

Naked Creek Stream Restoration

Wilkes County, North Carolina

2011 Year 4 Monitoring Report - Final

EEP Project Number: 261

USGS HUC 030401010100

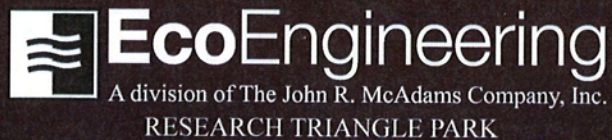
EcoEngineering Project Number: EEP-08000

Prepared for:

NCDENR Ecosystem Enhancement Program

2728 Capital Blvd., Suite 1H 103

Raleigh, NC 27604



P. O. Box 14005 Research Triangle Park, NC 27709
919-287-4262 FAX 919-361-2269
www.ecoengr.com

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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)

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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

Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all planted stems within a vegetation monitoring plot have been surveyed and accounted for. Therefore, any additional species observed in proceeding monitoring years are considered volunteer species. The 2011 Monitoring Year 4 data was provided by Carolina Vegetation Survey and was not manipulated for presentation within Table 7 - Stem Count Total and Planted by Plot Species **Appendix C.**

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 for Monitoring Year 4, Naked Creek had 5 vegetation plots encompassing 0.12 acres, containing a total of 42 planted stems excluding live stakes. When examining total stems within all 5 vegetation plots, there were 53 planted stems including volunteer stems. In total, the 5 vegetation plots yielded a density of 340 planted trees per acre excluding live stakes. When examining the density total of all trees within all 5 vegetation plots, there was a density of 429 planted trees including volunteer trees. These density totals exceed the requirements by 10% for both planted trees per acre excluding live stakes and planted trees including volunteer trees. With regard to each individual vegetation plot, Vegetation Plots 1, 4, and 5 failed to meet the requirements by less than 10% while Vegetation Plots 2 and 3 exceed the requirements by 10% when examining planted stems excluding live stakes. Vegetation Plots 1 failed to meet the requirements by less than 10% while Vegetation Plots 2, 3, 4, and 5 exceed the requirements by 10% when examining planted stems including volunteer stems.

Exotic/invasive species were observed at the site. Exotic species observed at the site include Chinese privet (*Ligustrum sinense*) and cattail (*Typha latifolia*). In previous monitoring years silktree (*Albizia julibrissin*) was listed as an exotic/invasive species. However, it was determined that this species was incorrectly identified and is actually partridge pea (*Chamaecrista fasciculata*); and therefore, eliminated as an exotic/invasive species. There are seven areas in which exotic/invasive species were observed totaling approximately 0.04 acres in size and are approximately 1.03% of the easement acreage. The extent of

exotic/invasive species is depicted in the Consolidated Current Condition Plan View **Appendix A**.

Bare areas which exhibit limited cover of both woody and herbaceous material were observed at the site. There were two areas which were considered bare areas which total approximately 0.23 acres in size and are approximately 9.05% of the planted area at the site. The extent of the bare areas is depicted in the Consolidated Current Condition Plan View **Appendix A**.

The restoration project includes within the conservation easement areas designated as “Allowable Use Area”. Allowable Use Areas are 10 foot wide areas in which mowing activities have occurred and are permissible. In general, the Allowable Use Areas are located within the upstream section of the restoration project between Station 0+05 and Station 16+30. These Allowable Use Areas are noted within Table 6A – Vegetation Condition Assessment **Appendix C** as Easement Encroach Areas. There were two areas considered to be Allowable Use Areas which total approximately 0.34 acres in size and are approximately 8.71% of the easement acreage. The extent of the Allowable Use Areas is depicted in the Consolidated Current Condition Plan View **Appendix A**.

Based on guidance provided to EcoEngineering from EEP (Julie Cahill, EEP Project Manager) on January 25, 2011, the conservation easement for the restoration project is not shown on the Consolidated Current Condition Plan View **Appendix A**. EcoEngineering conducted field work for Monitoring Year 4 between the dates of April 4 and April 6, 2011. At the time of the field work, EcoEngineering visually identified stakes and diamond shaped yellow and black EEP markers primarily located within the downstream section of the restoration project between Stations 16+80 and 27+00. The approximate location of the stakes and EEP markers are depicted in the Consolidated Current Condition Plan View **Appendix A**. EcoEngineering did survey locate one EEP Conservation Monument located at Station 26+70 and is depicted on the Consolidated Current Condition Plan View **Appendix A**. Many of the EEP markers and stakes were noted to be within 10 feet of the restored stream’s top of bank. Areas have been mowed immediately adjacent to the east of the stakes and EEP markers. As a result, approximately 60% of Vegetation Plot 5 has been mowed. However, EcoEngineering recreated Vegetation Plot 5 and surveyed the vegetation within the plot. It should be noted that a section of fence has been removed between Stations 16+80 and 19+60. Furthermore, EcoEngineering was not able to visually identify any additional stakes and EEP markers located on the western side of the restoration project other than those depicted on the Consolidated Current Condition Plan View **Appendix A**.

Based on the survey conducted for the Naked Creek Stream Restoration project, the restoration project is 2,652 linear feet and will provide a total of 2,652 stream mitigation units.

1.3 Stream Stability/Condition and Comparison

Overall, the stream system appears stable and is not migrating toward lateral or vertical instability. 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**. Evidence of a bankfull event was observed this monitoring year.

