UT to Little Coharie Stream and Buffer Restoration Project
Sampson County
North Carolina

CU: 030030006
SCO# 040634201
EEP Project No. 314

1st Year Monitoring Report
February 2010

Prepared for:

North Carolina Department of Environment and Natural Resources
Ecosystem Enhancement Program
Parker Lincoln Building
2728 Capital Boulevard, Suite 1H-103
Raleigh, NC 27606

UT to Little Coharie Stream and Buffer Restoration Project
Columbus County
North Carolina

CU: 030030006
SCO# 040634201
EEP Project No. 314

1st Year Monitoring Report
February 2010

Prepared by:

Rummel, Klepper & Kahl, LLP
900 Ridgefield Drive
Suite 350
Raleigh, NC 27609

2.0 Table of Contents

3.0 Executive Summary/Project Abstract

Project goals and objectives for the UT to Little Coharie Stream Restoration Project included:

- Restore and Enhance 2,330 linear feet of stream
- Obtain a stable stream system that adequately conveys water and sediment
- Improve water quality
- Improve aquatic and terrestrial habitat
- Reducing nutrient loads from entering the stream via the buffer acting as a filter exclusion of nearby horse grazing areas
- Reducing erosion and sedimentation

Seven (7) permanent vegetation plots were established and used in annual vegetation monitoring. Overall, the site is not meeting the minimum success requirements. The vegetative success criteria based on the US Army Corps of Engineers Stream Mitigation Guidelines (USACE, 2003) will require the survival of 320 5-year old planted woody stems per acre at the end of the year 5 monitoring period. Monitoring for 2009 revealed that vegetation plots VP1, VP2, VP3, VP5, VP6, and VP7 fall below the minimum success requirements. Vegetation plot VP4 meets or exceed minimum success requirements. Vegetation plot locations are identified in Appendix C.

Overall, the stream is functioning well and holding grade, however, the stream has areas that are of concern. Channel dimension and pattern are similar to as-built conditions and currently meeting monitoring minimum success requirement thresholds. The Main Reach channel profile appears to be holding grade and maintaining some bedform features. The Northern Reach channel profile has areas that appear to have significant aggradation. This aggradation may be cause by vegetation growing within the bankfull channel. Since project construction, North Carolina has been in a moderate to severe drought. The drought has caused low flow periods resulting in vegetation growing within the stream channel. Asiatic daylily and cattail are growing within the stream bed and is causing disruption of sediment transport resulting in aggradation on parts of the project.

Wetland restoration or enhancement was not a part of the UT to Little Coharie Stream Restoration Site therefore no wetland monitoring is required.

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

4.0 Methodology

Vegetative sample plots were quantitatively monitored during the growing season. Seven (7) 100m^2 plots were established for site monitoring. Species composition, density, vigor and survival were all monitored. Each plot corner is permanently located with rebar. Year 1 vegetation monitoring was completed in October 2009 utilizing the Carolina Vegetation Survey (CVS) – EEP protocol Level 1 (version 4.1).

Stream monitoring was completed by utilizing total station survey along with Rosgen Level II techniques to determine stream stability and performance. The annual cross-sectional survey included points surveyed at all breaks in slope, including top of bank, bankfull, inner berm, edge of water, and thalweg, if the features were present. Longitudinal profile survey was conducted for the entire length of the restored channel for stream reaches. Measurements included thalweg, water surface, and bankfull. Existing onsite benchmarks were used for survey control.

Photo monitoring was conducted by walking each stream reach and taking photos at each predetermined photo point location using a digital camera.

5.0 References

Harrelson, C.C., C.L. Rawlins and J.P. Potyondy. 1994. Stream Channel Reference Sites: An Illustrated Guide to Field Technique. United States Department of Agriculture, Fort Collins, CO.

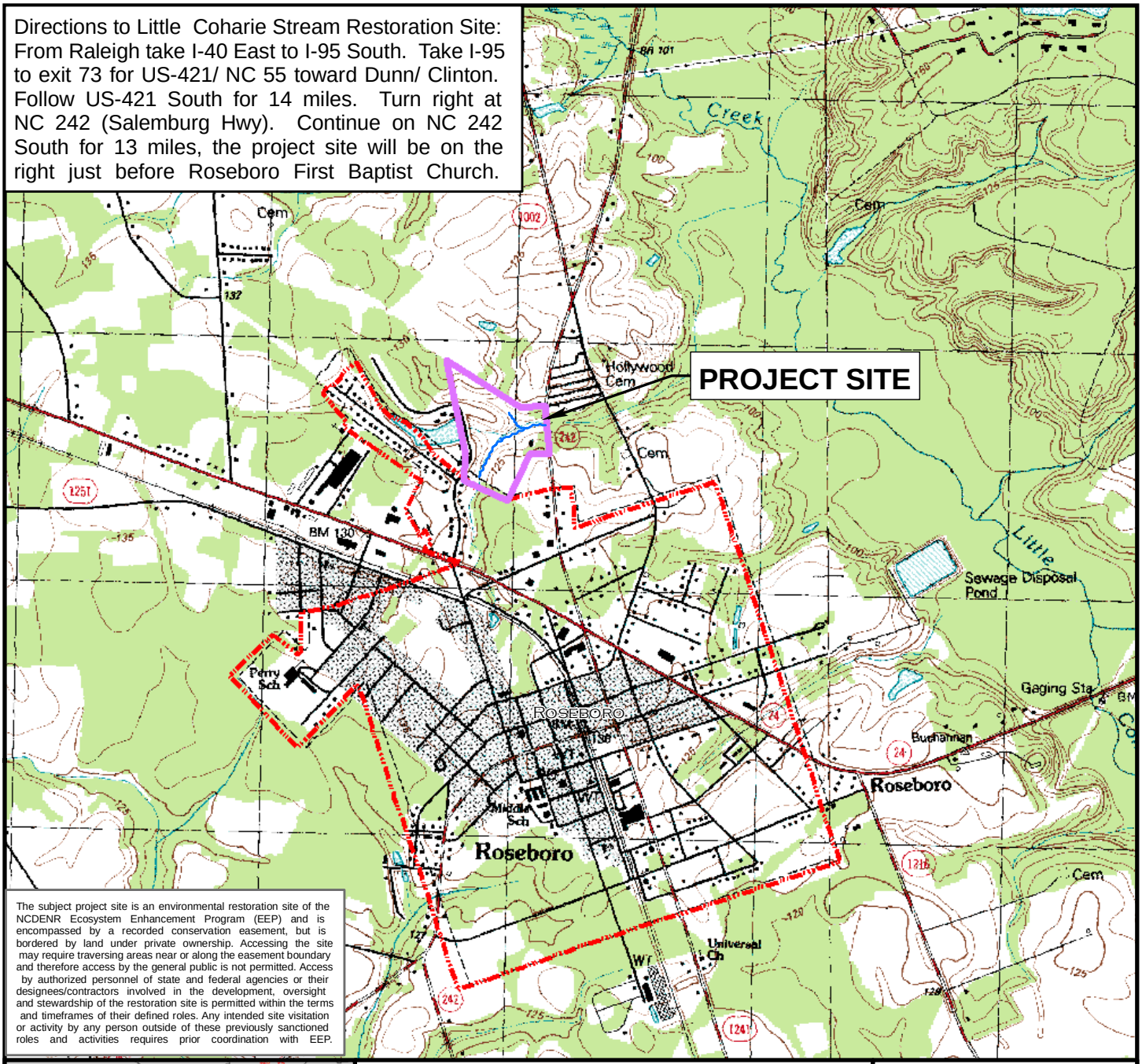
NCEEP. 2006. Content, Format and Data Requirements for EEP Monitoring Reports. North Carolina Department of Environment and Natural Resources, Ecosystem Enhancement Program. Raleigh, NC. Version 1.2 November 16, 2006.

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

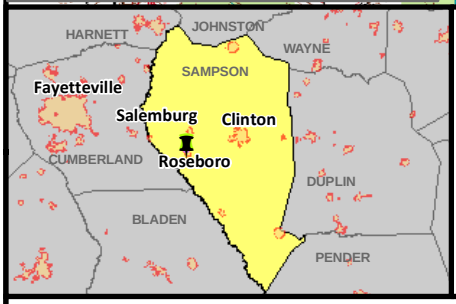
6.0 Project Condition and Monitoring Data Appendices

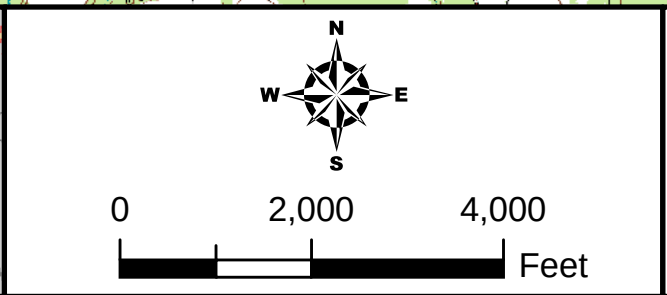
APPENDIX A

Directions to Little Coharie Stream Restoration Site: From Raleigh take I-40 East to I-95 South. Take I-95 to exit 73 for US-421/ NC 55 toward Dunn/ Clinton. Follow US-421 South for 14 miles. Turn right at NC 242 (Salemburg Hwy). Continue on NC 242 South for 13 miles, the project site will be on the right just before Roseboro First Baptist Church.



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





Ecosystem Enhancement PROGRAM

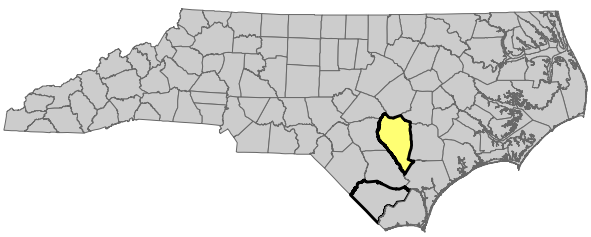


FIGURE 1

Site Location Map

UT to Little Coharie Stream Restoration Project
EEP No. 314
Sampson County, North Carolina
February 2010

FIGURE 2

Current Conditions Plan View

UT to Little Coharie
Stream Restoration Project
EEP No. 314
Sampson County, North Carolina

SR#1497

N East St

ROSEBORO

Cattail and Asiatic Daylily

VP 1
VP 2
VP 3
VP 4
VP 5
VP 6
VP 7

XS-12-B
XS-11-B
XS-12-A
XS-11-A
XS-10-B
XS-10-A
XS-8-B
XS-9-A
XS-9-B
XS-8-A
XS-6-A
XS-5-A
XS-4-A
XS-7-A
XS-7-B
XS-6-B
XS-4-B
XS-5-B
XS-3-A
XS-3-B
XS-2-B
XS-2-A
XS-1-B
XS-1-A

Legend

- Stream Thalweg
- Cross Section

Vegetation Monitoring Counts

- Less Than 320 Stems per Acre
- More Than 320 Stems per Acre

0 50 100 200 300 Feet

Ecosystem Enhancement Program

November 2009

APPENDIX B

Appendix B – General Project Tables

Table 1. Project Restoration Components UT to Little Coharie Stream Restoration Project (EEP #314)							
Reach ID	**Existing Feet/Acres**	**Type**	**Approach**	**Footage or Acreage**	**Stationing**		**Comment**
Main Channel	1630	R	P1	1630	10+00.0 to 26+30		Main Reach
North Branch	700	E	P2	700	10+00.0 to 17+00		Northern Reach
Restoration Summary	N/A			*2,330*			

Component Summations

Restoration Level	Stream (lf)	Riparian Wetland (ac)	Nonriparian Wetland (ac)	Total Wetland (ac)	Buffer (ac)	Comment
Restoration	1630	N/A	N/A	N/A	5	
Enhancement	700	N/A	N/A	N/A		
Totals	2330				5	

R = Restoration
P1 = Priority 1
P1 = Priority 2
E = Enhancement

Table 2. Project Activity and Reporting History UT to Little Coharie Stream Restoration Project (EEP #314)		
Activity or Report	**Data Collection Complete**	**Actual Completion or Delivery**
Restoration Plan	May 2005	June 2005
Final Design - 90%	N/A	July 2007
Construction	N/A	9/26/07 to 4/3/08
Temporary S&E mix applied to entire project area	N/A	Feb 2008
Permanent seed mix applied to entire project area	N/A	Feb 2008
Containerized and B&B plantings	N/A	Feb 2008
Mitigation Plan	December 2009	February 2010
Year 1 Monitoring	August 2009	February 2010
Year 2 Monitoring	N/A	N/A
Year 3 Monitoring	N/A	N/A
Year 4 Monitoring	N/A	N/A
Year 5 Monitoring	N/A	N/A

Table 3. Project Contacts Table UT to Little Coharie Stream Restoration Project (EEP #314)	
Designer Primary project design POC	HSMM, Inc. 1305 Navaho Drive Raleigh, NC 27609 NA
Construction Contractor Construction contractor POC	Shamrock Environmental Corp. 6106 Corprate Park Drive Browns Summit, NC 27214 NA
Planting Contractor Planting POC	Habitat Assessment and Restoration Program, Inc. 9305-D Monroe Road Charlotte, NC 28270 NA
Seeding Contractor Planting POC Seed Mix Sources Nursery Stock Suppliers	Seal Brothers Contracting, LLC 3618 West Pine Street. Mount Airy, NC 27030 NA Contact Shamrock Environmental Corp. Contact Shamrock Environmental Corp.
Monitoring Performers 	Rummel, Klepper, and Kahl, LLP. 900 Ridgefield Drive Suite 350 Raleigh, NC 27609
Stream Monitoring POC Vegetation Monitoring POC Wetland Monitoring POC	Pete Stafford (919)878-9560 Pete Stafford (919)878-9560 NA

