## **Russell Gap Stream Mitigation Project Year 3 (2022) Monitoring Report FINAL**

DMS Project ID No. 100003, DEQ Contract No. 6980 USACE Action ID No. SAW-2017-00826, DWR# 20150416 Alexander County, North Carolina, Catawba River Basin: 03050101-120010 MY3 Data Collection Period: January – October 2022



Submitted to/Prepared for:

NC Department of Environmental Quality Division of Mitigation Services (DMS) 1652 Mail Service Center Raleigh, North Carolina 27699-1652

### **Michael Baker**

**INTERNATIONAL** Submission Date: February 2023

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February 15, 2023

Matt Reid, PM NCDEQ, Division of Mitigation Services Asheville Regional Office 2090 U.S. 70 Highway Swannanoa, NC 28778-8211

#### Subject:

Response to DMS Comments (January 19, 2023) for DRAFT Monitoring Year 3 Report. Russell Gap Mitigation Project, Alexander County Catawba River Basin: 06010106 DMS Project #100003 DEQ Contract #6980

Dear Mr. Reid,

Please find below our responses to the NC Division of Mitigation Services (DMS) review comments dated January 19, 2023, in reference to the Russel Gap Mitigation Project's DRAFT Monitoring Year 3 Report. We have revised the Draft document in response to review comments as outlined below.

- In an effort to identify and resolve property issues, please verify the conservation easement has been inspected, marking is up to date, fencing is intact, and no encroachments have been identified.
   RESPONSE: The conservation easement has been inspected, marking is up to date, fencing is intact, and no encroachments were observed during MY3.
- 1.4 Monitoring Results: Section indicates that the right floodplain of R26 was replanted during MY3. Please include a brief discussion with approximate number, area and type of plants installed (bare root, gallon, etc.). Were the species used from the approved planting list from the mitigation plan? Please add this supplemental planting to Table 2 and to the CCPV. RESPONSE: The discussion has been included as requested. The encroachment area noted during MY2 was approximately 577 square feet. This area was replanted along the easement boundary for clear visibility with approximately seven 3-gallon pots of Willow Oak (*Quercus phellos*) and Sycamore (*Platanus occidentalis*), both of which are included on the approved planting list.
- Please include a statement regarding average tree height for MY3 monitoring. Is the site on track to meet the MY5 6' success criteria?
   RESPONSE: A statement has been added to section 1.4 as requested.
- At the 2022 Credit Release Meeting, the IRT expressed concern with the amount of juncus at the site and potential problems with tree growth. The IRT requested a random vegetation

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plot on this reach due to vegetation success concerns. Please add a short discussion regarding the two random plots added and the status of the juncus on the site. RESPONSE: Dense populations of *Juncus* occur mainly along the right floodplain of R1. A vegetation transect was included on the right bank of R1 and is shown as MY3 RVP4 on Figure 3A. This transect was considered one of nine annual Random Vegetation Plots and did not meet the success criteria of 320 stems per acre by the end of Year 3 at 161 stems per acre; however, permanent vegetation plots 2 and 4 both exceeded criteria at 566 and 526 stems per acre respectively. Permanent vegetation plots 1, 3, and Random vegetation plot 2 on the left floodplain of R1 are also located in areas with *Juncus* and exceeded success criteria. Existing stems in these areas were just beginning to exceed the height of the *Juncus* during MY3, thus we will continue to watch the area and will add containerized material if necessary.

 Only 4 of 12 groundwater gauges met success criteria in MY3 and lower rainfall was discussed in the report as a possible reason. DMS recommends adding additional gauges in areas with failing gauges prior to the start of the growing season. If wetland gauges are not trending towards success in MY4, credit releases and invoice payment will need to be adjusted to reflect the site conditions. Please be prepared to discuss this issue at the 2023 Credit Release Meeting.

RESPONSE: We acknowledge that 8 of 12 wells did not meet success criteria in MY3; however, only one well (RGAW1) has ever failed to meet success criteria in one previous monitoring year. We request to postpone any addition of monitoring wells pending well data analysis from the MY4 growing season.

• Figure 2: There are two dark green lines in the wetland restoration area along R9/R4 floodplain that are not include in the legend. Recommend reducing the width of these lines so it can clearly be seen that these areas are cut out of the wetland restoration areas or turn off the layer

RESPONSE: The line thickness and color has been revised as requested.

- CCPV: Please update color codes for vegetation plots, wetland gauges, and flow gauges for meeting/not meeting criteria.
   RESPONSE: Vegetation plots, wetland gauges, and flow gauges have been color coded for meeting/not meeting criteria as requested. All permanent vegetation plots met criteria in MY3 and are all colored green; therefore, color coding is not represented for these plots in the CCPV legend.
- CCPV: Random Vegetation Plots are labeled with different colors on various sheets. Please update for consistency.
   RESPONSE: Random Vegetation Plot labels and colors have been updated for consistency as requested.

## Michael Baker

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- Table 5 R1: Table shows 2 areas of aggradation for a total of 40'. These areas are not shown on the CCPV. Section 1.4 indicates all reaches are performing at 100%. Please review and revise as necessary.
   RESPONSE: A discussion of these areas has been added to Section 1.4 and these areas are depicted on CCPV A.
- Table 11: Recommend color coding cells for meeting/not meeting success criteria. RESPONSE: Cells have been color coded to indicate those wells not meeting success criteria.
- Flow Gauge Graphs: Graph notes for RGFL2 and RGFL5 are misleading. Note indicates that flow criteria is met; however, both gauges failed to meet the 30 day success criteria. Please revise for clarity. Also, four of the five graph notes are in red, and one is in black. Recommend using red for gauges not meeting and black for gauges that are meeting. RESPONSE: Language was changed on graph notes for clarification. Font colors have been changed to black when criteria is met and red when it is not.

#### **Electronic Deliverable Comments:**

 Please include a USB with updated digital files based on comments above with final submittal.
 RESPONSE: A USB and updated digital files are included with the final submittal as requested.

As requested, Michael Baker has provided an electronic response letter addressing the DMS comments received and two (2) hardcopies of the FINAL report, and the updated e-submission digital files will be sent via secure ftp link. A full final electronic copy with electronic support files have been included on a USB drive. Please do not hesitate to contact me (Jason.york@mbakerintl.com 828-412-6101) should you have any questions regarding our response submittal.

Sincerely,

Jason York Environmental Scientist

Jason Gork

Enclosure: Final MY3 Report Russell Gap Mitigation Project

#### TABLE OF CONTENTS

# 1.0 PROJECT SUMMARY 3 1.1 PROJECT DESCRIPTION 3 1.2 GOALS AND OBJECTIVES 3 1.3 PROJECT SUCCESS CRITERIA 4 1.4 MONITORING RESULTS AND PROJECT PERFORMANCE 4 1.5 TECHNICAL AND METHODOLOGICAL DESCRIPTIONS 5 1.6 REFERENCES. 5

#### APPENDICES

Appendix	Α	Backgro	ound I	Tables and Figures
		Figure	1	Project Vicinity Map
		Figure	2	Project Asset Map
		Table	1	Project Components and Mitigation Credits
		Table	2	Project Activity and Reporting History
		Table	3	Project Contacts
		Table	4	Project Attributes
Appendix	В	Visual A	lssess	ment Data
		Figure	3	Current Condition Plan View (CCPV)
		Table	5	Visual Stream Morphology Stability Assessment
		Table	6	Vegetation Condition Assessment
		Stream	Statio	n Photo-Points
		Vegetat	ion M	lonitoring Plot Photos
		Monitor	ring G	auges and Overbank Photographs
Appendix	С	Vegetati	ion Pl	lot Data
		Table	7	Planted Stem Counts by Plot and Species
Appendix	D	Stream	Geom	orphology Data
		Figure	4	Cross-Sections with Annual Overlay
		Table	8	Baseline Stream Data Summary
		Table	9	Cross-Section Morphology Data Summary
Appendix	E	Hydrolo	ogic D	Pata
		Table	10	Verification of Bankfull Events
		Figure	5	Wetland Monitoring Well Graphs
		Table	11	Wetland Hydrology Summary Data
		Figure	6	Flow Gauge Graphs
		Table	12	All Years Flow Gauge Success
		Figure	7	Observed Rainfall Versus Historic Averages

#### **1.0 PROJECT SUMMARY**

#### **1.1 Project Description**

Michael Baker Engineering, Inc. (Michael Baker) restored approximately 4,209 linear feet of existing stream, enhanced 8,857 linear feet of stream along Unnamed Tributaries (UTs) to Davis Creek, the East Prong Lower Little River, and UTs to the East Prong Lower Little River. Michael Baker also restored and/or enhance approximately 7.3 acres of riparian wetland in the Catawba River Watershed. The project is located in the Catawba River Basin, within the Hydrologic Unit Code (HUC) 03050101-120010, which is identified as a Targeted Local Watershed (TLW) in the NC Division of Mitigation Services' (DMS) 2009 *Upper Catawba River Basin Restoration Priorities* (RBRP) report.

The Russell Gap Stream Mitigation project is located on an active cattle farm in Alexander County, North Carolina, 10 miles northwest of the Town of Taylorsville as shown on the Project Vicinity Map (Figure 1). Historic agriculture uses on the project site include cattle production, row crops, and apple orchards. These activities had negatively impacted both water quality and streambank stability along the project streams and their tributaries (Table 4). The project is being conducted as part of the NCDMS Full Delivery In-Lieu Fee Program and is anticipated to generate at close-out a total of 9,166.949 stream mitigation credits (contracted for 9,400) and up to 7.053 riparian wetland mitigation units (contracted for 4.0) (Table 1) and is protected by a 35.97-acre permanent conservation easement.

#### 1.2 Goals and Objectives

The goals of this project are identified below:

- Establishment of geomorphically stable conditions along all project reaches,
- Improvement of water quality by reducing nutrient and sediment inputs,
- Restoration of natural stream and floodplain interactions,
- Restoration and enhancement of riparian wetland functions,
- Restoration and protection of riparian buffer functions and corridor habitat,
- Improvement of in-stream aquatic habitat, and
- Establishment of a permanent conservation easement on the entire project.

To accomplish these goals, the following objectives were identified:

- To restore appropriate bankfull dimensions, remove spoil berms, and/or raise channel beds, by utilizing either a Priority I Restoration approach or an Enhancement Level I approach.
- To construct streams of appropriate dimensions, pattern, and profile in restored reaches, slope stream banks and provide bankfull benches on enhanced streams and utilize bioengineering to provide long-term stability.
- Construct a correct channel morphology to all streams increasing the number and depths of pools, with structures including geo-lifts with brush toe, log vanes/weirs, root wads, and/or J-hooks.
- Raise ground water levels in delineated hydric soils areas through the implementation of Priority I restoration and the filling of ditches. Wetland vegetation will also be planted.
- Establish riparian buffers at a 50-foot minimum width along all stream reaches, planted with native tree and shrub species.
- Establish a permanent conservation easement restricting land use in perpetuity. This will prevent site disturbance and allow the project to mature and stabilize.

#### **1.3 Project Success Criteria**

The success criteria and performance standards for the project will follow the North Carolina Interagency Review Team (NCIRT) guidance document *Wilmington District Stream and Wetland Compensatory Mitigation Update* dated October 24, 2016 and as described in Section 7 of the approved Mitigation Plan. All specific monitoring activities will follow those outlined in detail in Section 8 of the approved Mitigation Plan and will be conducted for a period of seven years unless otherwise noted. Annual monitoring reports will follow the DMS document *Annual Monitoring Report Format, Data Requirements, and Content Guidance* from April 2015. The performance standards for the riparian buffer assets will be held in accordance with 15A NCAC 02B.0295(n)(2)(B) and 15A NCAC 02B.0295(n)(4), and annual monitoring reports will be submitted at the end of each of the seven monitoring years.

#### 1.4 Monitoring Results and Project Performance

The Year 3 monitoring survey data of the twenty-six permanent cross-sections indicates that these stream sections are geomorphically stable and are within the lateral/vertical stability and in-stream structure performance categories. Live staking successfully stabilized Stream Problem Area 1 (SPA1) on R1 that was reported during MY2. This area is stable and functioning and has been removed as a Stream Problem Area in MY3. This location will continue to be monitored in MY4. SPA2 on R4a was also live staked and is currently stable. Two approximately 20-foot-long mid-channel bars were found on R1, although no lateral bank scour was observed. These bars will be removed with hand tools during MY4. R1 is 98% stable and performing as intended. All other reaches were stable and performing as designed and are rated at 100 percent for all the parameters evaluated (Table 5 in Appendix B).

During Year 3 monitoring, the planted acreage performance categories were functioning well overall. The average density of total planted stems based on data collected from the 20 permanent and 9 random monitoring plots for the Year 3 monitoring conducted in November 2022 was 556 stems per acre (Table 7 in Appendix C). Thus, the Year 3 vegetation data demonstrate that the Site has met the minimum success interim criteria of 320 trees per acre by the end of Year 3 and based on observation appears to be on track to meet the MY5 6-foot height success criteria. No vegetation problem areas (VPAs) were identified as exceeding the reportable mapping threshold of 0.1 acres. Planted trees in the R1 floodplain have begun over top the *Juncus*. Containerized plants may be added to this area if competition from *Juncus* inhibits growth of planted stems or causes widespread mortality. Scattered stems of privet (*Ligustrum spp.*) and multiflora rose (*Rosa multiflora*) located throughout the site were treated with herbicide in April 2022 and follow up treatment is anticipated to occur in future monitoring years.

A culverted crossing on Reach 1 was damaged during a high flow event in November 2020. The culvert was replaced with a railcar bridge in May 2021. During MY3 the bridge remains stable. The encroachment area reported on the right floodplain of R26 during MY2 was clearly marked and replanted during MY3 with approximately seven 3-gallon pots of *Quercus phellos* (Willow Oak) and *Platanus occidentalis* (Sycamore), both of which are included on the approved planting list. No further encroachments have occurred.

During Year 3 monitoring, one post-construction bankfull event on R9 was observed (see Table 10 in Appendix E and the Overbank Photographs in Appendix B). Bankfull events are documented using manual cork crest gauge readings and post-flood event site inspection photographs. Rain data and groundwater well inundation is also considered to determine the approximate date of bankfull events. Crest gauges located on R1, R4, and R6 did not record an overbank event during MY3.

Figure 6 in Appendix E demonstrates that rainfall since November 2021 has been lower than the historic averages all months during MY3 monitoring and growing season. A total of 37.2 inches of rainfall was observed for the project which is less than the annual historic average of 52.36 inches. All observed project rainfall was collected from the North Carolina Climate Office Weather Climate Database CRONOS station TAYL, located in Taylorsville, NC.

During Year 3 monitoring, four of twelve automated groundwater monitoring wells met or exceeded the minimum hydroperiod performance criteria approved in the Mitigation Plan of 12% of the 227-day growing season (27 or more consecutive days). Three of five automated flow gauges met or exceeded the minimum 30-day performance criteria during MY3. One of the two flow gauges needed only four more days to meet success. It was noticed that the dry month of December 2021 and dry months of April – June 2022 shortened the window for success. Historically both flow and groundwater need this time period with near average precipitation in order to meet consecutive day criteria. (See Appendix E, Table 12).

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 3 monitoring activities for the postconstruction monitoring period.

#### **1.5** Technical and Methodological Descriptions

Stream survey data was collected to a minimum of Class C Vertical and Class A Horizontal Accuracy using a Leica TS06 Total Station and was georeferenced to the NAD83 State Plane Coordinate System, FIPS3200 in US Survey Feet, which was derived from the MY-1 Survey. The survey data from the permanent project cross-sections were collected and classified using the Rosgen Stream Classification System to confirm design stream type (Rosgen 1994 and 1996).

The twenty permanent and nine annual random vegetation-monitoring quadrants (plots) were installed across the site in accordance with the CVS-DMS Protocol for Recording Vegetation, Version 4.1 (Lee 2007) and the data collected from each was input into the CVS-DMS Data Entry Tool v. 2.3.1 (CVS 2012).

Nine automated groundwater monitoring wells were installed in the floodplain along Reach R1 following USACE protocols (USACE 2005). Three additional groundwater monitoring wells were installed in the floodplain along R9. Flow gauges were installed on R11, R13, R14, R19 and R20 and an additional camera was installed on R11 to capture pictures of flow. Collective data will document that these intermittent streams continue to exhibit base flow for at least thirty consecutive days throughout each monitoring year. The gauges themselves are all Van Essen DI800 BARO Diver data loggers. Four manual cork crest gauges were installed on R1, R4, R6, and R9.

All observed project rainfall was collected from the North Carolina Climate Office Weather Climate Database CRONOS station TAYL, located in Taylorsville, NC approximately nine miles south of the project at 35.9139, -81.19087.

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

#### 1.6 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. 2012.

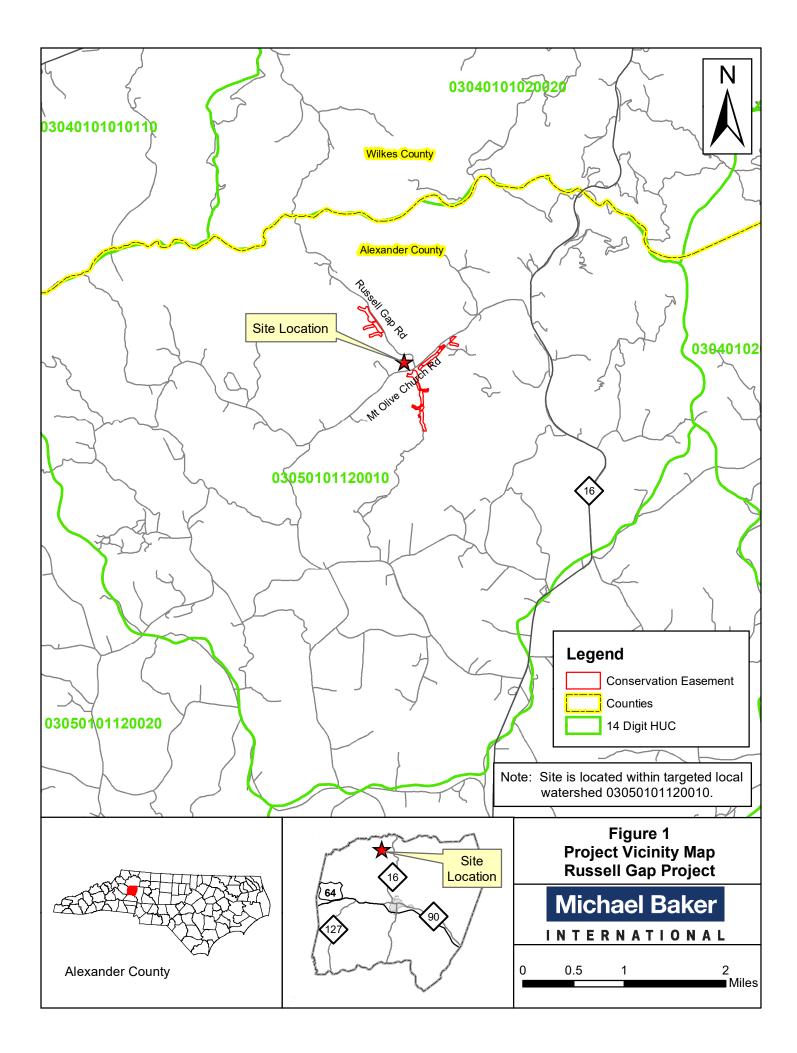
Lee, M., Peet R., Roberts, S., Wentworth, T. 2007. CVS-DMS Protocol for Recording Vegetation, Version 4.1.

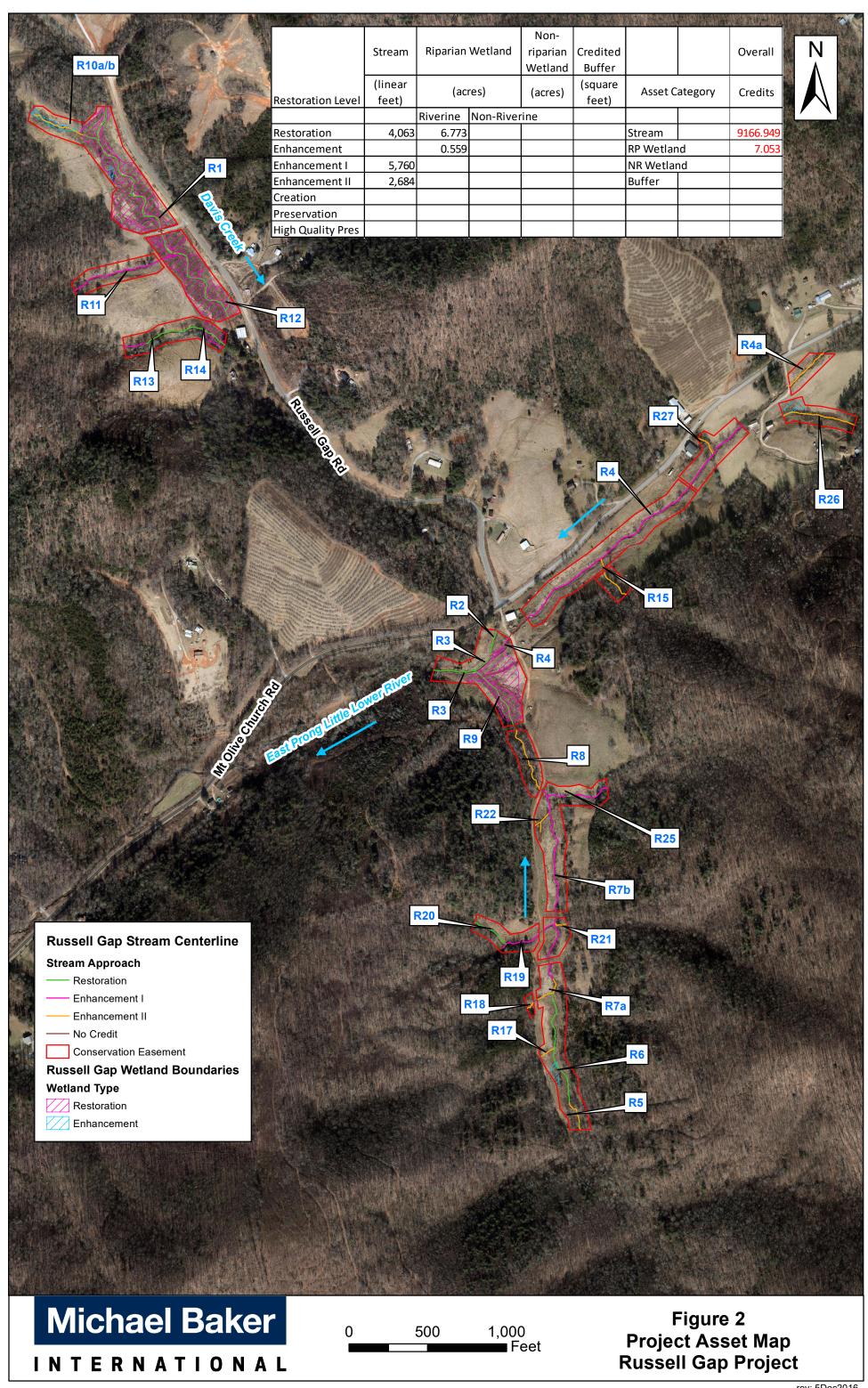
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- North Carolina Division of Mitigation Services. 2016. Neuse River Basin Restoration Priorities: Neuse-01 Catalog Unit *Update*. NC Department of Environmental Quality. Raleigh, NC.
- North Carolina Division of Mitigation Services. 2017. Annual Monitoring Report Format, Data Requirements, and Content Guidance June 2017. NC Department of Environmental Quality. Raleigh, NC.
- North Carolina Interagency Review Team (NCIRT). 2016. Guidance document "Wilmington District Stream and Wetland Compensatory Mitigation Update". October 24, 2016
- Rosgen, D.L. 1994. A Classification of Natural Rivers. Catena 22:169-199.
- Rosgen, D.L. 1996. Applied River Morphology. Wildlands Hydrology. Pagosa Springs, CO.
- United States Army Corps of Engineers (USACE). 2005. "Technical Standard for Water-Table Monitoring of Potential Wetland Sites," WRAP Technical Notes Collection (ERDC TN-WRAP-05-2), U.S. Army Engineer Research and Development Center. Vicksburg, MS.

## **APPENDIX** A

Background Tables and Figures





rev: 5Dec2016

#### Table 1. Project Components and Mitigation Credits Russell Gap Stream Mitigation Project - NCDMS Project No. 100003

		Existing		As-Built CL	As-Built CL	Mitigation				
Project	Wetland	Footage		Restored	w/o Xing	Plan		Approach		Mitigation
Component	Position and	or		Footage,	Footage,	Designed	Restoration	Priority	Mitigation	Plan
(reach ID, etc.)	HydroType	Acreage	Stationing	or SF <sup>1</sup>	or SF <sup>2</sup>	Footage	Level	Level	Ratio (X:1)	Credits 3
Reach R1		2,142	10+00 - 29+45.90	1,946	1,910.90	1,841.60	R	PI	1.0	1,841.60
Reach R2		288	10+00 - 11+65.62	166	165.62	174.21	R	P2	1.0	174.21
Reach R3	-	388		406	406.30	388.74	R	P2	1.0	388.74
	-		32+28.36 - 36+34.66							
Reach R4a	-	299	10+00 - 13+00.00	300	300.00	300.00	EII	-	2.5	120.00
Reach R4	-	2,245	10+00 - 32+28.36	2,228	2,038.36	2,063.32	EI	-	1.5	1,375.55
Reach R5	_	256	10+00 - 12+10.00 w/o pipe	193	193.00	193.00	EII	-	2.5	77.20
Reach R5 Pipe Removal	_	17	10+32 - 10+49 pipe	17	17.00	17.00	R	P1	1.0	17.00
Reach R6	_	631	12+10.00 - 19+57.36	747	747.36	741.05	R	P1	1.0	741.05
Reach R7a		155	19+57.36- 20+61.17	104	103.81	110.12	EII	-	2.5	44.05
Reach R7b		1,170	20+61.17 - 33+51.48	1,290	1,216.31	1,202.37	EI	-	1.5	801.58
Reach R8		463	33+75.40 - 38+28.55	453	453.15	455.79	EII	-	2.5	182.32
Reach R9		439	38+65.34 - 43+10.91	446	445.57	445.52	R	Pl	1.0	445.52
Reach R10a		371	10+08.40 - 13+74.94	367	366.54	376.11	EII		2.0	188.06
Reach R10b		0	13+74.94 - 14+79.77	105	104.83	112.65	R	P1	1.0	112.65
Reach R11	-	481	10+00 - 17+31.85	732	711.85	725.83	EI	-	1.5	483.89
Reach R12		86	10+00 - 11+01.78	102	101.78	120.02	R	P1	1.0	120.02
Reach R13		124	10+00 - 11+45.00	145	145.00	145.00	EI	-	1.5	96.67
Reach R14		528	11+45.00 - 17+14.80	570	569.80	572.27	R	P1/2	1.0	572.27
Reach R15		226	10+00 - 13+02.77	303	283.77	281.80	EII	-	2.5	112.72
Reach R17		130	10+00 - 11+06.64	107	106.64	104.44	EII	-	2.5	41.78
Reach R18		185	10+00 - 12+03.31	203	176.31	179.01	EII	-	2.5	71.60
Reach R19		481	9+86.00 - 13+75.96	390	352.96	359.49	EI	-	1.5	239.66
Reach R20		206	10+00 - 12+52.61	253	252.61	252.68	R	P1	1.0	252.68
Reach R21		67	10+00 - 10+91.76	92	91.76	89.11	EII	-	2.5	35.64
Reach R22		161	10+00 - 11+19.46	119	119.46	136.87	EII	-	2.5	54.75
Reach R22a		68	10+60 - 11+28.42	68	68.42	68.42	EII	-	2.5	27.37
Reach R25		422	10+00 - 14+30.52 (w/o pipe)	403	402.52	399.05	EI	-	1.5	266.03
Reach R25 Pipe Removal		28	12+62 - 12+90 pipe	28	28.00	28.00	R	P1	1.0	28.00
Reach R26		548	10+00 - 14+72.96	473	472.96	472.13	EII	-	2.5	188.85
Reach R27		165	10+00 - 11+63.76	164	163.76	163.76	EII	-	2.5	65.50
Wetland Group 1	RR	0		5.285		5.285	Restoration		1.0	5.285
Wetland Group 2	RR	0		1.488		1.488	Restoration		1.0	1.488
Wetland Group 3	RR	0.261		0.261		0.261	Enhancement		2.0	0.131
Wetland Group 4	RR	0.156		0.156		0.156	Enhancement		2.0	0.078
Wetland Group 5	RR	0.034		0.034		0.034	Enhancement		2.0	0.017
Wetland Group 6	RR	0.108		0.108		0.108	Enhancement		2.0	0.054
				_						

1 All stream stationing and restored footage numbers reported here, discussed in the report text, and shown in the as-built plan sheets use survey values.

2 The stream footage reported here uses the as-built stream entertime survey values and have all easement breaks removed from their totals. Buffer group values

reported here are the creditable areas as allowed for each group as described in detail in the mitigation plan.