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).

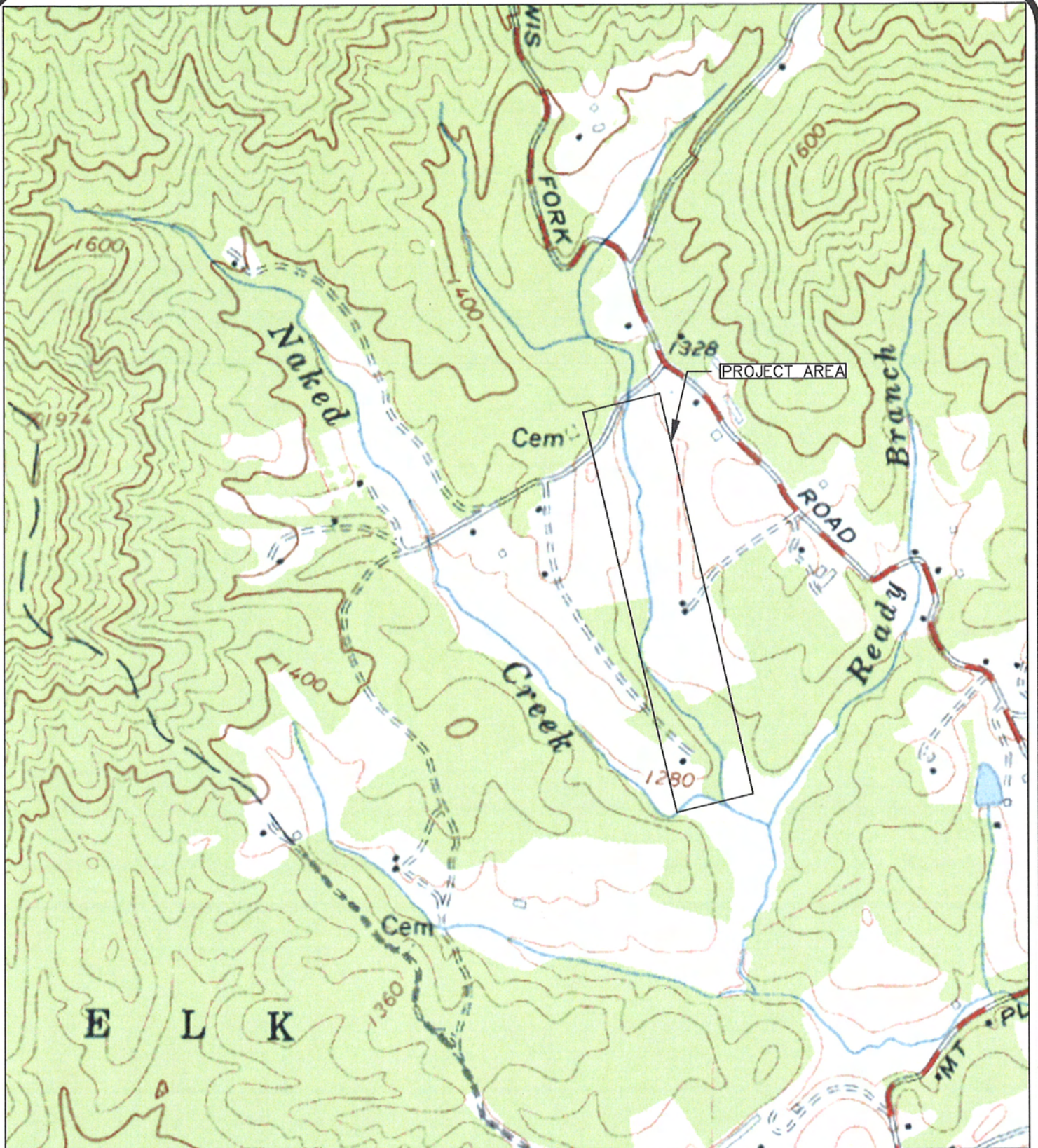
Vegetation monitoring methods followed the 2008, Version 4.2 CVS-EEP Protocol for Recording Vegetation (Lee et. al., 2008). Vegetation plot photographs were collected for each vegetation plot. Vegetation monitoring plots were re-marked in the field by replacing all old flagging with new orange flagging. 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:	04-29-11



