FINAL-MY3 Monitoring Report
Seniard Creek Mitigation Site

Henderson County
French Broad River Basin
Cataloging Unit # 06010105

NCDMS Project No. 100017
NCDMS Contract No. 7189
DMS RFP No. 16-006991
USACE Action ID: SAW-2017-01571 **DWR#** 20171160
Data Collected: May 2023- Nov 2023

Prepared for:

North Carolina Department of Environmental Quality
Division of Mitigation Services
1652 Mail Service Center
Raleigh N C 27699-1652

Mitigation Services
ENVIRONMENTAL QUALITY

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Prepared for:

EW SOLUTIONS

14 O'Henry Avenue, Suite 206
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Prepared by:

EQUINOX

balance through proper planning

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January 31, 2024

Harry Tsomides
Project Manager
NCDEQ-DMS
Asheville Regional Office
2090 U.S. 70 Highway

Subject: RE: Draft MY3 Monitoring Report
Seniard Creek Site, Henderson County
French Broad River CU 06010105
DMS Project ID No. 100017 / DEQ Contract #7189

Dear Harry,

EWS received and reviewed the comments for the Seniard Creek Site Draft MY3 Monitoring Report from DMS on January 11, 2024. The following are the responses to those comments/questions (**IN RED**):

Report Comments

- At the 2023 IRT Credit Release Meeting, the IRT requested an additional random vegetation transect/ plot in the low-density supplemental planting area reported in the prior year's (MY2) monitoring report. Data for an added random plot is shown in the vegetation table (Plot 11R) however it is not mentioned in the report narrative, performance table, or apparently mapped. Please provide the required additional background and data/information for the plot. In addition, please make the naming convention consistent; the plot name should match the name with the Vegetation Performance Standards Summary Table. **References to the random vegetation plot changed from the default naming output to maintain consistency**. **Table 7a added**.

- EWS reported at the 2023 Credit Release meeting that supplemental planting was planned in the next dormant season (2023-24), however this is not mentioned in the report. Does EWS plan to conduct supplemental planting in the 2023-24 dormant season? If so, can EWS provide information on the planned planting event (areas, acreage, species, quantities)? **In light of Duke Energy Carolina's intent to move the overhead powerline, (listed as a current encroachment). EWS plans to conduct supplemental planting in areas impacted by maintenance of the overhead powerline right-of-way. Timing, acreage, of this planting effort will be dependent on when the overhead line has been moved and no additional impacts to the area are likely. Species will be selected from the approved species list within the Mitigation plan and by availability.**

- Thank you for voluntarily upgrading the performance and goals table to include cumulative monitoring results. This is much appreciated.

- Please provide the Vegetation Plot Criteria Attainment MY3 (2023) table for the project. **Added**

- At the 2023 IRT Credit Release Meeting, the continuous stage recorders were discussed in regard to data collection & sediment in the stage recorders causing potential data misinterpretation. **Additional text added**. The stream flow data was requested by the IRT after mitigation plan approval. The IRT requested a data table to document the yearly and historical continuous stream flow data on each project reach. Please provide this table. **Table 11b added to report and deliverables.**

- At the 2023 IRT Credit Release Meeting, it was noted that a stream problem area was reported and had been planted with live stakes. The IRT requested a zoomed-out photo in the MY3(2023) report to document the successful progression of the reported stream problem area. Is this available? **Historic and current photo documentation of the bank scour on Sitton Creek and Lee Branch are provided in the Problem Area section of Appendix A. Neither locations are listed as a current problem areas.**

- Please include the year of the aerial imagery; is this the most recent available? **Added footnote to CCPV, to the best of our knowledge this is the most recent imagery.**

- Monitoring providers are responsible for annually checking and reporting on the easement integrity across the project site for encroachments, missing markers, adequate signage, fence breaks, etc. Please provide a narrative indicating how the boundary was checked and what the results were. **Text added to Section 1.6.**

- Thank you for pairing the cross sections with their photos as requested at the 2023 IRT Credit Release Meeting.

Digital Support File Comments

- Looks good, no edits

Please submit two final hard copies, in addition to a flash drive or CD with a PDF of the report and all digital support files (addressing any comments) in the correct file structure. Please include a copy of your response letter, inserted inside the front cover of each hard copy report (and included in the final PDF). P

If you have any questions about these comments, please contact me at (828) 545-7057 or email me at harry.tsomides@ncdenr.gov before running any final copies.

End of DMS Comments_____

Sincerely,

David Tuch
Managing Partner
EW Solutions
14 O' Henry Avenues, Suite 206
Asheville, NC 28801

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1.0 PROJECT SUMMARY

1.1. Project Setting and Background

The Seniard Creek Mitigation Site (Seniard Mitigation Site) is located in the French Broad River Basin (CU 06010105). The Seniard Mitigation Site also lies within the North Fork Mills River Watershed (HUC 060101050403) which is identified as a Targeted Local Watershed (TLW) according to the 2009 French Broad River Basin Restoration Priorities (RBRP) Plan. Project work at the Seniard Site was completed in late February 2021 including construction and monitoring feature installation; bare root and live stake installation was completed in February 2021.

Historic land use at the Seniard Mitigation Site consisted of forestry and agricultural use for at least 65 years, according to historic aerial photos. Historic agricultural practices, relocation of the Seniard and Sitton Creeks had functionally removed the streams' connectivity with the floodplain. One poorly functioning culvert on Seniard Creek has degraded the ecological connectivity of the stream at the head of the Seniard Mitigation Site. The lack of deep-rooted vegetation and unstable channel characteristics have contributed to the degradation of the streambanks on both sides of the project. Ecological function has been restored to the existing streams, wetlands, and riparian corridor by returning the stream channels to a stable condition. The relocation of Seniard and Sitton Creeks to the historic floodplain has restored proper floodplain connectivity. The restoration of the upper Seniard Creek reach addressed a perched culvert by raising the bed elevation. In the mid and downstream reaches of Seniard Creek, the profile of the channel was raised, shifted, and proper channel dimensions were restored. The restoration of the upper Sitton Creek reach focused on realigning the channel, reestablishing dimensions, and floodplain connectivity. Additional measures that promoted functional uplift included stabilizing and revegetating disturbed areas, restoring floodplain connectivity and wetland hydrology, reestablishing wooded riparian areas. These measures contribute to reduced downstream sediment and nutrient loads, as well as improving aquatic and terrestrial habitat.

This project is protected by an 11.68-acre conservation easement and is located approximately 3.7 miles northwest of Mills River, NC in Henderson County at 35.409056° N, -82.627667° W. The Seniard Mitigation Site is bounded by agricultural and residential properties.

1.2. Project Quantities and Credits

The Seniard Mitigation Site has restored a total of 3,637, enhanced 1,462 and preserved 128 linear feet of stream. The project is expected to generate a total of 3,645.949 SMU's (Seniard Stream and Wetland Mitigation Plan - May 27, 2020). Refer to Table 1 for the project components and mitigation credit information and Figure 1 for the Project Asset Map.

1.3. Monitoring Plan Components

A total of sixteen (16) cross-sections, three (3) groundwater monitoring gages, five (5) continuous stage recorders, and two (2) crest gages were initially installed within the restoration and enhancement reaches to evaluate the stream and wetland components. Following the NC Interagency Review Team recommendations, the two crest gauges were removed from the enhancement reaches in MY3. Ten (10) permanent vegetation plots were installed to evaluate the planted areas within the site. Twelve (12) photo

stations were established for visual representation of the site. An additional seven (7) photo stations were added in MY1 at the request of the NC Interagency Review Team.

Table 1. Seniard Creek Mitigation Site (100017) Project Mitigation Quantities and Credits.

Component (Reach ID)	Mitgation Plan Footage (ft)	As-Built (ft)	Mitigation Category	Restoration Level	Mitigation Ration (X:1)	Mitigation Plan Credits	+Comments
Seniard Creek 1A	376	376.509	Cold	R	1:1	376.000	
*Seniard Creek 1B	1213	1198.706	Cold	R	1:1	1213.000	Confluence with Sitton farther upstream than design
*Seniard Creek 2	176	187.521	Cold	R	1:1	176.000	Confluence with Sitton farther upstream than design
*Sitton Creek 1	1095	1070.019	Cold	R	1:1	1095.000	Confluence with Seniard farther upstream than design
*Lee Branch	212	209.48	Cold	R	1:1	212.000	Reduced sinuosity compared to design
David Branch 1A	132	128.298	Cold	P	10:1	13.200	Restoration on David 1B begins upstream compared to design
David Branch 1B	296	296.779	Cold	R	1:1	296.000	
David Branch 1C	226	220.522	Cold	R	1:1	226.000	Longer Non-Creditable section for culvert outfall
Whitaker Branch	416	415.749	Cold	EII	8:1	52.000	
Redmond Branch 1A	1046	1046.569	Cold	EII	7:1	149.429	
Redmond Branch 1B	76	78.036	Cold	R	1:1	76.000	Shorter Non-Creditable section for culvert outfall

*Deviations in As-Built vs. Design footage relate directly to reduction in sinuosity when calculated using As-Built centerline derived from surveyed top of bank.

+ No redlines were displayed on the As-built record drawing due to no significant deviations from the design (<1%).

Project Credits

Restoration Level	Stream (ft)			Wetlands (ac)		
	Warm	Cool	Cold	Riparian	Non-Riparian	Coastal
Restoration			3670.000			
Re-establishment						
Rehabilitation						
Enhancement						
Enhancement I						
Enhancement II			201.429			
Creation						
Preservation			13.200			
Totals^	0	0	3884.629	0	0	0

Stream Credits						
Total Baseline Credit			3884.629			
Credit Loss in Required Buffer			-441.360			
Credit Gained for Additional Buffer			202.680			
Net Change in Credit from Buffers			-238.680			
Total Project Credits^			3645.949			

Overall Asset Summary	
Total Stream Credit	**3,645.949**
Total Wetland Credit	**0.000**

Wetland Mitigation Category

CM Coastal Marsh
R Riparian
NR Non-Riparian

Restoration Level

HQP High Quality Preservation
P Preservation
E Wetland Enhancement - Veg and Hydro
EII Stream Enhancement II
EI Stream Enhancement I
C Wetland Creation
RH Wetland Rehabilitation - Veg and Hydro
REE Wetland Re-establishment Veg and Hydro
R Restoration

^These numbers are 2.701 SMUs less than the the corresponding numbers in the Project Assets (Table 18A) of the approved mitigation plan. This is the result of an error in the approved mitigation plan table. The credit sums in this table are correct.

1.4. Project Performance Standards

The stream restoration performance standards for the project will follow accepted and approved criteria in Table 2 and based on the Final Mitigation Plan - Seniard Creek Mitigation Site (May 27, 2020). Annual monitoring reports will follow the DMS Stream and Wetland Mitigation Plan Template and

Guidance (October 2020). Performance criteria will be evaluated throughout the seven-year monitoring period.

Table 2. Seniard Creek Mitigation Site (100017) Summary Goals, Performance, and Results.

Goal	Objective/Treatment	Likely Functional Uplift	Performance Standard	Measurement	Cumulative Monitoring Results
Provide a stream with natural, stabe forms that supports proper stream function.	Construct stream channels that will maintain proper dimension, pattern and profile.	Reduced erosion, increased habitat heterogeneity, and floodplain connection	□ Riffle section W/D ratios should remain within the range of the appropriate stream type. □ BHR should not exceed 1.2. BHR should not change more than 10% in any given monitoring interval. Changes that do occur should indicate a trend toward stability. □ Entrenchment Ratios should be ≥2.2 for C/E channels and ≥ 1.4 for B Channels. □ Document nearly continuous surface flow.	10-Cross sections, visual assessment and 5-continuous stage recorders.	Both Width-Depth and Entrenchment ratios within specifications or are similar to As-Built for all constructed streams. Surface flow meet standard during MY3.
Improve groundwater hydrology to support recovery of native riparian vegetation.	Construct streams with proper bankfull to floodplain relationship.	Increased landscape connectivity, water transport and storage.	Four bankfull events or greater, in separate years, will be documented during the monitoring period.	*2-Crest gauges, 5-continuous stage recorders, and debris lines.	Three bankful events documented on Seniard Cr, four on Sitton Cr, seven on Lee Br, and a minimum of six on David Br since project completion.
Reduce sediment inputs from eroding stream banks to reduce fine sediment loads and percentage fo fines in the bed-material load.	Construct streams that provide naturally stable dimensions and stabilize constructed banks with appropriate bioengineering.	Reduced eroson, increased sediment transport and storage.	Channel banks should generally remain stable. Where bank migration does occur, it should not exceed 10% of the previous monitored bankfull width and 20% of the original design bankfull width.	Visual assessment and bank pin monitoring as necessary.	No evidence of instability within fixed cross-sections.
Restore proper sediment transport to support channel stability and bedform diversity.	Construct streams that maintain an appropriate sediment transport balance with the sediment that is supplied by the watershed so that the overall stream profile neither aggrades nor degrades over time.	Reduced eroson, increased sediment transport and storage.	Profile adjustments should not indicate significant aggradation or degradation. BHR requirements as stated above.	Longitudinal profile if visual assessment indicates potential instability.	
	Create and improve stream bedform diversity by constructing pools of varied depths and riffles of varied slopes.		Profile should maintain a diversity of depths expressed in riffle/pool forms.	Visual assessment	
Improve substrate quality to facilitate hyporheic flow and support aquatic communities.	Construct stable riffles that provide an improved diversity of bed material clast and a reduction in fines relative to existing conditions.		Substrate material should progress towards or maintain coarser material in riffles and runs with finer material present in pools and glides.	8-Pebble counts at established cross-sections.	Criteria abandonded per Technical Working Group policy change on 9/29/2021
Improve quantity, quality, and diversity of habitats to support healthy aquatic communities.	Construct in-stream habitat features from native material to provide a diversity of habitats.	Improved natural communities and landscape connectivity.	In-stream habitat structures should remain intact and functional.	Visual assessment	

* Gages removed from service following MY2.

Table 2. Seniard Creek Mitigation Site (100017) Summary Goals, Performance, and Results.					
Goal	**Objective/Treatment**	**Likely Functional Uplift**	**Performance Standard**	**Measurement**	**Cumulative Monitoring Results**
Restore continuity of the stream channel by removing barriers to migration.	Provide improved fish passage through previous upstream impediments.	Increased genetic transfer and species distribution.	No standards have been set, but results should present trends in increased fish passage.	Annual electrofishing surveys	Increased relative abundance in MY3 compared to MY1 and pre-construction.
Reduce pollutant in puts to the project stream (nitrogen, phosphorus) to restore a balance to proper nutrient cycles.	Provide a buffer from agricultural activities and row crops.	Reduced sediment and chemical inputs.	Record conservation easement prior to implementation.	Conservation Easement Compliance	
Improve riparian vegetation community to provide temperature regulation of the streams, provide a future source of organic inputs, and aid in long-term channel bank stability.	Plant native climax tree species and understory species in the riparian zone.	Improved natural communities and landscape connectivity.	At project initiation, a minimum of 680 stems/ac are to be planted. Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present, measuring 6ft at MY-5. Minimum of 210 stems/ac present, measuring 8ft at MY-7.	10-Vegetation plots	7 of 10 Permanent Vegetation plots meeting stem/ac critera. 6 of 10 Permanent Vegetation plots meeting ALL criteria.
Restore former riparian areas so that the hydrology and soils will support native vegetative communities and wildlife.	Reconstruct stream channels that are properly connected to the riparian areas.	Increased water, sediment, and organic material transport and storage.	Bankfull elevations and profile should be consistent with valley grade.	Visual assessment	Bankfull events recorded on four reaches.
	Re-grade topography to eliminate ditches and drainage features.	Increased water, sediment, transport and storage.	Floodplain topography should no longer contain lateral ditches or drainage features.	Visual assessment	
	Plant native wetland tree and shrub species.	Improved natural communities and landscape connectivity.	At project initiation, a minimum of 680 stems/ac are to be planted. Minimum of 320 stems/ac present at MY-3. Minimum of 260 stems/ac present, measuring 6ft at MY-5. Minimum of 210 stems/ac present, measuring 8ft at MY-7.	10-Vegetation plots	7 of 10 Permanent Vegetation plots meeting stem/ac critera. 6 of 10 Permanent Vegetation plots meeting ALL criteria.
Improve landscape connectivity that allows space for biotic and abiotic process and provides a source and sink for natural populations.	Establish a conservation easement that provides a minimum buffer from future activities in the adjacent watershed.	Improved natural communities and landscape connectivity.	Record conservation easement prior to implementation.	Conservation Easement Compliance	
Prevent future impacts to the site from development and agricultural uses.					

1.5. Restoration Type and Approach

In restoration reaches activities included excavation of the proposed channels, partial or complete backfilling of existing channels, and removal of spoil berms. Grading was designed to restore floodplain access and mimic natural contours.

In enhancement reaches, no in-channel work was performed. Invasive species were mechanically removed, or chemically treated, and woody stems and live stakes were planted to augment the existing vegetation structure.

1.6. Project Performance

Visual assessment of easement integrity, stream channel, and vegetation was performed on May 2, 2023, during the initial site assessment, and again on October 24, 2023. Visual assessments involved walking the easement boundary, and each stream reach. Visual assessments documented easement integrity, signage, encroachments, signs of channel instability, such as eroding banks, structural instability, and excessive sedimentation.

1.6.1 **Geomorphology**

The two areas along Lee and Sitton Creek identified in MY1 as problem areas, Lee Branch at Station 300+25, and Sitton Creek at Station 211+25, have remained stable through MY3. Lee branch experienced a pulse of sediment related to a heavy storm event during MY1. The area had stabilized and revegetated by MY2. Lee Branch had undergone some bank building over the MY3 season indicating additional sediment inputs from upstream. The heavy riparian vegetation along this reach has trapped most of this deposition and Lee continues to maintain bed and bank. The area of bank scour and slump noted at Sitton Creek Station 211+25 during MY1 has completely revegetated following the installation of live stakes in MY2. No further erosion has taken place in this area following the addition and growth of live stakes (See problem area photographs, Appendix A). No additional areas of concern were identified in MY3.

Geomorphic data for MY3 was completed during November 2023. Summary tables and cross-section data plots related to stream morphology are located in Appendix C. Cross-sectional dimensions remained relatively stable between baseline conditions and MY3 monitoring efforts, with the exception of Lee Branch, discussed above (Table 8, Cross-Section overlays, Appendix C). The site will continue to be monitored for signs of instability. The next site visit is planned for spring 2024.

Pebble counts were not conducted during MY3 citing The Technical Working Groups September 29, 2021 policy change. Pebble counts will not be performed as part of routine monitoring unless a need is identified.

