

# Naked Creek Stream Restoration

Wilkes County, North Carolina

2009 Year 2 Monitoring Report

EEP Project Number: 261

USGS HUC 03040101010100

EcoEngineering Project Number: EEP-08000

Prepared for:

NCDENR Ecosystem Enhancement Program

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**EcoEngineering**

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- Morphology and Hydraulic Monitoring Summary [Exhibit Table IX] (Cross Section and Reach Parameters submitted electronically)
- Stream Problem Area Photos (submitted electronically)
- Stream Problem Area Inventory Table (submitted electronically)

## **Appendix E – Wetland Assessment**

Table 10. Wetland Criteria Attainment (omitted, not applicable)  
– Precipitation and Water Level Plots (omitted, not applicable)

## **1.0 Executive Summary/Project Abstract**

### ***1.1 Project Goals and Objectives***

The goal of the restoration project is to improve the water quality and biological habitat of the site's streams, wetlands, and riparian buffers through the following:

- Restore (pattern, dimension, and profile) unstable streams using natural channel design techniques
- Re-establish riparian buffers (Kimley-Horn, 2007)

### ***1.2 Vegetation Condition and Comparison***

Current stem counts were calculated using vegetation plot monitoring data. Interim density targets (stems/acre) are 320 at year 3 and 288 at year 4. Final stem count criteria are 260 trees per acre at the end of the five (5) year monitoring. As monitored for Year 2, Naked Creek had 5 plots encompassing 0.12 acres, containing 53 planted and volunteer stems, which yielded a density of 429 trees per acre including planted and volunteer species. Vegetation survival threshold was met for each of the 5 plots.

Various exotic/invasive species were observed at the site. Exotic species observed at the site include Chinese privet (*Ligustrum sinense*), silktree (*Albizia julibrissin*), and cattail (*Typha latifolia*). The extent of exotic/invasive species is depicted in the Consolidated Current Condition Plan View **Appendix A**.

### ***1.3 Stream Stability/Condition and Comparison***

Overall the stream system appears stable and is not migrating toward lateral or vertical instability. Vegetation was observed within the channel between stations 11+00 and 29+00. Based on the prior year comparison using longitudinal profile data, it appears that minor systemic aggradation has occurred throughout the reach, although this condition does not appear to pose an imminent threat to the overall stability of the system. To document bankfull events a crest gage is located approximately 450 feet upstream of cross section 4 and is depicted in the Consolidated Current Condition Plan View **Appendix A**.

### ***1.4 Wetland Conditions and Performance***

No wetlands are being monitored for mitigation credits at this project site.

### ***1.5 Narrative Background***

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 the EEP website. All raw data supporting the tables and figures in the appendices is available from EEP upon request.

## **2.0 Methodology**

All monitoring methodologies follow the most current templates and guidelines provided by EEP (EEP, 2006; EEP, 2009). Photographs were taken at high resolution using an Olympus FE-115 5.0 megapixel digital camera. GPS location information was collected using a Trimble Geo XT handheld mapping grade GPS unit. Stream and vegetation problem areas were noted in the field on As-Built Plan Sheets.

The methods used to generate the data in this report are standard fluvial geomorphology techniques as described in *Applied River Morphology* (Rosgen, 1996) and related publications from US Forest Service and the interagency Stream Mitigation Guidelines (USACE, 2003).

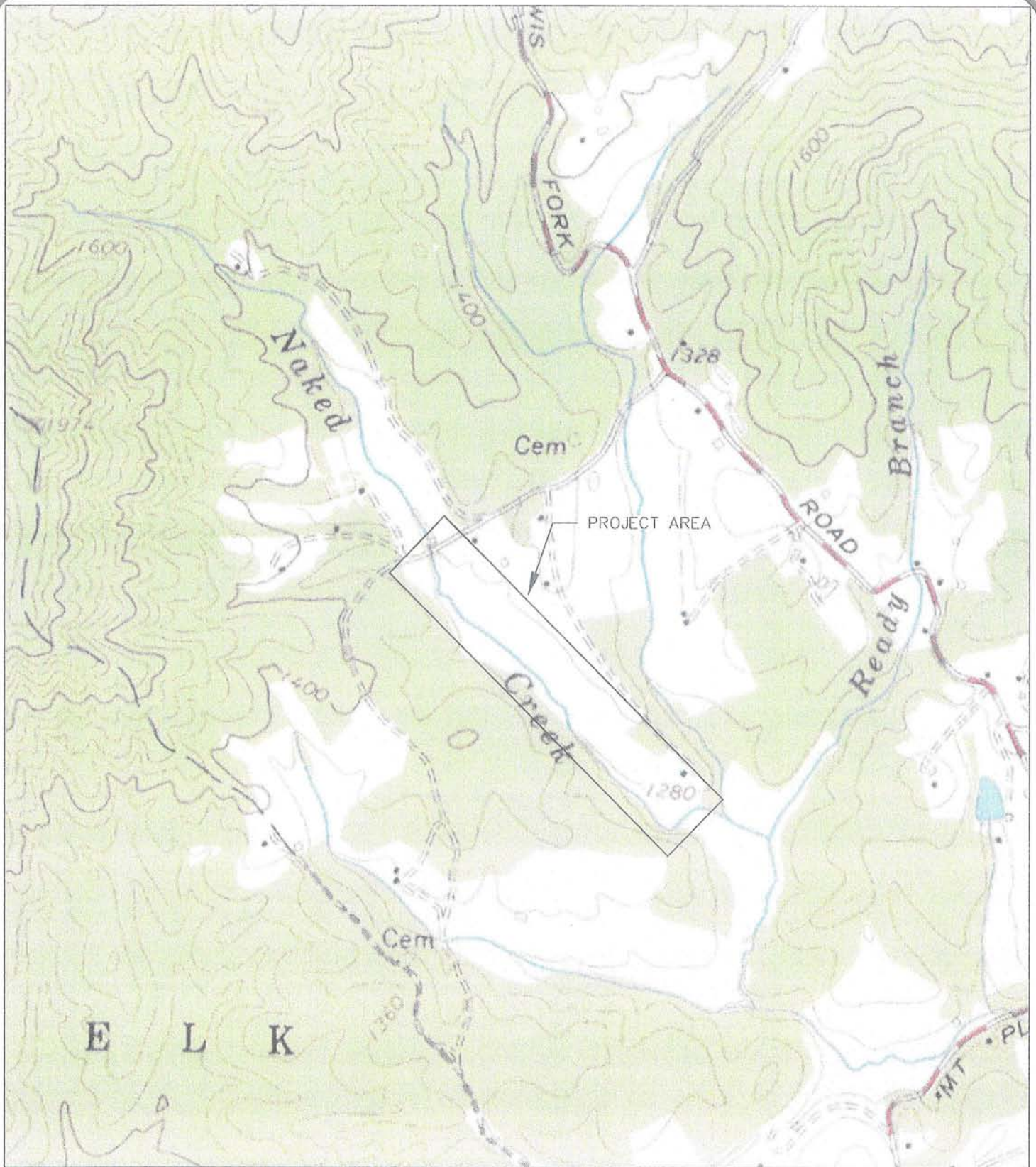
Vegetation monitoring methods followed the 2008, Version 4.2 CVS-EEP Protocol for Recording Vegetation (Lee et. al., 2008). Vegetation plot photographs were collected for each vegetation plot. Vegetation monitoring plots were re-marked in the field by replacing all old flagging with new orange flagging. Monitoring taxonomy follows *Flora of the Carolinas, Virginia, Georgia, and Surrounding Areas* (Weakley 2007). Stem height was measured with a folding one-meter rule. Diameter at breast height and decimeter height were measured with calipers.

### **3.0 References**

- Ecosystem Enhancement Program (EEP), 2006. Monitoring Report Guidelines, November 16, 2006.
- Ecosystem Enhancement Program (EEP), 2009. Monitoring Report Guidelines, June 1, 2009.
- Kimley-Horn and Associates, Inc., 2007. Naked Creek Stream Final Mitigation Report. Submitted to NCDENR-EEP, August 2007.
- Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2008. CVS-EEP Protocol for Recording Vegetation, Version 4.2 (<http://cvs.bio.unc.edu/methods.htm>)
- Rosgen, D.L. 1996. Applied Morphology. Wildland Hydrology, Pagosa Springs, CO.
- US Army Corps of Engineers (USACE), 2003. April 2003 Stream Mitigation Guidelines.
- US Army Corps of Engineers (USACE), 2005. Information Regarding Stream Restoration In The Outer Coastal Plain of North Carolina. US Army Corps of Engineers, Wilmington District, Regulatory Division and North Carolina Department of Environment and Natural Resources, Division of Water Quality, December 1, 2005.
- Weakley, A. S., 2008. Flora of the Carolinas, Virginia, Georgia, northern Florida, and surrounding areas. University of North Carolina Herbarium (NCU), North Carolina Botanical Garden, University of North Carolina at Chapel Hill, working Draft as of April 7, 2008.

APPENDIX A

General Figures and Plan View



USGS, 7.5 MINUTE, TOPOGRAPHIC QUADRANGLE;  
 PURLEAR, N.C.; 1966; LAT: 36.1394315° N  
 LON: 81.3634822° W



	PROJECT NO.	EEP-08000
	FILENAME:	EEP-08000
	SCALE:	1" = 1,000
	DATE:	11-01-09



# NAKED CREEK

## VICINITY MAP

WILKES COUNTY, NORTH CAROLINA

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# NAKED CREEK

## CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR TWO MONITORING

CONTROL TABLE				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	1770034.41	2615810.00	1323.68	CP 1
2	1769414.45	2615886.09	1334.03	CP 2
5	1768883.08	2616058.80	1293.99	CP 5
6	1768567.01	2616040.08	1295.62	CP 6
7	1768230.13	2616220.26	1286.57	CP 7
8	1767905.05	2616419.19	1276.62	CP 8
21	1769876.73	2615841.40	1314.65	XSEC
22	1769875.01	2615907.57	1310.10	XSEC
23	1769811.05	2615854.15	1312.41	XSEC
24	1769833.93	2615921.91	1309.27	XSEC
25	1769517.07	2615935.30	1309.93	XSEC
26	1769528.18	2616000.38	1304.25	XSEC
27	1768845.89	2616001.39	1299.91	XSEC
28	1768841.05	2616071.64	1294.02	XSEC
29	1768081.50	2616056.52	1285.76	XSEC
30	1768135.40	2616090.71	1282.76	XSEC
31	1768008.00	2616130.42	1281.06	XSEC
32	1768024.62	2616192.14	1280.54	XSEC
200	1767923.77	2616295.32	1277.98	NS TRV
201	1768021.09	2616272.32	1277.98	NMAG
202	1767750.03	2616140.01	1317.13	NS TRV
203	1768246.83	2616709.45	1326.95	NS TRAV
204	1768660.70	2616461.82	1313.51	NS SPUR
206	1768656.44	2616054.29	1297.16	NS SPUR/10/05RC
207	1767885.75	2616033.96	1320.66	NS TRAV
210	1767586.20	2616220.21	1307.38	NS TRAV
211	1767350.07	2616460.29	1293.22	NS TRAV
300	1767935.38	2616171.69	1279.68	1/2" EIR AT BASE
301	1767797.67	2616275.95	1284.75	1/2" EIR BASE
302	1767806.16	2616267.50	1284.82	27" MARKED BEECH
303	1767724.60	2616119.08	1317.87	3/4" EIP
304	1767910.76	2615956.19	1326.65	PP
305	1768030.62	2616849.25	1318.89	1/2" EIP
306	1768672.92	2616491.75	1313.53	1/2" EIP
307	1768555.88	2616073.60	1287.44	1/2" EIR
308	1768794.01	2615411.25	1362.06	3/4" EIP RAB
309	1768399.81	2615612.93	1340.59	3/4" EIP
310	1768247.44	2615709.89	1335.95	PP
311	1768094.04	2615832.43	1327.39	AXLE
312	1768624.46	2616090.77	1289.05	1/2" EIR
313	1767394.13	2616438.23	1299.30	3/4" EIP
314	1767353.37	2616475.02	1297.61	1.5" EIP
315	1767947.48	2616180.14	1278.67	1/2" EIR
316	1768132.37	2616037.55	1280.22	1/2" EIR
317	1768209.14	2615980.69	1282.38	1/2" EIR
318	1768578.84	2615504.74	1350.98	AXLE
319	1768471.54	2615925.36	1307.83	NS SPUR
320	1768546.42	2616163.77	1289.41	NS TRV
321	1767748.03	2616432.00	1273.34	NS TRAV

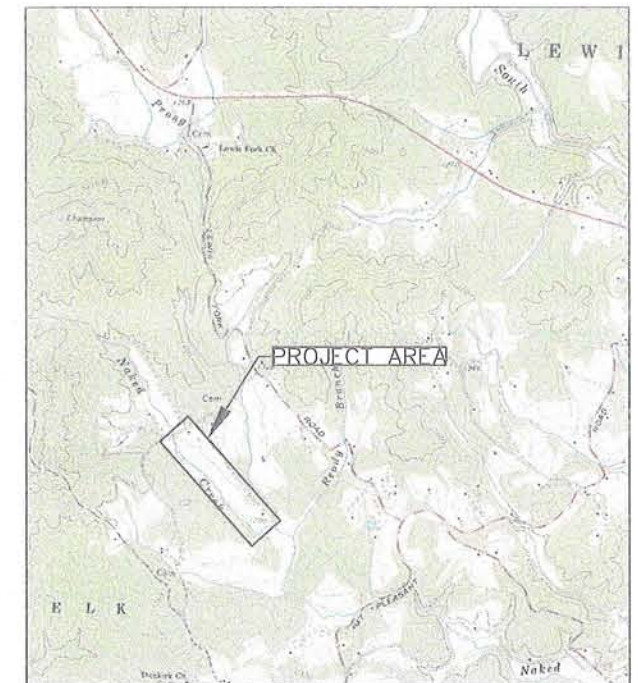
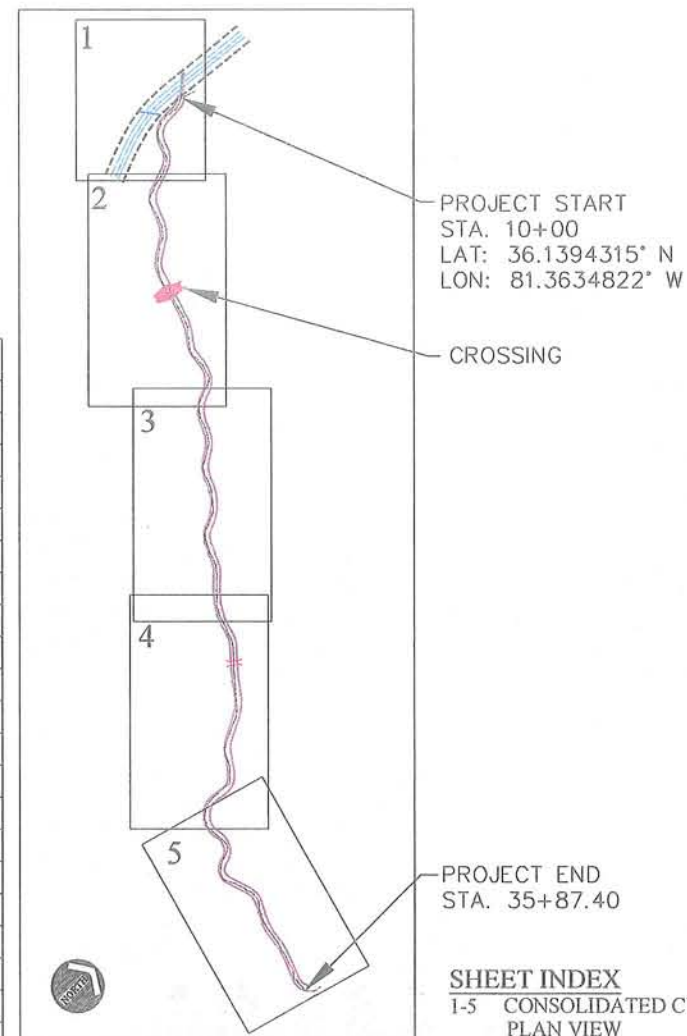
(ECO)

