FINAL

Browns Summit Creek Restoration Project
Year 1 Monitoring Report

Guilford County, North Carolina

DMS Project ID No. 96313, DEQ Contract No. 5792

Permits: SAW-2014-01642, DWR No. 14-0332

Cape Fear River Basin: 03030002-010020

Project Info:	Monitoring Year: 1 of 7 Year of Data Collection: 2017 Year of Completed Construction (including planting): 2017 Submission Date: January 2018
Submitted To:	NCDEQ - Division of Mitigation Services 1652 Mail Service Center Raleigh, NC 27699-1652

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Innovation Done Right...We Make a Difference

January 8, 2018

Jeff Schaffer
NCDENR, Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

Subject: Response to Task 7 Draft Year 1 Monitoring Report Comments dated January 2, 2018
Browns Summit Creek Mitigation Project, Guilford County
Cape Fear Cataloging Unit 03030002
USACE AID SAW 2014-01642, CMS Project #96313

Dear Mr. Schaffer:

Please find enclosed our responses to the Year 1 Monitoring Report Comments dated January 2, 2018 regarding the Browns Summit Creek Mitigation Project. We have revised the Year 1 Monitoring Report document in response to this review.

1. Digital files - The digital data and drawings have been reviewed by DMS and appear to meet DMS requirements.
Response: The digital submittal has been revised per comments below and provided in the same format as previously submitted.

2. Section 1, page 2: Explain why there was a month gap in data for gauge BSAW2 during the monitoring period.
Response: The automated collector was not acquiring data properly, upon re-inspection approximately one month into the monitoring season, the logger was re-set and began acquiring data.

3. Section 2.1.1, page 4: The report states that certain cross-sections have shown minor fluctuations in their geometry as compared to their as-built conditions and that these fluctuations do not represent any trends toward instability based off visual field evaluations. Please state which cross-section you are referring to and explain the cause of these fluctuations and why there is no need for concern.
Response: All the cross-sections show some level of change between the As-Built and MY1 condition based on the overlays; however, we feel the change is due to survey quality and extents. The quality of the sealed as-built survey provided by the contractor was not discovered until the MY1 survey was overlain. The channel has not fluctuated as shown in Figure 5 (cross section overlays), has remained stable and is performing as designed. We now have Kee Surveying working on the site throughout the monitoring period and anticipate their surveys will capture exactly what is happening on-site in future monitoring efforts. The language in question has been removed and replace to provide clarification of MY0 and MY1 cross section discrepancies.

4. Appendix E, Table 15: Please indicate hydrologic success criteria for each well.
Response: Added under "Well ID", e.g. BSAW (9% Criteria).

RBF jma LPA KASEMAN SALLYPORT MBAKERINTL.COM
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5. Appendix D: For Tables 11a and 11b, provide a footnote with the tables that describes the method by which Baker 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.

Response: Due to the MY0 survey quality discovered during MY1, Michael Baker proposes to utilize the detailed survey data and associated parameters collected during MY1 as the basis of comparison through the monitoring phase of the project. This will ensure an accurate assessment of success and trends throughout the life of the project. Language stating this has been added to Section 2.1.1 and has also been added to tables 11a, and 11b in Appendix D. Moving forward, BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

6. This is a reminder that in accordance with RFP#16-005568 Addendum#1 and email correspondence between Jake Byers and Jeff Jurek, Baker must substitute an approved Monitoring Phase Performance Bond (MPPB) for the original Performance Bond prior to DMS approval to retire the Performance Bond. Per the correspondence between Jake and Jeff J., Baker can submit the MPPB for 20% of the contract value, and can be reduced concurrent with the payment schedule once the annual monitoring deliverable is approved by DMS and the credits are released by the Interagency Review Team (IRT). Therefore, the MPPB can be reduced to 18% of the contract value after release of the mitigation credit for Monitoring Year 2, continuing with a reduction of the MPPB by 2% of the contract value through Monitoring Year 6. A MPPB of 10% of the contract value must be maintained through Monitoring Year 7 and project closeout including final determination/release of mitigation credits by the IRT. For specifics and preliminary approval of the draft MPPB, please talk with Jeff Jurek. Be advised that until the MPPB is approved DMS will not be able to pay the invoices for Tasks 6 and 7.

Response: MPPB is being provided for review and approval.

Three hard copies and on pdf copy along with updated digital files (via FTP) are being provided. If you have any questions concerning the Year 1 Monitoring Report, please contact me at 919-805-1750 or via email at Katie.McKeithan@mbakerintl.com.

Sincerely,

Kathleen McKeithan

Kathleen McKeithan, PE, CPESC, CPSWQ, CFM

Michael Baker Engineering, Inc.

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Report Prepared and Submitted by Michael Baker Engineering, Inc.

NC Professional Engineering License # F-1084

Michael Baker
INTERNATIONAL

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APPENDICES

1. EXECUTIVE SUMMARY

Michael Baker Engineering, Inc. (Baker) restored approximately 3,903 linear feet (LF) of jurisdictional stream and enhanced 2,478 LF of stream (of which 559 is for BMPs) along unnamed tributaries (UT) to the Haw River and restored over 4.44 acres of wetland (existing channel lengths). The unnamed tributary (mainstem) has been referred to as Browns Summit Creek for this project. In addition, Baker constructed two best management practices (BMPs) within the conservation easement boundary. The Browns Summit Creek Restoration Project (project) is located in Guilford County, North Carolina (NC) (Figure 1) approximately three miles northwest of the Community of Browns Summit. The project is located in the NC Division of Water Resources (NCDWR) subbasin 03-06-01 and the NC Division of Mitigation Services (NCDMS) Targeted Local Watershed (TLW) 03030002-010020 (the Haw River Headwaters) of the Cape Fear River Basin. The purpose of the project is to restore and/or enhance the degraded stream, wetland, and riparian buffer functions within the site. A recorded conservation easement consisting of 20.2 acres (Figure 2) will protect all stream reaches, wetlands, and riparian buffers in perpetuity. Examination of the available hydrology and soil data indicate the project will potentially provide numerous water quality and ecological benefits within the Haw River watershed, and the Cape Fear River Basin.

Based on the NCDMS 2009 Cape Fear River Basin Restoration Priority (RBRP) Plan, the Browns Summit Creek Restoration Project area is located in an existing targeted local watershed (TLW) within the Cape Fear River Basin (2009 Cape Fear RBRP), but is not located in a Local Watershed Planning (LWP) area. The restoration strategy for the Cape Fear River Basin targets specific projects, which focuses on developing creative strategies for improving water quality flowing to the Haw River in order to reduce non-point source (NPS) pollution to Jordan Lake.

The primary goals of the project, set in the Mitigation Plan, are to improve ecologic functions and to manage nonpoint source loading to the riparian system as described in the NCDMS 2009 Cape Fear RBRP. These goals are identified below:

- Create geomorphically stable conditions along the unnamed tributaries across the site,
- Implement agricultural BMPs to reduce nonpoint source inputs to receiving waters,
- Address known and obvious water quality and habitat stressors present on site,
- Restore stream and floodplain connectivity, and
- Restore and protect riparian buffer functions and corridor habitat.

To accomplish these goals, the following objectives were identified:

- Restore existing incised, eroding, and channelized streams by creating stable dimension and connecting them to their relic floodplains;
- Re-establish and rehabilitate site wetlands that have been impacted by cattle, spoil pile disposal, channelization, subsequent channel incision, and wetland vegetation loss;
- Prevent cattle from accessing the conservation easement boundary by installing permanent fencing and thus reduce excessive stream bank erosion and undesired nutrient inputs;
- Increase aquatic habitat value by improving bedform diversity, riffle substrate and in-stream cover; creating natural scour pools; adding woody debris and reducing sediment loading from accelerated stream bank erosion;

- Construct a wetland BMP on the upstream extent of Reach R6 to capture and retain and for sediment to settle out of the water column;
- Construct a step pool BMP channel to capture and disperse volumes and velocities by allowing discharge from a low density residential development to spread across the floodplain of Reach R4; thereby, diffusing energies and promoting nutrient uptake within the riparian buffer;
- Plant native species within the riparian corridor to increase runoff filtering capacity, improve stream bank stability and riparian habitat connectivity, and shade the stream to decrease water temperature;
- Control invasive species vegetation within the project area and, if necessary, continue treatments during the monitoring period; and
- Establish a conservation easement to protect the project area in perpetuity.

The Year 1 monitoring survey data of seventeen cross-sections indicates that the Site is geomorphically stable and performing at 100 percent for all the parameters evaluated. Certain cross-sections (located in Appendix D) have shown minor fluctuations in their geometry as compared to their as-built conditions; however, visually the site has remained stable with very little fluctuation. The as-built (MY0) cross section survey was conducted by the construction contractor's sub and has not provided the level of detail that is normally provided. Therefore, the fluctuations shown on the MY0 and MY1 overlay graphs found in Appendix D is much more pronounced than what is actually observed in the field. Cross section surveys moving forward will be to the appropriate level of detail as is reflected in the MY1 cross sections. These fluctuations do not represent a trend towards instability based off visual field evaluations. All reaches are stable and performing as designed. The data collected are within the lateral/vertical stability and in-stream structure performance categories. No stream problem areas were found.

During Year 1 monitoring, all plots meet the planted acreage performance categories (Appendix B and C). The average density of total planted stems, based on data collected from the fourteen monitoring plots following Year 1 monitoring in September of 2017, was 705 stems per acre. Thus, the Year 1 vegetation data demonstrate that the Site is on track to meet the minimum success interim criteria of 320 trees per acre by the end of Year 3. Additionally, there were no areas within the conservation easement of invasive species vegetation observed during the Year 1 monitoring. No vegetative problem areas were found.

Year 1 flow monitoring demonstrated that all flow gauges (BSFL1, BSFL2 and BSFL3) met the stated success criteria of 30 days or more of consecutive flow through R4, T3 and T1 respectively. Flow gauge BSFL1 documented 127 days of consecutive flow in R4, while flow gauge BSFL2 documented 166 days of consecutive flow in T3, and BSFL3 documented 263 days of consecutive flow in T1. The gauges demonstrated similar patterns relative to rainfall events observed in the vicinity of the Site as shown in the flow gauge graphs in Appendix E.

During Year 1 monitoring, the R1 crest gauge documented one post-construction bankfull event from April 2017 and second event in August of 2017.

Seven wells were installed in the wetland restoration areas. Six of the seven are preforming successfully. One well did not meet success (BSAW2). This is likely due to a month gap in data during a time of year in which success is generally achieved; however, the well shows hydrology coming to within twelve inches of the ground surface relatively consistently. It is anticipated that wetland hydrology will improve with additional monitoring.

Summary information/data related to the Site and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report Appendices. Narrative background and supporting information formerly found in these reports can be found in the Baseline Monitoring Report and in the Mitigation Plan available on the DMS website. Any raw data supporting the tables and figures in the Appendices is available from DMS upon request.

This report documents the successful completion of the Year 1 monitoring activities for the post-construction monitoring period.

2. METHODOLOGY

The seven-year monitoring plan for the Site includes criteria to evaluate the success of the stream and vegetation components of the Site. The methodology and report template used to evaluate these components adheres to the DMS monitoring report template document Version 1.5 (June 8, 2012), which will continue to serve as the template for subsequent monitoring years. The vegetation-monitoring quadrants follow CVS-DMS monitoring levels 1 and 2 in accordance with CVS-DMS Protocol for Recording Vegetation, Version 4.1 (2007).

Stream survey data was collected to a minimum of Class C Vertical and Class A Horizontal Accuracy using Leica TS06 Total Station and was georeferenced to the NAD83 State Plane Coordinate System, FIPS3200 in US Survey Feet, which was derived from the As-built Survey.

The specific locations of monitoring features, such as vegetation plots, permanent cross-sections, reference photograph stations, crest gauges and flow gauges, are shown on the CCPV map found in Appendix B.

Channel construction began in October 10, 2016 at the upstream extent of the site and worked in the downstream direction (begin on Reach 6 and ended with Reach 1). The construction was completed on March 8, 2017. Planting was installed as major reaches were completed and finalized by March 10, 2017.

The Monitoring Year 1 vegetation plot data was collected in September 2017, the visual site assessment data contained in Appendix B was collected in November 2017, and the cross-section data was collected in October 2017.

2.1 Stream Assessment

Historically, the Browns Summit site has been utilized for agriculture. Cattle have had direct access to the entire site. Ponds were located throughout the project, including within the alignment of R1, R3, R4, and R6. Channelization was clearly confirmed by the historical aerial photo from 1937 and spoil piles were found along several of the reaches. The Project involved the restoration and enhancement of the headwater system. Restoration practices involved raising the existing streambed and reconnecting the stream to the relic floodplain to restore natural flow regimes to the system. The existing channels abandoned within the restoration areas were filled to decrease surface and subsurface drainage and to raise the local water table. Permanent cattle exclusion fencing was provided around all proposed reaches and riparian buffers, except along reaches where no cattle are located or lack stream access.

2.1.1 Morphological Parameters and Channel Stability

Cross-sections were classified using the Rosgen Stream Classification System, and all monitored cross-sections fall within the quantitative parameters defined for channels of the design stream type. Morphological survey data are presented in Appendix D.

A longitudinal profile was surveyed for the entire length of channel immediately after construction to document as-built baseline conditions for the Monitoring Year 0 only. Annual longitudinal profiles will not be conducted during subsequent monitoring years unless channel instability has been documented or remedial actions/repairs are required by the U.S. Army Corps of Engineers (USACE) or DMS.

During preparation of the MY1 monitoring report and data collection, it was discovered that the data provided by the construction contractor's survey subcontractor for as-built cross sections was of low quality and insufficient. The quality of the sealed as-built survey provided by the contractor wasn't discovered until the MY1 survey was overlain on top of the MY0 cross sections. The channel in reality has not fluctuated nearly as dramatically as shown in Figure 5 (cross section overlays) and has remained stable and is performing as designed. This has been documented through field inspections throughout MY1 by Michael Baker and DMS staff. Due to the MY0 survey quality discovered during MY1, Michael Baker proposes to utilize the detailed survey data and associated parameters collected during MY1 by a different surveyor as the basis of comparison through the monitoring phase of the project. This will ensure an accurate assessment of success and trends throughout the life of the project.

2.1.2 Hydrology

To monitor on-site bankfull events, one crest gauge (crest gauge #1) was installed along R1's left bank at bankfull elevation. During Year 1 monitoring, one above bankfull stage event was documented in April 2017 and one in August of 2017 by the crest gauge. The crest gauge readings are presented in Appendix E. Year 1 flow monitoring demonstrated that all flow gauges (BSFL1, BSFL2 and BSFL3) met the stated success criteria of 30 days or more of consecutive flow through R4, T3 and T1 respectively. Flow gauge BSFL1 documented 127 days of consecutive flow in R4, while flow gauge BSFL2 documented 166 days of consecutive flow in T3, and BSFL3 documented 263 days of consecutive flow in T1. The gauges demonstrated similar patterns relative to rainfall events observed in the vicinity of the Site as shown in the flow gauge graphs in Appendix E.

2.1.3 Photographic Documentation

Reference photograph transects were taken at each permanent cross-section. The survey tape was centered in the photographs of the bank. The water line was located in the lower edge of the frame, and as much of the bank as possible is included in each photograph. Representative photographs for Monitoring Year 1 were taken along each Reach in October 2017 and are provided in Appendix D. No Stream Problem Areas were found; thus, no photographs are included. Photographs of each Vegetation Plot taken in September 2017 can be found in Appendix B.

2.1.4 Visual Stream Morphological Stability Assessment

The visual stream morphological stability assessment involves the qualitative evaluation of lateral and vertical channel stability, and the integrity and overall performance of in-stream structures throughout the Project reaches as a whole. Habitat parameters and pool depth maintenance are also measured and scored. During Year 1 monitoring, Michael Baker staff walked the entire length of each of the Project reaches several times throughout the year, noting geomorphic conditions of the stream bed profile (riffle/pool facets), both stream banks, and engineered in-stream structures. Representative photographs were taken per the Site's Mitigation Plan, and the locations of any Stream Problem Areas (SPAs) were documented in the field for subsequent mapping on the CCPV figures. No SPAs were discovered during Year 1 monitoring. A more detailed summary of the results for the visual stream stability assessment can be found in Appendix B, which includes supporting data tables, as well as general stream photos.

3.1 Vegetation Assessment

In order to determine if the success criteria were achieved, vegetation-monitoring quadrants were installed and are monitored across the site in accordance with the CVS-DMS Protocol for Recording Vegetation, Version 4.1 (2007). The vegetation monitoring plots are a minimum of 2 percent of the planted portion of the Site with fourteen plots established randomly within the planted riparian buffer areas per Monitoring Levels 1 and 2. The sizes of individual quadrants are 100 square meters for woody tree species.

Based on the recent Year 1 data collected from the vegetation monitoring plots, the planted stem density is 705 stems per acre. Therefore, the vegetation data demonstrate that the Site is on track for meeting the minimum success criteria of 320 trees per acre by the end of Year 3.

Additionally, there were no areas of invasive species vegetation observed during the Year 1 monitoring.

Year 1 vegetation assessment information is provided in Appendix B and C.

4.1 Wetland Assessment

Seven (7) groundwater monitoring wells were installed in the wetland mitigation area to document hydrologic conditions of the restored wetland area. Six of the seven wells are showing successful hydrology. BSAW2 is currently unsuccessful; however, the well did not perform initially and had to be re-installed. Thus, approximately a month of the initial part of the growing season is missing. The well is showing a similar wetting cycle to the other wells and will be monitored closely during 2018 for expected improvement. Visually, the wetland areas are performing very well with saturated soils and hydrophytic vegetation.

3. REFERENCES

Carolina Vegetation Survey (CVS) and NC Division of Mitigation Services (DMS). CVS-DMS Data Entry Tool v. 2.3.1. University of North Carolina, Raleigh, NC.

Lee, M., Peet R., Roberts, S., Wentworth, T. 2007. CVS-DMS Protocol for Recording Vegetation, Version 4.1.

North Carolina Division of Mitigation Services (DMS). 2012. Monitoring Requirements and Performance Standards for Stream and/or Wetland Mitigation. Version 1.5, June 8, 2012.

North Carolina Division of Mitigation Services (DMS). 2009. Cape Fear River Basin Restoration Priorities.

Rosgen, D. L. 1994. A Classification of Natural Rivers. Catena 22:169-199.

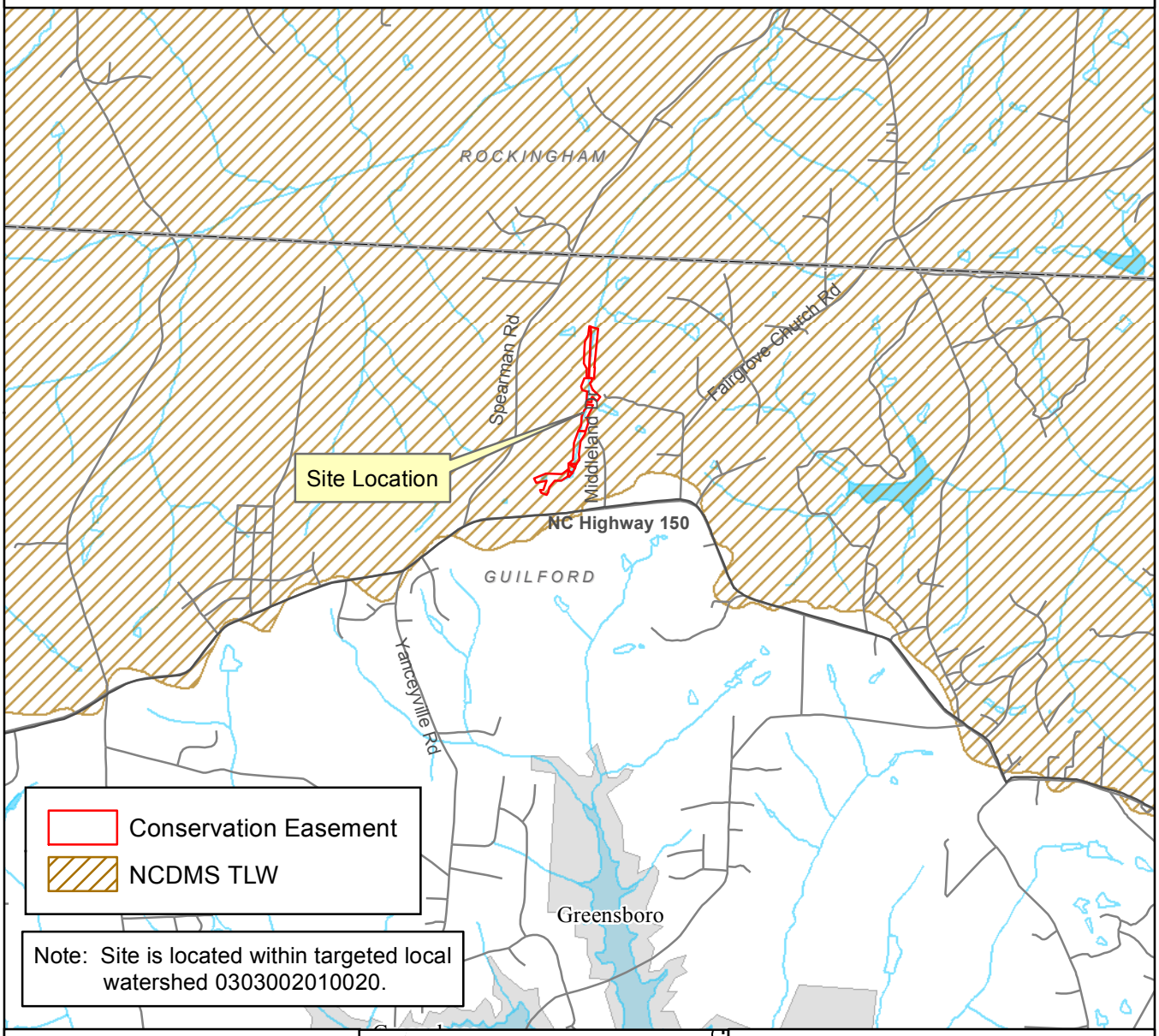
Schafale, M. P., and A. S. Weakley. 1990. Classification of the natural communities of North Carolina, third Approximation. North Carolina Natural Heritage Program. Division of Parks and Recreation, NCDEQ. Raleigh, NC.

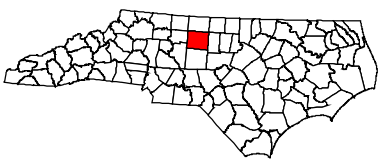
U.S. Army Corps of Engineers. 2003. Stream Mitigation Guidelines, April 2003, U.S. Army Corps of Engineers (USACE). Wilmington District.

Appendix A

Project Vicinity Map and Background Tables

To access the site from Raleigh, take Interstate 40 and head west on I-40 towards Greensboro, for approximately 68 miles. Take the exit ramp to E. Lee St. (exit 224) towards Greensboro and continue for 2 miles before turning onto U.S. Highway 29 North. Once on U.S. Highway 29 North, travel north for approximately 10 miles before exiting and turning on to NC-150 West. Continue west on NC-150 for 5 miles. The project site is located along and between NC-150 and Spearman Rd., with access points through residences on Middleland Dr. and Broad Ridge Ct. 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 activities requires prior coordination with DMS.