Table 3. Seniard Creek Mitigation Site Attribute Table				
Project Name		Seniard Creek Mitigation Site		
County		Henderson		
Project Area (acres)		11.68		
Project Coordinates (latitude and longitude decimal		35.409056° N, -82.627667° W		
Project Watershed Summary Information				
Physiographic Province		Blue Ridge Mountains		
River Basin		French Broad		
USGS Hydrologic Unit 8-digit	06010105	060101050403		
DWR Sub-basin		04-03-03		
Project Drainage Area (acres)		2310		
Project Drainage Area Percentage of Impervious Area		<1		
Land Use Classification		Cropland (Hayland)		
Reach Summary Information				
Parameters		**Seniard Reach 1A**	**Seniard Reach 1B**	**Seniard Reach 2**
Pre-project length (feet)		443	1272	422
Post-project (feet)		396	1274	176
Valley confinement (Confined, moderately confined,		Moderately Confined	Moderately Confined	Moderately Confined
Drainage area (acres)		826	858	1574
Perennial, Intermittent, Ephemeral		Perennial	Perennial	Perennial
NCDWR Water Quality Classification		WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (existing)		G/F	G	G
Dominant Stream Classification (proposed)		B	B	B
Dominant Evolutionary class (Simon) if applicable		N/A	N/A	N/A
Wetland Summary Information				
Parameters		**Wetland 1**	**Wetland 2**	**Wetland 3**
Pre-project (acres)		N/A	N/A	N/A
Post-project (acres)		N/A	N/A	N/A
Wetland Type (non-riparian, riparian)		N/A	N/A	N/A
Mapped Soil Series		N/A	N/A	N/A
Soil Hydric Status		N/A	N/A	N/A
Regulatory Considerations				
Parameters		**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404		Yes	Yes	SAW-2017-01571
Water of the United States - Section 401		Yes	Yes	DWR # 17-1160
Endangered Species Act		Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act		Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)		No	N/A	N/A
Essential Fisheries Habitat		No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table				
Project Name		Seniard Creek Mitigation Site		
County		Henderson		
Project Area (acres)		11.68		
Project Coordinates (latitude and longitude decimal		35.409056° N, -82.627667° W		
Project Watershed Summary Information				
Physiographic Province		Blue Ridge Mountains		
River Basin		French Broad		
USGS Hydrologic Unit 8-digit	06010105	060101050403		
DWR Sub-basin		04-03-03		
Project Drainage Area (acres)		2310		
Project Drainage Area Percentage of Impervious Area		<1		
Land Use Classification		Cropland (Hayland)		
Reach Summary Information				
Parameters		**Sitton Creek Reach 1**	**Lee Branch Reach 1**	**Whitaker Branch Reach 1**
Pre-project length (feet)		1105	129	426
Post-project (feet)		1236	226	426
Valley confinement (Confined, moderately confined,		Moderately Confined	Moderately Confined	Moderately Confined
Drainage area (acres)		633	13	26
Perennial, Intermittent, Ephemeral		Perennial	Perennial	Perennial
NCDWR Water Quality Classification		WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (existing)		G	G	B
Dominant Stream Classification (proposed)		B	B	B
Dominant Evolutionary class (Simon) if applicable		N/A	N/A	N/A
Wetland Summary Information				
Parameters		**Wetland 1**	**Wetland 2**	**Wetland 3**
Pre-project (acres)		N/A	N/A	N/A
Post-project (acres)		N/A	N/A	N/A
Wetland Type (non-riparian, riparian)		N/A	N/A	N/A
Mapped Soil Series		N/A	N/A	N/A
Soil Hydric Status		N/A	N/A	N/A
Regulatory Considerations				
Parameters		**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404		Yes	Yes	SAW-2017-01571
Water of the United States - Section 401		Yes	Yes	DWR # 17-1160
Endangered Species Act		Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act		Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)		No	N/A	N/A
Essential Fisheries Habitat		No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table				
Project Name		Seniard Creek Mitigation Site		
County		Henderson		
Project Area (acres)		11.68		
Project Coordinates (latitude and longitude decimal		35.409056° N, -82.627667° W		
Project Watershed Summary Information				
Physiographic Province		Blue Ridge Mountains		
River Basin		French Broad		
USGS Hydrologic Unit 8-digit	06010105	060101050403		
DWR Sub-basin		04-03-03		
Project Drainage Area (acres)		2310		
Project Drainage Area Percentage of Impervious Area		<1		
Land Use Classification		Cropland (Hayland)		
Reach Summary Information				
Parameters		**David Branch 1A**	**David Branch 1B**	**David Branch 1C**
Pre-project length (feet)		132	224	165
Post-project (feet)		132	335	273
Valley confinement (Confined, moderately confined,		Moderately Confined	Moderately Confined	Moderately Confined
Drainage area (acres)		6	6	26
Perennial, Intermittent, Ephemeral		Perennial	Perennial	Perennial
NCDWR Water Quality Classification		WSII, TR, HQW	WSII, TR, HQW	WSII, TR, HQW
Dominant Stream Classification (existing)		B	G	G
Dominant Stream Classification (proposed)		B	B	B
Dominant Evolutionary class (Simon) if applicable		N/A	N/A	N/A
Wetland Summary Information				
Parameters		**Wetland 1**	**Wetland 2**	**Wetland 3**
Pre-project (acres)		N/A	N/A	N/A
Post-project (acres)		N/A	N/A	N/A
Wetland Type (non-riparian, riparian)		N/A	N/A	N/A
Mapped Soil Series		N/A	N/A	N/A
Soil Hydric Status		N/A	N/A	N/A
Regulatory Considerations				
Parameters		**Applicable?**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404		Yes	Yes	SAW-2017-01571
Water of the United States - Section 401		Yes	Yes	DWR # 17-1160
Endangered Species Act		Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act		Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)		No	N/A	N/A
Essential Fisheries Habitat		No	N/A	N/A

Table 3 cont. Seniard Creek Mitigation Site Attribute Table				
Project Name		Seniard Creek Mitigation Site		
County		Henderson		
Project Area (acres)		11.68		
Project Coordinates (latitude and longitude decimal		35.409056° N, -82.627667° W		
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Physiographic Province		Blue Ridge Mountains		
River Basin		French Broad		
USGS Hydrologic Unit 8-digit	06010105	060101050403		
DWR Sub-basin		04-03-03		
Project Drainage Area (acres)		2310		
Project Drainage Area Percentage of Impervious Area		<1		
Land Use Classification		Cropland (Hayland)		
Reach Summary Information				
Parameters		**Redmond Branch 1A**	**Redmond Branch 1B**	
Pre-project length (feet)		1066	40	
Post-project (feet)		1054	94	
Valley confinement (Confined, moderately confined,		Moderately Confined	Moderately Confined	
Drainage area (acres)		45	45	
Perennial, Intermittent, Ephemeral		Perennial	Perennial	
NCDWR Water Quality Classification		WSII, TR, HQW	WSII, TR, HQW	
Dominant Stream Classification (existing)		B	G	
Dominant Stream Classification (proposed)		N/A	B	
Dominant Evolutionary class (Simon) if applicable		N/A	N/A	
Wetland Summary Information				
Parameters		**Wetland 1**	**Wetland 2**	**Wetland 3**
Pre-project (acres)		N/A	N/A	N/A
Post-project (acres)		N/A	N/A	N/A
Wetland Type (non-riparian, riparian)		N/A	N/A	N/A
Mapped Soil Series		N/A	N/A	N/A
Soil Hydric Status		N/A	N/A	N/A
Regulatory Considerations				
Parameters		**Applicable**	**Resolved?**	**Supporting Docs?**
Water of the United States - Section 404		Yes	Yes	SAW-2017-01571
Water of the United States - Section 401		Yes	Yes	DWR # 17-1160
Endangered Species Act		Yes	Yes	04EN1000-2017-SLI-0139
Historic Preservation Act		Yes	Yes	ER 17-1172
Coastal Zone Management Act (CZMA or CAMA)		No	N/A	N/A
Essential Fisheries Habitat		No	N/A	N/A

1.6.2 **Vegetation**

Visual assessment of vegetation indicates that the herbaceous vegetation is well established throughout the project with one bare area noted. Monitoring of permanent (n=10) and one (1) temporary vegetation plot was completed in October 2023. MY3 stems/acre and ranged from 40 to 769 stems per acre. Fifteen species were documented within the vegetation monitoring plots. Summary tables and photographs associated with MY3 vegetation monitoring are located in Appendix B and Appendix C. MY3 monitoring data indicates that all but three permanent vegetation plots were meeting the MY3 interim success criteria of 320 planted stems per acre (Table 6 and 7, Appendix C). Plots 6, 7, 9 and 10 contain dominant species percentages greater than or equal to 50%. In all four cases volunteer recruitment has either surpassed planted stem density or low survival has resulted in the changes in species composition. Similarly, the same veg plots were identified as having low species counts. In the case of plot #6, standing surface water and soil saturation has limited stem survival to only the most hydrophytic species. Plot #7 has had generally poor survival, presumably due to poor soil conditions. Vegetation plot

nine had been previously impacted by a mowing encroachment in MY1, and again by an overhead right-of-way crew in MY3. The overhead right-of-way is slated to be moved adjacent to the conservation easement. Following realignment, the impacted area will be replanted with height appropriate stems. Veg plot #10 contains a stand of previously established alders which have shaded some planted stems and allowed for increased establishment of volunteer alder seedlings. The one temporary plot established to evaluate stem density and heights within a noted "bare area" was meeting performance standards. Plots will continue to be monitored for stem survival and growth throughout the life of the project.

Areas of exotic vegetation are depicted within the CCPV, Appendix A. Multiflora rose (*Rosa multiflora*), Asiatic bittersweet (*Celastrus orbiculatus*) and English Ivy (*Hedera helix*) remain the dominant observed species. Invasive vegetation was identified in moderate density along Seniard Creek 1A and low density and in limited areas scattered throughout the site. The majority of Sitton Creek has few invasives. One stand of Cattail (*Typha latifolia*) was identified in moderate density in and around vegetation plot #6 which extends downstream and south-southeast. Location and general densities of invasive vegetation can be found in Table 5 and the CCPV, Appendix A.

1.6.3 **Hydrology**

The area between Stations 205+00 and 210+00 along Sitton Creek has been monitored for an increased hydrological influence since construction. This area was anticipated to form riparian wetland, thereby providing functional uplift. This area is non-creditable but has been monitored since MY0 to provide evidence of the functional uplift to the system. GG2 continues to exceed the typical performance criteria of 12% (Groundwater gauges, Appendix D). The wetland area between Lee Branch and Sitton Creek continues to maintain strong hydrology and wetland vegetation through the drought conditions experienced during the 2023 monitoring period (Photo Stations and CCPV, Appendix A, and Drought.gov). These areas will continue to be monitored through photographic documentation and existing groundwater wells.

Three reaches, Lee, David 1B, and David 1C are being monitored for continuous surface flow using Onset Hobo water level loggers. Following casing elevation adjustments in early 2022, detectability at lower flow has been improved. David Branch 1B and 1C maintained a measurable surface flow for 303 consecutive days and 283 consecutive days, respectively. Lee Branch maintained a measurable surface flow for 302 consecutive days.

Since project completion in early 2021, ten bankfull events have been documented within the Seniard Creek Site. Based on precipitation and stage recorder data the events were recorded over 3 days in 2021; March 25, August 17, October 6; four events in 2022; April 12, May 6, July 3-5, and August 2; three events in 2023, August 21, September 18, and 30th (Table 12, Appendix D). Three events were documented on Seniard, four on Sitton Creek, seven on Lee Branch, and a minimum of six on David Branch. Crest gages were removed from both Redmond Branch and Whitaker Branch in MY3 on the advisement of the NC IRT.

1.6.4 **Additional Information**

MY3 marked the third year of post construction fish monitoring. Preconstruction data identified five fish species with very low abundance downstream of the perched culvert. The MY1 survey identified a similar number of fish species with a 3-fold increase in abundance. Showing a similar trend, the MY2 survey identified an additional three species with a two-fold increase in overall abundance. The downstream reach had a large bump in number mainly due to the significant number of juvenile sculpin collected. A similar trend was noted upstream of the culvert. MY3 results were similar to MY2 with

regard to species diversity. Preconstruction data identified one individual fish above the culvert. Five fish representing three species were collected in MY1 and seven fish representing five species in MY2. MY3 data collection was complicated by a bald-faced hornets' nest mid-reach. Regardless, seven fish representing four species were collected. A more detailed report on the MY3 fisheries survey is available in Appendix F.

During the MY1 monitoring period a utility easement was documented crossing Whitaker Branch. Negotiations between DMS and Duke Energy has resulted in plans to realign the overhead wire to avoid the conservation easement. EWS along with DMS staff marked the easement to facilitate planning the future alignment to avoid the easement.

2.0 REFERENCES

Lee, Michael T., R.K. Peet, S.D. Roberts, and T.R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2 (http://cvs.bio.unc.edu/methods.htm).

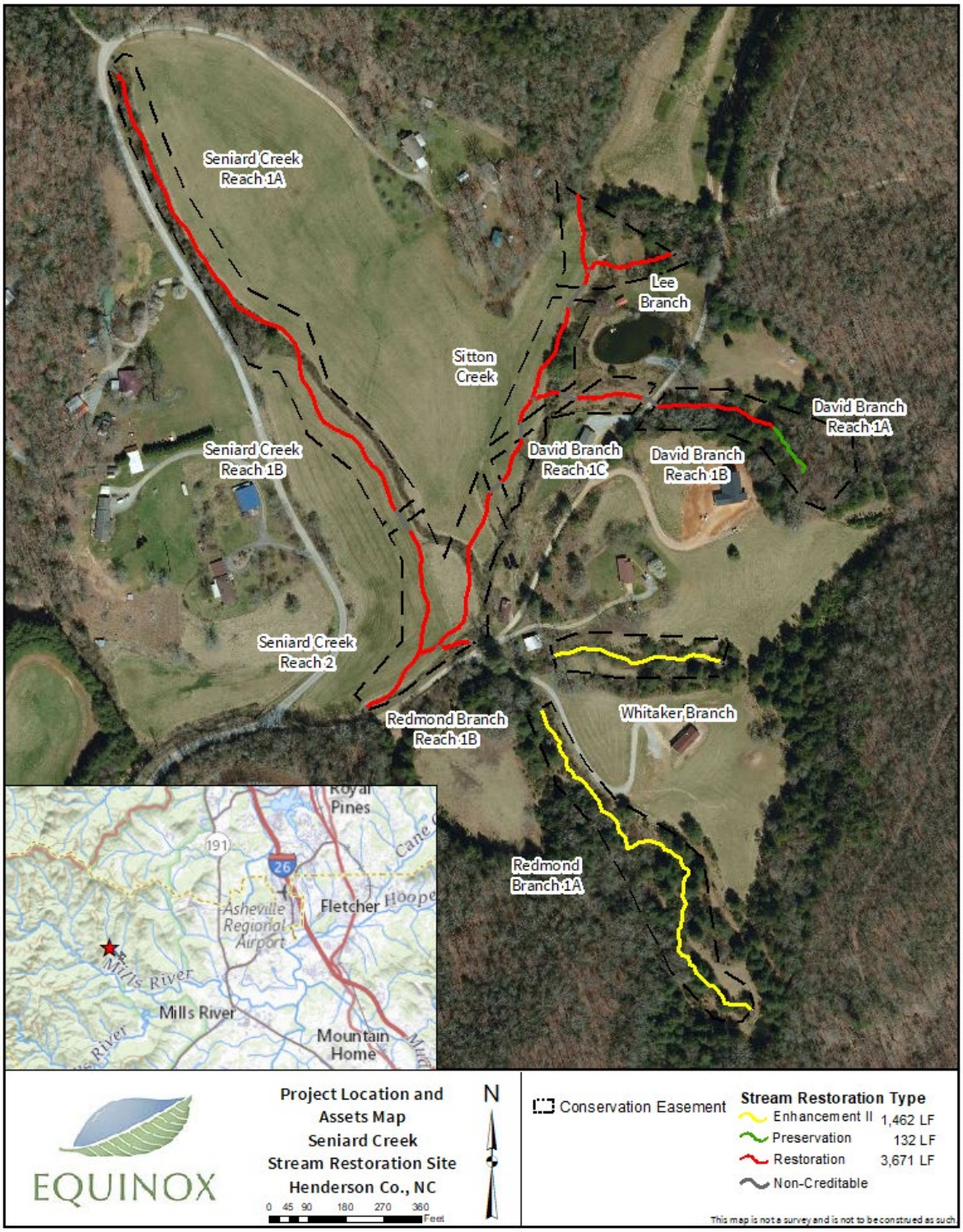
National Integrated Drought information System (Drought.gov). https://www.drought.gov/states/north-carolina#historical-conditions Accessed November 30, 2023.

NCDMS Stream and Wetland Mitigation Annual Monitoring Template (October 2020).

NCDMS Veg Table Production Tool, Version (8/23/2021). https://ncdms.shinyapps.io/Veg_Table_Tool/

Stantec Consulting, Inc. 2020. Final Mitigation Plan – Seniard Mitigation Site (May 27, 2020). Prepared for the North Carolina Department of Environmental Quality, Division of Mitigation Services. DMS Project No. 100017.

3.0 FIGURE 2. PROJECT LOCATION AND ASSETS MAP



Sheet 2
Sheet 3
Sheet 4
Sheet 1
Lee Branch
David Branch 1A
David Branch 1B
David Branch 1C
Sitton Creek 1
Whitaker Branch
Seniard Creek 1A
Seniard Creek 1B
Redmond Branch 1B
Redmond Branch 1A
Seniard Creek 2

EQUINOX

CCPV MY3
Sheet Key
Seniard Creek
Stream Restoration Site
Henderson Co., NC
Orthoimagery 2022 (latest available)

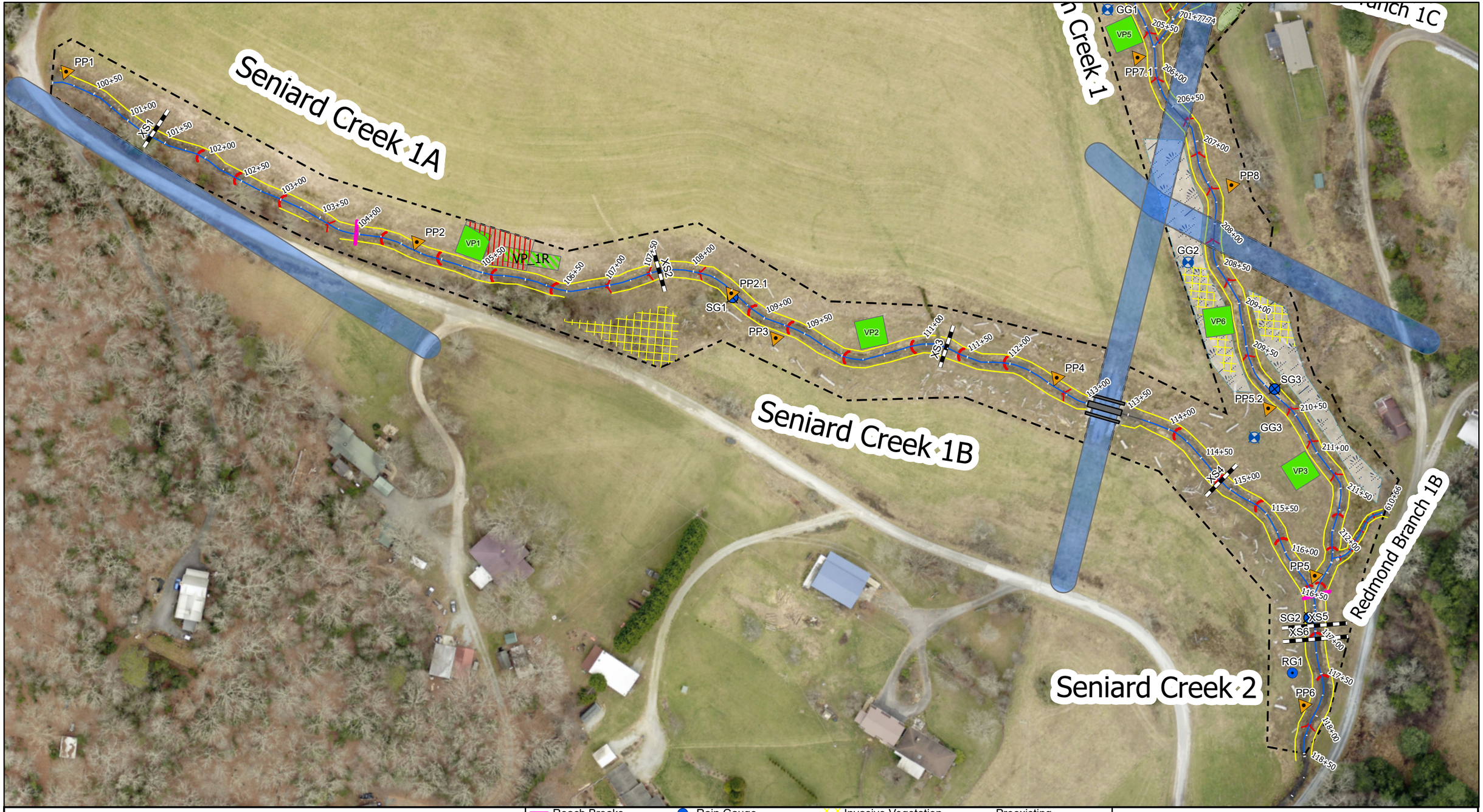
Restoration Type
- Enhancement II
- Preservation
- Restoration
- No Credit

- Reach Breaks
- Utility Easement
- Conservation Easement

N

0 65 130 260 390 520 Feet

This map is not a survey and is not to be construed as such.