NAKED CREEK

VICINITY MAP

WILKES COUNTY, NORTH CAROLINA

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NAKED CREEK

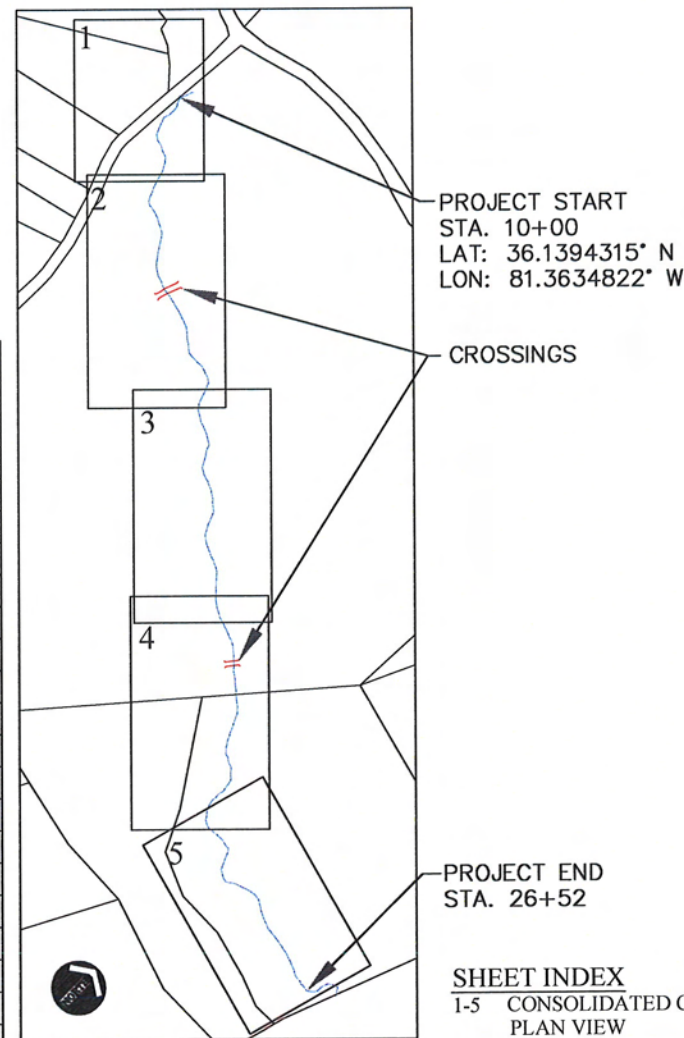
CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FOUR MONITORING

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

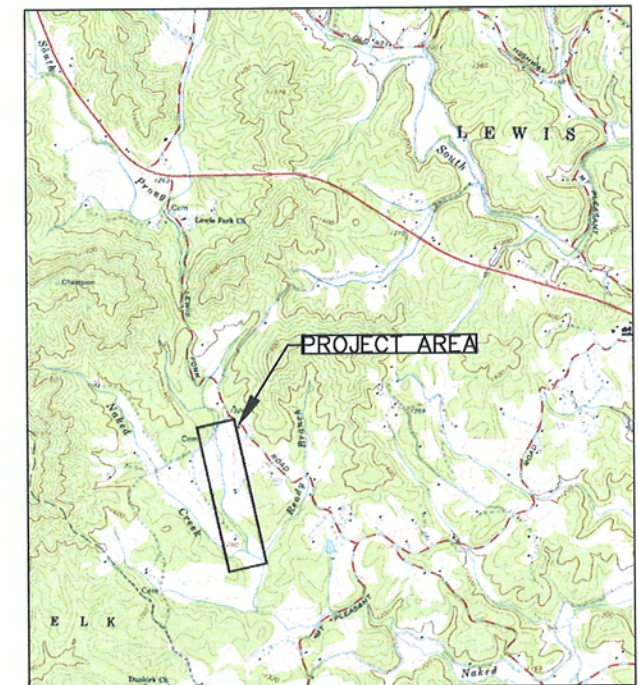
WILKES COUNTY, NORTH CAROLINA EEP PROJECT NUMBER: 261

DATE: APRIL 29, 2011

NORTH CAROLINA
ECOSYSTEM ENHANCEMENT PROGRAM
NC-EEP CONTACT: JULIE CAHILL (828)230-5172



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



VICINITY MAP
NTS

NOTE: SURVEY DATES OF THALWEG AND TOP-OF-BANK - 4/04/11 TO 4/06/11.

