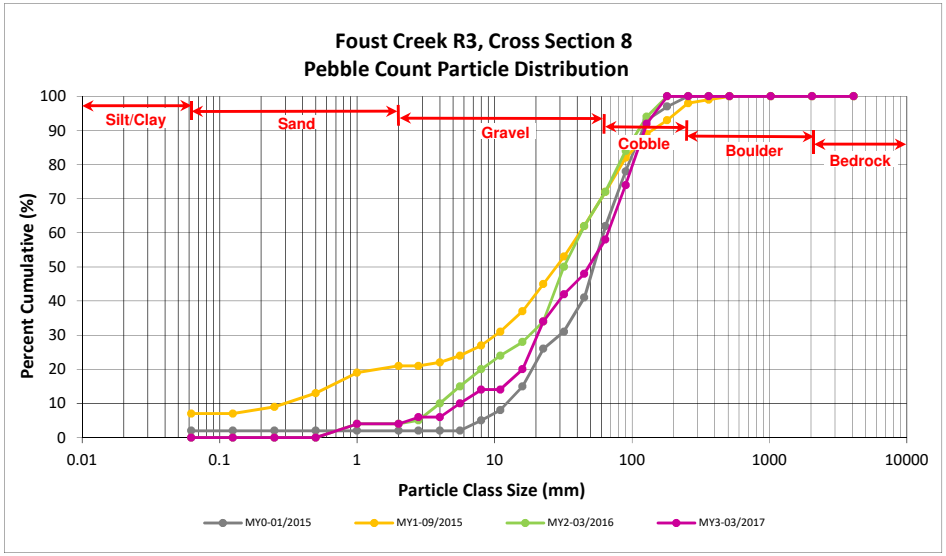
Foust Creek Mitigation Site (DMS Project No. 95715)

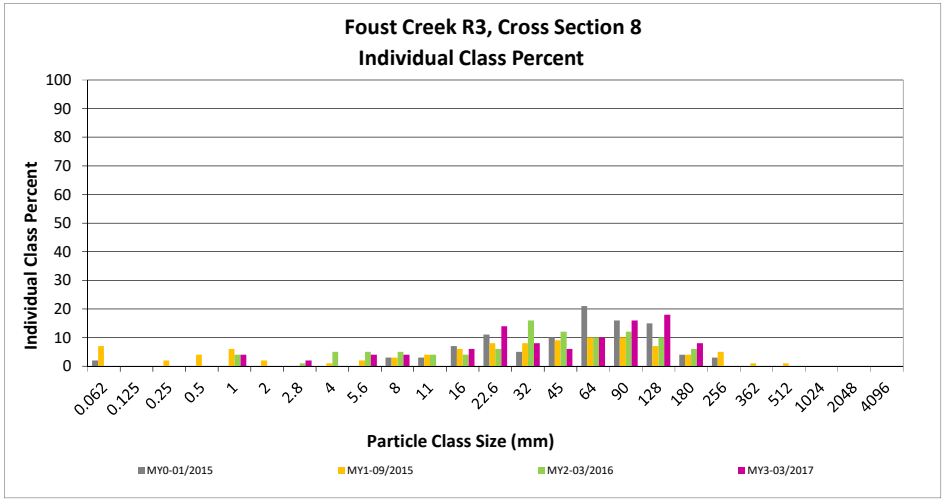
Monitoring Year 3 - 2017

Foust Creek R3, Cross Section 8

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062			0
SAND	Very fine	0.062	0.125			0
	Fine	0.125	0.250			0
	Medium	0.25	0.50			0
	Coarse	0.5	1.0	4	4	4
	Very Coarse	1.0	2.0			4
GRAVEL	Very Fine	2.0	2.8	2	2	6
	Very Fine	2.8	4.0			6
	Fine	4.0	5.6	4	4	10
	Fine	5.6	8.0	4	4	14
	Medium	8.0	11.0			14
	Medium	11.0	16.0	6	6	20
	Coarse	16.0	22.6	14	14	34
	Coarse	22.6	32	8	8	42
	Very Coarse	32	45	6	6	48
	Very Coarse	45	64	10	10	58
COBBLE	Small	64	90	16	16	74
	Small	90	128	18	18	92
	Large	128	180	8	8	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 8	
Channel materials (mm)	
D_{16} =	12.46
D_{35} =	23.60
D_{50} =	48.3
D_{84} =	109.5
D_{95} =	145.5
D_{100} =	180.0





Reachwide and Cross Section Pebble Count Plots

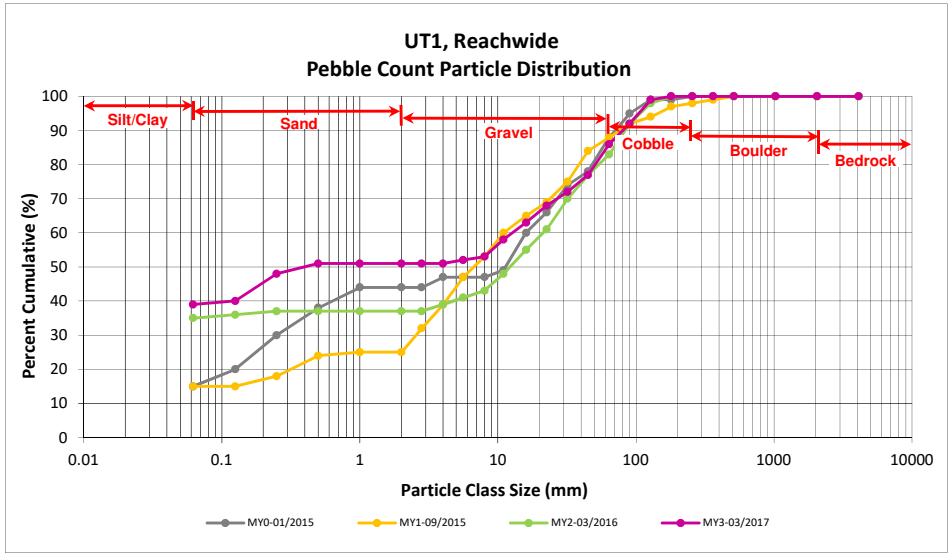
Foust Creek Mitigation Site (DMS Project No. 95715)

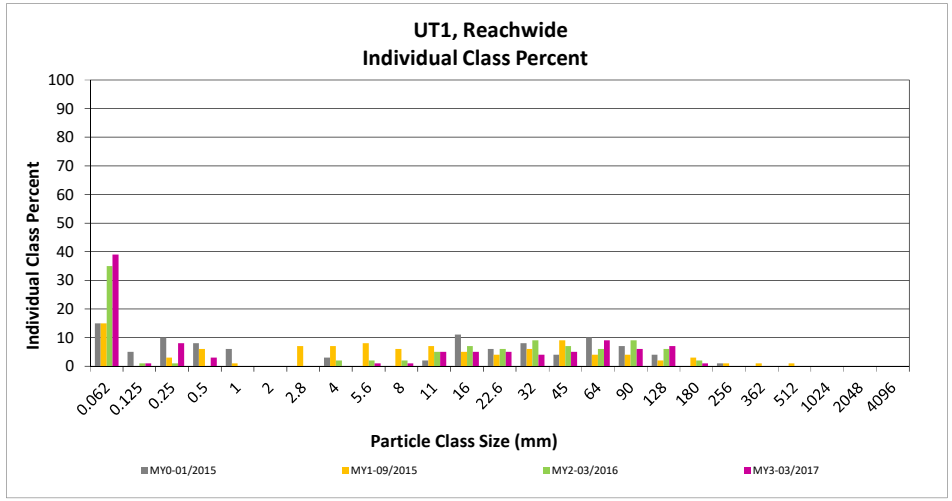
Monitoring Year 3 - 2017

UT1, Reachwide

Particle Class		Diameter (mm)		Particle Count			Reach Summary	
		min	max	Riffle	Pool	Total	Class Percentage	Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062		39	39	39	39
SAND	Very fine	0.062	0.125		1	1	1	40
	Fine	0.125	0.250	3	5	8	8	48
	Medium	0.25	0.50		3	3	3	51
	Coarse	0.5	1.0					51
	Very Coarse	1.0	2.0					51
GRAVEL	Very Fine	2.0	2.8					51
	Very Fine	2.8	4.0					51
	Fine	4.0	5.6	1		1	1	52
	Fine	5.6	8.0	1		1	1	53
	Medium	8.0	11.0	5		5	5	58
	Medium	11.0	16.0	5		5	5	63
	Coarse	16.0	22.6	5		5	5	68
	Coarse	22.6	32	4		4	4	72
	Very Coarse	32	45	4	1	5	5	77
	Very Coarse	45	64	9		9	9	86
COBBLE	Small	64	90	6		6	6	92
	Small	90	128	6	1	7	7	99
	Large	128	180	1		1	1	100
	Large	180	256					100
BOULDER	Small	256	362					100
	Small	362	512					100
	Medium	512	1024					100
	Large/Very Large	1024	2048					100
BEDROCK	Bedrock	2048	>2048					100
			Total	**50**	**50**	**100**	**100**	**100**

