UT to Cane Creek (Pickard)
Restoration Site
Alamance County, North Carolina

EEP Project #395

MY – 05 Monitoring Report

Data Collected: October 2013

Submitted: December 2013

Prepared for:

North Carolina Department of Environment and Natural Resources

Ecosystem Enhancement Program

217 West Jones St. Suite 3000A

Raleigh, NC 27603

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I. Executive Summary

The Upper UT to Cane Creek (Pickard) Restoration Site (Site) is located in southwest Alamance County approximately five miles east of the town of Liberty, NC. The Site drains to the Cape Fear River and is in USGS HUC 03030002050050.This 14-digit HUC has been identified as a Targeted Local Watershed in NCEEP's Cape Fear River Basin Restoration Priorities 2009. The Site is designed to help meet NCEEP's wetland and stream restoration goals. The primary restoration activities included stabilizing stream banks, installing in-stream structures, adjusting the channel's pattern, profile and dimension, removing invasive species, excluding livestock via cattle exclusion fencing and planting riparian and flood plain wetlands with native, bottomland hardwood tree and shrub species. This Site proposes to generate 6783 Stream Mitigation Units (SMU's) and 1.1 Riparian Wetland Mitigation Units (WMU's). This is the Year #5 Monitoring Report (closeout) and conforms to the NCEEP Monitoring Report Template Version 1.5_updated November 7, 2011_adopted June 8, 2012 and CVS-EEP Protocol for Recording Vegetation Level 2. The goals and objectives of the Upper UT to Cane Creek (Pickard) Stream Restoration Project focused on improving local and downstream water quality, increasing flood storage attenuation and restoring native aquatic and riparian habitat:

Goals

1. Reestablish stream stability and capacity to transport watershed flows and sediment load on 6783 linear feet of stable channel;
2. Introduce a stable meandering pattern to all stream reaches;
3. Eliminate accelerated bank erosion;
4. Re-establish native riparian bottomland hardwood tree and shrub community;
5. Reduce nonpoint source sediment pollution and excessive nutrient inputs;
6. Enhance the flood storage capacity of the Site by adjusting channel and/or flood plain elevations while improving the hydrologic connection of the stream to its floodplain.

Objectives

1. Utilize natural channel design principles to create a more stable stream pattern, profile and dimension morphology and improved habitat using grade/bank stabilization structures;
2. Successfully replant riparian and flood plain areas with native woody trees and shrubs conforming to the density requirements specified below;
3. Exclude livestock and reestablish native riparian buffers substantially greater than 50 feet in width;
4. Reconnect the stream channel hydrology to the floodplain;
5. Preserve the entire Site with a Conservation Easement in perpetuity.

A cumulative total of 2,917 linear feet out of 6,783 linear feet (44%) of the total restored stream was monitored and surveyed within five separate designated project reaches. Overall, the entire

site is stable with little change to pattern, profile and dimension geometry. When compared to the MY 4 longitudinal profile surveys, little (insignificant) change has occurred. Past reports show that beaver dams were present on the site at one time but have been since been removed as there was no sign of backwater pools caused by dams. All streams were flowing during the monitoring field work in October, 2013. All stream features including rock vanes, log vanes, riffles and pools were evident during the field work. A comparison to previous years' monitoring report shows little change. The stream banks all remain stable with the exception of the livestock crossing area previously mentioned in MY-04 report. When comparing cross-sections of previous years with MY-05, little change in geometry was observed within each of the reaches, which further suggests site stability. Pebble counts were performed in each of the five reaches at the Site. The sediment and substrate loads were a mix of sand in slower moving stream reaches and cobble & gravel in the riffles. The reach pebble counts shows slight coarsening in reach 3. The pebble counts for reach 2 shows slight fining. The reach 1, 4, and 5 pebble counts remains consistent with the previous year's data. The visual assessment concluded that the site exhibits a 100% structural integrity and function.
Fifteen (15) 10 x 10 meter vegetation plots were monitored using CVS-EEP Level 2 Vegetation Monitoring Protocol (count both planted and volunteer woody stems). The success criterion for vegetation is 320 stems per acre in MY-03, 288 stems per acre in MY-04 and 260 stems per acre in MY-05. Vegetation data was collected by MMI staff during the first week of October, 2013. Based on the CVS vegetation monitoring data for MY-05 there are 2,350 total woody stems per acre including planted stems, live stakes and volunteer stems. Counting only planted stems and excluding live stakes there are 604 stems per acre. All the vegetation plots met the threshold of 280 stems per acre, except VP 4 with 243 stems per acre. Data collected for all the plots are included in Appendix C. Supplemental planting of low density areas was conducted in November of 2013. The supplemental planting plan is included in Appendix C.

The invasive species encountered included multiflora rose (*Rosa multiflora*), Japanese honeysuckle (*Lonicera japonica*) and Japanese stilt grass (*microstegium vimineum*). Other invasive species observed included kudzu (*Pueraria Montana*) along the road frontage and Chinese privet (*Ligustrum sinense*). The kudzu is found sporadically along the road crossings at the base of the cattle fencing. It is being treated (apparently herbicide spray) by the landowner during routine maintenance so it should not be a concern at this time. The long term land steward should continue to check along the fence lines near the conservation easement in the future, particularly if there is a change in land use on the property. No invasive species are causing significant problems at this time. Tall fescue is also present near the road crossings but is not dominant.

II. Methodology

Monitoring methodologies follow the CVS-EEP Level 2 Vegetation Monitoring Protocol for Recording Vegetation (Lee et al 2008). All photos were taken with a Nikon digital camera and are available electronically. A Trimble Hand Held GPS unit was used to locate veg. plot corners, groundwater gauges and problem areas.

All graphics have been done using ArcGIS and are available electronically.

Vegetation Methodologies
Fifteen 10 x 10 square meter veg. plots were monitored according to the CVS-EEP Level 2 Vegetation Monitoring Protocol Version 4.2 (Lee et al 2006/8). The plot corners were marked with 1" PVC pipe and flagged with bright orange flagging tape. Data collected from each plot is included in Appendix C. Monitoring plot locations are shown on the maps in Appendix B. Plant identification was aided by the seminal publication *Flora of the Carolinas, Virginia, Georgia and Surrounding Areas* (Schaffle & Weakly).

Stream Methodologies
Twelve cross-sections and 2,917 linear feet of stream long-pro in five separate reaches were surveyed in October 2013 using a RTK survey grade GPS unit. The survey data was plotted using ARC GIS 10.0. Cross-sectional data was based on a linear alignment between end points marked by metal posts. Measurements at each cross-section include points at point of origin, bankfull, top of bank, toe of slope and thalweg for each stream side supplemented with photos. Long-pro measurements include thalweg and water surface taken at the head of feature (i.e. riffle, run, pool glide) in addition to pool depths. In addition, visual assessment of in-stream structures was conducted to determine overall project success. Common structure failures include collapse of structure, undermining, abandonment of channel, and piping around the structure however, none of this was observed at the Site. Stream assessment data are included in Appendix D with cross-sections and monitored stream reaches indicated on maps in Appendix B.

All raw data supporting the tables, figures and graphs in the appendices are available to NCEEP upon request.

III. References

Doll, B. A., Grabow, G.L., Hall, K. A., Halley, J., Harman, W. A. Jennings, G.D., Wise, D.E., 2003. *Stream Restoration A Natural Channel Design Handbook*.

Lee, Michael T.; Peet, Robert K.; Roberts, Steven D.; Wentworth, Thomas R. (2008). *CVS-EEP Protocol for Recording Vegetation Version 4.2.*

Axiom Environmental, Inc. January 2011. Monitoring Report Year #2. Raleigh, NC.

Ward Consulting, P.C. March 2012. Monitoring Report Year #3. Raleigh, NC.

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

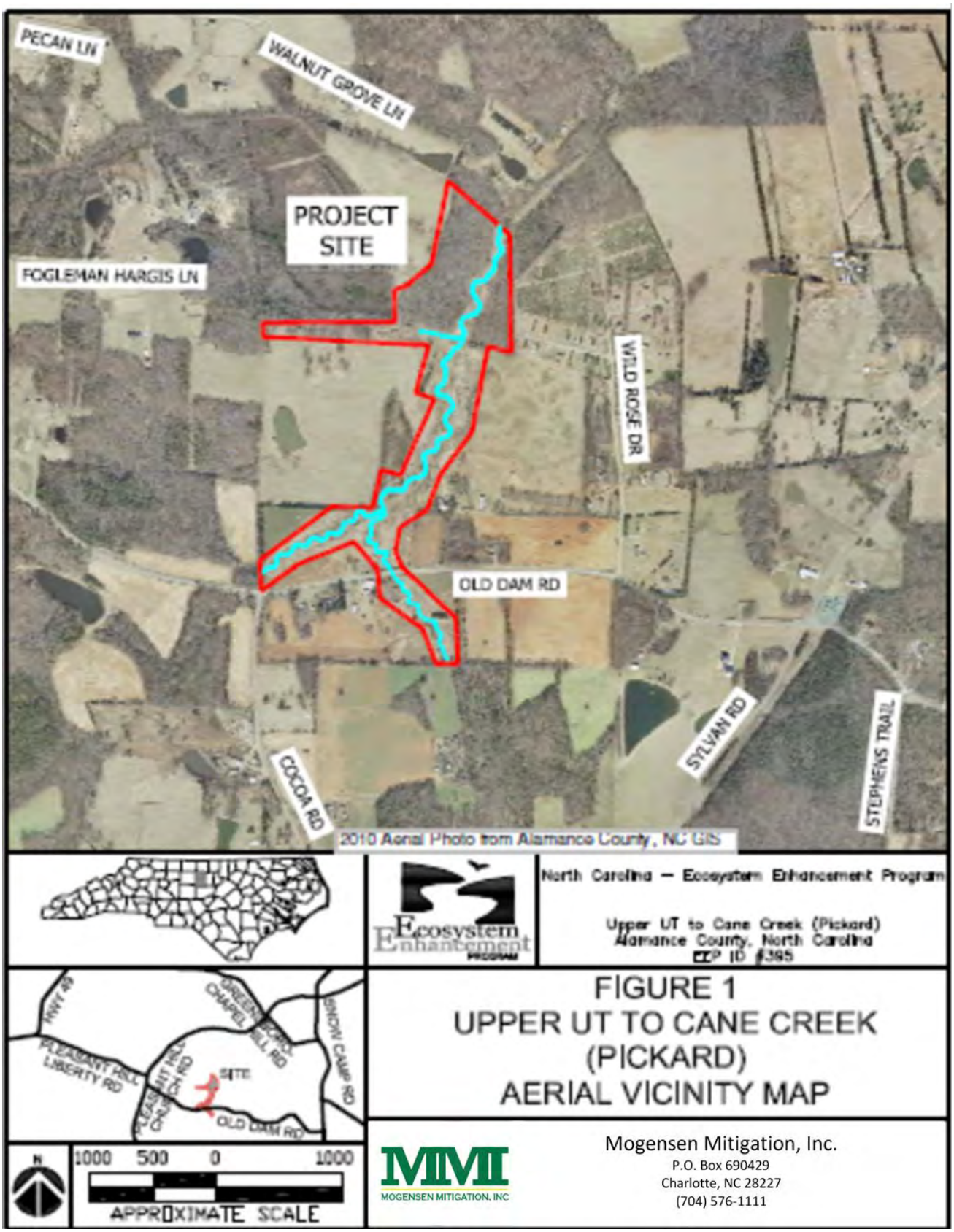
Weakly, A. S. (2011) *Flora of the Carolinas, Virginia, Georgia and the Surrounding Areas* University of North Carolina at Chapel Hill.

Miller, James H. *Nonnative Invasive Plants of Southern Forests. A field guide for identification and Control*. USDA Forest Service Southern Research station General Technical Report SRS-62.

Wolman, M. G. 1954. A Method of Sampling Coarse River-Bed Material, Transactions of American Geophysical Union 35:951-956.

Various NCEEP Guideline Documents as noted.

APPENDIX A. PROJECT VICINITY MAP AND BACKGROUND DATA


PECAN LN
WALNUT GROVE LN
PROJECT SITE
FOGLEMAN HARGIS LN
WILD ROSE DR
OLD DAM RD
SYLVAN RD
STEPHENS TRAIL
COCOA RD
2010 Aerial Photo from Alamance County, NC GIS
North Carolina – Ecosystem Enhancement Program
Upper UT to Cane Creek (Pickard)
Alamance County, North Carolina
EEP ID #395
FIGURE 1
UPPER UT TO CANE CREEK
(PICKARD)
AERIAL VICINITY MAP
SITE
1000 500 0 1000
APPROXIMATE SCALE
Mogensen Mitigation, Inc.
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(704) 576-1111

Table 1. Project Restoration Components

Table 1. Project Components Upper UT to Cane Creek (Pickard) / EEP# 395									
Project Component or Reach ID	**Existing Linear Feet (LF) / Acres (AC)**	**Restoration Level**	**Approach**	**Design Linear Feet (LF) / Acres (AC)**	**Stationing**	**Mitigation Ratio**	**Mitigation Units (SMU/WMU)**	**BMP Elements[1]**	**Comment**
Reach A	1,430.00	R	P1	1,810.76	10+00 - 28+10.76	1:1	1,738.76		Excludes 72-foot ROW at Old Dam
Reach B	2,065.00	R	P1	2,118.69	28+10.76 - 49+29.45	1:1	2,118.69		
Reach C	1,435.00	R	P2	1,194.58	49+29.45 - 61+24.03	1:1	1,194.58		
Reach D	1,100.00	R	P1	1,357.31	100+00 - 113+57.31	1:1	1,357.31		
Reach E	300.00	R	P1	373.25	200+00 - 203+73.25	1:1	373.25		
Wetlands	1.3	E		1.3		2:1	0.65		
Wetlands	2	P		2		5:1	0.4		
Note 1: BR = Bioretention Cell; SF = Sand Filter; SW = Stormwater Wetland; WDP = Wet Detention Pond; DDP = Dry Detention Pond; FS = Filter Strip; Grassed Swale = S; LS = Level Spreader; NI = Natural Infiltration Area, O = Other; CF = Cattle Fencing; WS = Watering System; CH = Livestock Housing									
	Non-Applicable								

Restoration Level	**Stream (LF)**	**Riparian Wetland (Ac)**		**(Ac)**	**Upland (Ac)**	**(Ac)**	**BMP**
		Riverine	**Non-Riverine**				
Restoration	6,782.59						
Enhancement		1.3					
Enhancement I							
Enhancement II							
Creation							
Preservation		2					
HQ Preservation							
Totals (Feet/Acres)	**6,782.59**	**3.3**		**0**	**0**	**41**	
MU Totals	**6783**	**0.0**		**0**	**0**	**0**	
	Non-Applicable						

Table 2. Project Activity and Reporting History

Table 2. Project Activity and Reporting History Upper UT to Cane Creek (Pickard) / EEP# 395		
Elapsed Time Since Grading Complete:	4 yrs 8 months	
Elapsed Time Since Planting Complete:	4 yrs 8 Months	
Number of Reporting Years[1]:	5	
Activity or Deliverable	**Data Collection Complete**	**Completion or Delivery**
Restoration Plan		Feb-06
Construction		Mar-09
Site Planting		Mar-09
As-built Drawings		Mar-09
Mitigation Plan (Year 0 Monitoring – baseline)	July-Oct 2008	July-09
Year 1 Monitoring	Oct-09	Nov-09
Year 2 Monitoring	Sep-10	Jan-11
Year 3 Monitoring	Aug-11	Dec-11
Year 4 Monitoring	Sep-12	Nov-12
Year 5 Monitoring	Oct-13	Nov-13
1 = Equals the number of reports or data points produced excluding the baseline		

Table 3. Project Contacts Table

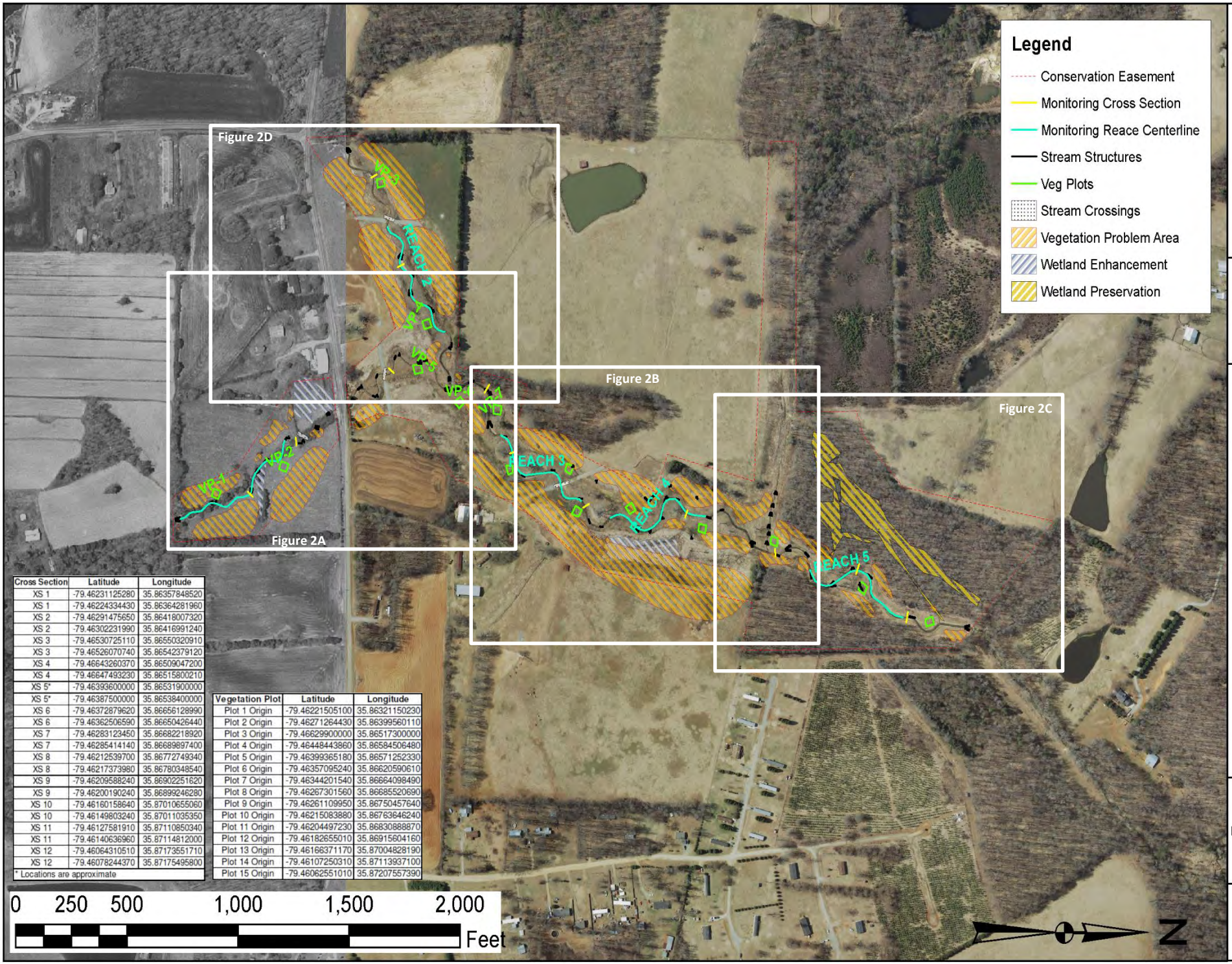
Table 3. Project Contacts Table Upper UT to Cane Creek (Pickard) / EEP# 395	
Designer Primary Project Design POC	**URS Corporation** 1600 Perimeter Park Drive, Suite 400 Morrisville, North Carolina 27560 Kathleen McKeithan (919) 461-1597
Construction Contractor Construction Contractor POC	**River Works, Inc.** 6105 Chapel Hill Road Raleigh, NC 27607 Phillip Todd (919) 582-3574
Survey Contractor Survey contractor POC	**Level Cross Surveying, PLLC** 668 Marsh County Lane Randleman, North Carolina 23717 Sherri Willard (336) 495-1713
Planting Contractor Planting contractor POC	**Habitat Assessment & Restoration Program, Inc.** 9305-D Monroe Road Charlotte, North Carolina 28270 Karri Blackmon (704) 841-2841
Seeding Contractor Contractor POC	**River Works, Inc.** 6105 Chapel Hill Road Raleigh, NC 27607 Phillip Todd (919) 582-3574
Seed Mix Sources POC	**Green Resource Colfax, NC** Rodney Montgomery (336) 855-6363
Nursery Stock Suppliers	**Strader Fencing, Inc. Julian, NC** Kenneth Strader (336)-697-5715
Monitoring Performers	**Mogensen Mitigation, Inc.** P.O. Box 690429 Charlotte, North Carolina 28227
Stream Monitoring POC	Melissa Lanza (406) 471-1028
Vegetation Monitoring POC	Melissa Lanza (406) 471-1028
Wetland Monitoring POC	Melissa Lanza (406) 471-1028

Table 4. Project Attribute Table

Table 4. Project Baseline Information and Attributes Upper UT to Cane Creek (Pickard) / EEP# 395					
Project County	Alamance County, North Carolina				
Physiographic Region	Piedmont				
Ecoregion	Carolina Slate Belt				
Project River Basin	Cape Fear				
USGS HUC for Project (14 digit)	3030002050050				
NCDWQ Sub-basin for Project	3/6/2004				
Within extent of EEP Watershed Plan?	Cape Fear River Basin Restoration Priorities 2009				
WRC Hab Class (Warm, Cool, Cold)	Warm				
% of project easement fenced or demarcated	100%				
Beaver activity observed during design phase?	No				
Restoration Component Attribute Table					
	Reach A	Reach B	Reach C	Reach D	Reach E
Drainage area	390	1333	1640	892	282
Stream order	first	third	third	third	second
Restored length (feet)	1738.76	2118.69	1194.58	1357.31	373.25
Perennial or Intermittent	perennial	perennial	perennial	perennial	perennial
Watershed type (Rural, Urban, Developing etc.)	Rural				
Watershed LULC Distribution (e.g.)					
Managed Herbaceous Coverage	49.8				
Mixed Upland Hardwoods	31.4				
Cultivated	9.9				
Southern Yellow Pine	4.6				
Deciduous Shrubland	2				
Mixed Hardwoods/Conifers	0.9				
Unmanaged Herbaceous Upland	0.6				
Evergreen Shrubland	0.4				
Water Bodies	0.4				
Etc.					
Watershed impervious cover (%)	<0.1				
NCDWQ AU/Index number	16-28				
NCDWQ classification	C, NSW				
303d listed?	No				
Upstream of a 303d listed segment?	No				
Reasons for 303d listing or stressor	N/A				
Total acreage of easement	50.75				
Total vegetated acreage within the easement	-	-	-	-	-
Total planted acreage as part of the restoration	41				
Rosgen classification of pre-existing	E4	Degraded E4	E4	E4	Degraded E4
Rosgen classification of As-built	E4	E4	E4	E4	E4
Valley type	VIII	VIII	VIII	VIII	VIII
Valley slope	0.0083	0.0041	0.0045	0.0046	0.0156
Valley side slope range (e.g. 2-3.%)	-	-	-	-	-
Valley toe slope range (e.g. 2-3.%)	-	-	-	-	-
Cowardin classification	R3UB1	R3UB1	R3UB1	R3UB1	R3UB1
Trout waters designation	No	No	No	No	No
Species of concern, endangered etc.? (Y/N)	No	No	No	No	No
Dominant soil series and characteristics					
Series	Tirzah silt loam, Georgeville silt loam, Starr loam, Colfax silt loam, Herndon silt loam, and mixed alluvial land				
Depth	-	-	-	-	-
Clay%	-	-	-	-	-
K	-	-	-	-	-
T	-	-	-	-	-

Use N/A for items that may not apply. Use "-" for items that are unavailable and "U" for items that are unknown

APPENDIX B. VISUAL ASSESSMENT DATA



Cross Section	Latitude	Longitude
XS 1	-79.46231125280	35.86357848520
XS 1	-79.46224334430	35.86364281960
XS 2	-79.46291475650	35.86418007320
XS 2	-79.46302231990	35.86416991240
XS 3	-79.46530725110	35.86550320910
XS 3	-79.46526070740	35.86542379120
XS 4	-79.46643260370	35.86509047200
XS 4	-79.46647493230	35.86515800210
XS 5*	-79.46393600000	35.86531900000
XS 5*	-79.46387500000	35.86538400000
XS 6	-79.46372879620	35.86656128990
XS 6	-79.46362506590	35.86650426440
XS 7	-79.46283123450	35.86682218920
XS 7	-79.46285414140	35.86689897400
XS 8	-79.46212539700	35.86772749340
XS 8	-79.46217373980	35.86780348540
XS 9	-79.46209588240	35.86902251620
XS 9	-79.46200190240	35.86899246280
XS 10	-79.46160158640	35.87010655060
XS 10	-79.46149803240	35.87011035350
XS 11	-79.46127581910	35.87110850340
XS 11	-79.46140636960	35.87114812000
XS 12	-79.46064310510	35.87173551710
XS 12	-79.46078244370	35.87175495800

* Locations are approximate

Vegetation Plot	Latitude	Longitude
Plot 1 Origin	-79.46221505100	35.86321150230
Plot 2 Origin	-79.46271264430	35.86399560110
Plot 3 Origin	-79.46629900000	35.86517300000
Plot 4 Origin	-79.46448443860	35.86584506480
Plot 5 Origin	-79.46399365180	35.86571252330
Plot 6 Origin	-79.46357095240	35.86620590610
Plot 7 Origin	-79.46344201540	35.86664098490
Plot 8 Origin	-79.46267301560	35.86685520690
Plot 9 Origin	-79.46261109950	35.86750457640
Plot 10 Origin	-79.46215083880	35.86763646240
Plot 11 Origin	-79.46204497230	35.86830888870
Plot 12 Origin	-79.46182655010	35.86915604160
Plot 13 Origin	-79.46166371170	35.87004828190
Plot 14 Origin	-79.46107250310	35.87113937100
Plot 15 Origin	-79.46062551010	35.87207557390

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Upper UT to Cane Creek (Pickard) Restoration Site