3 Credits reported here are taken directly from the approved mitigation plan Table 11.1

#### Table 1.1

#### As-Built Centerline Length and Area Summations by Mitigation Category

Restoration Level	Stream (linear feet)		Riparian Wetland (acres)	Wetland (acres)	Credited Buffer (square feet)
		Riverine	Non-Riverine		
Restoration	4,063	6.773			
Enhancement		0.559			
Enhancement I	5,760				
Enhancement II	2,684				
Creation					
Preservation					
High Quality Pres					

Table 1.2

Asset Category	Overall Credits
Stream	9,166.949
RP Wetland	7.053
NR Wetland	
Buffer	

## Table 2. Project Activity and Reporting History Russell Gap Stream Mitigation Project - NCDMS Project No. 100003

Elapsed Time Since grading complete:	34 months
Elapsed Time Since planting complete:	33 months
Number of Reporting Years <sup>1</sup> :	3

Activity or Deliverable	Data Collection Complete	Completion or Delivery
404 permit date	N/A	Dec-18
Mitigation Plan	N/A	Sep-18
Final Design – Construction Plans	N/A	Sep-18
Construction Grading Completed	N/A	Feb-20
As-Built Survey	May-20	May-20
Livestake and Bareroot Planting Completed	N/A	Mar-20
As-Built Baseline Monitoring Report (MY0)	Mar-20	Sep-20
Year 1 Monitoring	Nov-20	Dec-20
Year 2 Monitoring	Oct-21	Dec-21
Vegetation Monitoring	Oct-21	Dec-21
Stream Survey	Oct-21	Dec-21
Bridge Replacement	May-21	May-21
Maintenance, Repairs, Live Staking	May and Oct-21	Dec-21
Invasive Treatment	June and Oct-21	Dec-21
Year 3 Monitoring	Oct and Nov-22	Dec-22
Vegetation Monitoring	Aug, Oct, Nov 2022	Dec-22
Stream Survey	Sep-22	Sep-22
Invasive Treatment and Supplemental Planting	Apr-22	Apr-22
Year 4 Monitoring		
Year 5 Monitoring		
Year 6 Monitoring		
Year 7 Monitoring		

<sup>1</sup> = The number of monitoring reports excluding the as-built/baseline report

Designer 8000 Regency Parkway, Suite 600 Cary, NC 27518 Contact: Michael Baker Engineering, Inc. Katie McKeithan, Tel. 919-481-5703 **Construction Contractor** 5616 Coble Church Rd Julian, NC 27283 KBS Earthworks, Inc. Contact: Kory Strader, Tel. 336-362-0289 Survey Contractor P.O. Box 148 Swannanoa, NC 28778 Turner Land Surveying Contact: (As-Built Only) David Turner, Tel. 919-827-0745 88 Central Avenue Kee Mapping and Surveying Asheville, NC 28801 (Existing Conditions and Monitoring Contact: Survey) Brad Kee, Tel. 828-575-9021 **Planting Contractor** 5616 Coble Church Rd Julian, NC 27283 KBS Earthworks, Inc. Contact: Kory Strader, Tel. 336-362-0289 Seeding Contractor 5616 Coble Church Rd Julian, NC 27283 KBS Earthworks, Inc. Contact: Kory Strader, Tel. 336-362-0289 Seed Mix Sources Telephone: **Green Resources** 336-855-6363 Nursery Stock Suppliers **Mellow Marsh Farm** Telephone: 919-742-1200 ArborGen Telephone: 843-528-3204 **Monitoring Performers** 797 Haywood Rd. Suite 201. Michael Baker Engineering, Inc. Asheville, NC 28806 Monitoring Point of Contact Jason York, Tel. 828-380-0118

 Table 3. Project Contacts

 Russell Gap Stream Mitigation Project - NCDMS Project No. 100003

 Table 4. Project Attributes

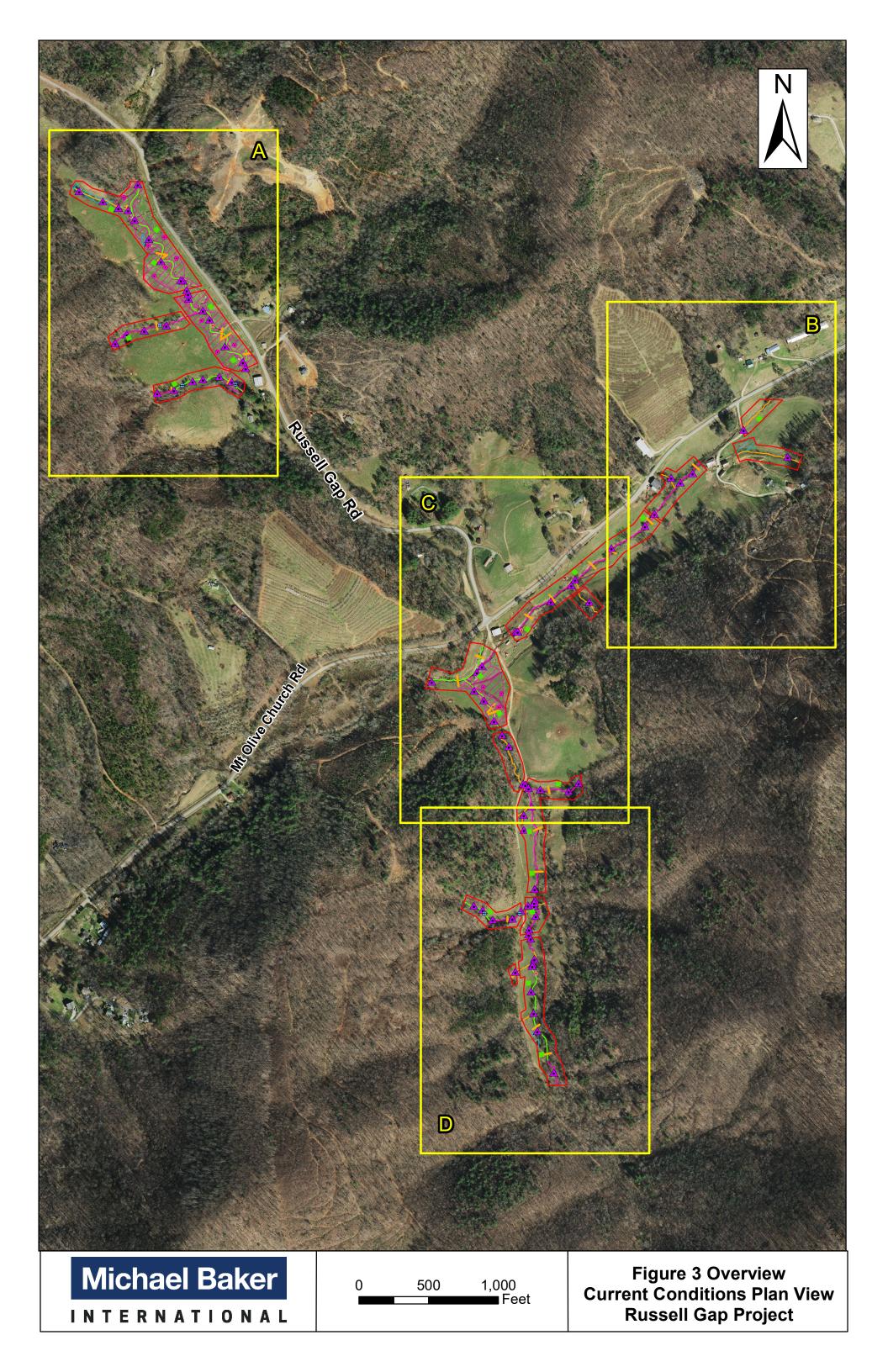
 Russell Gap Stream Mitigation Project - NCDMS Project No. 100003

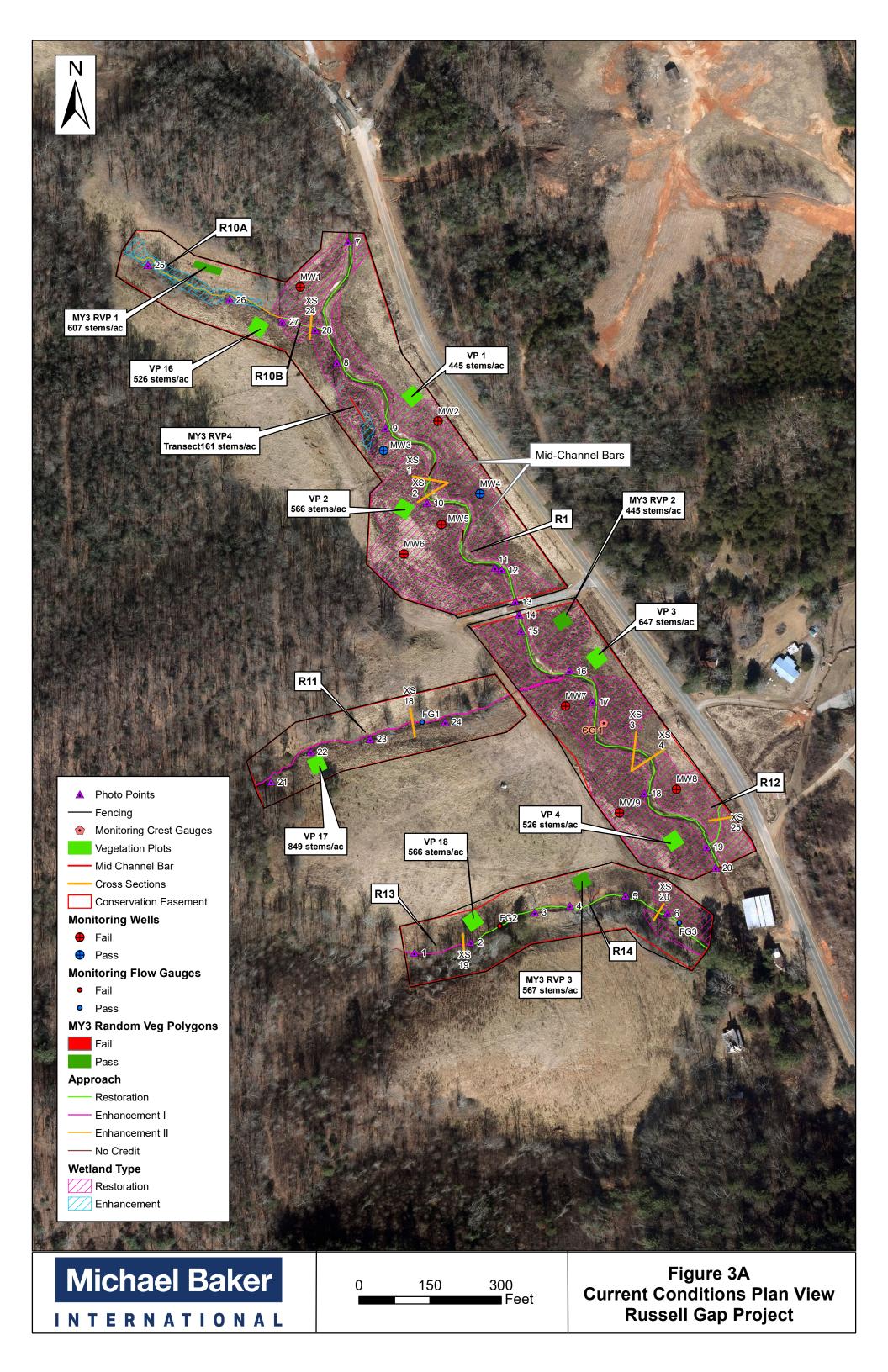
Russell Gap Stream Mitigation Project - NCDMS F Project Name	10/00/05	Russell Gan Stream	n Mitigation Project	
County		1	er County	
Project Area (acres)			.97	
Project Coordinates (latitude and longitude)			-81.2139 W	
Planted Acreage (Acres of Woody Stems Planted)			0.67	
	Watershed Summary I		.07	
Physiographic Province	watershed Summary I		lmont	
River Basin			awba	
USGS Hydrologic Unit 8-digit 3050101	USGS Hydrologic U	1	03050101-120	0010
DWR Sub-basin		03-0	08-32	
Project Drainage Area (Acres and Square Miles)	2.227 ac	res / 3.48 square mil	es (at downstream end	d of R3)
Project Drainage Area Percentage of Impervious Area	, , ,		ervious area	- /
CGIA Land Use Classification	82.6% forested	1	1.5% rural residential,	1.4% roadway
Exist	ing Reach Summary Info	-		2
Parameters	Reach R1	Reach R2	Reach R3	Reach R4
Length of reach (linear feet)	2,142	288	388	2,245
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
Drainage area (Acres)	960	1,056	2227	806
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	C	C	C	C
Stream Classification (existing)	E4 (incised)	E4 (incised)	E4	E4
Stream Classification (proposed)	C4	C4	C4	B4c
Evolutionary trend (Simon)	IV - Degradation and Widening	III - Degradation	III - Degradation	IV - Degradation and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X
Exist	ing Reach Summary Info	ormation	-	
Parameters	Reach R4a	Reach R5	Reach R6	Reach R7a
Length of reach (linear feet)	299	256	631	155
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
Drainage area (Acres)	716	150	154	210
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	С	С	С	С
Stream Classification (existing)	E4	C4b	G4	E4b
Stream Classification (proposed)	B4c	C4b	B4	E4b
Evolutionary trend (Simon)	I - Stable System	I - Stable System	IV - Degradation and Widening	I - Stable System
FEMA classification	Zone X	Zone X	Zone X	Zone X
Exist	ing Reach Summary Info	ormation	1	T
Parameters	Reach R7b	Reach R8	Reach R9	Reach R10(A/B)
Length of reach (linear feet)	1,170	463	439	371
			-	
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Unconfined
	Unconfined 288	Unconfined 333		
Valley confinement (Confined, moderately confined, unconfined) Drainage area (Acres)	288	333	358	17
Valley confinement (Confined, moderately confined, unconfined) Drainage area (Acres) Perennial, Intermittent, Ephemeral	288 Perennial	333 Perennial	358 Perennial	17 Perennial
Valley confinement (Confined, moderately confined, unconfined) Drainage area (Acres) Perennial, Intermittent, Ephemeral NCDWR Water Quality Classification	288 Perennial C	333 Perennial C	358 Perennial C	17 Perennial C
Valley confinement (Confined, moderately confined, unconfined) Drainage area (Acres) Perennial, Intermittent, Ephemeral NCDWR Water Quality Classification Stream Classification (existing)	288 Perennial C E4b	333 Perennial C C4	358 Perennial C E4b	17 Perennial C E4b
Valley confinement (Confined, moderately confined, unconfined) Drainage area (Acres) Perennial, Intermittent, Ephemeral NCDWR Water Quality Classification	288 Perennial C	333 Perennial C	358 Perennial C	17 Perennial C

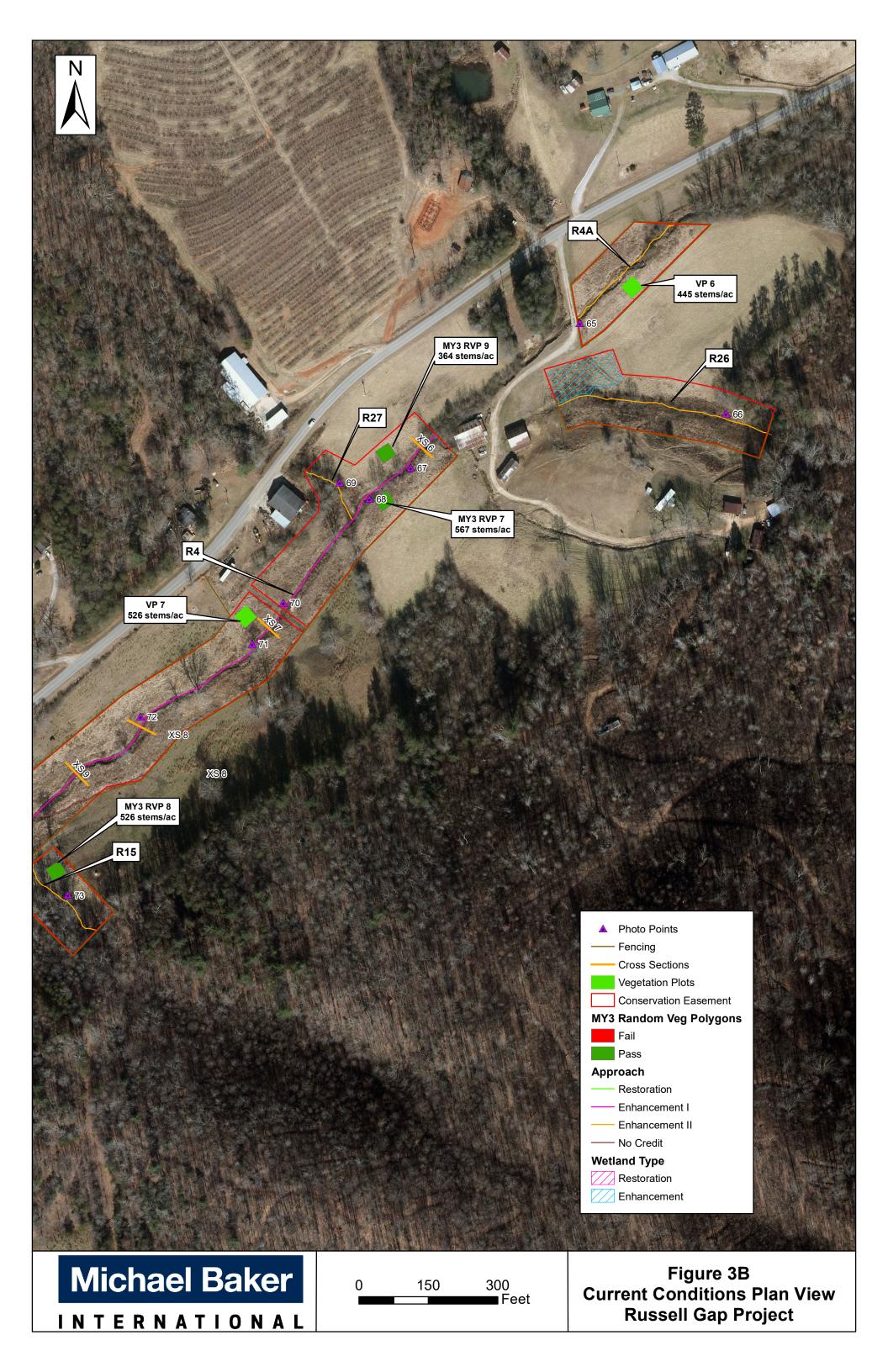
Existing	<b>Reach Summary Inf</b>	ormation		
Parameters	Reach R11	Reach R12	Reach R13	Reach R14
Length of reach (linear feet)	481	86	124	528
Valley confinement (Confined, moderately confined, unconfined)	Confined	Unconfined	Moderately Confined	Confined (Upper) Unconfined (Lower)
Drainage area (Acres)	17	115	21	22
Perennial, Intermittent, Ephemeral	Intermittent	Perennial	Intermittent	Perennial
NCDWR Water Quality Classification	С	С	С	C
Stream Classification (existing)	B4a	Eb	C4	A4
Stream Classification (proposed)	B4a	C4b	C4	E4
Evolutionary trend (Simon)	III - Degradation	IV - Degradation and Widening	II - Disurbance	IV - Degradation and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X
Existing	Reach Summary Inf	ormation	-	
Parameters	Reach R15	Reach R17	Reach R18	Reach R19
Length of reach (linear feet)	226	130	185	481
Valley confinement (Confined, moderately confined, unconfined)	Unconfined	Unconfined	Unconfined	Moderately Confined
Drainage area (Acres)	19	26	24	22
Perennial, Intermittent, Ephemeral	Intermittent	Intermittent	Intermittent	Perennial
NCDWR Water Quality Classification	С	С	С	С
Stream Classification (existing)	E4b	E4b	E4b	B4a
Stream Classification (proposed)	E4b	E4b	E4b	B4a
Evolutionary trend (Simon)	I - Stable System	I - Stable System	I - Stable System	IV - Degradation and Widening
FEMA classification	Zone X	Zone X	Zone X	Zone X
Existing	Reach Summary Inf	ormation		
Parameters	Reach R20	Reach R21	Reach R22	Reach R22a
Length of reach (linear feet)	206	67	161	68
Valley confinement (Confined, moderately confined, unconfined)	Confined	Unconfined	Moderately Confined	Moderately Confined
Drainage area (Acres and Square Miles)	9	33	3	3
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	Perennial
NCDWR Water Quality Classification	С	С	С	С
Stream Classification (existing)	A4a+	B4	B4	B4
Stream Classification (proposed)	A4a+	B4	B4	B4
Evolutionary trend (Simon)	III - Degrading	I - Stable System	II - Channelized	II - Channelized
FEMA classification	Zone X	Zone X	Zone X	Zone X
Existing	Reach Summary Inf	ormation		
Parameters	Reach R25	Reach R26	Reach R27	
Length of reach (linear feet)	422	548	165	
Valley confinement (Confined, moderately confined, unconfined)	Moderately Confined	Unconfined	Moderately Confined	
Drainage area (Acres and Square Miles)	33	32	19	
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Perennial	
NCDWR Water Quality Classification	С	С	С	
Stream Classification (existing)	B4a	E4b	E4b	
Stream Classification (proposed)	B4a	E4b	E4b	
Evolutionary trend (Simon)	III - Degrading	I - Stable System	I - Stable System	
FEMA classification	Zone X	Zone X	Zone X	
Regulatory Considerations	1			
Parameters	Applicable?	Resolved?	Supporting Docs?	
Water of the United States - Section 404	Yes	Yes	PCN	
Water of the United States - Section 401	Yes	Yes	PCN	
Endangered Species Act	Yes	Yes	Categorical Exclusion	
Historic Preservation Act	Yes	Yes	Categorical Exclusion	
Coastal Zone Management Act (CZMA or CAMA)	No	N/A	N/A	
FEMA Floodplain Compliance	No	N/A	N/A	

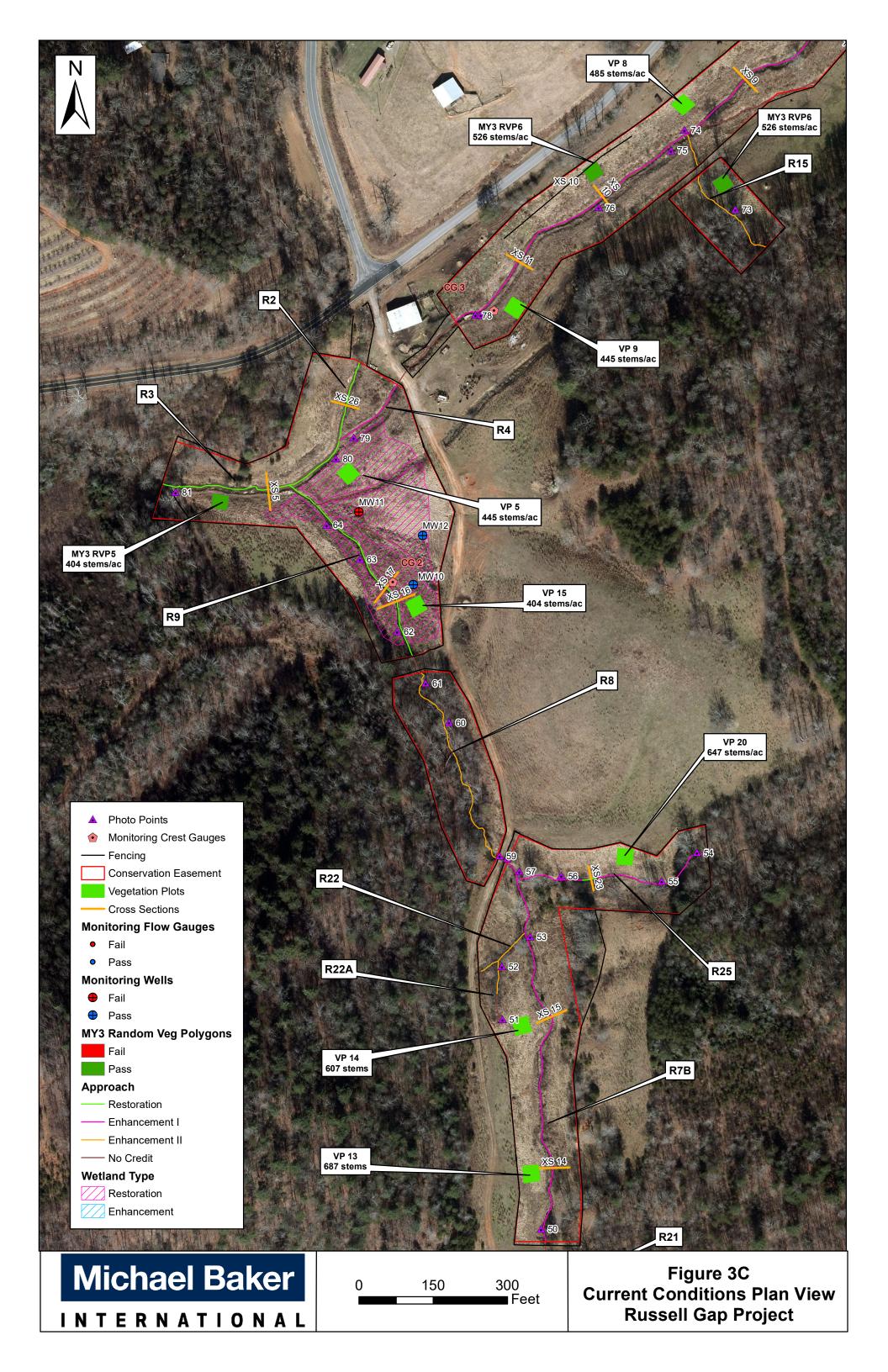
## **APPENDIX B**

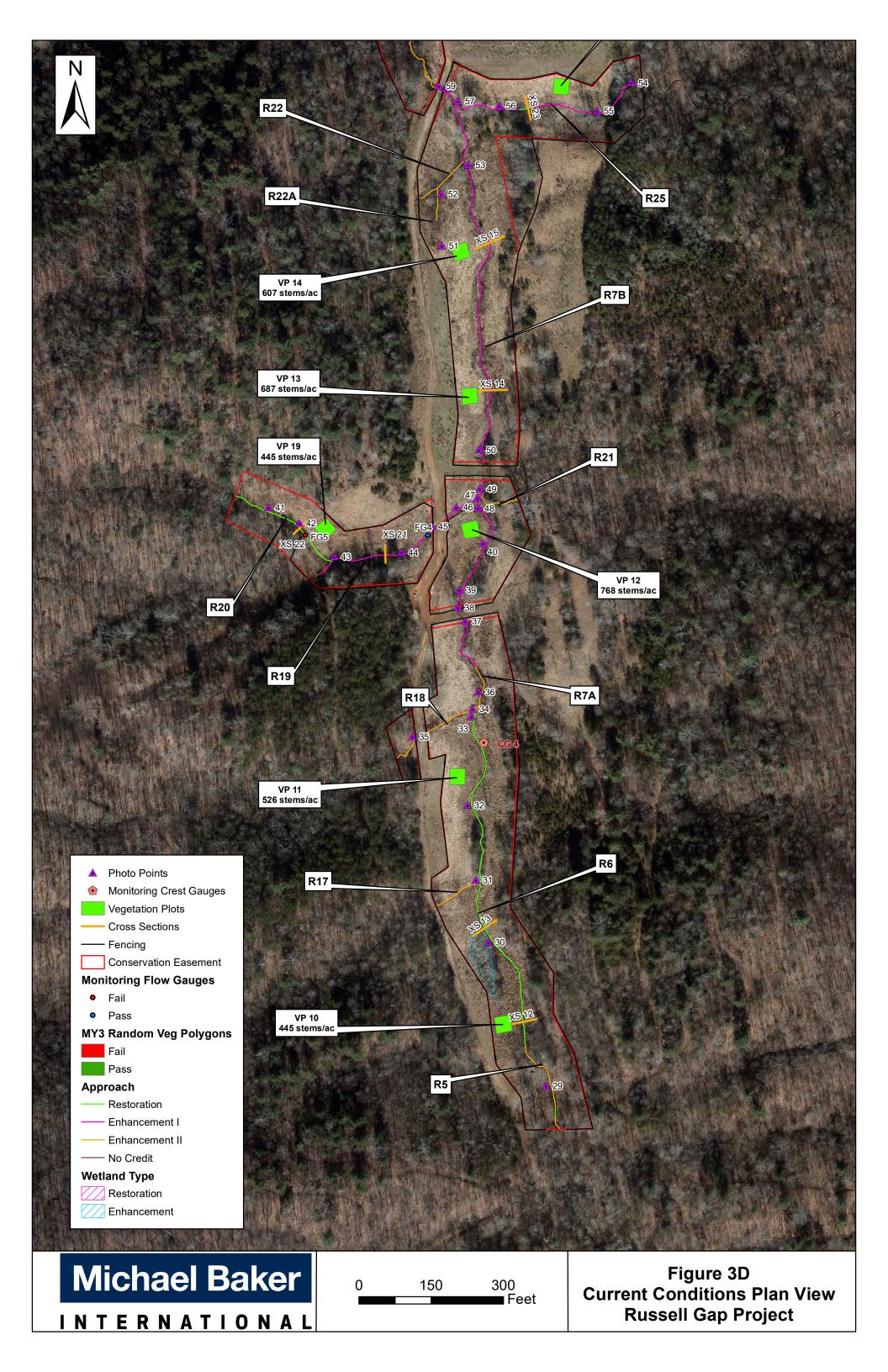
Visual Assessment Data











Reach ID: Reach R1							
Assessed Length (LF):	1,911		Name of the	,	New Lorent		0/ 6/-11-
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing a Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			2	40	98%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	21	21	0.00	0.00	100%
1. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	19	19			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	19	19			100%
		1. Thalweg centering at upstream of meander bend (Run)	21	21			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	19	19			100%
	•						
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion		0	0	0	100%
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected		0	0	0	100%
2. Bank	4. I halveg Position       2. Thalveg centering at downstream of meander bend (Glide)       19       19       19       19         2. Thalveg centering at downstream of meander bend (Glide)       19       19       0       0         1. Scoured/Eroding       Bank lacking vegetative cover due to active scour and erosion       0       0       0         2. Undercut       Banks undercut/overhanging to the extent that mass wasting is expected       0       0       0         3. Mass Wasting       Banks slumping, caving or collapse       0       0       0       0         tructures       1. Overall Integrity       Structures physically intact with no dislodged boulders or logs       27       27       Image: Control       Crade Control       Grade control structures exhibiting maintenance of grade across the sill       27       27       Image: Control       Image: Control structures lacking any substantial flow underneath or around sills or arms       27       27       Image: Control       Image: Control structures exhibiting maintenance of grade across the sill       27       27       Image: Control       Image: Control structures exhibiting maintenance of grade across the sill or arms       27       27       Image: Control       Image: Control structures exhibiting maintenance of grade across the sill or arms       27       27       Image: Control structures exhibitic contrelife       Image: Control structures exhibiti	100%					
				Totals	0	Unstable Segments         Unstable Footage           2         40         1           0         0         0         1           0         0         0.00         1           0         0         0.00         1           0         0         0.00         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1           0         0         0         1         1      0         0         1         1         1      0         0         1         1         1         1      0         0         1         1         1         1      0         0         1         1         1         1      0         0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs					100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	27	27			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	27	27			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	27	27			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	24	24			100%
Reach ID: Reach R2	4. Habitat		24	24			100%
Reach ID: Reach R2 Assessed Length (LF):	4. Habitat 166			24			
			Number Stable, Performing as	24 Total Number per As-built	Unstable		% Stable, Performing a
Assessed Length (LF):	166	providing some cover at low flow	Number Stable,	Total Number per	Unstable Segments	0         0.00           0         0.00           0         0.00           0         0.00           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0           0         0	% Stable,
Assessed Length (LF):	166 Channel Sub-Category	providing some cover at low flow Metric 1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include	Number Stable, Performing as	Total Number per	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended
Assessed Length (LF):	166 Channel Sub-Category	providing some cover at low flow Metric  1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)	Number Stable, Performing as	Total Number per	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing a Intended 100%
Assessed Length (LF):	166 Channel Sub-Category I.Vertical Stability	providing some cover at low flow Metric 1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting	Number Stable, Performing as Intended	Total Number per	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing as <u>Intended</u> 100% 100%
Assessed Length (LF): Major Channel Category	166 Channel Sub-Category I.Vertical Stability	providing some cover at low flow Metric 1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate	Number Stable, Performing as Intended 1	Total Number per	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing a Intended 100% 100%
Assessed Length (LF): Major Channel Category	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition	providing some cover at low flow  Metric  1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)  2. Degradation - Evidence of downcutting  1. Texture Substrate - Riffle maintains coarser substrate  1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)  2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	Number Stable, Performing as Intended 1	Total Number per	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing as Intended 100% 100% 100%
Assessed Length (LF): Major Channel Category	166       Channel Sub-Category       1.Vertical Stability       2. Riffle Condition	providing some cover at low flow  Netric  I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing a Intended 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle         1. Thalweg centering at upstream of meander bend (Run)	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing as Intended 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle         1. Thalweg centering at upstream of meander bend (Run)	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0	Unstable Footage 0 0	% Stable, Performing as Intended 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category I. Bed	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0 0.00	Unstable Footage 0 0 0 0.00 0 0.00 0 0.00 0 0.00 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a Intended           100%           100%           100%           100%           100%           100%           100%           100%           100%           100%           100%
Assessed Length (LF): Major Channel Category I. Bed	166         Channel Sub-Category         I.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (J30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Banks undercut/overhanging to the extent that mass wasting is expected	Number Stable, Performing as Intended 1 1 1	Total Number per As-built 1 1 1	Unstable Segments 0 0.00 0.00	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a Intended 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category 1. Bed	166         Channel Sub-Category         I.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (J30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Banks undercut/overhanging to the extent that mass wasting is expected	Number Stable, Performing as Intended 1 1 1	Total Number per As-built	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category 1. Bed	166         Channel Sub-Category         I.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (J30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Banks undercut/overhanging to the extent that mass wasting is expected	Number Stable, Performing as Intended 1 1 1	Total Number per As-built	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut         3. Mass Wasting	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Jass Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Jass Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Jass Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Jass Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent gat upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion         Banks undercut/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse	Number Stable, Performing as Intended 1 1 1	Total Number per As-built	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing at Intended           100%
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut         3. Mass Wasting         1. Overall Integrity	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (J30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Banks undercut/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse         Structures physically intact with no dislodged boulders or logs	Number Stable, Performing as Intended 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Total Number per As-built	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a Intended           100%
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	166         Channel Sub-Category         1.Vertical Stability         2. Riffle Condition         3. Meander Pool Condition         4. Thalweg Position         1. Scoured/Eroding         2. Undercut         3. Mass Wasting         1. Overall Integrity         2. Grade Control	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion         Banks undercut/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse         Structures physically intact with no dislodged boulders or logs         Grade control structures exhibiting maintenance of grade across the sill	Number Stable, Performing as Intended	Total Number per As-built	Unstable Segments 0 0 0.00 0.00 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended           100%