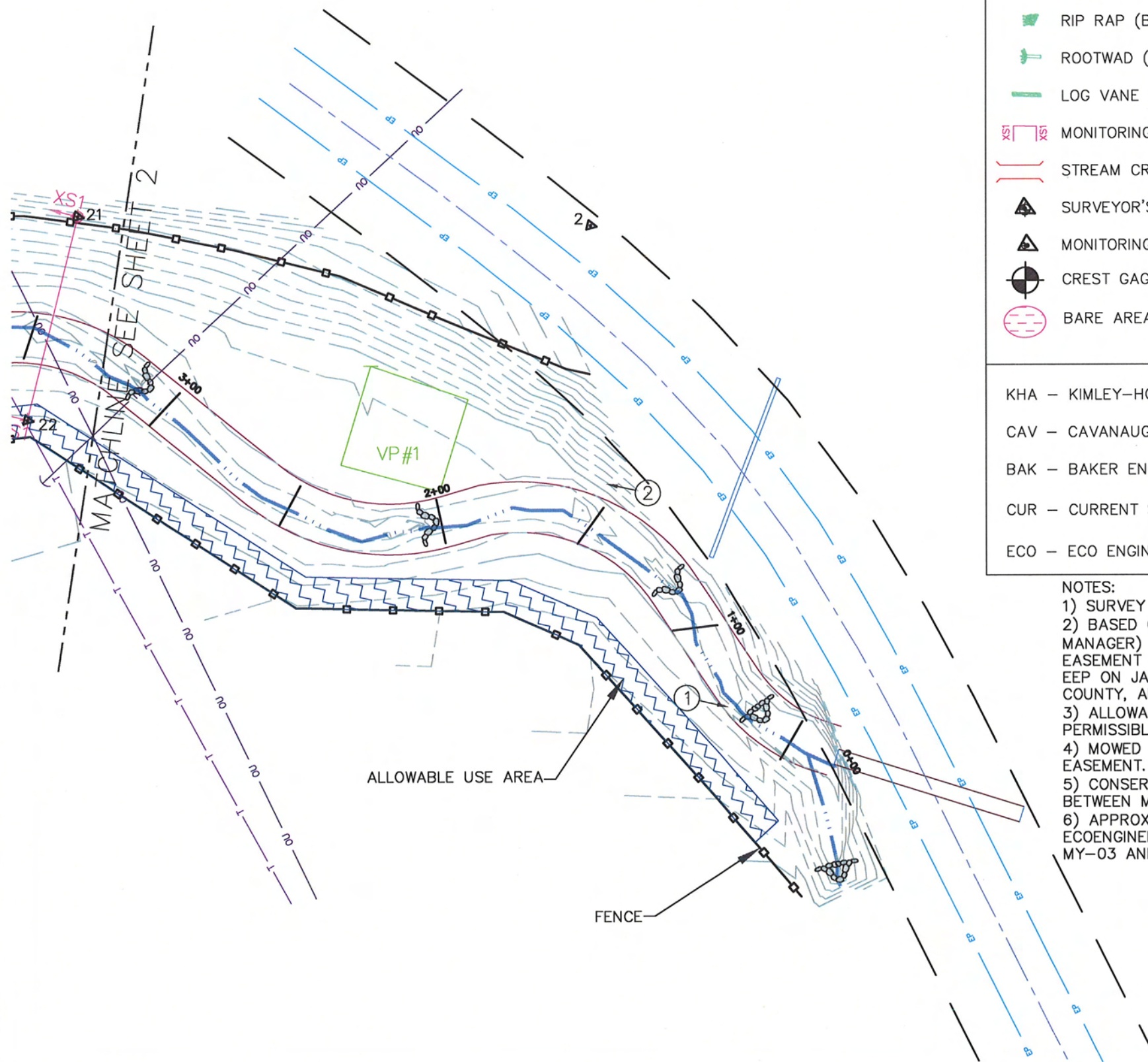


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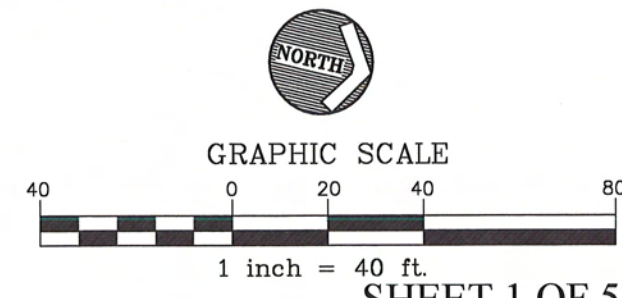


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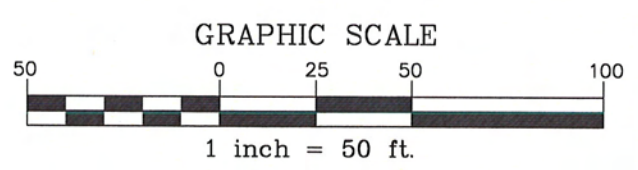
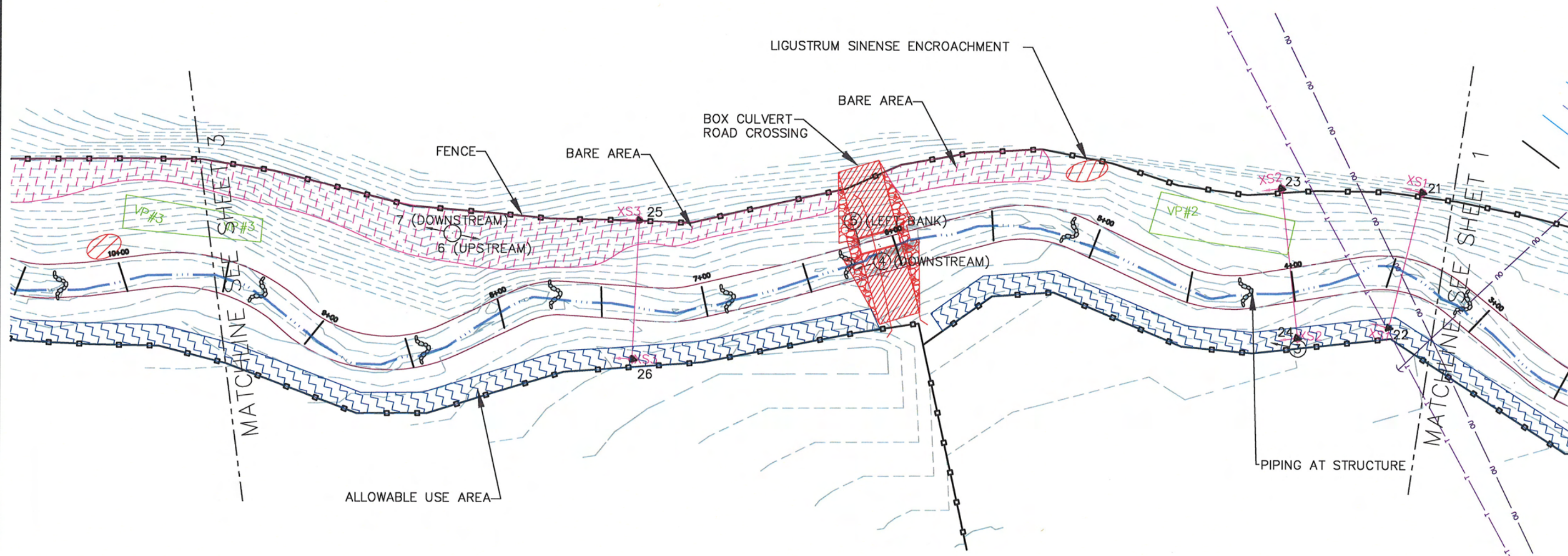
	PHOTO POINT (ECO)		FENCE (BAK)
	VEGETATION MONITORING PLOT (KHA)		CONSERVATION EASEMENT ²
	ROCK CROSS VANE (BAK)		EDGE OF PAVEMENT (CAV)
	ROCK A-VANE (BAK)		TELEPHONE LINE (CAV)
	RIP RAP (BAK)		OVERHEAD POWER LINE (CAV)
	ROOTWAD (BAK)		YEAR FOUR STREAM CENTERLINE (ECO) ¹
	LOG VANE (BAK)		AS-BUILT TOP OF BANK (BAK)
	MONITORING CROSS SECTIONS (ECO)		VEGETATION MONITORING PLOT (KHA)
	STREAM CROSSING/FORD (BAK)		ALLOWABLE USE AREA ³
	SURVEYOR'S BENCHMARKS (CAV, BAK)		INVASIVE / EXOTIC VEGETATION
	MONITORING BENCHMARKS (KHA)		PHOTO POINT LOCATION AND DIRECTION
	CREST GAGE		MOWED AREA ⁴
	BARE AREAS		CONSERVATION EASEMENT MONUMENT ⁵
			CONSERVATION EASEMENT STAKES ⁶

