Jacksonville Country Club
Stream Restoration and Enhancement Project

SCO No. 070715501
DEQ Contract No. D08049S
DMS Project No. 194
Action ID# 2006-40325-067
Onslow County, North Carolina

Year 4 of 5 Monitoring Report
Data Collection: January through December 2017
Submission Date: March 9, 2018

Prepared for:

North Carolina Department of Environmental Quality
Division of Mitigation Services
2728 Capital Boulevard, Suite 1H-103 Raleigh, NC 27606

LMG
LAND MANAGEMENT GROUP INC.
Environmental Consultants

March 9, 2018

TO: Mr. Jeff Schaffer
North Carolina Division of Mitigation Services
1652 Mail Service Center
Raleigh, NC 27699-1652

RE: Jacksonville Country Club Stream Restoration & Enhancement Project
Year 4 of 5 Monitoring Report: Response to Comments
SCO No. 070715501
DEQ Contract No. D08049S
DMS Project No. 194

Dear Jeff:

Thank you for your letter regarding the Year 4 Monitoring Report for the Jacksonville Country Club Stream Restoration and Enhancement Project. Below is a response to each of your comments. Additionally, I have enclosed three hard copies of the report and one CD containing a pdf of the report and updated digital files.

1. *The digital data and drawings have been reviewed and determined to meet DMS requirements. However, during the review, DMS received a pop-up warning that the spatial reference information is missing for the Aggradation, Degradation, Mass Wasting, Scour, and Undercut layers.*

   The enclosed digital data has been spatially referenced.

2. *Appendix A, Table 1:*
   a. *I know this occurred a couple years back, but please explain why the assets changed from MY1 to MY2. Please include as a footnote under Table 1.*

   There were two separate as-built Autocad files for this project; one dated 2009 from Barrow and Barrow and one dated 2010 from Stantec. LMG had originally used the data from Barrow and Barrow to calculate linear footage of restoration (total of 3,145 LF). It was later determined by DMS that the 2010 data from Stantec was more accurate (3,109 LF). A footnote has been added to the table.

b. *In the Mitigation Credits Section at the top of the table, RE credits are normally for preservation only credits.*
c. *The number LMG has in the Stream RE cell is the linear footage for the Enhancement reach E. This should be 188 credits.*
d. *Since there are no preservation only credits, the stream credits should be totaled and shown in the Stream R cell. DMS calculates total credits to be 3,297.*

These changes have been made to Table 1.

3. *Appendix A, Figure 2, CCPV:*
   a. *Please label Reach E.*

      This label has been added to the CCPV.

   b. *Please differentiate between bank scour and bed scour problem areas.*

      All of the scour problem areas are bank scours. The label has been changed to 'Bank Scour'.

   c. *Please note areas of easement encroachment.*

      LMG staff has observed vegetation maintenance in several locations within the project area. Most of the maintenance occurred around the playover areas and consisted of cutting the tops of the trees so that greens are visible to the golfers (total of approximately 3.2 acres). Trees were generally cut to approximately 5' in height, although it varied based on the topography of the area. Some mowing, where vegetation was cleared to the ground, also occurred in two areas near Vegetation Plots #6 & #8 (total of approximately 0.26 acre). These areas are now shown on Figure 2. At this time, we are only considering the mowed areas to be an encroachment. This information has also been added to the report.

4. *Appendix B, Tables 5a-e: Please explain how LMG determined the percentages of stable, performing as intended stream for each reach. These do not appear to be representative of the number of problem areas shown of the CCPV or what DMS staff saw during our February 8, 2018 site visit.*

   For each problem area encountered, an approximate length was visually estimated. This length was totaled by reach and problem area and added to the Tables 5a-e. The percentage of stable, performing as intended stream reach was then automatically calculated per the excel table provided by DMS. Please let us know if a site visit is needed to review these problem areas and confirm the lengths.

5. *Appendix D: Please add cross-section graphs showing historical data with MY4 for comparison in the hardcopy of the report. Make sure that bankfull is shown on each graph, and label each graph as whether it is a riffle or a pool cross section on both the electronic and hardcopy versions.*

The cross section graphs have been revised to include the bankfull width and the riffle/pool labels. These graphs are now included in the hard copies of the report.

6. *Appendix D, Table 14a: Please update the calculations to reflect changes observed in the overlays and explain in detail as footnote with the tables that describes the method by which LMG is calculating Bank Height Ratio and Entrenchment Ratio. In addition, please provide context to any observed changes in these calculated ratios in the report narrative.*

   Tables 14a – 14d have been revised to hold the baseline bankfull datum constant. LMG calculates the Bank Height Ratio to be Low Bank Height (LBH) / Maximum Depth of Bankfull Channel (dmbkf). This calculation has been added as a footnote to the tables. The Bank Height Ratio of the stream cross sections has remained fairly constant over the monitoring period. However, LMG staff has observed channel deepening from increased sheer on the bed elevation. Additionally, the accuracy of the survey equipment may be reaching its limits for these small stream measurements.

Please let me know if you have any other questions about the report or would like to meet on site.

Sincerely,

Kim Williams
Wetland Scientist

Encl.

Jacksonville Country Club
Stream Restoration and Enhancement Project

SCO No. 070715501
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DMS Project No. 194
Action ID# 2006-40325-067
Onslow County, North Carolina

Year 4 of 5 Monitoring Report
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Prepared by:

Land Management Group, Inc.
3805 Wrightsville Avenue; Suite 15
Wilmington, NC 28403
(910) 452-0001

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3.0 EXECUTIVE SUMMARY/PROJECT ABSTRACT

3.1 Goals and Objectives

The overall goal of the Jacksonville Country Club project is to facilitate the development of a natural system which will exhibit desired functions appropriate to the geomorphic setting of the site (EEP, 2006). Specific goals include: 1) water quality improvement; and 2) natural community improvement. To achieve these specific goals, the following objectives have been pursued:

- Form and/or reform stream dimension, pattern, and profile for a stable system
- Generate aquatic and terrestrial habitat elements
- Implement pollutant removal features

3.2 Project Success Criteria

The final vegetative success criterion is the survival of 320 planted woody stems per acre at the end of the Year 3 monitoring period and 260 planted woody stems per acre at the end of the Year 5 monitoring period, which is based on the US Army Corps of Engineers Stream Mitigation Guidelines (COE 2003). In order for the stream mitigation to be successful, the overall cross section geometry of the reaches should remain consistent without significant sediment aggradation or degradation. The hydrologic success criterion will be the documentation of two bankfull flow events over the five year monitoring period. The bankfull events must occur during separate monitoring years (USACE, 2003). Observations of wrack and deposition may serve to augment gauge observations when necessary.

3.3 Site Location and History

The Jacksonville Country Club Stream Restoration and Enhancement Site is located northwest of the intersection of Country Club Road and Country Club Drive in Jacksonville, Onslow County, North Carolina within the White Oak River Basin #03030001 Cataloging Unit (Figure 1). It is located within an active country club and a golf course traverses either side of the stream channel project area. The stream network within the project area consists of a main channel with four tributaries (Figure 2). Prior to mitigation, the channels were characterized by sparse woody vegetation and by steep eroding banks.

3.4 Project Components

The project includes 3,109 linear feet (LF) of stream restoration and 376 LF of stream enhancement. Reach 1A is the main channel through the project area and begins at the upstream end of the channel restoration. The reach crosses through the golf course as a priority 1 restoration. Reach 2A is priority 1 in most sections and priority 2 when necessary to tie into the existing channel. Reach B is priority 1 restoration. Reach C is approximately half priority 1 restoration and half priority 2 restoration. Refer to Table 1 and Figure 2 in Appendix A for a table and detailed plan view of the project components.

3.5 Project Design/Approach

To accomplish the above-stated goals, the dimension, pattern and profile of the channel was restored and enhanced. Where possible, fifty-foot vegetative buffers have been added to each side of the channel. The provision of a wider floodplain, the retrofitting of an existing stormwater wetland and the addition of stormwater BMPs (best management practice) helps to maintain the integrity of the designed project. In addition, the project replaces habitat to a system relatively void in plant community diversity. Refer to Tables 2-4 in Appendix A for additional project and contact details.

3.6 Project Performance

Vegetation monitoring is conducted on an annual basis using nine (9) permanent vegetation plots (Figure 2). Monitoring Year 4 (MY4 2017) observed a mean stem density of 422 planted stems per acre in the plots, which is higher than what was observed last year (404 planted stems) and well above the Year 5 vegetative success criterion of 260 planted woody stems per acre. When volunteer stems were included, the site had an overall mean stem density of 3,534 stems per acre. As in previous years, Plots #2, #6, and #8 did not meet the vegetation success criterion in MY4 2017. During the vegetation monitoring, herbaceous vegetation had volunteered into these areas.

Stream monitoring in MY4 (2017) consisted of both visual and morphological (i.e. survey) assessment of the channels. A visual inspection of the restored and enhanced stream channels and the BMP areas was conducted in November of 2017. Please see Appendix B for stream morphology assessment tables and photos. The BMP areas were stable. However, the BMP along the north side of 2A is actively managed because of the playover and trees are kept to a minimum height.

As observed in the baseline and annual monitoring evaluations, many problem areas were identified along the four restored stream reaches (1A, 2A, B & C) and the enhancement reach during the visual inspection. Appendix B contains photographs of the problem areas and Figure 2 depicts the GPS location of specific points noted below.

Reach 1A

A total of 28 problem areas were noted within Reach 1A. These included four undercuts, 10 areas of degradation, 11 scour holes, one area of mass wasting, and two areas of aggradation. This was fairly consistent with what was observed in MY3. As in previous years, an area of aggradation is causing a new channel to form at the very top of the reach.

Reach 2A

Twenty-five problem areas were noted within this reach during the visual inspection (compared to 24 areas in MY3). These included 3 bank undercuts, 5 areas of degradation, 12 scour holes, and 5 areas of mass wasting. Grade control structures were observed. Most appeared to be functioning properly, but areas of scour were noted downstream at several locations.

Reach B

As observed during the previous monitoring events, some water was bypassing the constructed channel and forming another, more direct route to the main channel (Pt 51). This was again classified as aggradation. Additionally, three areas of bank undercut, one scour hole, and two areas of mass wasting were noted within this reach. As in previous years, most of the grade controls features were not observed and it was assumed that they have been buried by sediment. However, the stream appeared to be functioning properly in these areas.

Reach C

As observed in previous years, gravel from the road at the top of this reach washed down into the stream channel. This was classified as aggradation. Several grade control features were not observed and it was assumed that they have been buried by sediment. However, the stream appeared to be functioning properly in these areas.

Enhancement Reach

The enhancement reach is a small channel and it contains a great deal of vegetative debris. As observed in MY3, three areas of aggradation and two scour holes were noted within this channel.

A longitudinal profile and cross sectional survey (nine cross sections) was performed by Paramounte Engineering in November of 2017. Please see Appendix D for summary tables and plots of longitudinal profiles and cross sections for each reach. Based on the MY4 survey data, reaches remain fairly consistent with MY3, MY2, MY1 and baseline data. While many problem areas were noted along the reaches during the visual inspection, there was no significant channel aggradation or degradation.

The on-site occurrence of bankfull events is documented using two stream gauges (Figure 2). Both stream gauges documented many occurrences of overbank flooding in 2017 (Table 16; Appendix E).

LMG staff observed vegetation maintenance in several locations within the project area. Most of the maintenance occurred around the playover areas and consisted of cutting the tops of the trees so that greens are visible to the golfers (total of approximately 3.2 acres). Trees were generally cut to approximately 5' in height, although it varied based on the topography of the area. Some mowing, where vegetation was cleared to the ground, also occurred in two areas near Vegetation Plots #6 & #8 (total of approximately 0.26 acre) (see Figure 2). The mowed areas are considered an encroachment.

It should also be noted that several survey markers were missing or were unstable. At Plot 5, the origin plot marker was missing. Three plot markers were missing at Plot 6. At Plot 7, two markers were missing. One of these was the northeast plot marker, which likely eroded into the channel (mass wasting area). Additionally, the northern pin at Cross Section 2 was missing and may have been mowed/removed.

4.0 METHODOLOGY

Nine (9) permanent vegetation plots are used for vegetation monitoring. All vegetation monitoring was completed in September 2016 utilizing the Carolina Vegetation Survey (CVS) – EEP protocol Level 2 (version 4.2)

Stream morphological monitoring will occur annually. Elevation data will be collected at nine permanent cross section stations located along each channel. Width/depth ratio, entrenchment ratio, and low bank height ratio is measured and compared with the constructed stream geomorphology (the as-builts) for dimension and profile. Longitudinal profile data will be collected and analyzed to identify bankfull slope, pool-to-pool spacing, pool length, riffle length, max-pool depth and other parameters. Plan views will be evaluated for sinuosity, meander width ratio, radius of curvature and compared with the post construction as-builts.

The on-site occurrence of bankfull events is monitored with two stream gauges (Figure 2). Gauges were downloaded monthly utilizing Remote Data Systems data loggers and software.

Photo monitoring is conducted by walking the entire site. A digital camera is used to take photos at each predetermined photo point location.

Summary information/data related to the occurrence of items such as beaver or encroachment and statistics related to performance of various project and monitoring elements can be found in the tables and figures in the report appendices. Narrative background and supporting information formerly found in these reports can be found in the mitigation and restoration plan documents available on DMS's website. All raw data supporting the tables and figures in the appendices are available from DMS upon request.

5.0 REFERENCES

NCDMS. 2017. Jacksonville Country Club Stream Restoration and Enhancement Project Year Three Monitoring Report. North Carolina Department of Environmental Quality, Division of Mitigation Services. Raleigh, NC. February, 2017.

NCDMS. 2016. Jacksonville Country Club Stream Restoration and Enhancement Project Year Two Monitoring Report. North Carolina Department of Environmental Quality, Division of Mitigation Services. Raleigh, NC. April, 2016.

NCEEP. 2015. Jacksonville Country Club Stream Restoration and Enhancement Project Year One Monitoring Report. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. March, 2015.

NCEEP. 2014. Jacksonville Country Club Stream Restoration and Enhancement Project Baseline Monitoring Report. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. June, 2014.

NCEEP. 2014. Annual Monitoring and Closeout Reporting Format, Data Requirements, and Content Guidance. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. February, 2014.

NCEEP. 2008. CVS-EEP Vegetation Sampling Protocol. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 4.2, 2008.

NCEEP. 2007. Jacksonville Country Club Stream Restoration, Restoration Plan Addendum. Prepared by Stantec for the North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. June 11, 2007.

NCEEP. 2006. Jacksonville Country Club Stream Restoration Project. Draft Restoration Plan Report. Prepared by BLWI for the North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. April 24, 2006.

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

US Army Corps of Engineers. 2005. U.S. Army Corps of Engineers. Information Regarding Stream Restoration in the Outer Coastal Plain of NC, Wilmington Regulatory Field Office.

US Army Corps of Engineers. 2003. U.S. Army Corps of Engineers. Stream Mitigation Guidelines.

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US Army Corps of Engineers. 1987. U.S. Army Corps of Engineers. Tech Report Y-87-1, 1987 Wetland Delineation Manual, Washington, DC. AD/A176.

6.0 PROJECT CONDITION AND MONITORING DATA APPENDICES

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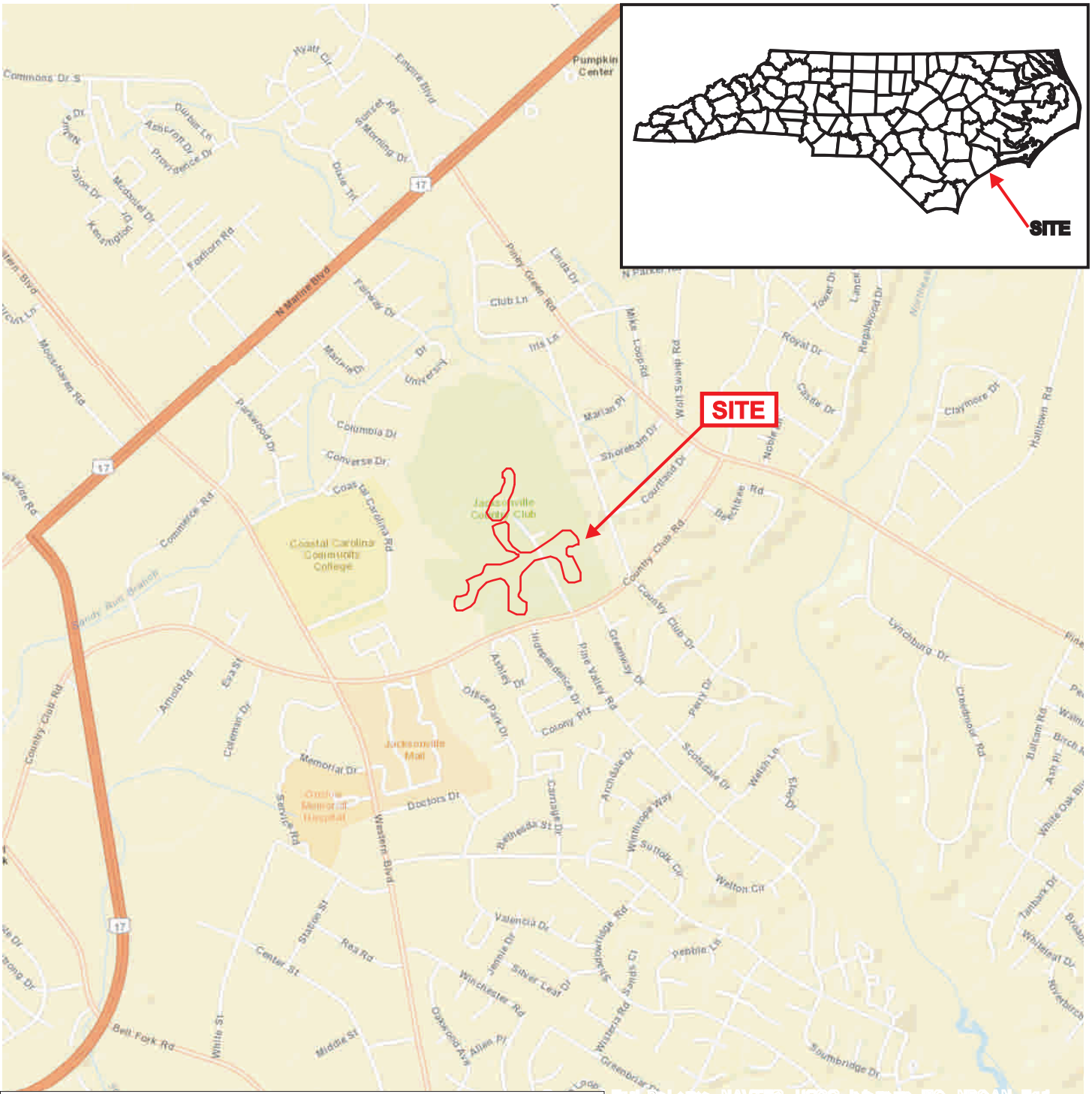
Appendix A.
Project Background Data and Maps



Directions to Site: Directions to Site: From Wilmington, take US 17 North toward Jacksonville. Turn right on Western Blvd. Turn left on Country Club Drive. Turn left on Pine Valley Rd. This will take you into the Jacksonville Country Club. Project site is located within the country club.

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

*Boundaries are approximate and are not meant to be absolute.

Map Source: ArcGIS World Street Map

N

SCALE 1" = 2,000'

Jacksonville Country Club
Stream Restoration & Enhancement Project
Onslow County, NC

LMG Project No. 40-08-189
DMS Project No. 194

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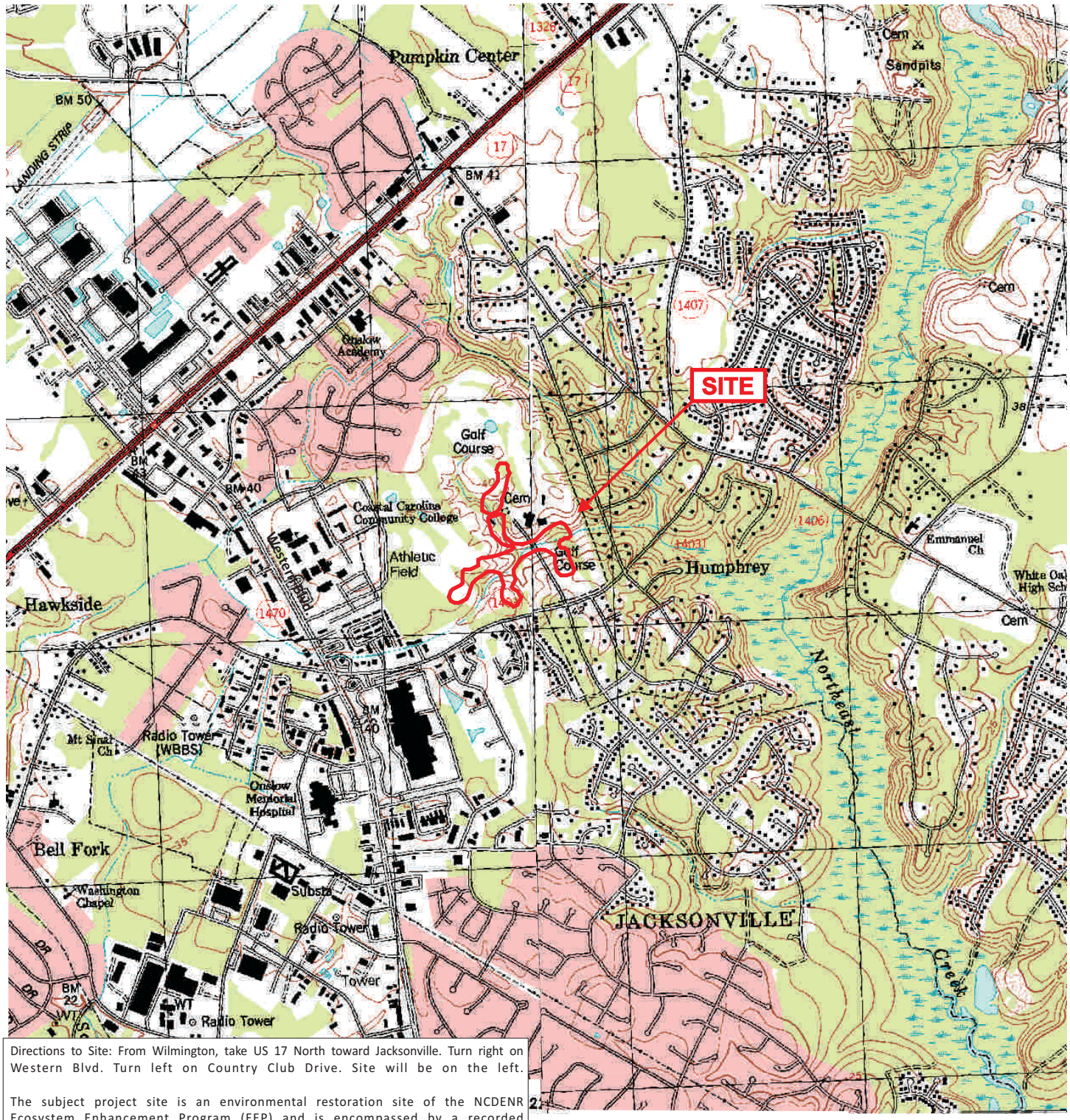
Figure 1a
Site Vicinity Map



Directions to Site: From Wilmington, take US 17 North toward Jacksonville. Turn right on Western Blvd. Turn left on Country Club Drive. Site will be on the left.

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

*Boundaries are approximate and are not meant to be absolute.

Map Source: USGS Kellum/Jacksonville NorthQuadrangle 7.5 minute

SCALE 1" = 2,000'

Jacksonville Country Club
Stream Restoration & Enhancement Project
Onslow County, NC

LMG Project No. 40-08-189
DMS Project No. 194

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Figure 1b
Topographic Map

Table 1. Project Components and Mitigation Credits

Jacksonville Country Club Stream Restoration & Enhancement Project, DMS No. 194

Mitigation Credits

	Stream		Riparian Wetland		Non-Riparian Wetland		Buffer	Nitrogen Nutrient Offset	Phosphorus Nutrient Offset
Type	R	RE	R	RE	R	RE			
Totals	3,297								

Project Components

Project Component	Stationing/ Location	Existing Footage/ Acreage	Priority Approach	Restoration or Restoration Equivalent	Restoration Footage or Acreage	Mitigation Ratio
Stream Restoration	1A	1,388	P1	Restoration	1307 LF	1:1
Stream Restoration	2A	772	P1 and P2	Restoration	711 LF	1:1
Stream Restoration	B	403	P1 and P2	Restoration	478 LF	1:1
Stream Restoration	C	556	P1	Restoration	613 LF	1:1
Stream Enhancement	E	376	Enhancement	Enhancement (RE)	376	2:1

Component Summation

Restoration Level	Stream (lf)	Riparian Wetland (ac)	Non-Riparian Wetland (ac)	Buffer (sq ft)	Upland (ac)
Restoration	3109*				
Enhancement					
Enhancement I					
Enhancement II	376				
Creation					
Preservation					
HQ Preservation					

BMP Elements*

Element	Location	Purpose/Function	Notes
BR	North Side of Reach 2A	Collect and treat runoff before entering stream system	See Figure 2
SW	North Side of Reach 2A	Collect and treat runoff before entering stream system	See Figure 2
SW	South Side of Reach 2A	Collect and treat runoff before entering stream system	See Figure 2
SW	Near Fairway #11	Collect and treat runoff before entering stream system	See Figure 2
SW	Upper end of Reach C	Collect and treat runoff before entering stream system	See Figure 2

* MY0 and MY1 reports incorrectly documented 3,145 LF of stream restoration, which was taken from a 2009 survey.
It was later determined that data from a 2010 survey that documented 3,109 LF of stream restoration was more accurate.

Table 2. Project Activity and Reporting History Jacksonville Country Club Stream Restoration and Enhancement Project -DMS Project No. 194		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan	NA	Jun-07
Final Design – Construction Plans	NA	
Construction	NA	Aug-10
Temporary S&E mix applied to entire project area	NA	Aug-10
Containerized and B&B plantings	NA	Apr-10 & Apr-11
Temporary repairs to site	NA	Jan-11
Permanent repairs to stream & culvert/headwall	NA	Jun-13
Invasives Treatment (Chinese tallow tree)	NA	2013
Invasives Treatment (Chinese tallow tree)	NA	2014
Invasives Treatment (Chinese tallow tree)	NA	2015
Baseline Monitoring Document (Year 0 Monitoring - baseline)	November-13	June-14
Year 1 Monitoring	December-14	March-15
Year 2 Monitoring	December-15	April-16
Year 3 Monitoring	December-16	December-16
Year 4 Monitoring	December-17	December-17
Year 5 Monitoring		

Table 3. Project Contacts Table Jacksonville Country Club Stream Restoration & Enhancement Project	
DMS Project No. 194	
Designer Primary project design POC	BLWI; 295 Becky Branch Rd; Southern Pines, NC Stantec; 801 Jones Franklin Rd #300; Raleigh, NC (919) 851-6866
Construction Contractor Construction contractor POC	Charles Hughes Construction; 4675 Ben Dail Rd, La Grange, NC (252) 566-5040
Live Staking & Seeding Contractor Seeding Contractor POC	Charles Hughes Construction; 4675 Ben Dail Rd, La Grange, NC (252) 566-5040
Planting Contractor Planting Contractor POC	Backwater Environmental; 119 Ilex Ct, Pittsboro, NC (919) 523-4375
Seed Mix Sources	Unknown
Nursery Stock Suppliers	Unknown
Construction Contractor (Repairs) Construction contractor POC	NorthState Environmental; 2889 Lowery Street, Winston-Salem, NC (336) 725-2010
Baseline Monitoring Performers (MY0) Stream Monitoring POC Vegetation Monitoring POC Wetland Monitoring POC	Land Management Group, Inc. 3805 Wrightsville Avenue, Suite 15; Wilmington, NC 28403 Kim Williams (910) 452-0001 Kim Williams (910) 452-0001 N/A
Monitoring Performers (MY1 - MY5) Stream Monitoring POC Vegetation Monitoring POC	Land Management Group, Inc. 3805 Wrightsville Avenue, Suite 15; Wilmington, NC 28403 Kim Williams (910) 452-0001 Kim Williams (910) 452-0001

Table 4. Project Baseline Information and Attributes
Jacksonville Country Club Stream Restoration & Enhancement Project
DMS Project No. 194

Project Information				
Project Name	Jacksonville Country Club Stream Restoration & Enhancement Project			
Project County	Onslow			
Project Area	9.34 acres			
Project Coordinates (Lat and Long)	34° 46', -77° 22'			
Project Watershed Summary Information				
Physiographic Region	Coastal Plain			
River Basin	White Oak			
USGS HUC 8 Digit 03030001	USGS HUC 14 Digit 03030001020010			
NCDWQ Subbasin	03-05-02			
Project Drainage Area	253 ac			
Project Drainage impervious cover estimate (%)	< 5%			
CGIA Land Use Classification				
Reach Summary Information				
Parameters	**Reach 1A**	**Reach 2A**	**Reach B**	**Reach C**
Length of Reach	1429 LF	743 LF	512 LF	558 LF
Valley Classification	unknown	unknown	unknown	unknown
Drainage Area	99 ac	253 ac	55 ac	79 ac
NCDWQ Stream Identification Score	N/A	N/A	N/A	N/A
NCDWQ Water Quality Classification	SC NSW	SC NSW	SC NSW	SC NSW
Morphological Description (stream type)	C5/E5	C5/E5	C5/E5	C5/E5
Evolutionary Trend	N/A	N/A	N/A	N/A
Underlying Mapped Soils	Craven	Craven	Craven	Craven
Drainage Class	Moderately Well Drained	Moderately Well Drained	Moderately Well Drained	Moderately Well Drained
Soil Hydric Status	Hydric B	Hydric B	Hydric B	Hydric B
Slope	0-1%	0-1%	0-1%	0-1%
FEMA Classification	Zone X	Zone X	Zone X	Zone X
Native Vegetation Community	N/A	N/A	N/A	N/A
Percent Composition Exotic Invasive Vegetation	< 1%	< 1%	< 1%	< 1%
Regulatory Considerations				
Regulation		**Applicable?**	**Resolved?**	**Supporting Documentation**
Waters of the US – Section 404		Yes	Yes	Upon Request
Waters of the US – Section 401		Yes	Yes	Upon Request
Endangered Species Act		Yes	Yes	Upon Request
Historic Preservation Act		Yes	Yes	Upon Request
Coastal Zone Management Act (CZMA) Coastal Area Management Act (CAMA)		Yes	Yes	Upon Request
FEMA Floodplain Compliance		Yes	Yes	Upon Request
Essential Fisheries Habitat		No	N/A	N/A

Appendix B.
Visual Assessment Data

FIGURE 2.