Assessed Length (LF):	406						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stabl Performin Intende
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	0	0			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
	4. Thalweg Position	Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)	0	0			100%
		2. I halweg centering at downstream of meander bend (Glide)	0	0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion		1	0	0	100%
	2. Undercut	Bank adding vegetative cover due to active sour and erosion Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering 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 or around sills or arms	1	1			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	1	1			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs	0	0			100%
	4. Habitat	providing some cover at low flow	0	Ů			1007
Reach ID: Reach R4a							
Assessed Length (LF):	300						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stab Performi Intend
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate		0			100%
. Bed		1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)		0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>		0			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)		0			100%
		2. Thalweg centering at downstream of meander bend (Glide)		0			100%
							16.00
	1. Scoured/Eroding 2. Undercut	Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2 Decile	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse			0	0	100%
2. Bank	3 Mass Wasting						1009
2. Bank	3. Mass Wasting			Totals	0	0	
2. Bank	3. Mass Wasting			Totals	0	0	_
2. Bank 3. Engineering Structures	3. Mass Wasting 1. Overall Integrity	Structures physically intact with no dislodged boulders or logs		Totals 0	0	0	100%
	1. Overall Integrity 2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill		0	0		100%
	1. Overall Integrity 2. Grade Control 2a. Piping	Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms		0 0 0	0		100% 100% 100%
	1. Overall Integrity 2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill		0	0		100%

Reach ID: Reach R4 Assessed Length (LF):	2,063						
Assessed Length (LF): Major Channel Category	2,063 Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing a Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	17	17			100%
1. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	15	15			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	15	15			100%
		1. Thalweg centering at upstream of meander bend (Run)	17	17			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	15	15			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
Bank 2. Undercut 3. Mass Wast	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
	brinning virusting	During stamping, curring of compact		Totals	0	0	100%
				- otais		· · ·	10070
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	20	20		1	100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	20	20			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	20	20			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	20	20			100%
		Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq 1.5$ . Rootwads/logs					
	4. Habitat	providing some cover at low flow	15	15			100%
Reach ID: Reach R5							
Assessed Length (LF):	193						
Major Channel Category			Number Stable,		Number of		% Stable,
	Channel Sub-Category	Metric	Performing as	Total Number per As-built	Unstable	Amount of Unstable Footage	Performing a
	Channel Sub-Category	Metric  1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)	Performing as Intended				,
		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include			Unstable Segments	Unstable Footage	Performing as Intended
		<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			Unstable Segments 0	Unstable Footage	Performing as Intended 100%
l. Bed	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> <li>Degradation - Evidence of downcutting</li> </ol>			Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
1. Bed	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     I. Texture Substrate - Riffle maintains coarser substrate	Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
1. Bed	1. Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100%
l. Bed	1.Vertical Stability 2. Riffle Condition	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100%
l. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (C30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Langth - Sufficenting at downstream of meander bend (Glide)	Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100% 100%
	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (As Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion	Intended	As-built	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100%
1. Bed 2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)     Depth query at gate and of meander bend (Run)     Thalweg centering at upstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undereut/overhanging to the extent that mass wasting is expected	Intended	As-built	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100%
	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Langth - Sufficent (Ars Pool Depth/Mean Bank Iacking vegetative cover due to active scour and erosion	Intended	As-built	Unstable Segments 0 0 0 0	Ustable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing a Intended 100% 100% 100% 100% 100% 100% 100%
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)     Depth query at upstream of meander bend (Run)     Thalweg centering at upstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undereut/overhanging to the extent that mass wasting is expected	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (C+30% of c enterline distance between tail of upstream riffle and head of downstream riffle)     In Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks underu/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a Intended 100% 100% 100% 100% 100% 100% 100% 100
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     I. Texture Substrate - Riffle maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle)     I. Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Bank slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a Intended 100% 100% 100% 100% 100% 100% 100% 100
2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)     Depth - Lindweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks underculvorethanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs     Grade control structures exhibiting maintenance of grade across the sill	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100% 100
2. Bank	I.Vertical Stability  Z. Riffle Condition  Meander Pool Condition  A. Thalweg Position  I. Scoured/Eroding  L. Grade Condition  I. Overall Integrity  G. Grade Control  Za. Piping	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Gave Content in the distance between tail of upstream riffle and head of downstream riffle)     In Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the actent that mass wasting is expected     Bank slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs     Grade control structures exhibiting maintenance of grade across the sill     Structures lacking any substratial flow underneath or around sills or arms	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100% 100
2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)     Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)     Depth - Lindweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks underculvorethanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs     Grade control structures exhibiting maintenance of grade across the sill	Intended	As-built 	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100

Reach ID: Reach R6							
Assessed Length (LF):	747						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing a Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	-	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	9	9			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	8	8			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	8	8			100%
		1. Thalweg centering at upstream of meander bend (Run)	9	9			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	8	8			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
D. D	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
Bank 2. Undercut 3. Mass Wastin Engineering Structures 1. Overall Inte	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering 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 or around sills or arms	8	8			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	8	8			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	8	8			100%
Reach ID: Reach R7a		providing some cover acrow new					
Assessed Length (LF):	104						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
			Intenueu				Intended
	1 Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> <li>Deeradation - Evidence of downcutting</li> </ol>				0	100%
	1.Vertical Stability 2. Riffle Condition	point bars)		0	0		
1. Bed		point bars) 2. Degradation - Evidence of downcutting		0	0		100%
. Bed		point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate			0		100% 100%
l. Bed	2. Riffle Condition 3. Meander Pool Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream		0	0		100% 100% 100%
. Bed	2. Riffle Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)		0	0		100% 100% 100% 100%
l. Bed	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide)		0 0 0	0		100% 100% 100% 100% 100%
. Bed	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion		0 0 0	0		100% 100% 100% 100% 100% 100%
	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected		0 0 0	0 0		100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion			0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected		0 0 0	0 0		100% 100% 100% 100% 100% 100%
. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks underculvoverhanging to the extent that mass wasting is expected Banks slumping, caving or collapse		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Nax Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting     1. Overall Integrity     2. Grade Control	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (~30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position  1. Scoured/Eroding 2. Undercut 3. Mass Wasting  1. Overall Integrity 2. Grade Control 2a. Piping	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks underculvoverhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting     1. Overall Integrity     2. Grade Control	point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at downstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion         Banks undercut/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse         Structures physically intact with no dislodged boulders or logs         Grade control structures exhibiting maintenance of grade across the sill         Structures lacking any substantial flow underneath or around sills or arms         Bank resion within the structures center of influence does not exceed 15%		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position  1. Scoured/Eroding 2. Undercut 3. Mass Wasting  1. Overall Integrity 2. Grade Control 2a. Piping	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks underculvoverhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms		0 0 0 0 Totals	0 0		100% 100% 100% 100% 100% 100% 100% 100%

Reach ID: Reach R7b							
Assessed Length (LF):	1,216						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	9	9			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	7	7			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	7	7			100%
		1. Thalweg centering at upstream of meander bend (Run)	9	9			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	7	7			100%
			,	, · ,			
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2 Deck	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
	2		1	Totals	0	0	100%
	•						
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs					100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill					100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms					100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%					100%
		n të filo e shtiri në njin dhe in tëtin di shtën si të					
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs					100%
Reach ID: Reach R8	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Banktull Depth ratio $\geq$ 1.5. Kootwads/logs providing some cover at low flow					100%
Reach ID: Reach R8 Assessed Length (LF):	4. Habitat						100%
Reach ID: Reach R8 Assessed Length (LF): Major Channel Category			Number Stable, Performing as	Total Number per As-built	Number of Unstable	Amount of Unstable Footage	% Stable, Performing as
Assessed Length (LF):	453 Channel Sub-Category	Providing some cover at low flow Metric 1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include					% Stable,
Assessed Length (LF):	453	providing some cover at low flow Metric I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)	Performing as		Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100%
Assessed Length (LF):	453 Channel Sub-Category I.Vertical Stability	Providing some cover at low flow Metric I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting	Performing as	As-built	Unstable Segments	Unstable Footage	% Stable, Performing as Intended 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category	Providing some cover at low flow Metric  I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate	Performing as	As-built 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100%
Assessed Length (LF):	453 Channel Sub-Category I.Vertical Stability 2. Rifle Condition	Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)	Performing as	As-built	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category I.Vertical Stability	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)         2. Length - Sufficent / 30% of centerline distance between tail of upstream riffle and head of downstream	Performing as	As-built 0 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Riffer maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Performing as	As-built 0 0 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category I.Vertical Stability 2. Rifle Condition	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth≥ 1.5)         2. Length - Sufficent / 30% of centerline distance between tail of upstream riffle and head of downstream	Performing as	As-built 0 0 0 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Image: system of the syste	Performing as	As-built 0 0 0 0 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Image: system of the syste	Performing as	As-built 0 0 0 0 0	Unstable Segments 0	Unstable Footage	% Stable, Performing as Intended 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category I. Bed	453 Channel Sub-Category 1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (C-30% of centerline distance between tail of upstream riffle and head of downstream riffle         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)	Performing as	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category	453 Channel Sub-Category 1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	Image: some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficient (30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion	Performing as	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category I. Bed	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	Image: some cover at low flow           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Riffer maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)           1. Thalweg centering at upstream of meander bend (Run)           2. Thalweg centering at downstream of meander bend (Glide)           Bank lacking vegetative cover due to active scour and erosion           Banks underculvorethanging to the extent that mass wasting is expected	Performing as	As-built 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a: Intended 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category I. Bed	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	Image: some cover at low flow           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Riffer maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)           1. Thalweg centering at upstream of meander bend (Run)           2. Thalweg centering at downstream of meander bend (Glide)           Bank lacking vegetative cover due to active scour and erosion           Banks underculvorethanging to the extent that mass wasting is expected	Performing as	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category I. Bed	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	Image: some cover at low flow           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Riffer maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)           1. Thalweg centering at upstream of meander bend (Run)           2. Thalweg centering at downstream of meander bend (Glide)           Bank lacking vegetative cover due to active scour and erosion           Banks underculvorethanging to the extent that mass wasting is expected	Performing as	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a: Intended 100% 100% 100% 100% 100% 100% 100%
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	453 Channel Sub-Category 1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Bank sudercu/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse	Performing as	As-built	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position I. Scoured/Eroding 2. Undercut 3. Mass Wasting I. Overall Integrity	Image: some cover at low flow           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Rifle maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle)           1. Thalweg centering at upstream of meander bend (Glide)           2. Thalweg centering at downstream of meander bend (Glide)           Bank lacking vegetative cover due to active scour and crosion           Banks slumping, caving or collapse           Structures physically intact with no dislodged boulders or logs	Performing as	As-built 0 0 0 0 0 0 0 Totals	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing a Intended 100% 100% 100% 100% 100% 100% 100% 100
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	453 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control	Image: some cover at low flow           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting           1. Texture Substrate - Riffer maintains coarser substrate           1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)           2. Length - Sufficent (-30% of c enterline distance between tail of upstream riffle and head of downstream riffle)           1. Thalweg centering at upstream of meander bend (Run)           2. Thalweg centering at downstream of meander bend (Glide)           Bank lacking vegetative cover due to active scour and erosion           Banks underculvorethanging to the extent that mass wasting is expected           Banks sulerculvorethanging to the extent that mass wasting is expected           Banks sulerculvorethanging to the extent that mass wasting is expected           Banks underculvorethanging to the extent that mass mass may be expected           Banks underculvorethanging to the extent that mass mass may be expected           Banks underculvorethanging to the extent that mass mass may be expected           Banks underculvorethanging to the extent that mass mass may be expected           Banks underculvorethanging to the extent that mass mass may be expected           Banks underculvorethanging to the extent that mass mass may be expected	Performing as	As-built 0 0 0 0 0 0 0 Totals 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
Assessed Length (LF): Major Channel Category 1. Bed 2. Bank	453 Channel Sub-Category 1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control 2a. Piping	providing some cover at low flow         Metric         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficent (of a worker of meander bend (Run)         2. Thalweg centering at upstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and erosion         Banks undercut/overhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse         Structures physically intact with no dislodged boulders or logs         Grade control structures exhibiting maintenance of grade across the sill         Structures lacking any substratial flow undereath or arous dills or arms	Performing as	As-built 0 0 0 0 0 0 Totals 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	% Stable, Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100

Reach ID: Reach R9							
Assessed Length (LF):	446						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	-	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	7	7			100%
I. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	6	6			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	6	6			100%
		1. Thalweg centering at upstream of meander bend (Run)	7	7			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	6	6			100%
	•						
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2 Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
	2			Totals	0	0	100%
3. Engineering 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 or around sills or arms	6	6			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	6	6			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	6	6			100%
Reach ID: Reach R10a		providing some cover a low now					
Assessed Length (LF):	367						
			N. 1. 0. 11	1 1			
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as	Total Number per As-built	Number of Unstable	Amount of Unstable Footage	
Major Channel Category		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include					
Major Channel Category	Channel Sub-Category 1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>	Performing as		Unstable Segments	Unstable Footage	Performing as Intended 100%
Major Channel Category	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Z. Degradation - Evidence of downcutting	Performing as Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     I. Texture Substrate - Riffle maintains coarser substrate	Performing as	As-built 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
Major Channel Category	1.Vertical Stability 2. Riffle Condition	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffle maintains coarser substrate     1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)	Performing as Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100%
	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     I. Texture Substrate - Riffle maintains coarser substrate	Performing as Intended	As-built 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
	1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Performing as Intended 0 0	As-built 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100%
	1.Vertical Stability 2. Riffle Condition	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> <li>Degradation - Evidence of downcutting</li> <li>Texture Substrate - Riffle maintains coarser substrate</li> <li>Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> <li>Length - Sufficient (&gt;30% of centerline distance between tail of upstream riffle and head of downstream</li> </ol>	Performing as Intended 0 0 0	As-built 0 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100%
	1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100% 100%
	1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Lingth - Sufficient (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100% 100%
. Bed	1.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100%
. Bed	I.Vertical Stability  2. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Topth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Ars Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (7:30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Deptring at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0 0	Ustable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100%
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (7:30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Deptring at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
l. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (7:30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Deptring at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100%
. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth - Sufficent (Max Pool Depth ≥ 1.5)     Depth	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
. Bed	I.Vertical Stability  Z.Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding  2. Undercut  3. Mass Wasting  1. Overall Integrity	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Texture Substrate - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Teagth - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100% 100
l. Bed	I.Vertical Stability  I.Vertical Stability  C.Riffle Condition  A. Thalweg Pool Condition  I. Scoured/Eroding  L. Undercut  A. Mass Wasting  I. Overall Integrity  C. Grade Control	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Degradation - Evidence of downcutting     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (730% of centerline distance between tail of upstream riffle and head of downstream riffle)     Depth - gentering at upstream of meander bend (Run)     Depth - Sufficent (varget distance between tail of upstream riffle)     Depth - Sufficent (varget distance between tail of upstream riffle)     Thalweg centering at upstream of meander bend (Run)     Depth - Sufficent due to active scour and erosion     Banks underculverthanging to the extent that mass wasting is expected     Banks sulmerulverulverthanging to the extent that mass wasting is expected     Banks sulmerulverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks underculverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass wasting is expected     Banks undertulverthanging to the extent that mass the extent that mass the extent that mas	Performing as Intended 0 0 0 0 0 0 0 0 0 0 0 0 0 0 7 1	As-built	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
1. Bed 2. Bank	I.Vertical Stability  Z. Riffle Condition  A. Thalweg Position  I.Scoured/Eroding  L.Overall Integrity  Grade Control  C.Grade Control  C.P. Sping	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Sufficent (Aax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth ≥ 1.5)     Length - Sufficent (Aax Pool Depth ≥ 1.5)     Sufficent (Aax Pool D	Performing as Intended 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	As-built	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0	Peri

105						
Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	2. Degradation - Evidence of downcutting			0	0	100%
2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	1	1			100%
	<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
	1. Thalweg centering at upstream of meander bend (Run)	1	1			100%
4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
•						
1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
Č Č			Totals	0	0	100%
	·					
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 or around sills or arms	2	2			100%
3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	2	2			100%
4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs	0	0			100%
	Norman's some corer at low now					
712						
Channel Sub-Category	Metric	Number Stable, Performing as	Total Number per As-built	Number of Unstable	Amount of Unstable Footage	% Stable, Performing as Intended
1 Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>	Intended		0	0	100%
in ter dear Stability				0	0	100%
2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	2	2	-	-	100%
21 Millie Condition		0	0			100%
3. Meander Pool Condition						
		0	0			100%
		2	2			100%
4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
•						
1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
			Totals	0	0	100%
1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	38	38			100%
1. Overall Integrity 2. Grade Control	Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	38 38	38 38			100% 100%
2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	38	38			100%
	Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position I.Scoured/Eroding I.Grade Control 2a. Piping 3. Bank Position 4. Habitat 712 Channel Sub-Category I.Vertical Stability 2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position I. Scoured/Eroding 1. Scoured/Eroding 1. Scoured/Eroding 2. Undercut	Channel Sub-Category         Metric           I.Vertical Stability         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)           2. Degradation - Evidence of downcutting         2. Degradation - Evidence of downcutting           3. Meander Pool Condition         1. Texture Substrate - Riffle maintains coarser substrate           4. Thalweg Position         1. Thalweg centering at upstream of meander bend (Run)           2. Indercut         2. Bank lacking vegetative cover due to active scour and erosion           2. Undercut         Bank lacking vegetative cover due to active scour and erosion           2. Indercut         Banks undercut/vertinging to the extent that mass wasting is expected           3. Mass Wasting         Banks slumping, caving or collapse           1. Overall Integrity         Structures physically intact with no dislodged boulders or logs           2. Grade Control         Grade control structures extent of influence does not exceed 15%           3. Bank Position         Bank erosion within the structures extent of influence does not exceed 15%           4. Habitat         Pool forming structures naintaining - Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow           712           Metric           1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)	Channel Sub-Category         Metric         Number Stable. Performing as Intended           1.Vertical Stability         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         1           2. Niffle Condition         1. Texture Substate - RTHE maintains coarser substrate         1           3. Meander Pool Condition         1. Depth - Sufficent (MAR Pool Depth/Mean Bkf Depth ≥ 1.5)         0           3. Meander Pool Condition         1. Thalweg centering at upstream of meander bend (Clide)         0           4. Thalweg Position         1. Thalweg centering at downstream of meander bend (Clide)         0           1. Corpet Action Banks submping, aving or collapse         2         2           2. Corget Control         Grade control structures exclusing maintenance of grade across the sill         2           2. Corget Control         Grade control structures exclusing maintenance of grade across the sill         2           2. Grade Control         Grade control structures achibiting maintenance of grade across the sill         2           3. Bank Position         Bank rescling my substanial flow underneatior around sills or around	Channel Sub-Category         Metric         Number Stable, Performing as Intended         Total Number per As-built           I.Vertical Stability         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         1.         1.           2. Riffle Condition         1. Texture Substrate - Riffle maintains courser substrate         1         1           3. Meander Pool Condition         1. Depth - Sufficient (Max Pool Depth/Mon BHX Depth 215)         0         0           4. Thalweg Position         1. Thubeg centering at upstram of meander bend (Run)         1         1           1. Thubeg centering at upstram of meander bend (Glide)         0         0         0           2. Undercut         Bank lacking vagetative cover due to active scora rand erosion         2         2           2. Grade Control         Grade control structures exhibiting in texture scheduling antennance of grade across the sill         2         2         2           2. Grade Control         Grade control structures exhibiting instructures antisting - Nax Pool Depth/Mean Biks         2         2         2           2. Grade Control         Grade control structures exhibiting instructures antisting - Nax Pool Depth/Mean Biks         2         2         2           3. Bank Position         Bank substrate and the structures extend of inflocure does nor exceed 15%         2         2	Channel Sub-Category         Metric         Performing as Intended         Total Number pr As-built         Number of Unstable comments           1.Vertical Stability         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include poin hars).         0         0           2. Riffe Condition         1. Certure Substrate - Riffe maintains coarser substrate         1         1         0           3. Meander Pool Condition         1. Depth - Sufficent (Ma Pool Depth/Mean BB (Depth ≥ 15)         0         0         0           4. Thalweg Position         1. Endpti - Sufficent (Pot Pohl Pan BB (Depth ≥ 15)         0         0         0           1. Depth - Sufficent (Ma Pool Depth/Mean BB (Depth ≥ 15)         0         0         0         0           4. Thalweg Position         1. Endpti = Sufficient (2 + 00 (Stabutate - Riff (Run))         1         1         1           3. Mass Wasting         Bank lucking vegetative cover due to active scoar and erosion         0         0         0           1. Overall Integrity         Structures physically intact with no disologed boulders or logs         2         2         2           2. Grade Control         Grade control structures lacking any substantial flow undergot or logs         2         2         2           2. Grade Control         Grade control structures lacking any substantial flow	Channel Sub-Category         Metric         Number Sub- Performing         Total Number per Ax-built         Number of Unstable Semential Distable Source         Amount of Unstable Footupe           1.Vertical Stability         1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)         0         0         0           2. Bdffe Condition         1. Texture Substrate - Riffe maintain courser substrate         1         1         0         0           3. Meander Pool Condition         1. Deptis - Sufficient (OMA FeO Deptis Agric (MAR FEO Deptis - 15)         0         0         0         0           4. Thalveg Position         1. Texture Substrate - Riffe maintain courser substrate         0

Reach ID: Reach R12							
Assessed Length (LF):	120						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	2	2			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	1	1			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	1	1			100%
		1. Thalweg centering at upstream of meander bend (Run)	2	2			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	1	1			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2 Pank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	3	3			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	3	3			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	3	3			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	3	3			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	1	1			100%
Reach ID: Reach R13		providing some cover acrow new					
Assessed Length (LF):	145						
Major Channel Category			Number Stable,	Tetel New house	Number of		% Stable,
	Channel Sub-Category	Metric	Performing as	Total Number per As-built	Unstable	Amount of Unstable Footage	
		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include	Performing as Intended				Performing as Intended 100%
	Channel Sub-Category I.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			Unstable Segments	Unstable Footage	
	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting	Intended	As-built	Unstable Segments 0	Unstable Footage	Intended 100% 100%
1. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Coggradation - Evidence of downcutting     I. Texture Substrate - Riffle maintains coarser substrate			Unstable Segments 0	Unstable Footage	Intended 100%
l. Bed	1.Vertical Stability	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffle maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	Intended 0 0	As-built 0 0 0 0	Unstable Segments 0	Unstable Footage	Intended 100% 100% 100%
I. Bed	1. Vertical Stability 2. Riffle Condition 3. Meander Pool Condition	I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Z. Degradation - Evidence of downcutting     I. Texture Substrate - Riffer maintains coarser substrate     L. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Z. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Intended 0	As-built 0	Unstable Segments 0	Unstable Footage	Intended 100% 100% 100% 100%
. Bed	1.Vertical Stability 2. Riffle Condition	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffle maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	Intended 0 0	As-built 0 0 0 0	Unstable Segments 0	Unstable Footage	Intended 100% 100% 100%
l. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (C>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Lifthalveg centering at upstream of meander bend (Run)     Lifthalveg centering at downstream of meander bend (Glide)	0 0 0 1	As-built 0 0 0 0 1	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100%
. Bed	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Degnt - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth ≥ 1.5     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth ≥ 1.5)     Sufficent (Nax Pool De	0 0 0 1	As-built 0 0 0 0 1	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100%
		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffu maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0 1	As-built 0 0 0 0 1	Unstable Segments 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100%
	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Degnt - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Depth ≥ 1.5     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth ≥ 1.5)     Sufficent (Nax Pool De	0 0 0 1	As-built 0 0 0 1 0 1 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100%
		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffu maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0 1	As-built 0 0 0 0 1	Unstable Segments 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100%
2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffer maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (C>30% of centerlyine distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Rum)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks underculvorthanging to the extent that mass wasting is expected     Banks slumping, caving or collapse	Intended 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0	As-built 0 0 0 1 0 1 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     I. Texture Substrate - Riffle maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     I. Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs	Intended 0 0 1 0 0	As-built 0 0 1 0 1 0 Totals 9	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%
2. Bank		I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     I. Texture Substrate - Riff maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (730% of centerline distance between tail of upstream riffle and head of downstream riffle)     I. Thalweg centering at upstream of meander bend (Run)     Z. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs     Grade control structures exhibiting maintenance of grade across the sill	Intended 0 0 0 1 0 1 0 9 9 9 9	As-built 0 0 0 1 0 1 0 Totals 9 9	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	I.Vertical Stability  Z. Riffle Condition  Meander Pool Condition  A. Thalweg Position  I. Scoured/Eroding  L. Goveral/Eroding  I. Overall Integrity  Grade Control  Za. Piping	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Case of the substrate of the su	Intended 0 0 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 0 0	As-built 0 0 0 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 1 0 0 1 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100
2. Bank		I. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     I. Texture Substrate - Riff maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (730% of centerline distance between tail of upstream riffle and head of downstream riffle)     I. Thalweg centering at upstream of meander bend (Run)     Z. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs     Grade control structures exhibiting maintenance of grade across the sill	Intended 0 0 0 1 0 1 0 9 9 9 9	As-built 0 0 0 1 0 1 0 Totals 9 9	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0	Intended 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%

Reach ID: Reach R14							
Assessed Length (LF):	570						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	2	2			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
		1. Thalweg centering at upstream of meander bend (Run)	1	1			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2 Pank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
	e e			Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	26	26			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	26	26			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	26	26			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	26	26			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	0	0			100%
Reach ID: Reach R15	l	providing some cover at low new					
Assessed Length (LF):	284						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as	Total Number per As-built	Number of Unstable	Amount of	% Stable, Performing as Intended
					Somonte	Unstable Footage	
	1 Vertical Stability	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point hars)	Intended		Segments 0	Unstable Footage	100%
	1.Vertical Stability	point bars)	Intended			5	
			0	0	0	0	100%
l. Bed	1.Vertical Stability 2. Riffle Condition	point bars) 2. Degradation - Evidence of downcutting			0	0	100% 100%
. Bed		point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	0 0	0	0	0	100% 100% 100%
. Bed	2. Riffle Condition 3. Meander Pool Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	0	0 0	0	0	100% 100% 100%
. Bed	2. Riffle Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream	0 0 0	0 0 0	0	0	100% 100% 100% 100%
. Bed	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide)	0 0 0 0	0 0 0 0	0		100% 100% 100% 100% 100% 100%
. Bed	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Glude) 2. Thalweg centering at downstream of meander bend (Glude) Bank lacking vegetative cover due to active scour and crosion	0 0 0 0	0 0 0 0	0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0 0	0 0 0 0	0 0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Glude) 2. Thalweg centering at downstream of meander bend (Glude) Bank lacking vegetative cover due to active scour and crosion	0 0 0 0		0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0 0	0 0 0 0	0 0		100% 100% 100% 100% 100% 100% 100%
. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks underculvoverhanging to the extent that mass wasting is expected Banks slumping, caving or collapse			0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position  1. Scoured/Eroding 2. Undercut 3. Mass Wasting  1. Overall Integrity	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Nax Pool Depth/Mean Bkt Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Seoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (~30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control 2a. Piping	point bars)         2. Degradation - Evidence of downcutting         1. Texture Substrate - Riffle maintains coarser substrate         1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)         2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)         1. Thalweg centering at upstream of meander bend (Run)         2. Thalweg centering at downstream of meander bend (Glide)         Bank lacking vegetative cover due to active scour and crosion         Banks underculvoverhanging to the extent that mass wasting is expected         Banks slumping, caving or collapse         Structures physically intact with no dislodged boulders or logs         Grade control structures exhibiting maintenance of grade across the sill         Structures lacking any substantial flow underneath or around sills or arms	0 0 0 0 0	0 0 0 0 0 0 0 Totas	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Seoured/Eroding 2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (~30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	0 0 0 0 0	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%

Reach ID: Reach R17							
Assessed Length (LF):	107						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate		0			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>		0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>		0			100%
		1. Thalweg centering at upstream of meander bend (Run)		0			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)		0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs		0			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill		0			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms		0			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%		0			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow		0			100%
Reach ID: Reach R18	L	providing some cover at row now					
Assessed Length (LF):	176						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
			Intended				
	1 Vantinal Stability	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include			0	0	100%
	1.Vertical Stability	point bars)			0		100%
		point bars) 2. Degradation - Evidence of downcutting	0	0		0	100% 100%
1 Red	1.Vertical Stability 2. Riffle Condition	peint bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate	0	0	0		100% 100% 100%
1. Bed	2. Riffle Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)	0 0	0	0		100% 100% 100%
1. Bed		point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream	0	0	0		100% 100% 100%
1. Bed	2. Riffle Condition 3. Meander Pool Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	0		0		100% 100% 100% 100%
1. Bed	2. Riffle Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficient (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream	0	0	0		100% 100% 100%
l. Bed	2. Riffle Condition 3. Meander Pool Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run)	0 0 0	0 0 0	0		100% 100% 100% 100% 100%
1. Bed	2. Riffle Condition 3. Meander Pool Condition	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run)	0 0 0	0 0 0	0		100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (-30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide)	0 0 0	0 0 0	0		100% 100% 100% 100% 100% 100%
1. Bed 2. Bank	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (~30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion	0 0 0	0 0 0	0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0	0 0 0	0 0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0		0 0 0		100% 100% 100% 100% 100% 100% 100%
	2. Riffle Condition 3. Meander Pool Condition 4. Thalweg Position 1. Scoured/Eroding 2. Undercut	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected	0 0 0		0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercul/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse	0 0 0		0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting     1. Overall Integrity	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) 3. Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse 3. Structures physically intact with no dislodged boulders or logs	0 0 0 0	0 0 0 0 Totals	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%
2. Bank	2. Riffle Condition     3. Meander Pool Condition     4. Thalweg Position     1. Scoured/Eroding     2. Undercut     3. Mass Wasting     1. Overall Integrity     2. Grade Control	point bars) 2. Degradation - Evidence of downcutting 1. Texture Substrate - Riffle maintains coarser substrate 1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5) 2. Length - Sufficent (~30% of centerline distance between tail of upstream riffle and head of downstream riffle) 1. Thalweg centering at upstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Run) 2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	0 0 0 0 2 2	0 0 0 Totals	0 0 0		100% 100% 100% 100% 100% 100% 100% 100%