Alamance County, North Carolina

December, 2013

Figure 2
Overall

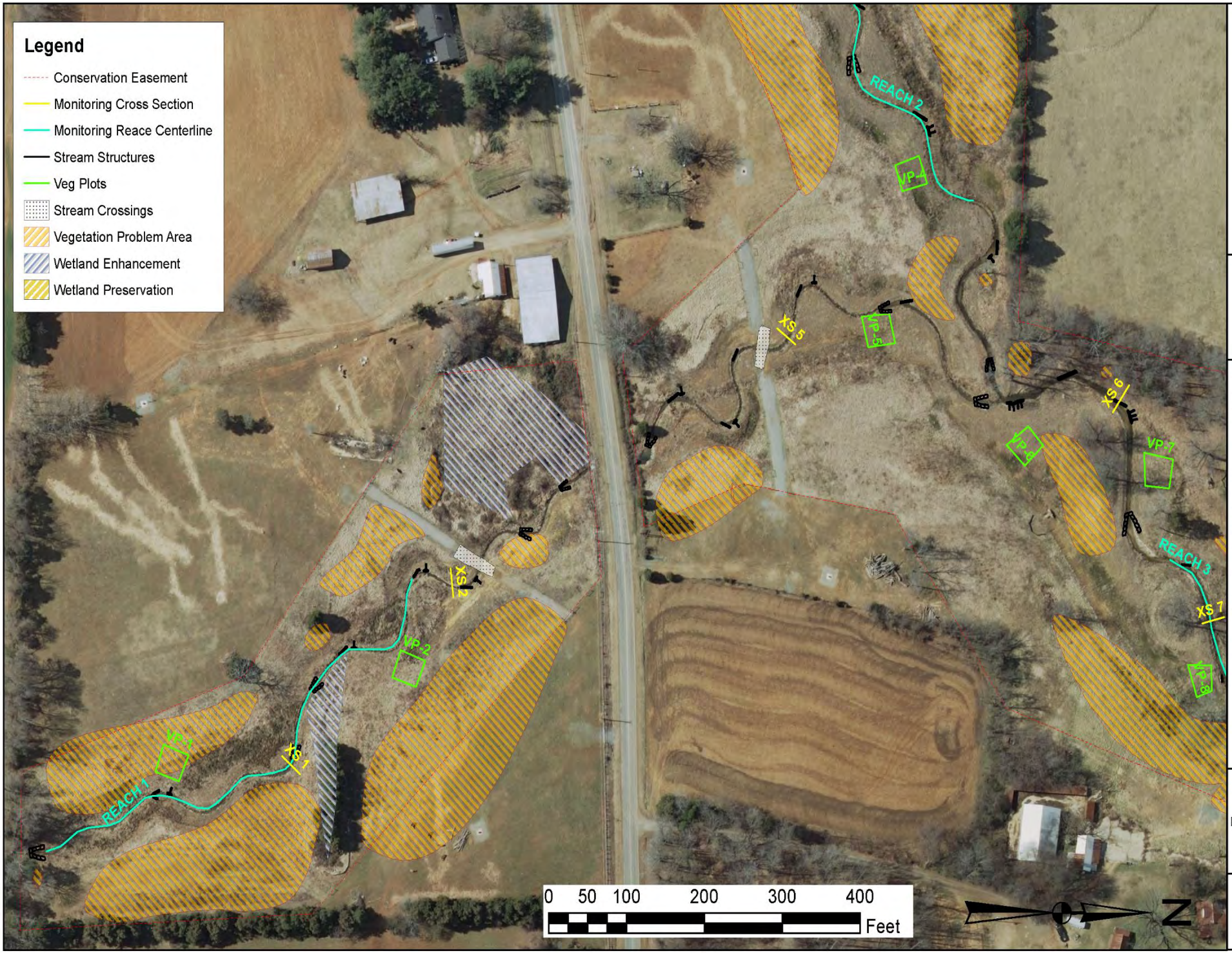

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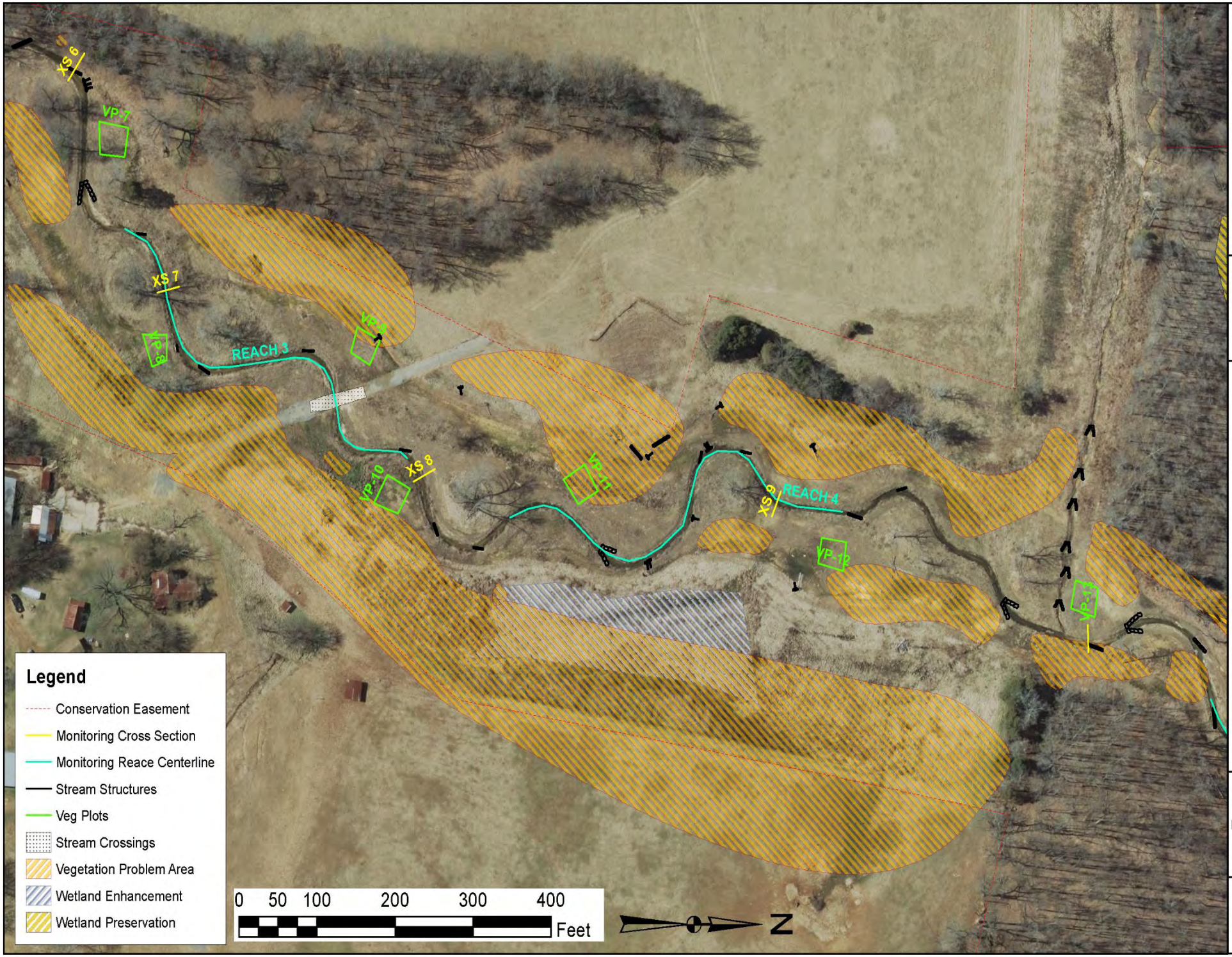
Figure 2A



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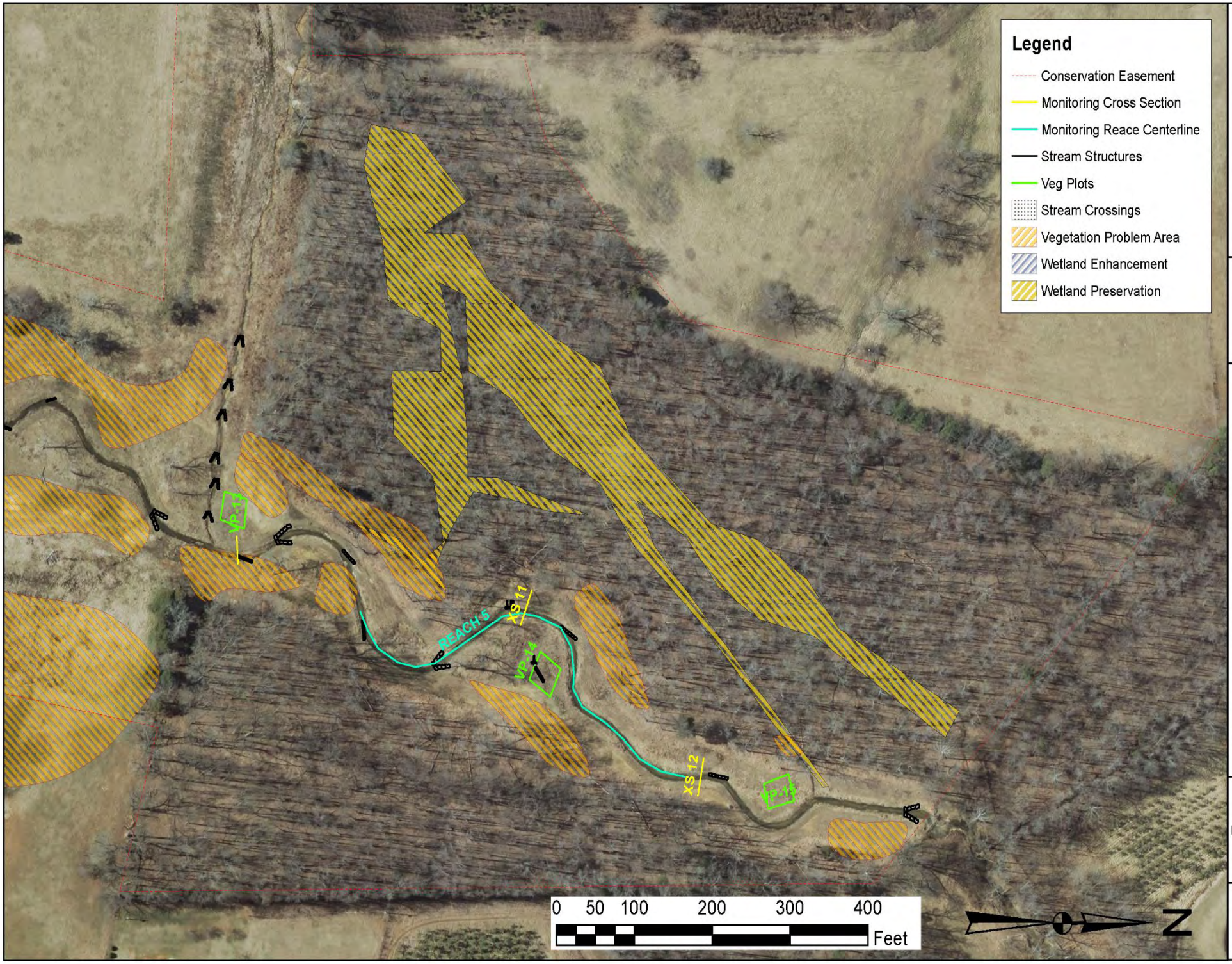
Upper UT to Cane Creek (Pickard) Restoration Site

Alamance County, North Carolina

December, 2013

Figure 2B



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Upper UT to Cane Creek (Pickard) Restoration Site

Alamance County, North Carolina

December, 2013

Figure 2C

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Upper UT to Cane Creek (Pickard) Restoration Site

Alamance County, North Carolina

December, 2013

Figure 2D

Table 5. Visual Stream Morphology Stability Assessment Upper UT to Cane Creek (Pickard) / EEP# 395							
REACH 1 (Design Reach A) Station 10+33 - 16+93 (641 LF)							
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**
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)					100%
		2. Degradation - Evidence of downcutting					100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	9	11			82%
	3. Meander Pool Condition	1. Depth - Sufficient (Max Pool Depth/Mean Bankfull Depth ≥ 1.5)	9	11			82%
		2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	9	11			82%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	10	11			91%
		2. Thalweg centering at downstream of meadnder (Glide)	10	11			91%
2. Bank	1. Scoured/Eroding	Bank lacks vegetative cover due to active scour and erosion					100%
	2. Undercurt	Banks undercut/overhanging to the extent that mass wasting is expected. Do NOT include undercuts that are stabilized by roots and are providing habitat					100%
	3. Mass Wasting	Bank slumping, caving, or collapse					100%
				Totals	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.	6	8			75%
	2a. Piping	Structures lacking any substantial flow underneath or around sill or arms.	6	8			75%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. See exhibit describing bank influenced by vane arms.	8	8			100%
	4. Habitat	Pool forming structures maintaining Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow.	8	8			100%

REACH 2 (Design Reach D) Station 104+65 - 110+40 (587 LF)							
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**
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)					100%
		2. Degradation - Evidence of downcutting					100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	7	7			100%
	3. Meander Pool Condition	1. Depth - Sufficient (Max Pool Depth/Mean Bankfull Depth ≥ 1.5)	7	7			100%
		2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	7	7			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	7	7			100%
		2. Thalweg centering at downstream of meadnder (Glide)	7	7			100%
2. Bank	1. Scoured/Eroding	Bank lacks vegetative cover due to active scour and erosion					100%
	2. Undercurt	Banks undercut/overhanging to the extent that mass wasting is expected. Do NOT include undercuts that are stabilized by roots and are providing habitat					100%
	3. Mass Wasting	Bank slumping, caving, or collapse					100%
				Totals	0	0	100%
3. Engineered Structures	1. Overall integrity	Structures physically intact with no dislodged boulders or logs	6	6			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	4	4			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sill or arms.	4	4			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. See exhibit describing bank influenced by vane arms.	6	6			100%
	4. Habitat	Pool forming structures maintaining Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow.	6	6			100%

REACH 3 (Design Reach B) Station 31+11 - 36+48 (531 LF)							
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**
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)					100%
		2. Degradation - Evidence of downcutting					100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	4	5			80%
	3. Meander Pool Condition	1. Depth - Sufficient (Max Pool Depth/Mean Bankfull Depth ≥ 1.5)	4	4			100%
		2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	4	4			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	5	5			100%
		2. Thalweg centering at downstream of meadnder (Glide)	5	5			100%
2. Bank	1. Scoured/Eroding	Bank lacks vegetative cover due to active scour and erosion			1	10	98%
	2. Undercurt	Banks undercut/overhanging to the extent that mass wasting is expected. Do NOT include undercuts that are stabilized by roots and are providing habitat					100%
	3. Mass Wasting	Bank slumping, caving, or collapse					100%
				Totals	1	10	98%
3. Engineered Structures	1. Overall integrity	Structures physically intact with no dislodged boulders or logs	5	5			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	5	5			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sill or arms.	5	5			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. See exhibit describing bank influenced by vane arms.	5	5			100%
	4. Habitat	Pool forming structures maintaining Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow.	5	5			100%

REACH 4 (Design Reach B) Station 38+49 - 44+06 (570 LF)							
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**
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)					100%
		2. Degradation - Evidence of downcutting					100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	5	5			100%
	3. Meander Pool Condition	1. Depth - Sufficient (Max Pool Depth/Mean Bankfull Depth ≥ 1.5)	4	4			100%
		2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	4	4			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	5	5			100%
		2. Thalweg centering at downstream of meadnder (Glide)	5	5			100%
2. Bank	1. Scoured/Eroding	Bank lacks vegetative cover due to active scour and erosion					100%
	2. Undercurt	Banks undercut/overhanging to the extent that mass wasting is expected. Do NOT include undercuts that are stabilized by roots and are providing habitat					100%
	3. Mass Wasting	Bank slumping, caving, or collapse					100%
				Totals	0	0	100%
3. Engineered Structures	1. Overall integrity	Structures physically intact with no dislodged boulders or logs	6	6			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sill or arms.	3	3			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. See exhibit describing bank influenced by vane arms.	6	6			100%
	4. Habitat	Pool forming structures maintaining Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow.	6	6			100%

REACH 5 (Design Reach C) Station 50+23 - 55+97 (634 LF)							
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**
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)					100%
		2. Degradation - Evidence of downcutting					100%
	2. Riffle Condition	1. Texture/Substrate - Riffle maintains coarser substrate	5	5			100%
	3. Meander Pool Condition	1. Depth - Sufficient (Max Pool Depth/Mean Bankfull Depth ≥ 1.5)	4	5			80%
		2. Length - Sufficient (>30% of centerline distance between tail of upstream riffle and head of downstream riffle)	5	5			100%
	4. Thalweg Position	1. Thalweg centering at upstream of meander bend (Run)	5	5			100%
		2. Thalweg centering at downstream of meadnder (Glide)	5	5			100%
2. Bank	1. Scoured/Eroding	Bank lacks vegetative cover due to active scour and erosion					100%
	2. Undercurt	Banks undercut/overhanging to the extent that mass wasting is expected. Do NOT include undercuts that are stabilized by roots and are providing habitat					100%
	3. Mass Wasting	Bank slumping, caving, or collapse					100%
				Totals	0	0	100%
3. Engineered Structures	1. Overall integrity	Structures physically intact with no dislodged boulders or logs	4	4			100%
	2. Grade Control	Grade control structures exhibiting maintenance of grade across the sill.	3	3			100%
	2a. Piping	Structures lacking any substantial flow underneath or around sill or arms.	3	3			100%
	3. Bank Protection	Bank erosion within the structures extent of influence does not exceed 15%. See exhibit describing bank influenced by vane arms.	4	4			100%
	4. Habitat	Pool forming structures maintaining Max Pool Depth/Mean Bankfull Depth ratio ≥ 1.5. Rootwads/logs providing some cover at low flow.	4	4			100%

Table 6. Vegetation Condition Assessment

Table 6. Vegetation Condition Assessment Upper UT to Cane Creek (Pickard) / EEP# 395						
Planted Acreage[1] = 41						
Vegetation Category	**Definitions**	**Mapping Threshold**	**CCPV Depiction**	**Number of Polygons**	**Combined Acreage**	**% of Planted Acreage**
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	Brown Hatch	3	0.55	1.3%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.01 acres	Brown Hatch	15	12.34	30.1%
			Total	**18**	**12.89**	**31.4%**
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	Brown Hatch	0	0.00	0.0%
			Cumulative Total	**18**	**12.89**	**31.4%**
Easement Acreage[2] = 51.83						
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).	500 SF	Brown Hatch	7	0.83	1.6%
5. Easement Encroachment Areas[3]	Areas or points (if too small to render as polygons at map scale).	none	Brown Hatch	0	0.00	0.0%

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

2 = The acreage within the easement boundaries.

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

4 = Invasives may occur in or out of planted areas, but still within the easement and will therefore be calculated against the overall easement acreage. Invasives of concern/interest are listed below. The list of high concern spcies are those with the potential to directly outcompete native, young, woody stems in the short-term (e.g. monitoring period or shortly thereafter) or affect the community structure for existing, more established tree/shrub stands over timeframes that are slightly longer (e.g. 1-2 decades). The low/moderate concern group are those species that generally do not have this capacity over the timeframes discussed and therefore are not expected to be mapped with regularity, but can be mapped, if in the judgement of the observer their coverage, density or distribution is suppressing the viability, density, or growth of planted woody stems. Decisions as to whether remediation will be needed are based on the integration of risk factors by EEP such as species present, their coverage, distribution relative to native biomass, and the practicality of treatment. For example, even modest amounts of Kudzu or Japanese Knotweed early in the projects history will warrant control, but potentially large coverages of Microstegium in the herb layer will not likley trigger control because of the limited capacities to impact tree/shrub layers within the timeframes discussed and the potential impacts of treating extensive amounts of ground cover. Those species with the "watch list" designator in gray shade are of interest as well, but have yet to be observed across the state with any frequency. Those in *reditalics* are of particular interest given their extreme risk/threat level for mapping as points where isolated specimens are found, particularly ealry in a projects monitoring history. However, areas of discreet, dense patches will of course be mapped as polygons. The symbology scheme below was one that was found to be helpful for symbolzing invasives polygons, particulalry for situations where the conditon for an area is somewhere between isolated specimens and dense, discreet patches. In any case, the point or polygon/area feature can be symbolized to describe things like high or low concern and species can be listed as a map inset, in legend items if the number of species are limited or in the narrative section of the executive summary.

Table 6. Vegetation Condition Assessment (Cont.)

Table 6. Vegetation Condition Assessment (Cont.) Upper UT to Cane Creek (Pickard) / EEP# 395					
High Concern:				**Low/Moderate Concern:**	
Vines	**Genus/Species**	**Shrubs/Herbs**	**Genus/Species**	**Shrubs/Herbs**	**Genus/Species**
Kudzu	*Pueraria lobata*	Japanese Knotweed	Polygonum cuspidatum	Japanese Privet	Ligustrum Japonicum
Porcelain Berry	Ampelopsis brevipeduncul	Oriental Bittersweet	Celastrus orbiculatus	Glossy Privet	Ligustrum lucidum
Japanese Honeysuckle	Lonicera japonica	Multiflora Rose	Rosa multiflora	Fescue	Festuca spp.
Japanese Hops	Humulus japonicus	Russian olive	Elaeagnus angustifolia	English Ivy	Hedera helix
Wisterias	Wisteria spp.	Chinese Privet	Ligustrum sinense	Microstegium	Microstegium vimineum
Winter Creeper	Euonymus fortunei	Chinese Silvergrass	Miscanthus sinensis	Burning Bush	Euonymus alatus
Bush Killer (Watch List)	Cayratia japonica	Phragmites	Phragmites australis	Johnson Grass	Sorghum halepense
		Bamboos	Phyllostachys spp	Bush Honeysuckles	Lonicera, spp.
Trees	**Genus/Species**	Sericea Lespedeza	Sericea Lespedeza	Periwinkles	Vinca minor
Tree of Heaven	Ailanthus altissima	Garlic Mustard (Watch List)	Alliaria petiolata	Morning Glories	Morning Glories
Mimosa	Albizia julibrissin	Cogon Grass (Watch List)	Imperata cylindrica	Bicolor Lespedeza (Watch List)	Lespedeza bicolor
Princess Tree	Paulownia tomentosa	Giant Reed (Watch List)	Arundo donax	Chinese Yams (Watch List)	Dioscorea oppositifolia
China Berry	Melia azedarach	Tropical Soda Apple (Watch List)	Solanum viarum	Air Potato (Watch List)	Dioscorea bulbifera
Callery Pear	Pyrus calleryana	Japanese Spirea (Watch List)	Spiraea japonica	Japanese Climbing Fern (Watch List)	Lygodium japonicum
White Mulberry	Morus alba	Japanese Barberry (Watch List)	Berberis thunbergii		
Tallow Tree (Watch List)	Triadica sebifera				

Stream Station Photos

Cross Section #1 Photo A

Cross Section #1 Photo B

Cross Section #2 Photo A

Cross Section #2 Photo B

Cross Section #3 Photo A

Cross Section #3 Photo B

Cross Section #4 Photo A

Cross Section #4 Photo B

Cross Section #5 Photo A

Cross Section #5 Photo B

Cross Section #6 Photo A

Cross Section #6 Photo B

Cross Section #7 Photo A

Cross Section #7 Photo B

Cross Section #8 Photo A

Cross Section #8 Photo B

Cross Section #9 Photo A

Cross Section #9 Photo B

Cross Section #10 Photo A

Cross Section #10 Photo B

Cross Section #11 Photo A

Cross Section #11 Photo B

Cross Section #12 Photo A

Cross Section #12 Photo B

Vegetation Monitoring Plots MY-05
October 22, 2013

Veg Plot 1

Veg Plot 2

Veg Plot 3

Veg Plot 4

Veg Plot 5

Veg Plot 6

Veg Plot 7

Veg Plot 8

Veg Plot 9

Veg Plot 10

Veg Plot 11

Veg Plot 12

Veg Plot 13

Veg Plot 14

Veg Plot 15

APPENDIX C. VEGETATION PLOT DATA

Table 7. Vegetation Plot Criteria Attainment

Vegetation Plot ID	Vegetation Survival Threshold Met? (260 planted stems/acre)	Monitoring Year 05 Planted Stem Density stems/acre	Monitoring Year -05 Total Stem Density stems/acre
VP1	Yes	324	283
VP2	Yes	324	567
VP3	Yes	567	1983
VP4	No	243	1012
VP5	Yes	647	1821
VP6	Yes	364	3602
VP7	Yes	526	3966
VP8	Yes	486	2711
VP9	Yes	607	2509
VP10	Yes	283	2469
VP11	Yes	283	971
VP12	Yes	283	2509
VP13	Yes	688	1781
VP14	Yes	486	4775
VP15	Yes	607	1821

Table 8. CVS Metadata

Report Prepared By	Mogensen Mitigation, Inc.
Date Prepared	11/14/2013 12:00

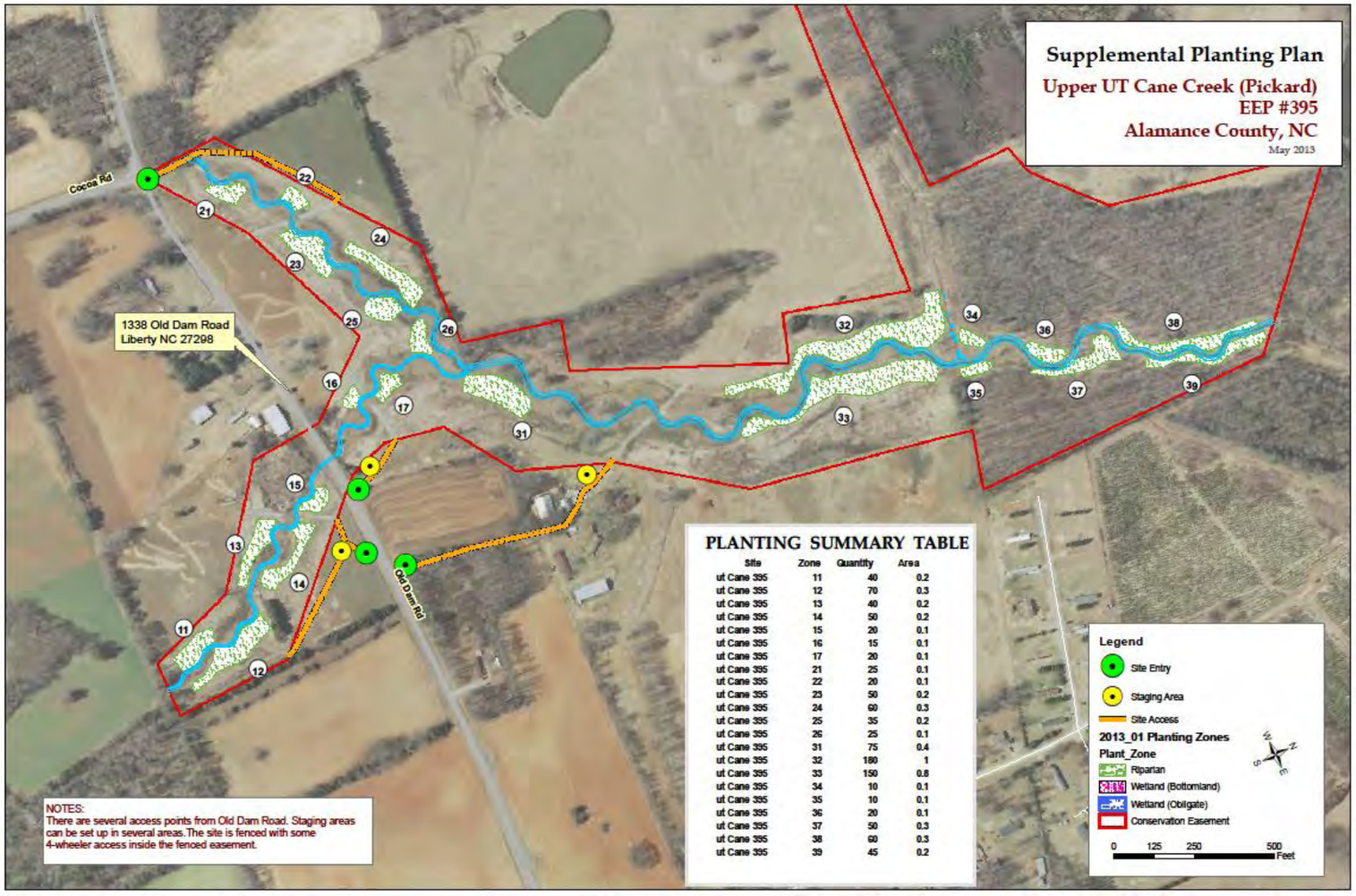
database name	cvs-eep-entrytool-v2.3.11.mdb
database location	C:\Users\Melissa\Downloads
computer name	
file size	
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
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.
ALL Stems by Plot and spp	A matrix of the count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded.
PROJECT SUMMARY----------	
Project Code	395
project Name	UT to Cane Creek
Description	UT to Cane Creek Stream and Wetland Restoration
River Basin	Cape Fear
length(ft)	6782.59
stream-to-edge width (ft)	
area (sq m)	51.83
Required Plots (calculated)	
Sampled Plots	15