Current Conditions Plan View

Jacksonville Country Club
Stream Restoration
and Enhancement Site

Project No: D08049S
DMS No. 194
Onslow County, NC

LEGEND

- Stream Restoration (3109 LF)
  (taken from 2010 as-built survey)
- Stream Enhancement (376 LF)
  (approximated on map)
- Easement Boundary
- Property Boundary
- Stream Cross Section (9)
- Vegetation Monitoring Plot (9)
- Plot that did not meet success criterion
- Stream Gauge (2)
- Rain Gauge (1)
- BMP (approximated on map)

Bed/Bank Problem Areas

- Undercut
- Degradation
- Bank Scour
- Mass Wasting
- Aggradation
- New Channel Formation
- Encroachment (Mowing): 0.26 acre
- Tree Topping: 3.2 acres

N

SCALE 1" = 200'

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March 2018

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Accompanying guidance document on EEP website provides a companion table to the data table below, which provides more detailed definitions, criteria, and thresholds. Cells for data entry below are accessible, all others are protected (without a password).
If access is needed for any reason go to the 'Tools' menu and choose 'Protection' and then choose 'Unprotect Sheet'

Table 5a **Visual Stream Morphology Stability Assessment**
Reach ID **Reach 1A**
Assessed Length **1307**

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. Bed	1. **Vertical Stability**	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			2	85	93%			
	(Riffle and Run units)	2. Degradation - Evidence of downcutting			10	200	85%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	34	34			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth≥ 1.6)	34	34			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	34	34			100%			
	4.**Thalweg Position**	1. Thalweg centering at upstream of meander bend (Run)	34	34			100%			
		2. Thalweg centering at downstream of meander (Glide)	34	34			100%			
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			11	95	96%	0	0	96%
	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.			4	25	99%	0	0	99%
	3. Mass Wasting	Bank slumping, calving, or collapse			1	10	100%			100%
				Totals	16	130	95%	0	0	95%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	14	14			100%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	13	14			93%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	14	14			100%			
	3. Bank Protection	Bank erosion within the structures extent of influence doesnot exceed 15%. (See guidance for this table in EEP monitoring guidance document)	11	14			79%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio ≥ 1.6 Rootwads/logs providing some cover at base-flow.	14	14			100%			

Table 5b **Visual Stream Morphology Stability Assessment**
Reach ID **Reach 2A**
Assessed Length **711**

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. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			0	0	100%			
		2. Degradation - Evidence of downcutting			5	135	81%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	12	12			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth > 1.6)	11	11			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	11	11			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	11	11			100%			
		2. Thalweg centering at downstream of meander (Glide)	11	11			100%			
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			12	120	92%	0	0	92%
	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.			3	50	96%	0	0	96%
	3. Mass Wasting	Bank slumping, calving, or collapse			5	60	96%	0	0	96%
				Totals	20	230	84%	0	0	84%
3. Engineered Structures	**1. Overall Integrity**	Structures physically intact with no dislodged boulders or logs.	13	14			93%			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	12	14			86%			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	13	14			93%			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	11	14			79%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio > 1.6 Rootwads/logs providing some cover at base-flow.	14	14			100%			

Table 5c **Visual Stream Morphology Stability Assessment**
Reach ID **Reach B**
Assessed Length **478**

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. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			1	15	97%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	11	11			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth > 1.6)	10	10			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	10	10			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	10	10			100%			
		2. Thalweg centering at downstream of meander (Glide)	10	10			100%			
2. Bank	**1. Scoured/Eroding**	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			1	12	99%			99%
	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.			3	22	98%			98%
	3. Mass Wasting	Bank slumping, calving, or collapse			2	10	99%			99%
				Totals	6	44	95%	0	0	95%
3. 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%. (See guidance for this table in EEP monitoring guidance document)	7	7			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio > 1.6 Rootwads/logs providing some cover at base-flow.	7	7			100%			

Table 5d **Visual Stream Morphology Stability Assessment**
Reach ID **Reach C**
Assessed Length **613**

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. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			1	27	96%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	12	12			100%			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth > 1.6)	11	11			100%			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	11	11			100%			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	11	11			100%			
		2. Thalweg centering at downstream of meander (Glide)	11	11			100%			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			0	0	100%			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%			100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%			100%
				Totals	0	0	100%	0	0	100%
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%. (See guidance for this table in EEP monitoring guidance document)	8	8			100%			
	4. Habitat	Pool forming structures maintaining ~ Max Pool Depth : Mean Bankfull Depth ratio > 1.6 Rootwads/logs providing some cover at base-flow.	8	8			100%			

Table 5e **Visual Stream Morphology Stability Assessment**
Reach ID **Enhancement**
Assessed Length **376**

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. Bed	1. Vertical Stability (Riffle and Run units)	1. Aggradation - Bar formation/growth sufficient to significantly deflect flow laterally (not to include point bars)			3	80	79%			
		2. Degradation - Evidence of downcutting			0	0	100%			
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	10	N/A			N/A			
	3. Meander Pool Condition	1. Depth Sufficient (Max Pool Depth : Mean Bankfull Depth > 1.6)	10	N/A			N/A			
		2. Length appropriate (>30% of centerline distance between tail of upstream riffle and head of downstrem riffle)	10	N/A			N/A			
	4.Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	N/A	N/A			N/A			
		2. Thalweg centering at downstream of meander (Glide)	N/A	N/A			N/A			
2. Bank	1. Scoured/Eroding	Bank lacking vegetative cover resulting simply from poor growth and/or scour and erosion			2	25	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%	0	0	100%
	3. Mass Wasting	Bank slumping, calving, or collapse			0	0	100%	0	0	100%
				Totals	0	0	100%	0	0	100%
3. Engineered Structures	1. Overall Integrity	Structures physically intact with no dislodged boulders or logs.	N/A	N/A			N/A			
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	N/A	N/A			N/A			
	2a. Piping	Structures lacking any substantial flow underneath sills or arms.	N/A	N/A			N/A			
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. (See guidance for this table in EEP monitoring guidance document)	N/A	N/A			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			N/A			

Table 6 Vegetation Condition Assessment

Planted Acreage[1] **8.1**

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.	N/A	N/A	0	0.00	0.0%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	Red Square	3	0.10	1.2%
			Total	3	0.10	1.2%
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	0.00	0.0%
			Cumulative Total	3	0.10	1.2%

Easement Acreage[2] **14**

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern[4]	Areas or points (if too small to render as polygons at map scale).	1000 SF	N/A	0	0.00	0.0%
5. Easement Encroachment Areas[3]	Areas or points (if too small to render as polygons at map scale).	none	green line	2	0.26	3.2%

Vegetation Plot Photos (recorded on 11/1/2017 & 11/2/2017)

Vegetation Plot 1 - X-axis

Vegetation Plot 1 - diagonal

Photos recorded on November 1, 2017

Vegetation Plot 2 - X-axis

Vegetation Plot 2 - diagonal

Photos recorded on November 1, 2017

Vegetation Plot 3 - X-axis

Vegetation Plot 3 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 4 - X-axis

Vegetation Plot 4 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 5 - X-axis

Vegetation Plot 5 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 6 - X-axis

Vegetation Plot 6 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 7 - X-axis

Vegetation Plot 7 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 8 - X-axis

Vegetation Plot 8 - diagonal

Photos recorded on November 2, 2017

Vegetation Plot 9 - X-axis

Vegetation Plot 9 - diagonal

Photos recorded on November 2, 2017

BMP: Top of Reach B

BMP: Top of Reach C

Photos recorded on November 2, 2017

BMP: Reach 2A (northwest)

BMP: Middle of Reach 2A

Photos recorded on November 2, 2017

BMP: South of Reach 2A

Reach 1A: Cross Section #1

Photos recorded on November 2 and November 10, 2017

Reach 1A: Cross Section #2

Reach 1A: Cross Section #5

Photos recorded on November 10, 2017

Reach 1A: Cross Section #X2

Reach 2A: Cross Section #9

Photos recorded on November 9, 2017

Reach 2A: Cross Section #X3

Reach B: Cross Section #X1

Photos recorded on November 10, 2017

Reach C: Cross Section #7

Reach C: Cross Section #8

Photos recorded on November 9, 2017

Stream Enhancement Reach - Looking South Along Channel

Photos recorded on November 9, 2017

Stream Problem Area Photos

Reach 1A - Stream Problem Area 1; Aggradation; New Channel Continues to Form

Reach 1A - Stream Problem Area 2; Undercut near Log Vane Structure

Photos recorded on November 9, 2017

Stream Problem Area Photos

Reach 1A - Stream Problem Area #2a; scour along bank near log vane structure.

Reach 1A - Stream Problem Area #3; scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #3a; scour

Reach 1A - Stream Problem Area #4; bank undercut

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #5; scour

Reach 1A - Stream Problem Area #6; degradation

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #7; degradation

Reach 1A - Stream Problem Area #8; degradation

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #9; Degradation

Reach 1A - Stream Problem Area #10; Log Vane Undercut becoming scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #11; Log Vane Undercut becoming scour

Reach 1A - Stream Problem Area #12; Scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #12a; Aggradation

Reach 1A - Stream Problem Area #13a; Scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #13aa; Log Vane Undercut

Reach 1A - Stream Problem Area #13b; Degradation

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #14; Scour

Reach 1A - Stream Problem Area #16; Scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #17; Degradation

Reach 1A - Stream Problem Areas #18 & 19; Scour & Mass Wasting

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #20; Degradation

Reach 1A - Stream Problem Area #20a; Scour

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #21; Bank Undercut

Reach 1A - Stream Problem Area #22; Degradation

Photos recorded on November 9, 2017

Reach 1A - Stream Problem Area #23; Degradation

Reach 1A - Stream Problem Area #24; Degradation

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #26; Mass Wasting

Reach 2A - Stream Problem Area #28; Degradation

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #29; Scour

Reach 2A - Stream Problem Area #30 & 31; Log Vane Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #32; Degradation

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #33; Scour

Reach 2A - Stream Problem Area #34; Log Vane Undercut

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #35; Log Vane Mass Wasting

Reach 2A - Stream Problem Area #35a; Log Vane Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #36; Degradation

Reach 2A - Stream Problem Area #37; Undercut turning into Mass Wasting

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Areas #38 & 39; Degradation and Undercut

Reach 2A - Stream Problem Area #40; Log Vane Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #41; Scour

Reach 2A - Stream Problem Area #42; Mass Wasting

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #43; Degradation

Reach 2A - Stream Problem Area #43a; Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #44; Scour

Reach 2A - Stream Problem Area #45; Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #45a; Log Vane Scour

Reach 2A - Stream Problem Areas #47-48; Scour

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #49; Mass Wasting

Reach 2A - Stream Problem Area #50; Undercut

Photos recorded on November 9, 2017

Reach 2A - Stream Problem Area #50a; Scour below Log Vane

Photos recorded on November 9, 2017

Reach B - Stream Problem Area #51; Aggradation

Reach B - Stream Problem Area #52; Mass Wasting

Photos recorded on November 9, 2017

Reach B - Stream Problem Area #52a; Log Vane Undercut

Reach B - Stream Problem Area #52b; Mass Wasting

Photos recorded on November 9, 2017

Reach B - Stream Problem Area #53; Undercut

Reach B - Stream Problem Area #54; Undercut

Photos recorded on November 9, 2017

Reach B - Stream Problem Area #55; Undercut becoming Scour

Enhancement Reach - Stream Problem Area #56; Aggradation

Photos recorded on November 9, 2017

Enhancement Reach - Stream Problem Area #57; Aggradation

Enhancement Reach - Stream Problem Area #57a; Scour

Photos recorded on November 9, 2017

Enhancement Reach - Stream Problem Area #57b; Aggradation

Enhancement Reach - Stream Problem Area #57c; Scour (difficult to see through vegetation)

Photos recorded on November 9, 2017

Reach C - Stream Problem Area #58; Aggradation

Photos recorded on November 9, 2017

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Appendix C.
Vegetation Plot Data

Table 7. Vegetation data by plot

Scientific Name	Common Name	Species Type	Current Plot Data (MY4 2017)																				
			194-01-0001			194-01-0002			194-01-0003			194-01-0004			194-01-0005			194-01-0006			194-01-0007		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree												1			7						
Baccharis halimifolia	eastern baccharis	Shrub			4			20			48			4			1			20			6
Betula nigra	river birch	Tree	4	4	5				1	1	1				1	1	1				4	4	5
Carya	hickory	Tree															2						
Celtis laevigata	sugarberry	Tree							1	1	1												
Cephalanthus occidentalis	common buttonbush	Shrub							1	1	1	5	5	5	3	3	3						
Clethra alnifolia	sweetpepperbush	Shrub																					
Diospyros virginiana	common persimmon	Tree																					
Fraxinus pennsylvanica	green ash	Tree							1	1	1										2	2	2
Hamamelis virginiana	American witchhazel	Tree																					
Ilex glabra	inkberry	Shrub				3	3	3										3	3	3			
Itea virginica	Virginia sweetspire	Shrub							3	3	3	3	3	4							5	5	5
Juniperus virginiana	eastern redcedar	Tree									2						2						
Ligustrum sinense	Chinese privet	Exotic									1						13						2
Liquidambar styraciflua	sweetgum	Tree			28			2						10			22						7
Liriodendron tulipifera	tuliptree	Tree																					
Magnolia virginiana	sweetbay	Tree													1	1	3						
Malus angustifolia	southern crabapple	Tree	1	1	1										1	1	2						
Morella cerifera	wax myrtle	shrub	8	8	8			3	1	1	1			3	8	8	12			2	4	4	4
Nyssa sylvatica	blackgum	Tree															1				1	1	1
Pinus	pine	Tree																					
Pinus taeda	loblolly pine	Tree			79			105			64			1			6			1			
Platanus occidentalis	American sycamore	Tree							2	2	2				5	5	5						
Prunus serotina	black cherry	Tree															1						
Quercus michauxii	swamp chestnut oak	Tree													1	1	1						
Quercus pagoda	cherrybark oak	Tree																					
Quercus phellos	willow oak	Tree							1	1	1				1	1	1						
Rhus copallinum	flameleaf sumac	shrub																					
Salix nigra	black willow	Tree															1				2	2	19
Triadica sebifera	tallowtree	Exotic																		1			4
	Stem count		13	13	125	3	3	133	11	11	126	8	8	28	21	21	84	3	3	27	18	18	55
	size (ares)		1			1			1			1			1			1			1		
	size (ACRES)		0.02			0.02			0.02			0.02			0.02			0.02			0.02		
	Species count		3	3	6	1	1	5	8	8	12	2	2	7	8	8	18	1	1	5	6	6	10
	Stems per ACRE		526.1	526.1	5059	121.4	121.4	5382	445.2	445.2	5099	323.7	323.7	1133	849.8	849.8	3399	121.4	121.4	1093	728.4	728.4	2226

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

Table 7 contd. Vegetation data by plot

Scientific Name	Common Name	Species Type	Current Plot Data (MY4 2017)						Annual Means														
			194-01-0008			194-01-0009			MY4 (2017)			MY3 (2016)			MY2 (2015)			MY1 (2014)			MY0 (2013)		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
Acer rubrum	red maple	Tree			2			20			30			2			5			1			16
Baccharis halimifolia	eastern baccharis	Shrub			18			3			124			71			97			47			41
Betula nigra	river birch	Tree							10	10	12	10	10	10	11	11	12	12	12	12	11	11	11
Carya	hickory	Tree									2												
Celtis laevigata	sugarberry	Tree	1	1	1				2	2	2												
Cephalanthus occidentalis	common buttonbush	Shrub		2	2				9	11	11	9	11	12	10	12	13	9	11	11	9	11	11
Clethra alnifolia	sweetpepperbush	Shrub																			2	2	2
Diospyros virginiana	common persimmon	Tree												1									
Fraxinus pennsylvanica	green ash	Tree							3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Hamamelis virginiana	American witchhazel	Tree																			2	2	2
Ilex glabra	inkberry	Shrub							6	6	6	6	6	6	4	4	7	6	6	6	9	9	9
Itea virginica	Virginia sweetspire	Shrub	3	3	5	13	13	13	27	27	30	24	24	24	26	26	26	27	27	27	51	51	51
Juniperus virginiana	eastern redcedar	Tree						1			5			2			1			1			
Ligustrum sinense	Chinese privet	Exotic			2						18			8			4						
Liquidambar styraciflua	sweetgum	Tree						39			108			60			81			38			274
Liriodendron tulipifera	tuliptree	Tree																					2
Magnolia virginiana	sweetbay	Tree							1	1	3	1	1	1	1	1	1	1	1	1	1	1	1
Malus angustifolia	southern crabapple	Tree							2	2	3	2	2	3	2	2	3	2	2	2			1
Morella cerifera	wax myrtle	shrub			1			14	21	21	48	22	22	48	22	22	42	22	22	38	22	22	41
Nyssa sylvatica	blackgum	Tree						3	1	1	5	1	1	2			4	1	1	1	1	1	16
Pinus	pine	Tree												117									
Pinus taeda	loblolly pine	Tree			28			52			336						218			464			1346
Platanus occidentalis	American sycamore	Tree							7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Prunus serotina	black cherry	Tree									1			1									
Quercus michauxii	swamp chestnut oak	Tree							1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Quercus pagoda	cherrybark oak	Tree															1	1	1	1	1	1	1
Quercus phellos	willow oak	Tree							2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Rhus copallinum	flameleaf sumac	shrub						1			1												
Salix nigra	black willow	Tree						3	2	2	23	2	2	19	2	2	16			24			
Triadica sebifera	tallowtree	Exotic									5												
	Stem count		4	6	59	13	13	149	94	96	786	90	92	400	91	93	544	94	96	687	122	124	1838
	size (ares)		1			1			9			9			9			9			9		
	size (ACRES)		0.02			0.02			0.22			0.22			0.22			0.22			0.22		
	Species count		2	3	8	1	1	10	14	14	24	13	13	21	12	12	20	13	13	19	14	14	20
	Stems per ACRE		161.9	242.8	2388	526.1	526.1	6030	422.7	431.7	3534	404.7	413.7	1799	409.2	418.2	2446	422.7	431.7	3089	548.6	557.6	8265

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

Table 8. CVS Vegetation Plot Metadata
Jacksonville Country Club Project DMS No. 194

Report Prepared By	Kim Williams
Date Prepared	12/21/2017 10:00
Database Name	JacksonvilleCountryClub_194_MY42017.mdb
Database Location	L:\Wetlands\2008\Jacksonville Country Club/Annual Monitoring Report\Year 4
Computer Name	KWILLIAMS
Description Worksheets in This Document	
Metadata	Description of database file, the report worksheets, and a summary of project and project data.
Proj Planted	Each project is listed with its PLANTED stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Proj Total Stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc)
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
Project Summary	
Project Code	194
Project Name	Jacksonville Country Club
Description	Stream Restoration and Enhancement Project
River Basin	White Oak
Length (ft)	3485
Stream-to-Edge Width (ft)	
Area (sq m)	
Required Plots (calculated)	9

Table 9. CVS Vegetation Vigor by Species

	Species	CommonName	4	3	2	1	0	Missing	Unknown
	Betula nigra	river birch	6	3	1				
	Celtis laevigata	sugarberry	2						
	Cephalanthus occidentalis	common buttonbush		6	5		1		
	Fraxinus pennsylvanica	green ash	3						
	Ilex glabra	inkberry	6						
	Itea virginica	Virginia sweetspire	14	8	4	1	1	4	
	Nyssa sylvatica	blackgum	1						
	Quercus michauxii	swamp chestnut oak		1					
	Quercus phellos	willow oak	2						
	Salix nigra	black willow	2						
	Morella cerifera	wax myrtle	21					1	
	Malus angustifolia	southern crabapple	2						
	Magnolia virginiana	sweetbay	1						
	Platanus occidentalis	American sycamore	5	2					
TOT:	**14**	**14**	**65**	**20**	**10**	**1**	**2**	**5**	

Table 10. CVS Vegetation Damage by Species

	Species	CommonName	Count of Damage Categories	(no damage)	_Enter other damage_	Insects	Mowing	Vine Strangulation
	Betula nigra	river birch	3	7		2		1
	Celtis laevigata	sugarberry	0	2				
	Cephalanthus occidentalis	common buttonbush	7	5	1			6
	Fraxinus pennsylvanica	green ash	0	3				
	Ilex glabra	inkberry	3	3			3	
	Itea virginica	Virginia sweetspire	3	29	1			2
	Magnolia virginiana	sweetbay	0	1				
	Malus angustifolia	southern crabapple	0	2				
	Morella cerifera	wax myrtle	1	21			1	
	Nyssa sylvatica	blackgum	0	1				
	Platanus occidentalis	American sycamore	0	7				
	Quercus michauxii	swamp chestnut oak	0	1				
	Quercus phellos	willow oak	0	2				
	Salix nigra	black willow	1	1			1	
TOT:	**14**	**14**	**18**	**85**	**2**	**2**	**5**	**9**

Table 11. CVS Vegetation Damage by Plot

	plot	Count of Damage Categories	(no damage)	_Enter other damage_	Insects	Mowing	Vine Strangulation
	194-01-0001-year:4	2	11		2		
	194-01-0002-year:4	0	3				
	194-01-0003-year:4	2	11	2			
	194-01-0004-year:4	4	8				4
	194-01-0005-year:4	0	21				
	194-01-0006-year:4	3				3	
	194-01-0007-year:4	4	15			2	2
	194-01-0008-year:4	3	3				3
	194-01-0009-year:4	0	13				
TOT:	**9**	**18**	**85**	**2**	**2**	**5**	**9**

Table 12. CVS Vegetation Planted Stems by Plot and Species

	Comment	Species	SpType	CommonName	Total Planted Stems	# plots	avg# stems	plot 194-01-0001-year:4	plot 194-01-0002-year:4	plot 194-01-0003-year:4	plot 194-01-0004-year:4	plot 194-01-0005-year:4	plot 194-01-0006-year:4	plot 194-01-0007-year:4	plot 194-01-0008-year:4	plot 194-01-0009-year:4
		Betula nigra	Tree	river birch	10	4	2.5	4		1		1		4		
		Celtis laevigata	Shrub Tree	sugarberry	2	2	1			1					1	
		Cephalanthus occidentalis	Shrub Tree	common buttonbush	11	4	2.75			1	5	3			2	
		Fraxinus pennsylvanica	Tree	green ash	3	2	1.5			1				2		
		Ilex glabra	Shrub	inkberry	6	2	3		3				3			
		Itea virginica	Shrub	Virginia sweetspire	27	5	5.4			3	3			5	3	13
		Magnolia virginiana	Shrub Tree	sweetbay	1	1	1					1				
		Malus angustifolia	Shrub Tree	southern crabapple	2	2	1	1				1				
		Morella cerifera	Shrub Tree	wax myrtle	21	4	5.25	8		1		8		4		
		Nyssa sylvatica	Tree	blackgum	1	1	1							1		
		Platanus occidentalis	Tree	American sycamore	7	2	3.5			2		5				
		Quercus michauxii	Tree	swamp chestnut oak	1	1	1					1				
		Quercus phellos	Tree	willow oak	2	2	1			1		1				
		Salix nigra	Tree	black willow	2	1	2							2		
TOT:	**0**	**14**	**14**	**14**	**96**	**14**		**13**	**3**	**11**	**8**	**21**	**3**	**18**	**6**	**13**

Appendix D.
Stream Geomorphology Data

Table 13a. Baseline Stream Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: 1A (1307 feet)

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Dimension and Substrate - Riffle Only																									
Bankfull Width (ft)				4.1								15.5						10		3.8	4.3		4.8		
Floodprone Width (ft)												200						n/a		20.3	36.5		52.8		
Bankfull Mean Depth (ft)				1.7								1.54						0.83		0.3	0.5		0.7		
[1]Bankfull Max Depth (ft)												n/a						1.2		0.8	0.9		1		
Bankfull Cross Sectional Area (ft^2)				16.2								23.9						8.33		1.5	2		2.5		
Width/Depth Ratio												10.05						12		5.8	10.7		15.5		
Entrenchment Ratio												12.9						n/a		4.2	9		13.8		
[1]Bank Height Ratio												**n/a**						**n/a**		**1.3**	**1.45**		**1.6**		
Profile																									
Riffle Length (ft)												30						33		2.6	8		40.5		
Riffle Slope (ft/ft)												0.002						n/a		0	1		6.9		
Pool Length (ft)											22.5	26.3		30				24		4	16.8		54.8		
Pool Max depth (ft)												3						2.1		1.2	1.2		1.3		
Pool Spacing (ft)											26.4	43.4		60.5				52.5		9.5	33.3		143.4		
Pattern																									
Channel Beltwidth (ft)											45	57.4		69.8			20	35	50	8	22		34		
Radius of Curvature (ft)											10.9	25.6		40.3			20	27.5	35	8.3	22.7		32.4		
Rc:Bankfull width (ft/ft)											**0.7**	**1.7**		**2.6**			**2**	**2.8**	**3.5**	**2.2**	**5.3**		**6.8**		
Meander Wavelength (ft)											63.6	84.5		105.4			70	105	140	64	108		140		
Meander Width Ratio											2.9	3.7		4.5			2	3.5	5	2.1	5.1		7.1		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																		0.01			0.207				
Max part size (mm) mobilized at bankfull																					10.2				
Stream Power (transport capacity) W/m^2																					24.6				
Additional Reach Parameters																									
Rosgen Classification	C5/E5											E5						C5			E5				
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)				23																					
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)						1.1						1.2						1.2			1.2				
Water Surface Slope (Channel) (ft/ft)												0.0012						n/a							
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Table 13b. Baseline Stream Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: 2A (711 feet)

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)				4.1								15.5						12.9			5.7				
Floodprone Width (ft)												200						n/a			34.3				
Bankfull Mean Depth (ft)				1.7								1.54						0.89			0.4				
[1]Bankfull Max Depth (ft)												n/a						1.3			0.9				
Bankfull Cross Sectional Area (ft^2)				16.2								23.9						11.5			2.4				
Width/Depth Ratio												10.05						14.47			13.8				
Entrenchment Ratio												12.9						n/a			6				
[1]Bank Height Ratio												**n/a**						**n/a**			**1.2**				
Profile																									
Riffle Length (ft)												30						38		6.2	20.8		42.7		
Riffle Slope (ft/ft)												0.002						n/a		0	1		3.5		
Pool Length (ft)											22.5	26.3		30				22		13.1	20		29.8		
Pool Max depth (ft)												3						2.4		2.9	2.9		2.9		
Pool Spacing (ft)											26.4	43.4		60.5			40	60	80	18.6	56.3		103		
Pattern																									
Channel Beltwidth (ft)											45	57.4		69.8			25	40	55	11	23.5		33		
Radius of Curvature (ft)											10.9	25.6		40.3			25	30	35	20.7	24.7		29.5		
Rc:Bankfull width (ft/ft)											**0.7**	**1.7**		**2.6**			**1.9**	**2.3**	**2.7**	**3.6**	**4.3**		**5.2**		
Meander Wavelength (ft)											63.6	84.5		105.4			80	120	160	59	116		140		
Meander Width Ratio											2.9	3.7		4.5			1.9	3.1	4.3	1.9	4.1		5.8		

Transport parameters						
Reach Shear Stress (competency) lb/f^2					0.25	
Max part size (mm) mobilized at bankfull					12.3	
Stream Power (transport capacity) W/m^2					22.3	
Additional Reach Parameters						
Rosgen Classification			E5 and C5	C5	C5	
Bankfull Velocity (fps)				n/a		
Bankfull Discharge (cfs)		23				
Valley length (ft)						
Channel Thalweg length (ft)						
Sinuosity (ft)				1.2	1.2	
Water Surface Slope (Channel) (ft/ft)			0.0037	n/a		
BF slope (ft/ft)						
[3]Bankfull Floodplain Area (acres)						
[4]% of Reach with Eroding Banks						
Channel Stability or Habitat Metric						
Biological or Other						

Table 13c. Baseline Stream Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: B (478 feet)

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)				2.3	3.32	3.65		3.97			10.4	10.95		11.5				6			4				
Floodprone Width (ft)					45	68.5		92			199.7	199.9		200				n/a			46.8				
Bankfull Mean Depth (ft)				1.1	1.17	1.21		1.25			0.83	1.19		1.56				0.5			0.68				
[1]Bankfull Max Depth (ft)					1.8	1.96		2.11			n/a	n/a		n/a				0.7			1.4				
Bankfull Cross Sectional Area (ft^2)				5.5	3.88	4.42		4.95			8.6	13.2		17.9				3			2.7				
Width/Depth Ratio					2.84	3.01		3.18			7.39	10		12.58				12			5.9				
Entrenchment Ratio					13.55	18.36		23.17			17.39	18.3		19.2				n/a			11.7				
[1]Bank Height Ratio					**1.66**	**1.7**		**1.74**													**1.1**				
Profile																									
Riffle Length (ft)											13.4	17.7		22				14		6.3	12.5		22		
Riffle Slope (ft/ft)											0.004	0.005		0.006				n/a		0	1.6		4.5		
Pool Length (ft)											10.6	15.4		20.2				18		6.3	10.7		14.5		
Pool Max depth (ft)											1.7	2.1		2.5				1.3							
Pool Spacing (ft)											13.75	33.1		52.5			25	35	45	24.7	31.9		36.8		
Pattern																									
Channel Beltwidth (ft)					6.25	7.32		8.38			17.7	45.2		72.9			18	24	30	9	16.4		23		
Radius of Curvature (ft)					12.68	15.52		18.36			7.6	14.1		20.6			12	15	18	8.1	11.8		12.5		
Rc:Bankfull width (ft/ft)					**3.82**	**4.22**		**4.62**			**0.47**	**1.3**		**1.9**			**2**	**2.5**	**3**	**2.0**	**3.0**		**3.1**		
Meander Wavelength (ft)					14.02	15.61		17.2			23.1	51		78.8			50	70	90	46	54		80		
Meander Width Ratio					1.88	2		2.11			2.1	4.6		7.1			1.2	3	5	2.3	4.1		5.8		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																				0.3					
Max part size (mm) mobilized at bankfull																				14.7					
Stream Power (transport capacity) W/m^2																				48.1					
Additional Reach Parameters																									
Rosgen Classification																				E5					
Bankfull Velocity (fps)																				8.2					
Bankfull Discharge (cfs)				7.1																					
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)							1.15													1.3					
Water Surface Slope (Channel) (ft/ft)							1.7																		
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Table 13d. Baseline Stream Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: C (613 feet)

Parameter	Gauge[2]	Regional Curve			Pre-Existing Condition						Reference Reach(es) Data						Design			Monitoring Baseline					
Dimension and Substrate - Riffle Only		LL	UL	Eq.	Min	Mean	Med	Max	SD[5]	n	Min	Mean	Med	Max	SD[5]	n	Min	Med	Max	Min	Mean	Med	Max	SD[5]	n
Bankfull Width (ft)				2.3							1.01	1.1		1.18				7			4				
Floodprone Width (ft)											199.7	199.9		200				n/a			7.8				
Bankfull Mean Depth (ft)				1.1							0.83	1.19		1.56				0.7			0.2				
[1]Bankfull Max Depth (ft)											n/a	n/a		n/a				1.1			0.4				
Bankfull Cross Sectional Area (ft^2)				5.5							8.6	13.2		17.9				4.9			0.6				
Width/Depth Ratio											7.39	10		12.58				10			25.4				
Entrenchment Ratio											17.39	18.3		19.2				n/a			2				
[1]Bank Height Ratio																		**n/a**			**2.1**				
Profile																									
Riffle Length (ft)											13.4	17.7		22				20		4.6	10.5		20		
Riffle Slope (ft/ft)											0.004	0.005		0.006				n/a		0	0.7		3.4		
Pool Length (ft)											10.6	15.4		20.2				12		0	9.9		14.8		
Pool Max depth (ft)											1.7	2.1		2.5				1.8		1.1	1.1		1.1		
Pool Spacing (ft)											13.75	33.1		52.5			25	33.75	42.5	4.5	32.3		71.9		
Pattern																									
Channel Beltwidth (ft)											17.7	45.2		72.9			14	19.5	25	8	14.8		32		
Radius of Curvature (ft)											7.6	14.1		20.6			9	11.5	14	6.1	8.5		11.4		
Rc:Bankfull width (ft/ft)											**0.47**	**1.3**		**1.9**			**1.3**	**1.6**	**2**	**1.5**	**2.1**		**2.9**		
Meander Wavelength (ft)											23.1	51		78.8			50	67.5	85	43	65.7		89		
Meander Width Ratio											2.1	4.6		7.1			2	2.8	3.6	2	3.7		8		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																					0.041				
Max part size (mm) mobilized at bankfull																					2				
Stream Power (transport capacity) W/m^2																					2.96				
Additional Reach Parameters																									
Rosgen Classification																					B5c				
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)				7.1																					
Valley length (ft)																									
Channel Thalweg length (ft)																									
Sinuosity (ft)																					1.3				
Water Surface Slope (Channel) (ft/ft)																									
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% of Reach with Eroding Banks																									
Channel Stability or Habitat Metric																									
Biological or Other																									

Table 14a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)
Jacksonville Country Club (DMS# 194) Segment/Reach: 1A (1307 feet)