Table 4. Project Attribute Table UT to Little Coharie Stream Restoration Project (EEP #314)	
Project County	Sampson
Drainage Area	0.7 sq. miles
Drainage impervious cover estimate (%)	< 1 percent
Stream Order (from Soil Survey)	2nd order: Northern
	3rd order: Main
Physiographic Region	Coastal Plain
Ecoregion	Rolling Coastal Plain
Rosgen Classification of As-built	C
Dominant soil types	AyB - Aycock
	BH – Bibb and Johnston
Reference site ID	Stable section of the Northern Reach
USGS HUC for Project	03030006080030
USGS HUC for Reference	03030006080030
NCDWQ Subbasin for Project	03-06-19
NCDWQ Subbasin for Reference	03-06-19
NCDWQ Classification for Project	C SW
NCDWQ Classification for Reference	C SW
Any portion of any project segment 303d listed?	No
Any portion of any project segment upstream of a 303d listed segment?	No
Reasons for 303d listing or stressor	No
Percent of project easement fenced	100%

APPENDIX C

Appendix C – Vegetation Assessment Data

Table 5. Vegetation Plot Mitigation Success Summary Table			
Tract	**Vegetation Plot ID**	**Vegetation Survival Threshold Met?**	**Tract Mean**
Main	VP1	N	25%
Main	VP2	N	
Main	VP3	N	
Main	VP4	Y	
Northern	VP5	N	0%
Northern	VP6	N	
Northern	VP7	N	

Appendix C – Vegetation Monitoring Plot Photos (all photos recorded on September 28, 2009)

Vegetation Plot 1

Vegetation Plot 2

All photos recorded on September 28, 2009

Vegetation Plot 3

Vegetation Plot 4

All photos recorded on September 28, 2009

Vegetation Plot 5

Vegetation Plot 6

All photos recorded on September 28, 2009

Vegetation Plot 7

All photos recorded on September 28, 2009

Appendix C - Vegetation Metadata

Table 6. Vegetation Metadata Table Ut to Little Coharie EEP No: 314	
Report Prepared By	William (Pete) Stafford
Date Prepared	1/26/2010 4:23:45 PM
Database Name	UTLittleCoharie-2009-A_Backup.mdb
Database Location	C:\Documents and Settings\pstafford\Desktop\CVS Veg Data\2009Sample\UTLC
Computer Name	STAFFORDP
Description Worksheets In This Document	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Total Stems	Each Project is listed with its total stems for each year. This includes all planted stems in stems per acre.
Plots	List of Plots surveyed
Vigor	Frequency distribution of vigor classes
Vigor by Species	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 Species	Damage values tallied by type for each species
Damage by Plot	Damage values tallied by type for each plot
Planted Stems by Plot	Count of planted living stems of each species for each plot; dead and missing stems are excluded
Project Summary	
EEP Project Number	314
Project Name	Ut to Little Coharie
Description	Stream Restoration
River Basin	Cape Fear
Length (ft)	
Stream to Edge width (ft)	
Area (sq. m)	
Required Plots (calculated)	
Sampled Plots	13

Appendix C - Stem Count Total and Planted Species by Plot and Species

CURRENT DATA (MY2 2009)																	ANNUAL MEANS					
			Plot 1		Plot 2		Plot 3		Plot 4		Plot 5		Plot 6		Plot 7		Current Mean		MY1 (2009)		AB (2008)	
Scientific Name	Common Name	Type	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T	P	T
Alnus serrulata	Tag Alder	s	*	1	*		*	1	*		*		*		*	1	*	3	*	3	*	*
Callicarpa	Beautyberry	s	*		*		*	1	*		*		*		*		*	1	*	1	*	*
Callicarpa americana	Beautyberry	s	*		*		*		*	2	*	1	*	2	*		*	5	*	5	*	*
Liriodendron tulipifera	Tulip Poplar	t	*		*		*		*	1	*		*	2	*		*	3	*	3	*	*
Myrica	Wax Myrtle	s	*	2	*		*	2	*	2	*	3	*		*	2	*	11	*	11	*	*
Quercus lyrata	Overcup Oak	t	*		*		*	2	*	3	*		*		*		*	5	*	5	*	*
Quercus michauxii	Laurel Oak	t	*		*		*		*	1	*		*		*		*	1	*	1	*	*
Quercus pagoda	Chrerrybark Oak	t	*		*		*		*	1	*		*		*		*	1	*	1	*	*
Quercus stellata	Post Oak	t	*	2	*		*		*		*		*		*	2	*	4	*	4	*	*
		Plot Area (acres)	0.025		0.025		0.025		0.025		0.025		0.025		0.025							
*No baseline data for this project		Species Count		3		0		4		6		2		2		3		9		9		
Type = Tree or Shrub		Stem Count		5		0		6		10		4		4		5		34		34		
P = Planted, T = Total		Stems/Acre		200		0		240		400		160		160		200		194		194		

APPENDIX D

Appendix D - Stream Photo Station Photos (all photos recorded on September 28, 2009)

Main Reach Station 2+20 – Looking upstream

Main Reach Station 2+20 – Looking downstream

Photos recorded on September 28, 2009

Main Reach Station 4+00 – Looking downstream across the site

Main Reach Station 4+00 – Looking downstream

Photos recorded on September 28, 2009

Main Reach Station 9+00 – Looking to Northern Reach confluence

Main Reach Station 10+50 – Stream Crossing

Photos recorded on September 28, 2009

Main Reach Station 11+50 – Looking Downstream

Northern Reach Station 0+50 – Looking across site to HWY 242

Photos recorded on September 28, 2009

Northern Reach Station 2+50 – Looking upstream

Northern Reach Station 2+50 – Looking downstream

Photos recorded on September 28, 2009

Northern Reach Station 3+00 – Looking downstream to confluence with Main Reach

Photos recorded on September 28, 2009

Table 8A. Visual Morphological Stability Assessment UT to Little Coharie Stream Restoration Project/EEP Project No. 314 Main Reach						
Feature Category	**Metric (per As-built and reference baselines)**	**(# Stable) Number Performing as Intended**	**Total Number per As-built**	**Total Number/Feet in Unstable State**	**% Perform in Stable Condition**	**Feature Perform. Mean or Total**
A. Riffles	1. Present?	26	26	0.00	100.00	
	2. Armor stable (eg no displacement?)	NA	NA	NA	NA	
	3. Facet grade appears stable?	26	26	0.00	100.00	
	4. Minimal evidence of embedding/fining?	26	26	0.00	100.00	
	5. Length appropiate?	26	26	0.00	100.00	100
B. Pools	1. Present? (e.g. not subject to severe aggrad. or migrat.?)	27	27	0.00	100.00	
	2. Sufficiently deep (Max Pool D:Mean Bkf > 1.6?)	27	27	0.00	100.00	
	3. Length appropriate?	27	27	0.00	100.00	100
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	NA	NA	NA		
	2. Downstream of meander (glide/inflection) centering?	NA	NA	NA		NA
D. Meanders	1. Outer bend in state of limited/controlled erosion?	22	22	0.00	100.00	
	2. Of those eroding, # w/concomitant point bar formation?	22	22	0.00	100.00	
	3. Apparent Rc within spec?	22	22	0.00	100.00	
	4. Sufficient floodplain access and relief?	22	22	0.00	100.00	100
E. Bed General	1. General channel bed aggradation areas (bar formation)	1630	1630	0.00	100.00	
	2. Channel bed degradation - areas of increasing down-cutting or head-cutting?	1630	1630	0.00	100.00	0
F. Bank	1. Actively eroding, wasting, or slumping bank?	1630	1630	0.00	100.00	0
G. Vanes	1. Free of back or arm scour?	14	14	0.00	100.00	
	2. Height appropriate?	14	14	0.00	100.00	
	3. Angle and geometry appear appropriate?	14	14	0.00	100.00	
	4. Free of piping or other structural failures?	14	14	0.00	100.00	100
H. Wads/Boulders	1. Free of scour?	NA	NA	NA	NA	
	2. Footing stable?	NA	NA	NA	NA	NA

Table 8B. Visual Morphological Stability Assessment UT to Little Coharie Stream Restoration Project/EEP Project No. 314 Northern Reach						
Feature Category	**Metric (per As-built and reference baselines)**	**(# Stable) Number Performing as Intended**	**Total Number per As-built**	**Total Number/Feet in Unstable State**	**% Perform in Stable Condition**	**Feature Perform. Mean or Total**
A. Riffles	1. Present?	7	10	0.00	70.00	
	2. Armor stable (eg no displacement?)	NA	NA	0.00	NA	
	3. Facet grade appears stable?	7	10	0.00	70.00	
	4. Minimal evidence of embedding/fining?	7	10	0.00	70.00	
	5. Length appropiate?	7	10	0.00	70.00	70.00
B. Pools	1. Present? (e.g. not subject to severe aggrad. or migrat.?)	7	10	0.00	70.00	
	2. Sufficiently deep (Max Pool D:Mean Bkf > 1.6?)	7	10	0.00	70.00	
	3. Length appropriate?	7	10	0.00	70.00	70.00
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	NA	NA	NA		
	2. Downstream of meander (glide/inflection) centering?	NA	NA	NA		NA
D. Meanders	1. Outer bend in state of limited/controlled erosion?	9	9	0.00	100.00	
	2. Of those eroding, # w/concomitant point bar formation?	9	9	0.00	100.00	
	3. Apparent Rc within spec?	9	9	0.00	100.00	
	4. Sufficient floodplain access and relief?	9	9	0.00	100.00	100
E. Bed General	1. General channel bed aggradation areas (bar formation)	600	700	100	85.71	
	2. Channel bed degradation - areas of increasing down-cutting or head-cutting?	700	700	0.00	100.00	85.71
F. Bank	1. Actively eroding, wasting, or slumping bank?	700	700	0.00	100.00	0
G. Vanes	1. Free of back or arm scour?	7	7	0.00	100.00	
	2. Height appropriate?	7	7	0.00	100.00	
	3. Angle and geometry appear appropriate?	7	7	0.00	100.00	
	4. Free of piping or other structural failures?	7	7	0.00	100.00	100
H. Wads/Boulders	1. Free of scour?	NA	NA	NA	NA	
	2. Footing stable?	NA	NA	NA	NA	NA

Appendix D – Verification of Bankfull Events

Table 9. Verification of Bankfull Events Ut to Little Coharie - EEP Project No. 314			
Date of Data Collection	**Date of Occurrence**	**Method**	**Photo**
October 29, 2009	October 2009*	Visual Observation	NA

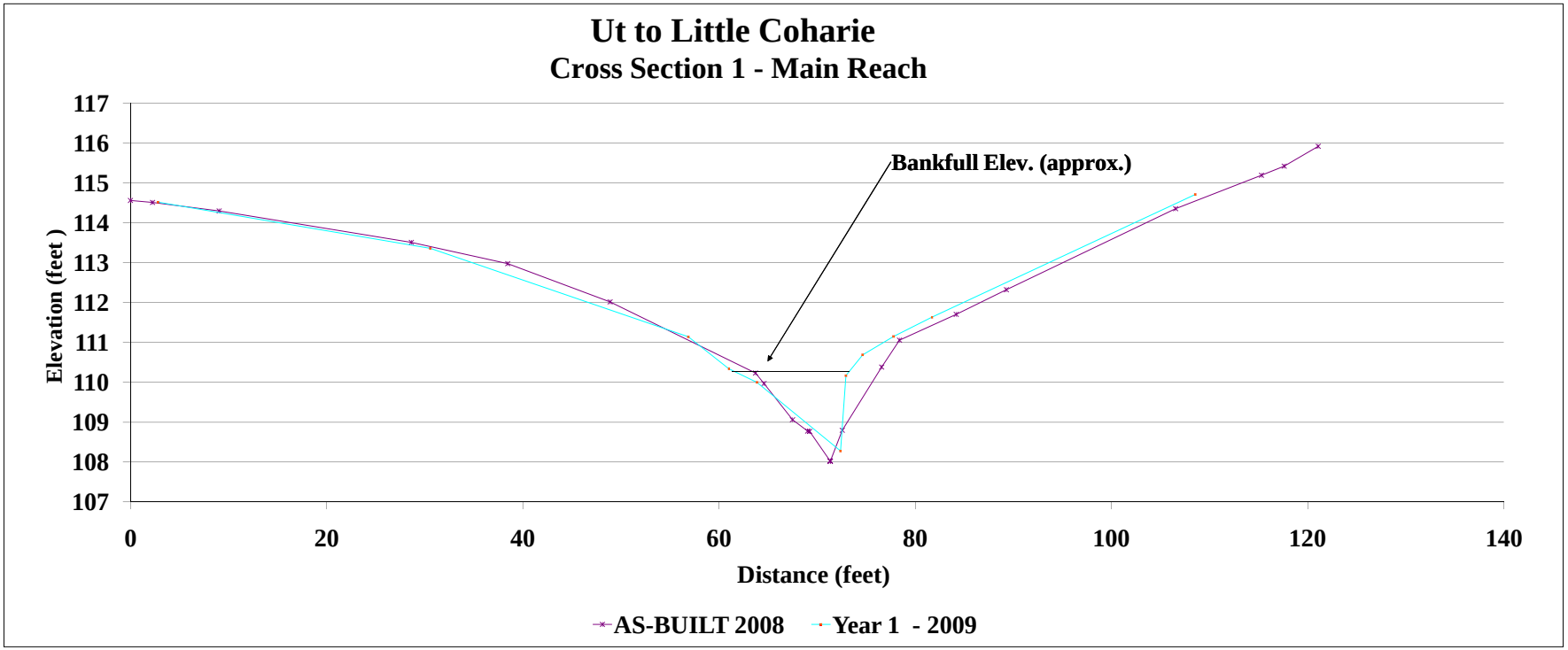
*Photographic evidence of banfull events were not available due to camera failure. The evidence observed consisted of racklines outside of the bankfull elevation and debris in the trees and shrubs throughout the project.