EQUINOX

CCPV MY3
Sheet
Seniard Creek Stream Restoration Site
Henderson Co., NC
November, 2023

- Reach Breaks
- Project Installed Culverts
- Utility Easement
- Photo Stations
- Continuous Stage Recorder
- Groundwater Gauge
- Rain Gauge
- Cross Section
- Bare Areas

Random Veg Plot
- Meeting

Vegetation Plot
- Meeting

- Invasive Vegetation
- Encroachment

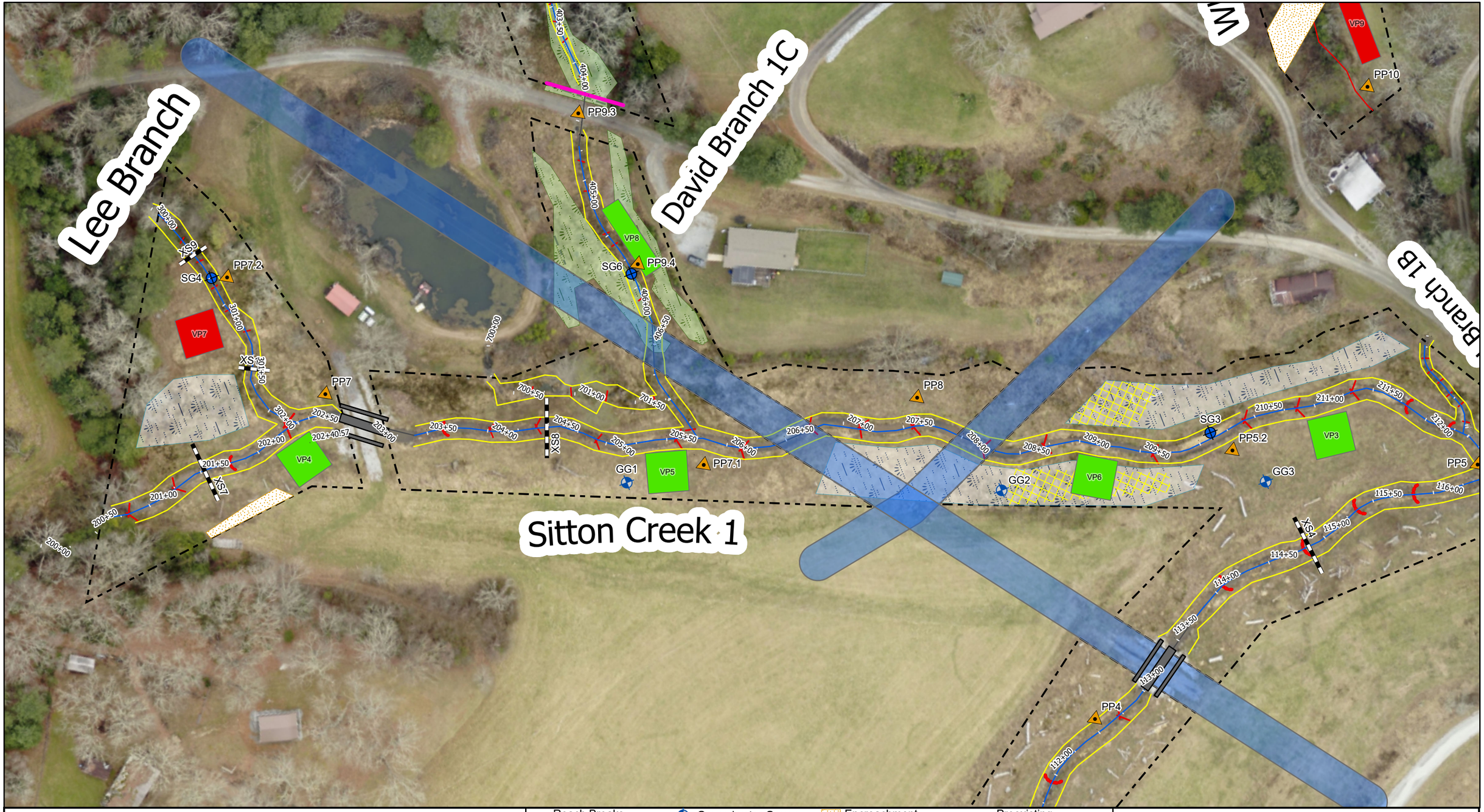
Restoration Type
- Restoration
- No Credit
- Top of Bank

- Preexisting Jurisdictionally Determined Wetlands
- Potential Non-Creditable Wetland Restoration Areas
- Conservation Easement

N

0 40 80 160 240 320 Feet

This map is not a survey and is not to be construed as such.



CCPV MY3
Sheet
Seniard Creek Stream Restoration Site
Henderson Co., NC
November, 2023

EQUINOX

- Reach Breaks
- Project Installed Culverts
- Utility Easement
- Photo Stations
- Continuous Stage Recorder
- Groundwater Gauge
- Cross Section

Vegetation Plot
- Meeting
- Failing
- Invasive Vegetation

- Encroachment

Restoration Type
- Enhancement II
- Restoration
- No Credit
- Top of Bank

- Preexisting Jurisdictionally Determined Wetlands
- Potential Non-Creditable Wetland Restoration Areas
- Conservation Easement

N

0 25 50 100 150 200 Feet

This map is not a survey and is not to be construed as such.

EQUINOX

CCPV MY3
Sheet
Seniard Creek Stream Restoration Site
Henderson Co., NC
November, 2023

- Reach Breaks
- Project Installed Culverts
- Utility Easement
- Photo Stations
- Continuous Stage Recorder
- Groundwater Gauge
- Cross Section

Vegetation Plot
- Meeting

Restoration Type
- Preservation
- Restoration
- No Credit
- Top of Bank
- Preexisting Jurisdictionally Determined Wetlands
- Potential Non-Creditable Wetland Restoration Areas
- Conservation Easement

N

0 20 40 80 120 160 Feet

This map is not a survey and is not to be construed as such.

EQUINOX

CCPV MY3
Sheet
Seniard Creek Stream Restoration Site
Henderson Co., NC
November, 2023

- Utility Easement
- Photo Stations
- Cross Section

Vegetation Plot
- Failing
- Encroachment

Restoration Type
- Enhancement II
- Restoration
- Top of Bank
- Preexisting Jurisdictionally Determined Wetlands

- Potential Non-Creditable Wetland Restoration Areas
- Conservation Easement

N

0 25 50 100 150 200 Feet

This map is not a survey and is not to be construed as such.

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Appendix A
Visual Assessment Data

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Table 4. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Seniard Reach 1A - Restoration PII Assessed Length 396 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	4	4			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	4	4			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	4	4			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	4	4			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Seniard Reach 1B - Restoration PI Assessed Length 1274 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	19	19			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	19	19			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	19	19			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	19	19			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	19	19			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Seniard Reach 2 - Restoration PI Assessed Length 176 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered 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 sills or arms.	3	3			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	3	3			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	3	3			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Sitton Reach 1 - Restoration PI Assessed Length 1236 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	100%
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	96%
				Totals	0	0	100%	N/A	N/A	96%
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	22	22			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	22	22			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	22	22			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	22	22			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	22	22			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Lee Reach 1 - Restoration PII Assessed Length 226 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	8	8			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	8	8			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	8	8			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	8	8			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	8	8			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - David Reach 1A - Preservation Assessed Length 132 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.					N/A			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - David Reach 1B - Restoration PI&II Assessed Length 335 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	16	16			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	16	16			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	16	16			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	16	16			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	16	16			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - David Reach 1C - Restoration PI Assessed Length 273 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	7	7			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	7	7			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	7	7			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	7	7			100%			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Whitaker Reach 1 - Enhancement II Assessed Length 426 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.					N/A			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Redmond Reach 1A - Enhancement II Assessed Length 1054 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.					N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.					N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.					N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.					N/A			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.					N/A			

N/A - Item does not apply.

Table 4 cont. Visual Stream Morphology Stability Assessment Seniard Mitigation Site - Redmond Reach 1B - Restoration PI Assessed Length 94 feet (May 2 and Oct 24, 2023)										
Major Channel Category	**Channel Sub-Category**	**Metric**	**Number Stable, Performing as Intended**	**Total Number in As-built**	**Number of Unstable Segments**	**Amount of Unstable Footage**	**% Stable, Performing as Intended**	**Number with Stabilizing Woody Vegetation**	**Footage with Stabilizing Woody Vegetation**	**Adjusted % for Stabilizing Woody Vegetation**
1. Bank	**1. Scoured / Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion.			0	0	100%	0	0	100%
	2. Undercut	Banks undercut/overhanging to the extent that mass wasting appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	0	100%	N/A	N/A	N/A
	3. Mass Wasting	Bank slumping, calving, or collapse.			0	0	100%	N/A	N/A	N/A
				Totals	0	0	100%	N/A	N/A	N/A
2. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	6	6			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	6	6			100%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	6	6			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence does NOT exceed 15%.	6	6			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth Ratio ≥ 1.6. Rootwads/logs providing some cover at base-flow.	6	6			100%			

N/A - Item does not apply.

Table 5. Vegetation Condition Assessment Seniard Mitigation Site						
Planted Acreage: 7.4 (Assessed May 2 and October 24, 2023)						
Vegetation Category	**Definitions**	**Mapping Threshold**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres		1	0.09	1.22%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres		0	0	0.00%
			Total	1	0.09	1.22%
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	n/a	0	0	0.00%
			Cumulative Total	1	0.09	1.22%
Easement Acreage:	**11.8**					
Vegetation Category	**Definitions**	**Mapping Threshold**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Easement Acreage**
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale). High Density	1000 SF		0	0	0.00%
	Areas or points (if too small to render as polygons at map scale). Low Density	1000 SF		3	0.22	1.86%
***5. Easement Encroachment Areas**	Areas or points (if too small to render as polygons at map scale).	none		2	0.11	0.93%

* Easement Encroachment Areas were not duplicated in the Low Stem Density Areas category.

Photo Point 1. Facing downstream

Photo Point 2. Facing downstream

Photo Point 2. Facing upstream

Photo Point 2.1 Seniard Creek Reach 1 Stage Recorder and Pre-existing Wetland.

Photo Point 3. Facing downstream

Photo Point 3. Facing upstream.

Photo Point 4. Facing downstream

Photo Point 4. Facing downstream through culvert.

Photo Point 4. Facing upstream.

Photo Point 4.1. Facing downstream

Photo Point 4.1. Facing upstream.

Photo Point 5. Facing downstream.

Photo Point 5. Facing upstream Seniard Creek

Photo Point 5. Facing upstream Sitton Creek and Redmond Br.

Photo Point 6. Facing downstream

Photo Point 6. Facing upstream

Photo Point 7. Facing upstream Lee Branch

Photo Point 7. Facing upstream Sitton Creek

Photo Point 7.1 Facing upstream David Branch.

Photo Point 7.2 Facing downstream Lee Branch.

Photo Point 7.2 Stage Recorder Lee Branch.

Photo Point 7.3 Facing downstream Sitton Branch culvert.

Photo Point 7.3 Facing upstream Sitton Branch culvert.

Photo Point 8. Facing downstream

Photo Point 8. Facing upstream

Photo Point 9. Facing downstream

Photo Point 9.1 David Branch 1B DS

Photo Point 9.1 David Branch 1B stage recorder.

Photo Point 9.2 David Branch 1B US.

Photo Point 9.3 David Branch 1B US.

Photo Point 9.3 David Branch 1B DS.

Photo Point 9.3 David Branch 1B US culvert.

Photo Point 9.4 Facing downstream, David Branch.

Photo Point 9.4 David Branch 1C Stage Recorder.

Photo Point 10. Facing downstream.

Photo Point 10. Facing upstream.

Photo Point 11. Facing downstream.

Photo Point 12. Facing downstream.

Photo Point 12. Facing upstream.

Cross Section 1, Left descending bank.

Cross Section 1, Right descending bank

Cross Section 2, Left descending bank.

Cross Section 2, Right descending bank.

Cross Section 3, Left descending bank.

Cross Section 3, Right descending bank.

Cross Section 4, Left descending bank.

Cross Section 4, Upstream.

Cross Section 5 and 6, Left descending bank.

Cross Section 5 and 6, Right descending bank.

Cross Section 7, Left descending bank.

Cross Section 7, Right descending bank.

Cross Section 8, Left descending bank.

Cross Section 8, Right descending bank.

Cross Section 9, Left descending bank.

Cross Section 9, Right descending bank.

Cross Section 10, Left descending bank.

Cross Section 10, Right descending bank.

Cross Section 11, Left descending bank.

Cross Section 11, Right descending bank.

Cross Section 12, Left descending bank.

Cross Section 12, Right descending bank.

Cross Section 13, Left descending bank.

Cross Section 13, Right descending bank.

Cross Section 14, Left descending bank.

Cross Section 14, Right descending bank.

Cross Section 15, Left descending bank.

Cross Section 15, Right descending bank.

Cross Section 16, Left descending bank.

Cross Section 16, Right descending bank.

Problem Areas

MY1 (2021) Sitton Creek Station 211+25 facing downstream.

MY3 (2023) Sitton Creek Station 211+25 facing downstream.

MY1 (2021) Lee Branch Station 300+25 facing upstream.

MY3 (2023) Lee Branch Station 300+25 facing upstream.

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Appendix B
Vegetation Plot Data

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Planted AB2:C29creage	7.4
Date of Initial Plant	2021-02-26
Date(s) of Supplemental Plant(s)	2022-02-25
Date(s) Mowing	2023-10-31
Date of Current Survey	2023-10-31
Plot size (ACRES)	0.0247

Table 6. Vegetation Plot Data
Seniard Creek Mitigation Site MY3 (2023)

	Scientific Name	Common Name	Tree/Shrub	Indicator Status	Veg Plot 1 F		Veg Plot 2 F		Veg Plot 3 F		Veg Plot 4 F		Veg Plot 5 F		Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot 10 F		Veg Plot 1 R
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total	Total
Species Included in Approved Mitigation Plan	Alnus serrulata	hazel alder	Tree	OBL	1	2	2	3	2	2	3	3	3	3					3	3			1	4	3
	Betula nigra	river birch	Tree	FACW	1	1					2	2							2	2			2	3	1
	Carpinus caroliniana	American hornbeam	Tree	FAC			1	1	1	1			1	1											2
	Cornus amomum	silky dogwood	Shrub	FACW										1	4	4			4	4					1
	Diospyros virginiana	common persimmon	Tree	FAC	1	1																			
	Hamamelis virginiana	American witchhazel	Tree	FACU	3	3	1	1			1	1	1	1											
	Ilex verticillata	common winterberry	Tree	FACW	1	1	1	1	1	1	1	1													
	Liriodendron tulipifera	tuliptree	Tree	FACU													3	4			2	2			
	Platanus occidentalis	American sycamore	Tree	FACW	4	4	1	1	2	2			1	1					1	1					
	Quercus sp.								1	1			1	1											
	Salix nigra	black willow	Tree	OBL	1	6					1	1			1	11									3
	Salix sericea	silky willow	Shrub	OBL	1	1	1	1	2	2	1	1	3	3											
Sum	Performance Standard				13	19	7	8	9	9	9	9	10	11	5	15	3	4	10	10	2	2	3	7	10
Post Mitigation Plan Species	*Acer rubrum*	*red maple*	*Tree*	*FAC*														*1*		*2*				*1*	
	Prunus serotina	*black cherry*	*Tree*	*FACU*																*1*					
	Quercus imbricaria	shingle oak	Tree	FAC									1	1			2	2							1
Sum	Proposed Standard				13	19	7	8	9	9	9	9	11	12	5	15	5	6	10	10	2	2	3	7	11
Mitigation Plan Performance Standard	Current Year Stem Count					19		8		9		9		11		15		4		10		2		7	10
	Stems/Acre					769		324		364		364		445		445		121		405		40		283	405
	Species Count					8		6		6		6		7		2		1		4		1		2	5
	Dominant Species Composition (%)					32		38		22		33		25		73		57		31		100		50	27
	Average Plot Height (ft.)					2		3		2		3		2		6		1		2		2		2	2
	% Invasives					0		0		0		0		0		0		0		0		0		0	0
Post Mitigation Plan Performance Standard	Current Year Stem Count					19		8		9		9		12		15		6		10		2		7	11
	Stems/Acre					769		324		364		364		486		445		202		405		40		283	445
	Species Count					8		6		6		6		8		2		2		4		1		2	6
	Dominant Species Composition (%)					32		38		22		33		25		73		57		31		100		50	27
	Average Plot Height (ft.)					2		3		2		3		2		6		1		2		2		2	2
	% Invasives					0		0		0		0		0		0		0		0		0		0	0

1). Bolded species are proposed for the current monitoring year, italicized species are not approved, and a regular font indicates that the species has been approved.
2). The "Species Included in Approved Mitigation Plan" section contains only those species that were included in the original approved mitigation plan. The "Post Mitigation Plan Species" section includes species that are being proposed through a mitigation plan addendum for the current monitoring year (bolded) , species that have been approved in prior monitoring years through a mitigation plan addendum (regular font), and species that are not approved (italicized).
3). The "Mitigation Plan Performance Standard" section is derived only from stems included in the original mitigation plan, whereas the "Post Mitigation Plan Performance Standard" includes data from mitigation plan approved, post mitigation plan approved, and proposed stems.

Table 7. Vegetation Performance Standards Summary Table
Seniard Creek Mitigation Site MY3 (2023)

	Veg Plot 1 F				Veg Plot 2 F				Veg Plot 3 F			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	769	2	8	0	324	3	6	0	364	2	6	0
Monitoring Year 2	688	2	8	0	405	1	7	0	324	2	5	0
Monitoring Year 1	526	1	8	0	405	1	8	0	364	1	6	0
Monitoring Year 0	607	1	10	0	607	1	9	0	648	1	9	0
	Veg Plot 4 F				**Veg Plot 5 F**				**Veg Plot 6 F**			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	364	3	6	0	445	2	7	0	445	6	2	0
Monitoring Year 2	526	2	6	0	405	2	6	0	405	4	2	0
Monitoring Year 1	526	1	6	0	486	1	8	0	405	2	4	0
Monitoring Year 0	526	1	7	0	688	1	9	0	567	1	5	0
	Veg Plot 7 F				**Veg Plot 8 F**				**Veg Plot 9 F**			
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	121	1	1	0	405	2	4	0	40	2	1	0
Monitoring Year 2	364	1	3	0	445	2	4	0	405	1	5	9
Monitoring Year 1	486	1	4	0	243	2	3	0	162	1	3	0
Monitoring Year 0	405	1	4	0	648	1	6	0	364	1	5	0
	Veg Plot 10 F				**Veg Plot Group 1 R**							
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives				
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3	283	2	2	0	405	2	5	0				
Monitoring Year 2	324	1	3	0								
Monitoring Year 1	405	1	6	0								
Monitoring Year 0	405	1	6	0								

*Each monitoring year represents a different plot for the random vegetation plot "groups". Random plots are denoted with an R, and fixed plots with an F.