	Cross Section 1 (Riffle)							Cross Section 2 (Pool)							Cross Section 5 (Riffle)							Cross Section X2 (Pool)													
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	26.25	26.25	26.25	26.25	26.25			23.05	23.05	23.05	23.05	23.05			18.96	18.96	18.96	18.96	18.96			17.35	17.35	17.35	17.35	17.35									
Bankfull Width (ft)	8.8	6.9	6.4	6.2	6.1			6.3	5.8	5.9	6.5	5.6			5	3.4	4.5	4.4	4.6			3.1	3.2	3.7	3.7	3.7									
Floodprone Width (ft)	44.6	38.2	38.9	42.8	44.7										63.8	63.9	69.8	66.8	68.8																
Bankfull Mean Depth (ft)	0.6	0.5	0.7	0.8	0.8			0.9	1.2	1.2	1.1	1.1			0.8	1.1	1.2	0.8	1.2			0.7	0.7	1	1.3	1.5									
Bankfull Max Depth (ft)	1.4	1	1.1	1.5	1.6			1.5	1.6	1.7	1.8	1.8			1.4	1.4	1.8	1.7	1.8			1.2	1.2	1.7	1.8	1.9									
Bankfull Cross Sectional Area (ft^2)	5.1	3.4	4.2	4.8	4.7			5.7	6.9	6.8	7	6.4			3.9	3.7	5.5	3.7	5.6			2.3	2.3	3.8	4.6	5.6									
Bankfull Width/Depth Ratio	15.3	14.2	9.6	7.8	7.9			6.9	5	5.1	5.9	5			6.2	3.2	3.7	5.2	3.8			4.3	4.3	3.5	2.9	2.5									
Bankfull Entrenchment Ratio	5.1	5.5	6.1	7	7.4										12.9	18.6	15.3	15.2	14.9																
Bankfull Bank Height Ratio	1	1.2	1	1	1			1.2	1.1	1.2	1.2	1.2			1	1.3	1.2	1.2	1.3			1.2	1.2	1.3	1.3	1.4									
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Cross Sectional Area between end pins (ft^2)																																			
d50 (mm)																																			

These cells may or may not require population in any given year. See footnote 2 below

	Cross Section 6 (Riffle)							Cross Section 7 (Pool)							Cross Section 8 (Riffle)							Cross Section 9 (Riffle)							Cross Section 10 (Pool)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Cross Sectional Area between end pins (ft^2)																																			
d50 (mm)																																			

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum us
for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a pr
performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."
2 = Based on the elevation of any dominant depositional feature that develops and is observed at the time of survey. If the baseline datum remains the only significant depositional featu
then these two sets of dimensional parameters will be equal, however, if another depositional feature of significance develops above or below the baseline bankfull datum then this should be tracked and quantified in these cells

Table 14b. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)

Jacksonville Country Club (DMS# 194) Segment/Reach: 2A (711 feet)

	Cross Section 9 (Riffle)							Cross Section X3 (Pool)																			Cross Section 5 (Riffle)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	16.75	16.75	16.75	16.75	16.75			14.3	14.3	14.3	14.3	14.3																						
Bankfull Width (ft)	12.6	11.7	11.5	11.4	12.1			13.3	11.2	13.9	13.4	11.8																						
Floodprone Width (ft)	73	65.2	75.7	73.3	75.5																													
Bankfull Mean Depth (ft)	0.7	0.8	0.9	1	1			1.9	2.8	2.2	2.1	2.5																						
Bankfull Max Depth (ft)	1.7	1.7	1.8	2.1	2.4			3.9	4.6	4.6	4.4	4.2																						
Bankfull Cross Sectional Area (ft^2)	9.2	9.1	10.2	11.4	12.3			25	30.8	30.9	28.4	29.5																						
Bankfull Width/Depth Ratio	17.3	15	12.9	11.3	12			7	4.1	6.2	6.4	4.8																						
Bankfull Entrenchment Ratio	5.8	5.6	6.6	6.4	6.2																													
Bankfull Bank Height Ratio	1	0.8	1.1	0.9	1			1	1	1	1	0.9																						
Based on current/developing bankfull feature[2]																																		
Record elevation (datum) used																																		
Bankfull Width (ft)																																		
Floodprone Width (ft)																																		
Bankfull Mean Depth (ft)																																		
Bankfull Max Depth (ft)																																		
Bankfull Cross Sectional Area (ft^2)																																		
Bankfull Width/Depth Ratio																																		
Bankfull Entrenchment Ratio																																		
Bankfull Bank Height Ratio																																		
Cross Sectional Area between end pins (ft^2)																																		
d50 (mm)																																		

These cells may or may not require population in any given year. See footnote 2 below

	Cross Section 6 (Riffle)							Cross Section 7 (Pool)							Cross Section 8 (Riffle)							Cross Section 9 (Riffle)							Cross Section 10 (Pool)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used																																		
Bankfull Width (ft)																																		
Floodprone Width (ft)																																		
Bankfull Mean Depth (ft)																																		
Bankfull Max Depth (ft)																																		
Bankfull Cross Sectional Area (ft^2)																																		
Bankfull Width/Depth Ratio																																		
Bankfull Entrenchment Ratio																																		
Bankfull Bank Height Ratio																																		
Based on current/developing bankfull feature[2]																																		
Record elevation (datum) used																																		
Bankfull Width (ft)																																		
Floodprone Width (ft)																																		
Bankfull Mean Depth (ft)																																		
Bankfull Max Depth (ft)																																		
Bankfull Cross Sectional Area (ft^2)																																		
Bankfull Width/Depth Ratio																																		
Bankfull Entrenchment Ratio																																		
Bankfull Bank Height Ratio																																		
Cross Sectional Area between end pins (ft^2)																																		
d50 (mm)																																		

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum used for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a prior performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."

2 = Based on the elevation of any dominant depositional feature that develops and is observed at the time of survey. If the baseline datum remains the only significant depositional feature then these two sets of dimensional parameters will be equal, however, if another depositional feature of significance develops above or below the baseline bankfull datum then this should be tracked and quantified in these cells.

Table 14c. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)

Jacksonville Country Club (DMS# 194) Segment/Reach: B (478 feet)

	Cross Section X1 (Riffle)							Cross Section (Riffle)							Cross Section (Riffle)							Cross Section (Pool)							Cross Section 5 (Riffle)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	21.22	21.22	21.22	21.22	21.22																														
Bankfull Width (ft)	5	4.7	7	5.8	7.2																														
Floodprone Width (ft)	51.8	54.5	57.3	59.3	59.9																														
Bankfull Mean Depth (ft)	0.7	0.8	1.1	1.3	1.5																														
Bankfull Max Depth (ft)	1.5	1.6	1.8	2	2.6																														
Bankfull Cross Sectional Area (ft^2)	3.5	4	7.6	7.5	10.9																														
Bankfull Width/Depth Ratio	7.1	5.5	6.5	4.5	4.7																														
Bankfull Entrenchment Ratio	10.4	11.7	8.2	10.2	8.4																														
Bankfull Bank Height Ratio	**1**	1.1	1	1.1	1																														
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Cross Sectional Area between end pins (ft^2)																																			
d50 (mm)																																			

These cells may or may not require population in any given year. See footnote 2 below

	Cross Section 6 (Riffle)							Cross Section 7 (Pool)							Cross Section 8 (Riffle)							Cross Section 9 (Riffle)							Cross Section 10 (Pool)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
d50 (mm)																																			

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum used for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a prior performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."

2 = Based on the elevation of any dominant depositional feature that develops and is observed at the time of survey. If the baseline datum remains the only significant depositional feature then these two sets of dimensional parameters will be equal, however, if another depositional feature of significance develops above or below the baseline bankfull datum then this should be tracked and quantified in these cells.

Table 14d. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)

Jacksonville Country Club (DMS# 194) Segment/Reach: C (613 feet)

	Cross Section 7 (Riffle)							Cross Section 8 (Pool)							Cross Section (Riffle)							Cross Section (Pool)							Cross Section 5 (Riffle)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used	20.54	20.54	20.54	20.54	20.54			19.68	19.68	19.68	19.68	19.68																							
Bankfull Width (ft)	8.1	9.5	10.3	9.3	9.2			6	7.1	6.6	6.4	6																							
Floodprone Width (ft)	91.5	111.1	128.5	138.7	131.7																														
Bankfull Mean Depth (ft)	0.4	0.5	0.5	0.6	0.8			0.7	0.8	0.7	0.7	0.9																							
Bankfull Max Depth (ft)	0.9	1.2	1.6	2	2.1			1.5	1.5	1.3	1.3	1.7																							
Bankfull Cross Sectional Area (ft^2)	3.5	4.9	5.6	5.8	7.5			4	5.6	4.8	4.6	5.3																							
Bankfull Width/Depth Ratio	19	18.1	18.9	15	11.3			8.9	9	9.1	8.9	6.9																							
Bankfull Entrenchment Ratio	11.3	11.7	12.4	14.9	14.4																														
Bankfull Bank Height Ratio	1	1	1	1	1			1	1	0.9	0.9	0.9																							
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Cross Sectional Area between end pins (ft^2)																																			
d50 (mm)																																			

These cells may or may not require population in any given year. See footnote 2 below

	Cross Section 6 (Riffle)							Cross Section 7 (Pool)							Cross Section 8 (Riffle)							Cross Section 9 (Riffle)							Cross Section 10 (Pool)						
Based on fixed baseline bankfull elevation[1]	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+	Base	MY1	MY2	MY3	MY4	MY5	MY+
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Based on current/developing bankfull feature[2]																																			
Record elevation (datum) used																																			
Bankfull Width (ft)																																			
Floodprone Width (ft)																																			
Bankfull Mean Depth (ft)																																			
Bankfull Max Depth (ft)																																			
Bankfull Cross Sectional Area (ft^2)																																			
Bankfull Width/Depth Ratio																																			
Bankfull Entrenchment Ratio																																			
Bankfull Bank Height Ratio																																			
Cross Sectional Area between end pins (ft^2)																																			
d50 (mm)																																			

1 = Widths and depths for monitoring resurvey will be based on the baseline bankfull datum regardless of dimensional/depositional development. Input the elevation used as the datum, which should be consistent and based on the baseline datum established. If the performer has inherited the project and cannot acquire the datum used for prior years this must be discussed with EEP. If this cannot be resolved in time for a given years report submission a footnote in this should be included that states: "It is uncertain if the monitoring datum has been consistent over the monitoring history, which may influence calculated values. Additional data from a prior performer is being acquired to provide confirmation. Values will be recalculated in a future submission based on a consistent datum if determined to be necessary."

2 = Based on the elevation of any dominant depositional feature that develops and is observed at the time of survey. If the baseline datum remains the only significant depositional feature then these two sets of dimensional parameters will be equal, however, if another depositional feature of significance develops above or below the baseline bankfull datum then this should be tracked and quantified in these cells.

Table 15a. Monitoring Data - Stream Reach Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: 1A (1307 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Riffle only	Min	n	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	3.8	4.3		4.8			5.3	5.4		5.4		2	6.2	6.4		6.5			5.6	5.9		6.1			5		5.2	5.4								
Floodprone Width (ft)	20.3	36.5		52.8			34.3	50		65.6		2	37.1	56.7		76.4			42.7	58.1		73.4			43.7		57.5	70.5								
Bankfull Mean Depth (ft)	0.3	0.5		0.7			0.4	0.7		0.9		2	0.6	0.89		1.2			0.8	0.85		0.9			0.8		1.05	1.3								
[1]Bankfull Max Depth (ft)	0.8	0.9		1			0.8	1.2		1.5		2	1	1.6		2.1			1.5	1.7		2			1.5		1.8	2.1								
Bankfull Cross Sectional Area	1.5	2		2.5			2.3	3.5		4.6		2	3.7	5.7		7.6			4.8	5		5.3			4.4		5.55	6.7								
Width/Depth Ratio	5.8	10.7		15.5			6	9.3		12.5		2	5.5	7.1		10.4			6.1	6.9		7.9			3.8		5.3	6.8								
Entrenchment Ratio	4.2	9		13.8			6.4	9.4		12.4		2	5.8	8.9		12			7.2	9.8		12.5			8.1		11.1	14								
[1]Bank Height Ratio	**1.3**	**1.45**		**1.6**			**1**	**1.1**		**1.2**		**2**	**0.6**	**1**		**1.4**			**0.9**	**1**		**1.1**			**1**		**1.1**	**1.2**								
Profile																																				
Riffle Length (ft)	2.6	8		40.5			3.7	16.6		50.6			6.6	27.9		78.9			7.6	29.2		76.5			1.5	27		52.5								
Riffle Slope (ft/ft)	0	1		6.9			0	1.7		7.5			0	1.1		9.2			0	1.4		5.9			0	1.05		2.1								
Pool Length (ft)	4	16.8		54.8			4.7	15.7		31.9			7.1	13.7		33.1			4.3	11.2		22.3			5.5	17.2		28.9								
Pool Max depth (ft)	1.2	1.2		1.3			1.12	2.08		3.3			0.9	2.77		4.36			1.25	2.83		4.17			0.53	2.64		4.18								
Pool Spacing (ft)	9.5	33.3		143			8	29.4		67.2			11.1	44.1		103			8	39		111			8.3	35.3		62.2								
Pattern																																				
Channel Beltwidth (ft)	8	22		34																																
Radius of Curvature (ft)	8.3	22.7		32.4																																
Rc:Bankfull width (ft/ft)	**2.2**	**5.3**		**6.8**																																
Meander Wavelength (ft)	64	108		140																																
Meander Width Ratio	2.1	5.1		7.1																																

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Additional Reach Parameters																																				
Rosgen Classification	E5						E5						E5						E5						E5											
Channel Thalweg length (ft)							1403						1424						1423						1423											
Sinuosity (ft)	1.2						1.2						1.2						1.2						1.2											
Water Surface Slope (Channel) (ft/ft)																																				
BF slope (ft/ft)																																				
[3]Ri% / Ru% / P% / G% / S%	0.21	0.08	0.5	0.21																																
[3]SC% / Sa% / G% / C% / B% / Be%																																				
[3]d16 / d35 / d50 / d84 / d95 /																																				
[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

Table 15b. Monitoring Data - Stream Reach Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: 2A (711 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n
Bankfull Width (ft)		5.7						6.7						12.3						10.9						7.9										
Floodprone Width (ft)		34.3						65.2						78.4						73.3						72										
Bankfull Mean Depth (ft)		0.4						0.5						1.02						0.8						0.6										
[1]Bankfull Max Depth (ft)		0.9						1.1						2						1.8						1.7										
Bankfull Cross Sectional Area (ft^2)		2.4						3.1						12.5						8.4						5.1										
Width/Depth Ratio		13.8						14.4						12.1						14.2						12.3										
Entrenchment Ratio		6						1.3						6.4						6.7						9.1										
[1]Bank Height Ratio		**1.2**						**1.2**						**1**						**1**						**1.3**										
Profile																																				
Riffle Length (ft)	6.2	20.8		42.7			4.1	19		37.4			10.7	25.5		43.9			4.7	19.8		30.1			7.9	26.9		47								
Riffle Slope (ft/ft)	0	1		3.5			0	1.4		5.5			0	1.4		3.7			0	1.8		7.8			0	2.3		6								
Pool Length (ft)	13.1	20		29.8			3.5	15		41.8			2.5	14.3		32.1			4.1	15.5		25.3			1.9	11.6		25								
Pool Max depth (ft)	1.4	2.09		3.39			1.56	2.7		4.43			2.68	3.8		5.75			2.55	3.91		5.88			1.52	3.56		5.57								
Pool Spacing (ft)	18.6	56.3		103			6.8	30.9		73.5			9.8	39.8		72.9			8.9	44.8		82.9			9.4	40.1		88.6								
Pattern																																				
Channel Beltwidth (ft)	11	23.5		33																																
Radius of Curvature (ft)	20.7	24.7		29.5																																
Rc:Bankfull width (ft/ft)	**3.63**	**4.33**		**5.18**																																
Meander Wavelength (ft)	59	116		140																																
Meander Width Ratio	1.93	4.12		5.79																																

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Additional Reach Parameters																																				
Rosgen Classification	C5						C5						C5						C5						C5											
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.1						1.1						1.1						1.1						1.1											
Water Surface Slope (Channel) (ft/ft)																																				
BF slope (ft/ft)																																				
[3]Ri% / Ru% / P% / G% / S%	0.33	0.08	0.29	0.3																																
[3]SC% / Sa% / G% / C% / B% / Be%																																				
[3]d16 / d35 / d50 / d84 / d95 /																																				
[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

Table 15c. Monitoring Data - Stream Reach Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: B (478 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n
Bankfull Width (ft)		4						5						6.9						6.1						5										
Floodprone Width (ft)		46.8						53.8						56.3						>59.7						53.9										
Bankfull Mean Depth (ft)		0.68						0.8						1.05						1.4						1.5										
[1]Bankfull Max Depth (ft)		1.4						1.6						1.7						2.2						2										
Bankfull Cross Sectional Area (ft[2])		2.7						3.8						7.2						8.7						7.6										
Width/Depth Ratio		5.9						6.6						6.5						4.3						3.3										
Entrenchment Ratio		11.7						10.8						8.2						9.7						10.8										
[1]Bank Height Ratio		**1.1**						1						**1**						**1**						**1.3**										
Profile																																				
Riffle Length (ft)	6.3	12.5		22			6.5	20.5		52.5			8	17.9		55.2			9	17.7		24.2			5.1	15.3		34								
Riffle Slope (ft/ft)	0	1.6		4.5			0	0.25		1.8			0	1.8		5			0	2.3		5.3			0	1.9		11								
Pool Length (ft)	6.3	10.7		14.5			10.5	20.4		46.4			5	14.5		26.5			5.8	12.8		23			5.4	13.5		27.5								
Pool Max depth (ft)	0.85	1.51		2.41			0.86	1.61		2.46			1.31	2.08		3.14			1.58	2.4		3.42			1.11	2.36		3.65								
Pool Spacing (ft)	24.7	31.9		36.8			20.3	39.6		64			17.3	37.1		70.2			18.7	36.8		63.9			12.9	32.5		51.9								
Pattern																																				
Channel Beltwidth (ft)	9	16.4		23																																
Radius of Curvature (ft)	8.1	11.8		12.5																																
Rc:Bankfull width (ft/ft)	**2.03**	**2.95**		**3.13**																																
Meander Wavelength (ft)	46	54		80																																
Meander Width Ratio	2.25	4.1		5.75																																

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Additional Reach Parameters																																				
Rosgen Classification	E5						E5						E5						E5						E5											
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.1						1.3						1.3						1.3						1.3											
Water Surface Slope (Channel) (ft/ft)																																				
BF slope (ft/ft)																																				
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																																				
[3]d16 / d35 / d50 / d84 / d95 /																																				
[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

Table 15d. Monitoring Data - Stream Reach Data Summary
Jacksonville Country Club (DMS# 194) Segment/Reach: C (613 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n	Min	n	Med	Max	SD[4]	n
Bankfull Width (ft)		4						3.9						5.6						6.6						7.3										
Floodprone Width (ft)		7.8						17.4						94.8						132						132										
Bankfull Mean Depth (ft)		0.2						0.2						0.51						0.7						0.8										
[1]Bankfull Max Depth (ft)		0.4						0.7						1.2						1.8						1.9										
Bankfull Cross Sectional Area (ft^2)		0.6						0.9						2.8						4.6						5.8										
Width/Depth Ratio		25.4						16						11.1						9.5						9.1										
Entrenchment Ratio		2						4.5						16.9						20						18										
[1]Bank Height Ratio		**2.1**						**1.6**						**1**						**1**						**1.1**										
Profile																																				
Riffle Length (ft)	4.6	10.5		20			3.4	21.8		52.8			2.7	15.8		48.9			4	11.5		25.3			4.2	17.5		45.6								
Riffle Slope (ft/ft)	0	0.71		3.4			0	0.92		2.9			0	1.4		4.5			0	2.2		6.8			0	1.5		7.2								
Pool Length (ft)	6.3	10.7		14.5			10.6	17		23.4			4	11.7		35.7			5.8	10.2		18			6.7	12.8		21.4								
Pool Max depth (ft)	0.46	1.29		2.11			0.56	1.32		1.73			0.92	1.61		2.38			0.9	1.76		2.32			1.13	1.73		2.47								
Pool Spacing (ft)	13.4	34.1		71.9			15.2	38.8		73.3			19.4	34.1		68.3			15.9	35.5		72.9			18.3	35.8		70.3								
Pattern																																				
Channel Beltwidth (ft)	8	14.8		32																																
Radius of Curvature (ft)	6.1	8.5		11.4																																
Rc:Bankfull width (ft/ft)	**1.53**	**2.13**		**2.85**																																
Meander Wavelength (ft)	43	65.7		89																																
Meander Width Ratio	2	3.7		8																																

Pattern data will not typically be collected unless visual data, dimensional data or profile data indicate significant shifts from baseline

Additional Reach Parameters																																				
Rosgen Classification	B5c						C5						E5						E5						E5											
Channel Thalweg length (ft)																																				
Sinuosity (ft)	1.1						1.3						1.3						1.3						1.3											
Water Surface Slope (Channel) (ft/ft)																																				
BF slope (ft/ft)																																				
[3]Ri% / Ru% / P% / G% / S%																																				
[3]SC% / Sa% / G% / C% / B% / Be%																																				
[3]d16 / d35 / d50 / d84 / d95 /																																				
[2]% of Reach with Eroding Banks																																				
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

Project Name: Jacksonville Country Club
Reach: 1A
Cross Section: CS-1; Riffle

Bankfull
26.3
26.3

Baseline	
0	29.872
3.8398	29.287
11.9994	28.229
20.4785	26.95
30.3465	26.466
34.0253	26.278
35.3144	25.851
37.7925	25.564
38.0095	25.26
38.3379	25.094
38.8898	24.9
39.2296	25.335
40.0053	25.398
41.0395	25.747
42.8953	26.252
48.0732	26.599
55.8552	26.73
59.2382	27.185
63.9148	28.524
66.4565	29.569
68.41	29.74
68.5435	30.219

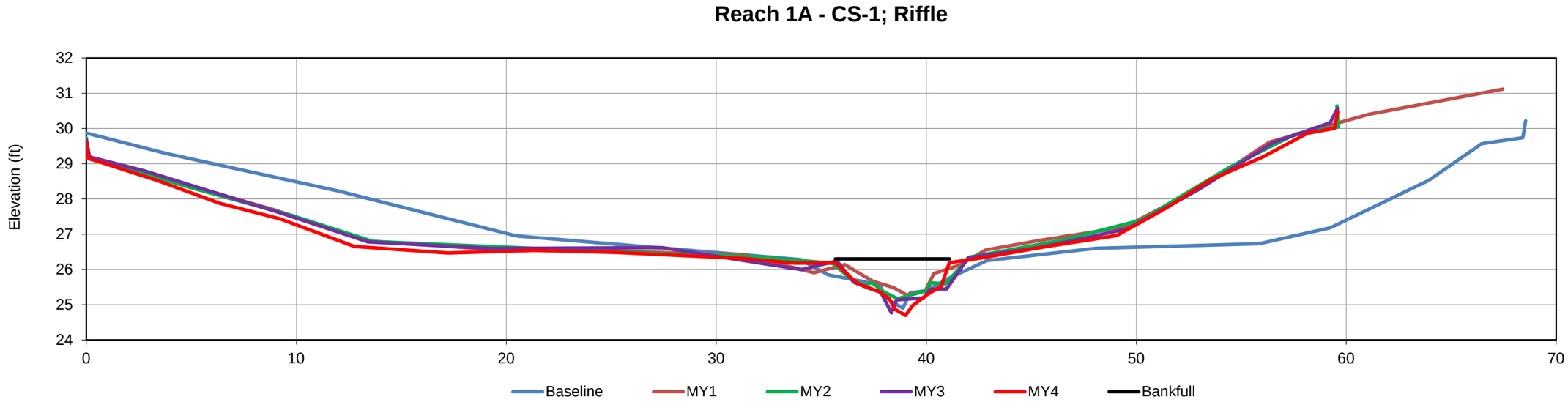
MY 1	
0.00	29.6441
0.02	29.1542
3.43	28.6337
8.93	27.6976
13.38	26.8087
19.50	26.5658
25.55	26.5175
31.40	26.406
34.65	25.9077
36.12	26.1359
37.44	25.6725
37.85	25.5944
38.44	25.4875
39.08	25.2728
39.94	25.3864
40.37	25.8883
41.56	26.1198
42.83	26.5555
45.37	26.8212
49.44	27.2028
53.11	28.3376
56.33	29.6127
61.09	30.4057
67.46	31.117

MY2	
0.00	29.7256
0.12	29.1915
4.95	28.3247
9.81	27.5311
13.66	26.7953
19.26	26.6545
26.32	26.4721
31.97	26.358
35.54	26.1732
36.43	25.7222
36.99	25.5392
37.42	25.6309
37.93	25.3762
38.64	25.1712
40.01	25.4004
40.21	25.624
40.91	25.5848
42.05	26.3476
46.49	26.8326
50.24	27.4016
54.44	28.8968
57.58	29.8423
59.61	30.0418
59.56	30.6416

MY3	
0	29.668
0.15265	29.1946
2.73522	28.806
9.26138	27.6007
13.4012	26.7861
19.3475	26.5962
27.3971	26.6225
34.0459	25.9984
35.7453	26.2424
36.5451	25.6422
37.3143	25.4545
37.8412	25.3532
38.3396	24.7673
38.5888	25.1371
39.8729	25.1944
40.1687	25.433
40.9613	25.446
42.0013	26.3393
45.4464	26.6279
49.574	27.1513
52.9662	28.2692
56.5195	29.6001
59.2283	30.164
59.5855	30.5692

MY4	
0	29.5869
0.09079	29.1535
3.37668	28.5275
6.33591	27.882
9.23753	27.4356
12.7669	26.6501
17.2302	26.4682
21.3714	26.54
25.1971	26.4858
28.7373	26.3857
31.3068	26.3109
33.7317	26.1818
35.6696	26.1861
36.7003	25.6066
37.7607	25.3721
38.249	25.1622
38.5075	24.8689
39.0207	24.6978
39.3307	24.966
40.0191	25.2791
40.7202	25.5296
41.0975	26.1916
42.7323	26.3382
45.5674	26.6352
49.0653	26.9602
51.4499	27.7489
53.5469	28.5455
56.0277	29.1941
58.1465	29.8654
59.4426	30.0044
59.5967	30.4774

Looking downstream at CS 1 (November 2017)

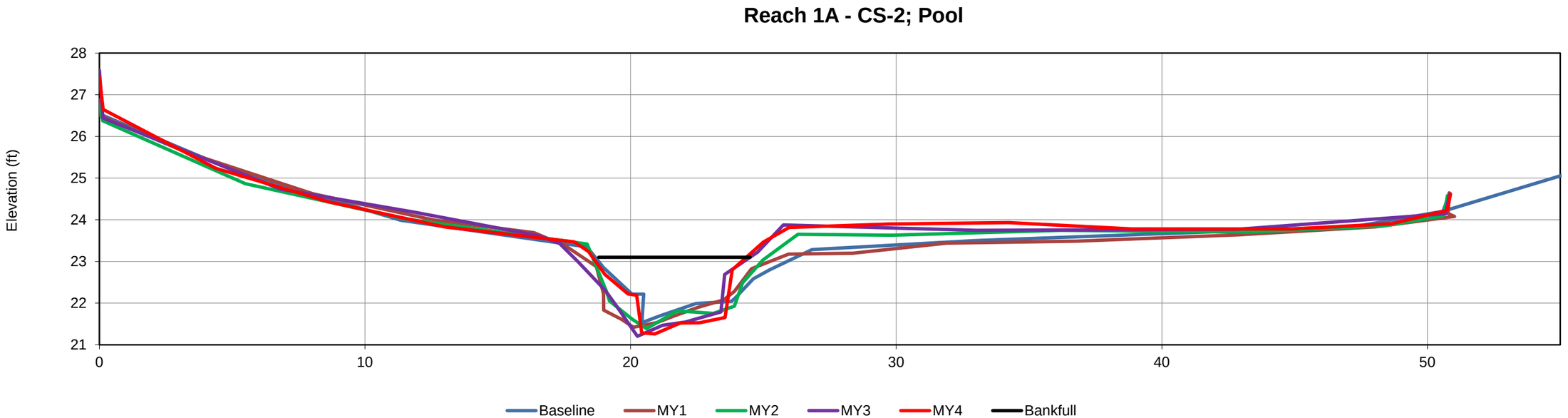


Project Name: Jacksonville Country Club
Reach: 1A
Cross Section: CS-2; Pool

Bankfull
23.1
23.1

Baseline		MY1		MY2		MY3		MY4	
0	26.882	0.00	26.7661	0	26.7761	0	27.5898	0	27.4099
-0.1236	26.573	0.05	26.4899	0.12922	26.3764	0.13509	26.4405	0.14	26.6477
4.91066	25.22	3.23	25.6319	5.4982	24.8656	6.82791	24.733	4.39268	25.2335
11.3404	23.987	8.03	24.6235	11.5476	24.0184	11.8532	24.1833	8.63775	24.428
18.3549	23.349	12.57	23.9982	18.366	23.4196	16.5066	23.6222	13.0014	23.828
18.9754	22.856	16.37	23.6892	19.1033	22.2608	17.3216	23.4349	17.8797	23.4721
20.0551	22.217	17.55	23.3725	19.2054	22.051	18.0295	22.9857	18.4152	23.2376
20.4922	22.217	18.71	22.8787	20.0608	21.6169	19.0427	22.3064	19.0306	22.6904
20.4276	21.531	18.98	22.2216	20.5976	21.3887	19.4321	21.9608	19.8995	22.2197
21.114	21.698	18.99	21.8321	21.7606	21.8145	20.2579	21.2046	20.23	22.1898
22.4646	21.993	19.66	21.6121	23.1116	21.7538	21.2025	21.4695	20.4172	21.288
23.7856	22.038	20.11	21.421	23.9065	21.9267	22.0587	21.5469	20.9119	21.2609
23.9298	22.117	20.99	21.534	24.2121	22.4837	23.4	21.7874	21.873	21.5255
24.6175	22.584	21.65	21.6951	24.9766	23.0343	23.5401	22.6888	22.5963	21.5299
25.2504	22.805	22.53	21.8952	26.2977	23.6536	24.7796	23.2228	23.5546	21.6564
26.832	23.285	23.50	22.0786	29.8387	23.6302	25.7511	23.8754	23.8295	22.7979
32.9515	23.501	23.91	22.2818	36.2082	23.7474	33.0299	23.7447	24.9991	23.4641
47.2695	23.837	24.55	22.8272	43.2881	23.7046	42.8556	23.771	25.9694	23.8151
50.5892	24.204	25.95	23.1779	48.3884	23.8565	50.6886	24.145	29.7348	23.8965
50.8532	24.629	28.36	23.1978	50.5954	24.0941	50.824	24.5982	34.222	23.9328
50.5892	24.204	31.90	23.4404	50.7575	24.5812			38.8513	23.7821
57.8977	25.611	36.79	23.4865					44.9208	23.782
		42.87	23.6384					48.6583	23.9049
		48.01	23.8283					50.746	24.2264
		51.02	24.0802					50.8676	24.6169
		50.78	24.1506						
		50.82	24.6449						

Looking downstream at CS 2 (November 2017)