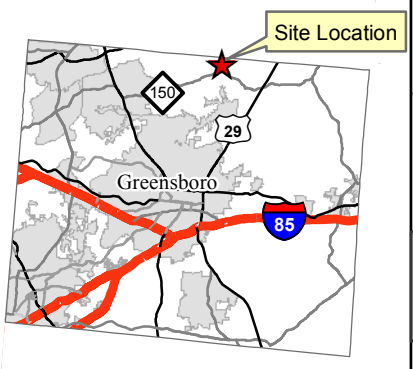


Figure 1
Project Vicinity Map
Browns Summit (DMS# 96313)

NCDEQ - Division of Mitigation Services

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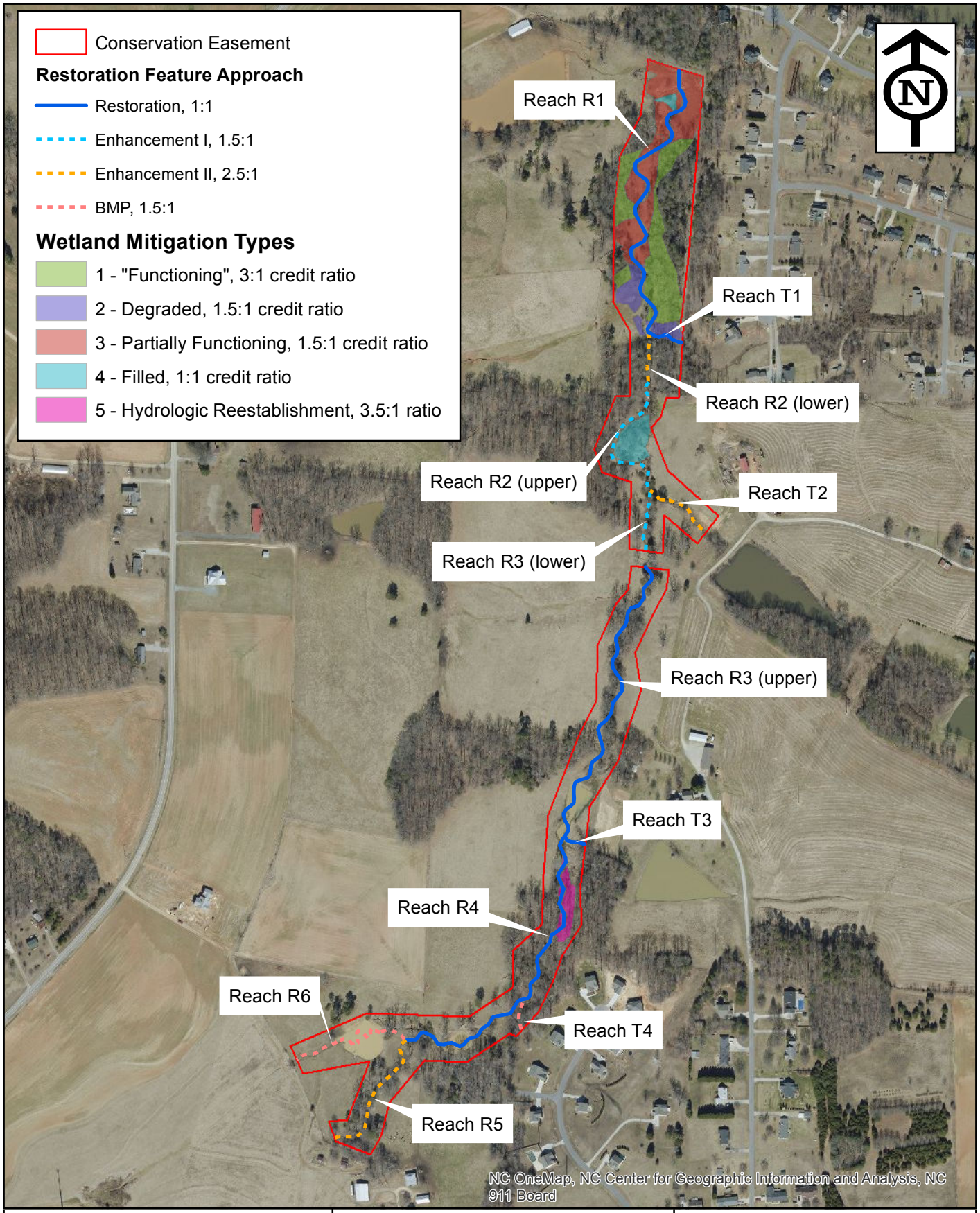
0.5 0 0.5 Miles



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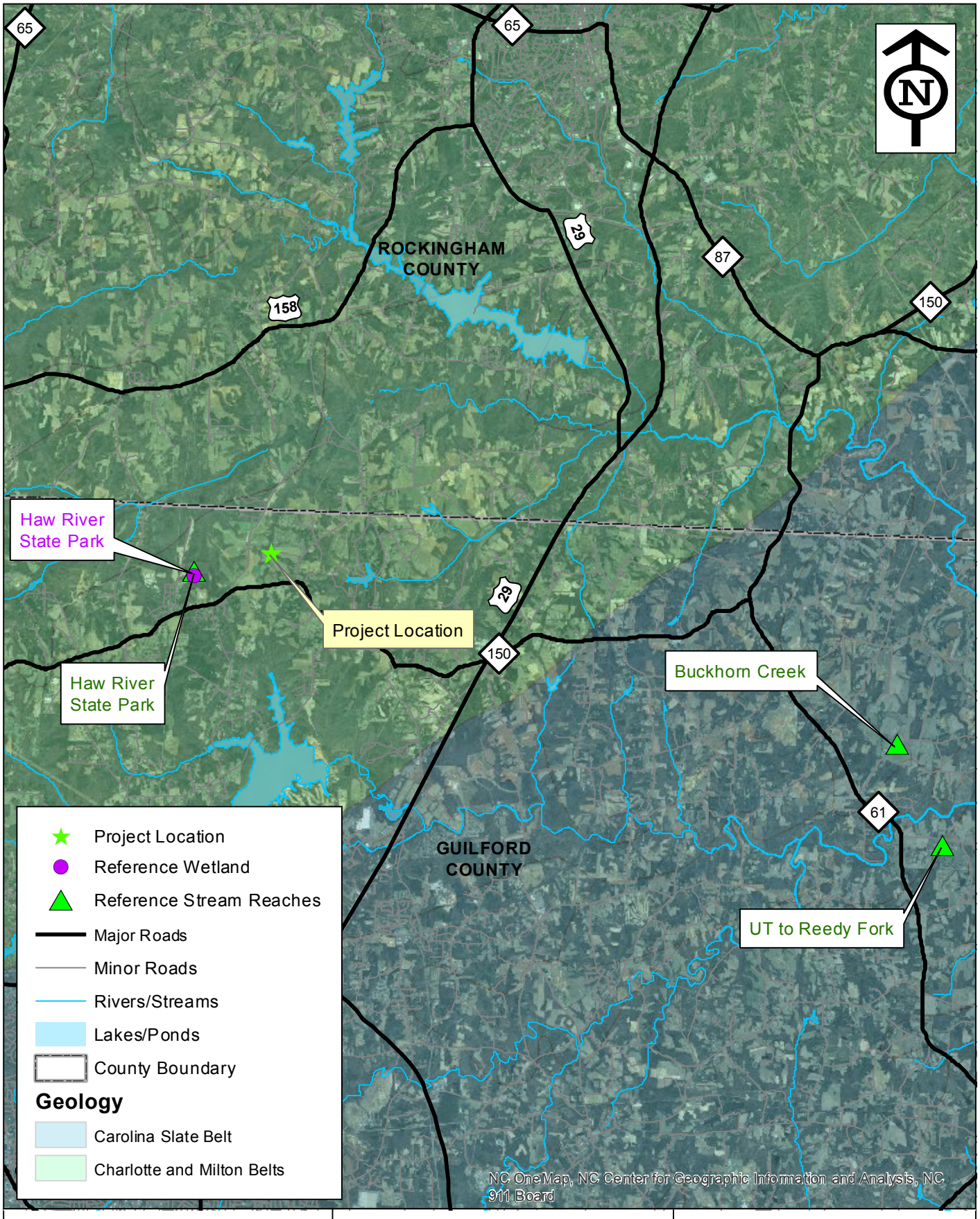
0 250 500 1,000
Feet

Figure 2
Restoration Summary Map
Browns Summit Site
(DMS #96313)



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2 1 0 2
Miles

Figure 3
Reference Stream Locations Map
Browns Summit Site

Table 1. Project Components and Mitigation Credits

Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Mitigation Credits

	Stream	Riparian Wetland		Non-riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorus Nutrient Offset
Type	R, E1, EII, BMP	R	E					
Totals	5,300.87 SMU	2.51 WMU (2.50 WMU requested)	0.0					

Project Components

Project Component or Reach ID	Stationing/ Location (As-Built)*	Existing Footage/ Acreage (LF/AC)*	Approach	Restoration/ Restoration Equivalent (SMU/WMU)	Restoration Footage or Acreage (LF/AC)**	Mitigation Ratio
R1	51+00.00 - 63+89.87	1,217	Restoration	1,290.00	1,290	1:1
R2 (downstream section)	49+65.28 - 51+00.00	167	Enhancement II	53.60	134	2.5:1
R2 (upstream section)	43+48.17 - 49+65.28	701	Enhancement I	409.33	614	1.5:1
R3 (downstream section) 60' easement break subtracted from stream lengths	39+35.73 - 43+48.17 (CE 40+45.09 - 41+05.52)	362	Enhancement I	234.67	352	1.5:1
R3 (upstream section)	28+31.92 - 39+35.73	1,224	Restoration	1,102.00	1,102	1:1
R4	15+35.86 - 28+31.92	1,350	Restoration	1,296.00	1,296	1:1
R5	10+00 - 15+35.86	536	Enhancement II	214.40	536	2.5:1
R6	10+00 - 15+19.39	536	Enhancement I/BMP	294.67	442 LF (valley length)	1.5:1
T1	10+00 - 11+44.99	121	Restoration	145.00	145	1:1
T2	10+00 - 12+85.21	283	Enhancement II	113.20	283	2.5:1
T3	10+04.88 - 10+92.84	83	Restoration	70.00	70	1:1
T4	10+30.18 - 11+49.36	47	Enhancement I/BMP	78.00	117 LF (valley length)	1.5:1
Wetland Area - Type 1	See Figures	1.57	Rehabilitation	0.51	1.53	3:1
Wetland Area - Type 2	See Figures	0.49	Rehabilitation	0.29	0.43	1.5:1
Wetland Area - Type 3	See Figures	2.06	Rehabilitation	1.17	1.75	1.5:1
Wetland Area - Type 4	See Figures	0.49	Re-establishment	0.46	0.46	1:1
Wetland Area - Type 5	See Figures	0.27	Re-establishment	0.08	0.27	3.5:1

*Wetland existing acrage and restoration acrages were swapped in Table 5.1 of the Mitigation Plan.

**Stations and lengths are taken from the 2017 As-Built survey and may thus differ slightly from the Mitigation Plan.

Component Summation

Restoration Level	Stream (LF)	Riparian Wetland (AC)		Non-riparian Wetland (AC)	Buffer (SF)	Upland (AC)
Restoration	3,903.00	4.44				
Enhancement I	1,525.00					
Enhancement II	953.00					

BMP Elements

Element	Location	Purpose/Function	Notes

BMP Elements: BR= Bioretention Cell; SF= Sand Filter; SW= Stormwater Wetland; WDP= Wet Detention Pond; DDP= Dry Detention Pond; FS= Filter Strip; S= Grassed Swale; LS= Level Spreader; NI=Natural Infiltration Area

Table 2. Project Activity and Reporting History			
Browns Summit Creek Restoration Project: DMS Project No ID. 96313			
Activity or Report	**Scheduled Completion**	**Data Collection Complete**	**Actual Completion or Delivery**
Mitigation Plan Prepared	not specified in proposal	Summer 2015	May 1, 2015
Mitigation Plan Amended	not specified in proposal	Summer 2015	September 17, 2015
Mitigation Plan Approved	December 4, 2014	Winter 2015	November 2, 2015
Final Mitigation Plan with PCN (minor revisions requested in approval letter)	not specified in proposal	Winter 2015	January 29, 2016
Final Design – (at least 90% complete)	not specified in proposal		September 20, 2016
Construction Begins	not specified in proposal		October 10, 2016
Temporary S&E mix applied to entire project area	June 1, 2015		March 10, 2017
Permanent seed mix applied to entire project area	June 2, 2015		March 10, 2017
Planting of live stakes	June 3, 2015		March 10, 2017
Planting of bare root trees	June 3, 2015		March 10, 2017
End of Construction	May 4, 2015		March 8, 2017
Survey of As-built conditions (Year 0 Monitoring-baseline)	June 3, 2015	Spring 2017	July 1, 2017
Baseline Monitoring Report*	May 7, 2017	Spring 2017	September 15, 2017
Year 1 Monitoring	December 1, 2017	November 2017	January 4, 2018
Year 2 Monitoring	December 1, 2018		
Year 3 Monitoring	December 1, 2019		
Year 4 Monitoring	December 1, 2020		
Year 5 Monitoring	December 1, 2021		
Year 6 Monitoring	December 1, 2022		
Year 7 Monitoring	December 1, 2023		
* Monitoring schedule completion dates updated based on completion of construction.			

Table 3. Project Contacts **Browns Summit Creek Restoration Project: DMS Project No ID. 96313**	
Designer	
Michael Baker Engineering, Inc.	8000 Regency Parkway, Suite 600 Cary, NC 27518 Contact: Katie McKeithan, Tel. 919-481-5703
Construction Contractor	
River Works, Inc.	6105 Chapel Hill Road Raleigh, NC 27607 Contact: Bill Wright, Tel. 919-818-6686
Planting Contractor	
River Works, Inc.	6105 Chapel Hill Road Raleigh, NC 27607 Contact: Bill Wright, Tel. 919-818-6686
Seeding Contractor	
River Works, Inc.	6105 Chapel Hill Road Raleigh, NC 27607 Contact: Bill Wright, Tel. 919-818-6686
Seed Mix Sources	Green Resources, Rodney Montgomery 336-215-3458
Nursery Stock Suppliers	Dykes and Son, 931-668-8833 Mellow Marsh Farm, 919-742-1200 ArborGen, 843-528-3204
Live Stakes Suppliers	Foggy Mountain Nursery, 336-384-5323
Monitoring Performers	
Michael Baker Engineering, Inc.	8000 Regency Parkway, Suite 600 Cary, NC 27518
Stream Monitoring Point of Contact	Contact: Katie McKeithan, Tel. 919-481-5703
Vegetation Monitoring Point of Contact	Katie McKeithan, Tel. 919-481-5703

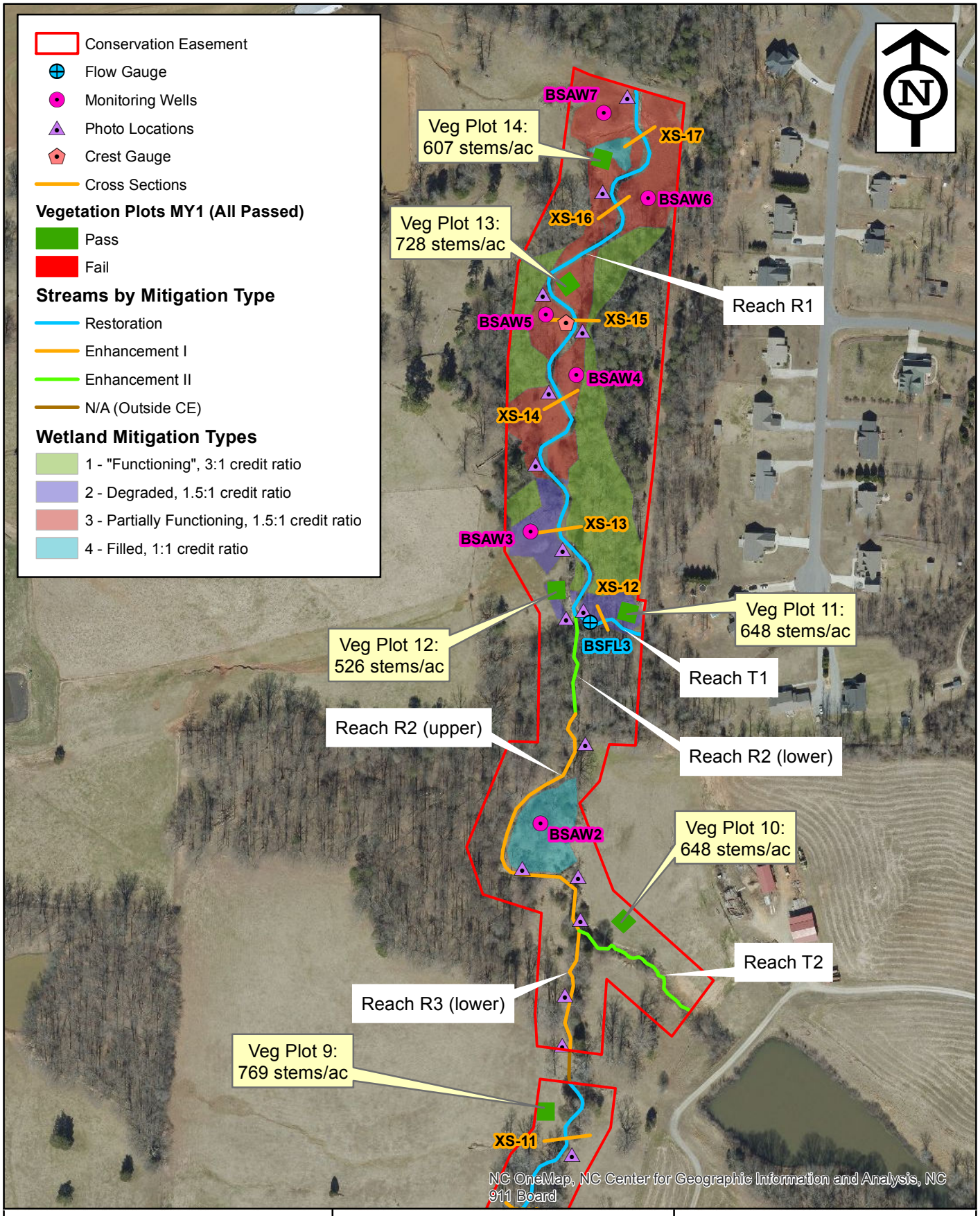
Table 4. Project Attributes
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Project Information					
Project Name	Browns Summit Creek Restoration Project				
County	Guilford				
Project Area (acres)	20.2				
Project Coordinates (latitude and longitude)	36.237 N, -79.749 W				
Project Watershed Summary Information					
Physiographic Province	Piedmont				
River Basin	Cape Fear				
USGS Hydrologic Unit 8-digit and 14-digit	03030002 / 03030002010020				
NCDWR Sub-basin	3/6/2001				
Project Drainage Area (acres)	438				
Project Drainage Area Percent Impervious	1%				
CGIA Land Use Classification	2.01.01.01, 2.03.01, 2.99.01, 3.02 / Forest (53%) Agriculture (39%) Impervious Cover (1%) Unclassified (7%)				
Reach Summary Information					
Parameters	**Reach R1**	**Reach R2**	**Reach R3**	**Reach R4**	**Reach R5**
Length of Reach (linear feet)	1,290	748	1,454	1,296	536
Valley Classification (Rosgen)	VII	VII	VII	VII	VII
Drainage Area (acres)	438	299	242	138/95	24
NCDWR Stream Identification Score	35.5	35.5	41.5	41.5/25	28.5
NCDWR Water Quality Classification	C; NSW				
Morphological Description (Rosgen stream type)	E	Bc incised	Bc incised	Gc	Bc
Evolutionary Trend	Incised E→Gc→F	Bc→G→F	Bc→G→F	G→F	Bc→G
Underlying Mapped Soils	CnA	CnA	CnA, PpE2	CnA, CkC	CkC
Drainage Class	Somewhat Poorly Drained	Somewhat Poorly Drained	Somewhat Poorly Drained and Well Drained	Somewhat Poorly Drained and Well Drained	Well Drained
Soil Hydric Status	Hydric	Hydric	Partially Hydric	Partially Hydric	Upland
Average Channel Slope (ft/ft)	0.0069	0.0068	0.0095	0.017	0.023
FEMA Classification	N/A	N/A	N/A	N/A	N/A
Native Vegetation Community	Piedmont Headwater Stream Forest				
Percent Composition of Exotic/Invasive Vegetation	25%	15%	5%	<5%	<5%
Parameters	**Reach R6**	**Reach T1**	**Reach T2**	**Reach T3**	**Reach T4**
Length of Reach (linear feet)	442	145	283	70	117
Valley Classification (Rosgen)	VII	VII	VII	VII	VII
Drainage Area (acres)	61	55	47	41	10
NCDWR Stream Identification Score	18	26.75	27.25	19	-
NCDWR Water Quality Classification	C; NSW				
Morphological Description (Rosgen stream type)	Bc incised	E incised	F	E incised	-
Evolutionary Trend	Bc→G→F	E→G→F	Bc→G→F	E→G→F	
Underlying Mapped Soils	CkC	CnA	CnA, PpE2	CnA	CkC
Drainage Class	Well Drained	Somewhat Poorly Drained	Somewhat Poorly Drained and Well Drained	Somewhat Poorly Drained	Well Drained
Soil Hydric Status	Upland	Hydric	Partially Hydric	Hydric	Upland
Average Channel Slope (ft/ft)	0.014	0.024	0.022	0.02	-
FEMA Classification	N/A	N/A	N/A	N/A	N/A
Native Vegetation Community	Piedmont Headwater Stream Forest				
Percent Composition of Exotic/Invasive Vegetation	5%	10%	10%	10%	10%

Regulatory Considerations			
Regulation	**Applicable**	**Resolved**	**Supporting Documentation**
Waters of the United States – Section 404	Yes	Yes	Categorical Exclusion (Appendix B)
Waters of the United States – Section 401	Yes	Yes	Categorical Exclusion (Appendix B)
Endangered Species Act	No	N/A	Categorical Exclusion (Appendix B)
Historic Preservation Act	No	N/A	Categorical Exclusion (Appendix B)
Coastal Area Management Act (CAMA)	No	N/A	Categorical Exclusion (Appendix B)
FEMA Floodplain Compliance	No	N/A	Categorical Exclusion (Appendix B)
Essential Fisheries Habitat	No	N/A	Categorical Exclusion (Appendix B)

Appendix B

Visual Assessment Data

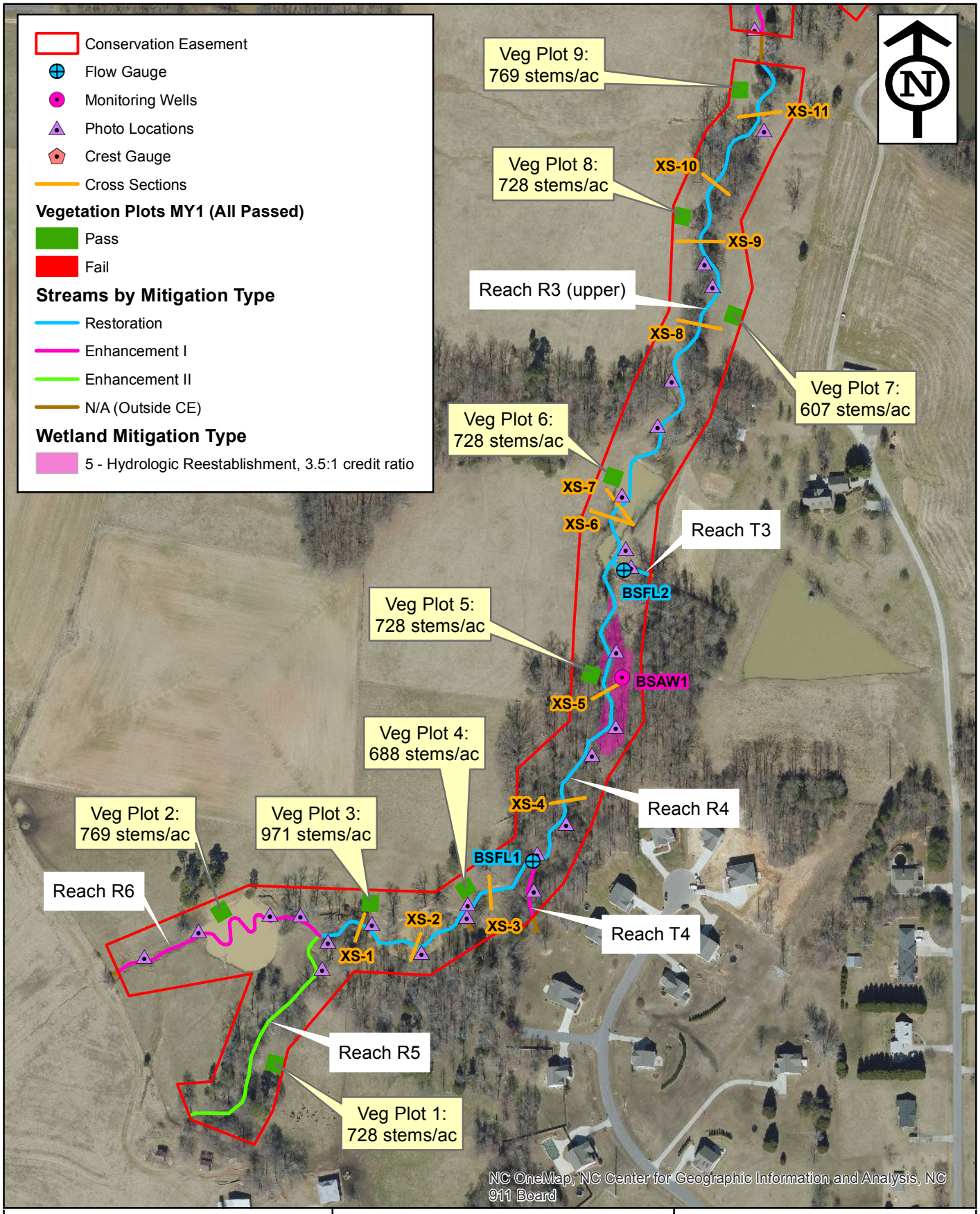


Michael Baker INTERNATIONAL

0 125 250 500

Feet

Figure 4.1
Current Conditions
Plan View
Browns Summit Site
(DMS #96313)



Michael Baker INTERNATIONAL

0 125 250 500

Feet

Figure 4.2
Current Conditions Plan View
Browns Summit Site
(DMS #96313)

Table 5. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID **R1**
Assessed Length **1,290**

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	20	20			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	11	11			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	20	20			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence doesnot exceed 15%. (See guidance for this table in EEP monitoring guidance document)	20	20			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio≥ 1.6 Rootwads/logs providing some cover at base-flow.	20	20			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID **R2 (downstream section)**
Assessed Length **134**

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	0	0			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	0	0			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	0	0			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence doesnot exceed 15%. (See guidance for this table in EEP monitoring guidance document)	0	0			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio≥ 1.6 Rootwads/logs providing some cover at base-flow.	0	0			100%			

Table 5 continued. Visual Stream Morphology Stability Assessmen
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID **R2 (upstream section)**
Assessed Length **614**

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. 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.	5	5			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	5	5			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	5	5			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID **R3 (downstream section)**
Assessed Length **352**

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	Footage with Stabilizing Woody	Adjusted % for Stabilizing Woody
1. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	7			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	7	7			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID R3 (upstream section)
Assessed Length 1,102

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	Footage with Stabilizing Woody	Adjusted % for Stabilizing Woody
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	15	15			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	10	10			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	15	15			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	15	15			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	15	15			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID R4
Assessed Length 1,296

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	Footage with Stabilizing Woody	Adjusted % for Stabilizing Woody
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	14	14			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	14	14			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	14	14			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	14	14			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID R5
Assessed Length 536

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
*	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	6	6			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	6	6			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID R6
Assessed Length 442

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	9	9			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	9	9			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	9	9			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	9	9			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	9	9			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID T1
Assessed Length 145

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	6	6			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	6	6			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID T2
Assessed Length 283

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	2	2			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	2	2			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	2	2			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	2	2			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	2	2			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID T3
Assessed Length 70

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	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	1	1			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	1	1			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	1	1			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	1	1			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	1	1			100%			

Table 5 continued. Visual Stream Morphology Stability Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach ID T4
Assessed Length 117

Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number in As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended	Number with Stabilizing Woody Vegetation	Footage with Stabilizing Woody Vegetation	Adjusted % for Stabilizing Woody Vegetation
1. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%			
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			
				Totals	0	0	100%			
2. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	8	8			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%			

Table 6. Vegetation Conditions Assessment
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Planted Acreage[1] 20.24

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Pattern and Color	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Pattern and Color	0	0.00	0.0%
			Total	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	Pattern and Color	0	0.00	0.0%
			Cumulative Total	0	0.00	0.0%

Easement Acreage[2] 20.24

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern[4]	Areas or points (if too small to render as polygons at map scale).	1000 SF	Pattern and Color	0	0.00	0.0%
5. Easement Encroachment Areas[3]	Areas or points (if too small to render as polygons at map scale).	none	Pattern and Color	0	0.00	0.0%

1 = Enter the planted acreage within the easement. This number is calculated as the easement acreage minus any existing mature tree stands that were not subject to supplemental planting of the understory, the channel acreage, crossings or any other elements not directly planted as part of the project effort.

2 = The acreage within the easement boundaries.

3 = Encroachment may occur within or outside of planted areas and will therefore be calculated against the overall easement acreage. In the event a polygon is cataloged into items 1, 2 or 3 in the table and is the result of encroachment, the associated acreage should be tallied in the relevant item (i.e., item 1,2 or 3) as well as a parallel tally in item 5.