Reachwide	
Channel materials (mm)	
D_{16} =	Silt/Clay
D_{35} =	Silt/Clay
D_{50} =	0.4
D_{84} =	59.2
D_{95} =	104.7
D_{100} =	180.0





Reachwide and Cross Section Pebble Count Plots

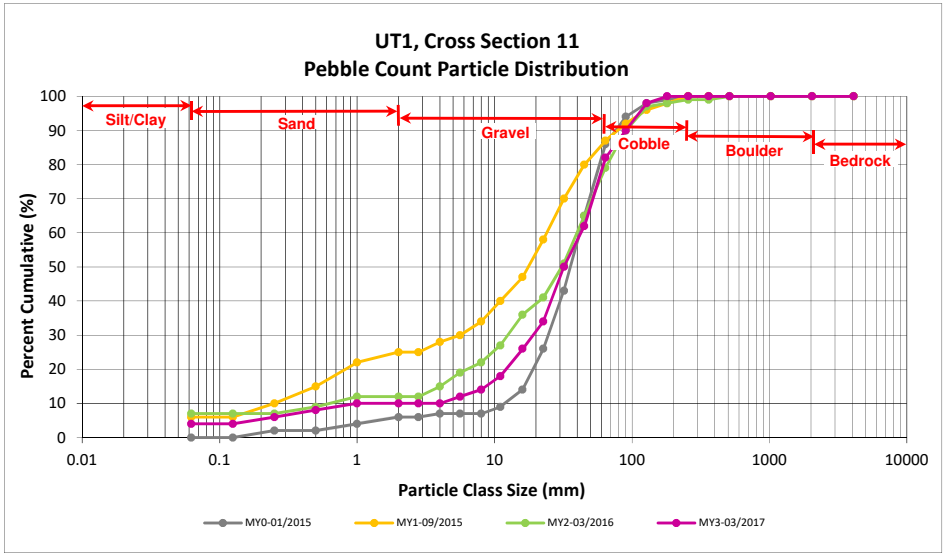
Foust Creek Mitigation Site (DMS Project No. 95715)

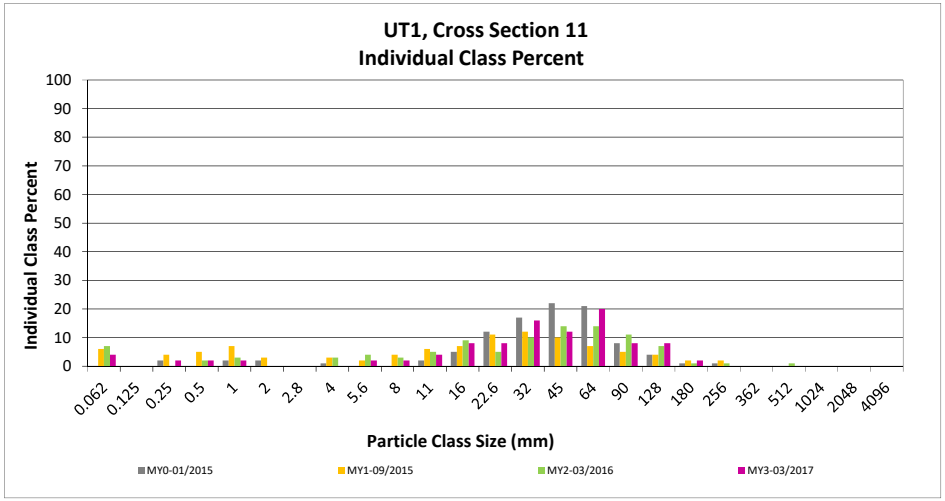
Monitoring Year 3 - 2017

UT1, Cross Section 11

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	4	4	4
SAND	Very fine	0.062	0.125			4
	Fine	0.125	0.250	2	2	6
	Medium	0.25	0.50	2	2	8
	Coarse	0.5	1.0	2	2	10
	Very Coarse	1.0	2.0			10
GRAVEL	Very Fine	2.0	2.8			10
	Very Fine	2.8	4.0			10
	Fine	4.0	5.6	2	2	12
	Fine	5.6	8.0	2	2	14
	Medium	8.0	11.0	4	4	18
	Medium	11.0	16.0	8	8	26
	Coarse	16.0	22.6	8	8	34
	Coarse	22.6	32	16	16	50
	Very Coarse	32	45	12	12	62
	Very Coarse	45	64	20	20	82
COBBLE	Small	64	90	8	8	90
	Small	90	128	8	8	98
	Large	128	180	2	2	100
	Large	180	256			100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 11	
Channel materials (mm)	
D_{16} =	9.38
D_{35} =	23.10
D_{50} =	32.0
D_{84} =	69.7
D_{95} =	112.2
D_{100} =	180.0





Reachwide and Cross Section Pebble Count Plots

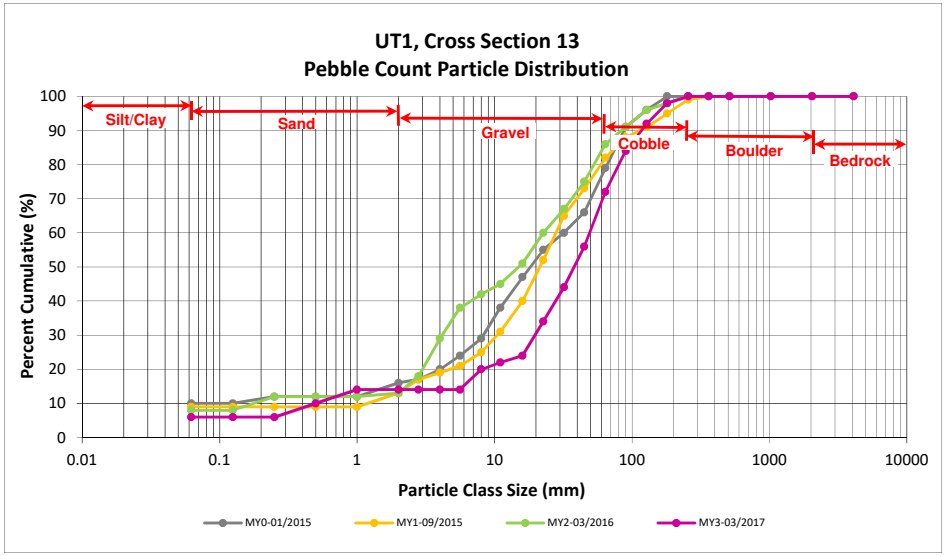
Foust Creek Mitigation Site (DMS Project No. 95715)