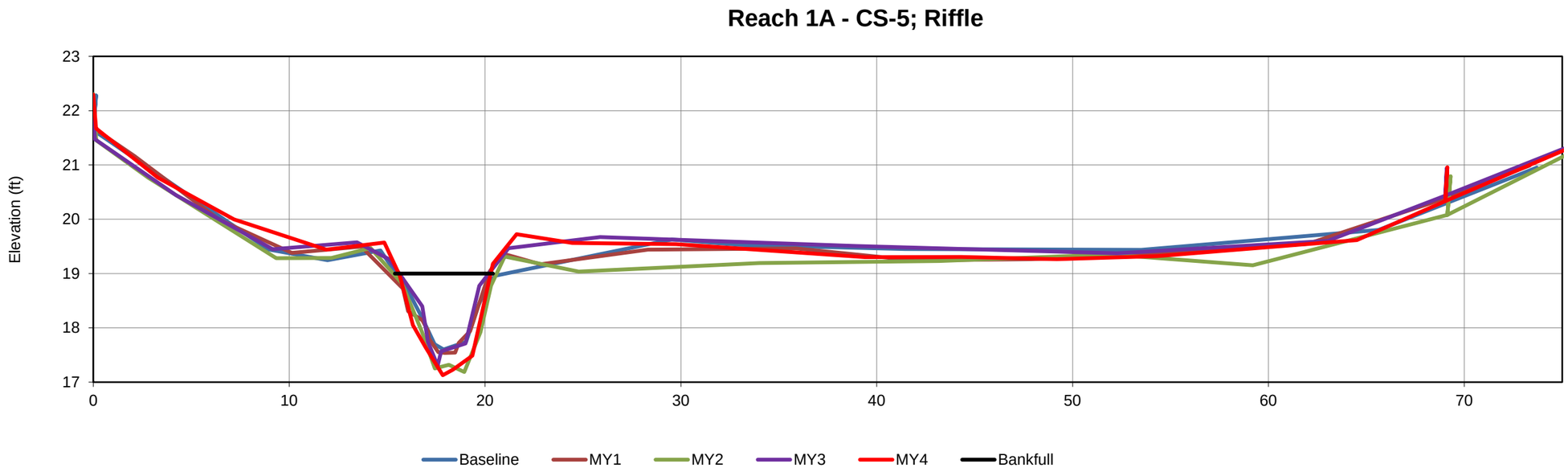


Project Name: Jacksonville Country Club
Reach: 1A
Cross Section: CS-5; Riffle

Bankfull
19
19

Baseline		MY1		MY2		MY3		MY4	
0	21.641	0.00	22.2472	0	22.3053	0	22.1735	0	22.2961
0.14081	22.278	-0.10	21.7089	0.15615	21.4511	0.08254	21.4767	0.13752	21.6717
0	21.641	2.10	21.1638	2.79365	20.7699	4.20874	20.4465	3.29578	20.7694
8.93127	19.444	6.40	19.9986	9.33638	19.285	9.16168	19.4483	7.18472	19.9966
11.9599	19.247	10.14	19.379	12.1624	19.2868	13.4648	19.5755	11.8953	19.442
14.6677	19.425	13.68	19.4963	14.1591	19.4686	15.1185	19.2619	14.8634	19.5729
16.1488	18.634	15.81	18.7218	15.7591	18.8192	16.8007	18.3978	15.6461	18.9634
16.8162	18.166	16.08	18.307	16.7726	17.9282	17.0916	17.7405	16.3227	18.0475
17.4309	17.697	16.80	18.1418	17.4371	17.2508	17.584	17.3005	16.973	17.6379
17.8877	17.602	17.10	17.9376	18.1498	17.3182	17.6224	17.3692	17.467	17.344
19.0341	17.742	17.13	17.8059	18.9403	17.1874	17.7648	17.5654	17.8424	17.128
19.6619	18.419	17.62	17.5504	19.7671	17.9223	19.0026	17.711	18.3586	17.2282
19.9206	18.602	17.95	17.5387	20.3069	18.7797	19.7105	18.7731	19.3602	17.4874
20.4975	18.958	18.48	17.543	20.9994	19.3117	21.2009	19.4648	20.4075	19.1778
29.5408	19.627	18.67	17.7227	24.7879	19.0368	25.8815	19.674	21.6171	19.723
33.0842	19.528	19.24	17.9418	34.0266	19.1948	38.9257	19.5076	24.4567	19.5633
41.459	19.452	20.23	19.0367	43.1906	19.2309	52.2772	19.3736	29.7512	19.5414
53.5022	19.438	20.89	19.37	51.9194	19.3525	63.0242	19.601	39.4182	19.3027
65.6245	19.805	22.84	19.1713	59.1994	19.1518	69.0336	20.4343	44.3246	19.304
73.7041	20.95	28.31	19.4399	69.1317	20.0788	69.1058	20.9372	49.1989	19.2648
		35.87	19.4646	69.3011	20.7917	69.0336	20.434	54.3212	19.3191
		41.93	19.2421	69.1317	20.0788	78.413	21.78	59.7059	19.4767
		47.89	19.2633	78.474	21.78			64.5209	19.615
		55.19	19.3799					69.0292	20.3335
		62.02	19.5498					69.1343	20.9543
		68.30	20.2958					69.0292	20.334
		73.34	20.9893					78.3788	21.78

Looking downstream at CS 5 (November 2017)

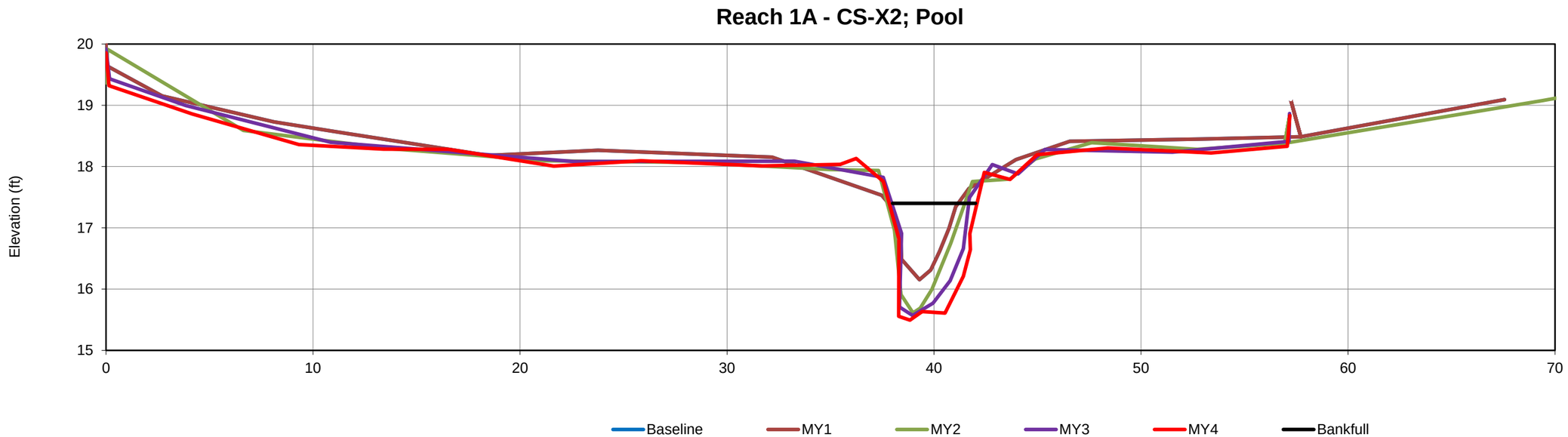


Project Name: Jacksonville Country Club
Reach: 1A
Cross Section: CS-X2; Pool

Bankfull
17.4
17.4

Baseline		MY1		MY2		MY3		MY4	
0	20.136	0.00	20.136	0	19.3639	0	19.9193	0	19.8549
0.00815	19.651	0.01	19.651	0.06532	19.9144	0.16691	19.4317	0.14283	19.3209
2.70842	19.154	2.71	19.154	6.63371	18.589	3.84893	18.9986	4.15395	18.8612
8.11315	18.731	8.11	18.731	13.7723	18.2897	10.8504	18.3956	9.31546	18.3587
11.35	18.555	11.35	18.555	21.2159	18.0934	22.6128	18.0822	13.4025	18.2841
18.4621	18.181	18.46	18.181	28.446	18.067	33.2448	18.0899	16.5415	18.2808
23.767	18.266	23.77	18.266	34.9777	17.9528	37.549	17.8238	21.6324	18.0078
32.1811	18.155	32.18	18.155	37.3173	17.9373	38.4334	16.908	25.8382	18.0963
37.4733	17.532	37.47	17.532	38.0861	16.9607	38.3303	15.7071	31.68	18.0095
37.8784	17.371	37.88	17.371	38.3988	15.9096	38.9695	15.57	35.4614	18.0365
38.3768	16.945	38.38	16.945	38.9801	15.6116	39.9489	15.77	36.2392	18.1327
38.4351	16.485	38.44	16.485	39.3357	15.6907	40.7802	16.1372	37.5496	17.7581
39.293	16.154	39.29	16.154	39.8967	15.9936	41.4118	16.6606	38.3018	16.8205
39.8396	16.312	39.84	16.312	40.8044	16.7484	41.7113	17.4933	38.2934	15.5563
40.2711	16.621	40.27	16.621	41.8533	17.7547	42.8161	18.0318	38.8358	15.4939
40.7253	16.992	40.73	16.992	43.6752	17.7953	44.0589	17.8801	39.4286	15.6339
41.0433	17.346	41.04	17.346	44.8878	18.1236	45.3525	18.2791	40.5333	15.6091
41.6799	17.642	41.68	17.642	47.6148	18.3898	51.5186	18.234	41.4119	16.2088
43.9561	18.114	43.96	18.114	52.73	18.2809	57.1495	18.4127	41.7538	16.6462
46.5589	18.413	46.56	18.413	56.9424	18.3799	57.1751	18.8674	41.7281	16.9024
52.9469	18.45	52.95	18.45	57.1832	18.8388			42.4322	17.9065
57.7137	18.488	57.71	18.488	56.9424	18.3799			43.6737	17.7897
57.233	19.092	57.23	19.092	69.3554	19.074			44.9777	18.196
57.7137	18.488	57.71	18.488	81.8062	19.8301			48.3996	18.303
67.5603	19.095	67.56	19.095					53.3881	18.2234
								57.0612	18.3299
								57.1894	18.833

Looking downstream at CS-X2 (November 2017)

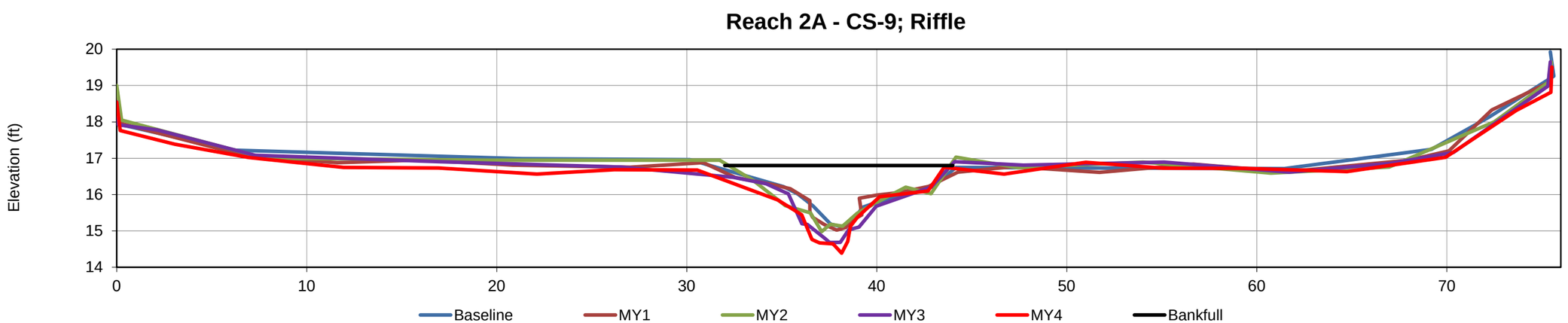


Project Name: Jacksonville Country Club
Reach: 2A
Cross Section: CS-9; Riffle

Bankfull
16.8
16.8

Baseline		MY1		MY2		MY3		MY4	
0	18.668	0.00	18.6985	0	19	0	18.5518	0	18.5413
0.03047	17.946	-0.12	18.0039	0.25904	18.0523	0.09284	17.9191	0.18729	17.7626
6.09708	17.222	2.63	17.6299	7.79233	17.0061	2.13617	17.7771	3.05702	17.3843
21.321	16.99	7.02	17.0419	19.6084	16.9436	7.27676	17.0844	6.95421	17.0171
30.1586	16.961	11.63	16.8793	31.7304	16.9454	16.9872	16.9039	11.9349	16.7457
35.0871	16.218	16.04	16.9497	33.5027	16.3872	26.5346	16.7571	16.9356	16.7307
35.8458	16.014	20.85	16.8085	35.1896	15.6937	32.4437	16.4754	22.1134	16.5646
36.6464	15.685	27.02	16.7506	36.5085	15.4976	34.1762	16.2974	26.1908	16.6859
37.5746	15.19	30.87	16.8774	37.0995	14.9797	35.3517	16.0218	30.5545	16.6751
38.2932	15.095	32.56	16.4693	37.5543	15.1825	36.0589	15.2007	34.7857	15.8531
38.6136	15.167	34.46	16.2815	38.2049	15.128	36.3525	15.1801	36.0485	15.4423
39.2474	15.646	35.45	16.1616	38.9674	15.4865	37.2898	14.7826	36.5879	14.7621
40.0611	15.802	36.48	15.8337	40.0213	15.7961	37.5218	14.6804	36.989	14.6714
42.9587	16.214	36.48	15.528	41.5293	16.2051	38.0857	14.6848	37.7043	14.6425
44.1722	16.748	36.62	15.376	42.861	16.0269	38.5206	15.0313	38.1537	14.3878
51.0992	16.733	37.25	15.1735	44.1722	17.0314	39.0638	15.1064	38.4736	14.7134
61.454	16.714	37.89	15.0223	47.408	16.7427	39.971	15.6792	38.6078	15.1238
69.1872	17.246	38.37	15.0959	54.0175	16.8916	42.8637	16.2084	38.9945	15.3829
72.214	18.129	38.66	15.2805	60.7448	16.5902	44.0963	16.9049	40.1507	15.9416
75.6315	19.261	39.21	15.437	66.9683	16.7561	47.7196	16.8121	42.7008	16.0988
75.451	19.927	39.08	15.8971	72.5027	18.0043	55.1227	16.8948	43.5443	16.7534
		39.98	15.9834	75.3422	19.0882	61.7001	16.6176	46.7044	16.564
		41.20	16.0584	75.5054	19.6414	67.0114	16.8564	51.0077	16.8902
		42.72	16.2228			70.3546	17.1609	55.0563	16.728
		44.27	16.6186			75.315	18.9826	59.4154	16.7188
		47.15	16.7675			75.449	19.6512	64.7496	16.6347
		51.73	16.612					69.9295	17.0252
		56.68	16.8383					73.6411	18.3116
		61.58	16.6258					75.4817	18.8152
		67.99	16.9448					75.5294	19.5081
		70.11	17.203						
		72.36	18.3293						
		75.43	19.0984						
		74.88	19.8096						

Looking downstream at CS-9 (November 2017)

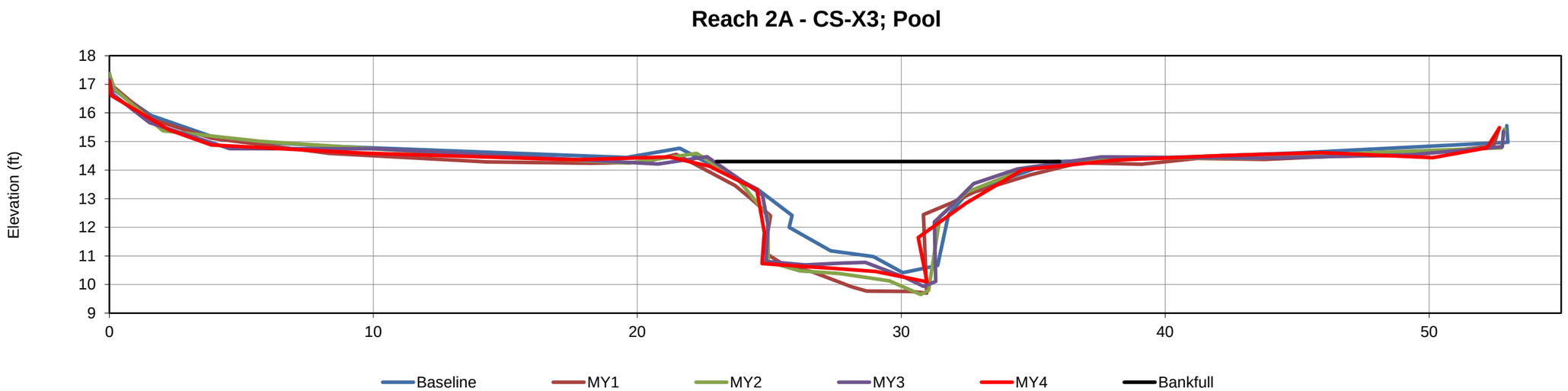


Project Name: Jacksonville Country Club
Reach: 2A
Cross Section: CS-X3; Pool

Bankfull
14.3
14.3

Baseline		MY1		MY2		MY3		MY4	
0	17.387	0.00	17.3498	0	17.3565	0	17.1699	0	17.1122
0.08785	16.861	0.00	17.0387	0.20244	16.8235	0.12545	16.658	0.0677	16.6095
1.58798	15.912	1.61	15.774	2.02547	15.3804	1.52392	15.658	2.25253	15.4143
4.23364	15.058	3.86	15.1168	5.71332	15.0069	4.55797	14.7526	3.85718	14.8828
8.60401	14.827	8.35	14.5814	12.7636	14.5779	10.0783	14.746	9.56027	14.5958
19.591	14.442	14.30	14.2891	19.6665	14.2465	17.0468	14.4044	13.44	14.4853
21.6076	14.763	18.20	14.2403	22.2461	14.5806	20.7824	14.2103	17.6366	14.3599
24.563	13.323	20.24	14.2764	23.8209	13.6701	22.6413	14.472	21.191	14.4615
25.8617	12.415	21.47	14.5522	24.9485	12.3892	23.6202	13.8405	22.7481	14.1294
25.755	11.999	23.71	13.4591	24.9568	10.7963	24.7381	13.1286	24.5268	13.3088
27.3275	11.179	24.25	13.0397	26.1512	10.4816	24.9508	12.0937	24.8145	11.8203
28.9433	10.979	25.05	12.4043	27.6597	10.387	24.8757	10.8087	24.7273	10.7311
30.0622	10.415	24.81	11.1275	29.5534	10.1297	26.3601	10.6887	25.9706	10.6568
31.3764	10.67	25.57	10.6813	30.7359	9.65075	27.7139	10.7491	27.4044	10.5634
31.7833	12.435	26.59	10.4601	31.0382	9.79832	28.6374	10.7752	29.0161	10.4595
32.4324	13.125	28.14	9.915	31.4647	12.3856	30.1682	10.2355	30.9797	10.0957
33.5305	13.561	28.69	9.7737	32.4804	13.2277	30.8372	9.9382	30.6461	11.6395
35.8249	14.295	30.37	9.757	34.5963	14.0048	31.3093	10.106	32.4536	12.849
44.8939	14.599	30.96	9.7017	37.5572	14.4375	31.2547	12.1861	34.5892	14.0139
52.9812	14.974	30.84	12.4447	43.4809	14.4172	31.8754	12.7239	38.1093	14.3481
52.9381	15.555	31.90	12.8539	48.3322	14.6334	32.7439	13.5252	42.1303	14.5126
		32.78	13.2347	52.7449	14.7811	34.3929	14.0401	45.934	14.6131
		34.90	13.8394	52.8529	15.4293	37.5944	14.4646	50.1394	14.437
		36.74	14.2567			43.8924	14.4241	52.1861	14.777
		39.11	14.2054			49.4036	14.5445	52.6638	15.4878
		41.21	14.4094			52.7732	14.8161		
		43.78	14.3749			52.8102	15.3569		
		46.32	14.4806						
		49.09	14.5151						
		52.43	14.8368						
		52.63	15.4203						

Looking downstream at CS-X3 (November 2017)

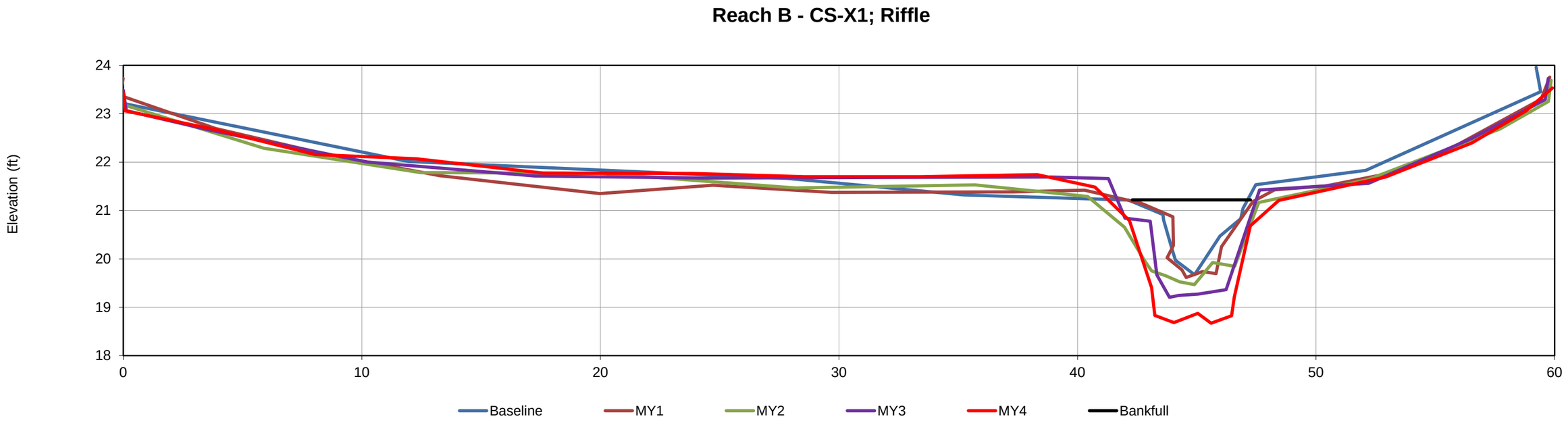


Project Name: Jacksonville Country Club
Reach: B
Cross Section: CS-X1; Riffle

Bankfull
21.22
21.22

Baseline		MY1		MY2		MY3		MY4	
0	23.483	0.00	23.732	0	23.4447	0	23.4867	0	23.4495
-0.6166	23.275	-0.15	23.3803	0.05773	23.1757	0.12818	23.0633	0.07043	23.0605
11.956	22.014	3.88	22.6942	5.88684	22.2892	3.5588	22.6704	3.82412	22.6747
27.8368	21.665	8.43	22.171	12.4611	21.7842	10.2278	22.0011	8.03762	22.1558
35.2505	21.322	13.26	21.7183	20.0004	21.7698	17.2685	21.713	12.2854	22.0697
42.1424	21.217	19.97	21.3489	28.1872	21.4645	24.436	21.6692	17.6032	21.7743
43.5846	20.916	24.71	21.5238	35.6995	21.5304	32.7307	21.684	23.841	21.7664
43.6087	20.81	29.69	21.3725	40.4241	21.2895	38.8801	21.6924	28.5518	21.6974
43.951	20.225	37.32	21.3856	41.9702	20.655	41.2937	21.6604	33.3948	21.6994
44.1044	19.971	40.30	21.4199	42.8188	19.9547	41.9904	20.8425	38.3067	21.7422
44.904	19.672	42.68	21.1476	43.1023	19.75	43.0456	20.7782	40.7295	21.4847
45.9742	20.47	44.00	20.8711	43.7038	19.6475	43.3279	19.6677	42.1744	20.7916
46.8442	20.83	44.02	20.2784	44.281	19.5269	43.8569	19.2048	43.104	19.4048
46.9401	21.043	43.76	20.0238	44.8962	19.468	44.2325	19.2452	43.2376	18.8313
47.4758	21.533	44.38	19.774	45.6615	19.9237	45.059	19.2729	44.0388	18.6811
52.0871	21.829	44.56	19.6151	46.5853	19.8455	46.2283	19.3647	45.0441	18.874
59.4151	23.455	45.24	19.7358	47.5941	21.1662	47.6276	21.4221	45.5988	18.6699
59.2239	23.958	45.81	19.696	52.1693	21.6373	52.198	21.5617	46.4559	18.8231
		46.04	20.2531	57.7053	22.6818	56.5058	22.4851	46.5703	19.2111
		47.35	21.1831	59.7429	23.2541	59.6044	23.2917	47.2468	20.6821
		48.26	21.4266	59.853	23.692	59.7336	23.7308	48.4394	21.2097
		50.41	21.5065					52.9153	21.6931
		53.08	21.768					56.5381	22.3956
		55.70	22.2998					58.8075	23.0593
		59.43	23.3014					59.9075	23.5321
		59.80	23.7573						

Looking downstream at CS-X1 (November 2017)

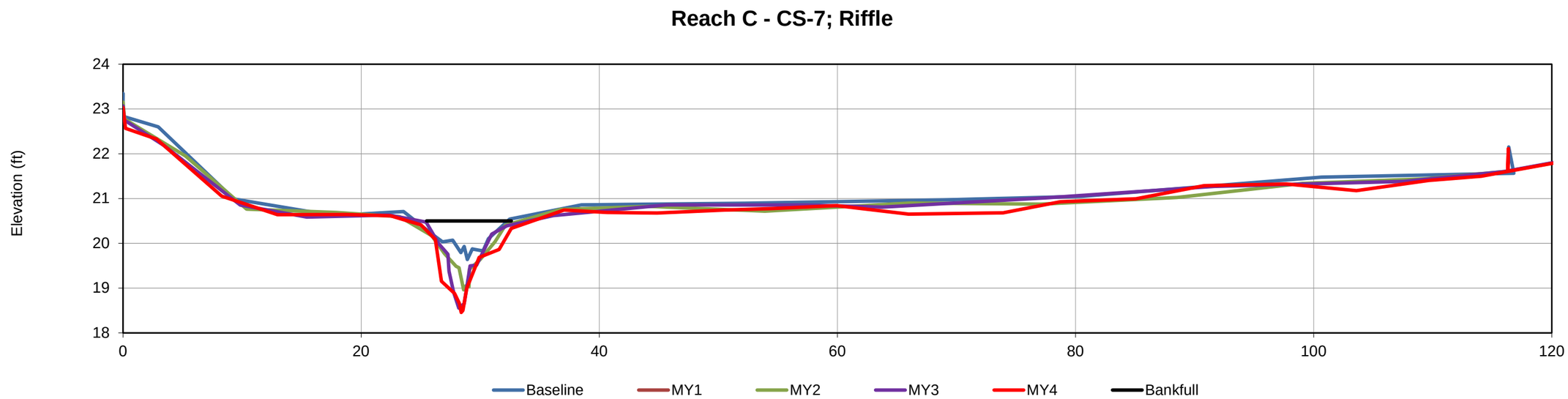


Project Name: Jacksonville Country Club
Reach: C
Cross Section: CS-7; Riffle

Bankfull
20.5
20.5

Baseline		MY1		MY2		MY3		MY4		MY4 contd.	
0	23.344	0	23.1438	0	23.156	0	23.0685	0	23.0296	103.586	21.1772
-0.008	22.837	3.8E-05	22.7715	0.13818	22.7736	0.09489	22.7549	0.20099	22.5698	109.637	21.4055
2.95515	22.6	2.02054	22.5659	5.25248	21.9494	3.423	22.19	2.82185	22.3296	114.078	21.4982
9.30797	20.99	4.51761	21.9127	10.3848	20.7658	9.84392	20.8562	8.29719	21.0525	116.311	21.6069
17.669	20.618	9.44018	20.8169	17.9218	20.6894	15.4444	20.5844	12.9667	20.6404	116.352	22.1103
23.5666	20.71	12.701	20.6076	23.2364	20.593	22.3325	20.6316	18.7293	20.6451	116.311	21.6069
26.0693	20.182	18.3812	20.6852	25.9416	20.1681	25.4611	20.4763	22.4745	20.6172	122.221	21.8925
26.8327	20.035	23.9404	20.4611	26.9948	19.7716	26.5309	19.9868	25.016	20.4141	129.853	21.9858
27.6852	20.071	23.847	20.5253	27.9647	19.4899	27.2832	19.7571	26.2289	20.0886	139.338	22.405
28.3705	19.793	26.1507	20.0197	28.2155	19.4567	27.3813	19.3774	26.7482	19.1527	150.515	23.6197
28.6524	19.929	27.3871	19.9653	28.6117	18.9624	27.7731	18.9052	27.8454	18.8826		
28.9192	19.639	28.7216	19.591	28.8063	19.0541	28.209	18.5531	28.2472	18.6584		
29.3438	19.875	29.4256	19.3022	29.0571	19.0284	28.6501	18.6554	28.4099	18.4567		
29.4648	19.866	29.2247	19.7189	29.0883	19.4166	29.1439	19.4962	28.5433	18.5019		
30.2346	19.831	29.7371	19.6765	30.0083	19.6417	29.6892	19.512	28.8648	18.9975		
30.6943	20.102	30.8326	19.8217	31.2456	20.0367	30.9678	20.2083	29.9186	19.6871		
32.4708	20.541	32.4674	20.3963	32.1121	20.4038	32.2426	20.3936	31.5855	19.8637		
38.5036	20.859	33.3184	20.5255	36.7348	20.7568	36.1417	20.6192	32.6119	20.3361		
52.2254	20.897	37.2558	20.7281	44.1365	20.8275	45.6395	20.8596	37.0328	20.7422		
68.8663	20.97	45.4275	20.7955	53.9212	20.7179	57.4483	20.8547	40.668	20.6914		
80.4744	21.05	54.2607	20.8105	66.0828	20.9013	63.7976	20.8087	44.8431	20.6784		
100.661	21.478	63.2065	20.8496	77.0937	20.8759	77.5191	21.0175	50.4987	20.7415		
116.813	21.565	71.8458	21.0011	88.5243	21.0255	91.6666	21.2715	54.4773	20.7754		
116.375	22.152	79.1737	21.0771	99.0672	21.339	107.564	21.385	59.9277	20.842		
		88.2064	21.1291	109.381	21.4425	115.999	21.6033	65.9817	20.6515		
		96.6109	21.4044	116.162	21.6076	121.922	21.8925	73.9119	20.6805		
		104.31	21.5104	122.092	21.8925	129.554	21.9858	78.7216	20.929		
		111.272	21.5082	129.724	21.9858	139.039	22.405	85.0851	20.9955		
		116.245	21.599	139.209	22.405	150.216	23.6197	90.8061	21.2871		
				150.386	23.6197			97.6978	21.3252		

Looking downstream at CS-7 (November 2017)