Reach ID: Reach R19							
Assessed Length (LF):	353						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	-	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	1	1			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
		1. Thalweg centering at upstream of meander bend (Run)	1	1			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	26	26			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	26	26			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	26	26			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	26	26			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	0	0			100%
Reach ID: Reach R20		providing some cover at low now					
Assessed Length (LF):	253						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>	Intended		0	0	100%
	1. vertical Stability	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	0	0	0	0	100%
1. Bed	2. Kine Condition	1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth > 1.5)	0	0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
		1. Thalweg centering at upstream of meander bend (Run)	0	ů			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Kuh) 2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
					0	0	100%
	1 Scourod/Freding				U	U	100%
	1. Scoured/Eroding 2. Undersut	Bank lacking vegetative cover due to active scour and erosion			0	0	
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	
2. Bank				Totale	0	0	100%
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected		Totals	0		
	2. Undercut 3. Mass Wasting	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse	36		0	0	100% 100%
. Bank . Engineering Structures	2. Undercut 3. Mass Wasting 1. Overall Integrity	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs	36 36	36	0	0	100% 100% 100%
	2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	36	36 36	0	0	100% 100% 100%
	2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control 2a. Piping	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms	36 36	36 36 36	0	0	100% 100% 100% 100%
	2. Undercut 3. Mass Wasting 1. Overall Integrity 2. Grade Control	Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	36	36 36	0	0	100% 100% 100%

Reach ID: Reach R21							
Assessed Length (LF):	92				-	-	
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing a Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	-	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate		0			100%
1. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>		0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>		0			100%
		1. Thalweg centering at upstream of meander bend (Run)		0			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)		0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2 Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs		0			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill		0			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms		0			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%		0			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow		0			100%
Reach ID: Reach R22, R22a		providing some cover at low now					
Assessed Length (LF):	187						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>	Intended		0	0	100%
	1. vertical Stability	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate		0	0		100%
1. Bed	2. Kine Condition	1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth > 1.5)		0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>		0			100%
	-	1. Thalweg centering at upstream of meander bend (Run)		0		-	100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Kuh) 2. Thalweg centering at downstream of meander bend (Glide)		0			100%
	1.0			-	0	0	1000/
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2. Bank	2. Undercut 3. Mass Wasting	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
2. Bank	5. mass wasting	Banks slumping, caving or collapse		Totals	0	0	100%
				Totals	0	0	100%
3 Engineering Structures	1 Overall Integrity	Structures physically intact with no dislodged boulders or logs		1 0 1		I	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs		0			100%
3. Engineering Structures	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill		0			100%
3. Engineering Structures	2. Grade Control 2a. Piping	Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms		0 0			100% 100%
3. Engineering Structures	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms Bank crosion within the structures extent of influence <b>does not</b> exceed 15%		0			100%
3. Engineering Structures	2. Grade Control 2a. Piping	Grade control structures exhibiting maintenance of grade across the sill Structures lacking any substantial flow underneath or around sills or arms		0 0			100% 100%

Reach ID: Reach R25							
Assessed Length (LF):	402						
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
	-	2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	6	6			100%
. Bed		<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
	3. Meander Pool Condition	<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
		1. Thalweg centering at upstream of meander bend (Run)	6	6			100%
	4. Thalweg Position	2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
2. Bank	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
			1	Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	13	13			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	13	13			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	13	13			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	13	13			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	0	0			100%
Reach ID: Reach R26		providing some cover at low now					
Assessed Length (LF):	473						
Major Channel Category			N. 1. 0. 11				
wajor Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as	Total Number per As-built	Number of Unstable	Amount of Unstable Footage	
Major Channel Category		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include					
Major Channer Category	Channel Sub-Category 1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>	Performing as		Unstable Segments	Unstable Footage	Performing as Intended 100%
Major Channel Category	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting	Performing as Intended	As-built	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Coggradation - Evidence of downcutting     I. Texture Substrate - Riffle maintains coarser substrate	Performing as	As-built 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
I. Bed	1.Vertical Stability	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (>3% of centerline distance between tail of upstream riffle and head of downstream	Performing as Intended 0 0	As-built 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100%
	1.Vertical Stability 2. Riffle Condition	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	Performing as Intended 0 0 0	As-built 0 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100% 100%
	1.Vertical Stability 2. Riffle Condition	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (>3% of centerline distance between tail of upstream riffle and head of downstream	Performing as Intended 0 0	As-built 0 0	Unstable Segments 0	Unstable Footage	Performing as Intended 100% 100% 100%
		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Caso of centerline distance between tail of upstream riffle and head of downstream riffle)     Lifthere and the sufficient of the sufficient of the sufficient of the sufficient (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth/Mean Bkf Depth ≥ 1.5)     Longth - Sufficient (Sator Depth > Sator Dept	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100%
	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Degn - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (3x9% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
I. Bed		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (7-30% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100%
	I.Vertical Stability  Z. Riffle Condition  3. Meander Pool Condition  4. Thalweg Position  1. Scoured/Eroding	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Degn - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (3x9% of centerline distance between tail of upstream riffle and head of downstream riffle)     Thalweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and crosion	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0 0 0 0 0 0 0 0 0	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
I. Bed		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (7-30% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected	Performing as Intended 0 0 0 0	As-built 0 0 0 0 0	Unstable Segments 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100%
1. Bed 2. Bank		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffer maintains coarser substrate     I. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (P30% of centerlyine distance between tail of upstream riffle and head of downstream riffle)     I. Thalweg centering at upstream of meander bend (Rum)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks underculvorthanging to the extent that mass wasting is expected     Banks slumping, caving or collapse	Performing as Intended 0 0 0 0 0 0	As-built	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
1. Bed		Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)     Taktweg centering at upstream of meander bend (Run)     Thalweg centering at downstream of meander bend (Glide)     Bank lacking vegetative cover due to active scour and erosion     Banks undercut/overhanging to the extent that mass wasting is expected     Banks slumping, caving or collapse     Structures physically intact with no dislodged boulders or logs	Performing as Intended 0 0 0 0 0 0 0	As-built 0 0 0 0 0 0 0 Totals	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
1. Bed 2. Bank		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (730% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	Performing as Intended 0 0 0 0 0 0 0 0 0 0 0	As-built 0 0 0 0 0 0 Totals 4 4	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
1. Bed	I.Vertical Stability  Z. Riffle Condition  Meander Pool Condition  A. Thalweg Position  I. Scoured/Eroding  L. Grade Condition  I. Overall Integrity  G. Grade Control  Za. Piping	Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     Degradation - Evidence of downcutting     Texture Substrate - Riffle maintains coarser substrate     Lopth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Nax Pool Depth/Mean Bkf Depth ≥ 1.5)     Length - Sufficent (Case of the substrate of the su	Performing as Intended 0 0 0 0 0 0 0 0 0 0	As-built 0 0 0 0 0 0 Totals 4 4 4 4 4 4	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing as Intended 100% 100% 100% 100% 100% 100% 100% 100
1. Bed 2. Bank		1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)     2. Degradation - Evidence of downcutting     1. Texture Substrate - Riffer maintains coarser substrate     1. Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)     2. Length - Sufficent (730% of centerline distance between tail of upstream riffle and head of downstream riffle)     1. Thalweg centering at upstream of meander bend (Run)     2. Thalweg centering at downstream of meander bend (Glide) Bank lacking vegetative cover due to active scour and erosion Banks undercut/overhanging to the extent that mass wasting is expected Banks slumping, caving or collapse Structures physically intact with no dislodged boulders or logs Grade control structures exhibiting maintenance of grade across the sill	Performing as Intended 0 0 0 0 0 0 0 0 0 0 0	As-built 0 0 0 0 0 0 Totals 4 4	Unstable Segments 0 0 0 0 0 0 0 0	Unstable Footage 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Performing a: Intended 100% 100% 100% 100% 100% 100% 100% 100

Reach ID: Reach R27							
Assessed Length (LF):							
Major Channel Category	Channel Sub-Category	Metric	Number Stable, Performing as Intended	Total Number per As-built	Number of Unstable Segments	Amount of Unstable Footage	% Stable, Performing as Intended
1. Bed	1.Vertical Stability	<ol> <li>Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)</li> </ol>			0	0	100%
		2. Degradation - Evidence of downcutting			0	0	100%
	2. Riffle Condition	1. Texture Substrate - Riffle maintains coarser substrate	0	0			100%
	3. Meander Pool Condition	<ol> <li>Depth - Sufficent (Max Pool Depth/Mean Bkf Depth ≥ 1.5)</li> </ol>	0	0			100%
		<ol> <li>Length - Sufficent (&gt;30% of centerline distance between tail of upstream riffle and head of downstream riffle)</li> </ol>	0	0			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	0	0			100%
		2. Thalweg centering at downstream of meander bend (Glide)	0	0			100%
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover due to active scour and erosion			0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting is expected			0	0	100%
	3. Mass Wasting	Banks slumping, caving or collapse			0	0	100%
				Totals	0	0	100%
3. Engineering Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs	7	7			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill	7	7			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sills or arms	7	7			100%
	3. Bank Position	Bank erosion within the structures extent of influence does not exceed 15%	7	7			100%
	4. Habitat	Pool forming structures maintaining - Max Pool Depth/Mean Bankfull Depth ratio $\geq$ 1.5. Rootwads/logs providing some cover at low flow	0	0			100%

## Table 6. Vegetation Conditions Assessment - Assessed November 2022 Russell Gap Stream Mitigation Project - NCDMS Project No. 100003

Planted Acreage: 9.8						
Vegetation Category	Defintions	Mapping Threshold (acres)	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas *	Very limited cover both woody and herbaceous material.	0.10 acres	N/A	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.	0.10 acres	N/A	0	0.00	0.0%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems or a size class that are obviously small given the monitoring year.	0.10 acres	N/A	0	0.00	0.0%
Easement Acreage: 15.8						
Vegetation Category	Defintions	Mapping Threshold	CCPV Depiction	Number of Points	Combined Acreage	% of Planted Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale)	0.10 acres	N/A	0	0.00	0.0%
5. Easement Encroachment Areas	Areas or points (if too small to render as polygons at map scale)	0	Polygon	0	0.00	0.0%



PP-1: Reach 13, view upstream Station 10+20. (November 8, 2022)



PP-3: Reach 14, view upstream Station 13+00. (November 8, 2022)



PP-2: Reach 14, view upstream toward Reach 13 at Station 11+45. (November 8, 2022)



PP-4: Reach 14, view upstream Station 13+75. (November 8, 2022)



PP-5: Reach 14, view upstream Station 15+00. (November 8, 2022)



PP-6: Reach 14, end of reach Station 16+00. (November 8, 2022)



PP-7: Reach 1, view upstream, at Station 10+20. (November 8, 2022)



PP-8: Reach 1, view upstream Reach 1 at Station 13+00. (November 8, 2022)



PP-9: Reach 1, view upstream at Station 15+00. (November 8, 2022)



PP-10: Reach 1, view upstream at Station 17+25. (November 8, 2022)



PP-11: Reach 1, view upstream at Station 20+00. (November 8, 2022)



PP-12: Reach 1, view downstream at Station 20+00. (November 8, 2022)



PP-13: Reach 1, view upstream at Station 20+75. (November 8, 2022)



PP-14: Reach 1, view downstream at Station 20+75. (November 8, 2022)



PP-15: Reach 1, view upstream at Station 21+50. (November 8, 2022)



PP-16: Reach 1, confluence of Reach 1 and Reach 11 at Station 22+75. (November 8, 2022)



PP-17: Reach 1, view upstream at Station 24+20. (November 8, 2022)



PP-18: Reach 1, view of upstream at Station 27+00. (November 8, 2022



PP-19: Reach 1, view upstream Reach 12 at Station 29+10. (November 8, 2022)



PP-20: Reach 1, view upstream at Station 29+20. (November 8, 2022)



PP-21: Reach 11, view upstream at Station 10+20. (November 8, 2022)



PP-23: Reach 11, view upstream at Station 12+75. (November 8, 2022)



PP-22: Reach 11, view upstream at Station 11+50. (November 8, 2022)



PP-24: Reach 11, view upstream at Station 14+50. (November 8, 2022)



PP-25: Reach 10A, view upstream at Station 10+50. (November 8, 2022)



PP-26: Reach 10A, view upstream at Station 12+50. (November 8, 2022)



PP-27: Reach 10A, view upstream at Station 13+75. (November 8, 2022)



PP-29: Reach 5, view upstream at Station 11+00. (November 8, 2022)



PP-28: Reach 10B, view upstream at Station 14+50. (November 8, 2022)



PP-30: Reach 6, view upstream at Station 14+50. (November 8, 2022)



PP-31: Reach 17, view upstream at Station 11+00. (November 8, 2022)



PP-32: Reach 6, view upstream at Station 17+50. (November 8, 2022)



PP-33: Reach 6, view upstream at Station 19+50. (November 8, 2022)



PP-34: Reach 18, view upstream at Station 12+00. (November 8, 2022)



PP-35: Reach 18, view upstream at Station 10+60. (November 8, 2022)



PP-36: Reach 7A, view upstream at Station 20+00. (November 8, 2022)



PP-37: Reach 7B, view upstream at Station 21+75. (November 8, 2022)



PP-38: Reach7B, view downstream at Station 22+00. (November 8, 2022)



PP-39: Reach 7B, view upstream at Station 22+25. (November 8, 2022)



PP-41: Reach 20, view upstream at Station 10+80. (November 8, 2022)



PP-40: Reach 7B, view upstream at Station 23+50. (November 8, 2022)



PP-42: Reach 20, view upstream at Station 11+50. (November 8, 2022)



PP-43: Reach 19, view upstream at Station 10+15. (November 8, 2022)



PP-44: Reach 19, view upstream at Station 11+85. (November 8, 2022)



PP-45: Reach 19, view upstream at Station 12+80. (November 8, 2022)



PP-47: Reach 19, view upstream at Station013+80. (November 8, 2022)



PP-46: Reach 19, view upstream at Station 13+20. (November 8, 2022)



PP-48: Reach 7B, view upstream at Station 24+10. (November 8, 2022)



PP-49: Reach 7B, view downstream at Station 24+60. (November 8, 2022)



PP-50: Reach 7B, view upstream at Station 25+25. (November 8, 2022)



PP-51: Reach 22A, view upstream at Station 10+00. (November 8, 2022)



PP-52: Reach 22A, view of upstream at Station 11+15. (November 8, 2022)



PP-53: Reach 7B, view upstream at Station 32+00. (November 8, 2022)



PP-54: Reach 25, view upstream at Station 10+10. (November 8, 2022)



PP-55: Reach 25, view upstream at Station 11+20. (November 8, 2022)

PP-56: Reach 25, view upstream at Station 13+40. (November 8, 2022)



PP-57: Reach 7B, view downstream at Station 33+00. (November 8, 2022)



PP-59: Reach 8, view downstream at Station 34+00. (November 8, 2022)



PP-58: Reach 7B, view upstream at Station 33+20. (November 8, 2022)



PP-60: Reach 8, view upstream at Station 37+00. (November 8, 2022)



PP-61: Reach 8, view upstream at Station 38+00. (November 8, 2022)

PP-62: Reach 9, view upstream at Station 39+20. (November 8, 2022)



PP-63: Reach 9, view upstream at Station 41+00. (November 8, 2022)



PP-64: Reach 9, view upstream at Station 42+00. (November 8, 2022)



PP-65: Reach 4A, view upstream at Station 13+00. (November 8, 2022)



PP-66: Reach 26, view upstream at Station 11+00. (November 8, 2022)



PP-67: Reach 4, view upstream at Station 11+10. (November 8, 2022)

PP-68: Reach 4, view upstream at Station 12+00. (November 8, 2022)



PP-69: Reach 27, view upstream at Station 11+60. (November 8, 2022)



PP-70: Reach 4, view upstream at Station 15+00. (November 8, 2022)



PP-71: Reach 4, view upstream at Station 16+10. (November 8, 2022)



PP-72: Reach 4, view upstream at Station 19+00. (November 8, 2022)



PP-73: Reach 15, view upstream at Station 11+00. (November 8, 2022)



PP-74: Reach 15, view upstream at Station 13+00. (November 8, 2022)



PP-75: Reach 4, view upstream at Station 23+20. (November 8, 2022)



PP-76: Reach 4, view upstream at Station 25+00. (November 8, 2022)



PP-77: Reach 4, view upstream at Station 28+30. (November 8, 2022)



PP-78: Reach 4, view upstream at Station 28+00. (November 8, 2022)



PP-79: Reach 4, view upstream at Station 32+00. (November 8, 2022)



PP-80: Reach 3, view upstream at Station 33+00. (November 8, 2022)



PP-81: Reach 3, view upstream at Station 36+40. (November 8, 2022)



Photo 1. Vegetation Plot 1 – (October 13, 2022).



Photo 3. Vegetation Plot 3 – (October 13, 2022).



Photo 5. Vegetation Plot 5- (October 13, 2022).



Photo 2. Vegetation Plot 2 – (October 13, 2022).



Photo 4. Vegetation Plot 4 – (October 13, 2022).



Photo 6. Vegetation Plot 6- (October 13, 2022).



Photo 7. Vegetation Plot 7 – (November 8, 2022).



Photo 9. Vegetation Plot 9 – (October 14, 2022).



Photo 11. Vegetation Plot 11 – (October 14, 2022).



Photo 8. Vegetation Plot 8 – (November 8, 2022).



Photo 10. Vegetation Plot 10 – (October 14, 2022).



Photo 12. Vegetation Plot 12 - (October 14, 2022).



Photo 13. Vegetation Plot 13 – (October 14, 2022).



Photo 15. Vegetation Plot 15 – (October 14, 2022).



Photo 17. Vegetation Plot 17 – (October 14, 2022).



Photo 14. Vegetation Plot 14 – (October 14, 2022).



Photo 16. Vegetation Plot 16 – (October 14, 2022).



Photo 18. Vegetation Plot 18 - (October 14, 2022).



Photo 19. Vegetation Plot 19 – (October 14, 2022).



Photo 21. Random Vegetation Plot 1- (August 17, 2022).



Photo 23. Random Vegetation Plot 3 - (August 17, 2022)



Photo 20. Vegetation Plot 20 – (October 14, 2022).



Photo 22. Random Vegetation Plot 2 - (August 17, 2022).



Photo 24. Random Vegetation Plot 4 – Transect (August 17, 2022).

MY3 Vegetation Monitoring Plot Photos Russell Gap – DMS Project #100003



Photo 25. Random Vegetation Plot 5 – (August 17, 2022).



Photo 26. Random Vegetation Plot 6 - (August 17, 2022).



Photo 27. Random Vegetation Plot 7 – (November 8, 2022).



Photo 28. Random Vegetation Plot 8 – (November 8, 2022).



Photo 29. Random Vegetation Plot 9 – (November 8, 2022).



Monitoring Well 1. (October 13, 2022)



Monitoring Well 3. (October 13, 2022)



Monitoring Well 5. (October 13, 2022)



Monitoring Well 2. (October 13, 2022)



Monitoring Well 4. (October 13, 2022)



Monitoring Well 6. (October 13, 2022)



Monitoring Well 7. (October 19, 2021)



Monitoring Well 9. (October 13, 2022)



Monitoring Well 11. (October 14, 2022)



Monitoring Well 8. (October 13, 2022)



Monitoring Well 10. (October 14, 2022)



Monitoring Well 12. (October 14, 2022)



Flow Gauge 1. Reach 11. (August 17, 2022)



Flow Gauge 3. Reach 13. (August 17, 2022)



Flow Gauge 5. Reach 20. (October 13, 2022)



Flow Gauge 2. Reach 14. (August 17, 2022)



Flow Gauge 4. Reach 19. (August 17, 2022)



Crest Gauge 1 Reach 1. (October 13, 2022)



Crest Gauge 2 R9. BKF reading 8.25 inches (October 14, 2022)



Crest Gauge 3 R4. (October 14, 2022)



Crest Gauge 2 R9. (October 14, 2022)



Crest Gauge 4 R6. (October 14, 2022)

# **APPENDIX C**

Vegetation Plot Data

Norm	Table 7: Planted Stem Coun	nts by Plot and Species																											
Image: Part of the state of			ject	<b> </b>												Current	Plot Data (N	AY3 2022)											
Image: Section of the section of t				19	57329-01-00	001	1	57329-01-00	002	1	57329-01-00	03	1	57329-01-000	4				15	7329-01-00	006	19	57329-01-00	007	1	157329-01-0	0008	157329-	-01-0009
		Common Name		Р	v	т	Р	v	т	Р	v	т	Р	v	Т	Р	v	т	Р	v	т	Р	v	т	Р	v	т	P \	V T
	-									-										8	8			6	6		5 5		1
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Barb Marb       Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb Marb       Marb       Marb      Marb M	Asimina triloba	Common Pawpaw, Indian-banana	Shrub Tree										1		1														
													1		1												_		
Cal       C		River Birch, Red Birch		3		-	3	3 1	4	4 8	3	٤	1	-	1	. 1		1	4		4						-		
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		Sour Gum, Black Gum, Pepperidge		1	1	1		1		1	1				4	Í			1			ĺ	1		1		-		
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Stem count       11       3       14       13       3       16       19       9       28       17       3       20       17       10       0       13       0       13       0       13       0       14	Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus momum Cornus florida Corgus amomum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Corgus anonum Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera Nyssa sylvatica Pinus strobus Pinus strobus Pinus strobus Piatanus occidentalis Prunus nigra Quercus alba Quercus falcata Quercus platana Quercus phellos Rhus copallinum	Tag Alder, Smooth Alder, Hazel Alder         Common Pawpaw, Indian-banana         River Birch, Red Birch         Silky Dogwood         Flowering Dogwood         American Hazelnut, American Filbert         Hawthorn, Haw, Thornapple         American Persimmon, Possumwood         Green Ash, Red Ash         Black Walnut         Sour Gum, Black Gum, Pepperidge         Sycamore, Plane-tree         White Oak         Spanish Oak, Southern Red Oak         Overcup Oak         Basket Oak, Swamp Chestnut Oak         Willow Oak	Species Type Tree Tree Shrub Tree Tree Tree Tree Tree Tree Tree Tree	1!	57329-01-00	010	1	57329-01-00	011	1	121.4057	890.3084	526.0913	364.2171 57329-01-001	930.777 <b>3</b>	445.1542 Current	242.8114 Plot Data (N 57329-01-00	687.9656 <b>//Y3 2022)</b> 014	445.1542	364.2171 7329-01-00	809.3713 15	526.0913	57329-01-00	016	1	157329-01-	0017	157329-	-01-0018
size (ares)     1	Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula Inigra Carpinus caroliniana Carpinus caroliniana Cercis canadensis Cornus amonum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera Nyssa sylvatica Pinus strobus Platanus occidentalis Prunus nigra Quercus Quercus alba Quercus flactata Quercus sicata Quercus michauxii Quercus pagoda Quercus pagoda Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Tag Alder, Smooth Alder, Hazel Alder         Common Pawpaw, Indian-banana         River Birch, Red Birch         Silky Dogwood         Flowering Dogwood         American Hazelnut, American Filbert         Hawthorn, Haw, Thornapple         American Persimmon, Possumwood         Green Ash, Red Ash         Black Walnut         Sour Gum, Black Gum, Pepperidge         Sycamore, Plane-tree         White Oak         Spanish Oak, Southern Red Oak         Overcup Oak         Basket Oak, Swamp Chestnut Oak         Willow Oak	Species Type Tree Tree Shrub Tree Tree Tree Tree Tree Tree Tree Tree	1!	57329-01-00	010	1	57329-01-00	011	1	121.4057	890.3084	526.0913	364.2171 57329-01-001	930.777 <b>3</b>	445.1542 Current	242.8114 Plot Data (N 57329-01-00	687.9656 <b>//Y3 2022)</b> 014	445.1542	364.2171 7329-01-00	809.3713 15	526.0913	57329-01-00	016	1	157329-01-	0017	157329-	-01-0018
Species count       5       2       7       7       1       7       9       3       10       9       3       12       7       2       8       5       0       5       0       5       4       0       4       3       0       3	Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula Inigra Carpinus caroliniana Carpinus caroliniana Cercis canadensis Cornus amonum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera Nyssa sylvatica Pinus strobus Platanus occidentalis Prunus nigra Quercus Quercus alba Quercus flactata Quercus sicata Quercus michauxii Quercus pagoda Quercus pagoda Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Tag Alder, Smooth Alder, Hazel Alder         Common Pawpaw, Indian-banana         River Birch, Red Birch         Silky Dogwood         Flowering Dogwood         American Hazelnut, American Filbert         Hawthorn, Haw, Thornapple         American Persimmon, Possumwood         Green Ash, Red Ash         Black Walnut         Sour Gum, Black Gum, Pepperidge         Sycamore, Plane-tree         White Oak         Spanish Oak, Southern Red Oak         Overcup Oak         Basket Oak, Swamp Chestnut Oak         Willow Oak	Species Type Tree Tree Shrub Tree Tree Tree Tree Tree Tree Tree Tree	1! P	57329-01-00		1       P       2 <t< td=""><td>57329-01-0( 57329-01-0( V 2 3 2 3 2 3 2 3 2 1 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>D11 T S S S S S S S S S S S S S S S S S S</td><td>1 P 5 5 1 1 3 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>121.4057       77329-01-00       V       1       1       2       1       2       1       3       6       4       1       1</td><td>890.3084 12 T 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>526.0913 P P 11: P 12: P 11: P 11: P 12: P 12:</td><td>364.2171 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>930.777 3 T 1 1 1 1 4 1 1 1 2 2 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>445.1542 Current I P </td><td>242.8114 Plot Data (N 57329-01-0 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>687.9656 <b>XY3 2022)</b> <b>314</b> T 1 1 1 1 1 1 6 1 2 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>445.1542 P P 15 P 15 P 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>364.2171 7329-01-00 V</td><td>809.3713 7 7 1 1 5 - - - - - - - - - - - - -</td><td>526.0913 P </td><td></td><td>D16 T T</td><td>11 P 4 - - - - - - - - - - - - -</td><td>157329-01-4  57329-01-4  V  5  5  7  7  4  5  4  5  4  5  4  5  4  4  5  5  4  4</td><td>0017 T </td><td>157329- P V</td><td></td></t<>	57329-01-0( 57329-01-0( V 2 3 2 3 2 3 2 3 2 1 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1	D11 T S S S S S S S S S S S S S S S S S S	1 P 5 5 1 1 3 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	121.4057       77329-01-00       V       1       1       2       1       2       1       3       6       4       1       1	890.3084 12 T 1 1 1 1 1 1 1 1 1 1 1 1 1	526.0913 P P 11: P 12: P 11: P 11: P 12:	364.2171 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	930.777 3 T 1 1 1 1 4 1 1 1 2 2 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	445.1542 Current I P 	242.8114 Plot Data (N 57329-01-0 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	687.9656 <b>XY3 2022)</b> <b>314</b> T 1 1 1 1 1 1 6 1 2 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1	445.1542 P P 15 P 15 P 1 1 1 1 1 1 1 1 1 1 1 1 1	364.2171 7329-01-00 V	809.3713 7 7 1 1 5 - - - - - - - - - - - - -	526.0913 P 		D16 T T	11 P 4 - - - - - - - - - - - - -	157329-01-4  57329-01-4  V  5  5  7  7  4  5  4  5  4  5  4  5  4  4  5  5  4  4	0017 T 	157329- P V	
	Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula Inigra Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera Nyssa sylvatica Pinus strobus Piatanus occidentalis Prunus nigra Quercus falcata Quercus falcata Quercus sichauxii Quercus picata Quercus picata Quercus picata Quercus picata Quercus picata Quercus picata Quercus pagoda Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Tag Alder, Smooth Alder, Hazel Alder         Common Pawpaw, Indian-banana         River Birch, Red Birch         Silky Dogwood         Flowering Dogwood         American Hazelnut, American Filbert         Hawthorn, Haw, Thornapple         American Persimmon, Possumwood         Green Ash, Red Ash         Black Walnut         Sour Gum, Black Gum, Pepperidge         Sycamore, Plane-tree         White Oak         Spanish Oak, Southern Red Oak         Overcup Oak         Basket Oak, Swamp Chestnut Oak         Willow Oak	Species Type Tree Tree Shrub Tree Tree Tree Tree Tree Tree Tree Tree	1! P	57329-01-00 57329-01-00 V 2 2 2 2 2 2 2 2 2 2 2 2 2		1       P       2 <t< td=""><td>57329-01-00 V 2 3 1 2 3 4 2 2 3 4 4 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7</td><td>D11 T S S S S S S S S S S S S S S S S S S</td><td>1 P 5 5 1 1 3 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>121.4057       57329-01-00       V       1       1       2       1       2       1       3       6       3       6       9       1</td><td>890.3084 12 T 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>526.0913 P P 11: P 12: P 11: P 11: P 12: P 12:</td><td>364.2171 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>930.777 3 T 1 1 1 1 4 1 1 1 2 2 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2</td><td>445.1542 Current I P </td><td>242.8114 Plot Data (N 57329-01-00 V 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>687.9656 <b>XY3 2022)</b> <b>314</b> T 1 1 1 1 1 1 6 1 2 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>445.1542 P P 15 P 15 P 1 1 1 1 1 1 1 1 1 1 1 1 1</td><td>364.2171 7329-01-00 V</td><td>809.3713 7 7 1 1 5 - - - - - - - - - - - - -</td><td>526.0913 P </td><td>57329-01-00 57329-01-00 V V V V V V V V V V V V V</td><td>D16 T T</td><td>11 P 4 - - - - - - - - - - - - -</td><td>157329-01-4 V V 5 5 7 7 7 4 4 5 5 </td><td>0017 T </td><td>157329-           P          </td><td></td></t<>	57329-01-00 V 2 3 1 2 3 4 2 2 3 4 4 5 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7	D11 T S S S S S S S S S S S S S S S S S S	1 P 5 5 1 1 3 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	121.4057       57329-01-00       V       1       1       2       1       2       1       3       6       3       6       9       1	890.3084 12 T 1 1 1 1 1 1 1 1 1 1 1 1 1	526.0913 P P 11: P 12: P 11: P 11: P 12:	364.2171 V 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	930.777 3 T 1 1 1 1 4 1 1 1 2 2 2 2 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2	445.1542 Current I P 	242.8114 Plot Data (N 57329-01-00 V 1 1 1 1 1 1 1 1 1 1 1 1 1	687.9656 <b>XY3 2022)</b> <b>314</b> T 1 1 1 1 1 1 6 1 2 3 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1	445.1542 P P 15 P 15 P 1 1 1 1 1 1 1 1 1 1 1 1 1	364.2171 7329-01-00 V	809.3713 7 7 1 1 5 - - - - - - - - - - - - -	526.0913 P 	57329-01-00 57329-01-00 V V V V V V V V V V V V V	D16 T T	11 P 4 - - - - - - - - - - - - -	157329-01-4 V V 5 5 7 7 7 4 4 5 5 	0017 T 	157329-           P	
Stems per ACRE 445.1542 121.4057 566.5599 526.0913 121.4057 647.497 768.9027 364.2171 1133.12 687.9656 121.4057 809.3713 607.0285 80.93713 687.9656 0 404.6856 526.0913 0 526.0913 0 526.0913 849.8398 0 849.8398 566.5599 0 566.5	Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corrus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera Nyssa sylvatica Pinus strobus Platanus occidentalis Prunus nigra Quercus falcata Quercus falcata Quercus falcata Quercus pegoda Quercus pegoda Quercus pellos Rhus copallinum	Tag Alder, Smooth Alder, Hazel Alder         Common Pawpaw, Indian-banana         River Birch, Red Birch         Silky Dogwood         Flowering Dogwood         American Hazelnut, American Filbert         Hawthorn, Haw, Thornapple         American Persimmon, Possumwood         Green Ash, Red Ash         Black Walnut         Sour Gum, Black Gum, Pepperidge         Sycamore, Plane-tree         White Oak         Spanish Oak, Southern Red Oak         Overcup Oak         Basket Oak, Swamp Chestnut Oak         Willow Oak	Species Type Tree Tree Shrub Tree Tree Tree Tree Tree Tree Tree Tree	111	57329-01-00 57329-01-00 V 2 2 2 2 2 2 2 2 2 2 2 2 2	D10 T T T T T T T T T T T T T T T T T T T	1           P           2	57329-01-0( V 2 3 1 2 3 4 2 2 3 4 4 5 5 5 5 5 5 5 5 5 5 5 5 5	11           T           5           1           1           2           1           2           1           2           1           2           1           2           1           2           1           2           1           2           1           2           1           2           1           2           1	1 P 5 5 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	121.4057       77329-01-00       V       1       1       2       1       2       1       3       6       3       6       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       1       0.02	890.3084 12 T 1 1 1 1 1 1 1 1 1 1 1 1 1	526.0913 11 P 	364.2171 V 37329-01-001 V 1 1 1 1 1 1 1 1 1	930.777 3 T 1 1 1 4 4 1 1 1 2 2 2 1 1 2 2 20	445.1542 Current I P 	242.8114 Plot Data (N 57329-01-00 V 1 1 1 1 1 1 1 1 1 1 1 1 1	687.9656 XY3 2022) 14 T 1 1 1 1 1 1 1 1 1 1 1 1 1	445.1542 P 15 P 15 P 15 P 15 P 10 10 10 10 10	364.2171 7329-01-00 V	809.3713 7 7 1 1 5 - - - - - - - - - - - - -	526.0913 11 P 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1	57329-01-0( 57329-01-0( V V V V V V V V V V V V V	D16 T T T T T T T T T T T T T T T T T T T	11 P 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1	157329-01-4 V V 5 5 5 7 7 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1	0017 T 	157329-           P         Y	-01-0018 V T