Vegetation Plot Criteria Attainment MY3 (2023)
Seniard Creek Restoration Project

Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
1	Yes	63.6%
2	Yes	
3	Yes	
4	Yes	
5	Yes	
6	Yes	
7	Yes	
8	Yes	
9	Yes	
10	No	
1R	Yes	

Vegetation Plot Photos

Vegetation Monitoring Plot 1

Vegetation Monitoring Plot 2

Vegetation Monitoring Plot 3

Vegetation Monitoring Plot 4

Vegetation Monitoring Plot 5

Vegetation Monitoring Plot 6

Vegetation Monitoring Plot 7

Vegetation Monitoring Plot 8

Vegetation Monitoring Plot 9

Vegetation Monitoring Plot 10

Random Vegetation Monitoring Plot 1R

Appendix C
Stream Geomorphology Data

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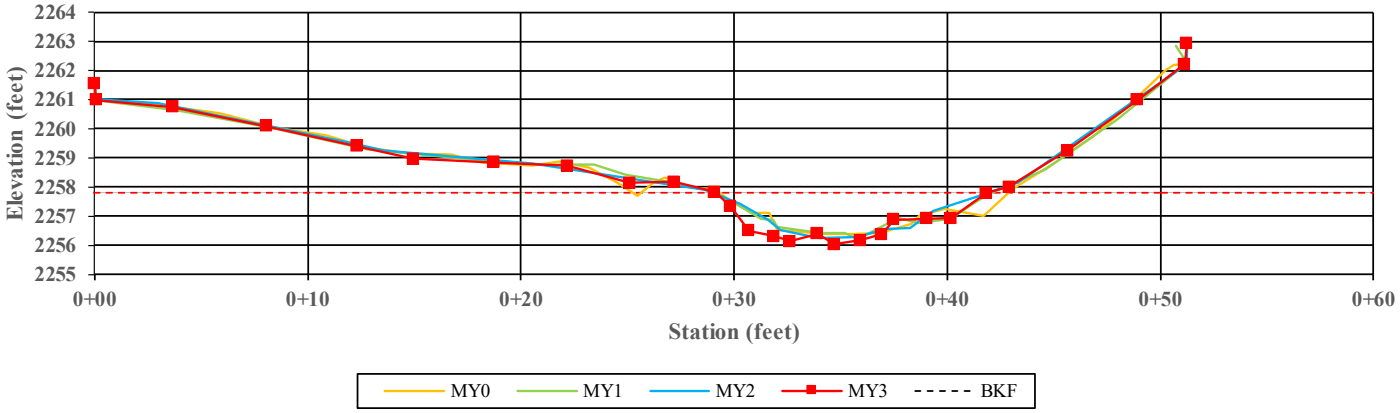
Project Name: Seniard **XS Number:** 1 **Station:** 100+32

Reach Name: Seniard Creek 1A **XS Type:** Riffle



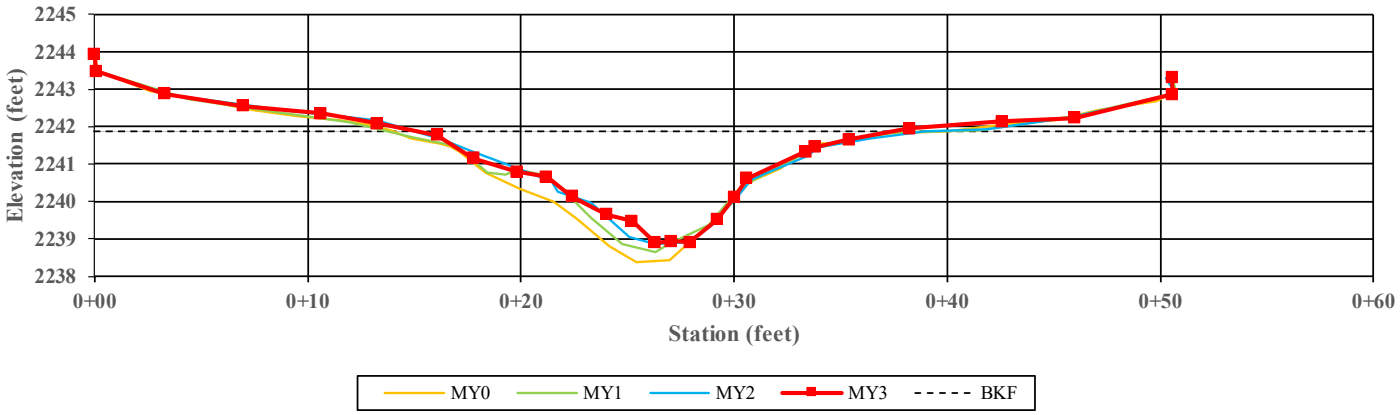
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	14.2	12.9	12.9	12.8	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	1.1	1.1	1.1	-	-	-	-
Bankfull Max Depth (ft)	1.5	1.8	1.8	1.8	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	14.6	14.6	14.6	14.6	-	-	-	-
Width/Depth Ratio	13.8	11.5	11.3	11.1	-	-	-	-
Entrenchment Ratio	3.5	3.9	3.9	3.9	-	-	-	-
Bank Height Ratio	1.0	0.9	0.9	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 2 **Station:** 107+60

Reach Name: Seniard Creek 1B **XS Type:** Pool



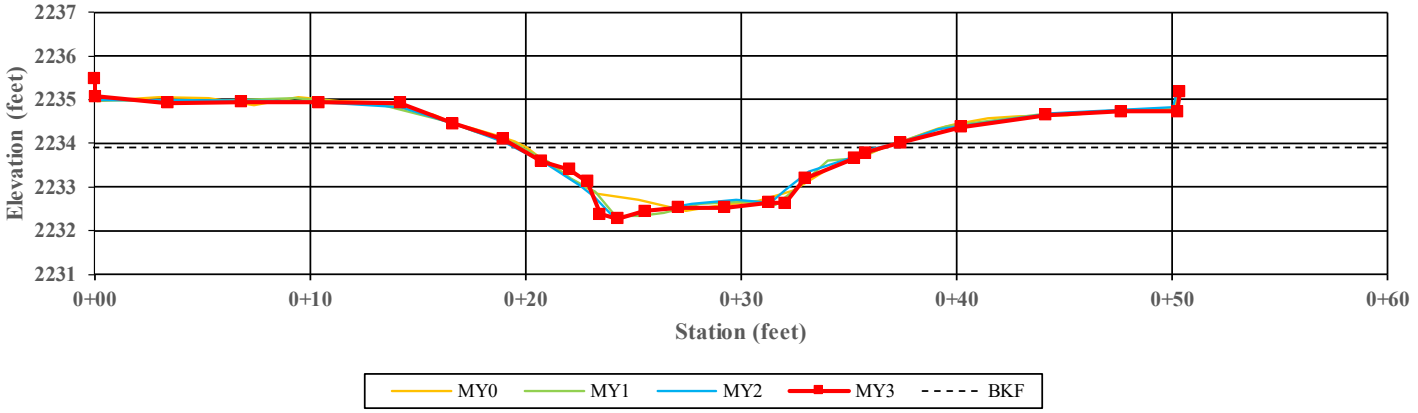
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	17.0	17.0	15.8	15.6	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.6	1.6	1.7	1.8	-	-	-	-
Bankfull Max Depth (ft)	3.1	3.1	3.0	3.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	27.6	27.6	27.6	27.6	-	-	-	-
Width/Depth Ratio	10.5	10.5	9.0	8.8	-	-	-	-
Entrenchment Ratio	2.9	2.9	3.2	3.2	-	-	-	-
Bank Height Ratio	1.0	0.9	0.9	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 3 **Station:** 111+23

Reach Name: Seniard Creek 1B **XS Type:** Riffle



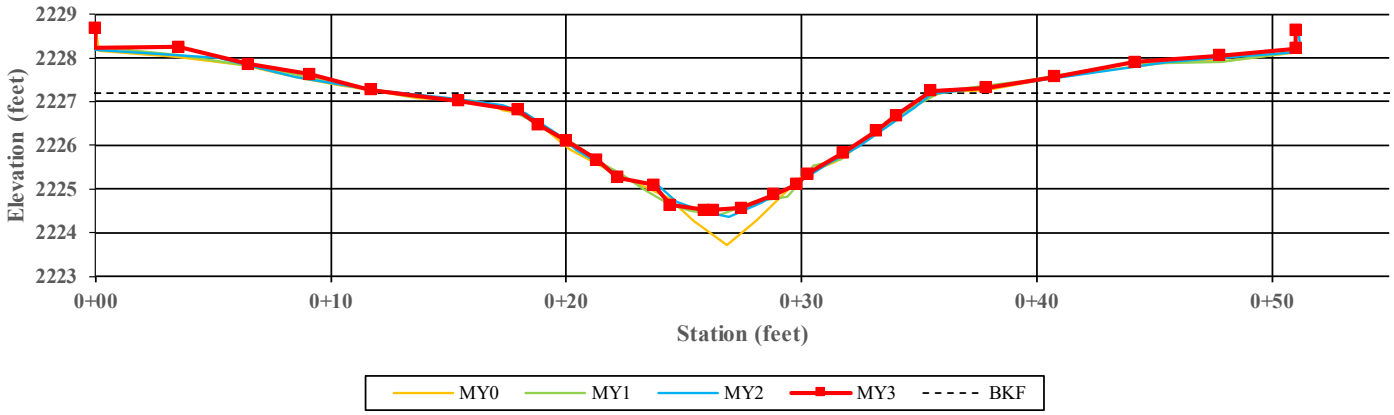
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	16.8	17.0	14.2	14.5	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.0	0.9	1.1	1.1	-	-	-	-
Bankfull Max Depth (ft)	1.5	1.6	1.7	1.6	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	16.0	16.0	16.0	16.0	-	-	-	-
Width/Depth Ratio	17.6	18.0	12.6	13.1	-	-	-	-
Entrenchment Ratio	3.0	2.9	3.5	3.4	-	-	-	-
Bank Height Ratio	1.0	1.0	0.9	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Seniard **XS Number:** 4 **Station:** 114+85

Reach Name: Seniard Creek 1B **XS Type:** Pool



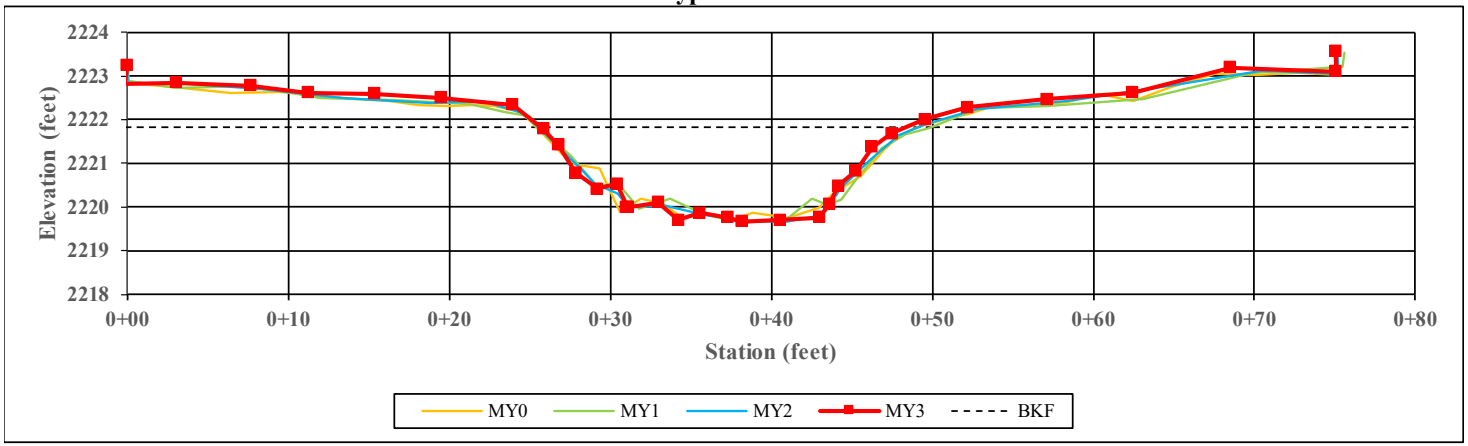
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	18.6	18.6	16.6	15.2	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.5	1.5	1.7	1.8	-	-	-	-
Bankfull Max Depth (ft)	3.3	2.7	2.8	2.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	28.2	28.2	28.2	28.2	-	-	-	-
Width/Depth Ratio	12.3	12.3	9.8	8.2	-	-	-	-
Entrenchment Ratio	2.7	2.7	3.0	3.3	-	-	-	-
Bank Height Ratio	1.0	1.0	0.9	0.9	-	-	-	-

Left Descending Bank

Upstream

Project Name: Seniard **XS Number:** 5 **Station:** 116+93

Reach Name: Seniard Creek 2 **XS Type:** Riffle



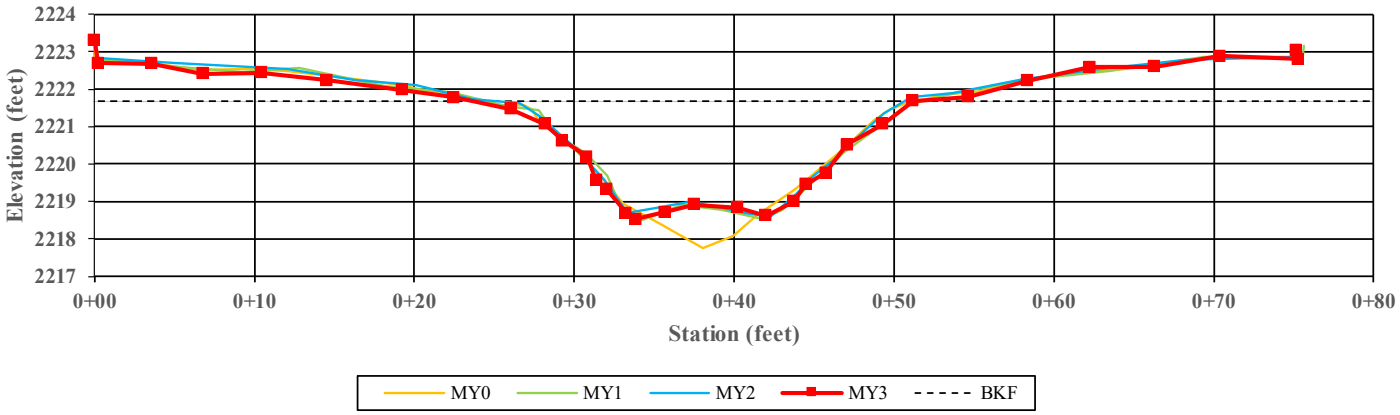
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	23.5	24.2	22.0	21.7	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	1.4	1.4	1.5	1.6	-	-	-	-
Bankfull Max Depth (ft)	2.1	2.2	2.1	2.2	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	34.0	34.0	34.0	34.0	-	-	-	-
Width/Depth Ratio	16.2	17.2	14.2	13.8	-	-	-	-
Entrenchment Ratio	4.3	4.1	4.5	4.6	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 6 **Station:** 117+09

Reach Name: Seniard Creek 2 **XS Type:** Pool



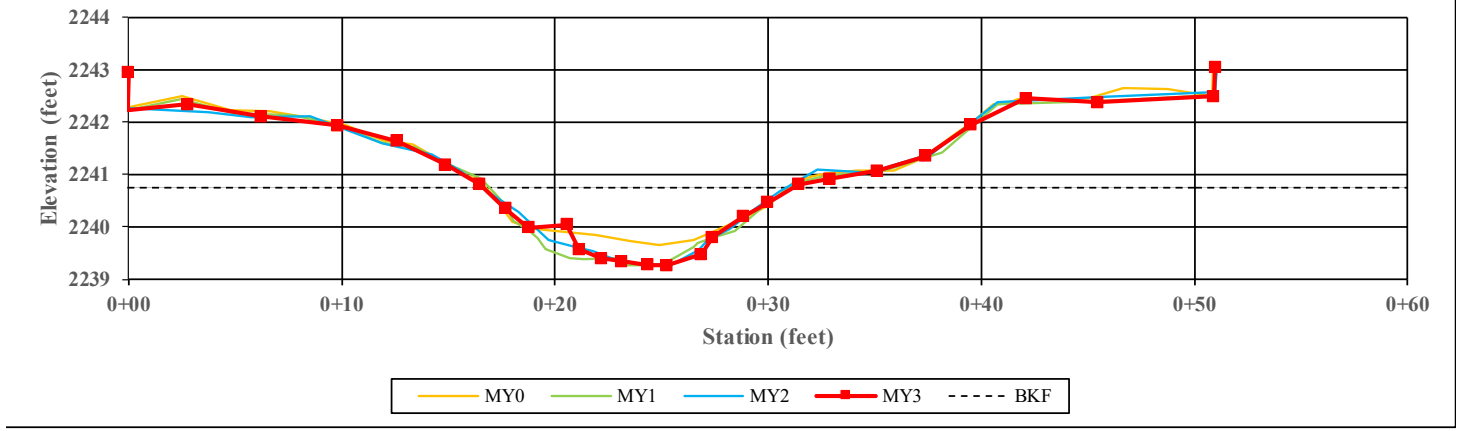
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	22.8	21.3	21.5	21.1	-	-	-	-
Floodprone Width (ft)	100.0	100.0	100.0	100.0	-	-	-	-
Bankfull Mean Depth (ft)	2.1	2.2	2.2	2.2	-	-	-	-
Bankfull Max Depth (ft)	3.8	3.2	3.1	3.1	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	47.4	47.4	47.4	47.4	-	-	-	-
Width/Depth Ratio	10.9	9.6	9.7	9.4	-	-	-	-
Entrenchment Ratio	4.4	4.7	4.7	4.7	-	-	-	-
Bank Height Ratio	1.0	0.9	1.0	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 7 **Station:** 201+53

Reach Name: Sitton Creek 1 **XS Type:** Riffle



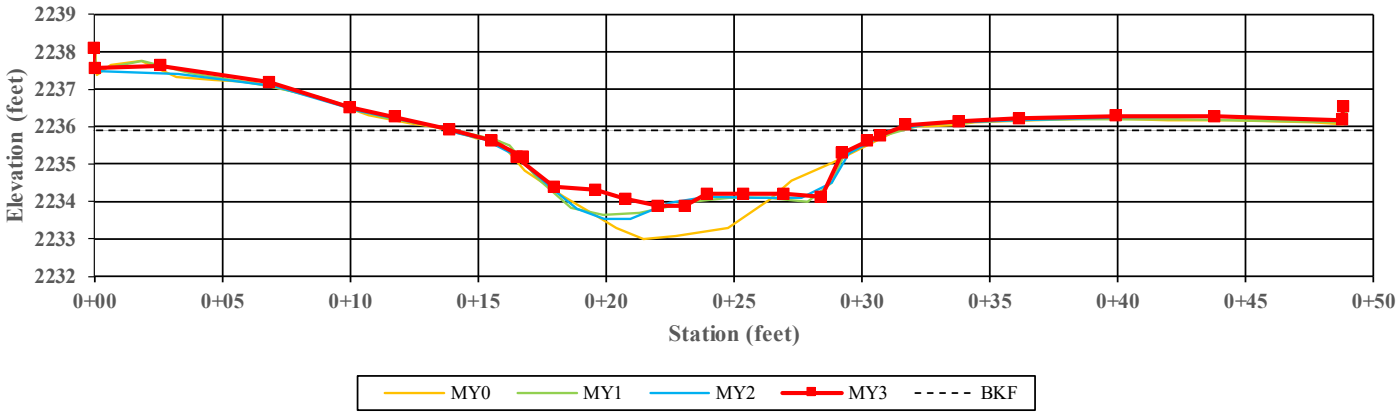
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	15.1	13.2	13.9	14.6	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	0.9	1.0	0.9	0.9	-	-	-	-
Bankfull Max Depth (ft)	1.3	1.4	1.5	1.5	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	13.1	13.1	13.1	13.1	-	-	-	-
Width/Depth Ratio	17.3	13.3	14.9	16.3	-	-	-	-
Entrenchment Ratio	3.3	3.8	3.6	3.4	-	-	-	-
Bank Height Ratio	1.0	1.1	1.2	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 8 **Station:** 204+48

Reach Name: Sitton Creek 1 **XS Type:** Pool



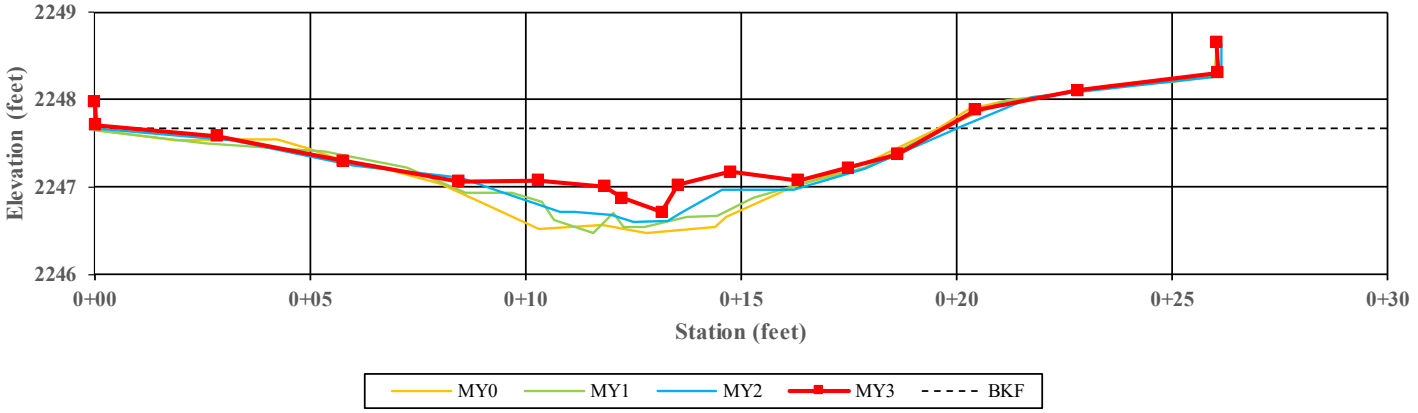
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	13.0	13.7	16.2	16.7	-	-	-	-
Floodprone Width (ft)	50.0	50.0	50.0	50.0	-	-	-	-
Bankfull Mean Depth (ft)	1.7	1.6	1.4	1.3	-	-	-	-
Bankfull Max Depth (ft)	2.6	2.1	2.2	2.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	22.3	22.3	22.3	22.3	-	-	-	-
Width/Depth Ratio	7.6	8.4	11.8	12.6	-	-	-	-
Entrenchment Ratio	3.8	3.7	3.1	3.0	-	-	-	-
Bank Height Ratio	1.0	0.9	1.1	1.1	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 9 **Station:** 300+51