WILKES COUNTY, NORTH CAROLINA  
EEP PROJECT NUMBER: 261  
DATE: NOVEMBER 1, 2009

NORTH CAROLINA  
ECOSYSTEM ENHANCEMENT PROGRAM  
NC-EEP CONTACT: JULIE VANN (919) 715-1950

VEGETATION PLOT MONITORING CONTROL POINTS			
POINT NUMBER	POINT TAG	NORTHING	EASTING
1	VC1	878937.6305	1303595.7584
2	VC2	878969.6963	1303599.5650
3	VC3	878967.2706	1303629.8125
4	VC4	878935.1638	1303628.2089
5	VC5	878716.8337	1303595.7108
6	VC6	878781.7716	1303595.5887
7	VC7	878781.7462	1303611.9076
8	VC8	878715.3560	1303616.0404
9	VC9	878238.8832	1303704.1393
10	VC10	878304.3131	1303701.2231
11	VC11	878305.6913	1303712.2540
12	VC12	878240.6355	1303720.0466
13	VC13	877913.0134	1303764.5696
14	VC14	877978.1274	1303757.1446
15	VC15	877977.1997	1303772.6940
16	VC16	877912.3357	1303778.7246
17	VC17	876852.8169	1303975.3137
18	VC18	876908.5974	1303941.6805
19	VC19	876917.5288	1303955.2972
20	VC20	876861.4609	1303990.4754

(KHA)

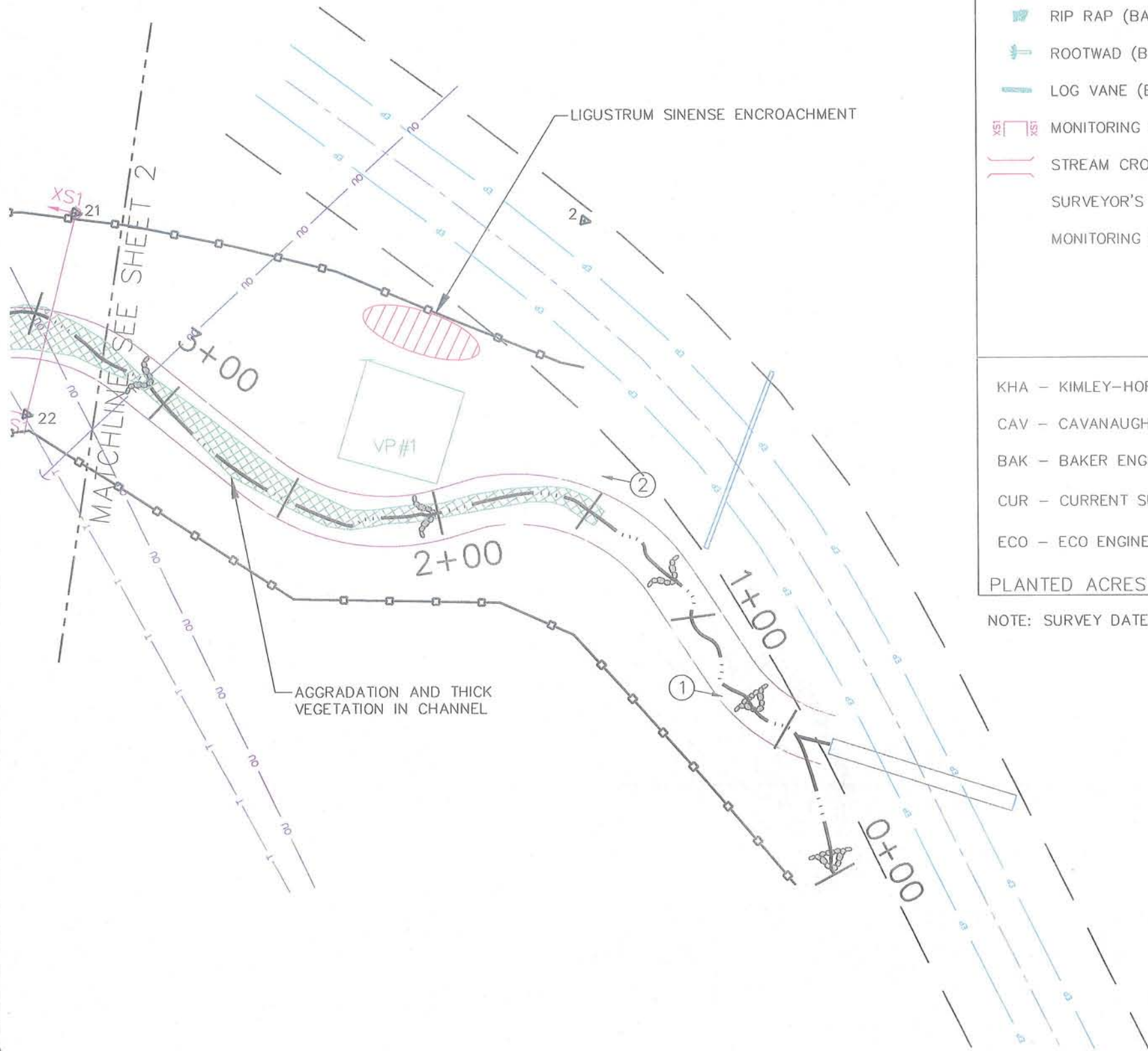


VICINITY MAP  
NTS

NOTE: SURVEY DATES OF THALWEG AND TOP-OF-BANK - 9/16/09 TO 9/18/09.



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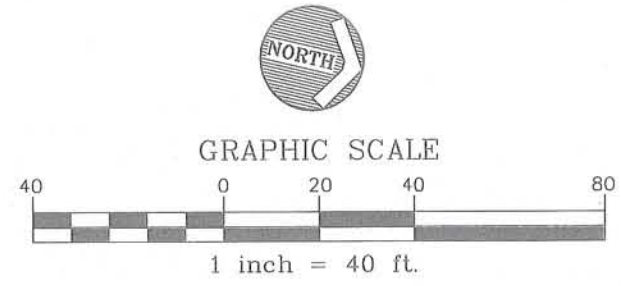
LEGEND

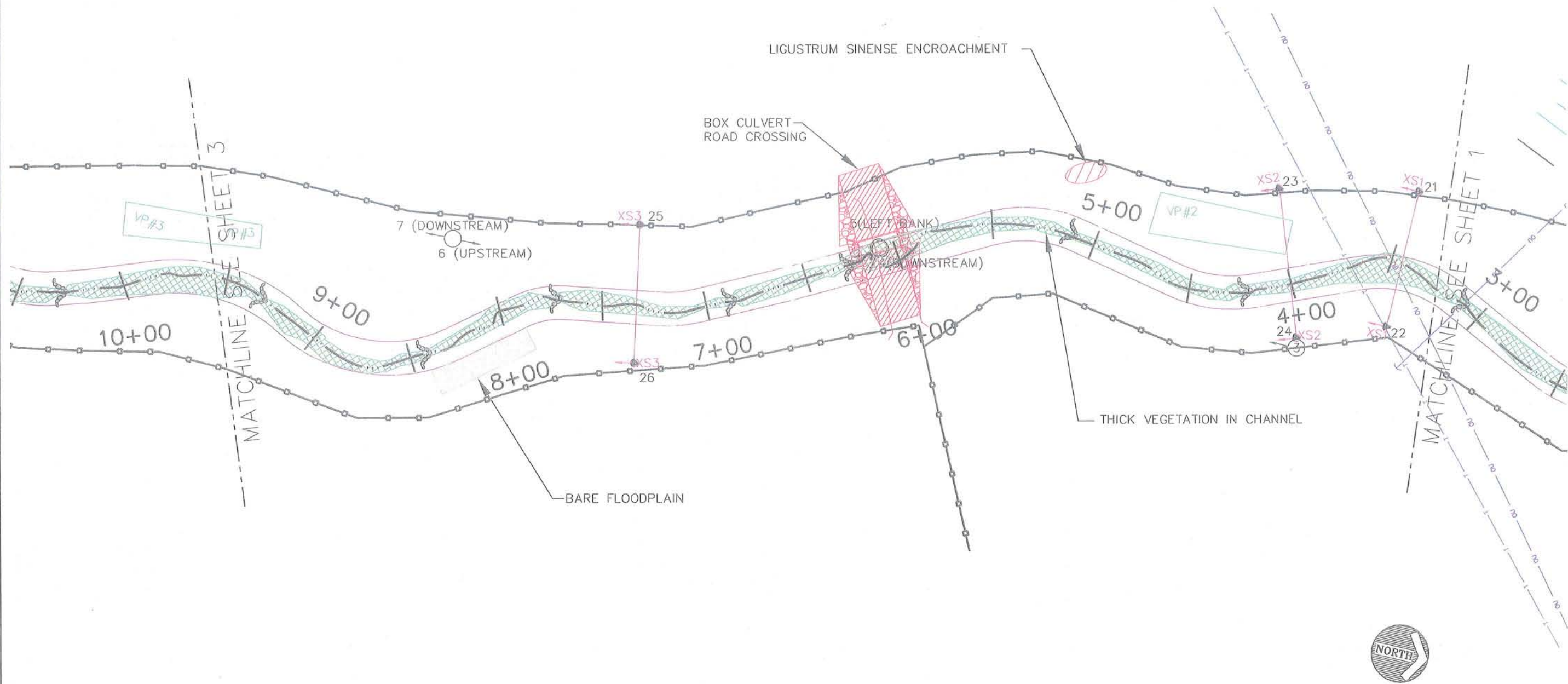
	PHOTO POINT (ECO)		EASEMENT (CUR)
	VEGETATION MONITORING PLOT (KHA)		FENCE (BAK)
	ROCK CROSS VANE (BAK)		EDGE OF PAVEMENT (CAV)
	ROCK A-VANE (BAK)		TELEPHONE LINE (CAV)
	RIP RAP (BAK)		OVERHEAD POWER LINE (CAV)
	ROOTWAD (BAK)		YEAR TWO STREAM CENTERLINE (ECO)
	LOG VANE (BAK)		AS-BUILT TOP OF BANK (BAK)
	MONITORING CROSS SECTIONS (ECO)		VEGETATION MONITORING PLOT (KHA)
	STREAM CROSSING/FORD (BAK)		NOXIOUS INSECT POPULATIONS
	SURVEYOR'S BENCHMARKS (CAV, BAK)		INVASIVE / EXOTIC VEGETATION
	MONITORING BENCHMARKS (KHA)		THICK VEGETATION IN CHANNEL
			PHOTO POINT LOCATION AND DIRECTION
			SIDE CHANNEL BAR
			PIPING AT STREAM STRUCTURE
			CREST GAGE

KHA - KIMLEY-HORN AND ASSOCIATES, INC. (DESIGN BASED ON CAV MAPPING)  
 CAV - CAVANAUGH ASSOCIATES, P.A. (BASE/PRE-CONSTRUCTION MAPPING)  
 BAK - BAKER ENGINEERING NY, INC. (AS-BUILT MAPPING)  
 CUR - CURRENT SURVEYING AND MAPPING, P.A. (STATE PROPERTY EASEMENT SURVEYOR)  
 ECO - ECO ENGINEERING (YEAR ONE MONITORING)

PLANTED ACRES = 2.92

NOTE: SURVEY DATES OF THALWEG AND TOP-OF-BANK - 9/16/09 TO 9/18/09.





GRAPHIC SCALE



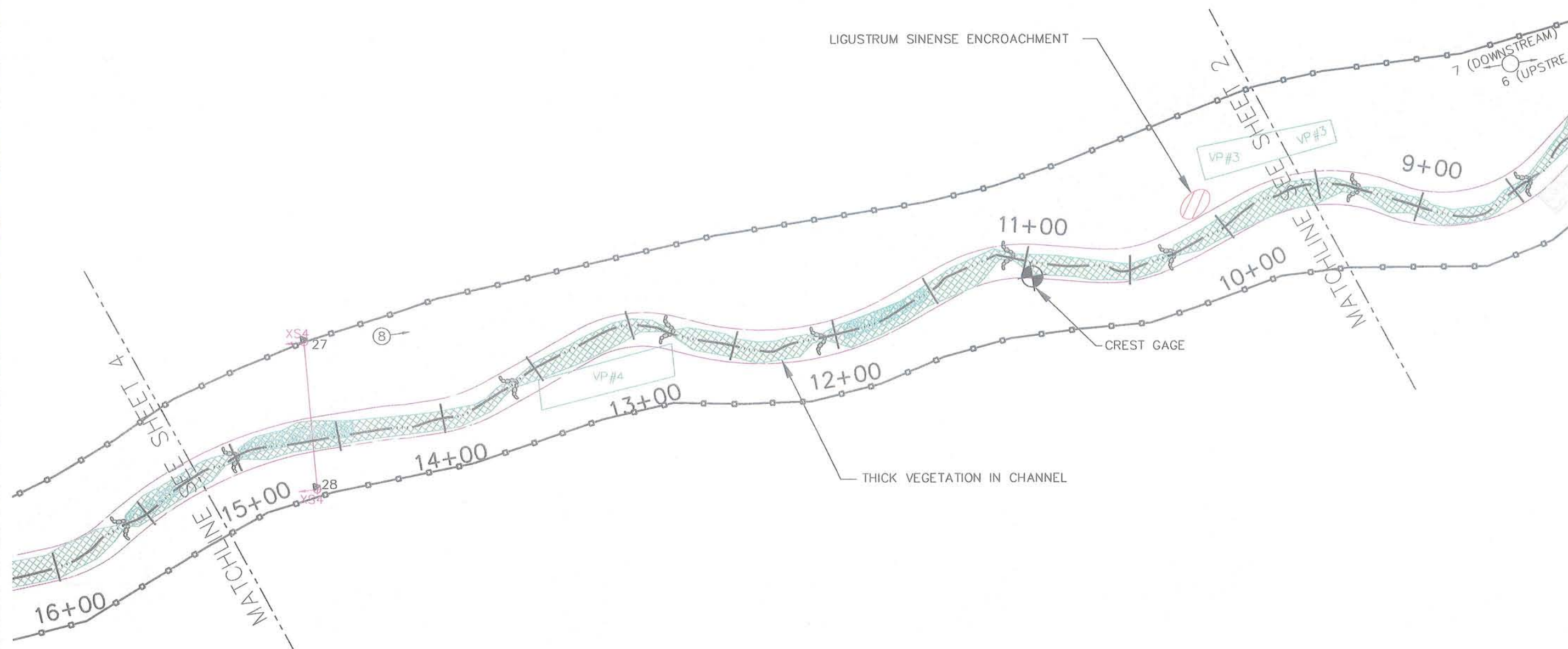
1 inch = 50 ft.