Project Name	Ut to Little Coharie
Cross Section	Cross-Section 1 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												2.8	114.52		0.0	114.6	
												30.56	113.36		2.2	114.5	LPIN
												56.86	111.14		9.0	114.30	
												61.01	110.34		28.6	113.5	
												63.86	110		38.5	113.0	
												72.39	108.28		48.9	112.0	
												72.94	110.17		63.7	110.2	
												74.64	110.69		64.6	110.0	
												77.79	111.15		67.5	109.1	LBKF
												81.7	111.63		69.0	108.8	
												108.53	114.71		69.3	108.8	
															71.3	108.0	
															71.4	108.0	
															71.4	108.0	
															72.5	108.8	
															76.6	110.38	
															78.4	111.1	
															84.2	111.7	
															89.3	112.3	RBKF
															106.5	114.4	
															115.3	115.2	
															117.6	115.4	
															121.1	115.9	

Photo of Cross-Section 1 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					10.2	13..5
Width					11.3	12.7
Mean Depth					0.9	1.1
Max Depth					2.0	2.2
W/D					12.5	11.9

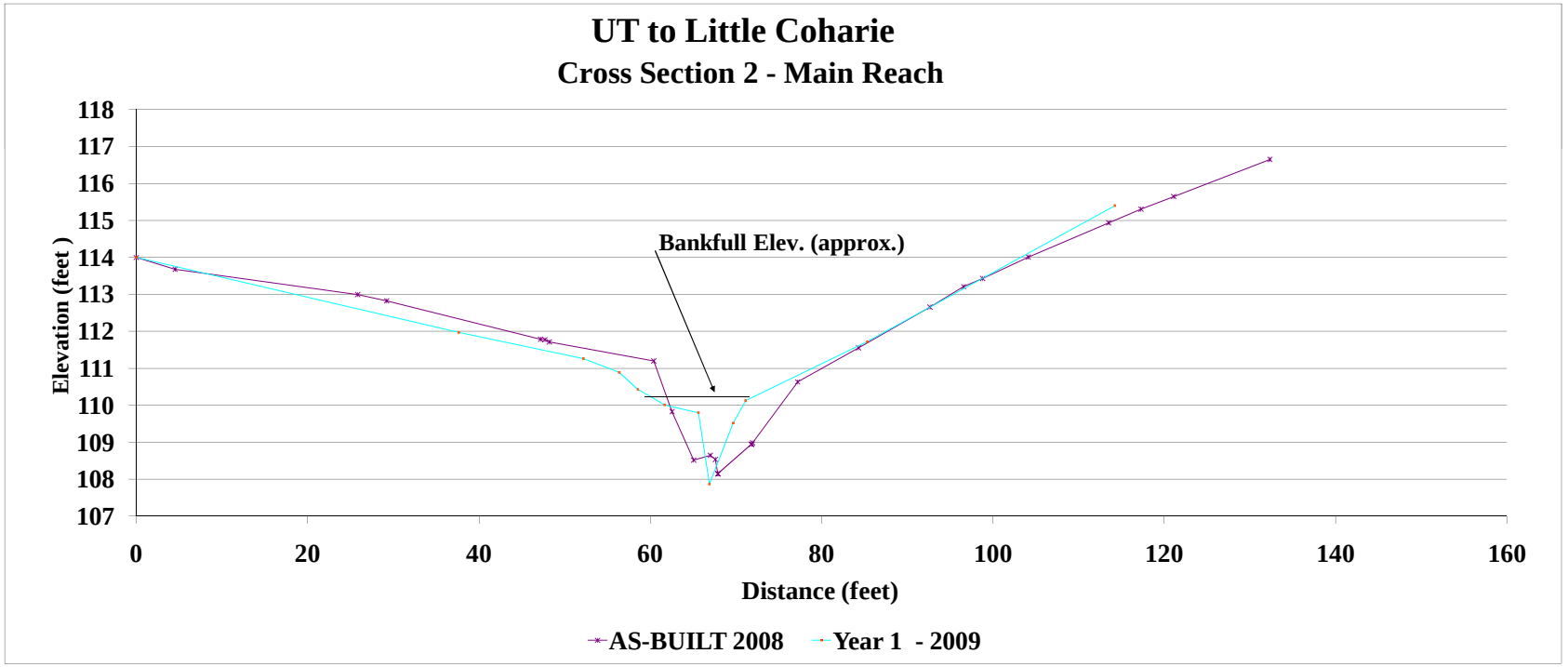


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 2 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												0	114		0.0	114.00	
												37.64	111.97		4.5	113.68	
												52.18	111.26		25.9	113.00	
												56.38	110.89		29.2	112.82	
												58.55	110.43		47.2	111.78	
												61.7	110.01		47.7	111.78	
												65.62	109.8		48.2	111.71	
												66.9	107.87		60.4	111.20	
												69.68	109.52		62.5	109.83	
												71.13	110.13		65.1	108.52	
												85.33	111.72		67.0	108.64	
												114.24	115.4		67.6	108.53	
															67.9	108.15	
															67.9	108.15	
															71.8	108.94	
															71.8	108.95	
															71.9	108.98	
															77.2	110.63	
															84.3	111.55	
															92.6	112.66	
															96.6	113.21	
															98.8	113.43	
															104.1	114.01	
															113.5	114.93	
															117.3	115.30	
															121.1	115.65	
															132.3	116.65	

Photo of Cross-Section 2 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					14.4	43.6
Width					15.9	24.9
Mean Depth					0.9	1.8
Max Depth					3.1	3.3
W/D					17.4	14.2

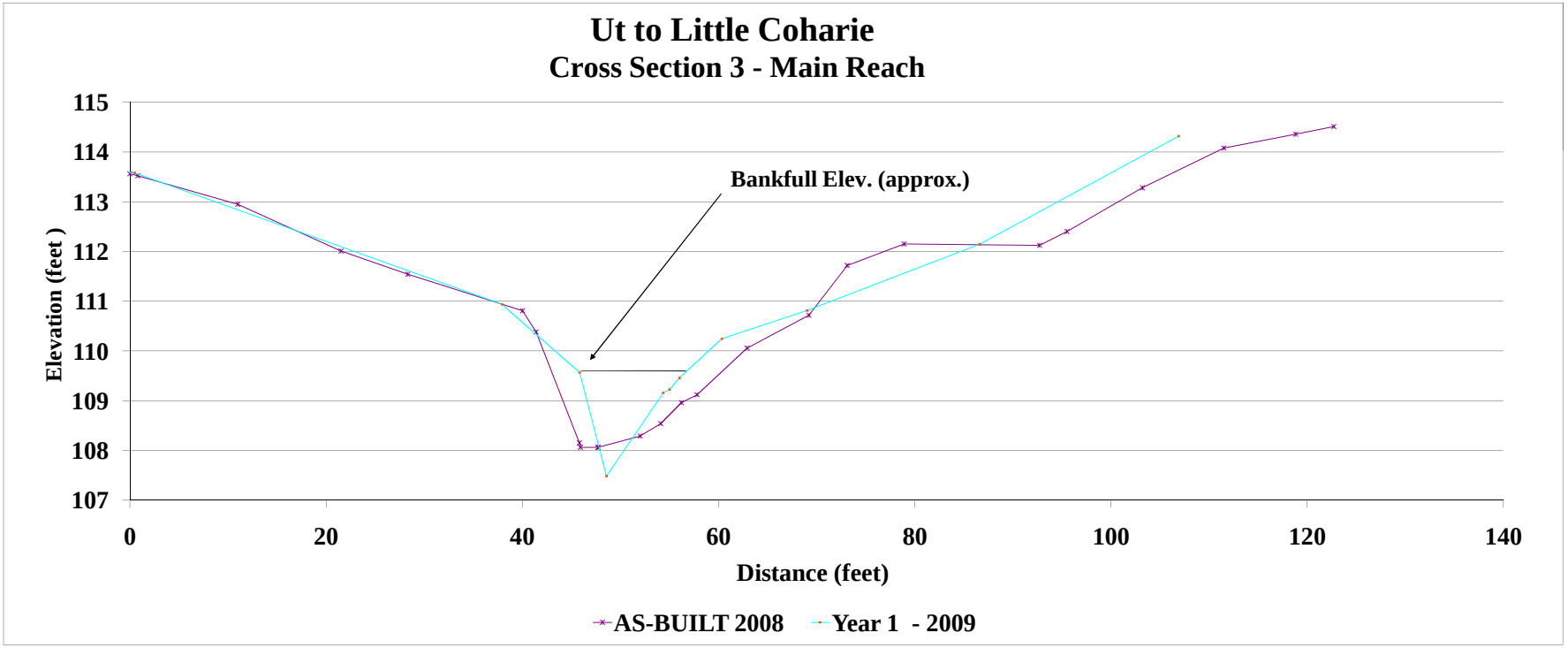


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 3 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
												-8	113.71		0.0	113.6	
												0.48	113.58		0.8	113.5	
												37.9	110.94		11.0	112.95	
												45.84	109.57		21.5	112.0	
												48.56	107.48		28.3	111.5	
												54.35	109.16		40.0	110.8	
												54.98	109.22		41.4	110.4	
												55.99	109.46		45.8	108.2	
												60.32	110.24		45.9	108.1	
												69.02	110.81		47.7	108.1	
												86.59	112.15		47.7	108.1	
												106.87	114.32		52.0	108.3	
															54.1	108.5	
															56.2	109.0	
															57.8	109.1	
															62.9	110.06	
															69.2	110.7	
															73.1	111.7	
															78.9	112.2	
															92.7	112.1	
															95.5	112.4	
															103.2	113.3	
															111.5	114.1	
															118.8	114.4	
															122.7	114.5	

Photo of Cross-Section 3 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					10.6	21.5
Width					10.6	14.5
Mean Depth					1.0	1.5
Max Depth					2.1	2.3
W/D					10.6	9.7

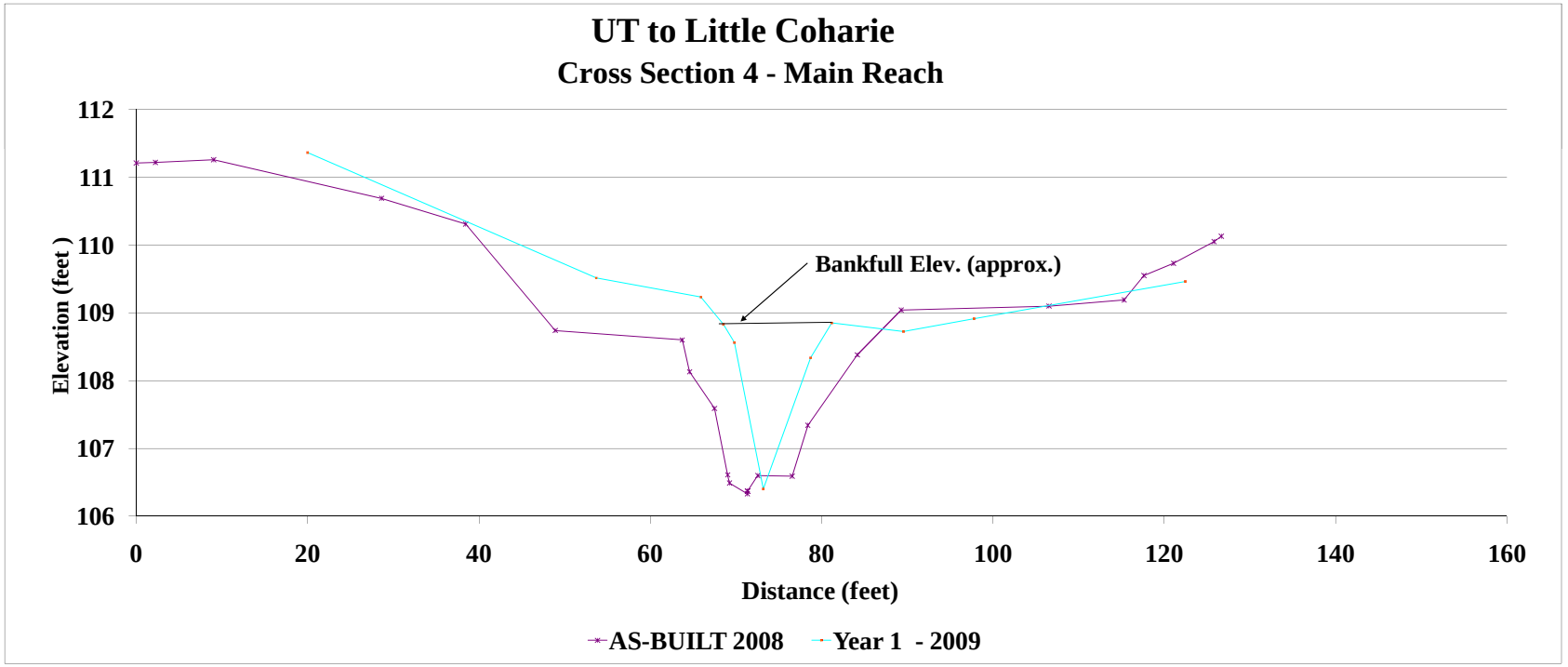


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 4 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												20.00	111.36		0.0	111.21	
												53.69	109.51		2.2	111.22	
												65.91	109.23		9.0	111.26	
												68.53	108.83		28.6	110.69	
												69.83	108.56		38.5	110.31	
												73.19	106.40		48.9	108.74	
												78.72	108.34		63.7	108.60	
												81.19	108.85		64.6	108.13	
												89.56	108.72		67.5	107.59	
												97.78	108.91		69.0	106.61	
												122.45	109.46		69.3	106.49	
															71.3	106.33	
															71.4	106.37	
															71.4	106.37	
															72.5	106.60	
															76.6	106.59	
															78.4	107.34	
															84.2	108.38	
															89.3	109.04	
															106.5	109.10	
															115.3	109.19	
															117.6	109.55	
															121.1	109.73	
															125.8	110.05	
															126.7	110.13	

