MONITORING YEAR 2 ANNUAL REPORT
FINAL

December 2022

MCCLENNY ACRES MITIGATION SITE
Wayne County, NC
Neuse River Basin
HUC 03020201

DMS Project No. 100038
NCDEQ Contract No. 7423
DWR Project No. 2018-0197
USACE Action ID No. 2018-02042

Data Collection Dates: April-November 2022

DMS RFP No. 16-007279
June 21, 2017

PREPARED FOR:

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

December 30, 2022

Jeremiah Dow
Project Manager
NCDEQ- Division of Mitigation Services
217 West Jones St.
Raleigh, NC 27603

Subject: McClenny Acres Mitigation Site – Monitoring Year 2 Report
Neuse River Basin – HUC 03020201
Wayne County
DMS Project ID No. 100038
Contract # 7423

Dear Mr. Dow:

On December 22, 2022, Wildlands Engineering received comments from the North Carolina Division of Mitigation Services (DMS) regarding the Draft Monitoring Year 2 Report for the McClenny Acres Mitigation Site. DMS comments are reprinted below with Wildlands' responses in italics.

1. Table 2 reports UT3 as having 95 consecutive days of stream flow and Section 2.6 reports 104 days. Please correct.

   Response: Table 2 was updated to indicate the correct value of 104 consecutive days of stream flow.

2. No hydrograph was included in Appendix D for UT3.

   Response: UT3 is equipped with an in-stream flow gauge which measures stream flow and bankfull events while UT1, UT2, and UT4 are equipped with crest gauges mounted on the stream bank which only measure high flow events. The UT3 Recorded In-Stream Flow Events Plot was included in Appendix D following the Recorded Bankfull Events Plots for UT1, UT2, and UT4. The two types of gauges are measuring different criteria parameters so they were separated in the appendix instead of providing hydrographs in sequence of tributary number.

3. The hydrograph for UT4 shows no variability in water level in response to rain events. Is this accurate?

   Response: This data is correct, but further explanation of how crest gauges are installed may facilitate interpretation. UT4 is equipped with a crest gauge mounted on the stream bank at an elevation above typical baseflow but below the bankfull elevation. During MY2, the stream flow elevation did not reach the elevation of the pressure transducer. For crest gauges installed as this one, plots are titled "Recorded Bankfull Events Plot." The flat line portions of recorded data on these plots are arbitrary and are the result of stream flow being below the elevation of the pressure transducer. The relevant and meaningful data are the spikes which are indicative of above baseflow conditions.

4. The mitigation plan states that "If a wetland zone does not meet the performance standard for a given monitoring year, rainfall patterns will be analyzed, and the hydrograph will be compared to that of the reference wetlands to assess whether atypical weather conditions occurred…" While atypical drought conditions are clearly shown with the drought conditions graph and

WETS precipitation data, is there a reference wetland that could be presented? This could be valuable considering so many wetland gauges failing to attain success criteria in MY1 and MY2.

Response: Wildlands is not currently monitoring a reference wetland that we expect to have similar hydrology to the McClenny Acres Mitigation Site. A reference well will be installed in a preservation area in the adjacent wetland mitigation bank.

Thank you for your review and providing comments on this submittal. In addition to the comments above, report figures, tables, and text were updated to include Chinese privet treatment which occurred during December 2022 after the draft submittal. If you have any further questions, please contact me at (919) 851-9986, or by email (jlorch@wildlandseng.com).

Sincerely,

Jason Lorch, *Monitoring Coordinator*

PREPARED BY:

WILDLANDS
ENGINEERING

312 West Millbrook Road, Suite 225
Raleigh, NC 27609

Jason Lorch
jlorch@wildlandseng.com
Phone: 919.851.9986

MCCLENNY ACRES MITIGATION SITE

Monitoring Year 2 Annual Report

TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

Section 1: PROJECT OVERVIEW

The McClenny Acres Mitigation Site (Site) is located in Wayne County, approximately four miles west of Goldsboro. The Site is within a new targeted local watershed (TLW) which was not described in the 2010 Neuse River Basin Restoration Priorities (RBRP) plan (Breeding, 2010). Table 3 presents information related to the project attributes.

1.1 Project Quantities and Credits

Mitigation work within the Site included restoration, enhancement II, and preservation of perennial and intermittent stream channels, along with re-establishment and enhancement of wetlands. Table 1 below shows stream credits by reach and the total amount of stream credits expected at closeout.

Table 1: Project Quantities and Credits

PROJECT MITIGATION QUANTITIES							
Project Segment	**Mitigation Plan Footage**	**As-Built Footage**	**Mitigation Category**	**Restoration Level**	**Mitigation Ratio (X:1)**	**Credits**	**Comments**
STREAMS							
UT1	1,263	1,286	Warm	R	1	1,263.000	Full Channel Restoration, Planted Buffer
	20	20	N/A	N/A	N/A	N/A	Utility R.O.W., Not for Credit
	1,471	1,497	Warm	R	1	1,471.000	Full Channel Restoration, Planted Buffer
UT2 Reach 1	95	89	Warm	P	10	8.900	Conservation Easement
UT2 Reach 2	574	574	Warm	R	1	574.000	Full Channel Restoration, Planted Buffer
	21	21	N/A	N/A	N/A	N/A	Utility R.O.W., Not for Credit
	314	311	Warm	R	1	314.000	Full Channel Restoration, Planted Buffer
UT3 Reach 1	472	472	Warm	R	1	472.000	Full Channel Restoration, Buffer Planting
UT3 Reach 2	170	153	Warm	R	1	145.000	Full Channel Restoration, Buffer Planting
	89	163	N/A	N/A	N/A	N/A	Utility R.O.W., Not for Credit
	1,117	1,082	Warm	R	1	1068.000	Full Channel Restoration
UT4 Reach 1	3,824	3,862	Warm	R	1	3,824.000	Full Channel Restoration
UT4 Reach 2	174	167	Warm	EII	2.5	69.600	Floodplain Berm Removed
					Total	**9,209.500**	
WETLANDS							
Wetland Re-establishment	36.795	36.328	Riparian	Re-establishment	1	36.328	Restored Hydrology, Planted
Wetland Enhancement	0.588	0.560	Riparian	Enhancement	2	0.280	Enhanced Hydrology
					Total	**36.608**	

Restoration Level	Stream	Riparian Wetland
	Warm	Riverine
Restoration	9,131.000	
Enhancement II	69.600	
Preservation	8.900	
Re-Establishment		36.328
Enhancement		0.280
Total Stream Credit	**9,209.500**	
Total Wetland Credit		**36.608**

1.2 Project Goals and Objectives

The project is intended to provide numerous ecological benefits within the Neuse River Basin. Table 2 below describes expected outcomes to water quality and ecological processes and provides project goals and objectives.

Table 2: Goals, Performance Criteria, and Functional Improvements

Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Improve the stability of stream channels.	Construct stream channels that will maintain a stable pattern and profile considering hydrologic and sediment inputs to the system, the landscape setting, and the watershed conditions.	Reduce and control sediment inputs and contribute to protection of or improvement to a Water Supply and Nutrient-Sensitive Water.	ER stays over 2.2 and BHR below 1.2 with visual assessments showing progression towards stability.	Cross-section monitoring and visual inspections.	All stream channels are stable and performing as designed.
Reconnect channels with floodplains and riparian wetlands.	Reconstruct stream channels with appropriate bankfull dimensions and depth relative to the existing floodplain.	Reduce shear stress on channel; hydrate adjacent wetland areas; and filter pollutants out of overbank flows.	Four bankfull events in separate monitoring years. 30 consecutive days of flow for intermittent channel.	Crest gauges and/or pressure transducers recording flow elevations.	Bankfull events were recorded on UT1 and UT3 during MY2. 104 consecutive days of stream flow were recorded on UT3.
Improve instream habitat.	Install habitat features such as cover logs, log sills, and brush toes into restored/enhanced streams. Add woody materials to channel beds. Construct pools of varying depth.	Support biological communities and processes; and provide aquatic habitats for diverse populations of aquatic organisms.	There is no required performance standard for this metric.	N/A	N/A

Goal	Objective/ Treatment	Likely Functional Uplift	Performance Criteria	Measurement	Cumulative Monitoring Results
Restore wetland hydrology, soils, and plant communities.	Restore and enhance riparian wetlands by raising stream beds, plugging existing ditches, removing berm material over relic hydric soils, and planting native wetland species.	Improve terrestrial habitat; and contribute to protection of or improvement of a Water Supply and Nutrient-Sensitive Water.	Free groundwater surface within 12 inches of the ground surface for 10-14% of the growing season under normal precipitation conditions.	Groundwater wells equipped with transducers recording depth to water table. Transducers recording soil temperature.	9 out of 19 groundwater gauges indicated successful criterion attainment during MY2.
Restore and enhance native floodplain vegetation.	Plant native tree species in riparian zone where insufficient.	Reduce and control sediment inputs; reduce and manage nutrient inputs; provide a canopy to shade streams and reduce thermal loadings; and contribute to protection of or improvement of a Water Supply and Nutrient-Sensitive Water.	Survival rate of 320 stems per acre at MY3, 260 planted stems per acre at MY5, and 210 stems per acre at MY7. Height requirement is 7 feet at MY5 and 10 feet at MY7.	One hundred square meter vegetation plots are placed on 2% of the planted area of the Site and monitored annually.	24 out of 25 vegetation plots have a planted stem density greater than 320 stems per acre.
Permanently protect the project site from harmful uses.	Establish conservation easements on the Site.	Ensure that development and agricultural uses that would damage the Site or reduce the benefits of the project are prevented.	Prevent easement encroachment.	Visually inspect the perimeter of the Site to ensure no easement encroachment is occurring.	No easement encroachments.

1.3 Project Attributes

The Site was restored by Wildlands through a full delivery contract with DMS. Table 3 provides detailed information regarding the project information and attributes.

Table 3: Project Attributes

PROJECT INFORMATION			
Project Name	McClenny Acres Mitigation Site	County	Wayne County
Project Area (acres)	52.08	Project Coordinates	35° 23’ 25” N, 78° 03’ 15” W
PROJECT WATERSHED SUMMARY INFORMATION			
Physiographic Province	Coastal Plain	River Basin	Neuse
USGS HUC 8-digit	03020201	USGS HUC 14-digit	03020201200030
DWR Sub-basin	03-04-12	Land Use Classification	38% cultivated crops; 21% forest; 17% shrub herbaceous; 15% wetland; 9% residential
Project Drainage Area (acres)	828	Percentage of Impervious Area	2.1%

RESTORATION TRIBUTARY SUMMARY INFORMATION				
Parameters	**UT1**	**UT2**	**UT3**	**UT4**
Pre-project length (feet)	2,986	1,254	2,610	2,826
Post-project (feet)	2,783	974	1,707	4,029
Valley confinement	Unconfined			
Drainage area (acres)	423	40	222	784
Perennial, Intermittent, Ephemeral	Perennial	Perennial	Intermittent/ Perennial	Perennial
DWR Water Quality Classification	WS-IV (NSW)			
Dominant Stream Classification (existing)	E5/G5	F5		E5/G5
Dominant Stream Classification (proposed)	C5	C5	C5	C5
Dominant Evolutionary class (Simon) if applicable	Stage III/IV	Stage III		Stage IV

REGULATORY CONSIDERATIONS			
Parameters	**Applicable?**	**Resolved?**	**Supporting Documentation**
Water of the United States - Section 404	Yes	Yes	USACE Nationwide Permit No. 27 and DWQ 401 Water Quality Certification No. 4134.
Water of the United States - Section 401	Yes	Yes	
Endangered Species Act	Yes	Yes	Categorical Exclusion in Mitigation Plan (Wildlands, 2020)
Historic Preservation Act	Yes	Yes	
Coastal Zone Management Act (CZMA or CAMA)	N/A	N/A	N/A
Essential Fisheries Habitat	No	N/A	N/A

Section 2: Monitoring Year 2 Data Assessment

Annual monitoring and site visits were conducted during MY2 to assess the condition of the project. The vegetation and stream success criteria for the Site follow the approved success criteria presented in the Mitigation Plan (Wildlands, 2020). Performance criteria for vegetation, stream, and hydrologic assessment are located in Section 1.2 Table 2: Goals, Performance Criteria, and Functional Improvements. Methodology for annual monitoring is presented in the MY0 Annual Report (Wildlands, 2021).

2.1 Vegetative Assessment

The MY2 vegetation survey was completed in September 2022. Twenty-four out of the 25 plots exceeded the MY3 interim success criterion of 320 planted stems per acre. Individual plot stem density ranged from 283 to 729 planted stems per acre. Vegetation plot 15 did not meet the interim density requirement due to mortality of unknown cause. Low stem density does not appear to be a problem in the general surrounding area. Overall tree survival and growth is excellent and on track to develop into an early successional ecosystem. Herbaceous vegetation is well established and includes native pollinator-friendly species. Refer to Appendix A for Vegetation Plot Photographs and the Vegetation Condition Assessment Table and Appendix B for Vegetation Plot Data.

2.2 Vegetation Areas of Concern

Chinese privet (*Ligustrum sinense*) was treated during December 2022 using the cut-stump method within a 0.19 acre area at the upstream extent of UT2 (Figure 1a). No other vegetation areas of concern have been identified during MY2.

2.3 Stream Assessment

Morphological surveys for MY2 were conducted in March 2022. All streams within the Site are stable and functioning as designed. Surveyed cross-sections at the Site show little to no change in the bankfull area and width-to-depth ratio and bank height ratios are less than 1.2. Refer to Appendix A for the Visual Stream Morphology Stability Assessment Table and Stream Photographs. Refer to Appendix C for Stream Geomorphology Data.

2.4 Stream Areas of Concern

No stream areas of concern were identified during MY2.

2.5 Monitoring Year 2 Precipitation Conditions

Stream and wetland hydrology has been significantly affected by drier than normal weather conditions that have occurred from September of 2021 until the present in the Wayne County area. The National Integrated Drought Information System (NIDIS) indicates that conditions ranging from “abnormally dry” to “severe drought” have occurred almost continuously since September of 2021 (Graph 1). Water levels in streams and wetlands on mitigation sites throughout the Wayne County area were clearly lower for more prolonged periods of time during 2022 than has occurred in at least the past five years of mitigation monitoring observation.

2.6 Stream Hydrology Assessment

Four bankfull events during separate monitoring years must occur on each of the project channels. Bankfull events were recorded on UT1 and UT3 during MY2 (Table 10). The lack of bankfull events on UT2 and UT4 was likely related to the low precipitation conditions.

In addition, the presence of baseflow must be documented on the restored intermittent reach (UT3 Reach 1) for a minimum of 30 consecutive days during a calendar year with normal precipitation. UT3 Reach 1 maintained baseflow for 104 consecutive days and 120 total days during MY2, despite drier than normal weather conditions. Refer to Appendix 5 for hydrologic data.

2.7 Wetland Assessment

The performance criterion for groundwater gauges (GW) 1 and 5 is a free groundwater surface within 12 inches of the soil surface for 14% (38 consecutive days) of the growing season. GW 2-4 and GW 6-19 have a 10% (27 consecutive days) hydroperiod criterion. Growing season dates approved in the Mitigation Plan were March 4 through November 21 with allowance for modification based on soil temperature data and bud burst. During MY1 and MY2, bud burst of red maple (*Acer rubrum*) was observed in late February and soil temperature was above 41 degrees Fahrenheit for the entire data observation period. Therefore, growing season dates used for MY2 wetland hydrology evaluation are March 1, 2022 through November 21, 2022.

Nine of the 19 GWs at the site attained the success criterion for MY2 (Table 13). GW 5 was only six days short of attaining the 38 day hydroperiod criterion. At this location, the water table receded only to a depth of 14 inches for two days before rising above 12 inches for another 10 consecutive days. GW 2, 4, 8-10, and 16-19 were significantly short in achieving the hydroperiod criterion during MY2. Given the dry conditions that occurred during the early spring of MY1 and the prolonged, exceptionally dry conditions that have occurred during MY2, additional seasons of water table observation are warranted to better understand hydrology of wetland re-establishment areas during normal quantities of precipitation. Refer to Figures 1-1b for the groundwater gauge locations and Appendix D for groundwater hydrology data and plots.

2.8 Adaptive Management Plan

Follow up treatment of the area treated for Chinese privet may be required during future monitoring years (Figure 1a). No other adaptive management practices are currently necessary.

2.9 Monitoring Year 2 Summary

Twenty-four out of 25 vegetation plots exceeded the MY3 interim stem density requirement of 320 planted stems per acre, with the last vegetation plot still meeting the final success criteria. Herbaceous vegetation and planted stems appear to have become well acclimated to site conditions and are growing vigorously throughout the project area. One small, minor population of Chinese privet was treated. All project streams are stable and well-functioning. Bankfull events were observed on UT1 and UT3, and greater than 30 consecutive days of flow were observed on UT3. Nine of the 19 groundwater wells were successful in attaining hydrology criteria. This low success rate is most likely related to the prolonged, exceptionally dry weather conditions that occurred from fall of 2021 until present. Overall, the Site has exhibited excellent vegetation growth and stream channel stability during MY2 and demonstrates early indicators of successfully restored, diverse aquatic and terrestrial ecosystems.

Summary information and data related to the performance of various project and monitoring elements can be found in the tables and figures in the report appendices. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

Section 3: REFERENCES

Breeding, R. 2010. Neuse River Basin Restoration Priorities. North Caroline Ecosystem Enhancement Program. Accessed at: https://files.nc.gov/ncdeq/Mitigation%20Services/Watershed_Planning/Neuse_River_Basin/FINAL%20RBRP%20Neuse%202010_%2020111207%20CORRECTED.pdf

National Oceanic and Atmospheric Administration National Integrated Drought Information System. Drought Conditions for Wayne County. https://www.drought.gov/states/north-carolina/county/Wayne

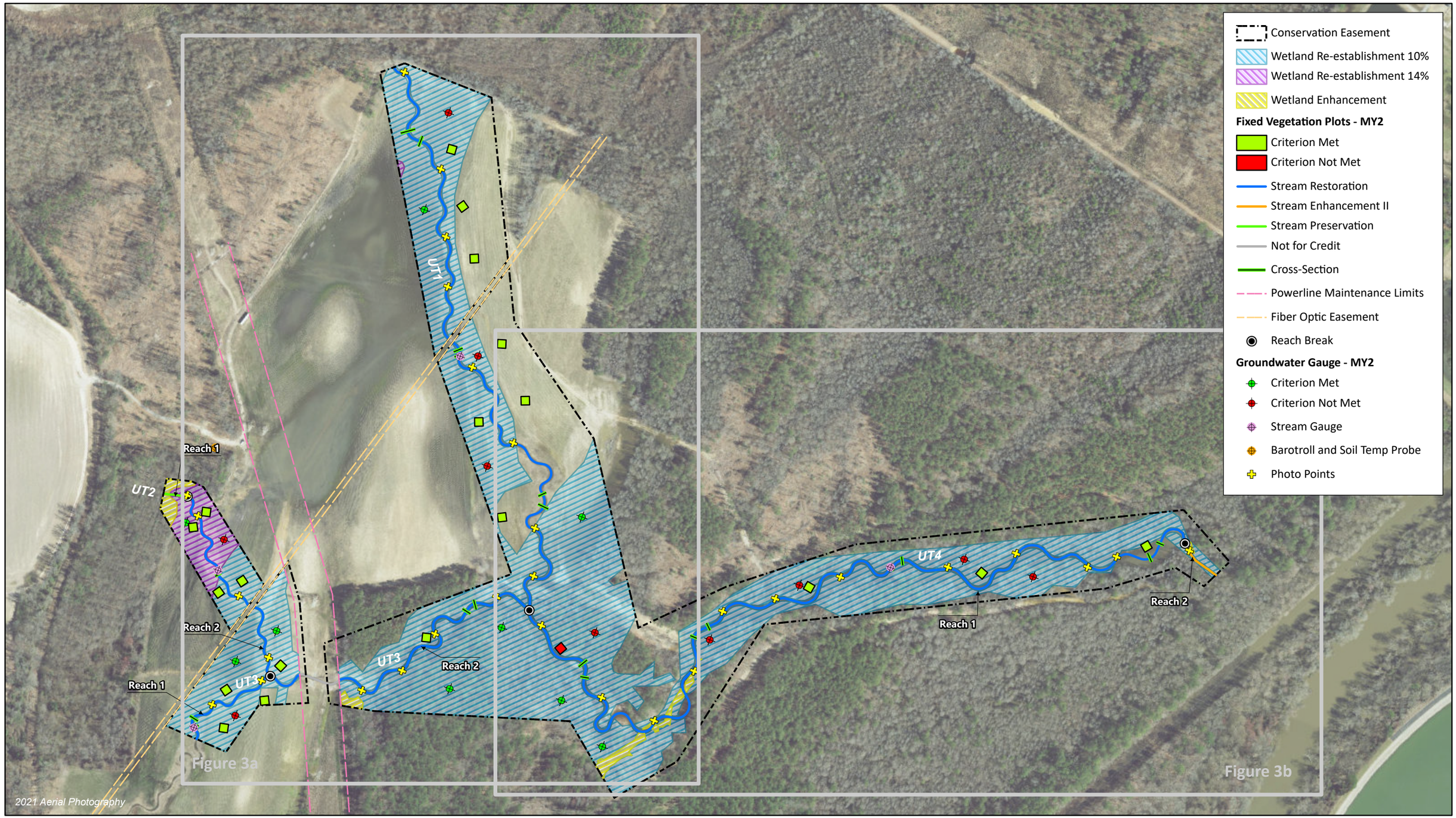
Rosgen, D. L. 1994. A classification of natural rivers. Catena 22:169-199.

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

Wildlands Engineering, Inc. 2020. McClenny Acres Mitigation Site Mitigation Plan. DMS, Raleigh, NC.

Wildlands Engineering, Inc. 2021. McClenny Acres Mitigation Site Monitoring Year 0 (MY0) Annual Report. DMS, Raleigh, NC.

FIGURES



WILDLANDS ENGINEERING

0 350 Feet

Figure 1 - Current Condition Plan View Key
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Wayne County, NC

Conservation Easement
Wetland Re-establishment 10%
Wetland Re-establishment 14%
Wetland Enhancement

Fixed Vegetation Plots - MY2

Criterion Met
Criterion Not Met

Random Vegetation Plots - MY2

Criterion Met
Structures
Chinese Privet Treated (0.19 acres)
Stream Restoration
Stream Enhancement II
Stream Preservation
Not for Credit
Cross Section
Top of Bank
Powerline Maintenance Limits
Fiber Optic Easement
Reach Break

Groundwater Gauge - MY2

Criterion Met
Criterion Not Met
Crest Gauge
Flow and Crest Gauge
Barotroll and Soil Temp Probe
Photo Points

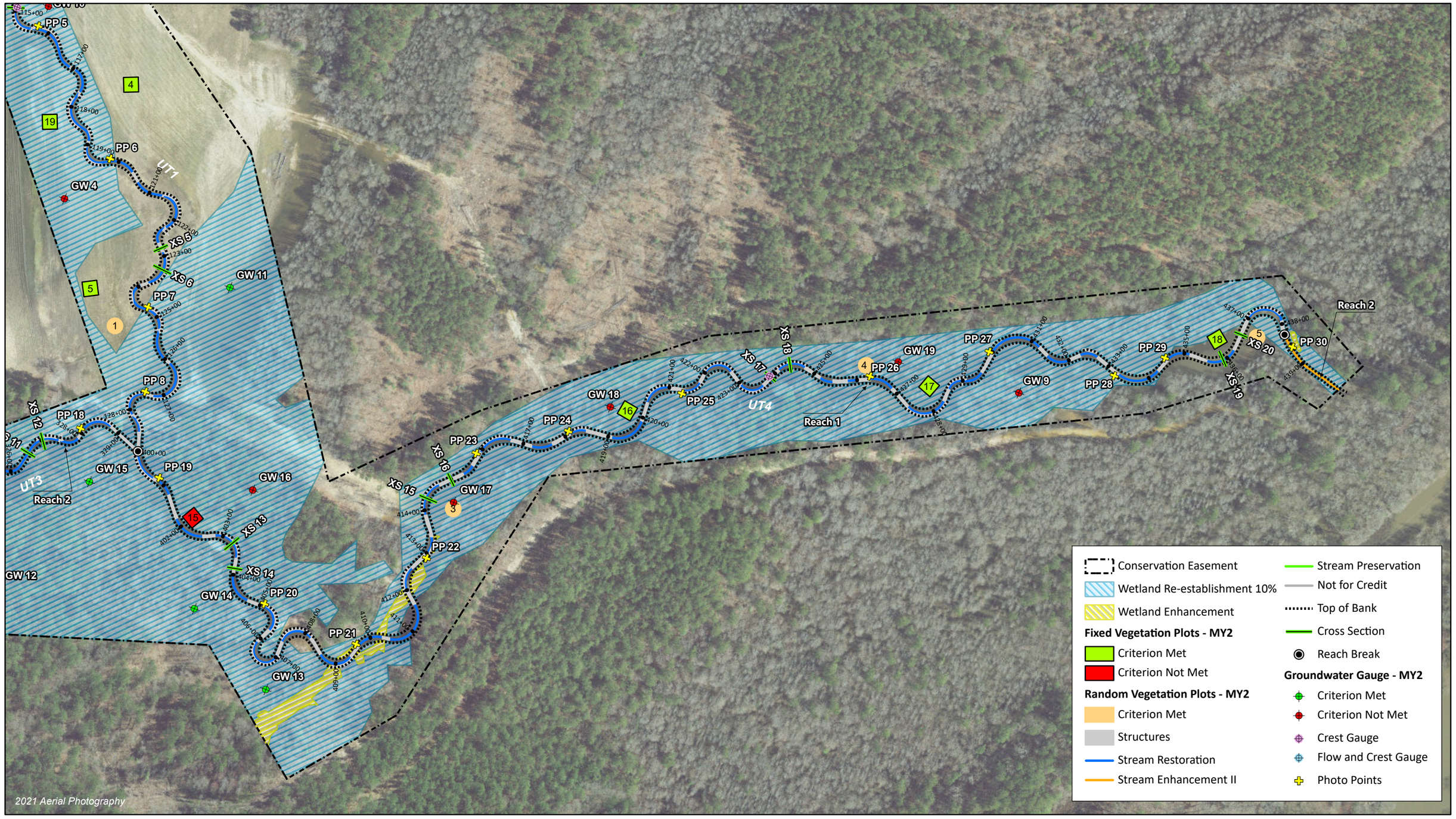
2021 Aerial Photography

0 100 200 Feet

WILDLANDS ENGINEERING

Figure 1a - Current Condition Plan View
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Wayne County, NC



WILDLANDS ENGINEERING

0 100 200 Feet

Figure 1b - Current Condition Plan View
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Wayne County, NC