SHEET 2 OF 5



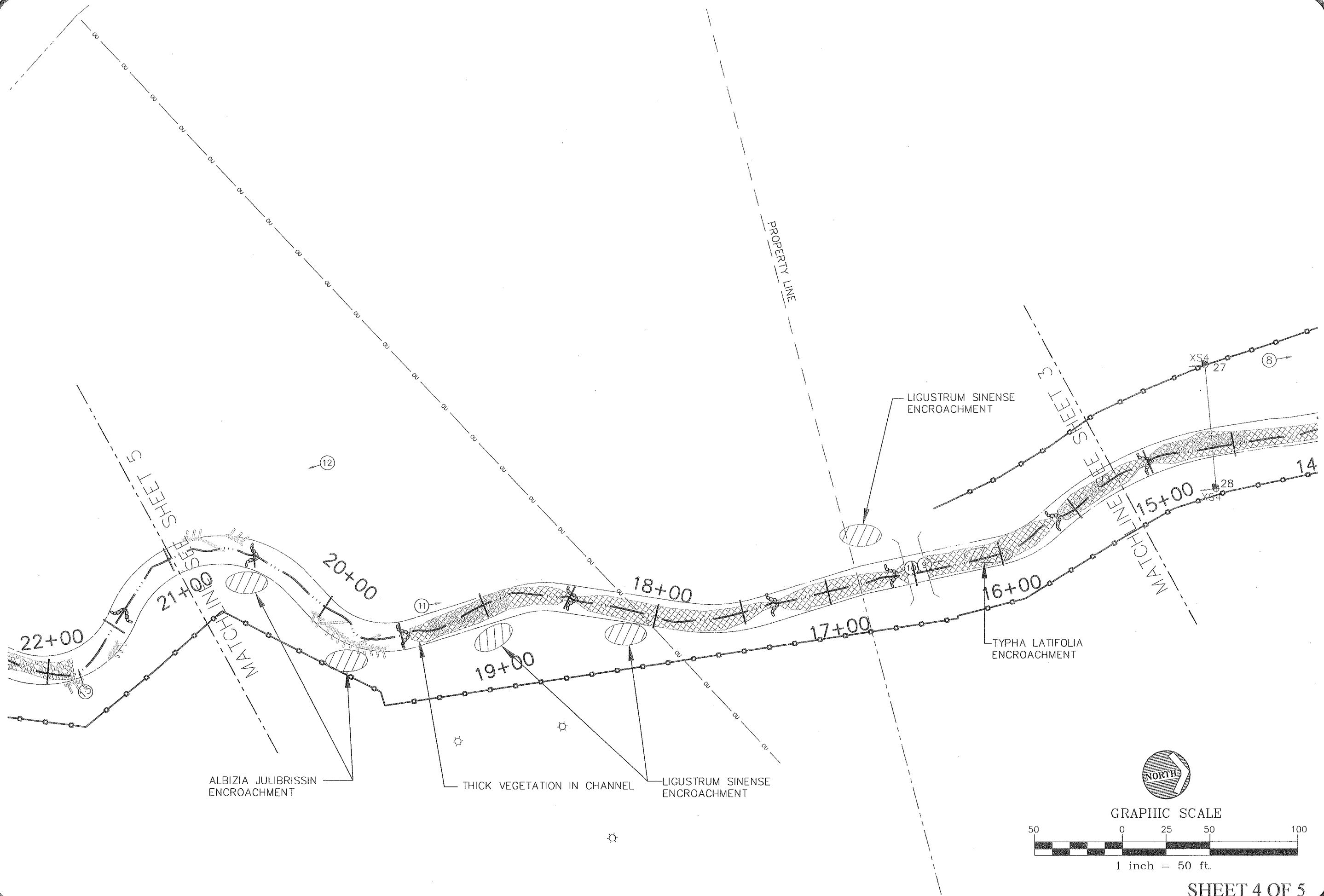
**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR TWO MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.	EEP-08000
FILENAME	EEP-08000
SCALE	1" = 50'
DATE	11-01-09

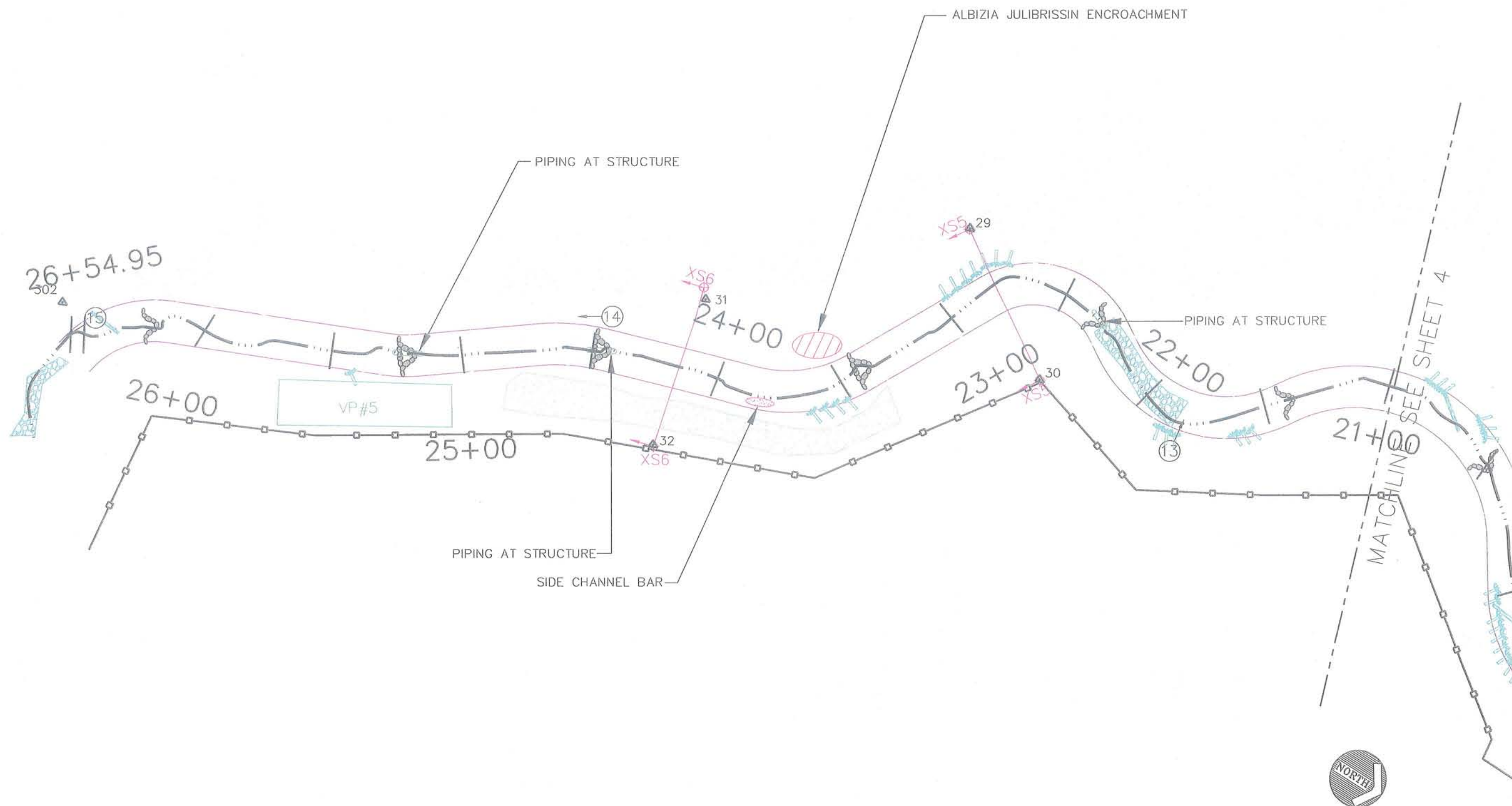


**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR TWO MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	11-01-09

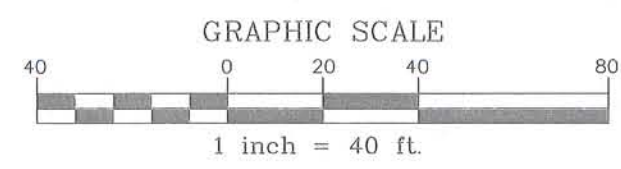


PROJECT NO. EEP - 08000
FILENAME: EEP-08000
SCALE: 1" = 50'
DATE: 11-01-09



**NAKED CREEK**  
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR TWO MONITORING  
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 40'
DATE:	11-01-09



APPENDIX B

General Project Tables

**Table 1. Project Restoration Components**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Project Segment or Reach ID</b>	<b>Existing Feet/Acres</b>	<b>Type</b>	<b>Approach</b>	<b>Footage or Acreage</b>	<b>Mitigation Ratio</b>	<b>Mitigation Units</b>	<b>Stationing</b>	<b>Comment</b>
UtNkd	2,800 lf	R	P2	2,562 lf	1	2,562	10+00 - 35+87.40	
<b>Mitigation Unit Summations</b>								
<b>Stream (lf)</b>	<b>Riparian Wetland (Ac)</b>	<b>Nonriparian Wetland (Ac)</b>	<b>Total Wetland (Ac)</b>	<b>Buffer (Ac)</b>	<b>Comment</b>			
2,562	0	0	0	2.92				

R= Restoration  
 EI= Enhancement

EII= Enhancement II  
 S= Stabilization

P1= Priority I  
 P2= Priority II

P3= Priority III  
 SS=Stream Bank Stabilization



**Table 2. Project Activity and Reporting  
Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Activity or Report</b>	<b>Data Collection Complete</b>	<b>Actual Completion or Delivery</b>
Restoration Plan	Summer 05	Nov-05
Final Design -- 90%	Spring 06	Summer 06
Construction	Fall 06	Winter 06
Temporary S&E mix applied to entire project area	Winter 06	Winter 06
Permanent seed mix applied to reach/segments 1 & 2	Winter 06	Winter 06
Containerized and B&B plantings for reach/segments 1 & 2	Winter 06	Winter 06
Mitigation Plan / As-built (Year 0 Monitoring -- baseline)	Spring 07	Aug-07
Year 1 Monitoring	Sep-08	Nov-08
Year 2 Monitoring	Sep-09	Nov-09

Note: Timeframe estimated from information provided by EEP.

**Table 3. Project Contacts Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Designer</b>	Kimley-Horn and Associates, Inc. P.O Box 33068, Raleigh, North Carolina 27636
Primary project design POC	POC name and phone 919-677-2050
<b>Construction Contractor</b>	Fluvial Solutions, Inc. PO Box 28749, Raleigh, NC 27611-8749
Construction contractor POC	Peter Jelenevsky, 919-605-6134
<b>Planting Contractor</b>	Carolina Silvics 908 Indian Trail Road, Edenton, NC 27932
Planting contractor POC	Mary-Margaret McKinney 252-482-8491
<b>Seeding Contractor</b>	Contact: Fluvial Solutions, Inc PO Box 28749, Raleigh, NC 27611-8749
Planting contractor POC	Peter Jelenevsky, 919-605-6134
Seed Mix Sources	Contact: Fluvial Solutions, Inc Peter Jelenevsky, 919-605-6134
Nursery Stock Suppliers	ArborGen 843-851-4129
<b>Monitoring Performers</b>	EcoEngineering - A Division of The John R. McAdams Co. 2905 Meridian Parkway, Durham, NC 27713
Stream Monitoring POC Jim Halley	919-287-4262
Vegetation Monitoring POC Jim Halley	919-287-4262
Wetland Monitoring POC NA	NA

Note: Information obtained from EEP documents and bid tabulation results. Use contacts in table for additional information or to verify data.

**Table 4. Project Attribute Table**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

Project County	Wilkes County
Drainage Area: UTto Naked Creek	0.53 square miles
Drainage impervious cover estimate (%)	Estimated at 0.2%
Stream Order	1st for UT to Naked Creek
Physiographic Region	Blue Ridge
Ecoregion	Appalachian Highlands
Rosgen Classification of As-built	C
Cowardin Classification	R3UBH
Dominant soil types	Chewacla loam, Pacolet sandy loam
Reference site ID	UT Purlear, Upper Big Warrior
USGS HUC for Project	03040101010100
NCDWQ Sub-basin for Project	12-31-3-(0.5)
NCDWQ classification for Project and Reference	C
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	100%

APPENDIX C

Vegetation Assessment Data

<b>Table 5. Vegetation Plot Mitigation Success Summary Table</b>			
<b>Naked Creek Stream Restoration Project/EEP Project Number: 261</b>			
<b>Tract</b>	<b>Vegetation Plot ID</b>	<b>Vegetation Survival Threshold Met?</b>	<b>Tract Mean</b>
Naked Creek	VP1	Y	100%
	VP2	Y	
	VP3	Y	
	VP4	Y	
	VP5	Y	

Note: Threshold criteria based on planted and volunteer species.

**Table 6. Vegetation Metadata**

**Naked Creek Stream Restoration Project/EEP Project Number: 261**

<b>Report Prepared By</b>	George Buchholz
<b>Date Prepared</b>	10/9/2009 16:02

<b>database name</b>	EcoEngineering-2009-A.mdb
<b>database location</b>	X:\Projects\EEP\EEP-08000 (Naked Creek)\Storm\CVS Vegetation Data\2009 Vegetation Data
<b>computer name</b>	BUCHHOLZGE
<b>file size</b>	44638208

**DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT-----**

<b>Metadata</b>	Description of database file, the report worksheets, and a summary of project(s) and project data.
<b>Proj, planted</b>	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
<b>Proj, total stems</b>	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
<b>Plots</b>	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
<b>Vigor</b>	Frequency distribution of vigor classes for stems for all plots.
<b>Vigor by Spp</b>	Frequency distribution of vigor classes listed by species.
<b>Damage</b>	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
<b>Damage by Spp</b>	Damage values tallied by type for each species.
<b>Damage by Plot</b>	Damage values tallied by type for each plot.
<b>Planted Stems by Plot and Spp</b>	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.

**PROJECT SUMMARY-----**

<b>Project Code</b>	261
<b>project Name</b>	Naked Creek
<b>Description</b>	10.6 miles west of Wilkesboro and 18.4 miles east of Boone in Wilkesboro, NC. One Reach (UtNkd) approximately 2,800 linear feet
<b>River Basin</b>	Yadkin-Pee Dee
<b>length(ft)</b>	2,562
<b>stream-to-edge width (ft)</b>	25
<b>area (sq m)</b>	0.01 sq miles (2.92 acres)
<b>Required Plots (calculated)</b>	5
<b>Sampled Plots</b>	5





PHOTO VP1: LOOKING NORTH AT VEGETATION PLOT VP1.



PHOTO VP2: LOOKING NORTH AT VEGETATION PLOT VP2.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
WILKES, NORTH CAROLINA**



RESEARCH TRIANGLE PARK, NC  
P.O. BOX 14005 ZIP 27709-4005  
(919) 361-5000



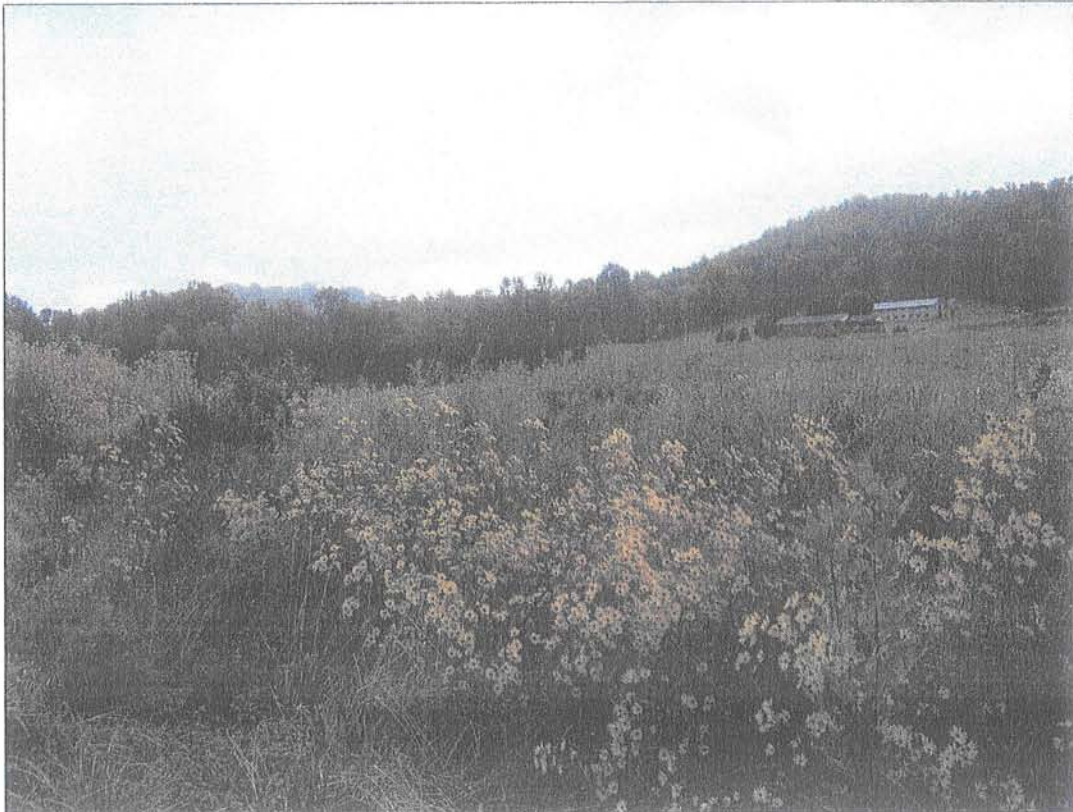


PHOTO VP 3: LOOKING NORTHEAST OF VEGETATION PLOT VP3.