Photo of Cross-Section 4 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					14.5	29.0
Width					26.6	27.8
Mean Depth					0.5	1.0
Max Depth					2.4	2.3
W/D					49.7	26.7

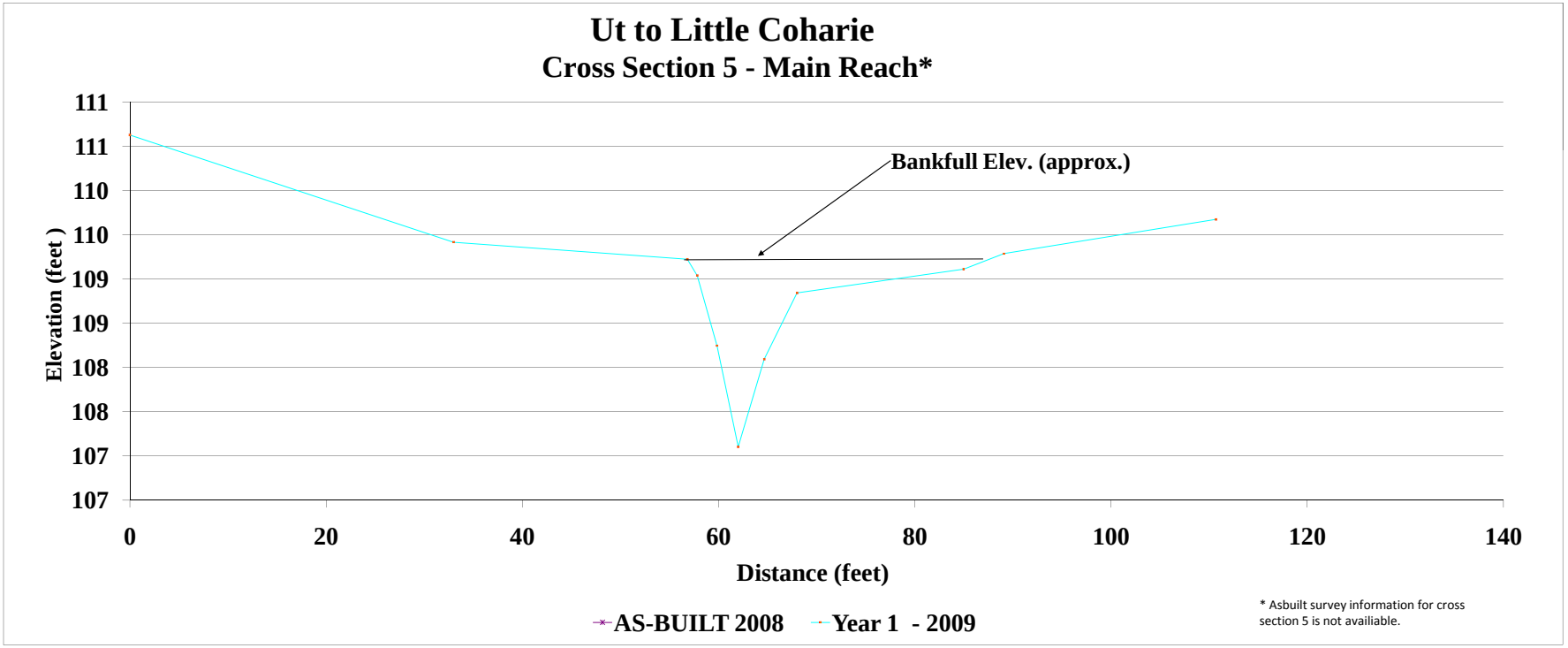


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 5 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
												0.00	110.63				
												32.97	109.42				
												56.80	109.23				
												57.80	109.04				
												59.83	108.25				
												61.99	107.10				
												64.65	108.09				
												67.99	108.84				
												84.97	109.11				
												89.07	109.29				
												110.69	109.68				

Photo of Cross-Section 5 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					15.1	
Width					30.1	
Mean Depth					0.5	
Max Depth					2.1	
W/D					60.1	

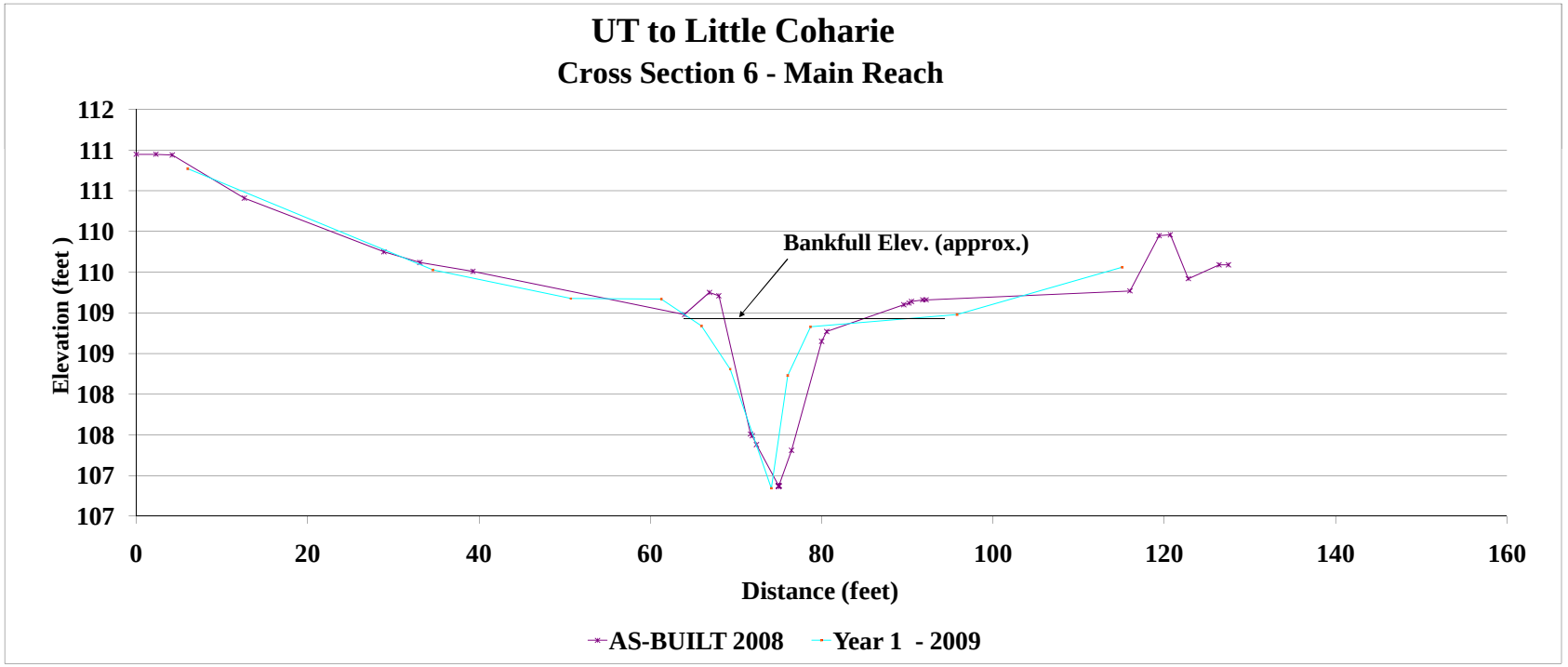


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 6 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												6.00	110.77		0.0	111.0	
												34.64	109.53		2.3	111.0	
												50.74	109.18		4.2	110.9	
												61.29	109.17		12.6	110.4	
												65.96	108.84		28.9	109.8	
												69.32	108.31		33.1	109.6	
												74.14	106.84		39.3	109.5	
												76.05	108.23		64.0	109.0	
												78.70	108.83		66.9	109.3	
												95.81	108.98		68.0	109.2	
												115.09	109.56		71.7	107.5	
															71.9	107.5	
															72.4	107.4	
															75.0	106.9	
															75.0	106.9	
															75.0	106.9	
															75.0	106.9	
															75.0	106.9	
															75.0	106.9	
															76.5	107.3	
															80.0	108.7	
															80.6	108.8	
															89.6	109.1	
															90.2	109.1	
															90.5	109.1	
															91.8	109.2	
															92.2	109.2	
															116.0	109.3	
															119.4	110.0	
															120.7	110.0	
															122.8	109.4	
															126.4	109.6	
															127.5	109.6	

Photo of Cross-Section 6 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					10.1	15.7
Width					12.6	19.7
Mean Depth					0.8	0.8
Max Depth					2.0	2.1
W/D					15.7	24.7

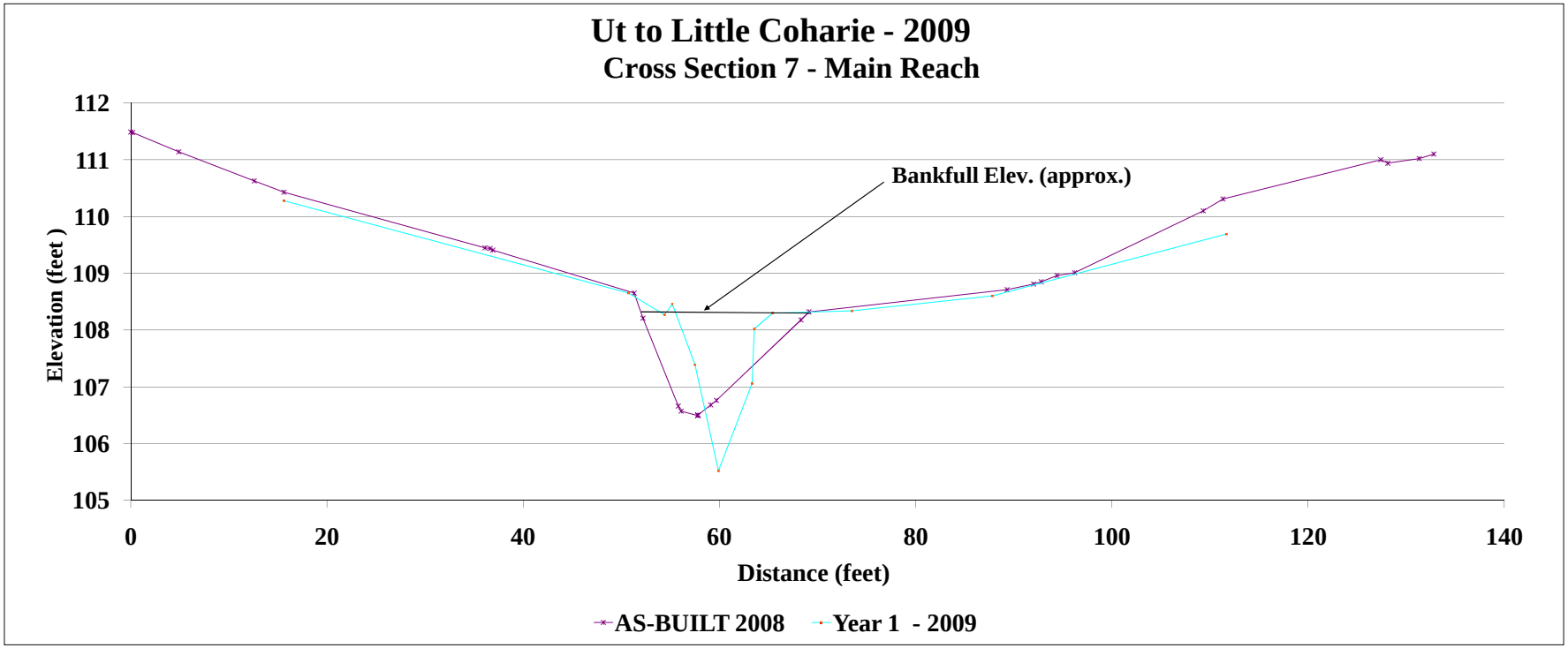


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 7 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												15.6	110.28		0.0	111.5	
												50.72	108.65		0.2	111.5	
												54.39	108.27		4.9	111.14	
												55.18	108.46		12.6	110.6	
												57.5	107.39		15.6	110.4	
												59.9	105.52		36.1	109.5	
												63.32	107.06		36.6	109.4	
												63.56	108.02		36.9	109.4	
												65.41	108.3		51.3	108.7	
												73.5	108.34		52.2	108.2	
												87.8	108.6		55.8	106.7	
												111.67	109.69		56.1	106.6	
															57.8	106.5	
															57.8	106.5	
															57.8	106.5	
															59.1	106.68	
															59.7	106.8	
															68.3	108.2	
															69.1	108.3	
															89.3	108.7	
															92.0	108.8	
															92.8	108.9	
															94.4	109.0	
															96.2	109.0	
															109.3	110.1	
															111.3	110.3	
															127.4	111.0	
															128.1	110.9	
															131.3	111.0	
															132.8	111.1	