APPENDIX A. VISUAL ASSESSMENT DATA

Table 4. Visual Stream Morphology Stability Assessment Table

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

UT1

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-Built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	2,783
					Assessed Bank Length	5,566
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	8	8		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	33	33		100%

UT2

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-Built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	974
					Assessed Bank Length	1,948
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	4	4		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	11	11		100%

Table 4. Visual Stream Morphology Stability Assessment Table

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

UT3

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-Built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	1,707
					Assessed Bank Length	3,414
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	3	3		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	7	7		100%

UT4

Major Channel Category		Metric	Number Stable, Performing as Intended	Total Number in As-Built	Amount of Unstable Footage	% Stable, Performing as Intended
					Assessed Stream Length	4,029
					Assessed Bank Length	8,058
Bank	**Surface Scour/ Bare Bank**	Bank lacking vegetative cover resulting simply from poor growth and/or surface scour.			0	100%
	Toe Erosion	Bank toe eroding to the extent that bank failure appears likely. Does NOT include undercuts that are modest, appear sustainable and are providing habitat.			0	100%
	Bank Failure	Fluvial and geotechnical - rotational, slumping, calving, or collapse.			0	100%
				Totals:	**0**	**100%**
Structure	**Grade Control**	Grade control structures exhibiting maintenance of grade across the sill.	1	1		100%
	Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%.	18	18		100%

Table 5. Vegetation Condition Assessment Table
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage **34.56**

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Planted Acreage
Bare Areas	Very limited cover of both woody and herbaceous material.	0.10	0	0%
Low Stem Density Areas	Woody stem densities clearly below target levels based on current MY stem count criteria.	0.10	0	0%
		Total	**0**	**0%**
Areas of Poor Growth Rates	Planted areas where average height is not meeting current MY Performance Standard.	0.10	0	0%
		Cumulative Total	**0.0**	**0%**

Easement Acreage **54.24**

Vegetation Category	Definitions	Mapping Threshold (ac)	Combined Acreage	% of Easement Acreage
Invasive Areas of Concern	Invasives may occur outside of planted areas and within the easement and will therefore be calculated against the total easement acreage. Include species with the potential to directly outcompete native, young, woody stems in the short-term or community structure for existing communities. Invasive species included in summation above should be identified in report summary.	0.10	0	0%
Easement Encroachment Areas	Encroachment may be point, line, or polygon. Encroachment to be mapped consists of any violation of restrictions specified in the conservation easement. Common encroachments are mowing, cattle access, vehicular access. Encroachment has no threshold value as will need to be addressed regardless of impact area.	none	0 Encroachments Noted / 0 ac	

STREAM PHOTOGRAPHS

	
PHOTO POINT 1 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 1 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 2 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 2 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 3 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 3 UT1 –** downstream *(3/15/2022)*

	
PHOTO POINT 4 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 4 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 5 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 5 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 6 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 6 UT1 –** downstream *(3/15/2022)*

	
PHOTO POINT 7 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 7 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 8 UT1 – upstream *(3/15/2022)*	**PHOTO POINT 8 UT1 –** downstream *(3/15/2022)*
	
PHOTO POINT 9 UT2 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 9 UT2 Reach 2 –** downstream *(3/15/2022)*

	
PHOTO POINT 10 UT2 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 10 UT2 Reach 2 –** downstream *(3/15/2022)*
	
PHOTO POINT 11 UT2 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 11 UT2 Reach 2 –** downstream *(3/15/2022)*
	
PHOTO POINT 12 UT2 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 12 UT 2 Reach 2 –** downstream *(3/15/2022)*

PHOTO POINT 13 UT3 Reach 1 – upstream *(3/15/2022)*

PHOTO POINT 13 UT3 Reach 1 – downstream *(3/15/2022)*

PHOTO POINT 14 UT3 Reach 1 – upstream *(3/15/2022)*

PHOTO POINT 14 UT3 Reach 1 – downstream *(3/15/2022)*

PHOTO POINT 15 UT3 Reach 2 – upstream *(3/15/2022)*

PHOTO POINT 15 UT3 Reach 2 – downstream *(3/15/2022)*

	
PHOTO POINT 16 UT3 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 16 UT3 Reach 2 –** downstream *(3/15/2022)*
	
PHOTO POINT 17 UT3 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 17 UT3 Reach 2 –** downstream *(3/15/2022)*
	
PHOTO POINT 18 UT3 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 18 UT3 Reach 2 –** downstream *(3/15/2022)*

	
PHOTO POINT 19 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 19 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 20 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 20 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 21 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 21 UT4 Reach 1 –** downstream *(3/15/2022)*

	
PHOTO POINT 22 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 22 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 23 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 23 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 24 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 24 UT4 Reach 1 –** downstream *(3/15/2022)*

	
PHOTO POINT 25 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 25 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 26 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 26 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 27 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 27 UT4 Reach 1 –** downstream *(3/15/2022)*

	
PHOTO POINT 28 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 28 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 29 UT4 Reach 1 – upstream *(3/15/2022)*	**PHOTO POINT 29 UT4 Reach 1 –** downstream *(3/15/2022)*
	
PHOTO POINT 30 UT4 Reach 2 – upstream *(3/15/2022)*	**PHOTO POINT 30 UT4 Reach 2 –** downstream *(3/15/2022)*

VEGETATION PLOT PHOTOGRAPHS

VEGETATION PLOT 1 ***(9/12/2022)***

VEGETATION PLOT 2 ***(9/12/2022)***

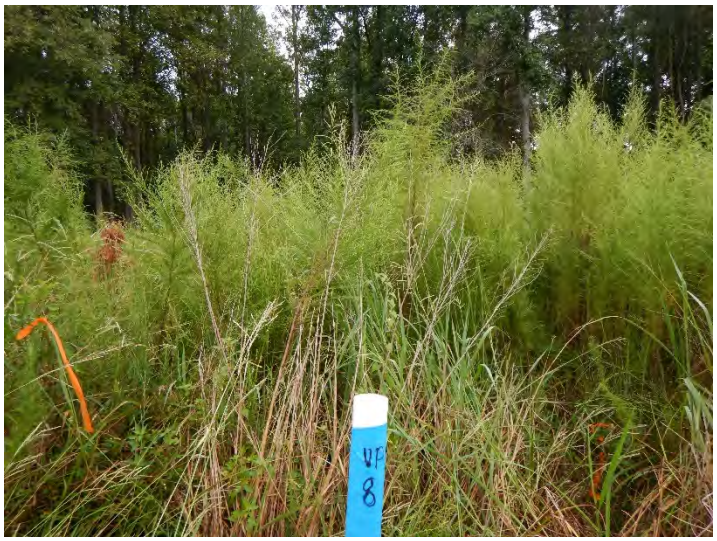
VEGETATION PLOT 3 ***(9/12/2022)***

VEGETATION PLOT 4 ***(9/12/2022)***

VEGETATION PLOT 5 ***(9/12/2022)***

VEGETATION PLOT 6 ***(9/12/2022)***

VEGETATION PLOT 7 (9/12/2022*)*



VEGETATION PLOT 8 *(9/12/2022)*

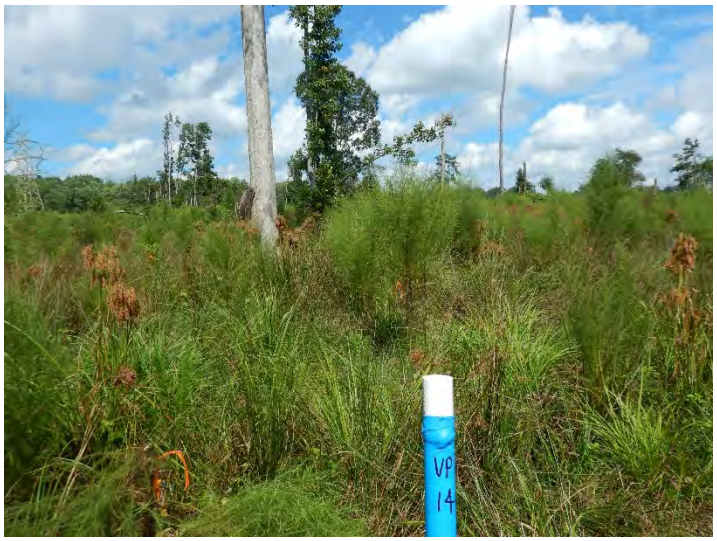
VEGETATION PLOT 9 *(9/12/2022)*

VEGETATION PLOT 10 *(9/12/2022)*

VEGETATION PLOT 11 *(9/12/2022)*

VEGETATION PLOT 12 *(9/12/2022)*

VEGETATION PLOT 13 ***(9/12/2022)***



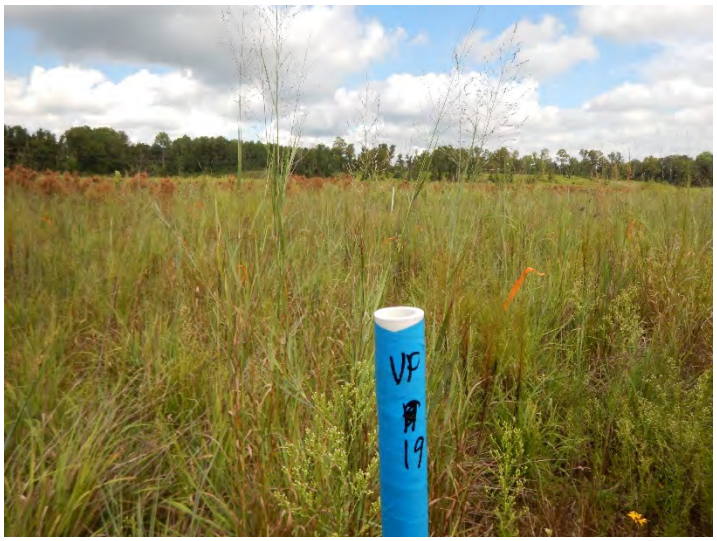
VEGETATION PLOT 14 ***(9/12/2022)***

VEGETATION PLOT 15 ***(9/12/2022)***

VEGETATION PLOT 16 ***(9/12/2022)***

VEGETATION PLOT 17 ***(9/12/2022)***

VEGETATION PLOT 18 ***(9/12/2022)***



VEGETATION PLOT 19 ***(9/12/2022)***

VEGETATION PLOT 20 ***(9/12/2022)***

RANDOM VP 1 ***(9/12/2022)***

RANDOM VP 2 ***(9/12/2022)***

RANDOM VP 3 ***(9/12/2022)***

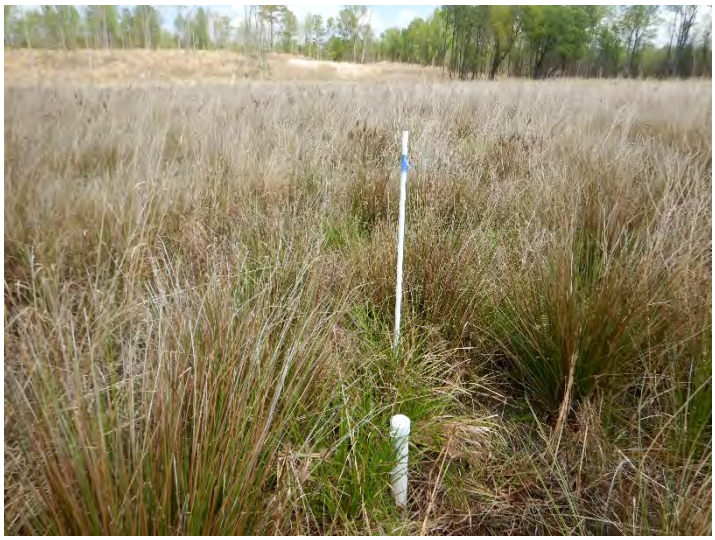
RANDOM VP 4 ***(9/12/2022)***

RANDOM VP 5 ***(9/12/2022)***

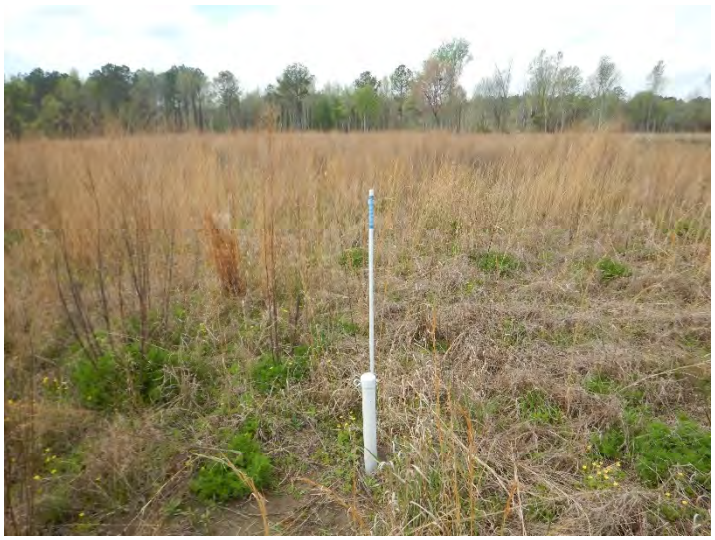
GROUNDWATER WELL PHOTOGRAPHS

GROUNDWATER WELL 1 - *(4/7/2022)*

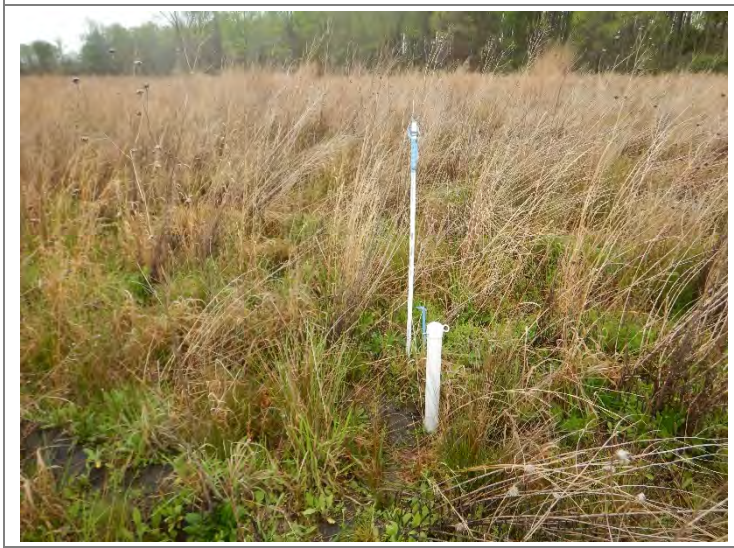
GROUNDWATER WELL 2 - *(4/7/2022)*



GROUNDWATER WELL 3 – *(4/7/2022)*

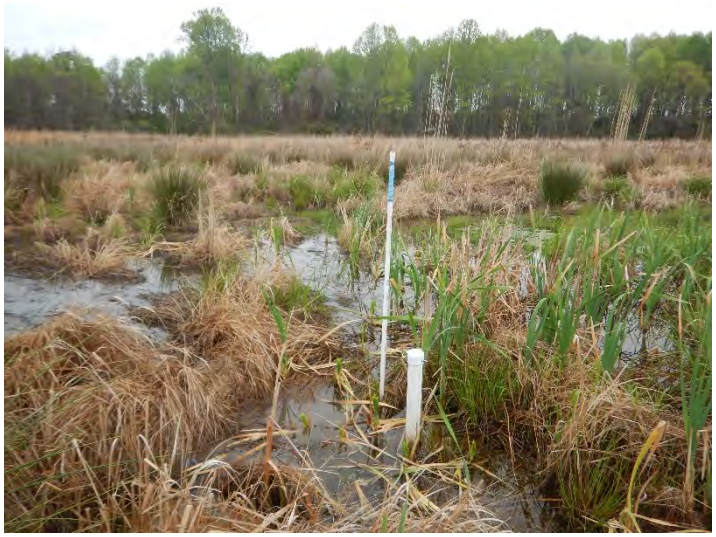


GROUNDWATER WELL 4 – *(4/7/2022)*

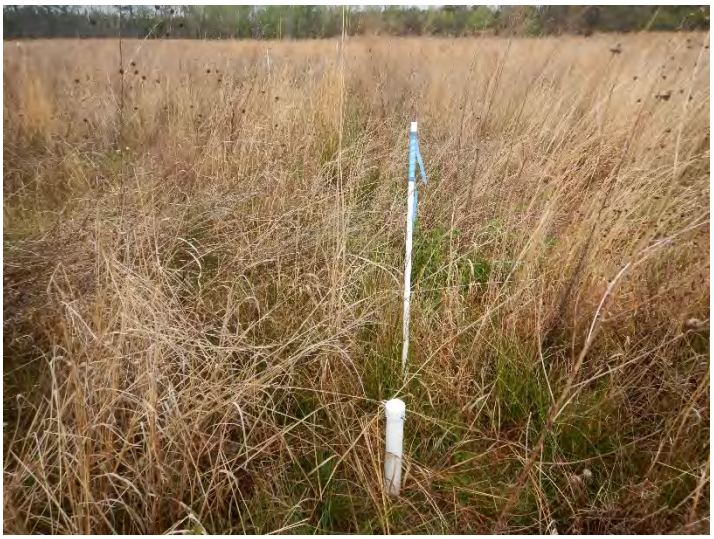


GROUNDWATER WELL 5 – *(4/7/2022)*

GROUNDWATER WELL 6 – *(4/7/2022)*



GROUNDWATER WELL 7 – *(4/7/2022)*



GROUNDWATER WELL 8 – *(4/7/2022)*

GROUNDWATER WELL 9 – *(4/7/2022)*

GROUNDWATER WELL 10 – *(4/7/2022)*

GROUNDWATER WELL 11 – *(4/7/2022)*

GROUNDWATER WELL 12 – *(4/7/2022)*

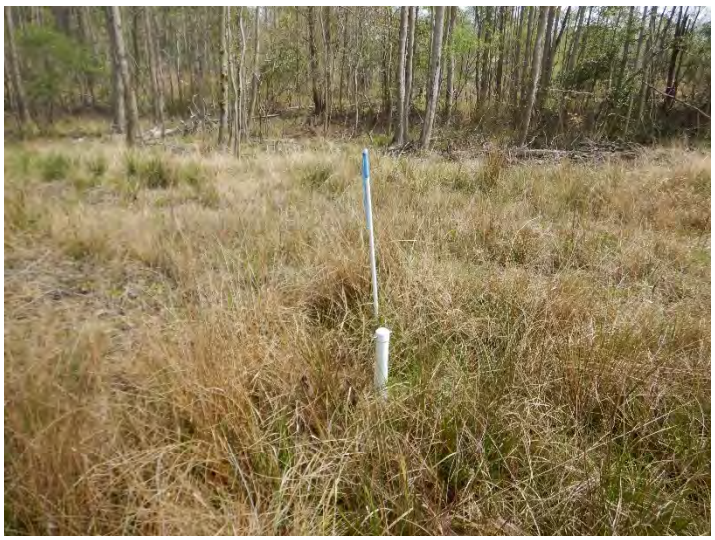
GROUNDWATER WELL 13 – *(4/7/2022)*

GROUNDWATER WELL 14 – *(4/7/2022)*

GROUNDWATER WELL 15 – *(4/7/2022)*

GROUNDWATER WELL 16 – *(4/7/2022)*

GROUNDWATER WELL 17 – upstream *(4/7/2022)*



GROUNDWATER WELL 18 – *(4/7/2022)*

GROUNDWATER WELL 19 – *(4/7/2022)*

APPENDIX B. VEGETATION PLOT DATA

Table 6. Vegetation Plot Data
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage	34.56
Date of Initial Plant	2021-02-08
Date of Current Survey	2022-09-12
Plot size (ACRES)	0.0247

	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	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Betula nigra*	river birch	Tree	FACW	4	4	3	3	3	3	4	4	1	1
	Diospyros virginiana	common persimmon	Tree	FAC			1	1	1	1	1	1		
	Fraxinus pennsylvanica	green ash	Tree	FACW	2	2					1	1	1	1
	Magnolia virginiana	sweetbay	Tree	FACW	1	1					1	1	1	1
	Nyssa biflora	swamp tupelo	Tree	OBL										
	Platanus occidentalis	American sycamore	Tree	FACW	2	2	3	3	3	3	3	3	5	5
	Populus deltoides	eastern cottonwood	Tree	FAC	1	1	1	1			1	1		
	Quercus lyrata	overcup oak	Tree	OBL										
	Quercus michauxii	swamp chestnut oak	Tree	FACW			1	1	1	1			2	2
	Quercus pagoda	cherrybark oak	Tree	FACW	1	1	2	2	1	1			1	1
	Quercus phellos	willow oak	Tree	FACW	3	3	1	1	6	6	2	2	2	2
	Salix nigra	black willow	Tree	OBL										
	Taxodium distichum	bald cypress	Tree	OBL							1	1	2	2
	Ulmus alata	winged elm	Tree	FACU										
Sum	Performance Standard				14	14	12	12	15	15	14	14	15	15
Mitigation Plan Performance Standard	Current Year Stem Count					14		12		15		14		15
	Stems/Acre					567		486		607		567		607
	Species Count					7		7		6		8		8
	Dominant Species Composition (%)					29		25		40		29		33
	Average Plot Height (ft.)					3		3		3		3		3
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					14		12		15		14		15
	Stems/Acre					567		486		607		567		607
	Species Count					7		7		6		8		8
	Dominant Species Composition (%)					29		25		40		29		33
	Average Plot Height (ft.)					3		3		3		3		3
	% Invasives					0		0		0		0		0

Table 6. Vegetation Plot Data
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage	34.56
Date of Initial Plant	2021-02-08
Date of Current Survey	2022-09-12
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 6 F		Veg Plot 7 F		Veg Plot 8 F		Veg Plot 9 F		Veg Plot 10 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Betula nigra*	river birch	Tree	FACW	1	1	2	2	3	3	2	2	4	4
	Diospyros virginiana	common persimmon	Tree	FAC	1	1								
	Fraxinus pennsylvanica	green ash	Tree	FACW			1	1			1	1	1	1
	Magnolia virginiana	sweetbay	Tree	FACW	1	1	1	1	1	1			1	1
	Nyssa biflora	swamp tupelo	Tree	OBL			2	2	1	1	2	2	1	1
	Platanus occidentalis	American sycamore	Tree	FACW	3	3	2	2	3	3	3	3	1	1
	Populus deltoides	eastern cottonwood	Tree	FAC										
	Quercus lyrata	overcup oak	Tree	OBL			1	1	1	1	1	1		
	Quercus michauxii	swamp chestnut oak	Tree	FACW	4	4					1	1		
	Quercus pagoda	cherrybark oak	Tree	FACW	2	2	1	1	1	1	1	1	1	1
	Quercus phellos	willow oak	Tree	FACW	1	1								
	Salix nigra	black willow	Tree	OBL			2	2			1	1	1	1
	Taxodium distichum	bald cypress	Tree	OBL			5	5	3	3	5	5	2	2
	Ulmus alata	winged elm	Tree	FACU			1	1			1	1	1	1
Sum	Performance Standard				13	13	18	18	13	13	18	18	13	13
Mitigation Plan Performance Standard	Current Year Stem Count					13		18		13		18		13
	Stems/Acre					526		729		526		729		526
	Species Count					7		10		7		10		9
	Dominant Species Composition (%					31		28		23		28		31
	Average Plot Height (ft.)					3		3		4		3		3
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					13		18		13		18		13
	Stems/Acre					526		729		526		729		526
	Species Count					7		10		7		10		9
	Dominant Species Composition (%					31		28		23		28		31
	Average Plot Height (ft.)					3		3		4		3		3
	% Invasives					0		0		0		0		0

Table 6. Vegetation Plot Data
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage	34.56
Date of Initial Plant	2021-02-08
Date of Current Survey	2022-09-12
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 11 F		Veg Plot 12 F		Veg Plot 13 F		Veg Plot 14 F		Veg Plot 15 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Betula nigra*	river birch	Tree	FACW	3	3	3	3	5	5	2	2	1	1
	Diospyros virginiana	common persimmon	Tree	FAC										
	Fraxinus pennsylvanica	green ash	Tree	FACW	1	1			1	1	1	1		
	Magnolia virginiana	sweetbay	Tree	FACW			1	1	1	1	2	2		
	Nyssa biflora	swamp tupelo	Tree	OBL	2	2	2	2	2	2			2	2
	Platanus occidentalis	American sycamore	Tree	FACW	1	1	4	4	2	2				
	Populus deltoides	eastern cottonwood	Tree	FAC										
	Quercus lyrata	overcup oak	Tree	OBL	1	1								
	Quercus michauxii	swamp chestnut oak	Tree	FACW			3	3			1	1	1	1
	Quercus pagoda	cherrybark oak	Tree	FACW					5	5				
	Quercus phellos	willow oak	Tree	FACW										
	Salix nigra	black willow	Tree	OBL	1	1								
	Taxodium distichum	bald cypress	Tree	OBL	3	3	3	3			2	2	3	3
	Ulmus alata	winged elm	Tree	FACU	1	1			1	1				
Sum	Performance Standard				13	13	16	16	17	17	8	8	7	7
Mitigation Plan Performance Standard	Current Year Stem Count					13		16		17		8		7
	Stems/Acre					526		648		688		324		283
	Species Count					8		6		7		5		4
	Dominant Species Composition (%)					23		25		29		25		43
	Average Plot Height (ft.)					3		4		3		2		2
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					13		16		17		8		7
	Stems/Acre					526		648		688		324		283
	Species Count					8		6		7		5		4
	Dominant Species Composition (%)					23		25		29		25		43
	Average Plot Height (ft.)					3		4		3		2		2
	% Invasives					0		0		0		0		0

Table 6. Vegetation Plot Data
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage	34.56
Date of Initial Plant	2021-02-08
Date of Current Survey	2022-09-12
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 16 F		Veg Plot 17 F		Veg Plot 18 F		Veg Plot 19 F		Veg Plot 20 F	
					Planted	Total	Planted	Total	Planted	Total	Planted	Total	Planted	Total
Species Included in Approved Mitigation Plan	*Betula nigra*	river birch	Tree	FACW	2	2			2	2	3	3	1	1
	Diospyros virginiana	common persimmon	Tree	FAC										
	Fraxinus pennsylvanica	green ash	Tree	FACW	1	1			1	1				
	Magnolia virginiana	sweetbay	Tree	FACW	1	1	1	1						
	Nyssa biflora	swamp tupelo	Tree	OBL	1	1					2	2		
	Platanus occidentalis	American sycamore	Tree	FACW	3	3	2	2	3	3	2	2	4	4
	Populus deltoides	eastern cottonwood	Tree	FAC										
	Quercus lyrata	overcup oak	Tree	OBL					1	1				
	Quercus michauxii	swamp chestnut oak	Tree	FACW	1	1	1	1	2	2	2	2	2	2
	Quercus pagoda	cherrybark oak	Tree	FACW			2	2	1	1	2	2		
	Quercus phellos	willow oak	Tree	FACW										
	Salix nigra	black willow	Tree	OBL					1	1	1	1		
	Taxodium distichum	bald cypress	Tree	OBL	1	1	2	2	4	4	3	3	5	5
	Ulmus alata	winged elm	Tree	FACU			1	1						
Sum	Performance Standard				10	10	9	9	15	15	15	15	12	12
Mitigation Plan Performance Standard	Current Year Stem Count					10		9		15		15		12
	Stems/Acre					405		364		607		607		486
	Species Count					7		6		8		7		4
	Dominant Species Composition (%					30		22		27		20		42
	Average Plot Height (ft.)					3		2		3		2		3
	% Invasives					0		0		0		0		0
Post Mitigation Plan Performance Standard	Current Year Stem Count					10		9		15		15		12
	Stems/Acre					405		364		607		607		486
	Species Count					7		6		8		7		4
	Dominant Species Composition (%					30		22		27		20		42
	Average Plot Height (ft.)					3		2		3		2		3
	% Invasives					0		0		0		0		0