Table 9. CVS Stem Count Total and Planted by Plot and Species

EEP Project Code 395. Project Name: Upper UT to Cane Creek (Picard)

			Current Data (MY5 2013)																																										Annual Means														
Scientific Name	Common Name	Species Type	E395-AXE-0001			E395-AXE-0002			E395-AXE-0003			E395-AXE-0004			E395-AXE-0005			E395-AXE-0006			E395-AXE-0007			E395-AXE-0008			E395-AXE-0009			E395-AXE-0010			E395-AXE-0011			E395-AXE-0012			E395-AXE-0013			E395-AXE-0014			E395-AXE-0015			MY5 (2013)			MY4 (2012)			MY3 (2011)			MY2 (2010)			MY1 (2009)		
			PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T	PnoLS	Pall	T
Acer rubrum	Red maple	Tree																2	2				5																					1				2	2	8			8			17			27			1
Alnus serrulata	hazel alder	Shrub				1	1	1						1							1	1	1																6	6	6							8	8	10	8	8	14	8	8	12	7	7	8	1	1	1
Aronia						4	4	4																									1	1	1													1	1	1	1	1	1	1	1	2						
Aronia arbutifolia	Red Chokeberry	Shrub																						1	1	1																						1	1	1	1	1	1	1	1	1	1	1	1			
Baccharis halimifolia	eastern baccharis	Shrub												3									4									2																		9			11			10			1			
Betula nigra	river birch	Tree							3	3	3				1	1	1				2	2	2	2	2	2	2	2	2	1	1	1							3	3	3							18	18	18	18	18	19	20	20	21	37	37	39	30	30	31
Carpinus caroliniana	American hornbeam	Tree	1	1	1				1	1	1				2	2	2	1	1		2	2	2				1	1	1										4	4	4	1	1	1	2	2	2	15	15	15	15	15	18	12	12	14						
Carya	hickory	Tree																																																							2	2	4	5	5	5
Carya cordiformis	bitternut hickory	Tree	1	1	1	1	1	1																																								2	2	2	2	2	2	1	1	1						
Celtis laevigata	sugarberry	Tree																			1	1	1				1	1	1																			2	2	2	2	2	2	5	5	6	6	6	7	6	6	6
Celtis occidentalis	common hackberry	Tree																			1	1	1																									1	1	1	1	1	1									
Cephalanthus occidentalis	common buttonbush	Shrub	2	2	2	2	2	2							1	1	1	1	1								1	1	2										2	2	2	1	1	1				10	10	11	10	10	10	10	10	10	11	11	11	9	9	9
Cornus amomum	silky dogwood	Shrub	1	1	1	1	1	1				3	3	3																						1	1	1										6	6	6	7	7	8	7	7	7	7	7	7	7	7	7
Corylus americana	American hazelnut	Shrub																			2	2	2																									2	2	2	2	2	3	2	2	3	3	3	3	3	3	3
Diospyros virginiana	common persimmon	Tree										3	3	6	3	3	3																					1										3	3	4	3	3	6	3	3	11	3	3	6	2	2	4
Fraxinus pennsylvanica	green ash	Tree				1	1	3	6	6	7						20	3	3	27	2	2	6			11	4	4	8	1	1	5	4	4	9	3	3	25			5	2	2	52	2	2	19	51	51	227	32	32	1752	33	33	438	35	35	2163	31	31	393
Juglans nigra	black walnut	Tree																																																				1	1	2	2	2	2			
Juniperus virginiana	eastern redcedar	Tree												1						12			6																									19	19	19			14			13			2			
Liquidambar styraciflua	sweetgum	Tree									33			11						45			64			18			38			9			6			17			21			50			11			323			2285			652			759			53
Liriodendron tulipifera	tuliptree	Tree																		1																						1	1	5			1	1	1	7	1	1	6	1	1	8	2	2	16	3	3	3
Liriodendron tulipifera var. tulipifera	Tulip-tree, Yellow Poplar, Whitewood	Tree																									2	2	2																			2	2	2												
Nyssa	tupelo	Tree																																																				1	1	1	2	2	2	1	1	1
Pinus taeda	loblolly pine	Tree																		1																														1			9			7			2			
Platanus occidentalis	American sycamore	Tree	1	1	1				4	4	4				1	1	1			1				7	7	7	2	2	6				1	1	2	1	1	3			1			1	6	6	7	33	33	45	22	22	41	22	22	31	22	22	30	18	18	22
Platanus occidentalis var. occidentalis	Sycamor, Plane-tree	Tree																																																						1						
Pyrus calleryana	Callery pear	Exotic																																																												
Quercus michauxii	swamp chestnut oak	Tree													3	3	3	2	2	2				1	1	1				5	5	5				1	1	1				2	2	2	5	5	5	19	19	19	20	20	20	20	20	20	21	21	21	21	21	21
Quercus pagoda	cherrybark oak	Tree																			2	2	2																			3	3	3				5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Quercus phellos	willow oak	Tree	1	1	1	2	2	4	1	1	1				4	4	4							1	1	1	2	2	2				1	1	1	1	1	1	2	2	2	2	2	2				17	17	19	20	20	21	20	20	22	20	20	21	19	19	19
Rhus copallinum	flameleaf sumac	Shrub																					2																											2			2			1			1			1
Rhus glabra	smooth sumac	Shrub																																																									3			1
Rosa multiflora	multiflora rose	Exotic																																																						2						
Rosa palustris	swamp rose	Shrub																																																			1									
Salix nigra	black willow	Tree	1	1	12	1	1	3	3	3	4				1	1	10									26						39			5			13										6	6	112	5	5	192	5	5	120	5	5	98	5	5	80
Sassafras albidum	sassafras	Tree																																																												1
Ulmus alata	winged elm	Tree																																																												
Unknown																																																									1	1	1	1	1	1
Vaccinium	blueberry	Shrub																																																									1			
		Stem Count	8	8	7	8	8	14	14	14	49	6	6	25	16	16	45	9	9	89	13	13	98	12	12	67	15	15	62	7	7	61	7	7	24	7	7	62	17	17	44	12	12	118	15	15	45	224	224	871	175	175	4452	178	178	1438	192	192	3241	167	167	668
		Size (Area)	1			1			1			1			1			1			1			1			1			1			1			1			1			1			1			15			15			15			15			15		
		Size (Acres)	0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.02			0.37			0.37			0.37			0.37			0.37		
		Species Count	7	7	7	8	8	8	6	6	7	2	2	6	8	8	9	5	5	7	8	8	13	5	5	8	8	8	9	3	3	6	4	4	6	5	5	8	5	5	8	7	7	10	4	4	6	224	224	871	19	19	26	20	20	28	19	19	27	17	17	22
		Stems per Acre	324	324	283	324	324	567	567	567	1983	243	243	1012	647	647	1821	364	364	3602	526	526	3966	486	486	2711	607	607	2509	283	283	2469	283	283	971	283	283	2509	688	688	1781	486	486	4775	607	607	1821	604	604	2350	472	472	12011	480	480	3880	518	518	8744	451	451	1802

Supplemental Planting Plan



UT Upper Cane Creek - Pickard (01)				
Species	**Type**	**Piedmont/Riparian**		**Nursery**
		Qty	%	
Betula nigra	1-gal	150	14%	Native Roots
Carya glabra	1-gal	50	5%	
Fraxinus pennsylvanica	1-gal	50	5%	Native Roots
Liriodendron tulipifera	1-gal	150	14%	Native Roots
Nyssa sylvatica var sylvatica	1-gal	50	5%	Native Roots
Platanus occidentalis	1-gal	150	14%	Native Roots
Populus deltoides	1-gal	50	5%	Native Roots
Quercus michauxii	1-gal	50	5%	Native Roots
Quercus phellos	1-gal	50	5%	Native Roots
Quercus rubra	1-gal	100	9%	
Quercus shumardii	1-gal	150	14%	
Ulmus americana	1-gal	50	5%	Native Roots
Diospyros virginiana	1-gal	50	5%	Native Roots
		1,100		

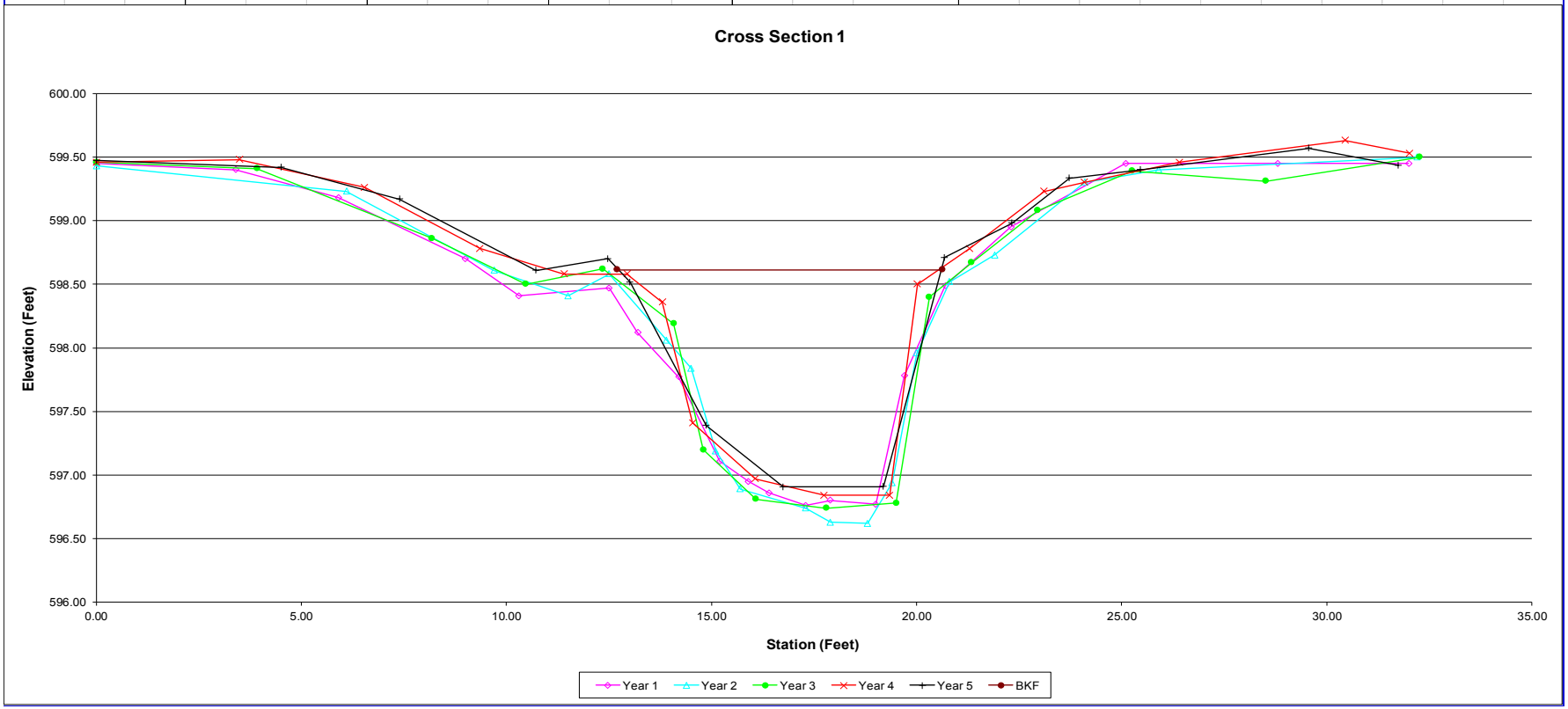
APPENDIX D. Stream Survey Data

Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 1
Feature	Pool
Date:	9/2/13
Crew:	ML, JP

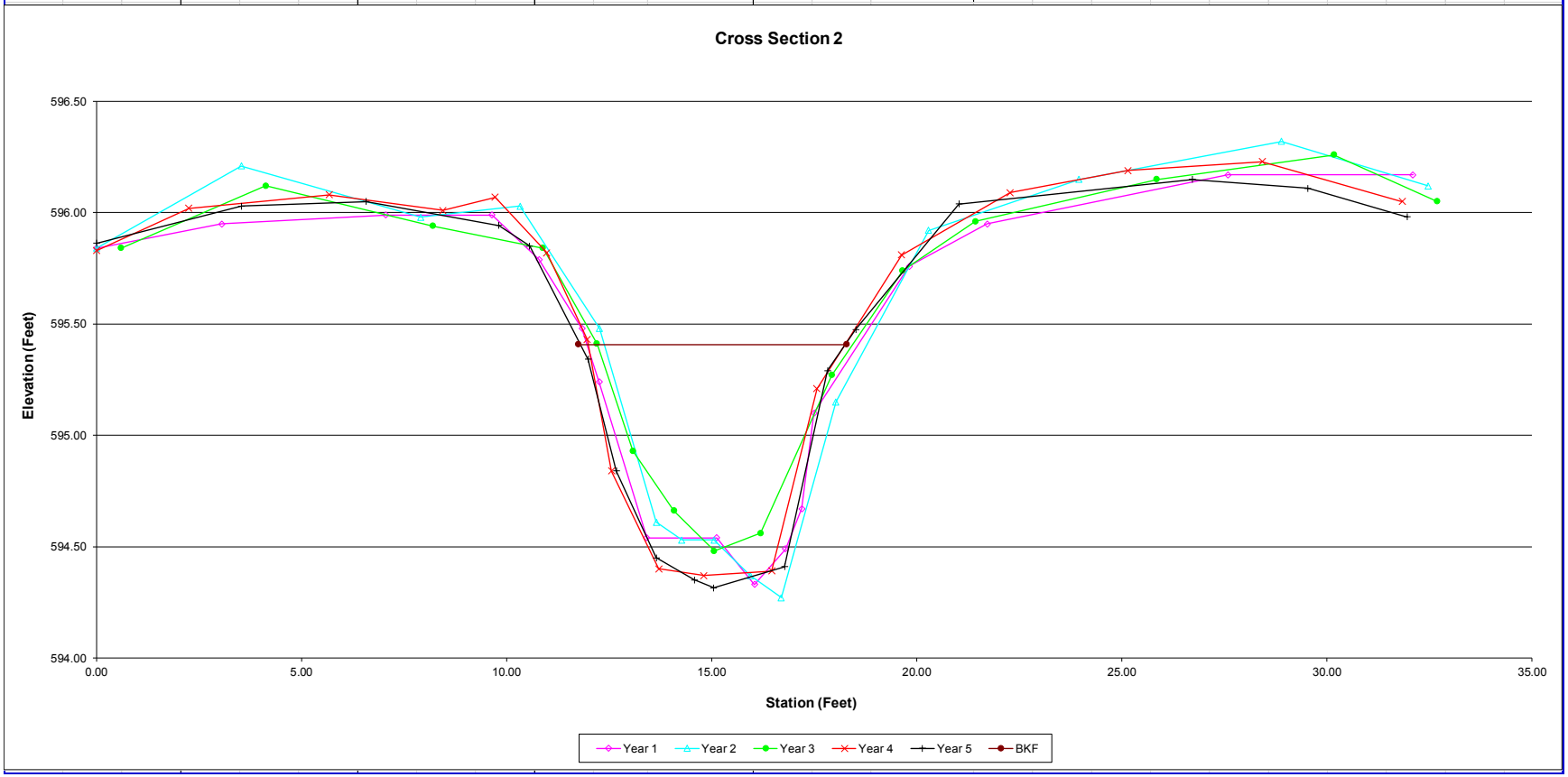
Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	9.0	8.8	9.4	8.2	8.86
W (BKF)	8.1	7.8	7.5	6.6	7.47
Max d	1.7	1.8	1.7	1.6	1.80
Mean d	1.1	1.1	1.3	1.2	1.14
W/D	N/A	N/A	5.9	5.2	4.15

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	599.45		0.00	599.43		0.00	599.46	LPIN	0.00	599.46	LPIN	0.00	599.47	LPIN
3.40	599.40		6.10	599.23		3.92	599.41		3.49	599.48		4.51	599.42	
5.90	599.18		9.70	598.61		8.18	598.86		6.54	599.26		7.39	599.17	
9.00	598.70		11.50	598.41	BL Bankfull	10.47	598.50		9.35	598.78		10.72	598.61	
10.30	598.41	BL Bankfull	12.50	598.58		12.35	598.62	BANKFULL	11.40	598.58		12.47	598.70	Top Of Bank L
12.50	598.47		13.90	598.06		14.08	598.19		12.94	598.58	BL Bankfull	13.01	598.52	L Bankfull
13.20	598.12		14.50	597.84		14.80	597.20	TOE L	13.80	598.36		14.87	597.39	
14.20	597.77		15.10	597.19		16.08	596.81		14.54	597.41	TOE L	16.74	596.91	Thalweg
15.20	597.11		15.70	596.89	TOE L	17.80	596.74	TW	16.07	596.97		19.19	596.91	
15.90	596.95		17.30	596.74		19.50	596.78	TOE R	17.74	596.84	TW	20.68	598.71	R Bankfull
16.40	596.86		17.90	596.63		20.31	598.40		19.34	596.84	TOE R	22.32	598.98	
17.30	596.76	TW	18.80	596.62	TW	21.34	598.67		20.02	598.50		23.72	599.34	Top of Bank Right
17.90	596.80		19.40	596.94	TOE R	22.95	599.08	TOBR	21.29	598.78		25.45	599.40	
19.00	596.77		20.00	597.96		25.25	599.39		23.11	599.23		29.56	599.57	
19.70	597.78		20.80	598.52	R Bankfull	28.52	599.31		24.08	599.30	R Bankfull	31.74	599.44	RPIN
20.70	598.49	R Bankfull	21.90	598.73		32.26	599.50	RPIN	26.41	599.46				
22.30	598.95		24.10	599.30					30.45	599.63				
25.10	599.45		25.90	599.40					32.02	599.53	RPIN			
28.80	599.45		32.20	599.50										
32.00	599.45													



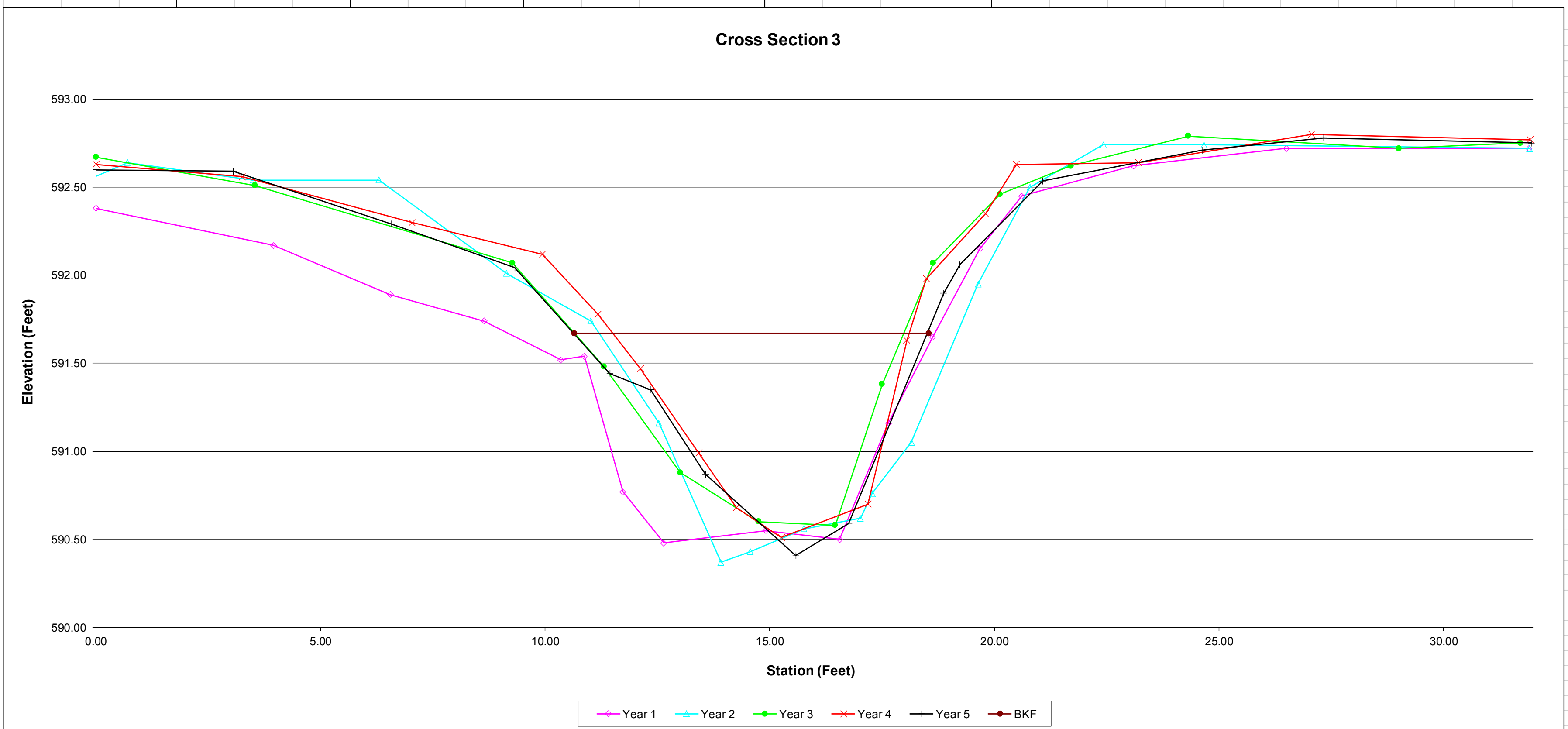
Project:		UT to Cane Creek (Pickard)		Summary (bankfull)											
Cross Section:		Cross Section 2			MY1	MY2	MY3	MY4	MY5						
Feature		Riffle		A (BKF)	9.3	8.6	8.1	9.3	5.4500						
Date:		9/2/13		W (BKF)	12.4	9.7	10.8	10.9	6.5400						
Crew:		ML, JP		Max d	1.6	1.7	1.5	1.6	1.1610						
				Mean d	0.8	0.9	0.8	0.8	1.0945						
				W/D	16.5	10.9	14.3	12.9	5.6331						
MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013			
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	
0.00	595.84		0.00	595.84		0.60	595.84	LPIN	0.00	595.83	LPIN	0.00	595.86	LPIN	
3.05	595.95		3.53	596.21		4.13	596.12		2.25	596.02		3.54	596.03		
7.05	595.99		7.90	595.98	BL Bankfull	8.21	595.94		5.67	596.08		6.58	596.05		
9.65	595.99	BL Bankfull	10.33	596.03		10.89	595.84	BANKFULL	8.45	596.01		9.81	595.94	Top Of Bank L	
10.79	595.79		12.27	595.48		12.21	595.41		9.72	596.07	TOBL Bankfull Left	10.56	595.85		
11.84	595.48		13.65	594.61	TOE L	13.08	594.93		10.98	595.82		11.99	595.34	L Bankfull	
12.26	595.24		14.27	594.53		14.09	594.66	TOE L	11.97	595.43		12.68	594.84		
13.42	594.54	TOE L	15.06	594.53		15.07	594.48	TW	12.56	594.84	TOE L	13.65	594.45		
15.13	594.54		15.94	594.37		16.20	594.56	TOE R	13.71	594.40		14.58	594.35		
16.05	594.33	TW	16.70	594.27	TW	17.93	595.27		14.81	594.37	TW	15.05	594.31	Thalweg	
16.80	594.49	TOE R	18.03	595.15		19.66	595.74		16.47	594.39	TOE R	16.78	594.41		
17.20	594.67		20.29	595.92	R Bankfull	21.44	595.96	TOBR	17.57	595.21		17.83	595.29		
17.50	595.10		23.96	596.15		25.86	596.15		19.63	595.81		18.52	595.48	R Bankfull	
19.82	595.76		28.90	596.32		30.18	596.26		22.28	596.09	TOBR Bankfull Right	21.03	596.04	Top of Bank Right	
21.72	595.95	R Bankfull	32.47	596.12		32.70	596.05	RPIN	25.16	596.19		26.72	596.15		
27.60	596.17								28.43	596.23		29.54	596.11		
32.10	596.17								31.84	596.05	RPIN	31.96	595.98	RPIN	



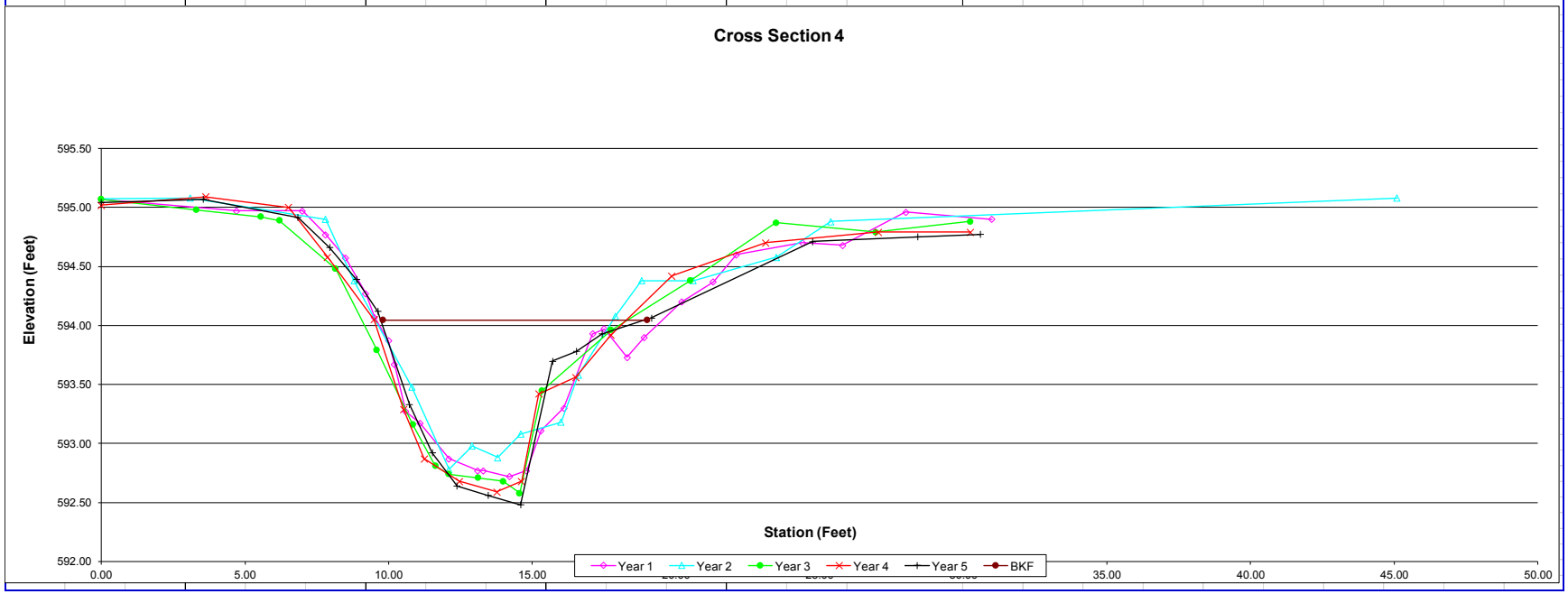
Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 3
Feature	Pool
Date:	9/2/13
Crew:	ML, JP