Photo of Cross-Section 7 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					12.6	16.6
Width					10.3	17.1
Mean Depth					1.2	1.0
Max Depth					2.8	1.8
W/D					8.4	17.6

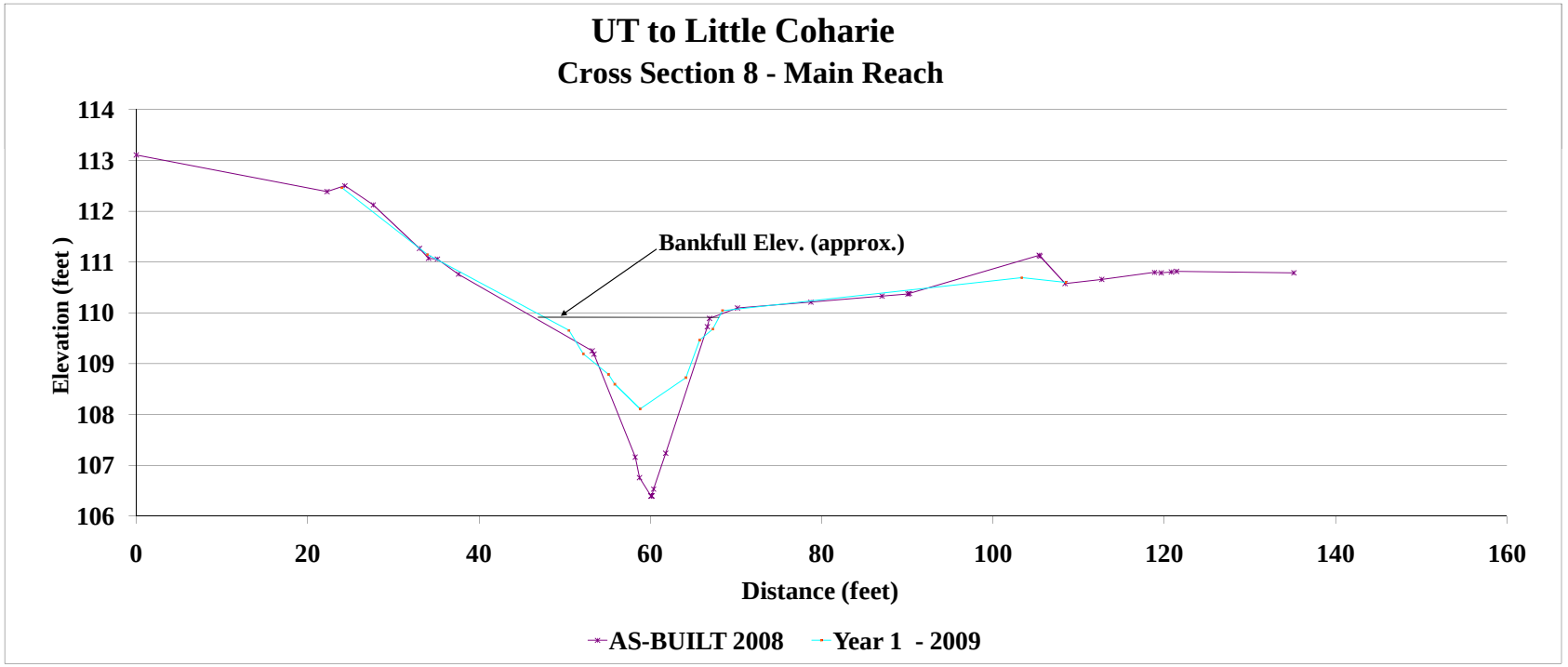


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 8 - Main Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												24.00	112.46		0.0	113.11	
												33.99	111.15		22.3	112.38	
												50.51	109.65		24.3	112.50	
												52.19	109.19		27.7	112.12	
												55.13	108.79		33.1	111.27	
												55.85	108.60		34.1	111.07	
												58.82	108.11		35.1	111.06	
												64.17	108.72		37.6	110.76	
												65.75	109.46		53.2	109.25	
												67.30	109.68		53.4	109.19	
												68.44	110.05		58.2	107.16	
												103.37	110.69		58.7	106.76	
												108.50	110.60		60.1	106.39	
															60.1	106.40	
															60.1	106.40	
															60.2	106.40	
															60.4	106.53	
															61.8	107.24	
															66.7	109.73	
															66.9	109.89	
															70.2	110.10	
															78.8	110.21	
															87.0	110.33	
															90.1	110.37	
															90.3	110.38	
															105.4	111.13	
															105.5	111.11	
															108.4	110.58	
															112.7	110.66	
															118.9	110.80	
															119.6	110.79	
															120.8	110.80	
															121.4	110.81	
															135.1	110.79	

Photo of Cross-Section 8 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					21.2	31.1
Width					21.6	23.2
Mean Depth					1.0	1.3
Max Depth					1.9	3.6
W/D					22.1	17.3

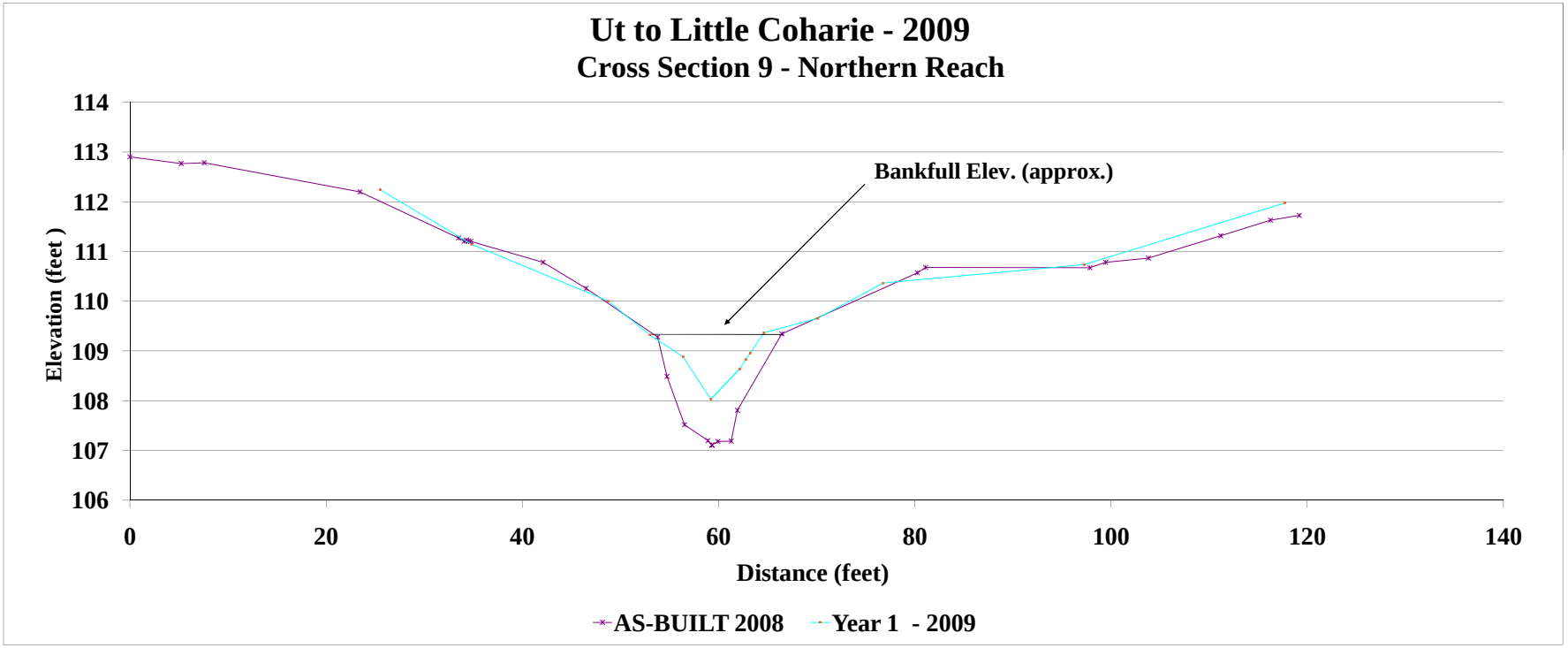


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 9 - Northern Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												25.50	112.24		0.0	112.90	
												34.82	111.15		5.2	112.77	
												48.75	110.00		7.6	112.78	
												53.00	109.32		23.4	112.20	
												56.38	108.88		33.5	111.27	
												59.21	108.03		34.1	111.21	
												62.15	108.64		34.3	111.23	
												62.78	108.83		34.5	111.21	
												63.20	108.96		34.8	111.20	
												64.62	109.37		42.1	110.78	
												70.09	109.65		46.5	110.26	
												76.76	110.36		53.8	109.28	
												97.27	110.74		54.7	108.49	
												117.71	111.98		56.5	107.52	
															58.9	107.20	
															59.3	107.11	
															59.3	107.11	
															59.9	107.18	
															61.3	107.19	
															61.9	107.81	
															66.4	109.34	
															80.3	110.57	
															81.1	110.68	
															97.8	110.67	
															99.4	110.78	
															103.8	110.86	
															111.2	111.32	
															116.2	111.63	
															119.2	111.72	

Photo of Cross-Section 9 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					7.8	18.2
Width					12.8	14.2
Mean Depth					0.6	1.3
Max Depth					1.4	2.3
W/D					20.8	11.1

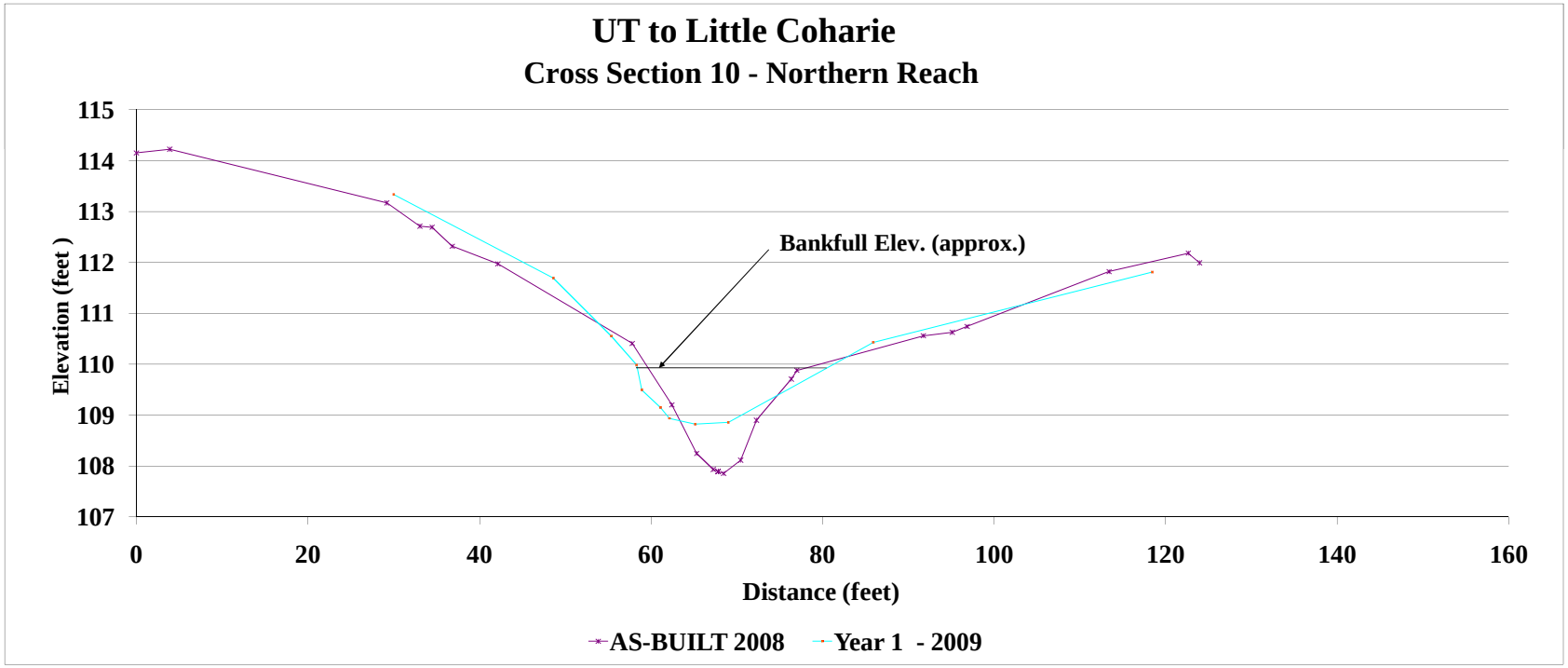


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 10- Northern Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												30.00	113.33		0.0	114.15	
												48.61	111.69		3.9	114.22	
												55.37	110.55		29.2	113.17	
												58.31	109.98		33.1	112.71	
												58.93	109.50		34.5	112.69	
												61.10	109.15		36.8	112.32	
												62.14	108.94		42.1	111.97	
												65.15	108.82		57.8	110.41	
												69.01	108.86		62.4	109.20	
												85.91	110.43		65.3	108.25	
												118.44	111.81		67.3	107.93	
															67.8	107.89	
															67.8	107.89	
															68.5	107.85	
															70.5	108.11	
															72.3	108.90	
															76.4	109.71	
															77.0	109.88	
															91.8	110.56	
															95.1	110.63	
															96.9	110.74	
															113.4	111.82	
															122.6	112.18	
															124.0	111.99	