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 FOUR MONITORING)

NOTES:
 1) SURVEY DATES OF THALWEG AND TOP-OF-BANK – 4/04/11 TO 4/06/11.
 2) BASED ON GUIDANCE PROVIDED TO ECOENGINEERING FROM EEP (JULIE CAHILL, EEP PROJECT MANAGER) ON JANUARY 25, 2011 THE CONSERVATION EASEMENT IS NOT SHOWN. CONSERVATION EASEMENT ACREAGE IS ASSUMED TO BE 3.9 ACRES AND IS BASED ON INFORMATION RECEIVED FROM EEP ON JANUARY 24, 2011 AND IS BASED ON DB 1019 PAGE 361, PLAT 10 PAGE 486 WILKES COUNTY, AND DB 1019 PAGE 417, PLAT 10 PAGE 486 WILKES COUNTY, DATED NOVEMBER 20, 2007.
 3) ALLOWABLE USE AREAS ARE AREAS IN WHICH MOWING ACTIVITIES HAVE OCCURRED AND ARE PERMISSIBLE.
 4) MOWED AREAS ARE AREAS IN WHICH MOWING HAS OCCURRED ADJACENT TO THE CONSERVATION EASEMENT.
 5) CONSERVATION EASEMENT MONUMENT SURVEY LOCATED BY ECOENGINEERING AND INSTALLED BETWEEN MY-03 AND MY-04 BY OTHERS.
 6) APPROXIMATE LOCATION OF CONSERVATION EASEMENT STAKES VISUALLY IDENTIFIED BY ECOENGINEERING DIAMOND SHAPED YELLOW AND BLACK EEP MARKERS AND INSTALLED BETWEEN MY-03 AND MY-4 BY OTHERS.