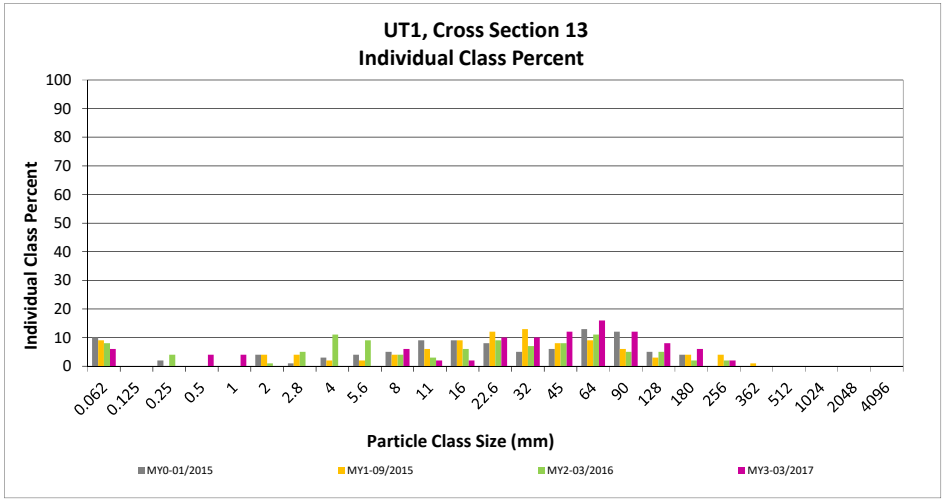
Monitoring Year 3 - 2017

UT1, Cross Section 13

Particle Class		Diameter (mm) min	Diameter (mm) max	Riffle 100-Count	Summary: Class Percentage	Summary: Percent Cumulative
SILT/CLAY	Silt/Clay	0.000	0.062	6	6	6
SAND	Very fine	0.062	0.125			6
	Fine	0.125	0.250			6
	Medium	0.25	0.50	4	4	10
	Coarse	0.5	1.0	4	4	14
	Very Coarse	1.0	2.0			14
GRAVEL	Very Fine	2.0	2.8			14
	Very Fine	2.8	4.0			14
	Fine	4.0	5.6			14
	Fine	5.6	8.0	6	6	20
	Medium	8.0	11.0	2	2	22
	Medium	11.0	16.0	2	2	24
	Coarse	16.0	22.6	10	10	34
	Coarse	22.6	32	10	10	44
	Very Coarse	32	45	12	12	56
	Very Coarse	45	64	16	16	72
COBBLE	Small	64	90	12	12	84
	Small	90	128	8	8	92
	Large	128	180	6	6	98
	Large	180	256	2	2	100
BOULDER	Small	256	362			100
	Small	362	512			100
	Medium	512	1024			100
	Large/Very Large	1024	2048			100
BEDROCK	Bedrock	2048	>2048			100
			Total	**100**	**100**	**100**

Cross Section 13	
Channel materials (mm)	
D_{16} =	6.31
D_{35} =	23.40
D_{50} =	37.9
D_{84} =	90.0
D_{95} =	151.8
D_{100} =	256.0





APPENDIX 5. Hydrology Summary Data and Plots

Table 13. Verification of Bankfull Events

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017

Reach	Date of Data Collection	Date of Occurrence	Method
Foust Creek	6/27/2017	4/24/2017	Crest Gage/ Pressure Transducer
	6/27/2017	6/20/2017	
UT1	6/27/2017	4/24/2017	
	6/27/2017	6/20/2017	

Table 14. Wetland Gage Attainment Summary

Foust Creek Mitigation Site (DMS Project No. 95715)

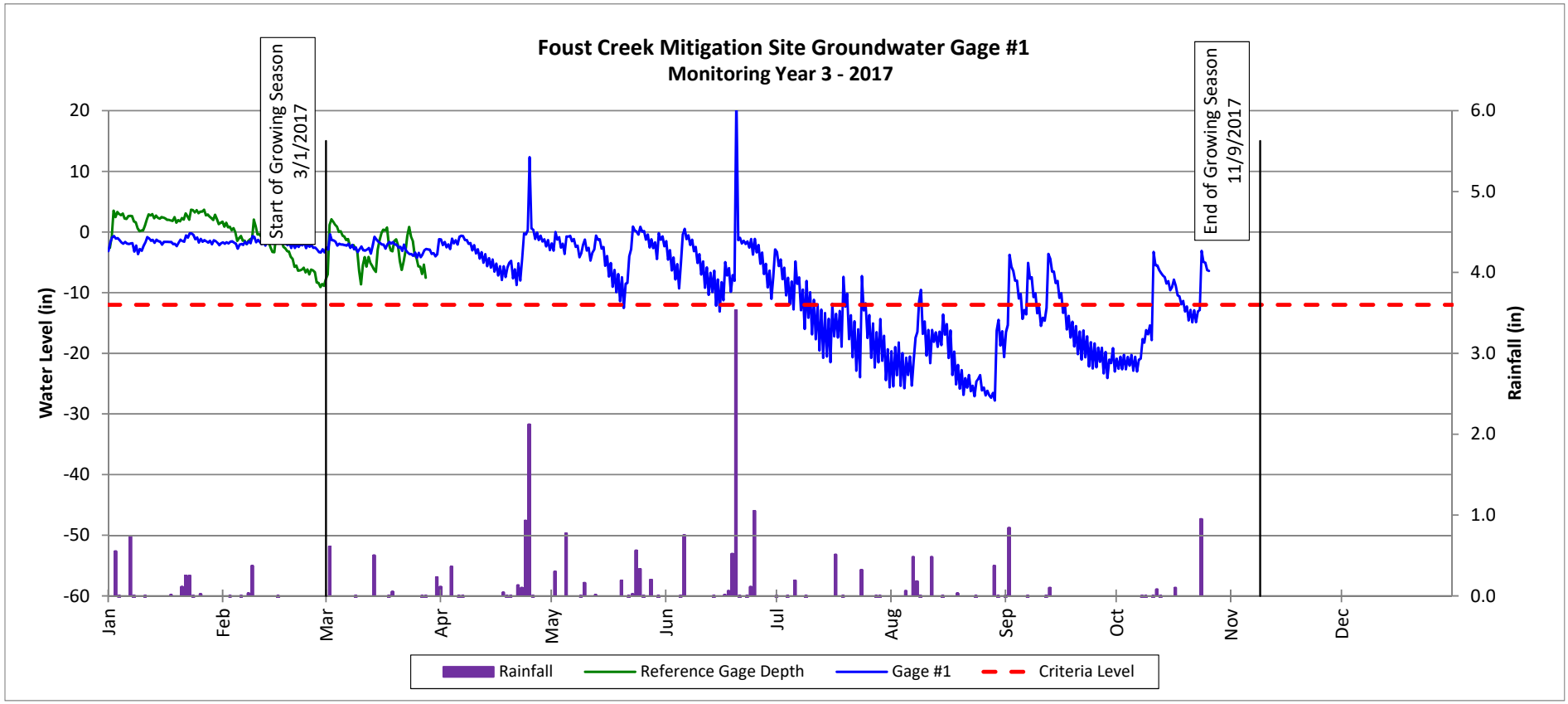
Monitoring Year 3 - 2017

Summary of Groundwater Gage Results for Monitoring Years 1 through 7							
Gage	**Success Criteria Achieved/Max Consecutive Days During Growing Season (Percentage)**						
	Year 1 (2015)	**Year 2 (2016)**	**Year 3 (2017)**	**Year 4 (2018)**	**Year 5 (2019)**	**Year 6 (2020)**	**Year 7 (2021)**
1	**Yes/93 Days (40.2%)**	**Yes/143 Days (57.0%)**	**Yes/134 Days (53.0%)**				
2	**Yes/46 Days (20.0%)**	**Yes/49 Days (19.5%)**	**Yes/44 Days (17.4%)**				
3	**Yes/57 Days (24.6%)**	**Yes/91 Days (36.3%)**	**Yes/23 Days (9.1%)**				
4	**Yes/63 Days (27.2%)**	**Yes/86 Days (34.3%)**	**Yes/132 Days (52.2%)**				
5	**Yes/124 Days (53.7%)**	**Yes/196 Days (78.1%)**	**Yes/153 Days (60.5%)**				
6	**Yes/47 Days (20.2%)**	**Yes/49 Days (19.5%)**	**Yes/45 Days (17.8%)**				
7	**Yes/152 Days (66.1%)**	**Yes/218 Days (86.9%)**	**Yes/202 Days (79.8%)**				
8	**Yes/51 Days (22.0%)**	**Yes/74 Days (29.5%)**	**Yes/23 Days (9.1%)**				
9	**No/ 16 Days (7.0%)**	**No/ 12 Days (4.8%)**	**No/10 Days (4.0%)**				
10	**Yes/ 119 Days (51.7%)**	**Yes/179 Days (71.3%)**	**Yes/144 Days (56.9%)**				

Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

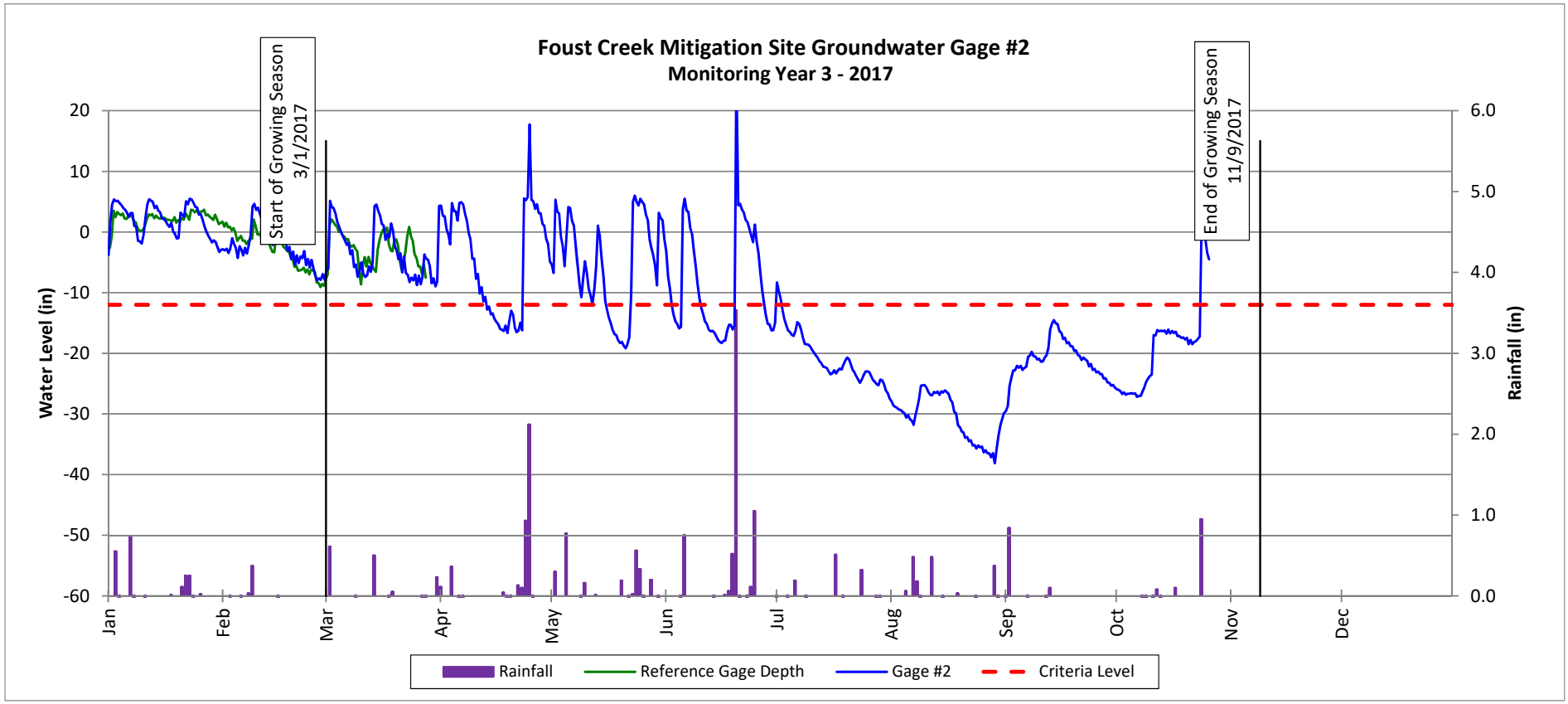
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

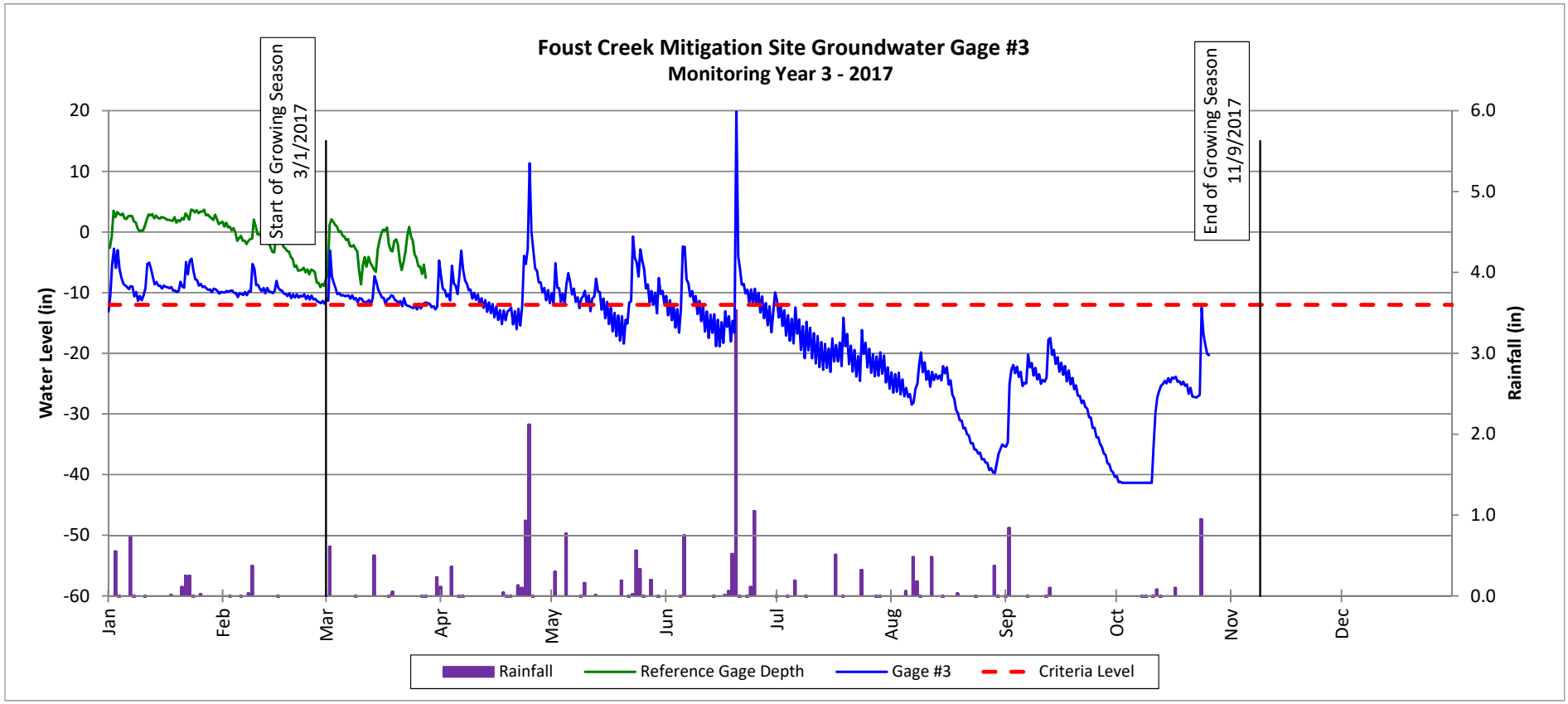
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