Table 6. Vegetation Plot Data
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Planted Acreage	34.56
Date of Initial Plant	2021-02-08
Date of Current Survey	2022-09-12
Plot size (ACRES)	0.0247

	Scientific Name	Common Name	Tree/ Shrub	Indicator Status	Veg Plot 1 R	Veg Plot 2 R	Veg Plot 3 R	Veg Plot 4 R	Veg Plot 5 R
					Total	Total	Total	Total	Total
Species Included in Approved Mitigation Plan	*Betula nigra*	river birch	Tree	FACW	1	2	6		2
	Diospyros virginiana	common persimmon	Tree	FAC	2			4	
	Fraxinus pennsylvanica	green ash	Tree	FACW	1	1			
	Magnolia virginiana	sweetbay	Tree	FACW		1	1	1	2
	Nyssa biflora	swamp tupelo	Tree	OBL					2
	Platanus occidentalis	American sycamore	Tree	FACW	3	1	1	2	3
	Populus deltoides	eastern cottonwood	Tree	FAC					
	Quercus lyrata	overcup oak	Tree	OBL	1	4	2		
	Quercus michauxii	swamp chestnut oak	Tree	FACW	2	1			1
	Quercus pagoda	cherrybark oak	Tree	FACW		2			
	Quercus phellos	willow oak	Tree	FACW					1
	Salix nigra	black willow	Tree	OBL					
	Taxodium distichum	bald cypress	Tree	OBL			4	3	2
	Ulmus alata	winged elm	Tree	FACU					
Sum	Performance Standard				10	12	14	10	13
Mitigation Plan Performance Standard				Current Year Stem Count	10	12	14	10	13
				Stems/Acre	405	486	567	405	526
				Species Count	6	7	5	4	7
				Dominant Species Composition (%)	30	33	43	40	23
				Average Plot Height (ft.)	2	3	2	2	2
				% Invasives	0	0	0	0	0
Post Mitigation Plan Performance Standard				Current Year Stem Count	10	12	14	10	13
				Stems/Acre	405	486	567	405	526
				Species Count	6	7	5	4	7
				Dominant Species Composition (%)	30	33	43	40	23
				Average Plot Height (ft.)	2	3	2	2	2
				% Invasives	0	0	0	0	0

Table 7. Vegetation Performance Standards Summary Table

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

	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												
Monitoring Year 2	567	3	7	0	486	3	7	0	607	3	6	0
Monitoring Year 1	567	3	7	0	567	3	7	0	607	2	6	0
Monitoring Year 0	567	3	7	0	567	3	7	0	607	2	6	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												
Monitoring Year 2	567	3	8	0	607	3	8	0	526	3	7	0
Monitoring Year 1	567	2	8	0	647	3	8	0	567	2	7	0
Monitoring Year 0	607	3	8	0	647	3	8	0	607	2	7	0
	Veg Plot 7 F				Veg Plot Group 8 F				Veg Plot Group 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												
Monitoring Year 2	729	3	10	0	526	4	7	0	729	3	10	0
Monitoring Year 1	728	3	10	0	607	3	8	0	728	2	10	0
Monitoring Year 0	728	3	10	0	607	2	8	0	728	2	10	0

*Fixed plots are donoted with an F and Random plots with an R.

Table 7. Vegetation Performance Standards Summary Table

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

	Veg Plot 10 F				Veg Plot 11 F				Veg Plot 12 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												
Monitoring Year 2	526	3	9	0	526	3	8	0	648	4	6	0
Monitoring Year 1	728	3	11	0	647	3	10	0	728	2	7	0
Monitoring Year 0	728	3	11	0	647	3	10	0	971	3	7	0
	Veg Plot 13 F				**Veg Plot 14 F**				**Veg Plot 15 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												
Monitoring Year 2	688	3	7	0	324	2	5	0	283	2	4	0
Monitoring Year 1	688	3	7	0	567	2	8	0	486	2	8	0
Monitoring Year 0	688	3	7	0	567	2	7	0	526	2	8	0
	Veg Plot 16 F				**Veg Plot Group 17 F**				**Veg Plot Group 18 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												
Monitoring Year 2	405	3	7	0	364	2	6	0	607	3	8	0
Monitoring Year 1	526	2	8	0	445	2	7	0	647	3	8	0
Monitoring Year 0	567	3	8	0	567	3	8	0	647	3	8	0

*Fixed plots are donoted with an F and Random plots with an R.

Table 7. Vegetation Performance Standards Summary Table

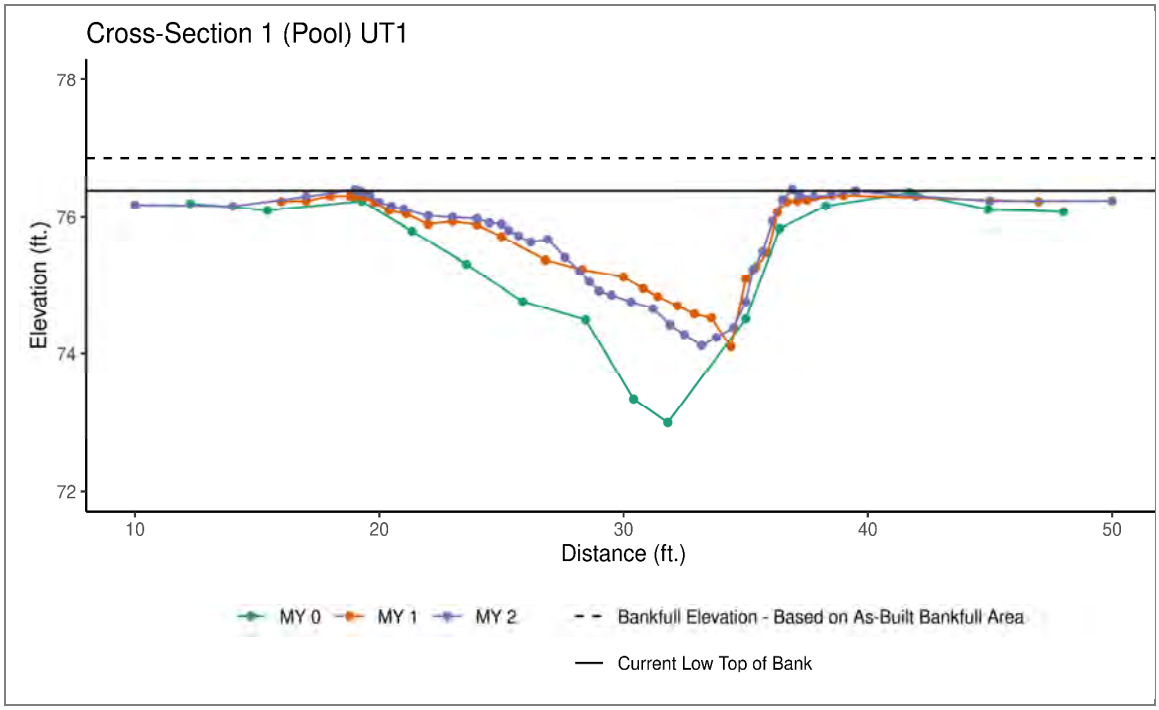
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

	Veg Plot 19 F				Veg Plot 20 F				Veg Plot 1 R			
	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												
Monitoring Year 2	607	2	7	0	486	3	4	0	405	2	6	0
Monitoring Year 1	647	3	7	0	567	3	6	0	324	4	4	0
Monitoring Year 0	647	3	7	0	567	3	6	0	526	3	6	0
	Veg Plot 2 R				**Veg Plot 3 R**				**Veg Plot 4 R**			
	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												
Monitoring Year 2	486	3	7	0	567	2	5	0	405	2	4	0
Monitoring Year 1	1,012	1	1	0	567	3	5	0	486	2	4	0
Monitoring Year 0	647	2	6	0	688	2	8	0	647	2	5	0
	Veg Plot 5 R											
	Stems/Ac.	Av. Ht. (ft)	# Species	% Invasives								
Monitoring Year 7												
Monitoring Year 5												
Monitoring Year 3												
Monitoring Year 2	526	2	7	0								
Monitoring Year 1	607	2	7	0								
Monitoring Year 0	647	2	7	0								

*Fixed plots are donoted with an F and Random plots with an R.

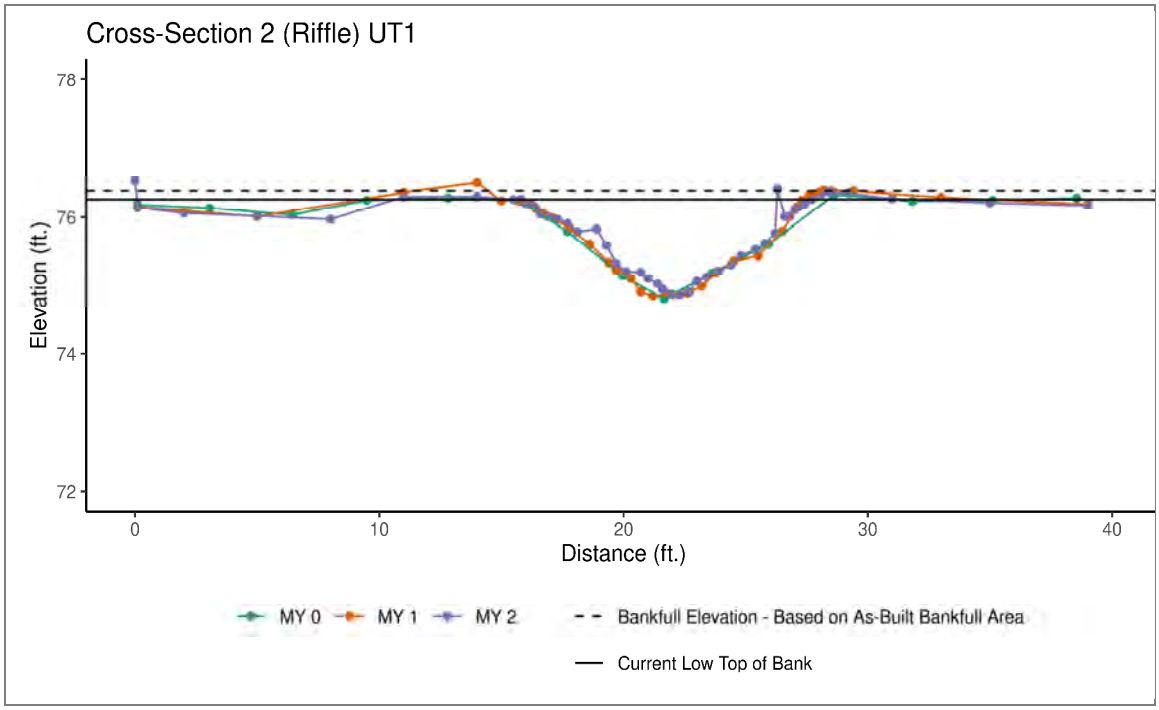
APPENDIX C. STREAM GEOMORPHOLOGY DATA

Cross-Section Plots



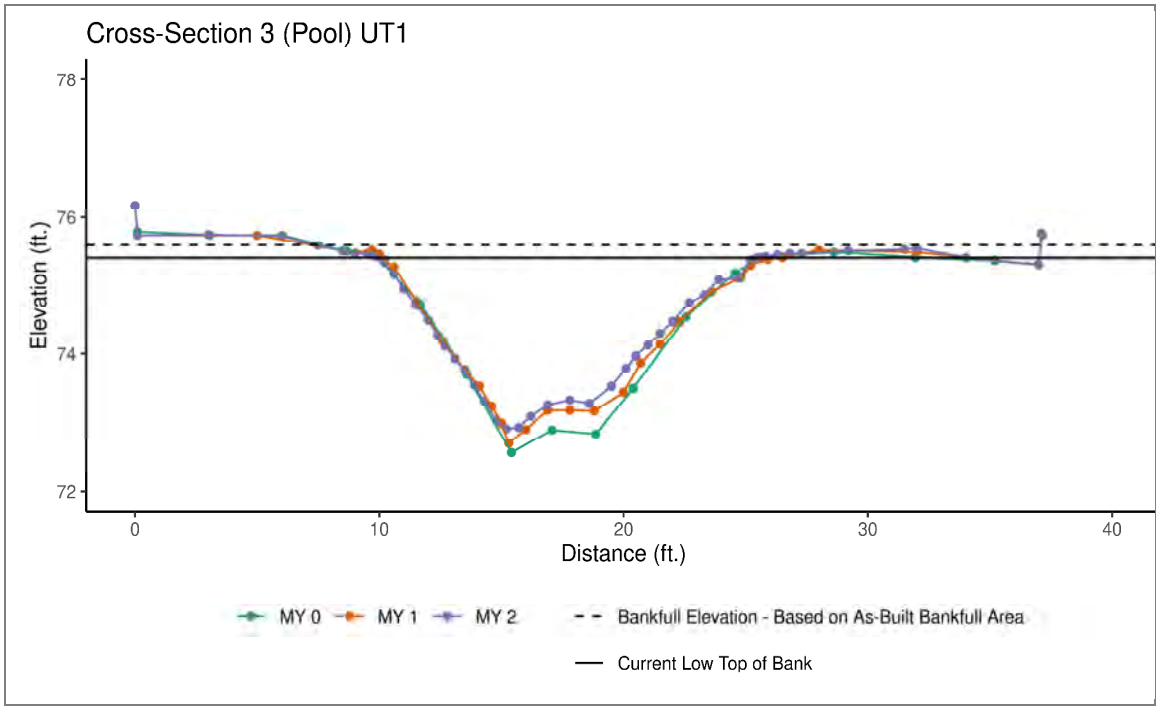
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	73.00	74.10	74.12			
LTOB Elevation	76.17	76.23	76.38			
LTOB Max Depth	3.17	2.13	2.26			
LTOB Cross-Sectional Area	26.20	14.60	17.74			

Downstream *(3/10/2022)*



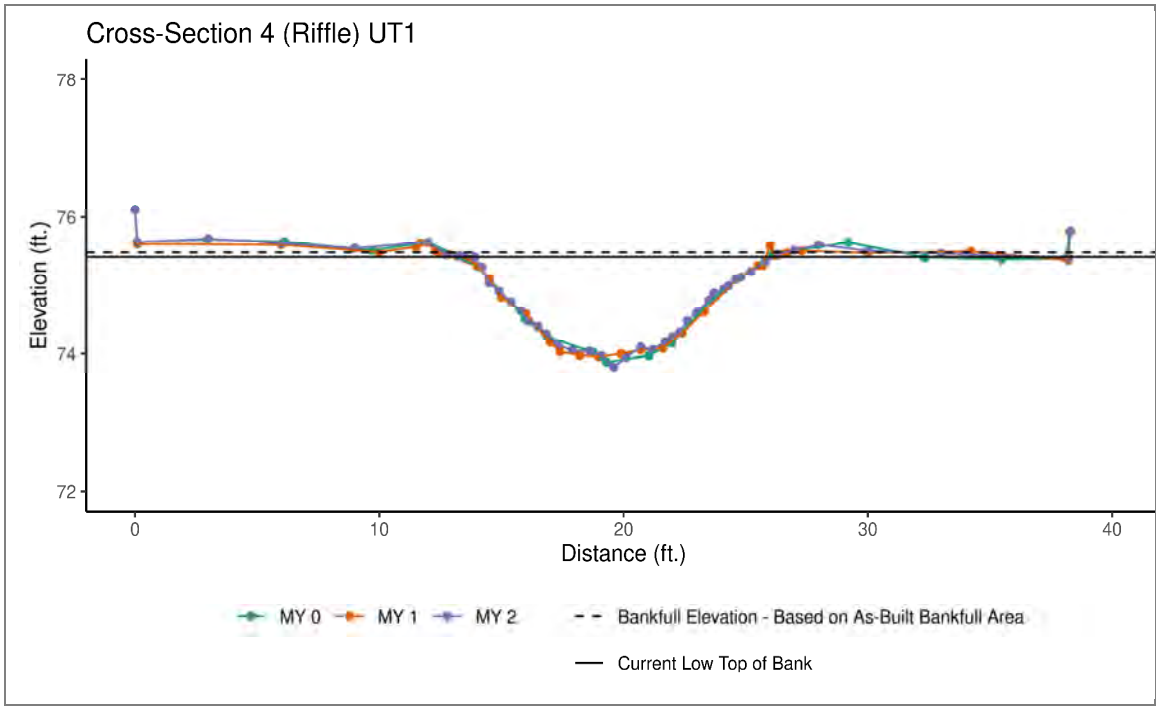
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	76.24	76.26	76.38			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.98	0.92			
Thalweg Elevation	74.81	74.85	74.87			
LTOB Elevation	76.24	76.23	76.26			
LTOB Max Depth	1.43	1.38	1.39			
LTOB Cross-Sectional Area	9.45	9.07	8.27			

Downstream *(3/10/2022)*



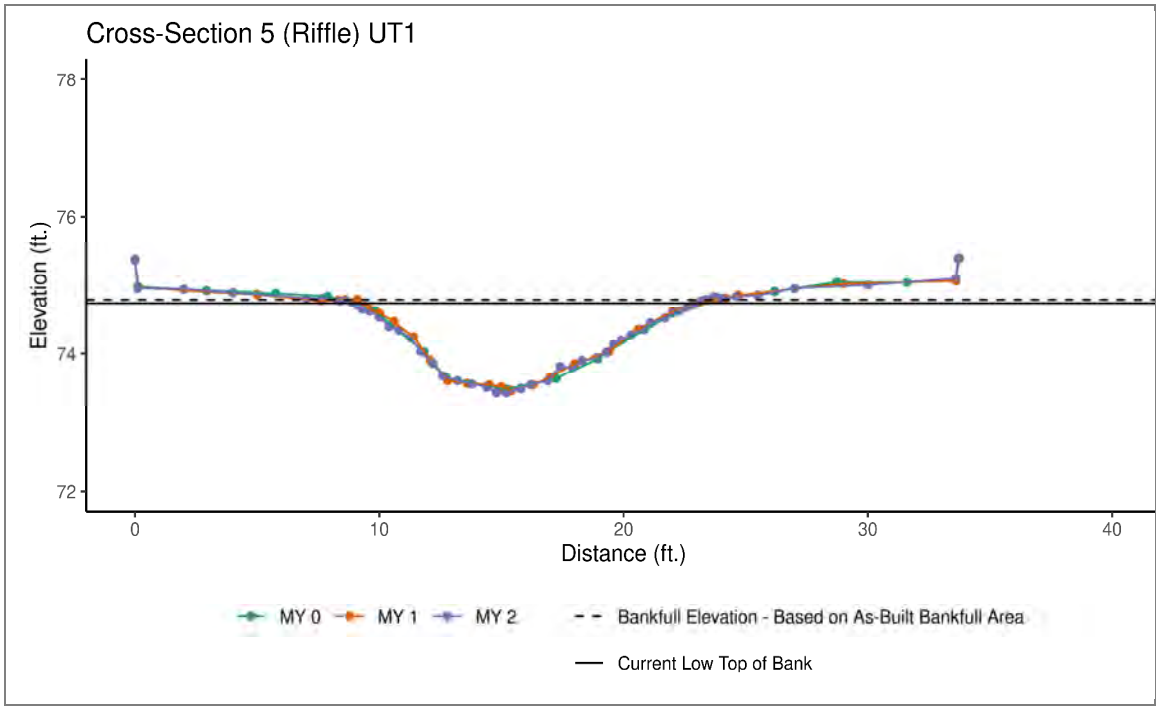
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	72.56	72.70	72.91			
LTOB Elevation	75.41	75.39	75.41			
LTOB Max Depth	2.85	2.69	2.50			
LTOB Cross-Sectional Area	23.72	21.60	20.83			

Downstream *(3/10/2022)*



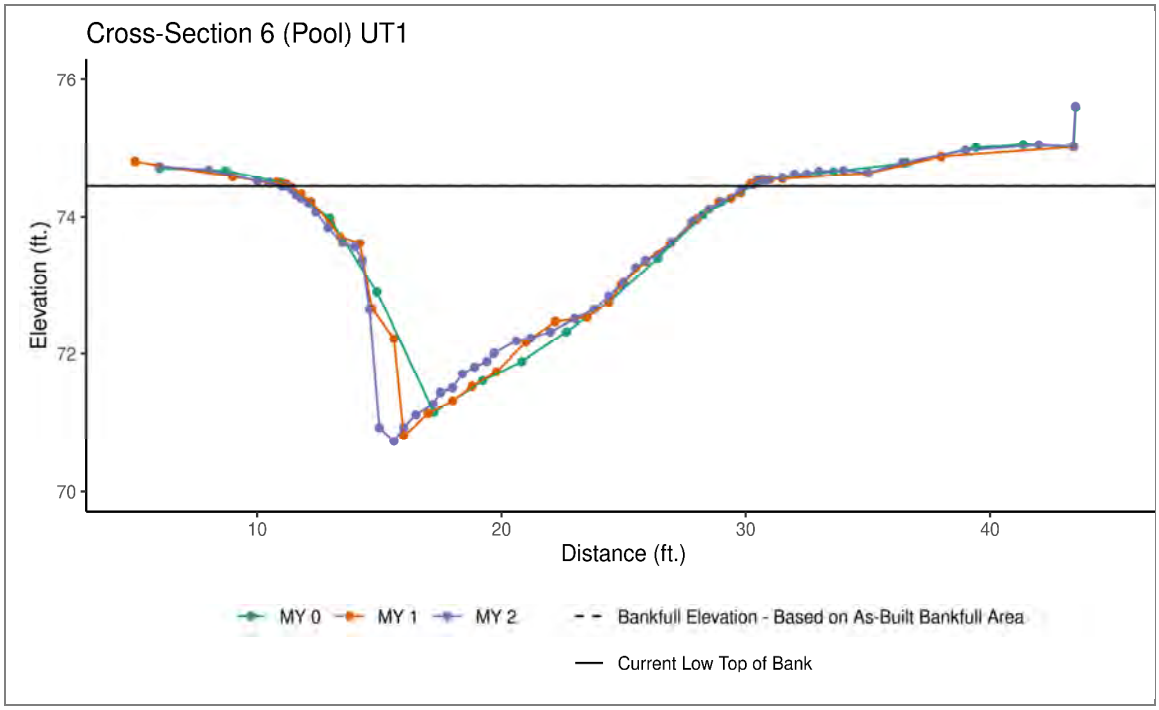
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	75.46	75.45	75.49			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.96	0.96			
Thalweg Elevation	73.88	73.96	73.81			
LTOB Elevation	75.46	75.41	75.42			
LTOB Max Depth	1.58	1.45	1.61			
LTOB Cross-Sectional Area	11.91	11.26	11.08			

Downstream *(3/10/2022)*



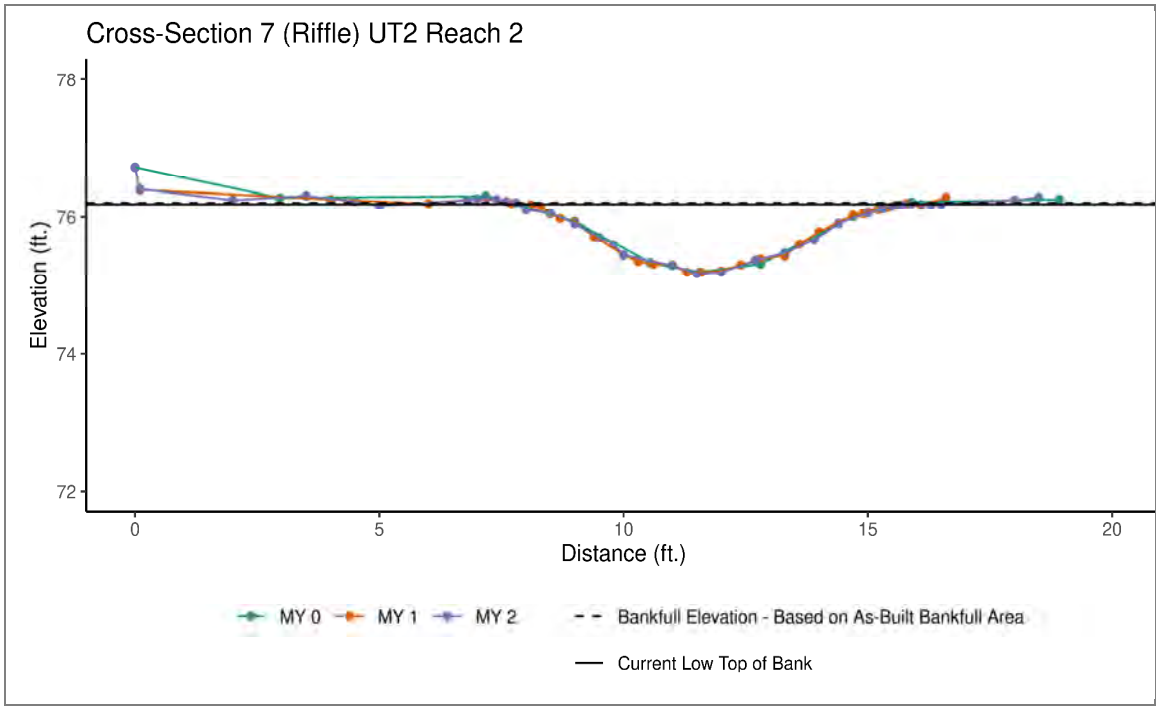
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	74.79	74.81	74.79			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.95	0.96			
Thalweg Elevation	73.48	73.47	73.44			
LTOB Elevation	74.79	74.75	74.74			
LTOB Max Depth	1.30	1.28	1.30			
LTOB Cross-Sectional Area	10.82	9.95	10.07			