PHOTO VP 4: LOOKING NORTHWEST AT VEGETATION PLOT VP4.

McADAMS

PROJECT NO. EEP-08000  
 FILENAME: EEP-08000  
 SCALE: NTS  
 DATE: 09-29-09



**NAKED CREEK RESTORATION**  
**MONITORING PHOTOS**  
**WILKES, NORTH CAROLINA**



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PHOTO VP 5: LOOKING SOUTHEAST AT VEGETATION PLOT VP5.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
WILKES, NORTH CAROLINA**

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APPENDIX D

Stream Assessment Data

**Table 8. Visual Morphological Stability Assessment  
Naked Creek Stream Restoration Project/EEP Project Number: 261  
Unnamed Tributary to Naked Creek: 2,562 Linear Feet**

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 <sup>1</sup>	% Perform in Stable Condition <sup>2</sup>	Feature Perform. Mean or Total <sup>3</sup>
A. Riffles	1. Present ? <sup>4</sup>	28	28	NA	100	
	2. Armor stable (e.g. no displacement)?	28	28	NA	100	
	3. Facet grade appears stable? (slope ≤ design range)	22	28	NA	79	
	4. Minimal evidence of embedding/fining?	28	28	NA	100	
	5. Length appropriate?	NA	NA	NA	NA	95
B. Pools	1. Present? (e.g. not subject to severe aggrad. or migrat.?)	17	17	NA	100	
	2. Sufficiently deep (Max Pool D:Mean Bk > 1.6?)	Design = 2.4 / 0.8 = 3 17	Max Pool / 0.8 > 1.6, 10 of 17	NA	59	
	3. Length appropriate? (pool-to-pool spacing)	15	17	NA	88	82
C. Thalweg	1. Upstream of meander bend (run/inflection) centering? <sup>5</sup>	26	28	NA	93	
	2. Downstream of meander (glide/inflection) centering? <sup>5</sup>	28	28	NA	100	96
D. Meander	1. Outer bend in state of limited/controlled erosion?	27	27	NA	100	
	2. Of those eroding, # w/concomitant point bar formation	27	27	NA	100	
	3. Apparent Rc within spec?	22	27	NA	82	
	4. Sufficient floodplain access and relief?	27	27	NA	100	96
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	1/700	73	
	2. Channel bed degradation – areas of increasing down-cutting or head cutting?	NA	NA	NA	100	87

F. Bank <sup>6</sup>	1. Actively eroding, wasting, or slumping bank	NA	NA	NA	100	100
	1. Free of bank or arm scour?	34	34	NA	100	
	2. Height appropriate?	34	34	NA	100	
	3. Angle and geometry appear appropriate?	34	34	NA	100	
	4. Free of piping or other structural failures?	33	34	NA	97	99
	1. Free of scour?	36	36	NA	100	
H. Wads/ Boulders	2. Footing stable?	36	36	NA	100	100

**Footnotes:**

The above table should be completed using the visual assessment data form for each project reach/segment. It is recognized that the various metrics within a feature category may not have equal influence on the overall stability of that feature and that this does not incorporate weighting or scoring; however, at this time, EEP requires documentation of the relevant observations for these feature categories.

- 1 Metrics that are spatial estimates that are continuous variables should be entered as:  
The number of locales over the reach for which the failing condition is observed / followed by the total linear distance (feet) or area for which the failing or unstable condition is observed.
- 2 In the case of categorical metrics for which a feature count is involved, this is simply calculated as the number of functional features that are in a state of stability as a percentage of the total. In the case of those metrics based on footage or aerial extent it is that amount in a state of failure or instability expressed as a proportion of the total amount of that feature. The resulting proportion is then subtracted from land then multiplied by 100 to give a percentage that represents the proportion of that feature category in a state of apparent stability.
- 3 The mean of the metrics for a given feature category.
- 4 Was the feature actually present as compared to the As-built or has the feature been completely obscured (aggraded) or removed (degraded).
- 5 Is the Thalweg centering up on the channel in between meander bends?
- 6 Amount of active bank failure/erosion. This should be the tally of all stressed and failing bank from the problem area plan view, which are then be calculated as indicated in footnote 1 above.

USDA-NRCS (1998) *Stream Visual Assessment Protocol* National Water and Climate Center (Technical Note 99-1)

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

Phankuch, D.J. (1975) Stream reach inventory and channel stability evaluation. USDA Forest Service, R1-75-002. GPO #696-260/200

**Table 9. Verification of Bankfull Events**  
**Naked Creek Stream Restoration Project/EEP Project Number: 261**

Date of Data Collection	Date of Occurrence	Method	Photo # (if available)
Installed 09/16/09			

Note: A crest gage was installed during the 2009 Monitoring Year 2 field investigations so that bankfull events can be documented during the 2010 Monitoring Year 3 field investigations. The crest gage is located at Station 10+97 and is depicted in the Consolidated Current Condition Plan View located in Appendix A.



PHOTO 1: LOOKING UPSTREAM AT THE CULVERT AT TOP OF PROJECT.



PHOTO 2: LOOKING DOWNSTREAM AT CHANNEL AND WET AREA NEAR RIGHT BANK.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**  
**MONITORING PHOTOS**  
**WILKES, NORTH CAROLINA**

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PHOTO 3: LOOKING DOWNSTREAM AT CHANNEL.

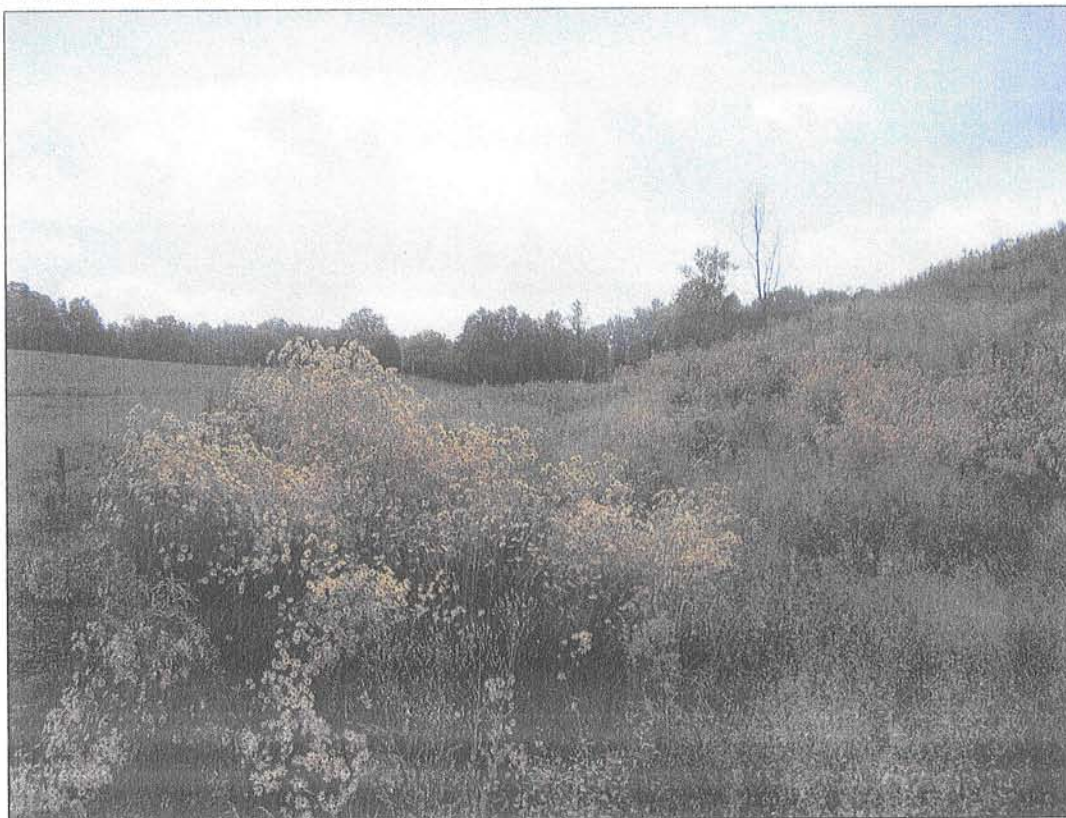


PHOTO 4: LOOKING DOWNSTREAM FROM UPPER CROSSING AT CHANNEL.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



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PHOTO 5: LOOKING AT LEFT BANK AT DRAINAGE SWALE ENTERING CHANNEL FROM LEFT SIDE.



PHOTO 6: LOOKING UPSTREAM FROM HILLSIDE ON RIGHT BANK.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



## NAKED CREEK RESTORATION

MONITORING PHOTOS  
WILKES, NORTH CAROLINA



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PHOTO 7: LOOKING DOWNSTREAM FROM HILLSIDE ON RIGHT BANK.

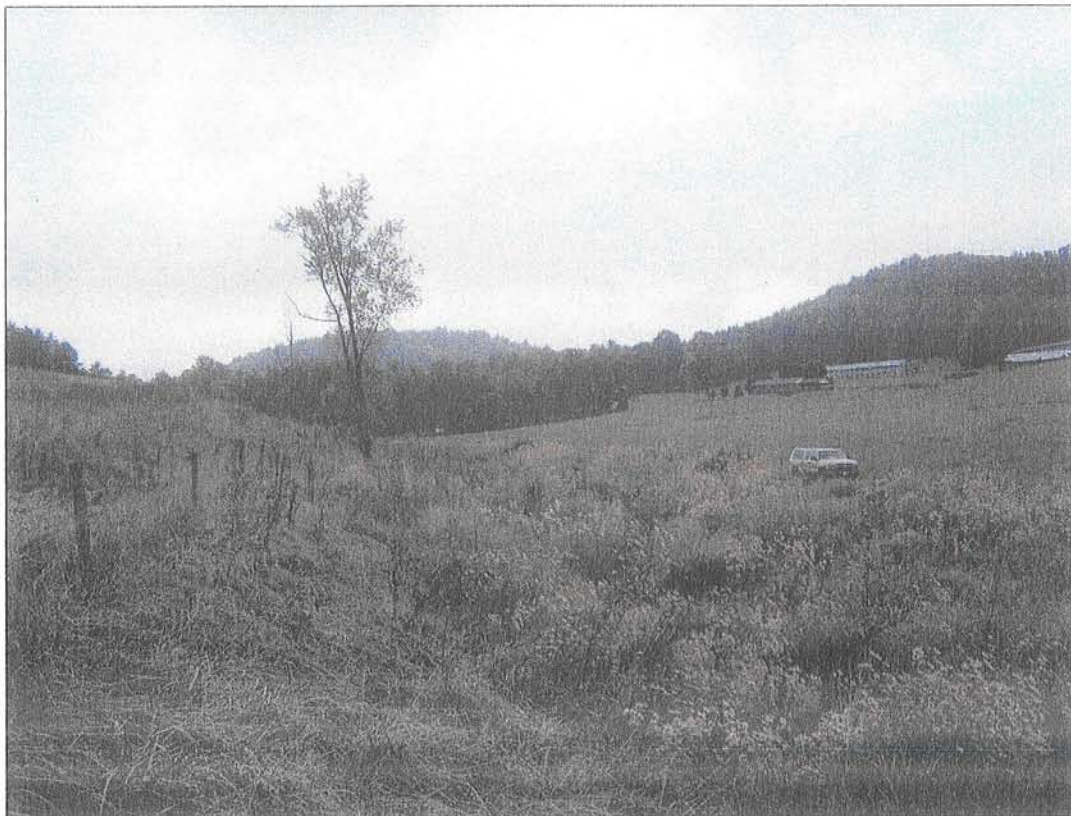


PHOTO 8: LOOKING UPSTREAM FROM HILLSIDE ON RIGHT BANK.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
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PHOTO 9: LOOKING UPSTREAM AT CHANNEL FROM LOWER CROSSING.



PHOTO 10: LOOKING DOWNSTREAM AT CHANNEL FROM LOWER CROSSING.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
WILKES, NORTH CAROLINA**



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PHOTO 11: LOOKING UPSTREAM FROM RIGHT BANK.



PHOTO 12: LOOKING DOWNSTREAM FROM HILLSIDE.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

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PHOTO 13: LOOKING FROM LEFT BANK TOWARD RIGHT BANK AT WET AREA DRAINING INTO RIGHT SIDE OF CHANNEL.



PHOTO 14: LOOKING DOWNSTREAM FROM RIGHT BANK AT CHANNEL AND RIPARIAN AREA.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
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PHOTO 15: LOOKING DOWNSTREAM FROM RIGHT BANK AT RIP-RAP TOE PROTECTION.