4 = Invasives may occur in or out of planted areas, but still within the easement and will therefore be calculated against the overall easement acreage. Invasives of concern/interest are listed below. The list of high concern spcies are those with the potential to directly outcompete native, young, woody stems in the short-term (e.g. monitoring period or shortly thereafter) or affect the community structure for existing, more established tree/shrub stands over timeframes that are slightly longer (e.g. 1-2 decades). The low/moderate concern group are those species that generally do not have this capacity over the timeframes discussed and therefore are not expected to be mapped with regularity, but can be mapped, if in the judgement of the observer their coverage, density or distribution is suppressing the viability, density, or growth of planted woody stems. Decisions as to whether remediation will be needed are based on the integration of risk factors by EEP such as species present, their coverage, distribution relative to native biomass, and the practicality of treatment. For example, even modest amounts of Kudzu or Japanese Knotweed early in the projects history will warrant control, but potentially large coverages of Microstegium in the herb layer will not likley trigger control because of the limited capacities to impact tree/shrub layers within the timeframes discussed and the potential impacts of treating extensive amounts of ground cover. Those species with the "watch list" designator in gray shade are of interest as well, but have yet to be observed across the state with any frequency. Those in *red italics* are of particular interest given their

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 1 – Station 63+75, Reach 1

Photo Point 2 – Station 61+50, Reach 1

Photo Point 3 – Station 58+75, Reach 1

Photo Point 4 – Station 57+85, Reach 1

Photo Point 5 – Station 56+75, Reach 1

Photo Point 6 – Station 55+00, Reach 1

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 7 – Station 53+50, Reach 1

Photo Point 8 – Station 51+75, Reach 1

Photo Point 9 – Station 11+25, Reach T1

Photo Point 10 – Station 49+00, Reach 2

Photo Point 11 – Station 46+00, Reach 2

Photo Point 12 – Station 44+75, Reach 2

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 13 – Station 43+75, Reach 2/Reach T2

Photo Point 14 – Station 42+25, Reach 3

Photo Point 15 – Station 41+50, Reach 3

Photo Point 16 – Station 36+25, Reach 3

Photo Point 17 – Station 36+00, Reach 3

Photo Point 18 – Station 35+00, Reach 3

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 19 – Station 33+00, Reach 3

Photo Point 20 – Station 32+00, Reach 3

Photo Point 21 – 31+50, Reach 3

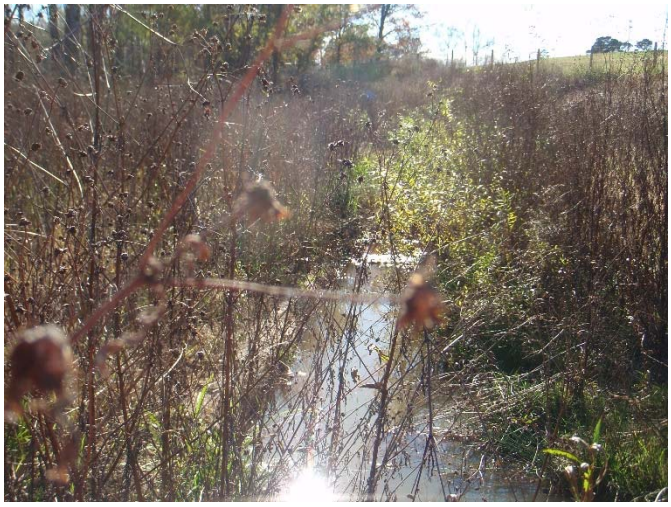


Photo Point 22 – Station 28+75, Reach 3/T3

Photo Point 23 – Station 10+25, Reach T3

Photo Point 24 – Station 26+50, Reach 4

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 25 – Station 24+50, Reach 4

Photo Point 26 – Station 24+00, Reach 4

Photo Point 27 – Station 22+50, Reach 4

Photo Point 28 – Station 21+50, Reach 4/T4

Photo Point 29 – Station 11+00, Reach T4

Photo Point 30 – Station 19+50, Reach 4

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 31 – Station 19+10, Step Pools

Photo Point 32 – Station 18+00, Reach 4

Photo Point 33 – Station 16+75, Reach 4

Photo Point 34 – Sta. 15+75, Reaches 4, 5 and 6

Photo Point 35 – Station 15+00, Reach 6, Step Pools

Photo Point 36 – Station 14+50, Reach 6, BMP

Browns Summit Creek Restoration Project – Longitudinal Stream Photo Stations
Photos take November 16, 2017 (All photos are viewing upstream)

Photo Point 37 – Station 11+90, Reach 6, BMP

Photo Point 38 – Station 10+50, Reach 6, Step Pools

Photo Point 39 – Station 15+00, Reach 5

Browns Summit Creek Restoration Project – Vegetation Plot Photo Stations
Photos take September 29, 2017

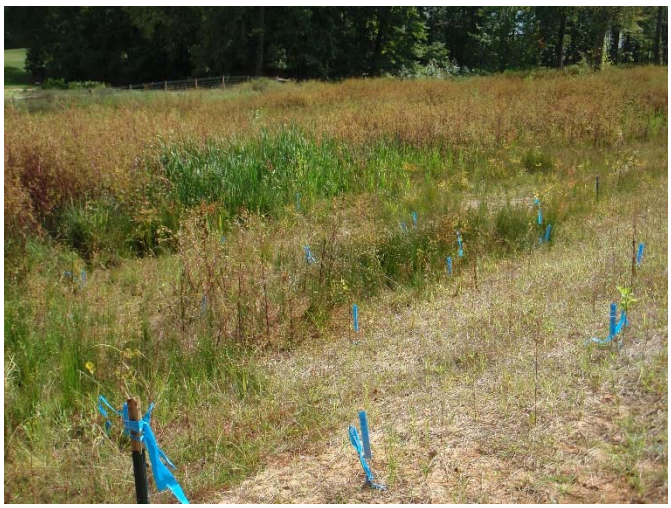
Vegetation Plot 1

Vegetation Plot 2

Vegetation Plot 3

Vegetation Plot 4

Vegetation Plot 5



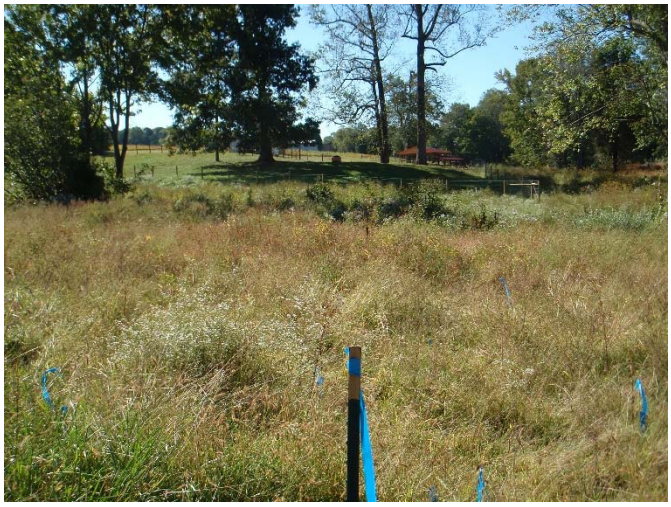
Vegetation Plot 6

Browns Summit Creek Restoration Project – Vegetation Plot Photo Stations
Photos take September 29, 2017

Vegetation Plot 7

Vegetation Plot 8

Vegetation Plot 9

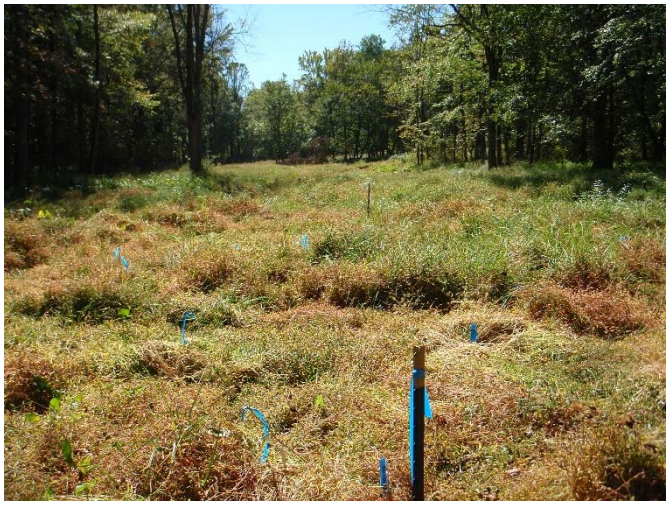


Vegetation Plot 10

Vegetation Plot 11

Vegetation Plot 12

Browns Summit Creek Restoration Project – Vegetation Plot Photo Stations
Photos take September 29, 2017



Vegetation Plot 13

Vegetation Plot 14

Appendix C

Vegetation Plot Data

Table 7. CVS Density Per Plot
Browns Summit Creek Restoration Project: DMS Project No ID. 96313
CVS Project Code 140048. Project Name: Browns Summit

Current Plot Data (MY1 2017)

Scientific Name	Common Name	140048-01-0001			140048-01-0002			140048-01-0003			140048-01-0004			140048-01-0005			140048-01-0006			140048-01-0007		
		Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T
Acer negundo	Boxelder maple	1		1	2		2	3		3				1		1						
Betula nigra	River Birch	5		5	5		5	3		3	1		1	4		4	3		3	2		2
Callicarpa americana	American Beautyberry																					
Carpinus caroliniana	American hornbeam				1		1	3		3	3		3	2		2				1		1
Celtis laevigata	Sugarberry																					
Diospyros virginiana	American Persimmon	1		1				1		1							1		1			
Euonymus americanus	Strawberry-bush							1		1												
Fraxinus pennsylvanica	Green Ash	4		4	3		3	2		2	5		5	4		4	3		3	4		4
Hamamelis virginiana	Witch-hazel				1		1							1		1						
Ilex opaca	American Holly													1		1				1		1
Ilex verticillata	Winterberry							1		1				1		1						
Liriodendron tulipifera	Tulip	1		1	2		2	1		1	1		1	2		2	2		2	1		1
Nyssa sylvatica	Black Gum							2		2	1		1									
Platanus occidentalis	Sycamore	2		2	3		3	5		5	1		1				7		7	1		1
Quercus alba	White Oak																					
Quercus lyrata	Overcup Oak	1		1										1		1	2		2	1		1
Quercus michauxii	Swamp Chestnut Oak	2		2	1		1	2		2				1		1				3		3
Quercus phellos	Willow Oak	1		1																		
Ulmus americana	American Elm										2		2							1		1
Viburnum dentatum	Arrow-wood										2		2									
Viburnum nudum	Possumhaw				1		1				1		1									
	Stem count	18		18	19		19	24		24	17		17	18		18	18		18	15		15
	size (ares)	1			1			1			1			1			1			1		
	size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02		
	Species count	9	0	9	9	0	9	11	0	11	9	0	9	10	0	10	6	0	6	9	0	9
	Stems per ACRE	728	0	728	769	0	769	971	0	971	688	0	688	728	0	728	728	0	728	607	0	607

Current Plot Data (MY1 2017) | **Annual Means**

Scientific Name	Common Name	140048-01-0008			140048-01-0009			140048-01-0010			140048-01-0011			140048-01-0012			140048-01-0013			140048-01-0014			MY1 (2017)		
		Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T	Planted	Vol	T
Acer negundo	Boxelder maple	2		2	1		1				2		2	1		1	1		1	1		1	15		15
Betula nigra	River Birch	1		1	1		1	1		1	1		1	1		1	1		1	4		4	33		33
Callicarpa americana	American Beautyberry														1	1								1	1
Carpinus caroliniana	American hornbeam	1		1	2		2	4		4				1		1	5		5				23		23
Celtis laevigata	Sugarberry										2		2	2		2							4		4
Diospyros virginiana	American Persimmon													1		1				1		1	5		5
Euonymus americanus	Strawberry-bush							2		2	1		1	1		1	1		1				6		6
Fraxinus pennsylvanica	Green Ash	3		3	1		1	1		1	2		2	1		1				3	1	4	36	1	37
Hamamelis virginiana	Witch-hazel	2		2	2		2							1		1				1		1	8		8
Ilex opaca	American Holly	2		2	1		1	1		1	1		1	2		2	1		1				10		10
Ilex verticillata	Winterberry																						2		2
Liriodendron tulipifera	Tulip				1		1													1		1	12		12
Nyssa sylvatica	Black Gum	1		1	2		2				2		2							2		2	10		10
Platanus occidentalis	Sycamore	3		3	4		4	3		3													29		29
Quercus alba	White Oak							1		1													1		1
Quercus lyrata	Overcup Oak	1		1							2		2				7		7				15		15
Quercus michauxii	Swamp Chestnut Oak	1		1							1		1	1		1				1		1	13		13
Quercus phellos	Willow Oak																						1		1
Ulmus americana	American Elm				2		2	2		2													7		7
Viburnum dentatum	Arrow-wood	1		1	1		1				1		1				2		2	1		1	8		8
Viburnum nudum	Possumhaw				1		1	1		1	1		1	1		1							6		6
	Stem count	18		18	19		19	16		16	16		16	13	1	14	18		18	15	1	16	244	2	246
	size (ares)	1			1			1			1			1			1			1			14		
	size (ACRES)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.35		
	Species count	11	0	11	12	0	12	9	0	9	11	0	11	11	1	12	7	0	7	9	1	9	20	2	21
	Stems per ACRE	728	0	728	769	0	769	647	0	647	647	0	647	526	40	567	728	0	728	607	40	647	705	6	711

Table 8. Vegetation Plot Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Browns Summit (#140048)

Year 1

Vegetation Plot Summary Information

Plot #	Riparian Buffer Stems[1]	Stream/ Wetland Stems[2]	Live Stakes	Invasives	Volunteers[3]	Total[4]	Unknown Growth Form
1	n/a	18	0	0	0	**18**	0
2	n/a	19	0	0	0	**19**	0
3	n/a	24	0	0	0	**24**	0
4	n/a	17	0	0	0	**17**	0
5	n/a	18	0	0	0	**18**	0
6	n/a	18	0	0	0	**18**	0
7	n/a	e	0	0	0	**15**	0
8	n/a	18	0	0	0	**18**	0
9	n/a	19	0	0	0	**19**	0
10	n/a	16	0	0	0	**16**	0
11	n/a	16	0	0	0	**16**	0
12	n/a	13	0	0	1	**14**	0
13	n/a	18	0	0	0	**18**	0
14	n/a	15	0	0	1	**16**	0

Wetland/Stream Vegetation Totals

(per acre)

Plot #	Stream/ Wetland Stems[2]	Volunteers[3]	Total[4]	Success Criteria Met?
1	18	0	728	Yes
2	19	0	769	Yes
3	24	0	971	Yes
4	17	0	688	Yes
5	18	0	728	Yes
6	18	0	728	Yes
7	e	0	607	Yes
8	18	0	728	Yes
9	19	0	769	Yes
10	16	0	647	Yes
11	16	0	647	Yes
12	13	1	567	Yes
13	18	0	728	Yes
14	15	1	647	Yes
Project Avg	18	0.1	**711**	Yes

Stem Class	**characteristics**
[1]Buffer Stems	Native planted hardwood trees. Does NOT include shrubs. No pines. No vines.
[2]Stream/ Wetland Stems	Native planted woody stems. Includes shrubs, does NOT include live stakes. No vines
[3]Volunteers	Native woody stems. Not planted. No vines.
[4]Total	Planted + volunteer native woody stems. Includes live stakes. Excl. exotics. Excl. vines.

Color for Density
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%

Table 9. Stem Count for Each Species Arranged by Plot

Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Botanical Name	Common Name	Browns Summit Creek Vegetation Plots													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Acer negundo	Boxelder maple	1	2	3	0	1	0	0	2	1	0	2	1	1	1
Betula nigra	River Birch	5	5	3	1	4	3	2	1	1	1	1	1	1	4
Callicarpa americana	American Beautyberry	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Carpinus caroliniana	American hornbeam	0	1	3	3	2	0	1	1	2	4	0	1	5	0
Celtis laevigata	Sugarberry	0	0	0	0	0	0	0	0	0	0	2	2	0	0
Diospyros virginiana	American Persimmon	1	0	1	0	0	1	0	0	0	0	0	1	0	1
Euonymus americanus	Strawberry-bush	0	0	1	0	0	0	0	0	0	2	1	1	1	0
Fraxinus pennsylvanica	Green Ash	4	3	2	5	4	3	4	3	1	1	2	1	0	4
Hamamelis virginiana	Witch-hazel	0	1	0	0	1	0	0	2	2	0	0	1	0	1
Ilex opaca	American Holly	0	0	0	0	1	0	1	2	1	1	1	2	1	0
Ilex verticillata	Winterberry	0	0	1	0	1	0	0	0	0	0	0	0	0	0
Liriodendron tulipifera	Tulip	1	2	1	1	2	2	1	0	1	0	0	0	0	1
Nyssa sylvatica	Black Gum	0	0	2	1	0	0	0	1	2	0	2	0	0	2
Platanus occidentalis	Sycamore	2	3	5	1	0	7	1	3	4	3	0	0	0	0
Quercus alba	White Oak	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Quercus lyrata	Overcup Oak	1	0	0	0	1	2	1	1	0	0	2	0	7	0
Quercus michauxii	Swamp Chestnut Oak	2	1	2	0	1	0	3	1	0	0	1	1	0	1
Quercus phellos	Willow Oak	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Ulmus americana	American Elm	0	0	0	2	0	0	1	0	2	2	0	0	0	0
Viburnum dentatum	Arrow-wood	0	0	0	2	0	0	0	1	1	0	1	0	2	1
Viburnum nudum	Possumhaw	0	1	0	1	0	0	0	0	1	1	1	1	0	0
Initial count of planted bareroot material		18	22	24	17	18	19	18	19	18	20	17	16	21	18
Stems/plot		18	19	24	17	18	18	15	18	19	16	16	14	18	16
Stems/acre		728	769	971	688	728	728	607	728	769	648	648	567	728	648
Average Stems / Acre for Year 1 (Planted + Volunteer)		**711**													

Appendix D

Stream Survey Data

Figure 5 Year 1 Cross-sections

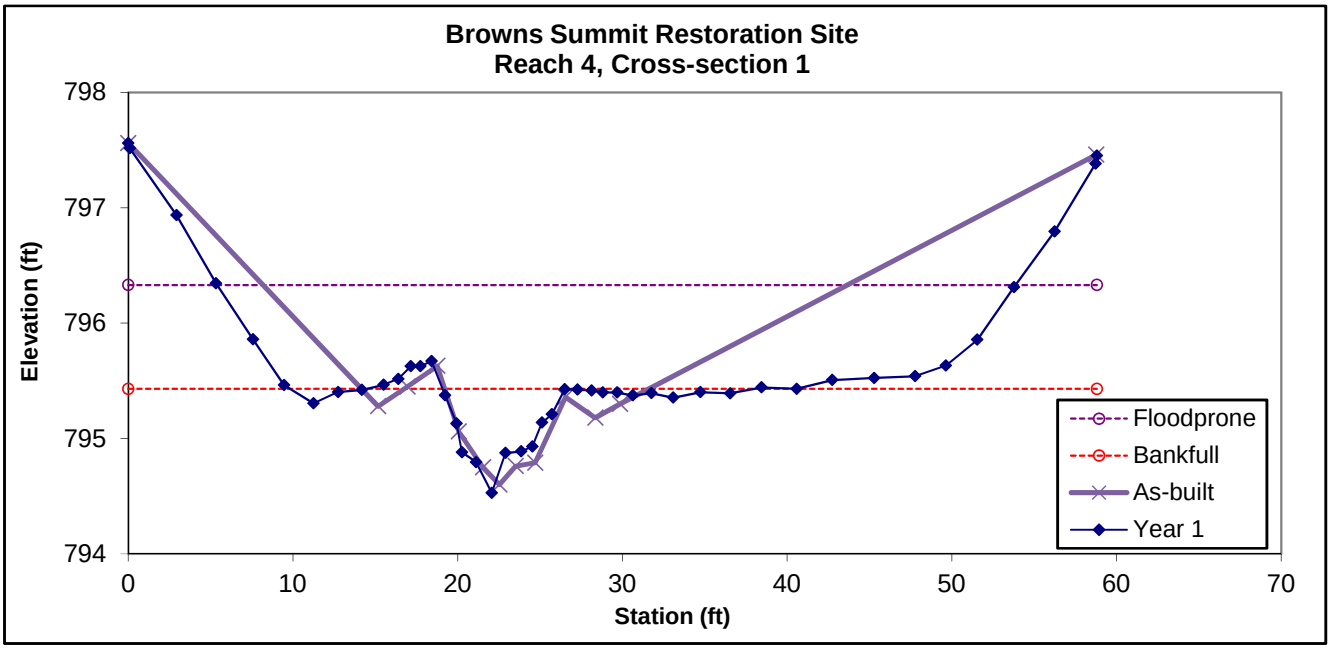
Permanent Cross-section 1

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	3.4	8.13	0.4	0.9	19.4	1	5.9	795.43	795.43



Permanent Cross-section 2

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool	C	10.5	12.8	0.8	2.5	15.6	--	--	793.70	793.48

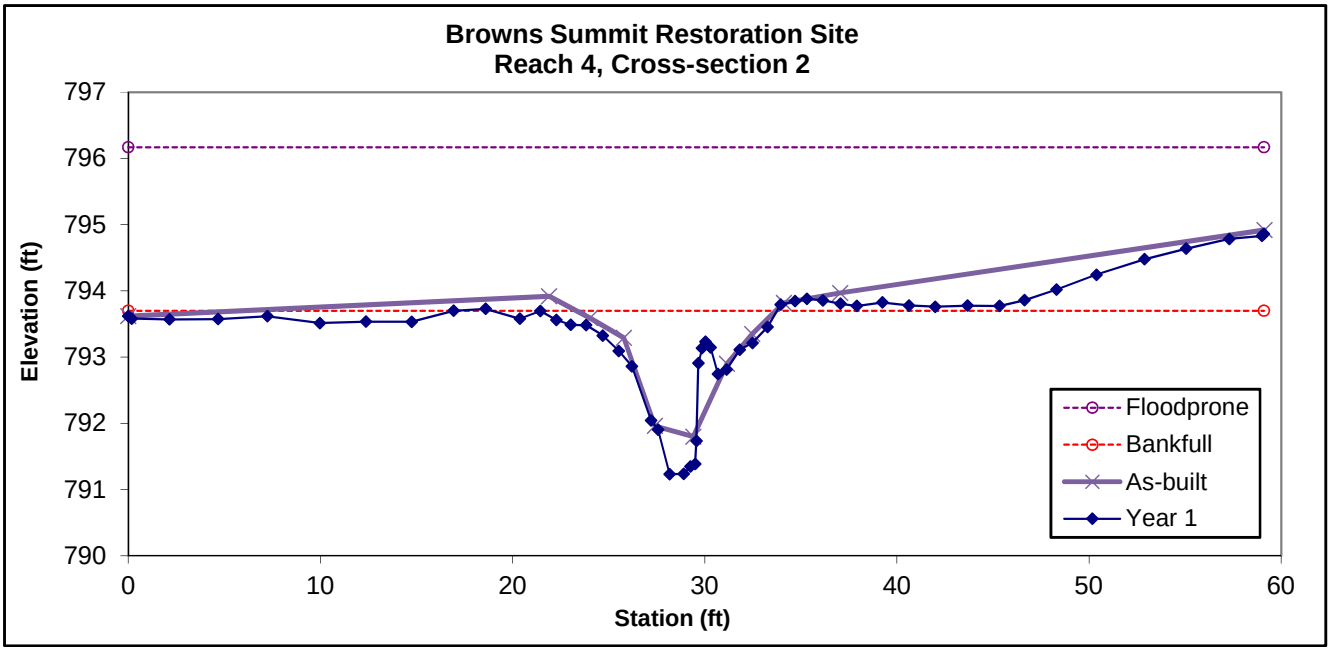


Figure 5 Year 1 Cross-sections

Permanent Cross-section 3

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Rifle	C	7.25	12.49	0.58	1.21	21.53	1	5.28	791.82	791.8