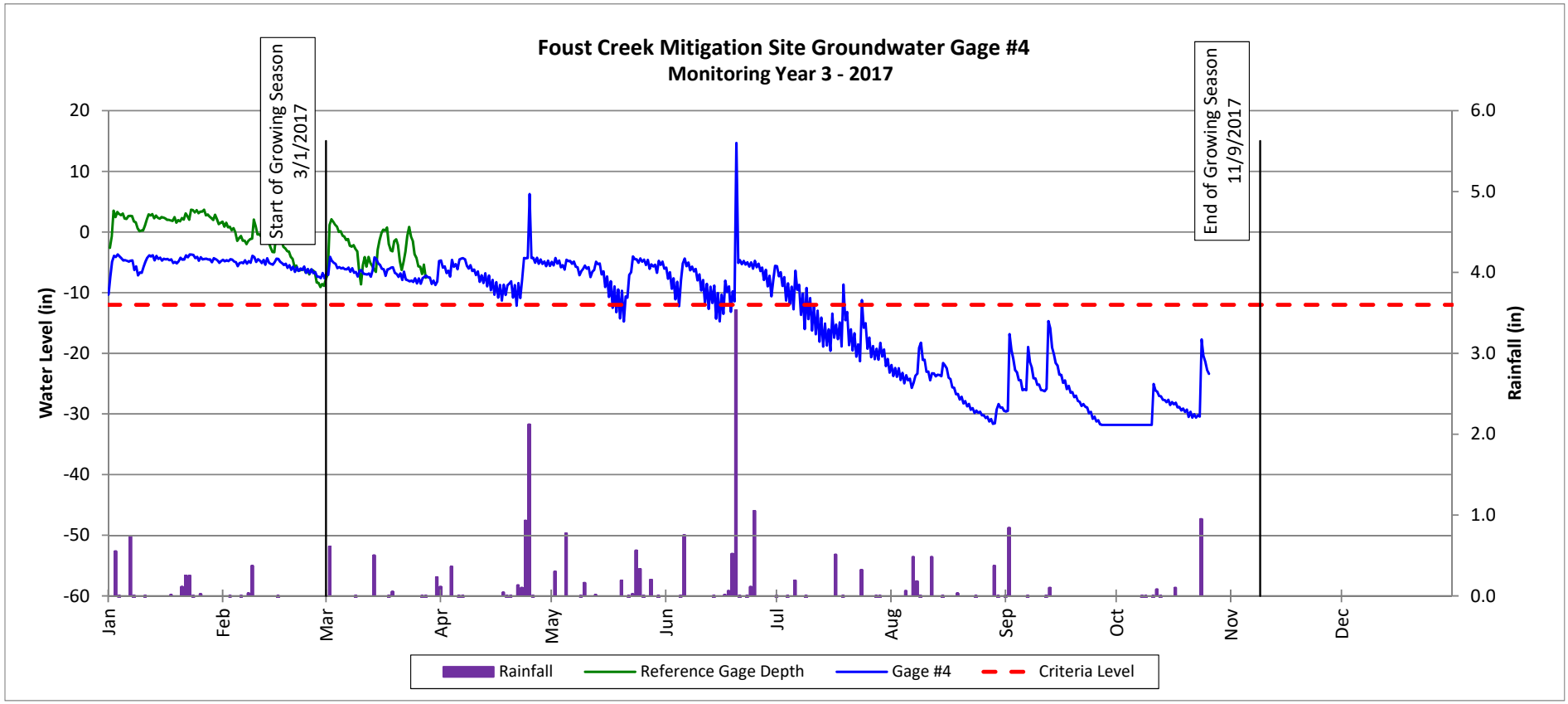
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

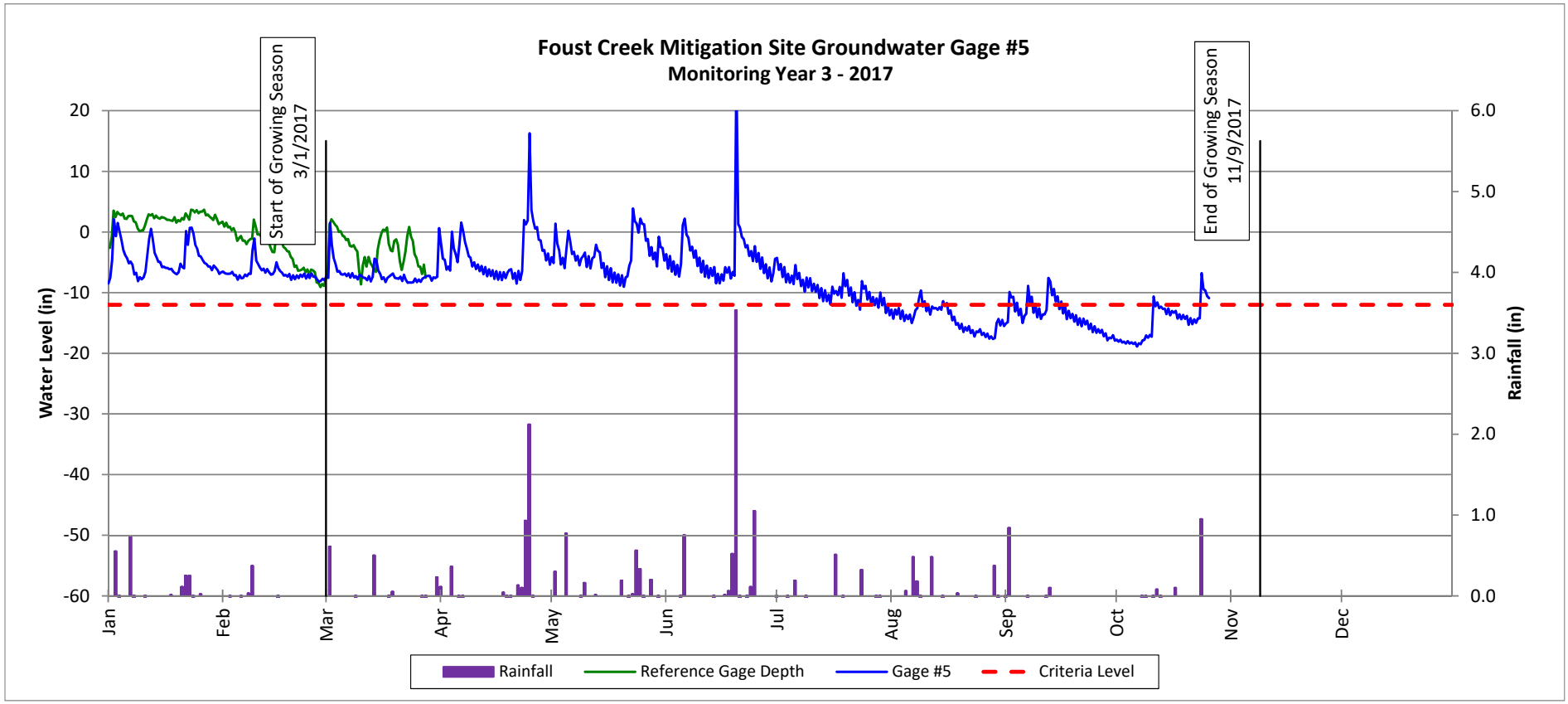
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