McADAMS

PROJECT NO. EEP-08000

FILENAME: EEP-08000

SCALE: NTS

DATE: 09-29-09



**NAKED CREEK RESTORATION**

**MONITORING PHOTOS  
WILKES, NORTH CAROLINA**

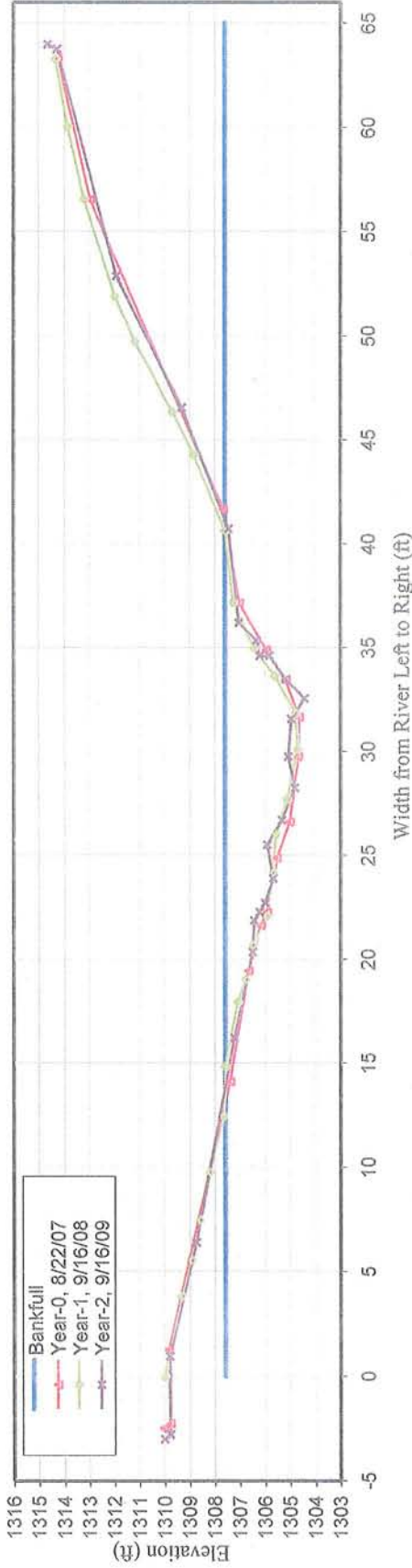
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NAKED CREEK		EEP PROJECT # 261										CROSS SECTION 1			
Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6			
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)		
-2.50	1310.07	0.00	1309.99	-3.00	1310.02										
-2.27	1309.80	3.84	1309.31	-2.79	1309.79										
1.27	1309.87	5.55	1308.91	0.96	1309.82										
14.11	1307.42	7.47	1308.57	6.40	1308.75										
19.44	1306.68	9.77	1308.17	16.22	1307.24										
21.63	1306.18	12.46	1307.64	20.34	1306.50										
22.26	1305.94	14.84	1307.58	21.87	1306.44										
24.87	1305.55	17.94	1307.07	22.28	1306.22										
26.61	1305.03	19.02	1306.73	22.70	1306.01										
29.75	1304.70	20.68	1306.47	23.89	1305.68										
31.66	1304.67	22.07	1305.93	25.50	1305.93										
33.44	1305.20	24.14	1305.68	26.69	1305.34										
34.89	1305.96	26.01	1305.55	28.26	1304.83										
37.15	1307.04	27.68	1305.11	29.75	1305.08										
41.68	1307.67	30.11	1304.68	31.57	1304.97										
56.53	1312.96	31.83	1304.77	32.55	1304.43										
63.35	1314.26	33.64	1305.59	33.47	1305.17										
		34.98	1306.43	34.61	1305.82										
		37.17	1307.25	34.61	1306.21										
		40.61	1307.57	35.35	1306.35										
		44.29	1308.81	36.20	1307.05										
		46.35	1309.66	40.72	1307.45										
		49.73	1311.14	46.54	1309.30										
		51.91	1311.94	52.87	1311.90										
		56.58	1313.19	63.76	1314.26										
		60.05	1313.83	63.99	1314.64										
		63.29	1314.30												



Naked Creek Cross Section 1 - Pool



CROSS SECTION PLOT - LOOKING DOWNSTREAM



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

**YEAR-1, 2008 SURVEY DATA**  
**PROJECT** NAKED CREEK  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 9/16/2009 to 9/18/2009  
**CREW** BUCHHOLZ/FURRY/PARRISH

**CROSS-SECTION:** 1  
**FEATURE:** Pool

**Summary Data**

All dimensions in feet.

Bankfull X-sec area	36.8	sq. ft.
Bankfull Width	27.1	ft.
Bankfull Mean Depth	1.4	ft.
Bankfull Max Depth	3.1	ft.
Width/Depth Ratio	20.0	ft.
Entrenchment Ratio	3.7	ft.
Classification	n/a	

Bankfull Elevation: 1307.58 ft.





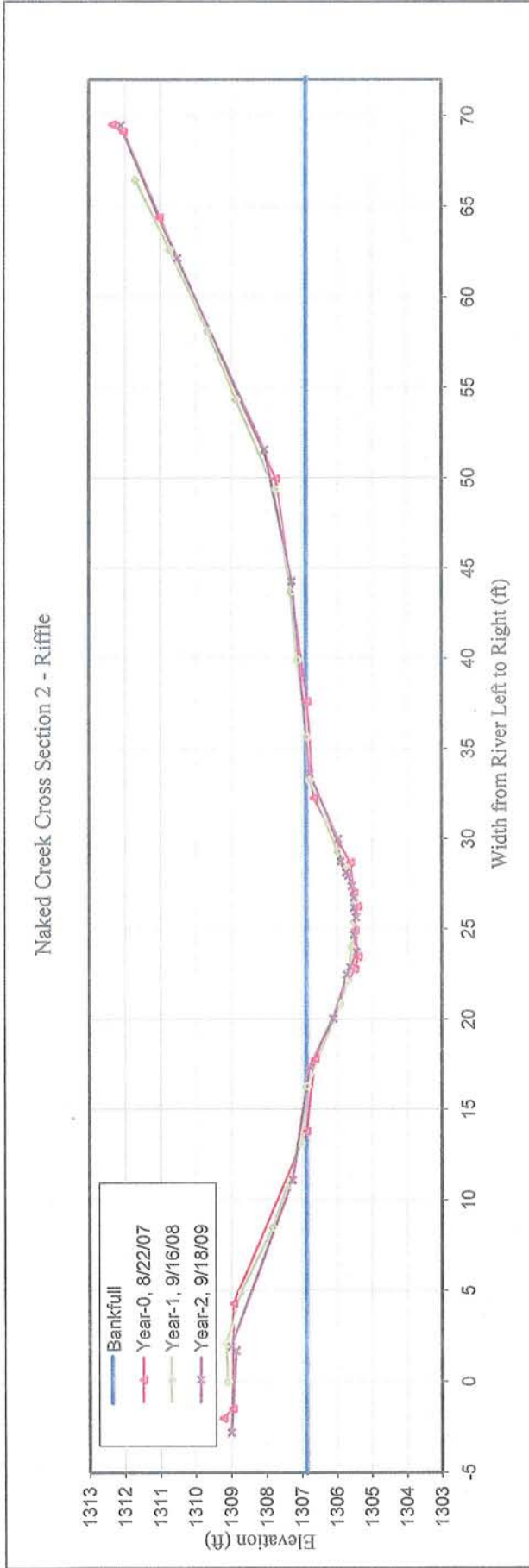
CROSS SECTION 2

EEP PROJECT # 261

NAKED CREEK

Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6	
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)
-2.00	1309.25	0.00	1309.10	-2.80	1309.01								
-1.48	1308.98	2.10	1309.14	1.72	1308.88								
4.32	1308.96	4.94	1308.72	1.94	1309.02								
13.81	1306.89	8.49	1307.82	11.12	1307.28								
17.81	1306.65	10.81	1307.41	17.38	1306.80								
22.79	1305.52	13.10	1307.01	20.04	1306.12								
23.48	1305.41	16.30	1306.86	22.47	1305.73								
24.93	1305.51	20.85	1305.88	22.89	1305.63								
26.27	1305.42	22.15	1305.67	23.72	1305.46								
27.00	1305.53	23.96	1305.57	24.70	1305.53								
28.69	1305.63	25.38	1305.51	25.65	1305.46								
32.26	1306.67	26.58	1305.47	26.17	1305.52								
37.62	1306.86	28.38	1305.74	26.75	1305.53								
49.96	1307.73	29.29	1305.97	27.38	1305.59								
64.39	1311.04	33.26	1306.79	27.98	1305.68								
69.12	1312.05	35.66	1306.85	28.13	1305.75								
69.52	1312.36	39.93	1307.12	28.74	1305.91								
		43.70	1307.30	29.98	1305.98								
		49.37	1307.75	33.65	1306.79								
		54.34	1308.84	44.29	1307.29								
		58.12	1309.64	51.58	1308.06								
		62.63	1310.72	62.15	1310.51								
		66.47	1311.70	69.48	1312.12								





### CROSS SECTION PLOT - LOOKING DOWNSTREAM



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

**YEAR-1, 2008 SURVEY DATA**      **CROSS-SECTION:** 2  
**PROJECT** NAKED CREEK      **FEATURE:** Riffle  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 9/16/2009 to 9/18/2009  
**CREW** BUCHHOLZ/FURRY/PARRISH

**Summary Data**  
 All dimensions in feet.

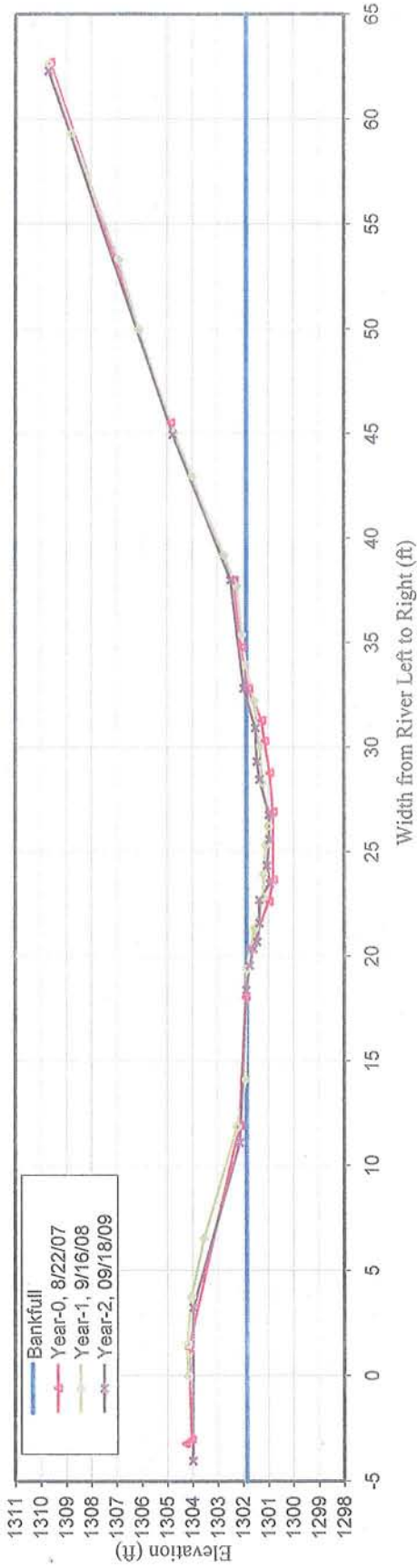
Bankfull X-sec area	14.5	sq. ft.
Bankfull Width	18.0	ft.
Bankfull Mean Depth	0.8	ft.
Bankfull Max Depth	1.4	ft.
Width/Depth Ratio	22.2	ft.
Entrenchment Ratio	5.6	ft.
Classification	C	
Bankfull Elevation:	1306.87	ft.



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 3		
Year-0	Year-1	Year-2	Year-3	Year-4	Year-5	Year-6
Station (ft)	Station (ft)	Station (ft)	Station (ft)	Station (ft)	Station (ft)	Station (ft)
Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. (ft)	Elev. (ft)
-3.20	0.00	-4.03				
1304.09	1304.18	1304.01				
-3.00	1.53	3.27				
1303.86	1304.20	1303.98				
1.35	3.77	11.12				
1303.96	1304.04	1302.14				
11.93	6.55	18.40				
1301.96	1303.54	1301.87				
18.06	11.86	19.57				
1301.71	1302.24	1301.75				
20.40	14.12	20.37				
1301.49	1301.91	1301.59				
22.63	19.40	20.70				
1300.78	1301.86	1301.46				
23.67	21.34	21.59				
1300.61	1301.53	1301.37				
26.92	22.85	22.70				
1300.63	1301.18	1301.36				
28.78	23.95	23.46				
1300.76	1301.18	1300.95				
30.30	25.32	24.34				
1300.96	1301.10	1301.05				
31.29	26.24	25.60				
1301.07	1300.99	1300.96				
32.81	28.29	26.77				
1301.58	1301.23	1300.98				
34.80	30.05	28.46				
1301.86	1301.34	1301.35				
38.00	32.25	29.33				
1302.16	1301.55	1301.45				
45.53	33.95	30.93				
1304.65	1301.89	1301.51				
62.71	35.38	32.82				
1309.43	1302.04	1301.98				
63.02	37.72	38.00				
1309.72	1302.24	1302.49				
	39.19	44.96				
	42.97	62.29				
	1304.00	1304.76				
	45.07	1304.00				
	50.00	1304.70				
	53.33	1306.11				
	59.33	1306.93				
	62.61	1308.78				
		1309.67				



Naked Creek Cross Section 3 - Riffle

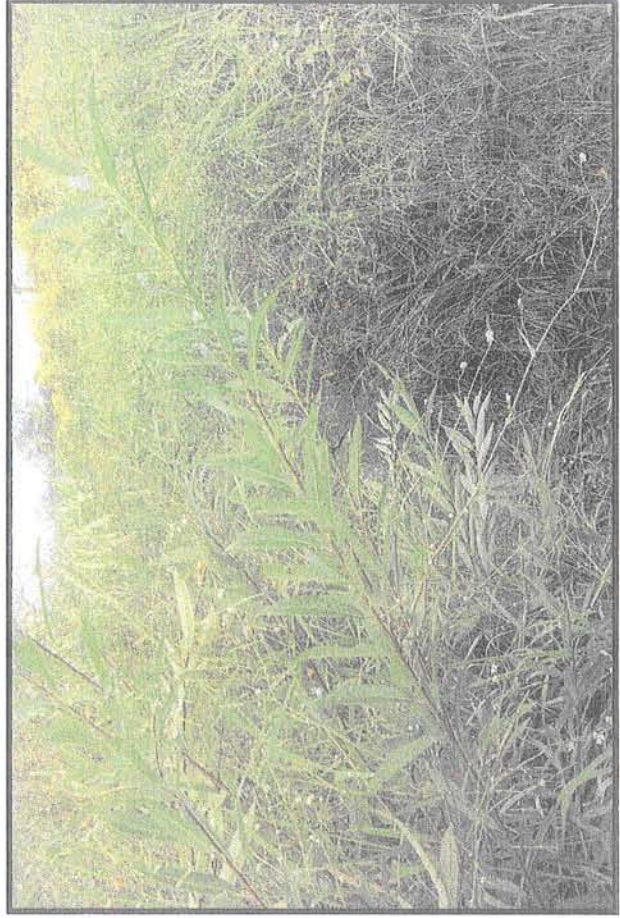


CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-1, 2008 SURVEY DATA CROSS-SECTION: 3  
 PROJECT NAKED CREEK FEATURE: Riffle  
 TASK CROSS SECTION  
 REACH NAKED CREEK  
 DATE 9/16/2008 to 9/18/2008  
 CREW BUCHHOLZ/FURRY/PARRISH

**Summary Data**  
 All dimensions in feet.

Bankfull X-sec area	7.1	sq. ft.
Bankfull Width	13.8	ft.
Bankfull Mean Depth	0.5	ft.
Bankfull Max Depth	0.9	ft.
Width/Depth Ratio	26.9	ft.
Entrenchment Ratio	13.4	ft.
Classification	C	
Bankfull Elevation:	1301.86	ft.