Table 7: CVS Density Per Plot DMS Project Code 100003. Project Name: Russell Gap Mitigation Project

Scientific Name Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula nigra Carpinus caroliniana Cerris canadensis Cornus anomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Common Name Tag Alder, Smooth Alder, Hazel Alder Common Pawpaw, Indian-banana River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood Green Ash, Red Ash	Species Type Tree Tree Shrub Tree Shrub Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	19 P 2 1 1	57329-01-	0019 T	1! P	57329-01-00 V 4	20 T 4	1573 P 2	829-01-RV1 V	MY3 T	1573 P	29-01-RV2_N V	VIY3 T		lot Data (N 29-01-RV3_ V		15732 P	29-01-RV4_ V	MY3 T	1573 P	29-01-RV5_ V	_MY3 T	157: P	329-01-RV V
Acer negundo Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus anomum Cornus florida Corgus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Tag Alder, Smooth Alder, Hazel Alder Common Pawpaw, Indian-banana River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Tree Tree Shrub Tree Shrub Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	P 2 1 1			P 2 2 1 1	V 4	T 4	Р 2	v	т 2	Р	v	т	Р	v	Т	Р	v	т	Р	v	Т	Р	V
Acer rubrum Alnus serrulata Asimina triloba Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Common Pawpaw, Indian-banana River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Tree Shrub Tree Shrub Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	2				4	4	2		2								•					0	-
Alnus serrulata Asimina triloba Betula lenta Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus momum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Liriodendron tulipifera	Common Pawpaw, Indian-banana River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree Shrub Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree				2			2		2													C	2
Asimina triloba Betula lenta Betula nigra Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Common Pawpaw, Indian-banana River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	1 1			1																			
Betula lenta Betula nigra Carpinus caroliniana Cerris canadensis Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	River Birch, Red Birch Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Tree Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	1		1	1												3		3					
Betula nigra Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Tree Shrub Tree Shrub Tree Shrub Tree Shrub Tree	1		1	1				-															
Carpinus caroliniana Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Silky Dogwood Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree Shrub Tree Shrub Tree Shrub Tree	1		1	1		1				C		6	1		1	1		1	1		1		
Cercis canadensis Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree Shrub Tree Shrub Tree	1			1		1				0		0	1		1	1		1	1		1		
Cornus amomum Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree Shrub Tree	-		1																				
Cornus florida Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Flowering Dogwood American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood	Shrub Tree			-	2		2							4		4								
Corylus americana Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	American Hazelnut, American Filbert Hawthorn, Haw, Thornapple American Persimmon, Possumwood							-																	
Crataegus Diospyros virginiana Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Hawthorn, Haw, Thornapple American Persimmon, Possumwood			1	1																				
Fraxinus pennsylvanica Ilex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera		Shrub Tree																							
llex opaca Hamamelis virginiana Juglans nigra Liriodendron tulipifera	Green Ash, Red Ash	Tree																			2		2	1	L
Hamamelis virginiana Juglans nigra Liriodendron tulipifera		Tree	2	2	2	2 4	1	5				3		3	1		1								
Juglans nigra Liriodendron tulipifera									3		3														
Liriodendron tulipifera		Shrub Tree			_																			1	L
	Black Walnut	Tree	1		1	L 5		5	2		2				2		2								
		Tree	3		3	3 2		2	5		5										1		1	. 1	L
Nyssa sylvatica	Sour Gum, Black Gum, Pepperidge	Tree		-		1		1	-		-														
Pinus strobus	Successory Diana trac	Tree			-				1		1										c		6	-	,
Platanus occidentalis	Sycamore, Plane-tree	Tree	3	,	5 6	2			2		2				1		1				0		0	2	<u> </u>
Prunus nigra Quercus		1					1	1	2		4				1		1								
Quercus alba	White Oak	Tree					1	1																	
Quercus falcata	Spanish Oak, Southern Red Oak	Tree		1	1	1	1	1	t		1				l			┝──┤					1	1	1
Quercus lyrata	Overcup Oak	Tree				-		-																2	2
Quercus michauxii	Basket Oak, Swamp Chestnut Oak	Tree		1	1	1		1																	
Quercus pagoda				1	1										4		4								
Quercus phellos	Willow Oak	Tree										1		1	1		1								
Rhus copallinum		Shrub Tree																							
Salix nigra	Black Willow	Tree										1		1											
Unknown																									
		Stem count	11	5	16	16	2	18	13	0	15	5	0	11	13	0	14	0	0	4	9	0	10	7	0
		size (ares)		1			1			1			1			1			1			1			1
		size (ACRES)		0.02	-		0.02			0.02	-		0.02			0.02			0.02			0.02			0.02
		Species count	6	1	6	7	2	8	5	0	5	3	0	3	6	0	6	0	0	0	3	0	3	5	0
		Stems per ACRE	445.1542			647.497		728.4342	607.0285	0	607.0285	445.1542	0	445.1542	566.5599	0	566.5599	161.8743	0	161.8743	404.6856	0	404.6856	526.0913	0
					urrent Plot 🛛	-	-					Means									1				
				329-01-RV	-	-	329-01-RV9			MY3 (2022	-		MY2 (2021)			MY1 (2020)			VIYO (2020)						
Scientific Name	Common Name	Species Type	Р	v	Т	Р	v	Т	Р	v	т	Р	v	Т	Р	v	Т	Р	v	Т					
Acer negundo		Tree	3	1	3	3				38	3 38	4	4	14	15	15	20								
Acer rubrum		Tree							3	2	2 5	8	8	17	6	6	6								Color for
Alnus serrulata	Tag Alder, Smooth Alder, Hazel Alder	Shrub Tree			_				7	19	26	11	11	46	4	4	14								Exceeds r
Asimina triloba	Common Pawpaw, Indian-banana	Shrub Tree							1		1	1	1	1	1	1	1								Exceeds r
Betula lenta	Diver Direk Ded Direk	Tree			-			2	2		2	3	3	3	4	4	4								Fails to m
Betula nigra	River Birch, Red Birch	Tree		-		2		2	32	11	1 43	60	60	60	50	50	50								Fails to m
Carpinus caroliniana		Shrub Tree Shrub Tree		-		1		1	3		17	32	32	4	11 26	11 26	11 26								
Cercis canadensis Cornus amomum	Silky Dogwood	Shrub Tree			-	1		1	21		3 29	32	32	32	38	38	38								
Cornus florida	Flowering Dogwood	Shrub Tree	3	,	-				21	c	5 25	2	21	32	30	30	30								
Corylus americana	American Hazelnut, American Filbert	Shrub			-							1	1	1	1	1	1								
Crataegus	Hawthorn, Haw, Thornapple	Shrub Tree	-	1									-		1	1	1								
Diospyros virginiana	American Persimmon, Possumwood	Tree	2			,			8	11	1 19	15	15	16	12	12	12								
Fraxinus pennsylvanica	Green Ash, Red Ash	Tree	2	:		2			36				47	49		49									
llex opaca				1	1	1	1		1	5						-									
Hamamelis virginiana	1	Shrub Tree		1	1	1	1		2	1	1 3	2	2	2	1										
Juglans nigra	Black Walnut	Tree	2	2	2	2			14	7	7 21	18	18	18	21	21	21								
Liriodendron tulipifera		Tree	1		1	L 4		4	32	11	1 43	54	54	59	62	62	62								
Nyssa sylvatica	Sour Gum, Black Gum, Pepperidge	Tree				1		1	1		1	1	1	1	7	7	7								
Pinus strobus										1	1 1														
Platanus occidentalis	Sycamore, Plane-tree	Tree				1		1	36	41	1 77	55	55	114	44	44	54								
				<u> </u>						3	3 3														
Prunus nigra				<b> </b>		Į	ļ		I	1	1 1				I										
Prunus nigra Quercus				l		<b>I</b>	ļ		7	1	1 8	14	14	14	9	9	9								
Prunus nigra Quercus Quercus alba	White Oak	Tree		1	4	<u> </u>			17		17	23	23	23	25	25	25								
Prunus nigra Quercus Quercus alba Quercus falcata	Spanish Oak, Southern Red Oak	Tree					1		<u> </u>	4	+ 4	1	1	1											
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata	Spanish Oak, Southern Red Oak Overcup Oak	Tree Tree										3	3	3	5	5	5								
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata Quercus michauxii	Spanish Oak, Southern Red Oak	Tree			_				3		3														
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak	Tree Tree Tree							3		3	45	45	4-	50										
Prunus nigra Quercus alba Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus pagoda	Spanish Oak, Southern Red Oak Overcup Oak	Tree Tree Tree Tree							33	g	9 42	45	45	45	52	52	52								
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus phellos Rhus copallinum	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak Willow Oak	Tree Tree Tree Tree Shrub Tree							33	g	9 42	45	45	45	52	52	52								
Prunus nigra Quercus alba Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak	Tree Tree Tree Tree							33	S	9 42 5 5	45 4 1		45 4 2	52	52	52	385	285	386					
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak Willow Oak	Tree Tree Tree Tree Shrub Tree Tree								5	5 5	4	4	4				388	388	388	1				
Prunus nigra Quercus alba Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak Willow Oak	Tree Tree Tree Shrub Tree Tree Stem count		1		3		9	33	188	5 5	4	4 1 440	45 4 2 563		445		388	388	388 388					
Prunus nigra Quercus alba Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda Quercus pagoda Quercus phellos Rhus copallinum Salix nigra	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak Willow Oak	Tree Tree Tree Shrub Tree Tree Stem count size (ares)		1	13		1	9		188 20	5 5	4	4 1 440 20	4		445 29			388 20						
Prunus nigra Quercus Quercus alba Quercus falcata Quercus lyrata Quercus michauxii Quercus pagoda	Spanish Oak, Southern Red Oak Overcup Oak Basket Oak, Swamp Chestnut Oak Willow Oak	Tree Tree Tree Shrub Tree Tree Stem count	6	1 0.02 0		3	1 0.02 0	9		188	5 5	4	4 1 440	4		445			388						

29-01-RV6_	MY3	1573	29-01-RV7	MY3
v	Т	Р	v	т
	6	4		4
		1		1
	1	1		1
	1			
		1		1
	1	1		1
	2	1		1
	2	1		1
	2			
		5		5
0	12			14
0	13	9	0	14
0.02			0.02	
0.02	5	5	0.02	5
0	526.0913	566.5599	0	566.5599
v	120.0313	0000000	, v	230.3333

or for Density	
eeds requirements by 10%	
eeds requirements, but by less than 10%	
s to meet requirements, by less than 10%	
s to meet requirements by more than 10%	

# **APPENDIX D**

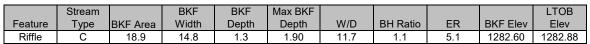
Stream Geomorphology Data

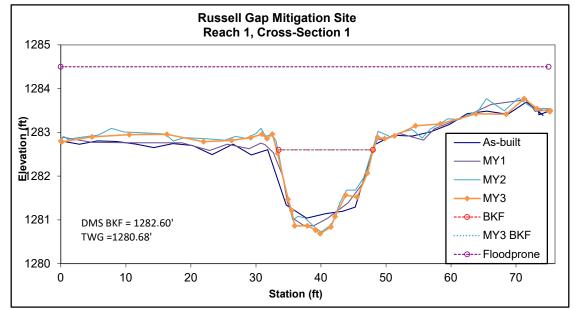
Year 3 Survey Collected: September 2022



Looking at the Left Bank

Looking at the Right Bank





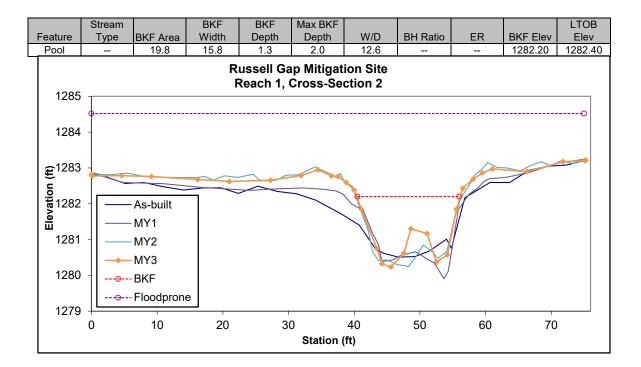
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1282.6 as determined from the as-built bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



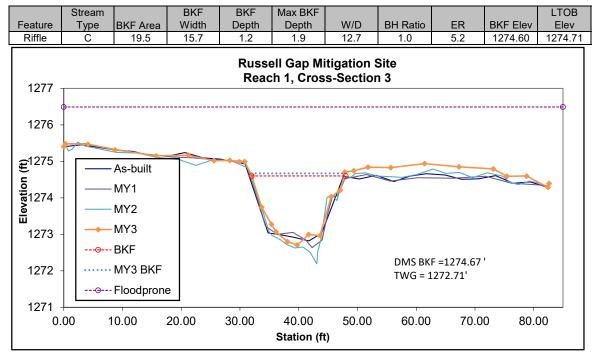
Looking at the Left Bank

Looking at the Right Bank



Year Survey Collected: September 2022

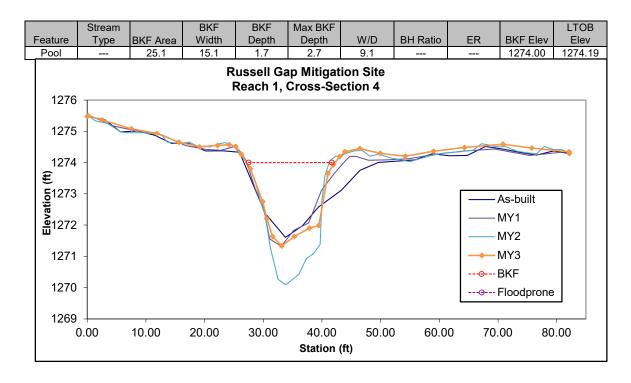




Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1274.62 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022





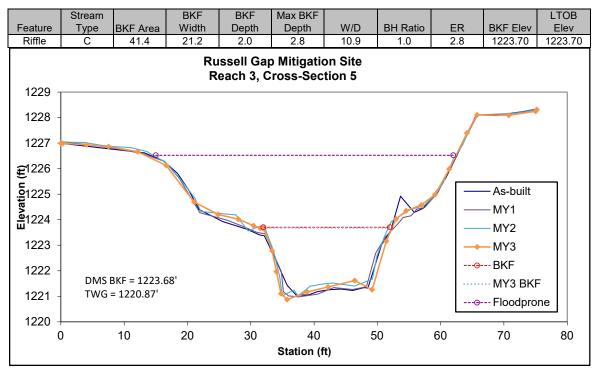
Year 3 Survey Collected: September 2022



Looking at the Left Bank



Looking at the Right Bank



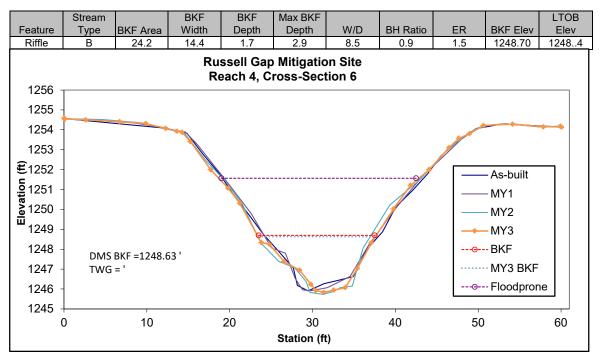
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1223.68 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



Looking at the Left Bank

Looking at the Right Bank



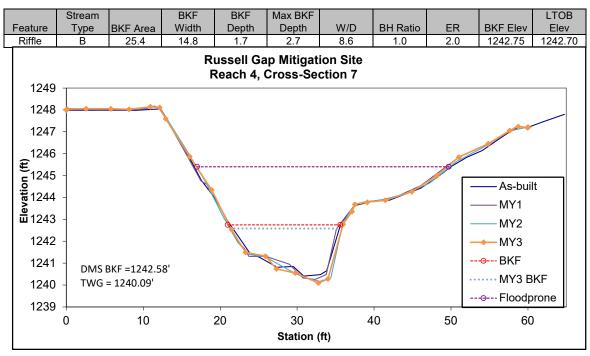
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1248.63 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



Looking at the Left Bank

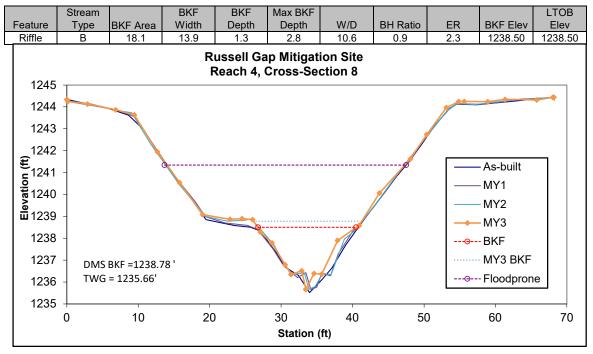
Looking at the Right Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1242.58 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



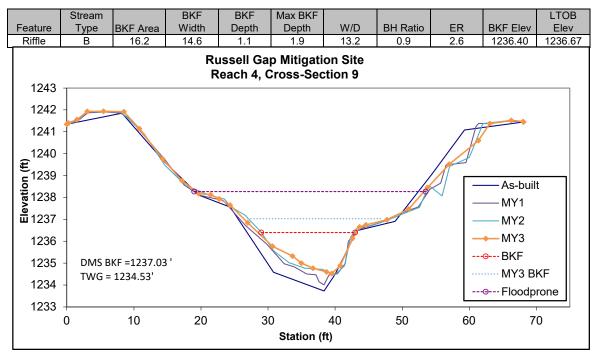


Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1238.78 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



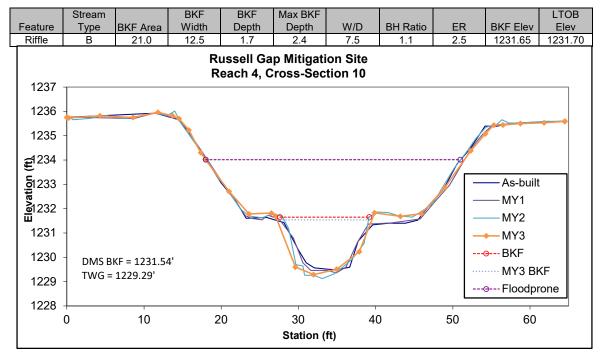
Looking at the Right Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1237.03 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022

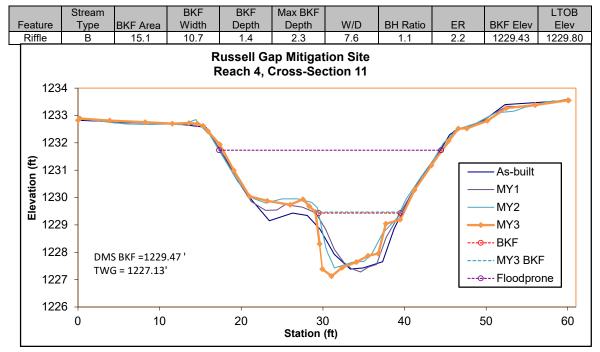




Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1231.54 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022





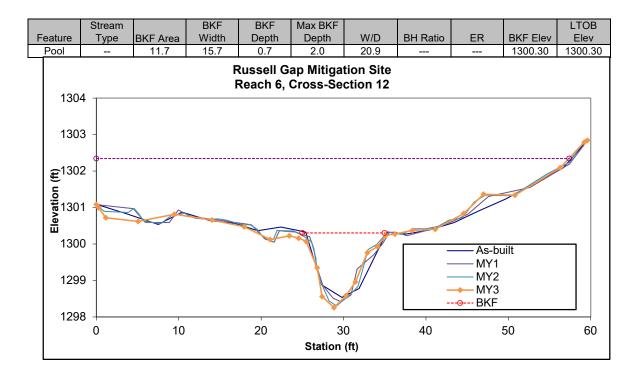
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1229.47 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



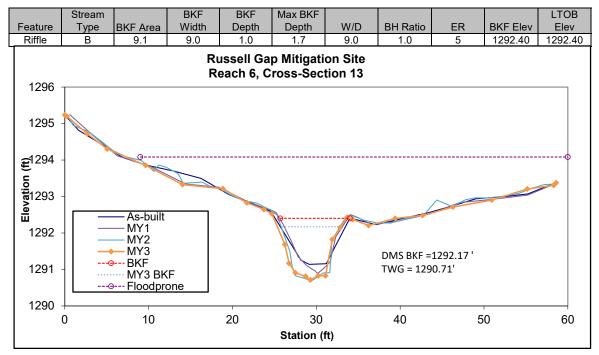
Looking at the Left Bank

Looking at the Right Bank



Year 3 Survey Collected: September 2022



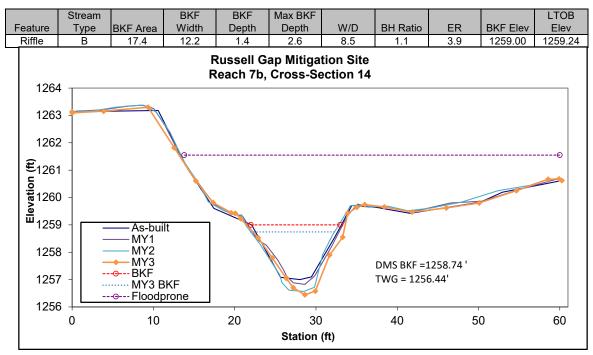


Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1292.17 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



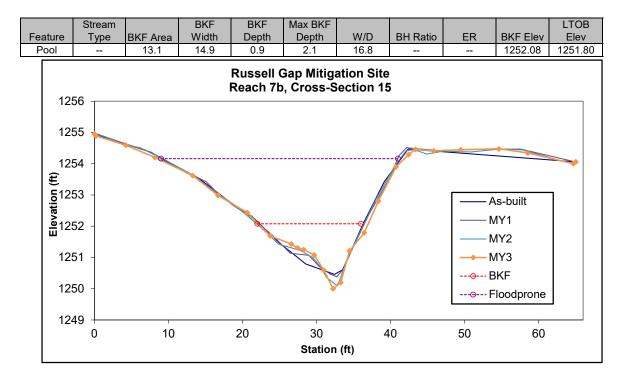
Looking at the Left Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1258.82 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



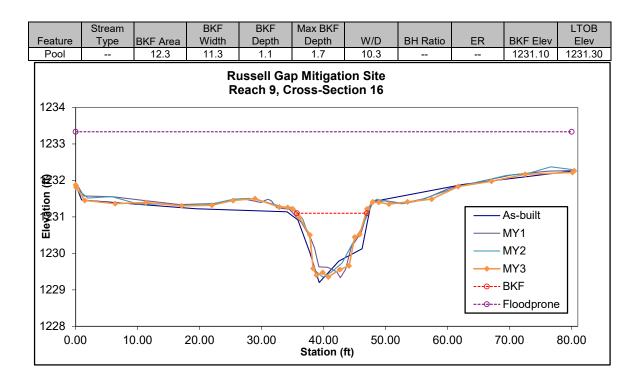


Year 3 Survey Collected: September 2022



Looking at the Left Bank

Looking at the Right Bank

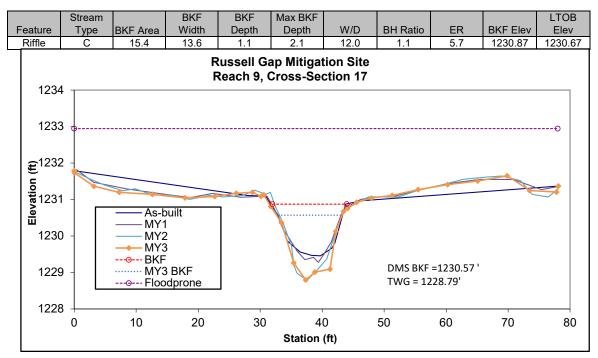


Year 3 Survey Collected: September 2022



Looking at the Left Bank

Looking at the Right Bank



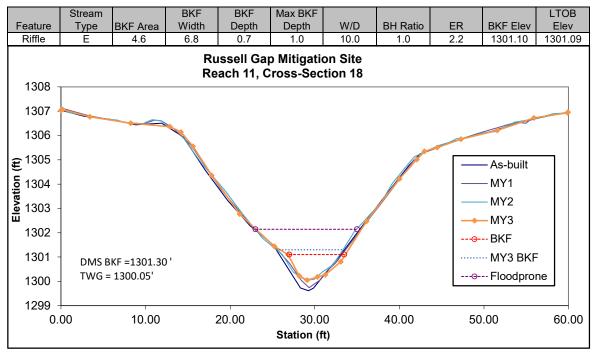
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1230.57 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



Looking at the Left Bank

Looking at the Right Bank



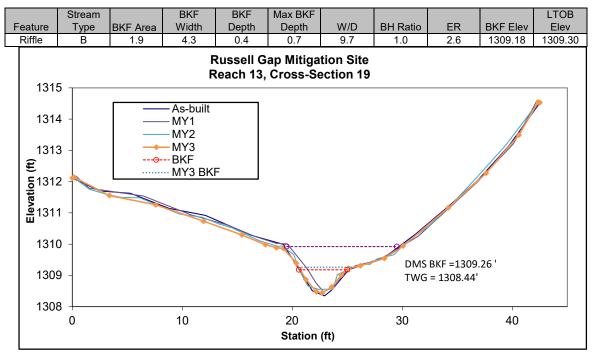
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1301.30 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



Xs19 rtb

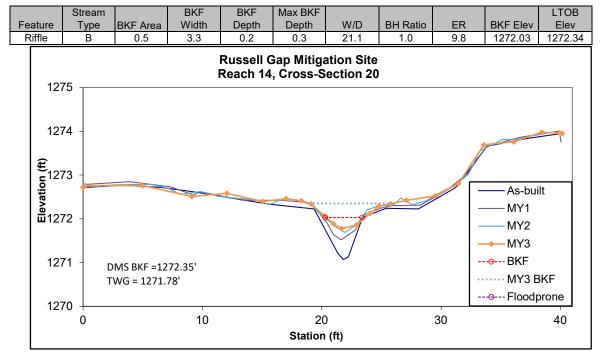
Looking at the Right Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1309.26 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022

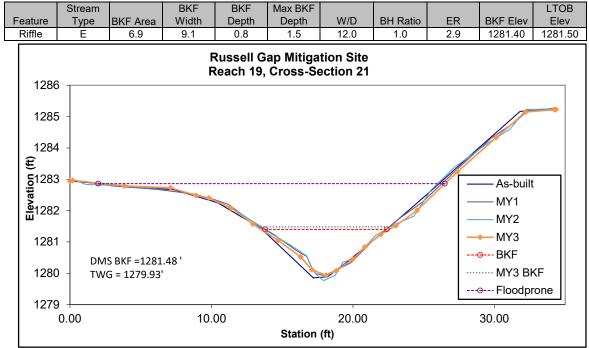




Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1272.35 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022





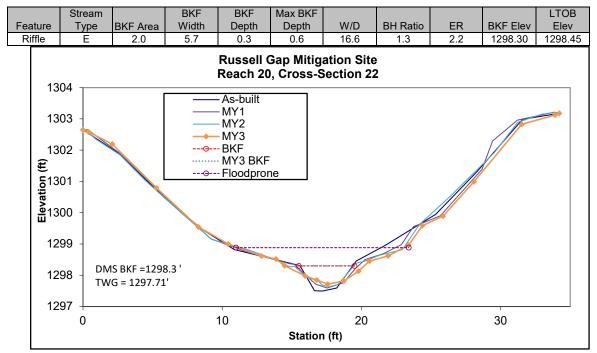
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1281.48 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022





Looking at the Right Bank



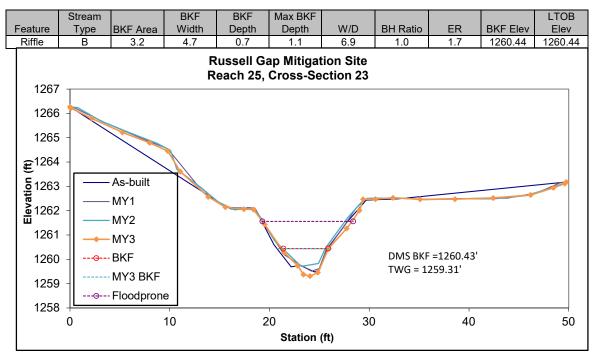
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation 1298.30 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



LOOKING at the Lett Bank

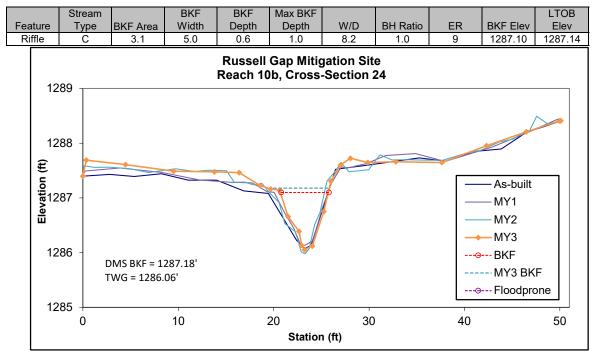
Looking at the Right Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1260.68 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



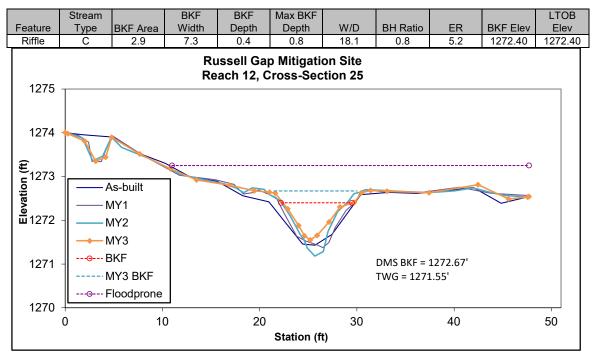


Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1287.18 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



Looking at the Right Bank



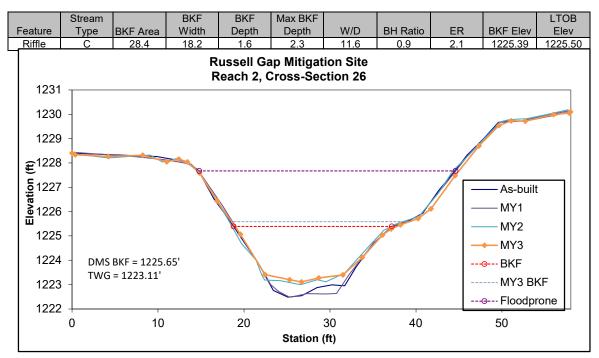
Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1272.67 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

Year 3 Survey Collected: September 2022



LOOKING AT THE LETT BANK

Looking at the Right Bank



Note: Per DMS/IRT request, bank height ratio for MY3 has been calculated using the bankfull elevation of 1225.65 as determined from the asbuilt bankfull area. All other values were calculated using the as-built bankfull elevation.