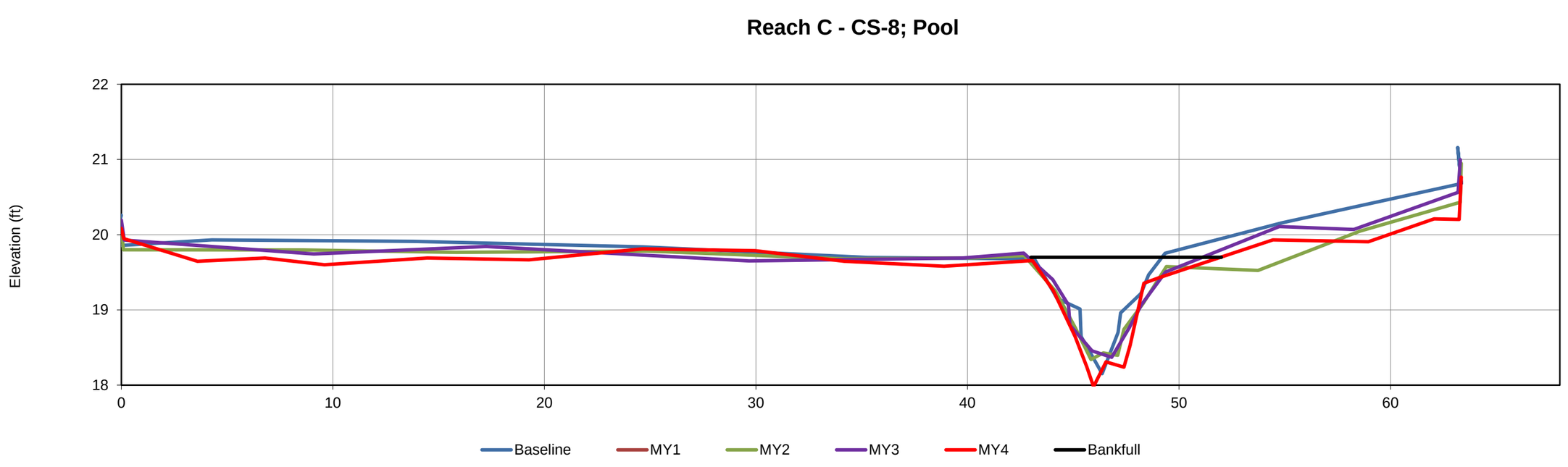


Project Name: Jacksonville Country Club
Reach: C
Cross Section: CS-8; Pool

Bankfull
19.7
19.7

Baseline		MY1		MY2		MY3		MY4	
0	20.26	0.00	20.1715	0	20.1441	0	20.1935	0	20.0849
-0.3907	19.85	-0.21	19.7283	0.09587	19.7995	0.13528	19.9288	0.10966	19.9469
4.27694	19.93	2.75	19.621	8.59386	19.7983	9.09502	19.7438	3.59744	19.6466
13.8257	19.912	9.58	19.7864	15.8374	19.7651	17.2405	19.8445	6.78522	19.6912
24.6438	19.839	17.12	19.6396	24.8774	19.7828	29.6772	19.6519	9.59623	19.6009
35.2746	19.697	25.54	19.5826	34.1883	19.6785	39.7684	19.6895	14.4606	19.6897
43.1636	19.678	32.39	19.5915	40.3919	19.6924	42.6495	19.7572	19.271	19.666
44.2267	19.156	39.13	19.5851	42.6829	19.7217	44.0278	19.4037	24.6455	19.8116
44.612	19.104	42.27	19.3821	44.1587	19.2503	44.768	19.0659	29.9594	19.7881
45.3187	19.011	44.06	19.0739	45.0932	18.7645	44.8395	18.7989	34.1818	19.6472
45.3679	18.647	45.60	18.5898	45.8359	18.3408	45.884	18.4557	38.8938	19.5814
46.3626	18.153	45.72	18.2052	46.4132	18.4283	46.8159	18.3703	43.0642	19.6561
47.1172	18.702	46.37	18.1198	47.1007	18.3981	47.6524	18.7657	44.0649	19.2519
47.234	18.962	46.73	18.0411	47.3976	18.7424	48.2204	19.0716	45.0858	18.6467
48.1966	19.219	47.05	18.1292	48.2925	19.0834	49.3572	19.5042	45.6413	18.245
48.5602	19.467	47.67	18.4681	49.4016	19.5754	54.7406	20.1093	45.958	17.9804
49.342	19.753	47.48	18.5992	53.7357	19.5258	58.2588	20.0693	46.5461	18.3086
54.8481	20.157	47.46	18.7959	58.5525	20.0476	63.1896	20.5639	47.3895	18.2402
63.3417	20.681	48.40	18.8499	63.2899	20.4316	63.2953	20.9974	47.6914	18.5316
63.1743	21.158	49.40	19.3348	63.3398	20.9486			48.3381	19.356
63.3417	20.681	51.69	19.6201					49.0985	19.4338
		58.66	19.9724					54.4352	19.9304
		66.09	20.4363					58.9489	19.907
								62.0591	20.2118
								63.2382	20.204
								63.3403	20.766

Looking downstream at CS-8 (November 2017)



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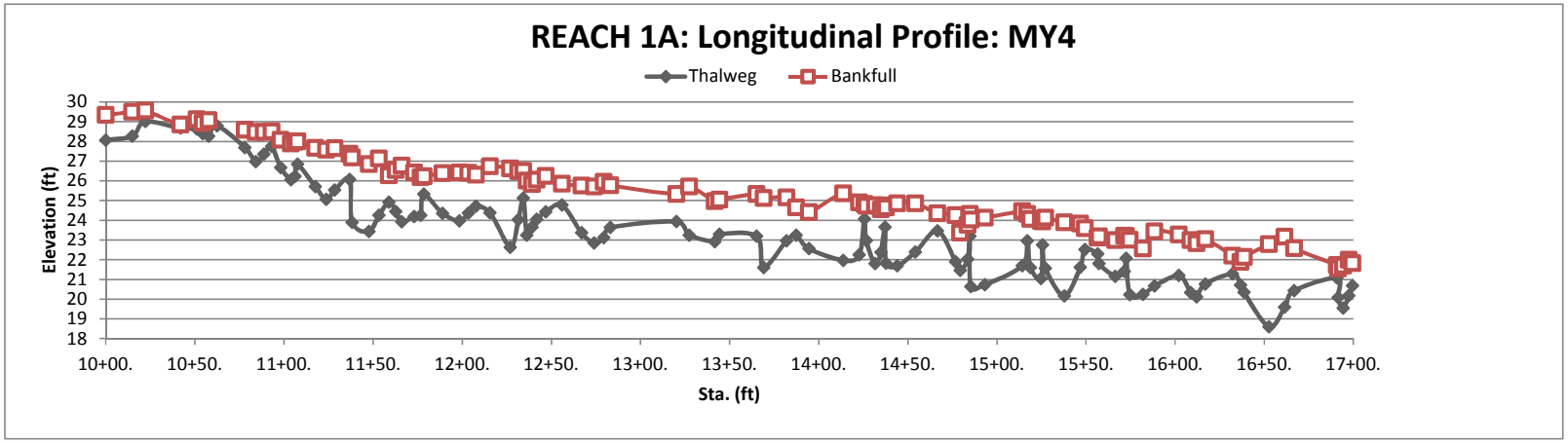

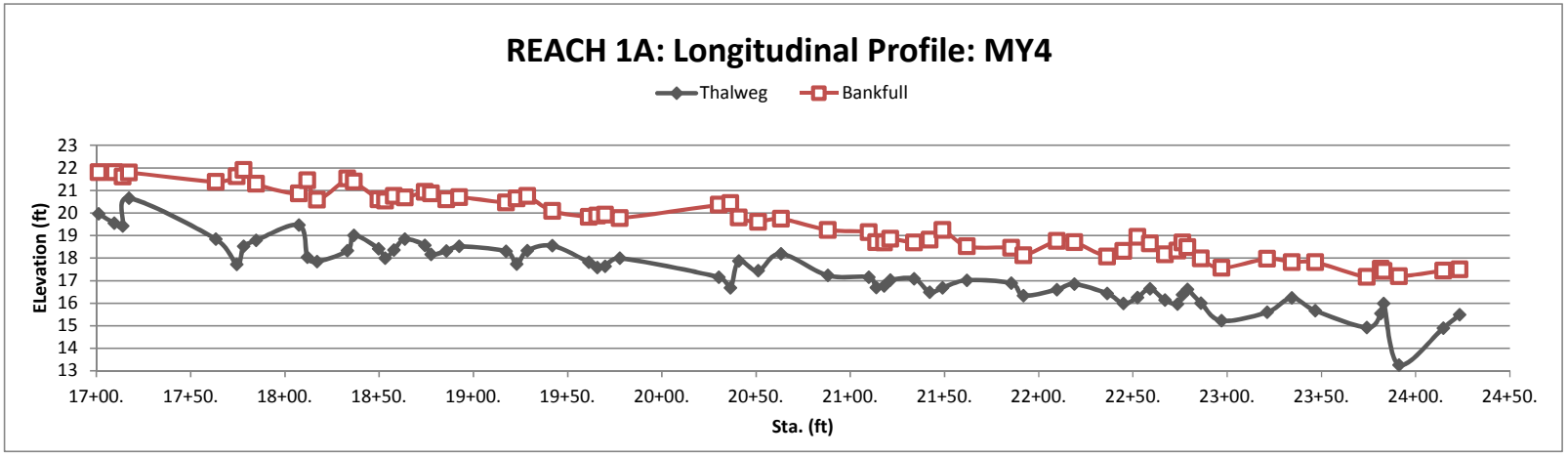

	Minimum	Mean	Max
Bankfull Slope		0.0083	
Pool-Pool Spacing (ft)	8.3	30.3	62.2
Pool Length (ft)	5.5	13.6	28.9
Riffle Length (ft)	1.5	17.8	52.5
Dmax Riffle (ft)	0.55	1.63	2.51
Dmax Pool (ft)	0.53	2.64	4.18

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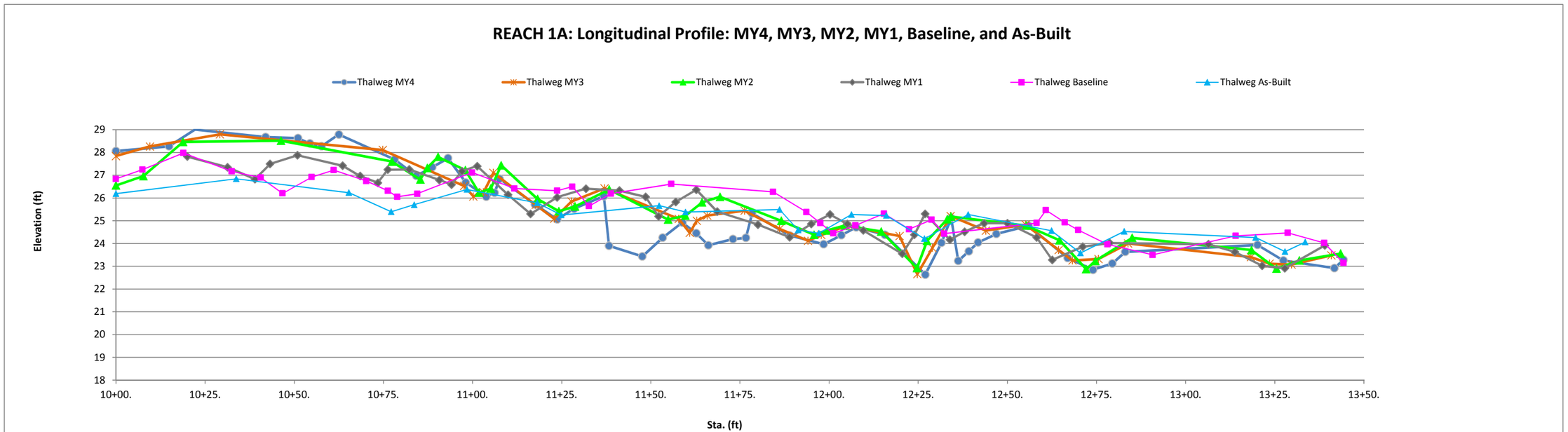
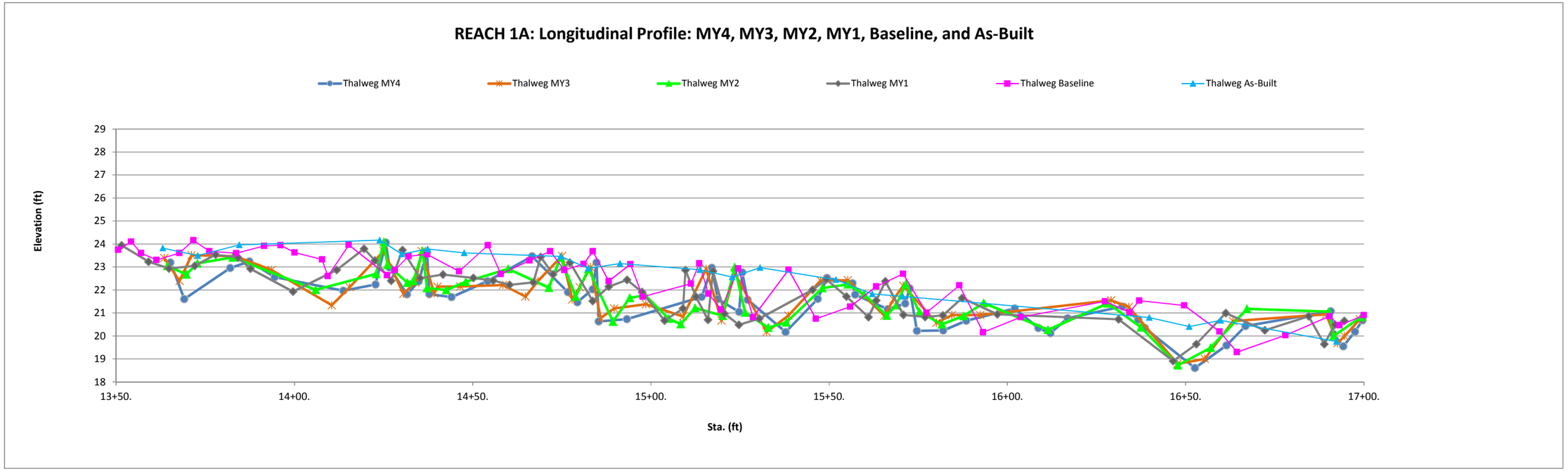
REACH 1A: MY4 LONGITUDINAL PROFILE DATA - UPSTREAM REACH

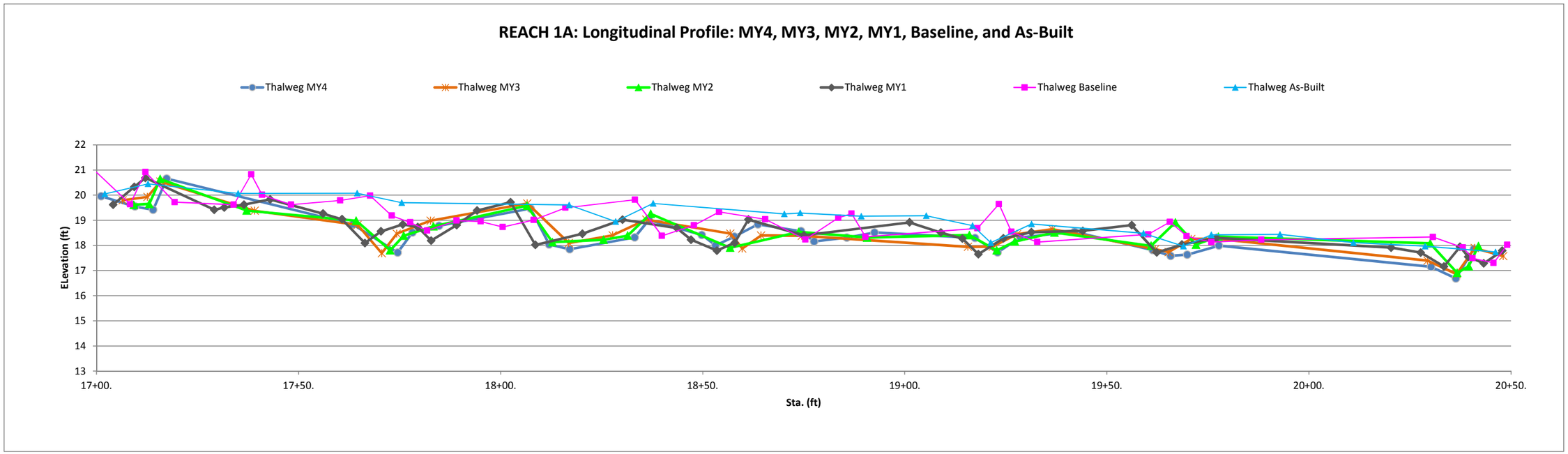
Sta.	Distance	ELEV-TW	BKF	Sta.	Distance	ELEV-TW	BKF
10+00.	0	28.0599	29.3356	12+66.91	266.9106	23.3642	25.7529
10+14.9	14.896396	28.2684	29.4955	12+74.02	274.018	22.8429	25.7037
10+22.17	22.166537	29.0039	29.5562	12+79.41	279.4108	23.1203	25.9408
10+41.94	41.944868	28.6727	28.8533	12+83.04	283.0438	23.6325	25.7705
10+51.03	51.030299	28.6263	29.1289	13+20.16	320.1594	23.9358	25.3342
10+54.38	54.382545	28.3947	28.9291	13+27.41	327.4059	23.2504	25.7074
10+57.65	57.651637	28.2679	29.0664	13+41.72	341.7219	22.9186	24.97
10+62.51	62.506041	28.7887		13+44.24	344.2439	23.2857	25.0489
10+78.12	78.116642	27.6892	28.5764	13+65.22	365.2211	23.1967	25.3335
10+84.2	84.203761	26.9715	28.4665	13+69.09	369.0872	21.6076	25.1312
10+88.71	88.706843	27.35	28.4728	13+81.98	381.9759	22.9543	25.1494
10+93.11	93.110368	27.7483	28.5029	13+87.36	387.3628	23.2443	24.6471
10+98.1	98.097579	26.6786	28.0847	13+94.45	394.4508	22.5592	24.41
11+03.86	103.859551	26.0549	27.8922	14+13.71	413.7052	21.9675	25.3668
11+06.19	106.187024	26.2291	27.9781	14+22.73	422.733	22.241	24.9008
11+07.57	107.566233	26.8407	28.0015	14+25.67	425.6671	24.0588	24.8232
11+17.52	117.515408	25.7133	27.6674	14+26.65	426.6511	22.977	24.7215
11+23.74	123.740604	25.0574	27.5688	14+31.56	431.5632	21.8113	24.763
11+28.49	128.486070	25.5273	27.6589	14+34.87	434.8658	22.3775	24.5527
11+36.84	136.837652	26.0794	27.3663	14+37.2	437.1977	23.6506	24.7452
11+38.29	138.288352	23.8954	27.1801	14+37.82	437.8217	21.8206	24.6476
11+47.62	147.618963	23.4324	26.8388	14+44.08	444.0782	21.6878	24.8584
11+53.33	153.328656	24.2571	27.1233	14+54.19	454.1915	22.3835	24.8587
11+58.86	158.858106	24.9216	26.2706	14+66.65	466.6478	23.465	24.3574
11+62.78	162.776672	24.4478	26.5483	14+76.73	476.726	21.9071	24.2548
11+66.12	166.115476	23.922	26.7593	14+79.35	479.352	21.4644	23.3626
11+73.02	173.021460	24.1934	26.4235	14+83.64	483.6363	22.0314	23.7697
11+76.64	176.644214	24.2474	26.1775	14+84.74	484.7361	23.199	24.3196
11+78.39	178.386048	25.3219	26.2235	14+85.36	485.36	20.6316	24.0385
11+89.04	189.038383	24.3461	26.3876	14+93.24	493.2413	20.7303	24.1283
11+98.45	198.454011	23.9655	26.4261	15+14.24	514.2379	21.6979	24.4545
12+03.42	203.423608	24.3669	26.396	15+17.08	517.0792	22.9647	24.3144
12+07.59	207.589049	24.7121	26.3078	15+18.76	518.762	21.6036	24.0653
12+15.63	215.631956	24.3807	26.7333	15+24.71	524.714	21.0472	23.948
12+27.	226.996679	22.6337	26.6209	15+25.64	525.6362	22.7613	23.9317
12+31.52	231.519495	24.0352	26.4846	15+27.11	527.1112	21.5728	24.1205
12+34.25	234.247861	25.1246	26.4993	15+37.75	537.7484	20.165	23.8982
12+36.23	236.225261	23.2375	26.0122	15+46.76	546.7639	21.6123	23.8333
12+39.19	239.189467	23.6594	25.8383	15+49.38	549.3754	22.5232	23.5846
12+41.77	241.771264	24.0464	26.0592	15+56.52	556.5217	22.2933	23.12
12+46.88	246.881296	24.4214	26.2467	15+57.29	557.2873	21.7979	23.1857
12+55.93	255.933413	24.7774	25.8557	15+66.38	566.376	21.1623	22.9935
				15+71.33	571.3347	21.4154	23.2072

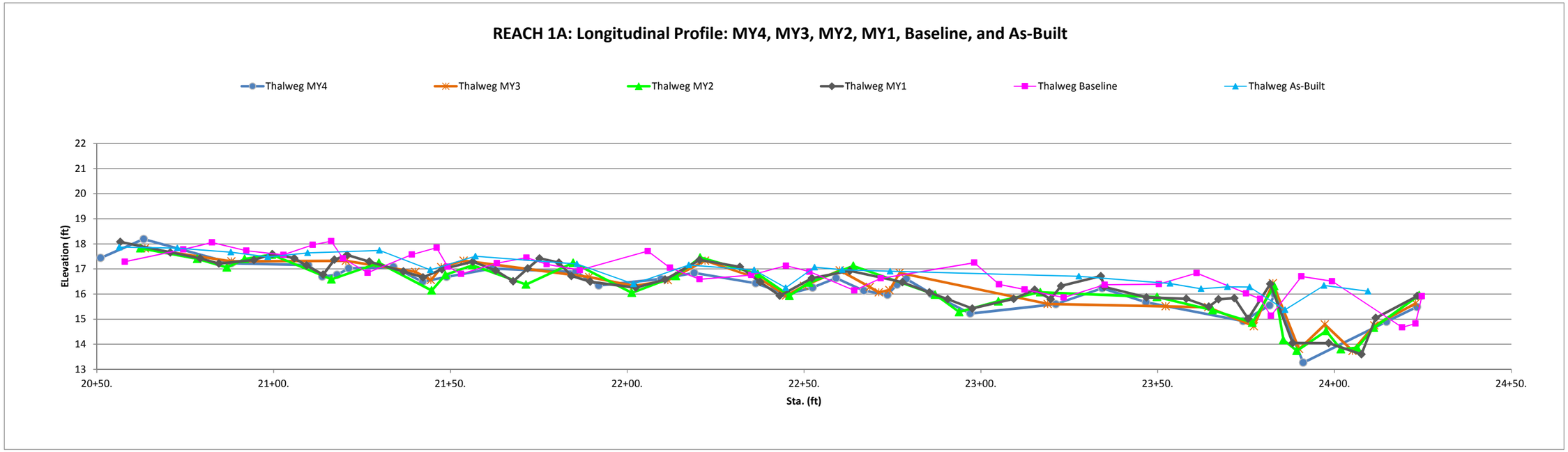
REACH 1A: MY4 LONGITUDINAL PROFILE DATA - UPSTREAM REACH

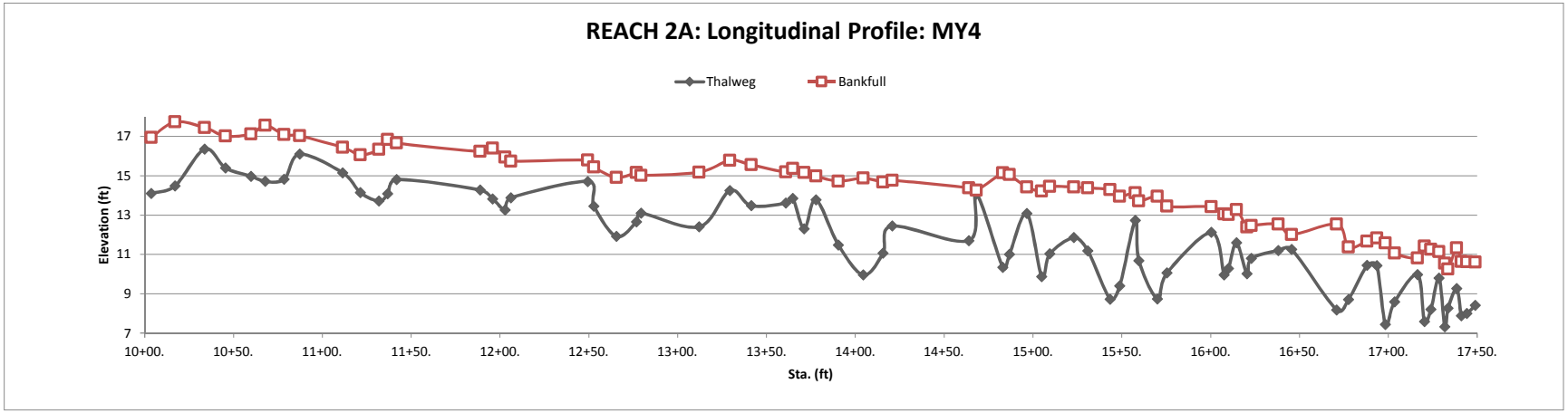
Sta.	Distance	ELEV-TW	BKF
15+72.55	572.5465392	22.0681	23.1996
15+74.59	574.5940142	20.2225	23.0138
15+81.99	581.9892542	20.2401	22.5712
15+88.43	588.4323008	20.6635	23.4408
16+02.04	602.0376788	21.1979	23.2755
16+08.68	608.6787836	20.3427	22.9964
16+12.03	612.0335871	20.1199	22.8381
16+16.87	616.8738702	20.7691	23.0365
16+32.2	632.1989222	21.2786	22.1984
16+36.7	636.7013667	20.7089	21.881
16+38.52	638.5202267	20.347	22.1356
16+52.6	652.5996967	18.605	22.7859
16+61.44	661.4352442	19.5919	23.1594
16+66.78	666.775479	20.4305	22.579
16+90.71	690.7107262	21.0718	21.7229
16+91.47	691.4681822	20.0794	21.5512
16+94.22	694.218743	19.5512	21.6961
16+97.46	697.4636123	20.1799	21.998
16+99.57	699.5686136	20.6766	21.8264
17+01.15	701.1501656	19.9597	21.7991
17+09.5	709.5049156	19.549	21.8098
17+14.01	714.0111477	19.4184	21.6155
17+17.36	717.35714	20.6559	21.7844
17+63.4	763.3982245	18.836	21.3793
17+74.53	774.5277531	17.7145	21.6207
17+78.16	778.1593115	18.516	21.9061
17+84.72	784.7248458	18.7806	21.2881
18+07.38	807.3807342	19.4689	20.8567
18+11.96	811.9624275	18.0398	21.4429
18+17.08	817.0788862	17.8498	20.5796
18+33.14	833.1431636	18.3214	21.521
18+36.68	836.6794406	19.0116	21.3926
18+49.75	849.7478977	18.4153	20.6016
18+53.15	853.150312	18.001	20.5386
18+57.8	857.800668	18.3511	20.7556
18+63.63	863.6340098	18.8383	20.6827
18+74.33	874.329029	18.5669	20.9257
18+77.56	877.5637268	18.1595	20.8622
18+85.63	885.6298679	18.3127	20.5944
18+92.47	892.4727783	18.5173	20.6993
19+17.35	917.3548594	18.2984	20.4627
19+22.94	922.9368614	17.7257	20.6385
19+28.57	928.5723538	18.3232	20.75
19+41.98	941.9793115	18.5436	20.0847
19+61.31	961.3114443	17.8128	19.829
19+65.76	965.7618	17.5838	19.8757
19+69.88	969.8783	17.6316	19.9203
19+77.69	977.6901	17.9942	19.7681
20+30.2	1030.201	17.1494	20.3585
20+36.35	1036.348	16.6866	20.4373
20+40.79	1040.794	17.8655	19.798
20+51.08	1051.076	17.4388	19.6078
20+63.26	1063.257	18.1894	19.7372
20+88.09	1088.086	17.2283	19.2489
21+09.84	1109.84	17.1536	19.1408
21+13.75	1113.746	16.6933	18.6998
21+17.95	1117.953	16.768	18.6887
21+21.25	1121.248	17.0233	18.8581
21+33.89	1133.89	17.0806	18.6912
21+42.13	1142.127	16.4903	18.8137
21+48.9	1148.904	16.6797	19.244
21+61.86	1161.856	17.0175	18.525
21+85.42	1185.417	16.8822	18.4497
21+91.94	1191.945	16.3402	18.1205
22+09.57	1209.573	16.6017	18.7508
22+18.93	1218.926	16.8435	18.7009
22+36.37	1236.372	16.4276	18.0652
22+44.99	1244.99	15.987	18.3153
22+52.45	1252.453	16.2569	18.9392
22+59.06	1259.06	16.6363	18.6478
22+66.92	1266.917	16.1347	18.1637
22+73.58	1273.575	15.9663	18.325
22+76.28	1276.281	16.3723	18.6927
22+78.93	1278.93	16.6037	18.4752
22+86.02	1286.023	16.0048	17.9855
22+97.	1296.997	15.2212	17.5636
23+21.19	1321.189	15.5977	17.9648
23+34.27	1334.268	16.234	17.8186
23+46.67	1346.67	15.6703	17.8091
23+74.15	1374.146	14.9216	17.1615
23+81.62	1381.625	15.5482	17.5207
23+83.06	1383.061	15.9896	17.4341
23+91.17	1391.174	13.2645	17.1934
24+14.69	1414.686	14.8971	17.4438
24+23.3	1423.298	15.4864	17.4906


REACH 1A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built
Thalweg MY4
Thalweg MY3
Thalweg MY2
Thalweg MY1
Thalweg Baseline
Thalweg As-Built
Elevation (ft)
29
28
27
26
25
24
23
22
21
20
19
18
10+00.
10+25.
10+50.
10+75.
11+00.
11+25.
11+50.
11+75.
12+00.
12+25.
12+50.
12+75.
13+00.
13+25.
13+50.
Sta. (ft)


REACH 1A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built
Thalweg MY4
Thalweg MY3
Thalweg MY2
Thalweg MY1
Thalweg Baseline
Thalweg As-Built
Elevation (ft)
29
28
27
26
25
24
23
22
21
20
19
18
13+50.
14+00.
14+50.
15+00.
15+50.
16+00.
16+50.
17+00.
Sta. (ft)


REACH 1A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built
Thalweg MY4
Thalweg MY3
Thalweg MY2
Thalweg MY1
Thalweg Baseline
Thalweg As-Built
Elevation (ft)
22
21
20
19
18
17
16
15
14
13
17+00.
17+50.
18+00.
18+50.
19+00.
19+50.
20+00.
20+50.
Sta. (ft)


REACH 1A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built
Thalweg MY4
Thalweg MY3
Thalweg MY2
Thalweg MY1
Thalweg Baseline
Thalweg As-Built
Elevation (ft)
22
21
20
19
18
17
16
15
14
13
20+50.
21+00.
21+50.
22+00.
22+50.
23+00.
23+50.
24+00.
24+50.
Sta. (ft)

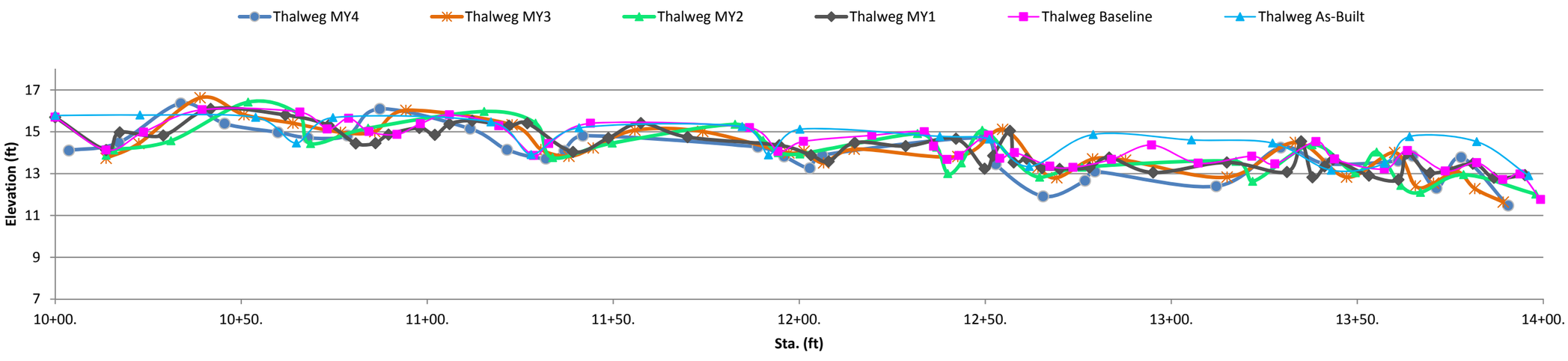


	Minimum	Mean	Max
Bankfull Slope		0.0086	
Pool-Pool Spacing (ft)	9.4	40.1	88.6
Pool Length (ft)	1.9	11.6	25
Riffle Length (ft)	7.9	26.9	47
Dmax Riffle	0.93	1.68	2.57
Dmax Pool (ft)	1.52	3.56	5.57