Summary (bankfull)					
	MY1	MY2	MY3	MY4	MY5
A (BKF)	6.1	6.9	4.1	4.0	5.42
W (BKF)	8.2	8.2	6.6	6.0	7.90
Max d	1.1	1.4	0.9	1.0	1.49
Mean d	0.7	0.8	0.6	0.7	0.69
W/D	N/A	N/A	10.5	9.0	11.40

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	592.38		-0.21	592.54		0.00	592.67	LPIN	0.00	592.63	LPIN	0.00	592.60	LPIN
3.95	592.17		0.70	592.64		3.54	592.51		3.25	592.56		3.05	592.59	
6.55	591.89		3.50	592.54		9.27	592.07	BANKFULL	7.03	592.30		6.58	592.29	
8.64	591.74		6.30	592.54		11.31	591.48		9.94	592.12	TOBL	9.32	592.04	Top Of Bank L
10.35	591.52	BL Bankfull	9.14	592.01		13.01	590.88	TOE L	11.17	591.78		11.44	591.44	L Bankfull
10.87	591.54		11.02	591.74	BL Bankfull	14.75	590.60	TW	12.12	591.47	Bankfull Left	12.35	591.35	
11.73	590.77		12.53	591.16		16.46	590.58	TOE R	13.42	590.99		13.57	590.87	
12.64	590.48	TOE L	13.91	590.37	TW	17.50	591.38		14.26	590.68	TOE L	15.58	590.41	Thalweg
14.91	590.55	TW	14.56	590.43		18.64	592.07		15.26	590.51	TW	16.76	590.59	
16.56	590.50	TOE R	15.76	590.56		20.13	592.46	TOBR	17.19	590.70	TOE R	18.87	591.90	R Bankfull
17.64	591.16		17.02	590.62	TOE R	21.70	592.62		18.05	591.63		19.23	592.06	
18.63	591.65	R Bankfull	17.28	590.76		24.32	592.79		18.49	591.98		21.08	592.54	Top of Bank Right
19.68	592.15		18.15	591.05		29.01	592.72		19.81	592.35		24.63	592.71	
20.61	592.45		19.64	591.95	R Bankfull	31.72	592.75	RPIN	20.49	592.63	TOBR Bankfull Right	27.33	592.78	
23.10	592.62		20.79	592.50					23.21	592.64		31.96	592.75	RPIN
26.50	592.72		22.43	592.74					27.06	592.80				
31.90	592.72		24.67	592.74					31.93	592.77	RPIN			
			31.92	592.72										



Project:		UT to Cane Creek (Pickard)			Summary (bankfull)											
Cross Section:		Cross Section 4				MY1	MY2	MY3	MY4	MY5						
Feature		Riffle			A (BKF)	6.1	8.8	6.5	6.7	6.99						
Date:		9/2/13			W (BKF)	8.6	9.8	8.6	8.4	9.20						
Crew:		ML, JP			Max d	1.2	1.6	1.4	1.4	1.91						
					Mean d	0.7	0.9	0.8	0.8	0.77						
					W/D	12.1	11.0	11.3	10.4	11.95						
MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	595.07		-3.40	595.07		0.00	595.07	LPIN	0.00	595.02	LPIN	0.00	595.04	LPIN
4.70	594.97		3.10	595.08		3.31	594.98		3.63	595.09		3.54	595.07	
7.00	594.97		7.80	594.90		5.55	594.92		6.52	595.00	TOBL	6.84	594.92	Top Of Bank L
7.80	594.77		8.80	594.38	BL Bankfull	6.20	594.89	BANKFULL	7.87	594.58		7.95	594.66	
8.50	594.57		10.80	593.48		8.15	594.48		9.49	594.05	Bankfull Lef	8.88	594.39	L Bankfull
9.20	594.27		12.10	592.78	TW	9.59	593.79		10.52	593.29		9.62	594.12	
9.50	594.07		12.90	592.98		10.85	593.16		11.24	592.87	TOE L	10.73	593.33	
10.00	593.87	BL Bankfull	13.80	592.88		11.63	592.81	TOE L	12.46	592.68		11.52	592.92	
10.20	593.67		14.60	593.08		12.09	592.74		13.77	592.59	TW	12.38	592.64	
10.60	593.27	TOE L	16.00	593.18	TOE R	13.11	592.71	TW	14.63	592.68	TOE R	13.46	592.56	
11.10	593.17		16.60	593.58		13.98	592.68		15.23	593.42		14.59	592.48	Thalweg
12.10	592.87		17.90	594.08		14.56	592.58	TOE R	16.51	593.56		15.71	593.70	R Bankfull
13.10	592.77		18.80	594.38	R Bankfull	15.35	593.45		17.75	593.92	R Bankfull	16.54	593.78	
13.30	592.77		20.60	594.38		17.74	593.96		19.86	594.42		17.43	593.93	
14.20	592.72	TW	23.50	594.58		20.50	594.38	TOBR	23.13	594.70		19.15	594.07	
14.80	592.77		25.40	594.88		23.49	594.87		27.04	594.79		24.76	594.71	Top of Bank Right
15.30	593.11		45.10	595.08		26.95	594.79		30.25	594.79	RPIN	28.42	594.75	
16.10	593.30	TOE R				30.25	594.88	RPIN				30.59	594.77	RPIN
17.10	593.93													
17.50	593.97													
18.30	593.73													
18.90	593.90	R Bankfull Right												
20.20	594.20													
21.30	594.37													
22.10	594.60													
24.40	594.70													
25.80	594.68													
28.00	594.96													
31.00	594.90													

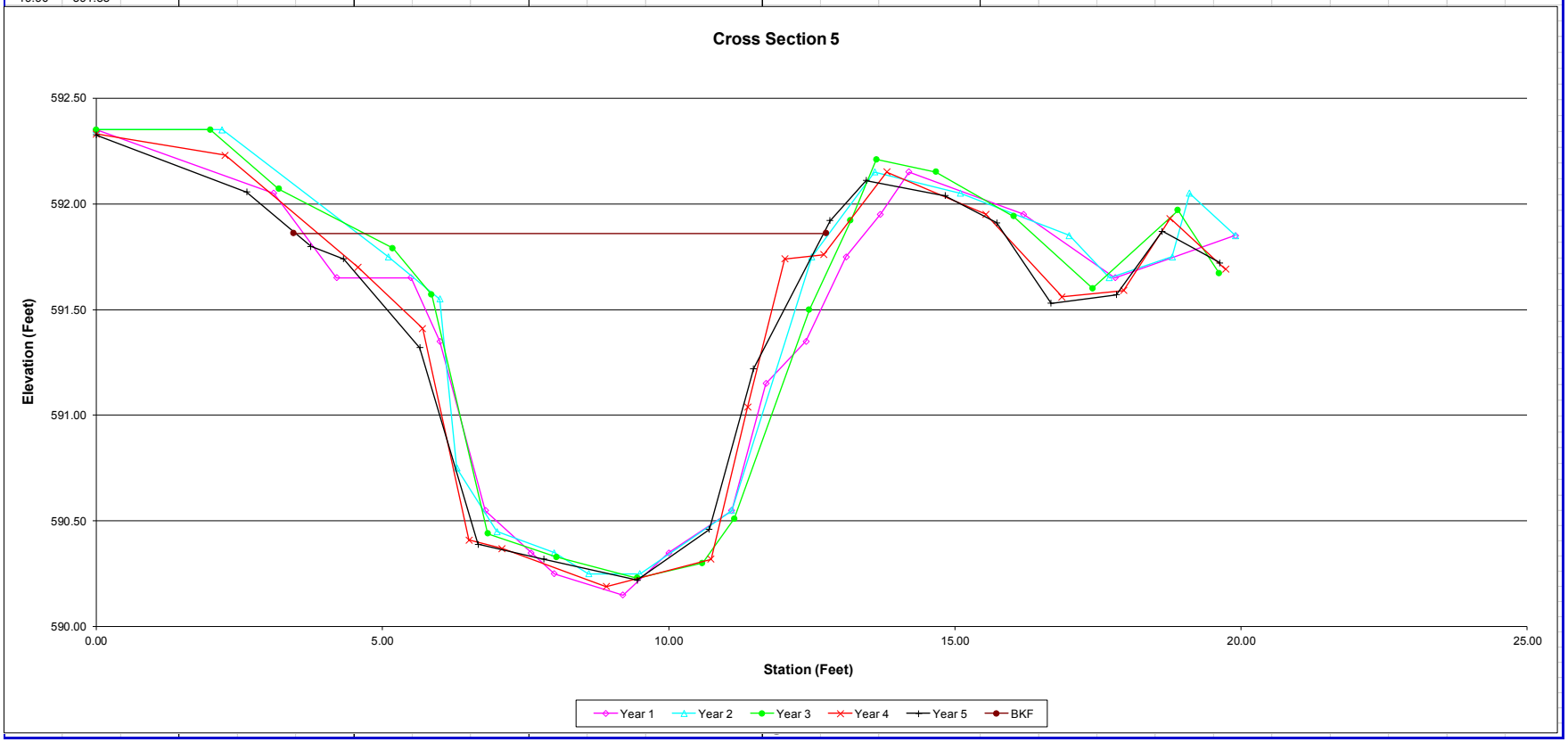


Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 5
Feature	Pool
Date:	9/2/13
Crew:	ML, JP

Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	11.1	11.1	10.7	10.9	9.61
W (BKF)	10.8	10.4	10.0	10.5	9.30
Max d	1.9	1.9	1.8	1.9	1.70
Mean d	1.0	1.1	1.1	1.0	0.74
W/D	N/A	N/A	9.4	10.1	12.57

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	592.35		0.00	592.35		0.00	592.35	LPIN	0.00	592.33	LPIN	0.00	592.33	LPIN
3.10	592.05	BL Bankfull	2.20	592.35	BL Bankfull	1.99	592.35	BANKFULL	2.25	592.23	TOBL Bankfull Left	2.63	592.06	Top Of Bank L
4.20	591.65		5.10	591.75		3.19	592.07		4.57	591.70		3.75	591.80	L Bankfull
5.50	591.65		6.00	591.55		5.18	591.79		5.70	591.41		4.32	591.74	
6.00	591.35		6.30	590.75		5.86	591.57		6.51	590.41	TOE L	5.65	591.32	
6.80	590.55	TOE L	7.00	590.45	TOE L	6.84	590.44	TOE L	7.09	590.37		6.67	590.39	
7.60	590.35		8.00	590.35		8.04	590.33		8.91	590.19	TW	7.82	590.32	
8.00	590.25		8.60	590.25		9.45	590.23	TW	10.74	590.32	TOE R	9.45	590.22	Thalweg
9.20	590.15	TW	9.50	590.25	TW	10.59	590.30		11.38	591.04		10.71	590.46	
10.00	590.35		11.10	590.55	TOE R	11.15	590.51	TOE R	12.03	591.74		11.48	591.22	
11.10	590.55	TOE R	12.50	591.75		12.46	591.50		12.71	591.76		12.82	591.92	R Bankfull
11.70	591.15		13.60	592.15	R Bankfull	13.18	591.92		13.81	592.15	TOBR Bankfull Right	13.45	592.11	
12.40	591.35		15.10	592.05		13.63	592.21	TOBR	15.54	591.95		14.83	592.04	Top of Bank Right
13.10	591.75		17.00	591.85		14.67	592.15		16.87	591.56		15.73	591.91	
13.70	591.95	R Bankfull	17.70	591.65		16.03	591.94		17.95	591.59		16.68	591.53	
14.20	592.15		18.80	591.75		17.41	591.60		18.76	591.93		17.82	591.57	
16.20	591.95		19.10	592.05		18.90	591.97		19.73	591.69	RPIN	18.62	591.87	
17.80	591.65		19.90	591.85		19.62	591.67	RPIN				19.63	591.72	RPIN
19.90	591.85													

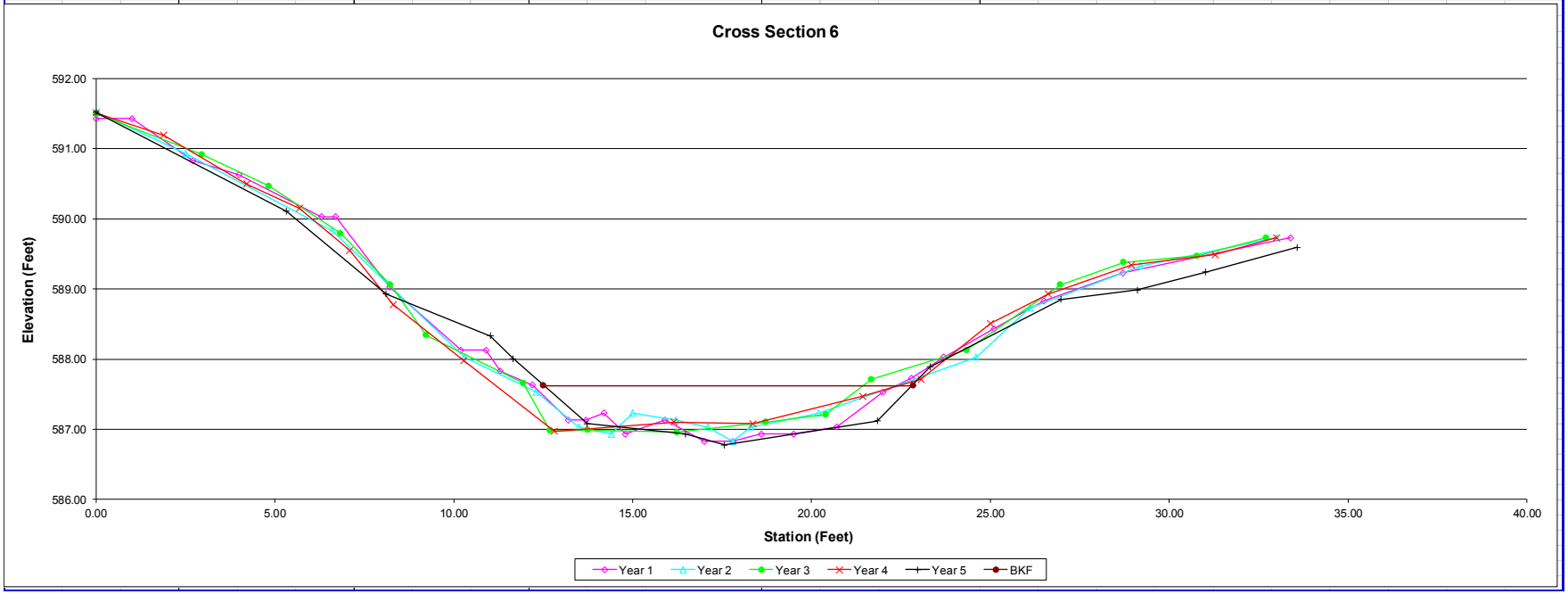


Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 6
Feature	Riffle
Date:	9/2/13
Crew:	ML, JP

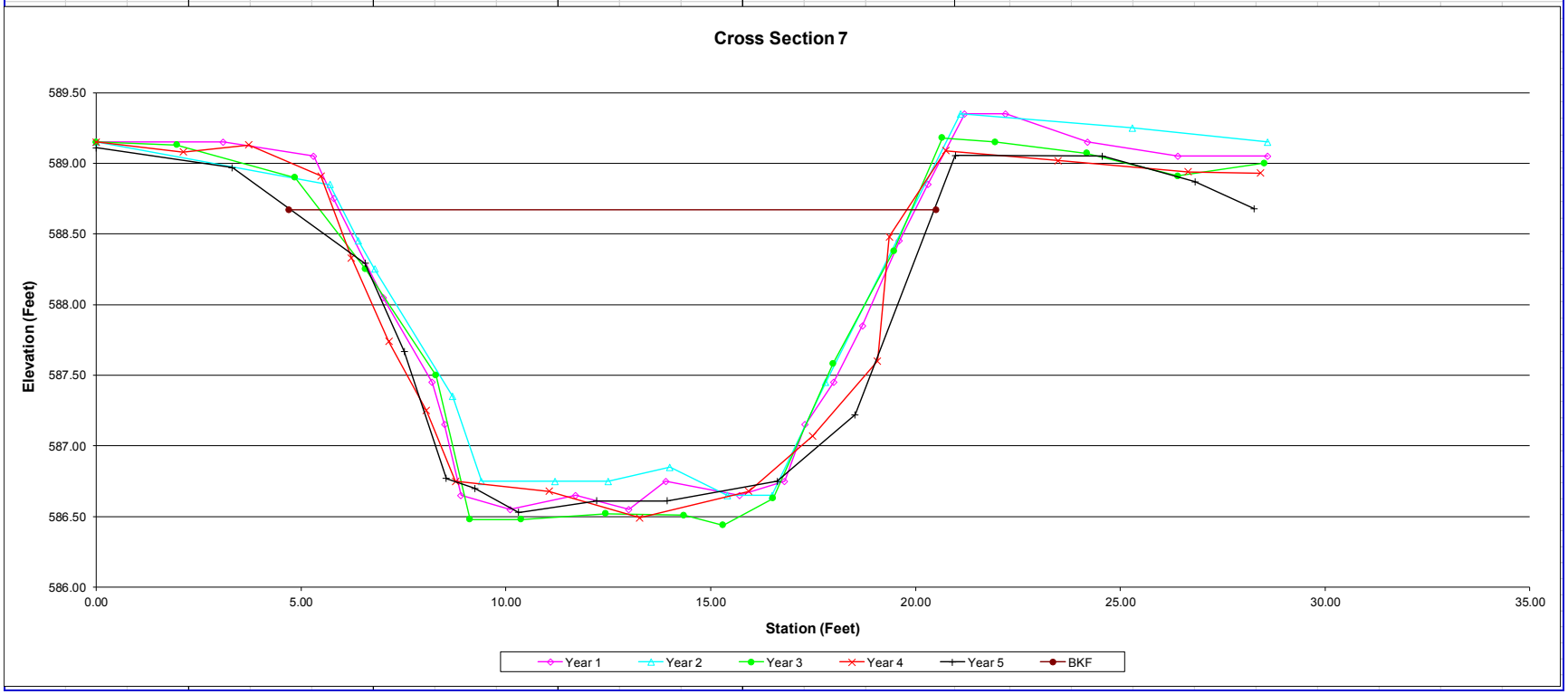
Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	22.2	22.2	21.8	22.6	5.97
W (BKF)	17.8	17.8	17.8	18.0	10.35
Max d	2.0	2.0	1.9	1.9	1.23
Mean d	1.2	1.2	1.2	1.3	0.57
W/D	14.3	14.3	14.5	14.4	18.16

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	591.43		0.00	591.53		0.00	591.50	LPIN	0.00	591.51	LPIN	0.00	591.52	LPIN
1.00	591.43		2.50	590.93		2.95	590.92		1.89	591.19		5.32	590.11	
2.70	590.83		6.60	589.83		4.83	590.47	BANKFULL	4.21	590.50		8.11	588.93	
4.00	590.63		10.30	588.03	BL Bankfull	6.83	589.79		5.69	590.15	TOBL Bankfull Left	11.02	588.33	Top Of Bank L
6.30	590.03		12.30	587.53		8.23	589.06		7.09	589.55		11.66	588.01	L Bankfull
6.70	590.03		13.50	587.03	TOE L	9.23	588.34		8.30	588.78		13.73	587.08	
8.20	589.03	BL Bankfull	14.40	586.93		11.94	587.66		10.27	587.98		16.47	586.93	
10.20	588.13		15.00	587.23		12.69	586.98	TOE L	12.81	586.97	TOE L	17.57	586.78	Thalweg
10.90	588.13		16.20	587.13		13.75	586.99		16.16	587.10	TW	21.84	587.12	
11.30	587.83		17.10	587.03		16.24	586.96	TW	18.37	587.08		23.32	587.89	R Bankfull
12.20	587.63		17.80	586.83	TW	18.72	587.10		21.43	587.47	TOE R	26.98	588.85	
13.20	587.13	TOE L	18.30	587.03	TOE R	20.40	587.21	TOE R	23.06	587.71		29.11	588.99	Top of Bank Right
13.70	587.13		20.20	587.23		21.68	587.71		25.01	588.51		31.02	589.24	
14.20	587.23		24.60	588.03		24.34	588.13		26.62	588.93		33.58	589.59	RPIN
14.80	586.93		26.10	588.73	R Bankfull	26.96	589.06		28.95	589.34	TOBR Bankfull Right			
15.90	587.13		29.20	589.33		28.73	589.38	TOBR	31.28	589.49				
17.00	586.83	TW	33.00	589.73		30.78	589.47		33.01	589.73	RPIN			
17.80	586.83					32.72	589.73	RPIN						
18.60	586.93													
19.50	586.93													
20.70	587.03	TOE R												
22.00	587.53													
22.80	587.73													
23.70	588.03													
25.10	588.43													
26.50	588.83	R Bankfull Right												
28.70	589.23													
33.40	589.73													



Project:		UT to Cane Creek (Pickard)				Summary (bankfull)											
Cross Section:		Cross Section 7					MY1	MY2	MY3	MY4	MY5						
Feature		Riffle				A (BKF)	26.3	22.4	21.8	22.6	23.50						
Date:		9/2/13				W (BKF)	15.2	14.5	17.8	18.0	15.80						
Crew:		ML, JP				Max d	2.5	2.2	1.9	1.9	1.76						
						Mean d	1.7	1.5	1.2	1.3	0.47						
						W/D	8.8	9.4	14.5	14.4	8.97						
MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013					
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes			
0.00	589.15		0.00	589.15		0.00	589.15	LPIN	0.00	589.15	LPIN	0.00	589.11	LPIN			
3.10	589.15		5.70	588.85	BL Bankfull	1.96	589.13		2.12	589.08		3.32	588.97				
5.30	589.05	BL Bankfull	6.40	588.45		4.85	588.90	BANKFULL	3.72	589.13		6.56	588.29	TBL Bankfull			
5.80	588.75		6.80	588.25		6.57	588.25		5.48	588.91	BL Bankfull	7.52	587.67				
7.00	588.05		8.70	587.35		8.29	587.50		6.23	588.33		8.54	586.77				
8.20	587.45		9.40	586.75	TOE L	9.12	586.48	TOE L	7.14	587.74		9.24	586.70				
8.50	587.15		11.20	586.75		10.37	586.48		8.06	587.25		10.31	586.53	Thalweg			
8.90	586.65	TOE L	12.50	586.75		12.44	586.52		8.77	586.75	TOE L	12.21	586.61				
10.10	586.55		14.00	586.85		14.35	586.51		11.05	586.68		13.93	586.61				
11.70	586.65		15.40	586.65	TW	15.30	586.44	TW	13.27	586.49	TW	16.62	586.75				
13.00	586.55	TW	16.50	586.65	TOE R	16.52	586.63	TOE R	15.93	586.68		18.52	587.22				
13.90	586.75		17.80	587.45		17.98	587.58		17.49	587.07	TOE R	20.97	589.06	TBR Bankfull			
15.70	586.65		21.10	589.35	R Bankfull	19.47	588.38		19.07	587.60		24.56	589.05				
16.80	586.75	TOE R	25.30	589.25		20.65	589.18	TOBR	19.36	588.48		26.82	588.87				
17.30	587.15		28.60	589.15		21.94	589.15		20.74	589.09	R Bankfull	28.26	588.68	RPIN			
18.00	587.45					24.18	589.07		23.48	589.02							
18.70	587.85					26.40	588.91		26.66	588.94							
19.60	588.45					28.52	589.00	RPIN	28.42	588.93	RPIN						
20.30	588.85																
21.20	589.35	R Bankfull right															
22.20	589.35																
24.20	589.15																
26.40	589.05																
28.60	589.05																

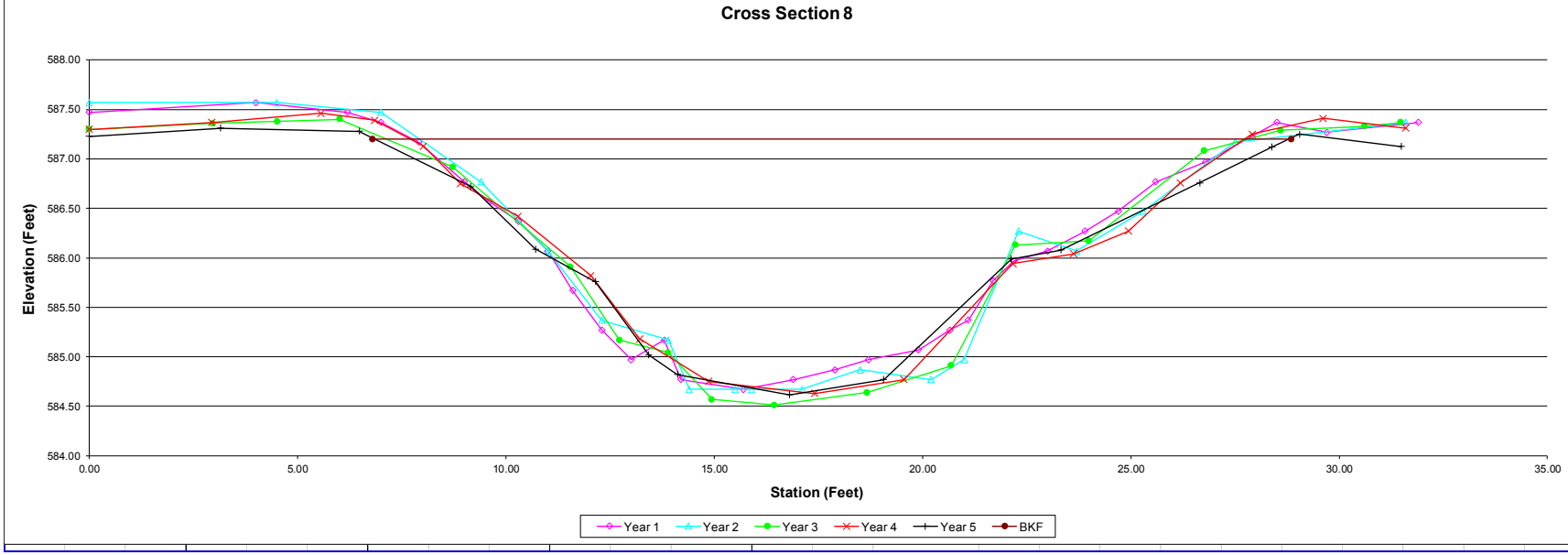


Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 8
Feature	Riffle
Date:	9/2/13
Crew:	ML, JP

Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	24.4	23.7	25.8	25.1	29.90
W (BKF)	18.3	17.6	18.0	18.5	23.10
Max d	2.3	2.2	2.5	2.3	2.66
Mean d	1.3	1.3	1.4	1.4	1.29
W/D	13.7	13.1	12.5	13.7	8.67