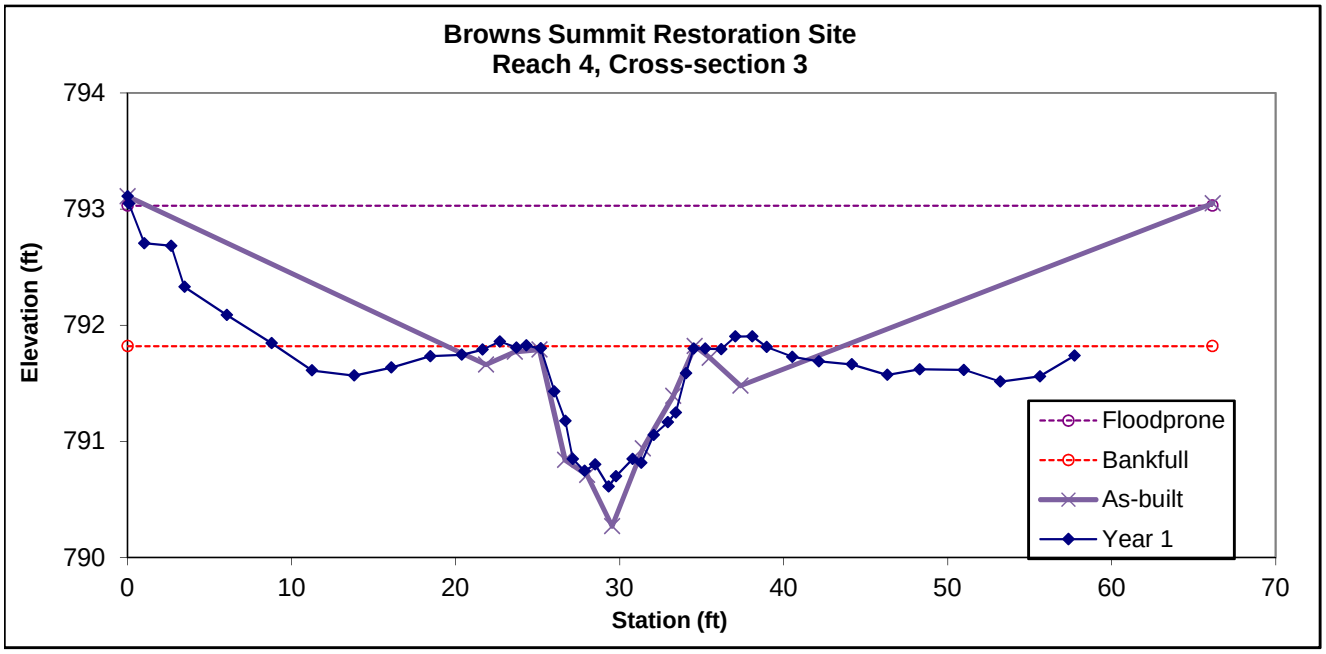


Figure 5 Year 1 Cross-sections

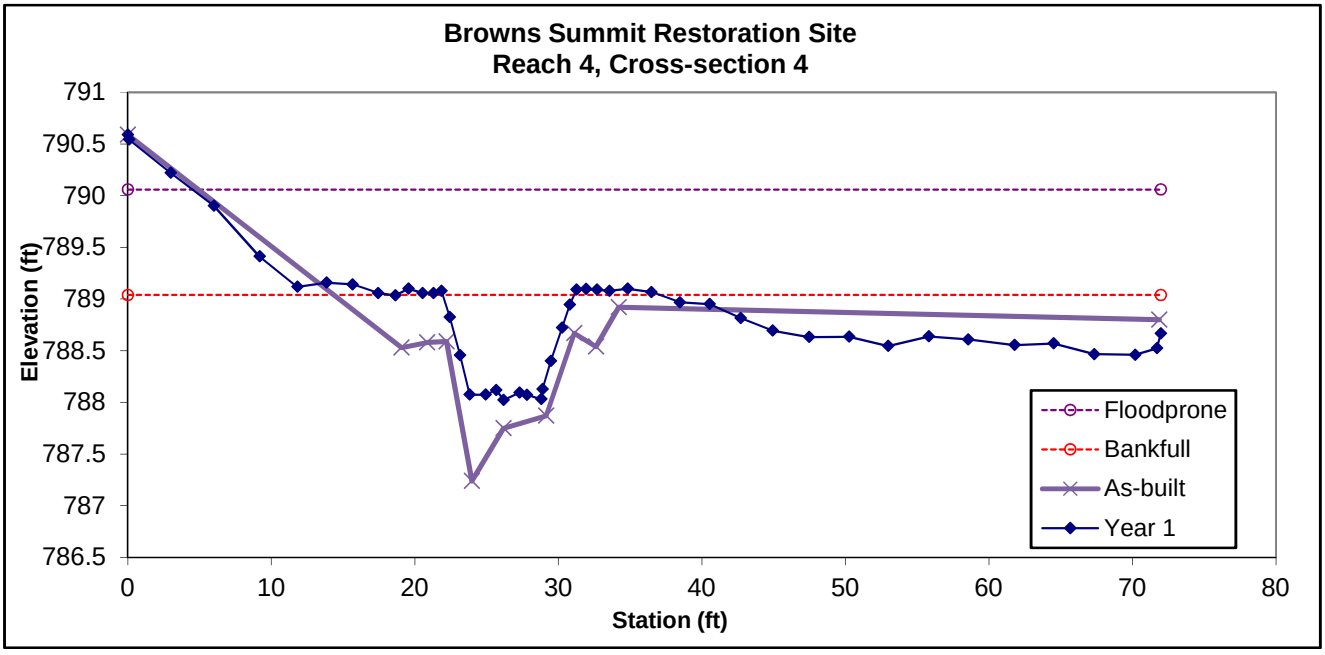
Permanent Cross-section 4

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	6.72	9.16	0.73	1.02	12.55	1	7.36	789.04	789.08



Permanent Cross-section 5

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	8.18	10.93	0.75	1.08	14.57	1	6.25	785.57	785.57

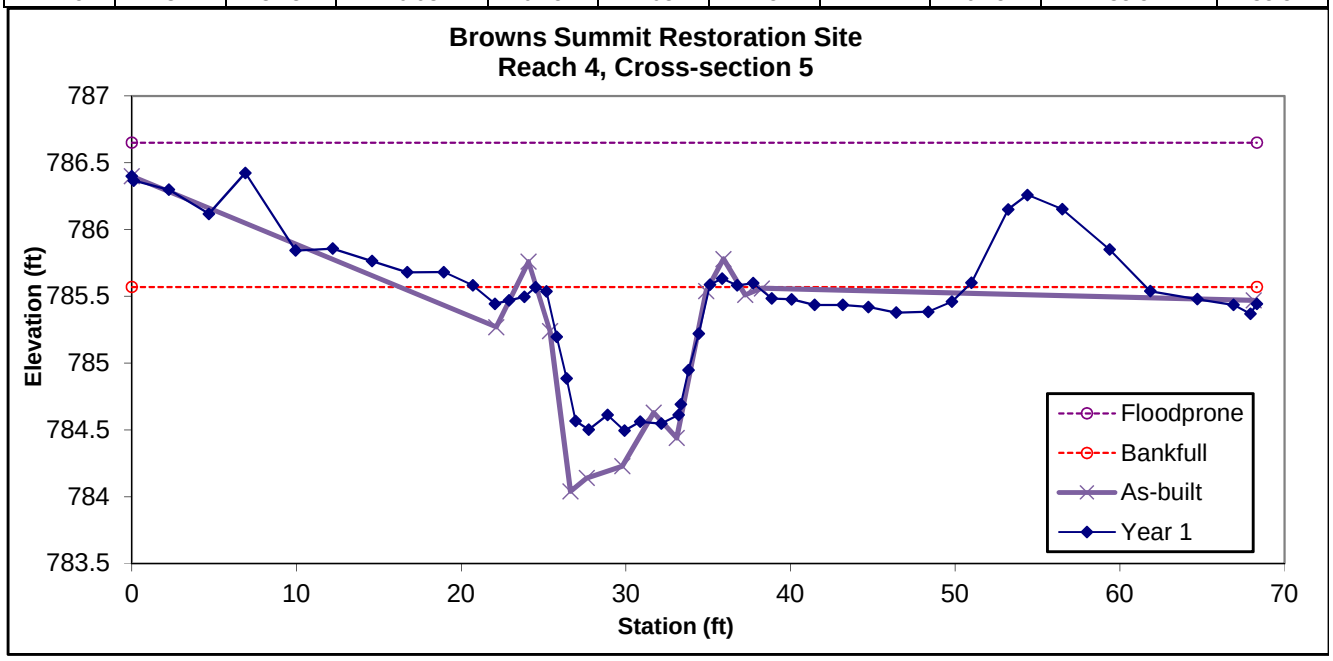


Figure 5 Year 1 Cross-sections

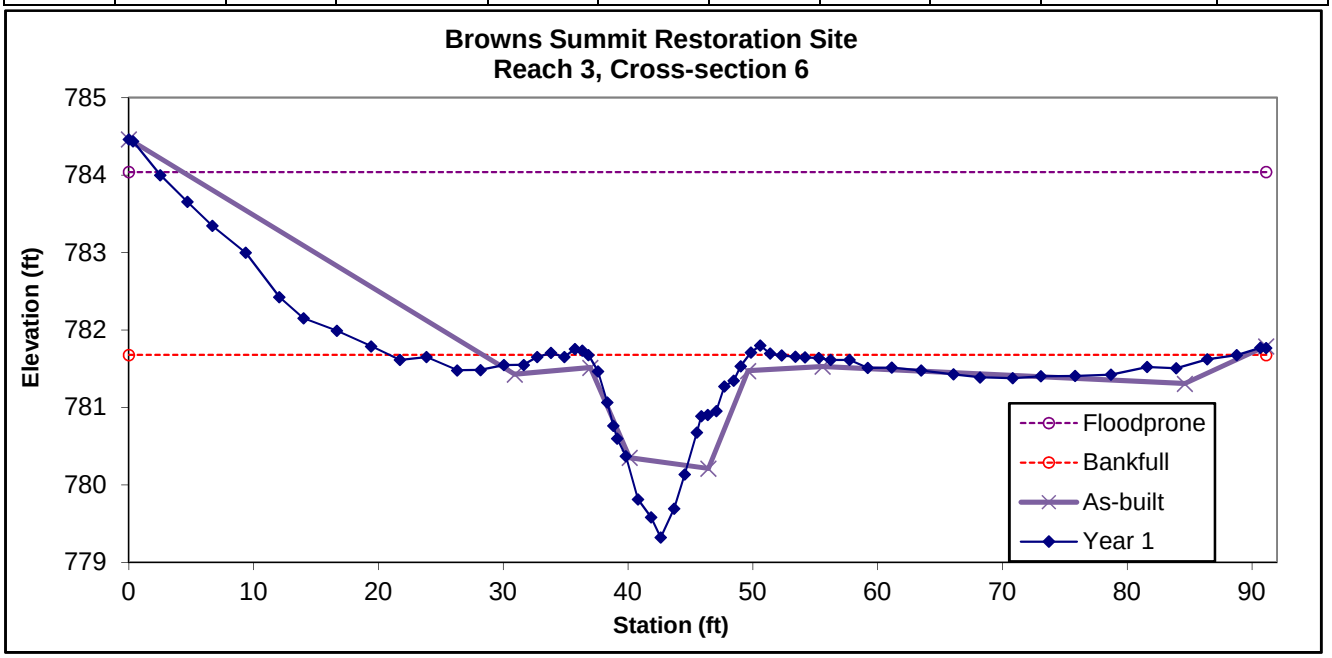
Permanent Cross-section 6

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool	E	14.4	12.9	1.1	2.4	11.6	--	--	781.678	781.678



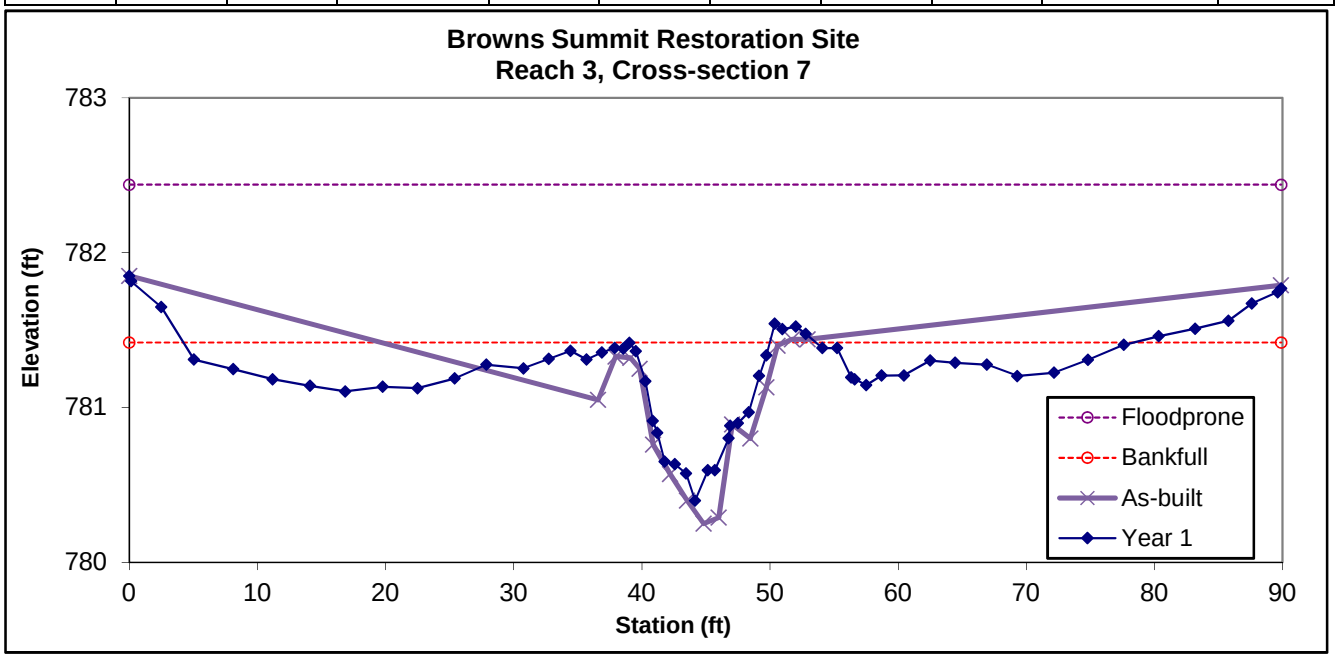
Permanent Cross-section 7

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	6.24	11.48	0.54	1.02	21.26	1	7.83	781.42	781.42



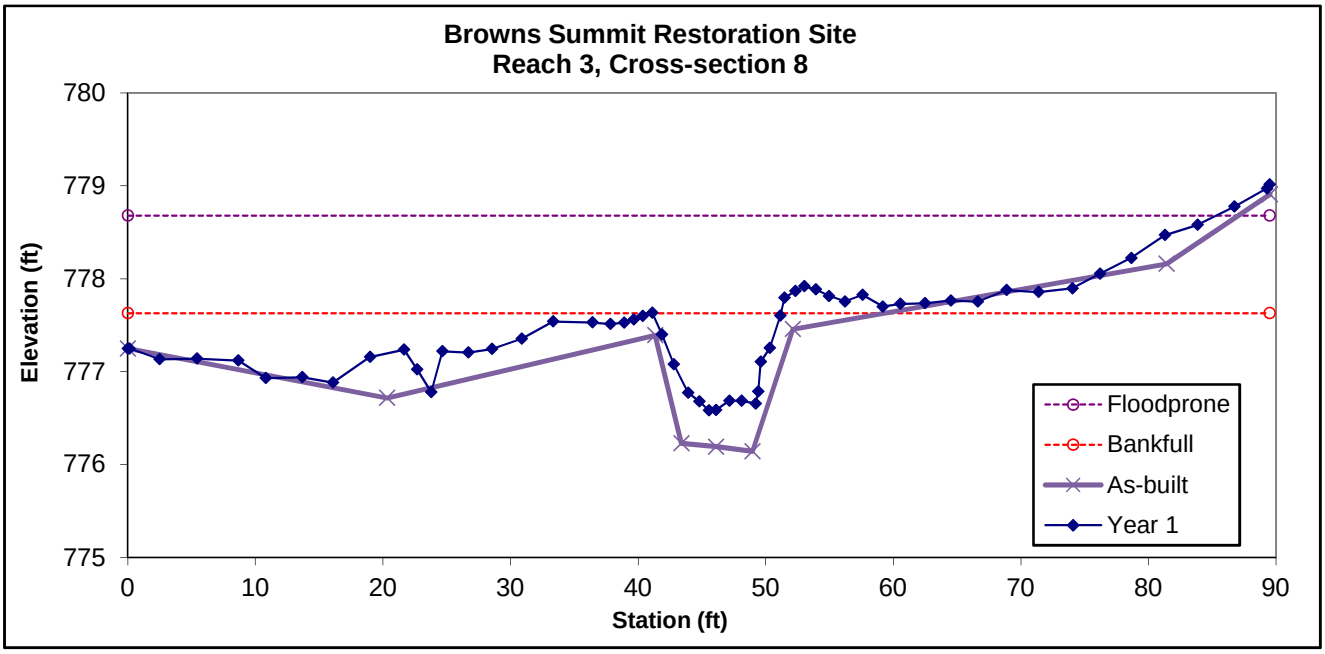
Permanent Cross-section 8

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	7.16	10.05	0.71	1.05	14.15	1	8.48	777.63	777.63



Permanent Cross-section 9

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool	E	17.2	15.3	1.1	2.4	13.5	--	--	775.88	775.88

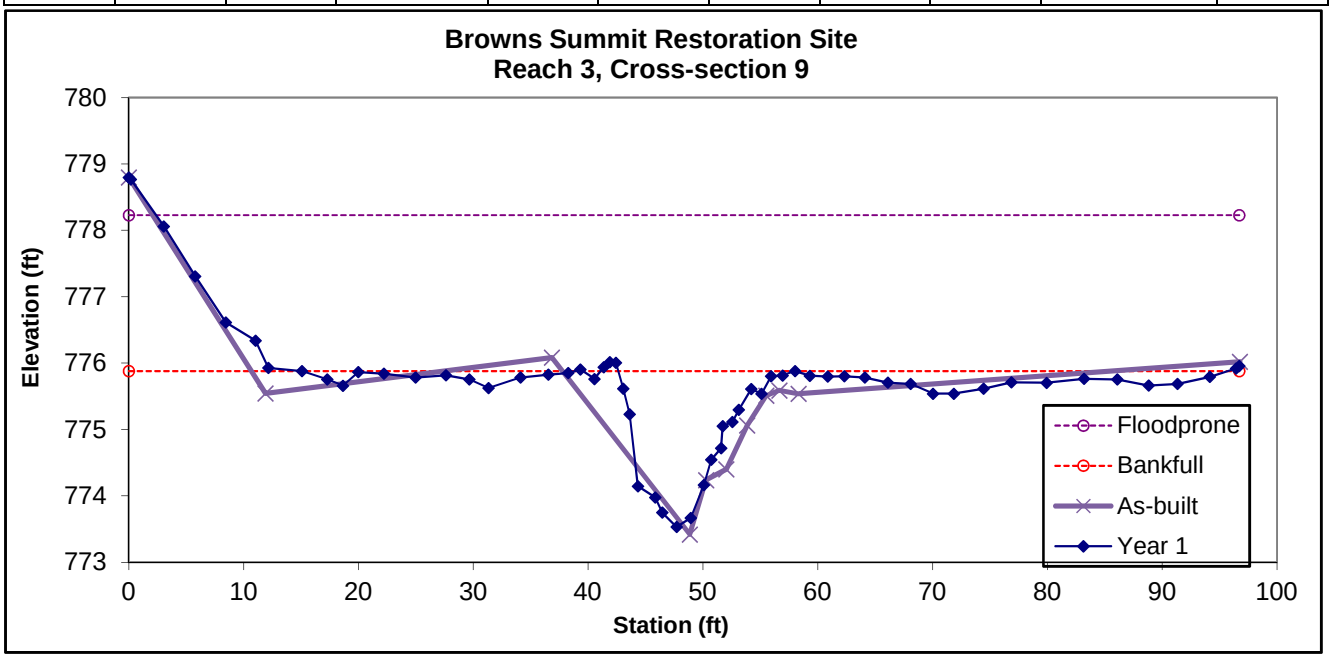


Figure 5 Year 1 Cross-sections

Permanent Cross-section 10

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	6.9	11.5	0.6	1.1	19.2	1	4.54	773.83	773.83

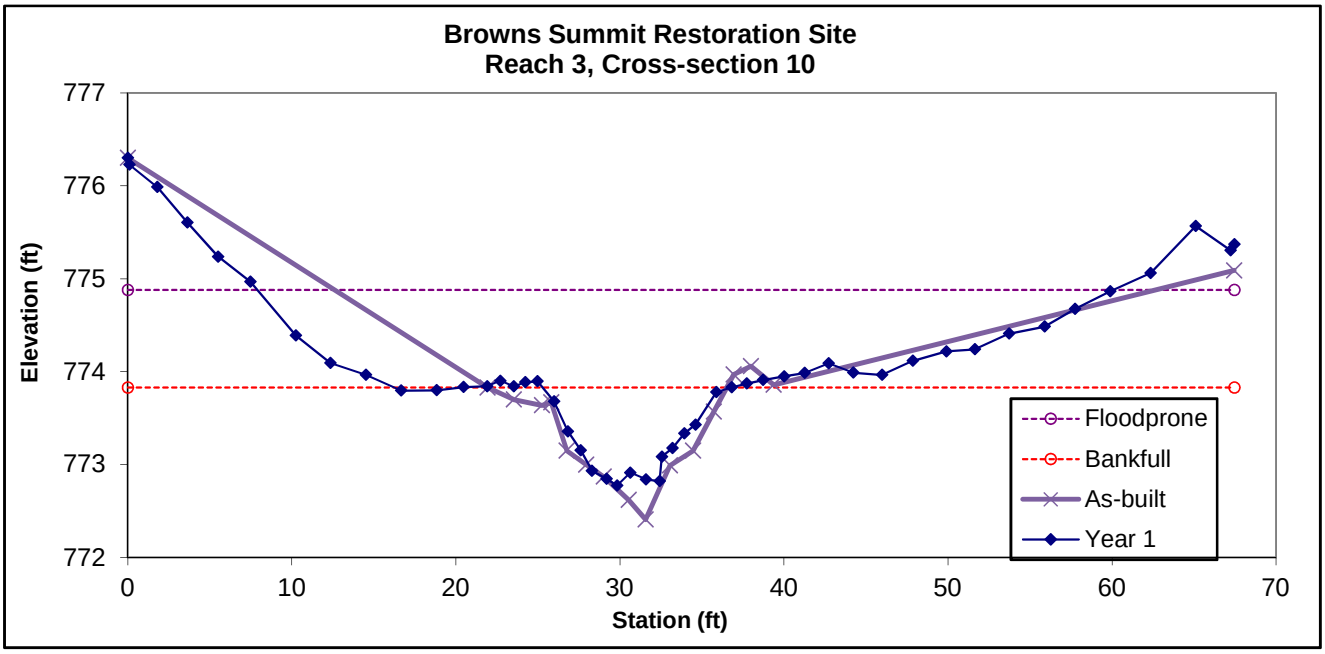


Figure 5 Year 1 Cross-sections

Permanent Cross-section 11

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	8.0	11.7	0.7	1.2	17.2	1	5.53	771.76	771.76

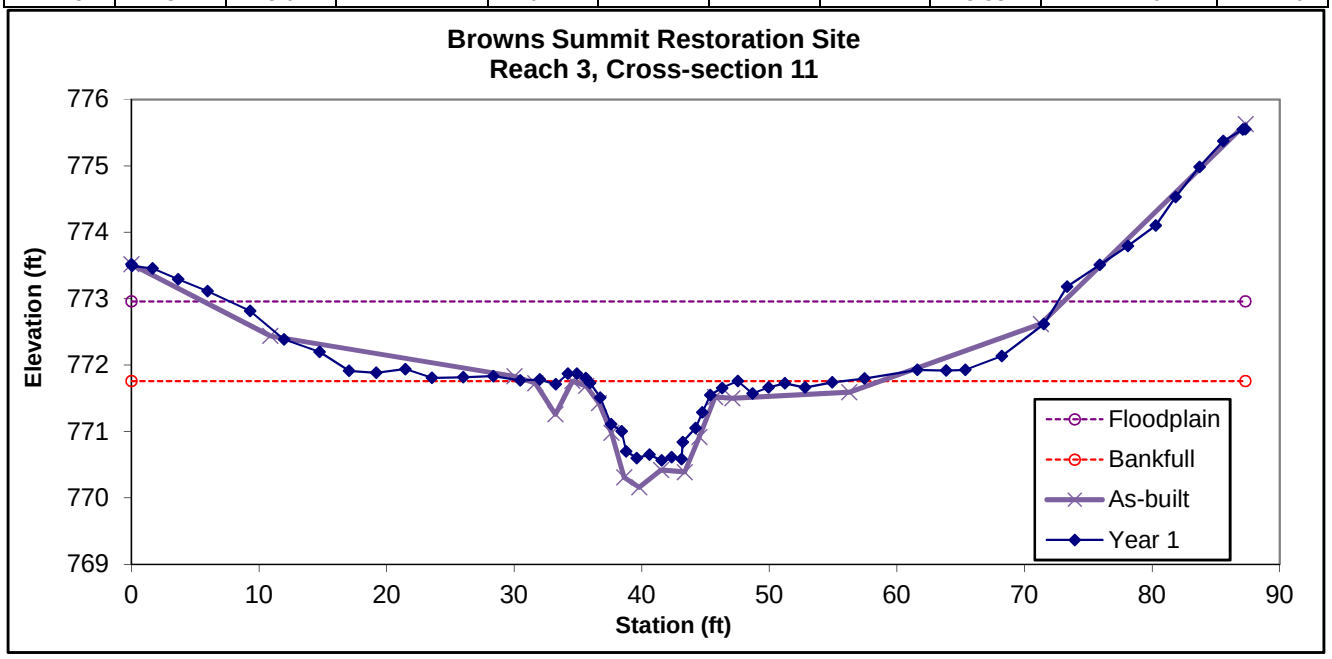
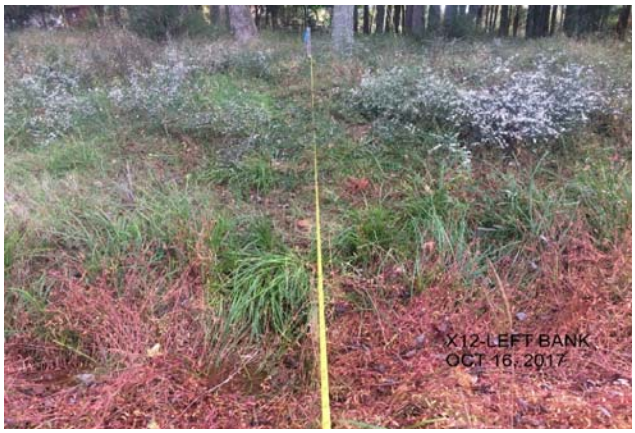


Figure 5 Year 1 Cross-sections

Permanent Cross-section 12

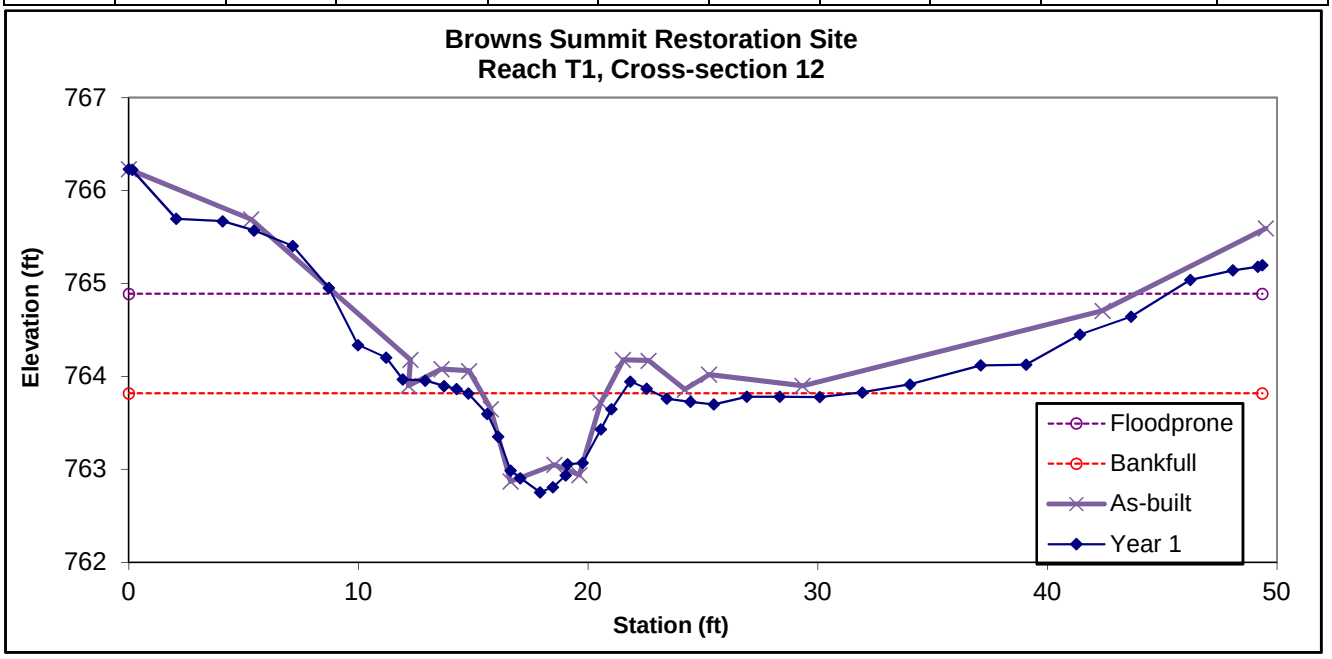
(As-built Data Collected March 2017, Year 1 Data Collected October 2017)



Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	4.1	6.7	0.6	1.1	11.0	1	5.41	763.8184	763.82



Permanent Cross-section 13

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool	C	17.1	18.7	0.9	1.7	20.6	--	-	762.95	762.95

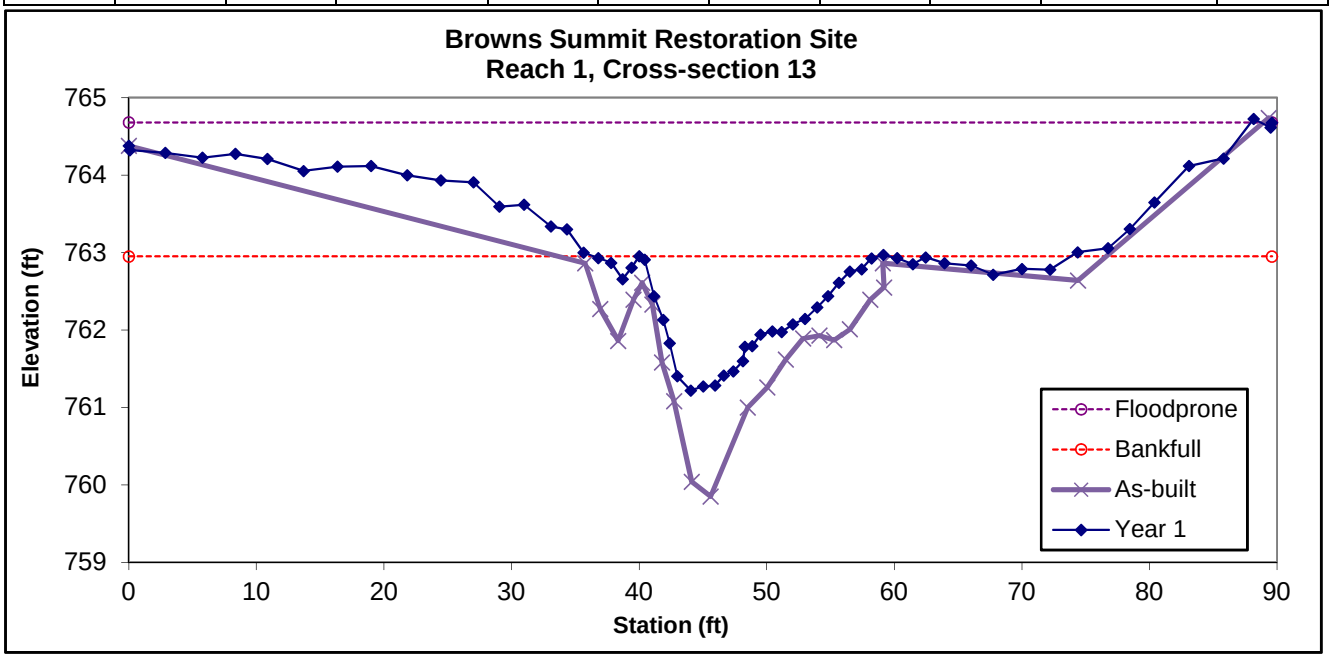


Figure 5 Year 1 Cross-sections

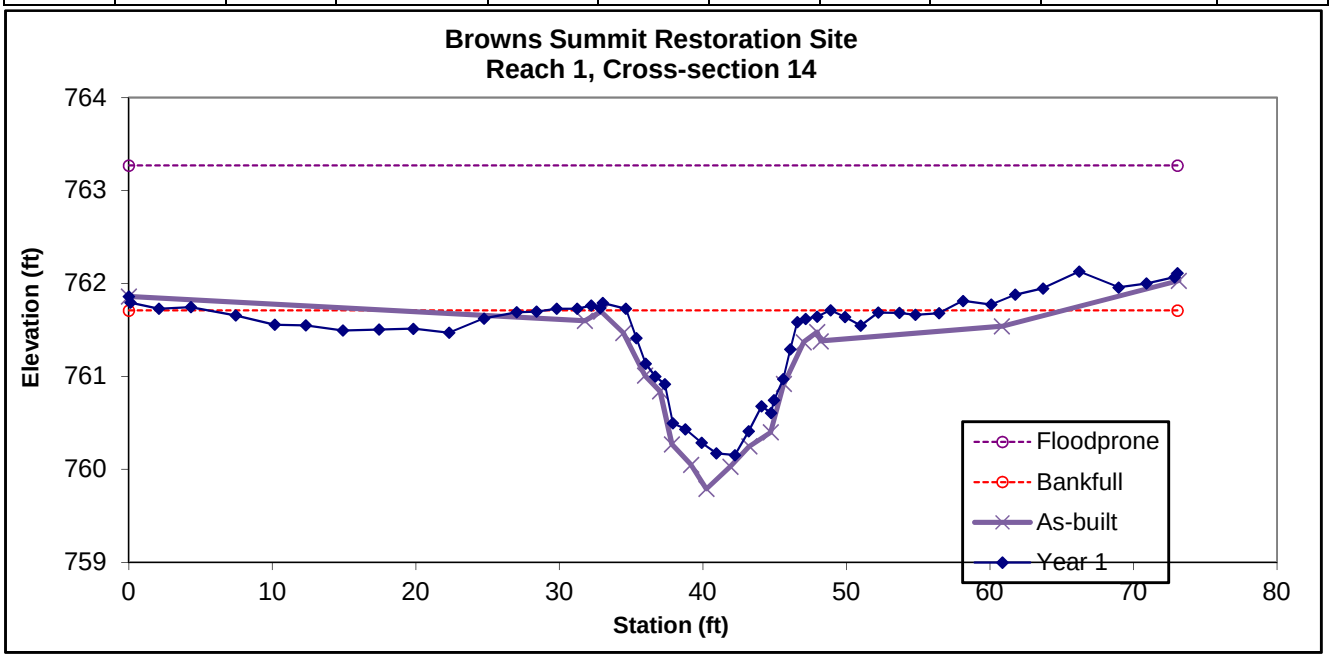
Permanent Cross-section 14

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	C	12.5	14.7	0.9	1.6	17.3	1	4.96	761.71	761.71



Permanent Cross-section 15

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Pool	C	20.8	24.3	0.9	2.5	28.3	--	--	760.52	760.52

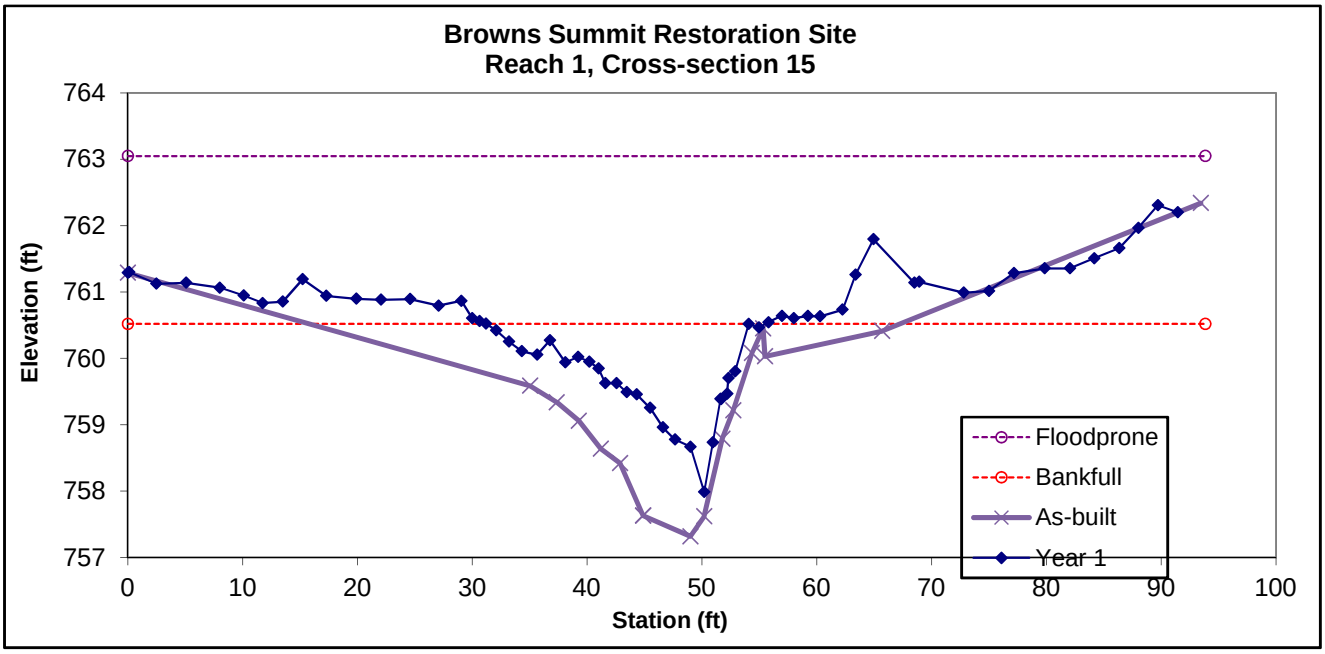


Figure 5 Year 1 Cross-sections

Permanent Cross-section 16

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	13.0	11.9	1.09	1.8	10.9	1	6	759.53	759.53

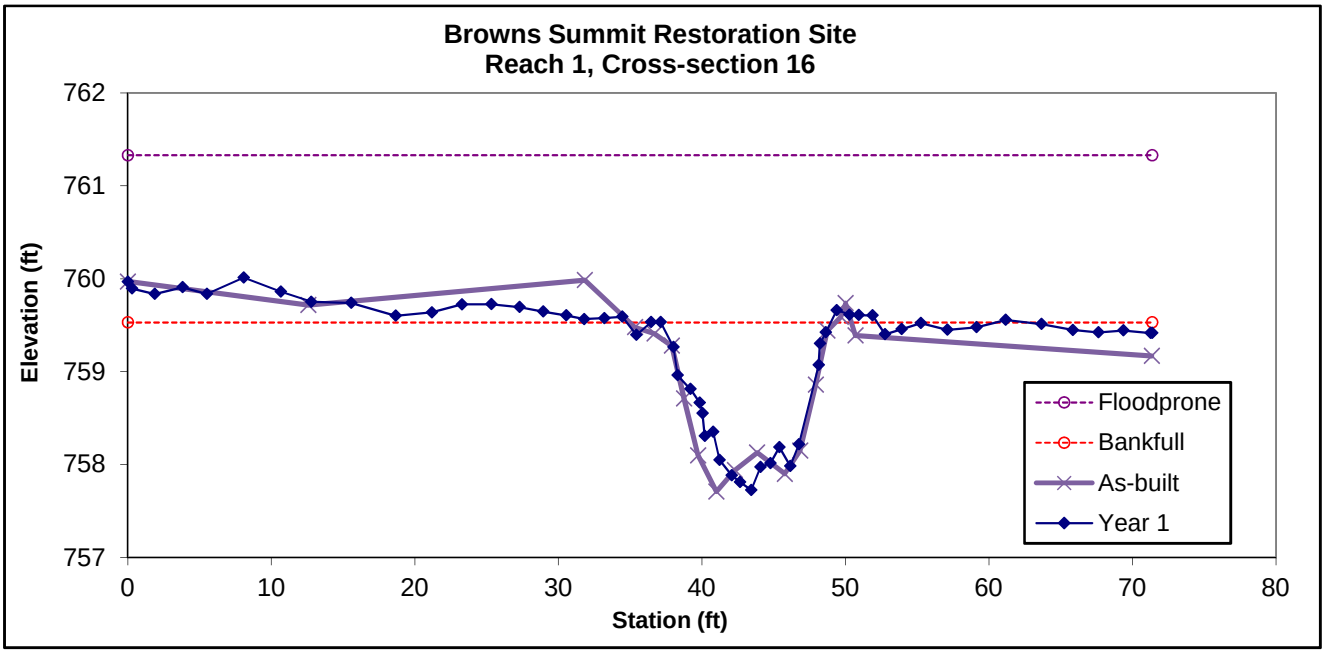


Figure 5 Year 1 Cross-sections

Permanent Cross-section 17

(As-built Data Collected March 2017, Year 1 Data Collected October 2017)

Looking at the Left Bank

Looking at the Right Bank

Feature	Stream Type	BKF Area	BKF Width	BKF Depth	Max BKF Depth	W/D	BH Ratio	ER	BKF Elev	TOB Elev
Riffle	E	14.6	12.2	1.2	2.0	10.3	1	5.62	758.65	758.65

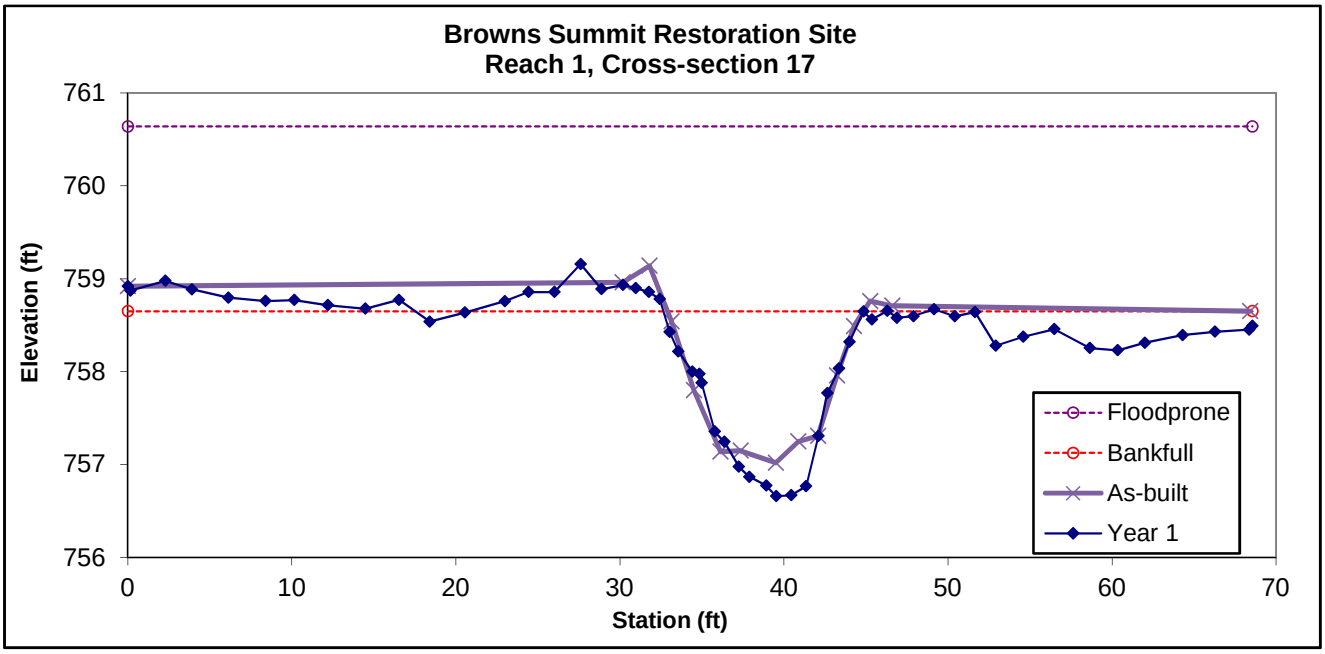


Table 10. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 1

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension and Substrate - Riffle																												
BF Width (ft)	-----	-----	-----	-----	-----	12.3	-----	-----		-----	-----	-----	-----	-----	-----	-----	-----	12.9	----	----	-----	-----	12.6	13.0	12.6	13.8	0.6	3
Floodprone Width (ft)	-----	-----	-----	-----	-----	>100	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	>100	----	----	-----	-----	100.0	100.0	100.0	100.0	0.0	3
BF Mean Depth (ft)	-----	-----	-----	-----	-----	1.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	----	----	-----	-----	0.9	1.1	1.1	1.2	0.1	3
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.5	----	----	-----	-----	1.7	1.7	1.7	1.7	0.0	3
BF Cross-sectional Area (ft^2)	-----	12.0	16.5	-----	-----	16.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	15.2	----	----	-----	-----	12.5	13.4	13.2	14.5	0.8	3
Width/Depth Ratio	-----	-----	-----	-----	-----	9.3	-----	-----	-----	-----	10	-----	-----	12	-----	-----	-----	11.0	----	----	-----	-----	10.9	12.7	12.0	15.2	1.8	3
Entrenchment Ratio	-----	-----	-----	-----	-----	8.7	-----	-----	-----	-----	-----	-----	-----	>2.2	-----	-----	-----	>6.7	----	----	-----	-----	5.3	5.5	5.4	5.7	0.2	3
Bank Height Ratio	-----	-----	-----	-----	-----	1	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	----	----	-----	-----	1	1	1	1	0	3
d50 (mm)	-----	-----	-----	-----	-----	0.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	50.0	-----	-----	75.0	-----	-----	72.6	88.2	75.3	136.9	24.7	5
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	26.0	-----	-----	39.0	-----	-----	25.9	34.5	35.4	42.0	5.3	7
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3	-----	-----	2.0	-----	-----	3.0	-----	-----	2.0	2.7	2.7	3.2	0.4	7
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	140	-----	-----	170	-----	-----	130.2	162.0	161.3	190.9	24.9	5
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.5	-----	-----	10	-----	-----	4	-----	-----	6		-----	5.6	6.8	5.8	10.5	1.9	5
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.4	20.5	13.0	47.7	14.6	13
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.013	-----	-----	-----	-----	0.001	0.019	0.010	0.091	0.023	13
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	50	-----	-----	87	-----	-----	41.4	63.2	59.1	100.8	18.2	12
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	-----	-----	2.5	-----	-----	-----	2.7	-----	-----	-----	-----	2.8	2.8	2.8	2.8	0.0	2
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			0.3/0.5/0.8/5.8/10.2																					
Reach Shear Stress (competency) lb/ft^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	114	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	88	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m^2	-----	-----	-----	-----	-----	25.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	20.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																												
Drainage Area (SM)	-----	-----	0.68	-----	-----	-----	-----	0.68	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.68	-----	-----	-----	-----	-----	0.68	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	E	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	-----	-----	C	-----	-----
BF Velocity (fps)	-----	3.6	4.1	-----	-----	3.56	-----	-----	-----	-----	4	-----	-----	6	-----	-----	-----	3.20	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	43.2	67.4	-----	-----	58	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	49	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	1086.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1036.3	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	1217	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1279.7	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.12	-----	-----	-----	-----	1.3	-----	-----	1.6	-----	-----	-----	1.40	-----	-----	-----	-----	-----	-----	-----	1.2	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0058	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0058	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0043	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 2

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	10.06	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	11.0	----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	22.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	1.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.0	----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	2.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.3	----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft²)	-----	-----	-----	-----	-----	11.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	11.1	----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	9.1	-----	-----	-----	-----	10	-----	-----	12	-----	-----	-----	11	----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	2.2	-----	-----	-----	-----	-----	-----	-----	>2.2	-----	-----	-----	-----	----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	2	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	0.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	22	-----	-----	33.0	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3	-----	-----	2	-----	-----	3.0	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.5	-----	-----	10	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	-----	-----	2.5	-----	-----	-----	2.2	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft³)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			0.2/0.4/0.6/2.9/6.9																					
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	100.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	90	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	20.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	19.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----																							
Drainage Area (SM)	-----	-----	0.47	-----	-----	-----	-----	0.47	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.47	-----	-----	-----	-----	-----	0.47	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	Bc	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	3.50	4.03	-----	-----	3.87	-----	-----	-----	-----	4	-----	-----	6	-----	-----	-----	2.91	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	32.4	51.6	-----	-----	43	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	32.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	643.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	868.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.35	-----	-----	-----	-----	1.3	-----	-----	1.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0054	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0054	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 3

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	8.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	10.3	----	----	-----	-----	9.3	10.7	10.9	11.6	0.9	4
Floodprone Width (ft)	-----	-----	-----	-----	-----	17.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	>23	----	----	-----	-----	51.6	73.4	76.1	89.9	15.7	4
BF Mean Depth (ft)	-----	-----	-----	-----	-----	1.15	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.9	----	----	-----	-----	0.6	0.8	0.8	0.9	0.2	4
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	----	----	-----	-----	1.1	1.3	1.3	1.3	0.1	4
BF Cross-sectional Area (ft²)	-----	6.5	9.3	-----	-----	9.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	9.7	----	----	-----	-----	6.8	7.9	7.6	9.8	1.2	4
Width/Depth Ratio	-----	-----	-----	-----	-----	7.15	-----	-----	-----	-----	10	-----	-----	12	-----	-----	-----	11.0	----	----	-----	-----	10.8	15.0	15.1	19.2	3.9	4
Entrenchment Ratio	-----	-----	-----	-----	-----	2.0	-----	-----	-----	-----	-----	-----	-----	>2.2	-----	-----	-----	>2.2	-----	----	-----	-----	4.4	6.9	7.5	8.2	1.5	4
Bank Height Ratio	-----	-----	-----	-----	-----	2	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	-----	----	-----	-----	1	1	1	1	0	4
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	35	-----	-----	56.0	-----	-----	37.4	54.0	59.9	64.7	11.9	3
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	20	-----	-----	30.0	-----	-----	20.0	27.8	25.8	37.2	6.3	10
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3	-----	-----	2	-----	-----	3.0	-----	-----	1.9	2.6	2.4	3.5	0.6	10
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	90	-----	-----	130.0	-----	-----	90.4	108.9	101.0	137.2	17.2	5
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.5	-----	-----	10	-----	-----	-----	-----	-----	----	-----	-----	3.5	5.1	5.6	6.1	1.1	3
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.018	-----	----	-----	-----	0.005	0.021	0.019	0.040	0.010	13
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	47	-----	-----	70.0	-----	-----	20.1	55.2	59.2	81.3	18.3	13
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	-----	-----	2.5	-----	-----	-----	2	-----	----	-----	-----	1.3	1.8	1.8	2.2	0.5	2
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			0.1/0.2/0.4/10.4/22.4																					
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	141	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	116	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	30.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	26.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----																							
Drainage Area (SM)	-----	-----	0.38	-----	-----	-----	-----	0.38	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.38	-----	-----	-----	-----	-----	0.38	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	Bc	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	E5	-----	-----	-----	-----	-----	-----	-----	C	-----	-----
BF Velocity (fps)	-----	3.42	3.97	-----	-----	3.5	-----	-----	-----	-----	4	-----	-----	6	-----	-----	-----	3.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	25.7	41.7	-----	-----	34.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	31.9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	1441.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1323.2	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	1586.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1495.2	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.10	-----	-----	-----	-----	1.3	-----	-----	1.6	-----	-----	-----	1.20	-----	-----	-----	-----	-----	-----	-----	1.13	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.0082	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0082	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.010	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----		-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 4

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design (lower/upper)						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	7.60	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	9.2 / 8.1	-----	-----	-----	-----	7.2	9.3	9.1	11.8	1.7	4
Floodprone Width (ft)	-----	-----	-----	-----	-----	9.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	>19 / >17	-----	-----	-----	-----	31.3	57.9	66.0	68.1	15.4	4
BF Mean Depth (ft)	-----	-----	-----	-----	-----	0.86	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.7 / 0.6	-----	-----	-----	-----	0.5	0.8	0.9	1.1	0.2	4
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.39	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.9 / 0.8	-----	-----	-----	-----	0.8	1.4	1.5	1.7	0.3	4
BF Cross-sectional Area (ft^2)	-----	-----	-----	-----	-----	6.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.5 / 5.0	-----	-----	-----	-----	3.3	7.7	7.4	12.7	3.4	4
Width/Depth Ratio	-----	-----	-----	-----	-----	8.8	-----	-----	-----	-----	10.0	-----	-----	14.0	-----	-----	-----	13.0	-----	----	-----	-----	11.0	12.3	11.3	15.4	1.8	4
Entrenchment Ratio	-----	-----	-----	-----	-----	1.2	-----	-----	-----	-----	-----	-----	-----	>2.2	-----	-----	-----	>2.2	-----	----	-----	-----	4.4	5.9	5.8	7.6	1.3	3
Bank Height Ratio	-----	-----	-----	-----	-----	7	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	-----	----	-----	-----	1	1	1	1	0	3
d50 (mm)	-----	-----	-----	-----	-----	0.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	30-42/22-43	-----	----	-----	-----	36.9	43.0	42.8	49.7	4.7	4
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3	-----	-----	-----	18-28/16-25	-----	-----	-----	-----	17.2	24.5	25.1	34.3	4.9	10
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.1 / 2.0	-----	-----	-----	-----	1.8	2.6	2.7	3.7	0.5	10
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	120.0 / 80.0	-----	-----	-----	-----	63.1	94.5	93.0	123.0	20.2	9
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.5	-----	-----	8	-----	-----	-----	12.0 / 2.7	-----	-----	-----	-----	4.0	4.6	4.6	5.3	0.5	4
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.019	-----	----	-----	-----	0.013	0.021	0.018	0.036	0.008	7
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	36-64/29-52	-----	----	-----	-----	31.2	58.1	56.1	87.8	18.7	6
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.0 / 1.9	-----	----	-----	-----	2.0	2.0	2.0	2.0	0.0	1
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			0.2/0.3/0.4/0.9/1.8																					
Reach Shear Stress (competency) lb/ft^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	208	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	141	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m^2	-----	-----	-----	-----	-----	-----	45.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	30.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----						-----																	
Drainage Area (SM)	-----	-----	0.22	-----	-----	-----	-----	0.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.22	-----	-----	-----	-----	-----	0.22	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	Gc	-----	-----	-----	-----	-----	C5	-----	-----	-----	-----	-----	C5	-----	-----	-----	-----	-----	-----	-----	E	-----	-----
BF Velocity (fps)	-----	3.29	3.90	-----	-----	3.69	-----	-----	-----	-----	3.5	-----	-----	5.0	-----	-----	-----	3.8 / 4.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	17.9	29.8	-----	-----	24	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	24.8 / 21.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	1173.9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1173.9	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	1350.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1263.4	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.15	-----	-----	-----	-----	1.2	-----	-----	1.5	-----	-----	-----	1.13/1.22	-----	-----	-----	-----	-----	-----	-----	1.08	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.011 / 0.016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.0	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 5