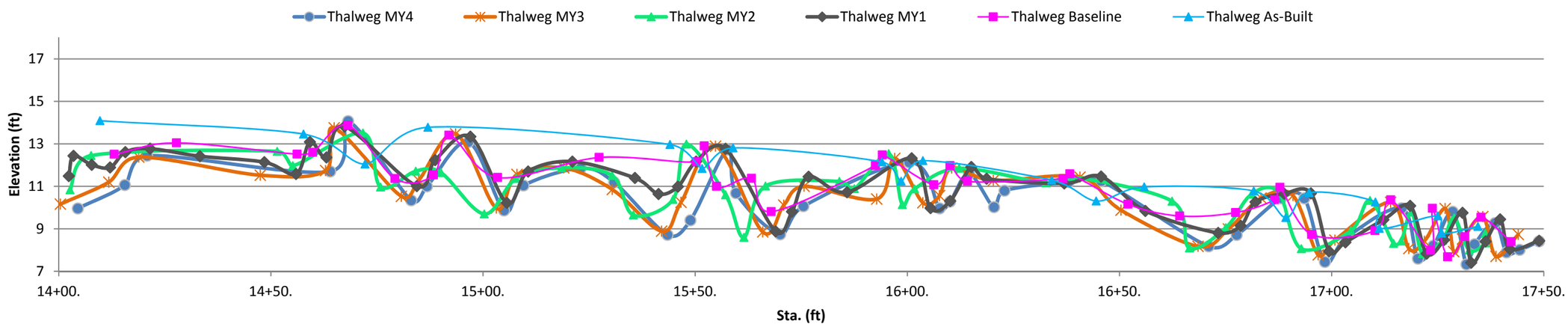
Reach 2A: MY4 Longitudinal Profile Data

Sta.	Distance	ELEV-TW	BKF
10+03.68	3.7	14.1034	16.9372
10+17.08	17.1	14.4847	17.7327
10+33.75	33.7	16.3581	17.4472
10+45.52	45.5	15.393	17.0176
10+59.88	59.9	14.9737	17.1186
10+67.89	67.9	14.7168	17.5606
10+78.54	78.5	14.8173	17.0859
10+87.25	87.3	16.094	17.0244
11+11.51	111.5	15.1457	16.4386
11+21.45	121.5	14.1396	16.0631
11+31.89	131.9	13.7139	16.3319
11+36.83	136.8	14.0846	16.8447
11+41.83	141.8	14.8099	16.6559
11+88.88	188.9	14.2744	16.2272
11+95.93	195.9	13.8212	16.3897
12+02.81	202.8	13.2599	15.9433
12+06.16	206.2	13.879	15.7363
12+49.46	249.5	14.7072	15.7869
12+52.84	252.8	13.4484	15.4357
12+65.54	265.5	11.9124	14.9066
12+76.81	276.8	12.6598	15.1528
12+79.45	279.5	13.0993	15.0169
13+12.07	312.1	12.3969	15.1775
13+29.41	329.4	14.245	15.7833
13+41.42	341.4	13.4756	15.5524
13+60.97	361.0	13.6051	15.1841
13+64.88	364.9	13.8401	15.3572
13+71.26	371.3	12.3062	15.154
13+77.89	377.9	13.7788	14.9773
13+90.54	390.5	11.4711	14.7238
14+04.49	404.5	9.9585	14.8779
14+15.58	415.6	11.0625	14.6791
14+20.82	420.8	12.4422	14.7675
14+63.97	464.0	11.6988	14.3846
14+68.19	468.2	14.071	14.2532
14+83.07	483.1	10.342	15.1479
14+86.78	486.8	10.9991	15.0518
14+96.54	496.5	13.0862	14.4232
15+04.96	505.0	9.864	14.2143
15+09.54	509.5	11.0387	14.4474
15+23.01	523.0	11.8521	14.4253
15+30.9	530.9	11.1854	14.3767
15+43.48	543.5	8.716	14.2901
15+48.87	548.9	9.4021	13.9503
15+57.58	557.6	12.7304	14.1328
15+59.62	559.6	10.679	13.7177
15+70.04	570.0	8.7371	13.9547
15+75.5	575.5	10.0636	13.4483
16+00.46	600.5	12.1242	13.4167
16+07.63	607.6	9.9633	13.0553
16+10.08	610.1	10.2829	13.0295
16+14.55	614.6	11.5914	13.2762
16+20.42	620.4	10.0176	12.3897
16+22.91	622.9	10.7955	12.466
16+38.05	638.0	11.2024	12.5359
16+45.7	645.7	11.2508	12.009
16+71.01	671.0	8.1716	12.5402
16+77.62	677.6	8.7112	11.3656
16+88.08	688.1	10.438	11.6669
16+93.57	693.6	10.4335	11.8297
16+98.41	698.4	7.4392	11.5756
17+03.55	703.5	8.5951	11.0567
17+16.47	716.5	9.9674	10.808
17+20.35	720.3	7.5924	11.419
17+23.98	724.0	8.2022	11.2606
17+28.54	728.5	9.801	11.1382
17+31.79	731.8	7.323	10.5549
17+33.7	733.7	8.2706	10.2593
17+38.51	738.5	9.2679	11.3346
17+41.21	741.2	7.8873	10.6431
17+44.31	744.3	8.0071	10.6266
17+48.89	748.9	8.4084	10.6043

REACH 2A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built



REACH 2A: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built



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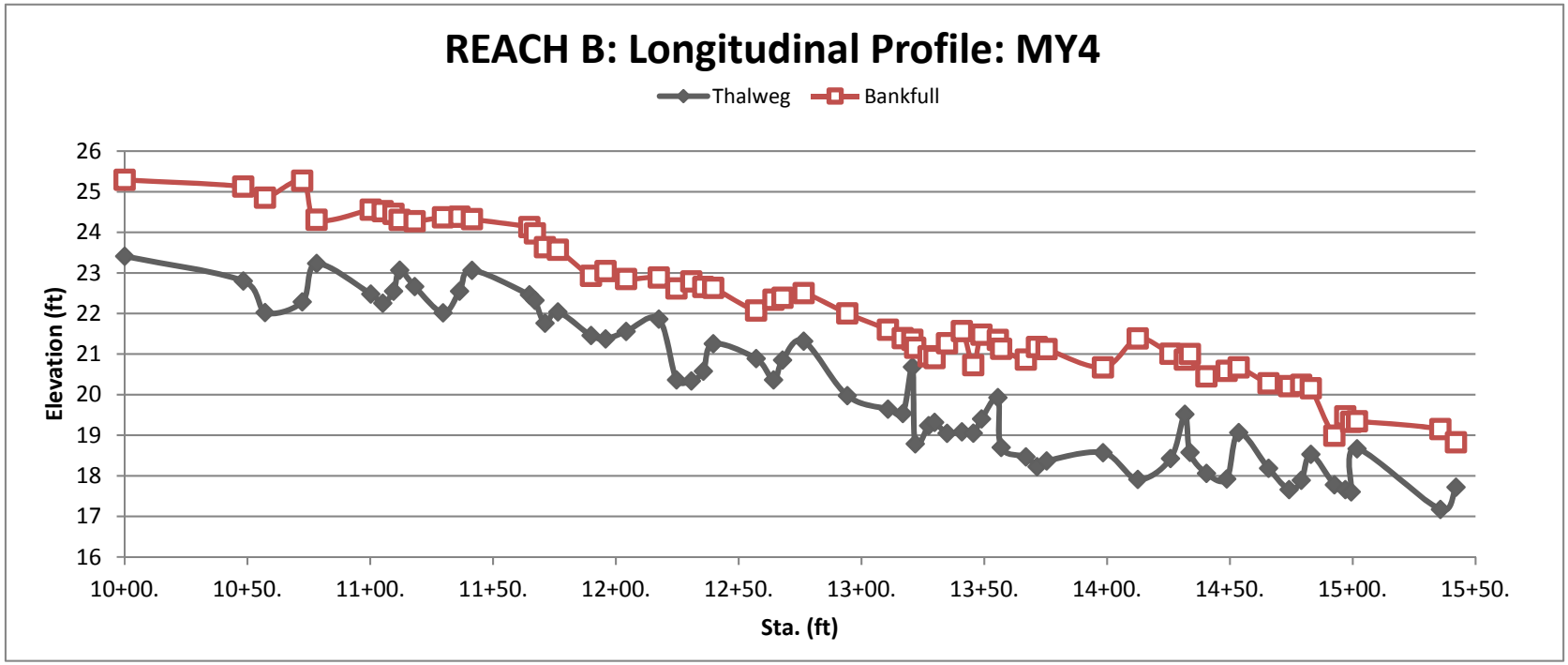
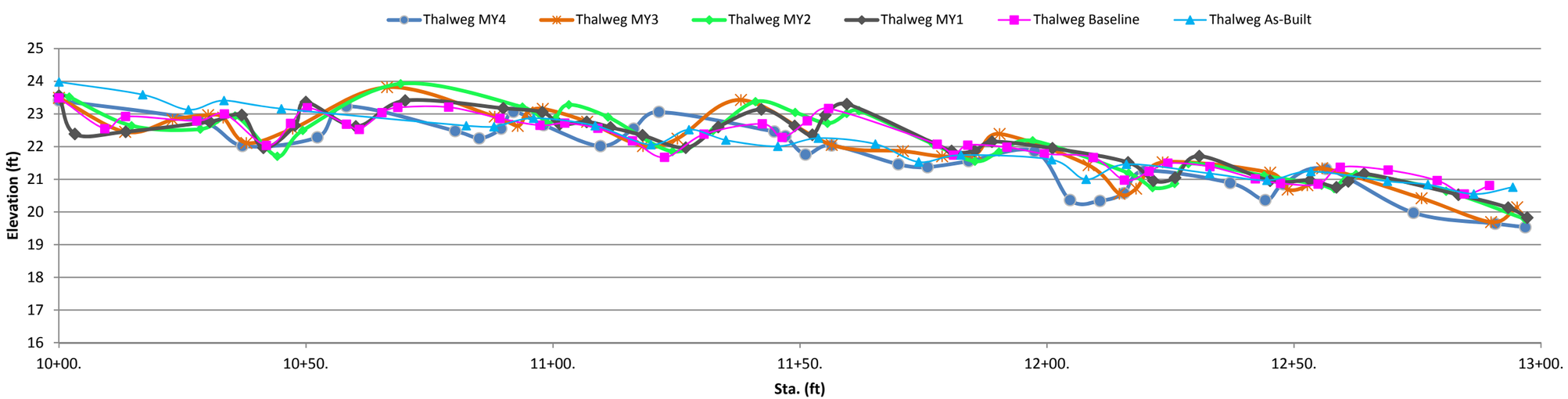


	Minimum	Mean	Max
Bankfull Slope		0.0121	
Pool-Pool Spacing (ft)	12.9	32.5	51.9
Pool Length (ft)	5.4	13.5	27.5
Riffle Length (ft)	5.1	15.3	34
Dmax Riffle (ft)	0.67	1.46	2.76
Dmax Pool (ft)	1.11	2.36	3.65

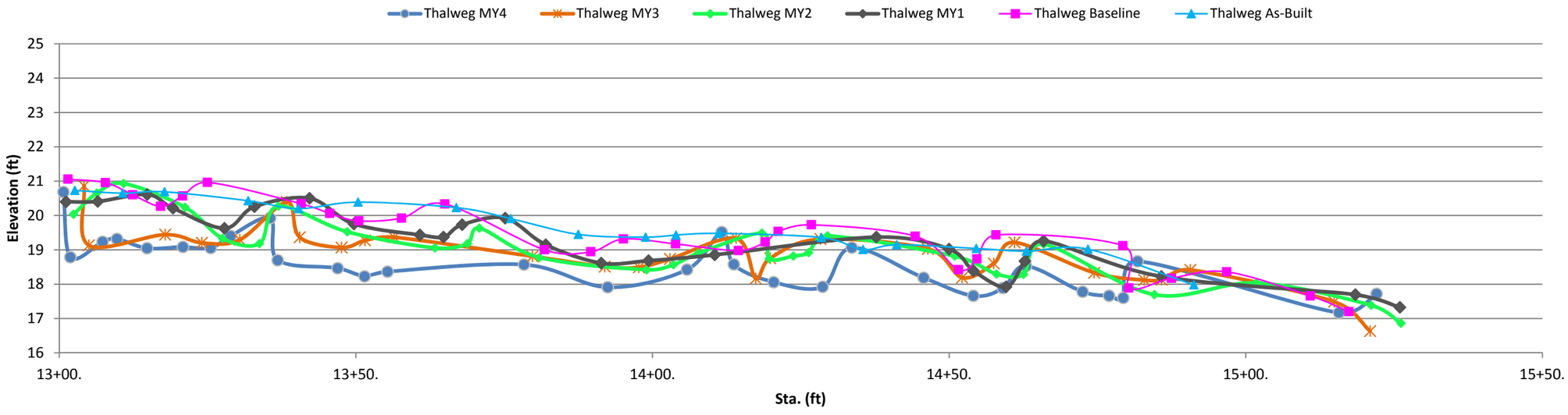
REACH B: MY4 LONGITUDINAL PROFILE DATA

Sta.	Distance	TW	BKF		Sta.	Distance	TW	BKF
10+00.	0	23.4119	25.2915		13+56.84	356.8363	18.6982	21.1297
10+48.31	48.31425	22.8012	25.1247		13+66.94	366.9372	18.4658	20.8618
10+57.13	57.12662	22.0224	24.8531		13+71.48	371.475	18.2262	21.174
10+72.29	72.29013	22.2861	25.2723		13+75.34	375.3378	18.3653	21.1212
10+78.18	78.17951	23.2317	24.309		13+98.35	398.3481	18.57	20.6702
11+00.21	100.2084	22.48	24.5553		14+12.46	412.4623	17.9114	21.3824
11+05.05	105.0524	22.2524	24.5217		14+25.82	425.8172	18.4249	21.0063
11+09.49	109.4873	22.5505	24.4552		14+31.67	431.668	19.5165	20.864
11+11.98	111.9829	23.0652	24.3051		14+33.71	433.7074	18.5755	20.9989
11+18.11	118.1079	22.6617	24.2719		14+40.43	440.4349	18.0586	20.4486
11+29.61	129.6086	22.0174	24.3681		14+48.67	448.6668	17.924	20.586
11+36.32	136.3214	22.5483	24.3835		14+53.59	453.5903	19.0641	20.6714
11+41.43	141.4321	23.064	24.3221		14+65.7	465.7018	18.1865	20.2775
11+64.79	164.7945	22.4596	24.1283		14+74.09	474.0918	17.6617	20.2095
11+67.04	167.0399	20.3219	23.971		14+79.06	479.0606	17.8876	20.2398
11+71.11	171.1125	21.7602	23.6326		14+82.96	482.9592	18.5287	20.1573
11+76.39	176.3882	22.0373	23.5697		14+92.5	492.5015	17.7781	18.9865
11+89.9	189.8995	21.4591	22.925		14+96.96	496.962	17.6612	19.4657
11+95.81	195.8097	21.3735	23.0462		14+99.35	499.3475	17.6029	19.3265
12+04.15	204.1499	21.5567	22.8489		15+01.76	501.7568	18.6669	19.3414
12+17.48	217.4759	21.862	22.887		15+35.71	535.7147	17.1701	19.1511
12+24.67	224.666	20.365	22.6157		15+42.05	542.0474	17.7178	18.8259
12+30.72	230.7174	20.3376	22.7904					
12+35.59	235.5901	20.578	22.653					
12+39.64	239.645	21.256	22.6316					
12+57.1	257.0958	20.8896	22.0734					
12+64.19	264.1925	20.3619	22.337					
12+67.84	267.8412	20.8503	22.3875					
12+76.48	276.4772	21.3174	22.499					
12+94.2	294.1959	19.9768	22.0014					
13+10.74	310.7449	19.6436	21.5984					
13+16.82	316.8166	19.5353	21.3904					
13+20.71	320.7099	20.6812	21.3515					
13+21.87	321.8731	18.7864	21.1541					
13+27.31	327.3127	19.2349	20.9422					
13+29.73	329.7347	19.3184	20.8987					
13+34.81	334.8067	19.0483	21.2669					
13+40.85	340.848	19.0853	21.5656					
13+45.53	345.5268	19.052	20.724					
13+48.88	348.8784	19.4032	21.4772					
13+55.55	355.5479	19.9265	21.3476					

REACH B: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built



REACH B: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline, and As-Built



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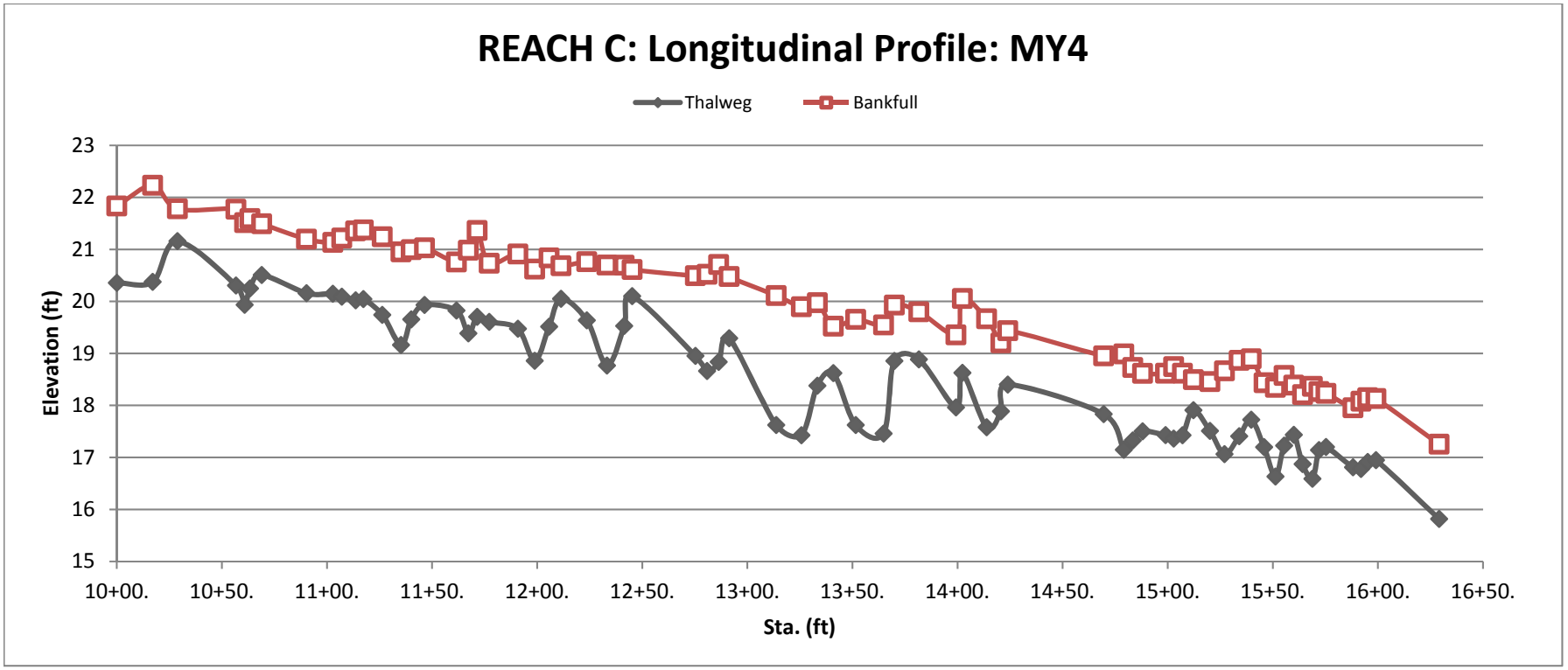
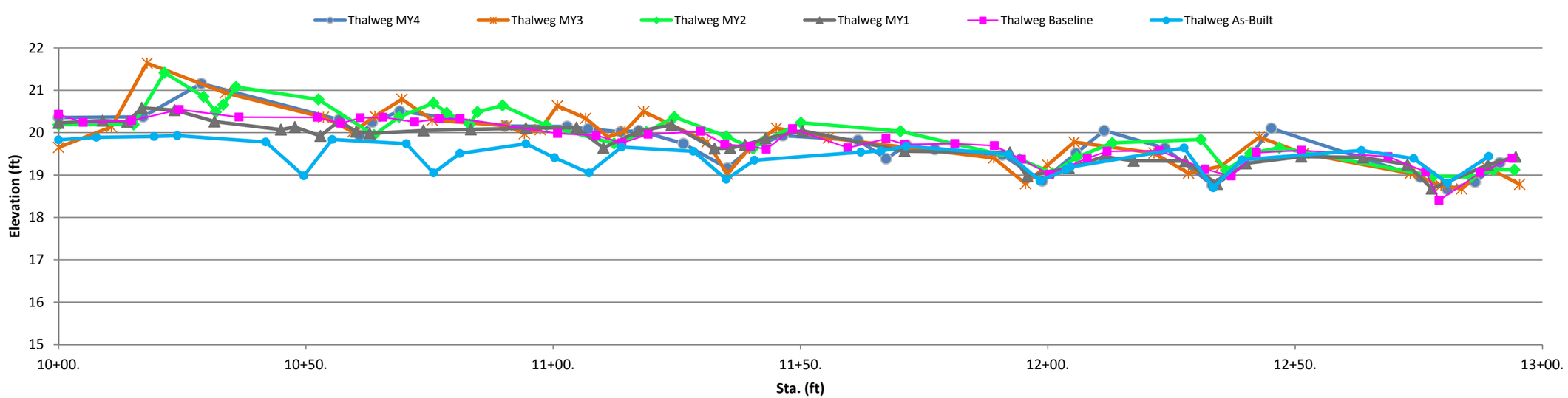


	Minimum	Mean	Max
Bankfull Slope		0.0066	
Pool-Pool Spacing (ft)	18.3	35.8	70.3
Pool Length (ft)	6.7	12.8	21.4
Riffle Length (ft)	4.2	17.5	45.6
Dmax Riffle (ft)	0.51	0.96	1.33
Dmax Pool (ft)	1.13	1.73	2.47

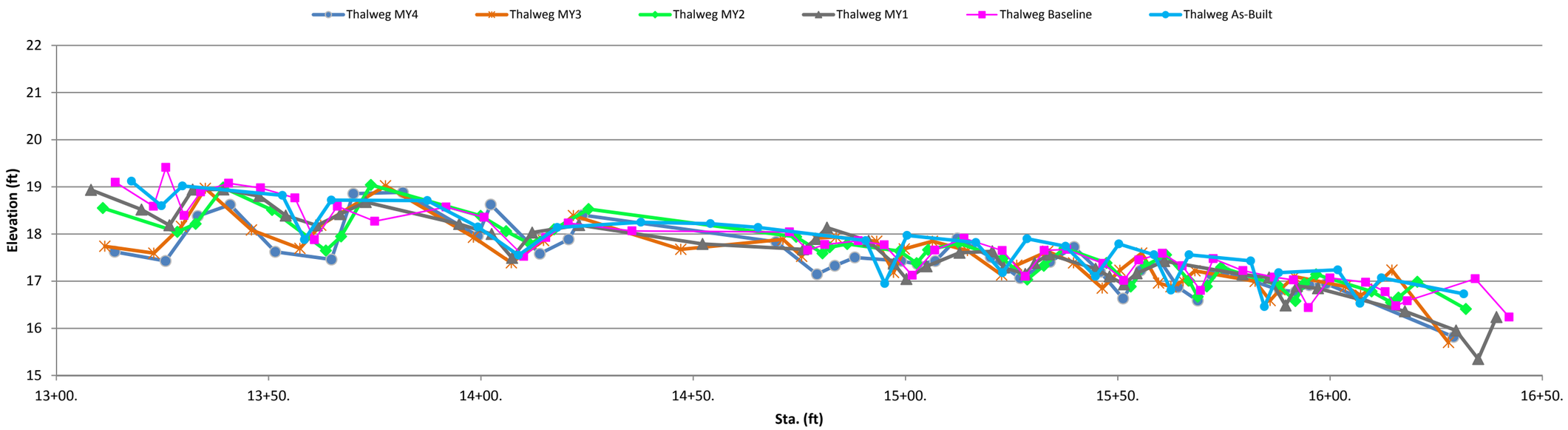
REACH C: MY4 LONGITUDINAL PROFILE DATA

Sta.	Distance	ELEV-TW	BKF		Sta.	Distance	ELEV-TW	BKF
10+00.	0.00	20.3567	21.8334		14+02.31	402.31	18.6257	20.0557
10+17.08	17.08	20.3751	22.2315		14+13.86	413.86	17.5809	19.6667
10+28.83	28.83	21.1595	21.7804		14+20.65	420.65	17.8875	19.203
10+56.71	56.71	20.3071	21.7722		14+23.93	423.93	18.4013	19.4365
10+60.85	60.85	19.9357	21.513		14+69.53	469.53	17.8338	18.9522
10+63.4	63.40	20.2486	21.592		14+79.15	479.15	17.1457	18.9901
10+68.98	68.98	20.5088	21.4932		14+83.35	483.35	17.3275	18.7286
10+90.29	90.29	20.1579	21.1971		14+88.05	488.05	17.5024	18.6149
11+02.8	102.80	20.1467	21.1357		14+98.97	498.97	17.4284	18.6186
11+07.05	107.05	20.0911	21.2174		15+02.84	502.84	17.3614	18.7443
11+13.63	113.63	20.0197	21.3558		15+07.02	507.02	17.4258	18.6192
11+17.31	117.31	20.0462	21.3733		15+12.2	512.20	17.9081	18.4941
11+26.31	126.31	19.7418	21.2417		15+20.08	520.08	17.5107	18.4582
11+35.24	135.24	19.1635	20.9527		15+27.	527.00	17.0645	18.6633
11+40.08	140.08	19.6535	20.9953		15+34.01	534.01	17.4084	18.8668
11+46.4	146.40	19.9306	21.0305		15+39.7	539.70	17.7244	18.8957
11+61.63	161.63	19.8249	20.7586		15+45.85	545.85	17.1976	18.4348
11+67.29	167.29	19.3851	20.9844		15+51.26	551.26	16.6323	18.3469
11+71.44	171.44	19.702	21.3646		15+55.36	555.36	17.2276	18.5756
11+77.17	177.17	19.6071	20.7342		15+59.96	559.96	17.435	18.3902
11+90.82	190.82	19.4738	20.9109		15+64.15	564.15	16.8729	18.208
11+98.87	198.87	18.8593	20.6215		15+68.84	568.84	16.589	18.3659
12+05.68	205.68	19.5152	20.8359		15+71.94	571.94	17.1417	18.2661
12+11.39	211.39	20.049	20.6848		15+75.3	575.30	17.2013	18.2317
12+23.65	223.65	19.6365	20.763		15+88.15	588.15	16.8093	17.9544
12+33.22	233.22	18.7678	20.7001		15+91.94	591.94	16.7777	18.0818
12+41.4	241.40	19.5283	20.695		15+95.12	595.12	16.9138	18.1492
12+45.19	245.19	20.1028	20.6114		15+99.07	599.07	16.9487	18.1306
12+75.27	275.27	18.9536	20.4932		16+29.09	629.09	15.8185	17.2537
12+80.81	280.81	18.6607	20.5207					
12+86.38	286.38	18.8357	20.7103					
12+91.39	291.39	19.292	20.4783					
13+13.74	313.74	17.6237	20.1127					
13+25.72	325.72	17.4281	19.8978					
13+33.31	333.31	18.3805	19.9747					
13+40.92	340.92	18.6209	19.5234					
13+51.55	351.55	17.6229	19.6545					
13+64.79	364.79	17.4596	19.5463					
13+69.94	369.94	18.8557	19.9303					
13+81.62	381.62	18.8842	19.801					
13+99.27	399.27	17.9614	19.356					

REACH C: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline and As-Built



REACH C: Longitudinal Profile: MY4, MY3, MY2, MY1, Baseline and As-Built



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Appendix E.
Hydrologic Data

Table 16. Documentation of Bankfull Events in 2017

Stream Gauge No.	#1		#2	
Location	Reach 2A		Reach 1A	
Date of Occurrence	1/2/2017	10/24/2017	1/2/2017	9/12/2017
	1/2/2017	10/29/2017	1/2/2017	9/21/2017
	1/7/2017	12/8/2017	1/7/2017	10/24/2017
	1/23/2017	12/9/2017	1/23/2017	10/29/2017
	1/23/2017		1/23/2017	12/8/2017
	2/8/2017		2/8/2017	12/9/2017
	2/9/2017		2/15/2017	
	2/15/2017		3/13/17 - 3/14/17	
	3/13/17 - 3/14/17		3/18/2017	
	3/18/2017		4/3/2017	
	4/3/2017		4/5/2017	
	4/5/2017		4/6/2017	
	4/6/2017		4/24/17 - 4/25/17	
	4/24/17 - 4/25/17		5/5/2017	
	5/5/2017		5/23/2017	
	5/23/2017		5/28/2017	
	5/30/2017		5/30/2017	
	5/31/2017		5/31/2017	
	6/7/2017		6/7/2017	
	6/24/2017		6/20/2017	
	6/30/2017		6/24/2017	
	7/1/2017		6/30/2017	
	7/3/2017		7/1/2017	
	7/3/2017		7/3/2017	
	7/9/2017		7/3/2017	
	7/15/2017		7/9/2017	
	7/17/2017		7/15/2017	
	7/19/2017		7/17/2017	
	7/25/2017		7/18/2017	
	8/4/2017		7/19/2017	
	8/7/2017		7/25/2017	
	8/8/2017		8/4/2017	
	8/9/2017		8/7/2017	
	8/11/2017		8/8/2017	
	8/18/2017		8/9/2017	
	8/19/2017		8/11/2017	
	8/23/17 - 8/24/17		8/18/2017	
	8/29/2017		8/19/2017	
	9/2/2017		8/23/17 - 8/24/17	
	9/2/2017		8/29/2017	
	9/5/2017		9/2/2017	
	9/12/2017		9/2/2017	
	9/21/2017		9/5/2017	
TOTAL NUMBER	**47**		**49**	

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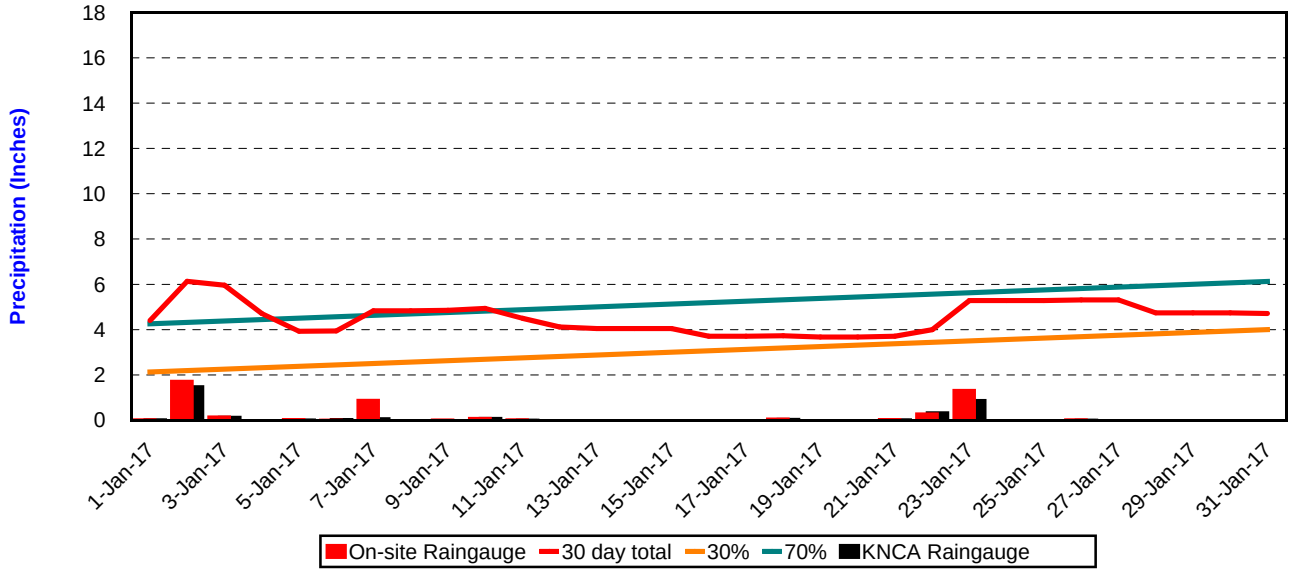
Hydrology Assessment

