East Tarboro Canal
Stream Restoration
Edgecombe County, North Carolina
Mitigation Report

SCO ID # 03-06031-01
NCEEP Project Number: 123
EEP Project Manager: Jesica Kemp

December 2007

EXECUTIVE SUMMARY

1. Pre-Construction Site Conditions

The project restored a portion of East Tarboro Canal, a tributary to the Tar River. The project is divided into two reaches that are approximately 2,000 feet apart. Reach 1 is located at the end of Battle Avenue and extends the full length of Canal Street. Reach 2 is located between Martin Luther King Jr. Drive and East Saint James Street. The project is located primarily on Town of Tarboro and the Edgecombe County Board of Education properties.

Prior to restoration East Tarboro Canal was a relatively straight stream with high banks and areas of severe bank erosion. There was a lack of streambank vegetation due to the fact that the Town of Tarboro routinely maintained the channel to provide flood control. Both reaches of the channel were classified as G5c before restoration.

2. Restoration Plan

Reach 1 was modified to improve the bedform and increase the vegetation on the streambanks. Two roads present on either side of the stream restricted pattern adjustment. However, bankfull benches and grading of the slope were performed to improve the stream's dimensional characteristics. Reach 1 is classified as Enhancement Level 1 because the profile and dimension were modified in addition to planting a narrow riparian buffer. Vegetation was used to provide stability and provide habitat along the streambanks and in the riparian area. Vegetation planted consisted of low growing shrubs and herbaceous vegetation because of the limited width of the buffer, adjacent landowner concerns, and sight constraints for traffic.

Reach 2 was modified to produce a C-type channel by reintroducing meanders and providing a floodplain at a lower level than the original floodplain. Reach 2 was classified as a Priority 2 restoration because the stream was not raised sufficiently to access its original floodplain. Rock vanes and sills were used to control grade and provide enhanced bedform features. Vegetation was used to provide stability and provide habitat along the streambanks and in the floodplain area. Vegetation planted consisted of trees, shrubs and herbaceous vegetation.

3. Post Construction Site Conditions

Stream bank enhancement was performed on 1,869 linear feet of Reach 1 of East Tarboro Canal due to the constraints of occurring in between two roads in a neighborhood. The dimension on Reach 1 was widened to allow for a C-type width-to-depth ratio. This modification should improve channel stability by decreasing the shear stress on the streambanks. Bankfull benches were incorporated to increase the floodprone width.

Restoration was performed on 2,933 linear feet of Reach 2. The stream restoration approach utilized for Reach 2 during construction was a Priority 2 restoration since the stream and tributaries have access only to a floodplain area that is lower than the original floodplain.

While the stream was slightly raised (about 1 foot), the stream is still unable to access the original floodplain as frequently as it would have if had never become incised. However, significantly more floodplain is available to the stream than before restoration.

A riparian buffer was planted along the streambank and side slopes along Reach 1, and along the streambank, floodplain and side slopes along Reach 2. Live stakes and brush mattresses were utilized for streambank stabilization along Reach 1 and only live stakes were utilized along Reach 2 for stabilization. There are on average 545 stems per acre along both reaches. This is higher than the final density requirement of 260 trees per acre at the end of five years.

4. Monitoring Plan

The restored reach should remain stable or if changes occur the movement should be in the direction of increased stability. There should be insignificant changes in channel cross-section and longitudinal profile from the as-built condition. The pool/riffle spacing should remain constant. Pools should not be filling in or riffles starting to change to pools. Pebble counts should show the development of a sand bed channel. The final vegetative success criteria will be the survival of 260 5-year old planted stems (both trees and shrubs) per acre at the end of year 5 of the monitoring period.

Success criteria will be measured by a variety of methods. Stream morphology will be measured using total station surveying methods to capture cross sectional profiles as well as a longitudinal profile of the stream. Vegetative success of both the wetland and riparian areas will be measured by performing yearly counts and measurements of living planted stems in 11 permanent vegetative sampling plots.

Project Mitigation Structure and Objectives Table
East Tarboro Canal Stream Mitigation Site/Project No: 123

Project Segment/Reach ID	Mitigation Type	Approach	Linear Footage	Stationing	Comment
Reach 1	Enhancement 1	N/A	1,869	10+00 to 28+69	Instream structures and vegetated buffers
Reach 2	Restoration	Priority 2	2,933	10+00 to 39+33	Instream structures and vegetated buffers

EAST TARBORO CANAL STREAM RESTORATION
MITIGATION REPORT

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I. PROJECT BACKGROUND

A. Location and Setting

The project site consists of two reaches along East Tarboro Canal which is located in Tarboro, North Carolina in Edgecombe County (**Figure 1**). This stream is a tributary of the Tar River. Reach 1 begins downstream of Forest Acres Drive and flows for approximately 1,900 feet. Reach 2 begins downstream of Martin Luther King Jr. Drive and continues downstream for approximately 2,900 linear feet to St. James St. The project is located primarily on town of Tarboro and the Edgecombe County Board of Education properties.

B. Project History and Background

The East Tarboro Canal is a Federal Emergency Management Agency (FEMA) regulated stream with a detailed study. The proposed stream restoration project is located within a zone AE flood hazard area. Zone AE indicates areas inundated by the 100-year recurrence storm event. The restoration will lower the floodplain and is projected to lower flood elevations in the reach. During Hurricane Floyd, most of the structures located in the floodplain in this area received substantial damage and were razed. The majority of these properties were purchased by FEMA and as a result, the property in the 100-year floodplain is generally structure-free and town-owned. Currently 49% of the watershed remains agricultural or undeveloped. This land has the potential for development due to its proximity to the main Town of Tarboro.

Prior to restoration East Tarboro Canal was defined as a long straight G5c-type channel with minimal sinuosity. The channel was incised and areas of severe bank erosion were located throughout both project reaches due to the high in-stream shear stress and lack of streambank vegetation.

East Tarboro Canal enters Reach 1 as a first-order stream and remains first order the entire reach. One additional stream enters East Tarboro Canal upstream of Reach 2 and a second tributary empties into Reach 2 near the start of the reach. Reach 2 begins as a 2nd order stream and becomes a third-order stream immediately downstream from the beginning of the reach. It remains a third order stream before emptying into the Tar River.

The project is located within the Coastal Plain Physiographic Province of the Tar/Pamlico River Basin (USGS Cataloging Unit 03020103). The watershed of the project is approximately 2.19 square miles (1401 acres) and the headwaters of East Tarboro Canal originate approximately 0.25 miles northwest of the beginning of Reach 1. From its headwaters East Tarboro Canal flows for approximately 2.46 miles before emptying into the Tar River. Two tributaries flow into East Tarboro Canal before it empties into the Tar River. The topography is relatively flat throughout and land surface elevations range from approximately 30 to 45 feet above mean sea level. Areas of hydric soils are common along the flat, wide drainageways of this watershed but the few intact wetland communities present in the watershed are primarily upstream and along tributaries of the East Tarboro Canal. East Tarboro Canal (NCDWQ Stream Index Number (28-(80) utilizes same stream index number

as Tar River) has a C; NSW classification. Class C designation indicates waters protected for secondary recreation, fishing, wildlife, fish and aquatic life propagation and survival, agriculture and other uses suitable for Class C. Secondary recreation includes wading, boating, and other uses involving human body contact with water where such activities take place in an infrequent, unorganized, or incidental manner. There are no restrictions on watershed development or types of discharges. The NSW supplemental classification indicates waters needing additional nutrient management due to their being subject to excessive growth of microscopic or macroscopic vegetation.

Directions: From Raleigh take US 64 east to exit 486 (Hwy 258). Take 258 to intersection with S. Main Street and turn left. Take S. Main Street north across the Tar River and to the intersection with Martin Luther King Jr. Drive. Turn right on Battle Avenue and follow until it dead ends. The dead end occurs at Reach 1 of the project. If traveling to Reach 2 cross the Tar River on S. Main Street to the intersection with E. St. James Street Turn right onto E. St. James Street and take to the intersection with E. Tarboro Canal (immediately past intersection with Oakland Street).

C. Restoration Plan

1. Stream Restoration

The Enhancement of Reach 1 and Priority 2 stream restoration of the Reach 2 of the main channel involved adjusting the dimension, pattern, and profile to allow the stream to more fully transport its water and sediment load. Enhancement was performed on Reach 1 by planting streambank and riparian vegetation combined with bedform transformations. A combination of bedform transformations, channel dimension adjustments, pattern alterations, and structure installations were used to accomplish a Priority 2 stream restoration of Reach 2. The natural meander patterns were restored and rock grade control vanes and rootwads were incorporated for aquatic habitat enhancement and bed and bank stability. A riparian buffer was planted along both reaches in February 2007.

The project had the following objectives:

- Enhance over 1,800 linear feet of stream on East Tarboro Canal along Reach 1 and restore approximately 2,900 linear feet of East Tarboro Canal along Reach 2.
- Create a limited floodplain for East Tarboro Canal below its natural floodplain to allow access during flood events (Reach 1).
- Construct a new floodplain at a lower elevation (Reach 2).

While project goals included:

- Provide a stable stream channel that neither aggrades nor degrades while maintaining its dimension, pattern, and profile with the capacity to transport its watershed's water and sediment load.
- Improve water quality and reduce erosion.

- Improve aquatic habitat with the use of natural material stabilization structures such as root wads, rock vanes, woody debris, and a riparian buffer.
- Provide a native stream buffer that will increase bank stability, improve wildlife habitat, and eliminate or reduce exotic invasive plant infestations and increase the aesthetic value by transforming the unvegetated ditch into a function stream buffer.

Table I. Project Activity and Reporting History
East Tarboro Canal Stream Mitigation Site/Project No. 123

Activity or Report	Scheduled Completion	Data Collection Complete	Actual Completion Date
Restoration Plan			January 2005
Final Design - 90%			May 2005
Construction	October 2006	N/A	February 2007
Temporary S&E mix applied to entire project area	During Const.	N/A	During Const.
Permanent seed mix applied to entire project area			March 2007
Containerized, B&B, and livestake plantings	February 2007	N/A	March 2007
Mitigation Plan / As-built (Year 0 Monitoring - baseline)		March 2007	April 2007
Year 1 Monitoring	Fall 2008	NA	NA
Year 2 Monitoring	Fall 2009	NA	NA
Year 3 Monitoring	Fall 2010	NA	NA
Year 4 Monitoring	Fall 2011	NA	NA
Year 5 Monitoring	Fall 2012	NA	NA

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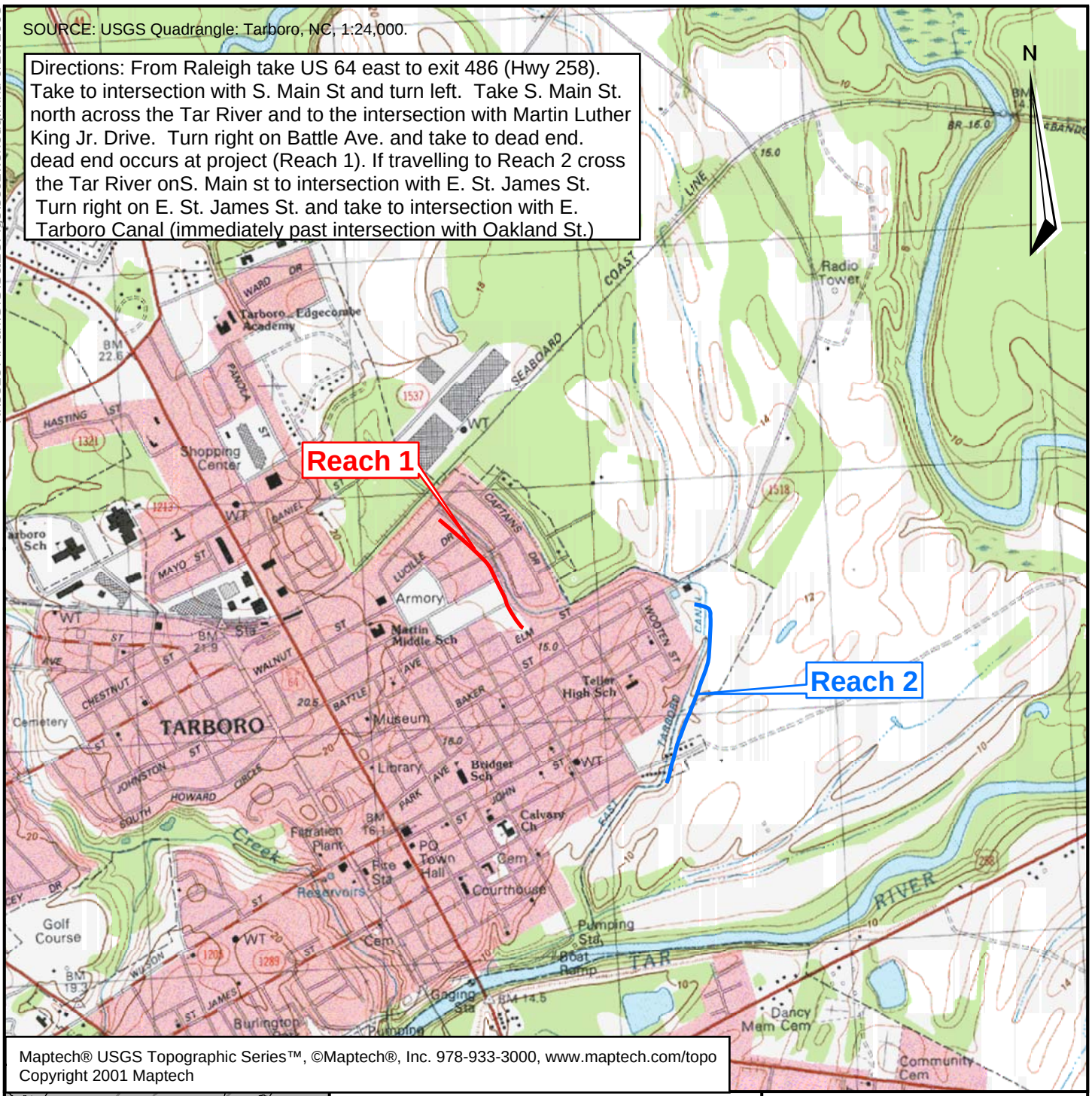
SOURCE: USGS Quadrangle: Tarboro, NC, 1:24,000.

Directions: From Raleigh take US 64 east to exit 486 (Hwy 258). Take to intersection with S. Main St and turn left. Take S. Main St. north across the Tar River and to the intersection with Martin Luther King Jr. Drive. Turn right on Battle Ave. and take to dead end. dead end occurs at project (Reach 1). If travelling to Reach 2 cross the Tar River onS. Main st to intersection with E. St. James St. Turn right on E. St. James St. and take to intersection with E. Tarboro Canal (immediately past intersection with Oakland St.)



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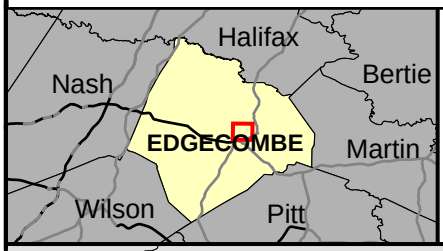
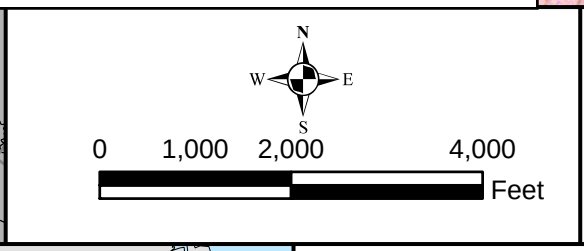




Ecosystem Enhancement Program

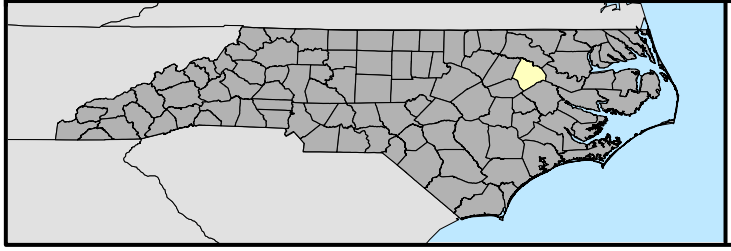


FIGURE 1
Site Location Map

East Tarboro Canal
EEP No.123
Edgecombe County, North Carolina

March 2007

Table II. Project Contact Table East Tarboro Canal Stream Restoration Site/Project No. 123	
Designer POC	*Earth Tech* 701 Corporate Center Drive Suite 475 Raleigh, NC 27607 Bill Jenkins PE (919) 854-6200
Construction Contractor POC	*Shamrock Environmental Corporation* P.O. Box 14987 Greensboro, NC 27415 Mike Granson (336)-375-1989
Planting Contractor POC	*Shamrock Environmental Corporation* P.O. Box 14987 Greensboro, NC 27415 Mike Granson (336)-375-1989
Seeding Contractor POC	*Shamrock Environmental Corporation* P.O. Box 14987 Greensboro, NC 27415 Mike Granson (336)-375-1989
Seed Mix Sources	
Nursery Stock Suppliers	*Mellow Marsh Farm* 1312 Woody Store Rd. Siler City, NC 27344 (919) 742-1200
Monitoring Performers	Earth Tech 701 Corporation Center Drive, Suite 475 Raleigh, NC 27607 Ron Johnson (919) 854-6210
Stream Monitoring	Ron Johnson
Vegetation Monitoring	Ron Johnson
Wetland Monitoring	NA

Table III. Project Background Table East Tarboro Canal Stream Mitigation Site/Project No. 123	
Project County	Edgecombe
Drainage Area	
East Tarboro Canal	2.78 sq mi
Drainage impervious cover estimate (%)	10%
Stream Order	
East Tarboro Canal	1st/2nd
Physiographic Region	Coastal Plain
Ecoregion	Southeastern Floodplains and Low Terraces
Rosgen Classification of As-Built	Reach 1 – NA, Reach 2 – C5
Cowardin Classification	Riverine
Dominant Soil Types	Grantham-Urban land complex
	Portsmouth fine sandy loam
	Roanoke loam
Reference site ID	Unnamed tributary to Mill Creek
USGS HUC for Project	03020103
USGS HUC for Reference	Unnamed tributary to Mill Creek (03020201)
NCDWQ Sub-basin for Project	030303
NCDWQ Sub-basin for Reference	Unnamed tributary to Mill Creek (030404)
NCDWQ Classification for Project	East Tarboro Canal (C, NSW)
NCDWQ Classification for Reference	Unnamed tributary to Mill Creek (C, NSW)
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	NA
% of project easement fenced	0%

II. PROJECT CONDITION AND BASELINE MONITORING RESULTS

A. Vegetation Assessment

1. *Vegetative Success Criteria*

The final vegetative success criteria will be the survival of 260 5-year old planted stems (both tree and shrub) per acre at the end of year 5 of the monitoring period. An interim measure of vegetation planting success will be the survival of at least 320 3-year old planted stems per acre at the end of year 3 of the monitoring period.

2. *Soil Data*

Table IV. Preliminary Soil Data East Tarboro Canal Stream Mitigation Site/Project No. 123					
Series	**Max Depth (in.)**	**% Clay in Surface Horizon**	**K**	**T**	**OM % (Surface)**
Grantham-Urban land complex	110		0.37 to 0.43	4	medium
Portsmouth fine sandy loam	82	<18%	NA	NA	medium
Roanoke loam	90		NA	NA	medium

3. *Stem Counts*

Baseline vegetation plots were established in March 5, 2007. Thirteen (13) vegetation sampling plots were placed in the floodplain terrace along East Tarboro Canal. Because of the narrow buffer along Reach 1 it was only possible to establish one (1) 10 X 10m vegetation sampling plot along this reach. Additionally, steep side slopes along Reach 1 reduced the area available for planting trees and shrubs. This Reach is only being enhanced and not restored. Twelve (12) 10m X 10m vegetation sampling plots were placed along Reach 2. Stems within the plots were identified and flagged. Appendix A-1 provides a table with the number and species of each stem planted in each plot.

Survival of the rooted vegetation will be evaluated using the thirteen plots and will continue for at least 5 years to determine survival. Currently the plots meet the criteria for final success of planted stem density as designated by the Corps of Engineers. There are on average 545 stems per acre along the entire project. The vegetation plot along Reach 1, VP-1 is the only plot where a sufficient density of tress and shrubs may not have been planted to insure meeting project goals within the plot. Monitoring of the plot in Reach 1 will determine if unacceptable mortality of planted material may be occurring that could jeopardize the stream bank stability.

4. *Vegetation Plot Photos*

Vegetation plot photos were taken and are located in Appendix A-2.

B. Stream Assessment

The restored reach should remain stable or if changes occur the movement should be in the direction of increased stability. There should be insignificant changes in channel cross-section and longitudinal profile from the as-built condition. The pool/riffle spacing should remain constant. Pools should not be filling in or riffles starting to change to pools. Pebble counts should indicate a development of a sand bed channel.

1. *Morphometric Criteria*

The assessment included the survey of cross-sections as well as the longitudinal profile. Thirteen cross-sections were established along the length of the project. Cross-sections were marked with wooden stakes and rebar. Cross-sections are located at the following stations.

Reach 1
Cross-section #1. East Tarboro Canal, Station 12+71
Cross-section #2. East Tarboro Canal, Station 18+08
Cross-section #3. East Tarboro Canal, Station 21+56
Cross-section #4. East Tarboro Canal, Station 22+91
Cross-section #5. East Tarboro Canal, Station 27+29

Reach 2
Cross-section #6. East Tarboro Canal, Station 13+97
Cross-section #7. East Tarboro Canal, Station 17+86
Cross-section #8. East Tarboro Canal, Station 19+93
Cross-section #9. East Tarboro Canal, Station 24+78
Cross-section #10. East Tarboro Canal, Station 26+76
Cross-section #11. East Tarboro Canal, Station 30+15
Cross-section #12. East Tarboro Canal, Station 33+80
Cross-section #13. East Tarboro Canal, Station 36+91

Cross-section and longitudinal surveys were completed on February 21, 2007. A bed material analysis was performed at each cross-section location on February 7, 2007. A pebble count was inadvertently not performed at Cross-section 11 but should be conducted and included in future monitoring reports. Photos were taken at eleven photo points and all cross-sections on March 5, 2007. A figure showing the cross-section and photo point locations is included in Appendix C.

Survey data collected during future monitoring periods may vary depending on actual rod placement and alignment; however, from this point forward this information should remain similar in overall appearance.

2. *Hydrologic Criteria*

Monitoring requirements state that at least two bankfull events must be documented through the five-year monitoring period. No surface water gauges exist on East Tarboro Canal. A review of known U.S. Geological Survey (USGS) surface water gauges identified three surface water gauges within 20 miles of the mitigation site: one on Town Creek near Pinetops (190 square miles), one on Fishing Creek near Leggett (758 square miles), and one on the Tar River at Tarboro (2,183 square miles). None of the three streams has a drainage area that is comparable to East Tarboro Canal (2.19 square miles). In order to determine future bankfull events for the site a crest gauge should be installed on Reach 2 since comparison to nearby gauges will not be possible given the large difference in watershed area between existing stream gauges and the project stream.

C. Wetland Assessment

No wetland restoration has been proposed for this project.