## Table 8. Baseline Stream Data Summary

#### Russell Gap Stream Mitigation Project: DMS Project No ID. 100003

Reach R1 - (Restoration XS 1-4)	r				D f	P	14.5	D (	r				r			
Parameter	1	Pre-Existing C	onditio	n	Refe	rence Re	( )	Data		Desi	gn			As-	built	
						Comp	osite									
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)	15.52	16.59		17.65						16.90			16.10	16.15	16.15	16.20
Floodprone Width (ft)	71.92	74.43		76.94					75.00	137.50		200.00	75.30	78.85	78.85	82.40
BF Mean Depth (ft)	1.05	1.25		1.44						1.3			1.20	1.25	1.25	1.30
BF Max Depth (ft)	2.64	2.97		3.30						1.60			1.60	1.70	1.70	1.80
BF Cross-sectional Area (ft <sup>2</sup> )	22.35	23.43		24.5						22.0			18.80	19.70	19.70	20.60
Width/Depth Ratio	10.78	13.80		16.81									12.50	13.20	13.20	13.90
Entrenchment Ratio	4.36	4.50		4.64					4.40	8.10		11.80	4.70	4.90	4.90	5.10
Bank Height Ratio	1.20	1.33		1.46	1.00	1.05		1.10		1.00			1.00	1.00	1.00	1.00
d50 (mm)																
Pattern																
Channel Beltwidth (ft)	33.00	73.50		114.00					60.00	97.50		135.00	53.11	73.15	72.84	89.22
Radius of Curvature (ft)	21.00	39.50		58.00					34.00	41.50		49.00	19.00	41.88	39.50	78.00
Rc/Bankfull width (ft/ft)	17.65	10.70		3.74	2.00	2.50		3.00	2.00	2.45		2.90	1.18	2.59	2.45	4.81
Meander Wavelength (ft)													142.35	192.15	163.81	303.38
Meander Width Ratio	1.87	4.61		7.35	3.50	5.75		8.00	3.60	5.80		8.00	3.30	4.53	4.51	5.51
Profile																
Riffle Length (ft)													33.61	50.90	49.22	64.82
Riffle Slope (ft/ft)	0.0120	0.04		0.0600					0.0110	0.0118		0.0125	0.0029	0.0111	0.0098	0.0168
Pool Length (ft)													16.67	26.35	29.91	43.15
Pool to Pool Spacing (ft)	23.00	123.50		224.00	60.00	89.50		119.00					84.80	101.00	98.09	111.38
Pool Max Depth (ft)	1.60	2.30		3.00						3.50			1.16	1.77	1.85	2.54
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		1.50								1.50				1.50		
Impervious cover estimate (%)																
Rosgen Classification		C4/E4				C4				C4				C4		
BF Velocity (fps)	3.67	3.85		4.03	3.50	4.25		5.00		4.10						
BF Discharge (cfs)		90.0								90.00						
Valley Length		1,756								1,535				1,593		
Channel Length (ft)		2,142								1,842				1,911		
Sinuosity		1.22			1.20	1.30		1.40		1.20				1.20		

Reach R2 - (Restoration XS-26)																
Parameter	p	Pre-Existing C	onditio	n	Refe	rence Re	ach(es)	Data		Desig	m			Ac	built	
i arameter	1	re-Existing C	onuntio	n		Comp	osite			Desig	311			A3-	bunt	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		15.00								18.00				18.50		
Floodprone Width (ft)	22.00	26.00		30.00						42.00				38.00		
BF Mean Depth (ft)		1.60								1.4				1.80		
BF Max Depth (ft)														2.90		
BF Cross-sectional Area (ft <sup>2</sup> )		25.00								25.0				33.60		
Width/Depth Ratio		9.40			10.00	12.50		15.00		13.00				10.20		
Entrenchment Ratio	1.50	1.75		2.00						2.30				2.10		
Bank Height Ratio		2.30			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern																
Channel Beltwidth (ft)		N/A								N/A				24.78		
Radius of Curvature (ft)		N/A								N/A				N/A		
Rc/Bankfull width (ft/ft)		N/A			2.00	2.50		3.00		N/A				N/A		
Meander Wavelength (ft)		N/A								N/A				N/A		
Meander Width Ratio		N/A			3.50	5.75		8.00		N/A				N/A		
Profile																
Riffle Length (ft)													32.58	48.51	48.51	64.43
Riffle Slope (ft/ft)		0.0179								0.0179			0.0058	0.0113	0.0113	0.0167
Pool Length (ft)													13.55	18.57	20.90	28.24
Pool to Pool Spacing (ft)	20.00	47.50		75.00					65.00	95.00		125.00	32.00	53.25	53.26	74.51
Pool Max Depth (ft)		2.50								3.50			0.43	0.95	1.05	1.66
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		1.65								1.65				1.65		
Impervious cover estimate (%)																
Rosgen Classification		E4				C4				C4				C4		
BF Velocity (fps)		4.00			3.50			5.00		4.00						
BF Discharge (cfs)		100.0								100.00						
Valley Length		288								174				166		
Channel Length (ft)		288								174				166		
Sinuosity		1.00			1.20	1.30		1.40		1.00				1.00		

Table 8. Baseline Stream Data Summary																
Russell Gap Stream Mitigation Project: DMS Project I	No ID. 10	0003														
Reach R3 - (Restoration XS-5)																
Parameter	1	Pre-Existing Co	onditio		Refe	rence Re	ach(es)	Data		Desi	an			Ac	built	
Farameter		re-Existing C	onaitio	n		Comp	osite			Desi	gn			As-	ount	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		21.00								23.70				23.80		
Floodprone Width (ft)		71.00								71.00				46.50		
BF Mean Depth (ft)		2.23						-		2.0				1.70		
BF Max Depth (ft)		3.40								2.50				2.70		
BF Cross-sectional Area (ft <sup>2</sup> )		46.87								47.0				40.90		
Width/Depth Ratio		9.42			10.00	12.50		15.00		11.90				13.80		
Entrenchment Ratio		3.38								3.00				2.00		
Bank Height Ratio		1.20			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern																
Channel Beltwidth (ft)		N/A								N/A				22.67		
Radius of Curvature (ft)		N/A								N/A				N/A		
Rc/Bankfull width (ft/ft)		N/A			2.00	2.50		3.00		N/A				N/A		
Meander Wavelength (ft)		N/A								N/A				N/A		
Meander Width Ratio		N/A			3.50	5.75		8.00		N/A				N/A		
Profile																
Riffle Length (ft)													29.93	47.57	51.32	72.70
Riffle Slope (ft/ft)		0.0075								0.0075			0.0044	0.0158	0.0138	0.0233
Pool Length (ft)													4.28	26.01	29.94	55.59
Pool to Pool Spacing (ft)	18.00	26.00		34.00					85.00	100.00		115.00	47.04	86.95	85.53	124.01
Pool Max Depth (ft)	3.60	3.70		3.80						4.00			0.57	1.27	1.24	1.90
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		3.48								3.48				3.48		
Impervious cover estimate (%)																
Rosgen Classification		E4 (Incised)								C4				C4		
BF Velocity (fps)		5.00			3.50	4.25		5.00		5.00						
BF Discharge (cfs)		235.0								235.00						
Valley Length		350								350				366		
Channel Length (ft)		388								389				406		
Sinuosity		1.11			1.20	1.30		1.40		1.11				1.11		

Reach R4 - (Enhancement I XS 6-11)					D.C	P	14.5	D. (								
Parameter	F	Pre-Existing Co	onditio	n	Refe	rence Re Comp	· · /	Data		Desig	gn		l	As-h	built	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		16.00								16.90			13.30	15.84	14.30	22.60
Floodprone Width (ft)		22.82								37.00			24.00	29.58	31.70	34.30
BF Mean Depth (ft)		1.54								1.3			0.90	1.38	1.50	1.70
BF Max Depth (ft)		2.72								1.60			2.00	2.46	2.30	3.00
BF Cross-sectional Area (ft <sup>2</sup> )		24.5								22.0			15.50	20.64	22.10	23.10
Width/Depth Ratio		10.36			12.00	15.00		18.00		13.00			8.40	13.04	10.30	26.10
Entrenchment Ratio		1.62								2.20			1.40	1.90	1.90	2.30
Bank Height Ratio		2.32			1.00	1.05		1.10		1.00			1.00	1.00	1.00	1.00
d50 (mm)																
Pattern																
Channel Beltwidth (ft)		N/A								N/A						
Radius of Curvature (ft)		N/A								N/A						
Rc/Bankfull width (ft/ft)		N/A								N/A						
Meander Wavelength (ft)		N/A								N/A						
Meander Width Ratio		N/A								N/A						
Profile																
Riffle Length (ft)													33.46	58.40	68.03	102.60
Riffle Slope (ft/ft)	0.0150	0.0250		0.0350					0.0110	0.0140		0.0170	0.0102	0.0178	0.0195	0.0289
Pool Length (ft)													2.23	14.40	20.08	37.92
Pool to Pool Spacing (ft)	55.00	167.50		280.00					85.00	100.00		115.00	33.46	103.56	113.76	194.05
Pool Max Depth (ft)	1.10			2.40						3.00			1.09	1.66	1.71	2.32
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		1.26								1.26					1.26	
Impervious cover estimate (%)																
Rosgen Classification		E4 (Incised)				B4c				B4c					B4c	
BF Velocity (fps)		4.01			4.00	5.00		6.00		4.00						
BF Discharge (cfs)		87.0								87.00						
Valley Length																
Channel Length (ft)		2,245								2,063				2,038		
Sinuosity		1.06			1.10	1.20		1.30		1.06				1.06		

Table 8. Baseline Stream Data Summary																
Russell Gap Stream Mitigation Project: DMS Project	No ID 10	0003														
Reach R6,R7b - (Restoration, Enhancement I XS 12-1:		0005														
	ĺ				Refe	rence Re	ach(es)	Data	1				1			
Parameter	F	Pre-Existing C	onditio	n		Comp				Desi	gn			As-	built	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		8.44								10.20			11.00	12.40	12.40	13.80
Floodprone Width (ft)		17.64								22.00			45.00	45.45	45.00	45.90
BF Mean Depth (ft)		0.94								0.8			0.80	1.05	1.05	1.30
BF Max Depth (ft)		1.27								1.10			1.30	1.65	1.65	2.00
BF Cross-sectional Area (ft <sup>2</sup> )		7.9								8.0			7.20	10.80	10.80	14.40
Width/Depth Ratio		8.98			12.00	15.00		18.00		12.80			8.40	9.65	9.65	10.90
Entrenchment Ratio		2.09								2.20			4.20	4.65	4.65	5.10
Bank Height Ratio		3.10			1.00	1.05		1.10		1.00			1.00	1.00	1.00	1.00
d50 (mm)																
Pattern																
Channel Beltwidth (ft)		N/A								N/A			13.95	40.15	33.06	58.59
Radius of Curvature (ft)		N/A								N/A			20.00	46.82	43.00	86.00
Rc/Bankfull width (ft/ft)		N/A								N/A			1.82	3.78	3.47	6.23
Meander Wavelength (ft)		N/A								N/A			58.19	108.11	113.28	170.29
Meander Width Ratio		N/A								N/A			1.27	3.24	2.67	4.25
Profile																
Riffle Length (ft)													34.21	91.23	89.80	145.39
Riffle Slope (ft/ft)	0.0260	0.0430		0.0600					0.0310	0.0375		0.0440	0.0202	0.0384	0.0435	0.0667
Pool Length (ft)													17.11	20.53	21.39	25.66
Pool to Pool Spacing (ft)	53.00	159.00		265.00					25.00	37.50		50.00	31.36	90.16	138.27	245.18
Pool Max Depth (ft)	1.50	2.05		2.60						1.80			2.28	2.58	2.66	3.04
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.29								0.29				0.2900		
Impervious cover estimate (%)																
Rosgen Classification		E4				B4				B4				B4		
BF Velocity (fps)		4.41			4.00			6.00		4.40						
BF Discharge (cfs)		35.0								35.00						
Valley Length		1,783								1,816				1,793		
Channel Length (ft)		1,801								1,943				1,919		
Sinuosity		1.01			1.10	1.15		1.20		1.07				1.07		

Russell Gap Stream Mitigation Project: DMS Project I		1003														
Reach 9 - (Restoration XS 16-17)																
Parameter	n	Pre-Existing C	onditio		Refe	rence Re	ach(es)	Data		Desis	~ ~			AcI	built	
		8				Comp					•					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		10.40								12.70				12.10		
Floodprone Width (ft)		45.00								60.00				18.70		
BF Mean Depth (ft)		1.15								0.9				1.00		
BF Max Depth (ft)		2.25								1.20				1.40		
BF Cross-sectional Area (ft <sup>2</sup> )		12.0								12.0				11.90		
Width/Depth Ratio		9.04			12.00	15.00		18.00		13.50				12.20		
Entrenchment Ratio		4.33								4.70				1.60		
Bank Height Ratio		1.19			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern																
Channel Beltwidth (ft)		N/A								N/A			20.86	24.81	22.89	30.60
Radius of Curvature (ft)		N/A								N/A			41.00	73.83	56.00	176.00
Rc/Bankfull width (ft/ft)		N/A								N/A			3.39	6.10	4.63	2.53
Meander Wavelength (ft)		N/A								N/A			105.77	121.47	117.31	146.34
Meander Width Ratio		N/A								N/A			1.72	2.05	1.89	2.53
Profile																
Riffle Length (ft)													31.00	41.69	42.23	53.45
Riffle Slope (ft/ft)	0.0410	0.0480		0.0550					0.2600	0.1505		0.0410	0.0065	0.0218	0.0199	0.0332
Pool Length (ft)													10.49	19.56	20.03	29.57
Pool to Pool Spacing (ft)	29.00	47.50		66.00					15.00	38.50		62.00	45.71	62.03	62.51	79.31
Pool Max Depth (ft)	2.30	2.70		3.10						2.50			0.52	1.62	1.55	2.58
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.56								0.56				0.5600		
Impervious cover estimate (%)																
Rosgen Classification		E4b								B4				B4		
BF Velocity (fps)		4.00			4.00	5.00		6.00		4.00						
BF Discharge (cfs)		48.0				B4				48.00						
Valley Length		422								429				429		
Channel Length (ft)		439								446				446		
Sinuosity		1.04			1.10	1.15		1.20		1.04				1.04		

Deach 10h (Destanation VS 24)																
Reach 10b - (Restoration XS-24)	1				De	P	14.5	D (					r –			
Parameter	F	Pre-Existing (	Conditio	n	Kere	rence Re Comn	( )	Data		Desi	gn			As-l	built	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		N/A						IVIAX		4.90				6.20		
Floodprone Width (ft)		N/A								115.00				32.00		
BF Mean Depth (ft)		N/A								0.4				0.50		
BF Max Depth (ft)		N/A								0.50				1.00		
BF Cross-sectional Area (ft <sup>2</sup> )		N/A								2.0				3.50		
		N/A N/A			10.00	12.50		15.00		12.30				11.00		
Width/Depth Ratio Entrenchment Ratio		N/A N/A			10.00	12.50		15.00		23.50				8.70		
Bank Height Ratio		N/A N/A			1.00	1.05		1.10		1.00				1.00		
d50 (mm)		N/A														
Pattern																
Channel Beltwidth (ft)		N/A								N/A			10.37	13.70	11.86	18.87
Radius of Curvature (ft)		N/A								N/A			34.00	66.67	82.00	84.00
Rc/Bankfull width (ft/ft)		N/A			2.00	2.50		3.00		N/A			5.48	10.75	1.91	13.55
Meander Wavelength (ft)		N/A								N/A			29.79	49.56	59.44	59.44
Meander Width Ratio		N/A			3.50	5.75		8.00		N/A			1.67	2.21	1.91	3.04
Profile																
Riffle Length (ft)		N/A												107.07		
Riffle Slope (ft/ft)		N/A								0.0142				0.0196		
Pool Length (ft)		N/A														
Pool to Pool Spacing (ft)		N/A								38.00						
Pool Max Depth (ft)		N/A								1.00						
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / Bo%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.26								0.26				0.2600		
Impervious cover estimate (%)																
•			-													
Rosgen Classification						4.25				C4				C4		
BF Velocity (fps)					3.50	4.25		5.00		3.50						
BF Discharge (cfs)										7.00						
Valley Length																
Channel Length (ft)		0								113				105		
Sinuosity					1.20	1.30		1.40								

Russell Gap Stream Mitigation Project: DMS Project 1	No ID. 10(	0003														
Reach 12 - (Restoration XS-25)	10 121 10															
					Refe	rence Re	ach(es)	Data								
Parameter	Р	re-Existing C	onditio	n		Comp	osite			Desi	gn		i i	As-l	built	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		7.97								8.80				9.10		
Floodprone Width (ft)		41.00								20.00				38.20		
BF Mean Depth (ft)		0.91								0.7				0.60		
BF Max Depth (ft)		1.84								0.80				1.00		
BF Cross-sectional Area (ft <sup>2</sup> )		7.3								6.0				5.20		
Width/Depth Ratio		8.75			12.00	13.50		15.00		12.60				16.20		
Entrenchment Ratio		5.14								2.30				4.20		
Bank Height Ratio		1.63			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern																
*Channel Beltwidth (ft)		N/A								N/A			14.22	18.28	18.28	22.33
*Radius of Curvature (ft)		N/A								N/A			40.00	40.00	40.00	40.00
*Rc/Bankfull width (ft/ft)		N/A								N/A			4.40	4.40	4.40	4.40
*Meander Wavelength (ft)		N/A								N/A			61.50	68.17	68.17	74.84
*Meander Width Ratio		N/A								N/A			1.56	2.01	2.01	2.45
Profile																
Riffle Length (ft)													16.04	25.93	25.93	35.81
Riffle Slope (ft/ft)	0.0350	0.0365		0.0380					0.0150	0.0160		0.0170	0.0123	0.1365	0.1123	0.2123
Pool Length (ft)													5.88	7.24	7.24	8.59
Pool to Pool Spacing (ft)	24.00	32.00		40.00					35.00	40.00		45.00	10.16	49.98	49.98	89.80
Pool Max Depth (ft)	1.80	2.00		2.20						1.50			0.61	0.78	0.82	1.03
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters													<u> </u>			<u> </u>
Drainage Area (SM)		0.18								0.18				0.1800		
Impervious cover estimate (%)																
*Rosgen Classification		E4				C4				C4				C4		
BF Velocity (fps)		4.13			3.50			5.00		5.00						
BF Discharge (cfs)		30.0								30.00						
Valley Length		83								115				98		
Channel Length (ft)		86								120				102		
Sinuosity		1.03								1.04				1.04		

Russell Gap Stream Mitigation Project: DMS Project	No ID. 10(	0003														
Reach 14 - (Restoration XS 19-20)																
Parameter	n	re-Existing C	anditio		Refe	rence Re	ach(es)	Data	n	esign Valu	on Ur-			<b>A</b> = 1	built	
rarameter	r	re-Existing C	onaitio	n		Comp	osite		De	esign valu	ies Opp	ber	1	AS-I	buiit	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		3.85								5.10			3.70	4.10	4.10	4.50
Floodprone Width (ft)		5.82								10.00			11.10	21.55	21.55	32.00
BF Mean Depth (ft)		0.51								0.4			0.50	0.50	0.50	0.50
BF Max Depth (ft)		0.70								0.50			0.80	0.90	0.90	1.00
BF Cross-sectional Area (ft <sup>2</sup> )		2.0								2.0			2.00	2.10	2.10	2.20
Width/Depth Ratio		7.55			12.00	15.00		18.00		12.80			6.80	7.95	7.95	9.10
Entrenchment Ratio		1.51								2.00			2.50	5.60	5.60	8.70
Bank Height Ratio		9.60			1.00	1.05		1.10		1.00			1.00	1.00	1.00	1.00
d50 (mm)																
Pattern																
*Channel Beltwidth (ft)		N/A								N/A			24.51	40.15	33.06	58.59
*Radius of Curvature (ft)		N/A								N/A			21.00	72.88	56.00	178.00
*Rc/Bankfull width (ft/ft)		N/A								N/A			5.68	17.78	13.66	39.56
*Meander Wavelength (ft)		N/A								N/A			62.14	95.04	83.77	56.00
*Meander Width Ratio		N/A								N/A			6.62	9.79	8.06	13.02
Profile																
Riffle Length (ft)													4.19	15.81	25.68	47.17
Riffle Slope (ft/ft)	0.1000	0.1400		0.1800					0.0850	0.1075		0.1300	0.0108	0.0398	0.0518	0.0928
Pool Length (ft)													1.17	2.00	1.87	2.57
Pool to Pool Spacing (ft)	24.00	37.00		50.00					5.00	12.50		20.00	5.84	14.71	14.13	22.41
Pool Max Depth (ft)	0.50	0.65		0.80						0.70			0.69	1.10	1.15	1.60
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.02								0.02				0.0180		
Impervious cover estimate (%)																
*Rosgen Classification		A4				B4a				B4a				B4a		
BF Velocity (fps)		4.10			4.00			6.00		4.00						
BF Discharge (cfs)		8.0								8.00						
Valley Length																
Channel Length (ft)		528								572				570		
Sinuosity		N/A			1.10			1.20		N/A				N/A		

MICHAEL BAKER ENGINEERING, INC. RUSSELL GAP STREAM MITIGATION PROJECT (DMS #100003) YEAR 3 MONITORING REPORT

Reach 19 - (Enhancement I XS-21)	1															
Parameter	Р	Pre-Existing C	onditio	n	Refe	rence Re	. ,	Data		Desig	n			As-	built	
		ie Einseing e				Comp	osite			2004	-					
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		4.31								5.40				8.80		
Floodprone Width (ft)		8.84								10.00				26.30		
BF Mean Depth (ft)		0.45								0.4				0.90		
BF Max Depth (ft)		0.91								0.50				1.50		
BF Cross-sectional Area (ft <sup>2</sup> )		1.9								2.0				7.60		
Width/Depth Ratio		9.58			12.00	15.00		18.00		13.50				10.20		
Entrenchment Ratio		2.05								1.90				3.00		
Bank Height Ratio		1.10			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern			_													
*Channel Beltwidth (ft)		N/A								N/A						
*Radius of Curvature (ft)		N/A								N/A						
*Rc/Bankfull width (ft/ft)		N/A								N/A						
*Meander Wavelength (ft)		N/A								N/A						
*Meander Width Ratio		N/A								N/A						
Profile																
Riffle Length (ft)													2.14	19.69	40.27	78.40
Riffle Slope (ft/ft)	0.0800	0.0950		0.1100					0.0800	0.0950		0.1100	0.0260	0.0561	0.0515	0.0771
Pool Length (ft)													1.27	2.01	2.06	2.85
Pool to Pool Spacing (ft)	7.00	31.50		56.00					4.00	12.00		20.00	6.35	9.34	9.34	12.33
Pool Max Depth (ft)		0.95								1.00			0.89	1.24	1.28	1.66
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.03								0.03				0.0300		
Impervious cover estimate (%)																
*Rosgen Classification		B4a				B4				B4a				B4a		
BF Velocity (fps)		4.12			4.00			6.00		4.00						
BF Discharge (cfs)		8.0								8.00						
Valley Length																
Channel Length (ft)		481								359				352		
Sinuosity		1.08			1.10			1.20		1.08				1.08		

Reach 25 - (Enhancement I XS-23)																
					Refe	rence Rea	ach(es)	Data								
Parameter	P	re-Existing C	onditio	n		Comp	osite			Desig	gn			As-l	built	
Dimension and Substrate - Riffle	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max	Min	Mean	Med	Max
BF Width (ft)		5.00								5.40				5.10		
Floodprone Width (ft)		12.00								12.00				11.10		
BF Mean Depth (ft)		0.40								0.4				0.50		
BF Max Depth (ft)		0.50								0.50				0.80		
BF Cross-sectional Area (ft <sup>2</sup> )		1.9								2.0				2.20		
Width/Depth Ratio		12.50			12.00	15.00		18.00		13.50				9.10		
Entrenchment Ratio		2.40								2.20				2.50		
Bank Height Ratio		2.00			1.00	1.05		1.10		1.00				1.00		
d50 (mm)																
Pattern																
*Channel Beltwidth (ft)		N/A								N/A						
*Radius of Curvature (ft)		N/A								N/A						
*Rc/Bankfull width (ft/ft)		N/A								N/A						
*Meander Wavelength (ft)		N/A								N/A						
*Meander Width Ratio		N/A								N/A						
Profile																
Riffle Length (ft)													6.68	17.65	18.60	30.52
Riffle Slope (ft/ft)	0.0800	0.0950		0.1100	1.1000	1.4500		1.8000	0.0950	0.1025		0.1100	0.0165	0.0591	0.0564	0.0962
Pool Length (ft)													2.23	5.21	5.41	8.59
Pool to Pool Spacing (ft)	7.00	31.50		56.00					7.00	13.50		20.00	7.63	16.24	23.05	38.47
Pool Max Depth (ft)		1.20								1.20			1.16	1.75	1.68	2.19
Substrate and Transport Parameters																
SC% / Sa% / G% / C% / B%																
d16 / d35 / d50 / d84 / d95																
Additional Reach Parameters																
Drainage Area (SM)		0.30								0.30				0.3000		
Impervious cover estimate (%)																
*Rosgen Classification		B4a				B4				B4a				B4a		
BF Velocity (fps)		4.64			4.00			6.00		4.50						
BF Discharge (cfs)		9.0								9.00						
Valley Length																
Channel Length (ft)		422								427				431		
Sinuosity		1.09			1.10			1.20		1.08				1.08		