Reach Name: Lee Branch 1 **XS Type:** Riffle



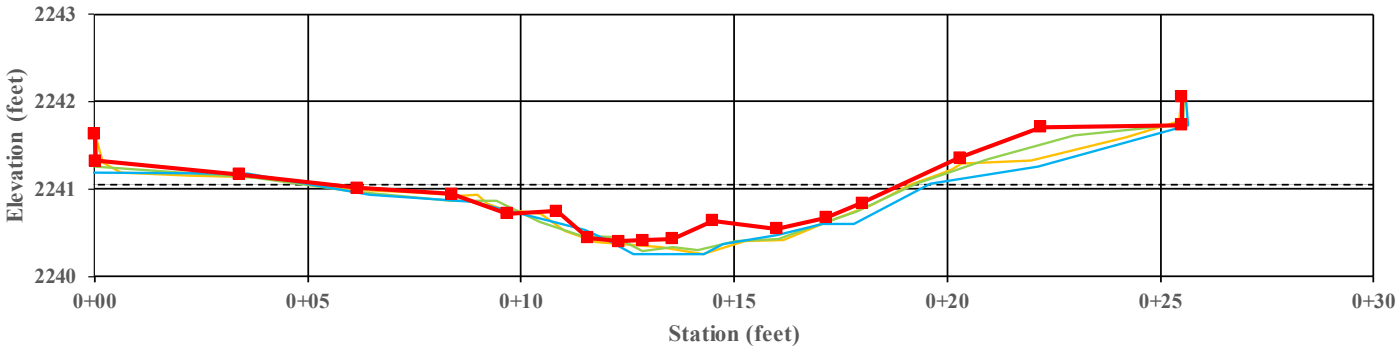
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	8.1	6.7	6.8	4.5	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.5	0.5	0.7	-	-	-	-
Bankfull Max Depth (ft)	0.6	0.5	0.7	1.0	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	3.1	3.1	3.1	3.1	-	-	-	-
Width/Depth Ratio	21.3	14.4	14.8	6.5	-	-	-	-
Entrenchment Ratio	3.1	3.7	3.7	5.6	-	-	-	-
Bank Height Ratio	1.0	0.7	0.8	0.4	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 10 **Station:** 301+61

Reach Name: Lee Branch 1 **XS Type:** Pool



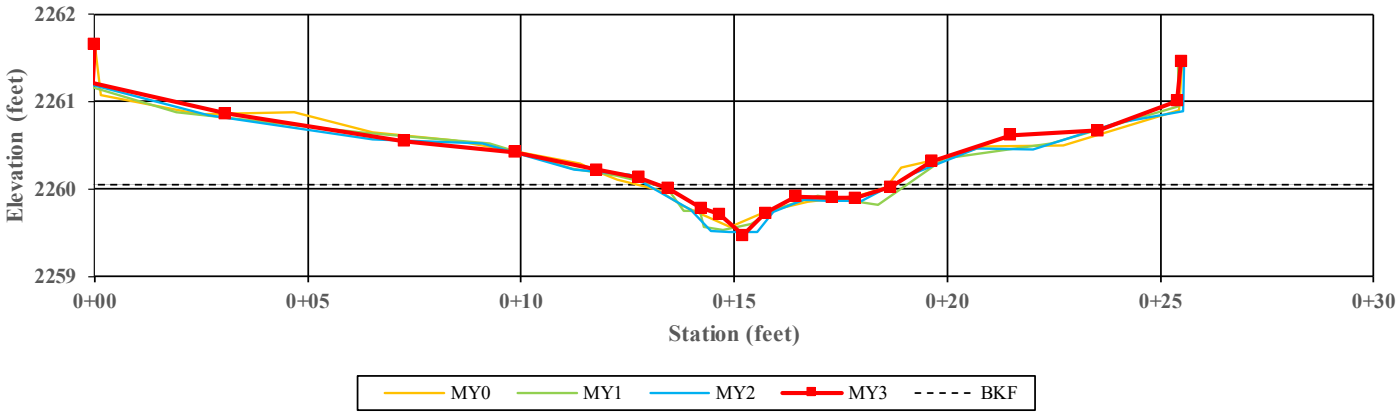
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	9.3	9.5	7.2	8.3	-	-	-	-
Floodprone Width (ft)	25.0	25.0	25.0	25.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.5	0.5	-	-	-	-
Bankfull Max Depth (ft)	0.7	0.6	0.7	0.7	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	3.9	3.9	3.9	3.9	-	-	-	-
Width/Depth Ratio	21.8	23.5	13.3	17.7	-	-	-	-
Entrenchment Ratio	2.7	2.6	3.5	3.0	-	-	-	-
Bank Height Ratio	1.0	0.9	0.8	0.8	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 11 **Station:** 402+31

Reach Name: David Branch 1B **XS Type:** Riffle



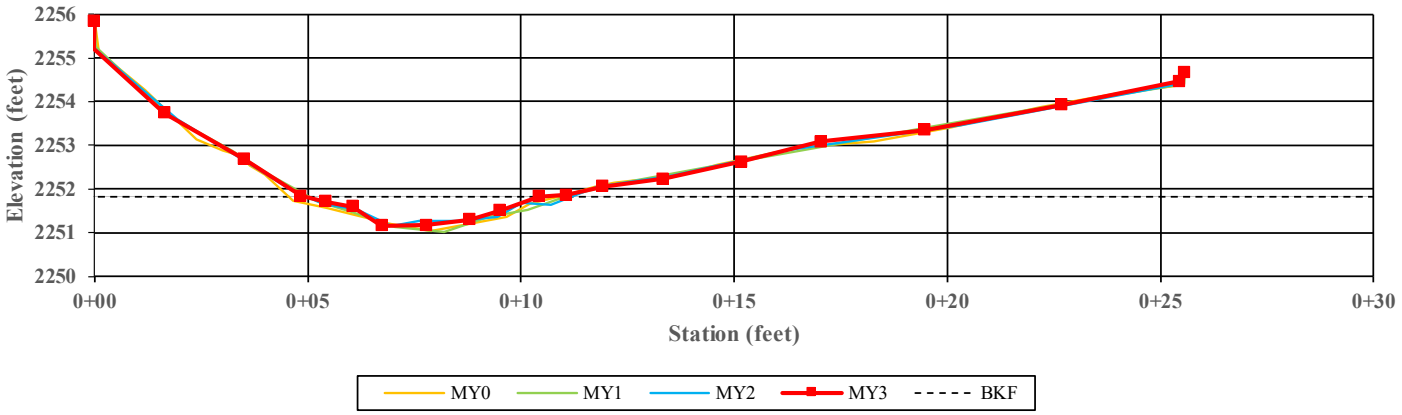
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.7	3.0	4.0	3.6	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.2	0.3	0.2	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.4	0.5	0.5	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	1.0	1.0	1.0	1.0	-	-	-	-
Width/Depth Ratio	22.2	9.1	16.1	13.2	-	-	-	-
Entrenchment Ratio	2.1	3.3	2.5	2.8	-	-	-	-
Bank Height Ratio	1.0	1.0	1.0	0.9	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 12 **Station:** 403+24

Reach Name: David Branch 1B **XS Type:** Pool



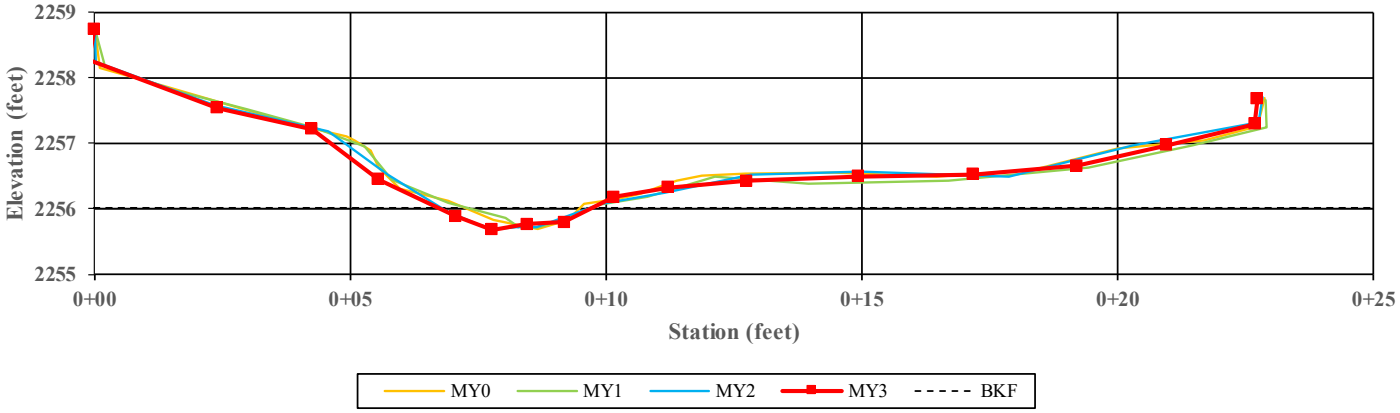
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.8	4.1	4.1	4.1	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.5	0.5	0.5	-	-	-	-
Bankfull Max Depth (ft)	0.6	0.7	0.6	0.6	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	1.9	1.9	1.9	1.9	-	-	-	-
Width/Depth Ratio	12.3	9.0	8.9	8.6	-	-	-	-
Entrenchment Ratio	2.1	2.4	2.5	2.4	-	-	-	-
Bank Height Ratio	1.0	1.0	0.8	1.0	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 13 **Station:** 601+41

Reach Name: Whitaker Branch 1 **XS Type:** Riffle



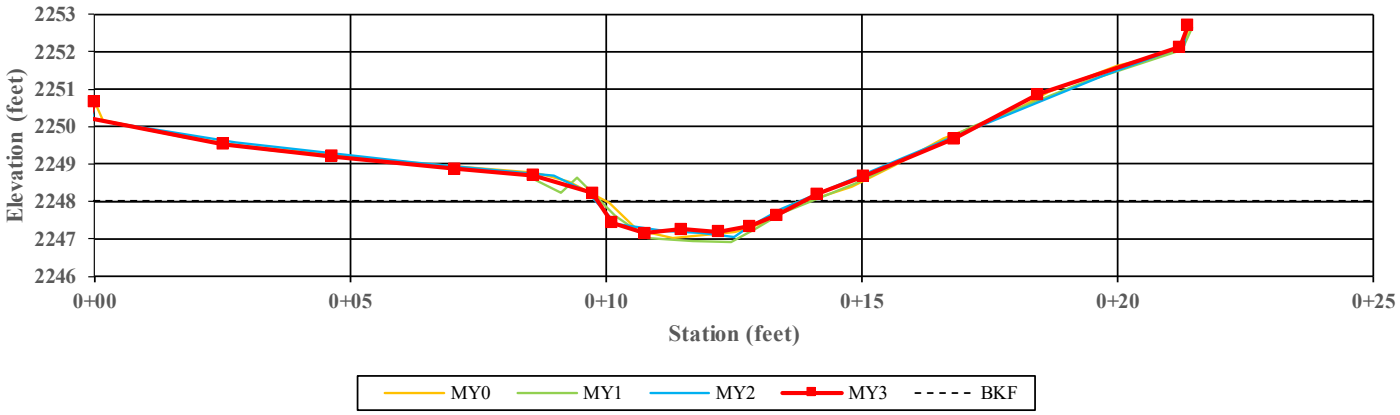
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	1.8	1.8	2.1	2.1	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.4	0.4	0.3	0.3	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	0.5	0.5	0.5	0.5	-	-	-	-
Width/Depth Ratio	6.1	6.7	8.1	8.3	-	-	-	-
Entrenchment Ratio	5.6	5.5	4.8	4.7	-	-	-	-
Bank Height Ratio	1.0	0.9	1.1	1.5	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 14 **Station:** 602+64

Reach Name: Whitaker Branch 1 **XS Type:** Pool



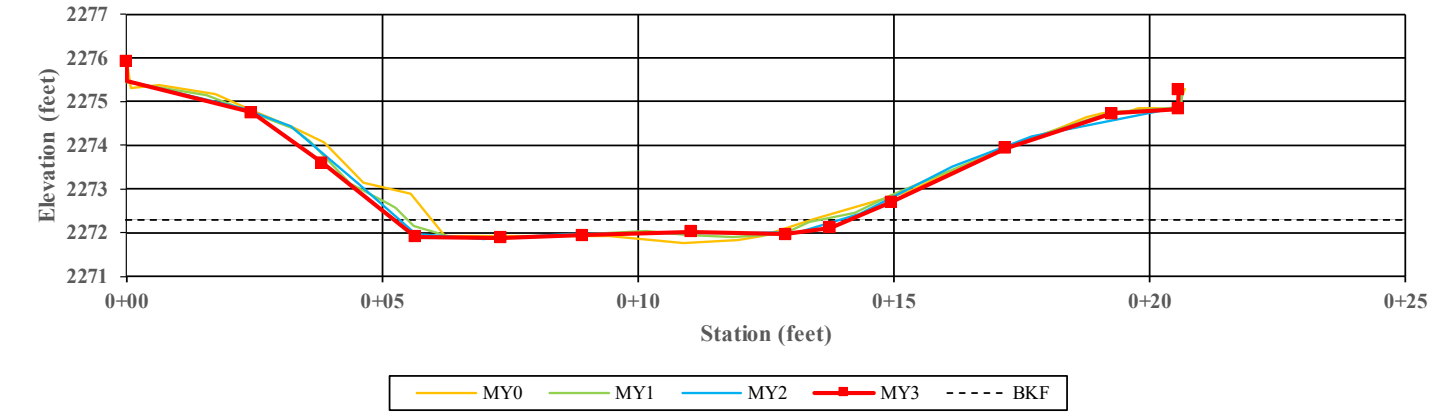
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	3.5	3.3	2.6	3.2	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.7	0.7	0.9	0.7	-	-	-	-
Bankfull Max Depth (ft)	0.9	0.9	1.0	0.9	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	2.3	2.3	2.3	2.3	-	-	-	-
Width/Depth Ratio	5.2	4.5	2.9	4.4	-	-	-	-
Entrenchment Ratio	2.9	3.1	3.9	3.1	-	-	-	-
Bank Height Ratio	1.0	0.8	0.7	1.2	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 15 **Station:** 702+67

Reach Name: Redmond Branch 1A **XS Type:** Riffle



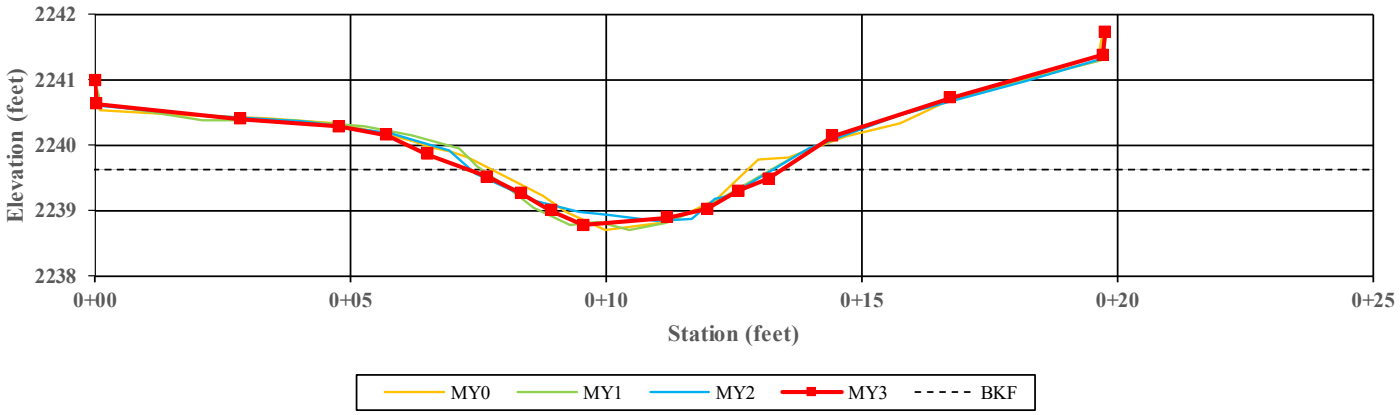
CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	7.2	7.7	7.5	8.1	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.4	0.4	0.4	0.3	-	-	-	-
Bankfull Max Depth (ft)	0.5	0.4	0.5	0.4	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	2.8	2.8	2.8	2.8	-	-	-	-
Width/Depth Ratio	18.7	21.4	20.0	23.7	-	-	-	-
Entrenchment Ratio	1.4	1.3	1.3	1.2	-	-	-	-
Bank Height Ratio	1.0	0.8	0.8	0.8	-	-	-	-

Left Descending Bank

Right Descending Bank

Project Name: Seniard **XS Number:** 16 **Station:** 709+81

Reach Name: Redmond Branch 1A **XS Type:** Pool



CHANNEL DIMENSIONS SUMMARY	MY0	MY1	MY2	MY3	MY4	MY5	MY6	MY7
Bankful Width (ft)	4.2	4.5	5.0	5.5	-	-	-	-
Floodprone Width (ft)	10.0	10.0	10.0	10.0	-	-	-	-
Bankfull Mean Depth (ft)	0.8	0.7	0.7	0.6	-	-	-	-
Bankfull Max Depth (ft)	1.1	1.0	0.9	0.9	-	-	-	-
Bankfull Cross-Sectional Area (ft^2)	3.2	3.2	3.2	3.2	-	-	-	-
Width/Depth Ratio	5.5	6.5	7.6	9.5	-	-	-	-
Entrenchment Ratio	2.4	2.2	2.0	1.8	-	-	-	-
Bank Height Ratio	1.0	1.1	1.2	1.3	-	-	-	-

Left Descending Bank

Right Descending Bank

Table 8. Baseline Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Seniard Mitigation Site

	Cross Section 1 (Riffle) Seniard Creek Reach 1A								Cross Section 2 (Pool) Seniard Creek Reach 1B								Cross Section 3 (Riffle) Seniard Creek Reach 1B								Cross Section 4 (Pool) Seniard Creek Reach 1B							
Dimension	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2257.9	2258.0	2258.0	2257.8					2241.5	2241.7	2241.8	2241.9					2234.0	2233.9	2234.0	2233.9					2227.0	2227.1	2227.1	2227.2				
Low Bank Height Elevation (datum) Used	2257.9	2257.8	2257.9	2258.0					2241.5	2241.5	2241.5	2241.4					2234.0	2234.0	2233.9	2233.8					2227.0	2227.0	2226.9	2226.8				
Bankfull Width (ft)	14.2	12.9	12.9	12.8					17.0	17.0	15.8	15.6					16.8	17.0	14.2	14.5					18.6	18.6	16.6	15.2				
Floodprone Width (ft)	50.0	50.0	50.0	50.0					50.0	50.0	50.0	50.0					50.0	50.0	50.0	50.0					50.0	50.0	50.0	50.0				
Bankfull Mean Depth (ft)	1.0	1.1	1.1	1.1					1.6	1.6	1.7	1.8					1.0	0.9	1.1	1.1					1.5	1.5	1.7	1.8				
Bankfull Max Depth (ft)	1.5	1.8	1.8	1.8					3.1	3.1	3.0	3.0					1.5	1.6	1.7	1.6					3.3	2.7	2.8	2.7				
Bankfull Cross Sectional Area (ft^2)	14.6	14.6	14.6	14.6					27.6	27.6	27.6	27.6					16.0	16.0	16.0	16.0					28.2	28.2	28.2	28.2				
Bankfull Width/Depth Ratio	13.8	11.5	11.3	11.1					10.5	10.5	9.0	8.8					17.6	18.0	12.6	13.1					12.3	12.3	9.8	8.2				
Bankfull Entrenchment Ratio	3.5	3.9	3.9	3.9					2.9	2.9	3.2	3.2					3.0	2.9	3.5	3.4					2.7	2.7	3.0	3.3				
Bankfull Bank Height Ratio	1.0	0.9	0.9	1.1					1.0	0.9	0.9	0.9					1.0	1.0	0.9	0.9					1.0	1.0	0.9	0.9				
Low Top of Bank Depth (ft)	1.5	1.6	1.7	2.0					3.1	2.9	2.6	2.5					1.5	1.7	1.6	1.5					3.3	2.6	2.6	2.3				