III. METHODOLOGY

The survey of the cross-sections and longitudinal profile were performed using total station survey equipment and methodology. Data was then entered into the stream morphology applications program, Rivermorph, to obtain the dimensions of the cross-sections and parameters applicable to the longitudinal profile. Reports were then generated by Rivermorph that are used in this report to display and summarize stream survey data.

Table VII. Baseline Morphology and Hydraulic Summary
East Tarboro Canal Stream Mitigation Site/Project No. 123
Reach 1 (1,869 Feet)

Parameter	USGS Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-built		
Dimension	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
BF Width (ft)						10.12	7.3	9.8	7.3	10.8	11.0	10.9	NA	NA	12.0	10.26	11.63	11.12
BF Cross Sectional Area (ft^2)						12.53	10.1	14.7	12.3	8.3	9.6	9.0	NA	NA	12.0	12.05	17.13	14.82
BF Mean Depth (ft)						1.21	1.23	2.02	1.5	0.77	0.87	0.82	NA	NA	1.0	1.09	1.55	1.33
BF Max Depth (ft)						NA	1.54	2.92	2.0	1.24	1.45	1.34	NA	NA	1.6	1.7	2.85	2.13
Width/Depth Ratio						NA	3.6	8.0	5.6	12.6	14.1	13.4	NA	NA	12.0	7.14	10.13	8.47
Entrenchment Ratio						NA	1.3	2.9	NA	>9.1	>9.3	NA	NA	NA	2.2	1.88	2.43	2.15
Wetted Perimeter (ft)						NA	12.4	14.1	12.8	NA	NA	NA	NA	NA	NA	11.5	13.3	12.48
Hydraulic radius (ft)						NA	.79	.97	1.04	NA	NA	NA	NA	NA	NA	1.03	1.25	1.18
Pattern																		
Channel Beltwidth (ft)						NA			NA	12.5	25.0	18.8	NA	NA	NA			NA
Radius of Curvature (ft)						NA			NA	14.4	39.8	23.3	NA	NA	NA			NA
Meander Wavelength						NA			NA	39	64	50.4	NA	NA	NA			NA
Meander Width ratio						NA			NA	3.6	5.9	4.6	NA	NA	NA			NA
Profile																		
Riffle length (ft)						NA			NA	NA	NA	NA	NA	NA	NA	13.16	123.04	65.47
Riffle slope (ft/ft)						NA			NA	0.000	.0055	.0022	0.000	.0040	NA	.00152	.00523	.00334
Pool length (ft)						NA			NA	NA	NA	13	NA	NA	15	112.67	609.88	289.02
Pool spacing (ft)						NA			NA	16	45	32.3	18	50	34	134.0	506.48	356.01
Substrate																		
d50 (mm)							NA	NA	NA	NA	NA	NA	NA	NA	NA	.04	.34	.05
d84 (mm)							NA	NA	NA	NA	NA	NA	NA	NA	NA	.63	10.64	1.2
Additional Reach Parameters																		
Valley Length (ft)									1,891						1,871			1871
Channel Length (ft)									1,833			280			1876			1869
Sinuosity									1.01			1.3			1.003			1.01
Water Surface Slope (ft/ft)									.0001	0.000	.0055	.0030	0.000	.0040	.0022			.00215
BF slope (ft/ft)									NA			NA			NA			.00413
Rosgen Classification									G5c			C5			C5			C5
Habitat Index																		
Macrobenthos																		

Table VII. Baseline Morphology and Hydraulic Summary
East Tarboro Canal Stream Mitigation Site/Project No. 123
Reach 2 (2,933 Feet)

Parameter	USGS Data			Regional Curve Interval			Pre-Existing Condition			Project Reference Stream			Design			As-built		
Dimension	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
BF Width (ft)						14.55	14.0	17.0	15.0	10.8	11.0	10.9	NA	NA	20.0	17.66	30.32	20.6
BF Cross Sectional Area (ft^2)						24.34	22.8	25.4	24.1	8.3	9.6	9.0	NA	NA	29.25	20.52	31.22	26.73
BF Mean Depth (ft)						1.63	1.5	1.72	1.61	0.77	0.87	0.82	NA	NA	1.46	.89	1.41	1.25
BF Max Depth (ft)							2.2	2.37	2.32	1.24	1.45	1.34	NA	NA	2.5	1.75	3.5	2.69
Width/Depth Ratio							8.2	11.4	9.4	12.6	14.1	13.4	NA	NA	13.7	13.23	34.07	16.22
Entrenchment Ratio							1.5	1.7	NA	>9.1	>9.3	NA	2.2	6.0	NA	1.75	5.52	4.65
Wetted Perimeter (ft)							17.6	31.1	21.75	NA	NA	NA	NA	NA	NA	19.2	30.78	21.88
Hydraulic radius (ft)							.87	1.36	1.14	NA	NA	NA	NA	NA	NA	0.88	1.29	1.19
Pattern																		
Channel Beltwidth (ft)							29	47	39	12.5	25.0	18.8	22	46	34	20.58	52.64	36.53
Radius of Curvature (ft)							75	560	220	14.4	39.8	23.3	40	72	56	22.99	71.49	37.54
Meander Wavelength							154	226	190	39	64	50.4	72	170	NA	100.91	147.32	129.22
Meander Width ratio							10.3	15.1	12.7	3.6	5.9	4.6	1.1	2.3	1.7	0.374	0.956	0.663
Profile																		
Riffle length (ft)							NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	64.25
Riffle slope (ft/ft)							.0002	.0044	.0002	0.000	.0055	.0022	0.000	.0036	NA	NA	NA	.00543
Pool length (ft)							NA	NA	23.3	NA	NA	13	NA	NA	24	49.66	113.74	70.29
Pool spacing (ft)							44	133	90	16	45	32.3	32	86	59	72.09	416.51	206.20
Substrate																		
d50 (mm)							NA	NA	NA	NA	NA	NA	NA	NA	NA	0.05	2.0	1.14
d84 (mm)							NA	NA	NA	NA	NA	NA	NA	NA	NA	1.88	18.06	4.49
Additional Reach Parameters																		
Valley Length (ft)									2722						2722			2722
Channel Length (ft)									2946			280			2989			2933
Sinuosity									1.03			1.3	1.20	1.4	1.10			1.19
Water Surface Slope (ft/ft)							0.000	.0044	.0007	0.000	.0055	.0030	0.000	.0036				.00185
BF slope (ft/ft)									NA			NA			NA			.00179
Rosgen Classification									G5c			C5			C5			C5
Habitat Index																		
Macrobenthos																		

Table VIII. Morphology and Hydraulic Monitoring Summary
East Tarboro Canal Stream Mitigation Site/Project No. 123
Reach 1 (1,876 Feet)

Parameter	Cross Section 1			Cross Section 2			Cross Section 3			Cross Section 4			Cross Section 5		
Dimension	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2
BF Width (ft)	10.26			11.07			11.62			11.04			11.63		
Floodprone Width (ft) (approx)	22.9			25.2			22.4			20.74			28.23		
BF Cross Sectional Area (ft^2)	13.72			17.13			14.78			12.05			16.42		
BF Mean Depth (ft)	1.34			1.55			1.27			1.09			1.41		
BF Max Depth (ft)	1.9			2.85			1.76			1.7			2.44		
Width/Depth Ratio	7.66			7.14			9.15			10.13			8.25		
Entrenchment Ratio	2.23			2.28			1.93			1.88			2.43		
Wetted Perimeter (ft)	11.5			13.3			12.72			11.75			13.13		
Hydraulic radius (ft)	1.19			1.29			1.16			1.03			1.25		
Substrate															
d50 (mm)	.05			.34			.04			.12			.04		
d84 (mm)	1.2			4.95			.85			.63			10.64		

Parameter	MY-01 (2006)			MY-02 (2007)			MY-03 (2008)			MY-04 (2009)			MY-05 (2010)			MY+ (2011)		
Pattern	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Channel Beltwidth (ft)																		
Radius of Curvature (ft)																		
Meander Wavelength (ft)																		
Meander Width Ratio																		
Profile																		
Riffle Length (ft)																		
Riffle Slope (ft/ft)																		
Pool length (ft)																		
Pool spacing (ft)																		
Additional Reach Parameters																		
Valley Length (ft)																		
Channel Length (ft)																		
Sinuosity																		
Water Surface Slope (ft/ft)																		
BF Slope (ft/ft)																		
Rosgen Classification																		
Habitat Index*																		
Macrobenthos*																		

Table VIII. Morphology and Hydraulic Monitoring Summary
East Tarboro Canal Stream Mitigation Site/Project No. 123
Reach 2 (2,989 Feet)

Parameter	Cross Section 6			Cross Section 7			Cross Section 8			Cross Section 9			Cross Section 10		
Dimension	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2
BF Width (ft)	30.32			22.54			20.6			19.36			20.6		
Floodprone Width (ft) (approx)	100			100			75			101.4			100		
BF Cross Sectional Area (ft^2)	26.95			31.22			22.99			27.34			25.78		
BF Mean Depth (ft)	0.89			1.39			1.12			1.41			1.25		
BF Max Depth (ft)	1.75			3.5			2.6			3.21			2.63		
Width/Depth Ratio	34.07			16.22			18.39			13.73			16.48		
Entrenchment Ratio	3.3			4.44			3.64			5.24			4.85		
Wetted Perimeter (ft)	30.78			24.92			21.88			21.35			21.75		
Hydraulic radius (ft)	0.88			1.25			1.05			1.28			1.19		
Substrate															
d50 (mm)	1.05			.05			.05			1.95			2		
d84 (mm)	1.88			18.06			4			5.25			5.26		

Parameter	MY-01 (2006)			MY-02 (2007)			MY-03 (2008)			MY-04 (2009)			MY-05 (2010)			MY+ (2011)		
Pattern	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Channel Beltwidth (ft)																		
Radius of Curvature (ft)																		
Meander Wavelength (ft)																		
Meander Width Ratio																		
Profile																		
Riffle Length (ft)																		
Riffle Slope (ft/ft)																		
Pool length (ft)																		
Pool spacing (ft)																		
Additional Reach Parameters																		
Valley Length (ft)																		
Channel Length (ft)																		
Sinuosity																		
Water Surface Slope (ft/ft)																		
BF Slope (ft/ft)																		
Rosgen Classification																		
Habitat Index*																		
Macrobenthos*																		

Table VIII. Morphology and Hydraulic Monitoring Summary
East Tarboro Canal Stream Mitigation Site/Project No. 123
Reach 2 (2,989 feet)

Parameter	Cross Section 11			Cross Section 12			Cross Section 13								
Dimension	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2	MY0	MY1	MY2
BF Width (ft)	18.93			18.13			21.52								
Floodprone Width (ft) (approx)	100			100			100								
BF Cross Sectional Area (ft^2)	26.71			24.83			26.73								
BF Mean Depth (ft)	1.41			1.37			1.24								
BF Max Depth (ft)	2.68			2.52			2.96								
Width/Depth Ratio	13.43			13.23			17.35								
Entrenchment Ratio	5.28			5.52			4.65								
Wetted Perimeter (ft)	20.87			19.2			23.18								
Hydraulic radius (ft)	1.28			1.29			1.15								
Substrate															
d50 (mm)	N/A			1.14			1.97								
d84 (mm)	N/A			4.49			4.19								

Parameter	MY-01 (2006)			MY-02 (2007)			MY-03 (2008)			MY-04 (2009)			MY-05 (2010)			MY+ (2011)		
Pattern	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med	Min	Max	Med
Channel Beltwidth (ft)																		
Radius of Curvature (ft)																		
Meander Wavelength (ft)																		
Meander Width Ratio																		
Profile																		
Riffle Length (ft)																		
Riffle Slope (ft/ft)																		
Pool length (ft)																		
Pool spacing (ft)																		
Additional Reach Parameters																		
Valley Length (ft)																		
Channel Length (ft)																		
Sinuosity																		
Water Surface Slope (ft/ft)																		
BF Slope (ft/ft)																		
Rosgen Classification																		
Habitat Index*																		
Macrobenthos*																		

IV. AS-BUILTS

The as built plans for the project are included in Appendix C at the end of this report.

V. MONITORING PLAN

A. Hydrology

No nearby USGS stream gauges apply to a stream with such a small watershed. A crest gauge will be installed along Reach 2 to document when bankfull events occur.

B. Profile

Channel profile will be surveyed once each year following As-built using total station methodology to detect thalweg, bankfull, and water surface elevations of East Tarboro Canal.

C. Pattern

Channel profile will be surveyed once each year following As-built using total station methodology to detect thalweg, bankfull, and water surface elevations of East Tarboro Canal.

D. Dimension

Channel dimension will be surveyed once each year following As-built at the thirteen permanently established cross-sections located along East Tarboro Canal. These will be surveyed using total station methodology and the data will be analyzed and plotted using Rivermorph software.

E. Bed Material

A bed material analysis will be done every year after as-built to determine if the channel develops into a sand bed system. Pebble counts will be conducted at every permanent cross-section that has been established in the project area. Each year's data will be included in the subsequent monitoring reports to enable comparison among years following construction.

F. Vegetation

Stem counts will occur annually toward the end of the growing season. Vegetation sampling will follow the CVS-EEP Protocol for Level 1 – 2, Version 4.0 dated 2006. Thirteen 10m X 10m ($100m^2$) plots were established on March 5, 2007. Planted woody stems in these plots were flagged and counted following planting to establish a baseline of planted vegetation for each plot. All 13 plots will be sampled in the fall of every year to determine vegetation survival and also demonstrate if vegetation survival is above or below the criteria that the U.S. Army Corps of Engineers stipulate for a successful project.

G. Benthos

Macrobenthos sampling is not proposed for this project.

H. BEHI

EEP requires that BEHI and NBS assessments be performed in Year 5 post construction. The entire project will be classified into the BEHI erosion hazard categories and accompanied by an NBS assessment for the purpose of describing the proportion of project bank footage in the various hazard categories and to produce project sediment export estimates. Sampling resolution will occur such that accurate estimates can be produced and the data will be compared to the BEHI and sediment export assessments conducted prior to construction.

I. Wetlands

No wetland restoration has been proposed for this project.

VI. MAINTENANCE AND CONTINGENCY PLANS

Site specific maintenance or contingency plans have not been developed for this project. During construction of the project the following were identified as areas of concern:

- Reach 2 – At the beginning of this reach are several pipes that are proposed for replacement by the Town of Tarboro. This work has a high potential of disturbing the restoration/stabilization effort in this area. Additionally, the channel plug and boulder wall should be watched for signs of failure.
- Reach 2 – The utility crossing near Station 20+50 should be monitored for signs of erosion at the crossing and immediately downstream of the crossing.
- Reach 2 – The double-drop cross-vane and utility crossing at Station 21+80 should be monitored for stability.
- The drainage from the school parking lot and tributary entering stream near 28+00 may cause erosion in the channel.
- The left floodplain at 28+50 to 29+00 should be watched for signs of scour.

VII. REFERENCES

USACOE (2003). *Stream Mitigation Guidelines*. USACOE, USEPA, NCWRC, NCDENR-DWQ.

USACOE (1987). *Corps of Engineers Wetlands Delineation Manual*. Tech report Y-87-1. AD/A176.

Rosgen, D.L. (1996) *Applied River Morphology*. Wildland Hydrology books, Pagosa Springs, CO.

Lee, M.T., R.K. Peet, S.D. Roberts, T.R. Wentworth. (2006). CVS-EEP Protocol for Recording Vegetation Version 4.0

APPENDIX A

A-1 Vegetation Survey Data Tables

A-2 Vegetation Monitoring Plot Photos

East Tarboro Canal Stream Restoration
Stream Mitigation Report
Appendix A-1
Vegetation Survey Data Table

Stem Counts for each species arranged by plot															
Species															**Initial Totals**
Scientific Name	**Common Name**	**VP-1**	**VP-2**	**VP-3**	**VP-4**	**VP-5**	**VP-6**	**VP-7**	**VP-8**	**VP-9**	**VP-10**	**VP-11**	**VP-12**	**VP-13**	**total shrubs**
Shrubs															
Alnus serrulata	Tag alder	1			2			2				1	2	1	***8***
Cornus foemina	Stiff dogwood		4	2			1		1		1			1	***10***
Itea virginica	Virginia sweetspire							1						1	***2***
Rosa palustris	Swamp rose			2		1		2	1		1	1			***8***
Aronia arbutifolia	Purple chokeberry							2		1					***3***
Cyrilla racemiflora	Swamp titi						1	1							***2***
Myrica cerifera	Wax myrtle		3		2		2	1			2	3	2	3	***18***
Viburnum dentatum	Arrowwood	2								1					***1***
Ilex verticillata	Winterberry					1									***1***
Rhus coppalinum	Winged sumac								1						***1***
Salix caroliniana	Coastal plain willow			1		2							1		***4***
Sambucus canadensis	Elderberry			1		1	2	2	1		2	2	2	1	***14***
Callicarpa americana	American beautyberry		3		1		1		1						***6***
Cornus florida	Flowering dogwood														***0***
Cephalanthus occidentalis	Buttonbush			1					1		1	1		2	***6***
	Total Shrubs	***3***	***10***	***7***	***5***	***5***	***7***	***11***	***6***	***2***	***7***	***8***	***7***	***9***	***84***
Trees															
Scientific Name	**Common Name**	**VP-1**	**VP-2**	**VP-3**	**VP-4**	**VP-5**	**VP-6**	**VP-7**	**VP-8**	**VP-9**	**VP-10**	**VP-11**	**VP-12**	**VP-13**	**total trees**
Platanus occidentalis	Sycamore			1		1	1	4							***7***
Taxodium distichum	Bald cypress		1												***1***
Carya cordiformis	Bitternut hickory		1		1					1				2	***5***
Quercus pagodifolia	Cherrybark oak								1	9	2	2	2	1	***17***
Fraxinus pennsylvanica	Green ash	2	3	3		4			1		3	2			***16***
Quercus laurifolia	Laurel oak														***0***
Betula nigra	River birch	1	2		4		2		1	3			2	2	***16***
Nyssa biflora	Swamp tupelo		3	2	2		1	1	1	4			4		***18***
Quercus nigra	Water oak			1			1		1						***3***
Quercus phellos	Willow oak	1		1											***1***
Quercus palustris	Pin oak														***0***
Quercus virginiana	Live oak														***0***
	Total Trees	***4***	***10***	***8***	***7***	***5***	***5***	***5***	***5***	***17***	***5***	***4***	***8***	***5***	***84***
TABLE SUMMARY	Total Stems of planted Woody vegetaion.		20	15	12	10	12	16	11	19	12	12	15	14	***168***
	Current Density														
	Shrubs per acre	121	405	283	202	202	283	445	243	81	283	324	283	364	***271***
	Trees per acre	162	405	324	283	202	202	202	202	688	202	162	324	202	***274***
	Total stems per acre	283	809	607	486	405	486	648	445	769	486	486	607	567	***545***

*All plots are 10x10 meters

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix A-2
Vegetation Plot Photos


Vegetation Plot 1.


Vegetation Plot 2.


Vegetation Plot 3.


Vegetation Plot 4.


Vegetation Plot 5.


Vegetation Plot 6.

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix A-2
Vegetation Plot Photos


Vegetation Plot 7.


Vegetation Plot 8.


Vegetation Plot 9.


Vegetation Plot 10.


Vegetation Plot 11.


Vegetation Plot 12.

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix A-2
Vegetation Plot Photos


Vegetation Plot 13.

APPENDIX B

GEOMORPHOLOGIC DATA

B-1 Stream Photo-Station Photos

B-2 Cross Section Plots and Raw Data Tables

B-3 Longitudinal Plots and Raw Data Tables

B-4 Pebble Count Plots and Raw Data Tables

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix B-1
Stream Photo-Station Photos

Photo Point 1. Beginning of Reach 1, culvert at Forest Acres Drive facing downstream. Station 10+00.

Cross Section 1. Facing downstream. Station 12+71

Cross Section 1. Facing upstream. Station 12+71.

Cross Section 2. Facing downstream. Station 18+08.

Cross Section 2. Facing upstream. Station 18+08.

Photo Point 2. Culvert at Clark St. facing upstream. Station 19+47.

Photo Point 3. Culvert at Clark St. facing downstream. Station 19+82.

Cross Section 3. Facing downstream. Station 21+56.

Cross Section 3. Facing upstream. Station 21+56.

Cross Section 4 Photos Not Available

Cross Section 5. Facing downstream. Station 27+29.

Cross Section 5. Facing upstream. Station 27+29.

Photo Point 4. End of Reach 1 facing upstream. Station 28+76.

Photo Point 5. Culvert at beginning of Reach 2 facing downstream. Station 10+00.

Photo Point 6. At culvert facing downstream. Station 10+57.

Photo Point 6. At culvert facing upstream. Station 10+57.

Cross Section 6. Facing downstream. Station 13+97.

Cross Section 6. Facing upstream. Station 13+97.

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix B-1
Stream Photo-Station Photos

Cross Section 7. Facing downstream. Station 17+86.

Cross Section 7. Facing upstream. Station 17+86.

Cross Section 8. Facing downstream. Station 19+93.

Cross Section 8. Facing upstream. Station 19+93.

Photo Point 7. Culvert at Wilson St. facing upstream. Station 22+24

Photo Point 8. Culvert at Wilson St. facing downstream. Station 23+00.

Cross Section 9. Facing upstream.
Station 24+78.

Cross Section 9. Facing downstream.
Station 24+78.

Cross Section 10. Facing downstream.
Station 26+76.

Cross Section 10. Facing upstream.
Station 26+76.

Cross Section 11. Facing downstream.
Station 30+15.

Cross Section 11. Facing upstream.
Station 30+15.

Cross Section 12. Facing downstream. Station 33+80.

Cross Section 12. Facing upstream. Station 33+80.

Photo Point 9. Facing Culvert. Station 34+25.

Photo Point 10. On culvert facing stream. Station 34+13 offset 58.05.