Photo of Cross-Section 10 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					16.3	19.2
Width					22.4	17.7
Mean Depth					0.7	1.1
Max Depth					1.1	2.1
W/D					30.7	16.3

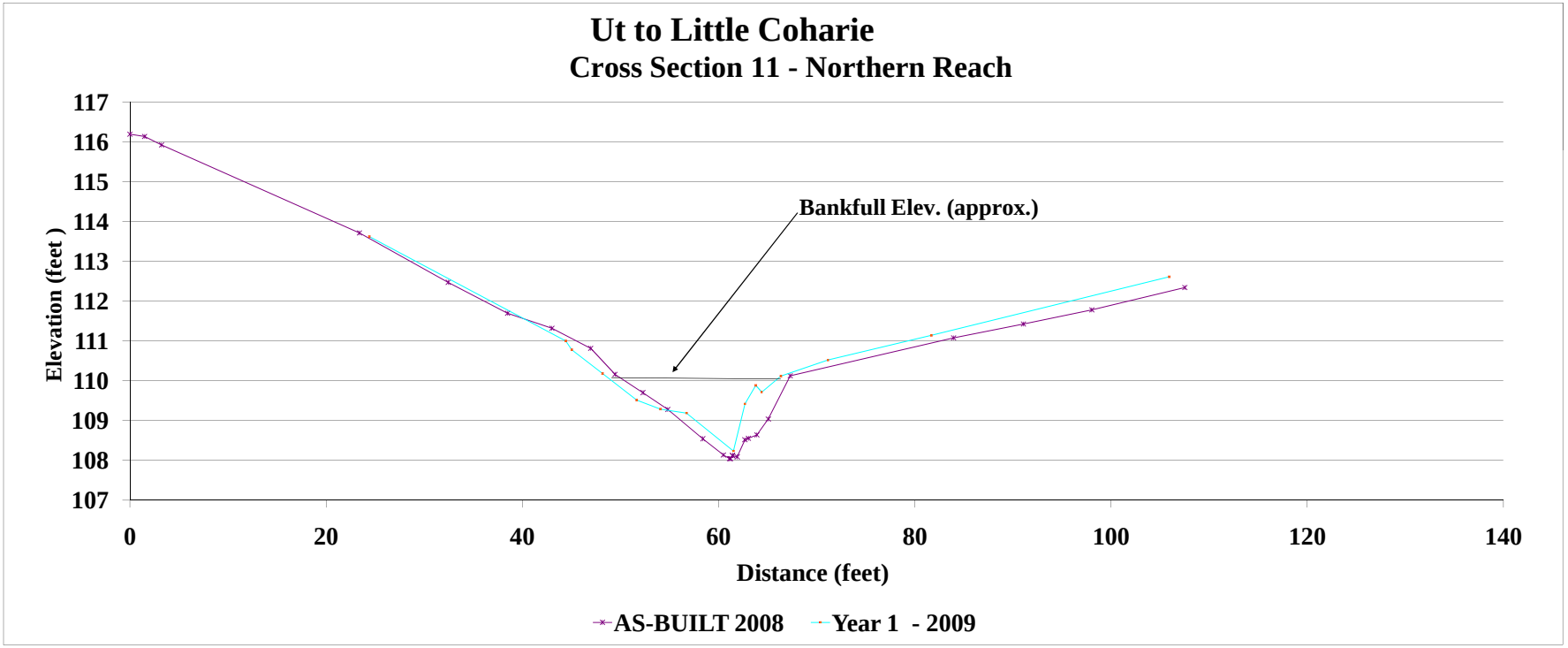


Project Name	Ut to Little Coharie
Cross Section	Cross-Section 11 - Northern Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**	**Station**	**Elevation**	**Notes**
												24.40	113.62		0.0	116.20	
												44.41	111.00		1.5	116.14	
												45.03	110.78		3.2	115.93	
												48.17	110.18		23.4	113.72	
												51.66	109.51		32.4	112.48	
												54.06	109.29		38.5	111.70	
												56.72	109.19		43.0	111.32	
												61.51	108.24		46.9	110.82	
												62.67	109.42		49.4	110.16	
												63.79	109.88		52.3	109.70	
												64.37	109.72		54.8	109.28	
												66.35	110.12		58.4	108.54	
												71.14	110.52		60.5	108.13	
												81.66	111.14		61.1	108.04	
												105.93	112.61		61.2	108.05	
															61.4	108.12	
															61.4	108.12	
															61.9	108.09	
															62.7	108.52	
															63.0	108.56	
															63.9	108.64	
															65.1	109.04	
															67.3	110.13	
															83.9	111.08	
															91.1	111.43	
															98.0	111.78	
															107.5	112.34	

Photo of Cross-Section 11 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					10.5	17.0
Width					15.0	16.6
Mean Depth					0.7	1.0
Max Depth					1.7	2.0
W/D					21.2	16.2

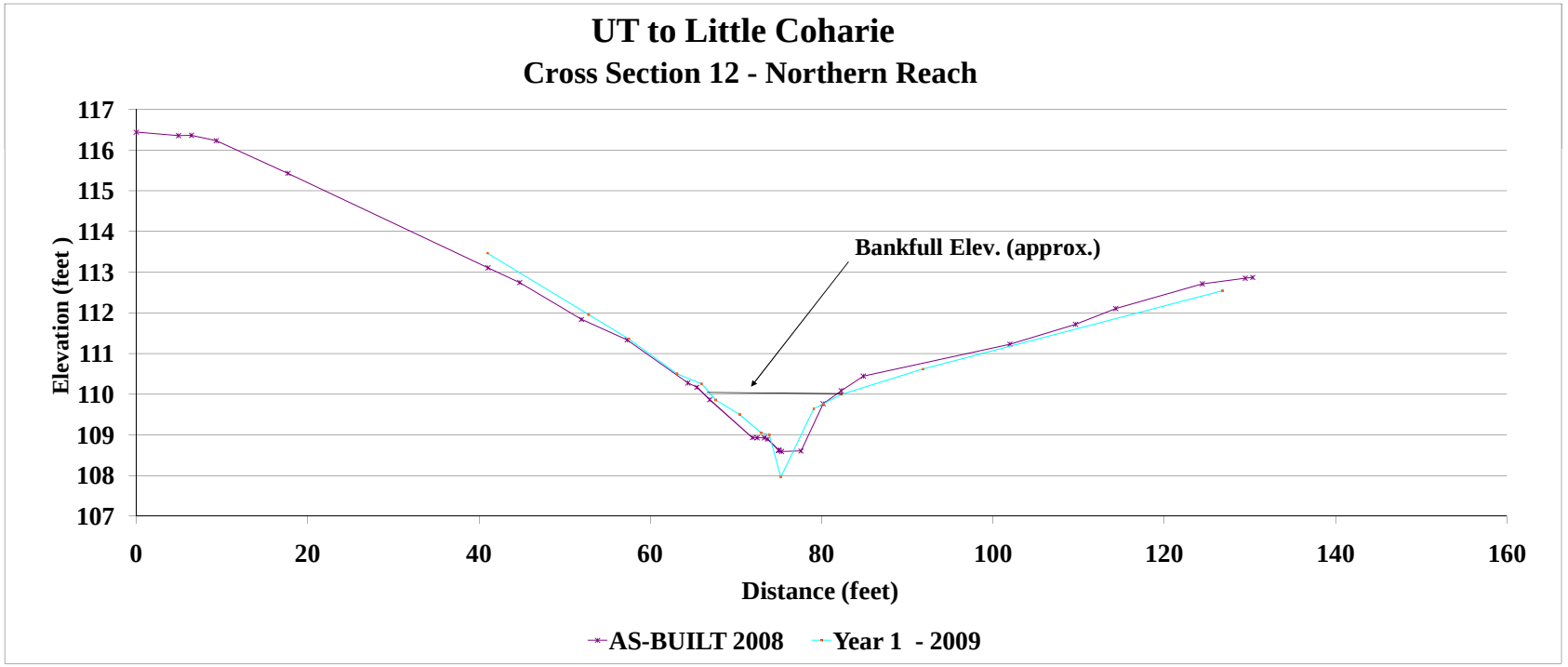


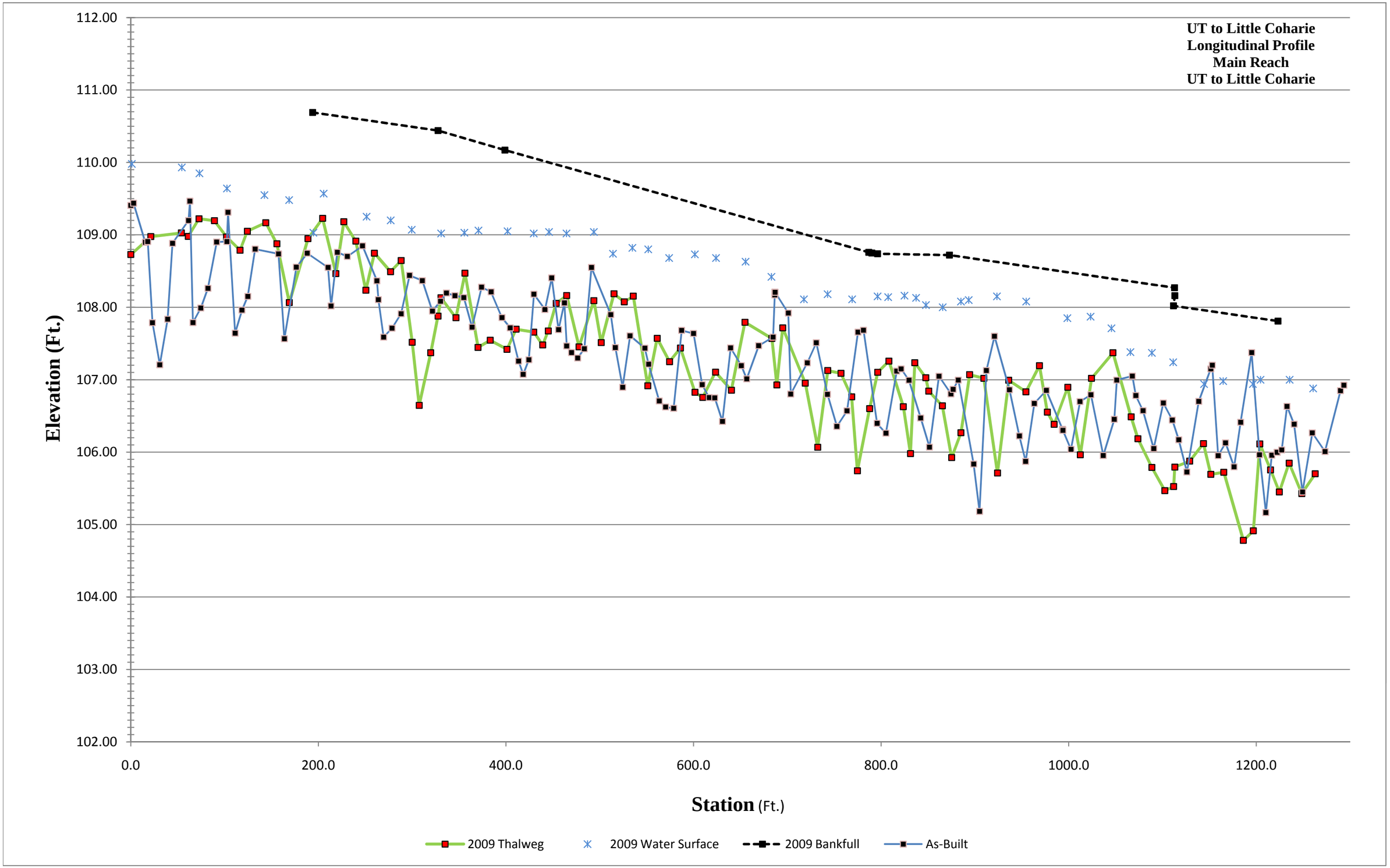
Project Name	Ut to Little Coharie
Cross Section	Cross-Section 12- Northern Reach
Feature	Pool
Date	Aug-09
Crew	Tutt, Stafford