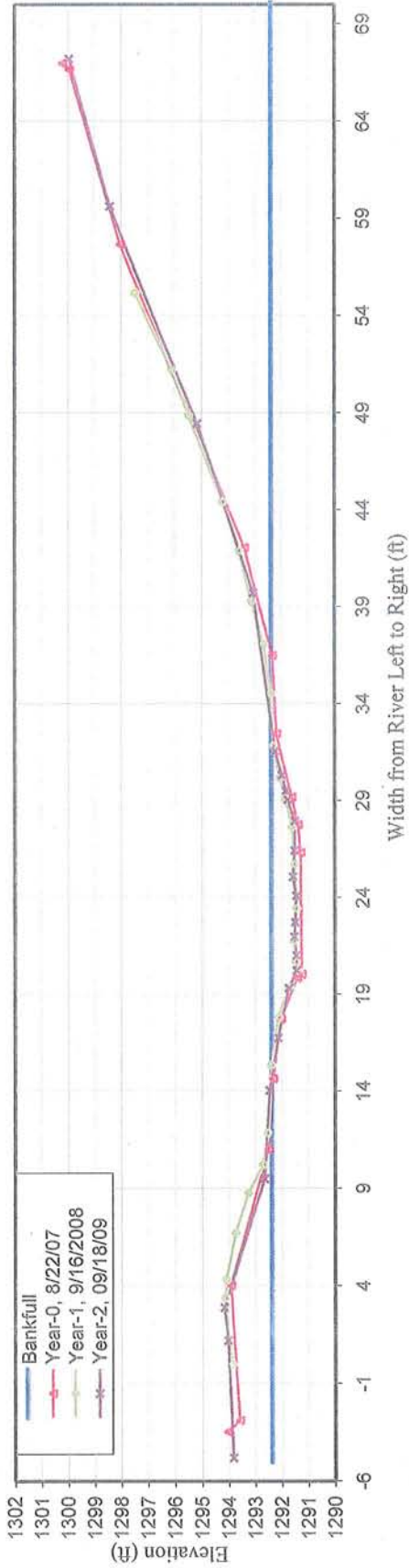
CROSS SECTION PHOTO - LOOKING DOWNSTREAM



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 4		Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6	
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)
-3.45	1294.08	0.00	1293.89	-4.80	1293.87														
-2.86	1293.64	3.40	1294.15	1.22	1294.06														
4.04	1293.97	4.36	1294.11	2.91	1294.21														
11.02	1292.54	6.74	1293.76	9.52	1292.69														
14.67	1292.38	8.77	1293.28	14.07	1292.49														
17.74	1292.08	10.25	1292.73	16.77	1292.17														
19.86	1291.46	11.87	1292.54	19.32	1291.78														
20.04	1291.29	15.36	1292.41	20.24	1291.47														
26.31	1291.33	17.81	1292.14	21.01	1291.48														
27.76	1291.43	19.39	1291.73	21.97	1291.56														
29.18	1291.66	20.24	1291.40	22.72	1291.53														
32.45	1292.24	20.69	1291.48	24.08	1291.48														
36.48	1292.38	21.74	1291.57	25.07	1291.62														
42.05	1293.42	23.44	1291.46	26.42	1291.55														
57.67	1298.07	25.73	1291.54	27.94	1291.55														
66.66	1299.97	27.62	1291.63	29.03	1291.81														
66.97	1300.23	29.10	1291.86	29.51	1291.87														
		30.18	1292.07	30.31	1292.02														
		31.82	1292.34	31.54	1292.28														
		34.52	1292.42	39.72	1293.09														
		37.08	1292.69	48.44	1295.18														
		39.29	1293.14	59.63	1298.45														
		41.90	1293.60	67.20	1299.97														
		44.43	1294.23																
		48.88	1295.48																
		51.23	1296.11																
		55.20	1297.48																
		58.52	1298.34																
		61.31	1298.85																
		64.99	1299.68																



Naked Creek Cross Section 4 - Riffle



CROSS SECTION PLOT - LOOKING DOWNSTREAM



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

**YEAR-1, 2008 SURVEY DATA**      **CROSS-SECTION:** 4  
**PROJECT** NAKED CREEK      **FEATURE:** Riffle  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 9/16/2008 to 9/18/2008  
**CREW** BUCHHOLZ/FURRY/PARRISH

**Summary Data**

All dimensions in feet.

Bankfull X-sec area	10.7	sq. ft.
Bankfull Width	18.1	ft.
Bankfull Mean Depth	0.6	ft.
Bankfull Max Depth	0.9	ft.
Width/Depth Ratio	>12	ft.
Entrenchment Ratio	1.7	ft.
Classification	B	

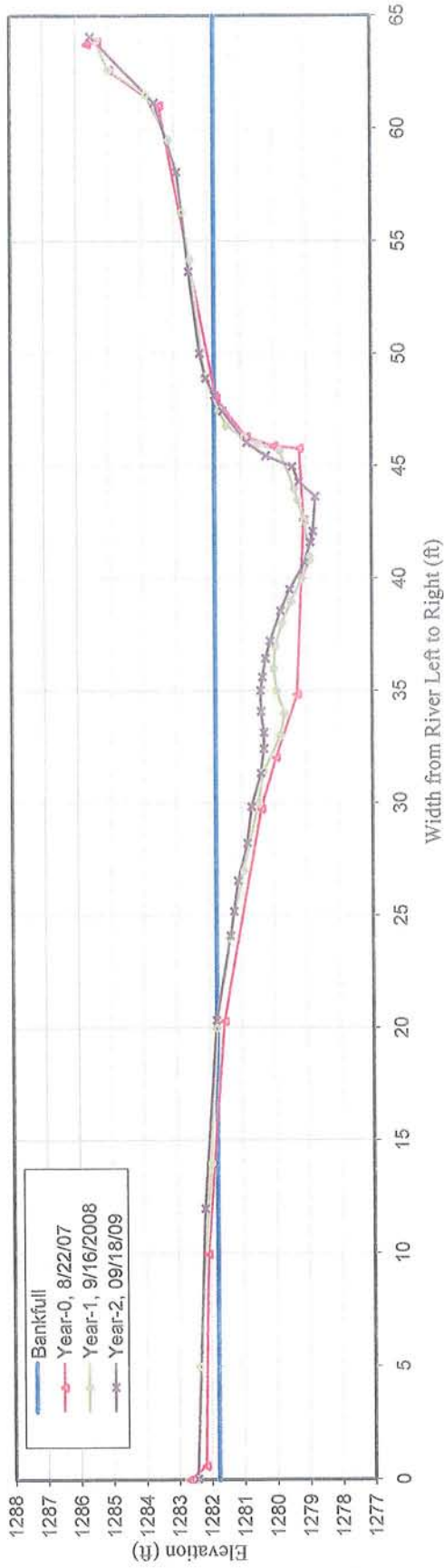
Bankfull Elevation: 1292.41 ft.



<b>NAKED CREEK</b>		<b>EEP PROJECT # 261</b>		<b>CROSS SECTION 5</b>									
<b>Year-0</b>		<b>Year-1</b>		<b>Year-2</b>		<b>Year-3</b>		<b>Year-4</b>		<b>Year-5</b>		<b>Year-6</b>	
<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>
-2.50	1282.92	0.00	1282.46	0.04	1282.46								
-1.88	1282.41	5.00	1282.37	12.00	1282.19								
7.47	1282.32	14.00	1281.99	20.35	1281.82								
17.80	1281.78	20.00	1281.80	24.12	1281.38								
27.26	1280.63	24.00	1281.39	25.20	1281.26								
29.53	1280.17	27.00	1280.95	26.56	1281.13								
32.35	1279.52	30.00	1280.50	28.23	1280.85								
40.12	1279.30	31.40	1280.33	29.85	1280.72								
43.31	1279.43	33.00	1279.82	31.33	1280.43								
43.41	1280.20	34.00	1279.69	32.44	1280.33								
43.82	1281.02	35.00	1279.93	33.14	1280.33								
45.56	1281.95	36.00	1280.01	34.10	1280.41								
58.52	1283.68	37.00	1279.96	35.03	1280.43								
60.09	1285.21	38.00	1279.76	35.63	1280.37								
61.33	1285.56	39.00	1279.48	36.46	1280.27								
61.22	1285.86	40.00	1279.14	37.23	1280.12								
		40.80	1278.91	38.58	1279.81								
		41.00	1278.91	39.53	1279.53								
		42.60	1279.07	40.71	1279.08								
		43.50	1279.27	41.63	1278.89								
		44.00	1279.36	42.12	1278.81								
		45.70	1279.81	43.66	1278.73								
		46.00	1280.46	44.33	1279.23								
		46.30	1280.90	45.00	1279.44								
		46.80	1281.42	45.46	1280.24								
		47.50	1281.65	46.07	1280.80								
		49.00	1282.08	47.47	1281.54								
		54.20	1282.53	48.17	1281.79								
		56.30	1282.78	48.93	1282.05								
		59.50	1283.18	50.03	1282.24								
		61.50	1283.86	53.67	1282.57								
		62.60	1285	58.07	1282.93								
		63.90	1285.39	61.15	1283.61								
				64.06	1285.55								



Naked Creek Cross Section 5 - Pool



CROSS SECTION PLOT - LOOKING DOWNSTREAM



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

**YEAR-1, 2008 SURVEY DATA**      **CROSS-SECTION:** 5  
**PROJECT** NAKED CREEK      **FEATURE:** Pool  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 9/16/2009 to 9/18/2009  
**CREW** BUCHHOLZ/FURRY/PARRISH

**Summary Data**

All dimensions in feet.

Bankfull X-sec area	35.1	sq. ft.
Bankfull Width	26.6	ft.
Bankfull Mean Depth	1.3	ft.
Bankfull Max Depth	3.0	ft.
Width/Depth Ratio	>12	ft.
Entrenchment Ratio	>2.2	ft.
Classification	n/a	

Bankfull Elevation: 1281.80 ft.

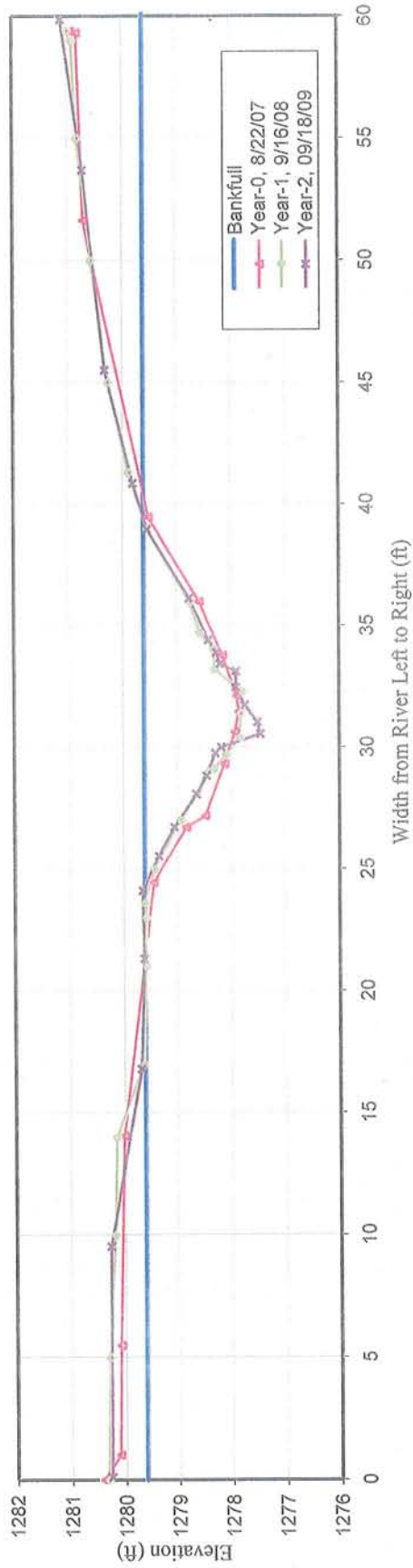




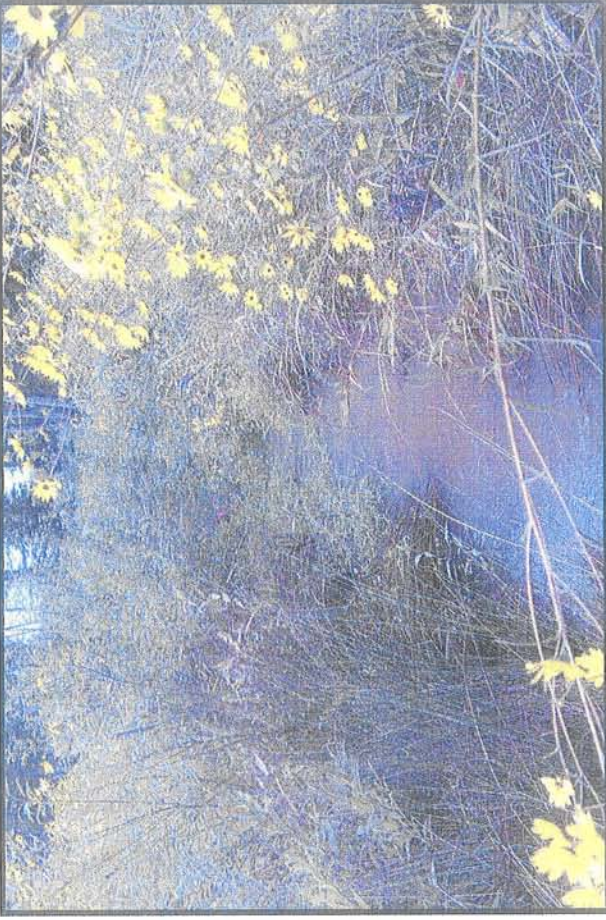
<b>NAKED CREEK</b>		<b>EEP PROJECT # 261</b>		<b>CROSS SECTION 6</b>									
<b>Year-0</b>		<b>Year-1</b>		<b>Year-2</b>		<b>Year-3</b>		<b>Year-4</b>		<b>Year-5</b>		<b>Year-6</b>	
<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>	<u>Station (ft)</u>	<u>Elev. (ft)</u>
0.00	1280.44	0.00	1280.34	0.00	1280.34								
1.02	1280.14	5.00	1280.30	5.00	1280.30								
5.49	1280.12	10.00	1280.20	10.00	1280.20								
14.07	1280.04	14.00	1280.16	14.00	1280.16								
24.46	1279.47	17.00	1279.65	17.00	1279.65								
26.73	1278.85	21.00	1279.60	21.00	1279.60								
27.19	1278.51	23.00	1279.61	23.00	1279.61								
29.33	1278.15	23.60	1279.63	23.60	1279.63								
30.64	1277.95	25.00	1279.44	25.00	1279.44								
31.47	1277.87	27.00	1278.94	27.00	1278.94								
32.13	1277.92	29.00	1278.42	29.00	1278.42								
33.79	1278.17	29.10	1278.33	29.10	1278.33								
36.00	1278.61	29.70	1278.10	29.70	1278.10								
39.47	1279.54	30.40	1277.84	30.40	1277.84								
51.65	1280.73	31.40	1277.83	31.40	1277.83								
59.31	1280.85	32.30	1277.80	32.30	1277.80								
59.38	1280.96	33.20	1278.30	33.20	1278.30								
		34.05	1278.33	34.05	1278.33								
		34.70	1278.58	34.70	1278.58								
		36.00	1278.77	36.00	1278.77								
		39.00	1279.57	39.00	1279.57								
		41.30	1279.90	41.30	1279.90								
		45.00	1280.27	45.00	1280.27								
		50.00	1280.58	50.00	1280.58								
		55.00	1280.84	55.00	1280.84								
		59.00	1280.93										
		59.40	1281.02										



Naked Creek Cross Section 6 - Pool



CROSS SECTION PLOT - LOOKING DOWNSTREAM



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

**YEAR-1, 2008 SURVEY DATA**  
**PROJECT** NAKED CREEK  
**TASK** CROSS SECTION  
**REACH** NAKED CREEK  
**DATE** 9/16/2009 to 9/18/2009  
**CREW** BUCHHOLZ/FURRY/PARRISH