	Cross Section 5 (Riffle) Seniard Reach 2								Cross Section 6 (Pool) Seniard Reach 2								Cross Section 7 (Riffle) Sitton Reach 1								Cross Section 8 (Pool) Sitton Reach 1							
Dimension	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2221.8	2221.9	2221.8	2221.8					2221.5	2221.7	2221.7	2221.7					2240.9	2240.7	2240.8	2240.8					2235.6	2235.8	2235.8	2235.9				
Low Bank Height Elevation (datum) Used	2221.8	2221.8	2221.9	2222.0					2221.5	2221.4	2221.6	2221.5					2240.9	2240.8	2241.1	2240.9					2235.6	2235.7	2235.9	2236.0				
Bankfull Width (ft)	23.5	24.2	22.0	21.7					22.8	21.3	21.5	21.1					15.1	13.2	13.9	14.6					13.0	13.7	16.2	16.7				
Floodprone Width (ft)	100.0	100.0	100.0	100.0					100.0	100.0	100.0	100.0					50.0	50.0	50.0	50.0					50.0	50.0	50.0	50.0				
Bankfull Mean Depth (ft)	1.4	1.4	1.5	1.6					2.1	2.2	2.2	2.2					0.9	1.0	0.9	0.9					1.7	1.6	1.4	1.3				
Bankfull Max Depth (ft)	2.1	2.2	2.1	2.2					3.8	3.2	3.1	3.1					1.3	1.4	1.5	1.5					2.6	2.1	2.2	2.0				
Bankfull Cross Sectional Area (ft^2)	34.0	34.0	34.0	34.0					47.4	47.4	47.4	47.4					13.1	13.0	13.1	13.1					22.3	22.3	22.3	22.3				
Bankfull Width/Depth Ratio	16.2	17.2	14.2	13.8					10.9	9.6	9.7	9.4					17.3	13.3	14.9	16.3					7.6	8.4	11.8	12.6				
Bankfull Entrenchment Ratio	4.3	4.1	4.5	4.6					4.4	4.7	4.7	4.7					3.3	3.8	3.6	3.4					3.8	3.7	3.1	3.0				
Bankfull Bank Height Ratio	1.0	1.0	1.0	1.1					1.0	0.9	1.0	0.9					1.0	1.1	1.2	1.1					1.0	0.9	1.1	1.1				
Low Top of Bank Depth (ft)	2.1	2.1	2.2	2.3					3.8	2.9	3.1	2.9					1.3	1.6	1.8	1.7					2.6	2.0	2.4	2.2				

	Cross Section 9 (Riffle) Lee Branch Reach 1								Cross Section 10 (Pool) Lee Branch Reach 1								Cross Section 11 (Riffle) David Branch Reach 1B								Cross Section 12 (Pool) David Branch Reach 1B							
Dimension	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2247.0	2247.2	2247.3	2247.7					2240.9	2240.9	2241.0	2241.1					2260.0	2260.0	2260.0	2260.1					2251.7	2251.7	2251.8	2251.8				
Low Bank Height Elevation (datum) Used	2247.0	2246.9	2247.1	2247.1					2240.9	2240.9	2240.9	2240.9					2260.0	2260.0	2260.0	2260.0					2251.7	2251.7	2251.7	2251.8				
Bankfull Width (ft)	8.1	6.7	6.8	4.5					9.3	9.5	7.2	8.3					4.7	3.0	4.0	3.6					4.8	4.1	4.1	4.1				
Floodprone Width (ft)	25.0	25.0	25.0	25.0					25.0	25.0	25.0	25.0					10.0	10.0	10.0	10.0					10.0	10.0	10.0	10.0				
Bankfull Mean Depth (ft)	0.4	0.5	0.5	0.7					0.4	0.4	0.5	0.5					0.2	0.3	0.2	0.3					0.4	0.5	0.5	0.5				
Bankfull Max Depth (ft)	0.6	0.5	0.7	1.0					0.7	0.6	0.7	0.7					0.4	0.5	0.5	0.6					0.6	0.7	0.6	0.6				
Bankfull Cross Sectional Area (ft^2)	3.1	3.1	3.1	3.1					3.9	3.9	3.9	3.9					1.0	1.0	1.0	1.0					1.9	1.9	1.9	1.9				
Bankfull Width/Depth Ratio	21.3	14.4	14.8	6.5					21.8	23.5	13.3	17.7					22.2	9.1	16.1	13.2					12.3	9.0	8.9	8.6				
Bankfull Entrenchment Ratio	3.1	3.7	3.7	5.6					2.7	2.6	3.5	3.0					2.1	3.3	2.5	2.8					2.1	2.4	2.5	2.4				
Bankfull Bank Height Ratio	1.0	0.7	0.8	0.4					1.0	0.9	0.8	0.8					1.0	1.0	1.0	0.9					1.0	1.0	0.8	1.0				
Low Top of Bank Depth (ft)	0.6	0.5	0.5	0.3					0.7	0.6	0.6	0.5					0.4	0.5	0.5	0.5					0.6	0.7	0.5	0.7				

	Cross Section 13 (Riffle) Whitaker Branch Reach 1								Cross Section 14 (Pool) Whitaker Branch Reach 1								Cross Section 15 (Riffle) Redmond Branch Reach 1								Cross Section 16 (Pool) Redmond Branch Reach 1							
Dimension	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**	***Base**	**MY1**	**MY2**	**MY3**	**MY4**	**MY5**	**MY6**	**MY7**
Record Elevation (datum) Used	2256.1	2256.1	2256.0	2256.0					2248.0	2247.9	2248.1	2248.0					2272.3	2272.3	2272.3	2272.3					2239.8	2239.7	2239.7	2239.6				
Low Bank Height Elevation (datum) Used	2256.1	2256.1	2256.1	2256.2					2248.0	2247.7	2247.8	2248.2					2272.3	2272.2	2272.2	2272.2					2239.8	2239.8	2239.9	2239.9				
Bankfull Width (ft)	1.8	1.8	2.1	2.1					3.5	3.3	2.6	3.2					7.2	7.7	7.5	8.1					4.2	4.5	5.0	5.5				
Floodprone Width (ft)	10.0	10.0	10.0	10.0					10.0	10.0	10.0	10.0					10.0	10.0	10.0	10.0					10.0	10.0	10.0	10.0				
Bankfull Mean Depth (ft)	0.3	0.3	0.3	0.3					0.7	0.7	0.9	0.7					0.4	0.4	0.4	0.3					0.8	0.7	0.7	0.6				
Bankfull Max Depth (ft)	0.4	0.4	0.3	0.3					0.9	0.9	1.0	0.9					0.5	0.4	0.5	0.4					1.1	1.0	0.9	0.9				
Bankfull Cross Sectional Area (ft^2)	0.5	0.5	0.5	0.5					2.3	2.3	2.3	2.3					2.8	2.8	2.8	2.8					3.2	3.2	3.2	3.2				
Bankfull Width/Depth Ratio	6.1	6.7	8.1	8.3					5.2	4.5	2.9	4.4					18.7	21.4	20.0	23.7					5.5	6.5	7.6	9.5				
Bankfull Entrenchment Ratio	5.6	5.5	4.8	4.7					2.9	3.1	3.9	3.1					1.4	1.3	1.3	1.2					2.4	2.2	2.0	1.8				
Bankfull Bank Height Ratio	1.0	0.9	1.1	1.5					1.0	0.8	0.7	1.2					1.0	0.8	0.8	0.8					1.0	1.1	1.2	1.3				
Low Top of Bank Depth (ft)	0.4	0.4	0.4	0.5					0.9	0.8	0.7	1.0					0.5	0.4	0.4	0.3					1.1	1.1	1.1	1.1				

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

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Table 9. Baseline Stream Data Summary Seniard Creek - Seniard Creek Reach 1A							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	10.7	-	-	13	-	17.4	14.2
*Floodprone Width (ft)	-	-	-	-	-	-	50.0
*Bankfull Mean Depth (ft)	0.8	-	-	1.2	-	1.1	1.0
*Bankfull Max Depth (ft)	-	-	-	-	-	1.4	1.5
*Bankfull Cross Sectional Area (ft^2)	8.3	-	-	15.3	-	18.3	14.6
*Width/Depth Ratio	11.1	-	-	13.8	-	16.5	13.8
*Entrenchment Ratio	1.1	-	-	1.3	-	1.4	3.5
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	G/F					B	B
Bankfull Discharge (cfs)	68					-	-
Sinuosity (ft)	1.03					0.01	1.03
Water Surface Slope (Channel) (ft/ft)	0.04					0.025	0.040
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seniard Creek - Seniard Creek Reach 1B							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	8.0	-	-	11.4	-	17.6	16.8
*Floodprone Width (ft)	-	-	-	-	-	-	50.0
*Bankfull Mean Depth (ft)	1.0	-	-	1.3	-	1.1	1.0
*Bankfull Max Depth (ft)	-	-	-	-	-	1.4	1.5
*Bankfull Cross Sectional Area (ft^2)	8.7	-	-	13.7	-	18.7	16.0
*Width/Depth Ratio	6.0	-	-	9.8	-	16.6	17.6
*Entrenchment Ratio	1.0	-	-	1.8	-	1.4	3.0
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	70					-	-
Sinuosity (ft)	1.08					1.00	1.07
Water Surface Slope (Channel) (ft/ft)	0.022					0.02	0.021
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Seniard Creek Reach 2							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	10.0	-	-	10.2	-	22.5	24.2
*Floodprone Width (ft)	-	-	-	-	-	-	100.0
*Bankfull Mean Depth (ft)	1.0	-	-	1.3	-	1.3	1.4
*Bankfull Max Depth (ft)	-	-	-	-	-	1.6	2.2
*Bankfull Cross Sectional Area (ft^2)	10.6	-	-	13.1	-	28.2	34.0
*Width/Depth Ratio	7.6	-	-	9.8	-	17.9	17.2
*Entrenchment Ratio	1.4	-	-	1.6	-	1.1	4.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	113					-	-
Sinuosity (ft)	1.13					1.03	1.03
Water Surface Slope (Channel) (ft/ft)	0.017					0.013	0.014
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Sitton Creek Reach							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	6.4	-	-	11.4	2	15.6	15.1
*Floodprone Width (ft)	11	-	-	21	2	-	50.0
*Bankfull Mean Depth (ft)	0.8	-	-	1.1	2	1.0	0.9
*Bankfull Max Depth (ft)	0.7	-	-	1.2	2	1.3	1.3
*Bankfull Cross Sectional Area (ft^2)	7.2	-	-	8.9	2	15.3	13.1
*Width/Depth Ratio	5.7	-	-	14.6	2	16.0	17.3
*Entrenchment Ratio	1.7	-	-	1.8	2	2.0	3.3
*Bank Height Ratio	3.6	-	-	5.9	2	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	55					-	-
Sinuosity (ft)	1.09					1.06	1.07
Water Surface Slope (Channel) (ft/ft)	0.018					0.015	0.016
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Lee Branch Reach							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	1.8	-	-	1.8	-	7.8	8.1
*Floodprone Width (ft)	-	-	-	-	-	-	25.0
*Bankfull Mean Depth (ft)	0.8	-	-	0.8	-	0.3	0.4
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.6
*Bankfull Cross Sectional Area (ft^2)	1.3	-	-	1.3	-	2.4	3.1
*Width/Depth Ratio	2.5	-	-	2.5	-	25.8	21.3
*Entrenchment Ratio	1.8	-	-	1.8	-	1.5	3.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	G					B	B
Bankfull Discharge (cfs)	3					-	-
Sinuosity (ft)	1.04					1.06	1.07
Water Surface Slope (Channel) (ft/ft)	0.048					0.029	0.056
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1A							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	**Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
Bankfull Width (ft)	-	-	-	-	-	7.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Cross Sectional Area (ft^2)	-	-	-	-	-	2.4	-
Width/Depth Ratio	-	-	-	-	-	25.8	-
Entrenchment Ratio	-	-	-	-	-	1.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	-					B	-
Bankfull Discharge (cfs)	-					-	-
Sinuosity (ft)	-					1.08	1.08
Water Surface Slope (Channel) (ft/ft)	-					0.135	-
Other	-					-	-

" - " denotes information is either not available or not applicable

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1B							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	6	-	-	8.4	-	7.8	4.7
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	0.5	-	-	0.6	-	0.3	0.2
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.4
*Bankfull Cross Sectional Area (ft^2)	2.9	-	-	4.7	-	2.4	1.0
*Width/Depth Ratio	12.6	-	-	15.2	-	25.8	22.2
*Entrenchment Ratio	1.8	-	-	2.0	-	1.9	2.1
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification			G			B	B
Bankfull Discharge (cfs)			1			-	-
Sinuosity (ft)			1.04			1.03	1.02
Water Surface Slope (Channel) (ft/ft)			0.05			0.07	0.08
Other			-			-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - David Branch Reach 1C							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	**Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
Bankfull Width (ft)	7.8	-	-	7.8	-	7.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	0.3	-	-	0.3	-	0.3	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Cross Sectional Area (ft^2)	2.6	-	-	2.6	-	2.4	-
Width/Depth Ratio	23.3	-	-	23.3	-	25.8	-
Entrenchment Ratio	1.3	-	-	1.3	-	1.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification			G			B	B
Bankfull Discharge (cfs)			4			-	-
Sinuosity (ft)			1.03			1.1	1.05
Water Surface Slope (Channel) (ft/ft)			0.058			0.051	0.052
Other			-			-	-

" - " denotes information is either not available or not applicable

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Whitaker Branch Reach 1A							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	-	-	-	-	-	7.8	1.8
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	0.3
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.4
*Bankfull Cross Sectional Area (ft^2)	-	-	-	-	-	2.4	0.5
*Width/Depth Ratio	-	-	-	-	-	25.8	6.1
*Entrenchment Ratio	-	-	-	-	-	1.5	5.6
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull						-	-
Rosgen Classification			-			B	B
Bankfull Discharge (cfs)			-			-	-
Sinuosity (ft)			-			1.0	1.05
Water Surface Slope (Channel) (ft/ft)			-			0.082	
Other			-			-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Redmond Branch Reach 1A							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	***Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
*Bankfull Width (ft)	-	-	-	-	-	7.8	7.2
*Floodprone Width (ft)	-	-	-	-	-	-	10.0
*Bankfull Mean Depth (ft)	-	-	-	-	-	0.3	0.4
*Bankfull Max Depth (ft)	-	-	-	-	-	0.5	0.5
*Bankfull Cross Sectional Area (ft^2)	-	-	-	-	-	2.4	2.8
*Width/Depth Ratio	-	-	-	-	-	25.8	18.7
*Entrenchment Ratio	-	-	-	-	-	2.6	1.4
*Bank Height Ratio	-	-	-	-	-	-	1.0
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	-					B	B
Bankfull Discharge (cfs)	-					-	-
Sinuosity (ft)	-					1.2	1.2
Water Surface Slope (Channel) (ft/ft)	-					0.05	
Other	-					-	-

" - " denotes information is either not available or not applicable

*A hidden cell formula error was discovered during data processing of MY1 Data. This error resulted in incorrect stationing being assigned to the MY0 Cross-sections and dimensioning calculations. The above data is reflective of the corrected stationing.

Table 9 cont. Baseline Stream Data Summary Seinard Creek - Redmond Branch Reach 1B							
Parameter	**Pre-Existing Condition (if applicable)**					**Design**	**Monitoring Baseline (MY0)**
Riffle Only	Min	Mean	Med	Max	n		
Bankfull Width (ft)	-	-	-	-	-	6.8	-
Floodprone Width (ft)	-	-	-	-	-	-	-
Bankfull Mean Depth (ft)	-	-	-	-	-	0.5	-
Bankfull Max Depth (ft)	-	-	-	-	-	0.8	-
Bankfull Cross Sectional Area (ft^2)	-	-	-	-	-	3.6	-
Width/Depth Ratio	-	-	-	-	-	12.8	-
Entrenchment Ratio	-	-	-	-	-	2.9	-
Bank Height Ratio	-	-	-	-	-	-	-
Max part size (mm) mobilized at bankfull	-					-	-
Rosgen Classification	-					B	-
Bankfull Discharge (cfs)	-					-	-
Sinuosity (ft)	-					1.06	1.08
Water Surface Slope (Channel) (ft/ft)	-					0.05	0.040
Other	-					-	-

" - " denotes information is either not available or not applicable

Appendix D
Hydrologic Data

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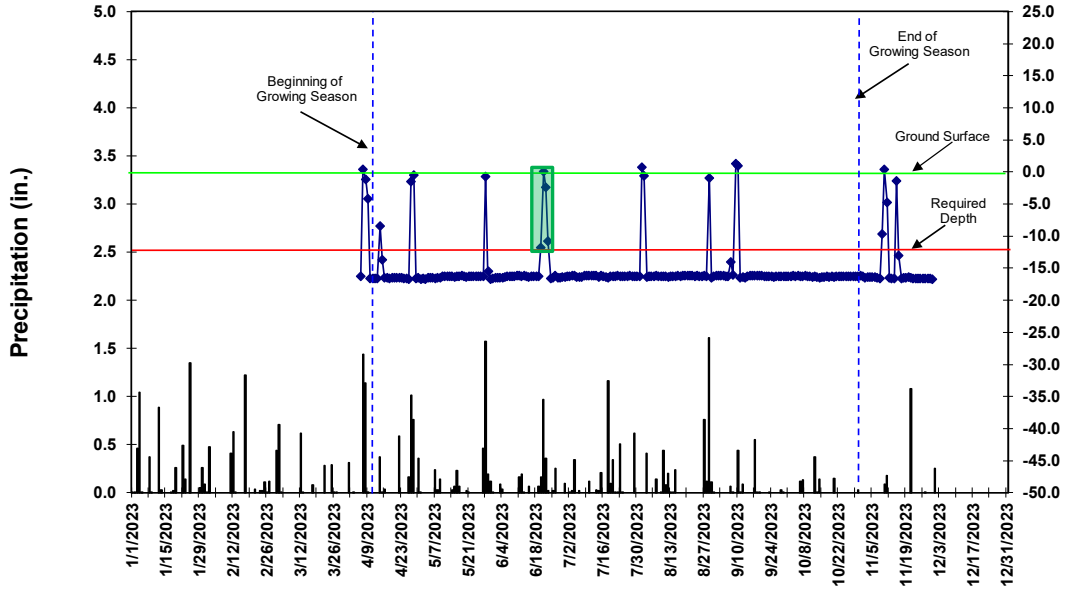
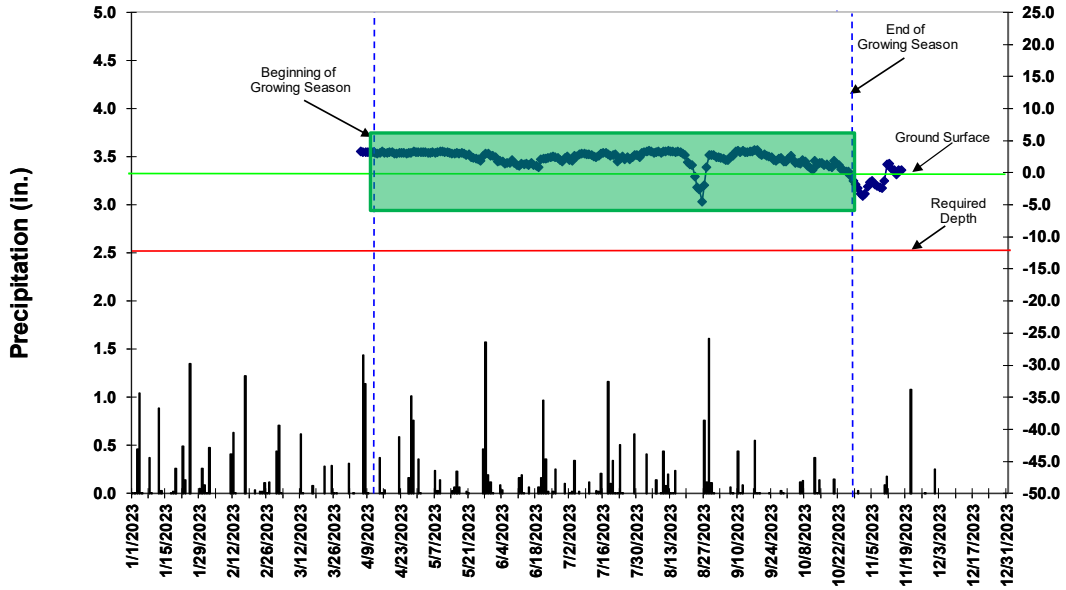
Gauge ID: **GG1** Reported Growing Season Days: 201 Dates:
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **4** **6/19-6/23**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **2%**