Downstream *(3/10/2022)*



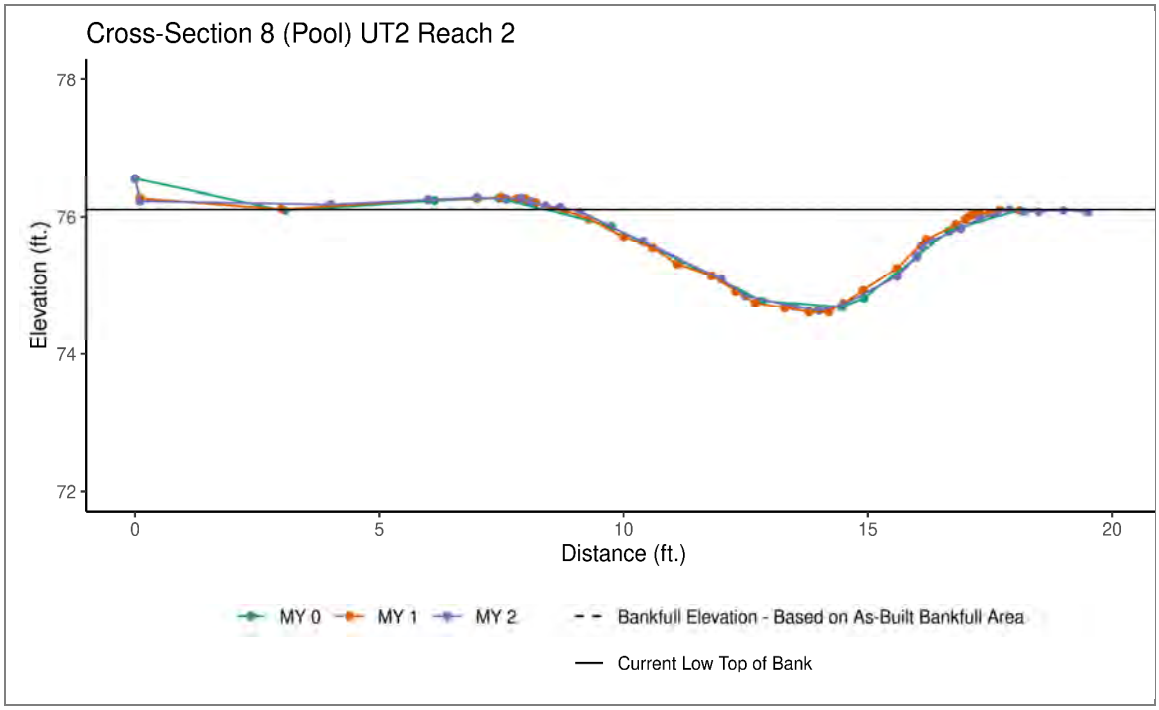
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	71.15	70.81	70.73			
LTOB Elevation	74.50	74.43	74.45			
LTOB Max Depth	3.36	3.62	3.72			
LTOB Cross-Sectional Area	31.59	30.39	31.55			

Downstream *(3/10/2022)*



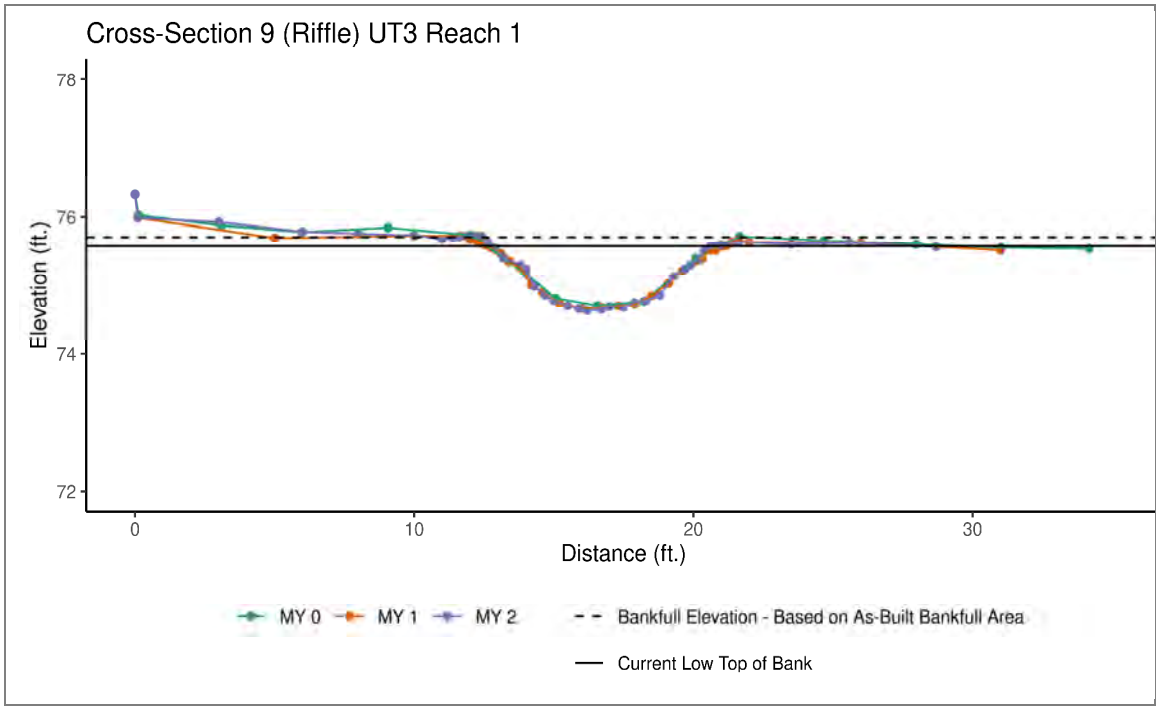
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	76.22	76.22	76.21			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.99	0.98			
Thalweg Elevation	75.20	75.20	75.18			
LTOB Elevation	76.22	76.21	76.19			
LTOB Max Depth	1.02	1.01	1.01			
LTOB Cross-Sectional Area	4.43	4.38	4.26			

Downstream *(3/10/2022)*



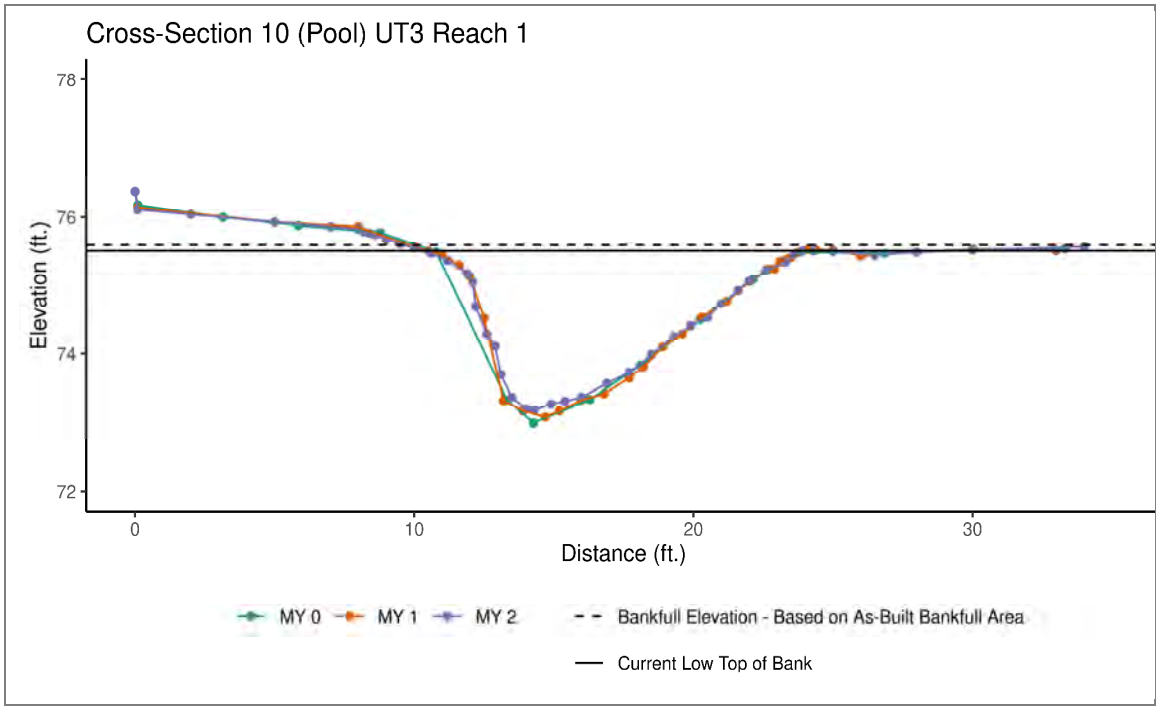
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	74.68	74.61	74.63			
LTOB Elevation	76.10	76.11	76.11			
LTOB Max Depth	1.42	1.50	1.48			
LTOB Cross-Sectional Area	7.00	7.00	6.97			

Downstream *(3/10/2022)*



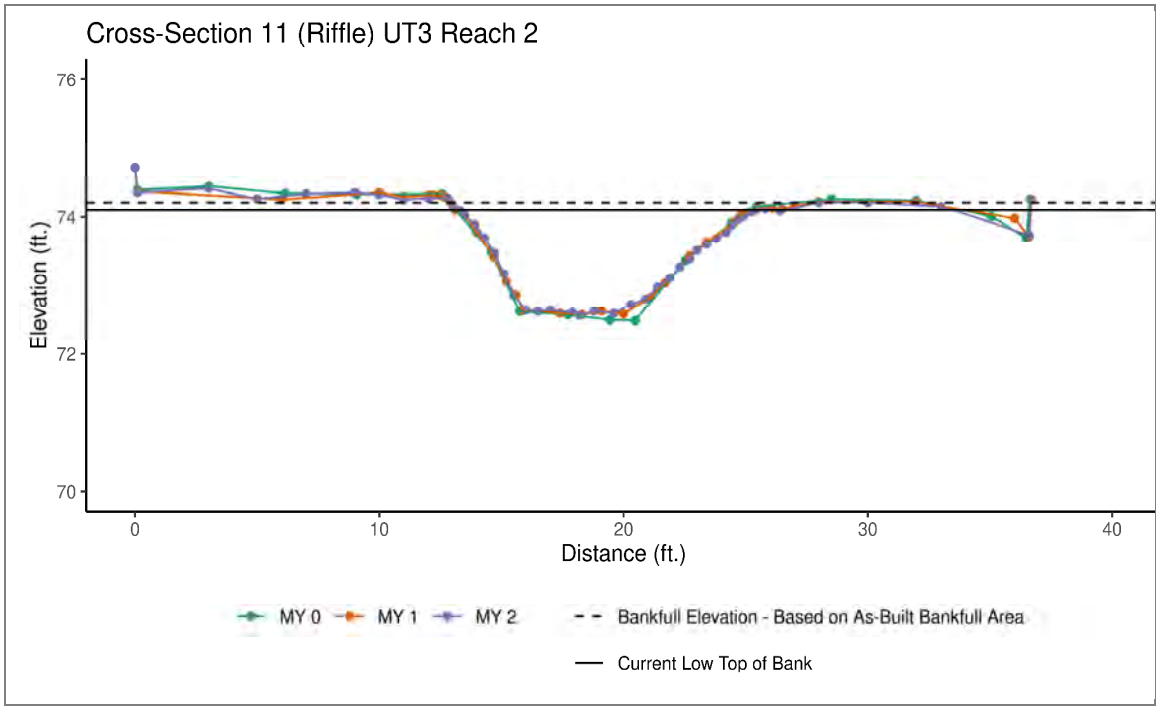
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	75.72	75.69	75.71			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.98	0.88			
Thalweg Elevation	74.71	74.66	74.63			
LTOB Elevation	75.72	75.67	75.58			
LTOB Max Depth	1.02	1.01	0.95			
LTOB Cross-Sectional Area	5.81	5.58	4.76			

Downstream *(3/10/2022)*



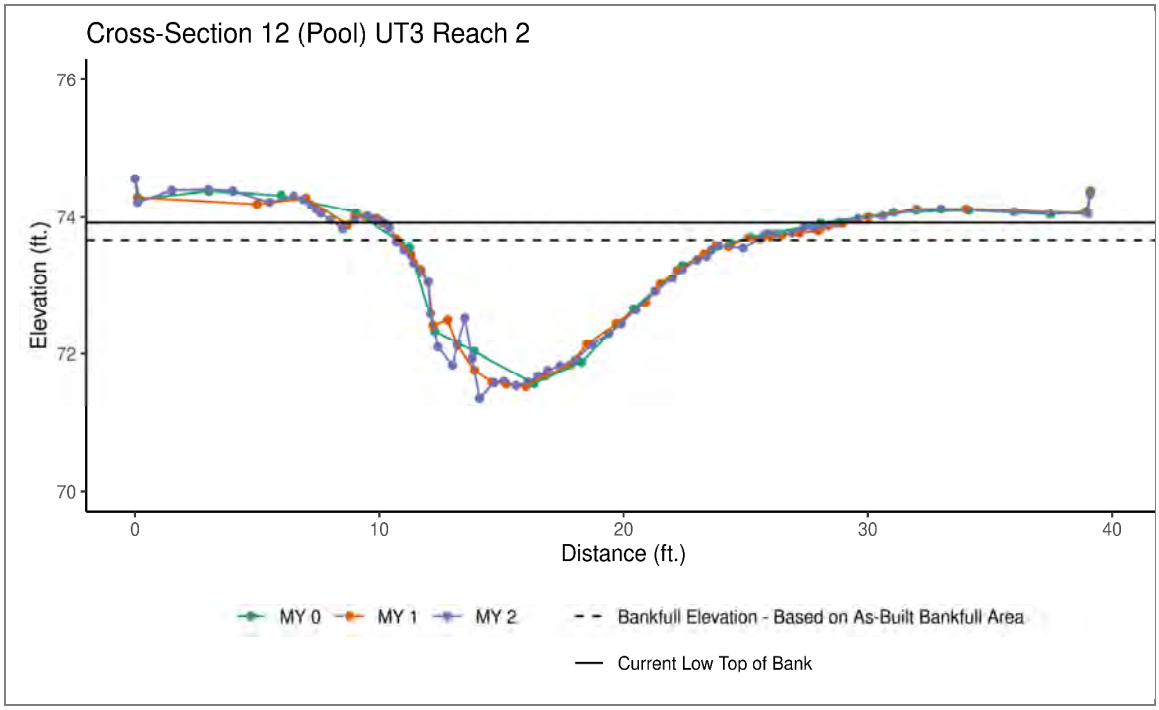
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	73.00	73.08	73.18			
LTOB Elevation	75.49	75.51	75.51			
LTOB Max Depth	2.50	2.43	2.33			
LTOB Cross-Sectional Area	17.58	16.96	16.42			

Downstream *(3/10/2022)*



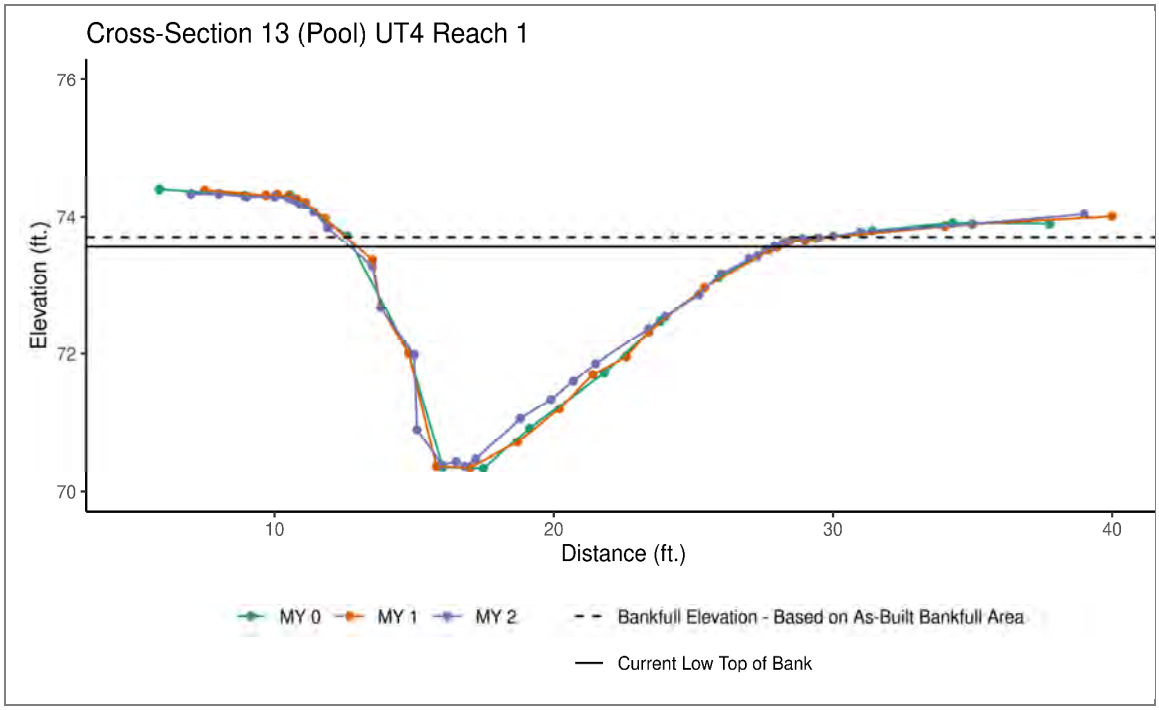
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	74.16	74.20	74.22			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.96	0.93			
Thalweg Elevation	72.49	72.57	72.56			
LTOB Elevation	74.16	74.13	74.10			
LTOB Max Depth	1.67	1.56	1.54			
LTOB Cross-Sectional Area	13.07	12.16	11.66			

Downstream *(3/10/2022)*



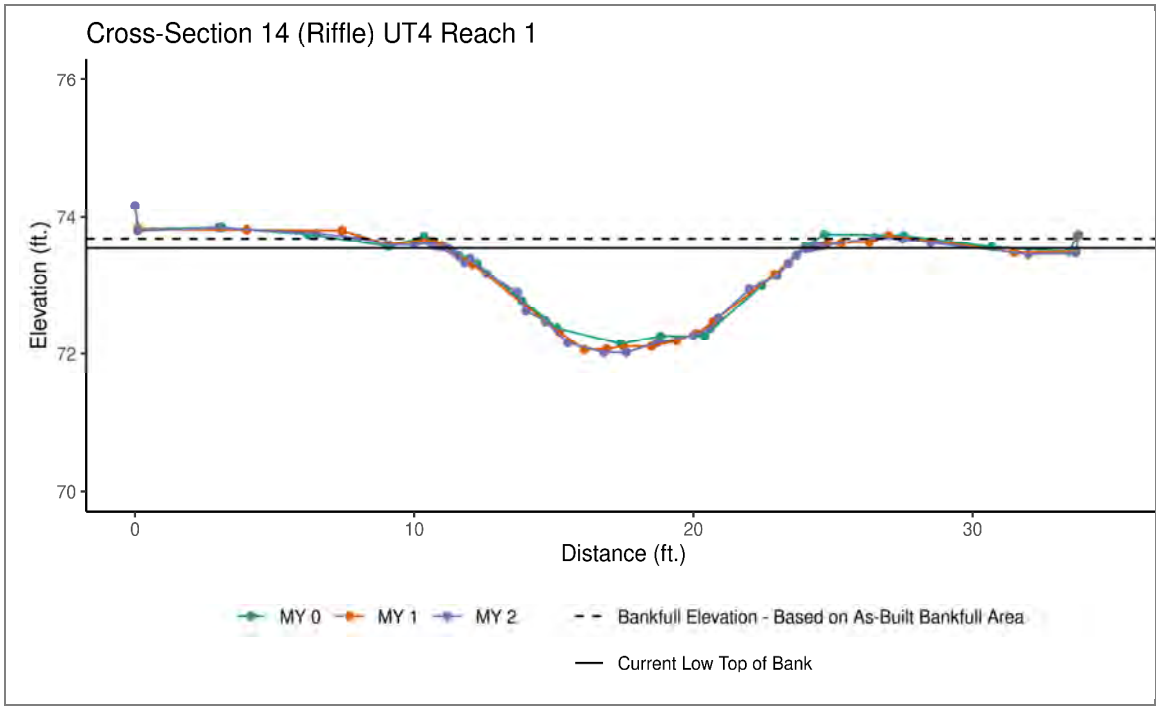
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	71.57	71.53	71.36			
LTOB Elevation	73.72	73.92	73.92			
LTOB Max Depth	2.15	2.39	2.56			
LTOB Cross-Sectional Area	16.99	20.62	21.09			

Downstream *(3/10/2022)*



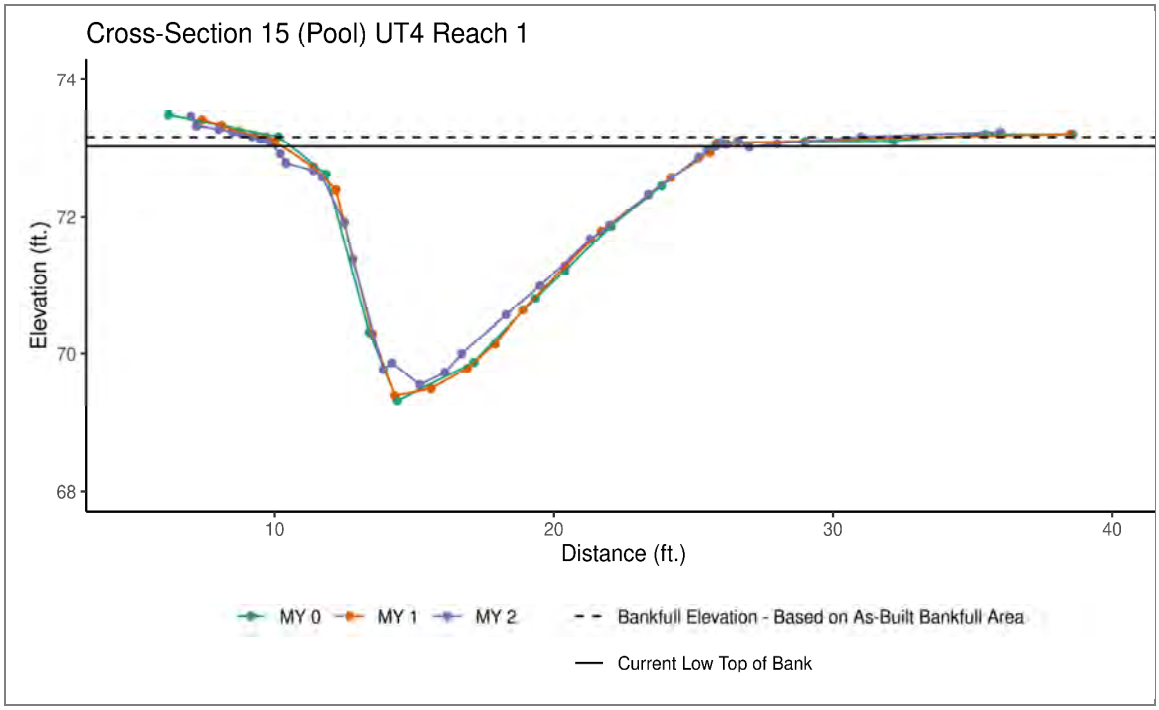
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	70.34	70.35	70.37			
LTOB Elevation	73.64	73.52	73.57			
LTOB Max Depth	3.30	3.17	3.20			
LTOB Cross-Sectional Area	26.09	24.38	23.89			

Downstream *(3/10/2022)*



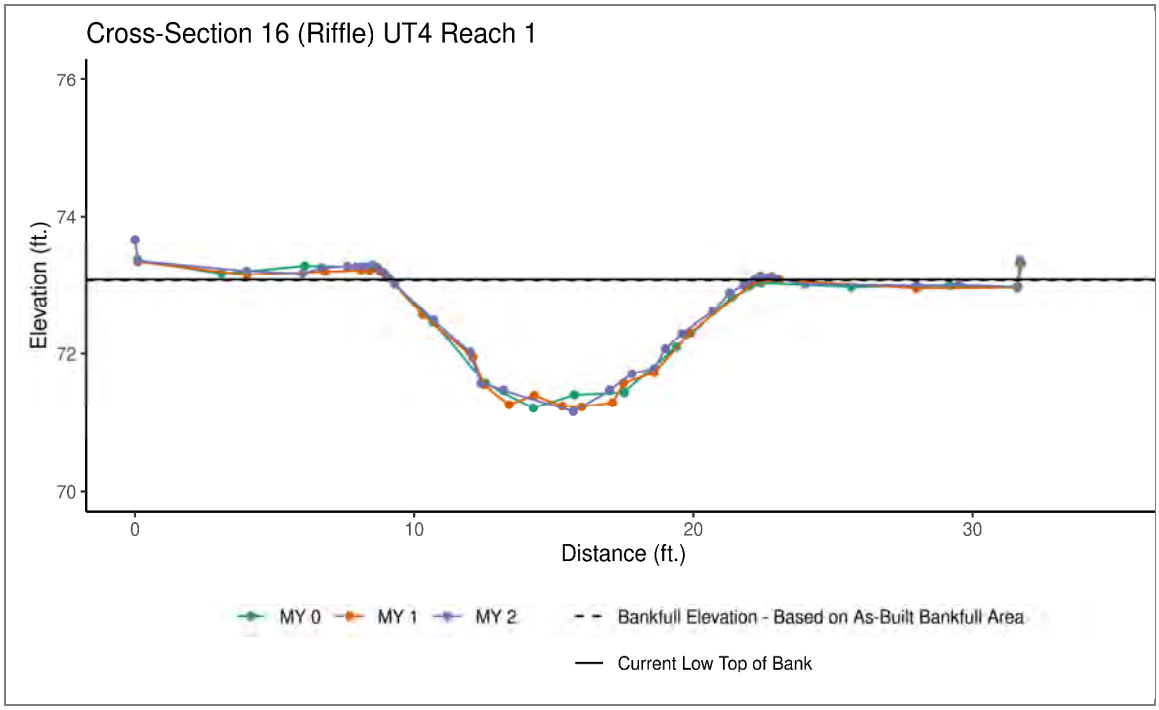
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	73.72	73.70	73.69			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.91	0.92			
Thalweg Elevation	72.15	72.06	72.02			
LTOB Elevation	73.72	73.55	73.55			
LTOB Max Depth	1.58	1.49	1.53			
LTOB Cross-Sectional Area	13.68	11.82	11.84			