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	7.38	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	11.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	0.44	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	0.67	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft²)	-----	-----	-----	-----	-----	3.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	16.77	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	1.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----				----																				
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----						-----																	
Drainage Area (SM)	-----	-----	0.04	-----	-----	-----	-----	0.04	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.04	-----	-----	-----	-----	-----	0.04	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	Bc	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	3.97	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	12.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	470.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	470	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	536.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	520	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.14	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.11	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.017	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 6

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	9.09	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.1	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	12.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	13.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	0.48	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.5	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	0.8	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft^2)	-----	-----	-----	-----	-----	4.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.1	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	18.94	-----	-----	-----	-----	12.0	-----	-----	18.0	-----	-----	-----	14.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	1.4	-----	-----	-----	-----	1.4	-----	-----	2.2	-----	-----	-----	<2.2	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	5	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	0.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.06	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	30	-----	-----	54.0	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.7	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----			0.2/0.3/0.4/0.9/1.8																					
Reach Shear Stress (competency) lb/ft^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----						-----																	
Drainage Area (SM)	-----	-----	0.10	-----	-----	-----	-----	0.10	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.10	-----	-----	-----	-----	-----	0.10	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	Bc	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	3.75	-----	-----	-----	-----	4	-----	-----	6.0	-----	-----	-----	5.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	16.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	16	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	468.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	501.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	468.2	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.07	-----	-----	-----	-----	1.1	-----	-----	1.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.014	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.016	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach T1

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	6.80	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	7.0	-----	----	-----	-----	7.7	7.7	7.7	7.7	0.0	1
Floodprone Width (ft)	-----	-----	-----	-----	-----	89.1	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	39.9	39.9	39.9	39.9	0.0	1
BF Mean Depth (ft)	-----	-----	-----	-----	-----	0.67	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.5	-----	----	-----	-----	0.7	0.7	0.7	0.7	0.0	1
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.53	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.7	-----	----	-----	-----	1.2	1.2	1.2	1.2	0.0	1
BF Cross-sectional Area (ft²)	-----	-----	-----	-----	-----	4.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.8	-----	----	-----	-----	5.1	5.1	5.1	5.1	0.0	1
Width/Depth Ratio	-----	-----	-----	-----	-----	10.15	-----	-----	-----	-----	10.0	-----	-----	14.0	-----	-----	-----	13.0	-----	----	-----	-----	11.7	11.7	11.7	11.7	0.0	1
Entrenchment Ratio	-----	-----	-----	-----	-----	13.1	-----	-----	-----	-----		-----	-----	>2.2	-----	-----	-----	-----	-----	----	-----	-----	5.2	5.2	5.2	5.2	0.0	1
Bank Height Ratio	-----	-----	-----	-----	-----	2	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	-----	-----	----	-----	-----	1	1	1	1	0	1
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	29.6	29.6	29.6	29.6	0.0	1
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	14	-----	-----	21.0	-----	-----	16.3	17.4	17.4	18.5	1.1	2
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3	-----	-----	-----	-----	-----	----	-----	-----	2.1	2.3	2.3	2.4	0.1	2
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	60.0	-----	----	-----	-----	56.0	57.9	57.9	59.7	1.8	2
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	3.5	-----	-----	8	-----	-----	-----	4.0	-----	----	-----	-----	3.8	3.8	3.8	3.8	0.0	1
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.029	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	27	-----	-----	35.0	-----	-----	18.2	23.8	26.6	34.6	7.6	3
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.2	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft³)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----																		
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----						-----																	
Drainage Area (SM)	-----	-----	0.09	-----	-----	-----	-----	0.09	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.09	-----	-----	-----	-----	-----	0.09	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	E	-----	-----	-----	-----	-----	C5	-----	----	-----	-----	-----	C5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	3.76	-----	-----	-----	-----	3.5	-----	-----	5.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	16.9	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	114.2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	114.2	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	121.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	139.6	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.06	-----	-----	-----	-----	1.2	-----	-----	1.5	-----	-----	-----	1.12	-----	-----	-----	-----	-----	-----	-----	1.22	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.024	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.019	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach T2

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data						Design						As-built					
											Composite																	
Dimension and Substrate - Riffle		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
BF Width (ft)	-----	-----	-----	-----	-----	18.00	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	23.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	0.22	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	0.78	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft^2)	-----	-----	-----	-----	-----	4.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	81.82	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	1.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----																		
Reach Shear Stress (competency) lb/ft^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m^2	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters					-----						-----																	
Drainage Area (SM)	-----	-----	0.07	-----	-----	-----	-----	0.07	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.07	-----	-----	-----	-----	-----	0.07	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	F	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	3.6	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	14.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	252.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	252.7	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	283.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	284.2	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.12	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.022	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313
Reach T3

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data Composite						Design						As-built					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension and Substrate - Riffle																												
BF Width (ft)	-----	-----	-----	-----	-----	2.93	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.8	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	66.5	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	15.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	1.12	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.5	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	1.76	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft²)	-----	-----	-----	-----	-----	3.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	2.62	-----	-----	-----	-----	12.0	-----	-----	18.0	-----	-----	-----	12.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	22.7	-----	-----	-----	-----	1.4	-----	-----	2.2	-----	-----	-----	<2.2	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	2	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2	-----	-----	3.0	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.033	-----	----	-----	-----	0.017	0.025	0.017	0.017	0.007	2
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	36	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.9	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----																		
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters											-----																	
Drainage Area (SM)	-----	-----	0.06	-----	-----	-----	-----	0.06	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.06	-----	-----	-----	-----	-----	0.06	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	E	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	3.6	-----	-----	-----	-----	4	-----	-----	6.0	-----	-----	-----	2.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	11.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	6.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	44.3	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	80.5	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	47.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	88.0	-----	-----
Sinuosity	-----	-----	-----	-----	-----	1.06	-----	-----	-----	-----	1.1	-----	-----	1.3	-----	-----	-----	1.20	-----	-----	-----	-----	-----	-----	-----	1.09	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	0.02	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.014	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 10 continued. Baseline Stream Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313
Reach T4

Parameter	USGS Gauge	Regional Curve*			Pre-Existing Condition						Reference Reach(es) Data Composite						Design						As-built					
		LL	UL	Eq.	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n	Min	Mean	Med	Max	SD	n
Dimension and Substrate - Riffle																												
BF Width (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	5.8	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Floodprone Width (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	12.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Mean Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.5	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.6	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
BF Cross-sectional Area (ft²)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	2.8	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Width/Depth Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	12.0	-----	-----	18.0	-----	-----	-----	12.0	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Entrenchment Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.4	-----	-----	2.2	-----	-----	-----	<2.2	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Bank Height Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1	-----	-----	1	-----	-----	-----	1	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
d50 (mm)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Pattern																												
Channel Beltwidth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Radius of Curvature (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Rc:Bankfull width (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Wavelength (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Meander Width Ratio	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Profile																												
Riffle Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Riffle Slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.051	-----	----	-----	-----	0.007	0.047	0.048	0.072	0.023	11
Pool Length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool to Pool Spacing (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	14	-----	----	-----	-----	12.3	16.1	14.6	21.6	3.5	11
Pool Max Depth (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.9	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Pool Volume (ft^3)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----	-----	-----	-----	-----	-----	-----	-----	-----
Substrate and Transport Parameters																												
Ri% / Ru% / P% / G% / S%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
SC% / Sa% / G% / B% / Be%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----
d16 / d35 / d50 / d84 / d95	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----																		
Reach Shear Stress (competency) lb/ft²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Max part size (mm) mobilized at bankfull (Rosgen Curve)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Stream Power (transport capacity) W/m²	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Additional Reach Parameters																												
Drainage Area (SM)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Impervious cover estimate (%)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Rosgen Classification	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	B5c	-----	-----	-----	-----	-----	-----	-----	B5c	-----	-----
BF Velocity (fps)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	4	-----	-----	6.0	-----	-----	-----	3.7	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF Discharge (cfs)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	10.4	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Valley Length	-----	-----	-----	-----	-----	-----	-----	117.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	143.34	-----	-----
Channel length (ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	119.18	-----	-----
Sinuosity	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	1.1	-----	-----	1.3	-----	-----	-----	1.20	-----	-----	-----	-----	-----	-----	-----	0.8314497	-----	-----
Water Surface Slope (Channel) (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	0.047	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BF slope (ft/ft)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Bankfull Floodplain Area (acres)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
BEHI VL% / L% / M% / H% / VH% / E%	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Channel Stability or Habitat Metric	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Biological or Other	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

* 1999 Regional Cruve and Esitmate from Revised Regional Curve. See Mitigation Plan for more information.

Table 11a. Morphology and Hydraulic Monitoring Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Stream Reach	**Reach 4**																													
	Cross-section X-1 (Riffle)							**Cross-section X-2 (Pool)**							**Cross-section X-3 (Riffle)**															
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+									
Based on fixed baseline bankfull elevation																														
BF Width (ft)	7.2	8.1						11.6	12.8						9.5	12.49														
BF Mean Depth (ft)	0.5	0.4						0.9	0.8						0.9	0.58														
Width/Depth Ratio	15.4	19.4						12.7	15.6						11	21.5														
BF Cross-sectional Area (ft²)	3.3	3.4						10.5	10.5						8.2	7.25														
BF Max Depth (ft)	0.8	0.9						2	2.5						1.6	1.21														
Width of Floodprone Area (ft)	31.3	58.8						-	-						66.2	66.1														
Entrenchment Ratio (MY1 will provide standard)*	4.4	5.9						-	-						7.0	5.3														
Bank Height Ratio (MY1 will provide standard)*	1	1.0						-	-						1	1														
Wetted Perimeter (ft)	7.4	8.5						12.6	15.3						10.1	13														
Hydraulic Radius (ft)	0.5	0.4						0.8	0.7						0.8	0.6														
Cross Sectional Area between end pins (ft²)	-	-						-	-						-	-														
d50 (mm)	-	-						-	-						-	-														

Stream Reach	**Reach 4**														**Reach 3**															
	Cross-section X-4 (Riffle)							**Cross-section X-5 (Riffle)**							**Cross-section X-6 (Pool)**							**Cross-section X-7 (Riffle)**									
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+			
Based on fixed baseline bankfull elevation																														
BF Width (ft)	8.7	9.16						11.8	10.93						12.5	12.9						11.2	11.5								
BF Mean Depth (ft)	0.8	0.73						1.1	0.75						0.9	1.1						0.6	0.5								
Width/Depth Ratio	11.6	12.55						11	14.57						14	11.6						18.6	21.3								
BF Cross-sectional Area (ft²)	6.6	6.72						12.7	8.18						11.2	14.4						6.8	6.2								
BF Max Depth (ft)	1.4	1.02						1.7	1.08						1.3	2.4						1.1	1.0								
Width of Floodprone Area (ft)	65.8	72.0						68.1	69.3						-	-						89.9	89.9								
Entrenchment Ratio (MY1 will provide standard)*	7.6	7.4						5.8	6.3						-	-						8	7.8								
Bank Height Ratio (MY1 will provide standard)*	1	1						1	1						-	-						1	1.0								
Wetted Perimeter (ft)	9.4	6.94						12.8	11.47						13.0	13.92						11.6	11.8								
Hydraulic Radius (ft)	0.7	0.7						1.0	0.71						0.9	1.03						0.6	0.5								
Cross Sectional Area between end pins (ft²)	-	-						-	-						-	-						-	-								
d50 (mm)	-	-						-	-						-	-						-	-								

Stream Reach	**Reach 3**																													
	Cross-section X-8 (Riffle)							**Cross-section X-9 (Pool)**							**Cross-section X-10 (Riffle)**							**Cross-section X-11 (Riffle)**									
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+			
Based on fixed baseline bankfull elevation																														
BF Width (ft)	10.60	10.05						17.60	15.3						11.60	11.5						9.30	11.7								
BF Mean Depth (ft)	0.90	0.71						1.00	1.1						0.60	0.6						0.90	0.7								
Width/Depth Ratio	11.5	14.15						17.7	13.5						19.2	19.2						10.8	17.2								
BF Cross-sectional Area (ft²)	9.8	7.16						17.5	17.2						7.0	6.9						8.1	8								
BF Max Depth (ft)	1.30	1.05						2.20	2.4						1.30	1.1						1.30	1.2								
Width of Floodprone Area (ft)	86.6	89.5						-	-						51.6	67.5						65.6	87.3								
Entrenchment Ratio (MY1 will provide standard)*	8.2	8.48						-	-						4.4	4.5						7.0	5.5								
Bank Height Ratio (MY1 will provide standard)*	1	1						-	-						1	1						1	1								
Wetted Perimeter (ft)	11.2	11.27						18.2	11.27						12.0	11.91						9.9	12.31								
Hydraulic Radius (ft)	0.9	0.64						1.0	0.64						0.6	0.58						0.8	0.65								
Cross Sectional Area between end pins (ft²)	-	-						-	-						-	-						-	-								
d50 (mm)	-	-						-	-						-	-						-	-								

*BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

Table 11a. Morphology and Hydraulic Monitoring Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Table 11a continued. Morphology and Hydraulic Monitoring Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Stream Reach	**Reach T1**							**Reach 1**																		
	Cross-section X-12 (Riffle)							**Cross-section X-13 (Pool)**							**Cross-section X-14 (Riffle)**							**Cross-section X-15 (Pool)**						
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Based on fixed baseline bankfull elevation																												
BF Width (ft)	7.70	6.7						19.60	18.7						13.80	14.7						29.40	24.3					
BF Mean Depth (ft)	0.70	0.6						1.20	0.9						0.90	0.9						1.10	0.9					
Width/Depth Ratio	11.7	11						16.4	20.6						15.2	17.3						26.1	28.3					
BF Cross-sectional Area (ft²)	5.1	4.1						23.5	17.1						12.5	12.5						33.2	20.8					
BF Max Depth (ft)	1.20	1.1						2.80	1.7						1.70	1.6						2.80	2.5					
Width of Floodprone Area (ft)	39.9	49.4						-	-						100.0	73.1						100.0	93.8					
Entrenchment Ratio (MY1 will provide standard)*	5.2	5.4						-	-						5.3	5.0						-	-					
Bank Height Ratio (MY1 will provide standard)*	1	1						-	-						1.0	1						-	-					
Wetted Perimeter (ft)	8.5	7.18						21.0	19.36						14.4	15.37						30.5	25.67					
Hydraulic Radius (ft)	0.6	0.57						1.1	0.88						0.9	0.81						1.1	0.81					
Cross Sectional Area between end pins (ft²)	-	-						-	-						-	-						-	-					
d50 (mm)	-	-						-	-						-	-						-	-					

Stream Reach	**Reach 1**																									
	Cross-section X-16 (Riffle)							**Cross-section X-17 (Riffle)**																		
Dimension and substrate	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+												
Based on fixed baseline bankfull elevation																										
BF Width (ft)	12.60	11.9						12.60	12.2																	
BF Mean Depth (ft)	1.10	1.09						1.20	1.2																	
Width/Depth Ratio	12.0	10.9						10.9	10.3																	
BF Cross-sectional Area (ft²)	13.2	13						14.5	14.6																	
BF Max Depth (ft)	1.70	1.8						1.70	2																	
Width of Floodprone Area (ft)	100.0	71.4						100.0	68.6																	
Entrenchment Ratio (MY1 will provide standard)*	5.7	6						5.4	5.6																	
Bank Height Ratio (MY1 will provide standard)*	1.0	1						1.0	1																	
Wetted Perimeter (ft)	13.5	13.0						13.3	13.1																	
Hydraulic Radius (ft)	1.0	1						1.1	1.1																	
Cross Sectional Area between end pins (ft²)	-	-						-	-																	
d50 (mm)	-	-						-	-																	

*BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

Table 11b. Stream Reach Morphology Summary

Browns Summit Creek Restoration Project: DMS Project No ID. 96313

Reach 4

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	7.2	9.3	9.1	11.8	1.7	4	8.1	10.2	10.0	12.5	1.7	4																								
Floodprone Width (ft)	31.3	57.9	66.0	68.1	15.4	4	58.8	66.6	67.7	72.0	4.9	4																								
Bankfull Mean Depth (ft)	0.5	0.8	0.9	1.1	0.2	4	0.4	0.6	0.7	0.8	0.1	4																								
[1]Bankfull Max Depth (ft)	0.8	1.4	1.5	1.7	0.3	4	0.9	1.1	1.1	1.2	0.1	4																								
Bankfull Cross Sectional Area (ft^2)	3.3	7.7	7.4	12.7	3.4	4	3.4	6.4	7.0	8.2	1.8	4																								
Width/Depth Ratio	11.0	12.3	11.3	15.4	1.8	4	12.6	17.0	17.0	21.5	3.6	4																								
Entrenchment Ratio (MY1 will provide standard)*	4.4	6.2	6.4	7.6	1.2	4	5.3	6.2	6.1	7.4	0.8	4																								
Bank Height Ratio (MY1 will provide standard)*	1	1	1	1	0	4	1	1	1	1	0	4																								
Profile																																				
Riffle Length (ft)																																				
Riffle Slope (ft/ft)																																				
Pool Length (ft)																																				
Pool Max depth (ft)																																				
Pool Spacing (ft)																																				
Pattern																																				
Channel Beltwidth (ft)																																				
Radius of Curvature (ft)																																				
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)																																				
Meander Width Ratio																																				
Additional Reach Parameters																																				
Rosgen Classification																																				
Channel Thalweg length (ft)																																				
Sinuosity (ft)																																				
Water Surface Slope (Channel) (ft/ft)																																				
BF slope (ft/ft)																																				
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																																				
[3]d16 / d35 / d50 / d84 / d95 /																																				
[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.

1 = The distributions for these parameters can include information from both the cross-section measurements and the longitudinal profile.

2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table

3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave

4. = Of value/needed only if the n exceeds 3

*BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

Table 11b continued. Stream Reach Morphology Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313
Reach 3

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	9.3	10.7	10.9	11.6	0.9	4	10.1	11.2	11.5	11.7	0.7	4																								
Floodprone Width (ft)	51.6	73.4	76.1	89.9	15.7	4	67.5	83.5	88.4	89.9	9.3	4																								
Bankfull Mean Depth (ft)	0.6	0.8	0.8	0.9	0.2	4	0.5	0.6	0.7	0.7	0.1	4																								
[1]Bankfull Max Depth (ft)	1.1	1.3	1.3	1.3	0.1	4	1.0	1.1	1.1	1.2	0.1	4																								
Bankfull Cross Sectional Area (ft^2)	6.8	7.9	7.6	9.8	1.2	4	6.2	7.1	7.0	8.0	0.6	4																								
Width/Depth Ratio	10.8	15.0	15.1	19.2	3.9	4	14.2	18.0	18.2	21.3	2.6	4																								
Entrenchment Ratio (MY1 will provide standard)*	4.4	6.9	7.5	8.2	1.5	4	4.5	6.6	6.7	8.5	1.6	4																								
Bank Height Ratio (MY1 will provide standard)*	1	1	1	1	0	4	1	1	1	1	0	4																								
Profile																																				
Riffle Length (ft)																																				
Riffle Slope (ft/ft)																																				
Pool Length (ft)																																				
Pool Max depth (ft)																																				
Pool Spacing (ft)																																				
Pattern																																				
Channel Beltwidth (ft)																																				
Radius of Curvature (ft)																																				
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)																																				
Meander Width Ratio																																				
Additional Reach Parameters																																				
Rosgen Classification																																				
Channel Thalweg length (ft)																																				
Sinuosity (ft)																																				
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[3]Ri% / Ru% / P% / G% / S%																																				
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[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

Shaded cells indicate that these will typically not be filled in.
1 = The distributions for these parameters can include information from both the cross-section measurements and the longitudinal profile.
2 = Proportion of reach exhibiting banks that are eroding based on the visual survey from visual assessment table
3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave
4. = Of value/needed only if the n exceeds 3
*BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

Table 11b continued. Stream Reach Morphology Summary
Browns Summit Creek Restoration Project: DMS Project No ID. 96313
Reach 1

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	12.6	13.0	12.6	13.8	0.6	3	11.9	12.9	12.2	14.7	1.3	3																								
Floodprone Width (ft)	100.0	100.0	100.0	100.0	0.0	3	68.6	71.0	71.4	73.1	1.9	3																								
Bankfull Mean Depth (ft)	0.9	1.1	1.1	1.2	0.1	3	0.9	1.1	1.1	1.2	0.1	3																								
[1]Bankfull Max Depth (ft)	1.7	1.7	1.7	1.7	0.0	3	1.6	1.8	1.8	2.0	0.2	3																								
Bankfull Cross Sectional Area (ft^2)	12.5	13.4	13.2	14.5	0.8	3	12.5	13.4	13.0	14.6	0.9	3																								
Width/Depth Ratio	10.9	12.7	12.0	15.2	1.8	3	10.3	12.8	10.9	17.3	3.2	3																								
Entrenchment Ratio (MY1 will provide standard)*	5.3	5.5	5.4	5.7	0.2	3	5.0	5.5	5.6	6.0	0.4	3																								
Bank Height Ratio (MY1 will provide standard)*	1	1	1	1	0	3	1	1	1	1	0	3																								
Profile																																				
Riffle Length (ft)																																				
Riffle Slope (ft/ft)																																				
Pool Length (ft)																																				
Pool Max depth (ft)																																				
Pool Spacing (ft)																																				
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[3]d16 / d35 / d50 / d84 / d95 /																																				
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Shaded cells indicate that these will typically not be filled in.
1 = The distributions for these parameters can include information from both the cross-section measurements and the longitudinal profile.
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3 = Riffle, Run, Pool, Glide, Step; Silt/Clay, Sand, Gravel, Cobble, Boulder, Bedrock; dip = max pave, disp = max subpave
4. = Of value/needed only if the n exceeds 3
*BHR and Entrenchment Ratio will be calculated by holding the MY1 bankfull riffle max depth constant throughout the life of the project.

Appendix E

Hydrologic Data

Table 12. Verification of Bankfull Events			
Browns Summit Creek Restoration Project: DMS Project No ID. 96313			
Date of Collection	**Reach1 Crest Gauge (feet ABOVE bankfull)**	**Approximate Date of Occurrence (Source: on-site rain gauge)**	**Method of Data Collection**
Year 1 Monitoring (2017)			
6/7/2017	0.46	4/25/2017	Crest Gauge Measurement
10/3/2017	0.22	8/17/2017	Crest Gauge Measurement

Table 13. Flow Gauge Success (2017)		
Browns Summit Creek Restoration Project: DMS Project ID No. 96313		
Flow Gauge ID	**Consecutive Days of Flow[1]**	**Cumulative Days of Flow[2]**
R4 Gauge		
BSFL1	127	171
T3 Gauge		
BSFL2	166	173
T1 Gauge		
BSFL3	263	263
Notes:		
[1]Indicates the number of consecutive days within the monitoring year where flow was measured.		
[2]Indicates the number of cumulative days within the monitoring year where flow was measured.		
Flow success criteria for the Site is stated as: 30 days of consecutive baseflow for monitoring wells installed in T1 and T3 during a normal rainfall year.		
* Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above **0.05** feet in depth.		

Table 14. Flow Gauge Success
Browns Summit Restoration Project: DMS Project ID No. 96313

Flow Gauge ID	Most Consecutive Days Meeting Criteria[1]							Cumulative Days Meeting Criteria[2]						
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)
Flow Gauges (Installed March 4, 2017)														
BSFL1	127.0							171.0						
BSFL2	166.0							173.0						
BSFL3	263.0							263.0						

Notes:

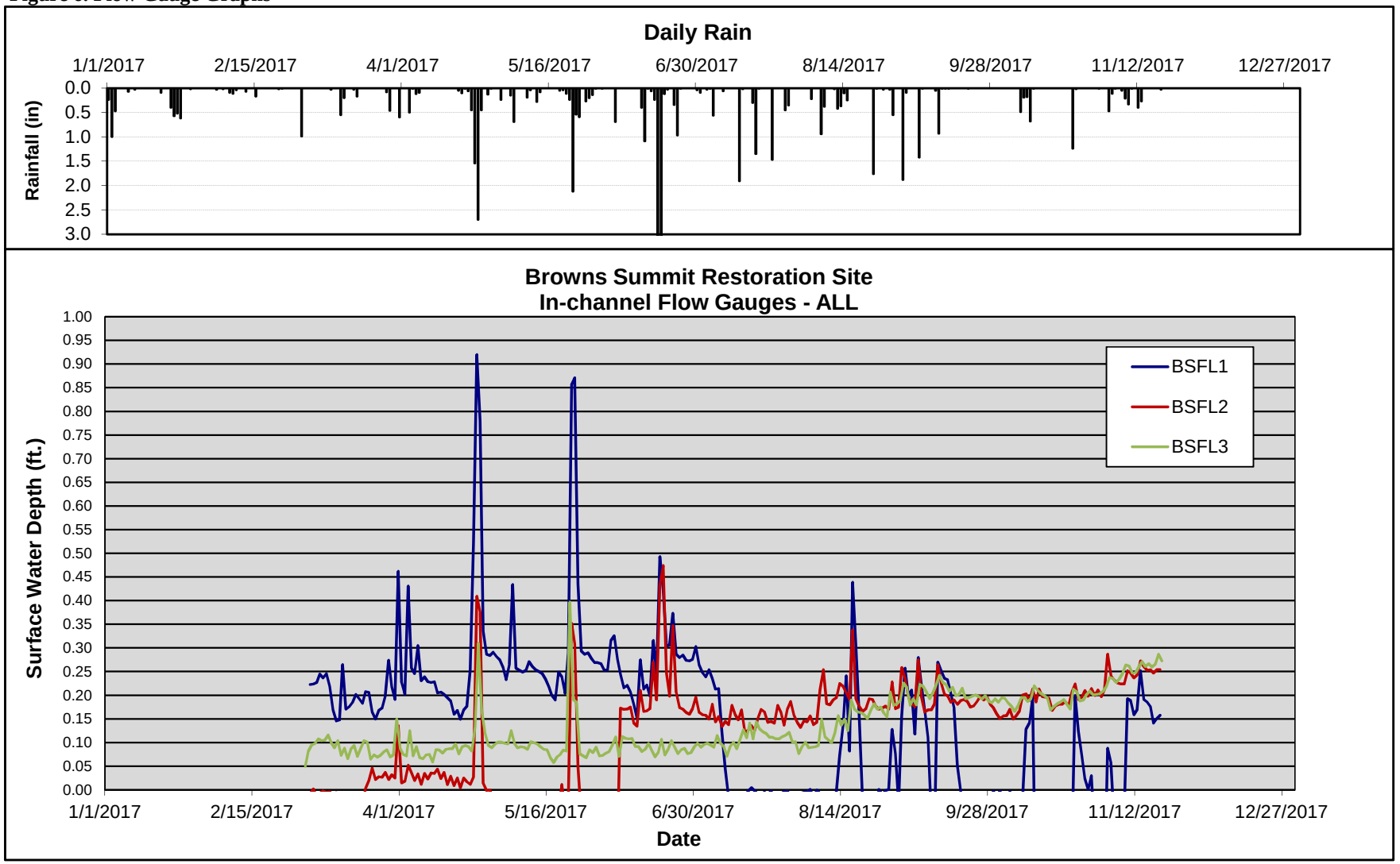
[1]Indicates the number of consecutive days within the monitoring year where flow was measured.