Gauge ID: **GG2** Reported Growing Season Days: 201 Dates:
Total Number of Consecutive Days Water Table within 12 inches of Soil Surface: **201** **07/10-10/26**
Percentage of Growing Season Water Table within 12 inches of Soil Surface: **100%**



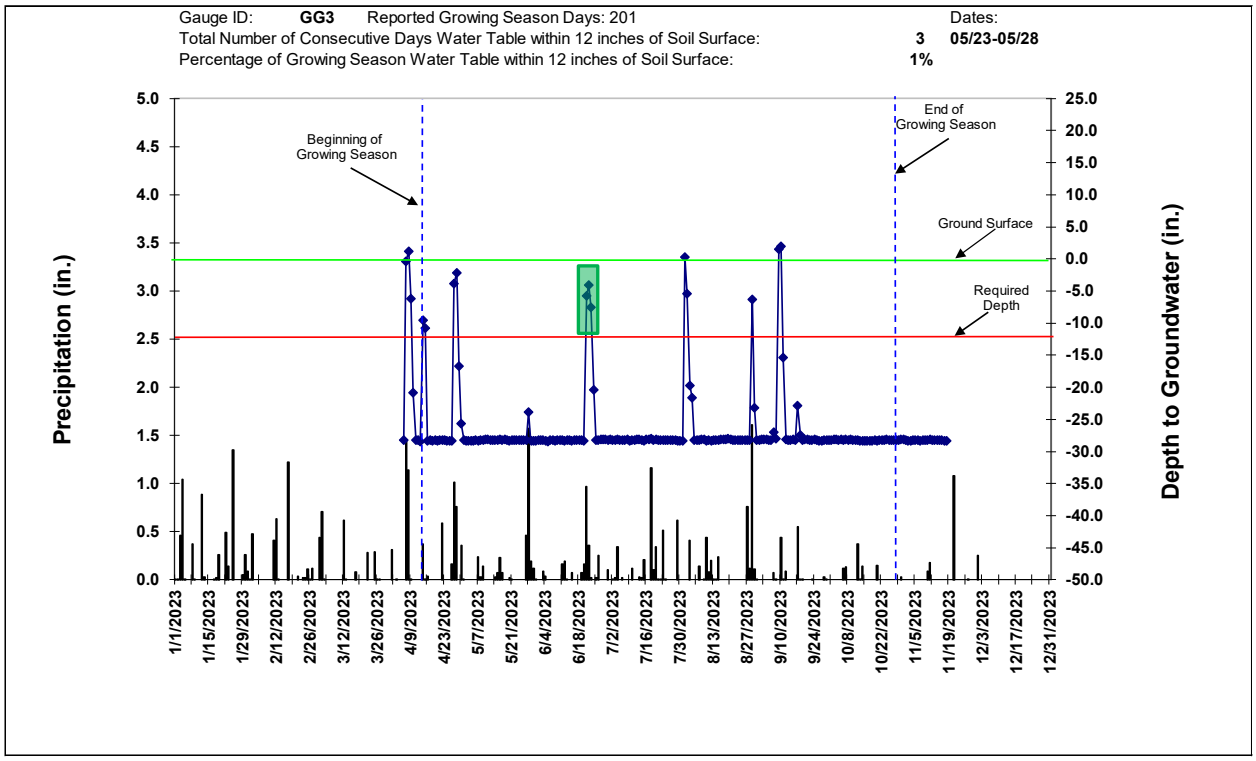
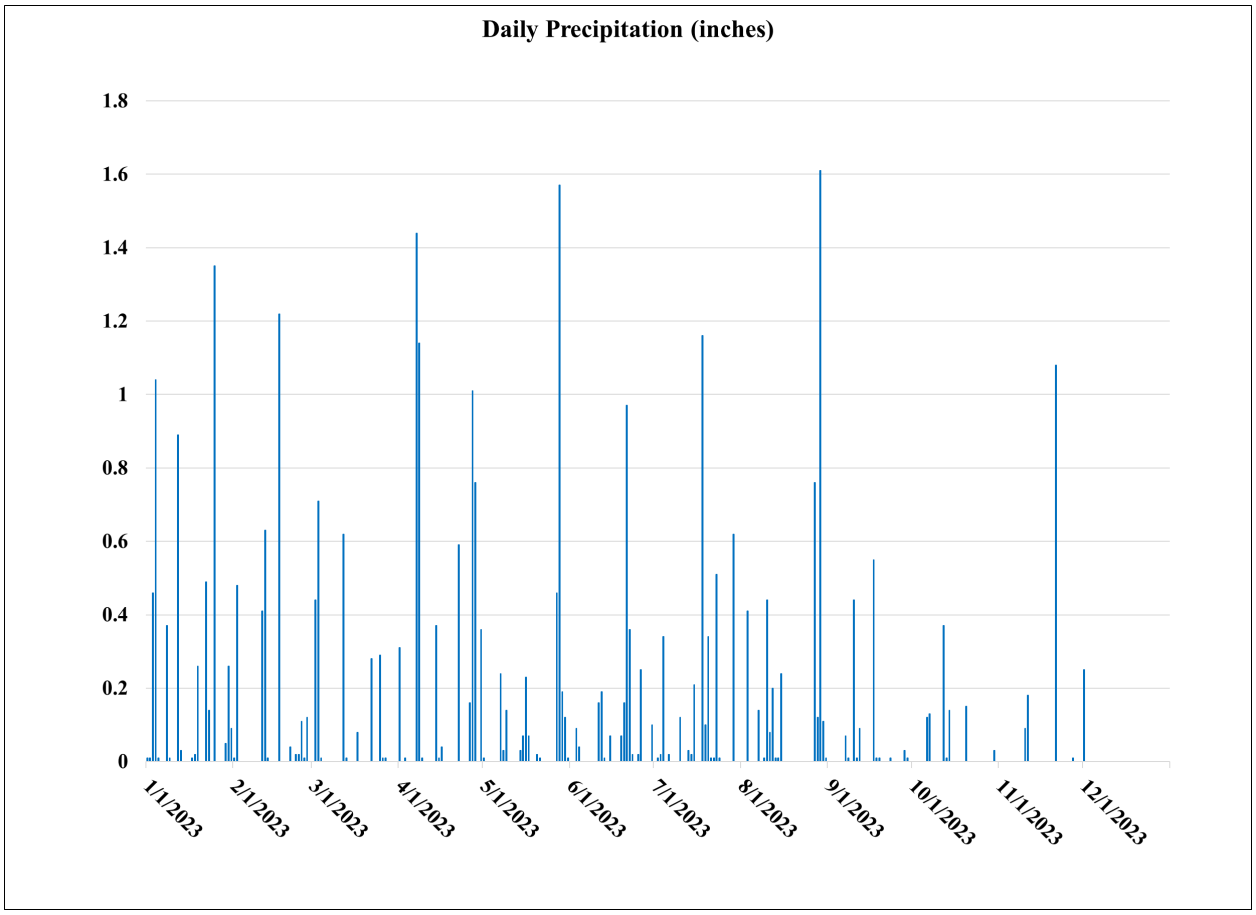


Table 10. Groundwater Gage Summary Table.

Monitoring Gauge	Typical Performance Standard: 12 % WETS Station: Asheville 13S Growing Season: 4/9 to 10/26 (201 days) Max. Consecutive Hydroperiod (%) and number of consecutive days (n)													
	MY-1 (2021)		MY-2 (2022)		MY-3 (2023)		MY-4 (2024)		MY-5 (2025)		MY-6 (2026)		MY-7 (2027)	
	%	n	%	n	%	n	%	n	%	n	%	n	%	n
GG-1	4	9	2	4	2	4	-	-	-	-	-	-	-	-
GG-2	55	110	100	201	100	201	-	-	-	-	-	-	-	-
GG-3	5	10	3	6	1	3	-	-	-	-	-	-	-	-

* Typcial performace standard for groundwater gauges is 12 percent (24 days), however wetland credits are not a part of this project.

Exceeds requirements by 10%	Fails to meet requirements, by less than 10%
Exceeds requirements, but by less than 10%	Fails to meet requirements by more than 10%


Daily Precipitation (inches)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1/1/2023
2/1/2023
3/1/2023
4/1/2023
5/1/2023
6/1/2023
7/1/2023
8/1/2023
9/1/2023
10/1/2023
11/1/2023
12/1/2023

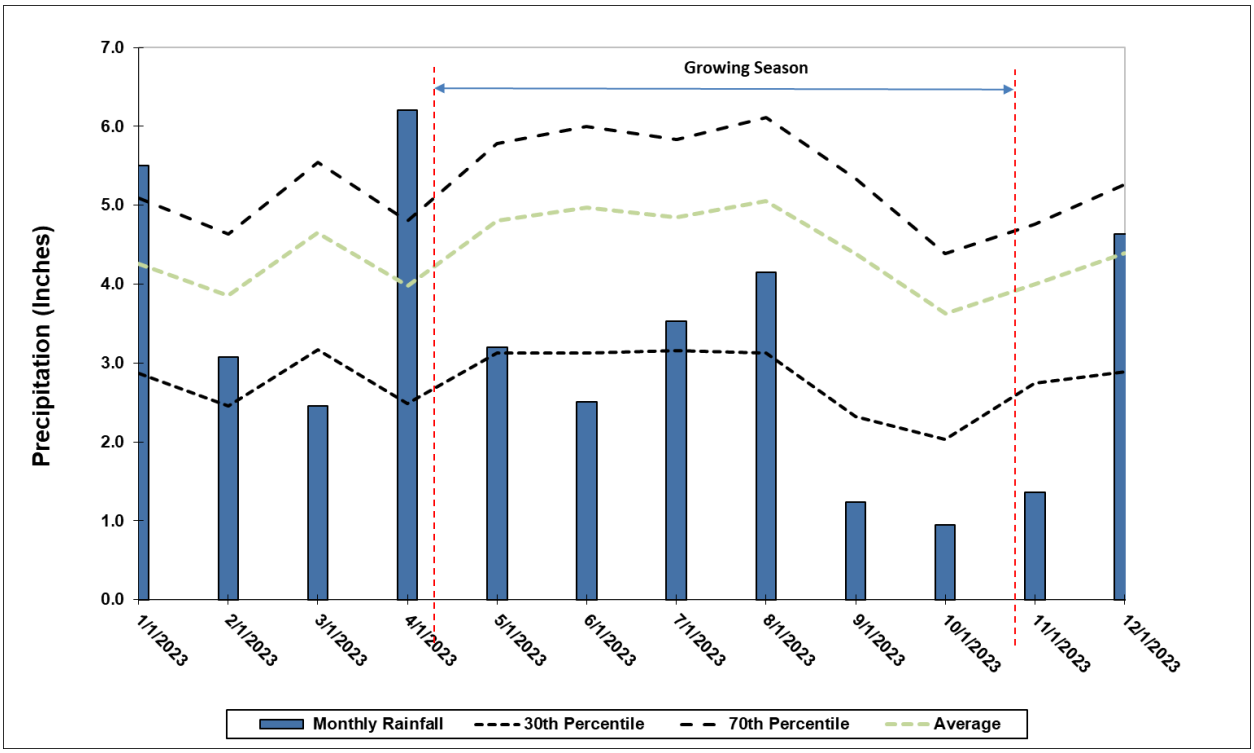
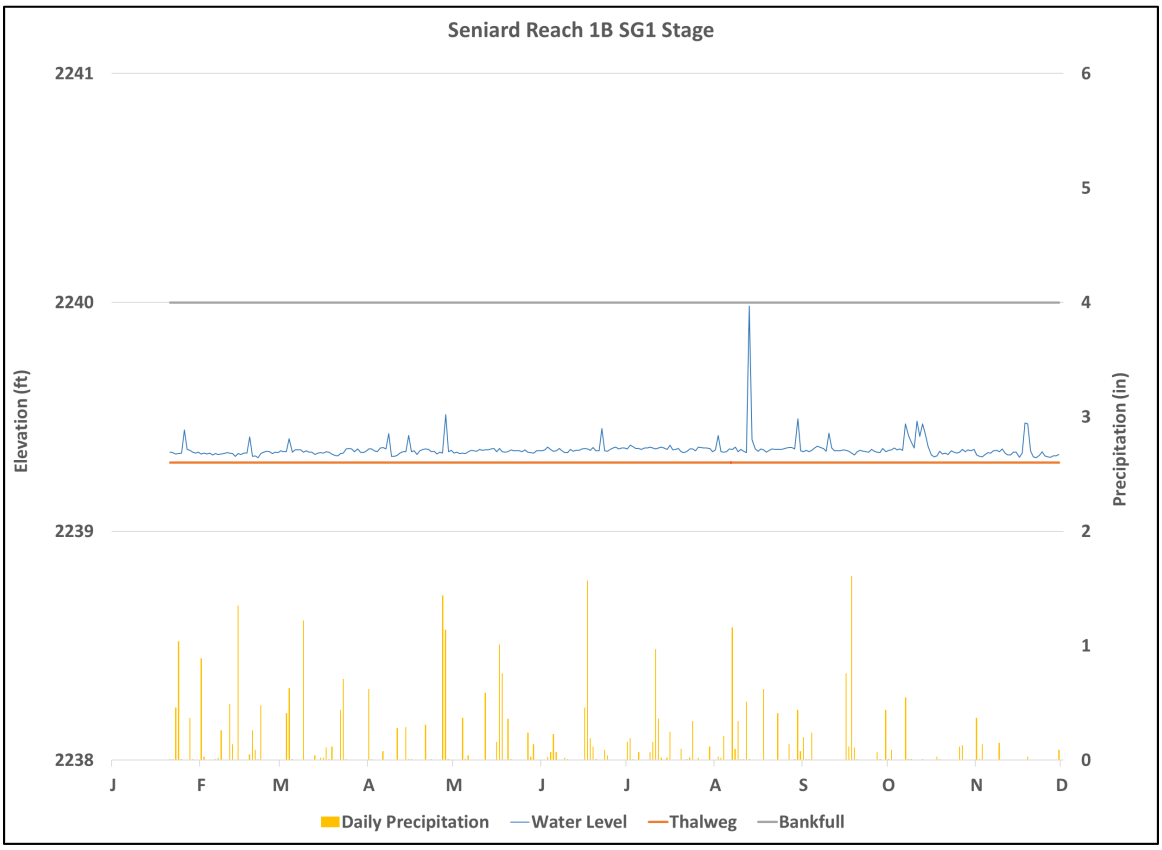

Precipitation (Inches)
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Growing Season
1/1/2023
2/1/2023
3/1/2023
4/1/2023
5/1/2023
6/1/2023
7/1/2023
8/1/2023
9/1/2023
10/1/2023
11/1/2023
12/1/2023
Monthly Rainfall
30th Percentile
70th Percentile
Average

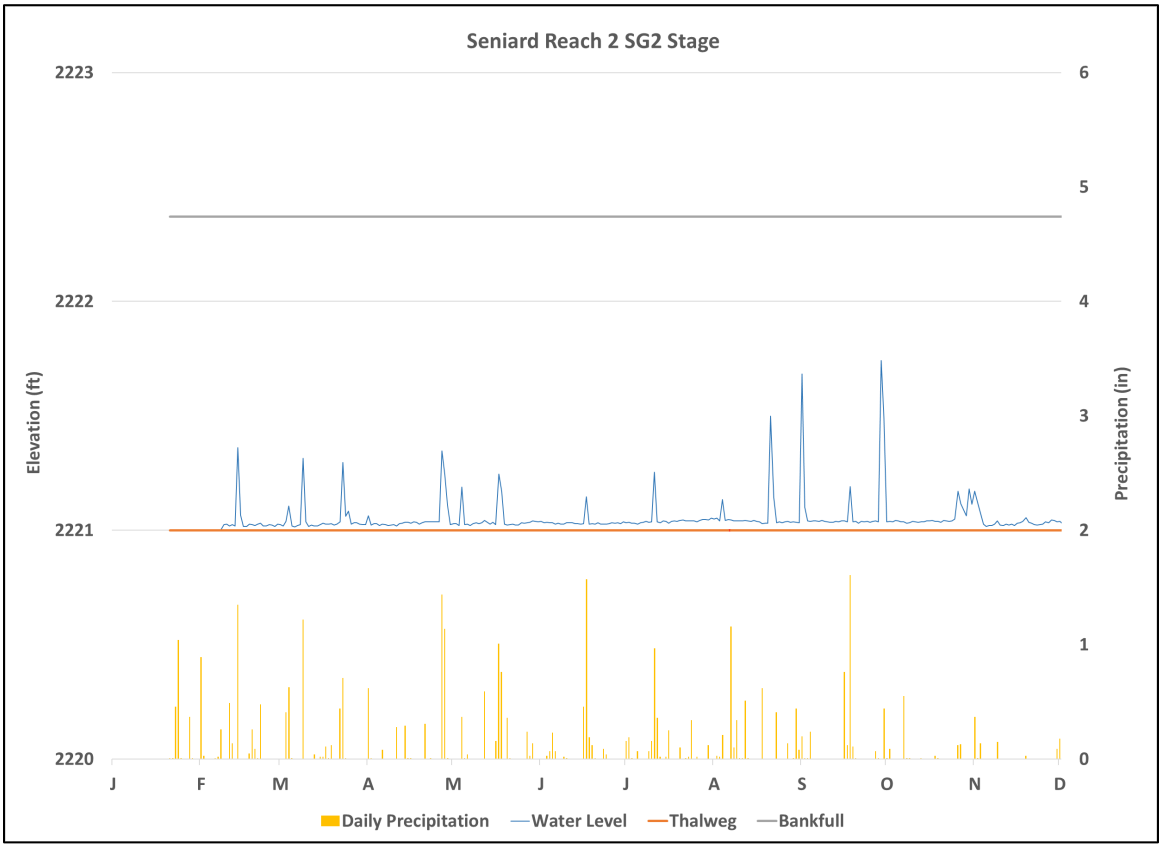
Table 11. Verification of Bankfull Events Seniard Creek Mitigation Project				
Date of Data Collection	**Date of Occurrence**	**Measurement location or Gage ID**	**Feet Above Bankfull Elevation**	**Photo # (if available)**
Seniard Reach 1B				
10/27/2021	8/17/2021	Stage Recorder (SG1)	0.19	n/a
Seniard Reach 2				
10/27/2021	8/17/2021	Stage Recorder (SG2)	0.75	n/a
1/20/2023	4/12/2022	Stage Recorder (SG2)	0.80	n/a
Sitton Reach				
10/27/2021	8/17/2021	Wrack Lines	Unknown	1 & 2
10/27/2021	10/7/2021	Stage Recorder (SG3)	0.09	n/a
1/20/2023	8/21/2022	Stage Recorder (SG3)	0.02	n/a
12/6/2023	8/14/2023	Stage Recorder (SG3)	0.06	n/a
Lee Branch Reach				
10/27/2021	3/25/2021	Stage Recorder (SG4)	0.09	n/a
10/27/2021	7/18/2021	Stage Recorder (SG4)	0.07	n/a
10/27/2021	8/17/2021	Stage Recorder (SG4)	0.20	n/a
10/27/2021	10/7/2021	Stage Recorder (SG4)	0.09	n/a
01/20/2023	7/5/2022	Stage Recorder (SG4)	0.10	n/a
11/18/2023	9/18/2023	Stage Recorder (SG4)	0.14	n/a
11/18/2023	*9/30/2023	Stage Recorder (SG4)	0.31	n/a
David Branch Reach 1B				
10/27/2021	3/25/2021	Stage Recorder (SG5)	0.05	n/a
10/27/2021	8/17/2021	Stage Recorder (SG5)	0.16	n/a
10/27/2021	10/7/2021	Stage Recorder (SG5)	0.06	n/a
01/20/2023	7/3/2022	Stage Recorder (SG5)	0.28	n/a
11/18/2023	*8/21/2023	Stage Recorder (SG5)	0.13	n/a
11/18/2023	9/18/2023	Stage Recorder (SG5)	0.16	n/a
11/18/2023	*9/30/2023	Stage Recorder (SG5)	0.28	n/a
David Branch Reach 1C				
10/27/2021	3/25/2021	Stage Recorder (SG6)	0.09	n/a
10/27/2021	7/18/2021	Stage Recorder (SG6)	0.05	n/a
10/27/2021	8/17/2021	Stage Recorder (SG6)	0.31	n/a
10/27/2021	10/7/2021	Stage Recorder (SG6)	0.04	n/a
01/20/2023	5/6/2022	Stage Recorder (SG6)	0.02	n/a
11/18/2023	*8/21/2023	Stage Recorder (SG5)	0.12	n/a
11/18/2023	9/18/2023	Stage Recorder (SG5)	0.16	n/a
11/18/2023	*9/30/2023	Stage Recorder (SG5)	0.39	n/a