**CROSS-SECTION:** 6  
**FEATURE:** Pool

**Summary Data**

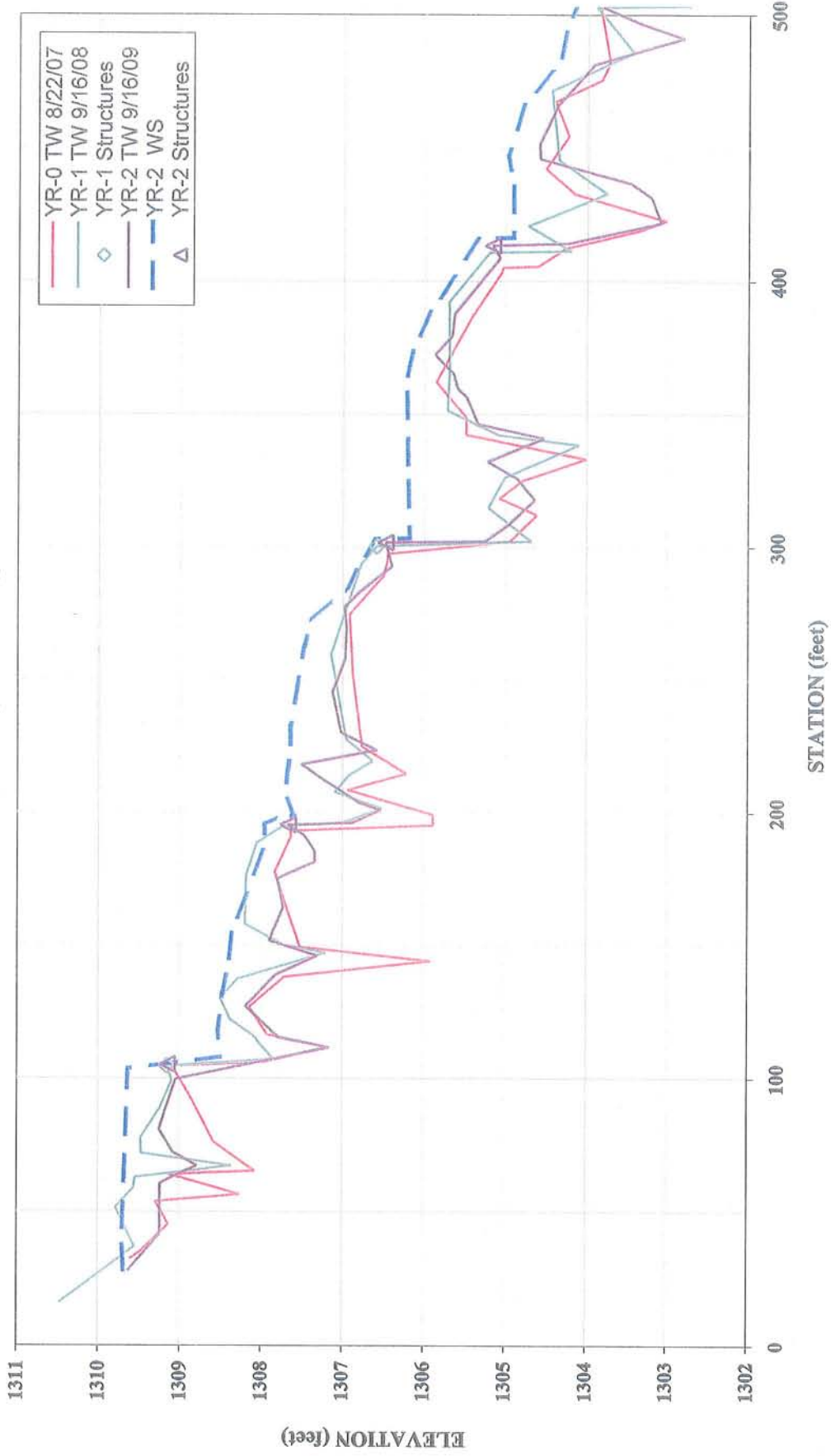
All dimensions in feet.

Bankfull X-sec area	13.2	sq. ft.
Bankfull Width	14.1	ft.
Bankfull Mean Depth	0.9	ft.
Bankfull Max Depth	2.1	ft.
Width/Depth Ratio	>12	ft.
Entrenchment Ratio	>2.2	ft.
Classification	n/a	

Bankfull Elevation: 1279.63 ft.

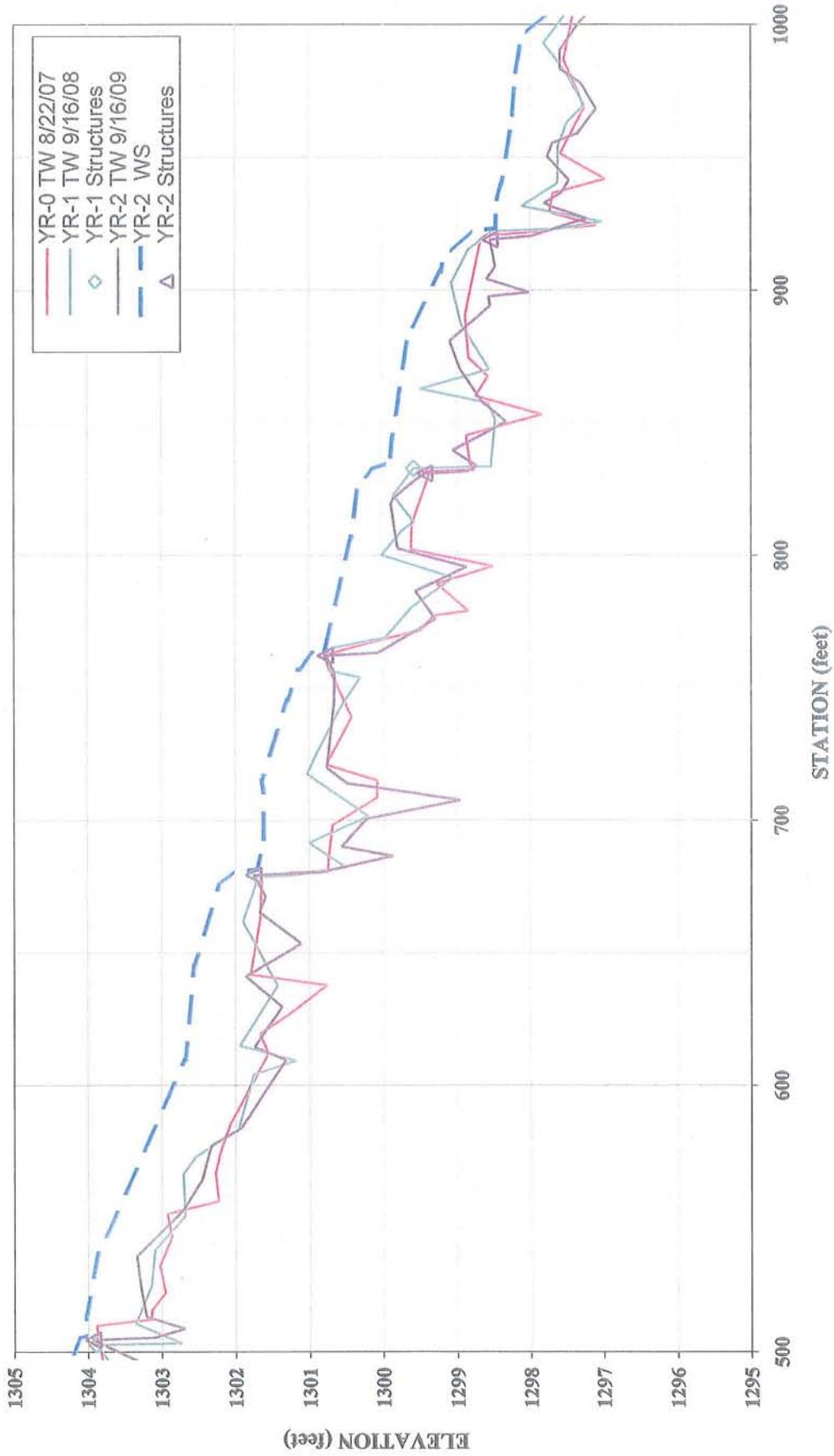


**Naked Creek  
Longitudinal Profile  
2009 (Year-2) Monitoring**



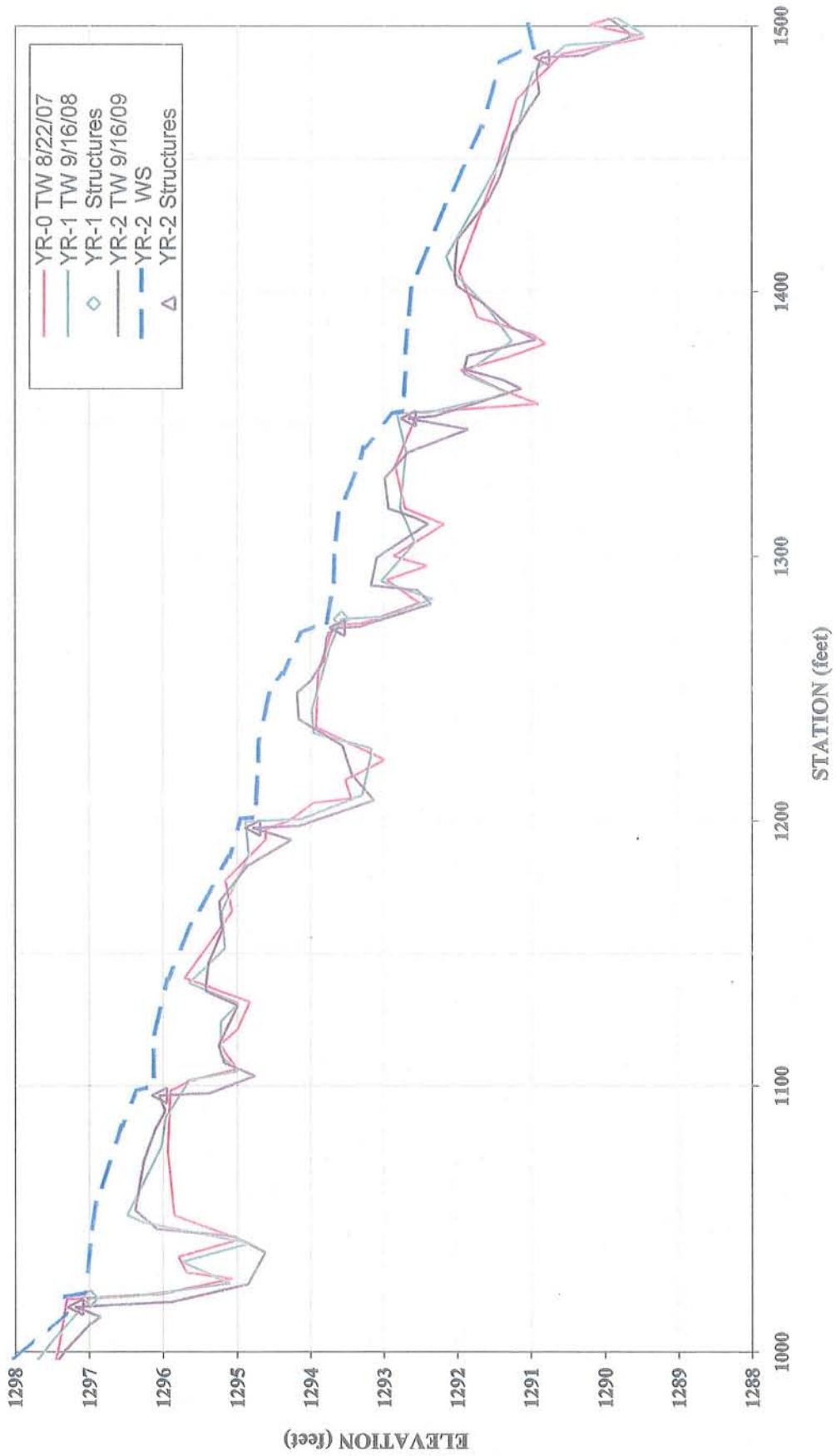
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2009 (Year-2) Monitoring**



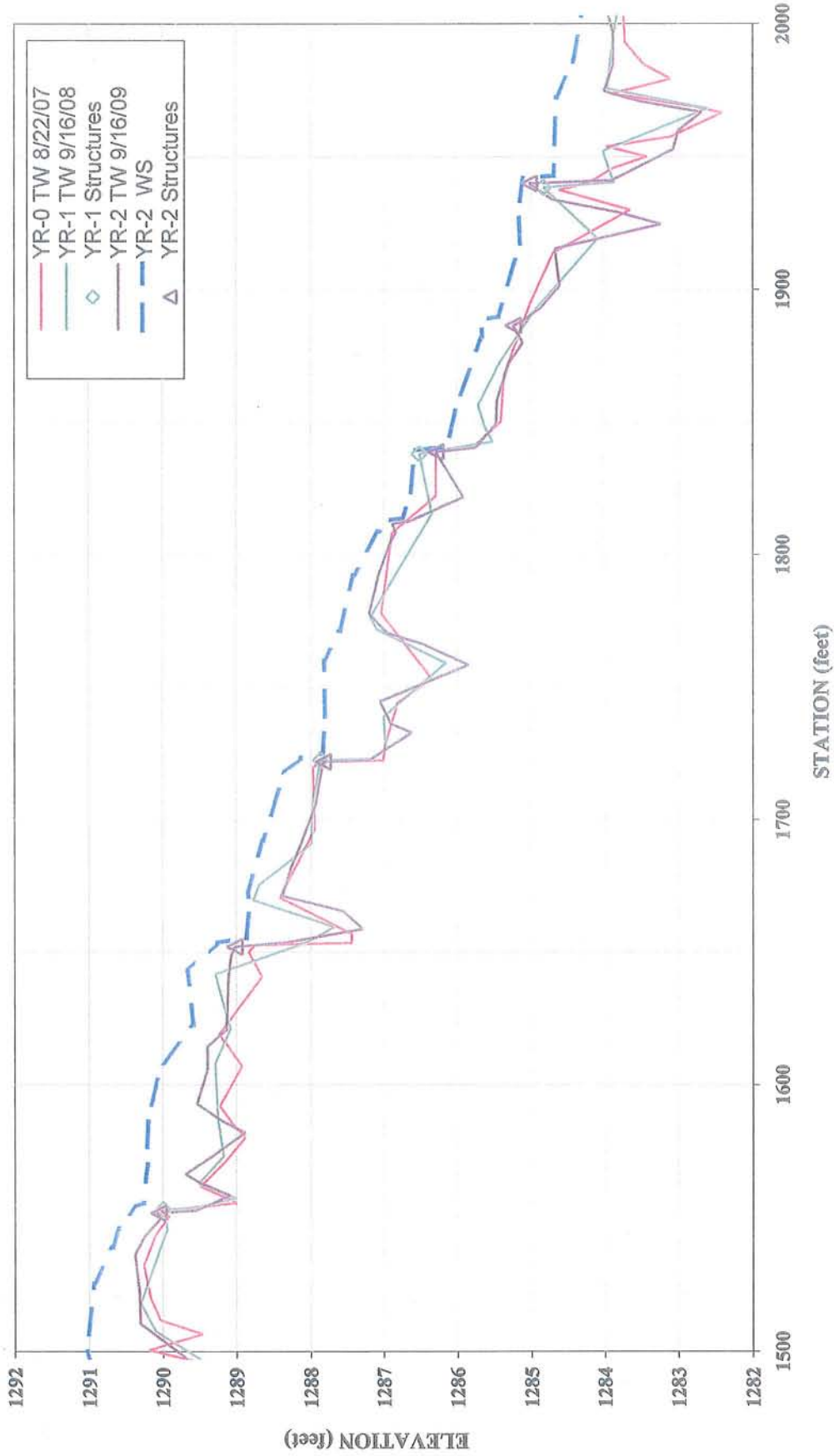
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2009 (Year-2) Monitoring**