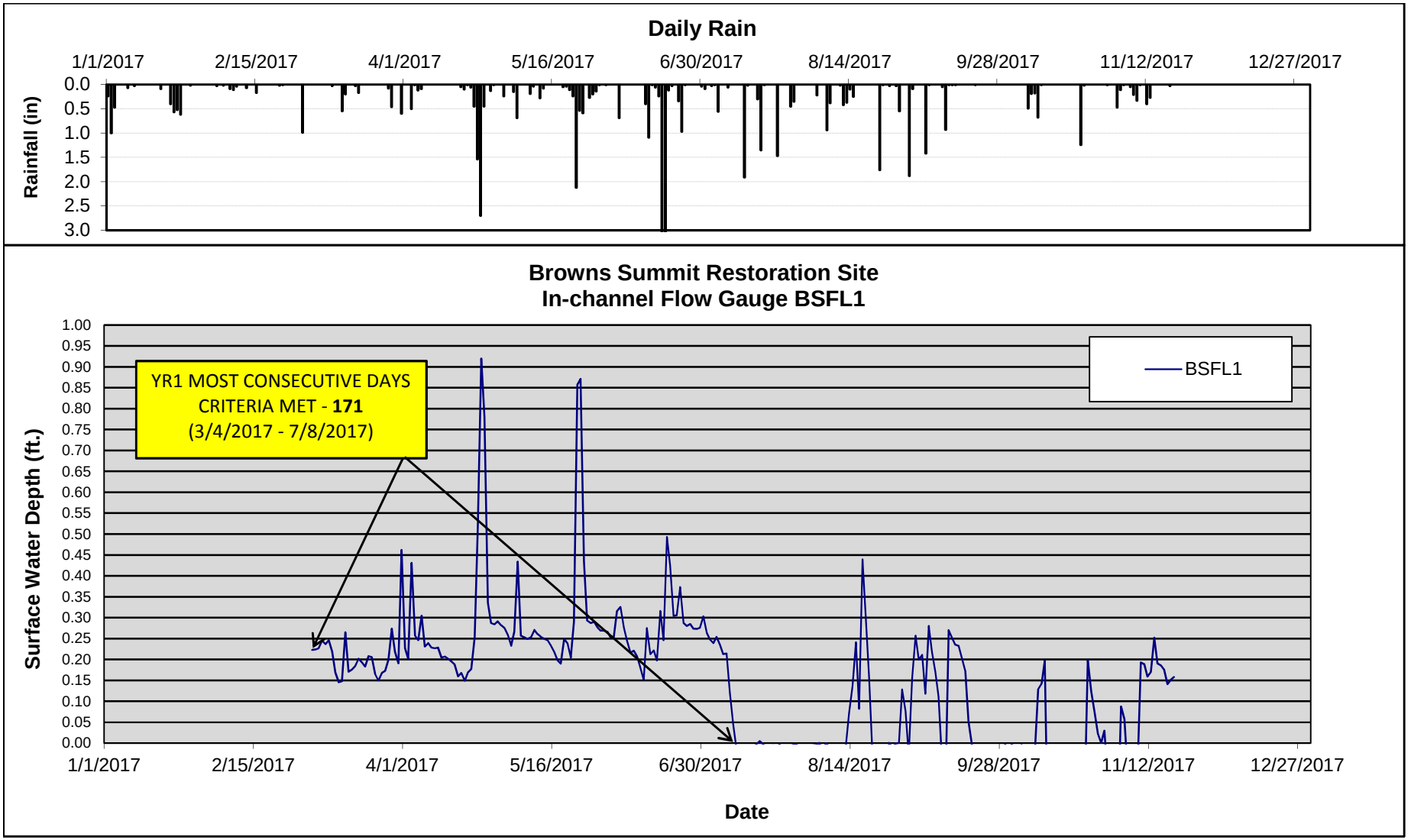
[2]Indicates the number of cumulative days within the monitoring year where flow was measured.

Success Criteria per Browns Summit Mitigation Plan (1/13/2016): "Success criteria wil include 30 days of consecutive baseflow for monitoirng wells installed in T1 and T3 during a normal rainfall year."

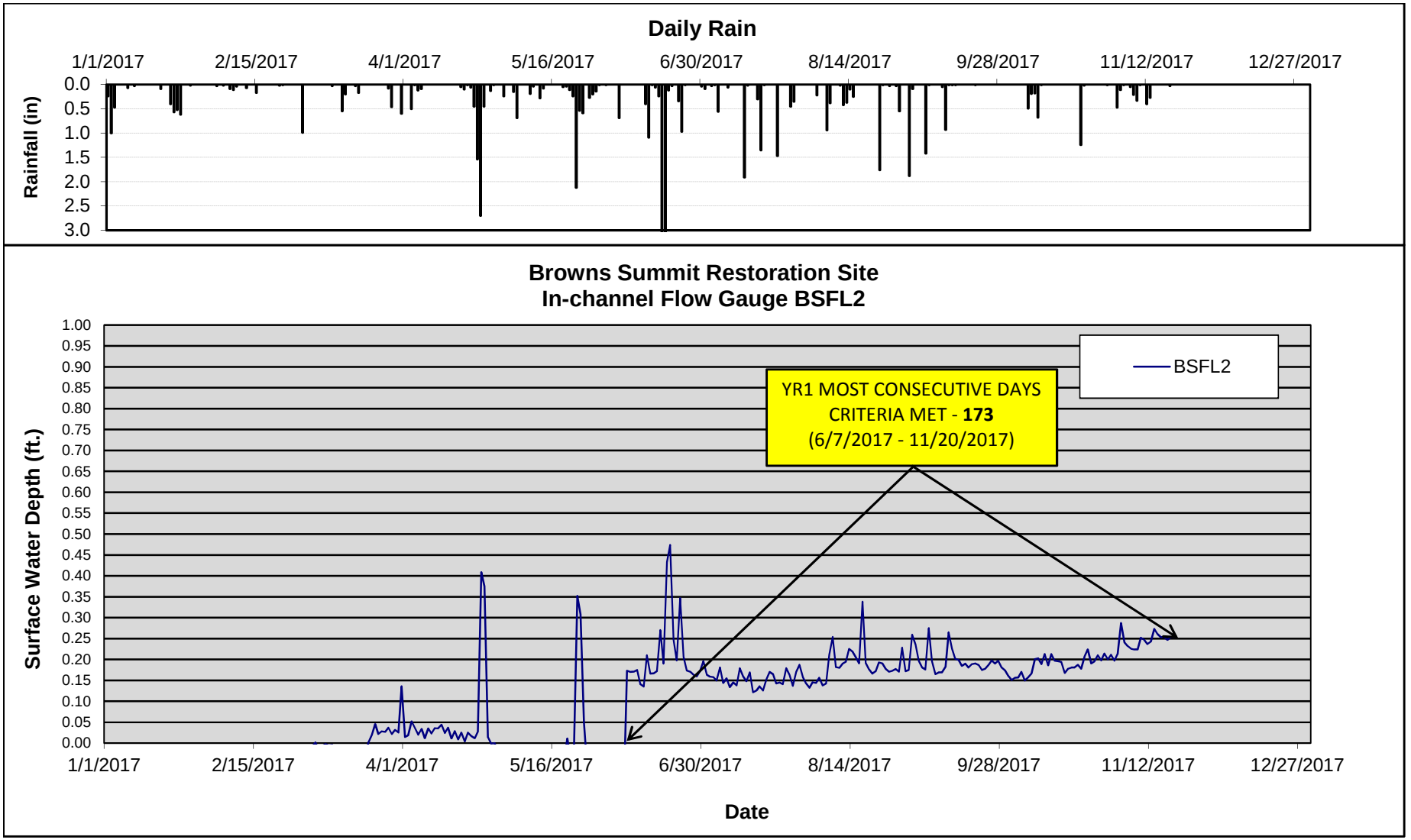
Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above 0.05 feet in depth.

Figure 6. Flow Gauge Graphs

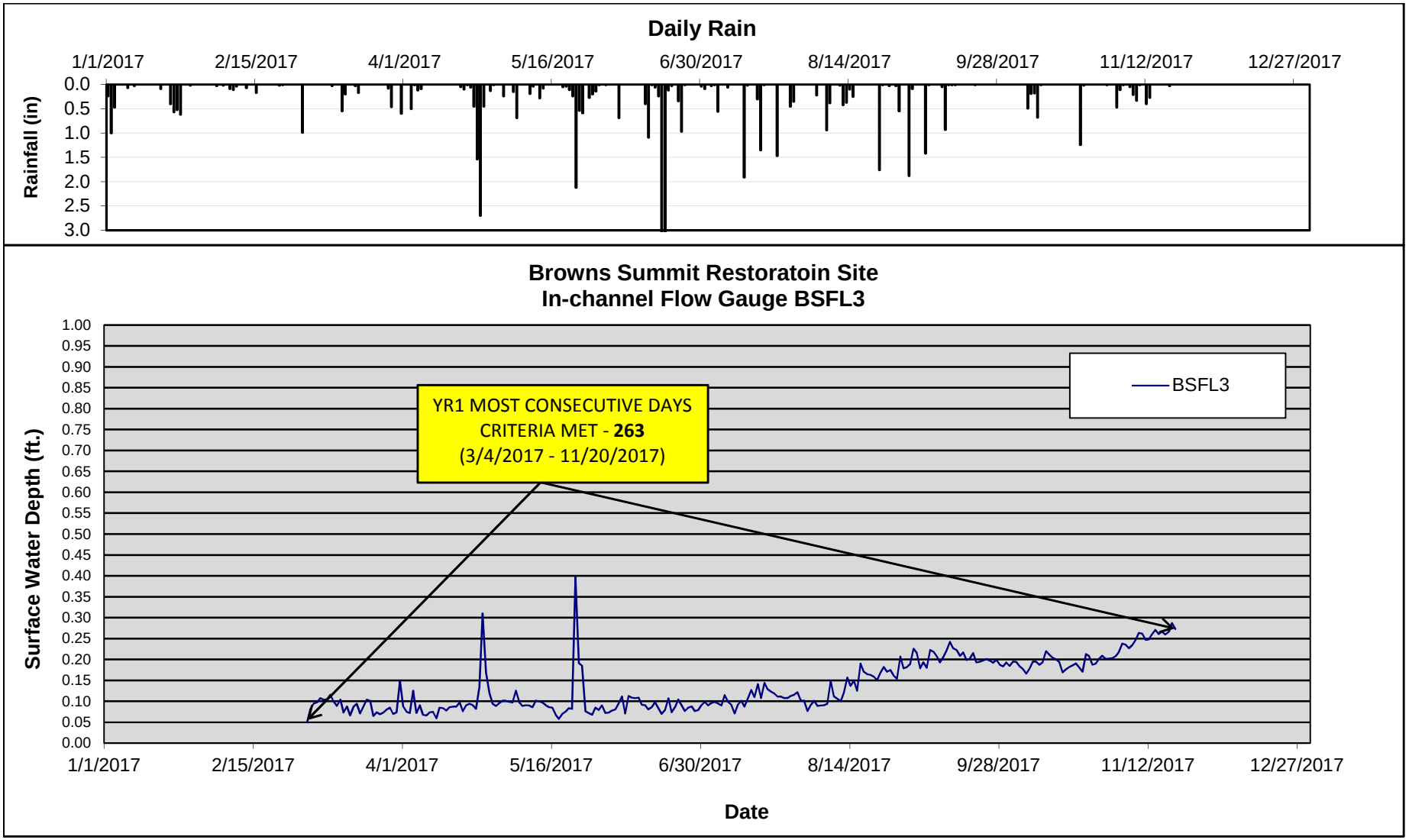




* Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above 0.05 feet in depth.



* Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above 0.05 feet in depth.



* Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above 0.05 feet in depth.

Table 15. Wetland Restoration Area Success (2017)

Wetland Restoration Area Success

Browns Summit Restoration Project: DMS Project ID No. 95019

Well ID	Percentage of Consecutive Days <12 inches from Ground Surface[1]	Most Consecutive Days Meeting Criteria[2]	Minimum Consecutive Days for Success	Percentage of Cumulative Days <12 inches from Ground Surface[1]	Cumulative Days Meeting Criteria[3]
Groundwater Monitoring Wells (Installed March 2017)					
BSAW1 (9% Criteria)	44.7	105.5	21	74.8	176.5
BSAW2 (12% Criteria)	3.2	7.5	28	13.8	32.5
BSAW3 (12% Criteria)	47.7	112.5	28	91.7	216.5
BSAW4 (12% Criteria)	100.0	236.0	28	100.0	236.0
BSAW5 (12% Criteria)	34.1	80.5	28	73.7	174.0
BSAW6 (12% Criteria)	46.0	108.5	28	89.4	211.0
BSAW7 (12% Criteria)	51.1	120.5	28	91.1	215.0

Notes:

[1]Indicates the percentage of most consecutive or cumulative number of days within the monitored growing season with a water 12 inches or less from the soil surface.

[2]Indicates the most consecutive number of days within the monitored growing season with a water table 12 inches or less from the soil surface.

[3]Indicates the cumulative number of days within the monitored growing season with a water table 12 inches or less from the soil surface.

[4]Indicates the number of instances within the monitored growing season when the water table rose to 12 inches or less from the soil surface.

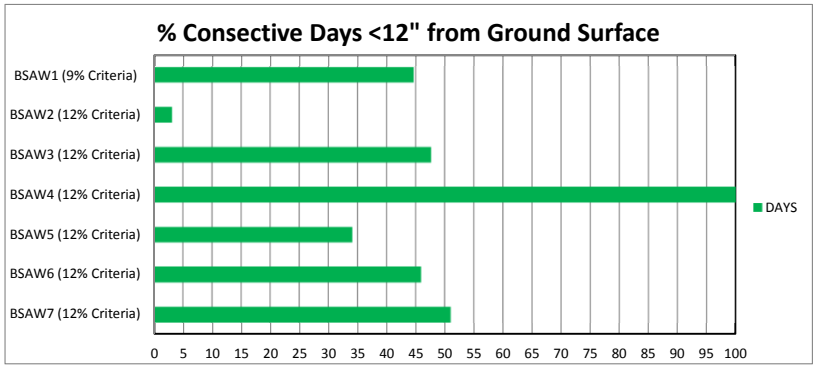
According to the Site Mitigation Plan, the growing season for Guilford County is from March 22 to November 13 and is 236 days long. 12% of the growing season is 28 days and 9% of the growing season is 21 days.

HIGHLIGHTED indicates wells that *did not* meet the success criteria for the most consecutive number of days within the monitored growing season with a water 12 inches or less from the soil surface.

Growing season for Guilford County is 3/22 - 11/13

*Growing season is 236 days long; 12% of 236 days = 28 days

*Growing season is 236 days long; 9% of 236 days = 21 days



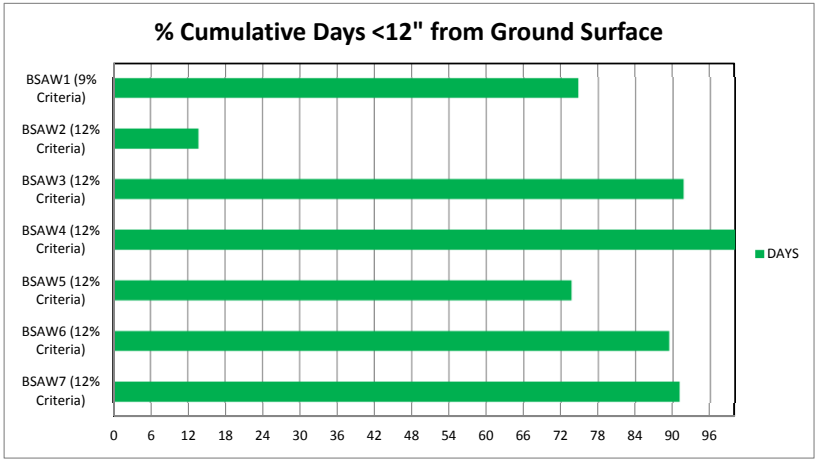


Table 16. Wetland Restoration Area Success
Browns Summit Restoration Project: DMS Project ID No. 96313

Well ID	Percentage of Consecutive Days <12 inches from Ground Surface[1]							Most Consecutive Days Meeting Criteria[2]							Percentage of Cumulative Days <12 inches from Ground Surface[1]							Cumulative Days Meeting Criteria[3]						
	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)	Year 1 (2017)	Year 2 (2018)	Year 3 (2019)	Year 4 (2020)	Year 5 (2021)	Year 6 (2022)	Year 7 (2023)
Type 5 (3.5:1 Ratio - Success Criteria 9 % of Growing Season)																												
BSAW1	**44.7**							**105.5**							**74.8**							**176.5**						
Type 4 (1:1 Ratio - Success Criteria 12% of Growing Season																												
BSAW2	**3.2**							**7.5**							**13.8**							**32.5**						
Type 2 (1.5:1 Ratio - Success Criteria 12% of Growing Season)																												
BSAW3	**47.7**							**112.5**							**91.7**							**216.5**						
Type 3 (1.5:1 Ratio - Success Criteria 12% of Growing Season)																												
BSAW4	**100.0**							**236.0**							**100.0**							**236.0**						
BSAW5	**34.1**							**80.5**							**73.7**							**174.0**						
BSAW6	**46.0**							**108.5**							**89.4**							**211.0**						
BSAW7	**51.1**							**120.5**							**91.1**							**215.0**						

Notes:

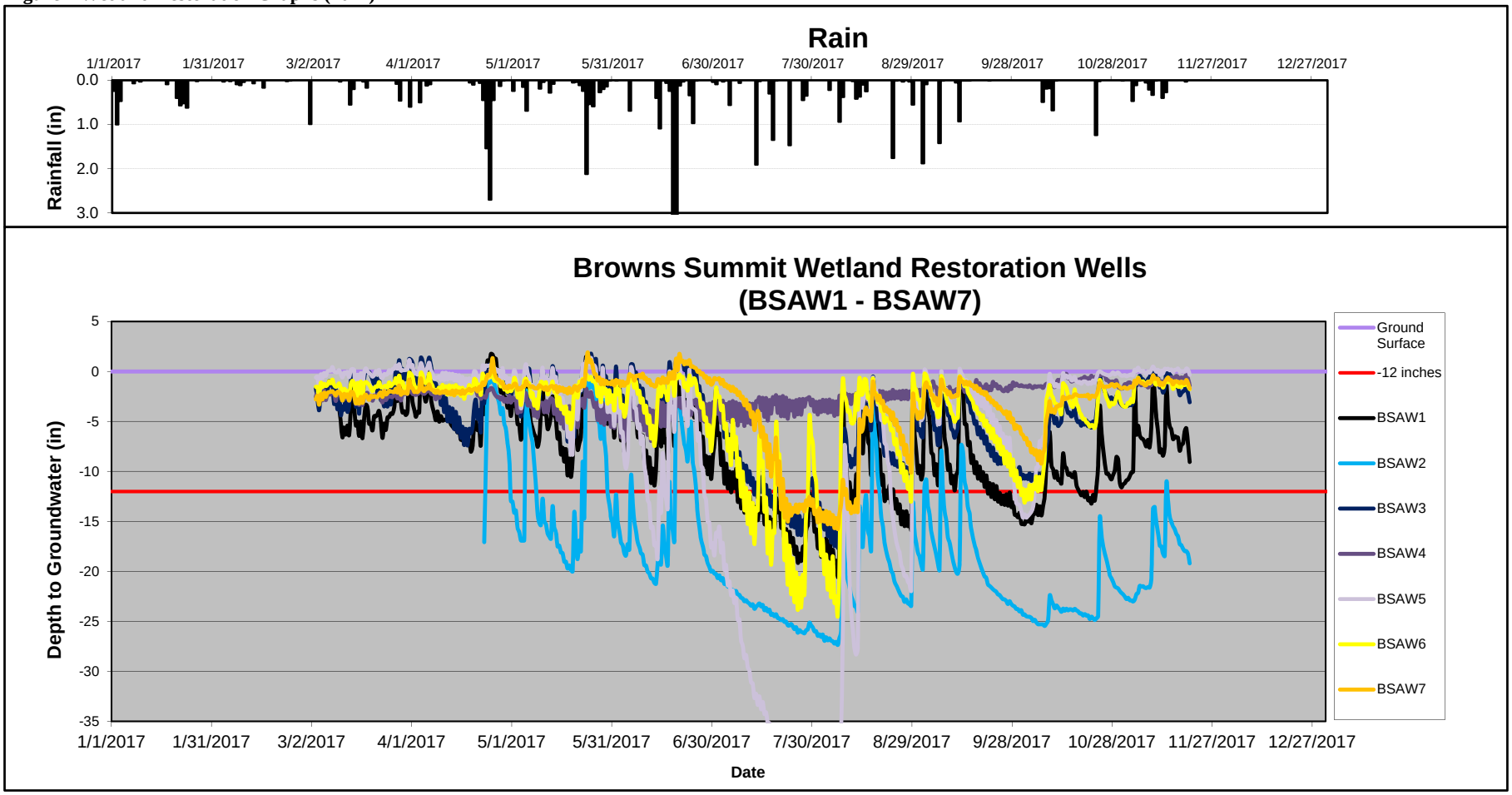
[1]Indicates the percentage of most consecutive or cumulative number of days within the monitored growing season with a water 12 inches or less from the soil surface.

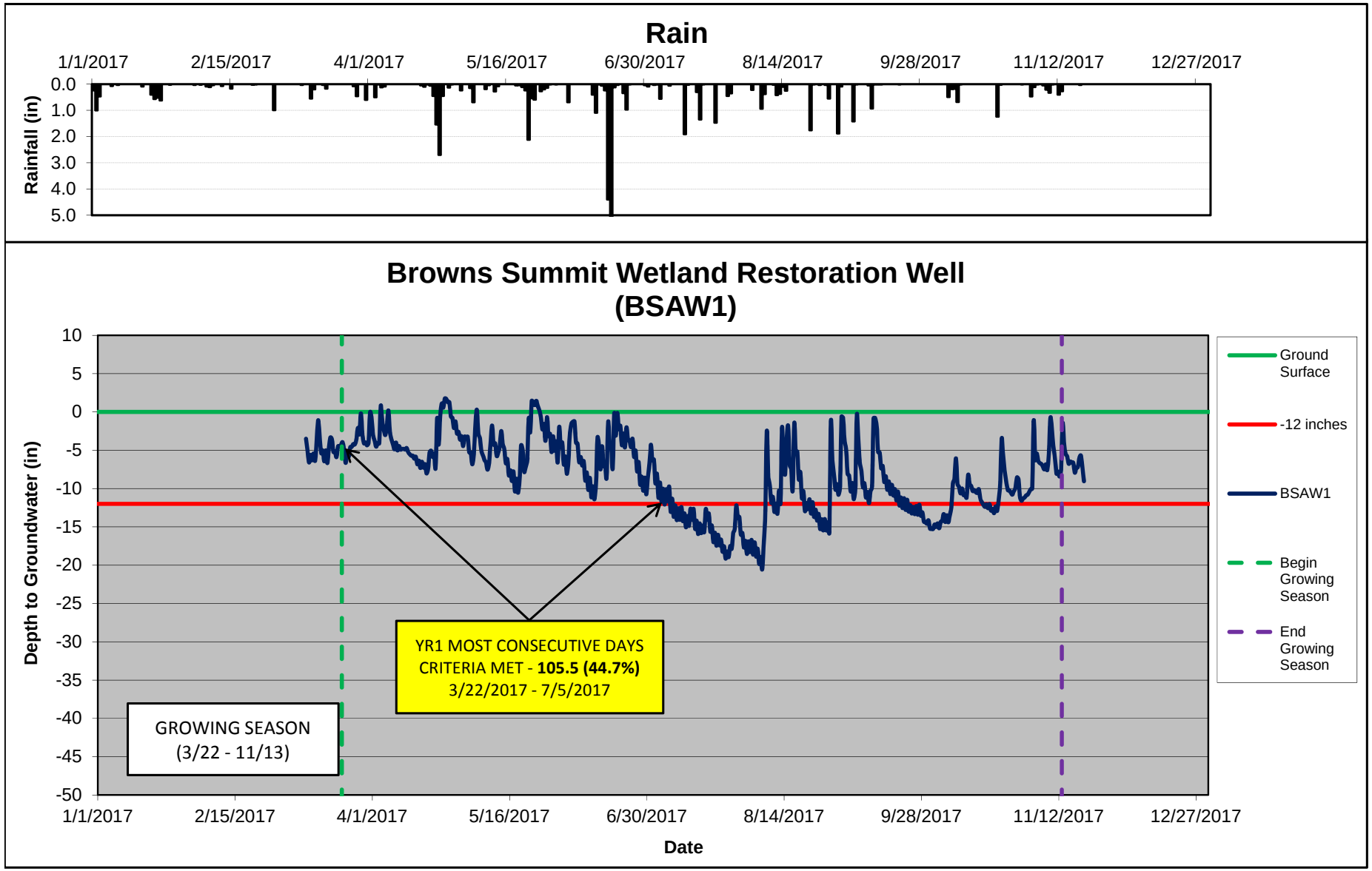
[2]Indicates the most consecutive number of days within the monitored growing season with a water table 12 inches or less from the soil surface.