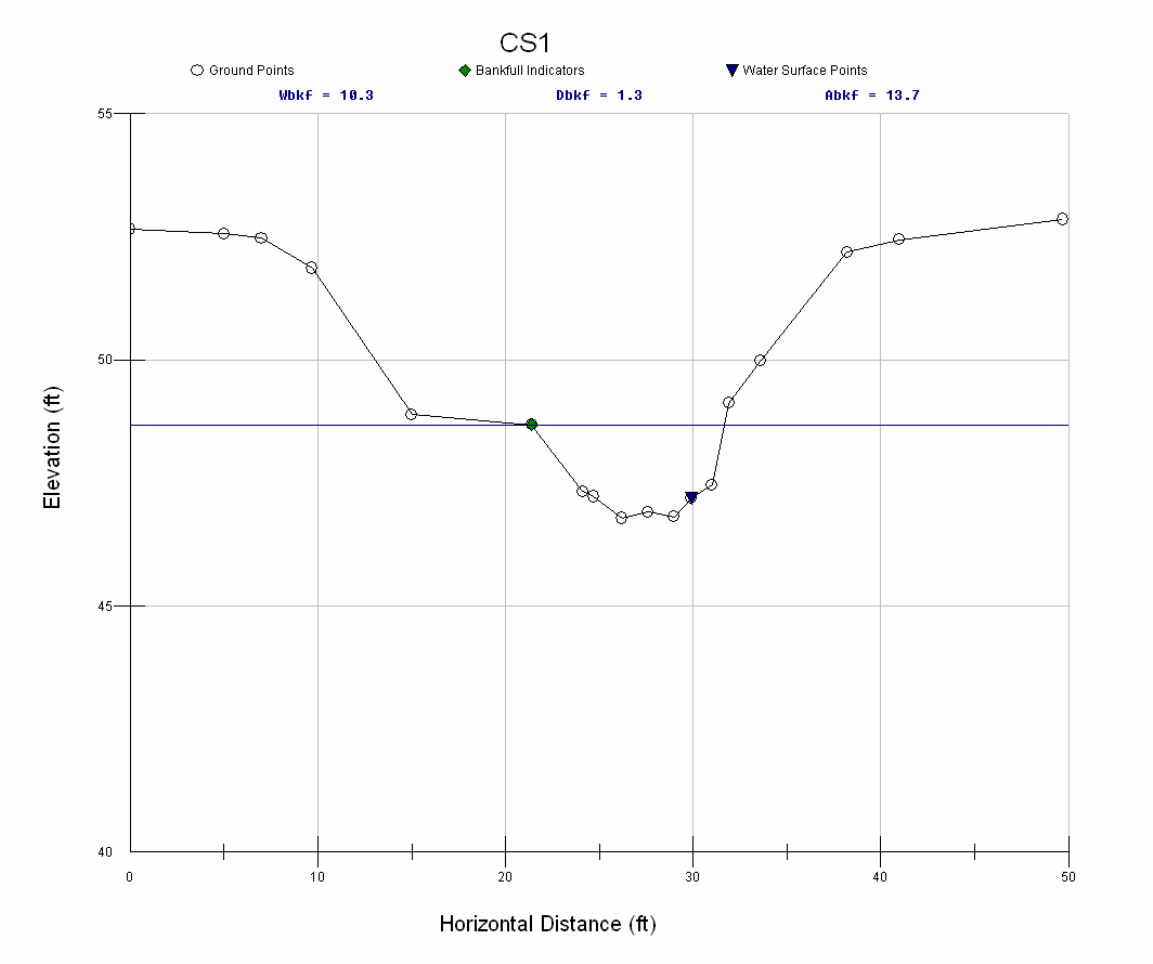
Cross Section 13. Facing downstream. Station 36+91.

Cross Section 13. Facing upstream. Station 36+91.

Photo Point 11. Culvert at St. James St. (End of Reach 2). Station 39+88.

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix B-2
Cross Section Plots and Raw Data Tables

REACH 1 CROSS SECTIONS



River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: cs1
Survey Date: 02/05/07

Cross Section Data Entry

BM Elevation: 51.76 ft
Backsight Rod Reading: 6.71 ft

TAPE	FS	ELEV	NOTE
0	5.82	52.65	LPIN

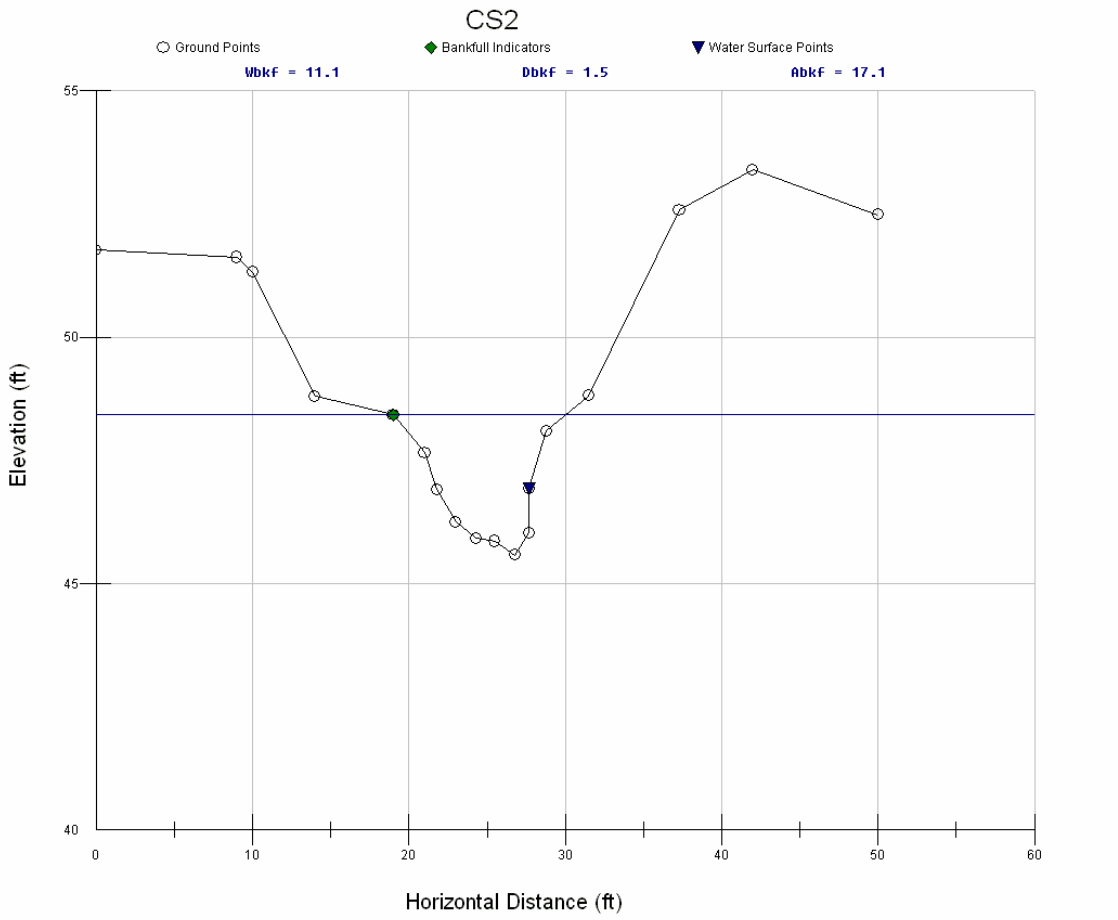
5	5.91	52.56	
7	6	52.47	
9.7	6.61	51.86	
15	9.58	48.89	
21.4	9.79	48.68	BKF
24.1	11.15	47.32	
24.7	11.25	47.22	LEW
26.2	11.69	46.78	TW
27.6	11.56	46.91	
29	11.66	46.81	
29.9	11.28	47.19	REW
31	11.01	47.46	
31.9	9.35	49.12	
33.6	8.49	49.98	
38.2	6.29	52.18	
41	6.03	52.44	
49.7	5.62	52.85	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	50.58	50.58	50.58
Bankfull Elevation (ft)	48.68	48.68	48.68
Floodprone Width (ft)	22.87	-----	-----
Bankfull Width (ft)	10.26	5.13	5.13
Entrenchment Ratio	2.23	-----	-----
Mean Depth (ft)	1.34	1.14	1.54
Maximum Depth (ft)	1.9	1.9	1.87
Width/Depth Ratio	7.66	4.5	3.33
Bankfull Area (sq ft)	13.72	5.82	7.9
Wetted Perimeter (ft)	11.5	7.4	7.84
Hydraulic Radius (ft)	1.19	0.79	1.01
Begin BKF Station	21.4	21.4	26.53
End BKF Station	31.66	26.53	31.66

East Tarboro Canal Stream Restoration Site
Mitigation Report
Appendix B-2
Cross Section Plots and Raw Data Tables

River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: cs2
Survey Date: 02/05/07



River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: cs2
Survey Date: 02/05/07

Cross Section Data Entry

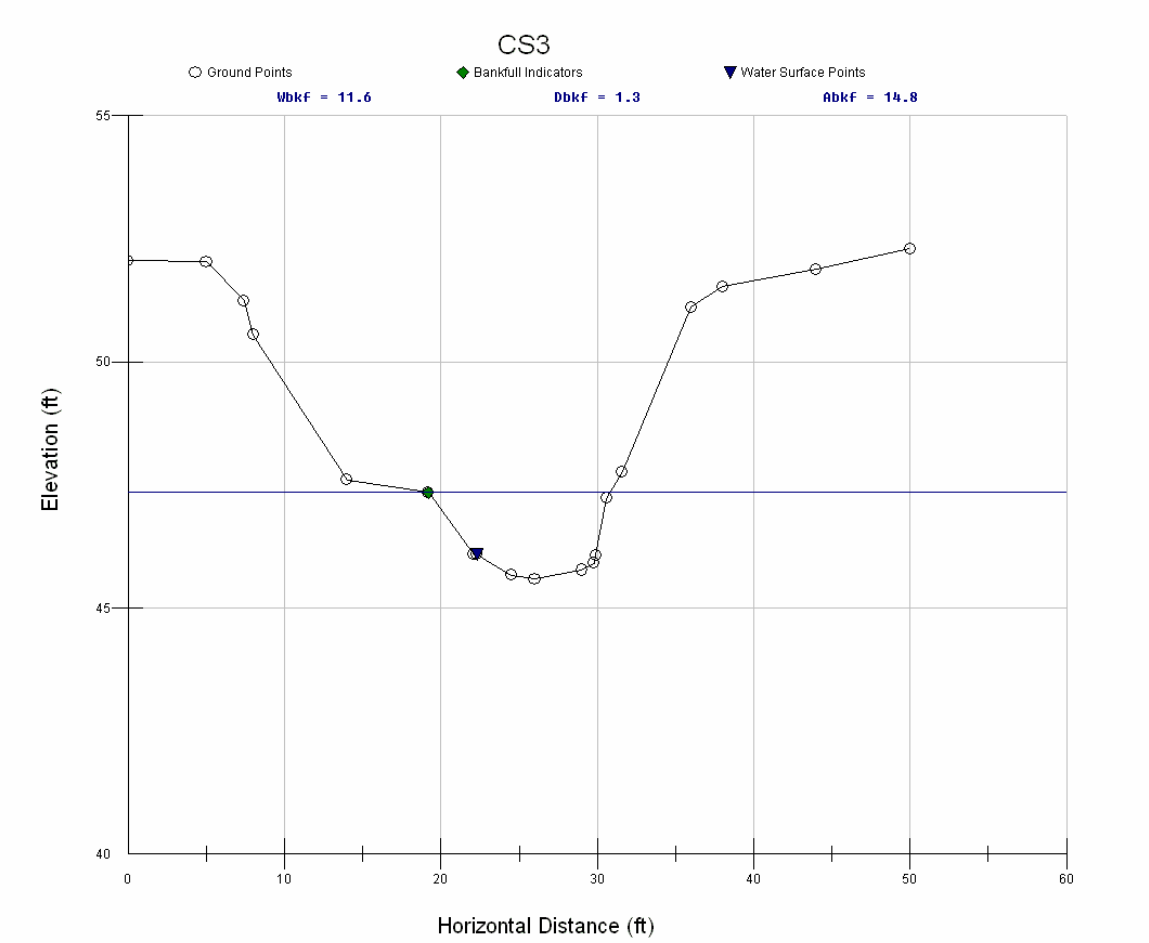
BM Elevation: 51.76 ft
Backsight Rod Reading: 5.96 ft

TAPE FS ELEV NOTE

0	5.95	51.77	LPIN
9	6.1	51.62	
10	6.4	51.32	
14	8.92	48.8	
19	9.29	48.43	BKF
21	10.07	47.65	
21.8	10.81	46.91	LEW
23	11.47	46.25	
24.3	11.8	45.92	
25.5	11.86	45.86	
26.8	12.14	45.58	TW
27.7	11.69	46.03	
27.7	10.79	46.93	REW
28.8	9.63	48.09	
31.5	8.91	48.81	
37.3	5.14	52.58	
42	4.32	53.4	
50	5.24	52.48	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	51.28	51.28	51.28
Bankfull Elevation (ft)	48.43	48.43	48.43
Floodprone Width (ft)	25.24	-----	-----
Bankfull Width (ft)	11.07	5.54	5.53
Entrenchment Ratio	2.28	-----	-----
Mean Depth (ft)	1.55	1.37	1.73
Maximum Depth (ft)	2.85	2.52	2.85
Width/Depth Ratio	7.14	4.04	3.2
Bankfull Area (sq ft)	17.13	7.57	9.56
Wetted Perimeter (ft)	13.3	8.71	9.63
Hydraulic Radius (ft)	1.29	0.87	0.99
Begin BKF Station	19	19	24.54
End BKF Station	30.07	24.54	30.07



River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: CS3
Survey Date: 02/05/07

Cross Section Data Entry

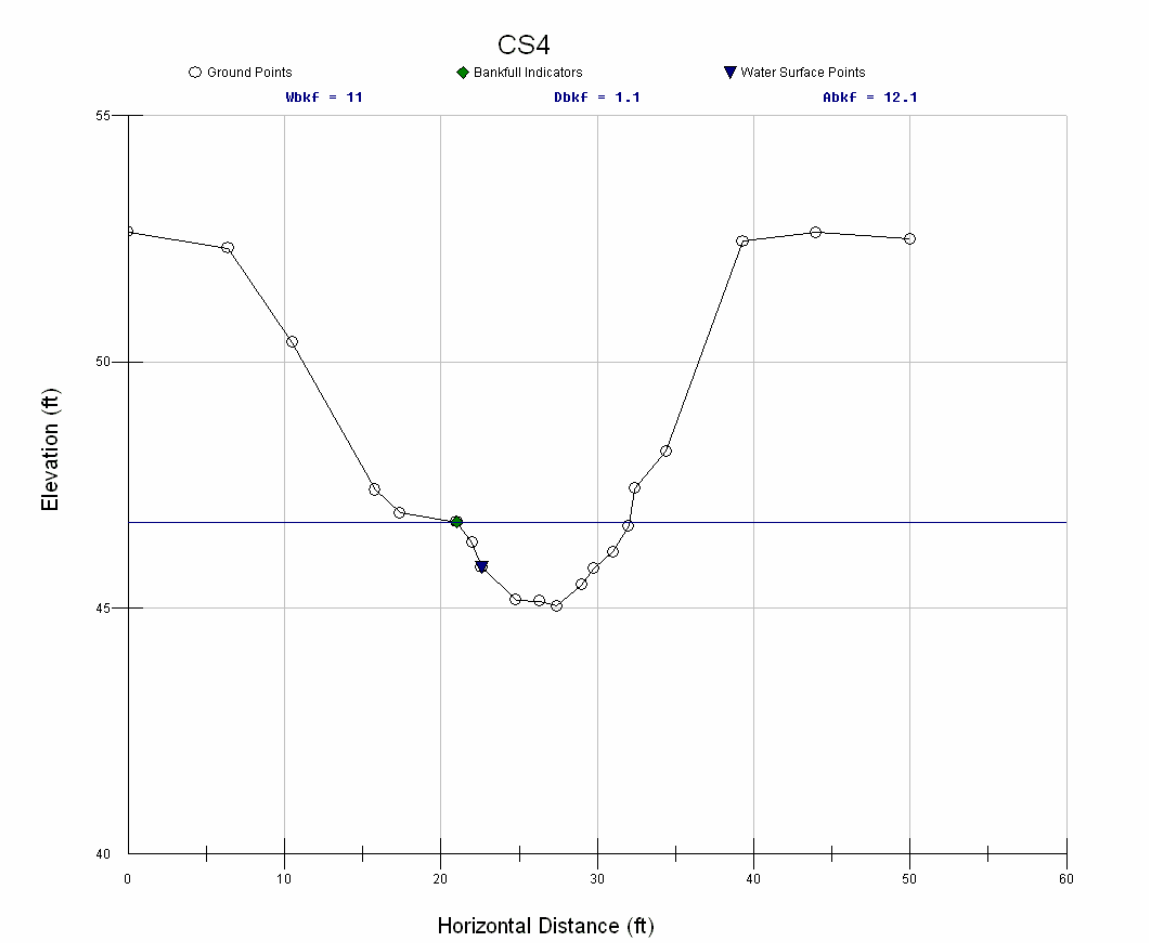
BM Elevation: 51.99 ft
Backsight Rod Reading: 5.48 ft

TAPE	FS	ELEV	NOTE
0	5.42	52.05	LPIN
5	5.44	52.03	
7.4	6.23	51.24	
8	6.92	50.55	
14	9.87	47.6	
19.2	10.12	47.35	BKF

22.1	11.39	46.08	
22.3	11.39	46.08	LEW
24.5	11.8	45.67	
26	11.88	45.59	TW
29	11.7	45.77	
29.8	11.56	45.91	
29.9	11.4	46.07	REW
30.6	10.24	47.23	
31.6	9.7	47.77	
36	6.36	51.11	
38	5.95	51.52	
44	5.59	51.88	
50	5.17	52.3	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	49.11	49.11	49.11
Bankfull Elevation (ft)	47.35	47.35	47.35
Floodprone Width (ft)	22.44	-----	-----
Bankfull Width (ft)	11.62	5.81	5.81
Entrenchment Ratio	1.93	-----	-----
Mean Depth (ft)	1.27	1.07	1.48
Maximum Depth (ft)	1.76	1.71	1.76
Width/Depth Ratio	9.15	5.43	3.93
Bankfull Area (sq ft)	14.78	6.2	8.57
Wetted Perimeter (ft)	12.72	7.82	8.31
Hydraulic Radius (ft)	1.16	0.79	1.03
Begin BKF Station	19.2	19.2	25.01
End BKF Station	30.82	25.01	30.82



River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: cs4
Survey Date: 02/05/07

Cross Section Data Entry

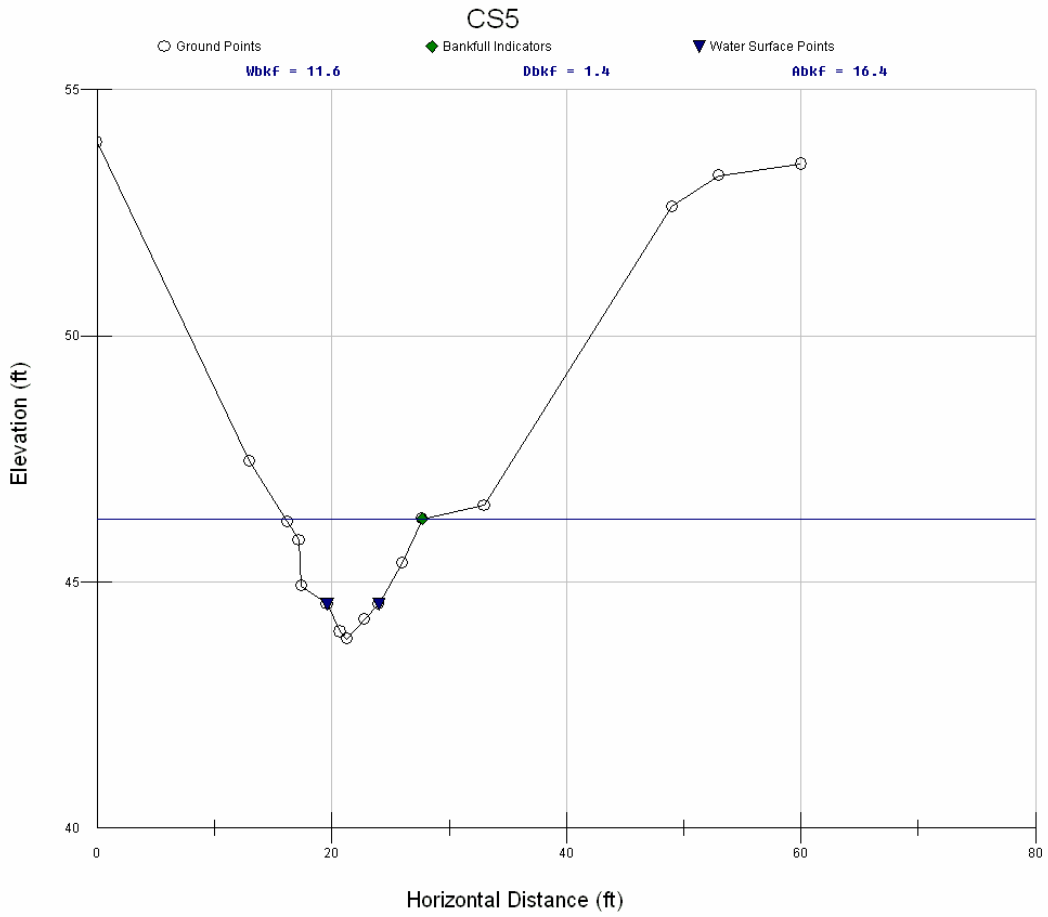
BM Elevation: 51.99 ft
Backsight Rod Reading: 6.28 ft

TAPE	FS	ELEV	NOTE
0	5.63	52.64	LPIN
6.4	5.96	52.31	
10.5	7.87	50.4	
15.8	10.87	47.4	
17.4	11.34	46.93	
21	11.53	46.74	BKF

22	11.94	46.33	
22.6	12.44	45.83	LEW
24.8	13.11	45.16	
26.3	13.13	45.14	
27.4	13.23	45.04	TW
29	12.8	45.47	
29.8	12.46	45.81	REW
31	12.13	46.14	
32	11.6	46.67	
32.4	10.84	47.43	
34.4	10.09	48.18	
39.3	5.82	52.45	
44	5.64	52.63	
50	5.78	52.49	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	48.44	48.44	48.44
Bankfull Elevation (ft)	46.74	46.74	46.74
Floodprone Width (ft)	20.74	-----	-----
Bankfull Width (ft)	11.04	5.52	5.52
Entrenchment Ratio	1.88	-----	-----
Mean Depth (ft)	1.09	1.1	1.08
Maximum Depth (ft)	1.7	1.62	1.7
Width/Depth Ratio	10.13	5.02	5.11
Bankfull Area (sq ft)	12.05	6.08	5.97
Wetted Perimeter (ft)	11.75	7.5	7.49
Hydraulic Radius (ft)	1.03	0.81	0.8
Begin BKF Station	21	21	26.52
End BKF Station	32.04	26.52	32.04



River Name: Tarboro Canal
Reach Name: Reach 1
Cross Section Name: CS5
Survey Date: 02/05/07