SHEET 1 OF 5

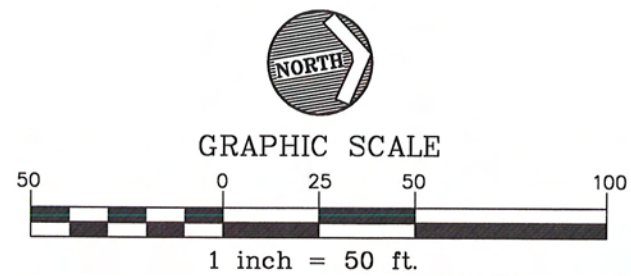
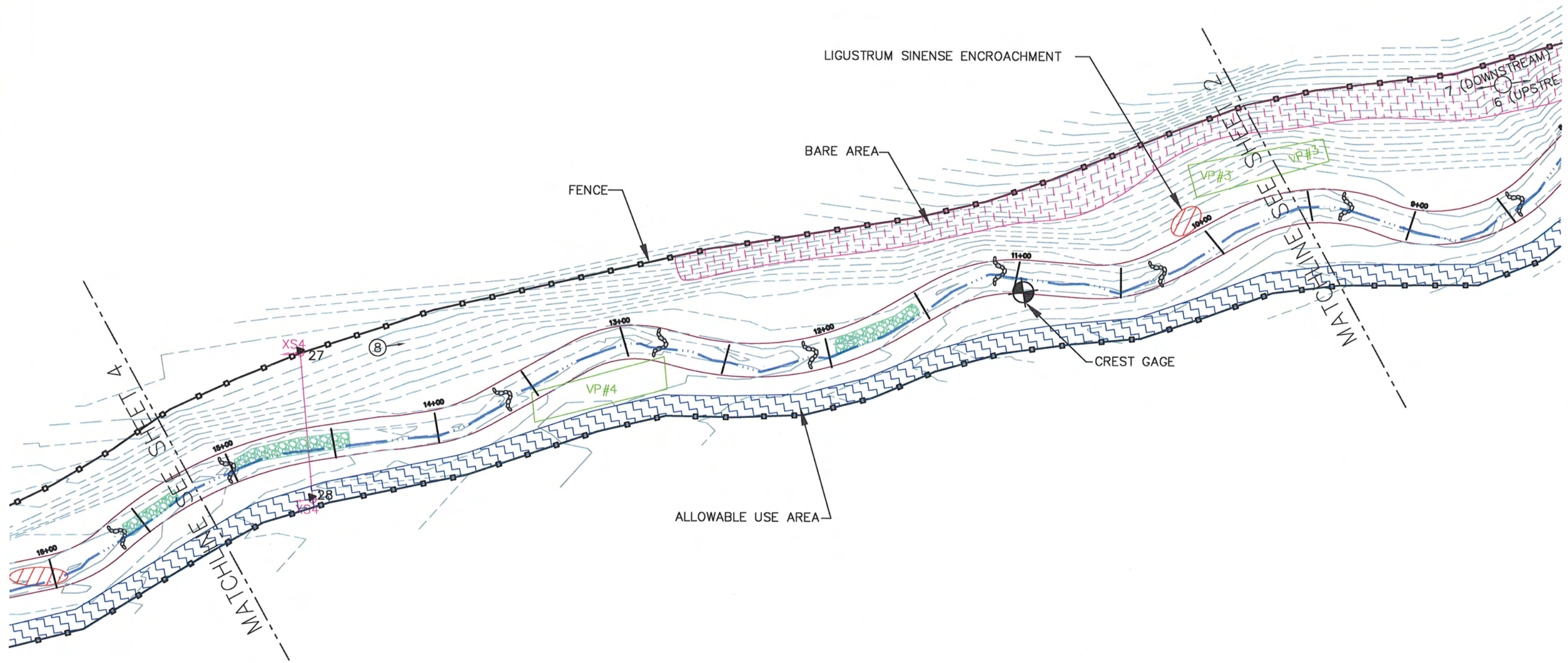