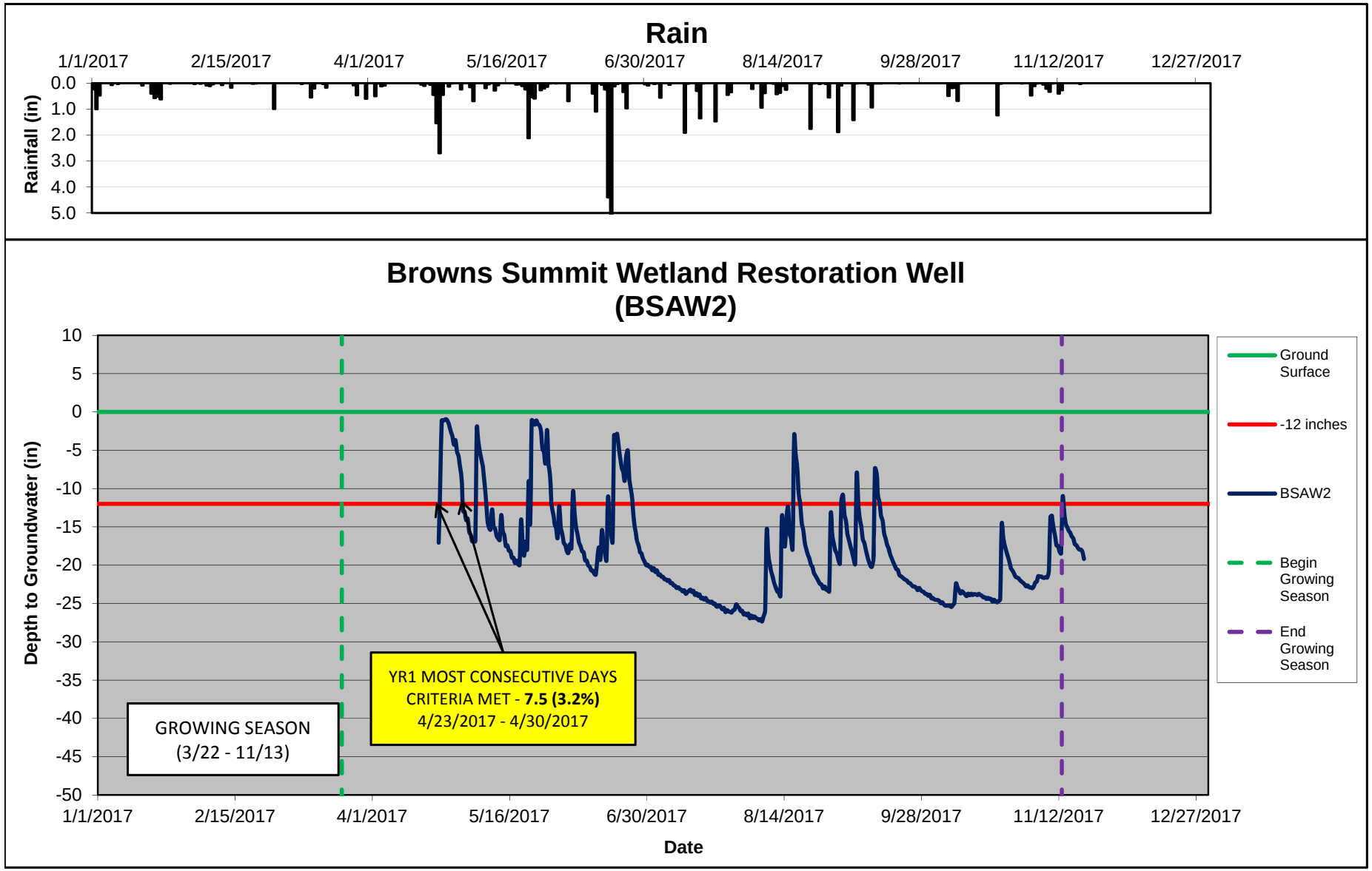
[3]Indicates the cumulative number of days within the monitored growing season with a water table 12 inches or less from the soil surface.

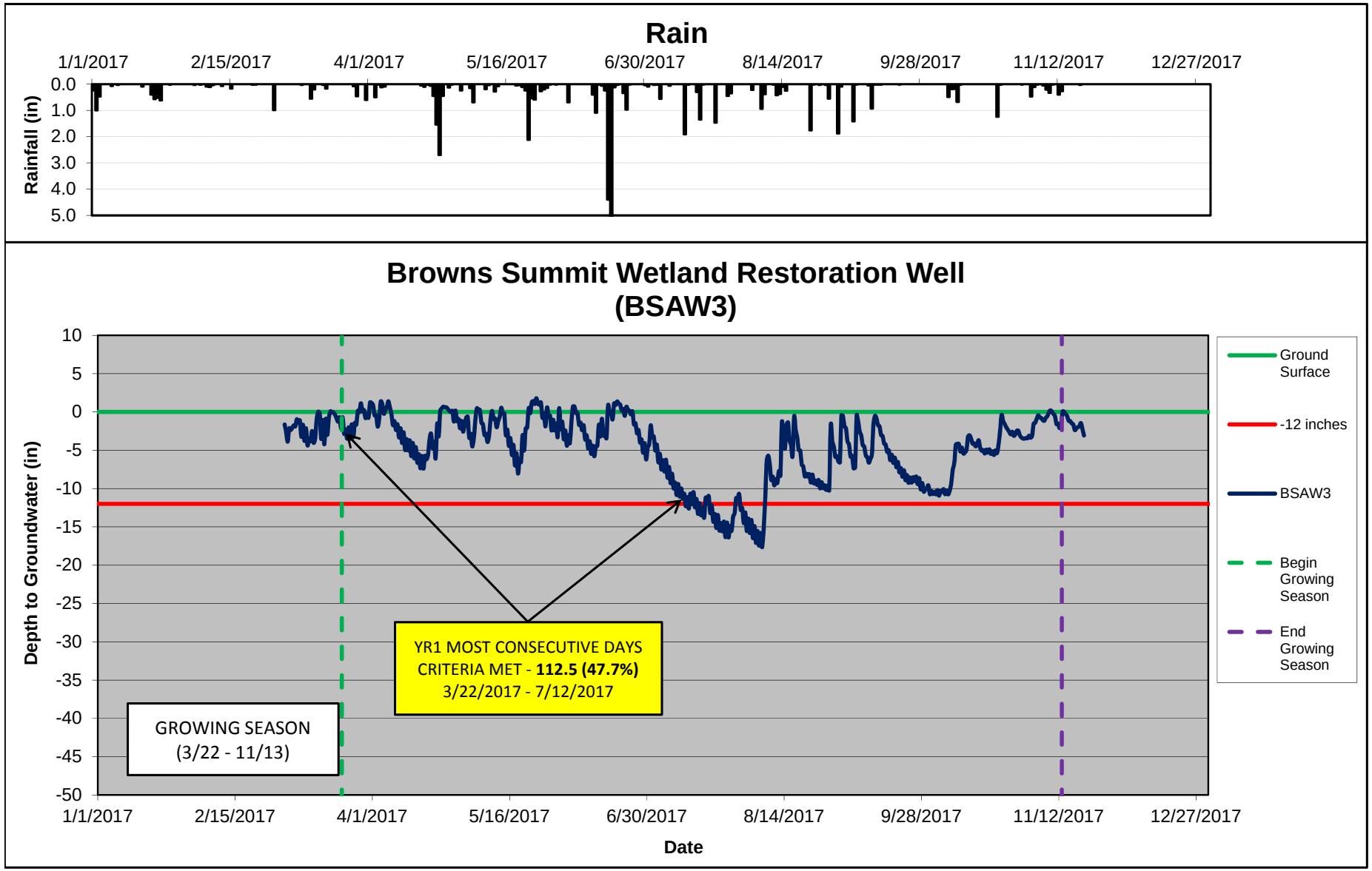
According to the Baseline Monitoring Report, the growing season for Guilford County is from March 22 to November 13 and is 229 days long. 12% of the growing season is 28 days and 9% of the growing season is 21 days.

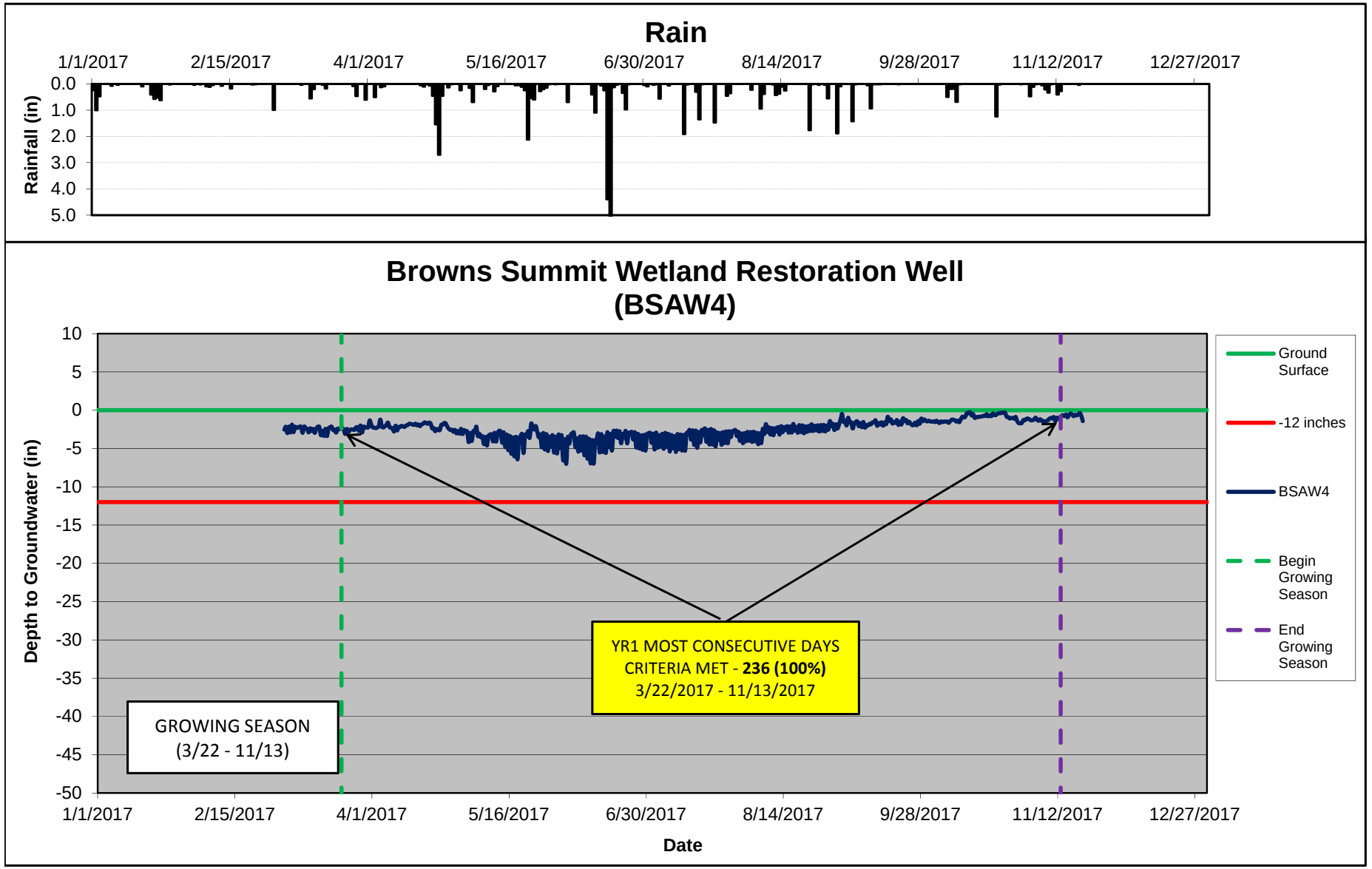
Figure 7 Wetland Restoration Graphs (2017)

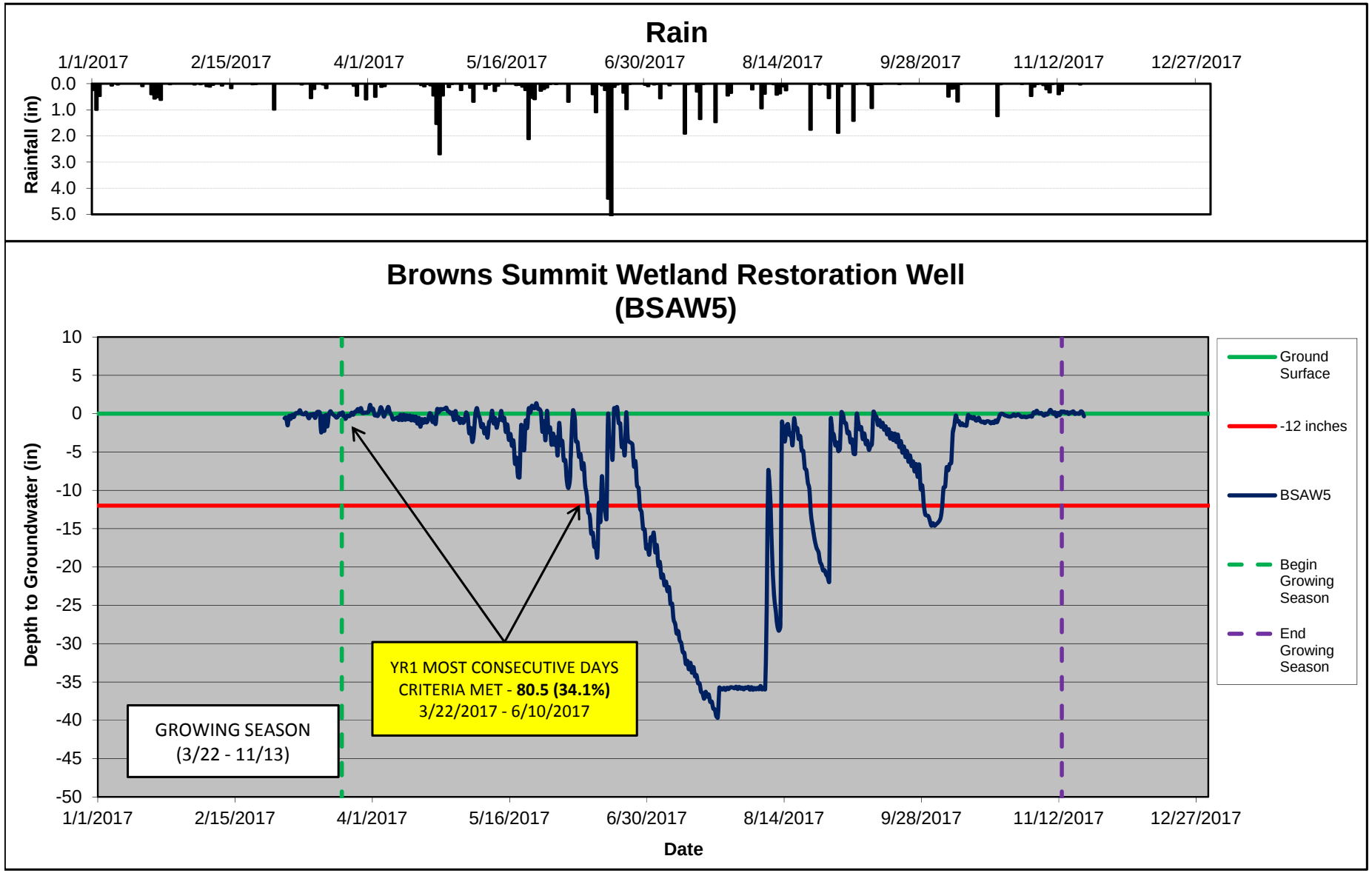


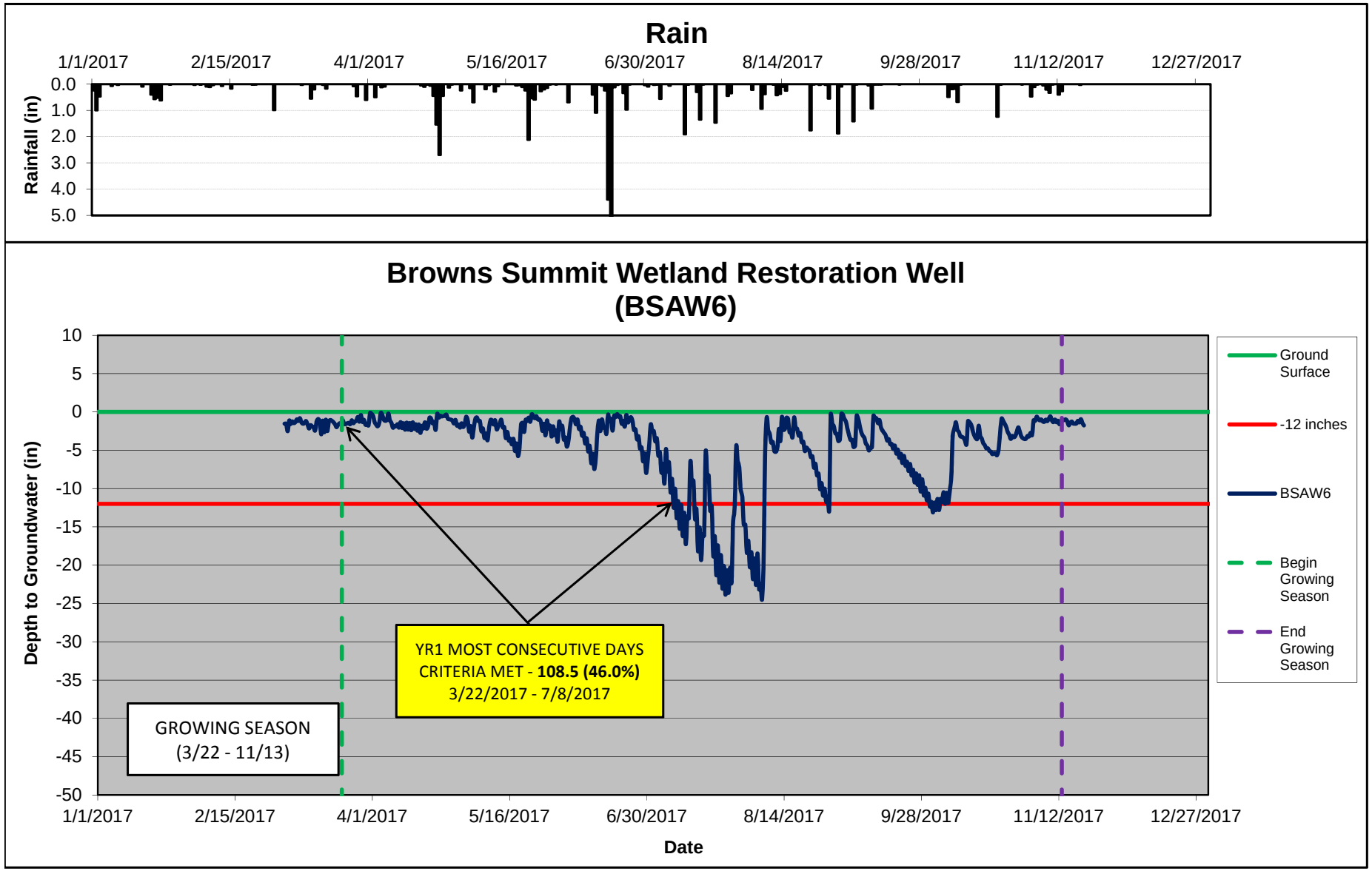

Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW1)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
YR1 MOST CONSECUTIVE DAYS
CRITERIA MET - 105.5 (44.7%)
3/22/2017 - 7/5/2017
GROWING SEASON
(3/22 - 11/13)
Ground Surface
-12 inches
BSAW1
Begin Growing Season
End Growing Season
Date

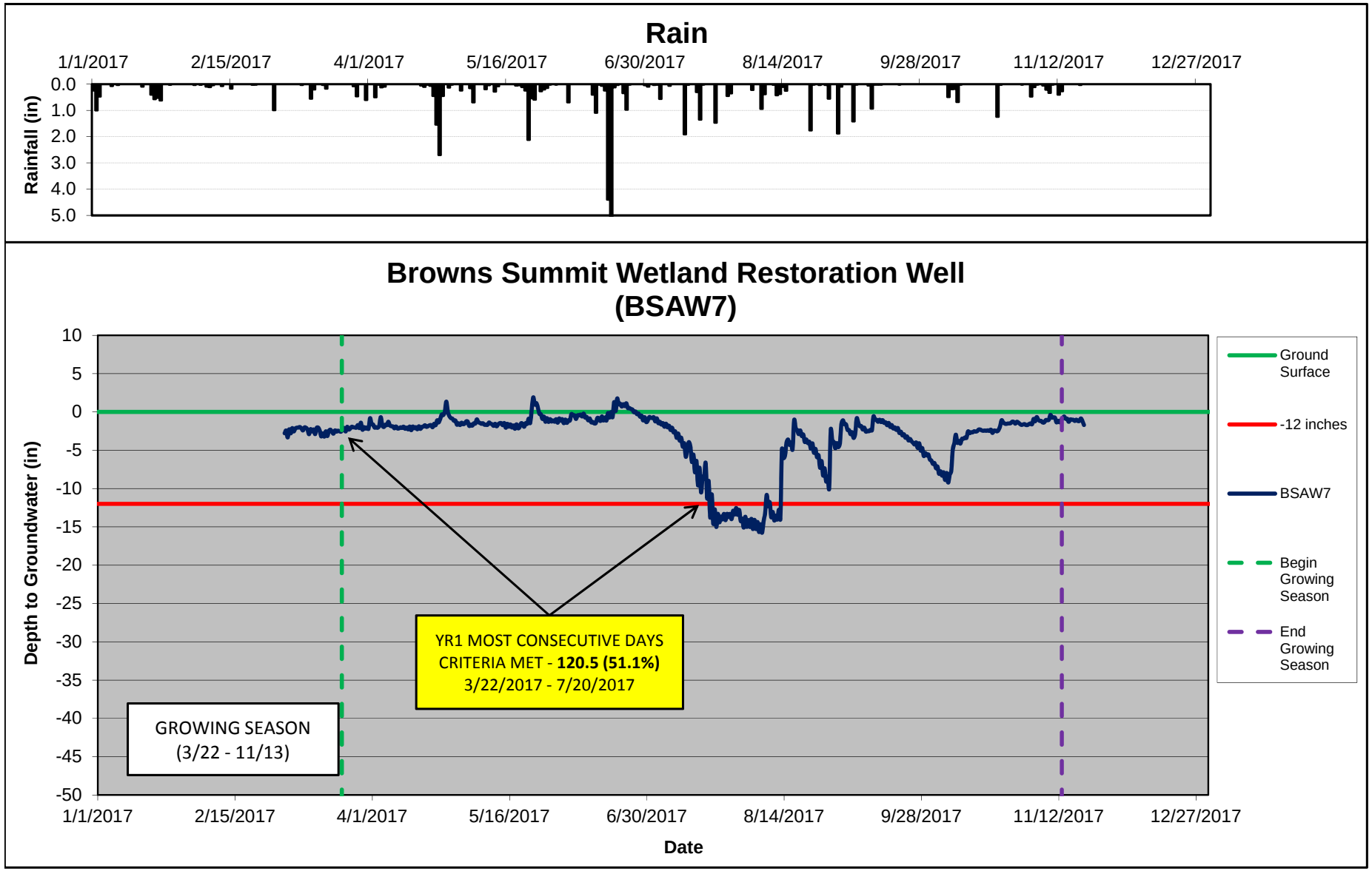

Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW2)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Ground Surface
-12 inches
BSAW2
Begin Growing Season
End Growing Season
GROWING SEASON
(3/22 - 11/13)
YR1 MOST CONSECUTIVE DAYS
CRITERIA MET - 7.5 (3.2%)
4/23/2017 - 4/30/2017
Date


Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW3)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Ground Surface
-12 inches
BSAW3
Begin Growing Season
End Growing Season
YR1 MOST CONSECUTIVE DAYS CRITERIA MET - 112.5 (47.7%)
3/22/2017 - 7/12/2017
GROWING SEASON
(3/22 - 11/13)
Date


Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW4)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Ground Surface
-12 inches
BSAW4
Begin Growing Season
End Growing Season
YR1 MOST CONSECUTIVE DAYS
CRITERIA MET - 236 (100%)
3/22/2017 - 11/13/2017
GROWING SEASON
(3/22 - 11/13)
Date


Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW5)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Ground Surface
-12 inches
BSAW5
Begin Growing Season
End Growing Season
YR1 MOST CONSECUTIVE DAYS
CRITERIA MET - 80.5 (34.1%)
3/22/2017 - 6/10/2017
GROWING SEASON
(3/22 - 11/13)
Date


Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW6)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
Ground Surface
-12 inches
BSAW6
Begin Growing Season
End Growing Season
YR1 MOST CONSECUTIVE DAYS CRITERIA MET - 108.5 (46.0%)
3/22/2017 - 7/8/2017
GROWING SEASON
(3/22 - 11/13)
Date


Rain
1/1/2017
2/15/2017
4/1/2017
5/16/2017
6/30/2017
8/14/2017
9/28/2017
11/12/2017
12/27/2017
Rainfall (in)
0.0
1.0
2.0
3.0
4.0
5.0
Browns Summit Wetland Restoration Well
(BSAW7)
Depth to Groundwater (in)
10
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-45
-50
YR1 MOST CONSECUTIVE DAYS
CRITERIA MET - 120.5 (51.1%)
3/22/2017 - 7/20/2017
GROWING SEASON
(3/22 - 11/13)
Ground Surface
-12 inches
BSAW7
Begin Growing Season
End Growing Season
Date

Browns Summit Creek Restoration Project – Hydrology Monitoring Stations

Photos take June 7, 2017 unless otherwise noted

Wetland Well 1 – Reach 4, Station 25+00

Wetland Well 2 – Reach 2, Station 47+00 March 9, 2017

Wetland Well 3 – Reach 1, Station 52+00

Wetland Well 4 – Reach 1, Station 55+00

Wetland Well 5 – Reach 1, Station 58+00

Wetland Well 6 – Reach 1, Station 61+00

Browns Summit Creek Restoration Project – Hydrology Monitoring Stations

Photos take June 7, 2017 unless otherwise noted

Wetland Well 7 – Reach 1, Station 63+50

Automated Flow Gauge 1 – Reach 4

Automated Flow Gauge 2 – Reach T3

Automated Flow Gauge 3 – Reach T1

Manual Crest Gauge – Reach 1, Left Bank

Manual Crest Gauge – Reading 6/7/2017

Browns Summit Creek Restoration Project – Hydrology Monitoring Stations
Photos take June 7, 2017 unless otherwise noted

Manual Crest Gauge – Reading 10/3/2017