Downstream *(3/10/2022)*



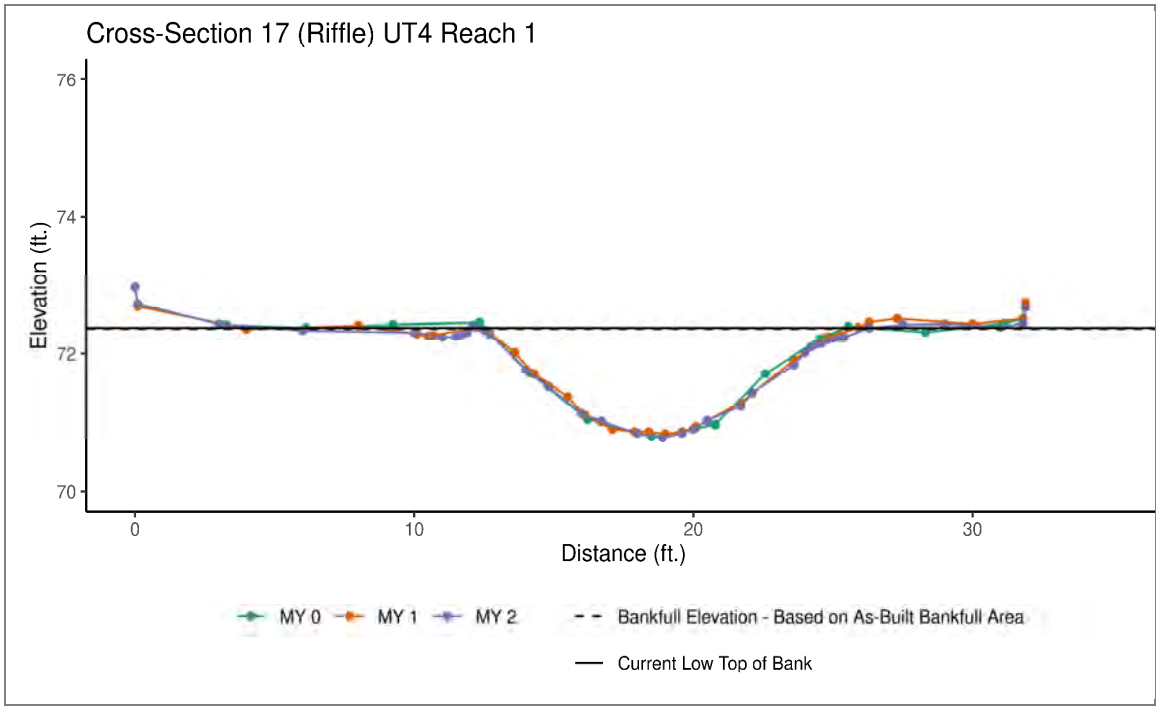
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	69.32	69.40	69.55			
LTOB Elevation	73.08	73.06	73.03			
LTOB Max Depth	3.76	3.66	3.48			
LTOB Cross-Sectional Area	28.70	28.02	26.53			

Downstream *(3/10/2022)*



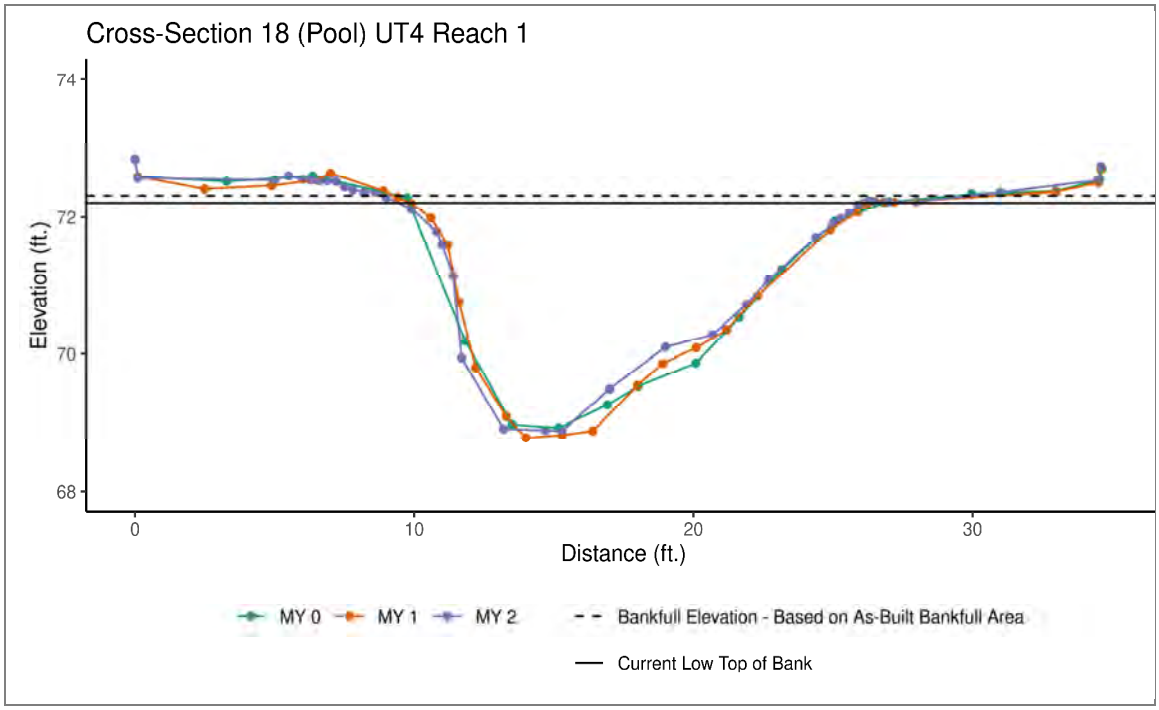
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	73.04	73.02	73.08			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.02	1.01			
Thalweg Elevation	71.21	71.23	71.16			
LTOB Elevation	73.04	73.05	73.09			
LTOB Max Depth	1.83	1.82	1.93			
LTOB Cross-Sectional Area	14.17	14.57	14.35			

Downstream *(3/10/2022)*



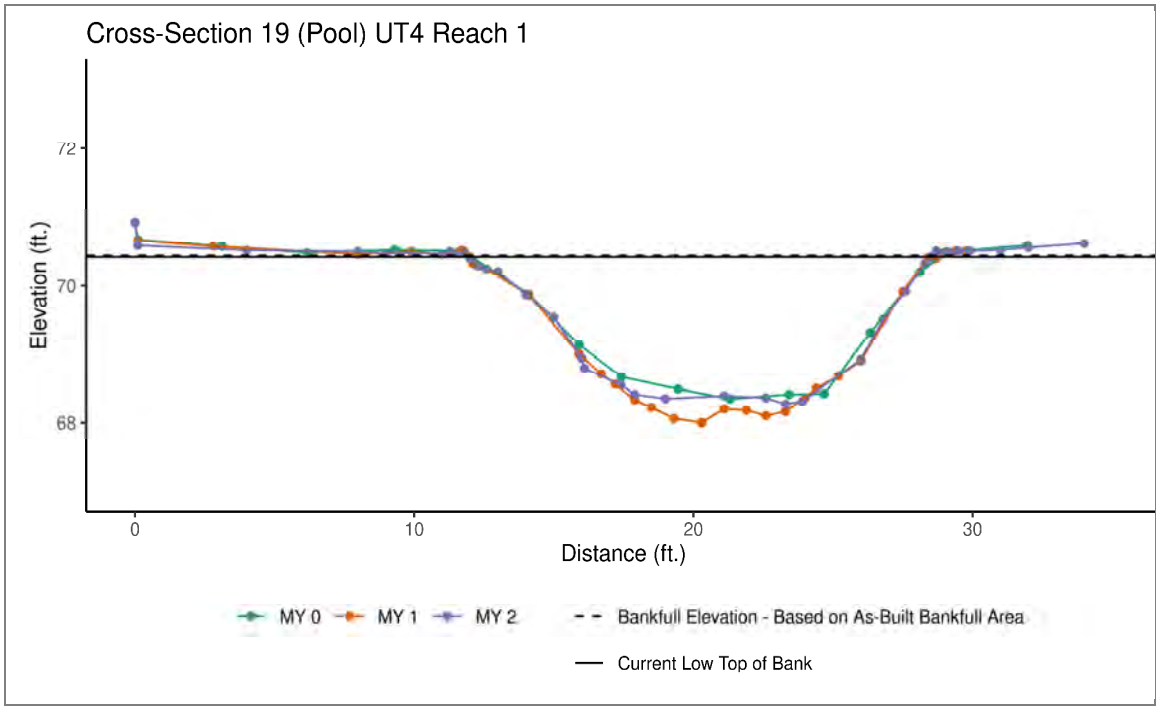
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	72.40	72.40	72.37			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	1.00	1.01			
Thalweg Elevation	70.79	70.84	70.78			
LTOB Elevation	72.40	72.39	72.38			
LTOB Max Depth	1.60	1.55	1.60			
LTOB Cross-Sectional Area	12.29	12.22	12.48			

Downstream *(3/10/2022)*



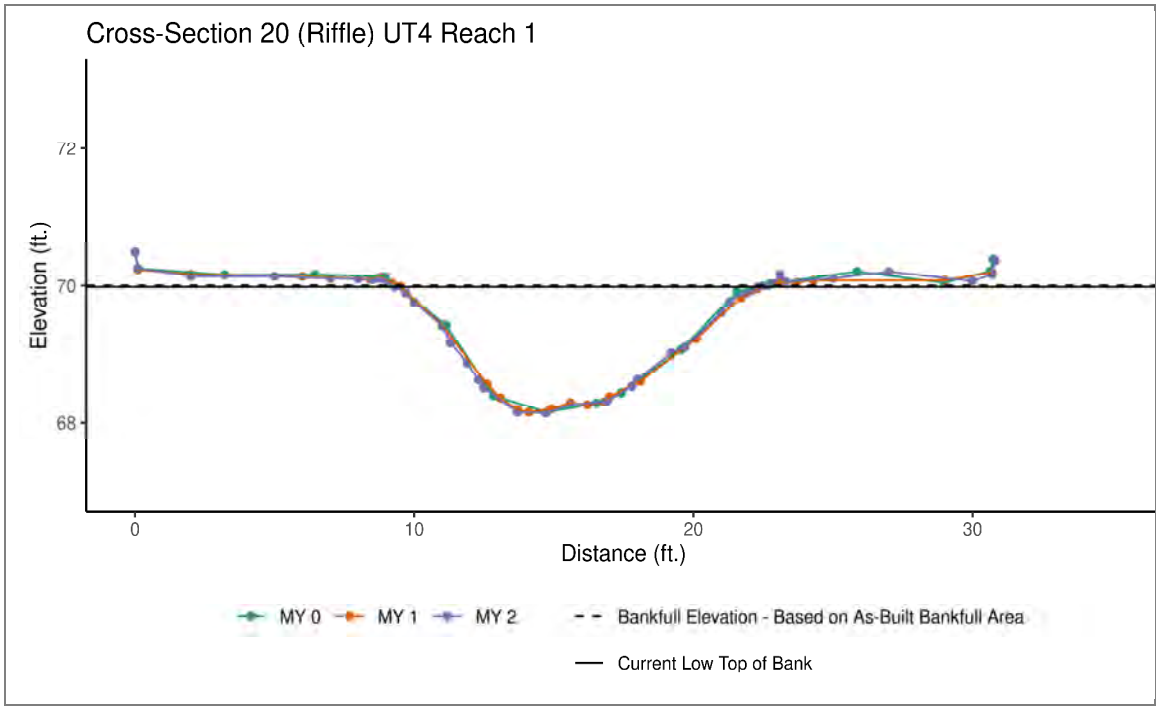
	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	68.92	68.78	68.88			
LTOB Elevation	72.22	72.23	72.21			
LTOB Max Depth	3.30	3.45	3.33			
LTOB Cross-Sectional Area	32.36	31.96	30.60			

Downstream *(3/10/2022)*



	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	N/A	N/A	N/A			
Bank Height Ratio - Based on AB-Bankfull Area	N/A	N/A	N/A			
Thalweg Elevation	68.35	68.00	68.27			
LTOB Elevation	70.50	70.41	70.42			
LTOB Max Depth	2.16	2.41	2.15			
LTOB Cross-Sectional Area	24.08	24.93	23.74			

Downstream *(3/10/2022)*



	MY0	MY1	MY2	MY3	MY5	MY7
Bankfull Elevation - Based on AB-Bankfull Area	70.03	70.01	70.00			
Bank Height Ratio - Based on AB-Bankfull Area	1.00	0.97	0.99			
Thalweg Elevation	68.15	68.15	68.14			
LTOB Elevation	70.03	69.96	69.98			
LTOB Max Depth	1.88	1.81	1.84			
LTOB Cross-Sectional Area	14.48	13.85	14.20			

Downstream *(3/10/2022)*

Table 8. Baseline Stream Data Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**UT1**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	5.7	7.1	3	11.6		12.5	14.9	3
Floodprone Width (ft)	10	100	3	26	58	>200		3
Bankfull Mean Depth	0.8	0.9	3	0.9		0.7	0.9	3
Bankfull Max Depth	1.2		3	1.3		1.3	1.6	3
Bankfull Cross Sectional Area (ft^2)	4.9	6.5	3	10.9		9.5	11.9	3
Width/Depth Ratio	6.6	8.1	3	12.4		14.4	20.3	3
Entrenchment Ratio	1.4	17.6	3	2.2	5.0	13.5	16.0	3
Bank Height Ratio	1.6	2.8	3	1.0		1.0		3
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	E5/G5			C5		C5		
Bankfull Discharge (cfs)	11.9			12		10.7	15.2	3
Sinuosity	1.05			1.25		1.28		
Water Surface Slope ($ft/ft)^2$	0.0022			0.0011		0.0014		
Other	---			---		---		
Parameter	**UT2 Reach 2**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	5.9		1	7.0		8.3		1
Floodprone Width (ft)	7		1	15	35	>200		1
Bankfull Mean Depth	0.3		1	0.6		0.5		1
Bankfull Max Depth	0.5		1	0.9		1.0		1
Bankfull Cross Sectional Area (ft^2)	1.8		1	4.3		4.4		1
Width/Depth Ratio	18.8		1	11.5		15.5		1
Entrenchment Ratio	1.2		1	2.2	5.0	>24		1
Bank Height Ratio	5.6		1	1.0		1.0		1
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F5			C5		C5		
Bankfull Discharge (cfs)	4.2			4.0		4.2		
Sinuosity	1.03			1.25		1.19		
Water Surface Slope ($ft/ft)^2$	0.0024			0.0014		0.0019		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**UT3 Reach 1**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	10.2		1	8.8		9.3		1
Floodprone Width (ft)	12		1	19	44	>200		1
Bankfull Mean Depth	0.3		1	0.7		0.6		1
Bankfull Max Depth	0.5		1	1.2		1.0		1
Bankfull Cross Sectional Area (ft^2)	3.5		1	6.3		5.8		1
Width/Depth Ratio	29.9		1	12.3		15.8		1
Entrenchment Ratio	1.2		1	2.2	5.0	>20		1
Bank Height Ratio	7.1		1	1.0		1.0		1
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F5			C5		C5		
Bankfull Discharge (cfs)	7.1			7		5		
Sinuosity	1.01			1.25		1.26		
Water Surface Slope ($ft/ft)^2$	0.0065			0.0015		0.0012		
Other	---			---		---		
Parameter	**UT3 Reach 2**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	12		1	11.0		12.5		1
Floodprone Width (ft)	13		1	24	55	>200		1
Bankfull Mean Depth	0.8		1	0.9		1.0		1
Bankfull Max Depth	1.3		1	1.0		1.7		1
Bankfull Cross Sectional Area (ft^2)	9.1		1	9.6		13.1		1
Width/Depth Ratio	16.0		1	12.6		11.9		1
Entrenchment Ratio	1		1	2.2	5.0	>16		1
Bank Height Ratio	3.4		1	1.0		1.0		1
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	F5			C5		C5		
Bankfull Discharge (cfs)	10.0			9.9		16.8		
Sinuosity	1.05			1.20		1.26		
Water Surface Slope ($ft/ft)^2$	0.0014			0.0010		0.0012		
Other	---			---		---		

Table 8. Baseline Stream Data Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

	PRE-EXISTING CONDITIONS			DESIGN		MONITORING BASELINE (MY0)		
Parameter	**UT4 Reach 1**							
Riffle Only	**Min**	**Max**	**n**	**Min**	**Max**	**Min**	**Max**	**n**
Bankfull Width (ft)	5.1	12.4	2	12.8		13.1	13.5	3
Floodprone Width (ft)	13	14	2	28	64	178	>200	3
Bankfull Mean Depth	0.9	1.8	2	1.1		0.9	1.1	3
Bankfull Max Depth	1.3	2.2	2	1.5		1.6	1.9	3
Bankfull Cross Sectional Area (ft^2)	9.0	11.1	2	13.6		12.3	14.5	3
Width/Depth Ratio	2.9	13.9	2	12.1		12.3	13.9	3
Entrenchment Ratio	1.2	2.5	2	2.2	5.0	13.2	>15	3
Bank Height Ratio	2.3	5.3	2	1.0		1.0		3
Max part size (mm) mobilized at bankfull	---			---		---		
Rosgen Classification	E5/F5			C5		C5		
Bankfull Discharge (cfs)	18.4			18.7		15.0	18.9	3
Sinuosity	1.04			1.25		1.29		
Water Surface Slope (ft/ft^2)	0.0010			0.0013		0.0012		
Other	---			---		---		

Table 9. Cross-Section Morphology Monitoring Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

	UT1																					
	Cross-Section 1 (Pool)						Cross-Section 2 (Riffle)						Cross-Section 3 (Pool)						Cross-Section 4 (Riffle)					
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**
Bankfull Elevation (ft) - Based on AB Bankfull[1] Area	N/A	N/A	N/A				76.24	76.26	76.38				N/A	N/A	N/A				75.46	75.45	75.49			
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A				1.00	0.98	0.92				N/A	N/A	N/A				1.00	0.96	0.96			
Thalweg Elevation (ft)	73.00	74.10	74.12				74.81	74.85	74.87				72.56	72.70	72.91				73.88	73.96	73.81			
LTOB[2] Elevation (ft)	76.16	76.23	76.38				76.24	76.23	76.26				75.41	75.39	75.41				75.46	75.41	75.42			
LTOB[2] Max Depth (ft)	3.17	2.13	2.26				1.43	1.38	1.39				2.85	2.69	2.50				1.58	1.45	1.61			
LTOB[2] Cross-Sectional Area (ft^2)	26.20	14.60	17.74				9.45	9.07	8.27				23.72	21.60	20.83				11.91	11.26	11.08			
	UT1												UT2 Reach 2											
	Cross-Section 5 (Riffle)						Cross-Section 6 (Pool)						Cross-Section 7 (Riffle)						Cross-Section 8 (Pool)					
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**
Bankfull Elevation (ft) - Based on AB Bankfull[1] Area	74.79	74.81	74.79				N/A	N/A	N/A				76.22	76.22	76.21				N/A	N/A	N/A			
Bank Height Ratio - Based on AB Bankfull[1] Area	1.00	0.95	0.96				N/A	N/A	N/A				1.00	0.99	0.98				N/A	N/A	N/A			
Thalweg Elevation (ft)	73.48	73.47	73.44				71.15	70.81	70.73				75.20	75.20	75.18				74.68	74.61	74.63			
LTOB[2] Elevation (ft)	74.79	74.75	74.74				74.50	74.43	74.45				76.22	76.21	76.19				76.10	76.11	76.11			
LTOB[2] Max Depth (ft)	1.30	1.28	1.30				3.36	3.62	3.72				1.02	1.01	1.01				1.42	1.50	1.48			
LTOB[2] Cross-Sectional Area (ft^2)	10.82	9.95	10.07				31.59	30.39	31.55				4.43	4.38	4.26				7.00	7.00	6.97			
	UT3 Reach 1												UT3 Reach 2											
	Cross-Section 9 (Riffle)						Cross-Section 10 (Pool)						Cross-Section 11 (Riffle)						Cross-Section 12 (Pool)					
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**
Bankfull Elevation (ft) - Based on AB Bankfull[1] Area	75.72	75.69	75.71				N/A	N/A	N/A				74.16	74.20	74.22				N/A	N/A	N/A			
Bank Height Ratio - Based on AB Bankfull[1] Area	1.00	0.98	0.88				N/A	N/A	N/A				1.00	0.96	0.93				N/A	N/A	N/A			
Thalweg Elevation (ft)	74.71	74.66	74.63				73.00	73.08	73.18				72.49	72.57	72.56				71.57	71.53	71.36			
LTOB[2] Elevation (ft)	75.72	75.67	75.58				75.49	75.51	75.51				74.16	74.13	74.10				73.72	73.92	73.92			
LTOB[2] Max Depth (ft)	1.02	1.01	0.95				2.50	2.43	2.33				1.67	1.56	1.54				2.15	2.39	2.56			
LTOB[2] Cross-Sectional Area (ft^2)	5.81	5.58	4.76				17.58	16.96	16.42				13.07	12.16	11.66				16.99	20.62	21.09			

[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent years bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

Table 9. Cross-Section Morphology Monitoring Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

	UT4 Reach 1																							
	Cross-Section 13 (Pool)						Cross-Section 14 (Riffle)						Cross-Section 15 (Pool)						Cross-Section 16 (Riffle)					
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**
Bankfull Elevation (ft) - Based on AB Bankfull[1] Area	N/A	N/A	N/A				73.72	73.70	73.69				N/A	N/A	N/A				73.04	73.02	73.08			
Bank Height Ratio - Based on AB Bankfull[1] Area	N/A	N/A	N/A				1.00	0.91	0.92				N/A	N/A	N/A				1.00	1.02	1.01			
Thalweg Elevation (ft)	70.34	70.35	70.37				72.15	72.06	72.02				69.32	69.40	69.55				71.21	71.23	71.16			
LTOB[2] Elevation (ft)	73.64	73.52	73.57				73.72	73.55	73.55				73.08	73.06	73.03				73.04	73.05	73.09			
LTOB[2] Max Depth (ft)	3.30	3.17	3.20				1.58	1.49	1.53				3.76	3.66	3.48				1.83	1.82	1.93			
LTOB[2] Cross-Sectional Area (ft^2)	26.09	24.38	23.89				13.68	11.82	11.84				28.70	28.02	26.53				14.17	14.57	14.35			
	UT4 Reach 1																							
	Cross-Section 17 (Riffle)						Cross-Section 18 (Pool)						Cross-Section 19 (Pool)						Cross-Section 20 (Riffle)					
Dimension and Substrate	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**	**Base**	**MY1**	**MY2**	**MY3**	**MY5**	**MY7**
Bankfull Elevation (ft) - Based on AB Bankfull[1] Area	72.40	72.40	72.37				N/A	N/A	N/A				N/A	N/A	N/A				70.03	70.01	70.00			
Bank Height Ratio - Based on AB Bankfull[1] Area	1.00	1.00	1.01				N/A	N/A	N/A				N/A	N/A	N/A				1.00	0.97	0.99			
Thalweg Elevation (ft)	70.79	70.84	70.78				68.92	68.78	68.88				68.35	68.00	68.27				68.15	68.15	68.14			
LTOB[2] Elevation (ft)	72.40	72.39	72.38				72.22	72.23	72.21				70.50	70.41	70.42				70.03	69.96	69.98			
LTOB[2] Max Depth (ft)	1.60	1.55	1.60				3.30	3.45	3.33				2.16	2.41	2.15				1.88	1.81	1.84			
LTOB[2] Cross-Sectional Area (ft^2)	12.29	12.22	12.48				32.36	31.96	30.60				24.08	24.93	23.74				14.48	13.85	14.20			

[1]Bank Height Ratio (BHR) takes the As-built bankful area as the basis for adjusting each subsequent years bankfull elevation.

[2]LTOB Area and Max depth - These are based on the LTOB elevation for each years survey (The same elevation used for the LTOB in the BHR calculation). Area below the LTOB elevation will be used and tracked for each year as above. The difference between the LTOB elevation and the thalweg elevation (same as in the BHR calculation) will be recroded and tracked above as LTOB max depth.