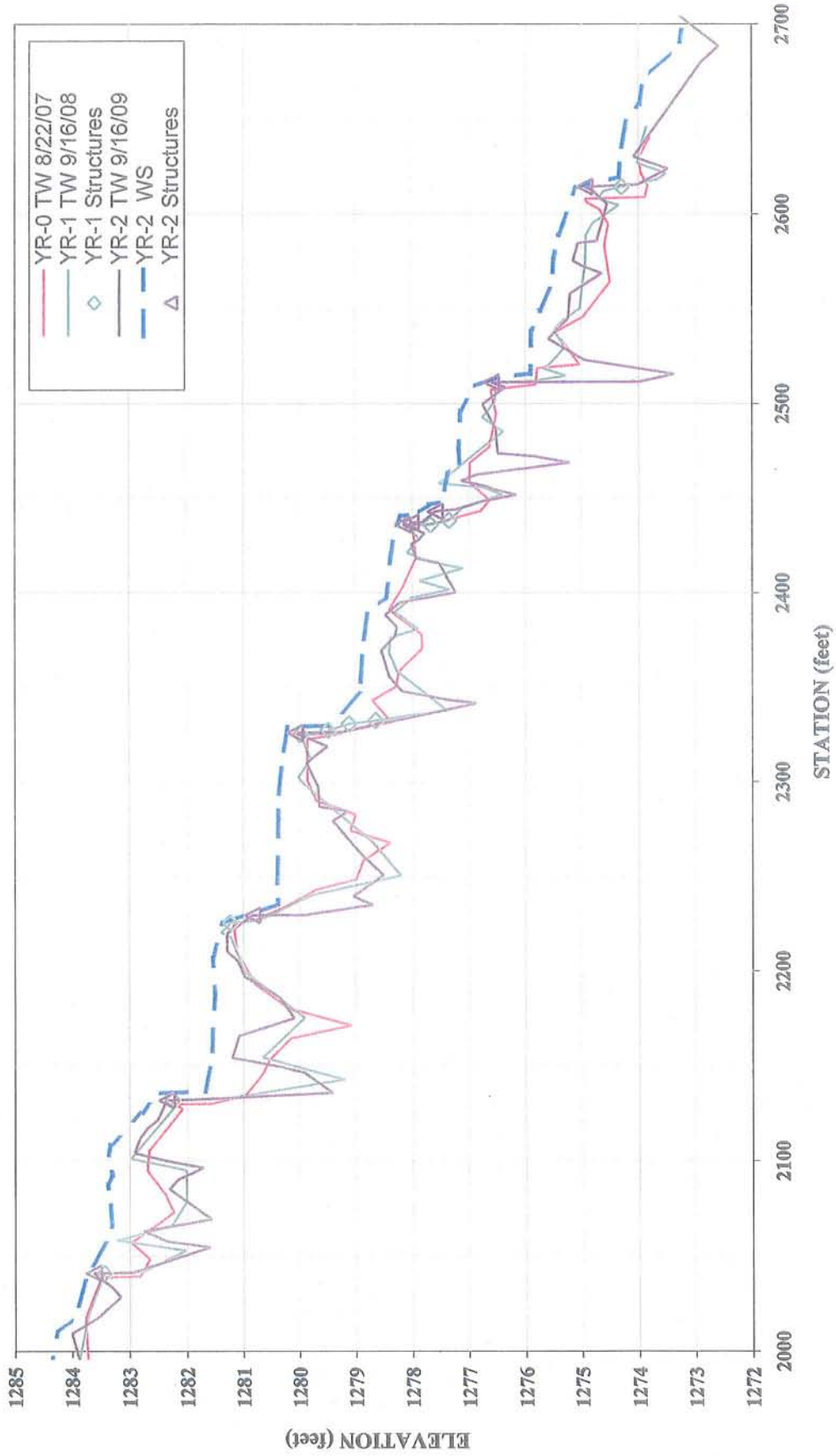
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2009 (Year-2) Monitoring**



Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek  
Longitudinal Profile  
2009 (Year-2) Monitoring**



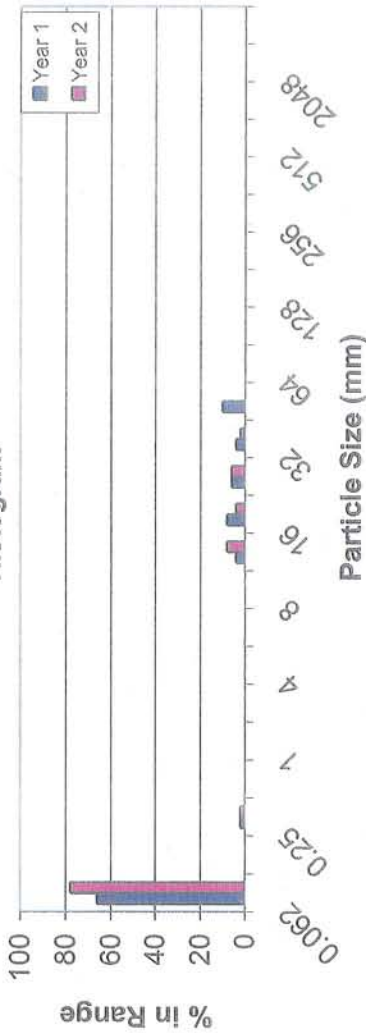
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

EEP PROJECT ID: 261  
 CROSS-SECTION: 2  
 FEATURE: RIFFLE

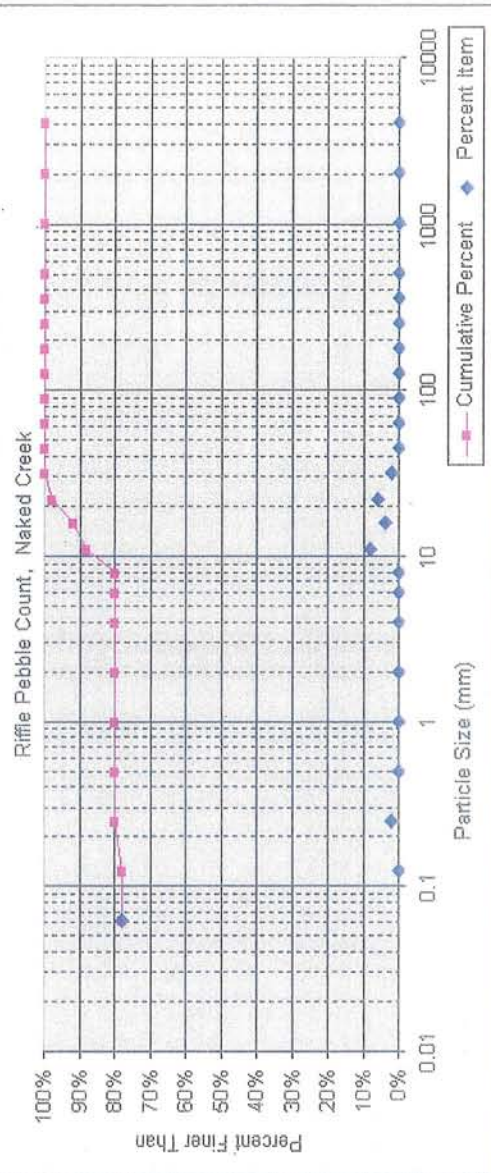


PROJECT NAKED CREEK  
 TASK PEBBLE COUNT  
 REACH NAKED CREEK  
 DATE 9/16/2009 to 9/18/2009  
 CREW BUCHHOLZ/PARRISH/FURRY

Histogram



Material	Size Range (mm)	Count
silt/clay	0 - 0.062	78
very fine sand	0.062 - 0.13	2
fine sand	0.13 - 0.25	2
medium sand	0.25 - 0.5	0
coarse sand	0.5 - 1	0
very coarse sand	1 - 2	0
very fine gravel	2 - 4	0
fine gravel	4 - 6	0
fine gravel	6 - 8	0
medium gravel	8 - 11	0
medium gravel	11 - 16	0
coarse gravel	16 - 22	0
coarse gravel	22 - 32	0
coarse gravel	32 - 45	0
very coarse gravel	45 - 64	0
very coarse gravel	64 - 90	0
small cobble	90 - 128	0
medium cobble	128 - 180	0
large cobble	180 - 256	0
very large cobble	256 - 362	0
small boulder	362 - 512	0
small boulder	512 - 1024	0
medium boulder	1024 - 2048	0
large boulder	2048 - 4096	0
very large boulder	4096 -	0
bedrock		0
Total Particle Count:		100



Size percent less than (mm)	D16	D35	D50	#N/A	D84	D95	Percent by substrate type
	#N/A	#N/A	#N/A	9	19		silt/clay 78%, sand 2%, gravel 20%, cobble 0%, boulder 0%, bedrock 0%

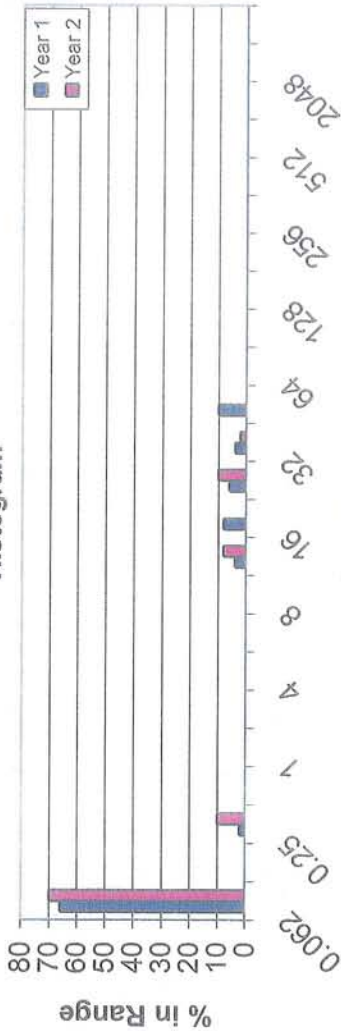


EEP PROJECT ID: 261  
 CROSS-SECTION: 3  
 FEATURE: RIFFLE



PROJECT NAKED CREEK  
 TASK PEBBLE COUNT  
 REACH NAKED CREEK  
 DATE 9/16/2009 to 9/18/2009  
 CREW BUCHHOLZ/PARRISH/FURRY

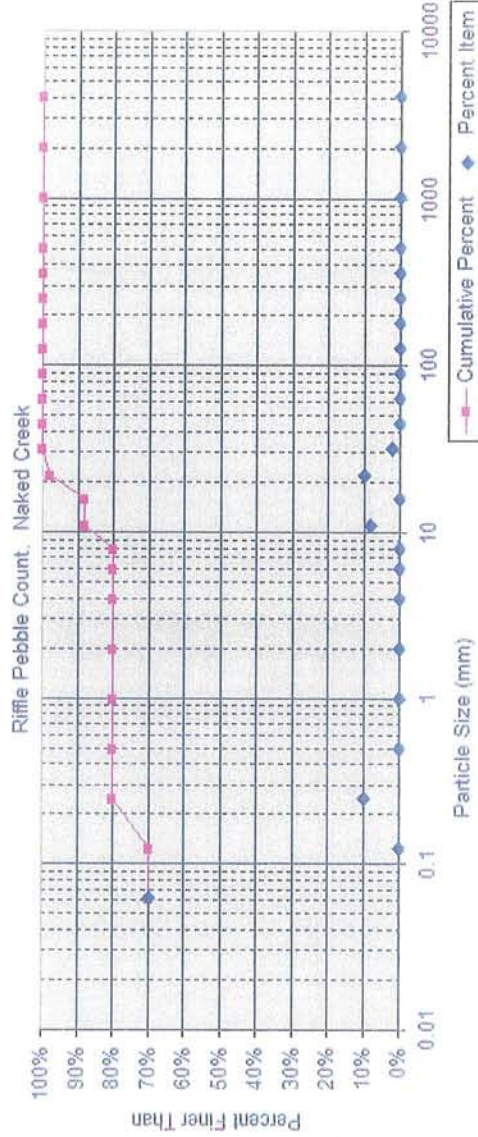
Histogram



Naked Creek

Note:

Riffle Pebble Count, Naked Creek



Size percent less than (mm)				Percent by substrate type						
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
#N/A	#N/A	#N/A	9	20	70%	10%	20%	0%	0%	0%

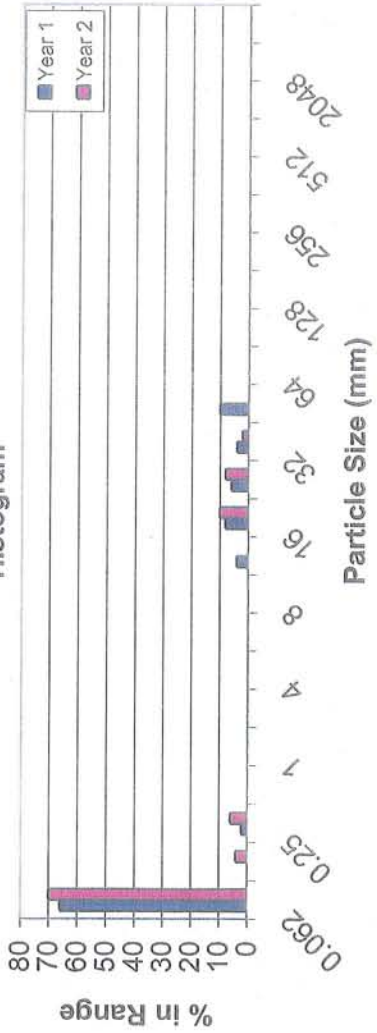
Total Particle Count: 100

EEP PROJECT ID: 261  
 CROSS-SECTION: 4 FEATURE: RIFFLE



PROJECT NAKED CREEK  
 TASK PEBBLE COUNT  
 REACH NAKED CREEK  
 DATE 9/16/2009 to 9/18/2009  
 CREW BUCHHOLZ/PARRISH/FURRY

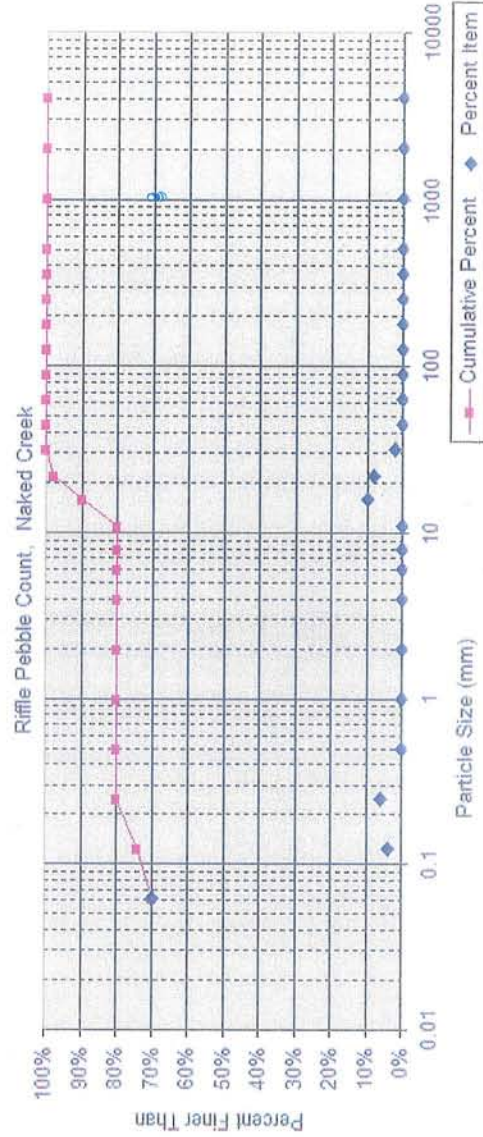
Histogram



Material	Size Range (mm)	Count
silt/clay	0 0.062	70
very fine sand	0.062 0.13	4
fine sand	0.13 0.25	6
medium sand	0.25 0.5	1
coarse sand	0.5 1	2
very fine gravel	1 2	4
fine gravel	2 4	6
fine gravel	4 6	8
medium gravel	6 8	11
medium gravel	8 11	10
coarse gravel	11 16	8
coarse gravel	16 22	2
very coarse gravel	22 32	45
very coarse gravel	32 45	64
small cobble	45 64	90
medium cobble	64 90	128
large cobble	90 128	180
very large cobble	128 180	256
small boulder	180 256	362
medium boulder	256 362	512
large boulder	362 512	1024
very large boulder	512 1024	2048
bedrock	1024 2048	4096
Total Particle Count:		100

Material: Naked Creek

Note:



Size percent less than (mm)			
D16	D35	D50	#N/A
#N/A	#N/A	D84	D95
		13	20

Percent by substrate type			
silt/clay	sand	gravel	bedrock
70%	10%	20%	0%
boulder	cobble		
0%	0%		

APPENDIX E

Wetland Assessment  
(omitted, not applicable)