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	587.47		0.00	587.57		0.00	587.30	LPIN	0.00	587.30	LPIN	0.00	587.23	LPIN
4.00	587.57		4.50	587.57		2.96	587.36		2.93	587.37		3.15	587.31	
6.20	587.47		7.00	587.47		4.51	587.38		5.56	587.46		6.48	587.28	TBL Bankfull
7.00	587.37		9.40	586.77	BL Bankfull	6.01	587.40	BANKFULL	6.84	587.39		9.15	586.72	
7.90	587.17	BL Bankfull	11.00	586.07		8.72	586.92		8.02	587.13	BL Bankfull L	10.71	586.09	
9.00	586.77		12.30	585.37		11.55	585.91		8.91	586.75		12.15	585.76	
9.60	586.57		13.90	585.17		12.72	585.17	TOE L	10.28	586.42		13.43	585.02	
10.30	586.37		14.40	584.67	TOE L	13.90	585.04		12.03	585.82		14.12	584.82	
11.00	586.07		15.50	584.67	TW	14.94	584.57		13.21	585.18	TOE L	16.81	584.62	Thalweg
11.60	585.67		15.90	584.67		16.44	584.51	TW	14.87	584.75		19.07	584.77	
12.30	585.27		17.10	584.67		18.67	584.64		17.41	584.63	TW	22.13	585.99	
13.00	584.97	TOE L	18.50	584.87		20.69	584.91	TOE R	19.55	584.77		23.32	586.08	
13.80	585.17		20.20	584.77		22.23	586.13		22.17	585.94		26.65	586.76	
14.20	584.77		21.00	584.97	TOE R	23.99	586.17		23.62	586.04		28.38	587.12	TBR Bankfull
15.70	584.67	TW	22.30	586.27		26.76	587.08		24.94	586.27		29.05	587.25	
16.90	584.77		23.70	586.07		28.59	587.29	TOBR	26.19	586.76		31.49	587.13	RPIN
17.90	584.87		25.30	586.47	R Bankfull	30.61	587.33		27.91	587.25	BR Bankfull Right			
18.70	584.97		27.50	587.17		31.47	587.37	RPIN	29.62	587.41				
19.90	585.07		31.60	587.37					31.60	587.31	RPIN			
20.66	585.27													
21.10	585.37	TOE R												
21.70	585.77													
22.20	585.97													
23.00	586.07													
23.90	586.27													
24.70	586.47													
25.60	586.77													
26.80	586.97	R Bankfull Right												
28.50	587.37													
29.70	587.27													
31.90	587.37													

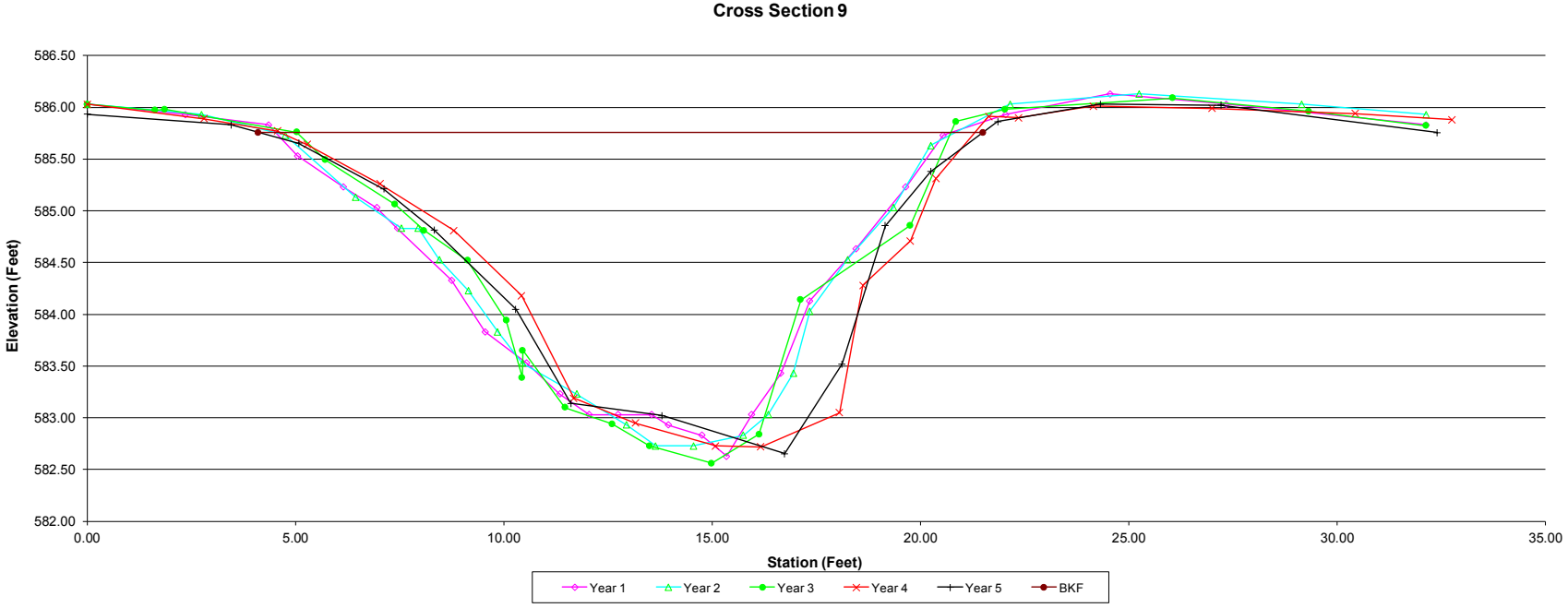


Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 9
Feature	Pool
Date:	9/2/13
Crew:	ML, JP

Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	28.4	28.5	28.4	29.4	27.80
W (BKF)	16.8	17.7	16.8	17.8	17.40
Max d	3.2	3.1	3.3	3.1	3.21
Mean d	1.7	1.6	1.7	1.7	1.59
W/D	N/A	N/A	9.9	10.8	10.94

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	586.03		0.00	586.03		0.00	586.03	LPIN	0.00	586.03	LPIN	0.00	585.93	LPIN
2.35	585.93		2.75	585.93		1.63	585.97		2.80	585.89		3.45	585.83	
4.35	585.83		4.75	585.73	BL Bankfull	1.86	585.98		4.57	585.77	BL Bankfull	5.08	585.65	TBL Bankfull
5.05	585.53		6.45	585.13		5.03	585.76		5.28	585.64		7.12	585.21	
6.15	585.23	BL Bankfull	7.55	584.83		5.72	585.49	BANKFULL	7.03	585.26		8.34	584.81	
6.95	585.03		7.95	584.83		7.39	585.06		8.80	584.81		10.29	584.05	
7.45	584.83		8.45	584.53		8.09	584.81		10.43	584.18		11.61	583.14	
8.75	584.33		9.15	584.23		9.13	584.52		11.68	583.19	TOE L	13.80	583.02	
9.55	583.83		9.85	583.83		10.06	583.94		13.16	582.95		16.74	582.65	Thalweg
10.55	583.53		10.45	583.53	TOE L	10.44	583.39	TOE L	15.09	582.73	TW	18.12	583.52	
11.35	583.23		11.75	583.23		10.46	583.65		16.17	582.72		19.16	584.85	
12.05	583.03	TOE L	12.95	582.93		11.47	583.10		18.06	583.05	TOE R	20.25	585.38	
12.75	583.03		13.65	582.73	TW	12.60	582.94		18.62	584.28		21.86	585.86	TBR Bankfull
13.55	583.03		14.55	582.73		13.50	582.73	TW	19.76	584.71		24.32	586.03	
13.95	582.93		15.75	582.83		14.99	582.56		20.37	585.31		27.22	586.02	
14.75	582.83		16.35	583.03	TOE R	16.13	582.84	TOE R	21.64	585.91	R Bankfull	32.41	585.75	RPIN
15.35	582.63	TW	16.95	583.43		17.13	584.14		22.36	585.90				
15.95	583.03		17.35	584.03		19.76	584.86		24.15	586.01				
16.65	583.43		18.25	584.53		20.85	585.86	TOBR	27.01	585.99				
17.35	584.13		19.35	585.03		22.04	585.98		30.44	585.94				
18.45	584.63		20.25	585.63	R Bankfull	26.06	586.09		32.76	585.88	RPIN			
19.65	585.23	R Bankfull	22.15	586.03		29.32	585.96							
20.55	585.73		25.25	586.13		32.15	585.82	RPIN						
22.05	585.93		29.15	586.03										
24.55	586.13		32.15	585.93										
27.35	586.03													
32.15	585.83													

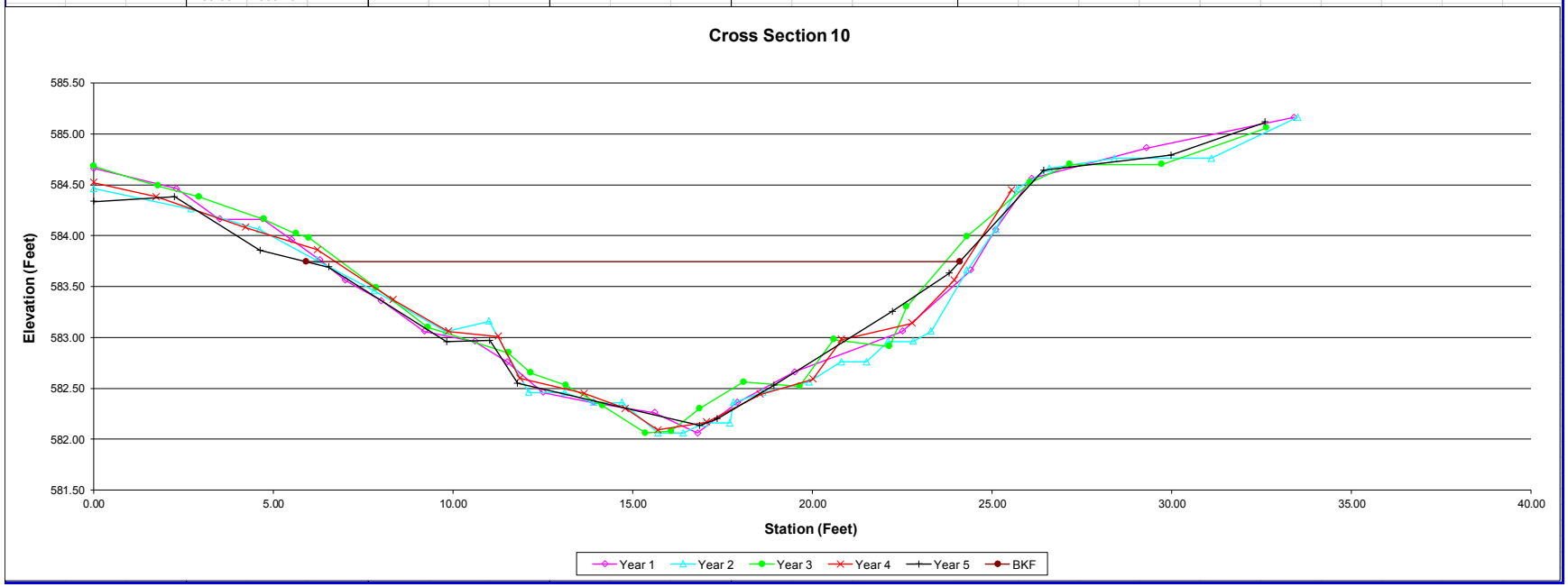


Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 10
Feature	Riffle
Date:	9/2/13
Crew:	ML, JP

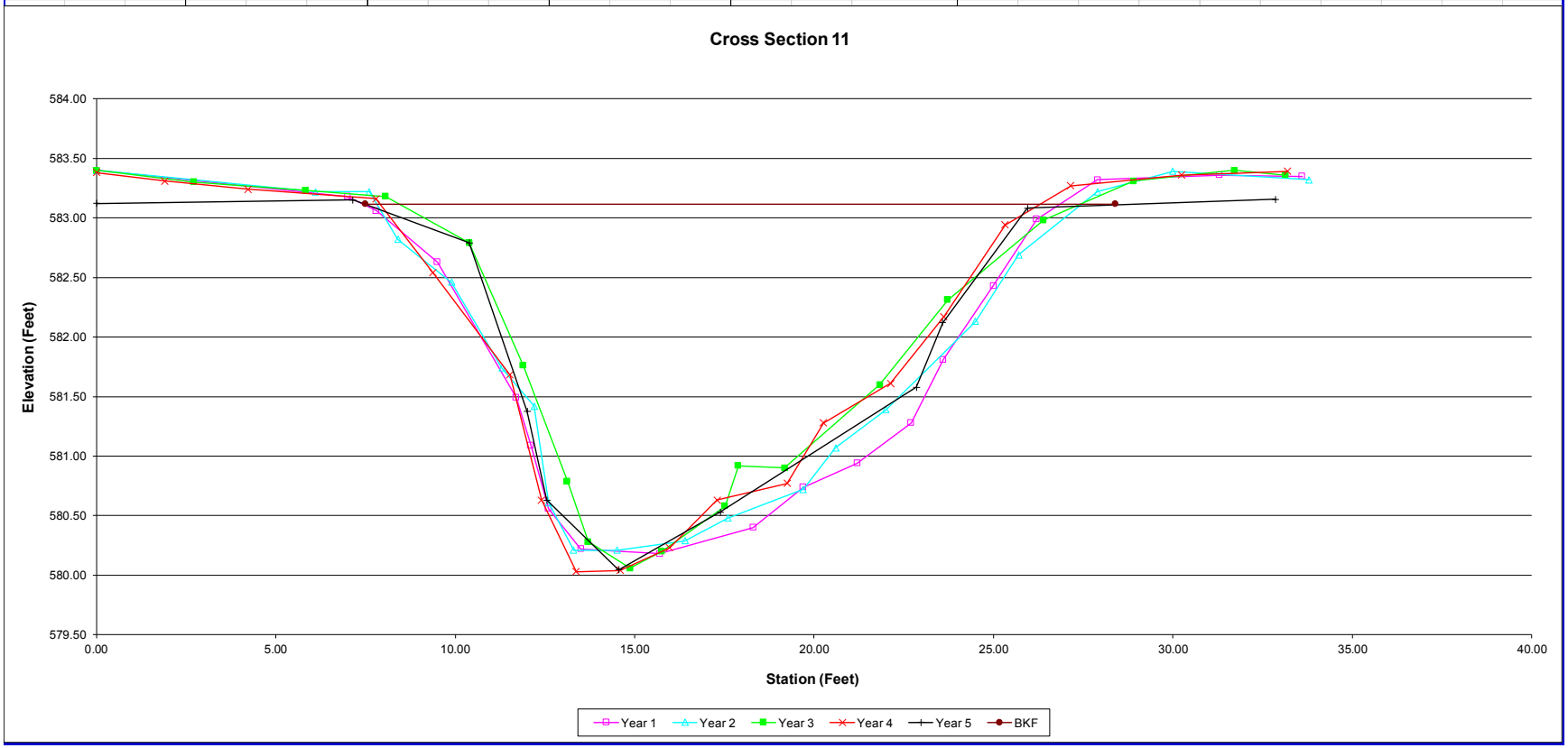
Summary (bankfull)

	MY1	MY2	MY3	MY4	MY5
A (BKF)	24.5	24.9	23.7	24.6	16.40
W (BKF)	20.6	21.1	20.1	21.5	18.20
Max d	2.0	2.0	2.1	2.1	1.50
Mean d	1.2	1.2	1.2	1.1	0.90
W/D	17.3	17.9	17.1	18.7	20.22

MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	584.66		0.00	584.46		0.00	584.68	LPIN	0.00	584.52	LPIN	0.00	584.34	LPIN
2.30	584.46		2.70	584.26		1.78	584.49		1.73	584.38		2.24	584.38	Top Of Bank L
3.50	584.16		4.60	584.06	BL Bankfull	2.92	584.38		4.22	584.08	BL Bankfull	4.62	583.85	L Bankfull
4.70	584.16	BL Bankfull	6.20	583.76		4.73	584.16		6.22	583.86		6.53	583.69	
5.50	583.96		7.80	583.46		5.62	584.02	BANKFULL	8.33	583.37		9.81	582.96	
6.30	583.76		9.80	583.06		5.98	583.98		9.87	583.06		11.02	582.97	
7.00	583.56		11.00	583.16		7.85	583.49		11.25	583.01		11.79	582.55	
8.00	583.36		12.10	582.46	TOE L	9.29	583.10		11.85	582.60	TOE L	16.86	582.14	Thalweg
9.20	583.06		13.10	582.46		11.53	582.85		13.64	582.45		17.34	582.20	
10.60	582.96		13.90	582.36		12.16	582.65		14.79	582.30		18.93	582.53	
11.50	582.76		14.70	582.36		13.13	582.53		15.69	582.09	TW	22.22	583.25	
12.50	582.46		15.70	582.06	TW	14.16	582.33		17.05	582.17		23.80	583.63	R Bankfull
13.90	582.36		16.40	582.06		15.35	582.06		18.54	582.44		26.43	584.64	Top of Bank Right
15.60	582.26		17.00	582.16		16.06	582.08	TW	20.01	582.59	TOE R	29.97	584.79	
16.80	582.06	TW	17.70	582.16		16.86	582.30	TOE R	20.81	582.98		32.60	585.11	RPIN
17.90	582.36		17.80	582.36		18.08	582.56		22.77	583.14				
19.50	582.66		18.60	582.46		19.64	582.52		23.94	583.56				
22.50	583.06		19.90	582.56	TOE R	20.59	582.98		25.54	584.45	R Bankfull Right			
24.40	583.66		20.80	582.76		22.14	582.91							
25.10	584.06	R Bankfull	21.50	582.76		22.61	583.30							
26.10	584.56		22.10	582.96		24.30	583.99							
29.30	584.86		22.80	582.96		26.05	584.52							
33.40	585.16		23.30	583.06		27.15	584.70	TOBR						
			24.30	583.66		29.72	584.70							
			25.10	584.06	R Bankfull	32.63	585.06	RPIN						
			25.70	584.46										
			26.60	584.66										
			28.40	584.76										
			31.10	584.76										
			33.50	585.16										



Project:		UT to Cane Creek (Pickard)			Summary (bankfull)												
Cross Section:		Cross Section 11				MY1	MY2	MY3	MY4	MY5							
Feature		Riffle			A (BKF)	25.7	25.8	20.5	23.0	30.30							
Date:		9/2/13			W (BKF)	15.9	17.0	14.3	15.4	21.60							
Crew:		ML, JP			Max d	2.4	2.5	2.6	2.6	3.11							
					Mean d	1.6	1.5	1.4	1.5	1.40							
					W/D	9.8	11.2	10.0	10.4	15.43							
MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013					
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes			
0.00	583.40		0.00	583.40		0.00	583.40	LPIN	0.00	583.38	LPIN	0.00	583.12	LPIN			
7.00	583.18		6.10	583.22		2.72	583.30		1.91	583.31		7.14	583.15	TBL Bankfull			
7.80	583.06		7.60	583.22		5.83	583.23		4.22	583.24		10.39	582.79				
9.50	582.63	BL Bankfull	8.40	582.82	BL Bankfull	8.06	583.18	BANKFULL	7.79	583.16	TOBL	12.01	581.37				
11.70	581.49		9.90	582.46		10.39	582.79		9.38	582.54	Bankfull Lef	12.55	580.63				
12.10	581.09		11.30	581.74		11.89	581.76		11.52	581.68		14.55	580.05	Thalweg			
12.60	580.56	TOE L	12.20	581.42		13.12	580.79	TOE L	12.40	580.63	TOE L	17.39	580.53				
13.50	580.22		12.60	580.61		13.70	580.28		13.37	580.03		22.86	581.58				
15.70	580.18	TW	13.30	580.21	TOE L	14.87	580.06	TW	14.59	580.04	TW	23.58	582.12				
18.30	580.40		14.50	580.21	TW	15.75	580.20		15.97	580.23	TOE R	25.95	583.08	TBR Bankfull			
19.70	580.74		16.40	580.29		17.52	580.58	TOE R	17.30	580.63		32.86	583.16	RPIN			
21.20	580.94		17.60	580.48		17.89	580.92		19.25	580.77							
22.70	581.28	TOE R	19.70	580.72	TOE R	19.18	580.90		20.26	581.28							
23.60	581.81		20.60	581.07		21.83	581.60		22.13	581.61							
25.00	582.43	R Bankfull	22.00	581.39		23.72	582.31		23.62	582.17							
26.20	582.99		24.50	582.13		26.40	582.98		25.32	582.94	R Bankfull Right						
27.90	583.32		25.70	582.69	R Bankfull	28.91	583.31	TOBR	27.15	583.27							
31.30	583.36		27.90	583.22		31.71	583.40		30.24	583.36							
33.60	583.35		30.00	583.39		33.14	583.36	RPIN	33.19	583.39	RPIN						
			33.80	583.32													

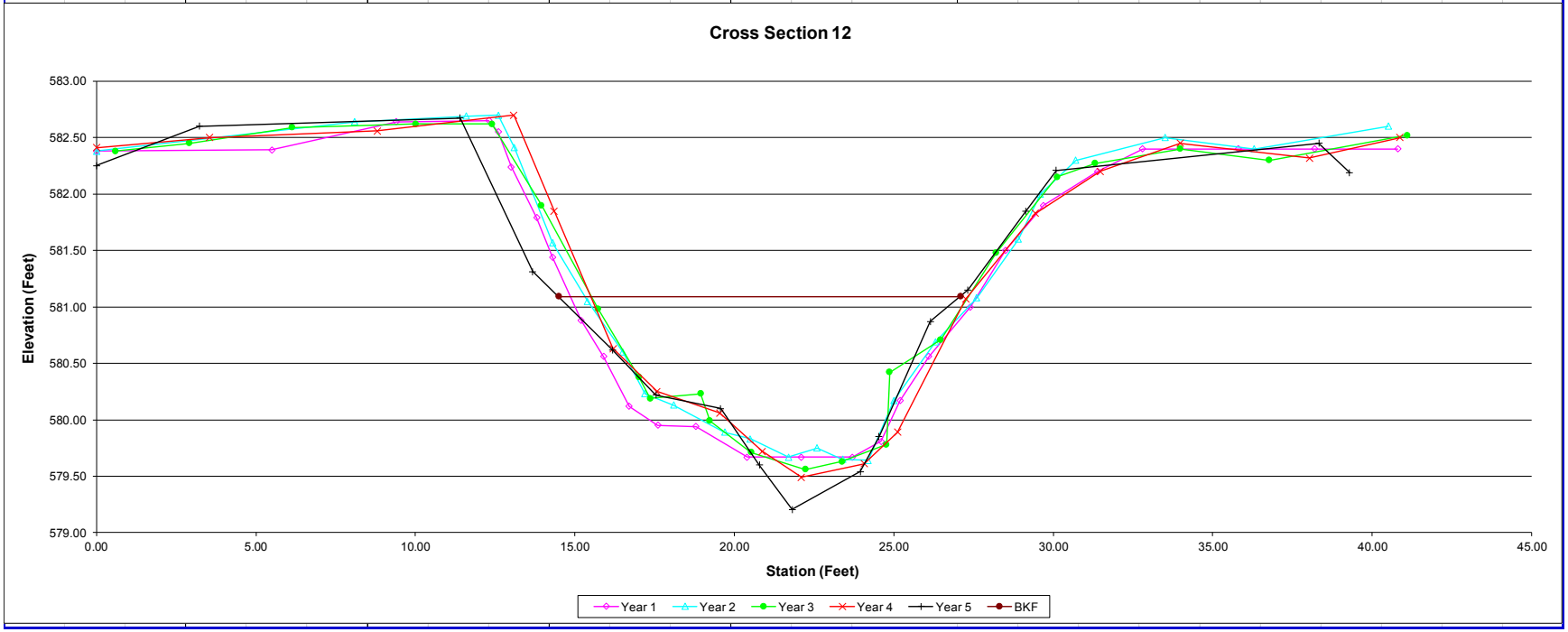


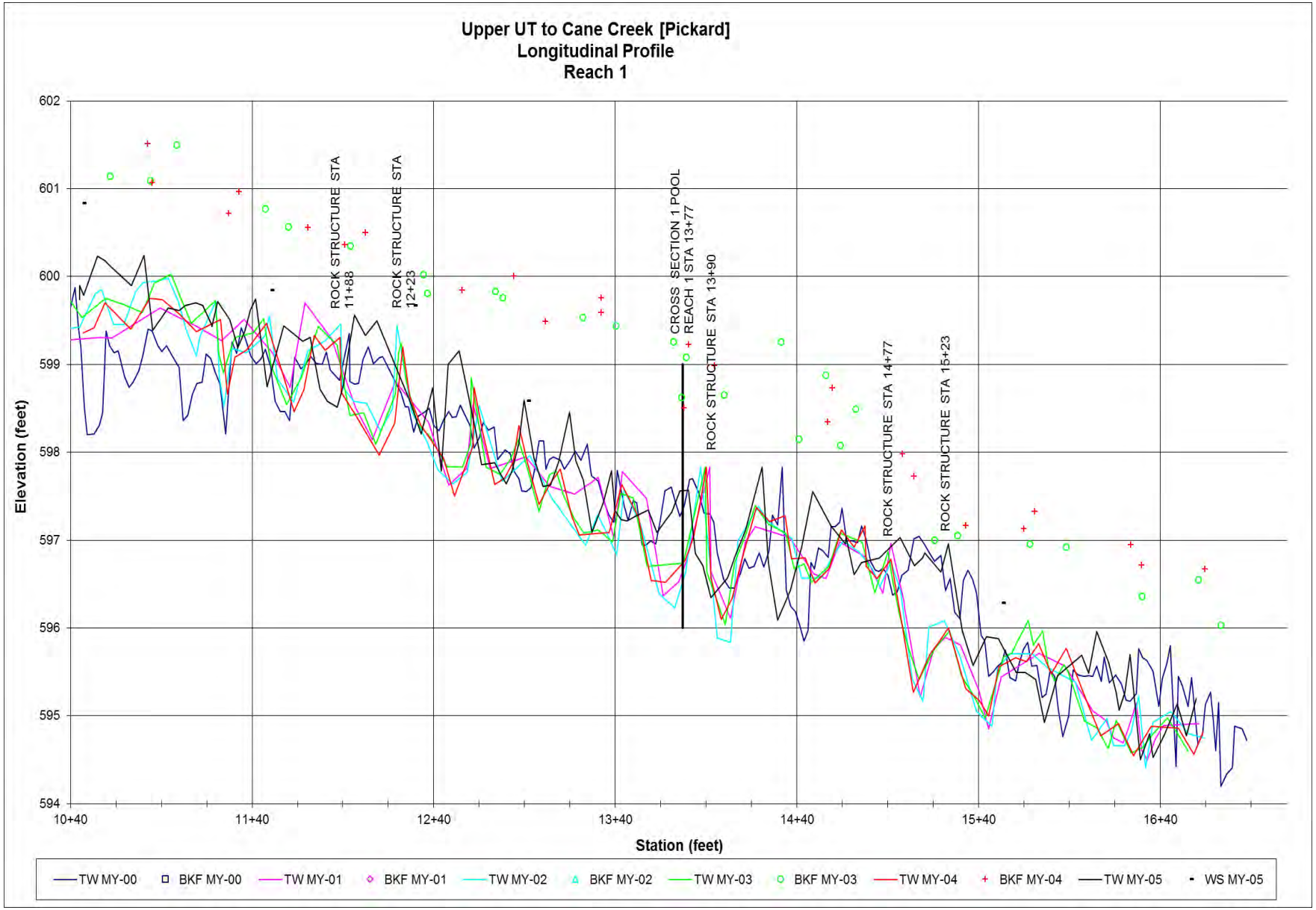
Project:	UT to Cane Creek (Pickard)
Cross Section:	Cross Section 12
Feature	Riffle
Date:	9/2/13
Crew:	ML, JP