APPENDIX D. HYDROLOGY DATA

Table 10. Bankfull Events

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Reach	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
UT1	3/16/2021 6/3/2021 6/12/2021 7/19/2021	1/17/2022					
UT2	7/19/2021						
UT3	6/3/2021 7/19/2021	1/16/2022 7/9/2022					
UT4	3/16/2021 7/19/2021						

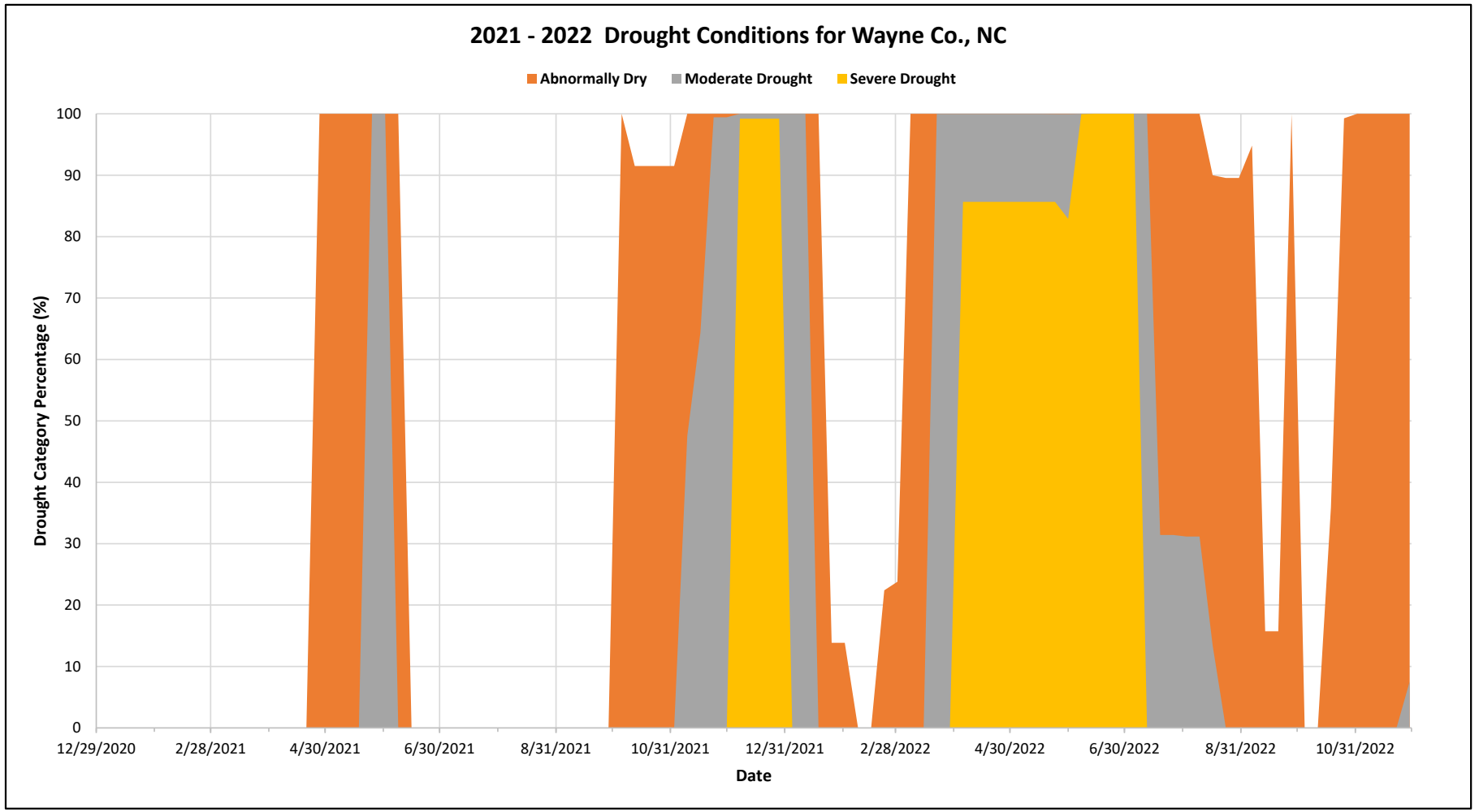
Table 11. Rainfall Summary

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
Annual Precip Total	54.18	35.65*					
WETS 30th Percentile	33.95	33.95					
WETS 70th Percentile	58.89	58.89					
Normal	Yes	*					

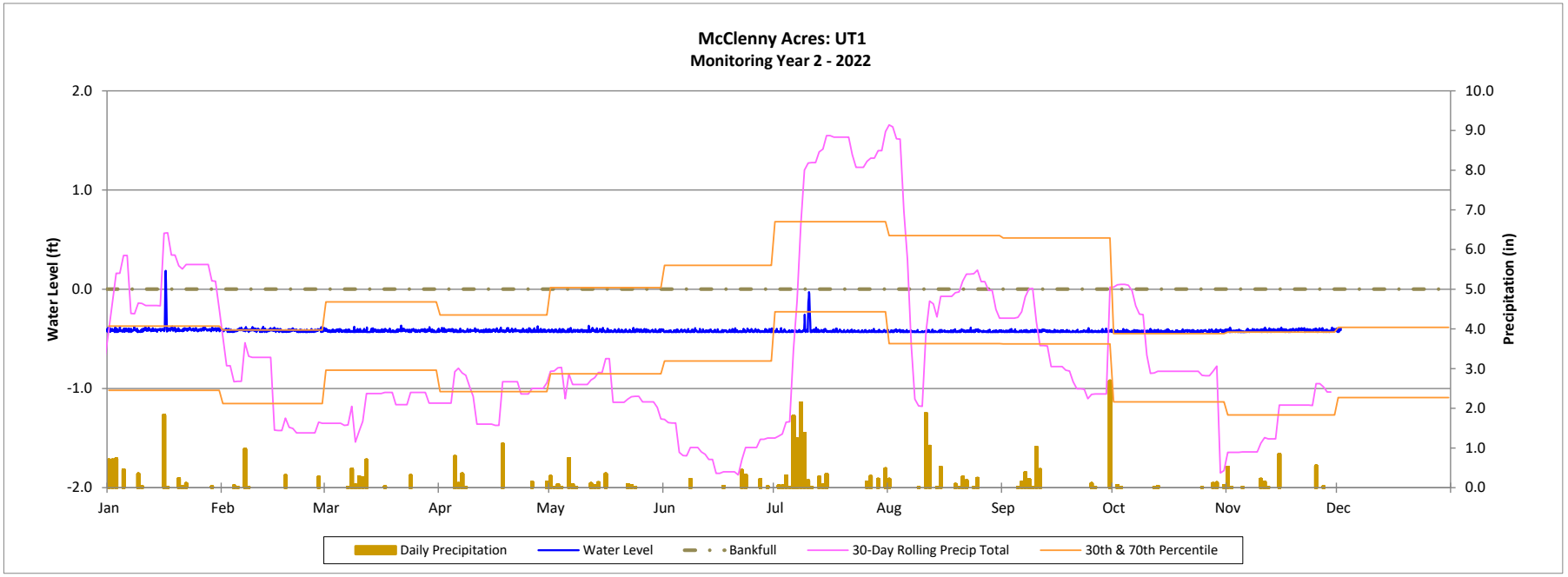
*Data collection period was from 1/1/2022 through 11/30/2022. Total rainfall amout will be updated during MY3.
2022 monthly rainfall data collected from Cherry Research Station (NC State Climate Office).
30th and 70 percintile rainfall data collected from Smithfield weather station (317994).

Graph 1. 2021 - 2022 Drought Conditions for Wayne Co., NC
McClenny Acres Mitigation Site
NCDMS Project No. 100038
Monitoring Year 2 - 2022

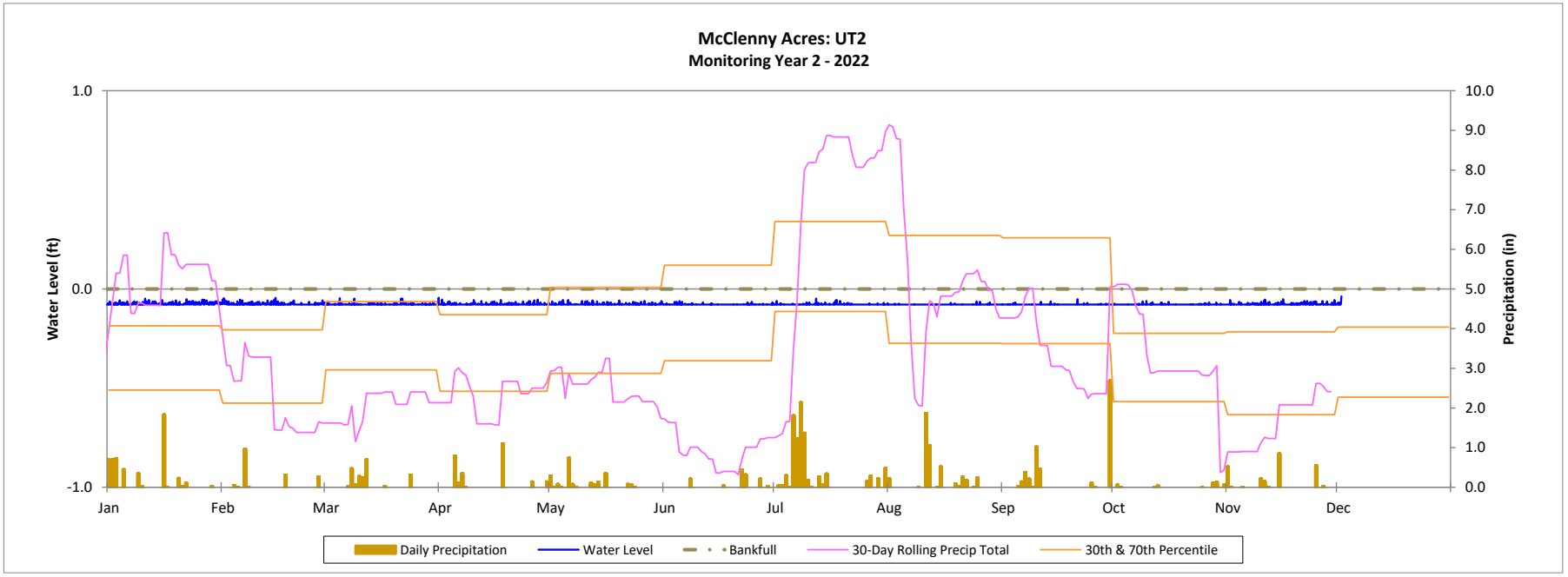


[1] Annual Drought Condition data from NIDIS US Drought Monitor Wayne Co. 2021-2022

Recorded Bankfull Events Plot
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022



Recorded Bankfull Events Plot
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022



Recorded Bankfull Events Plot
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

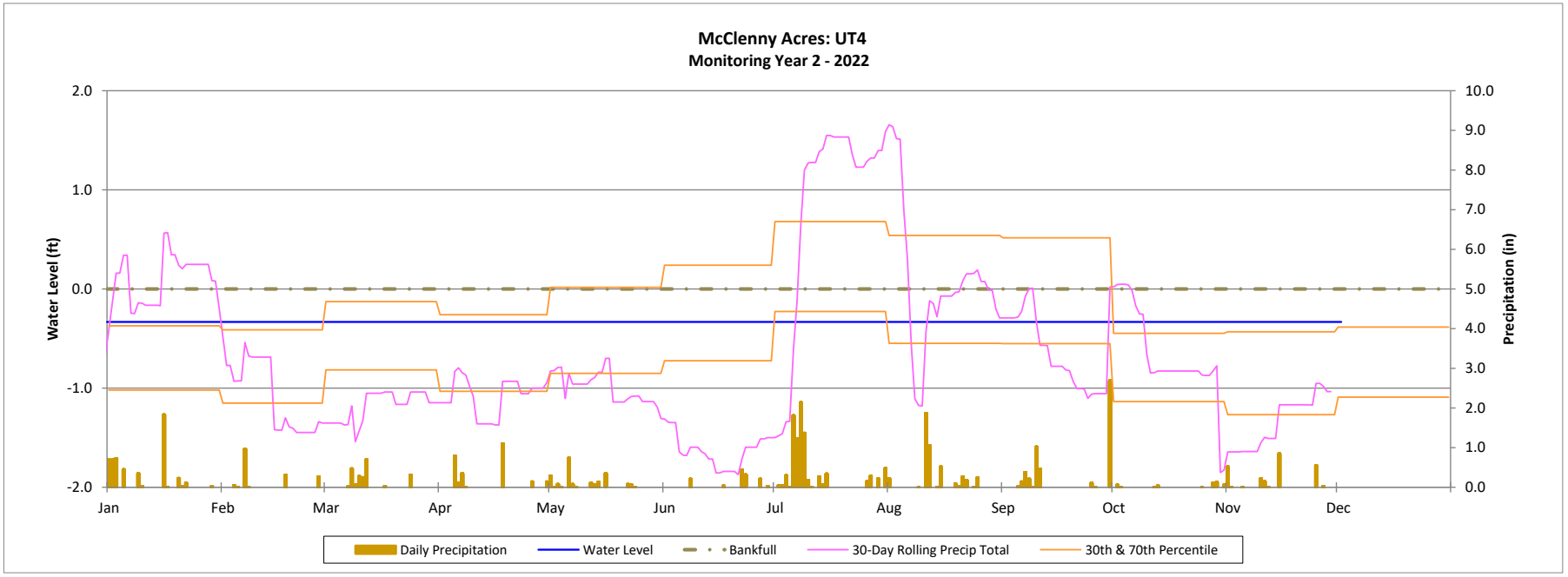


Table 12. Recorded In-Stream Flow Events Summary

McClenny Acres Mitigation Site

DMS Project No. 100038

Monitoring Year 2 - 2022

Reach	Max Consecutive Days/Total Days Meeting Success Criteria[1]						
	MY1 (2021)[2]	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
UT3 Reach 1	61 Days/ 143 Days	104 Days/ 120 Days					

[1]Success criteria is 30 consecutive days of flow.

[2]Data colleted 2/26/2021 through 12/2/2021.

Recorded In-Stream Flow Events Plot
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

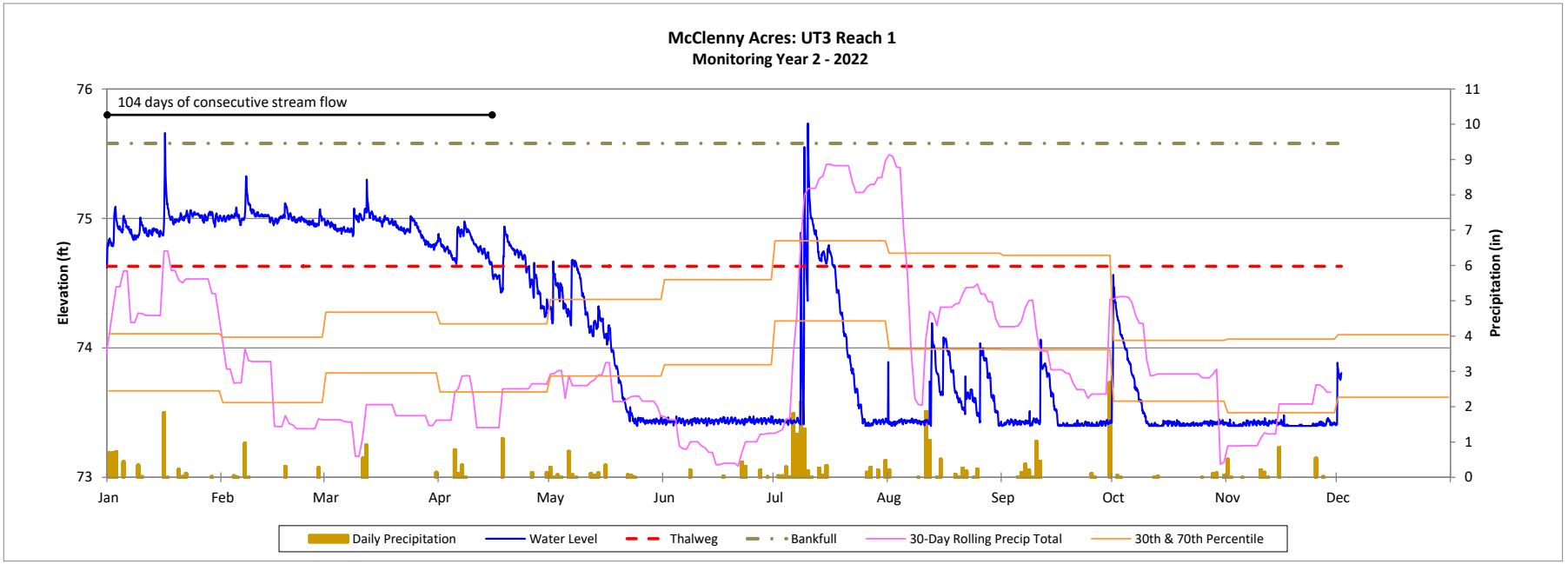


Table 13. Groundwater Gauge Summary

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Summary of Groundwater Gauge Results for Monitoring Years 1 through 7							
Gauge	Max Consecutive Days During Growing Season (Percentage)						
	MY1 (2021)	MY2 (2022)	MY3 (2023)	MY4 (2024)	MY5 (2025)	MY6 (2026)	MY7 (2027)
1	89 Days (33.5%)	79 Days (29.7%)					
2	6 Days (2.3%)	2 Days (0.8%)					
3	87 Days (32.7%)	62 Days (23.3%)					
4	4 Days (1.5%)	1 Day (0.4%)					
5	40 Days (15.0%)	32 Days (12.0%)					
6	40 Days (15.0%)	28 Days (10.5%)					
7	89 Days (33.5%)	67 Days (25.2%)					
8	20 Days (7.5%)	13 Days (4.9%)					
9	2 Days (0.8%)	2 Days (0.8%)					
10	3 Days (1.1%)	2 Days (0.8%)					
11	58 Days (21.8%)	45 Days (16.9%)					
12	57 Days (21.4%)	48 Days (18.0%)					
13	60 Days (22.6%)	46 Days (17.3%)					
14	52 Days (19.5%)	32 Days (12.0%)					
15	60 Days (22.6%)	57 Days (21.4%)					
16	2 Days (0.8%)	3 Days (1.1%)					
17	11 Days (4.1%)	1 Day (0.4%)					
18	24 Days (9.0%)	2 Days (0.8%)					
19	22 Days (8.3%)	3 Days (1.1%)					

Corresponds to gauges in units with a 10% (27 day) hydroperiod criterions

Corresponds to gauges in units with a 14% (38 day) hydroperiod criterions

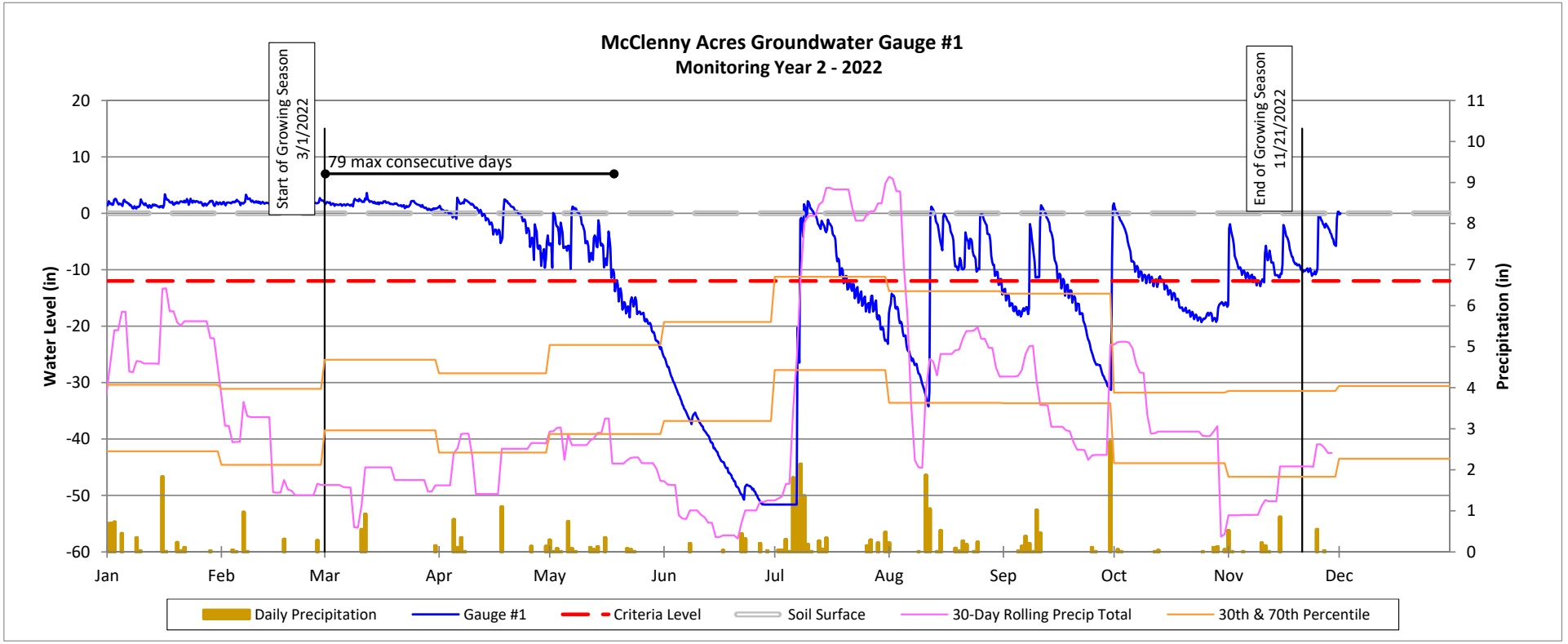
Growing Season Dates: 3/1/2022 to 11/21/2022 (265 days).

Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

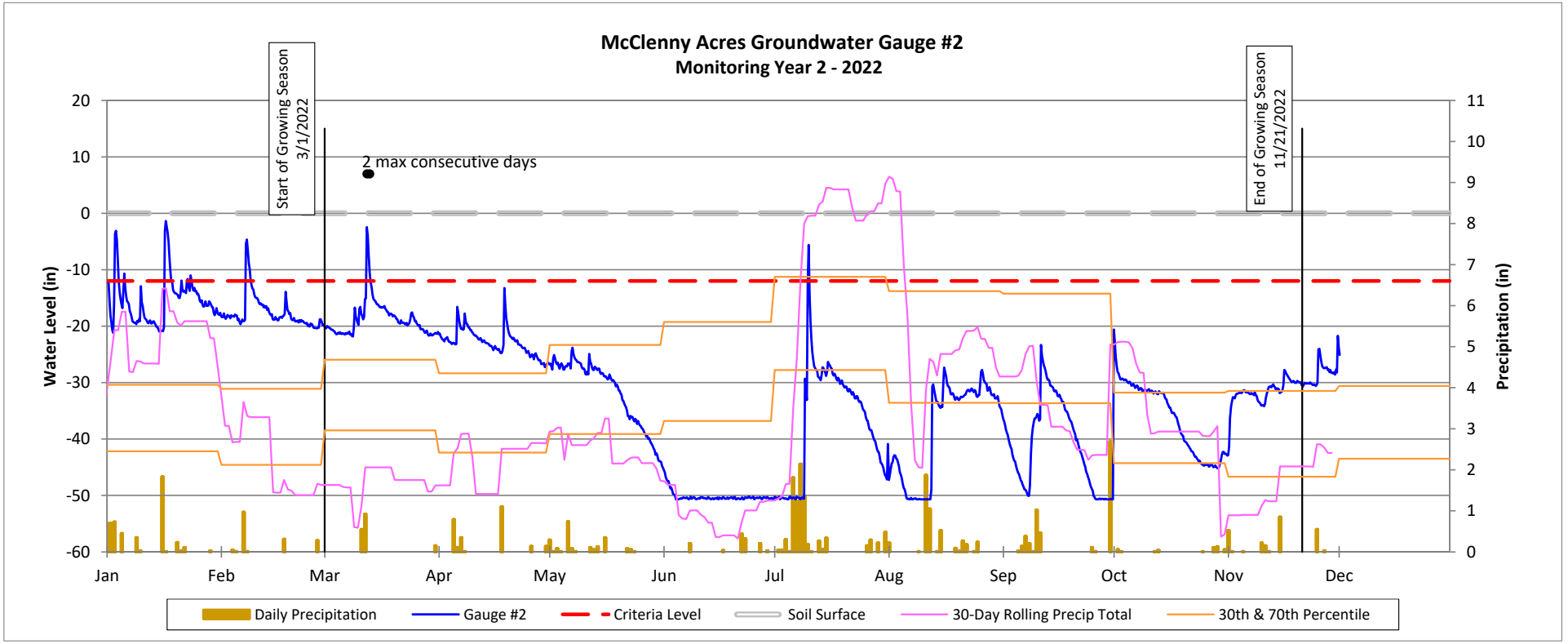


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

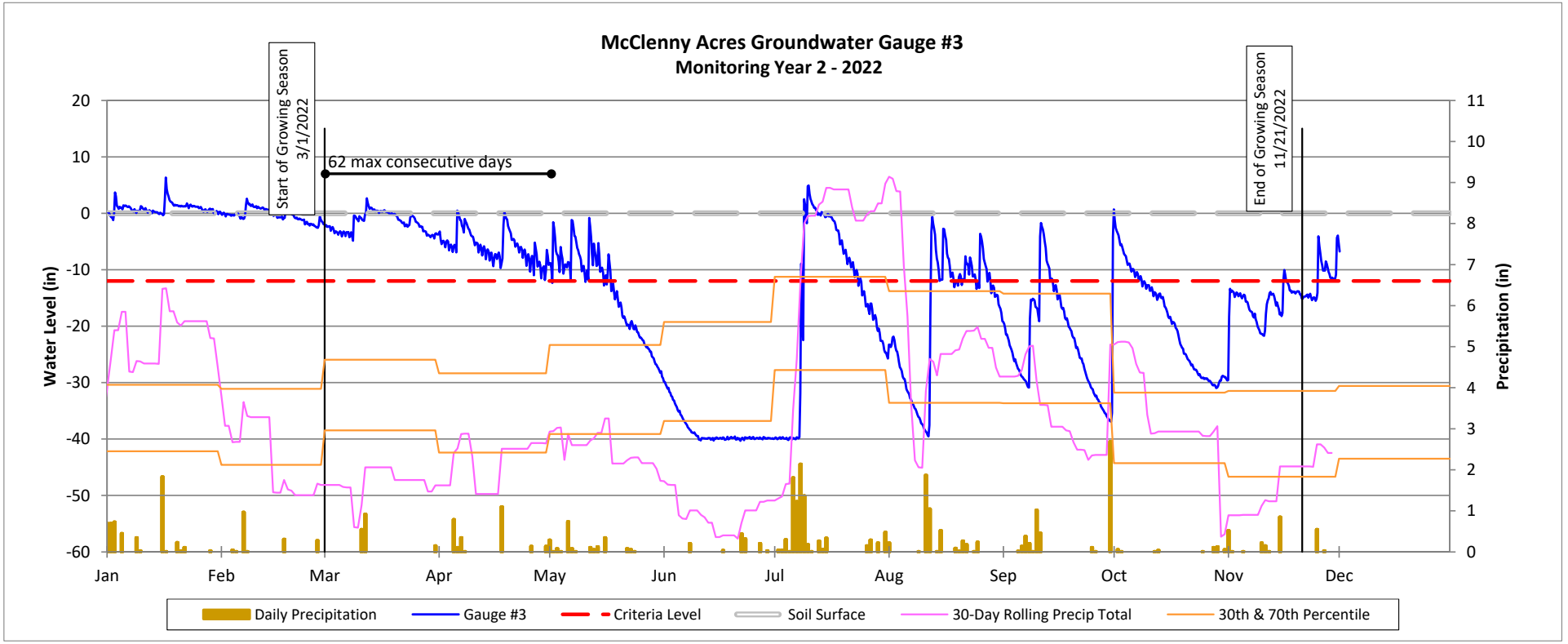


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

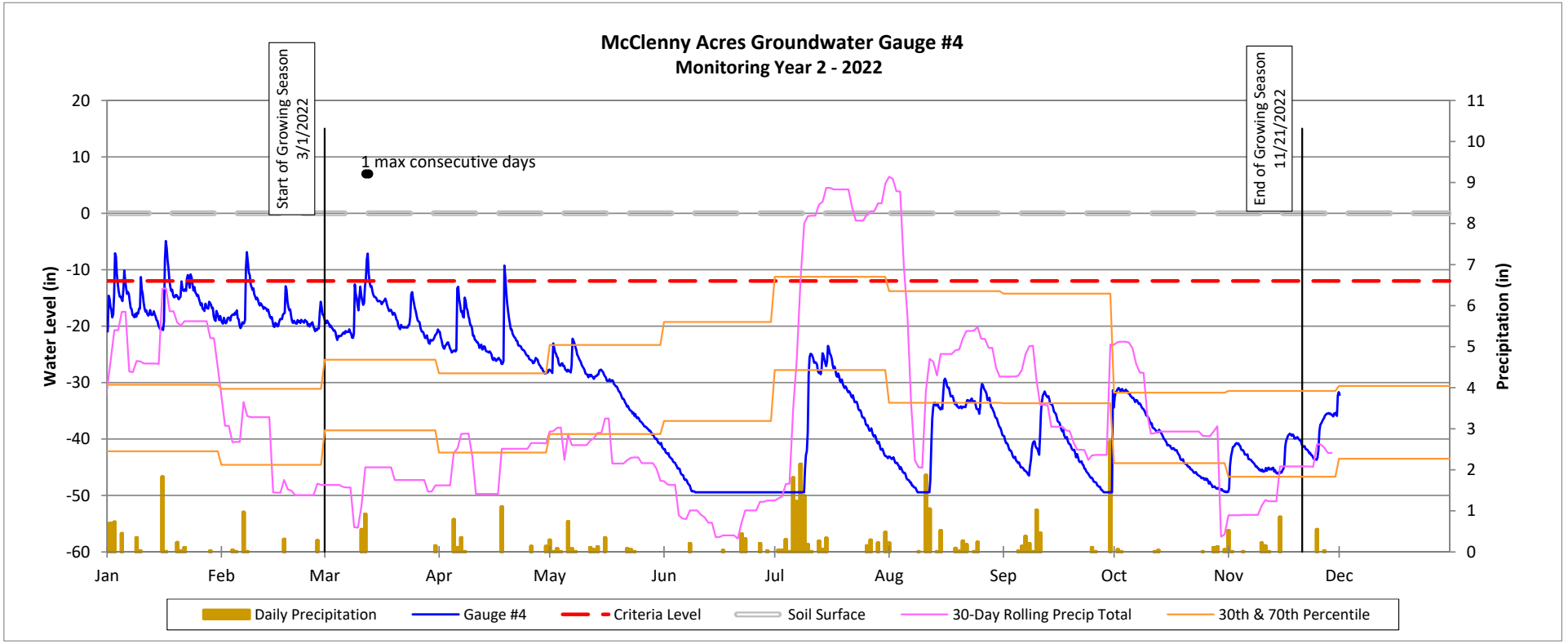


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

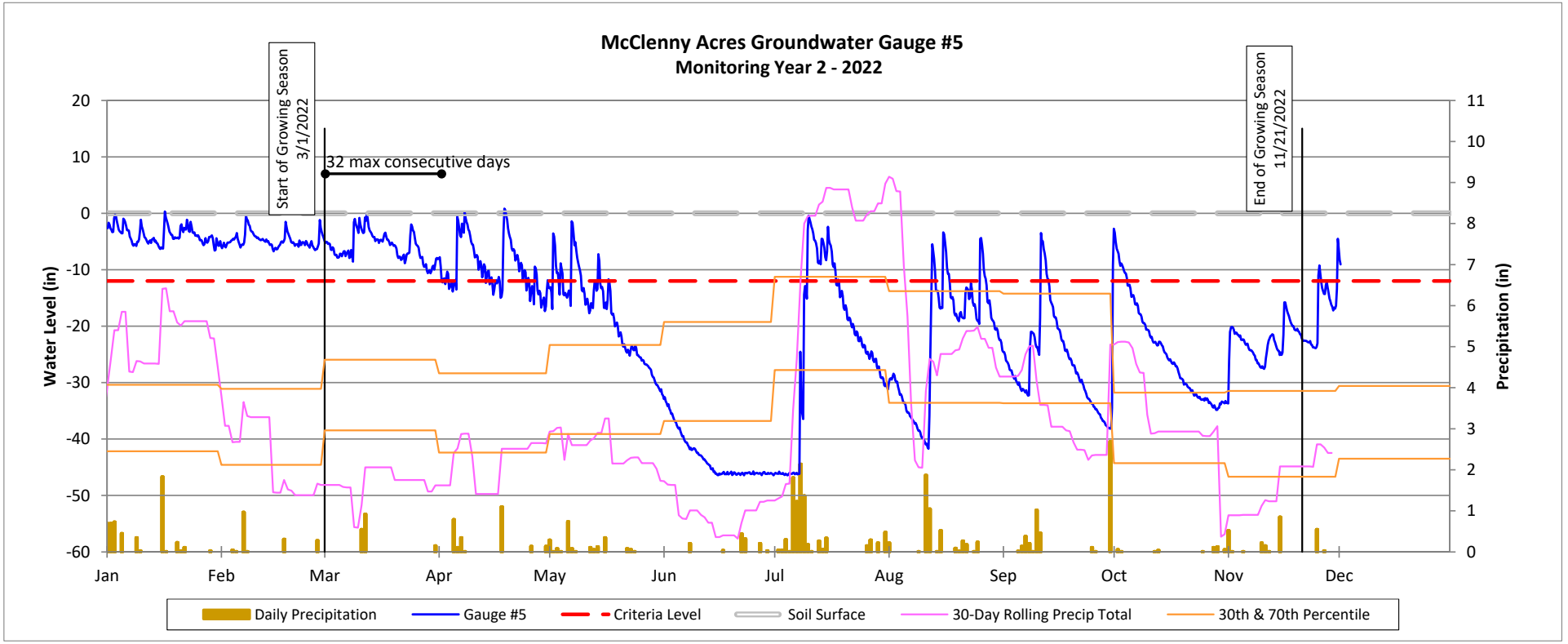


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

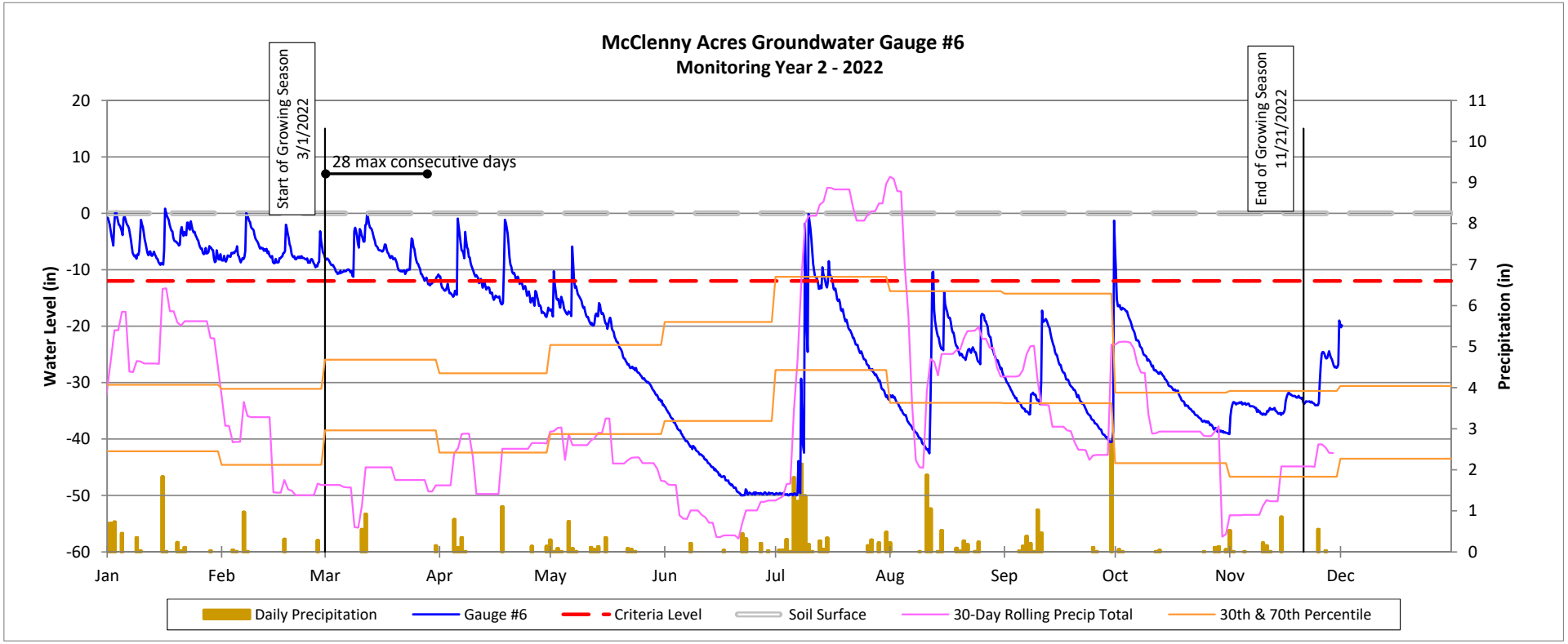


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

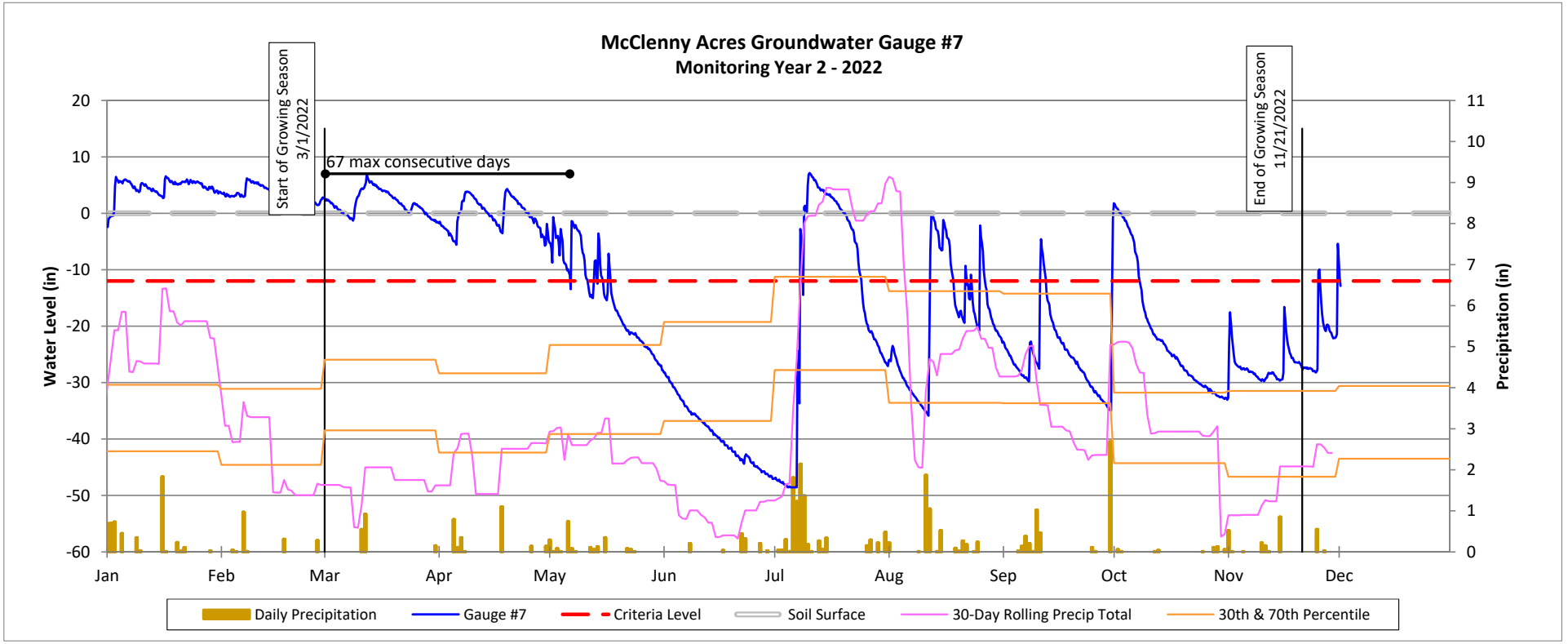


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

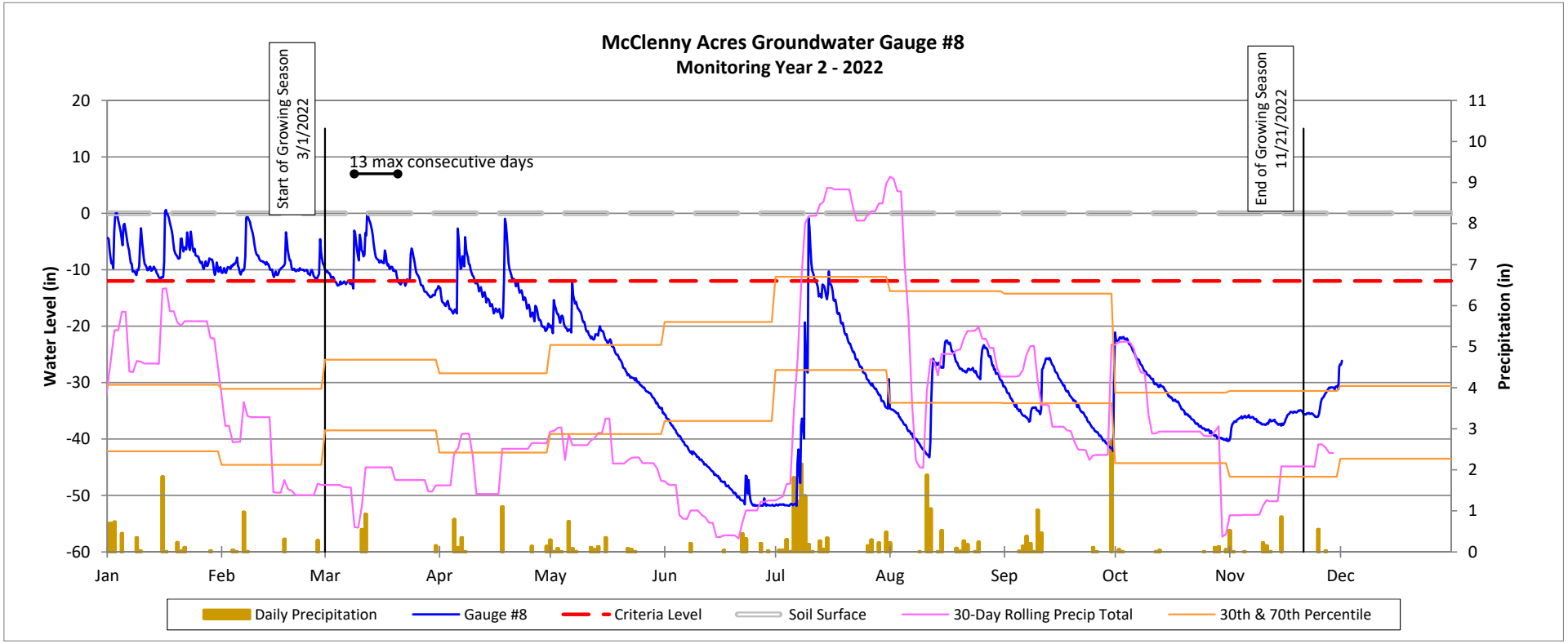


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

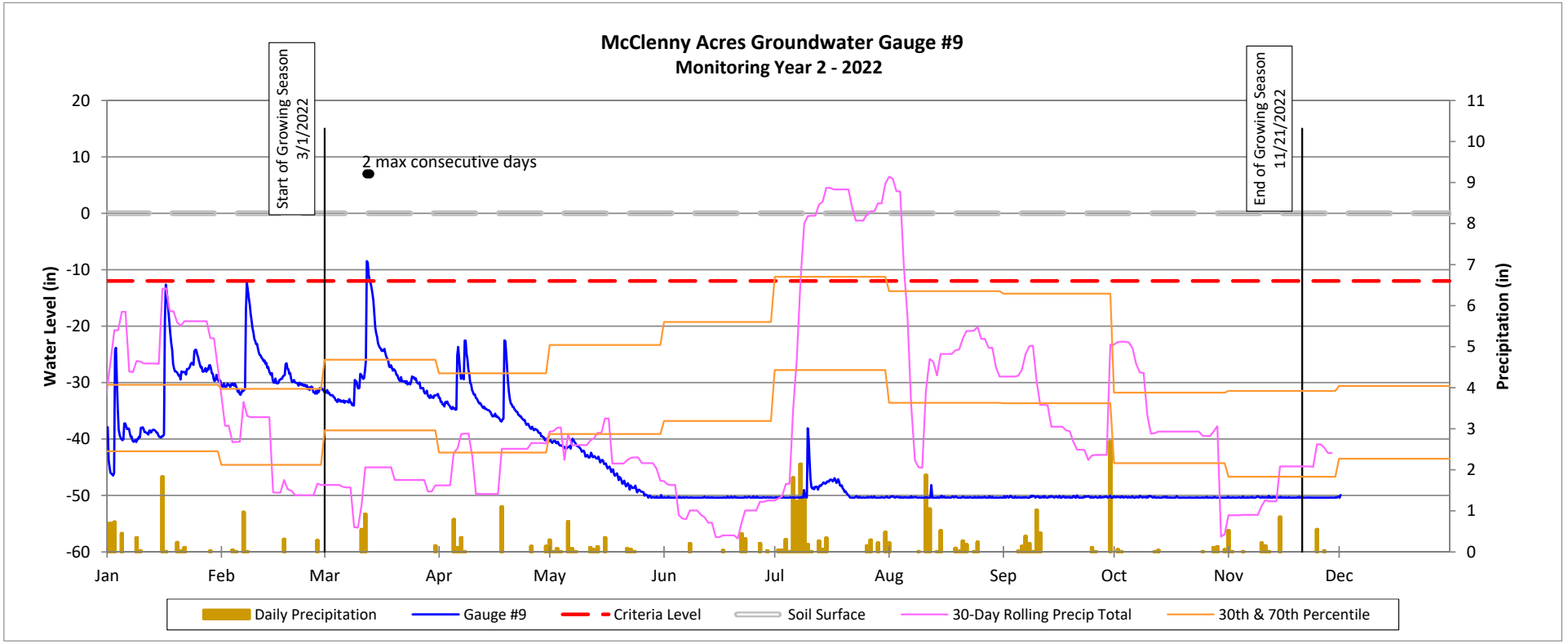


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

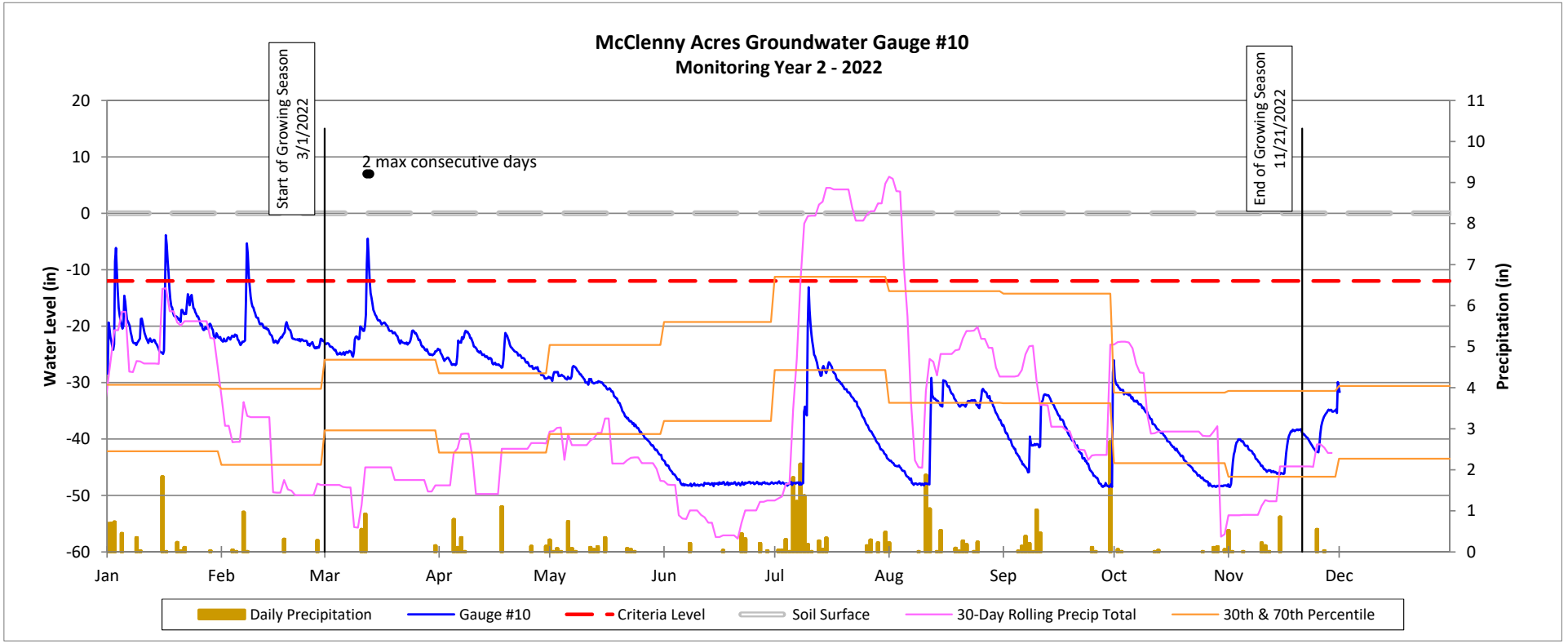


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

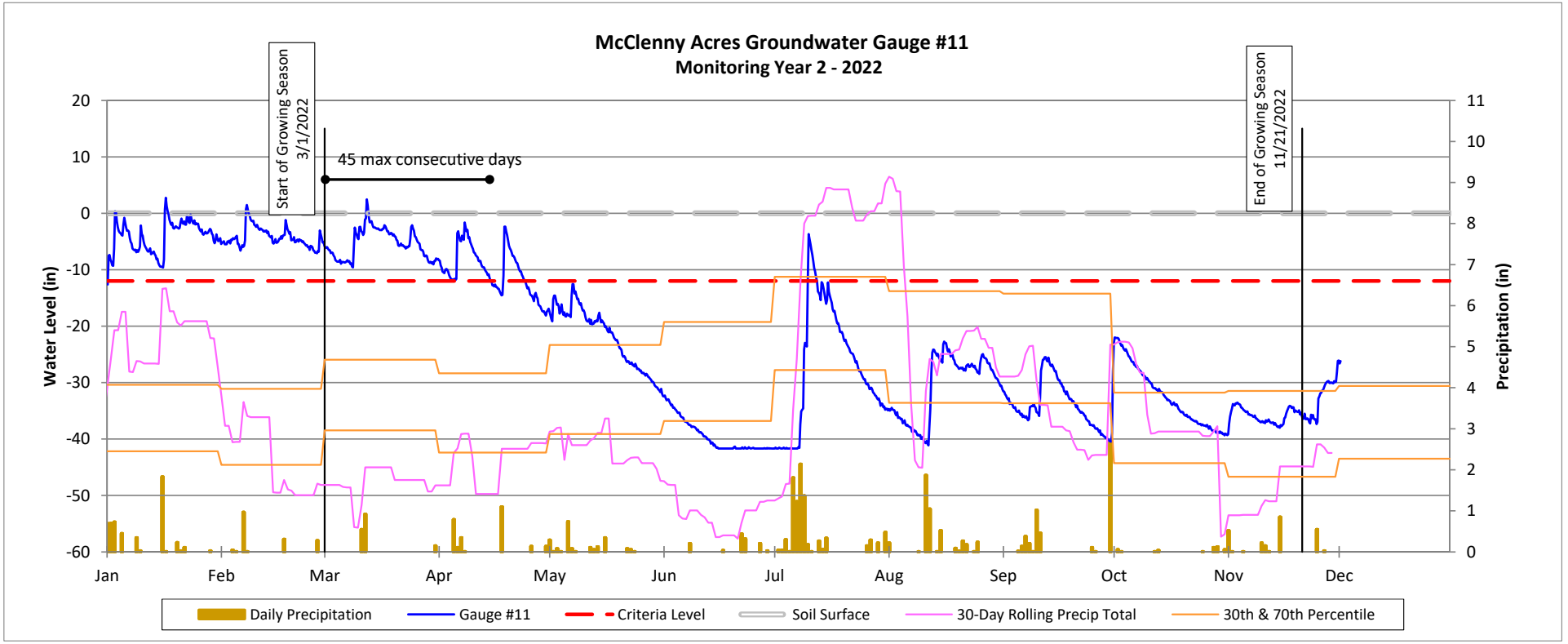


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

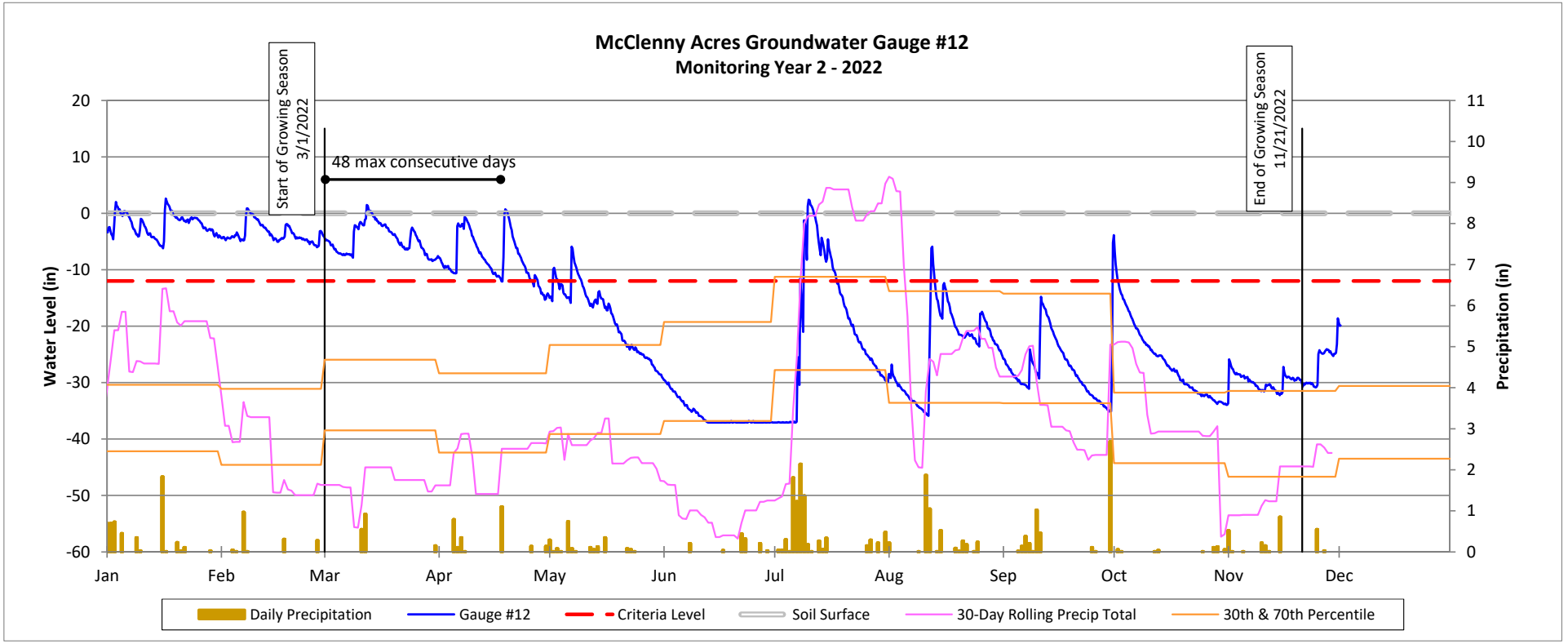


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

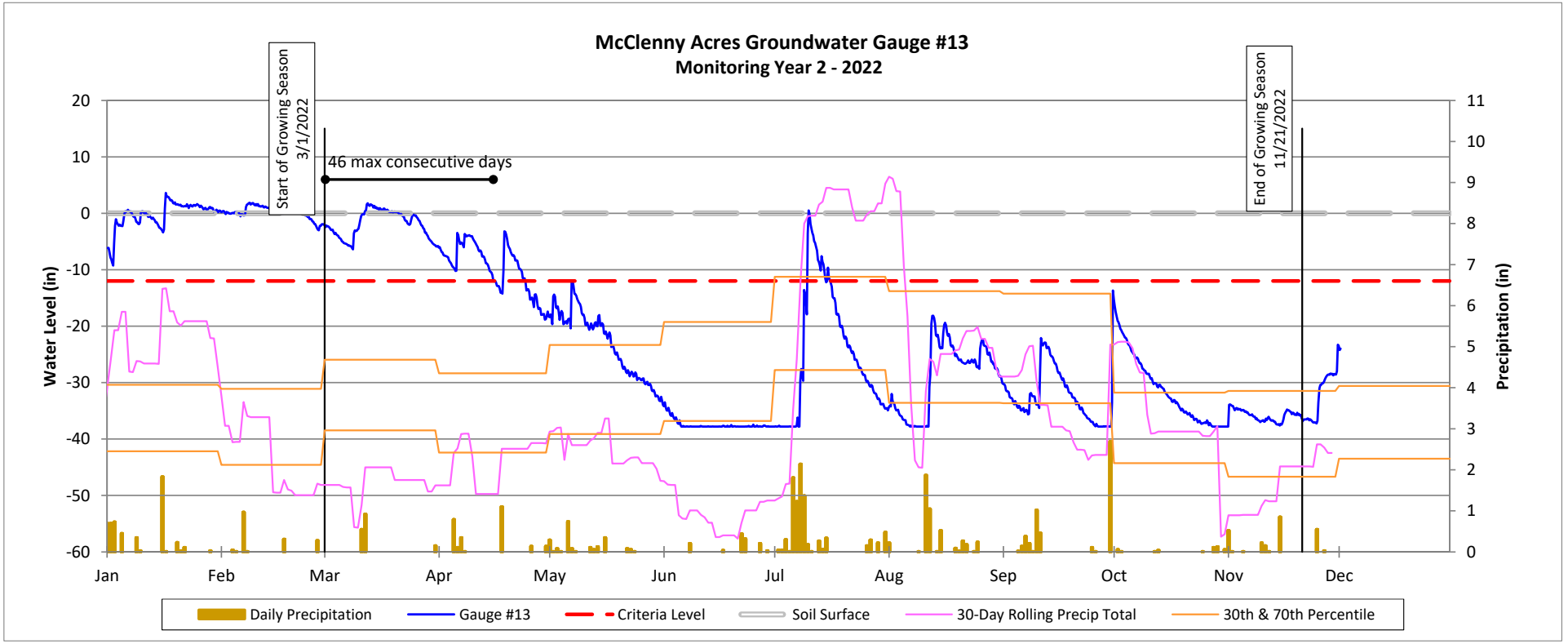


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

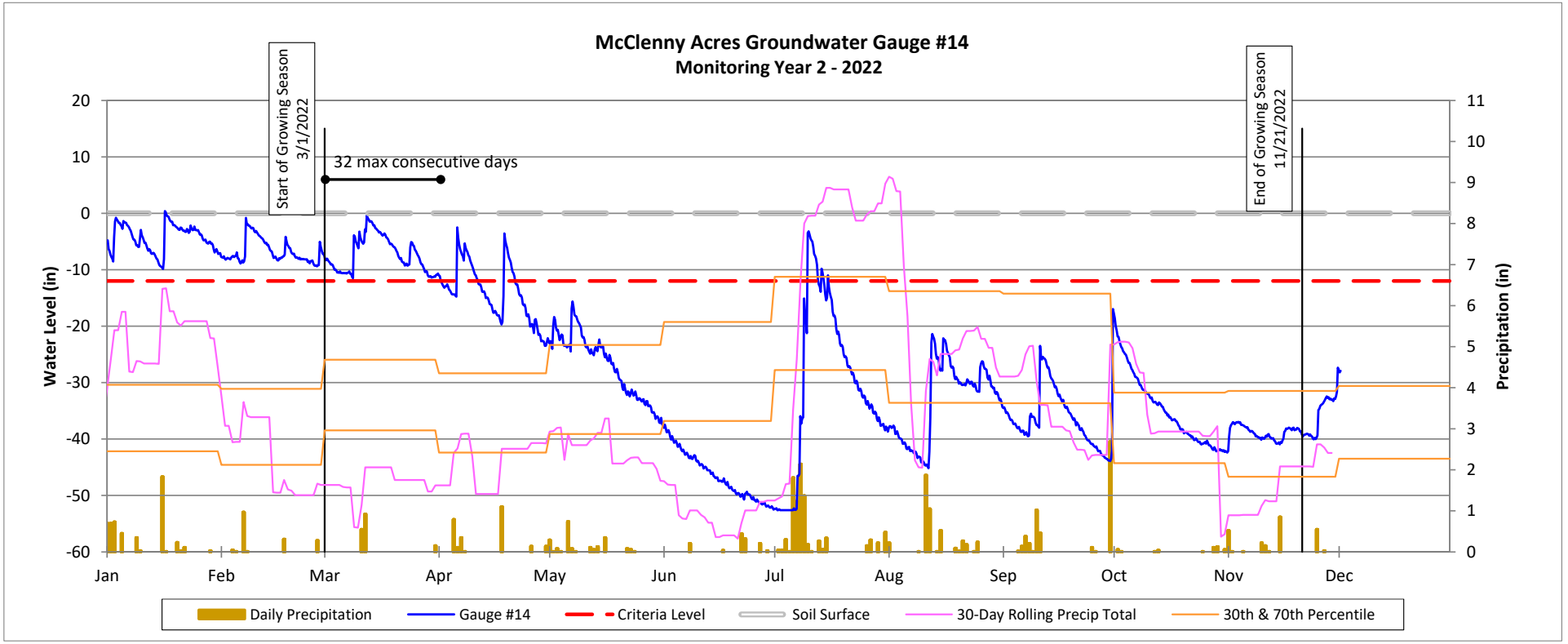


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

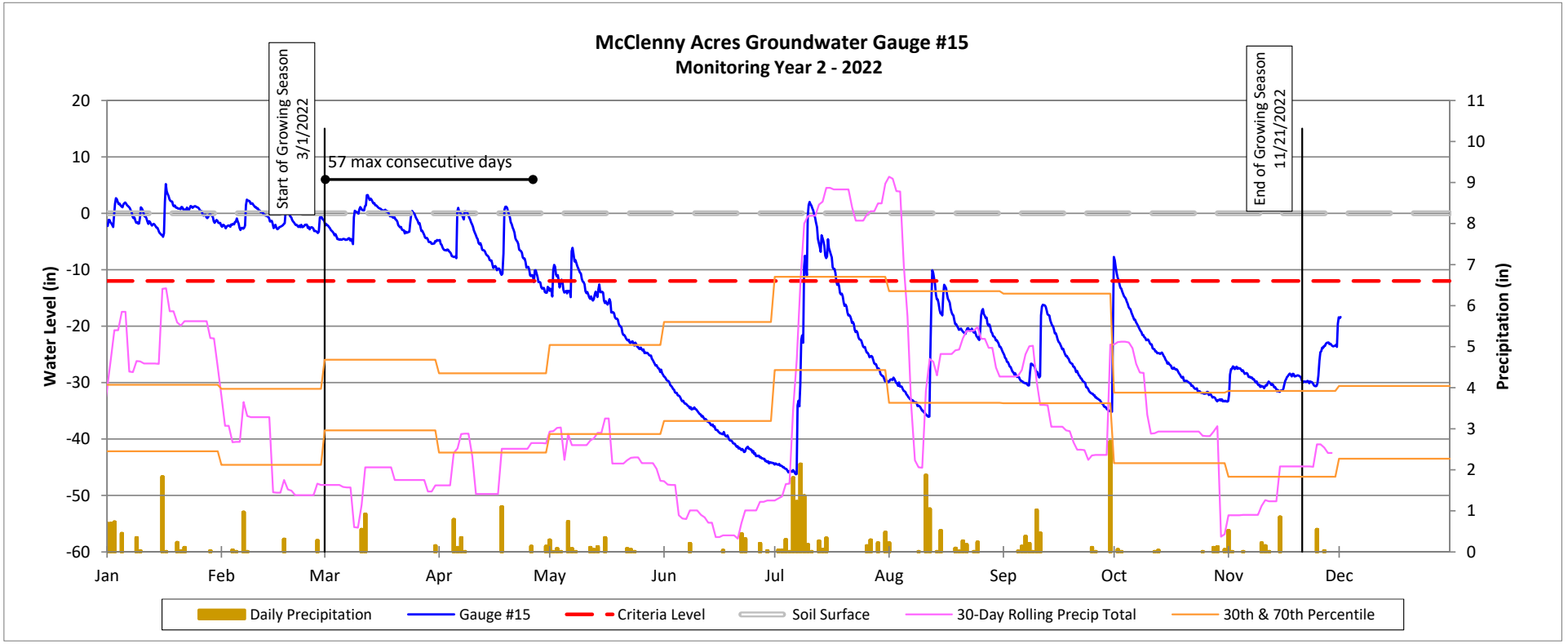


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

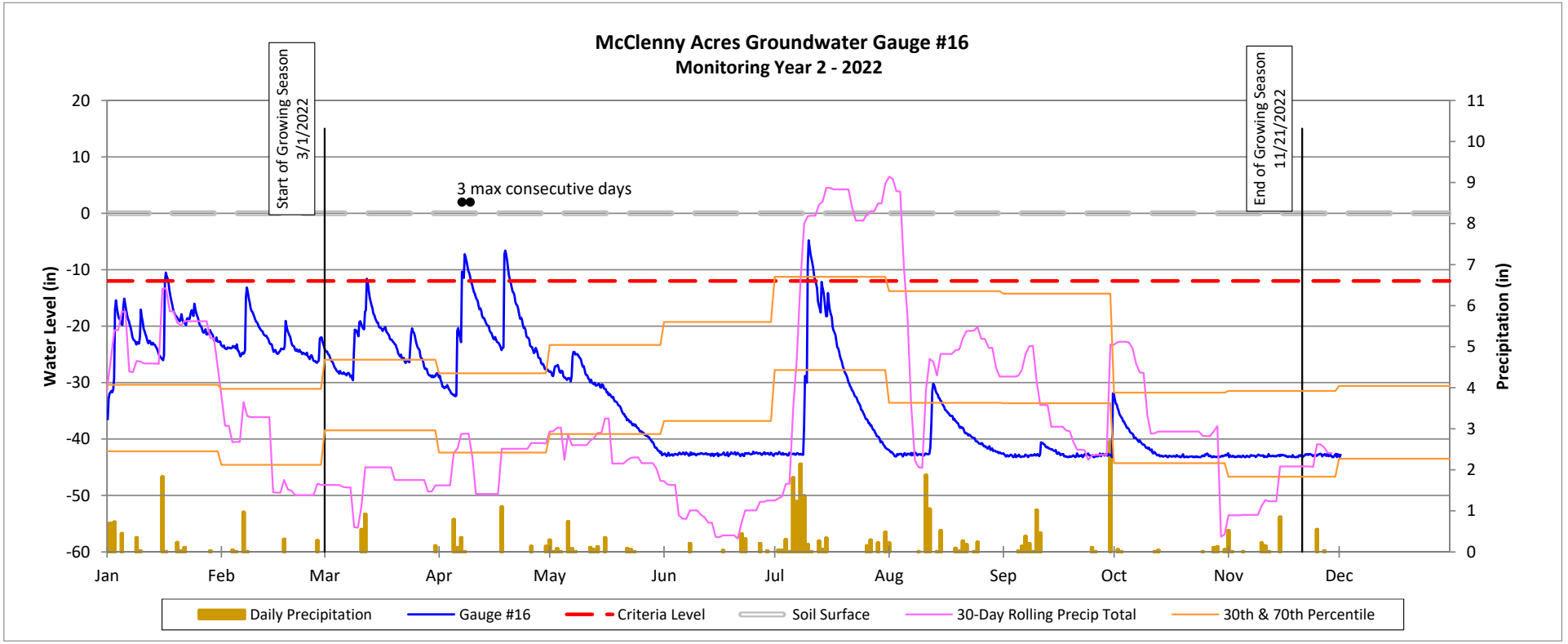


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

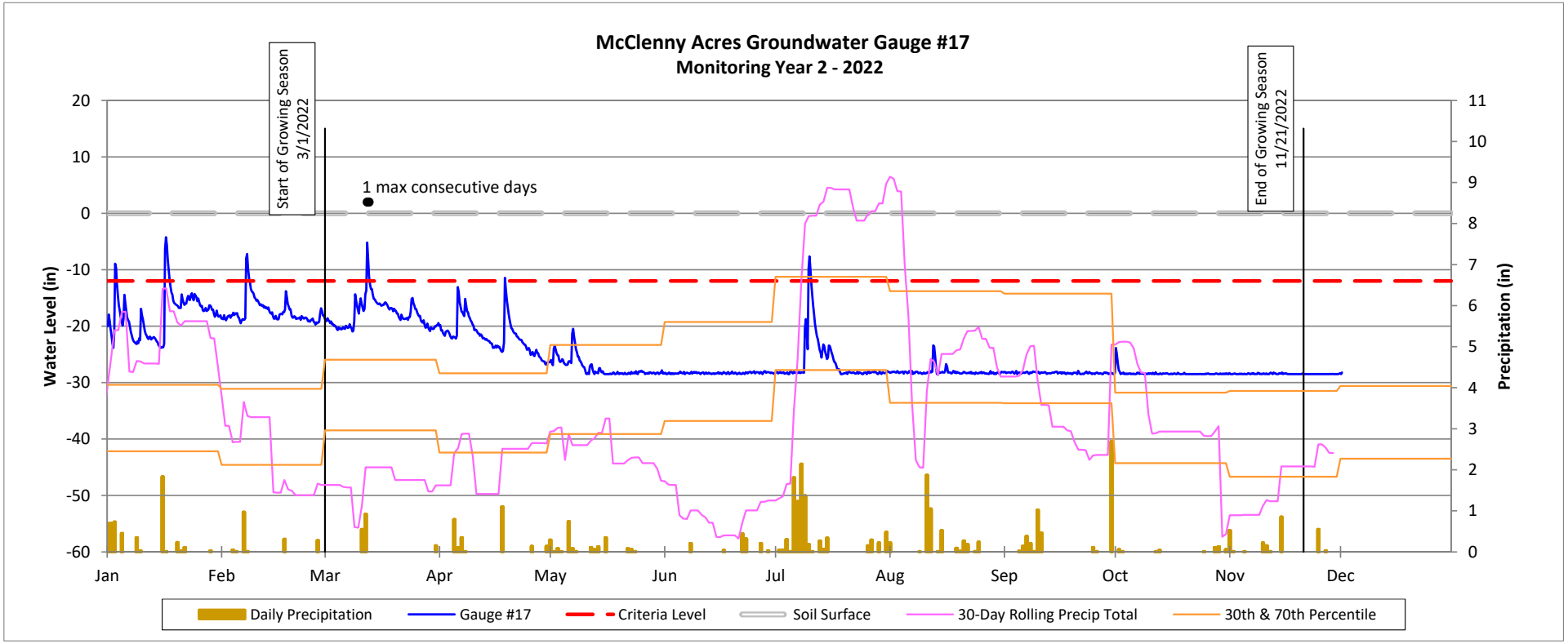


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

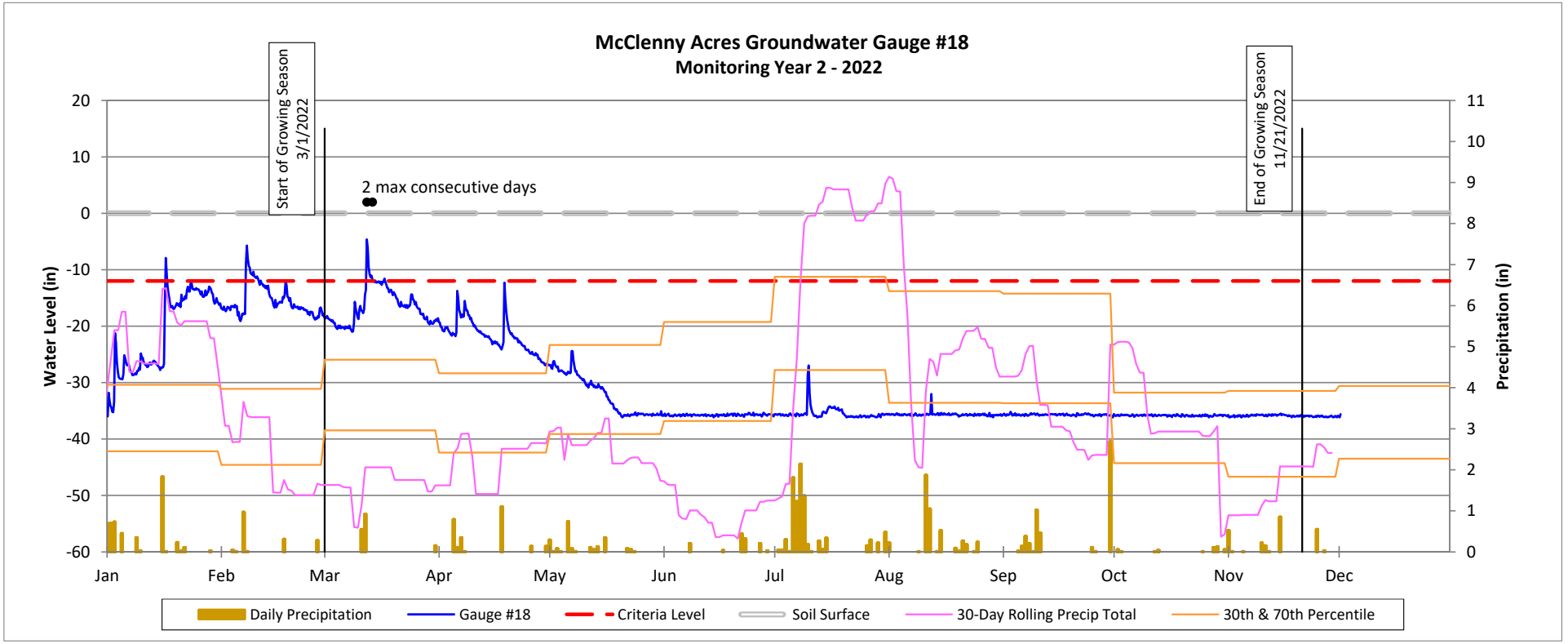


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

DMS Project No. 100038

Monitoring Year 2 - 2022

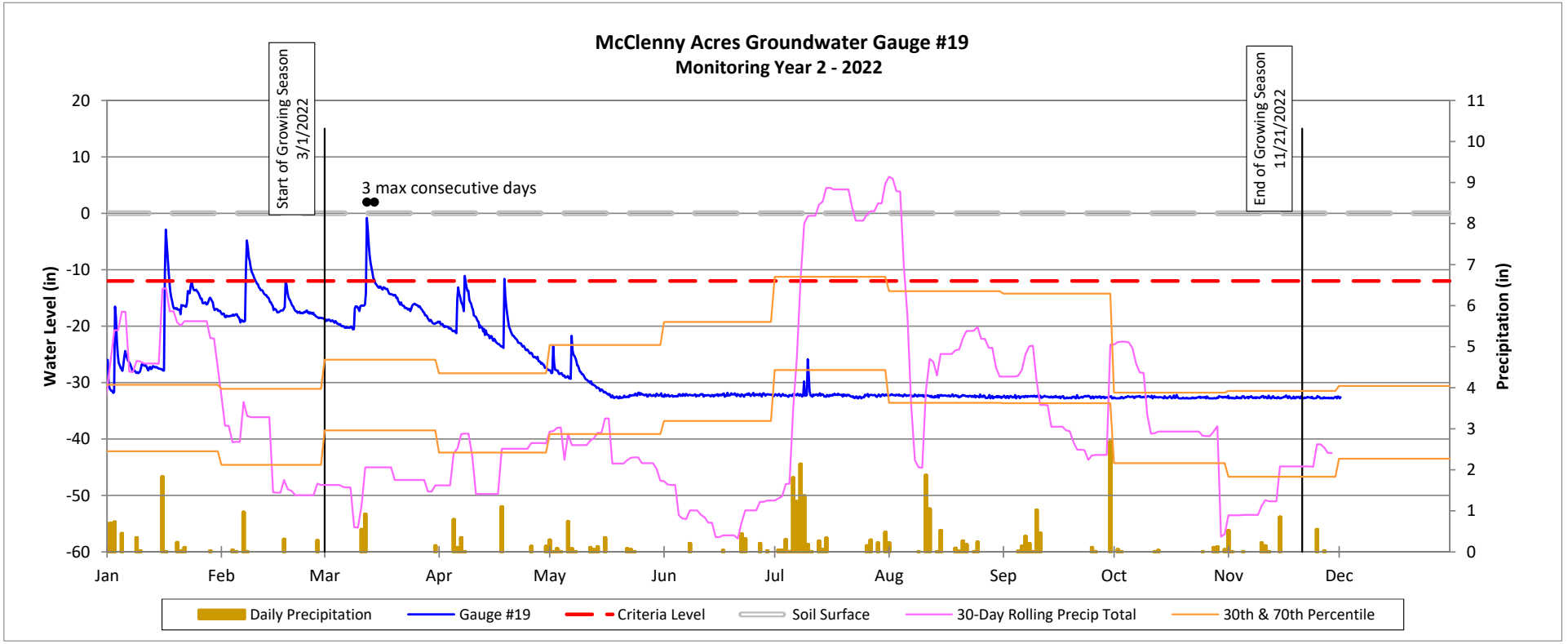