Russell Gap Restoration Project: DMS Project No ID. 100003 Stream Reach														R	each 1													
Si tan Kati			Cro	ss-section X	-1 (Riffle)					Cross	s-section X-2	(Pool)		R			Cross-	section X-3	(Riffle)					Cross	-section X-4	(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	Buse							Buse	1						Buse							Buse						T
Based on fixed basenile bankfull elevation BF Width (ft)	16.2	15.8	14.5	14.8				24.6	18.6	16.1	15.8				16.1	16.3	17.4	19.5				22.9	16.6	14.1	15.1	┢────┤	<b></b>	
BF Mean Depth (ft)	1.2	15.8	14.5	14.8				24.0	18.0	16.1	15.8				16.1	16.3	1/.4	19.5				1.2	16.6	2.4	15.1	┝───┦	<u> </u>	
Width/Depth Ratio	13.9	13.6	1.9	1.5		1		24.1	1.5	1.4	1.5				1.5	1.5	1.5	1.2				1.2	1.3	5.8	9.1	<b>├</b> ────┦	<u> </u>	-
BF Cross-sectional Area (ft <sup>2</sup> )	13.9	13.0	12.0	11.7		1		24.1	23.6	22.6	12.0				20.6	20.6	22.2	12.7				27.7	24.4	34.1	25.1	<b>├</b> ────┦	<u> </u>	-
BF Max Depth (ft)	1.6	18.4	2.0	18.9				1.7	2.3	22.0	2.0				20.0	20.0	22.2	19.5				27.7	24.4	3.9	2.7	───┦	<u> </u>	
Width of Floodprone Area (ft)	75.3	75.3	75.3	75.3				75.3	75.3	75.3	75.3				82.4	82.4	82.4	82.4				82.2	82.2	82.2	82.2	───┦	<u> </u>	
Entrenchment Ratio	4.7	4.8	5.2	5.1				3.1	4.0	4.7	4.8				5.1	5.0	4.7	5.2				3.6	5.0	5.8	5.4	───┦	<u> </u>	
Bank Height Ratio	1.0	4.8	1.1	1.1				0.9	1.0	4.7	4.8				1.0	1.0	4.7	1.0				1.1		0.7	1.1	───┦	<u> </u>	
Wetted Perimeter (ft)	16.7	1.1	1.1	1.1				25.3	20.0	17.2	1.1				16.8	1.0	18.7	16.4				23.5	1.1 17.7	17.2	1.1	───┦	<u> </u>	
		10.4	13.4	13.7				1.0	-	17.2	17.5				1.2			1.2				1.2		2.0	1.5	───┦	<u> </u>	
Hydraulic Radius (ft) d50 (mm)	1.1	1.1	1.1	1.2				1.0	1.2	1.5	1.1				1.2	1.2	1.2	1.2				1.2	1.4	2.0	1.5	$\vdash$	┝────	
																										L		
Stream Reach				Reach														Reach 4										
				ss-section X							-section X-6							section X-7							section X-8			
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)	23.8	23.7	19.6	21.2				13.9	13.5	13.7	14.4				14.3	14.4	14.9	14.8				15.1	14.6	13.8	13.9	l i	1	
BF Mean Depth (ft)	1.7	2.7	1.9	2.0				1.7	1.7	1.8	1.7				1.6	1.6	1.7	1.7				1.5	1.5	1.5	1.3	l i	1	
Width/Depth Ratio	13.8	13.8	10.1	10.9				8.4	7.8	7.4	8.5				9.0	9.1	8.8	8.6				10.3	9.9	9.4	10.6	l i	1	
BF Cross-sectional Area (ft <sup>2</sup> )	40.9	40.6	38.1	41.4				23.1	23.3	25.3	24.2				22.9	22.8	25.4	25.4				22.1	21.4	20.5	18.1		1	1
BF Max Depth (ft)	2.7	2.7	2.7	2.8				2.8	2.8	3.0	2.9				2.3	2.5	2.6	2.7				3.0	2.8	2.8	2.8		1	1
Width of Floodprone Area (ft)	46.5	47.5	59.3	59.3				24.0	23.4	21.8	21.8				31.7	30.3	30.3	30.3				34.3	33.2	31.5	31.5		[	1
Entrenchment Ratio	2.0	2.5	3.0	2.8				1.7	1.6	1.6	1.5				2.2	2.1	2.0	2.0				2.3	2.2	2.3	2.3		[	1
Bank Height Ratio	1.0	0.9	1.1	1.0				1.0	0.8	1.0	0.9				1.0	1.3	1.0	1.0				1.0	1.0	1.0	0.9		1	1
Wetted Perimeter (ft)	25.1	25.3	21.6	23.2				15.5	15.1	15.8	15.8				15.7	16.1	0.9	16.5				16.4	16.3	1.0	15.6		1	1
Hydraulic Radius (ft)	1.6	1.6	1.8	1.8				1.5	1.5	1.6	1.5				1.5	1.4	1.5	1.5				1.4	1.3	1.3	1.2		í	
d50 (mm)																											í	
Stream Reach											Reach	4													Reach 6			
			Cno	ss-section X	0 (D:61a)					Cuese	section X-10						Cuesa	section X-11	(D:61a)					Cross	section X-12	2 (Beel)		
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	2 (1 001) MY4	MY5	MY+
Based on fixed baseline bankfull elevation					1																							T
BF Width (ft)	16.2	15.2	13.8	14.6		-		22.6	21.3	12.2	12.5				13.3	10.3	9.9	10.7				13.8	9.2	11.0	15.7	<b>├───</b> ┦		+
BF Mean Depth (ft)	1.7	1.3	1.3	14.0				0.9	0.9	1.7	1.7				1.2	1.3	1.3	1.4				0.8	0.9	0.8	0.7	<b>├</b> ───┦		+
Width/Depth Ratio	9.7	11.4	10.7	13.2		-		26.1	23.4	7.3	7.5				11.4	7.9	7.6	7.6				16.3	10.8	15.6	20.9	<b>├</b> ───┦		+
BF Cross-sectional Area (ft <sup>2</sup> )	27.2	20.5	17.9	16.2		+		19.6	19.4	20.2	21.0				15.5	13.6	12.9	15.1				11.6	7.9	11.0	11.7	──┦	·	+
BF Max Depth (ft)	27.2	20.3	17.9	1.9		+		2.2	2.3	2.5	21.0				2.0	2.1	2.0	2.3				1.8	1.9	2.0	2.0	──┦	·	+
Width of Floodprone Area (ft)	38.0	38.0	38.0	38.0		+		32.0	31.5	31.5	31.5				2.0	23.3	2.0	2.3				56.8	56.8	56.8	56.8	┝───┦	·	+
Entrenchment Ratio	2.3	2.5	2.8	2.6		+		32.0	1.5	2.6	2.5				25.9	23.3	23.3	23.3				5.7	6.1	4.3	3.6	───┦	·	+
Entrelicitient Kato		0.9	2.8	2.6					-	2.6	2.5				1.9	-	2.4						-	4.3		──┤	<u> </u>	+
Dort Haisht Datis					1	1	1	1.0	1.0	1.0	1 1.1	1			1.0	1.1	1.1	1.1	1	1		1.0	1.0	0.9	1.0	1 1	1	1
Bank Height Ratio	1.0							-		14.2					14.2	11.4	11.0	12.0				10.0	0.0	14.2	16.6	1		
Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft)	1.0 17.4 1.6	16.6 1.2	14.9 1.2	15.3				23.7	22.5 0.9	14.2 1.4	13.9 1.5				14.3 1.1	11.4 1.2	11.2 1.2	12.8 1.2				10.8 1.1	9.9 0.8	14.2 0.8	16.6 0.7			

Table 9. Cross-Section Morphology Data Summary																								
Russell Gap Restoration Project: DMS Project No ID. 100003	·																							
Table 9. Cross-Section Morphology Data Summary           Russell Gap Restoration Project: DMS Project No ID. 100003																								
Stream Reach				Reach	6							Reac	h 7b									Rea	:h 9	
			Cro	oss-section X	-13 (Riffle)					Cross	-section X-14 (Riffle)				Cross	s-section X-1	5 (Pool)					Cross-section	X-16 (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 M	73 MY4	MY5 MY+
Based on fixed baseline bankfull elevation																							-	
BF Width (ft) BF Mean Depth (ft)	13.8 0.8	8.2 0.9	7.5	9.0				11.0	11.7	11.5	12.2		14.0	14.3 0.9	14.6 0.9	14.9 0.9				12.9		11.4 11 1.0 1.	.3	
Width/Depth Ratio	10.9	9.4		9.0				8.4	9.3	8.0	8.5		1.0	15.5	15.8	16.8				12.4			.3	
BF Cross-sectional Area (ft <sup>2</sup> )	7.2	7.1		9.1				14.4	14.6	16.4	17.4		13.6	13.2	13.4	13.1				13.5		11.5 12		
BF Max Depth (ft)	1.3	1.5	1.7	1.7				2.0	2.2	2.4	2.6		1.6	1.7	2.0	2.1				1.9	1.8	1.8 1.	7	
Width of Floodprone Area (ft)	45.0	45.0		45.0				45.9	45.9	45.9	45.9		27.3	27.3	27.3	27.3				80.4		80.4 80		
Entrenchment Ratio	5.1	5.5		5.0				4.2	3.9	4.0	3.9		1.9	1.9	1.9	1.8				6.2		7.1 7.		
Bank Height Ratio Wetted Perimeter (ft)	1.0 9.4	1.0 8.9	1.1 8.8	1.0		-		1.0 12.0	1.1 12.6	1.1 12.9	1.1 13.4		2.4	2.4 14.8	0.9	0.9				1.0	2.0	1.1 1. 12.2 12		
Hydraulic Radius (ft)	0.8	0.8		0.9				1.2	1.2	1.3	1.3		0.9	0.9	0.9	0.8				1.0			0	
d50 (mm)																							-	
Stream Reach				Reach	9							Reac	h 11											
			Cro	oss-section X	-17 (Riffle)					Cross	-section X-18 (Riffle)				Cross	-section X-19	9 (Riffle)					Cross-section	X-20 (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 MY	. ,	MY5 MY+
Based on fixed baseline bankfull elevation							ĺ					ĺ												
BF Width (ft)	12.1	12.2	12.9	13.6				8.9	7.1	6.8	6.8		4.5	3.8	4.4	4.3	1			3.7	3.3	3.1 3.	3	
BF Mean Depth (ft)	1.0	1.0	1.1	1.1				1.1	0.7	0.7	0.7		0.5	0.4	0.4	0.4				0.5		0.2 0.		
Width/Depth Ratio	12.2	11.9	11.7	12.0				8.4	9.8	10.2	10.0		9.1	9.7	10.9	9.7				6.8		16.3 21		
BF Cross-sectional Area (ft <sup>2</sup> )	12.2					-		9.5	5.2				2.2			-				2.0				
		12.4	14.3	15.4						4.5	4.6			1.5 0.7	1.8	1.9								
BF Max Depth (ft)	1.4	1.6	2.1	2.1				1.9	1.4	1.1	1.0		0.8		0.6	0.7				1.0		0.3 0.		
Width of Floodprone Area (ft)	18.7	78.1	78.1	78.1				18.6	14.7	14.7	14.7		11.1	11.1	11.1	11.1				32.0		32.0 32		
Entrenchment Ratio	1.6	6.4	6.0	5.7				2.1	2.1	2.2	2.2		2.5	2.9	2.5	2.6				8.7		10.3 9.		
Bank Height Ratio	1.0	1.0	1.1	1.1				2.9	1.2	1.0	1.0		1.0	1.1	1.0	1.0				1.0		1.0 1.	0	
Wetted Perimeter (ft)	12.6	12.7	13.8	14.6				9.8	7.7	7.2	7.2		4.8	4.1	4.8	4.5				4.2	3.5	3.2 3.	3	
Hydraulic Radius (ft)	0.9	1.0	1.0	1.1				1.0	0.7	0.6	0.6		0.5	0.4	0.4	0.4				0.5	0.3	0.2 0.	2	
d50 (mm)																								
Stream Reach			C	Reach ss-section X						Cross	Reach 20 -section X-22 (Riffle)				Cross	Reach 25 -section X-23			1			Reacl Cross-section		
Stream Reach										C1033	-section A-22 (Rine)					MY3	MY4	MY5	1.67	D			· · · /	MY5 MY+
	Base	MY1			MY4	MY5	MY+	Base	MY1	MY2	MY3 MY4 MY5	MY+	Base	MY1	MY2				MY+	Base	MY1 1	MY2 MY	73 MY4	
Dimension and substrate Based on fixed baseline bankfull elevation	Base	MY1	MY2	MY3	( /	MY5	MY+	Base	MY1	MY2	MY3 MY4 MY5	MY+	Base	MY1	MY2	WIT 5	11114	IVI I S	MY+	Base	MY1	MY2 M	73 MY4	
Dimension and substrate	Base 8.8	8.5	MY2 8.6		( /	MY5	MY+	Base 3.8	MY1 4.5	MY2 4.7	5.7	MY+	Base 5.1	MY1 4.7	MY2 4.2	4.7	IVI I 4	MT5	MY+	6.2		MY2 M 5.7 5.		
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft)	8.8 0.9	8.5 0.8	MY2 8.6 0.8	MY3 9.1 0.8	( /	MY5	MY+	3.8 0.5	4.5 0.4	4.7 0.4	5.7 0.3	MY+	5.1 0.6	4.7 0.6	4.2 0.5	4.7 0.7	1117	M15	MY+	6.2 0.6	5.5 0.5	5.7 5. 0.6 0.	0	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio	8.8 0.9 10.2	8.5 0.8 11.1	MY2 8.6 0.8 11.4	MY3 9.1 0.8 12.0	( /	MY5	MY+	3.8 0.5 7.0	4.5 0.4 10.2	4.7 0.4 12.8	5.7 0.3 16.6	MY+	5.1 0.6 8.1	4.7 0.6 8.2	4.2 0.5 8.9	4.7 0.7 6.9			M Y+	6.2 0.6 11.0	5.5 0.5 10.1	5.7         5.           0.6         0.           10.0         8.	0 6 2	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> )	8.8 0.9 10.2 7.6	8.5 0.8 11.1 6.6	MY2 8.6 0.8 11.4 6.5	MY3 9.1 0.8 12.0 6.9	( /	MY5	MY+	3.8 0.5 7.0 2.0	4.5 0.4 10.2 1.9	4.7 0.4 12.8 1.7	5.7 0.3 16.6 2.0	MY+	5.1 0.6 8.1 3.2	4.7 0.6 8.2 2.7	4.2 0.5 8.9 2.0	4.7 0.7 6.9 3.2			M Y+	6.2 0.6 11.0 3.5	5.5 0.5 10.1 3.0	5.7         5.           0.6         0.           10.0         8.           3.2         3.	0 6 2 1	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft)	8.8 0.9 10.2	8.5 0.8 11.1	MY2 8.6 0.8 11.4 6.5 1.6	MY3 9.1 0.8 12.0	( /	MY5	MY+	3.8 0.5 7.0	4.5 0.4 10.2	4.7 0.4 12.8	5.7 0.3 16.6	MY+	5.1 0.6 8.1	4.7 0.6 8.2	4.2 0.5 8.9	4.7 0.7 6.9			M Y+	6.2 0.6 11.0	5.5 0.5 10.1 3.0 1.0	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.	0 6 2 1	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> )	8.8 0.9 10.2 7.6 1.5	8.5 0.8 11.1 6.6 1.5	MY2 8.6 0.8 11.4 6.5 1.6 26.3	MY3 9.1 0.8 12.0 6.9 1.5	( /	MY5	MY+	3.8 0.5 7.0 2.0 0.8	4.5 0.4 10.2 1.9 0.7	4.7 0.4 12.8 1.7 0.7	5.7 0.3 16.6 2.0 0.6	MY+	5.1 0.6 8.1 3.2 1.0	4.7 0.6 8.2 2.7 0.9	4.2 0.5 8.9 2.0 0.7	4.7 0.7 6.9 3.2 1.1			M Y+	6.2 0.6 11.0 3.5 1.0	5.5 0.5 10.1 3.0 1.0 45.5	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.	0 6 2 1 0 5	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0	( /	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9	5.7         0.3           16.6         16.6           2.0         16.6           12.4         12.4           2.2         1.3	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0	5.5 0.5 10.1 3.0 1.0 45.5 8.2 1.0	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.	0 6 2 1 0 0 5 5 0 0	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6	( /	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0	5.7         0.3           16.6         2.0           0.6         12.4           2.2         1.3           5.8         5.8	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			M Y+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft]	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0	( /	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9	5.7         0.3           16.6         16.6           2.0         16.6           12.4         12.4           2.2         1.3	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0			M Y+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Uted Perimeter (ft)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6	( /	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0	5.7         0.3           16.6         2.0           0.6         12.4           2.2         1.3           5.8         5.8	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			M Y+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft]	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6	MY4	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0	5.7         0.3           16.6         2.0           0.6         12.4           2.2         1.3           5.8         5.8	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4		M13	M Y+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7	MY4	MY5	MY+	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7	$\begin{array}{c} 4.7\\ 0.4\\ 12.8\\ 1.7\\ 0.7\\ 12.4\\ 2.9\\ 0.9\\ 5.0\\ 0.3\\ \end{array}$	5.7         0.3         16.6         2.0         0.6         12.4         2.2         1.3         5.8         0.3	MY+	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			M Y+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b>	MY4	MY5	MY+ 	3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7	$\begin{array}{c} 4.7\\ 0.4\\ 12.8\\ 1.7\\ 0.7\\ 12.4\\ 2.9\\ 0.9\\ 5.0\\ 0.3\\ \end{array}$	5.7       0.3       16.6       2.0       0.6       12.4       2.2       1.3       5.8       0.3	MY+ 	5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b>	MY4 1 12 12 (Riffle)			$\begin{array}{c} 3.8 \\ 0.5 \\ 7.0 \\ 2.0 \\ 0.8 \\ 12.4 \\ 3.3 \\ 1.0 \\ 4.3 \\ 0.5 \end{array}$	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 Cross	5.7     0.3       16.6     2.0       0.6     12.4       2.2     1.3       5.8     0.3       0.3     1.3       Section X-26 (Riffle)		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b>	MY4 1 12 12 (Riffle)			$\begin{array}{c} 3.8 \\ 0.5 \\ 7.0 \\ 2.0 \\ 0.8 \\ 12.4 \\ 3.3 \\ 1.0 \\ 4.3 \\ 0.5 \end{array}$	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 Cross	5.7     0.3       16.6     2.0       0.6     12.4       2.2     1.3       5.8     0.3       0.3     1.3       Section X-26 (Riffle)		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 Base	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 MY1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7	MY3 9.1 0.8 12.0 6.9 1.5 2.6 3 2.9 1.0 9.6 0.7 <b>Reach</b> <b>Ses-section X</b> MY3	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 <b>Cross</b> MY2	5.7     0.3       0.3     16.6       2.0     0.6       12.4     12.4       2.2     1.3       5.8     0.3       0.3     10.3       Section X-26 (Riffle)       MY3     MY4		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Weidth (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Bank Height Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 Base 9.1	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 MY1 7.8	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b> <b>ss-section X</b> MY3 7.3	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1 13.4	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 Cross MY2 14.3	5.7     0.3       0.3     16.6       2.0     0.6       12.4     2.2       1.3     5.8       0.3     0.3       Reach 2       section X-26 (Riffle)       MY3     MY4       18.2     18.2		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Mean Depth (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 Base 9.1 0.6 16.2	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 MY1 7.8 0.6 12.8	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6 11.0	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 Reach WY3 WY3 7.3 0.4 18.1	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1 13.4 2.2 6.1	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 <b>Cross</b> MY2 14.3 1.4 10.4	5.7     0.3       0.3     16.6       2.0     0.6       12.4     2.2       1.3     5.8       0.3     0.3       Reach 2       section X-26 (Rifle)       MY3     MY4       18.2     1.6       11.6     11.6		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Bank Height Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> )	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 Base 9.1 0.6 16.2 5.2	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 MY1 7.8 0.6 12.8 4.7	MY2 8.6 0.8 11.4 6.5 26.3 3.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7  Reach 9.5 Section X MY3 7.3 0.4 18.1 2.9	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2 33.6	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1 13.4 2.2 6.1 29.4	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 <b>Cross</b> MY2 14.3 1.4 10.4 19.6	5.7     0.3       0.3     16.6       2.0     0.6       12.4     2.2       1.3     1.3       5.8     0.3       0.3     1       Reach 2       section X-26 (Riffle)       MY3     MY4       18.2     1.6       11.6     11.6       28.4     1		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft) BF Max Depth (ft) Width of Floodprone Area (ft) Bank Height Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft, d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 8 8 8 8 9.4 0.8 9.1 0.6 16.2 5.2 1.0	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7  8  8  8  8  8  9.1 0.7  9.1 0.7  9.1 1.1 1.1  9.1 0.7  9.1 1.1 1.1  9.1 1.1 1.1 1.1 1.5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 1.1 0.7 5 26.3 3.1 1.1 0.7 5 26.3 3.1 1.1 0.7 5 26.3 1.1 1.1 0.7 5 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 1.1 0.7 7 26.3 1.1 1.1 0.7 7 26.3 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1.1 1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b> <b>Sss-section X</b> MY3 7.3 0.4 18.1 2.9 0.8	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2 33.6 2.9	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1 13.4 2.2 6.1 29.4 2.9	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 <b>Cross</b> MY2 14.3 1.4 10.4 19.6 2.4	5.7     0.3       16.6     16.6       2.0     12.4       2.2     1.3       5.8     0.3       0.3     10.6       2.2     1.3       5.8     0.3       0.3     10.6       1.3     10.6       5.8     10.3       Section X-26 (Riffle)       MY3     MY4       MY5     18.2       1.6     11.6       28.4     2.3		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) BF Mean Depth (ft) BF Cross-sectional Area (ft?) BF Max Depth (ft) Width of Floodprone Area (ft) Bank Height Ratio Bank Height Ratio Bank Height Ratio Bank Jeight Ratio Bank Jeight Ratio Btream Reach Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft?) BF Max Depth (ft) BF Max Depth (ft) BF Cross-sectional Area (ft?) BF Max Depth (ft) BF Max D	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 0.8 0.8 9.1 0.6 16.2 5.2 1.0 38.2	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 7.8 0.6 12.8 4.7 1.0 38.2	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2 38.2 38.2	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7  Reach 0.7  Reach 0.4 18.1 2.9 0.8 38.2	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base Base 18.5 1.8 10.2 33.6 2.9 38.0	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 0.4 MY1 13.4 2.2 6.1 29.4 2.9 38.1	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 0.3 Cross MY2 14.3 1.4 10.4 10.4 19.6 2.4 38.1	5.7     0.3       0.3     16.6       2.0     0.6       12.4     12.4       2.2     1.3       5.8     0.3       0.3     10.4       5.8     0.3       5.8     0.3       5.8     10.4       1.3     10.4       5.8     10.4       1.3     10.4       1.3     10.4       1.3     10.4       1.3     10.4       1.3     10.4       1.4     11.6       11.6     11.6       28.4     1.3       2.3     38.1		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft; d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8 0.8	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 9.1 0.7 0.7 0.7 7.8 0.6 12.8 4.7 1.0 38.2 4.9	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2 38.2 5.7 .7 	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b> <b>ss-section X</b> MY3 7.3 0.4 18.1 2.9 0.8 38.2 5.2	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base Base 18.5 1.8 10.2 33.6 2.9 38.0 2.1	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 0.4 MY1 13.4 2.2 6.1 29.4 2.9 38.1 2.8	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 0.3 Cross MY2 14.3 1.4 10.4 19.6 2.4 38.1 2.7	5.7     0.3       0.3     16.6       2.0     0.6       12.4     12.4       2.2     1.3       5.8     0.3       0.3     10.4       5.8     0.3       5.8     0.3       5.8     10.4       5.8     10.4       5.8     10.4       5.8     10.4       10.3     10.4       10.4     10.4       11.6     11.6       12.4     11.6       11.6     11.6       12.4     11.6       13.1     11.6       13.2     11.6       13.3     13.3       13.4     13.4		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Weidth (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft) d50 (nm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Weidth (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft?) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio	8.8         0.9           10.2         7.6           1.5         26.3           3.0         1.0           9.4         0.8           0.8         9.1           0.6         16.2           5.2         1.0           38.2         4.2           1.0         1.0	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 0.7 7.8 0.6 12.8 4.7 1.0 38.2 4.9 0.9	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2 38.2 5.7 1.1	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 0.7 <b>Reach</b> 5000000000000000000000000000000000000	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2 33.6 2.9 38.0 2.1 1.0	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 0.4 MY1 13.4 2.2 6.1 29.4 2.9 38.1 2.8 0.9	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 0.3 <b>Cross</b> MY2 14.3 1.4 10.4 19.6 2.4 38.1 2.7 1.0	5.7     0.3       0.3     16.6       2.0     0.6       12.4     12.4       2.2     1.3       5.8     0.3       0.3     10.3       5.8     0.3       0.3     10.3       5.8     10.3       5.8     10.3       5.8     10.3       5.8     10.3       5.8     10.3       5.8     10.3       10.3     10.3       10.3     10.3       10.3     10.3       10.3     10.3       11.6     11.6       11.6     11.6       28.4     13.3       38.1     13.3       2.1     10.9		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) BF Mean Depth (ft) BF Cross-sectional Area (ft?) BF Max Depth (ft) Width of Floodprone Area (ft) Hydraulic Radius (ft; d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width/Depth Ratio BF Cross-sectional Area (ft?) BF Max Depth (ft) Width of Floodprone Area (ft) BF Max Depth (ft) BF Mean Depth (ft) BF Max Depth (ft)	8.8 0.9 10.2 7.6 1.5 26.3 3.0 1.0 9.4 0.8 8 ase 9.1 0.6 16.2 5.2 1.0 38.2 4.2 1.0 9.4	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 7.8 0.6 12.8 4.7 1.0 38.2 4.9 0.9 8.1	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2 38.2 5.7 1.1 7.3	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 <b>Reach</b> 9.6 0.7 <b>Reach</b> 9.6 0.7 <b>Reach</b> 9.6 0.7 <b>Reach</b> 9.6 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.6 0.7 <b>Reach</b> 9.8 9.8 9.6 0.7 <b>Reach</b> 9.8 9.8 9.8 9.8 9.8 9.8 9.8 9.8	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2 33.6 2.9 38.0 2.1 1.0 19.4	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 MY1 13.4 2.2 6.1 29.4 2.9 38.1 2.8 0.9 14.3	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 <b>Cross</b> MY2 14.3 1.4 10.4 19.6 2.4 38.1 2.7 1.0 15.3	5.7     0.3       0.3     16.6       2.0     0.6       12.4     2.2       1.3     1       5.8     0.3       0.3     0.3       Reach 2       section X-26 (Riffle)       MY3     MY4       MY3     MY4       18.2     1       11.6     1       12.4     1       2.7     1       13.3     1       14.2     1       15.2     1       16     1       1.6     1       28.4     2.3       38.1     2.1       0.9     19.0		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4			MY+	6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	
Dimension and substrate Based on fixed baseline bankfull elevation BF Weath (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft?) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft) Hydraulic Radius (ft; d50 (mm) Stream Reach Dimension and substrate Based on fixed baseline bankfull elevation BF Width (ft) BF Mean Depth (ft) Width/Depth Ratio BF Cross-sectional Area (ft <sup>2</sup> ) BF Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio BH Max Depth (ft) Width of Floodprone Area (ft) Entrenchment Ratio Bank Height Ratio Wetted Perimeter (ft)	8.8         0.9           10.2         7.6           1.5         26.3           3.0         1.0           9.4         0.8           0.8         9.1           0.6         16.2           5.2         1.0           38.2         4.2           1.0         1.0	8.5 0.8 11.1 6.6 1.5 26.3 3.1 1.1 9.1 0.7 0.7 7.8 0.6 12.8 4.7 1.0 38.2 4.9 0.9	MY2 8.6 0.8 11.4 6.5 1.6 26.3 3.0 1.0 9.4 0.7 Cro MY2 6.7 0.6 11.0 4.1 1.2 38.2 5.7 1.1	MY3 9.1 0.8 12.0 6.9 1.5 26.3 2.9 1.0 9.6 0.7 0.7 <b>Reach</b> 5000000000000000000000000000000000000	MY4 1 12 12 (Riffle)			3.8 0.5 7.0 2.0 0.8 12.4 3.3 1.0 4.3 0.5 Base 18.5 1.8 10.2 33.6 2.9 38.0 2.1 1.0	4.5 0.4 10.2 1.9 0.7 12.4 2.8 1.0 4.7 0.4 0.4 MY1 13.4 2.2 6.1 29.4 2.9 38.1 2.8 0.9	4.7 0.4 12.8 1.7 0.7 12.4 2.9 0.9 5.0 0.3 0.3 <b>Cross</b> MY2 14.3 1.4 10.4 19.6 2.4 38.1 2.7 1.0	5.7     0.3       0.3     16.6       2.0     0.6       12.4     12.2       1.3     15.8       5.8     0.3       0.3     10.3       5.8     0.3       0.3     10.3       5.8     10.3       5.8     10.3       5.8     10.3       5.8     10.3       5.8     10.3       10.3     10.3       10.3     10.3       10.3     10.3       10.3     10.3       10.3     10.3       11.6     11.6       12.4     10.3       12.1     10.9		5.1 0.6 8.1 3.2 1.0 8.1 1.6 1.0 5.7	4.7 0.6 8.2 2.7 0.9 8.1 1.7 0.9 5.2	4.2 0.5 8.9 2.0 0.7 8.1 1.9 1.0 4.6	4.7 0.7 6.9 3.2 1.1 8.1 1.7 1.0 5.4				6.2 0.6 11.0 3.5 1.0 45.5 7.3 1.0 6.6	5.5           0.5           10.1           3.0           1.0           45.5           8.2           1.0           5.9	5.7         5.           0.6         0.           10.0         8.           3.2         3.           1.1         1.           45.5         45           8.0         9.           1.0         1.           6.2         5.	0 6 2 1 0 5 5 0 0 6	

# **APPENDIX E**

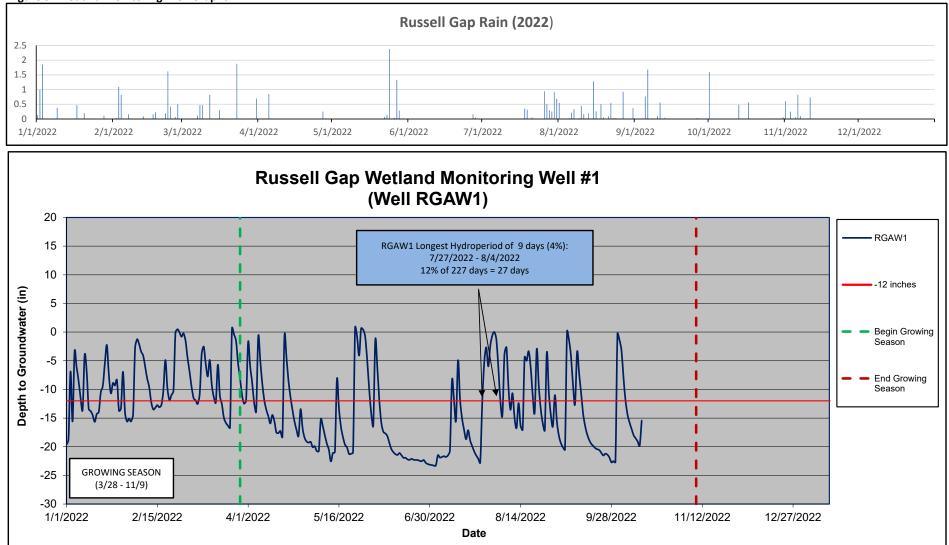
Hydrologic Data

Table 10. Verification of Bankfull Events

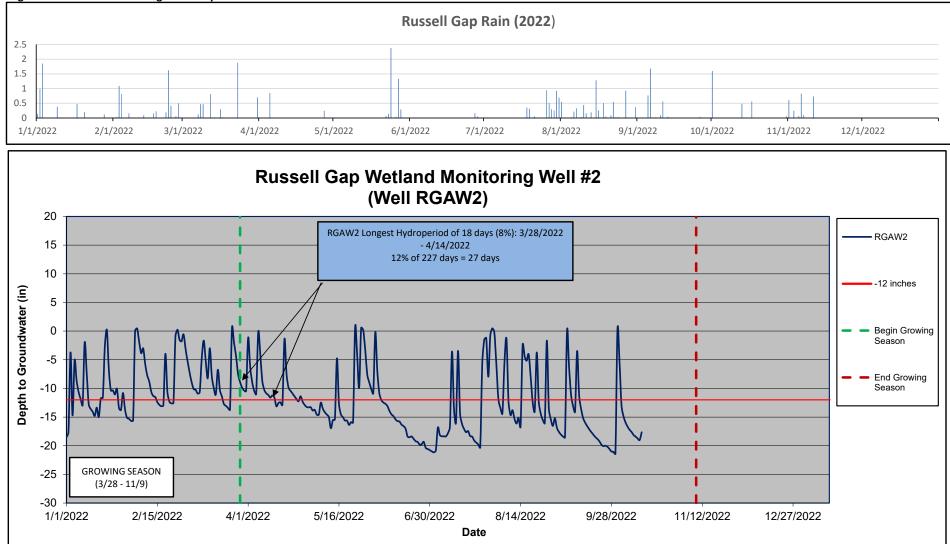
Russell Gap Stream Mitig	ation Project - NCDMS Project No. 100003

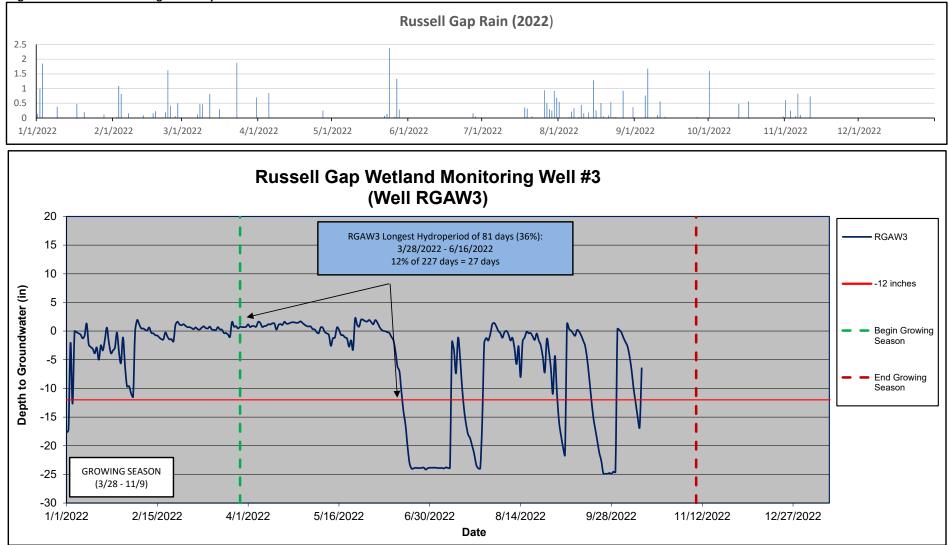
Date of Data Collection	R1 Manual Cork Crest Gauge #1	R9 Manual Cork Crest Gauge #2	R4 Manual Cork Crest Gauge #3	R6 Manual Cork Crest Gauge #4	Date of Bankfull Event Occurrence	Method of Data Collection
			Year 1 Monitoring (2020	))		
6/1/2020	NA	NA	1.25 ft.	NA	5/28/2020	Manual cork measurement
11/5/2020	1.5 ft.	NA	2.5 ft	NA	10/30/2020	Manual cork measurement
			Year 2 Monitoring (2021)			
6/14/2021			7.5 inches and 20.5 inches		3/25/2021 and 5/3/2021	Manual cork measurement
10/19/2021	1.1 ft.				10/7/2021	Manual cork measurement
			Year 3 Monitoring (2022)			
10/13/2022		8.25 inches			10/1/2022	Manual cork measurement

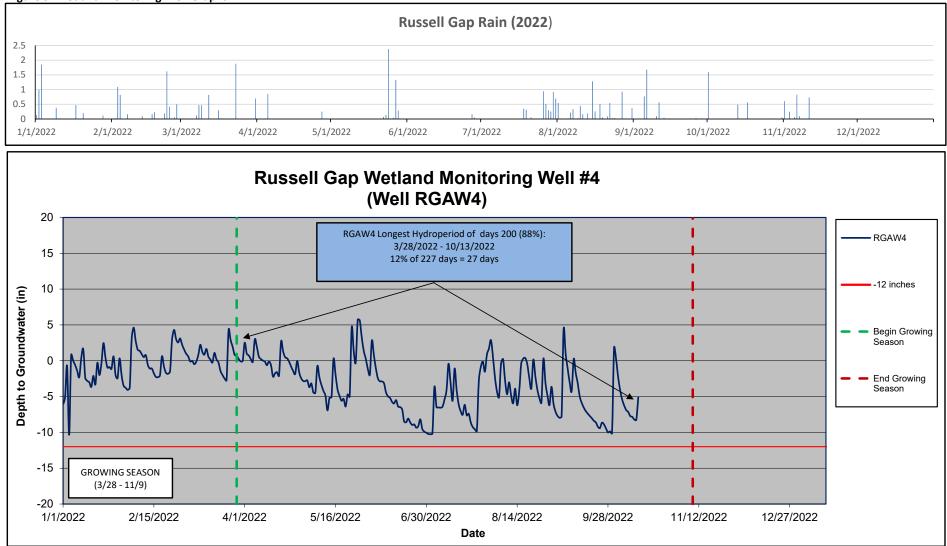
Note: Manual cork crest gauge readings were corroborated with associated spikes in the automated Continuous Stage Recorder (see graph in Appendix E) and/or with photographs (Appendix B).