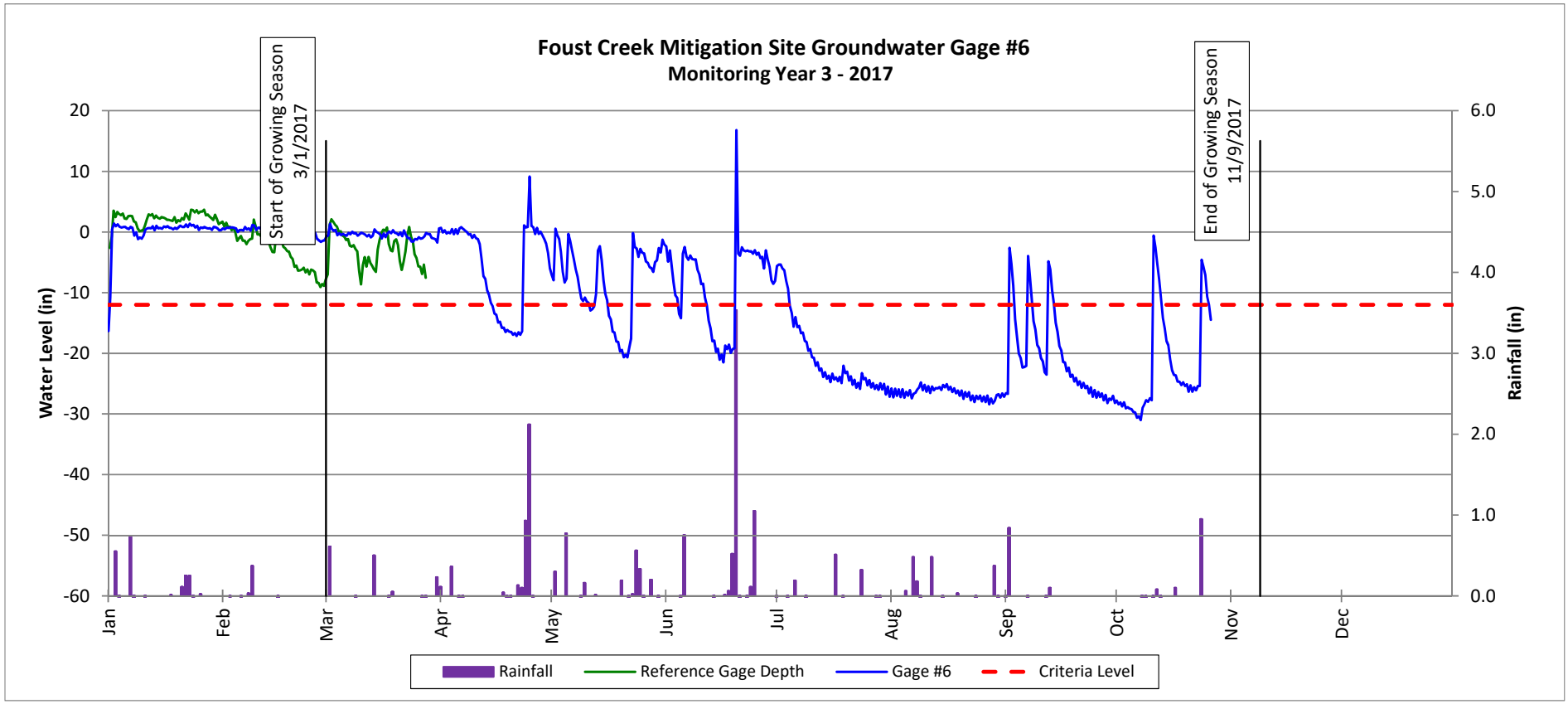
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

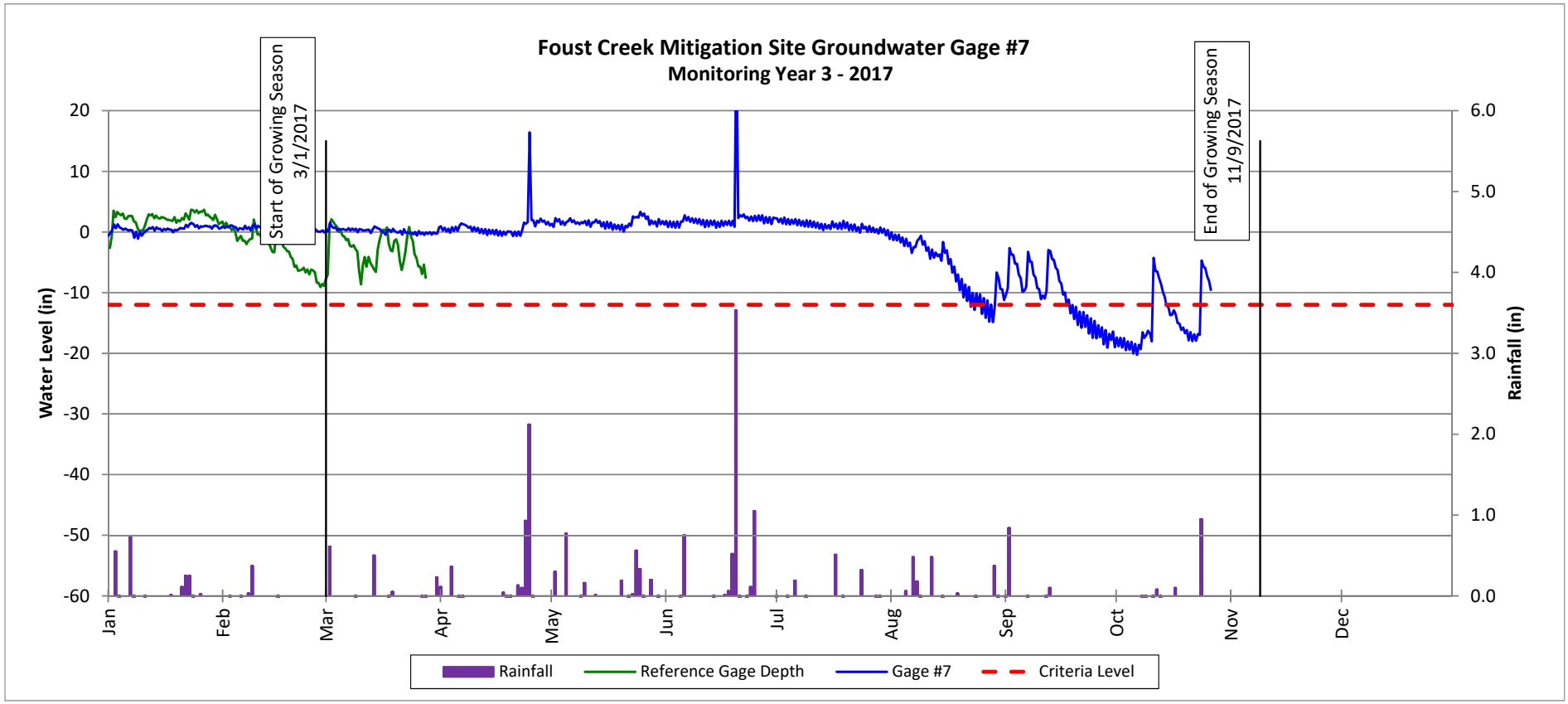
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

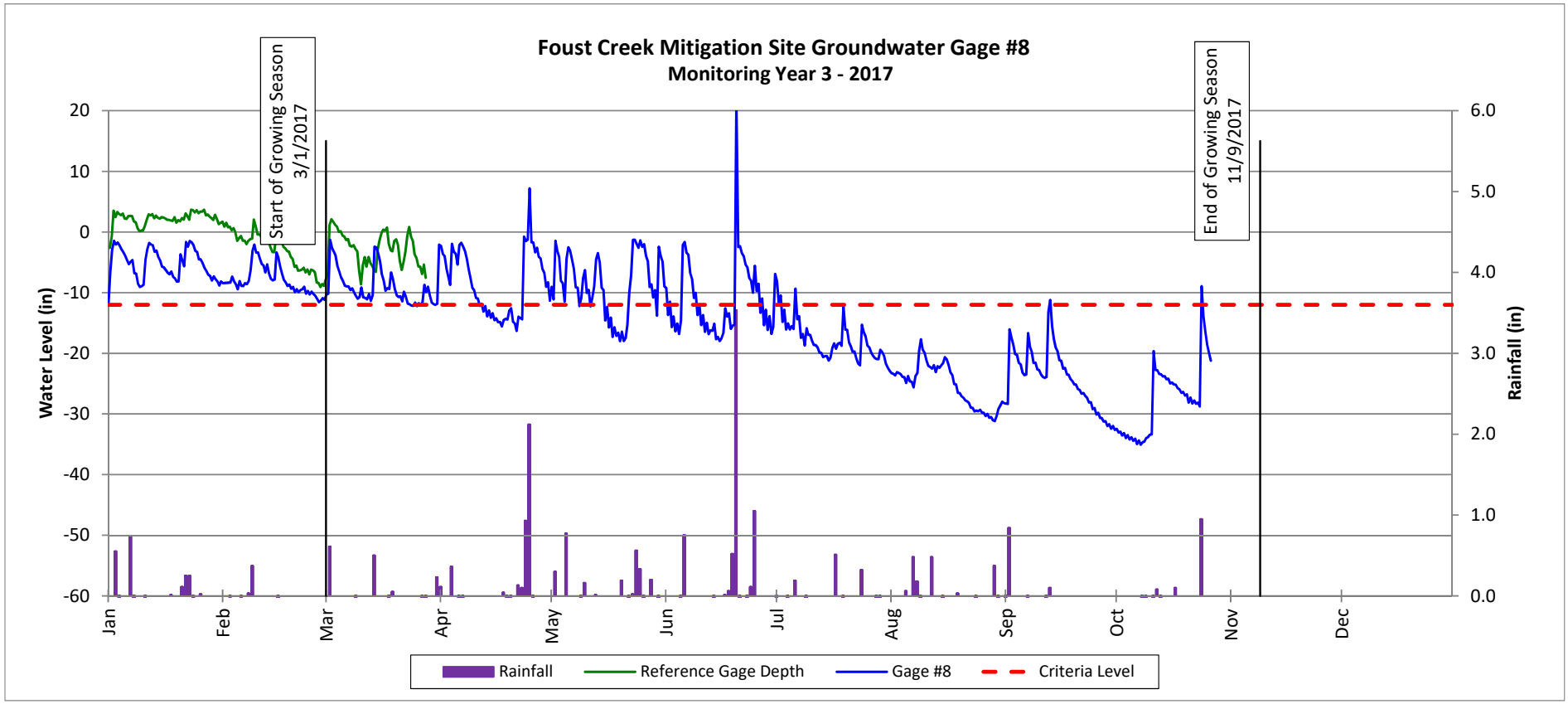
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