Cross Section Data Entry

BM Elevation: 53.98 ft
Backsight Rod Reading: 5.13 ft

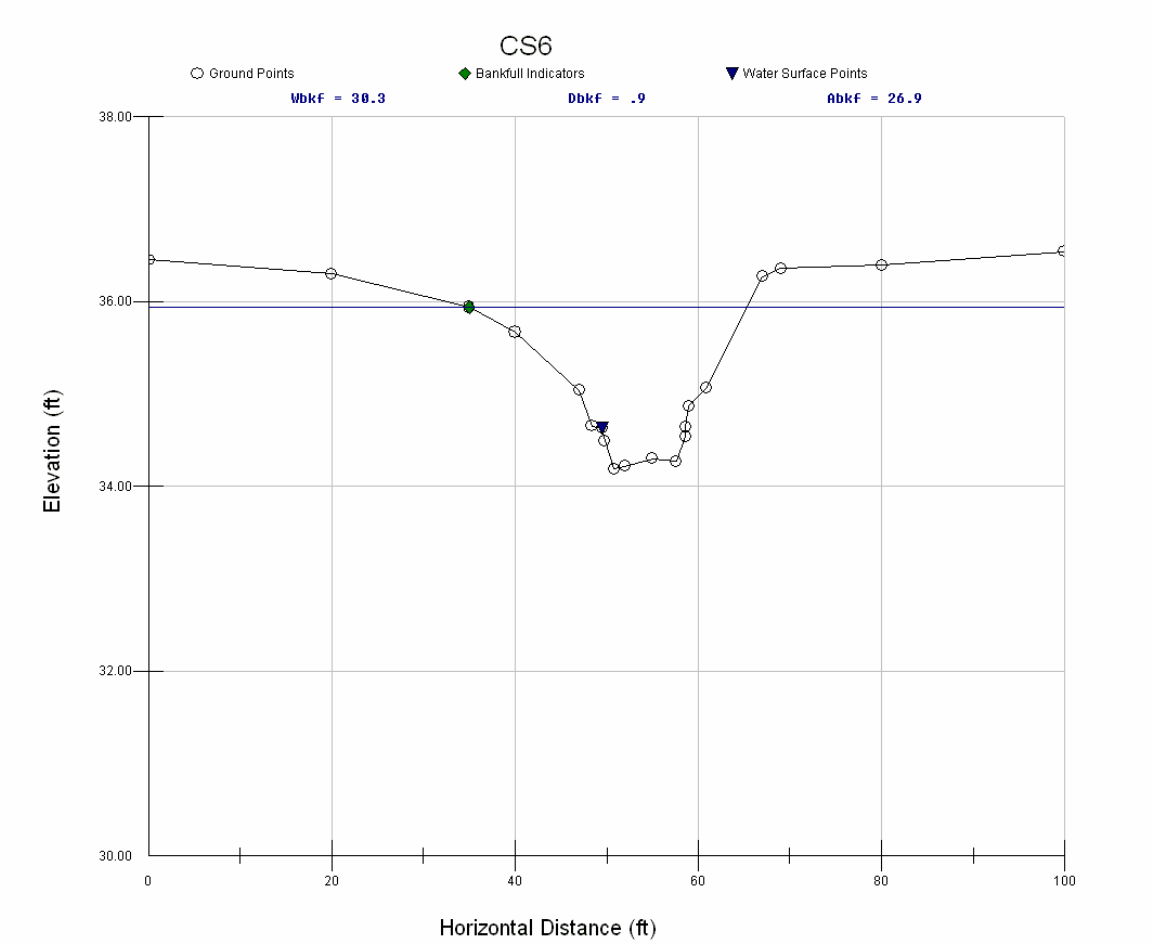
TAPE	FS	ELEV	NOTE
0	5.18	53.93	LPIN
13	11.65	47.46	
16.2	12.88	46.23	
17.2	13.26	45.85	
17.4	14.19	44.92	

19.6	14.55	44.56	LEW
20.7	15.12	43.99	
21.3	15.27	43.84	TW
22.8	14.86	44.25	
24	14.55	44.56	REW
26	13.73	45.38	
27.7	12.83	46.28	BKF
33	12.55	46.56	
49	6.48	52.63	
53	5.86	53.25	
60	5.62	53.49	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	48.72	48.72	48.72
Bankfull Elevation (ft)	46.28	46.28	46.28
Floodprone Width (ft)	28.23	-----	-----
Bankfull Width (ft)	11.63	5.81	5.82
Entrenchment Ratio	2.43	-----	-----
Mean Depth (ft)	1.41	1.52	1.31
Maximum Depth (ft)	2.44	2.44	2.28
Width/Depth Ratio	8.25	3.82	4.44
Bankfull Area (sq ft)	16.42	8.8	7.62
Wetted Perimeter (ft)	13.13	9.13	8.56
Hydraulic Radius (ft)	1.25	0.96	0.89
Begin BKF Station	16.07	16.07	21.88
End BKF Station	27.7	21.88	27.7

REACH 2 CROSS SECTIONS



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS6
Survey Date: 02/06/07

Cross Section Data Entry

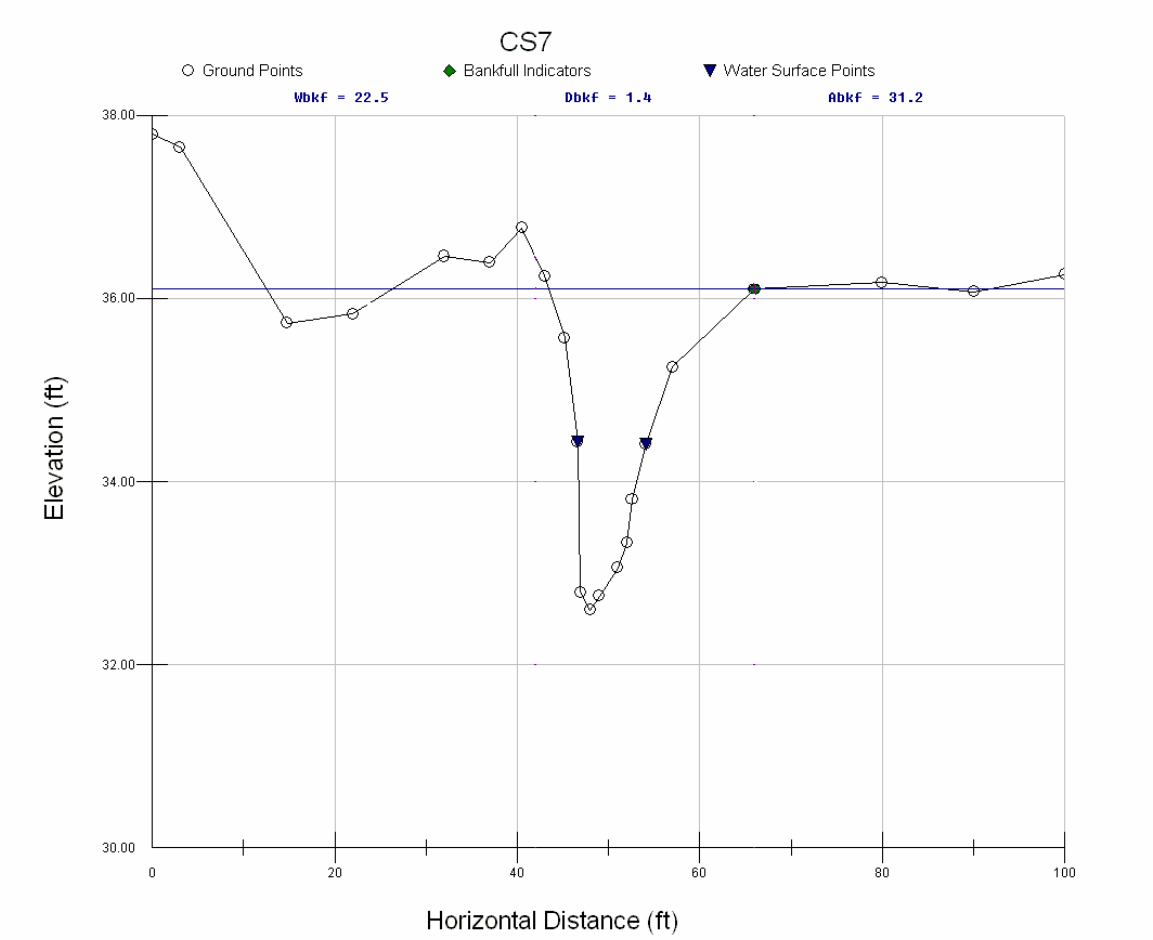
BM Elevation: 38.41 ft
Backsight Rod Reading: 5.26 ft

TAPE	FS	ELEV	NOTE
0	7.22	36.45	LPIN

20	7.37	36.3	
35	7.73	35.94	BKF
40	8	35.67	
47	8.63	35.04	
48.4	9.02	34.65	
49.5	9.04	34.63	LEW
49.8	9.18	34.49	
50.8	9.48	34.19	TW
52	9.45	34.22	
55	9.37	34.3	
57.6	9.4	34.27	
58.6	9.13	34.54	
58.6	9.03	34.64	REW
59	8.8	34.87	
60.9	8.6	35.07	
67	7.4	36.27	
69	7.31	36.36	
80	7.28	36.39	
100	7.13	36.54	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	37.69	37.69	37.69
Bankfull Elevation (ft)	35.94	35.94	35.94
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	30.32	5.5	24.82
Entrenchment Ratio	3.3	-----	-----
Mean Depth (ft)	0.89	0.15	1.05
Maximum Depth (ft)	1.75	0.31	1.75
Width/Depth Ratio	34.07	36.67	23.64
Bankfull Area (sq ft)	26.95	0.82	26.13
Wetted Perimeter (ft)	30.78	5.82	25.58
Hydraulic Radius (ft)	0.88	0.14	1.02
Begin BKF Station	35	35	40.5
End BKF Station	65.32	40.5	65.32



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS7
Survey Date: 02/06/07

Cross Section Data Entry

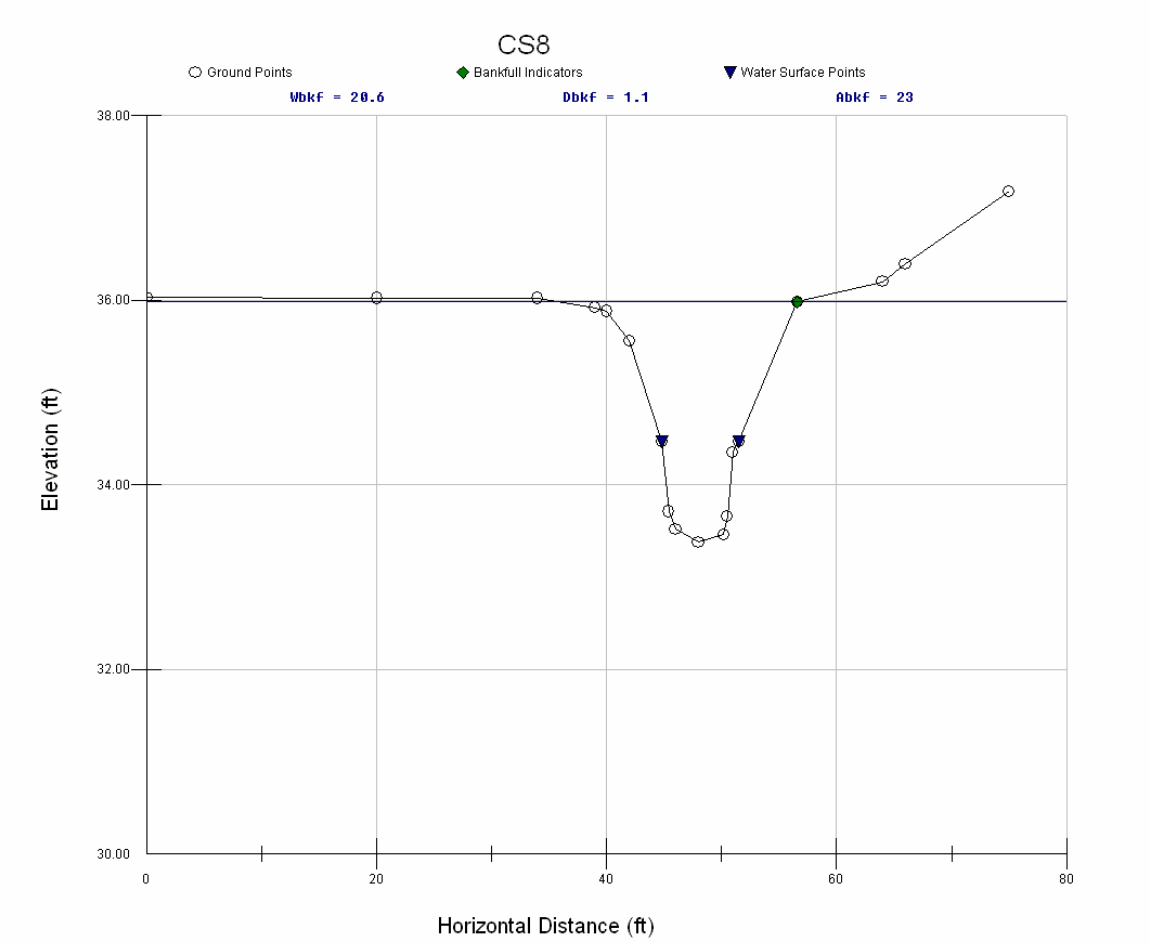
BM Elevation: 38.41 ft
Backsight Rod Reading: 5.26 ft

TAPE	FS	ELEV	NOTE
0	5.88	37.79	LPIN
3	6.02	37.65	
14.8	7.94	35.73	
22	7.84	35.83	
32	7.21	36.46	

37	7.28	36.39	
40.5	6.9	36.77	
43	7.43	36.24	
45.2	8.1	35.57	
46.6	9.24	34.43	LEW
46.9	10.88	32.79	
48	11.07	32.6	TW
49	10.92	32.75	
51	10.61	33.06	
52	10.34	33.33	
52.6	9.86	33.81	
54.1	9.26	34.41	REW
57	8.42	35.25	
66	7.57	36.1	BKF
80	7.5	36.17	
90	7.6	36.07	
100	7.41	36.26	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	39.6	39.6	39.6
Bankfull Elevation (ft)	36.1	36.1	36.1
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	22.54	11.27	11.27
Entrenchment Ratio	4.44	-----	-----
Mean Depth (ft)	1.39	2.19	0.58
Maximum Depth (ft)	3.5	3.5	1.51
Width/Depth Ratio	16.22	5.15	19.43
Bankfull Area (sq ft)	31.22	24.72	6.5
Wetted Perimeter (ft)	24.92	15.03	12.91
Hydraulic Radius (ft)	1.25	1.65	0.5
Begin BKF Station	43.46	43.46	54.73
End BKF Station	66	54.73	66



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS8
Survey Date: 02/06/07

Cross Section Data Entry

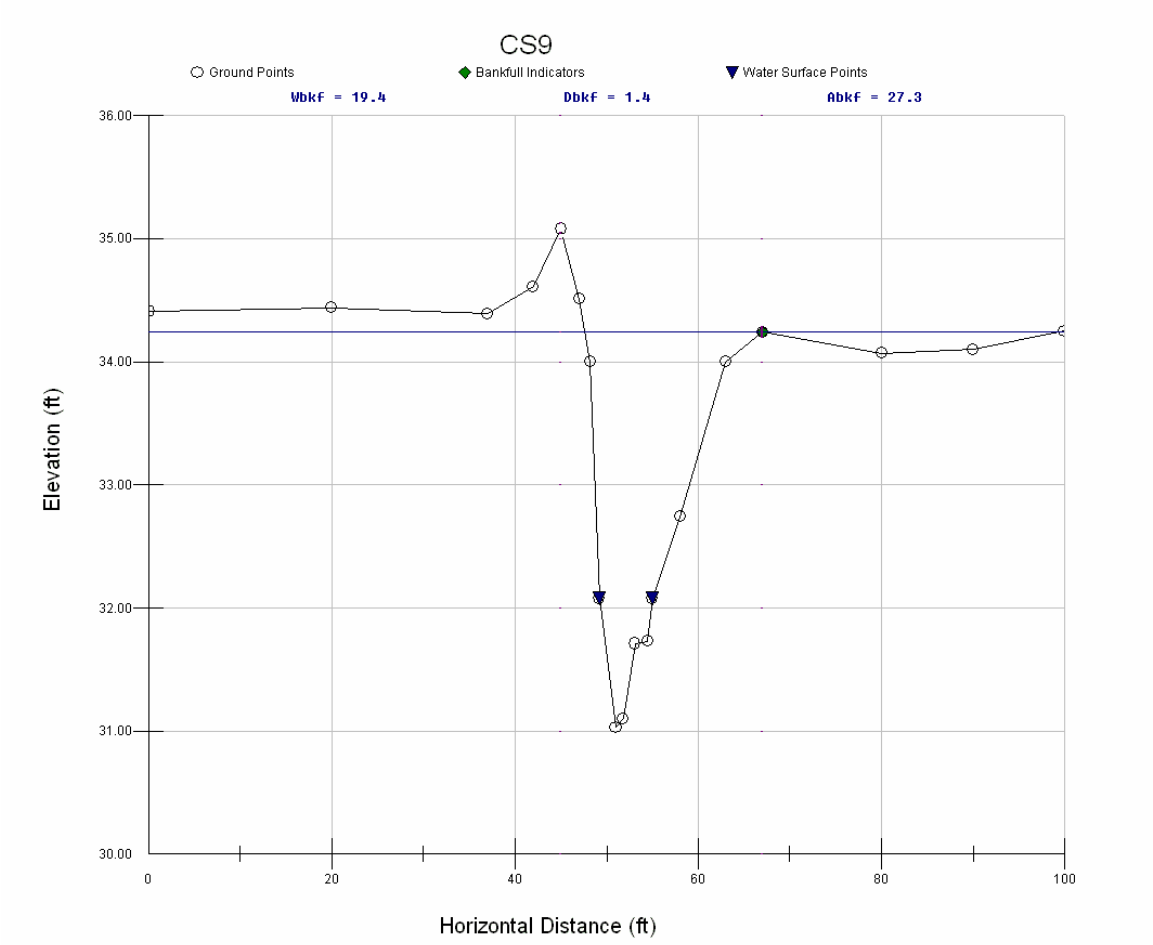
BM Elevation: 38.41 ft
Backsight Rod Reading: 5.26 ft

TAPE	FS	ELEV	NOTE
0	7.64	36.03	LPIN
20	7.65	36.02	
34	7.65	36.02	
39	7.75	35.92	
40	7.79	35.88	

42	8.11	35.56	
44.8	9.2	34.47	LEW
45.4	9.96	33.71	
46	10.15	33.52	
48	10.29	33.38	TW
50.2	10.21	33.46	
50.5	10.01	33.66	
51	9.32	34.35	
51.5	9.2	34.47	REW
56.6	7.69	35.98	BKF
64	7.47	36.2	
66	7.28	36.39	
75	6.49	37.18	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	38.58	38.58	38.58
Bankfull Elevation (ft)	35.98	35.98	35.98
Floodprone Width (ft)	75	-----	-----
Bankfull Width (ft)	20.6	12.13	8.47
Entrenchment Ratio	3.64	-----	-----
Mean Depth (ft)	1.12	0.94	1.37
Maximum Depth (ft)	2.6	2.6	2.6
Width/Depth Ratio	18.39	12.9	6.18
Bankfull Area (sq ft)	22.99	11.34	11.64
Wetted Perimeter (ft)	21.88	15.36	11.71
Hydraulic Radius (ft)	1.05	0.74	0.99
Begin BKF Station	36	36	48.13
End BKF Station	56.6	48.13	56.6



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS9
Survey Date: 02/06/07

Cross Section Data Entry

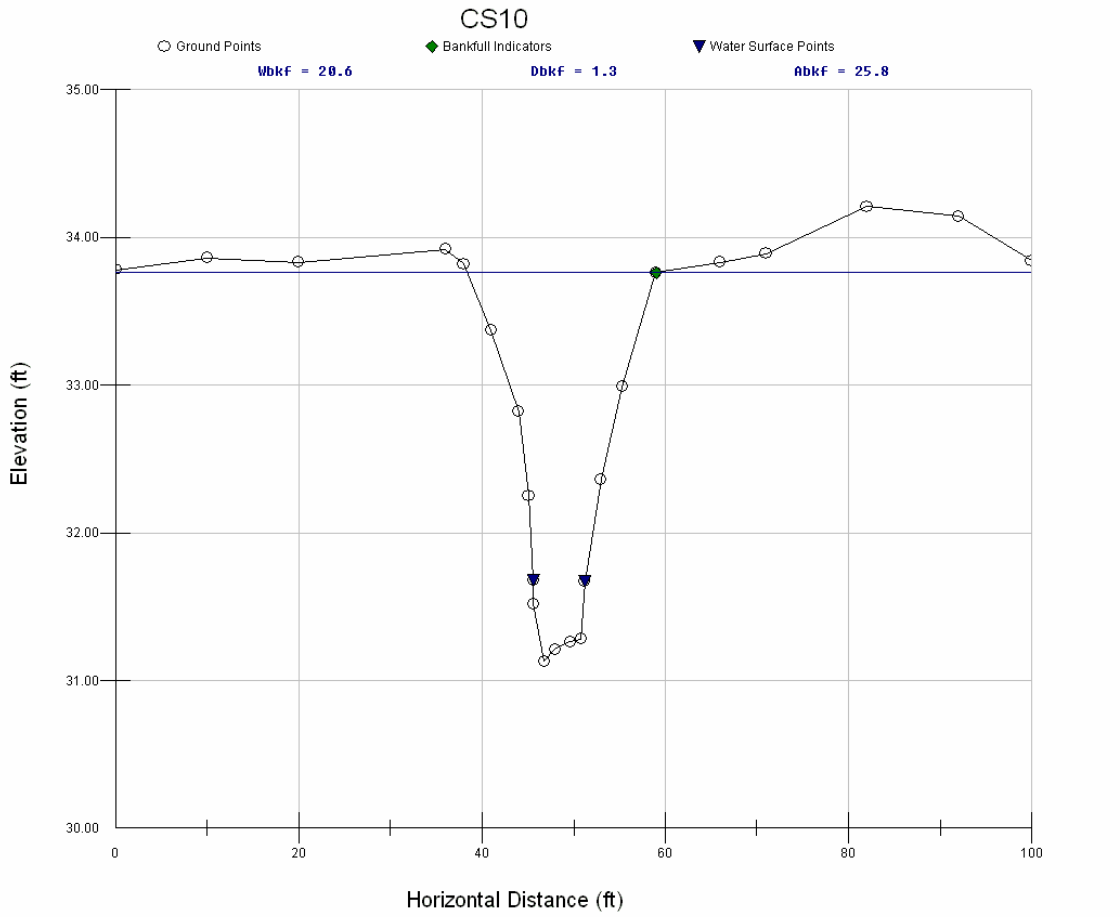
BM Elevation: 36.41 ft
Backsight Rod Reading: 5.44 ft

TAPE	FS	ELEV	NOTE
0	7.44	34.41	LPIN
20	7.41	34.44	
37	7.46	34.39	
42	7.24	34.61	

45	6.77	35.08	
47	7.34	34.51	
48.2	7.85	34	
49.2	9.77	32.08	LEW
51	10.82	31.03	TW
51.8	10.75	31.1	
53.1	10.14	31.71	
54.5	10.12	31.73	
55	9.77	32.08	REW
58	9.11	32.74	
63	7.85	34	
67	7.61	34.24	BKF
80	7.78	34.07	
90	7.75	34.1	
100	7.6	34.25	
101.4	7.6	34.25	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	37.45	37.45	37.45
Bankfull Elevation (ft)	34.24	34.24	34.24
Floodprone Width (ft)	101.4	-----	-----
Bankfull Width (ft)	19.36	9.68	9.68
Entrenchment Ratio	5.24	-----	-----
Mean Depth (ft)	1.41	2.21	0.61
Maximum Depth (ft)	3.21	3.21	1.65
Width/Depth Ratio	13.73	4.38	15.87
Bankfull Area (sq ft)	27.34	21.44	5.9
Wetted Perimeter (ft)	21.35	13.13	11.51
Hydraulic Radius (ft)	1.28	1.63	0.51
Begin BKF Station	47.64	47.64	57.32
End BKF Station	67	57.32	67