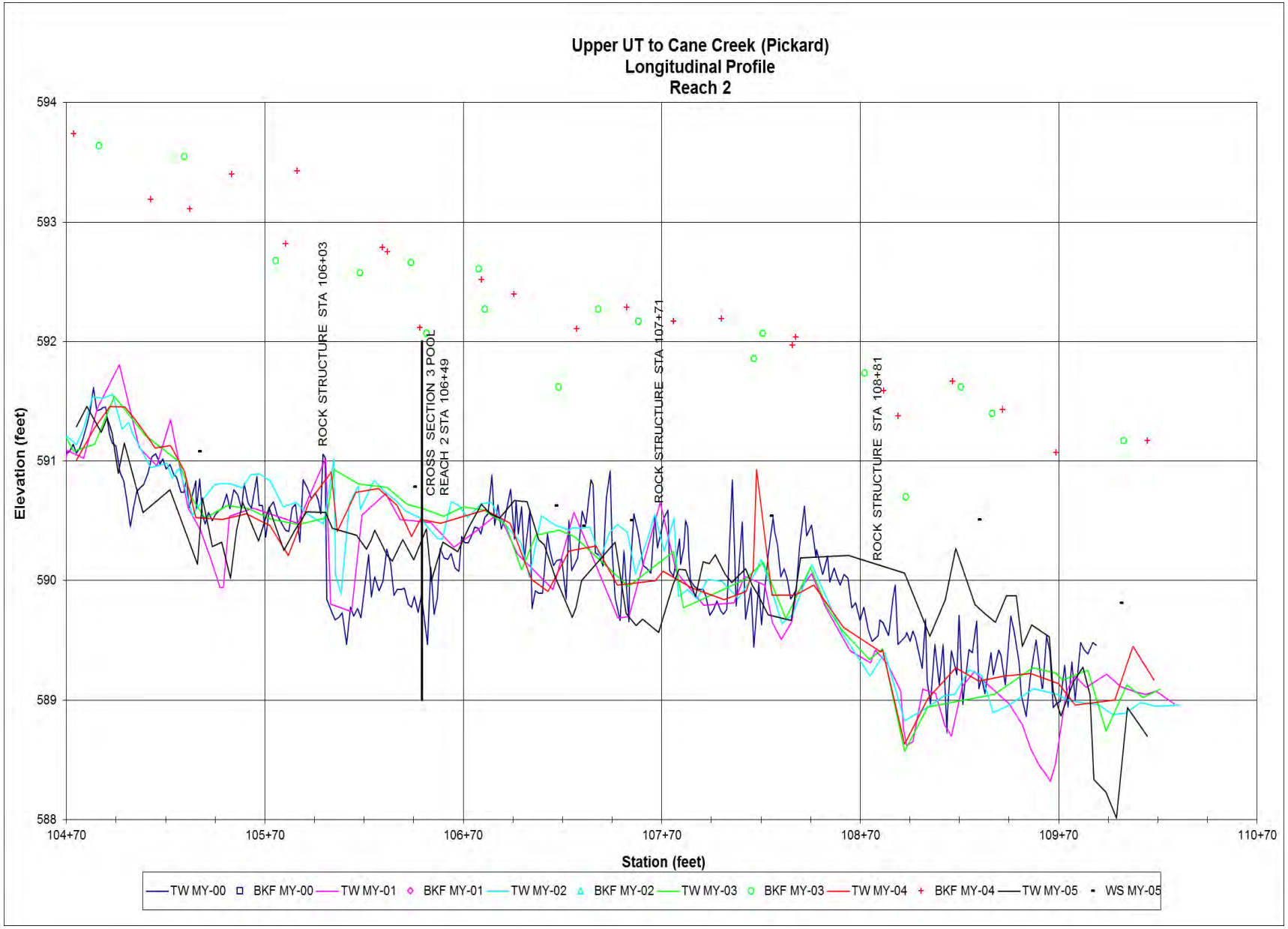
Summary (bankfull)

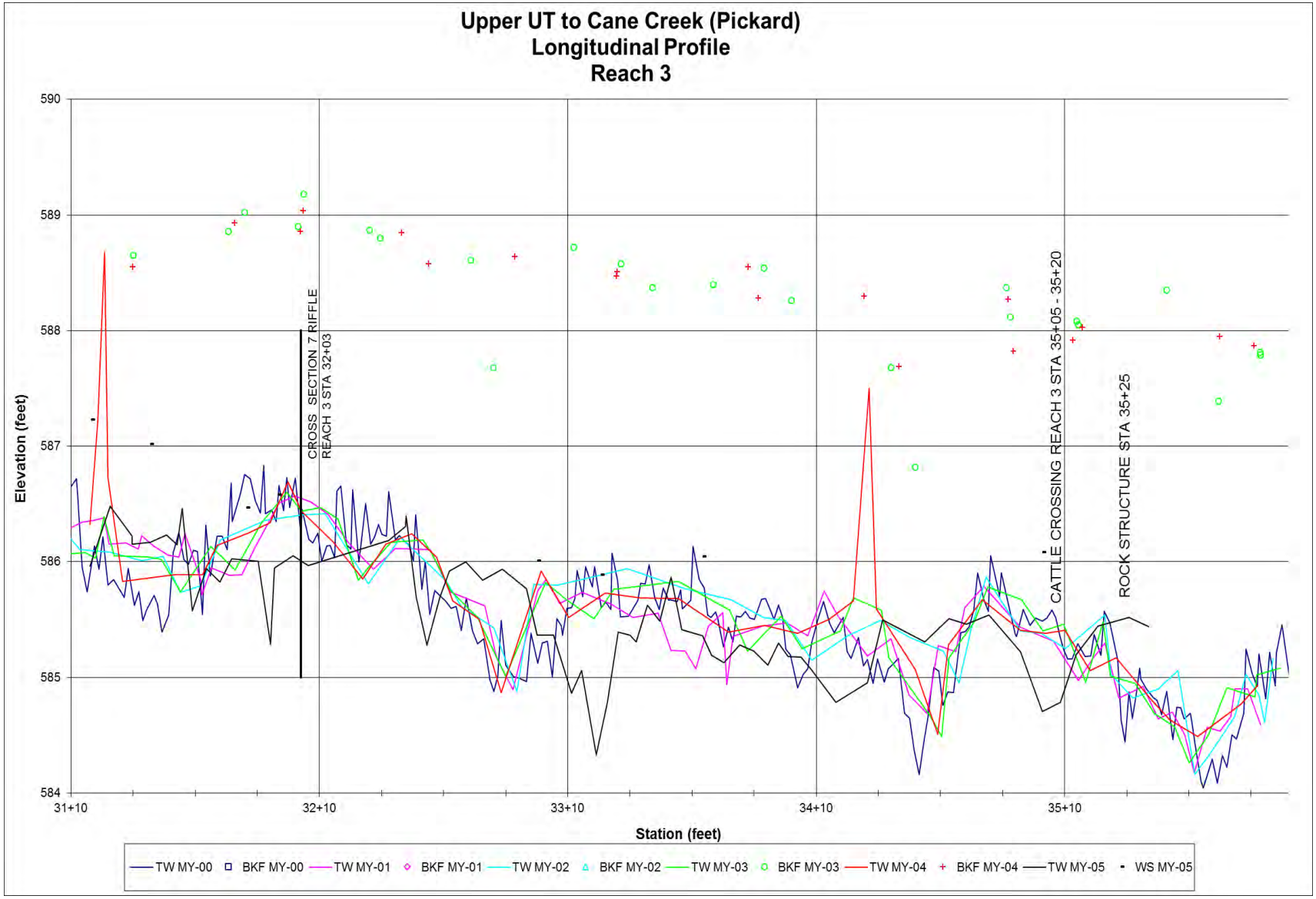
	MY1	MY2	MY3	MY4	MY5
A (BKF)	22.9	21.1	22.3	23.1	13.30
W (BKF)	14.5	12.4	15.5	15.6	12.60
Max d	2.6	2.6	2.3	2.4	2.11
Mean d	1.6	1.7	1.4	1.5	0.97
W/D	9.2	7.3	10.7	10.5	12.99

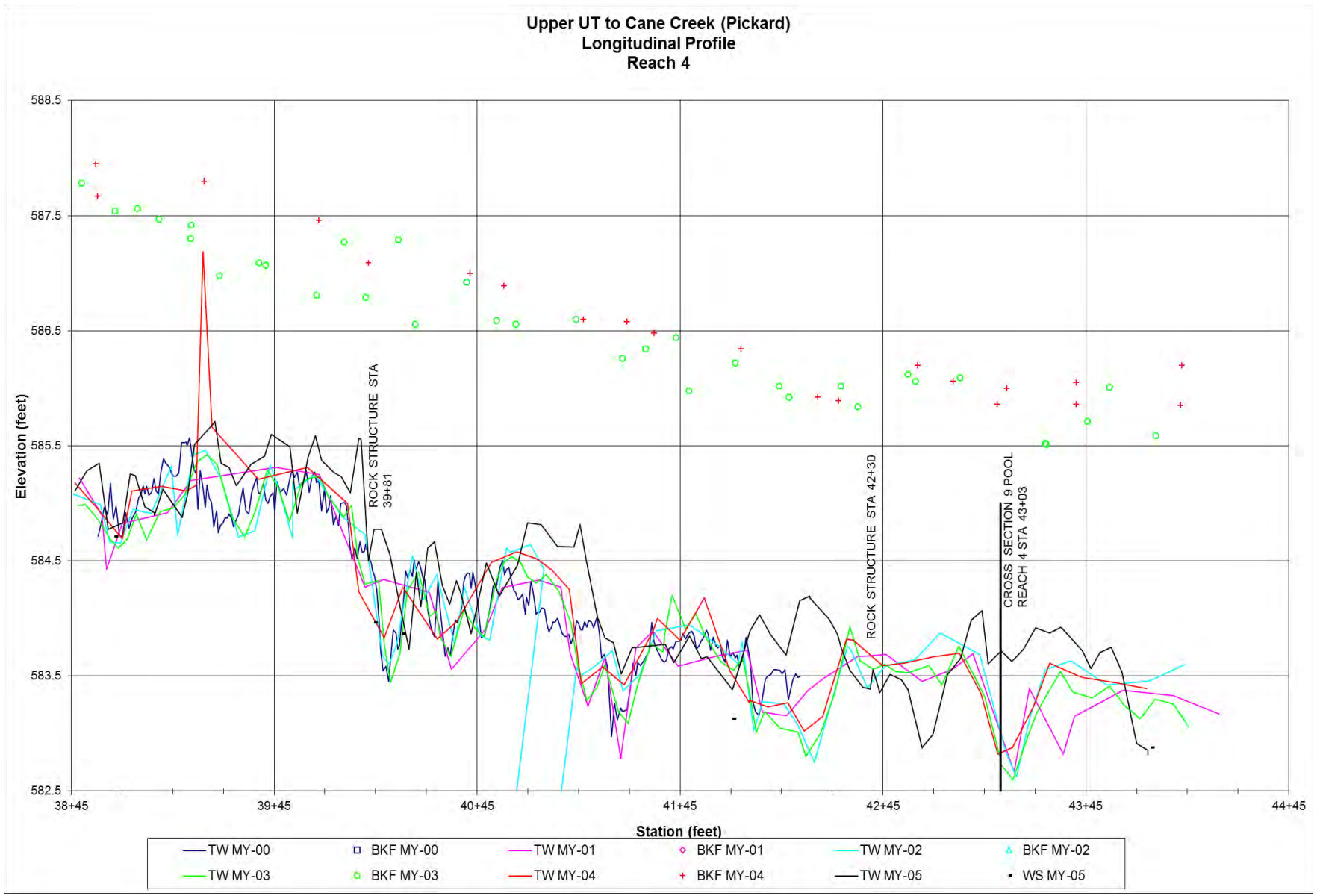
MY01-2009			MY02-2010			MY03-2011			MY04-2012			MY05-2013		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
0.00	582.38		0.00	582.38		0.60	582.38	LPIN	0.00	582.41	LPIN	0.00	582.25	LPIN
5.50	582.39		8.10	582.64		2.92	582.45		3.55	582.50		3.22	582.60	
9.40	582.64		11.60	582.69		6.14	582.59		8.80	582.56		11.40	582.67	Top Of Bank L
12.30	582.65		12.60	582.70		10.02	582.62		13.08	582.70	TOBL	13.68	581.31	L Bankfull
12.60	582.55		13.10	582.41	BL Bankfull	12.40	582.62	BANKFULL	14.35	581.85	Bankfull Lef	16.18	580.62	
13.00	582.24	BL Bankfull	14.30	581.57		13.95	581.90		16.20	580.63		17.54	580.22	
13.80	581.79		15.40	581.05		15.73	580.98		17.57	580.25		19.57	580.10	
14.30	581.44		16.50	580.60		17.01	580.38		19.54	580.06		20.79	579.60	
15.20	580.88		17.20	580.23	TOE L	17.36	580.19		20.87	579.72		21.81	579.21	Thalweg
15.90	580.56		18.10	580.13		18.95	580.23		22.10	579.49	TW	23.95	579.54	
16.70	580.12	TOE L	19.70	579.89		19.23	579.99		24.07	579.61		24.53	579.85	
17.60	579.95		20.50	579.83		20.53	579.71	TOE L	25.12	579.89	TOE R	26.15	580.87	R Bankfull
18.80	579.94		21.70	579.67		22.23	579.56	TW	27.25	581.07		27.32	581.15	
20.40	579.67		22.60	579.75		23.38	579.63		29.44	581.83		29.14	581.85	
22.10	579.67	TW	23.40	579.65		24.77	579.78	TOE R	31.48	582.20	R Bankfull	30.09	582.21	Top of Bank Right
23.70	579.67		24.20	579.64	TW	24.87	580.42		33.98	582.45		38.33	582.45	
24.60	579.81	TOE R	25.00	580.17		26.47	580.71		38.03	582.32		39.29	582.19	RPIN
25.20	580.17		26.30	580.69		28.21	581.48		40.87	582.50	RPIN			
26.10	580.56		27.60	581.08		30.12	582.15	TOBR						
27.40	581.00		28.90	581.60		31.31	582.27							
28.50	581.50		29.60	582.00		33.99	582.40							
29.70	581.90		30.70	582.30	R Bankfull	36.78	582.30							
31.40	582.20	R Bankfull	33.50	582.50		41.10	582.52	RPIN						
32.80	582.40		36.30	582.40										
35.80	582.40		40.50	582.60										
38.20	582.40													
40.80	582.40													

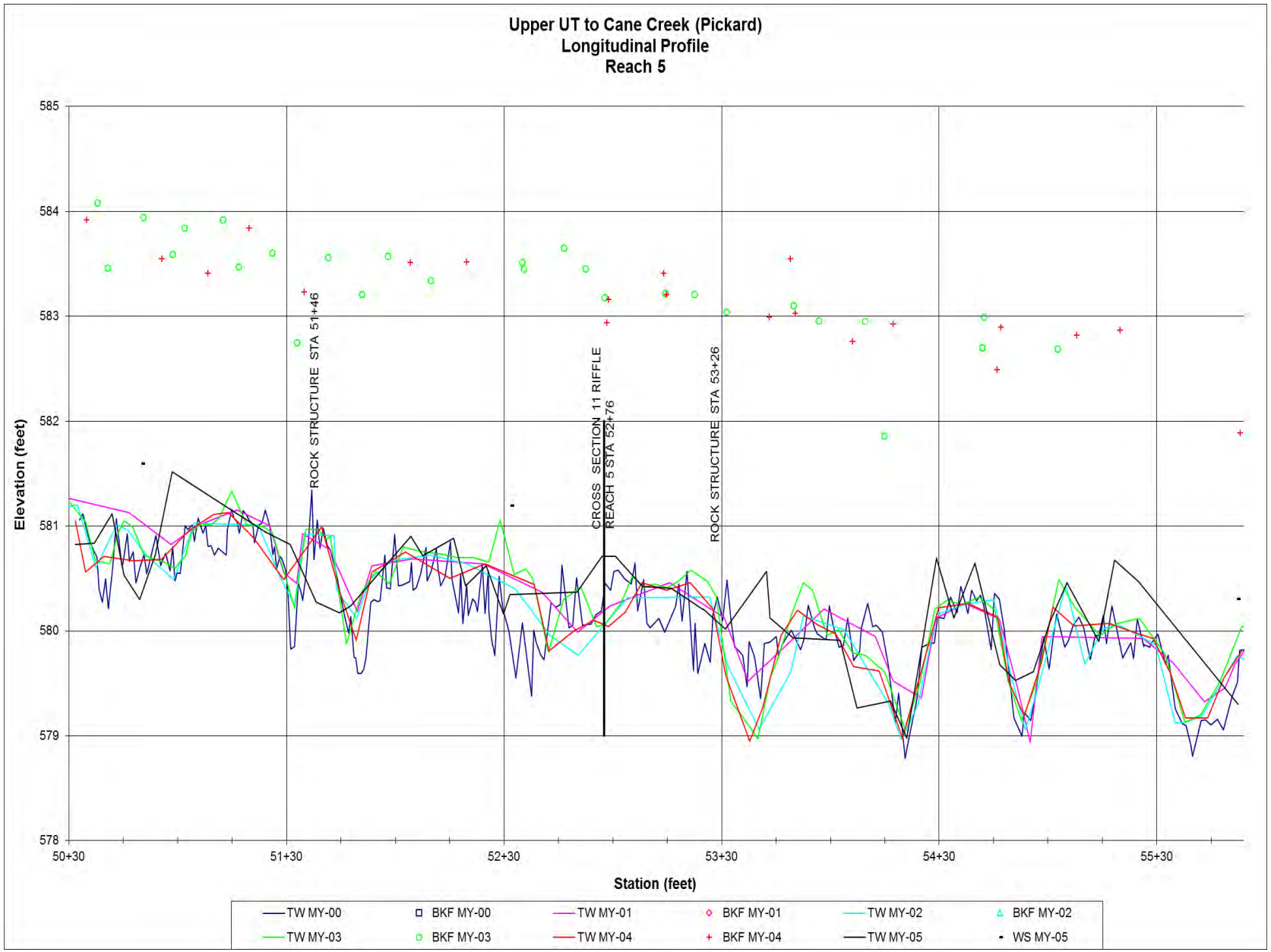



Upper UT to Cane Creek [Pickard]
Longitudinal Profile
Reach 1
Elevation (feet)
602
601
600
599
598
597
596
595
594
10+40
11+40
12+40
13+40
14+40
15+40
16+40
Station (feet)
ROCK STRUCTURE STA 11+88
ROCK STRUCTURE STA 12+23
CROSS SECTION 1 POOL REACH 1 STA 13+77
ROCK STRUCTURE STA 13+90
ROCK STRUCTURE STA 14+77
ROCK STRUCTURE STA 15+23
TW MY-00
BKF MY-00
TW MY-01
BKF MY-01
TW MY-02
BKF MY-02
TW MY-03
BKF MY-03
TW MY-04
BKF MY-04
TW MY-05
WS MY-05


Upper UT to Cane Creek (Pickard)
Longitudinal Profile
Reach 2
Elevation (feet)
Station (feet)
594
593
592
591
590
589
588
104+70
105+70
106+70
107+70
108+70
109+70
110+70
ROCK STRUCTURE STA 106+03
CROSS SECTION 3 POOL
REACH 2 STA 106+49
ROCK STRUCTURE STA 107+71
ROCK STRUCTURE STA 108+81
TW MY-00
BKF MY-00
TW MY-01
BKF MY-01
TW MY-02
BKF MY-02
TW MY-03
BKF MY-03
TW MY-04
BKF MY-04
TW MY-05
WS MY-05

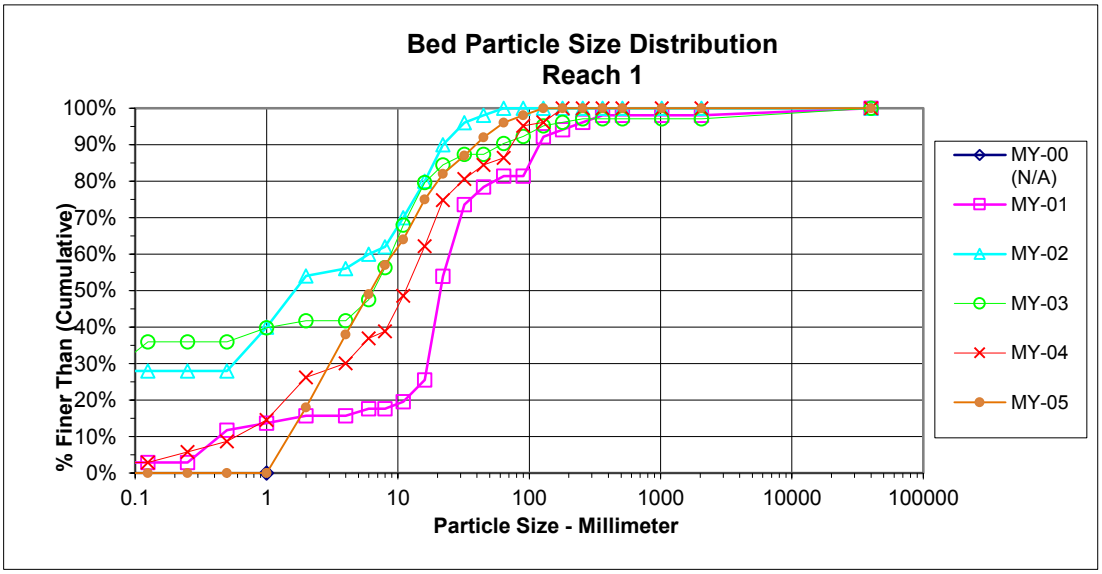

Upper UT to Cane Creek (Pickard)
Longitudinal Profile
Reach 3
Elevation (feet)
590
589
588
587
586
585
584
31+10
32+10
33+10
34+10
35+10
Station (feet)
CROSS SECTION 7 RIFFLE
REACH 3 STA 32+03
CATTLE CROSSING REACH 3 STA 35+05 - 35+20
ROCK STRUCTURE STA 35+25
TW MY-00
BKF MY-00
TW MY-01
BKF MY-01
TW MY-02
BKF MY-02
TW MY-03
BKF MY-03
TW MY-04
BKF MY-04
TW MY-05
WS MY-05


Upper UT to Cane Creek (Pickard)
Longitudinal Profile
Reach 4
Elevation (feet)
588.5
587.5
586.5
585.5
584.5
583.5
582.5
38+45
39+45
40+45
41+45
42+45
43+45
44+45
Station (feet)
ROCK STRUCTURE STA 39+81
ROCK STRUCTURE STA 42+30
CROSS SECTION 9 POOL REACH 4 STA 43+03
TW MY-00
BKF MY-00
TW MY-01
BKF MY-01
TW MY-02
BKF MY-02
TW MY-03
BKF MY-03
TW MY-04
BKF MY-04
TW MY-05
WS MY-05


Upper UT to Cane Creek (Pickard)
Longitudinal Profile
Reach 5
Elevation (feet)
585
584
583
582
581
580
579
578
50+30
51+30
52+30
53+30
54+30
55+30
Station (feet)
ROCK STRUCTURE STA 51+46
CROSS SECTION 11 RIFFLE
REACH 5 STA 52+76
ROCK STRUCTURE STA 53+26
TW MY-00
BKF MY-00
TW MY-01
BKF MY-01
TW MY-02
BKF MY-02
TW MY-03
BKF MY-03
TW MY-04
BKF MY-04
TW MY-05
WS MY-05

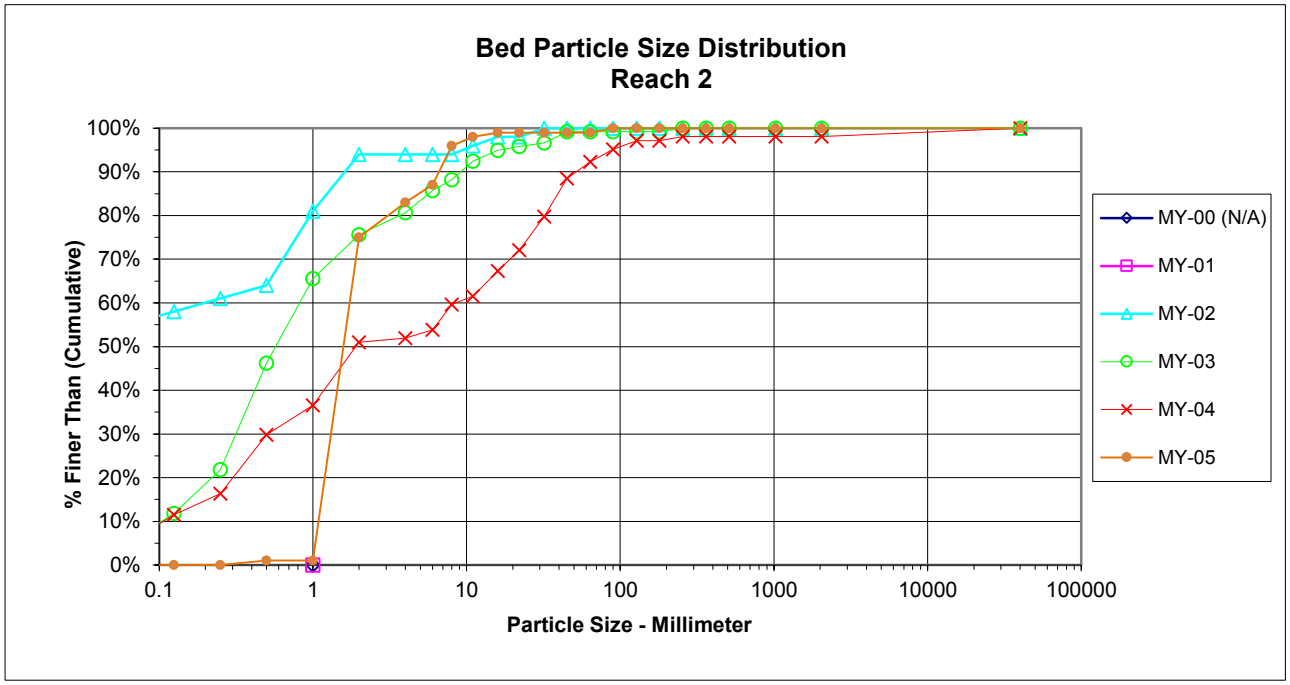
PEBBLE COUNT								
Project:	Upper UT to Cane Creek (Pickard)					**Date:**	8/28/2013	
Location:	Reach 1							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C			0	0%	0%
	Very Fine	.062 - .125	S			0	0%	0%
	Fine	.125 - .25	A			0	0%	0%
	Medium	.25 - .50	N			0	0%	0%
	Coarse	.50 - 1.0	D			0	0%	0%
.04 -.08	Very Coarse	1.0 - 2.0	S			18	18%	18%
.08 - .16	Very Fine	2.0 - 4.0				20	20%	38%
.16 - .22	Fine	4.0 - 5.7	G			11	11%	49%
.22 - .31	Fine	5.7 - 8.0	R			8	8%	57%
.31 - .44	Medium	8.0 - 11.3	A			7	7%	64%
.44 - .63	Medium	11.3 - 16.0	V			11	11%	75%
.63 - .89	Coarse	16.0 - 22.6	E			7	7%	82%
.89 - 1.26	Coarse	22.6 - 32.0	L			5	5%	87%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S			5	5%	92%
1.77 - 2.5	Very Coarse	45.0 - 64.0				4	4%	96%
2.5 - 3.5	Small	64 - 90	C			2	2%	98%
3.5 - 5.0	Small	90 - 128	O			2	2%	100%
5.0 - 7.1	Large	128 - 180	B			0	0%	100%
7.1 - 10.1	Large	180 - 256	L			0	0%	100%
10.1 - 14.3	Small	256 - 362	B			0	0%	100%
14.3 - 20	Small	362 - 512	L			0	0%	100%
20 - 40	Medium	512 - 1024	D			0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R			0	0%	100%
	Bedrock		BDRK			0	0%	100%
			Totals			**100**	**100%**	**100%**