SHEET 2 OF 5



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

PROJECT NO:	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	04-29-11

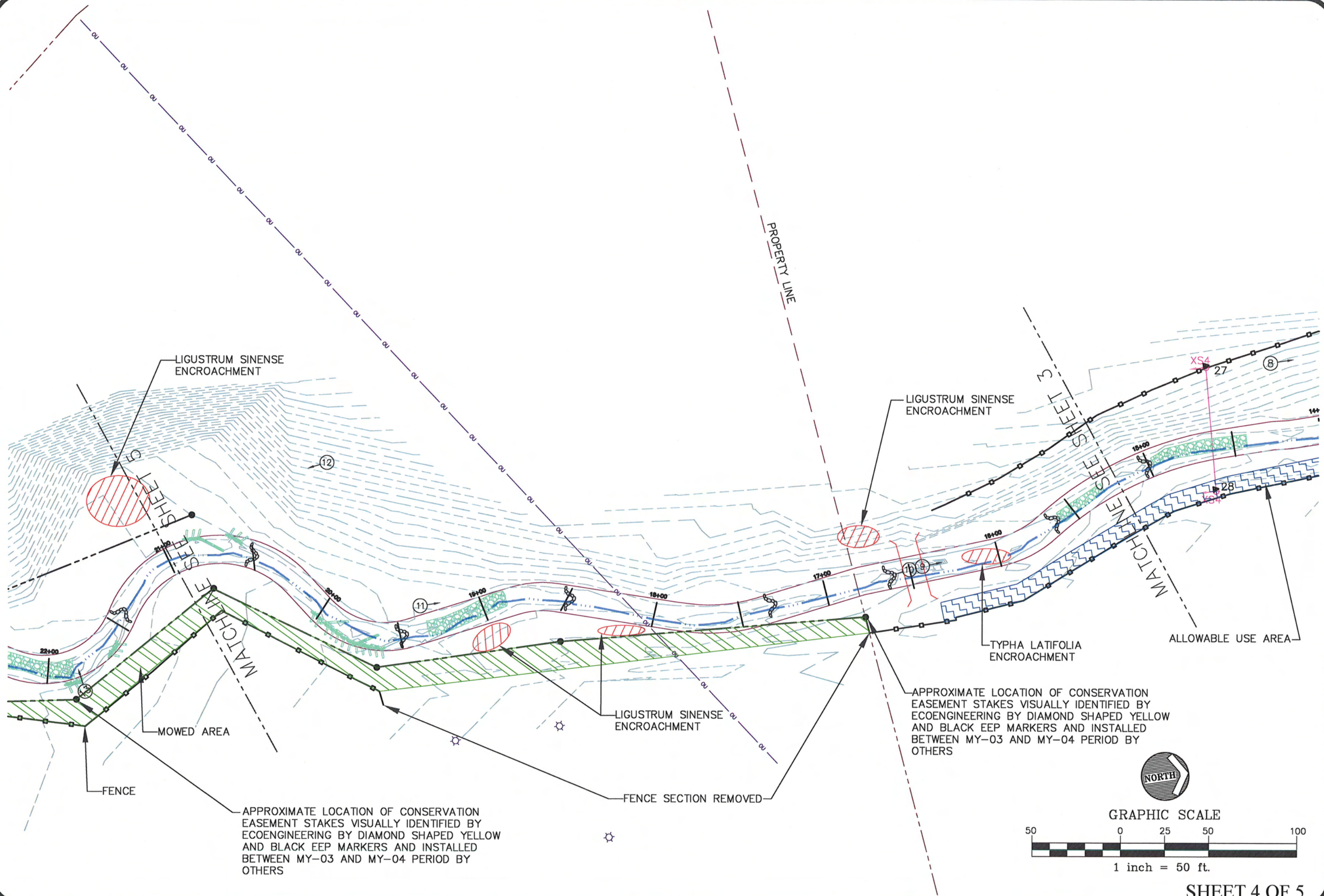


SHEET 3 OF 5



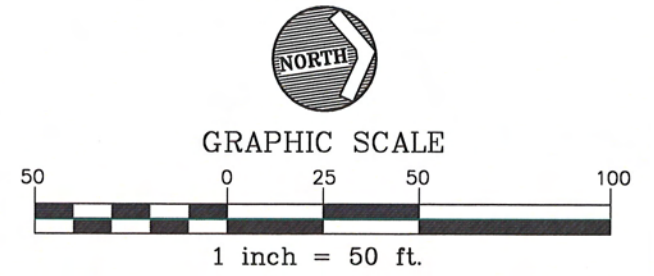
NAKED CREEK
 CONSOLIDATED CURRENT CONDITIONS PLAN VIEW - YEAR FOUR MONITORING
 WILKES COUNTY, NORTH CAROLINA

PROJECT NO.	EEP-08000
FILENAME:	EEP-08000
SCALE:	1" = 50'
DATE:	04-29-11



APPROXIMATE LOCATION OF CONSERVATION EASEMENT STAKES VISUALLY IDENTIFIED BY ECOENGINEERING BY DIAMOND SHAPED YELLOW AND BLACK EEP MARKERS AND INSTALLED BETWEEN MY-03 AND MY-04 PERIOD BY OTHERS

APPROXIMATE LOCATION OF CONSERVATION EASEMENT STAKES VISUALLY IDENTIFIED BY ECOENGINEERING BY DIAMOND SHAPED YELLOW AND BLACK EEP MARKERS AND INSTALLED BETWEEN MY-03 AND MY-04 PERIOD BY OTHERS

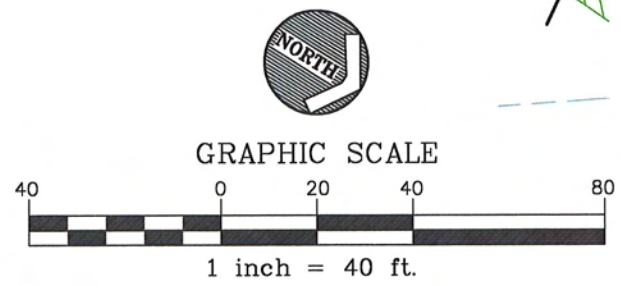
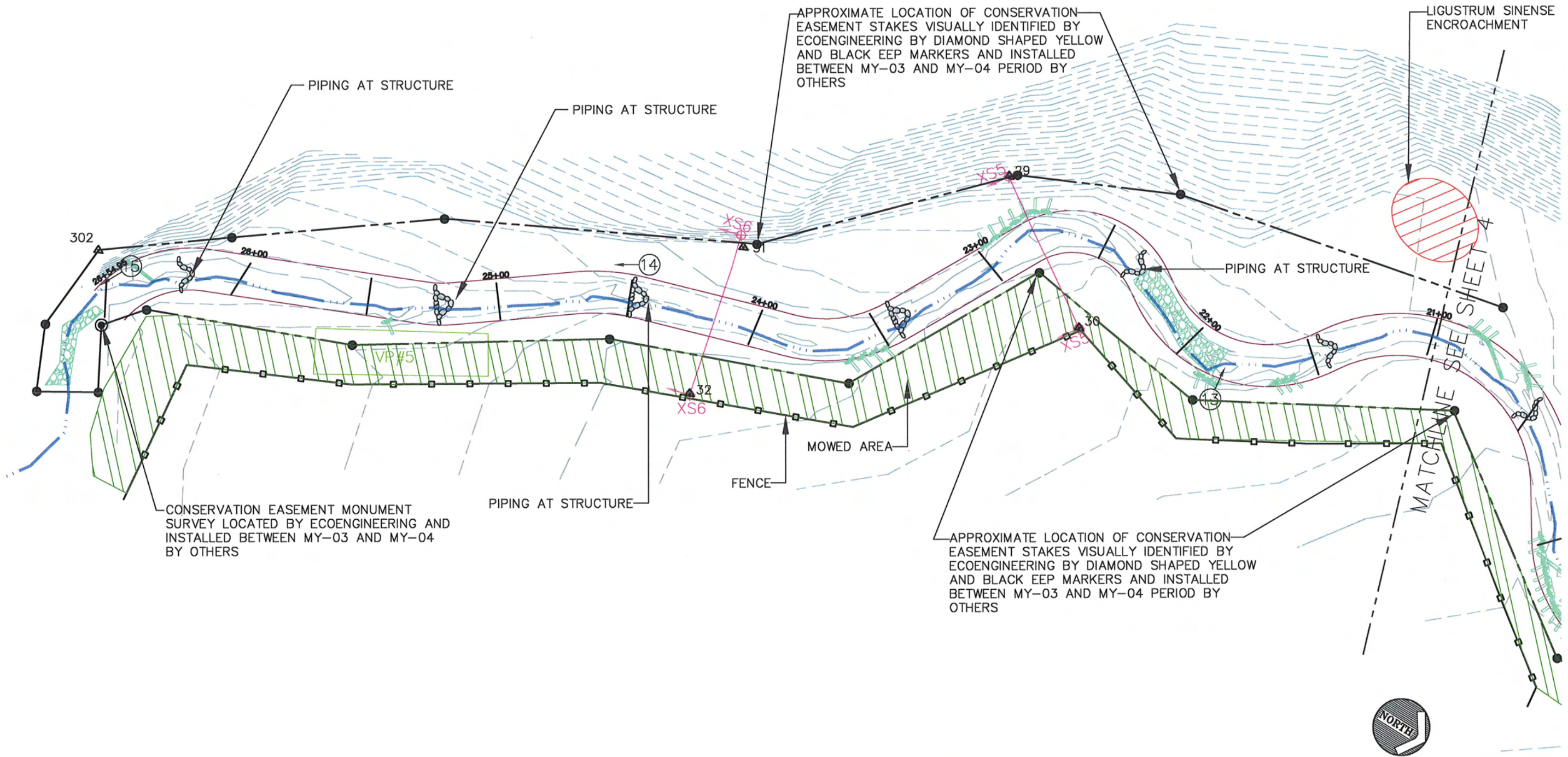