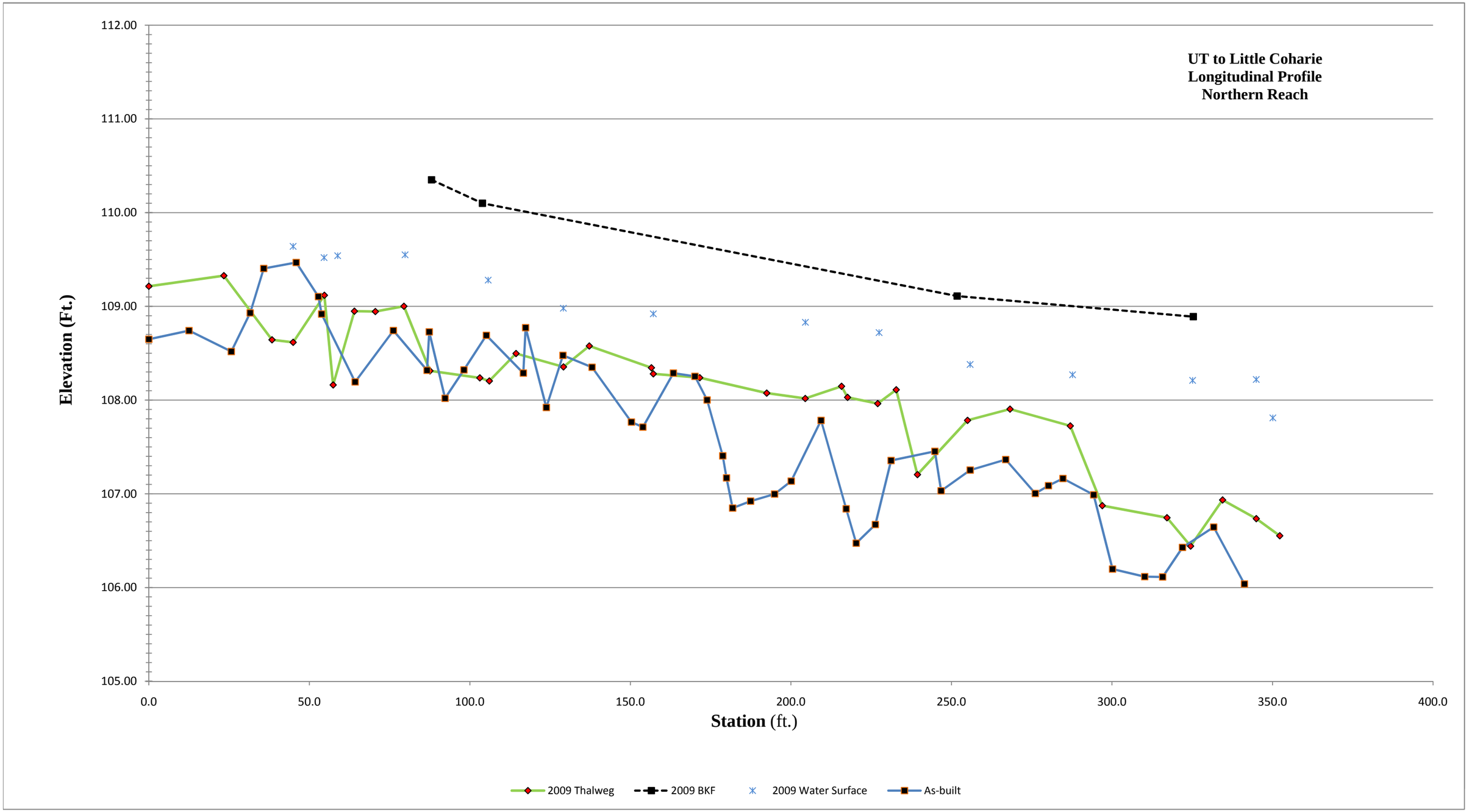
Year 5 2013 Survey - 2013			Year 4 - 2012 2012 Survey			Year 3 - 2011 2011 Survey			Year 2 - 2010 2010 Survey			Year 1 - 2009 2009 Survey			AS-BUILT 2008 AS-BUILT Survey		
Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes	Station	Elevation	Notes
												41.00	113.47		0.0	116.44	
												52.81	111.96		4.9	116.36	
												57.48	111.36		6.4	116.36	
												63.11	110.50		9.4	116.23	
												65.99	110.25		17.7	115.43	
												67.64	109.86		41.0	113.11	
												70.46	109.50		44.8	112.75	
												72.94	109.05		52.0	111.84	
												73.88	109.00		57.3	111.33	
												75.23	107.96		64.4	110.28	
												79.08	109.64		65.4	110.17	
												80.19	109.76		66.9	109.86	
												82.34	110.00		71.9	108.93	
												91.83	110.62		72.5	108.93	
												126.80	112.55		73.3	108.93	
															73.7	108.90	
															75.0	108.62	
															75.0	108.62	
															75.3	108.59	
															77.6	108.60	
															80.2	109.77	
															82.3	110.08	
															84.9	110.44	
															102.0	111.23	
															109.6	111.72	
															114.3	112.11	
															124.4	112.71	
															129.5	112.85	
															130.3	112.87	

Photo of Cross-Section 12 - Looking Downstream

	Year 5	Year 4 - 2012	Year 3 - 2011	Year 2 - 2010	Year 1 - 2009	AS-BUILT 2008
Area					9.0	10.1
Width					12.9	12.9
Mean Depth					0.7	0.8
Max Depth					2.0	1.6
W/D					18.3	16.6



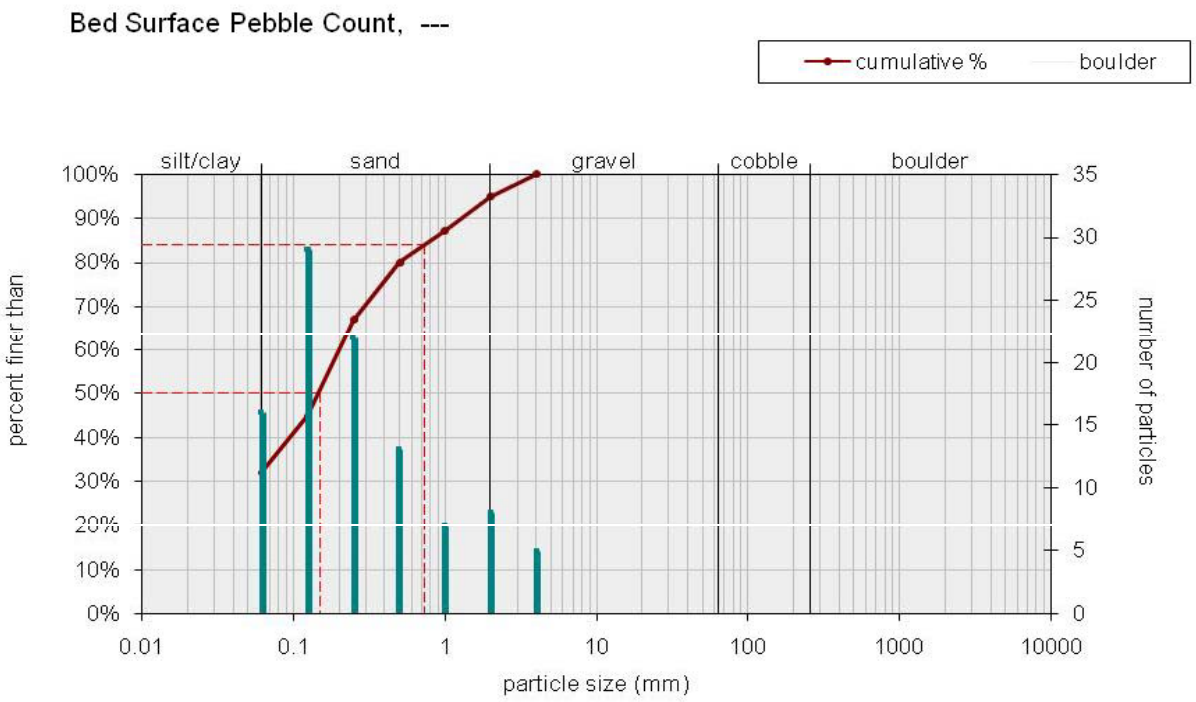

UT to Little Coharie
Longitudinal Profile
Main Reach
UT to Little Coharie
Elevation (Ft.)
112.00
111.00
110.00
109.00
108.00
107.00
106.00
105.00
104.00
103.00
102.00
0.0
200.0
400.0
600.0
800.0
1000.0
1200.0
Station (Ft.)
2009 Thalweg
2009 Water Surface
2009 Bankfull
As-Built


UT to Little Coharie
Longitudinal Profile
Northern Reach
Elevation (Ft.)
112.00
111.00
110.00
109.00
108.00
107.00
106.00
105.00
0.0
50.0
100.0
150.0
200.0
250.0
300.0
350.0
400.0
Station (ft.)
2009 Thalweg
2009 BKF
2009 Water Surface
As-built

Pebble Count 1 - Main Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	16
very fine sand	0.062 - 0.125	29
fine sand	0.125 - 0.25	22
medium sand	0.25 - 0.5	13
coarse sand	0.5 - 1	7
very coarse sand	1 - 2	8
very fine gravel	2 - 4	5
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 1



Size (mm)	
D16	0.062
D35	0.073
D50	0.15
D65	0.23
D84	0.74
D95	2

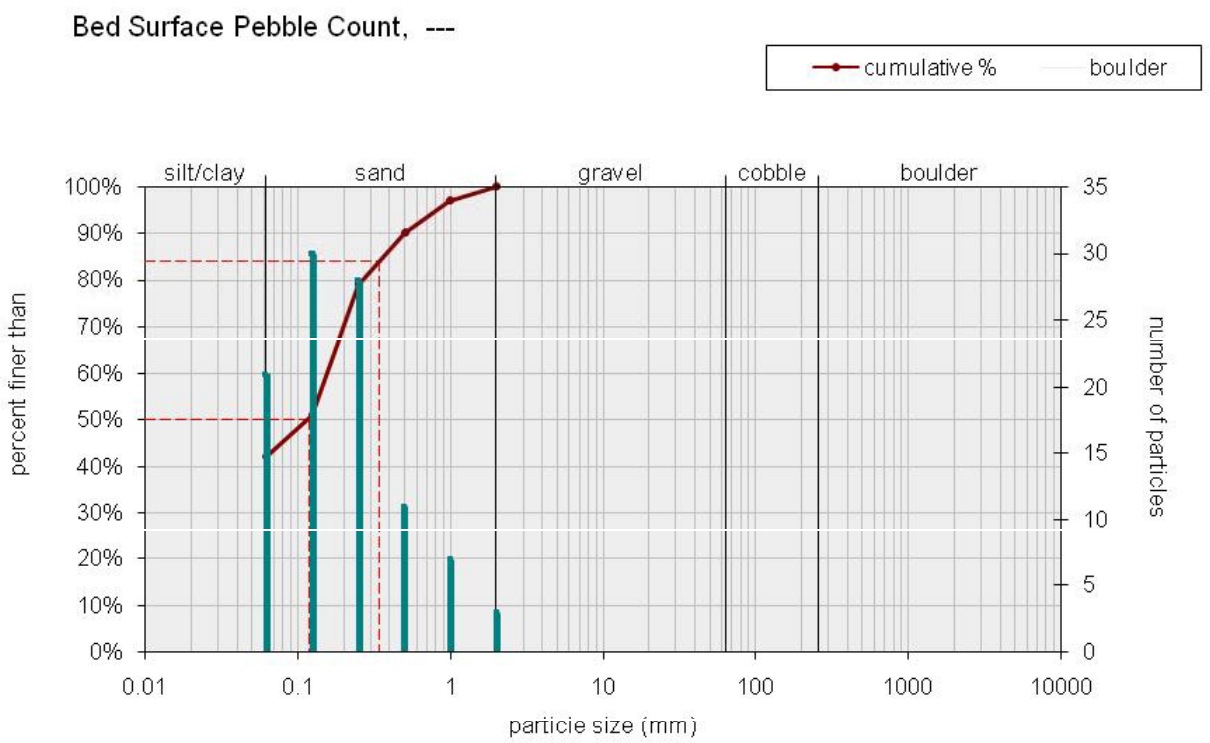
Size Distribution	
mean	0.2
dispersion	3.7
skewness	0.15

Type	
silt/clay	16%
sand	79%
gravel	5%
cobble	0%
boulder	0%

Pebble Count 2 - Main Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	21
very fine sand	0.062 - 0.125	30
fine sand	0.125 - 0.25	28
medium sand	0.25 - 0.5	11
coarse sand	0.5 - 1	7
very coarse sand	1 - 2	3
very fine gravel	2 - 4	
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 3



Size (mm)	
D16	0.062
D35	0.062
D50	0.12
D65	0.18
D84	0.34
D95	0.82

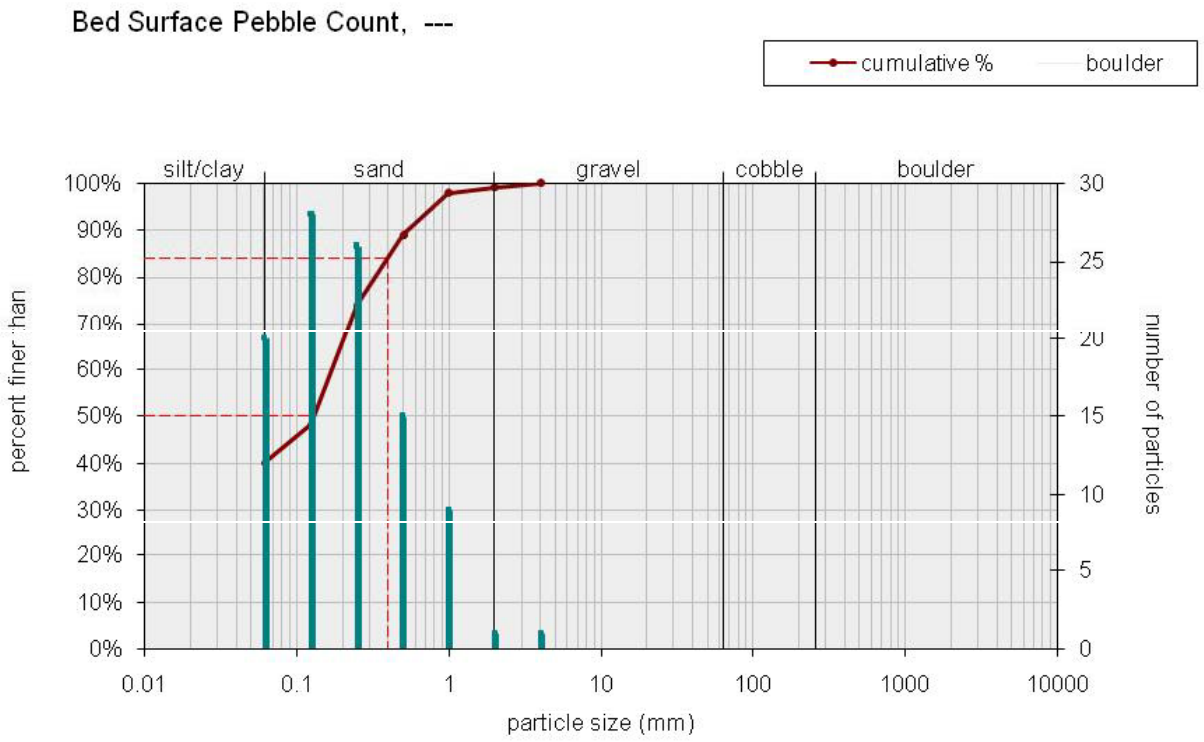
Size Distribution	
mean	0.1
dispersion	2.4
skewness	0.10