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS10
Survey Date: 02/06/07

Cross Section Data Entry

BM Elevation: 36.41 ft
Backsight Rod Reading: 5.44 ft

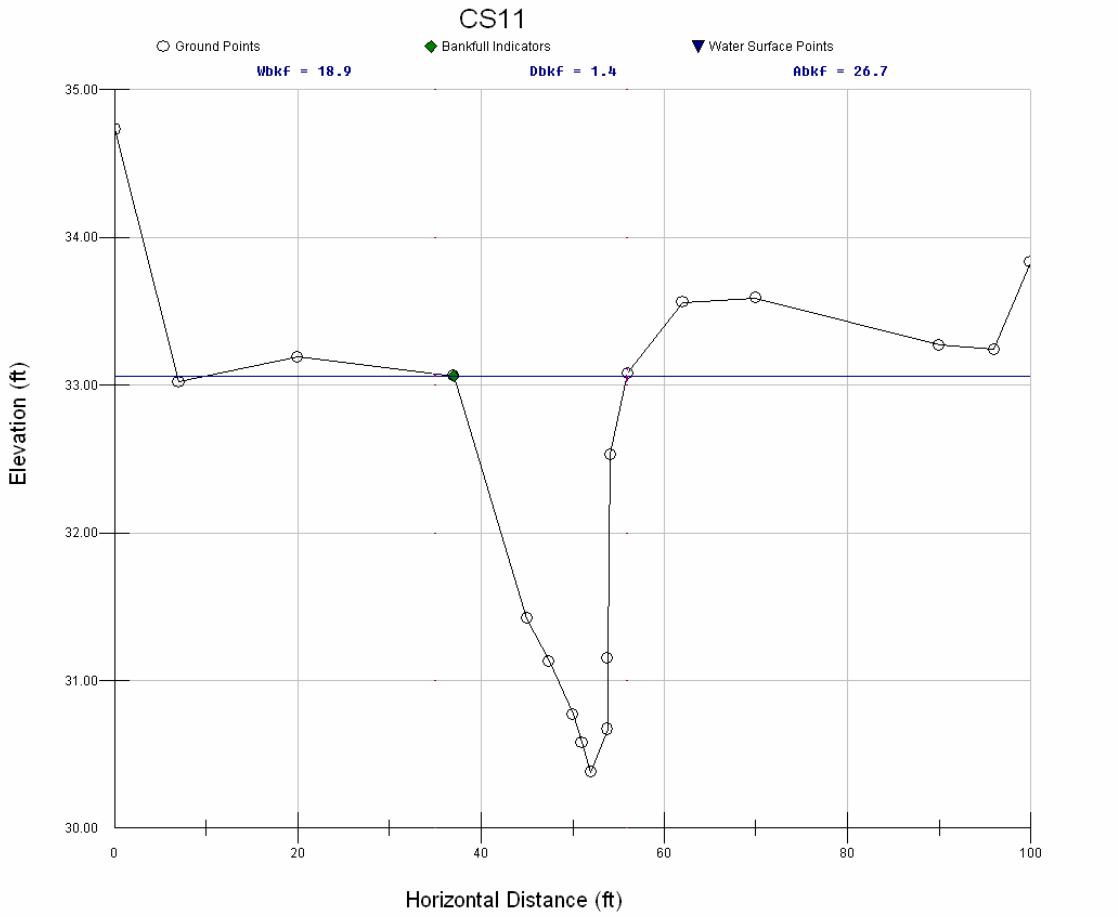
TAPE	FS	ELEV	NOTE
0	8.07	33.78	LPIN
10	7.99	33.86	
20	8.02	33.83	
36	7.93	33.92	
38	8.03	33.82	

41	8.48	33.37	
44	9.03	32.82	
45.1	9.6	32.25	
45.6	10.17	31.68	LEW
45.6	10.33	31.52	
46.8	10.72	31.13	TW
48	10.64	31.21	
49.6	10.59	31.26	
50.8	10.57	31.28	
51.2	10.18	31.67	REW
53	9.49	32.36	
55.3	8.86	32.99	
59	8.09	33.76	BKF
66	8.02	33.83	
71	7.96	33.89	
82	7.64	34.21	
92	7.71	34.14	
100	8.01	33.84	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	36.39	36.39	36.39
Bankfull Elevation (ft)	33.76	33.76	33.76
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	20.6	10.3	10.3
Entrenchment Ratio	4.85	-----	-----
Mean Depth (ft)	1.25	1.22	1.28
Maximum Depth (ft)	2.63	2.63	2.53
Width/Depth Ratio	16.48	8.44	8.05
Bankfull Area (sq ft)	25.78	12.55	13.23
Wetted Perimeter (ft)	21.75	13.53	13.28
Hydraulic Radius (ft)	1.19	0.93	1
Begin BKF Station	38.4	38.4	48.7
End BKF Station	59	48.7	59

River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS11
Survey Date: 02/06/07



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS11
Survey Date: 02/06/07

Cross Section Data Entry

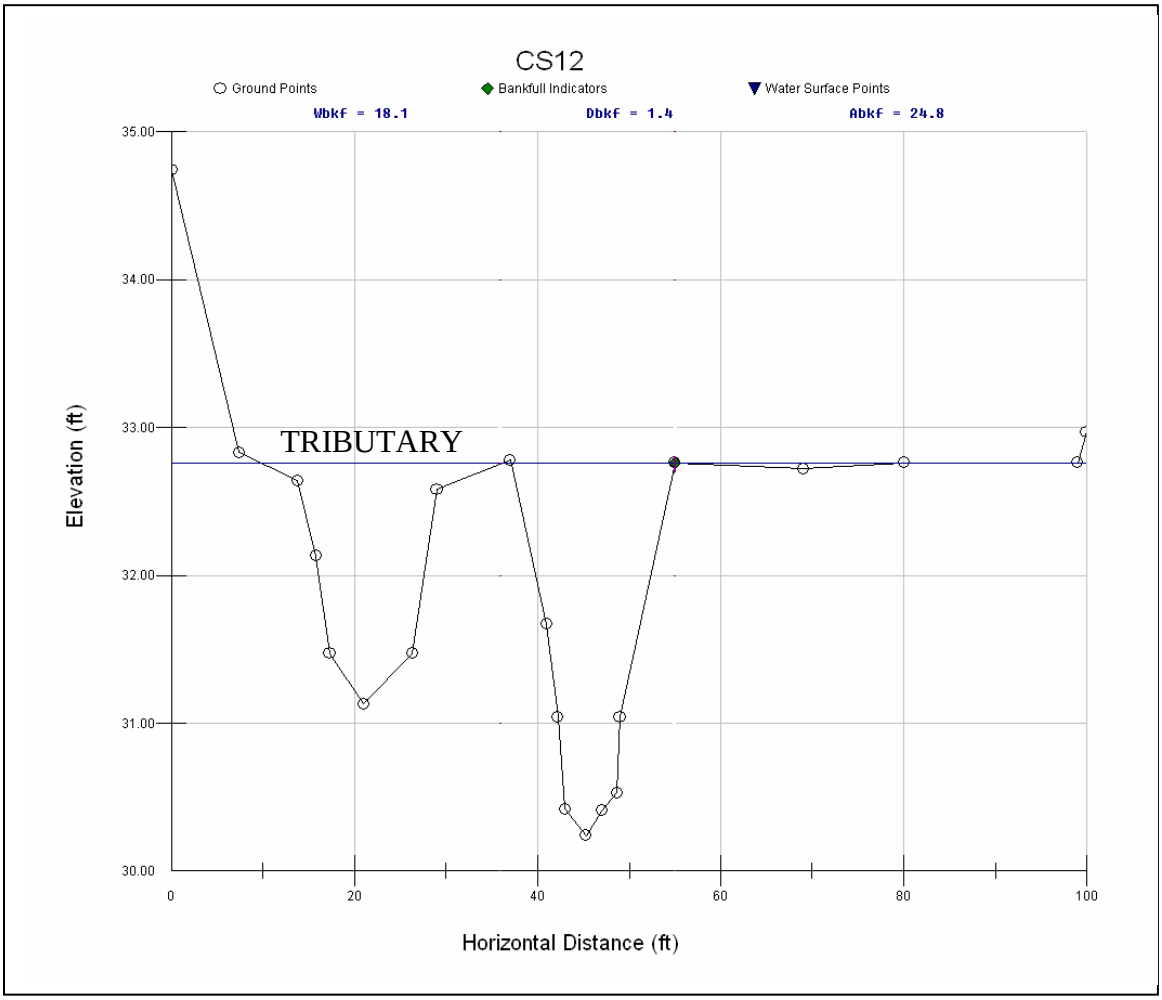
BM Elevation: 36.41 ft
Backsight Rod Reading: 5.44 ft

TAPE	FS	ELEV	NOTE
0	7.12	34.73	LPIN
7	8.83	33.02	
20	8.66	33.19	
37	8.79	33.06	BKF
45	10.43	31.42	
47.4	10.72	31.13	LEOW

50	11.08	30.77	
51	11.27	30.58	
52	11.47	30.38	TW
53.8	11.18	30.67	
53.8	10.7	31.15	REOW
54.1	9.32	32.53	
56	8.77	33.08	
62	8.29	33.56	
70	8.26	33.59	
90	8.58	33.27	
96	8.61	33.24	
100	8.02	33.83	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	35.74	35.74	35.74
Bankfull Elevation (ft)	33.06	33.06	33.06
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	18.93	9.54	9.39
Entrenchment Ratio	5.28	-----	-----
Mean Depth (ft)	1.41	0.97	1.86
Maximum Depth (ft)	2.68	1.83	2.68
Width/Depth Ratio	13.43	9.84	5.05
Bankfull Area (sq ft)	26.71	9.23	17.48
Wetted Perimeter (ft)	20.87	11.54	12.98
Hydraulic Radius (ft)	1.28	0.8	1.35
Begin BKF Station	37	37	46.54
End BKF Station	55.93	46.54	55.93



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS12
Survey Date: 02/06/07

Cross Section Data Entry

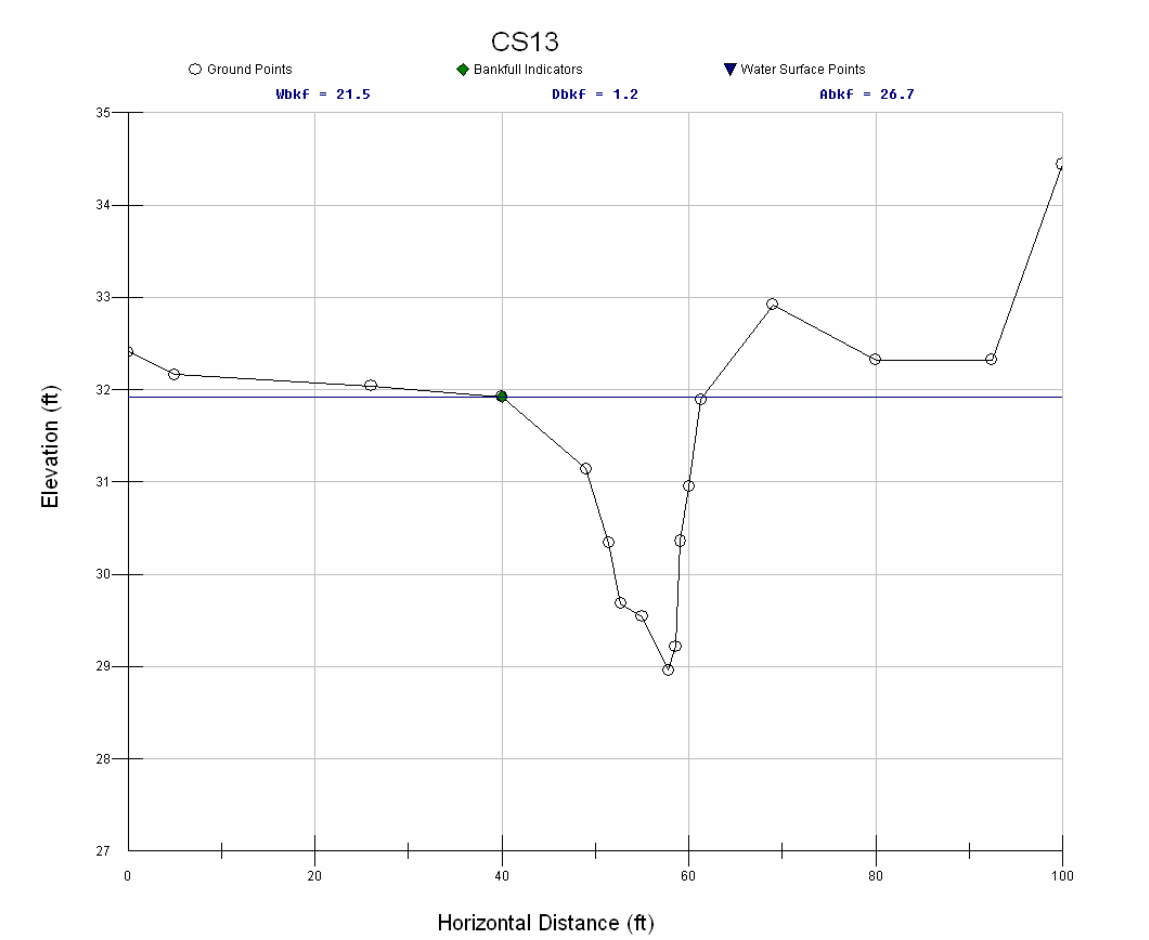
BM Elevation: 32.5 ft
Backsight Rod Reading: 5.33 ft

TAPE	FS	ELEV	NOTE
0	3.09	34.74	LPIN
7.4	5	32.83	
13.8	5.19	32.64	

15.8	5.7	32.13	
17.3	6.36	31.47	
21	6.7	31.13	
26.3	6.36	31.47	
29	5.25	32.58	
37	5.05	32.78	
41	6.16	31.67	
42.2	6.79	31.04	LEW
43	7.41	30.42	
45.3	7.59	30.24	TW
47	7.42	30.41	
48.7	7.3	30.53	
49	6.79	31.04	REW
55	5.07	32.76	BKF
69	5.11	32.72	
80	5.07	32.76	
99	5.07	32.76	
100	4.86	32.97	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	35.28	35.28	35.28
Bankfull Elevation (ft)	32.76	32.76	32.76
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	18.13	8.44	10.56
Entrenchment Ratio	5.52	-----	-----
Mean Depth (ft)	1.37	1.18	1.51
Maximum Depth (ft)	2.52	2.45	2.52
Width/Depth Ratio	13.23	7.15	6.99
Bankfull Area (sq ft)	24.83	8.9	15.92
Wetted Perimeter (ft)	19.2	10.55	13.56
Hydraulic Radius (ft)	1.29	0.84	1.17
Begin BKF Station	36	36	44.44
End BKF Station	55	44.44	55



River Name: Tarboro Canal
Reach Name: Reach 2
Cross Section Name: CS13
Survey Date: 02/06/07

Cross Section Data Entry

BM Elevation: 32.5 ft
Backsight Rod Reading: 5.28 ft

TAPE	FS	ELEV	NOTE
0	5.37	32.41	LPIN
5	5.62	32.16	
26	5.74	32.04	
40	5.86	31.92	BKF
49	6.64	31.14	

51.4	7.44	30.34	LEW
52.7	8.1	29.68	
55	8.24	29.54	
57.8	8.82	28.96	TW
58.6	8.56	29.22	
59.1	7.42	30.36	REW
60	6.83	30.95	
61.3	5.89	31.89	
69	4.86	32.92	
80	5.46	32.32	
92.4	5.46	32.32	
100	3.34	34.44	RPIN

Cross Sectional Geometry

	Channel	Left	Right
Floodprone Elevation (ft)	34.88	34.88	34.88
Bankfull Elevation (ft)	31.92	31.92	31.92
Floodprone Width (ft)	100	-----	-----
Bankfull Width (ft)	21.52	4.21	17.31
Entrenchment Ratio	4.65	-----	-----
Mean Depth (ft)	1.24	0.18	1.5
Maximum Depth (ft)	2.96	0.36	2.96
Width/Depth Ratio	17.35	23.39	11.54
Bankfull Area (sq ft)	26.73	0.77	25.97
Wetted Perimeter (ft)	23.18	4.59	19.31
Hydraulic Radius (ft)	1.15	0.17	1.34
Begin BKF Station	40	40	44.21
End BKF Station	61.52	44.21	61.52

East Tarboro Canal Stream Restoration
Year 0 Long Profile Raw Data

Reach 1	
Structure Location	
TW Station	Elevation
11+06.27	47.30
12+54.04	47.06
14+93.34	46.76
15+75.53	46.72
17+29.50	46.86
17+91.43	46.77
18+89.91	46.66
20+26.82	46.26
22+19.93	45.89
22+81.01	45.74
24+80.97	45.47
26+91.13	45.17
27+18.75	45.03
27+25.85	44.43
27+64.21	44.50
28+12.25	43.95

Reach 1					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
10+03.02	46.38	10+02.39	47.60	10+32.79	49.01
10+15.04	47.13	10+14.85	47.59	10+44.01	48.99
10+48.26	47.31	10+47.90	47.55	10+90.45	49.02
11+06.27	47.30	11+06.19	47.47	11+20.95	48.80
11+17.20	46.30	11+15.14	47.44	11+70.28	48.88
11+21.96	46.85	11+22.10	47.43	12+18.54	49.03
11+30.90	47.02	11+59.71	47.45	12+53.75	48.95
11+30.70	47.43	11+90.92	47.40	12+64.18	48.41
11+59.64	46.65	12+22.90	47.38	13+00.66	48.68
11+90.87	46.75	12+28.05	47.39	13+49.68	48.62
12+22.60	46.78	12+48.80	47.29	14+05.95	48.66
12+27.85	46.87	12+53.77	47.27	14+57.51	48.84
12+49.02	46.51	12+57.26	47.15	14+93.59	48.90
12+54.04	47.06	12+64.74	47.18	15+06.36	48.52
12+57.44	46.38	12+74.25	47.18	15+17.75	48.29
12+64.68	46.24	13+15.39	47.13	15+59.97	48.34
12+74.24	46.47	13+34.71	47.11	16+28.97	48.09
13+15.30	46.69	13+39.84	47.13	16+90.41	48.29
13+34.78	46.35	13+61.37	47.13	17+25.53	48.28
13+39.99	46.56	13+86.25	47.14	17+36.79	48.83
13+61.61	46.37	14+05.28	47.12	17+90.78	48.33
13+85.88	46.44	14+17.11	47.11	18+02.23	48.21
14+05.15	46.79	14+22.39	47.13	18+58.74	48.33
14+16.90	46.25	14+43.60	47.12	18+88.84	48.34
14+22.26	46.18	14+93.34	47.09	18+94.90	48.34
14+43.85	46.48	15+02.09	47.14	19+32.04	48.39
14+93.34	46.76	15+14.47	47.09	20+43.55	51.46
15+02.05	45.58	15+30.97	47.12	20+64.31	47.89
15+14.47	46.25	15+75.66	47.08	21+32.67	47.59
15+31.05	46.42	15+85.80	47.07	21+86.12	47.46
15+75.53	46.72	16+00.18	47.10	21+93.09	47.38
15+85.87	46.18	16+12.99	47.06	22+20.77	47.20
16+00.36	46.10	16+77.46	47.06	22+31.25	47.23
16+12.86	46.12	16+97.53	47.03	22+81.04	47.06
16+77.47	45.59	17+17.54	47.10	22+87.59	46.97
16+96.98	45.70	17+29.55	47.05	23+57.42	47.42
17+17.29	45.95	17+40.34	46.96	24+42.45	46.98
17+29.50	46.86	17+75.59	46.95	25+38.62	46.80
17+40.40	46.33	17+90.37	46.94	26+35.94	46.88
17+75.36	46.30	17+99.08	46.93	26+94.62	47.61
17+91.43	46.77	18+45.29	46.92	27+31.36	46.96
17+98.78	46.11	18+55.93	46.92	27+66.06	46.92
18+45.43	46.39	18+89.90	46.93	28+28.52	46.40
18+56.29	46.40	18+94.06	46.85	28+53.06	46.44
18+89.91	46.66	19+90.58	46.66		
18+94.20	46.13	20+15.13	46.67		
19+90.40	46.17	20+26.84	46.41		

Reach 1					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
20+15.04	46.46	20+36.24	46.32		
20+26.82	46.26	20+87.86	46.17		
20+36.13	45.71	21+89.06	46.15		
20+87.84	45.90	21+95.96	46.04		
21+50.33	45.57	22+20.11	46.01		
21+88.88	46.00	22+27.93	45.98		
21+95.88	45.30	22+35.12	45.97		
22+19.93	45.89	22+61.59	45.94		
22+27.57	44.86	22+80.93	45.92		
22+35.08	45.22	22+87.40	45.91		
22+61.55	45.48	22+93.64	45.87		
22+81.01	45.74	23+51.64	45.84		
22+87.53	44.89	24+11.08	45.73		
22+93.58	45.31	24+75.27	45.67		
23+51.90	45.46	24+80.96	45.67		
24+11.11	45.41	24+92.91	45.64		
24+74.88	44.94	25+60.75	45.61		
24+80.97	45.47	25+92.00	45.58		
24+93.05	44.98	26+25.36	45.60		
25+60.65	45.11	26+79.91	45.52		
25+91.62	44.66	26+91.07	45.55		
26+25.19	45.22	27+18.52	45.10		
26+80.04	45.13	27+20.82	44.64		
26+91.13	45.17	27+25.66	44.68		
27+18.75	45.03	27+43.50	44.59		
27+21.56	43.33	27+64.29	44.56		
27+25.85	44.43	27+74.03	44.15		
27+43.61	44.23	27+90.03	44.09		
27+64.21	44.50	28+12.23	44.03		
27+73.63	42.85	28+19.76	43.66		
27+90.11	43.66	28+53.49	43.57		
28+12.25	43.95	28+29.50	43.76		
28+19.61	43.08				
28+53.91	43.08				

Reach 2	
ucture Location	
TW Station	Elevation
15+80.75	33.98
16+86.81	33.71
17+72.24	33.90
19+22.07	33.69
19+70.76	33.80
19+81.57	32.80
19+86.34	33.10
20+75.71	33.42
21+58.43	33.25
21+68.46	32.58
22+25.08	32.28
23+14.14	31.84
23+14.16	31.84
24+65.36	31.87
25+27.42	31.59
25+98.68	31.45
27+32.63	31.31
28+22.24	31.26
29+03.30	31.05
29+97.73	30.68
31+17.58	30.75
31+95.04	30.45
32+67.48	30.21
33+05.41	30.44
33+55.98	30.25
34+60.18	29.97
35+26.75	29.83
35+69.80	29.75
36+12.88	29.66
36+37.87	29.35
37+32.43	29.46
38+10.45	29.14
38+71.04	29.04
39+59.90	28.78

Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
10+77.25	28.57	10+22.97	35.03	10+11.23	36.29
10+00.46	34.10	10+39.97	34.90	11+11.51	35.94
10+05.44	34.64	10+90.66	34.87	11+84.81	36.03
10+21.00	34.66	11+16.09	34.60	12+75.64	35.37
10+33.87	34.61	11+38.48	34.69	13+54.11	35.22
10+43.27	33.55	11+66.43	34.85	14+27.08	35.40
10+56.48	33.06	12+20.06	34.66	14+87.79	35.35
10+69.07	33.87	12+49.97	34.70	14+81.82	35.49
10+78.57	33.97	12+96.64	34.40	15+53.89	34.93
10+83.34	33.61	13+94.82	34.32	16+05.96	35.51
10+94.53	34.48	14+65.09	34.53	16+85.72	35.62
11+08.40	34.23	15+13.41	34.43	17+71.69	35.55
11+18.11	34.10	15+51.10	34.37	18+56.13	35.82
11+23.40	33.84	15+81.32	34.51	19+36.48	35.91
11+31.03	34.28	16+40.06	34.36	20+66.98	35.39
11+50.45	33.97	16+85.80	34.38	21+18.80	34.62
11+58.27	34.35	16+94.28	34.24	22+14.67	34.71
11+71.65	34.03	17+72.46	34.30	23+31.53	34.47
11+84.42	34.02	18+29.62	34.27	24+06.25	33.81
12+01.67	33.82	19+11.52	34.13	24+73.89	33.84
12+19.84	34.27	19+77.50	34.33	25+51.72	33.42
12+37.69	34.25	20+22.62	34.45	26+42.81	33.43
12+56.24	33.97	20+74.34	33.81	27+07.08	33.38
12+66.05	33.36	20+93.54	33.62	27+76.57	33.25
12+93.16	33.89	21+58.08	33.58	28+44.79	32.93
13+00.59	33.93	21+61.26	33.20	29+71.44	32.90
13+32.02	34.05	21+68.43	33.13	30+12.12	32.82
13+48.98	33.51	21+82.91	33.02	30+79.68	32.51
13+52.67	33.98	22+12.27	33.20	31+35.80	32.47
13+59.04	33.69	23+24.76	33.25		
13+73.74	34.00	23+60.13	33.15		
13+81.16	33.65	23+89.69	32.89		
13+98.31	34.09	24+01.64	32.91		
14+13.23	33.95	24+11.08	32.72		
14+20.77	33.22	24+63.90	32.69		
14+31.80	34.23	24+73.12	32.49		
14+49.57	33.62	25+26.80	32.46		
14+62.33	33.96	25+99.72	32.37		
14+61.20	34.06	26+00.05	32.17		
14+82.02	33.37	26+63.72	32.22		
14+90.29	33.41	27+05.73	32.05		
15+00.03	33.69	27+30.71	32.18		
15+22.65	34.10	27+59.03	32.03		
15+25.10	34.05	28+21.86	32.05		
15+57.77	33.34	28+26.05	32.11		
15+71.59	33.77	29+03.03	32.05		
15+80.75	33.98	29+06.92	31.83		

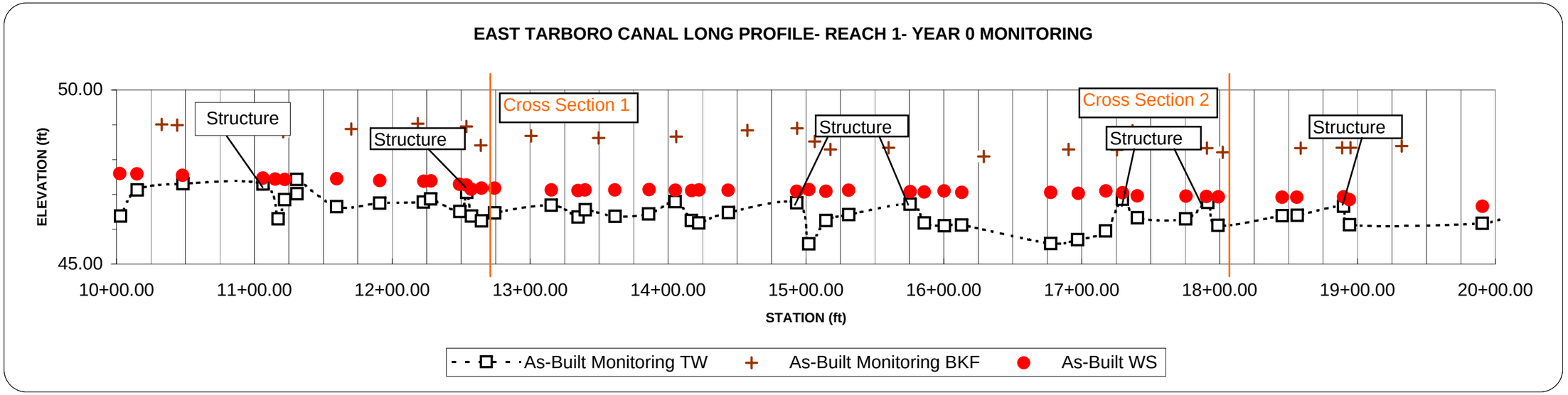
Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
15+92.79	33.71	29+67.86	31.72		
16+12.02	33.87	30+01.59	31.76		
16+39.87	31.88	30+32.49	31.66		
16+66.29	32.72	31+16.55	31.55		
16+86.81	33.71	31+25.44	31.64		
16+98.62	32.28	31+93.08	31.48		
17+20.03	32.32				
17+43.86	32.98				
17+72.24	33.90				
17+86.36	32.38				
17+97.99	31.83				
18+02.90	32.51				
18+18.46	32.83				
18+31.92	33.81				
18+34.99	33.05				
18+46.83	32.93				
18+64.96	31.80				
18+84.42	33.01				
19+06.04	32.86				
19+22.07	33.69				
19+24.67	32.68				
19+36.99	31.75				
19+60.02	33.11				
19+70.76	33.80				
19+81.57	32.80				
19+86.34	33.10				
20+03.07	33.04				
20+18.47	32.31				
20+24.66	33.06				
20+75.71	33.42				
20+98.86	31.78				
21+05.37	31.69				
21+24.95	31.41				
21+34.28	31.99				
21+58.43	33.25				
21+63.21	32.05				
21+68.46	32.58				
21+74.85	31.68				
21+83.03	31.74				
22+08.96	32.52				
22+25.08	32.28				
23+14.14	31.84				
23+14.16	31.84				
23+25.80	31.79				
23+41.37	31.78				
23+60.87	32.15				
23+77.06	31.92				

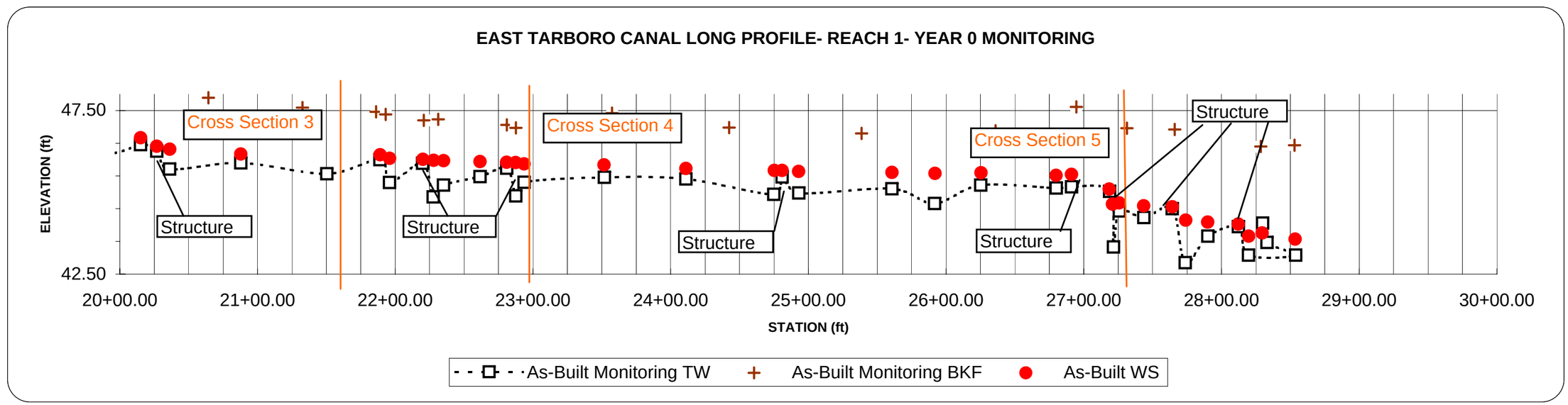
Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
23+84.52	31.54				
24+19.69	31.05				
24+43.50	31.65				
24+65.36	31.87				
24+80.02	30.06				
24+94.10	30.91				
25+12.86	31.04				
25+27.42	31.59				
25+28.56	31.38				
25+40.67	30.71				
25+50.11	31.05				
25+56.68	30.41				
25+66.85	30.61				
25+72.17	30.98				
25+98.68	31.45				
26+00.70	30.10				
26+04.65	29.93				
26+14.57	30.96				
26+28.51	30.46				
26+42.71	30.49				
26+59.94	30.96				
26+75.03	31.10				
26+88.75	30.88				
26+95.46	30.48				
27+08.41	30.61				
27+19.20	30.64				
27+32.63	31.31				
27+35.72	30.03				
27+53.29	30.74				
27+65.53	30.66				
27+71.35	30.65				
27+78.82	30.49				
27+90.34	30.61				
28+06.86	30.83				
28+14.02	30.56				
28+15.75	31.75				
28+22.24	31.26				
28+28.37	30.00				
28+33.59	30.21				
28+43.67	30.14				
28+46.52	30.30				
28+58.02	30.64				
28+61.77	30.16				
28+71.68	30.65				
28+88.60	30.84				
29+03.30	31.05				
29+07.63	30.04				

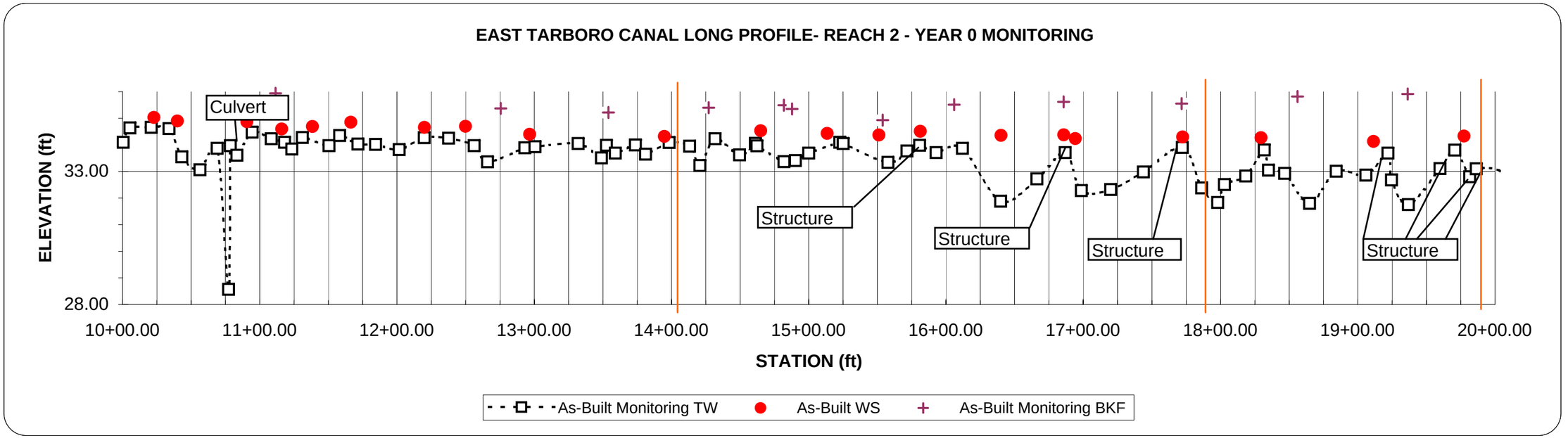
Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
29+12.90	30.39				
29+21.88	30.71				
29+50.13	30.09				
29+68.52	30.72				
29+84.92	30.50				
29+97.73	30.68				
30+04.07	29.85				
30+08.18	30.36				
30+19.53	30.33				
30+40.85	30.47				
30+52.82	30.54				
30+71.88	29.92				
30+80.28	30.33				
30+92.37	30.30				
31+17.58	30.75				
31+27.19	29.68				
31+37.34	30.12				
31+61.21	29.58				
31+70.47	30.11				
31+80.87	30.41				
31+95.04	30.45				
32+02.08	29.64				
32+17.46	30.22				
32+24.26	29.69				
32+32.10	30.06				
32+47.55	30.08				
32+57.90	30.12				
32+67.48	30.21				
32+76.44	29.93				
32+82.04	30.10				
32+90.91	29.83				
32+93.84	29.14				
33+05.27	29.66				
33+05.41	30.44				
33+11.10	29.19				
33+23.22	30.00				
33+37.38	30.27				
33+39.89	29.48				
33+55.98	30.25				
33+61.26	29.51				
33+71.44	29.76				
33+79.70	29.87				
33+96.57	30.07				
34+02.60	29.45				
34+10.56	29.84				
34+17.89	29.48				
34+24.98	29.67				

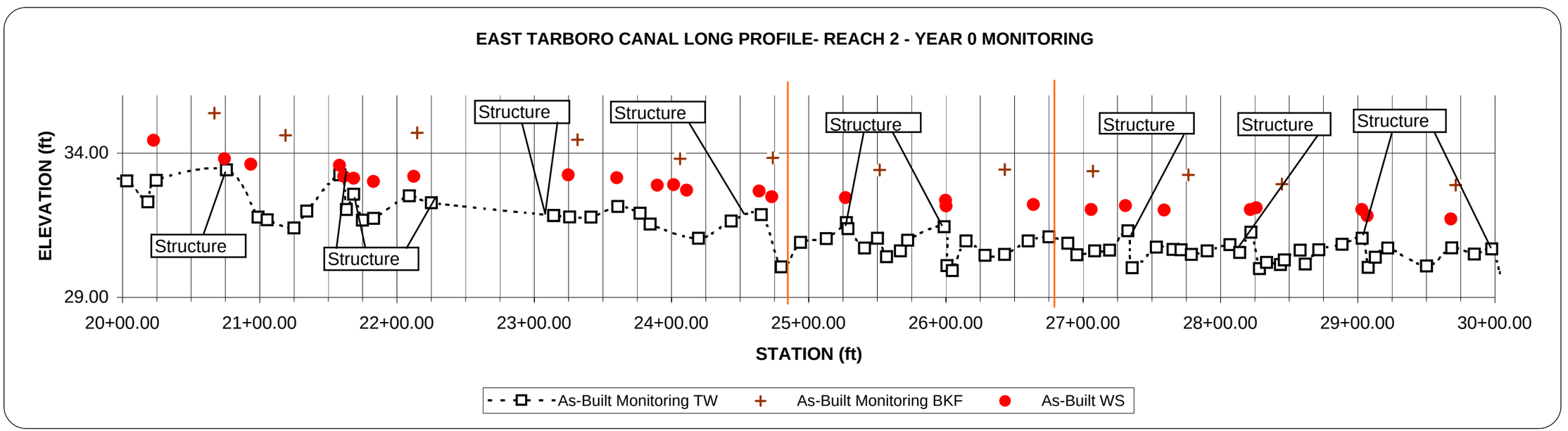
Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
34+32.86	29.56				
34+41.59	29.84				
34+56.88	29.59				
34+60.18	29.97				
34+67.42	29.14				
34+76.06	29.36				
34+84.35	29.65				
34+89.49	28.57				
35+04.53	29.48				
35+17.07	29.55				
35+26.75	29.83				
35+34.02	29.32				
35+37.98	29.37				
35+53.45	29.47				
35+51.97	29.67				
35+54.26	29.12				
35+67.07	29.43				
35+69.80	29.75				
35+68.77	28.66				
35+86.32	29.36				
36+03.76	28.70				
36+12.88	29.66				
36+16.53	29.07				
36+37.87	29.35				
36+44.57	28.97				
36+71.36	29.27				
36+80.99	28.53				
36+96.10	29.10				
37+03.27	28.70				
37+17.57	29.14				
37+32.43	29.46				
37+38.10	28.77				
37+50.66	29.12				
37+65.41	28.37				
37+78.22	28.81				
37+91.53	28.52				
38+05.32	28.94				
38+10.45	29.14				
38+12.39	28.53				
38+15.53	28.40				
38+28.33	28.71				
38+42.31	28.54				
38+56.46	28.87				
38+71.04	29.04				
38+78.18	28.34				
38+84.52	28.52				
38+89.44	28.19				

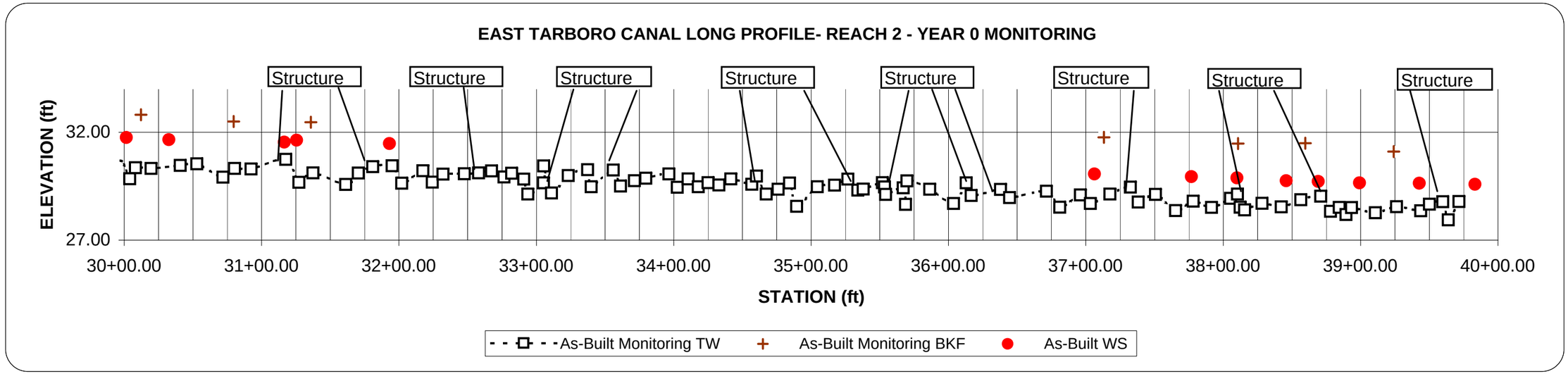
Reach 2					
TW	TW	WS	WS	BKF	BKF
Station	Elevation	Station	Elevation	Station	Elevation
38+93.36	28.51				
39+10.76	28.27				
39+26.13	28.55				
39+43.78	28.36				
39+50.12	28.67				
39+59.90	28.78				
39+63.82	27.94				
39+71.62	28.79				


EAST TARBORO CANAL LONG PROFILE- REACH 1- YEAR 0 MONITORING
ELEVATION (ft)
50.00
45.00
Structure
Structure
Cross Section 1
Structure
Cross Section 2
Structure
Structure
10+00.00
11+00.00
12+00.00
13+00.00
14+00.00
15+00.00
16+00.00
17+00.00
18+00.00
19+00.00
20+00.00
STATION (ft)
As-Built Monitoring TW
As-Built Monitoring BKF
As-Built WS

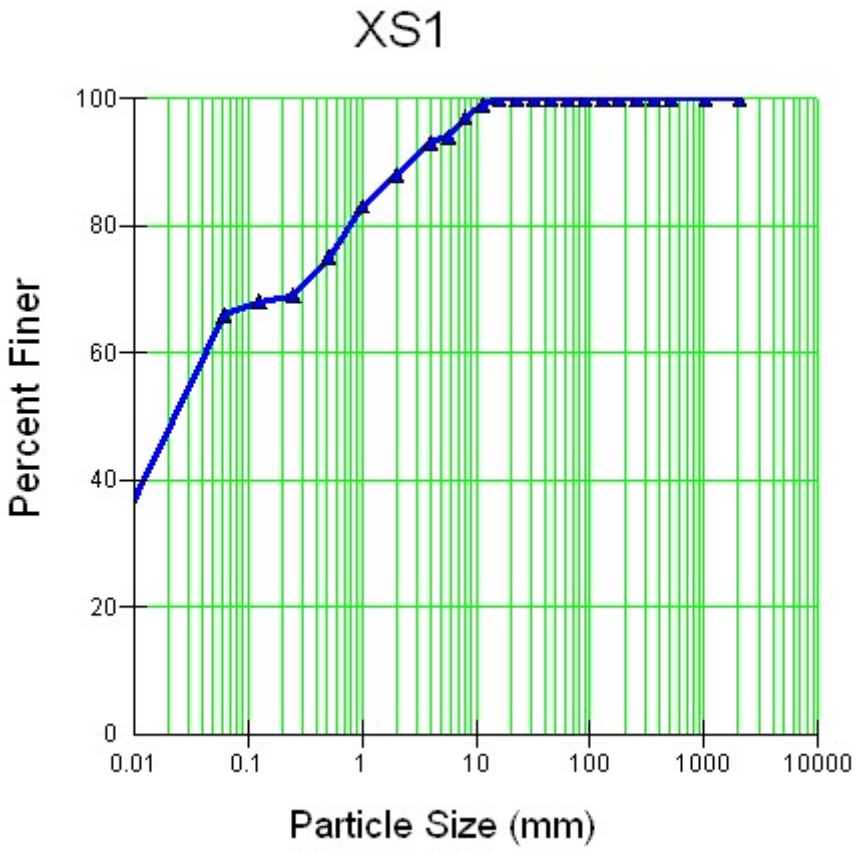

EAST TARBORO CANAL LONG PROFILE- REACH 1- YEAR 0 MONITORING
ELEVATION (ft)
47.50
42.50
Cross Section 3
Structure
Structure
Cross Section 4
Structure
Cross Section 5
Structure
Structure
20+00.00
21+00.00
22+00.00
23+00.00
24+00.00
25+00.00
26+00.00
27+00.00
28+00.00
29+00.00
30+00.00
STATION (ft)
As-Built Monitoring TW
As-Built Monitoring BKF
As-Built WS


EAST TARBORO CANAL LONG PROFILE- REACH 2 - YEAR 0 MONITORING
ELEVATION (ft)
33.00
28.00
Culvert
Structure
Structure
Structure
Structure
10+00.00
11+00.00
12+00.00
13+00.00
14+00.00
15+00.00
16+00.00
17+00.00
18+00.00
19+00.00
20+00.00
STATION (ft)
As-Built Monitoring TW
As-Built WS
As-Built Monitoring BKF


EAST TARBORO CANAL LONG PROFILE- REACH 2 - YEAR 0 MONITORING
ELEVATION (ft)
34.00
29.00
Structure
Structure
Structure
Structure
Structure
Structure
Structure
Structure
20+00.00
21+00.00
22+00.00
23+00.00
24+00.00
25+00.00
26+00.00
27+00.00
28+00.00
29+00.00
30+00.00
STATION (ft)
As-Built Monitoring TW
As-Built Monitoring BKF
As-Built WS


EAST TARBORO CANAL LONG PROFILE- REACH 2 - YEAR 0 MONITORING
Structure
Structure
Structure
Structure
Structure
Structure
Structure
Structure
ELEVATION (ft)
32.00
27.00
30+00.00
31+00.00
32+00.00
33+00.00
34+00.00
35+00.00
36+00.00
37+00.00
38+00.00
39+00.00
40+00.00
STATION (ft)
As-Built Monitoring TW
As-Built Monitoring BKF
As-Built WS