d16	**d35**	**d50**	**d84**	**d95**
1.8	3.6	5.5	22.3	49.8



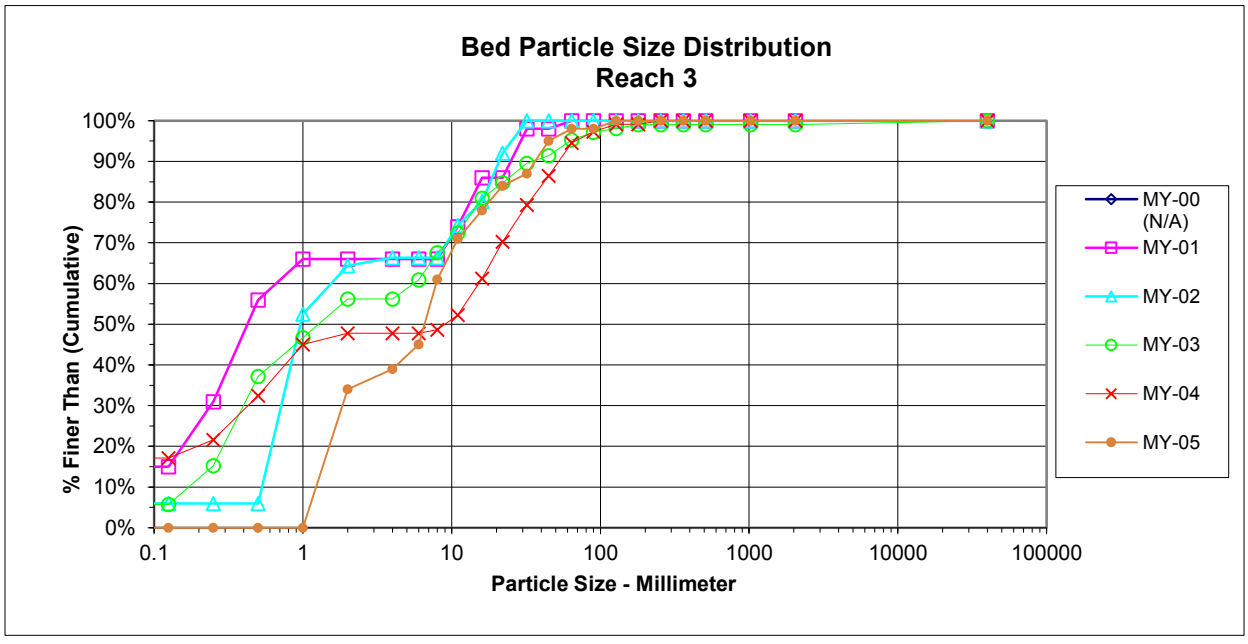
PEBBLE COUNT								
Project:	Upper UT to Cane Creek (Pickard)					**Date:**	8/28/2013	
Location:	Reach 2							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C			0	0%	0%
	Very Fine	.062 - .125	S			0	0%	0%
	Fine	.125 - .25	A			0	0%	0%
	Medium	.25 - .50	N			1	1%	1%
	Coarse	.50 - 1.0	D			0	0%	1%
.04 -.08	Very Coarse	1.0 - 2.0	S			74	74%	75%
.08 - .16	Very Fine	2.0 - 4.0				8	8%	83%
.16 - .22	Fine	4.0 - 5.7	G			4	4%	87%
.22 - .31	Fine	5.7 - 8.0	R			9	9%	96%
.31 - .44	Medium	8.0 - 11.3	A			2	2%	98%
.44 - .63	Medium	11.3 - 16.0	V			1	1%	99%
.63 - .89	Coarse	16.0 - 22.6	E			0	0%	99%
.89 - 1.26	Coarse	22.6 - 32.0	L			0	0%	99%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S			0	0%	99%
1.77 - 2.5	Very Coarse	45.0 - 64.0				0	0%	99%
2.5 - 3.5	Small	64 - 90	C			1	1%	100%
3.5 - 5.0	Small	90 - 128	O			0	0%	100%
5.0 - 7.1	Large	128 - 180	B			0	0%	100%
7.1 - 10.1	Large	180 - 256	L			0	0%	100%
10.1 - 14.3	Small	256 - 362	B			0	0%	100%
14.3 - 20	Small	362 - 512	L			0	0%	100%
20 - 40	Medium	512 - 1024	D			0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R			0	0%	100%
	Bedrock		BDRK			0	0%	100%
			Totals			**100**	**100%**	**100%**

d16	d35	d50	d84	d95
0.1	1.3	1.6	4.8	6.5



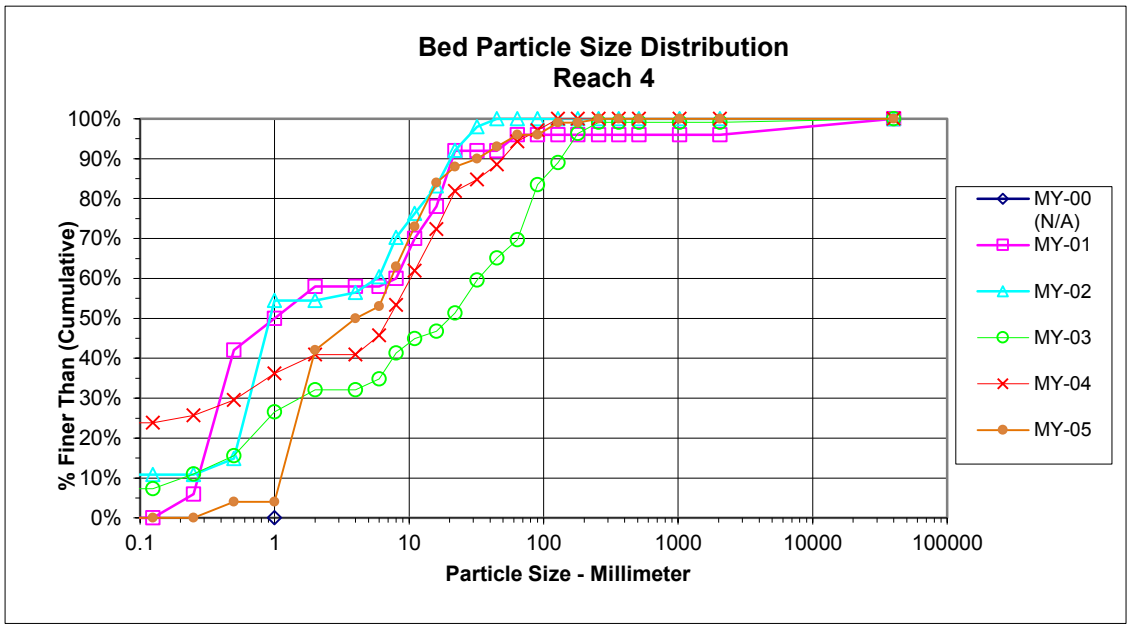
PEBBLE COUNT								
Project:	Upper UT to Cane Creek (Pickard)					**Date:**	8/28/2013	
Location:	Reach 3							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C			0	0%	0%
	Very Fine	.062 - .125	S			0	0%	0%
	Fine	.125 - .25	A			0	0%	0%
	Medium	.25 - .50	N			0	0%	0%
	Coarse	.50 - 1.0	D			0	0%	0%
.04 -.08	Very Coarse	1.0 - 2.0	S			34	34%	34%
.08 - .16	Very Fine	2.0 - 4.0				5	5%	39%
.16 - .22	Fine	4.0 - 5.7	G			6	6%	45%
.22 - .31	Fine	5.7 - 8.0	R			16	16%	61%
.31 - .44	Medium	8.0 - 11.3	A			10	10%	71%
.44 - .63	Medium	11.3 - 16.0	V			7	7%	78%
.63 - .89	Coarse	16.0 - 22.6	E			6	6%	84%
.89 - 1.26	Coarse	22.6 - 32.0	L			3	3%	87%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S			8	8%	95%
1.77 - 2.5	Very Coarse	45.0 - 64.0				3	3%	98%
2.5 - 3.5	Small	64 - 90	C			0	0%	98%
3.5 - 5.0	Small	90 - 128	O			2	2%	100%
5.0 - 7.1	Large	128 - 180	B			0	0%	100%
7.1 - 10.1	Large	180 - 256	L			0	0%	100%
10.1 - 14.3	Small	256 - 362	B			0	0%	100%
14.3 - 20	Small	362 - 512	L			0	0%	100%
20 - 40	Medium	512 - 1024	D			0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R			0	0%	100%
	Bedrock		BDRK			0	0%	100%
			Totals			**100**	**100%**	**100%**

d16	d35	d50	d84	d95
1.4	2.2	6.5	11.2	43.0



PEBBLE COUNT								
Project:	Upper UT to Cane Creek (Pickard)					**Date:**	8/28/2013	
Location:	Reach 4							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C			0	0%	0%
	Very Fine	.062 - .125	S			0	0%	0%
	Fine	.125 - .25	A			0	0%	0%
	Medium	.25 - .50	N			4	4%	4%
	Coarse	.50 - 1.0	D			0	0%	4%
.04 -.08	Very Coarse	1.0 - 2.0	S			38	38%	42%
.08 - .16	Very Fine	2.0 - 4.0				8	8%	50%
.16 - .22	Fine	4.0 - 5.7	G			3	3%	53%
.22 - .31	Fine	5.7 - 8.0	R			10	10%	63%
.31 - .44	Medium	8.0 - 11.3	A			10	10%	73%
.44 - .63	Medium	11.3 - 16.0	V			11	11%	84%
.63 - .89	Coarse	16.0 - 22.6	E			4	4%	88%
.89 - 1.26	Coarse	22.6 - 32.0	L			2	2%	90%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S			3	3%	93%
1.77 - 2.5	Very Coarse	45.0 - 64.0				3	3%	96%
2.5 - 3.5	Small	64 - 90	C			0	0%	96%
3.5 - 5.0	Small	90 - 128	O			3	3%	99%
5.0 - 7.1	Large	128 - 180	B			0	0%	99%
7.1 - 10.1	Large	180 - 256	L			1	1%	100%
10.1 - 14.3	Small	256 - 362	B			0	0%	100%
14.3 - 20	Small	362 - 512	L			0	0%	100%
20 - 40	Medium	512 - 1024	D			0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R			0	0%	100%
	Bedrock		BDRK			0	0%	100%
			Totals			**100**	**100%**	**100%**

d16	d35	d50	d84	d95
1.3	1.8	3.9	10.5	51.0



PEBBLE COUNT								
Project:	Upper UT to Cane Creek (Pickard)					**Date:**	8/28/2013	
Location:	Reach 5							
				Particle Counts				
Inches	Particle	Millimeter		Riffles	Pools	Total No.	Item %	% Cumulative
	Silt/Clay	< 0.062	S/C			0	0%	0%
	Very Fine	.062 - .125	S			0	0%	0%
	Fine	.125 - .25	A			0	0%	0%
	Medium	.25 - .50	N			0	0%	0%
	Coarse	.50 - 1.0	D			0	0%	0%
.04 -.08	Very Coarse	1.0 - 2.0	S			34	34%	34%
.08 - .16	Very Fine	2.0 - 4.0				4	4%	38%
.16 - .22	Fine	4.0 - 5.7	G			0	0%	38%
.22 - .31	Fine	5.7 - 8.0	R			10	10%	48%
.31 - .44	Medium	8.0 - 11.3	A			15	15%	63%
.44 - .63	Medium	11.3 - 16.0	V			8	8%	71%
.63 - .89	Coarse	16.0 - 22.6	E			10	10%	81%
.89 - 1.26	Coarse	22.6 - 32.0	L			4	4%	85%
1.26 - 1.77	Very Coarse	32.0 - 45.0	S			7	7%	92%
1.77 - 2.5	Very Coarse	45.0 - 64.0				3	3%	95%
2.5 - 3.5	Small	64 - 90	C			2	2%	97%
3.5 - 5.0	Small	90 - 128	O			0	0%	97%
5.0 - 7.1	Large	128 - 180	B			3	3%	100%
7.1 - 10.1	Large	180 - 256	L			0	0%	100%
10.1 - 14.3	Small	256 - 362	B			0	0%	100%
14.3 - 20	Small	362 - 512	L			0	0%	100%
20 - 40	Medium	512 - 1024	D			0	0%	100%
40 - 80	Lrg- Very Lrg	1024 - 2048	R			0	0%	100%
	Bedrock		BDRK			0	0%	100%
			Totals			**100**	**100%**	**100%**

d16	d35	d50	d84	d95
1.3	2.4	8.1	30.1	50.8

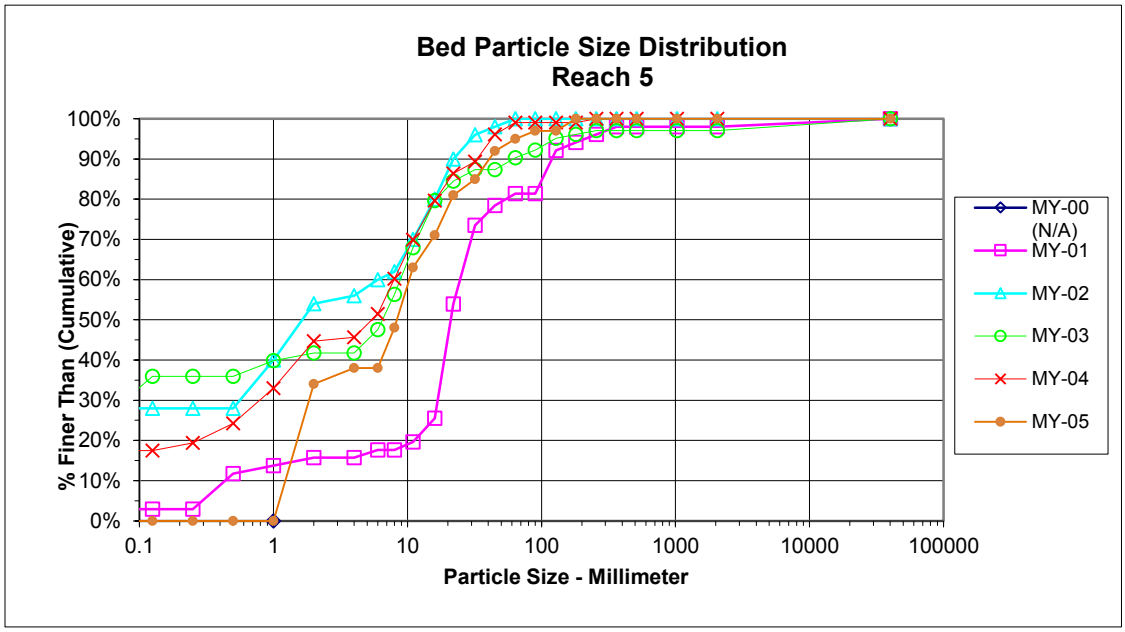


Table 10a. Baseline Stream Data Summary

Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 1 (641 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)							11.6						11.1					10				12.4			
Floodprone Width (ft)							65						102.5					65				150			
Bankfull Mean Depth (ft)							1.2328						1.1873					1.1				0.7258			
[1]Bankfull Max Depth (ft)							1.6						1.85					1.5				1.6			
Bankfull Cross Sectional Area (ft^2)							14.3						13.15					11				9			
Width/Depth Ratio							9.4098						9.9445					9.0909				17.084			
Entrenchment Ratio							5.6034						9.237					6.5				12.097			
[1]Bank Height Ratio							1.2						1.2					1				1			
Profile																									
Riffle Length (ft)																				5		17	66		
Riffle Slope (ft/ft)							0.008						0.0073					0.0065		0.0014		0.0066	0.0212		
Pool Length (ft)																				12		20	33		
Pool Max depth (ft)																									
Pool Spacing (ft)					100			240			15			87			13		66	39		70	113		
Pattern																									
Channel Beltwidth (ft)					20			50			15			50			35		70	24		64	64		
Radius of Curvature (ft)					40			385			8.6			25.6			23		42	16		68	68		
Rc:Bankfull width (ft/ft)																									
Meander Wavelength (ft)					80			460			29			57			40		140	74		198	198		
Meander Width Ratio					1.7			4.3			1.3			4.5			3.5		7	6		16	16		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																									
Max part size (mm) mobilized at bankfull																									
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification							Degraded E4						E4					E4				C4			
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)																									
Valley length (ft)							1375																		
Channel Thalweg length (ft)							1430											1737				1811			
Sinuosity (ft)							1.04						1.24					1.26				1.31			
Water Surface Slope (Channel) (ft/ft)							0.008						0.0046					0.0043				0.0066			
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% 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 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data. 5. Of value/needed only if the n exceeds 3

Table 10a. Baseline Stream Data Summary

Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 2 (587 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)							13.8						11					12.5				8.6			
Floodprone Width (ft)							150						105					102.5				150			
Bankfull Mean Depth (ft)							1.9855						1.4727					1.5935				0.7093			
[1]Bankfull Max Depth (ft)							2.9						2					2.05				1.2			
Bankfull Cross Sectional Area (ft^2)							27.4						16.2					20.1				6.1			
Width/Depth Ratio							6.9504						7.4691					7.8179				12.125			
Entrenchment Ratio							10.87						9.5455					8.3442				17.442			
[1]Bank Height Ratio							1.1						1.4					1.2				1			
Profile																									
Riffle Length (ft)																				6		13	54		
Riffle Slope (ft/ft)							0.0044						0.0112					0.0055		N/A		N/A	N/A		
Pool Length (ft)																				15		22	84		
Pool Max depth (ft)																									
Pool Spacing (ft)					31			295			2			95			19		93	64		82	109		
Pattern																									
Channel Beltwidth (ft)					20			40			50			77			49	98		33		44	61		
Radius of Curvature (ft)					22			70			11.3			27.1			32	58		19		36	45		
Rc:Bankfull width (ft/ft)																									
Meander Wavelength (ft)					80			540			29			96			56	140		122		144	159		
Meander Width Ratio					1.4			2.9			4.5			7			3.5	7		14		17	19		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																									
Max part size (mm) mobilized at bankfull																									
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification					Degraded E4						E4						E4			E/C5					
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)																									
Valley length (ft)					1986																				
Channel Thalweg length (ft)					2065												1322			1357					
Sinuosity (ft)					1.04						1.62						1.26			1.21					
Water Surface Slope (Channel) (ft/ft)					0.0044						0.0008						0.0037								
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% 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 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data; 5. Of value needed only if the n exceeds 3

Table 10a. Baseline Stream Data Summary

Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 3 (531 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)							16						11.1					16		15.2		17.8	18.3		
Floodprone Width (ft)							300						102.5					200		150		150	150		
Bankfull Mean Depth (ft)							2.1375						1.1873					2		1.2472		1.3333	1.7303		
[1]Bankfull Max Depth (ft)							3.3						1.85					2.4		2		2.3	2.5		
Bankfull Cross Sectional Area (ft^2)							34.2						13.15					32		22.2		24.4	26.3		
Width/Depth Ratio							7.4854						9.9445					8		8.7848		13.725	14.272		
Entrenchment Ratio							18.75						9.237					12.5		8.1967		8.427	9.8684		
[1]Bank Height Ratio							1.3						1.2					1		1		1	1		
Profile																									
Riffle Length (ft)																				5		33	136		
Riffle Slope (ft/ft)							0.007						0.0073					0.0049		0		0.0033	0.0108		
Pool Length (ft)																				10		31	54		
Pool Max depth (ft)																									
Pool Spacing (ft)					29			395			15			87			21		106	58		113	180		
Pattern																									
Channel Beltwidth (ft)					18			148			15			50			56		112	15		63	100		
Radius of Curvature (ft)					23			32			8.6			25.6			37		66	23		45	72		
Rc:Bankfull width (ft/ft)																									
Meander Wavelength (ft)					120			340			29			57			64		160	105		182	274		
Meander Width Ratio					1.1			9.2			1.3			4.5			3.5		7	5.9		10.2	15.4		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																									
Max part size (mm) mobilized at bankfull																									
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification							Degraded E4						E4					E4				E/C/5			
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)																									
Valley length (ft)							1541																		
Channel Thalweg length (ft)							2065											1984				2119			
Sinuosity (ft)							1.34						1.24					1.27				1.27			
Water Surface Slope (Channel) (ft/ft)							0.0031						0.0046					0.0032				0.0031			
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% 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 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data. 5. Of values needed only if the n exceeds 3.

Table 10a. Baseline Stream Data Summary

Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 4 (570 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)							16						11.1					16		15.2		17.8	18.3		
Floodprone Width (ft)							300						102.5					200		150		150	150		
Bankfull Mean Depth (ft)							2.1375						1.1873					2		1.2472		1.3333	1.7303		
[1]Bankfull Max Depth (ft)							3.3						1.85					2.4		2		2.3	2.5		
Bankfull Cross Sectional Area (ft^2)							34.2						13.15					32		22.2		24.4	26.3		
Width/Depth Ratio							7.4854						9.9445					8		8.7848		13.725	14.272		
Entrenchment Ratio							18.75						9.237					12.5		8.1967		8.427	9.8684		
[1]Bank Height Ratio							1.3						1.2					1		1		1	1		
Profile																									
Riffle Length (ft)																				5		33	136		
Riffle Slope (ft/ft)							0.007						0.0073					0.0049		0		0.0033	0.0108		
Pool Length (ft)																				10		31	54		
Pool Max depth (ft)																									
Pool Spacing (ft)					29			395			15			87			21		106	58		113	180		
Pattern																									
Channel Beltwidth (ft)					18			148			15			50			56		112	15		63	100		
Radius of Curvature (ft)					23			32			8.6			25.6			37		66	23		45	72		
Rc:Bankfull width (ft/ft)																									
Meander Wavelength (ft)					120			340			29			57			64		160	105		182	274		
Meander Width Ratio					1.1			9.2			1.3			4.5			3.5		7	5.9		10.2	15.4		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																									
Max part size (mm) mobilized at bankfull																									
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification							Degraded E4						E4					E4				E/C/5			
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)																									
Valley length (ft)							1541																		
Channel Thalweg length (ft)							2065											1984				2119			
Sinuosity (ft)							1.34						1.24					1.27				1.27			
Water Surface Slope (Channel) (ft/ft)							0.0031						0.0046					0.0032				0.0031			
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% 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 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data. 5. Of value needed only if the n exceeds 3

Table 10a. Baseline Stream Data Summary

Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 5 (634 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)							20.3						11.1					18		14.5		15.9	20.6		
Floodprone Width (ft)							300						102.5					300		150		150	150		
Bankfull Mean Depth (ft)							2.1133						1.1873					2.1111		1.1893		1.5793	1.6164		
[1]Bankfull Max Depth (ft)							2.9						1.85					2.7		2		2.4	2.6		
Bankfull Cross Sectional Area (ft^2)							42.9						13.15					38		22.9		24.5	25.7		
Width/Depth Ratio							9.6058						9.9445					8.5263		9.1812		9.837	17.321		
Entrenchment Ratio							14.778						9.237					16.667		7.2816		9.434	10.345		
[1]Bank Height Ratio							1.6						1.2					1		1		1	1		
Profile																									
Riffle Length (ft)																				12		33	78		
Riffle Slope (ft/ft)													0.0112							0		0.0036	0.0238		
Pool Length (ft)																				15		28	54		
Pool Max depth (ft)																									
Pool Spacing (ft)											2			95						58		83	201		
Pattern																									
Channel Beltwidth (ft)					23			91			50			77			63		126	34		82	104		
Radius of Curvature (ft)					19			34			11.3			27.1			41		75	33		54	90		
Rc:Bankfull width (ft/ft)																									
Meander Wavelength (ft)					99			150			29			96			72		180	124		156	303		
Meander Width Ratio					1.1			4.5			4.5			7			3.5		7	7.8		9.8	19.1		
Transport parameters																									
Reach Shear Stress (competency) lb/f^2																									
Max part size (mm) mobilized at bankfull																									
Stream Power (transport capacity) W/m^2																									
Additional Reach Parameters																									
Rosgen Classification							Degraded E4						E4					E4				E/C4			
Bankfull Velocity (fps)																									
Bankfull Discharge (cfs)																									
Valley length (ft)							1112																		
Channel Thalweg length (ft)							1435											1174				1194			
Sinuosity (ft)							1.29						1.62					1.09				1.24			
Water Surface Slope (Channel) (ft/ft)							0.0035						0.0008					0.0041				0.0023			
BF slope (ft/ft)																									
[3]Bankfull Floodplain Area (acres)																									
[4]% 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 = For projects with a proximal USGS gauge in-line with the project reach (added bankfull verification - rare).

3. Utilizing survey data produce an estimate of the bankfull floodplain area in acres, which should be the area from the top of bank to the toe of the terrace riser/slope.

4 = Proportion of reach exhibiting banks that are eroding based on the visual survey for comparison to monitoring data. 5. Of value needed only if the n exceeds 3

Table 10b. Baseline Stream Data Summary (Substrate, Bed, Bank, and Hydrologic Containment Parameter Distributions)
Upper UT to Cane Creek (Pickard) / EEP# 395

Parameter	Pre-Existing Condition	Reference Reach(es) Data	Design	As-built/Baseline
[1]Ri% / Ru% / P% / G% / S%				
[1]SC% / Sa% / G% / C% / B% / Be%				
[1]d16 / d35 / d50 / d84 / d95 / di^{p} / di^{sp} (mm)				
[2]Entrenchment Class <1.5 / 1.5-1.99 / 2.0-4.9 / 5.0-9.9 / >10				
[3]Incision Class <1.2 / 1.2-1.49 / 1.5-1.99 / >2.0				

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

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

2 = Entrenchment Class - Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as visual estimates

3 = Assign/bin the reach footage into the classes indicated and provide the percentage of the total reach footage in each class in the table. This will result from the measured cross-sections as well as the longitudinal profile

Footnotes 2,3 - These classes are loosley built around the Rosgen classification and hazard ranking breaks, but were adjusted slightly to make for easier assignment to somewhat coarser bins based on visual estimates in the field such that measurement of every segment for ER would not be necessary. The intent here is to provide the reader/consumer of design and monitoring information with a good general sense of the extent of hydrologic containment in the pre-existing and the rehabilitated states as well as comparisons to the reference distributions. ER and BHR have been addressed in prior submissions as a subsample (cross-sections as part of the design survey), however, these subsamples have often focused entirely on facilitating design without providing a thorough pre-constrution distribution of these parameters, leaving the reader/consumer with a sample that is weighted heavily on the stable sections of the reach. This means that the distributions for these parameters should include data from both the cross-section surveys and the longitudinal profile and in the case of ER, visual estimates. For example, the typical longitudinal profile permits sampling of the BHR at riffles beyond those subject to cross-sections and therefore can be readily integrated and provide a more complete sample distribution for these parameters, thereby providing the distribution/coverage necessary to provide meaningful comparisons.