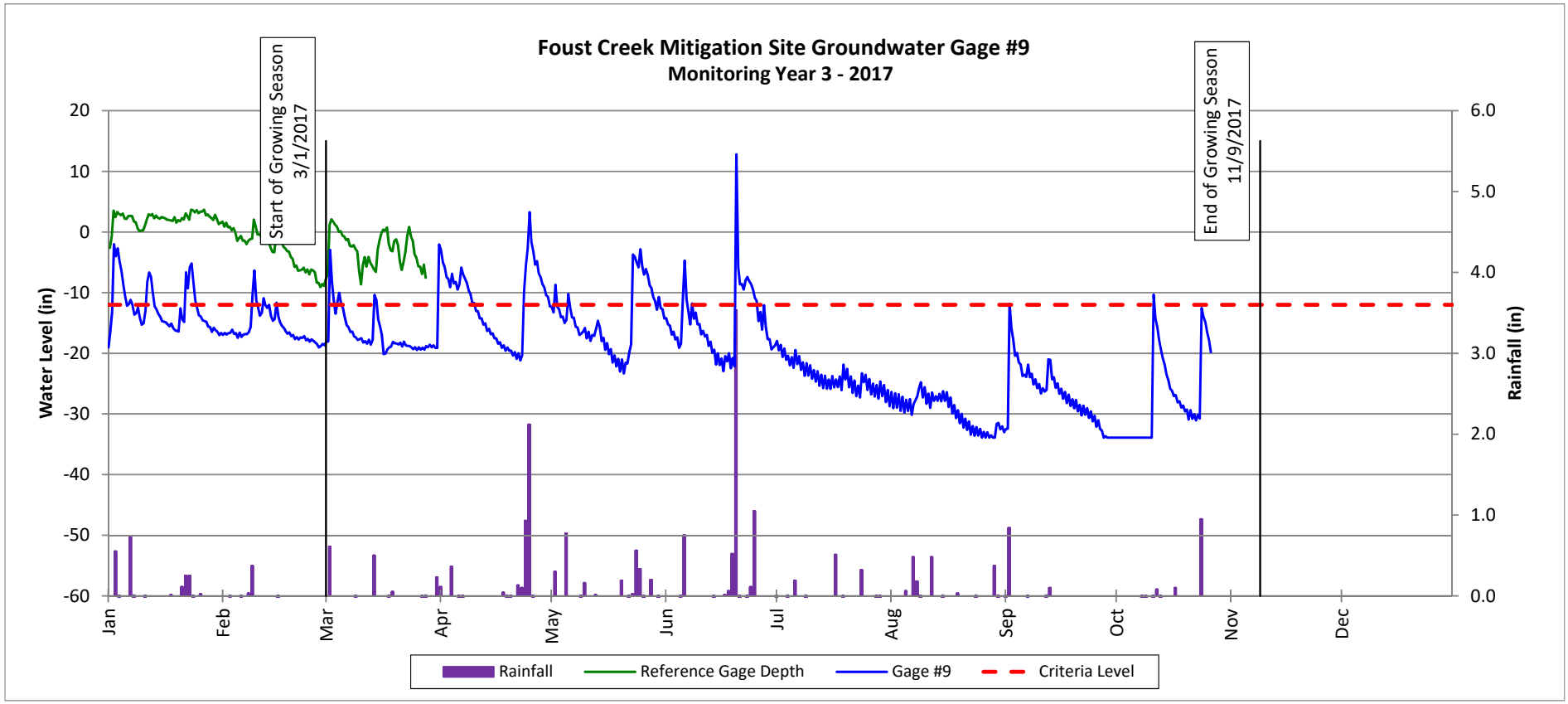
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

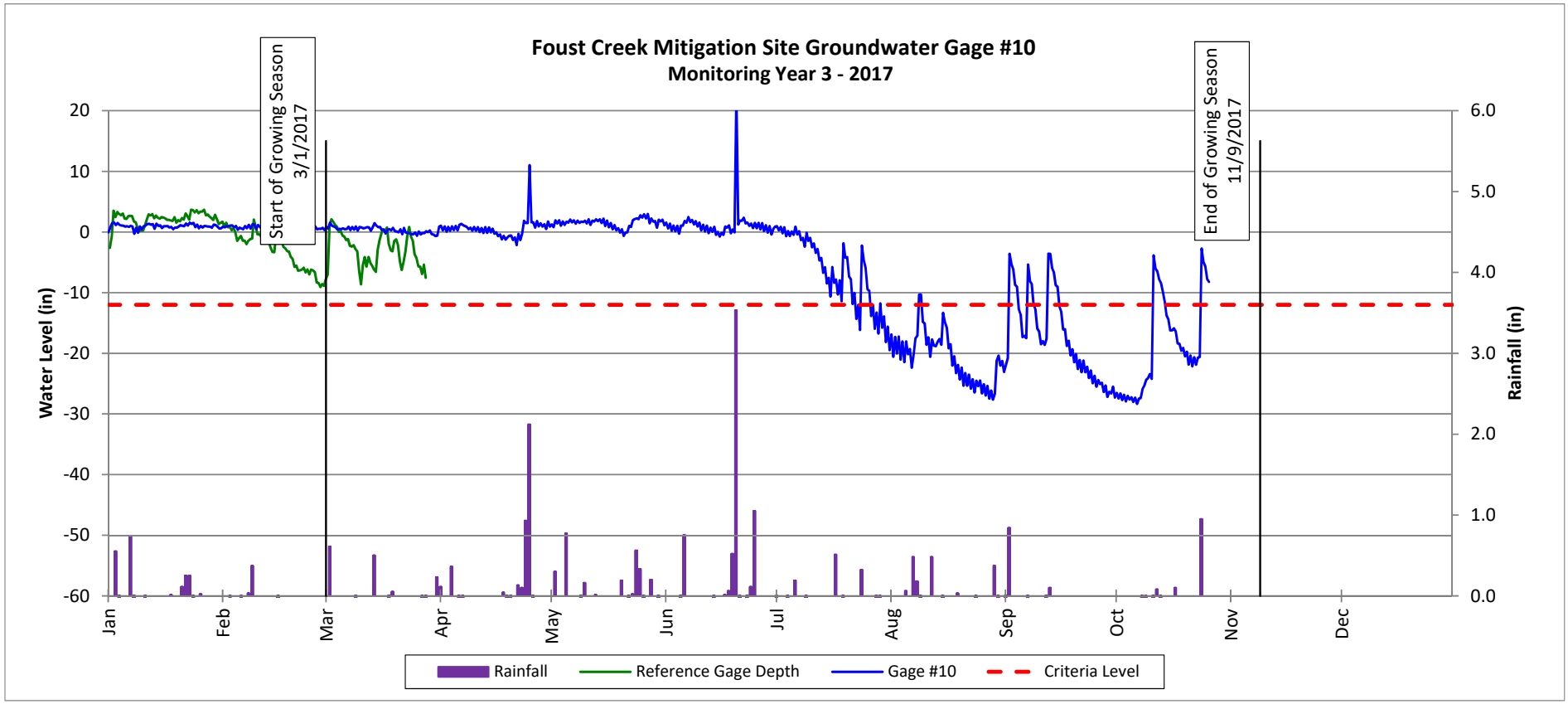
Monitoring Year 3 - 2017



Groundwater Gage Plots

Foust Creek Mitigation Site (DMS Project No. 95715)