January 2017

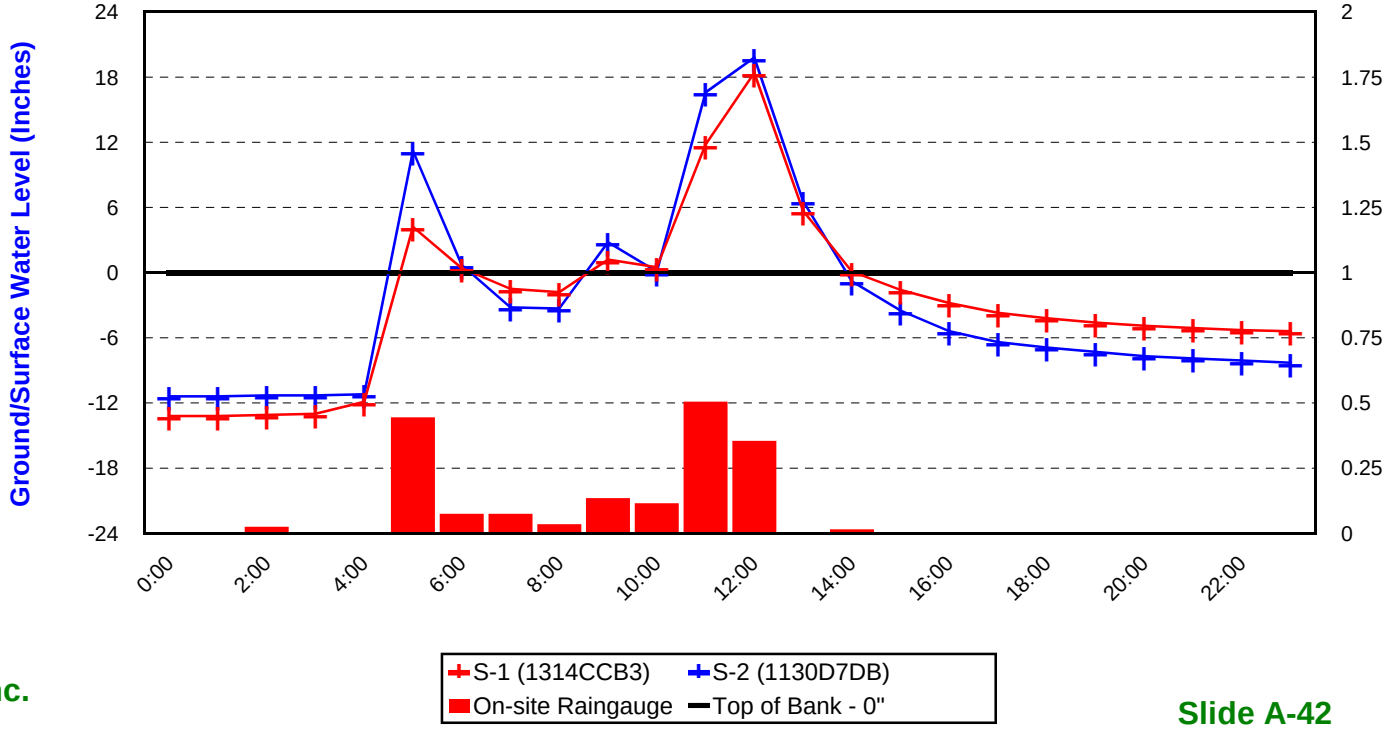
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- January 2, 2017
- One reading per hour

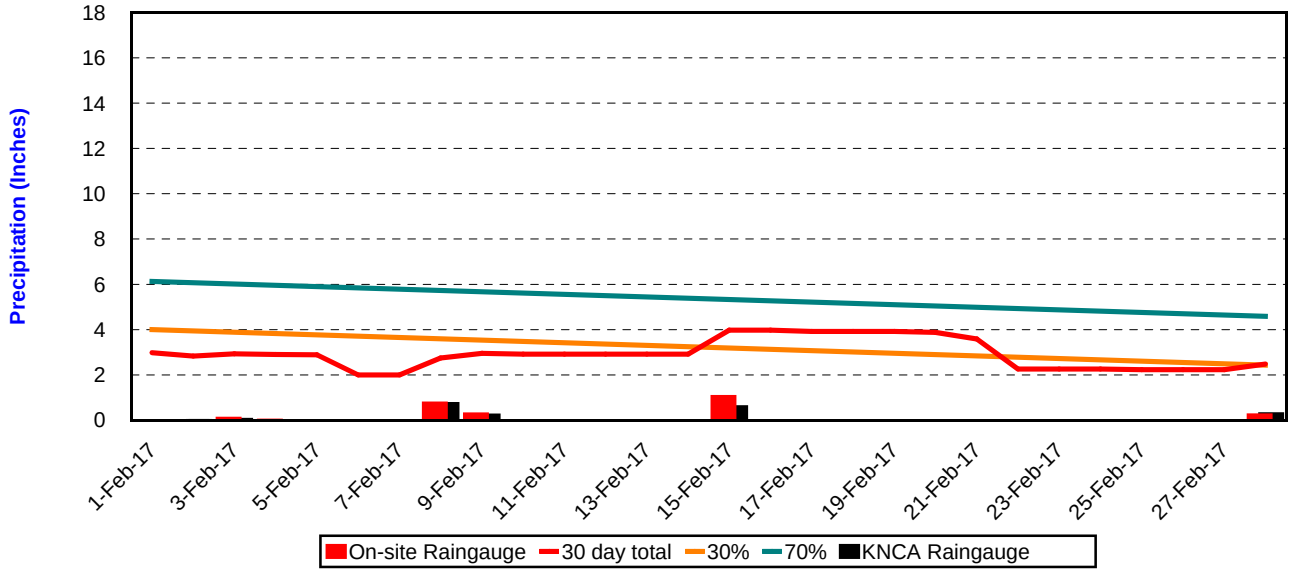


Hydrology Assessment

February 2017

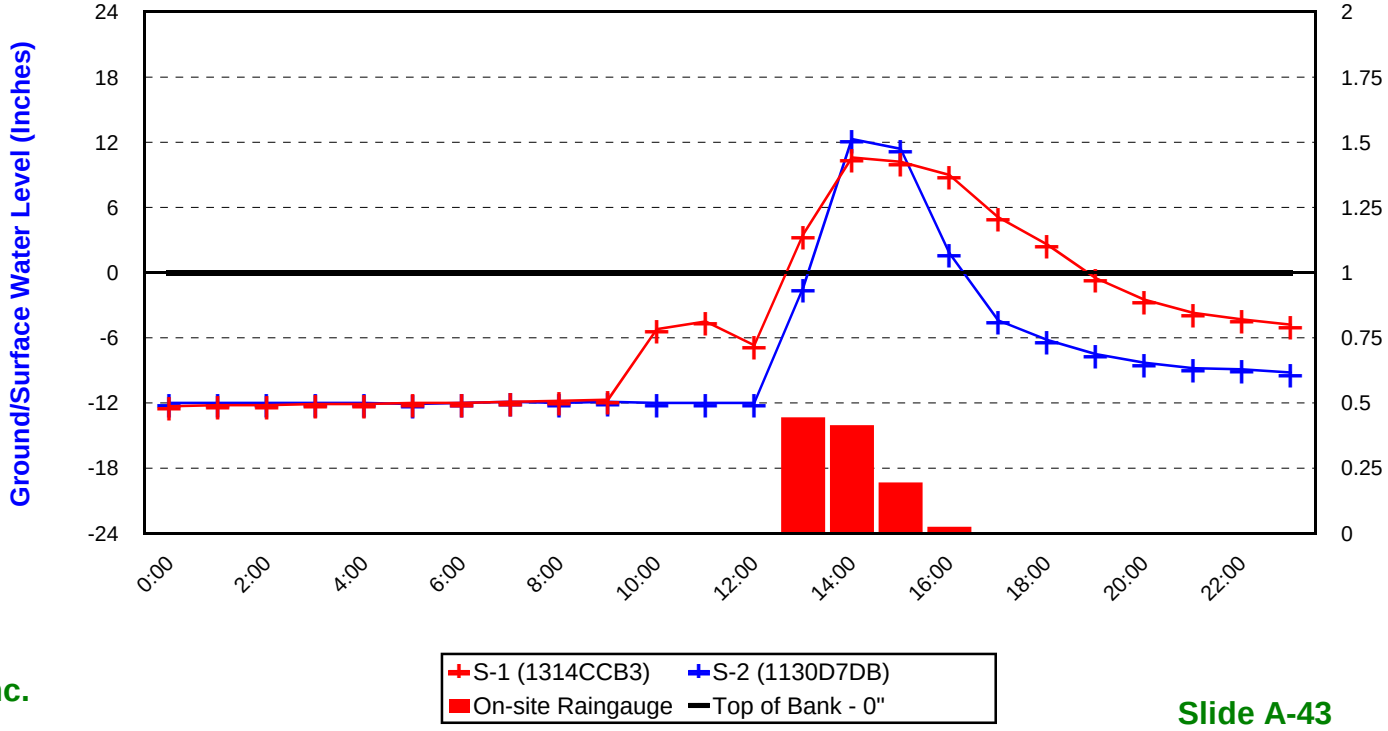
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- February 15, 2017
- One reading per hour

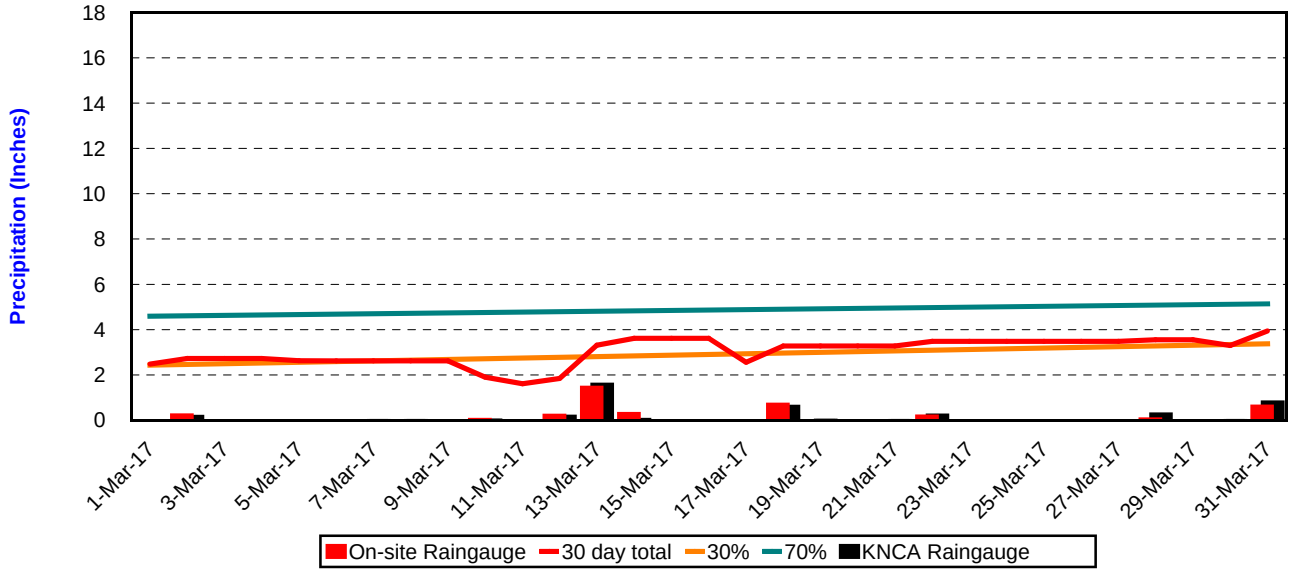


Hydrology Assessment

March 2017

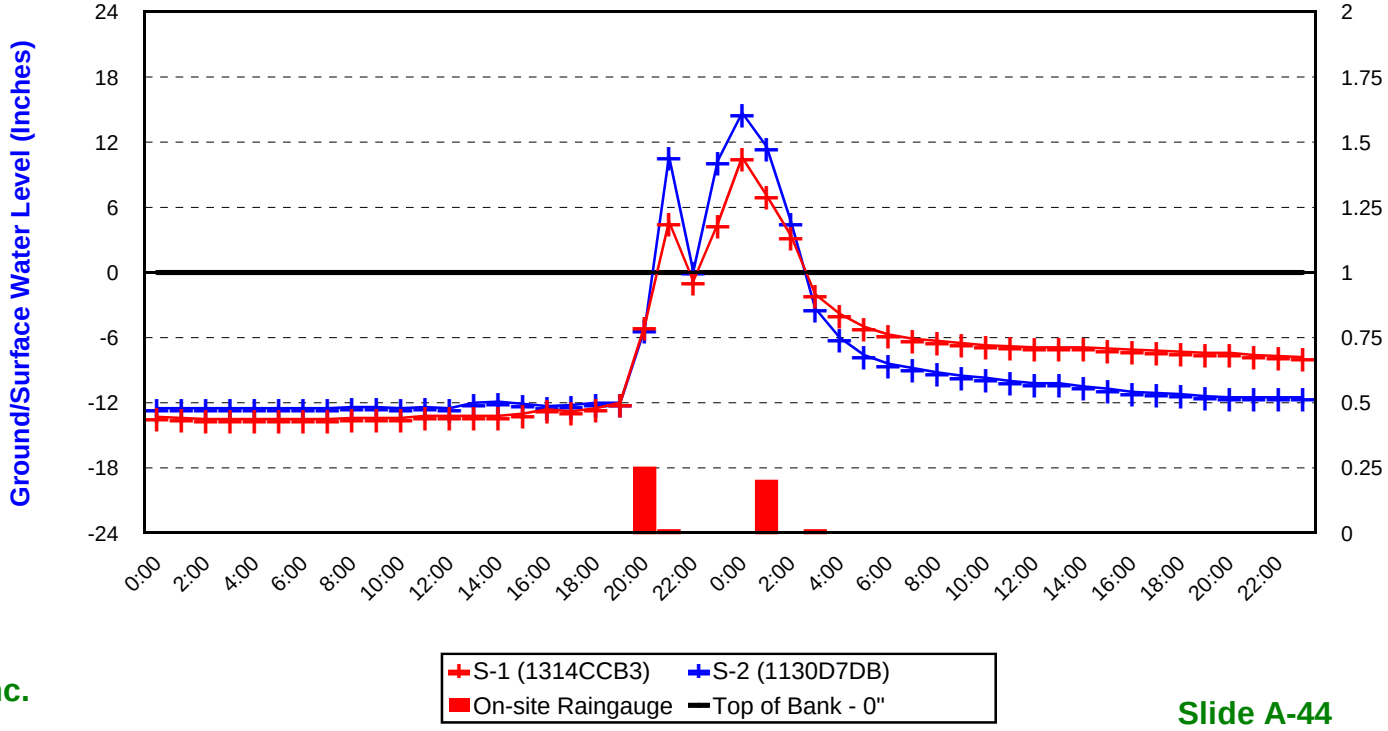
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- March 13, 2017 to March 14, 2017
- One reading per hour



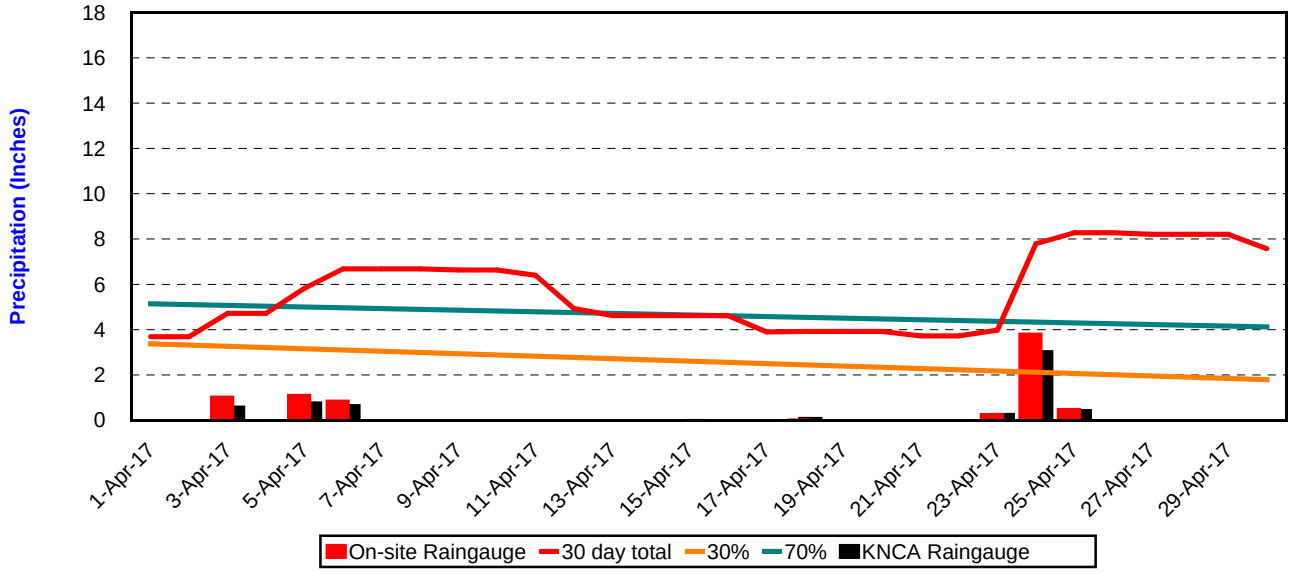
Hydrology Assessment

April 2017

Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

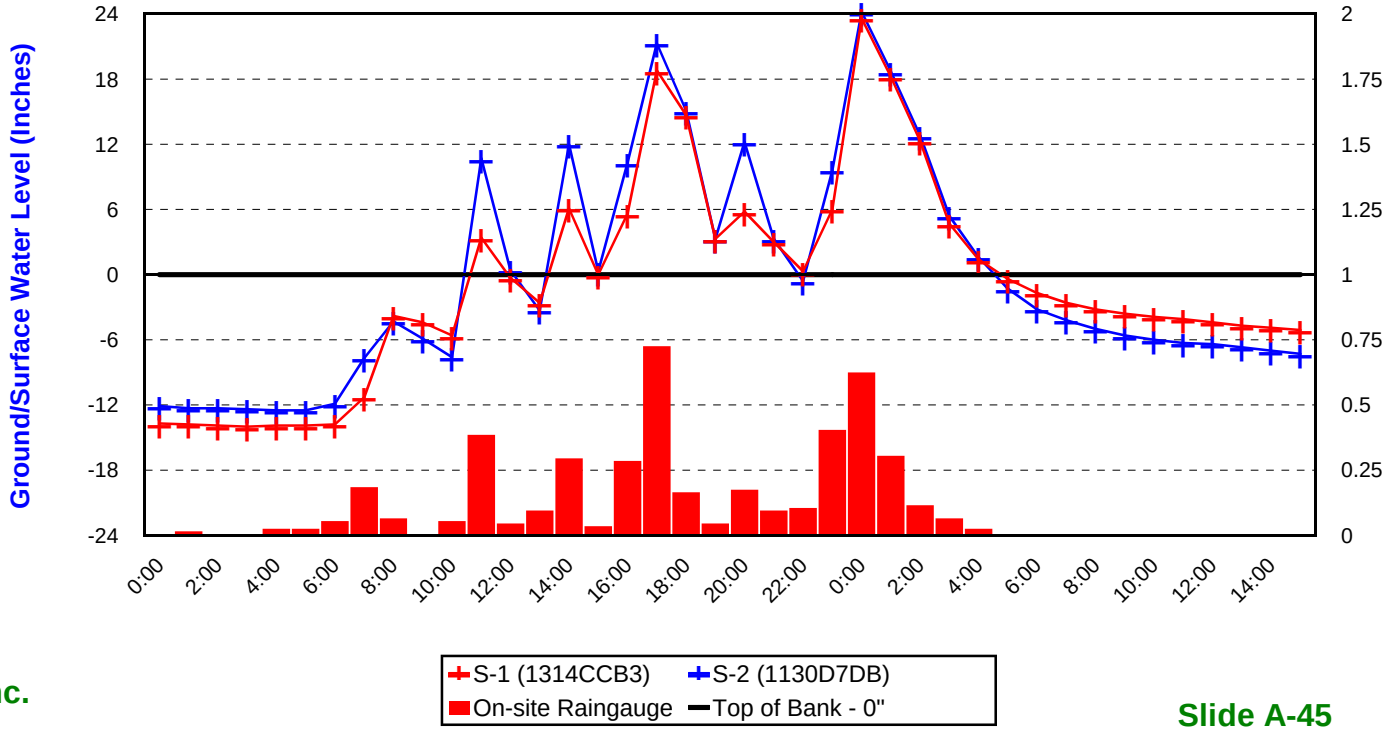
30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)

Onsite raingauge malfunction - Data substituted from KNCA from April 27 to July 13



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- April 24, 2017 to April 25, 2017
- One reading per hour



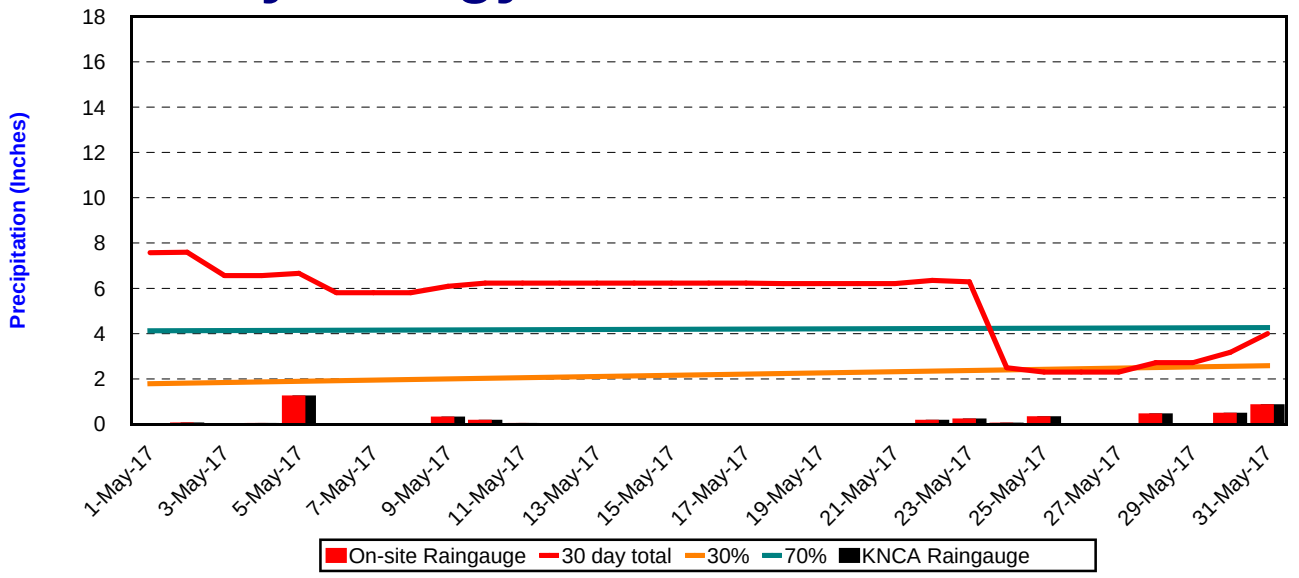
Hydrology Assessment

May 2017

Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

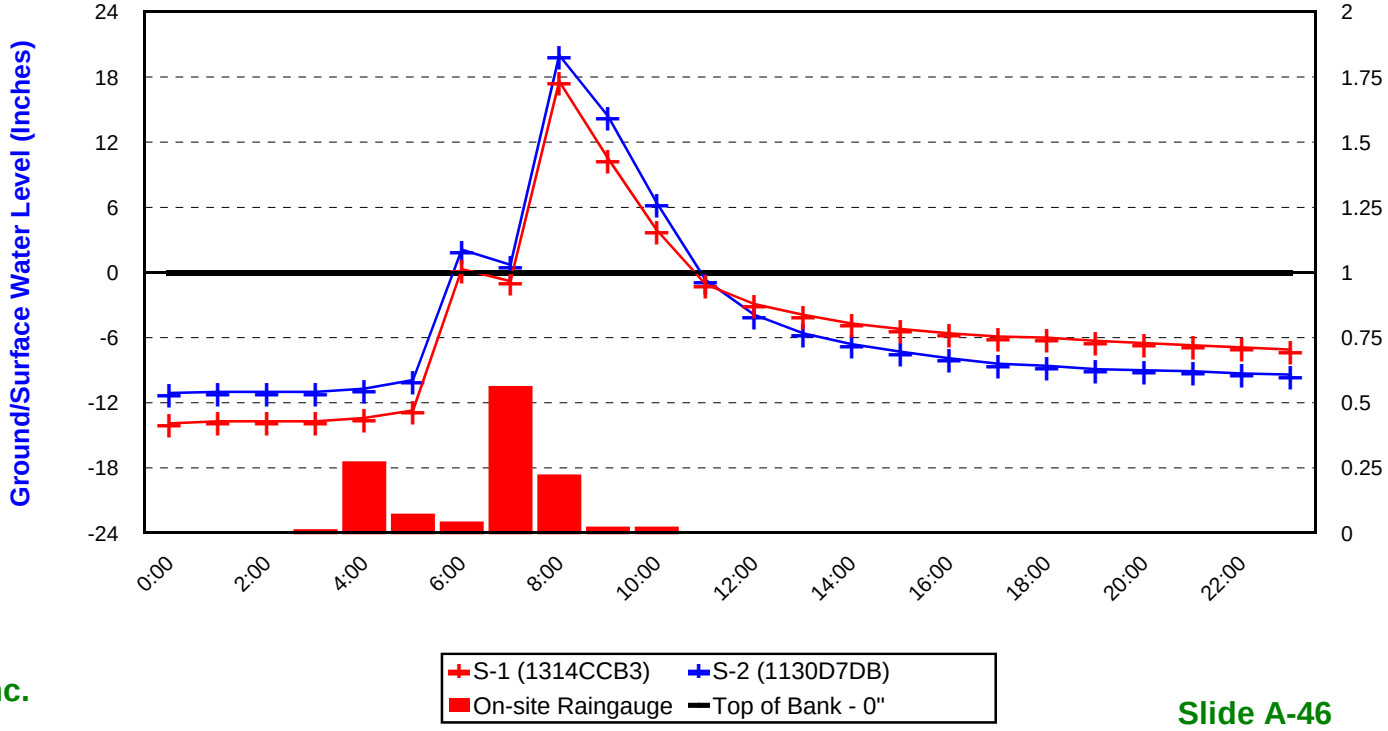
30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)

Onsite raingauge malfunction - Data substituted from KNCA from April 27 to July 13



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- May 5, 2017
- One reading per hour



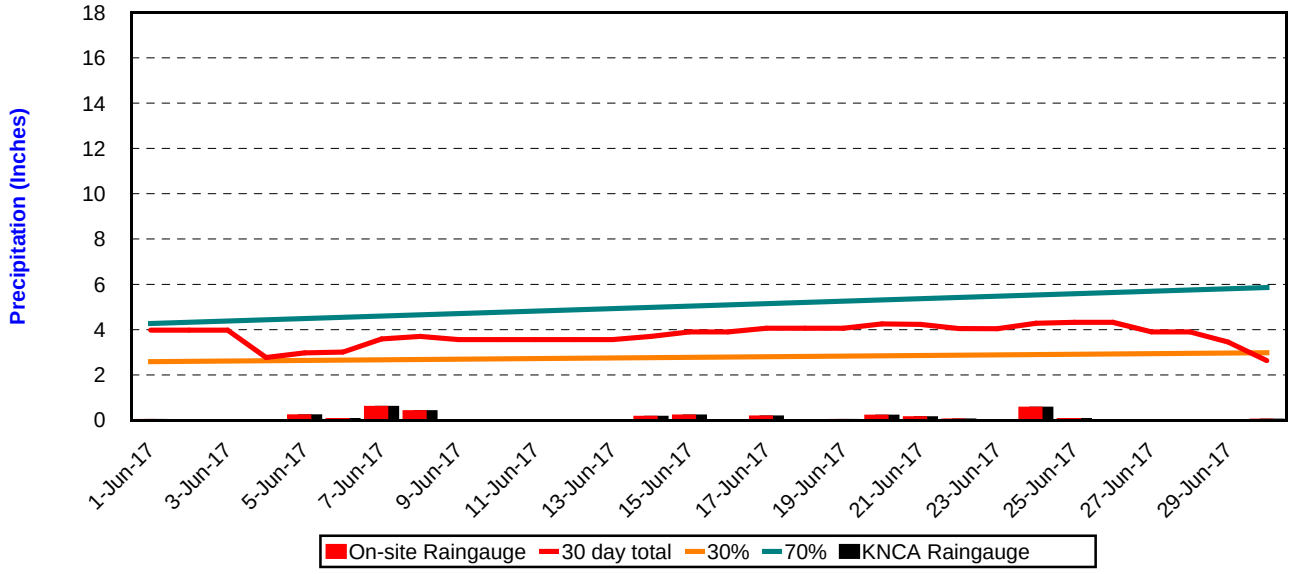
Hydrology Assessment

June 2017

Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

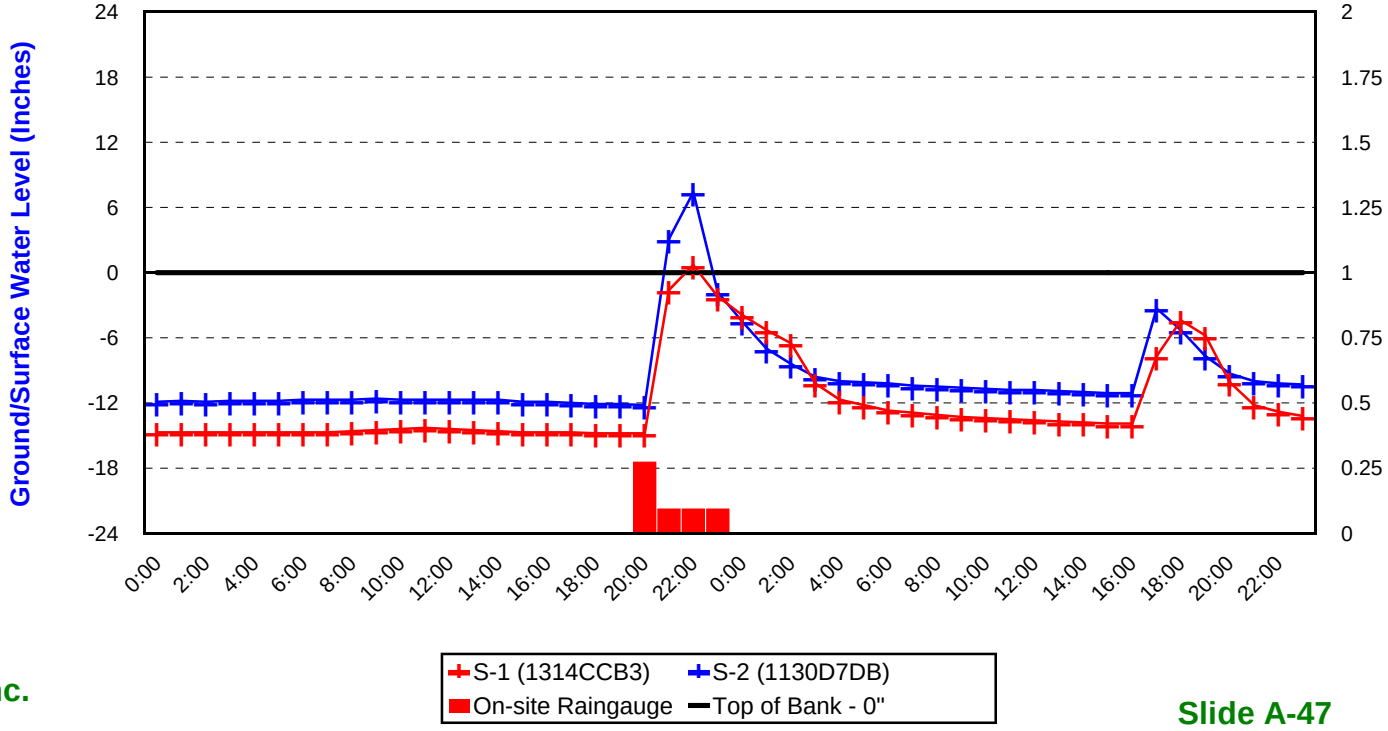
30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)