Data for Table 10b. Baseline Stream Summary Table is not available (Reaches 1-5)

Table 11a. Monitoring Data - Dimensional Morphology Summary (Dimensional Parameters – Cross Sections)

Upper UT to Cane Creek (Pickard) / EEP# 395

	Cross Section 1 (Pool)							Cross Section 2 (Riffle)							Cross Section 3 (Pool)							Cross Section 4 (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+
Record elevation (datum) used		598.45	598.40	598.45	598.45	-			595.97	595.97	595.97	595.97	-			591.52	591.84	591.52	591.52	-			593.97	594.38	593.97	593.97	-	
Bankfull Width (ft)		8.10	7.80	7.47	6.55	7.47			12.40	9.70	10.78	10.92	6.54			8.20	8.20	6.56	5.98	7.90			8.60	9.80	8.59	8.36	9.20	
Floodprone Width (ft)		-	-	-	-	-			150.00	150.00	150.00	150.00	150.00			-	-	-	-	-			150.00	150.00	150.00	150.00	150.00	
Bankfull Mean Depth (ft)		1.11	1.10	1.26	1.25	1.14			0.75	0.90	0.75	0.85	1.09			0.74	0.80	0.63	0.66	0.69			0.71	0.90	0.76	0.80	0.77	
Bankfull Max Depth (ft)		1.70	1.80	1.71	1.61	1.80			1.60	1.70	1.49	1.60	1.16			1.10	1.40	0.94	1.01	1.49			1.20	1.60	1.39	1.38	1.91	
Bankfull Cross Sectional Area (ft^2)		9.00	8.80	9.41	8.18	8.86			9.30	9.70	8.11	9.26	5.45			6.10	6.90	4.11	3.96	5.42			6.10	8.80	6.52	6.71	6.99	
Bankfull Width/Depth Ratio		-	-	-	-	-			16.53	11.10	14.34	12.88	5.63			-	-	-	-	-			12.12	11.00	11.31	10.42	3.57	
Bankfull Entrenchment Ratio		-	-	-	-	-			12.10	15.40	13.91	13.74	22.94			-	-	-	-	-			17.44	15.20	17.46	17.94	16.30	
Bankfull Bank Height Ratio		-	-	-	-	-			1.00	1.00	0.91	1.06	1.00			-	-	-	-	-			1.00	1.00	1.20	0.96	1.00	
Cross Sectional Area between end pins (ft^2)		-	-	25.62	23.24	21.50			-	-	11.10	12.42	9.90			-	-	18.75	17.82	20.20			-	-	20.96	20.34	23.70	
d50 (mm)		22.00	1.90	7.67	-	-			19.90	1.20	13.50	-	-			0.50	0.40	0.46	-	-			0.40	-	12.67	-	-	

	Cross Section 5 (Pool)							Cross Section 6 (Riffle)							Cross Section 7 (Riffle)							Cross Section 8 (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+
Record elevation (datum) used		592.05	592.15	592.05	592.05	-			588.83	588.83	588.83	588.83	-			589.05	588.85	589.05	589.05	-			586.97	586.87	586.97	586.97	-	
Bankfull Width (ft)		10.80	10.40	10.05	10.49	9.07			17.80	17.80	17.76	18.02	11.66			15.20	14.50	17.49	16.29	9.98			18.30	17.60	17.99	18.53	11.42	
Floodprone Width (ft)		-	-	-	-	-			150.00	150.00	150.00	150.00	150.00			150.00	150.00	150.00	150.00	150.00			150.00	150.00	150.00	150.00	150.00	
Bankfull Mean Depth (ft)		1.03	1.10	1.07	1.04	1.64			1.25	1.20	1.23	1.25	0.85			1.73	1.70	1.65	1.76	1.21			1.33	1.30	1.44	1.35	1.43	
Bankfull Max Depth (ft)		1.90	1.90	1.82	1.86	1.70			2.00	2.00	1.87	1.86	1.23			2.50	2.20	2.61	2.56	1.43			2.30	2.20	2.46	2.34	1.48	
Bankfull Cross Sectional Area (ft^2)		11.10	11.10	10.71	10.87	7.71			22.20	22.10	21.83	22.55	7.19			26.30	22.40	28.79	28.60	7.14			24.40	23.70	25.84	25.09	8.42	
Bankfull Width/Depth Ratio		-	-	-	-	-			14.27	14.30	14.45	14.39	13.78			8.78	9.40	10.63	9.28	8.27			13.73	13.10	12.52	13.69	8.01	
Bankfull Entrenchment Ratio		-	-	-	-	-			8.43	8.40	8.44	8.33	12.86			9.87	10.30	8.57	9.21	15.03			8.20	8.50	8.34	8.09	13.14	
Bankfull Bank Height Ratio		-	-	-	-	-			1.00	1.00	1.29	1.20	1.00			1.00	1.00	0.94	0.95	1.00			1.00	1.00	1.13	1.07	1.00	
Cross Sectional Area between end pins (ft^2)		-	-	12.40	12.95	17.20			-	-	67.28	68.81	81.20			-	-	29.78	29.09	32.20			-	-	33.55	32.60	28.40	
d50 (mm)		0.20	0.80	6.33	-	-			11.30	1.50	1.31	-	-			11.30	1.50	9.25	-	-			10.60	0.90	11.83	-	-	

	Cross Section 9 (Pool)							Cross Section 10 (Riffle)							Cross Section 11 (Riffle)							Cross Section 12 (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+
Record elevation (datum) used		585.83	585.83	585.83	585.83	-			584.16	584.16	584.16	584.16	-			582.62	582.72	582.62	582.62	-			582.20	582.20	582.22	582.22	-	
Bankfull Width (ft)		16.80	17.70	16.80	17.79	10.83			20.60	21.10	20.13	21.46	12.41			15.90	17.00	14.32	15.44	11.23			14.50	12.40	15.46	15.55	18.69	
Floodprone Width (ft)		-	-	-	-	-			150.00	150.00	150.00	150.00	150.00			150.00	150.00	150.00	150.00	150.00			150.00	150.00	150.00	150.00	150.00	
Bankfull Mean Depth (ft)		1.69	1.60	1.69	1.65	2.18			1.19	1.20	1.18	1.15	0.97			1.62	1..5	1.43	1.49	1.43			1.58	1.70	1.44	1.48	1.89	
Bankfull Max Depth (ft)		3.20	3.10	3.27	3.11	2.20			2.00	2.00	2.10	2.07	1.12			2.40	2.50	2.56	2.59	1.53			2.60	2.60	2.34	2.41	2.11	
Bankfull Cross Sectional Area (ft^2)		28.40	28.50	28.43	29.38	11.91			24.50	24.90	23.68	24.59	6.94			25.70	25.80	20.46	22.97	8.61			22.90	21.10	22.32	23.07	19.70	
Bankfull Width/Depth Ratio		-	-	-	-	-			17.32	17.90	17.11	18.73	12.77			9.84	11.20	10.02	10.38	7.85			9.18	7.30	10.70	10.48	9.91	
Bankfull Entrenchment Ratio		-	-	-	-	-			7.28	7.10	7.45	6.99	12.09			9.43	8.80	10.47	9.72	13.36			10.34	12.10	9.70	9.65	8.03	
Bankfull Bank Height Ratio		-	-	-	-	-			1.00	1.00	0.92	0.96	1.00			1.00	1.00	-226.59	1.12	1.00			1.00	1.00	1.11	1.12	1.00	
Cross Sectional Area between end pins (ft^2)		-	-	31.30	32.31	31.40			-	-	41.94	40.78	51.00			-	-	34.82	37.66	31.20			-	-	34.34	35.03	30.10	
d50 (mm)		0.40	0.90	13.50	-	-			20.30	6.00	7.25	-	-			20.30	6.00	14.75	-	-			20.30	6.00	13.50	-	-	

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."

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 1 (641 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)			12.4						12.4						9.7						10.78						10.92						7.47			
Floodprone Width (ft)			150						150						150						150						150						150			
Bankfull Mean Depth (ft)			0.726						0.75						0.9						0.752						0.848						1.14			
[1]Bankfull Max Depth (ft)			1.6						1.6						1.7						1.49						1.6						1.8			
Bankfull Cross Sectional Area (ft^2)			9						9.3						9.7						8.107						9.255						8.86			
Width/Depth Ratio			17.08						16.53						11.1						14.34						12.88						4.15			
Entrenchment Ratio			12.1						12.1						15.4						13.91						13.74						20.08			
[1]Bank Height Ratio			1						1						1						0.913						1.063						1			
Profile																																				
Riffle Length (ft)	5		17	66			5		17	66			4		19	65			3.88	12.62	10.37	29.11	9.361	11	4.47	15.66	14.42	31.83	10.08	7	4.47	14.14	15.56	51.59	9.722	9
Riffle Slope (ft/ft)	0.001		0.007	0.021			0.001		0.007	0.012			0		0.009	0.086			0.013	0.047	0.023	0.131	0.042	8	0.001	0.074	0.016	0.313	0.122	6	0.003	0.06	0.012	0.113	0.082	7
Pool Length (ft)							12		20	33			3		6	23			10.83	37.24	33.84	74.92	21.23	11	19.88	66.39	62.58	126.6	40.36	6	11.43	51.81	30.61	64.37	30.8	8
Pool Max depth (ft)	12		20	33															1.98	2.331	2.21	3.21	0.366	11	2.065	2.315	2.118	2.75	0.338	6	5.348	2.323	8.109	12.99	0.352	8
Pool Spacing (ft)	39		70	113			39		70	113			39		70	113			21.36	48.71	44.15	95.34	21.61	10	22.1	83.86	95.59	129.7	47.84	5	32.09	66.28	69.95	112.8	34.73	7
Pattern																																				
Channel Beltwidth (ft)	24		64	64																																
Radius of Curvature (ft)	16		68	68																																
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)	74		198	198																																
Meander Width Ratio	6		16	16																																
Additional Reach Parameters																																				
Rosgen Classification	C4						C type						E type						E type						E type						E type					
Channel Thalweg length (ft)	1811						650						642						642						642						642					
Sinuosity (ft)	1.31						1.31						1.31						1.31						1.31						1.31					
Water Surface Slope (Channel) (ft/ft)	0.0066						0.0066						0.0071						0.00744						0.00712						0.00728					
BF slope (ft/ft)																			0.00832						0.00749						0.0079					
[3]Ri% / Ru% / P% / G% / S%																			22%		66%				18%		64%				20%		66%			
[3]SC% / Sa% / G% / C% / B% / Be%																			27%	15%	48%	7%	0%	3%	3%	23%	60%	14%	0%	0%	17%	17%	57%	11%	0%	1%
[3]d16 / d35 / d50 / d84 / d95 /																			0.09	0.123	6.556	21.42	126.1		1.1	5.4	11.5	43.4	89.6		1.8	3.6	5.5	22.3	49.8	
[2]% of Reach with Eroding Banks																			0%						0%						0%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

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

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 2 (587 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)			8.60						8.60						9.80						8.59						8.36						7.90			
Floodprone Width (ft)			150						150						150						150						150						150			
Bankfull Mean Depth (ft)			0.71						0.71						0.90						0.76						0.80						0.69			
[1]Bankfull Max Depth (ft)			1.20						1.20						1.60						1.39						1.38						1.49			
Bankfull Cross Sectional Area (ft^2)			6.10						6.10						8.80						6.52						6.71						5.42			
Width/Depth Ratio			12.12						12.12						11.00						11.31						10.42						11.40			
Entrenchment Ratio			17.44						17.44						15.20						17.46						17.94						18.99			
[1]Bank Height Ratio			1.00						1.00						1.00						1.20						0.96						1.00			
Profile																																				
Riffle Length (ft)	6.00		13.00	54.00			6.00		13.00	54.00			6.00		10.00	15.00			19.16	40.18	31.24	86.49	26.62	5.00	22.70	45.02	34.70	77.67	28.90	3.00	11.97	42.60	20.39	57.43	27.76	4.00
Riffle Slope (ft/ft)	N/A		N/A	N/A			N/A		N/A	N/A			N/A		N/A	N/A			0.00	0.01	0.01	0.02	0.01	5.00	0.00	0.01	0.00	0.02	0.01	3.00	0.00	0.01	0.00	0.02	0.01	4.00
Pool Length (ft)							15.00		22.00	84.00			17.00		20.00	25.00			15.52	61.65	75.69	119.16	43.79	5.00	36.94	97.09	101.19	153.14	58.21	3.00	21.12	79.37	54.72	95.33	51.00	4.00
Pool Max depth (ft)	15.00		22.00	84.00															2.16	2.53	2.48	3.05	0.38	5.00	1.79	2.26	2.22	2.79	0.50	3.00	6.32	2.40	8.90	29.95	0.44	4.00
Pool Spacing (ft)	64.00		82.00	109.00			64.00		82.00	109.00			64.00		82.00	#####			60.00	113.44	117.20	159.34	42.79	4.00	130.99	155.30	155.30	179.60	34.37	2.00	76.60	134.37	103.70	133.19	38.58	3.00
Pattern																																				
Channel Beltwidth (ft)	33		44	61																																
Radius of Curvature (ft)	19		36	45																																
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)	122		144	159																																
Meander Width Ratio	14		17	19																																
Additional Reach Parameters																																				
Rosgen Classification	E/C5						C/E type						E type						E type						E type						E type					
Channel Thalweg length (ft)	1357						570						588						588						588						588					
Sinuosity (ft)	1.21						1.21						1.21						1.21						1.21						1.21					
Water Surface Slope (Channel) (ft/ft)	N/A						N/A						N/A						N/A						0.00076						0.00076					
BF slope (ft/ft)																			0.00437						0.00474						0.004555					
[3]Ri% / Ru% / P% / G% / S%																			36%		56%				25%		53%				31%		55%			
[3]SC% / Sa% / G% / C% / B% / Be%																			5%	71%	23%	1%	0%	0%	5%	46%	41%	6%	0%	2%	5%	59%	32%	4%	0%	1%
[3]d16 / d35 / d50 / d84 / d95 /																			0.18	0.38	0.60	5.32	16.30		0.20	0.90	1.90	38.30	88.30		0.10	1.30	1.60	4.80	6.50	
[2]% of Reach with Eroding Banks																			0%						0%						0					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

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

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 3 (531 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	15.20		17.80	18.30					16.50						16.15						17.63						17.15						15.80			
Floodprone Width (ft)	150		150	150					150						150						150						150						150			
Bankfull Mean Depth (ft)	1.25		1.33	1.73					1.49						1.45						1.44						1.50						0.47			
[1]Bankfull Max Depth (ft)	2.00		2.30	2.50					2.25						2.10						2.24						2.21						1.76			
Bankfull Cross Sectional Area (ft^2)	22.20		24.40	26.30					24.25						22.25						25.31						25.57						23.50			
Width/Depth Ratio	8.78		13.73	14.27					11.53						11.85						12.54						11.84						8.97			
Entrenchment Ratio	8.20		8.43	9.87					9.15						9.35						8.51						8.77						9.49			
[1]Bank Height Ratio	1.00		1.00	1.00					1.00						1.00						1.12						1.07						1.00			
Profile																																				
Riffle Length (ft)	5.00		33.00	136.00			29.00		96.00	136.00			10.00		54.00	144.00			11.38	33.07	20.60	74.10	26.88	5.00	49.81	79.53	53.77	135.00	48.08	3.00	21.04	56.30	51.47	125.02	37.48	4.00
Riffle Slope (ft/ft)	0.00		0.00	0.01			0.00		0.00	0.01			0.00		0.00	0.01			0.00	0.01	0.01	0.01	0.00	4.00	0.00	0.01	0.01	0.01	0.00	3.00	0.00	0.01	0.01	0.01	0.00	3.00
Pool Length (ft)							17.00		37.00	59.00			4.00		20.00	35.00			21.25	46.90	49.39	71.31	17.92	5.00	42.68	50.60	51.93	57.19	7.35	3.00	21.23	48.75	39.58	55.63	12.63	4.00
Pool Max depth (ft)	10.00		31.00	54.00															3.00	3.38	3.51	3.74	0.34	5.00	3.51	3.59	3.62	3.63	0.07	3.00	5.50	3.48	12.71	20.46	0.20	4.00
Pool Spacing (ft)	58.00		113.00	180.00			58.00		113.00	180.00			58.00		113.00	180.00			56.31	83.63	79.47	119.28	30.87	4.00	104.81	140.16	#####	175.51	49.99	2.00	67.02	111.90	111.73	166.96	40.43	3.00
Pattern																																				
Channel Beltwidth (ft)	15		63	100																																
Radius of Curvature (ft)	23		45	72																																
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)	105		182	274																																
Meander Width Ratio	5.9		10.2	15.4																																

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	E/C5						C/E type						C/E type						C/E type						C/E type						C/E type					
Channel Thalweg length (ft)	2119						518						531						531						531						531					
Sinuosity (ft)	1.27						1.27						1.27						1.27						1.27						1.27					
Water Surface Slope (Channel) (ft/ft)	0.0031						0.0025						0.0027						0.003						0.00406						0.00406					
BF slope (ft/ft)																			0.00189						0.00151						0.00151					
[3]Ri% / Ru% / P% / G% / S%																			34%		48%				49%		31%				42%		40%			
[3]SC% / Sa% / G% / C% / B% / Be%																			6%	50%	39%	4%	0%	1%	17%	31%	47%	5%	0%	0%	12%	41%	43%	5%	0%	1%
[3]d16 / d35 / d50 / d84 / d95 /																			0.3	0.5	1.4	20.8	62.8		0.1	0.6	9.1	40.5	67.9		1.4	2.2	6.5	11.2	43.0	
[2]% of Reach with Eroding Banks																			0%						0%						0%					
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

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 4 (570 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	15.2		17.8	18.3					18.3						17.6						17.99						18.53						17.40			
Floodprone Width (ft)	150		150	150					150						150						150						150						150			
Bankfull Mean Depth (ft)	1.25		1.33	1.73					1.33						1.30						1.44						1.35						1.59			
[1]Bankfull Max Depth (ft)	2.00		2.30	2.50					2.30						2.20						2.46						2.34						3.21			
Bankfull Cross Sectional Area (ft^2)	22.20		24.40	26.30					24.40						23.70						25.84						25.09						27.80			
Width/Depth Ratio	8.78		13.73	14.27					13.73						13.10						12.52						13.69						10.94			
Entrenchment Ratio	8.20		8.43	9.87					8.20						8.50						8.34						8.09						8.62			
[1]Bank Height Ratio	1.00		1.00	1.00					1.00						1.00						1.13						1.07						1.00			
Profile																																				
Riffle Length (ft)	5.00		33.00	136.00			7.00		23.00	97.00			5.00		37.00	47.00			3.86	23.51	17.32	55.73	20.66	8.00	16.10	41.14	40.89	66.68	22.65	4.00	7.39	32.32	30.24	80.48	21.65	6.00
Riffle Slope (ft/ft)	0.00		0.00	0.01			0.00		0.00	0.01			0.00		0.01	0.02			0.00	0.01	0.01	0.03	0.01	8.00	0.00	0.01	0.01	0.02	0.01	4.00	0.00	0.01	0.01	0.02	0.01	6.00
Pool Length (ft)							10.00		31.00	54.00			7.00		12.00	17.00			11.23	49.71	51.05	78.86	24.78	7.00	43.57	62.03	55.72	93.09	23.37	4.00	17.95	55.87	37.44	60.74	24.08	5.00
Pool Max depth (ft)	10.00		31.00	54.00															2.16	2.93	3.27	3.33	0.49	7.00	3.18	3.23	3.22	3.30	0.05	4.00	5.11	3.08	12.50	20.21	0.27	5.00
Pool Spacing (ft)	58.00		113.00	180.00			58.00		113.00	180.00			58.00		113.00	180.00			21.99	73.49	74.90	116.95	35.35	6.00	88.76	92.13	92.15	95.49	3.37	3.00	56.95	82.81	101.21	150.49	19.36	4.00
Pattern																																				
Channel Beltwidth (ft)	15		63	100																																
Radius of Curvature (ft)	23		45	72																																
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)	105		182	274																																
Meander Width Ratio	5.9		10.2	15.4																																
Additional Reach Parameters																																				
Rosgen Classification	E/C5						C type						C/E type						C/E type						C/E type						C/E type					
Channel Thalweg length (ft)	2119						571						570						570						570						570					
Sinuosity (ft)	1.27						1.27						1.27						1.27						1.27						1.27					
Water Surface Slope (Channel) (ft/ft)	0.0031						0.0037						0.039						0.00278						0.00677						0.00677					
BF slope (ft/ft)																			0.00414						0.00327						0.00327					
[3]Ri% / Ru% / P% / G% / S%																			34%		63%				30%		45%				32%		54%			
[3]SC% / Sa% / G% / C% / B% / Be%																			7%	25%	38%	29%	0%	1%	24%	17%	53%	6%	0%	0%	16%	21%	46%	18%	0%	1%
[3]d16 / d35 / d50 / d84 / d95 /																			0.52	6.04	20.20	93.55	170.58		0.10	0.90	7.10	29.30	70.50		1.30	1.80	3.90	10.50	51.00	
[2]% of Reach with Eroding Banks																			0%						0%						0%					
Channel Stability or Habitat Metric																																				
Biological or Other																																				

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

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

Exhibit Table 11b. Monitoring Data - Stream Reach Data Summary
Upper UT to Cane Creek (Pickard) / EEP# 395 - Reach: 5 (634 feet)

Parameter	Baseline						MY-1						MY-2						MY- 3						MY- 4						MY- 5					
Dimension and Substrate - Riffle only	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n	Min	Mean	Med	Max	SD[4]	n
Bankfull Width (ft)	14.50		15.90	20.60			14.50	17.00	15.90	20.60	3.20	3.00	12.40	16.83	17.00	21.10	4.35	3.00	14.32	16.64	15.46	20.13	3.08	3.00	15.44	17.48	15.55	21.46	3.45	3.00			21.60			
Floodprone Width (ft)	150		150	150			150	150	150	150	0	3	150	150	150	150	0	3	150	150	150	150	0	3	150	150	150	150	0	3			150			
Bankfull Mean Depth (ft)	1.19		1.58	1.62			1.19	1.46	1.58	1.62	0.24	3.00	1.20	1.45	1.45	1.70	0.35	3.00	1.18	1.35	1.43	1.44	0.15	3.00	1.15	1.37	1.48	1.49	0.20	3.00			1.40			
[1]Bankfull Max Depth (ft)	2.00		2.40	2.60			2.00	2.33	2.40	2.60	0.31	3.00	2.00	2.37	2.50	2.60	0.32	3.00	2.10	2.33	2.34	2.56	0.23	3.00	2.07	2.36	2.41	2.59	0.26	3.00			3.11			
Bankfull Cross Sectional Area (ft^2)	22.90		24.50	25.70			22.90	24.37	24.50	25.70	1.40	3.00	21.10	23.93	24.90	25.80	2.49	3.00	20.46	22.15	22.32	23.68	1.62	3.00	22.97	23.54	23.07	24.59	0.91	3.00			30.30			
Width/Depth Ratio	9.18		9.84	17.32			9.18	12.11	9.84	17.32	4.52	3.00	7.30	12.13	11.20	17.90	5.36	3.00	10.02	12.61	10.70	17.11	3.91	3.00	10.38	13.20	10.48	18.73	4.79	3.00			15.43			
Entrenchment Ratio	7.28		9.43	10.34			7.28	9.02	9.43	10.34	1.57	3.00	7.10	9.33	8.80	12.10	2.54	3.00	7.45	9.21	9.70	10.47	1.57	3.00	6.99	8.78	9.65	9.72	1.55	3.00			6.94			
[1]Bank Height Ratio	1.00		1.00	1.00			1.00	1.00	1.00	1.00	0.00	3.00	1.00	1.00	1.00	1.00	0.00	3.00	0.92	1.08	1.11	1.22	0.15	3.00	0.96	1.07	1.12	1.12	0.09	3.00			1.00			
Profile																																				
Riffle Length (ft)	12.00		33.00	78.00			12.00		33.00	78.00			6.00		29.00	56.00			3.99	25.55	27.82	59.49	18.07	9.00	17.75	37.55	37.64	59.19	14.78	6.00	10.35	31.55	32.09	66.14	16.43	7.00
Riffle Slope (ft/ft)	0.00		0.00	0.02			0.00		0.00	0.02			0.00		0.00	0.01			0.00	0.01	0.01	0.02	0.01	9.00	0.00	0.01	0.01	0.01	0.00	6.00	0.00	0.01	0.00	0.02	0.00	7.00
Pool Length (ft)	15.00		28.00	54.00			15.00		28.00	54.00			5.00		14.00	35.00			15.20	35.48	33.61	56.09	13.85	9.00	25.46	44.42	40.82	70.46	13.85	7.00	15.13	39.95	28.89	53.91	13.85	8.00
Pool Max depth (ft)																			3.02	3.51	3.58	4.15	0.34	9.00	2.94	3.51	3.47	4.05	0.37	7.00	2.98	3.51	3.52	4.10	0.36	8.00
Pool Spacing (ft)	58.00		83.00	201.00			58.00		83.00	201.00			58.00		83.00	201.00			23.99	61.76	61.37	96.27	26.51	8.00	55.92	85.96	86.41	124.39	23.14	6.00	50.78	73.86	79.36	164.73	24.83	7.00
Pattern																																				
Channel Beltwidth (ft)	34		82	104																																
Radius of Curvature (ft)	33		54	90																																
Rc:Bankfull width (ft/ft)																																				
Meander Wavelength (ft)	124		156	303																																
Meander Width Ratio	7.8		9.8	19.1																																

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	E/C4						C/E type						C/E type						C/E type						C/E type						C/E type					
Channel Thalweg length (ft)	1194						565						634						634						634						634					
Sinuosity (ft)	1.24						1.24						1.24						1.24						1.24						1.24					
Water Surface Slope (Channel) (ft/ft)	0.0023						0.0023						0.0028						N/A						0.00257						0.00257					
BF slope (ft/ft)																			0.00315						0.00308						0.00308					
[3]Ri% / Ru% / P% / G% / S%																			41%		58%				41%		57%				41%		58%			
[3]SC% / Sa% / G% / C% / B% / Be%																			10%	34%	39%	17%	0%	0%	17%	28%	54%	1%	0%	0%	14%	31%	47%	9%	0%	0%
[3]d16 / d35 / d50 / d84 / d95 /																			0.21	1.19	9.07	66.70	127.19		0.10	1.20	5.50	19.90	42.90		1.30	2.40	8.10	30.10	50.80	
[2]% of Reach with Eroding Banks																			0%						0%						0%					
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

APPENDIX E. Hydrologic Data

Table 12. Verification of Bankfull Events Upper UT to Cane Creek (Pickard) / EEP# 395			
Date of Data Collection	**Date of Occurrence**	**Method**	**Photo #**
16-Nov-09	11-Nov-09	Visual observation of wrack adjacent to the stream channel and within the floodplain as the result of Tropical Storm Ida	1-2 (MY-02 Report)
17-Feb-10	5-Feb-10	Visual observations of overbank event including wrack lines and sediment deposition resulting from a 1.36 inch* rainfall event on February 5, 2010 that occurred after numerous rainfall events, within the 3 weeks prior, that totaled 3.52 inches	3-4 (MY-02 Report)
16-Jun-10	17-May-10	Visual observations of overbank event including wrack lines and sediment deposition resulting from a 4.1 inch* rainfall event on May 16-17, 2010	N/A
5-Oct-10	30-Sep-10	A 4.43 inch* rainfall event occurring between September 26-October 2, 2010	N/A
18-Jan-13	18-Jan-13	A 2.1-inch** rainfall event within 4 hours occurred less than 24 hours after a 1.3 inch rainfall within 6 hours.	N/A
18-Jan-13	18-Jan-13	A 1.6-inch** rainfall event within 1 hour occurred less than 15 hours after a 1.3 inch rainfall within 4 hours	N/A
29-Jun-13	29-Jun-13	A 0.24-inch*** rainfall event within 11 hours occurred less than 12 hours after a 0.45 inch rainfall within 3 hours.	N/A

* - Reported at KBUY Weather Station in Burlington
** - Reported at USGS 355637079122545 Rain gauge at Berry Andrews Rd near White Cross
***-Reported at Burlington Alamance Regional Airport