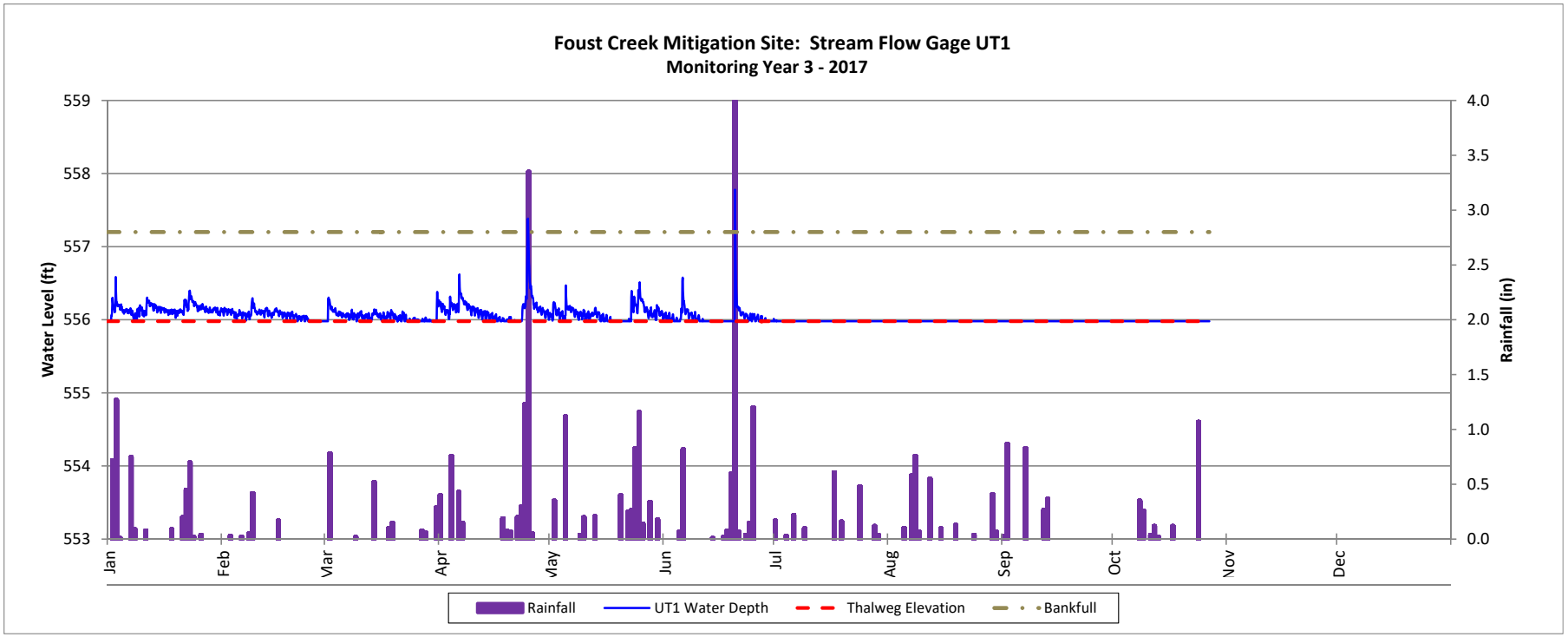
Monitoring Year 3 - 2017



Stream Flow Gage Plot

Foust Creek Mitigation Site (DMS Project No. 95715)

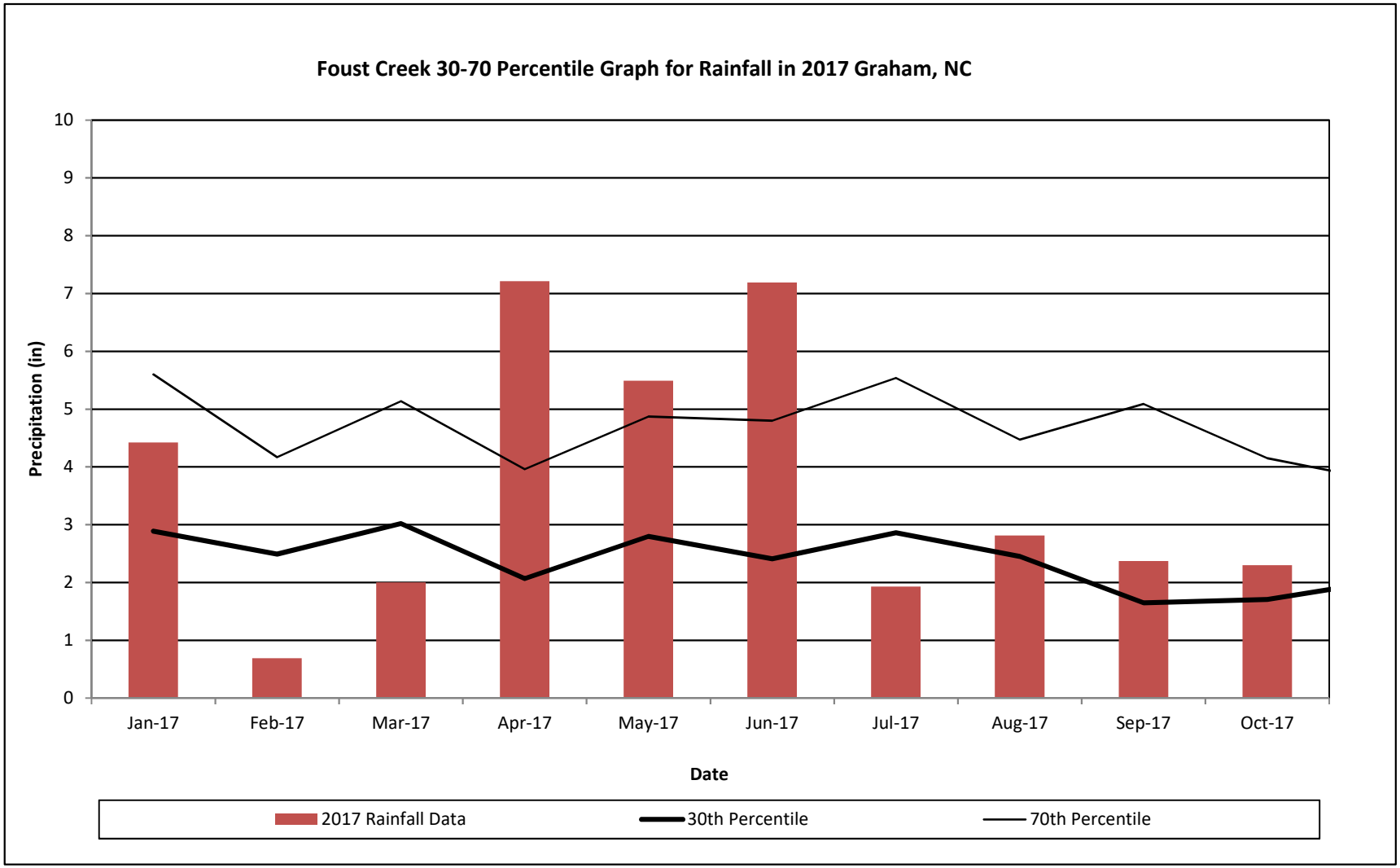
Monitoring Year 3 - 2017



Monthly Rainfall Data

Foust Creek Mitigation Site (DMS Project No. 95715)

Monitoring Year 3 - 2017



[1] 2017 monthly rainfall collected from weather station NC355, in Graham, NC (USDA, 2000).

[2] 30th and 70th percentile rainfall data collected from weather station NC355, in Graham, NC (USDA, 2000).