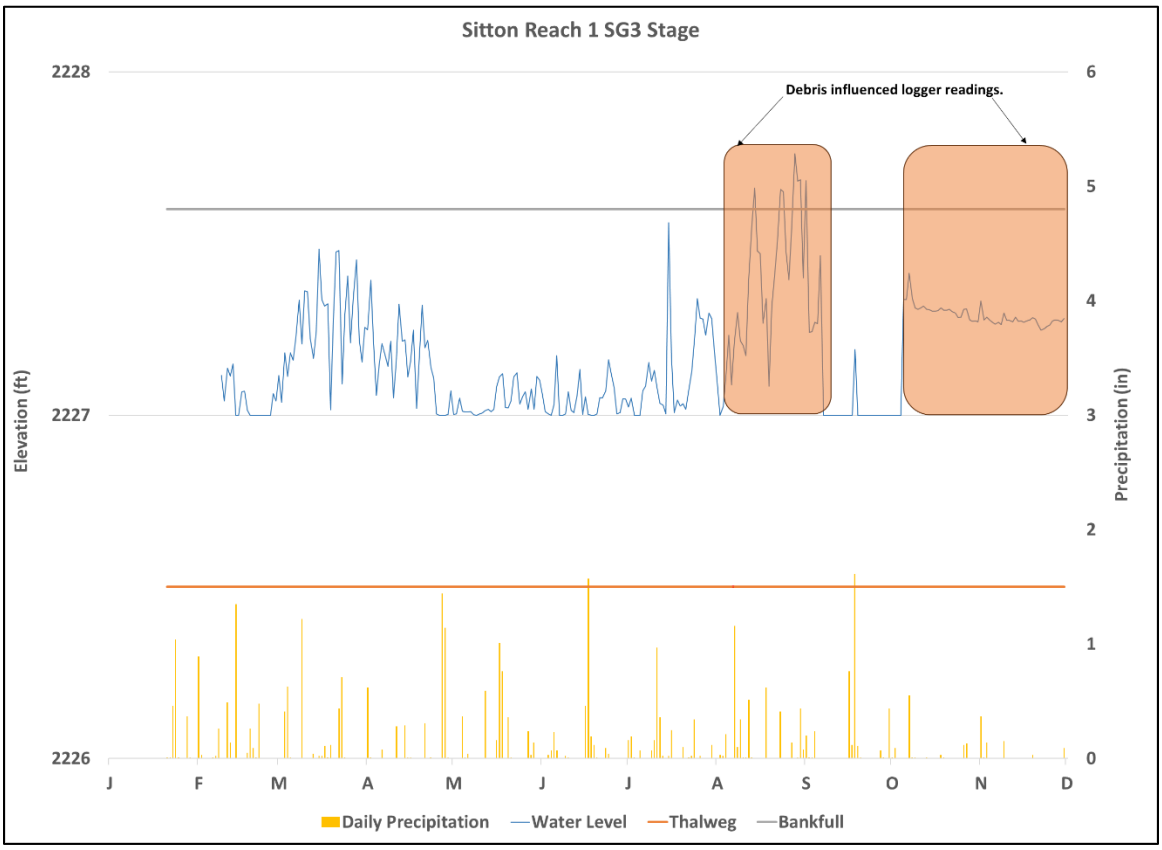
* Localized events not capured within rain data.

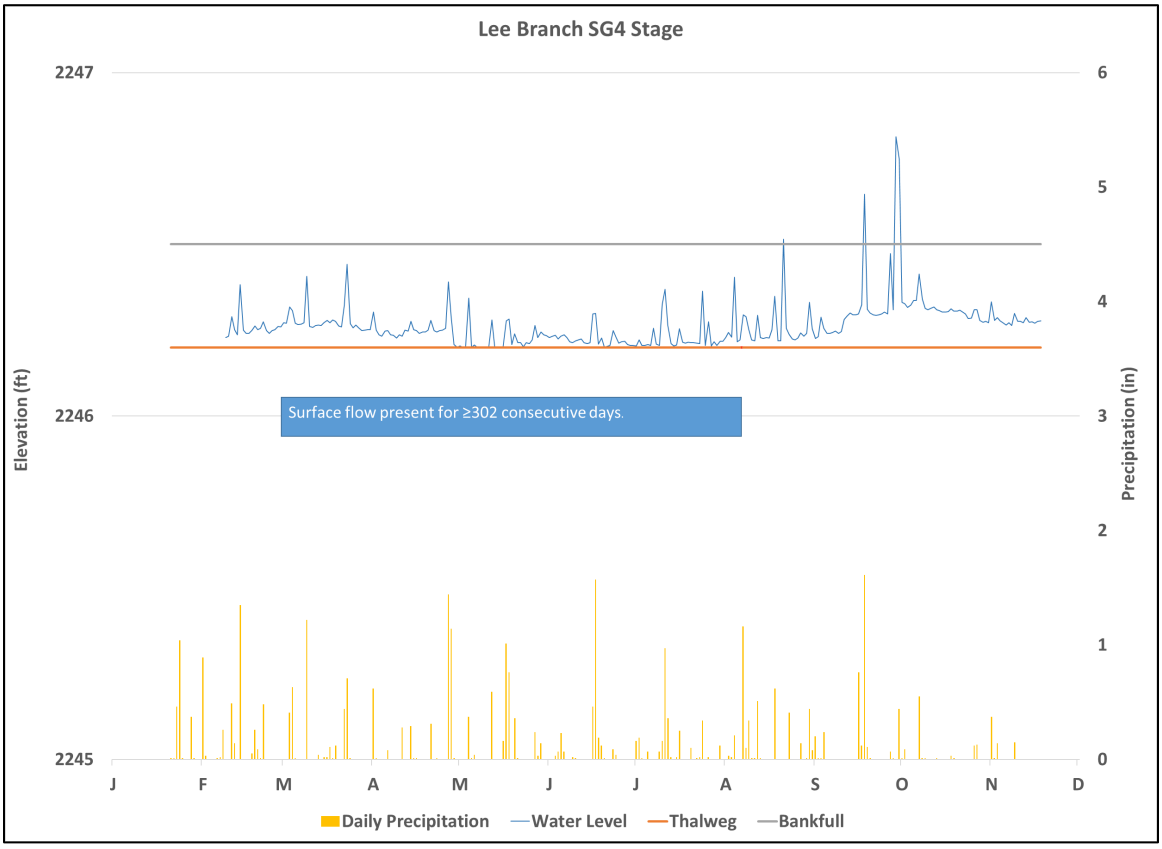
Table 11b. Streamflow Summary Table.							
Monitoring Gauge	Number of Days surface flow recorded.						
	MY-1 (2021)	**MY-2 (2022)***	**MY-3 (2023)**	**MY-4 (2024)**	**MY-5 (2025)**	**MY-6 (2026)**	**MY-7 (2027)**
	No. Days	No. Days	No. Days	No. Days	No. Days	No. Days	No. Days
Lee Branch	63	334	302	-	-	-	-
David Branch 1B	54	228	303	-	-	-	-
David Branch 1C	191	103	283	-	-	-	-

* Minimum logger detectability 0.81 inches depth. Loggers reset in MY2 to increase detectability at low flow.

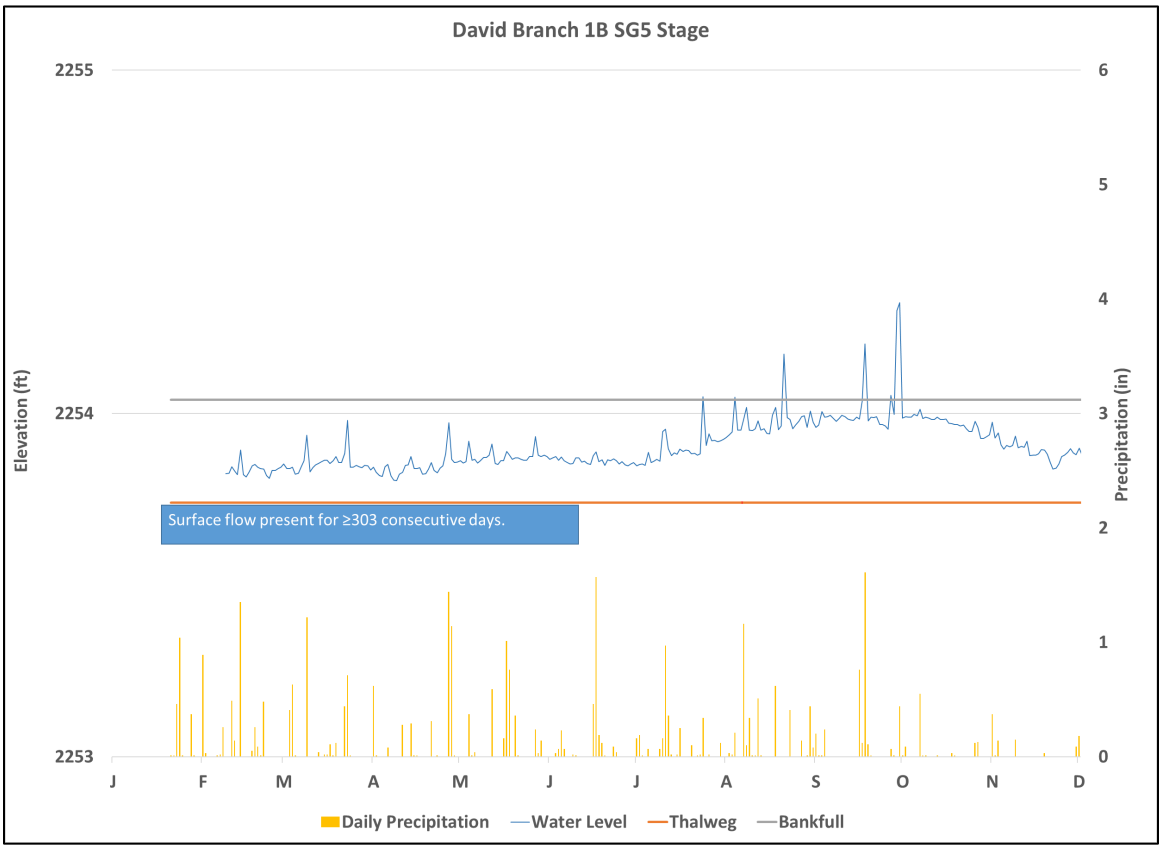

Seniard Reach 1B SG1 Stage
2241
2240
2239
2238
Elevation (ft)
6
5
4
3
2
1
0
Precipitation (in)
J
F
M
A
M
J
J
A
S
O
N
D
Daily Precipitation
Water Level
Thalweg
Bankfull


Seniard Reach 2 SG2 Stage
2223
2222
2221
2220
Elevation (ft)
6
5
4
3
2
1
0
Precipitation (in)
J
F
M
A
M
J
J
A
S
O
N
D
Daily Precipitation
Water Level
Thalweg
Bankfull

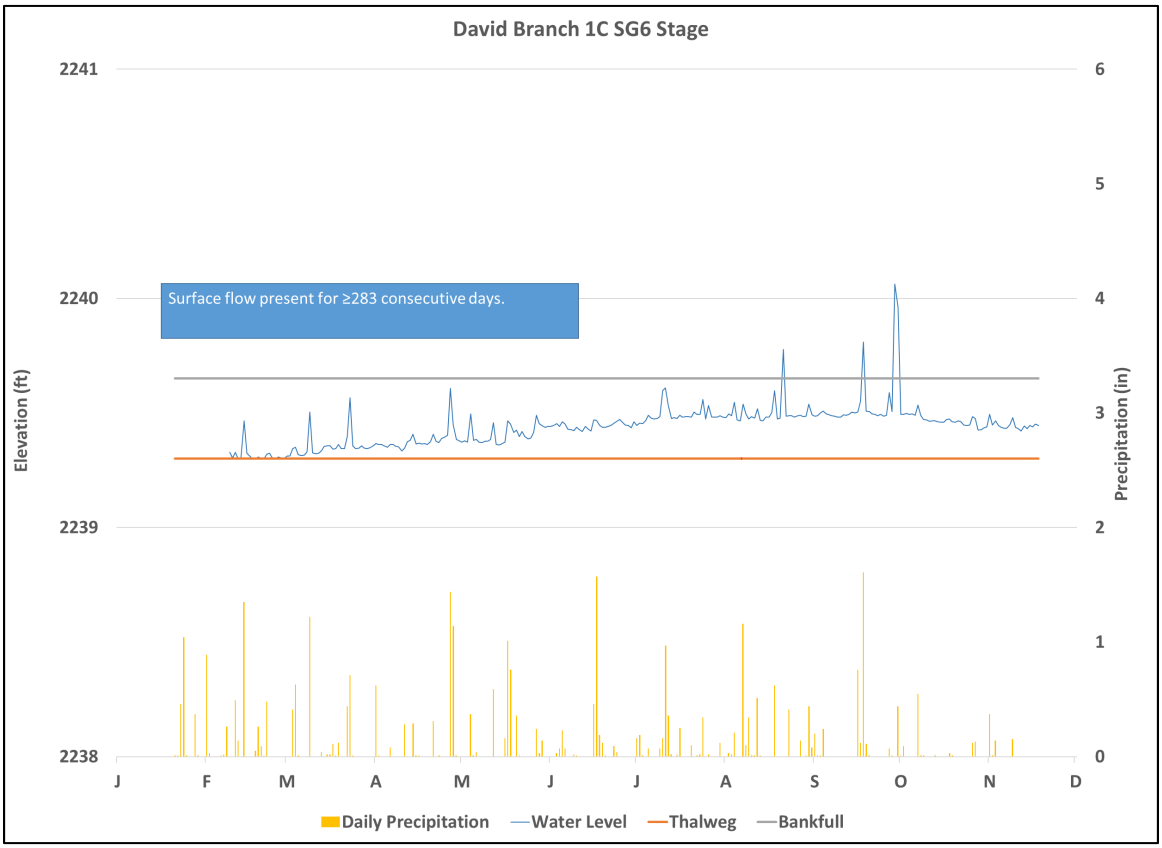




Minimum detectability = 0.81 inch



Minimum detectability = 0.81 inch



Minimum detectability = 0.81 inch

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Appendix E
Project Timeline and Contact Info

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Table 12. Project Activity and Timeline Seniard Creek Mitigation Site		
Activity or Report	**Data Collection Complete**	**Completion or Delivery**
Mitigation Plan	Dec - 2019	May - 2020
Mitigation Plan Addendum	-	-
Final Design - Construction Plans	-	Dec - 2020
Construction	-	Dec 5, 2020
Temporary S&E Mix Applied	-	Dec 5, 2020
Permanent Seed Mix Applied	-	Dec 5, 2020
Bare Root and Live Stake Plantings	-	Feb 25, 2021
Baseline Monitoring Document (Year 0 Monitoring - Baseline)		July - 2021
Stream Assessment	April 2, 2021	-
Vegetation Assessment	March 30, 2021	-
Invasive Vegetation Treatment	-	Jan - 2021
Year 1 Monitoring	-	Dec - 2021
Stream Assessment	October - 2021	-
Vegetation Assessment	November - 2021	-
Invasive Vegetation Treatment	January-June 2021	-
Year 2 Monitoring	-	Jan - 2023
Supplemental planting	February - 2022	-
Initial Site Assessment	April - 2022	May - 2022
Stream Assessment	Jan - 2023	-
Vegetation Assessment	Oct - 2022	-
Invasive Vegetation Treatment	June - 2022	-
Year 3 Monitoring	-	Dec- 2023
Initial Site Assessment	May - 2023	May - 2023
Stream Assessment	Nov - 2023	-
Vegetation Assessment	Oct - 2023	-

Table 12 cont. Project Contacts Seniard Mitigation Site	
Prime Contractor David Tuch (828) 253-6856	EW Solutions 37 Haywood Street, Suite 100 Asheville, NC 28801
Designer Grant Ginn (828) 449-1930	Stantec Consulting, Inc 56 College Street, Sute 201 Asheville NC, 28801
Construction Contractor Charles Baker (828) 668-5060	Baker Construction 1000 Bat Cave Rd, Old Fort NC 28762
Seeding Contractor Charles Baker (828) 668-5060	Baker Construction 1000 Bat Cave Rd, Old Fort NC 28762
Planting Contractor Owen Carson (828) 253-6856	Equinox Environmental 37 Haywood Street, Suite 100 Asheville, NC 28801
As-built Surveys Brad Kee (828) 575-9021	Kee Mapping 88 Central Ave Asheville, NC 28801
Seeding Mix Source (800) 873-3321	Ernst Conservation Seeds 8884 Mercer Pike Meadsville, PA 16335
Woody Stem Source Cole Williams (706) 483-3397	Native Forest Nursery 11306 Hwy 411 S Chatsworth, Ga 30705
Live Stakes Carla Scholl (919) 742-1200	Mellow Marsh Farms 1312 Woody Store Rd Siler City, NC 27344
Monitoring Performers (MY3)- 2023 Danvey Walsh (828) 253-6856 ext 201	Equinox Environmental 14 O' Henry Avenue, Suite 100 Asheville, NC 28801

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Appendix F
Other Data

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On June 15, 2023, the MY3 single pass electrofishing survey was conducted on Seniard Creek. This annual survey monitors relative abundance of fish species upstream and downstream of the previously hanging culvert at the project boundary. Stream stage was lower than in previous years leading to increased difficulty in sampling riffles within both reaches. Additionally, a short portion of the upstream reach could not be adequately sampled due to an active bald faced hornet nest situated directly above the channel. Despite sampling complications, seven species of fish were collected during MY3 surveys. A total of fifty-three fish were collected from Seniard Creek on the downstream side of the culvert, representing six species. Upstream of the previously hanging culvert, seven fishes were collected within this reach, representing five species. No young-of-year were collected during the MY3 survey.

Creek chub, and guilt darter were collected in the upstream reach during MY2 but not MY3. Similarly, central stoneroller and brown trout were absent from the downstream reach during MY3. Brown trout occurs in relatively low abundance within the site. No new species were collected during MY3. The biggest increase in relative abundance was noted within mottled sculpin and blacknose dace. Within mottled sculpin, a significant increase in juveniles was noted in both MY2 and MY3. Blacknose dace increased in number within both age classes. Density upstream of the previously hanging culvert remains low and may remain low considering the limited range of habitat when compared to the downstream reach. The increase in species distribution in the upper reach since MY0 is indicative of a connected system. Future surveys may provide additional information regarding the fisheries assemblage and distributional data.

Seniard Creek fish sampling summary

		Pre Construction			MY1			MY2			MY3		
Downstream of culvert													
Common Name	Binomial Name	YOY	J	A	YOY	J	A	YOY	J	A	YOY	J	A
River Chub	*Nocomis micropogon*			1						1		1	2
Central Stoneroller	*Campostoma anomalum*			1		1			5				
Mottled Sculpin	*Cottus bairdii*			2	2		2	1	10	4		23	3
Rosyside Dace*	*Clinostomus funduloides*			1									
Blacknose dace	*Rhinichthys atratulus*				1				1			4	9
Rainbow Trout	*Oncorhynchus mykiss*	1			5	4	1		3	4		4	
Brown Trout	*Salmo trutta*					2			3				
Gilt Darter	*Percina evides*									2			1
Creek Chub	*Semotilus atromaculatus*								2			5	1
	Sum	6			18			36			53		
Upstream of culvert													
Rainbow Trout	*Oncorhynchus mykiss*				2		1		1			1	
Brown Trout	*Salmo trutta*						1						
Mottled Sculpin	*Cottus bairdii*			1		1			3			1	
Creek Chub	*Semotilus atromaculatus*							1					
Gilt Darter	*Percina evides*									1			
Central Stoneroller	*Campostoma anomalum*								1			2	
Blacknose dace	*Rhinichthys atratulus*								2			3	
	Sum	1			5			7			7		
YOY - young of year, J - Juvenile, A - Adult		Species = 5			Species = 5			Species = 8			Species = 7		
* Likely misidentified saffron shiner													

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