Onsite raingauge malfunction - Data substituted from KNCA from April 27 to July 13



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- June 24, 2017 to June 25, 2017
- One reading per hour



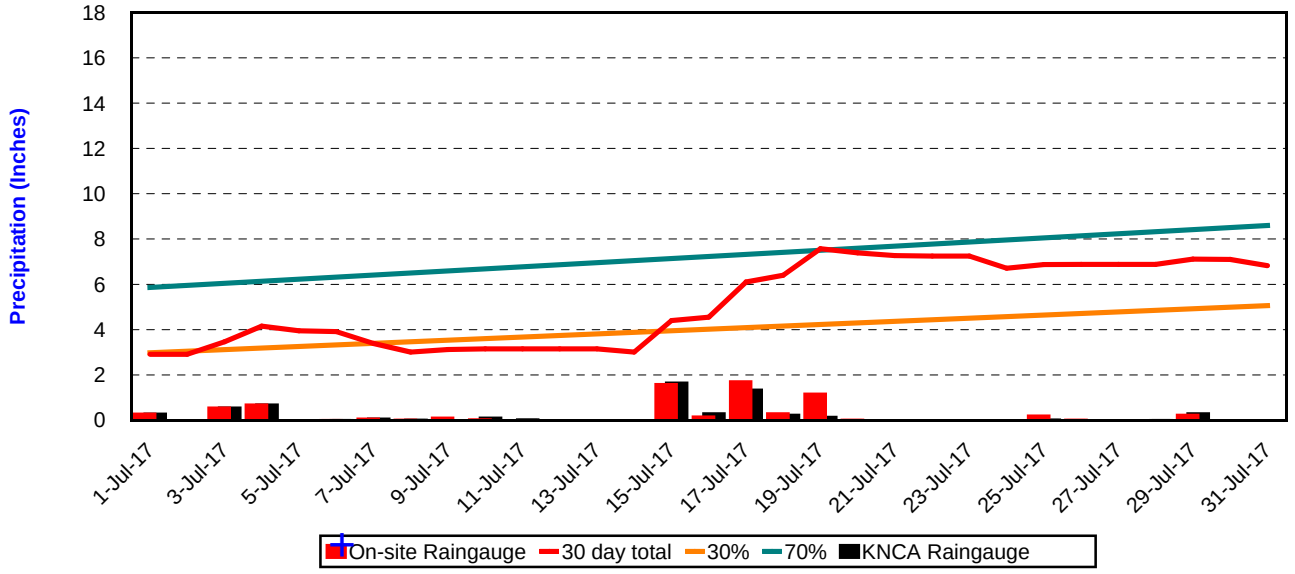
Hydrology Assessment

July 2017

Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

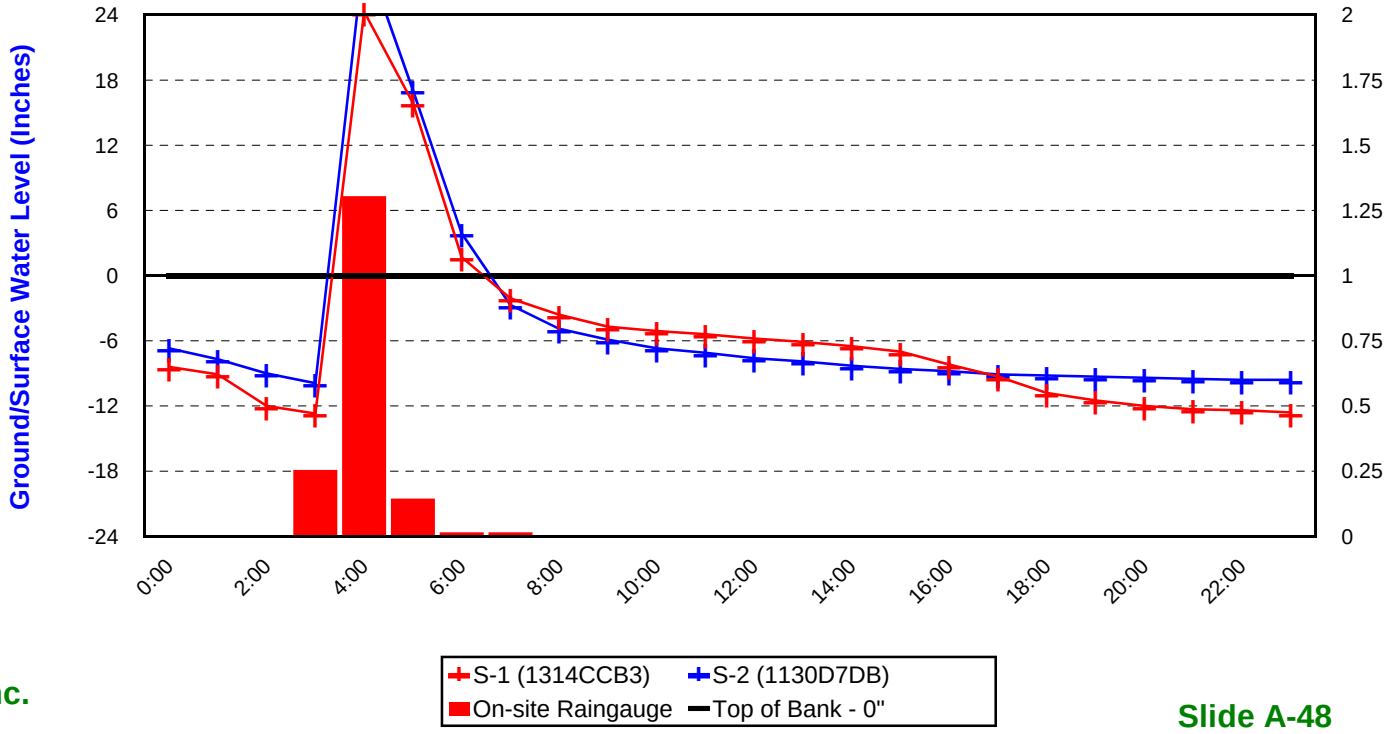
30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)

Onsite raingauge malfunction - Data substituted from KNCA from April 27 to July 13



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- July 17, 2017
- One reading per hour

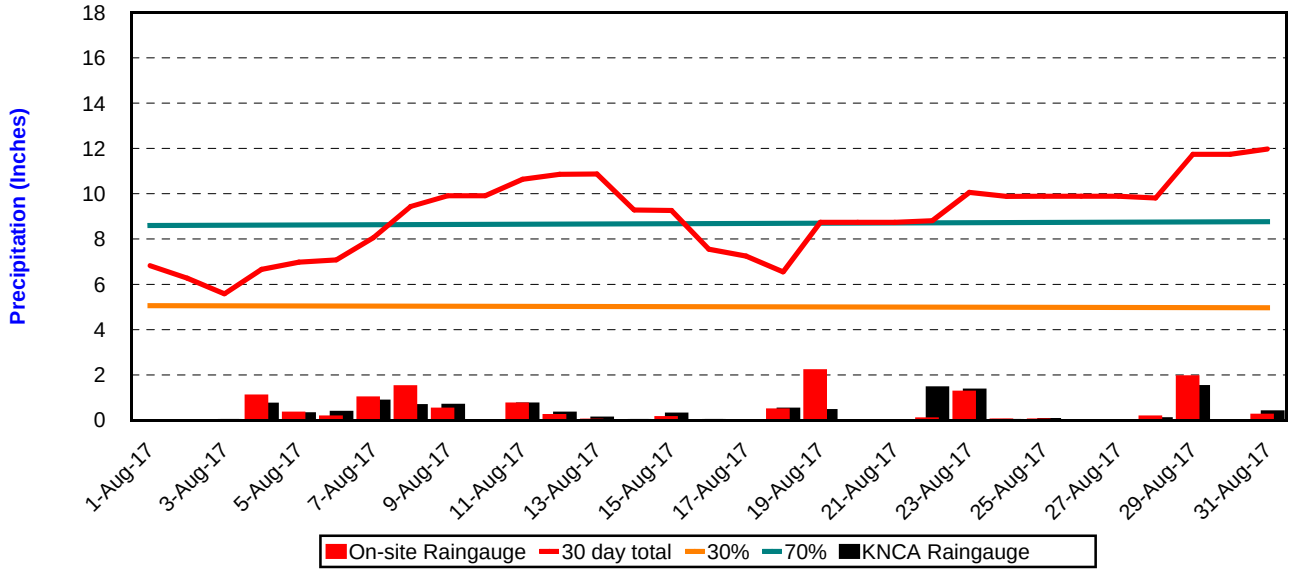


Hydrology Assessment

August 2017

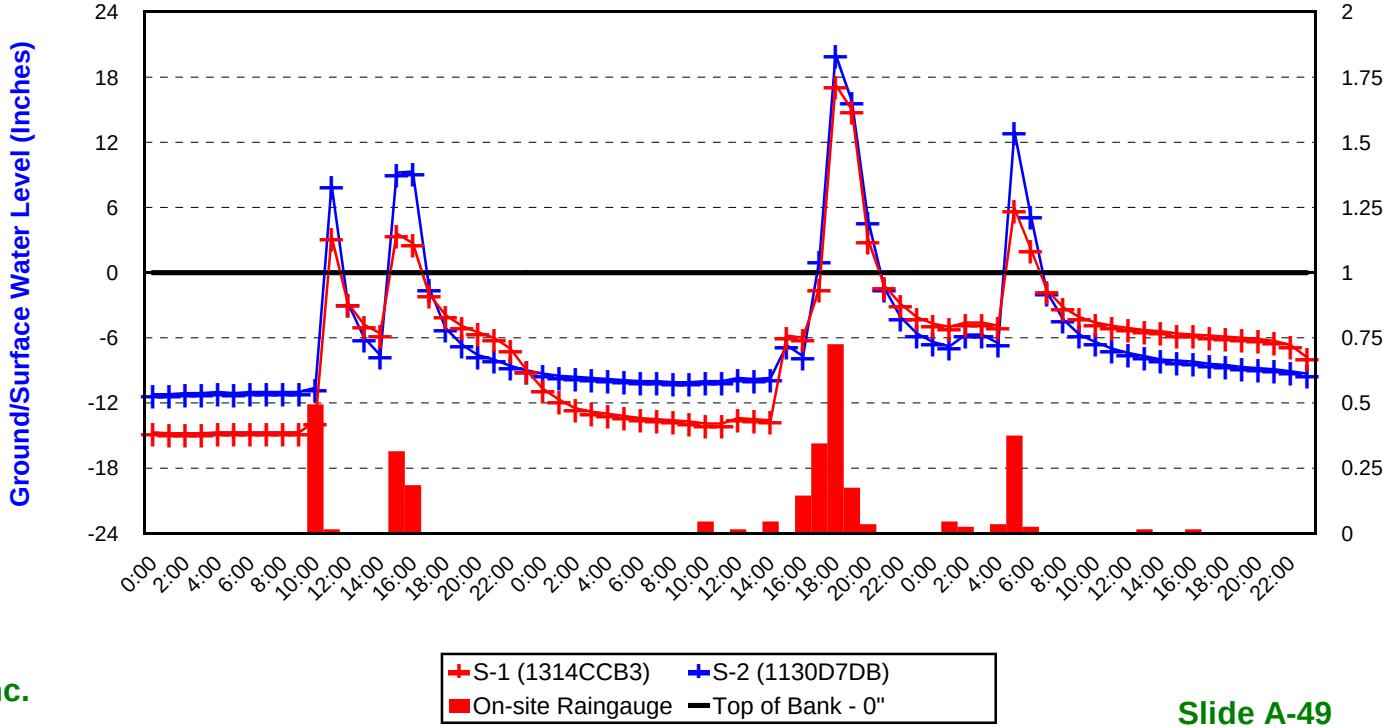
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- August 7, 2017 to August 9, 2017
- One reading per hour

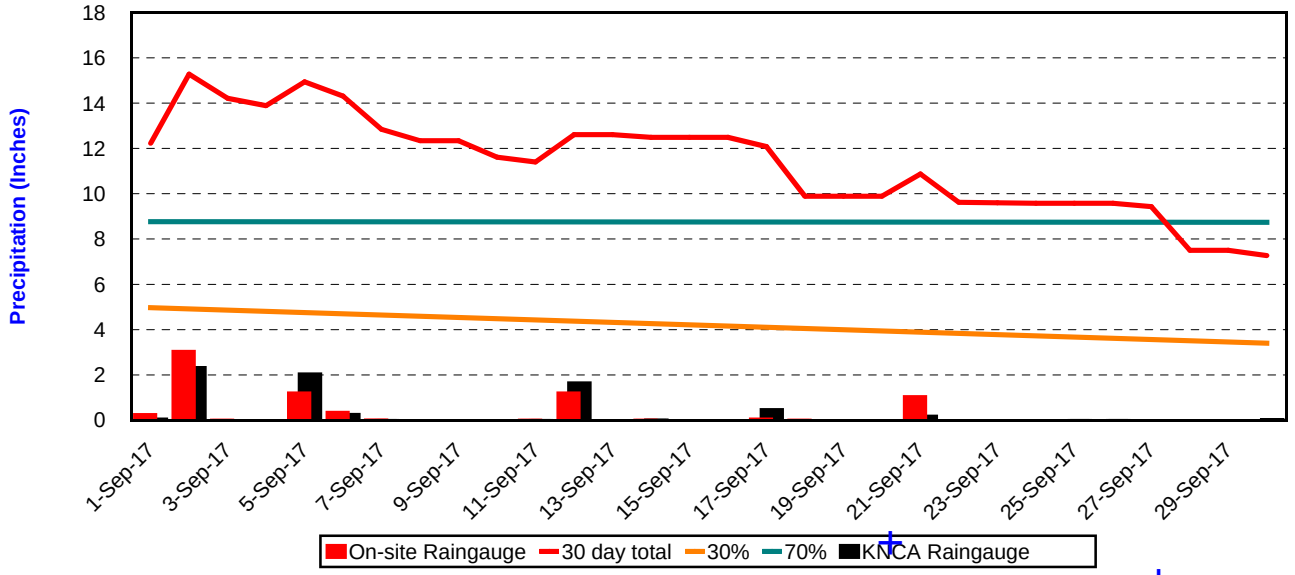


Hydrology Assessment

September 2017

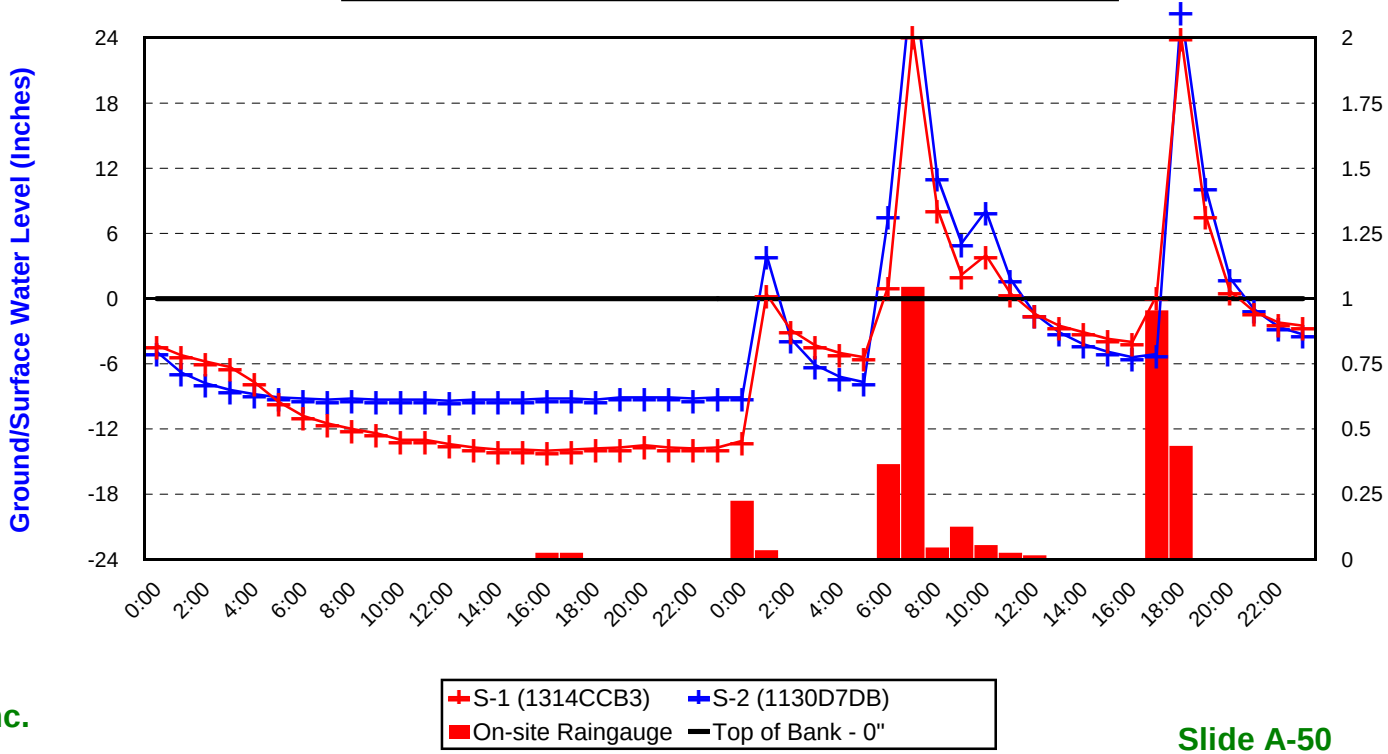
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- September 1, 2017 to September 2, 2017
- One reading per hour

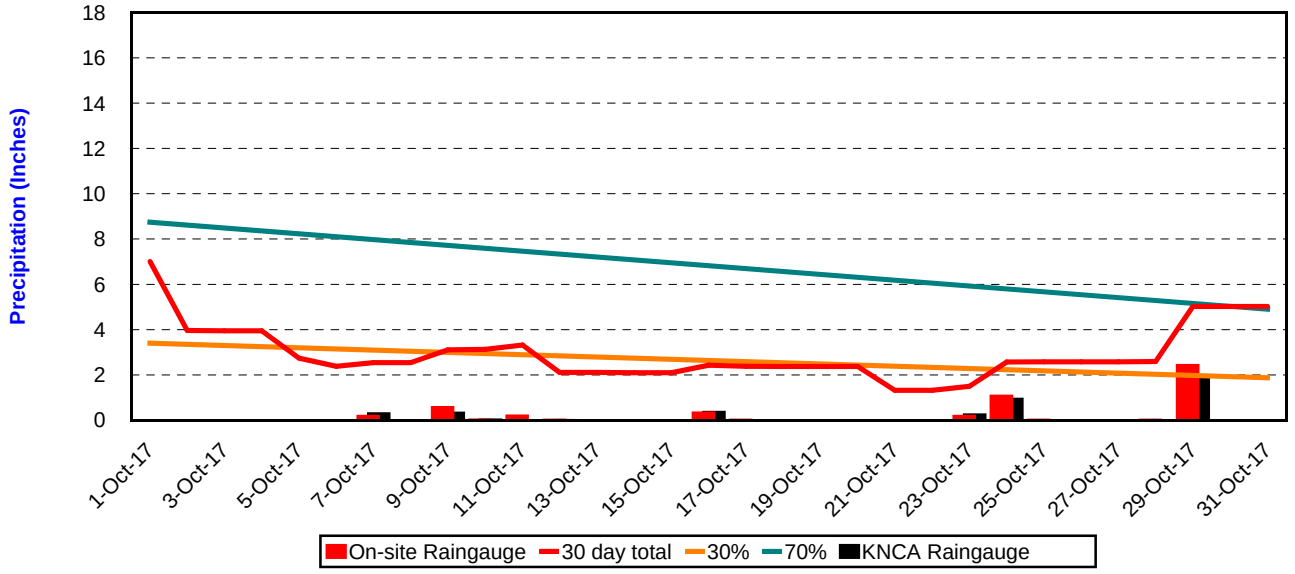


Hydrology Assessment

October 2017

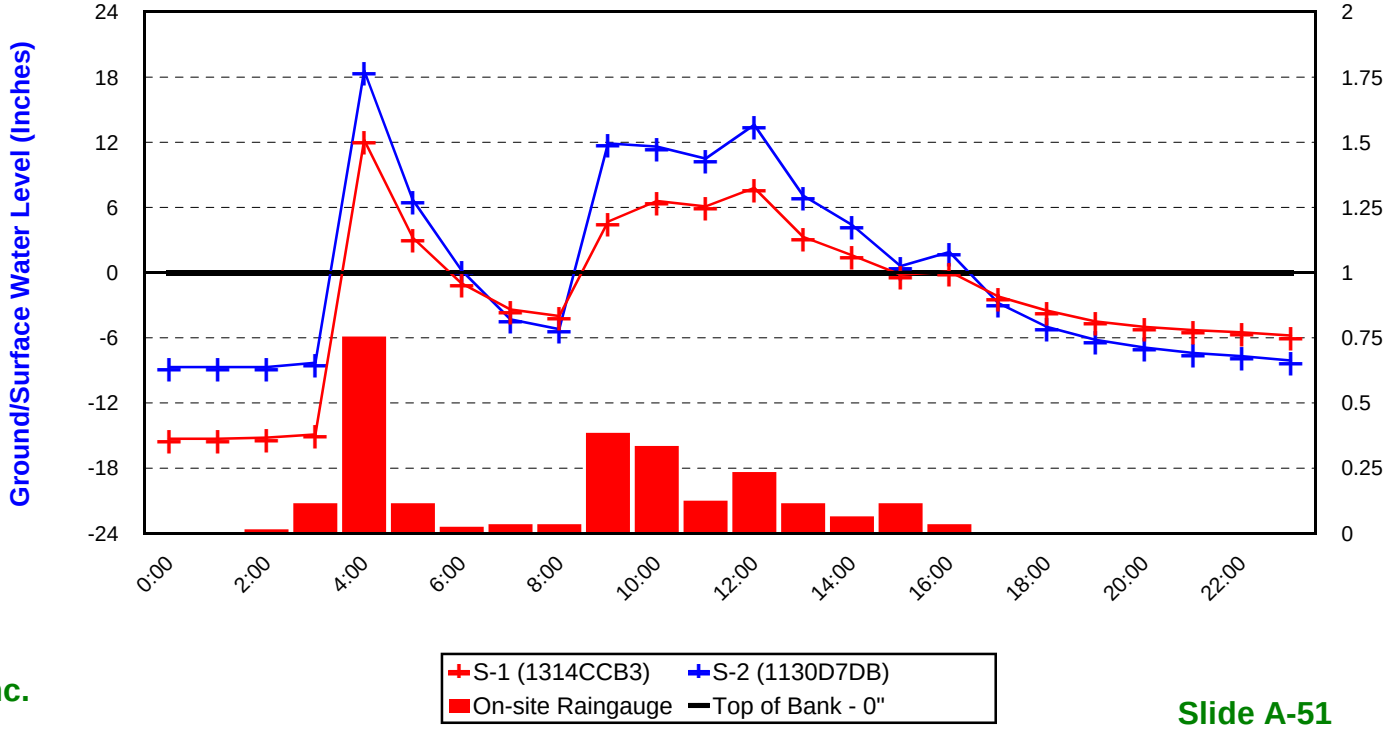
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- October 29, 2017
- One reading per hour

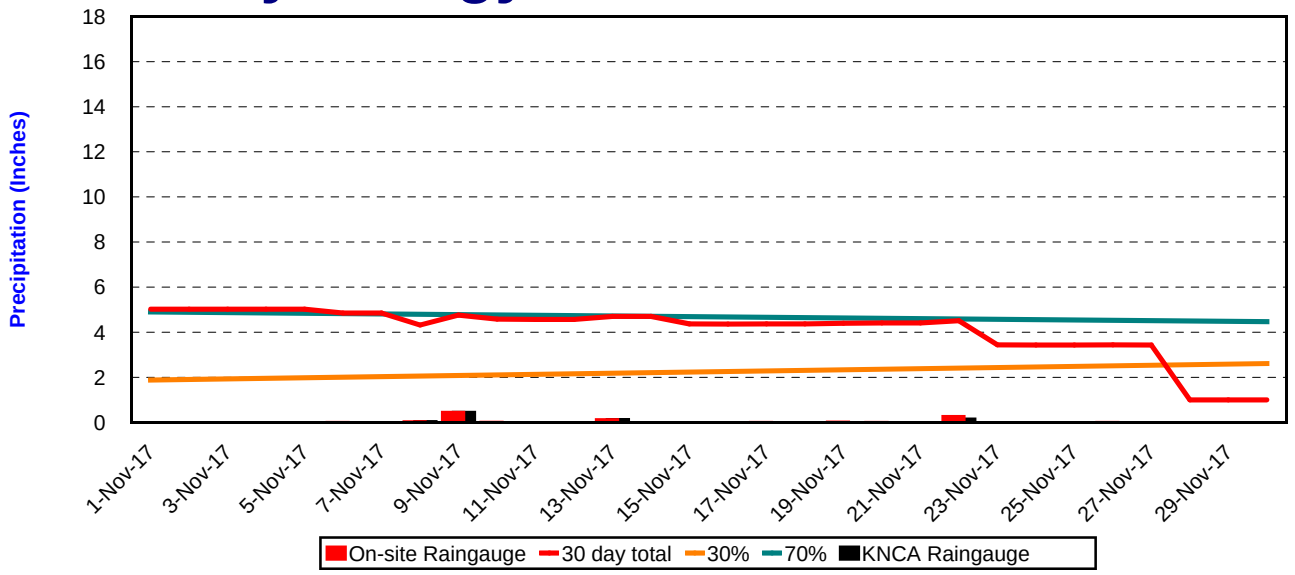


Hydrology Assessment

November 2017

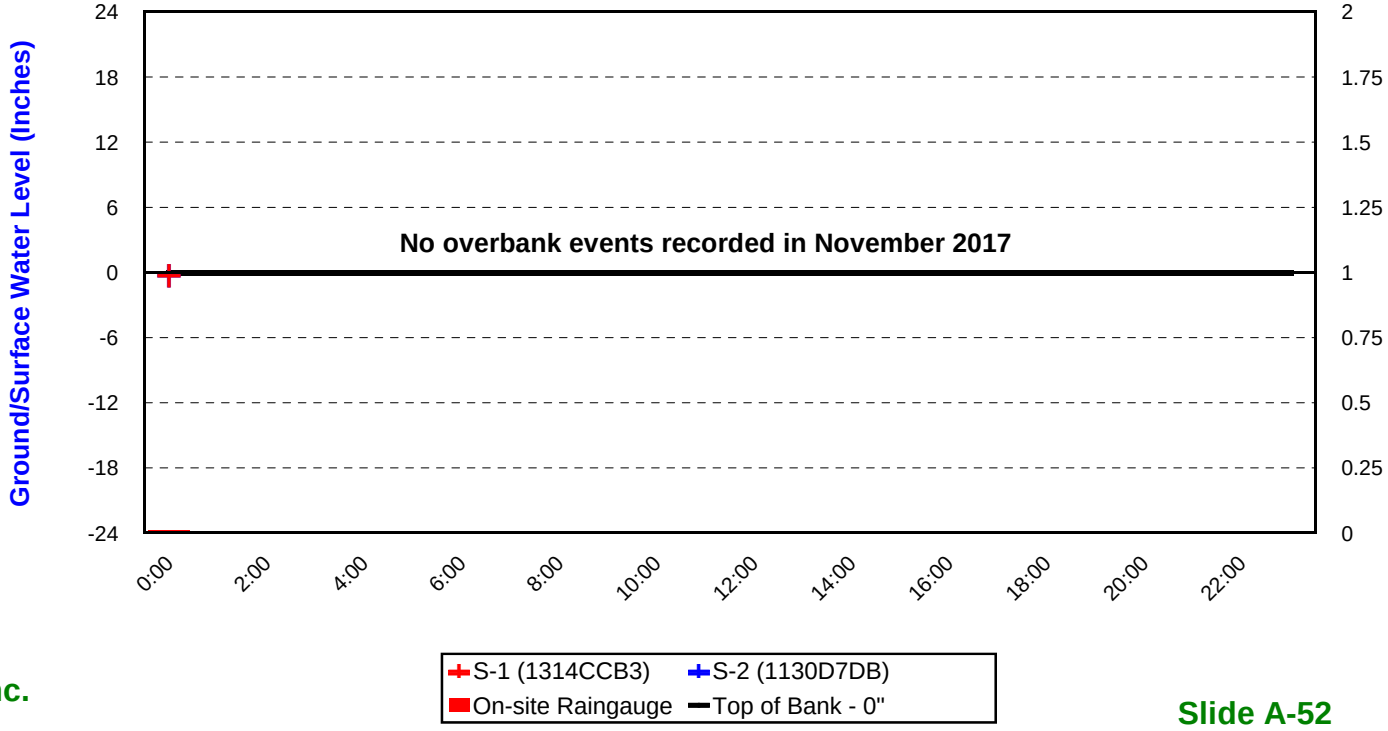
Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- November 2017
- One reading per hour

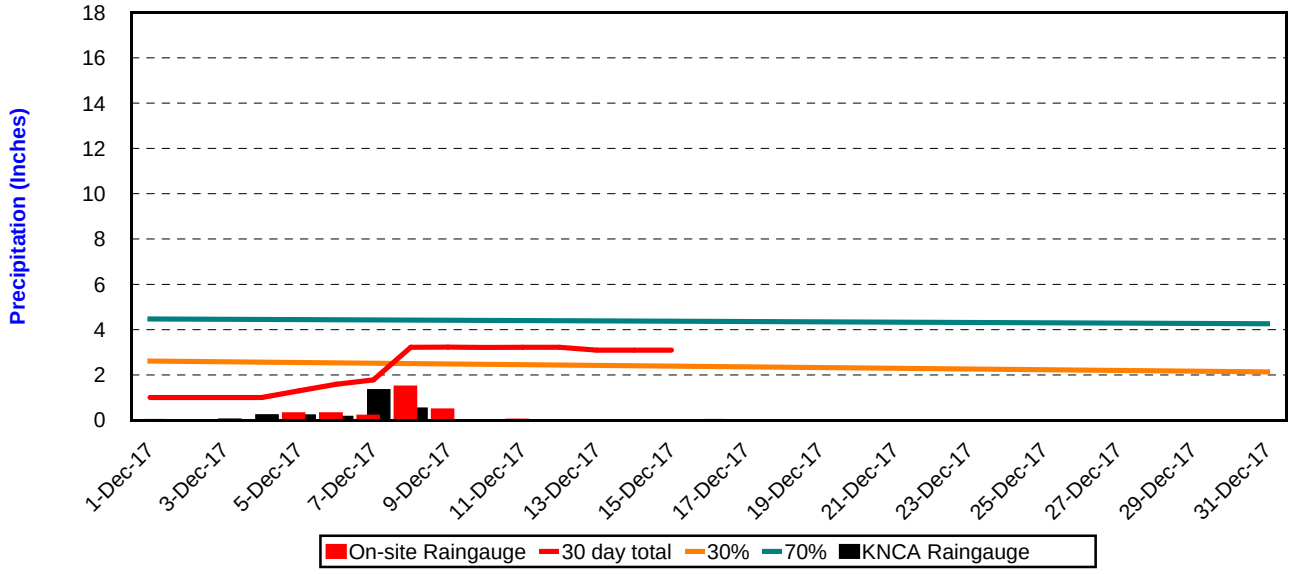


Hydrology Assessment

December 2017

Precipitation data obtained from: On-site rain gauge and New River MCAS (KNCA) (www.nc-climate.ncsu.edu)

30% & 70% precipitation data obtained from WETS Station : HOFFMANN FOREST, NC4144 (wcc.nrcs.usda.gov)



Monitoring Well Record

- EEP Jacksonville CC
- Onslow County, NC
- 40-08-189
- Stream Wells 1 & 2
- Ecotone WM 40
- December 8, 2017 to December 9, 2017
- One reading per hour