Groundwater Gauge Plot

McClenny Acres Mitigation SIte

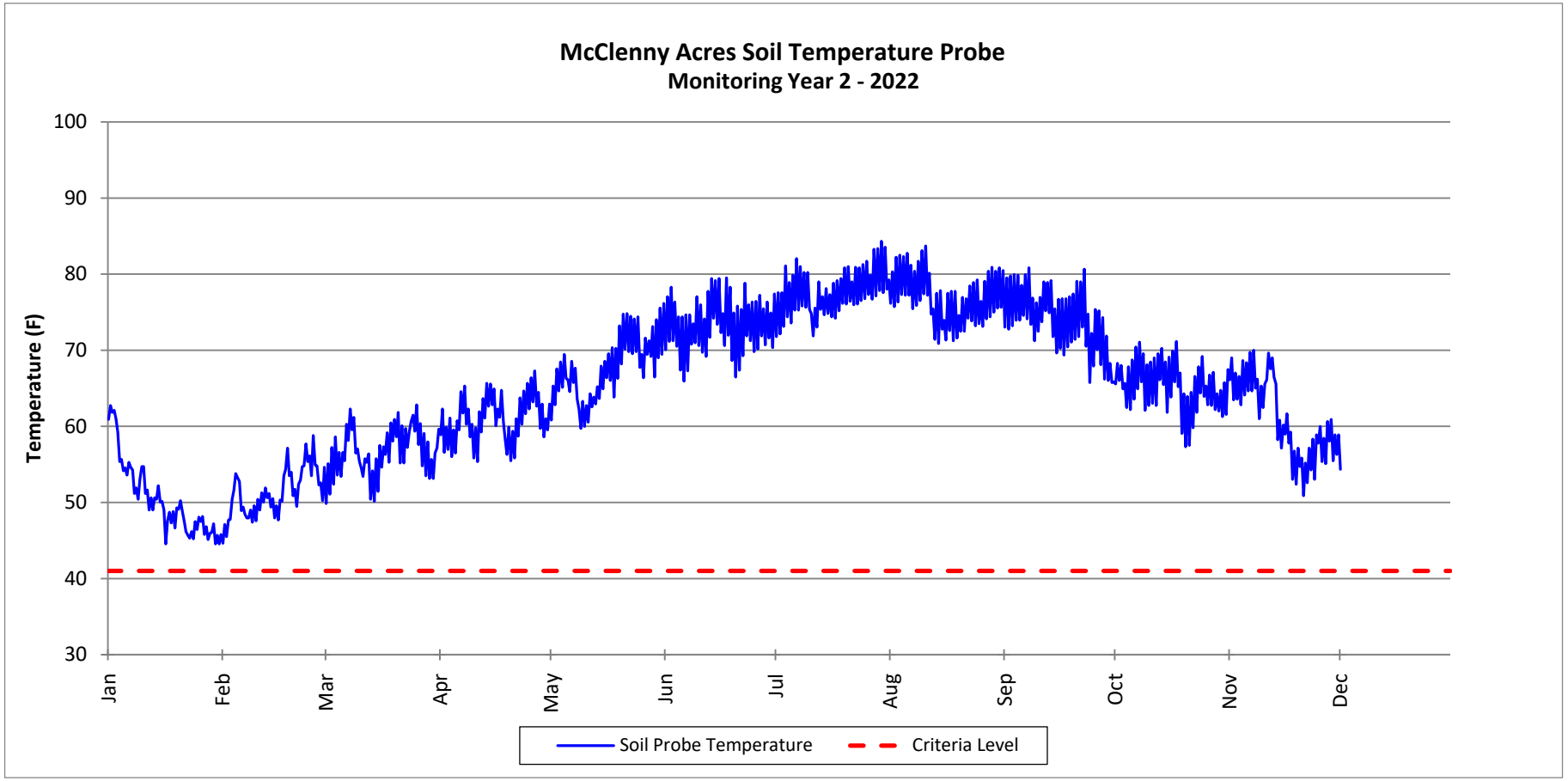
DMS Project No. 100038

Monitoring Year 2 - 2022



Soil Temperature Probe Plot

McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022



APPENDIX E. PROJECT TIMELINE AND CONTACT INFORMATION

Table 14. Project Activity and Reporting History
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Activity or Deliverable		Data Collection Complete	Task Completion or Deliverable Submission
Project Instituted		NA	Janurary 2018
Mitigation Plan Approved		February 2020	February 2020
Construction (Grading) Completed		NA	September 2020
Planting Completed		NA	March 2021
As-Built Survey Completed		September 2020	September 2020
Baseline Monitoring Document (Year 0)	Stream Survey	September 2020	May 2021
	Vegetation Survey	March 2021	
Year 1 Monitoring	Stream Survey	April 2021	December 2021
	Vegetation Survey	September 2021	
Loblolly Pine Removal			December 2021
Year 2 Monitoring	Stream Survey	March 2022	December 2022
	Vegetation Survey	September 2022	
	Chinese Privet Removal		
Year 3 Monitoring	Stream Survey	2023	December 2023
	Vegetation Survey	2023	
Year 4 Monitoring			December 2024
Year 5 Monitoring	Stream Survey	2025	December 2025
	Vegetation Survey	2025	
Year 6 Monitoring			December 2026
Year 7 Monitoring	Stream Survey	2027	December 2027
	Vegetation Survey	2027	

Table 15. Project Contact Table
McClenny Acres Mitigation Site
DMS Project No. 100038
Monitoring Year 2 - 2022

Designer Nicole Macaluso Millns, PE	**Wildlands Engineering, Inc.** 312 West Millbrook Road, Suite 225 Raleigh, NC 27609 919.851.9986
Construction Contractor	**Land Mechanic Designs, Inc.** 126 Circle G Lane Willow Spring, NC 27592
Monitoring Performers Monitoring, POC	**Wildlands Engineering, Inc.** Jason Lorch 919.851.9986