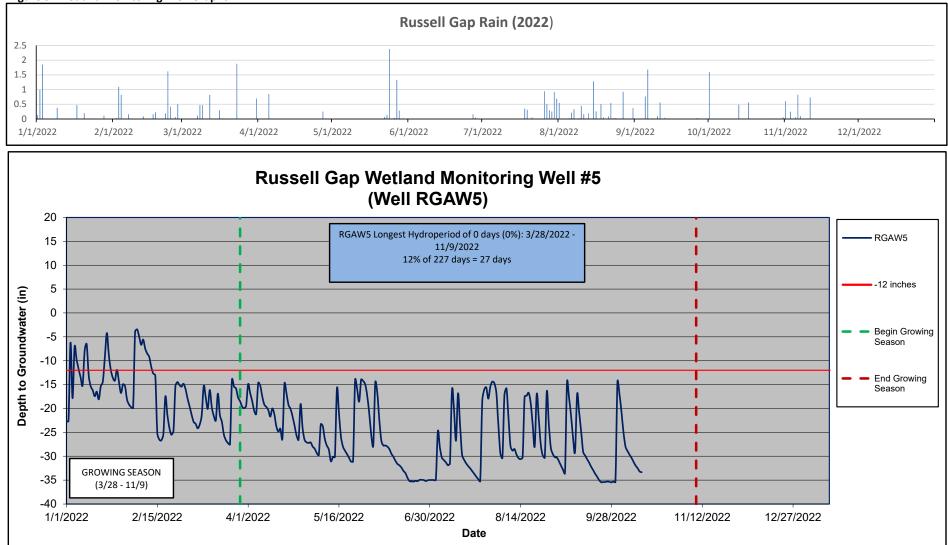


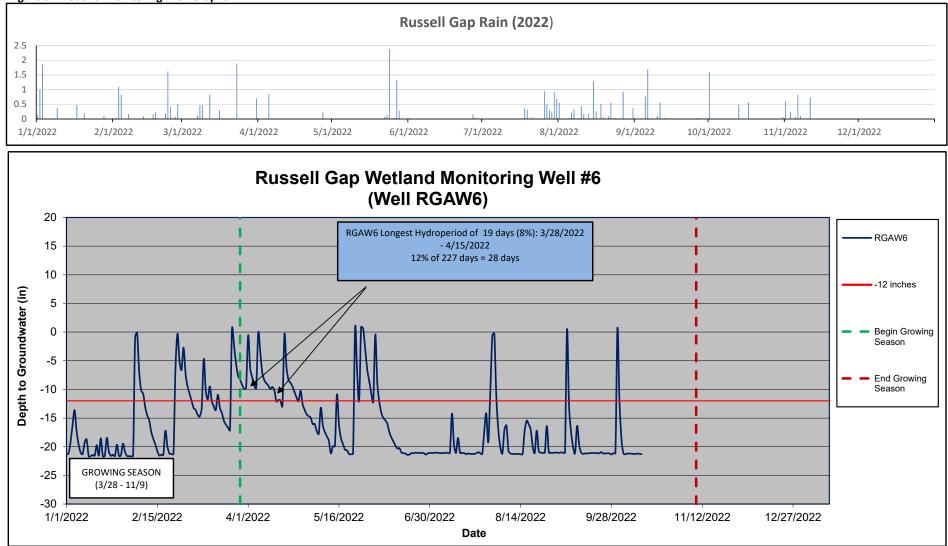


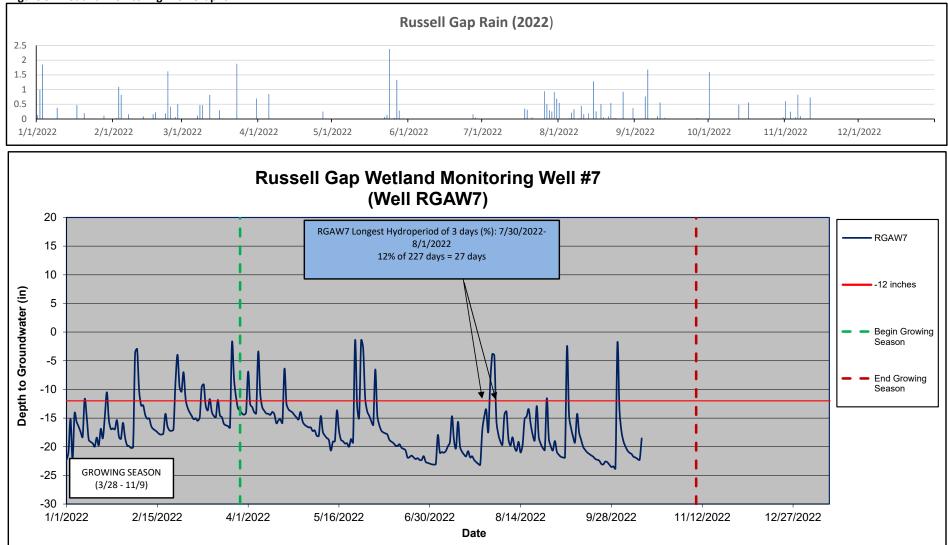


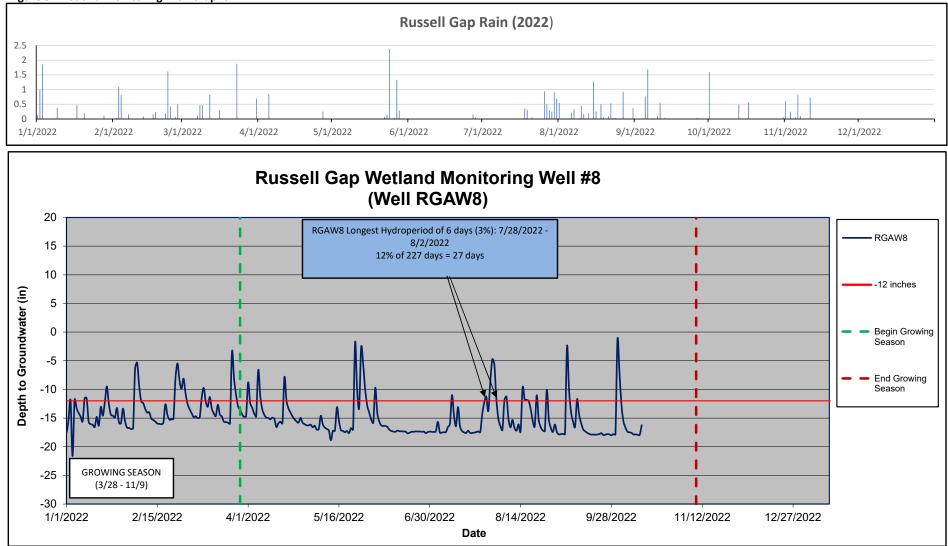


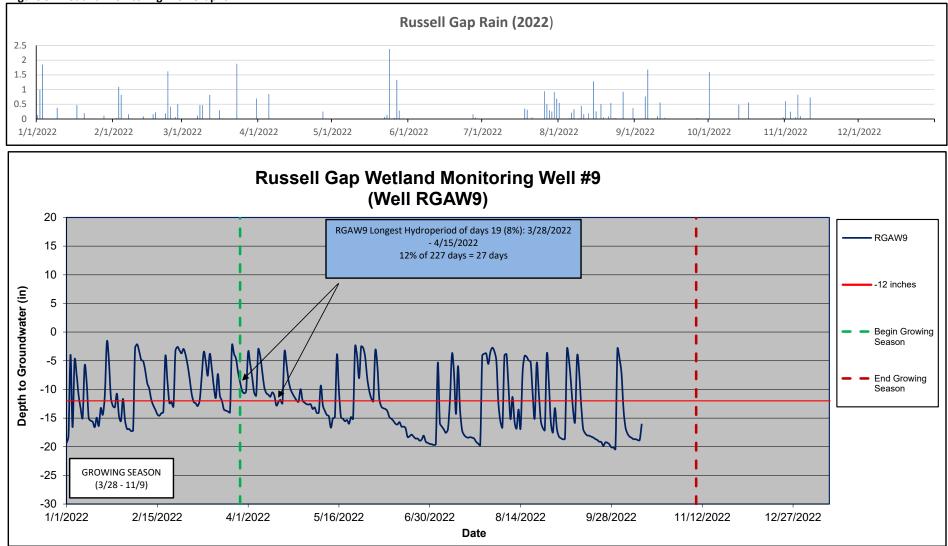


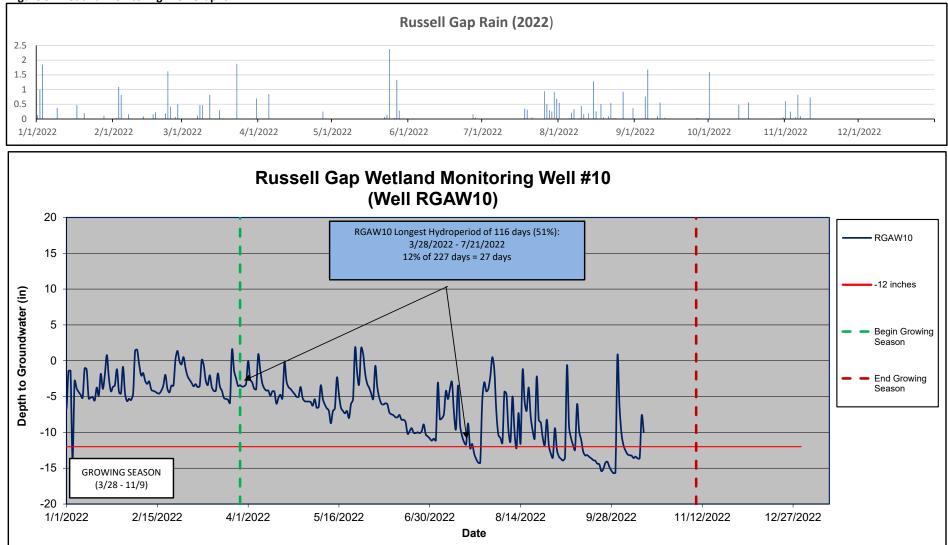


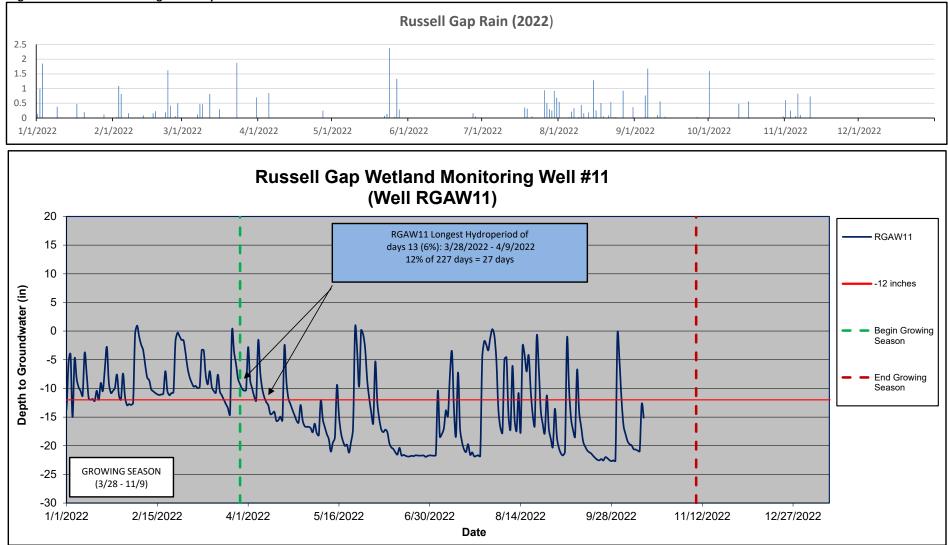


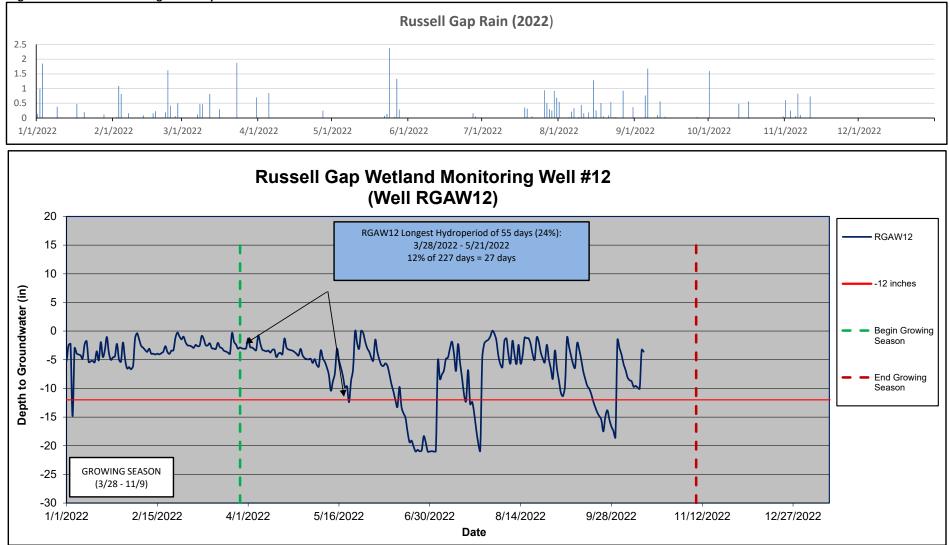






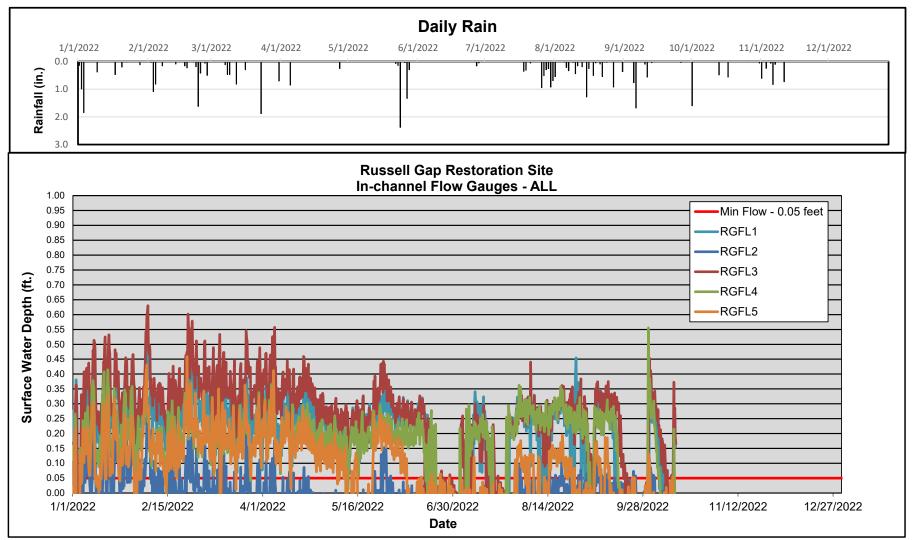


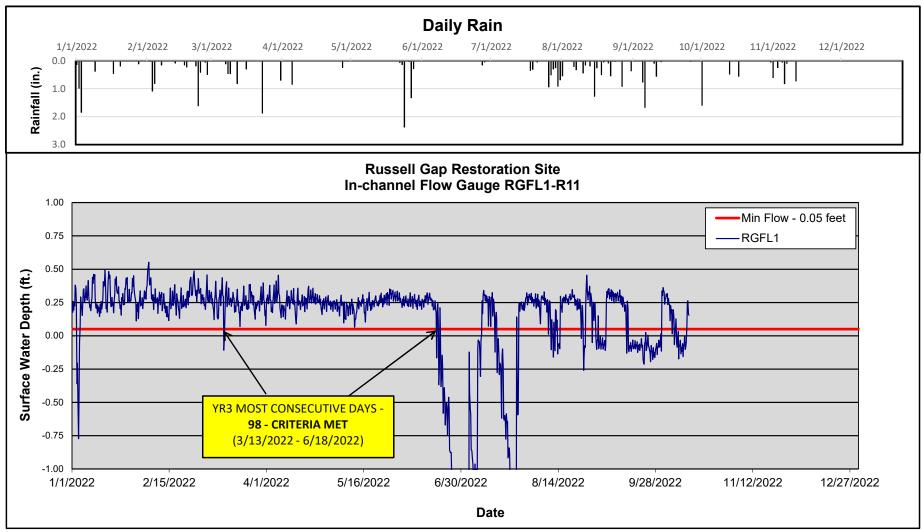




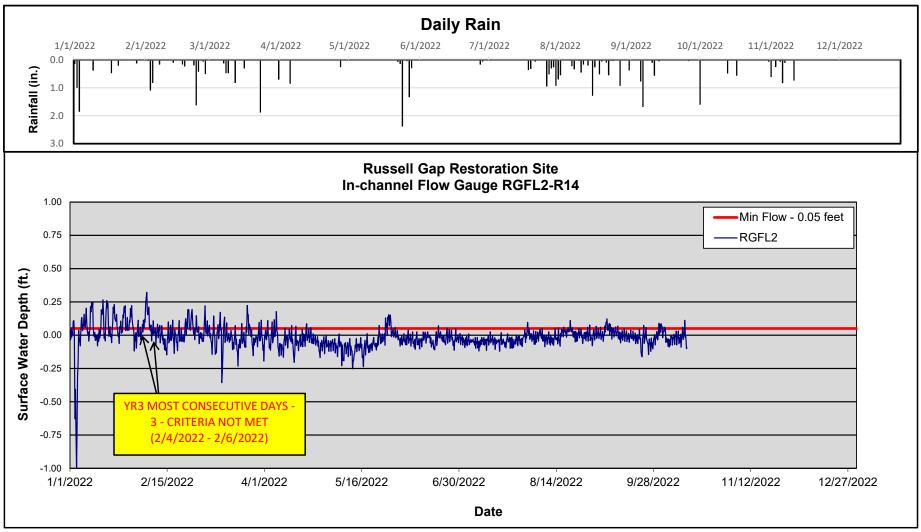
Well ID				e of Consecu from Groun							Consecutive reting Criter							ge of Cumul: from Grou						Cumul	ative Days M Criteria <sup>3</sup>	leeting		
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year
	(2020)	(2021)	(2022)	(2023)	(2024)	(2025)	(2026)	(2020)	(2021)	(2022)	(2023) V	(2024) Vetland M	(2025) onitoring	(2026) Wells (Ins	(2020) talled Ma	(2021) rch 2020)	(2022)	(2023)	(2024)	(2025)	(2026)	(2020)	(2021)	(2022)	(2023)	(2024)	(2025)	(202
GAW1	16.0	10.0	4.0					59	22.0	9.0					66.4	31.0	27.0					150	71.0	63.0				
GAW2	100.0	41.0	8.0					226	93.0	18.0					100.0	55.0	29.5					226	124.0	67.0				
GAW3	100.0	49.0	36.0					226	112.0	81.0					100.0	64.0	64.0					226	145.0	146.0				
GAW4	100.0	91.0	88.0					226	206.0	200.0					100.0	91.0	88.0					226	205.0	200.0				
GAW5	38.0	24.0	0.0					87	55.0	0.0					92.0	49.0	0.0					208	111.0	0.0				
GAW6	54.8	30.0	8.0					124	69.0	19.0					100.0	41.0	20.0					226	92.0	45.0				
GAW7	100.0	57.0						226	130.0	3.0					100.0	75.0	7.0					226	169.0	15.0				
GAW8	76.5	91.0	3.0					173	206.0	6.0					91.6	91.0	13.0					207	205.0	29.0				
GAW9	100.0	56.0	8.0					226	127.0	19.0					100.0	68.0	34.0					226	154.0	77.0				1
GAW10	100.0	91.0	51.0					226	206.0	116.0					100.0	91.0	71.0					226	205.0	161.0				1
GAW11	100.0	58.0	6.0					226	132.0	13.0					100.0	90.0	24.0					226	203.0	54.0				<u> </u>
GAW12	100.0	91.0	25.0					226	206.0	56.0					100.0	91.0	70.0					226	205.0	160.0				1

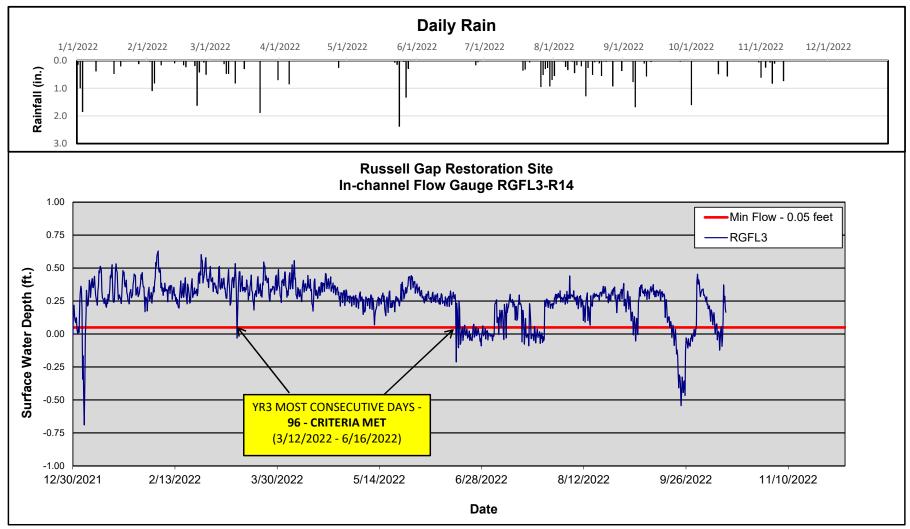
# Figure 6. Flow Gauge Success

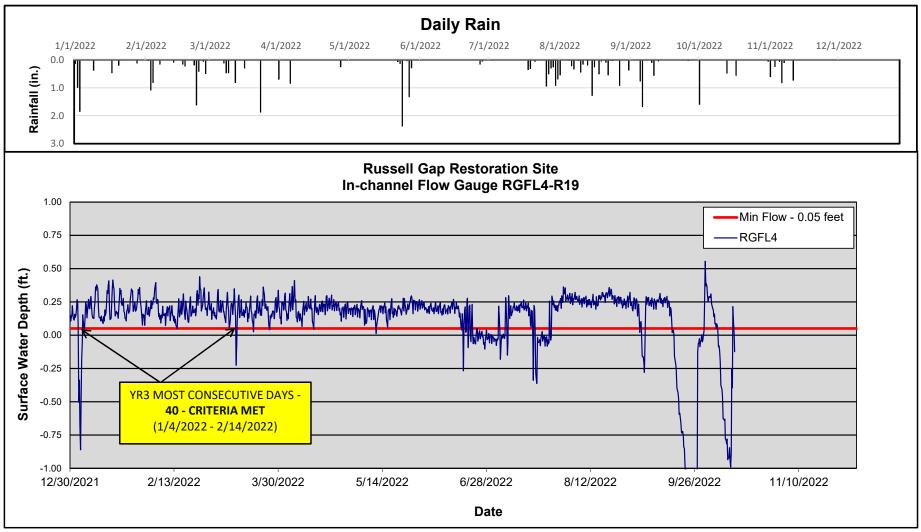


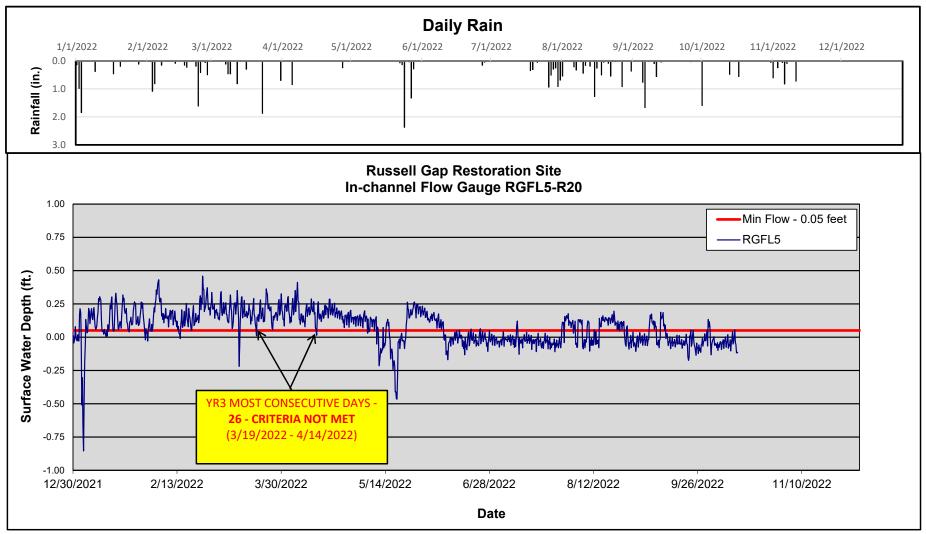


<sup>\*</sup> Surface water flow is estimated to have occurred when the pressure transducer reading is equal to or above 0.05 feet in depth.



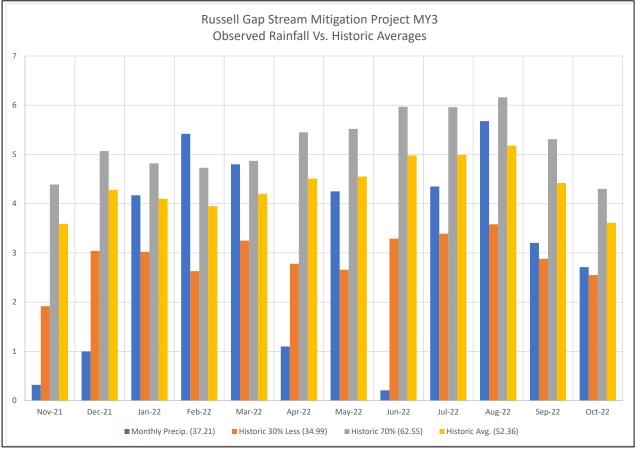






		Мо	st Consecut	ive Days M	eeting Crite	ria <sup>1</sup>			(	Cumulative	Days Meeti	ng Criteria	2	
Flow Gauge ID	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)	Year 6 (2025)	Year 7 (2026)	Year 1 (2020)	Year 2 (2021)	Year 3 (2022)	Year 4 (2023)	Year 5 (2024)	Year 6 (2025)	Year 7 (2026)
					Flow (	Gauges (In	stalled Ma	rch, 2020)						
RGFL1	64.0	103.0	98.0					209.0	146.0	207.0				
RGFL2	202.0	3.0	3.0					222.0	12.0	62.0				
RGFL3	232.0	42.0	96.0					232.0	93.0	231.0				
RGFL4	232.0	76.0	40.0					232.0	206.0	219.0				
RGFL5	232.0	38.0	26.0					232.0	214.0	138.0				
lotes:														
ndicates the number	r of consecuti	ve days withi	n the monitor	ing year wher	e flow was m	easured.								
ndicates the numbe	r of cumulativ	ve days within	n the monitori	ng year where	e flow was me	easured.								

Figure 7. Observed Rainfall Versus Historic Averages



Note: Historic average annual rainfall for Alexander County, NC is 52.36 inches, while the observed project rainfall recorded a total of 37.21 inches over the previous 12 months (Nov. 21 - Oct. 2022). Project rainfall data was collected from the NC-CRONOS station TAYL.