REACH 1 PARTICLE SUMMARIES

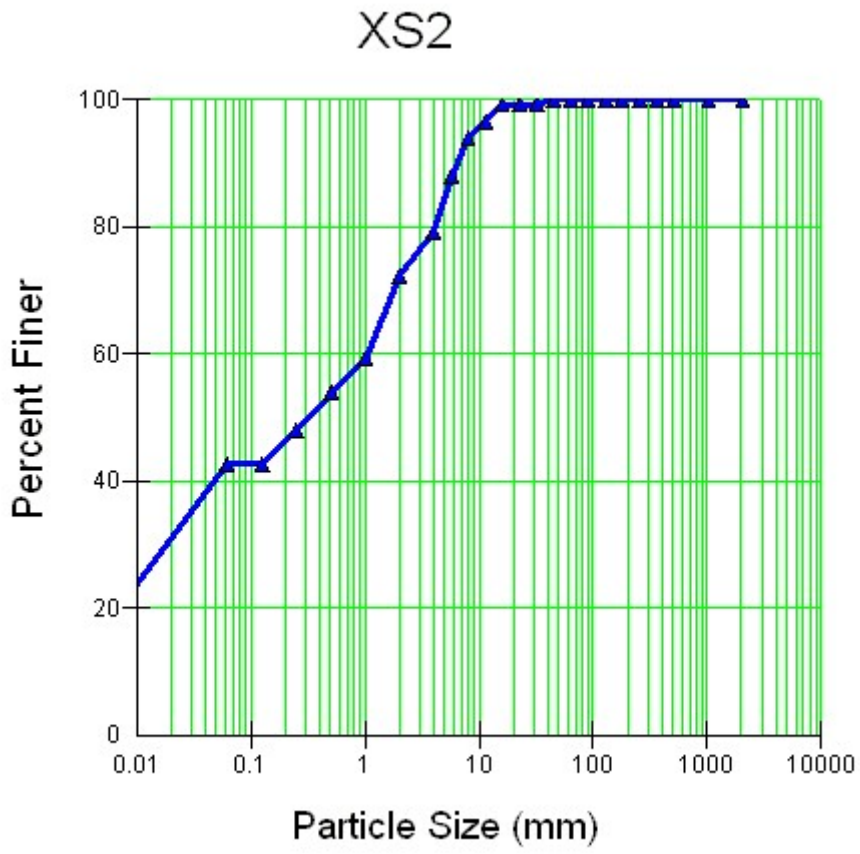


River Name: East Tarboro Canal
Reach Name: Reach 1
Sample Name: XS1
Survey Date: 03/06/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	66	66.00	66.00
0.062 - 0.125	2	2.00	68.00
0.125 - 0.25	1	1.00	69.00
0.25 - 0.50	6	6.00	75.00
0.50 - 1.0	8	8.00	83.00
1.0 - 2.0	5	5.00	88.00
2.0 - 4.0	5	5.00	93.00
4.0 - 5.7	1	1.00	94.00
5.7 - 8.0	3	3.00	97.00

8.0 - 11.3	2	2.00	99.00
11.3 - 16.0	1	1.00	100.00
16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.02
D35 (mm)	0.03
D50 (mm)	0.05
D84 (mm)	1.2
D95 (mm)	6.47
D100 (mm)	16
Silt/Clay (%)	66
Sand (%)	22
Gravel (%)	12
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

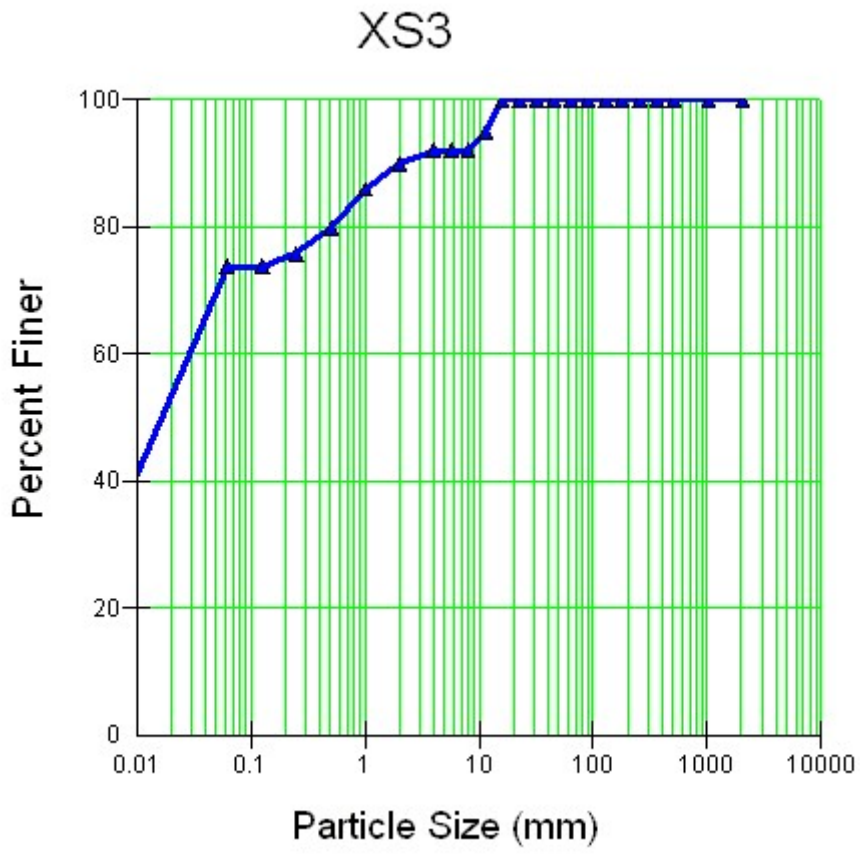


River Name: East Tarboro Canal
Reach Name: Reach 1
Sample Name: XS2
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	49	42.61	42.61
0.062 - 0.125	0	0.00	42.61
0.125 - 0.25	6	5.22	47.83
0.25 - 0.50	7	6.09	53.91
0.50 - 1.0	6	5.22	59.13
1.0 - 2.0	15	13.04	72.17
2.0 - 4.0	8	6.96	79.13
4.0 - 5.7	10	8.70	87.83
5.7 - 8.0	7	6.09	93.91
8.0 - 11.3	3	2.61	96.52
11.3 - 16.0	3	2.61	99.13
16.0 - 22.6	0	0.00	99.13

22.6 - 32.0	0	0.00	99.13
32 - 45	1	0.87	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.02
D35 (mm)	0.05
D50 (mm)	0.34
D84 (mm)	4.95
D95 (mm)	9.38
D100 (mm)	45
Silt/Clay (%)	42.61
Sand (%)	29.56
Gravel (%)	27.83
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

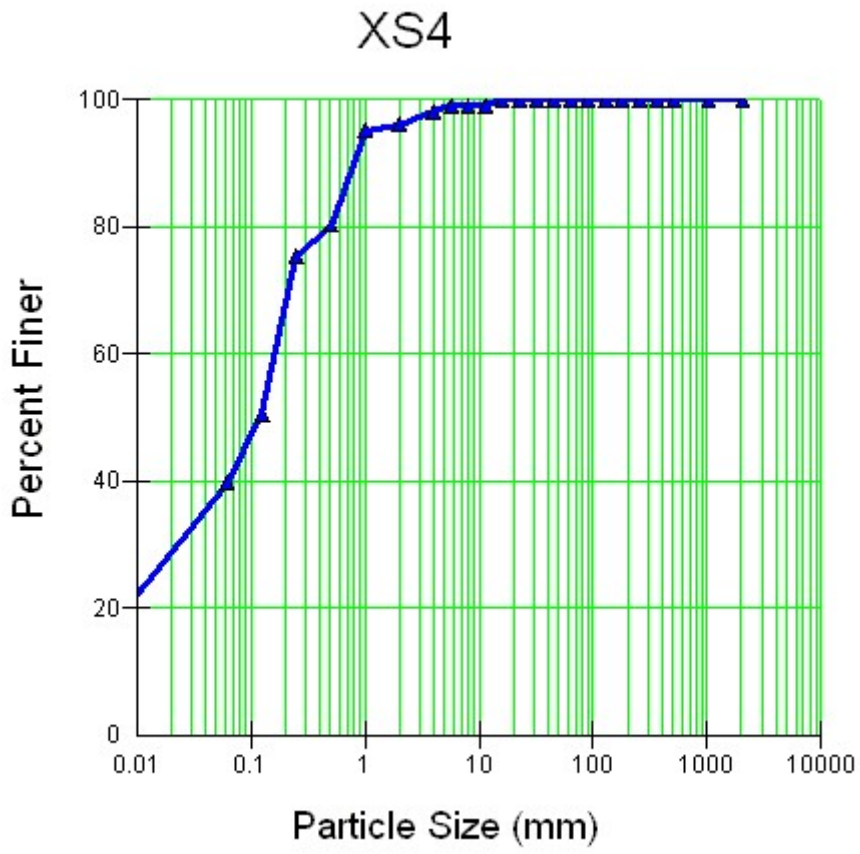


River Name: East Tarboro Canal
Reach Name: Reach 1
Sample Name: XS3
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	73	73.74	73.74
0.062 - 0.125	0	0.00	73.74
0.125 - 0.25	2	2.02	75.76
0.25 - 0.50	4	4.04	79.80
0.50 - 1.0	6	6.06	85.86
1.0 - 2.0	4	4.04	89.90
2.0 - 4.0	2	2.02	91.92
4.0 - 5.7	0	0.00	91.92
5.7 - 8.0	0	0.00	91.92
8.0 - 11.3	3	3.03	94.95
11.3 - 16.0	5	5.05	100.00

16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.01
D35 (mm)	0.03
D50 (mm)	0.04
D84 (mm)	0.85
D95 (mm)	11.35
D100 (mm)	16
Silt/Clay (%)	73.74
Sand (%)	16.16
Gravel (%)	10.1
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

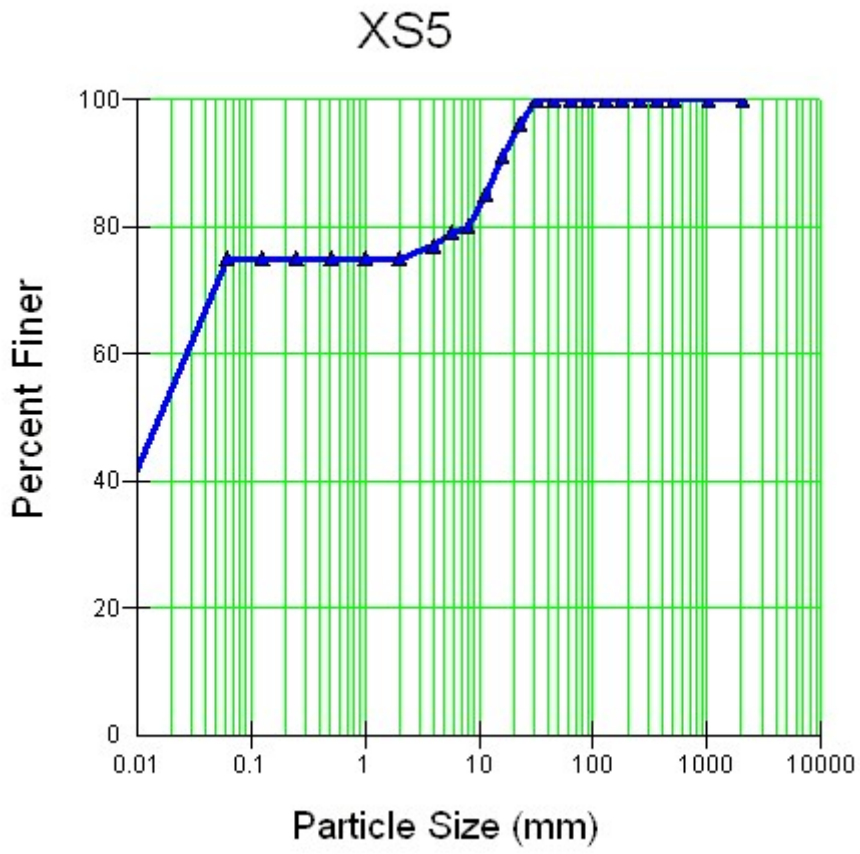


River Name: East Tarboro Canal
Reach Name: Reach 1
Sample Name: XS4
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	40	39.60	39.60
0.062 - 0.125	11	10.89	50.50
0.125 - 0.25	25	24.75	75.25
0.25 - 0.50	5	4.95	80.20
0.50 - 1.0	15	14.85	95.05
1.0 - 2.0	1	0.99	96.04
2.0 - 4.0	2	1.98	98.02
4.0 - 5.7	1	0.99	99.01
5.7 - 8.0	0	0.00	99.01
8.0 - 11.3	0	0.00	99.01
11.3 - 16.0	1	0.99	100.00
16.0 - 22.6	0	0.00	100.00

22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.03
D35 (mm)	0.05
D50 (mm)	0.12
D84 (mm)	0.63
D95 (mm)	1
D100 (mm)	16
Silt/Clay (%)	39.6
Sand (%)	56.44
Gravel (%)	3.96
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0



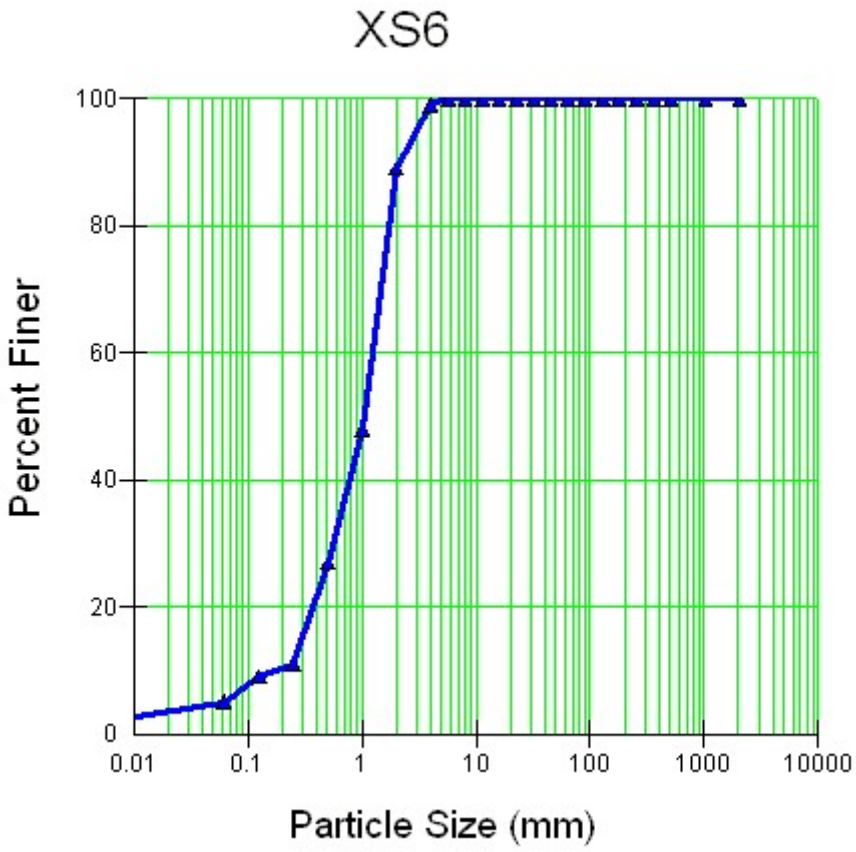
River Name: East Tarboro Canal
Reach Name: Reach 1
Sample Name: XS5
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	75	75.00	75.00
0.062 - 0.125	0	0.00	75.00
0.125 - 0.25	0	0.00	75.00
0.25 - 0.50	0	0.00	75.00
0.50 - 1.0	0	0.00	75.00
1.0 - 2.0	0	0.00	75.00
2.0 - 4.0	2	2.00	77.00
4.0 - 5.7	2	2.00	79.00
5.7 - 8.0	1	1.00	80.00
8.0 - 11.3	5	5.00	85.00
11.3 - 16.0	6	6.00	91.00
16.0 - 22.6	5	5.00	96.00

22.6 - 32.0	4	4.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.01
D35 (mm)	0.03
D50 (mm)	0.04
D84 (mm)	10.64
D95 (mm)	21.28
D100 (mm)	32
Silt/Clay (%)	75
Sand (%)	0
Gravel (%)	25
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

REACH 2 PARTICLE SUMMARIES

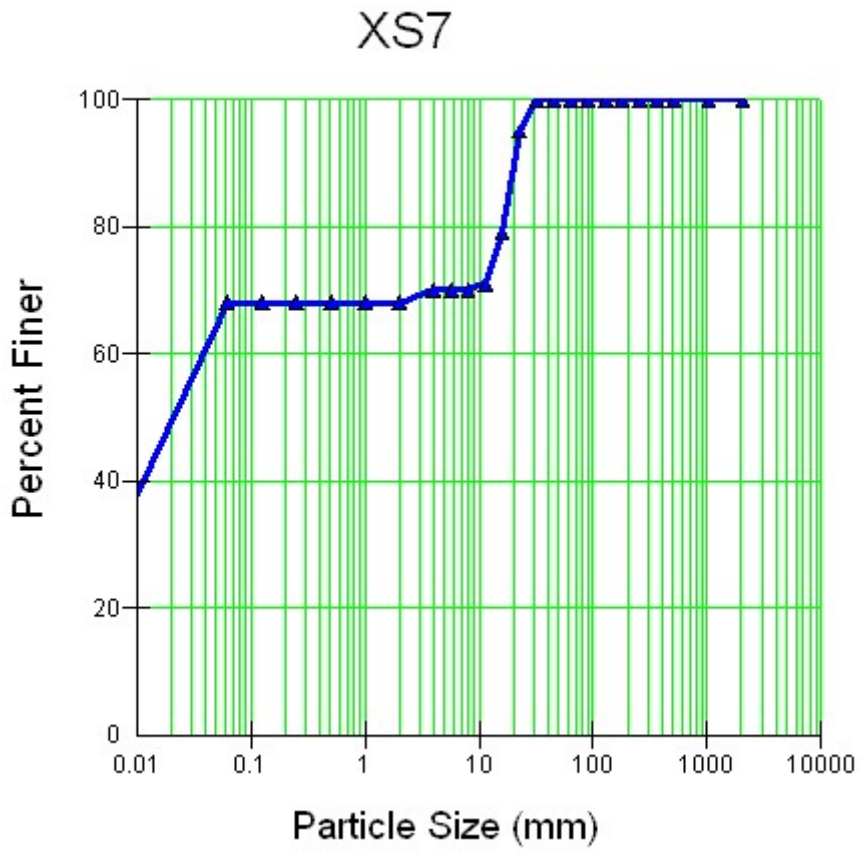


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS6
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	5	5.00	5.00
0.062 - 0.125	4	4.00	9.00
0.125 - 0.25	2	2.00	11.00
0.25 - 0.50	16	16.00	27.00
0.50 - 1.0	21	21.00	48.00
1.0 - 2.0	41	41.00	89.00
2.0 - 4.0	10	10.00	99.00
4.0 - 5.7	1	1.00	100.00

5.7 - 8.0	0	0.00	100.00
8.0 - 11.3	0	0.00	100.00
11.3 - 16.0	0	0.00	100.00
16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.33
D35 (mm)	0.69
D50 (mm)	1.05
D84 (mm)	1.88
D95 (mm)	3.2
D100 (mm)	5.7
Silt/Clay (%)	5
Sand (%)	84
Gravel (%)	11
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

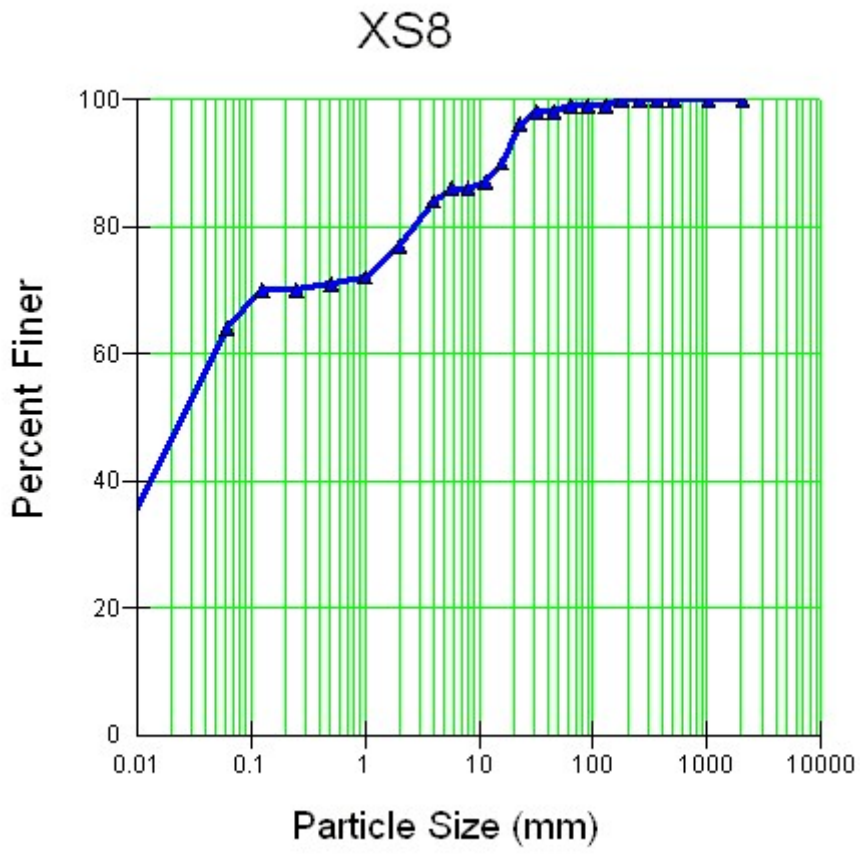


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS7
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	68	68.00	68.00
0.062 - 0.125	0	0.00	68.00
0.125 - 0.25	0	0.00	68.00
0.25 - 0.50	0	0.00	68.00
0.50 - 1.0	0	0.00	68.00
1.0 - 2.0	0	0.00	68.00
2.0 - 4.0	2	2.00	70.00
4.0 - 5.7	0	0.00	70.00
5.7 - 8.0	0	0.00	70.00
8.0 - 11.3	1	1.00	71.00
11.3 - 16.0	8	8.00	79.00
16.0 - 22.6	16	16.00	95.00

22.6 - 32.0	5	5.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.02
D35 (mm)	0.03
D50 (mm)	0.05
D84 (mm)	18.06
D95 (mm)	22.6
D100 (mm)	32
Silt/Clay (%)	68
Sand (%)	0
Gravel (%)	32
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