Type	
silt/clay	21%
sand	79%
gravel	0%
cobble	0%
boulder	0%

Pebble Count 3 - Main Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	29
very fine sand	0.062 - 0.125	35
fine sand	0.125 - 0.25	12
medium sand	0.25 - 0.5	17
coarse sand	0.5 - 1	3
very coarse sand	1 - 2	2
very fine gravel	2 - 4	0
fine gravel	4 - 6	1
fine gravel	6 - 8	1
medium gravel	8 - 11	0
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 6



Size (mm)	
D16	0.062
D35	0.062
D50	0.13
D65	0.2
D84	0.4
D95	0.79

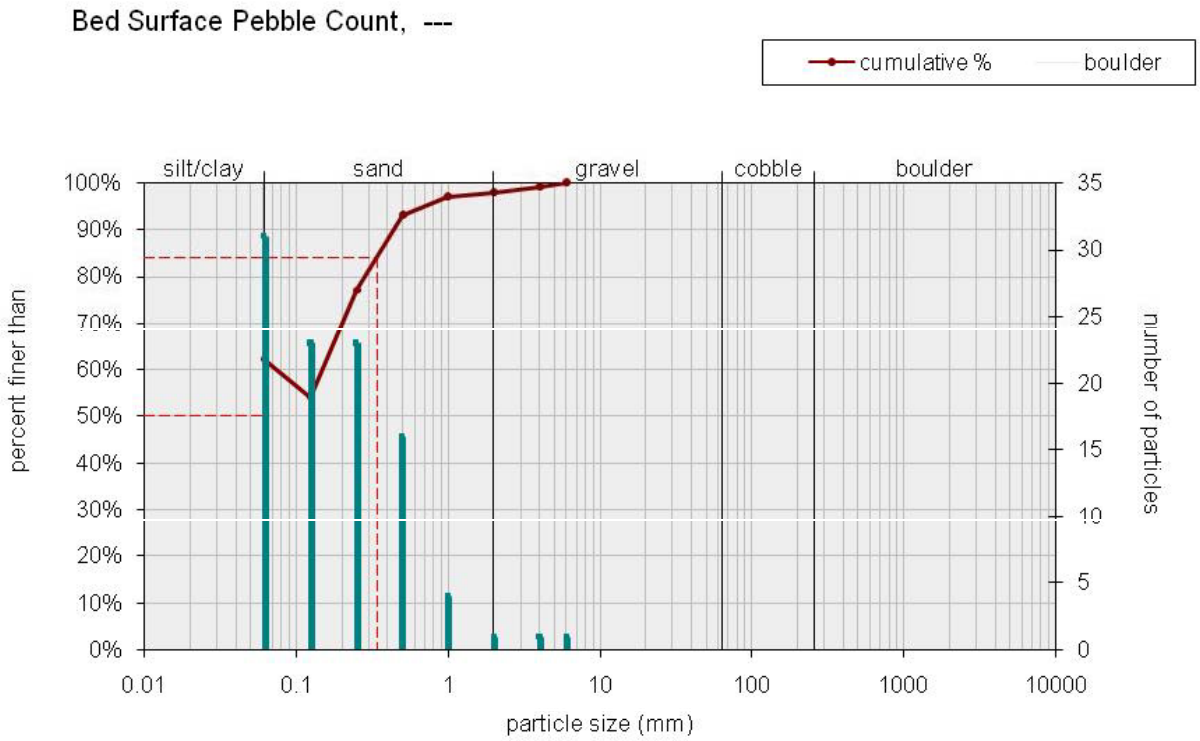
Size Distribution	
mean	0.2
dispersion	2.6
skewness	0.09

Type	
silt/clay	20%
sand	79%
gravel	1%
cobble	0%
boulder	0%

Pebble Count 4 - Main Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	31
very fine sand	0.062 - 0.125	23
fine sand	0.125 - 0.25	23
medium sand	0.25 - 0.5	16
coarse sand	0.5 - 1	4
very coarse sand	1 - 2	1
very fine gravel	2 - 4	1
fine gravel	4 - 6	1
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 7



Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.17
D84	0.34
D95	0.71

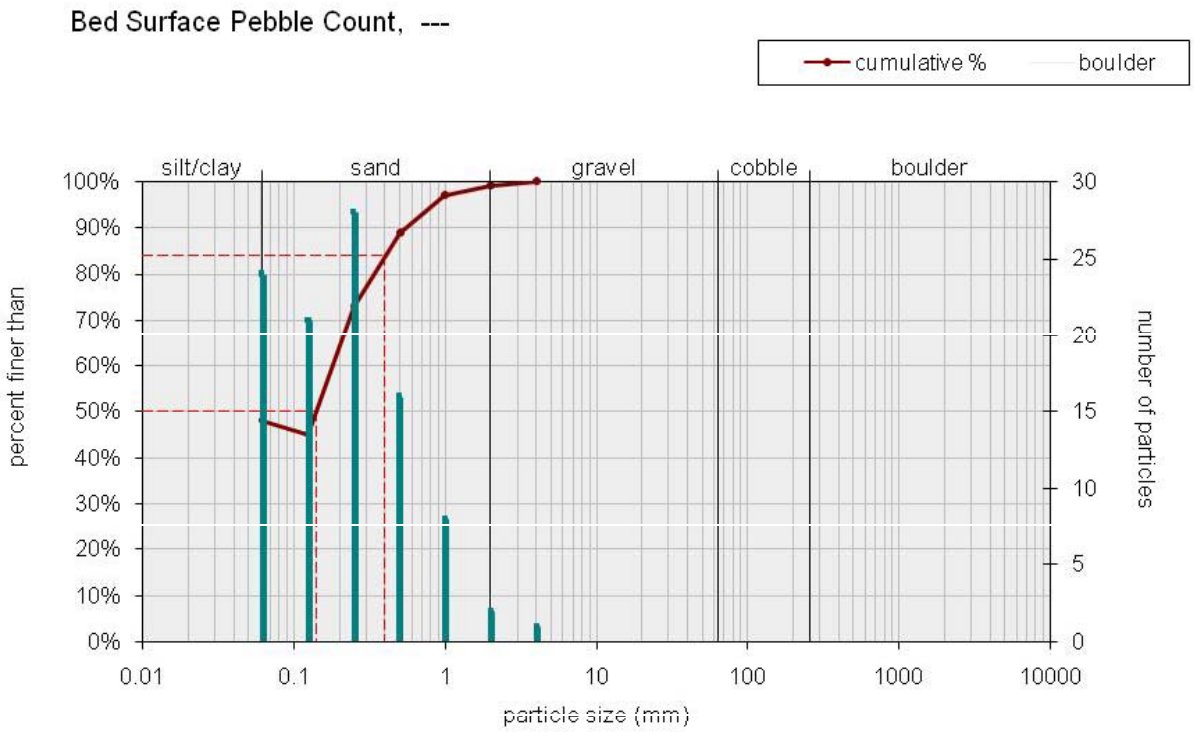
Size Distribution	
mean	0.1
dispersion	3.2
skewness	0.43

Type	
silt/clay	31%
sand	67%
gravel	2%
cobble	0%
boulder	0%

Pebble Count 6 - Northern Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	24
very fine sand	0.062 - 0.125	21
fine sand	0.125 - 0.25	28
medium sand	0.25 - 0.5	16
coarse sand	0.5 - 1	8
very coarse sand	1 - 2	2
very fine gravel	2 - 4	1
fine gravel	4 - 6	
fine gravel	6 - 8	
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 8



Size (mm)	
D16	0.062
D35	0.062
D50	0.14
D65	0.21
D84	0.4
D95	0.84

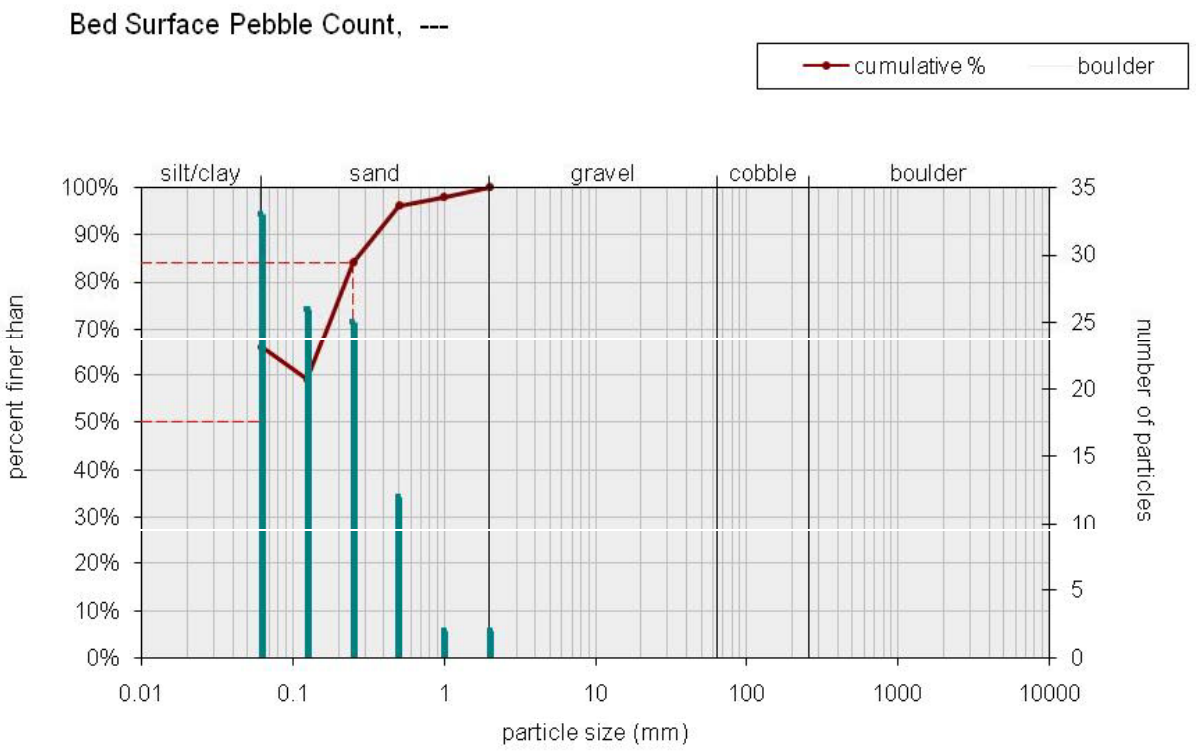
Size Distribution	
mean	0.2
dispersion	2.6
skewness	0.06

Type	
silt/clay	24%
sand	75%
gravel	1%
cobble	0%
boulder	0%

Pebble Count 5 - Northern Reach

Material	Size Range (mm)	Count
silt/clay	0 - 0.062	33
very fine sand	0.062 - 0.125	26
fine sand	0.125 - 0.25	25
medium sand	0.25 - 0.5	12
coarse sand	0.5 - 1	2
very coarse sand	1 - 2	2
very fine gravel	2 - 4	1
fine gravel	4 - 6	1
fine gravel	6 - 8	1
medium gravel	8 - 11	
medium gravel	11 - 16	
coarse gravel	16 - 22	
coarse gravel	22 - 32	
very coarse gravel	32 - 45	
very coarse gravel	45 - 64	
small cobble	64 - 90	
medium cobble	90 - 128	
large cobble	128 - 180	
very large cobble	180 - 256	
small boulder	256 - 362	
small boulder	362 - 512	
medium boulder	512 - 1024	
large boulder	1024 - 2048	
very large boulder	2048 - 4096	
	total particle count:	100
bedrock	----------	
clay hardpan	----------	
detritus/wood	----------	
artificial	----------	
	total count:	100

Note: Cross Section 12



Size (mm)	
D16	0.062
D35	0.062
D50	0.062
D65	0.062
D84	0.25
D95	0.47

Size Distribution	
mean	0.1
dispersion	2.5
skewness	0.39

Type	
silt/clay	33%
sand	67%
gravel	0%
cobble	0%
boulder	0%