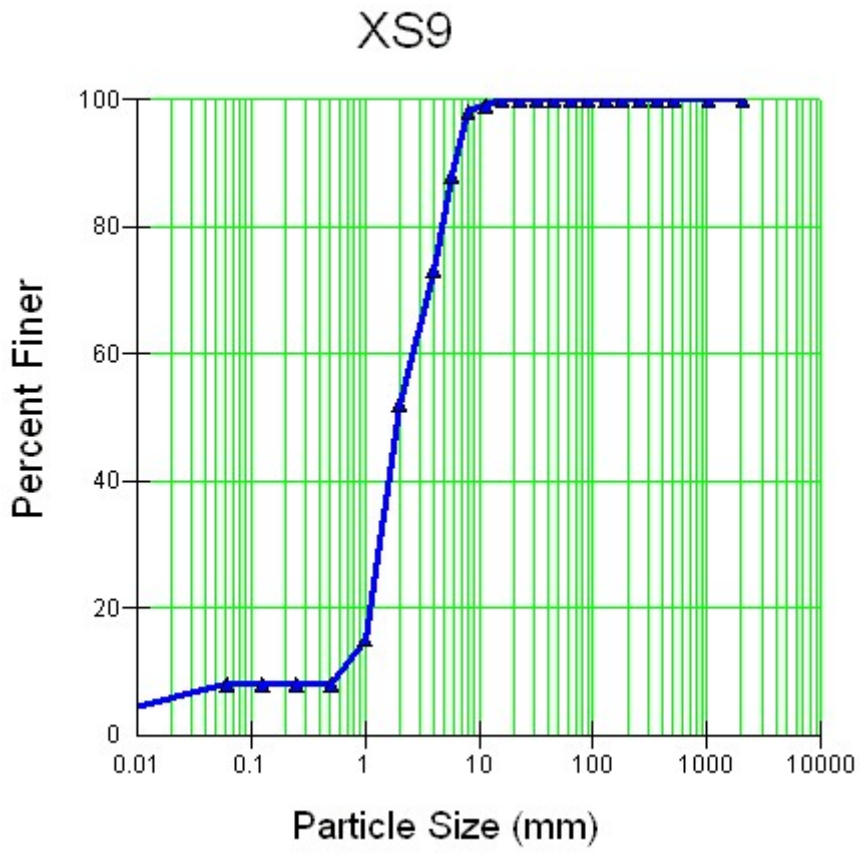


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS8
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	64	64.00	64.00
0.062 - 0.125	6	6.00	70.00
0.125 - 0.25	0	0.00	70.00
0.25 - 0.50	1	1.00	71.00
0.50 - 1.0	1	1.00	72.00
1.0 - 2.0	5	5.00	77.00
2.0 - 4.0	7	7.00	84.00
4.0 - 5.7	2	2.00	86.00
5.7 - 8.0	0	0.00	86.00
8.0 - 11.3	1	1.00	87.00
11.3 - 16.0	3	3.00	90.00
16.0 - 22.6	6	6.00	96.00

22.6 - 32.0	2	2.00	98.00
32 - 45	0	0.00	98.00
45 - 64	1	1.00	99.00
64 - 90	0	0.00	99.00
90 - 128	0	0.00	99.00
128 - 180	1	1.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.02
D35 (mm)	0.03
D50 (mm)	0.05
D84 (mm)	4
D95 (mm)	21.5
D100 (mm)	179.99
Silt/Clay (%)	64
Sand (%)	13
Gravel (%)	22
Cobble (%)	1
Boulder (%)	0
Bedrock (%)	0

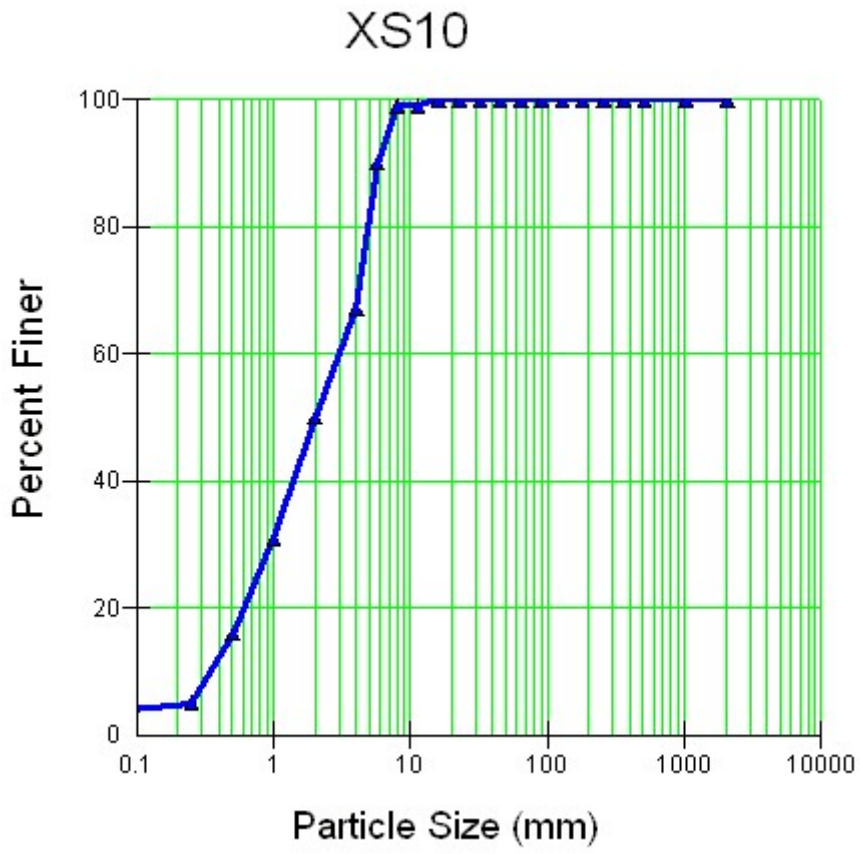


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS9
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	8	8.00	8.00
0.062 - 0.125	0	0.00	8.00
0.125 - 0.25	0	0.00	8.00
0.25 - 0.50	0	0.00	8.00
0.50 - 1.0	7	7.00	15.00
1.0 - 2.0	37	37.00	52.00
2.0 - 4.0	21	21.00	73.00
4.0 - 5.7	15	15.00	88.00
5.7 - 8.0	10	10.00	98.00
8.0 - 11.3	1	1.00	99.00
11.3 - 16.0	1	1.00	100.00
16.0 - 22.6	0	0.00	100.00

22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	1.03
D35 (mm)	1.54
D50 (mm)	1.95
D84 (mm)	5.25
D95 (mm)	7.31
D100 (mm)	16
Silt/Clay (%)	8
Sand (%)	44
Gravel (%)	48
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

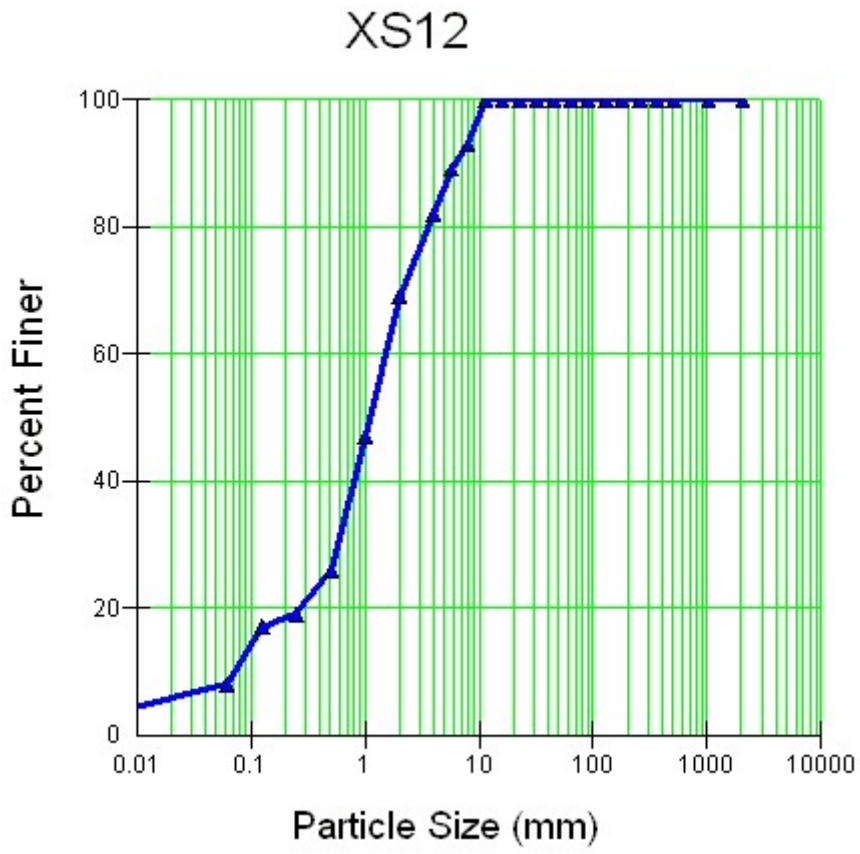


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS10
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	0	0.00	0.00
0.062 - 0.125	0	0.00	0.00
0.125 - 0.25	5	5.00	5.00
0.25 - 0.50	11	11.00	16.00
0.50 - 1.0	15	15.00	31.00
1.0 - 2.0	19	19.00	50.00
2.0 - 4.0	17	17.00	67.00
4.0 - 5.7	23	23.00	90.00
5.7 - 8.0	9	9.00	99.00
8.0 - 11.3	0	0.00	99.00
11.3 - 16.0	1	1.00	100.00
16.0 - 22.6	0	0.00	100.00

22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.5
D35 (mm)	1.21
D50 (mm)	2
D84 (mm)	5.26
D95 (mm)	6.98
D100 (mm)	16
Silt/Clay (%)	0
Sand (%)	50
Gravel (%)	50
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

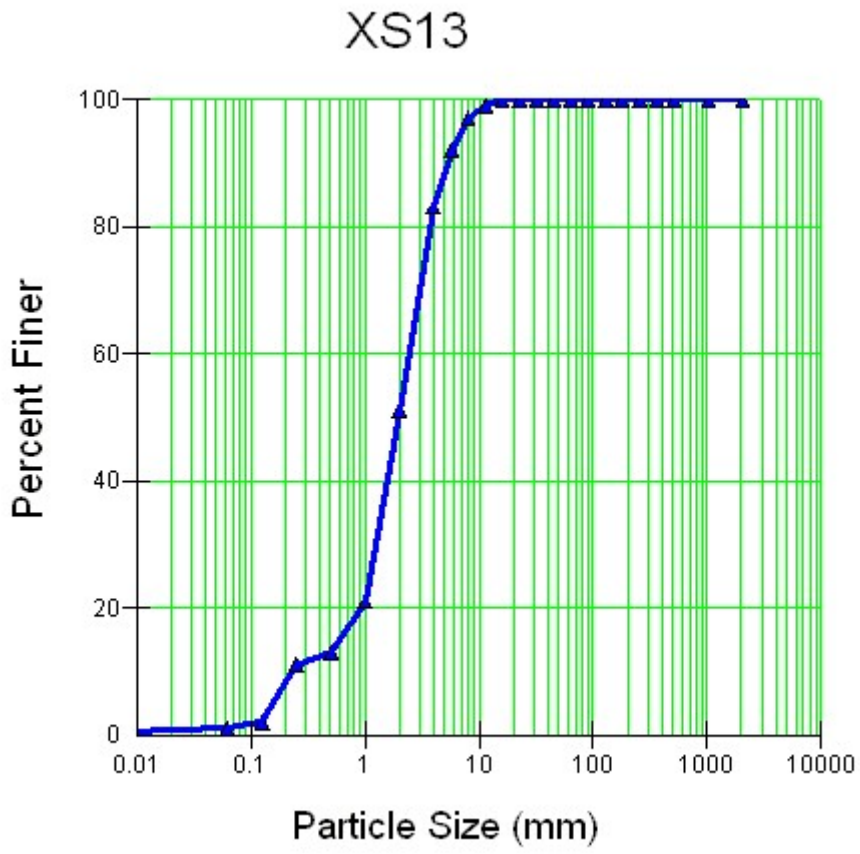


River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS12
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	8	8.00	8.00
0.062 - 0.125	9	9.00	17.00
0.125 - 0.25	2	2.00	19.00
0.25 - 0.50	7	7.00	26.00
0.50 - 1.0	21	21.00	47.00
1.0 - 2.0	22	22.00	69.00
2.0 - 4.0	13	13.00	82.00
4.0 - 5.7	7	7.00	89.00
5.7 - 8.0	4	4.00	93.00
8.0 - 11.3	7	7.00	100.00
11.3 - 16.0	0	0.00	100.00
16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00

32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.12
D35 (mm)	0.71
D50 (mm)	1.14
D84 (mm)	4.49
D95 (mm)	8.94
D100 (mm)	11.3
Silt/Clay (%)	8
Sand (%)	61
Gravel (%)	31
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0



River Name: East Tarboro Canal
Reach Name: Reach 2
Sample Name: XS13
Survey Date: 02/07/07

Size (mm)	TOT #	ITEM %	CUM %
0 - 0.062	1	1.00	1.00
0.062 - 0.125	1	1.00	2.00
0.125 - 0.25	9	9.00	11.00
0.25 - 0.50	2	2.00	13.00
0.50 - 1.0	8	8.00	21.00
1.0 - 2.0	30	30.00	51.00
2.0 - 4.0	32	32.00	83.00
4.0 - 5.7	9	9.00	92.00
5.7 - 8.0	5	5.00	97.00
8.0 - 11.3	2	2.00	99.00
11.3 - 16.0	1	1.00	100.00

16.0 - 22.6	0	0.00	100.00
22.6 - 32.0	0	0.00	100.00
32 - 45	0	0.00	100.00
45 - 64	0	0.00	100.00
64 - 90	0	0.00	100.00
90 - 128	0	0.00	100.00
128 - 180	0	0.00	100.00
180 - 256	0	0.00	100.00
256 - 362	0	0.00	100.00
362 - 512	0	0.00	100.00
512 - 1024	0	0.00	100.00
1024 - 2048	0	0.00	100.00
Bedrock	0	0.00	100.00

D16 (mm)	0.69
D35 (mm)	1.47
D50 (mm)	1.97
D84 (mm)	4.19
D95 (mm)	7.08
D100 (mm)	16
Silt/Clay (%)	1
Sand (%)	50
Gravel (%)	49
Cobble (%)	0
Boulder (%)	0
Bedrock (%)	0

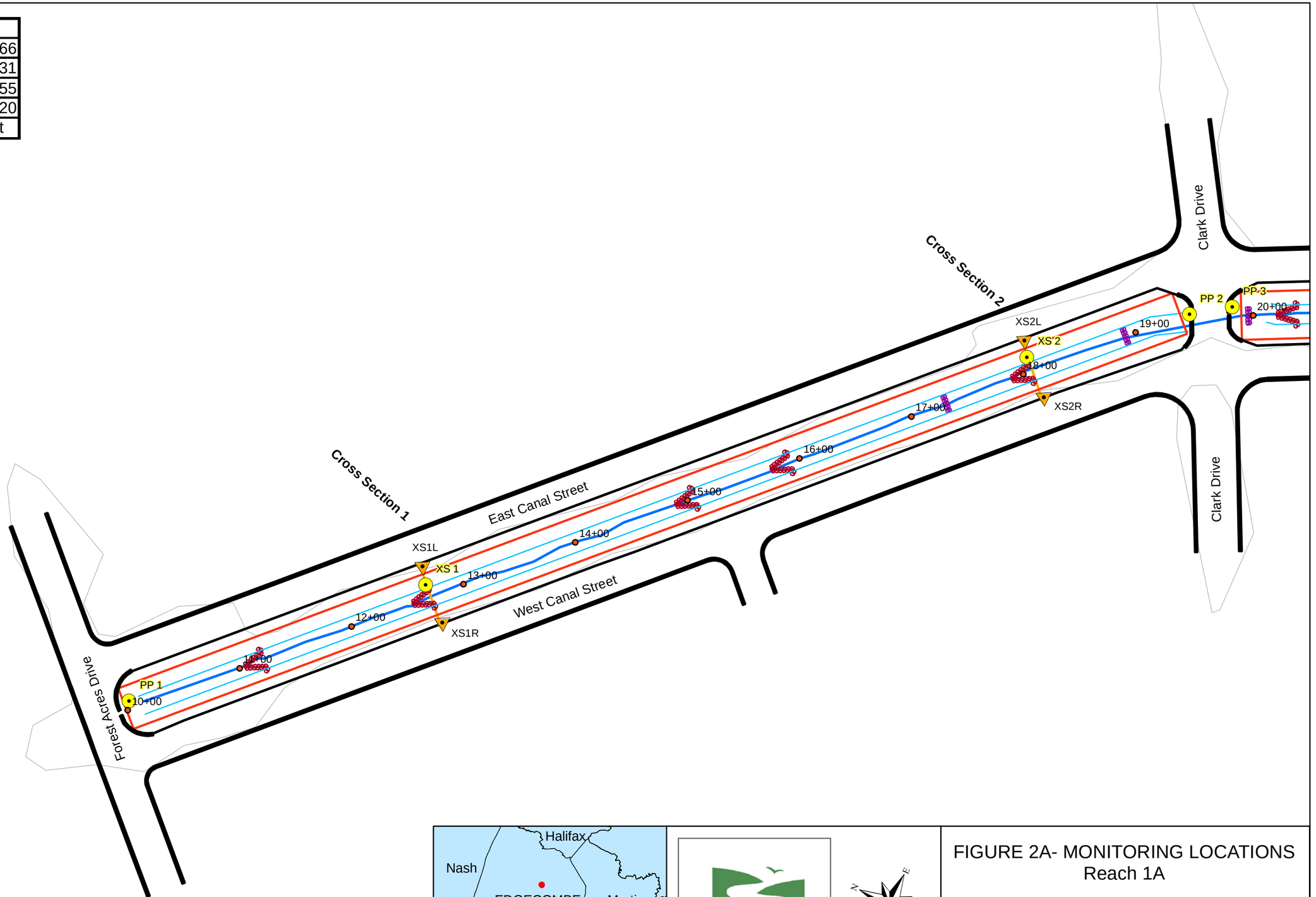
APPENDIX C

Monitoring Locations

Contractor As-Built Survey

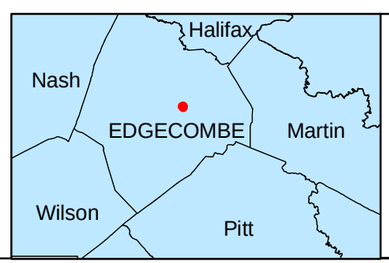
As-Built Construction Plans (on CD)

Pin	Northing	Easting
XC1LPIN	789958	2434466
XC1RPIN	789922.8	2434431
XC2LPIN	789587.4	2434855
XC2RPIN	789552	2434820
NAD 1983 NC State Plane Feet		



Legend

- Stations
- Cross Section Pins
- Photopoints
- Roads
- Easement Boundary
- Bank
- Cross Vane
- Leaf Collector
- J-Hook
- Sill
- Rootwads
- Contours
- Thalweg
- Created Depression
- Vegetation Plot



Ecosystem Enhancement Program

FIGURE 2A- MONITORING LOCATIONS
Reach 1A

East Tarboro Canal Stream Restoration Site
Edgecombe County, North Carolina

120 60 0 120 Feet

December 2007

Pin	Northing	Easting
XC3LPIN	789294.3	2435053
XC3RPIN	789274.2	2435008
XC4LPIN	789175.1	2435115
XC4RPIN	789152.4	2435071
XC5LPIN	788784.7	2435314
XC5RPIN	788758.1	2435261
NAD 1983 NC State Plane Feet		

Clark Drive

Cross Section 3

Cross Section 4

Cross Section 5

East Canal Street

West Canal Street

XS3L

XS3

XS3R

XS4L

XS4R

XS5L

XS5

XS5R

PP 2

PP 3

PP 4

VP 1

VP1 PP

19+00

20+00

21+00

22+00

23+00

24+00

25+00

26+00

27+00

28+00

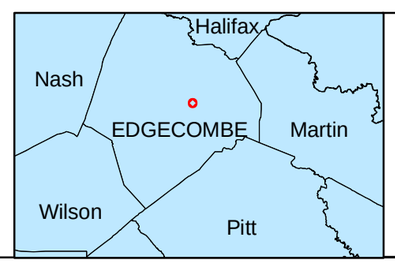
29+00

S2R

Clark Drive

Legend

- Stations
- Cross Section Pins
- Photopoints
- Roads
- Easement Boundary
- Bank
- Cross Vane
- Leaf Collector
- J-Hook
- Sill
- Rootwads
- Contours
- Thalweg
- Created Depression
- Vegetation Plot



Ecosystem Enhancement PROGRAM

FIGURE 2A- MONITORING LOCATIONS
Reach 1B

East Tarboro Canal Stream Restoration Site
Edgecombe County, North Carolina

120 60 0 120 Feet

December 2007

Pin	Northing	Easting
XS6LPIN	788640.3	2437904
XS6RPIN	788725.1	2437851
XS7LPIN	788375.2	2437826
XS7RPIN	788360	2437727
XS8LPIN	788191.3	2437894
XS8RPIN	788199.8	2437819
NAD 1983 NC State Plane Feet		

Parking Lot

Parking Lot

VP2 PP

PP 6

VP 2

PP 5

10+00

11+00

12+00

13+00

XS6R

14+00

XS 6

XS6L

Cross Section 6

VP 3

VP3 PP

15+00

VP4 PP

VP 4

16+00

VP6 PP

VP 6

XS7L

Cross Section 8

XS8L

17+00

XS7R

XS7

18+00

VP 5

VP5 PP

19+00

XS8R

XS 8

20+00

21+00

Cross Section 7

22+00

PP 7

Wilson Street

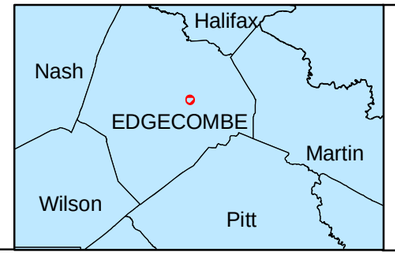
PP 8

23+00

XS9L

Legend

- Stations
- Cross Section Pins
- Photopoints
- Roads
- Easement Boundary
- Bank
- Cross Vane
- Leaf Collector
- J-Hook
- Sill
- Rootwads
- Contours
- Thalweg
- Created Depression
- Vegetation Plot



Ecosystem Enhancement PROGRAM

FIGURE 2A- MONITORING LOCATIONS
Reach 2A

East Tarboro Canal Stream Restoration Site
Edgecombe County, North Carolina

120 60 0 120 Feet

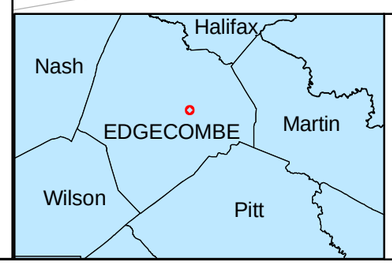
December 2007

Pin	Northing	Easting
XS9LPIN	787750.5	2437837
XS9RPIN	787742.6	2437736
XS10LPIN	787532.4	2437804
XS10RPIN	787602.8	2437733
XS11LPIN	787299.8	2437627
XS11RPIN	787360.4	2437548
XS12LPIN	787017.1	2437495
XS12RPIN	787051.2	2437401
XS13LPIN	786776.9	2437396
XS13RPIN	786763.5	2437298
NAD 1983 NC State Plane Feet		

PP 8
23+00
XS9L
VP7 PP
XS 9
VP 7
24+00
25+00
26+00
XS10L
Cross Section 10
XS13
XS9R
Cross Section 9
VP 8
VP8 PP
27+00
XS10R
28+00
29+00
XS11L
30+00
XS 10
VP 9
VP9 PP
XS11R
Cross Section 11
31+00
VP 10
VP10 PP
32+00
XS12L
XS 11
33+00
34+00
PP 9
XS12R
Cross Section 12
PP 10
35+00
VP 11
VP11 PP
XS13L
36+00
VP 12
VP12 PP
37+00
XS12
38+00
39+00
VP 13
VP13 PP
PP 11
40+00
XS13R
Cross Section 13

Legend

- Stations
- Cross Section Pins
- Photopoints
- Roads
- Easement Boundary
- Bank
- Cross Vane
- Leaf Collector
- J-Hook
- Sill
- Rootwads
- Contours
- Thalweg
- Created Depression
- Vegetation Plot



Ecosystem Enhancement PROGRAM

FIGURE 2A- MONITORING LOCATIONS
Reach 2B

East Tarboro Canal Stream Restoration Site
Edgecombe County, North Carolina

120 60 0 120 Feet

December 2007