SHEET 4 OF 5



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

PROJECT NO. EEP - 08000
FILENAME: EEP-08000
SCALE: 1" = 50'
DATE: 04-29-11



SHEET 5 OF 5

APPENDIX B

General Project Tables

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

Project Segment or Reach ID	Existing Feet/Acres	Type	Approach	Footage or Acreage	Mitigation Ratio	Mitigation Units	Stationing	Comment
UtNkd	2,652 lf	R	P2	2,652 lf	1	2,652	10+00 - 26+52	
Mitigation Unit Summations								
Stream	Riparian Wetland	Nonriparian Wetland		Total Wetland		Buffer	Comment	
2,652	0	0		0		0		

R= Restoration

EII= Enhancement II

P1= Priority I

P3= Priority III

EI= Enhancement

S= Stabilization

P2= Priority II

SS=Stream Bank Stabilization

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

Activity or Report	Data Collection Complete	Actual Completion or Delivery
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
Year 3 Monitoring	Jul-10	Oct-10
Year 4 Monitoring	Apr-11	Nov-11

Note: Timeframe estimated from information provided by EEP.

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

Designer	Kimley-Horn and Associates, Inc. P.O Box 33068, Raleigh, North Carolina 27636 POC name and phone 919-677-2050
Primary project design POC	
Construction Contractor	Fluvial Solutions, Inc. PO Box 28749, Raleigh, NC 27611-8749 Peter Jelenevsky, 919-605-6134
Construction contractor POC	
Planting Contractor	Carolina Silvics 908 Indian Trail Road, Edenton, NC 27932 Mary-Margaret McKinney 252-482-8491
Planting contractor POC	
Seeding Contractor	Contact: Fluvial Solutions, Inc PO Box 28749, Raleigh, NC 27611-8749 Peter Jelenevsky, 919-605-6134
Planting contractor POC	
Seed Mix Sources	Contact: Fluvial Solutions, Inc Peter Jelenevsky, 919-605-6134
Nursery Stock Suppliers	ArborGen 843-851-4129
Monitoring Performers	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	030401010100
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	80%

APPENDIX C

Vegetation Assessment Data

Table 5. Vegetation Plot Mitigation Success Summary Table

Naked Creek Stream Restoration Project/EEP Project Number: 261

Planted Excluding Live Stakes Summary

Tract	Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
Naked Creek	VP1	N	40%
	VP2	Y	
	VP3	Y	
	VP4	N	
	VP5	N	

Total Planted and Volunteer Stem Summary

Tract	Vegetation Plot ID	Vegetation Survival Threshold Met?	Tract Mean
Naked Creek	VP1	N	80%
	VP2	Y	
	VP3	Y	
	VP4	Y	
	VP5	Y	

Table 6. Vegetation Metadata	
Naked Creek Stream Restoration Project/EEP Project Number:261	
Report Prepared By	George Buchholz
Date Prepared	5/12/2011 10:07
database name	EcoEngineering-2011-A.mdb
database location	X:\Projects\EEP\EEP-08000 (Naked Creek)\Storm\CVS Vegetation Data\2011 Vegetaion Data
computer name	BUCHHOLES
file size	49315840
DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT	
Metadata	Description of database file, the report worksheets, and a summary of project(s) and project data.
Proj, planted	Each project is listed with its PLANTED stems per acre, for each year. This excludes live stakes.
Proj, total stems	Each project is listed with its TOTAL stems per acre, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems.
Plots	List of plots surveyed with location and summary data (live stems, dead stems, missing, etc.).
Vigor	Frequency distribution of vigor classes for stems for all plots.
Vigor by Spp	Frequency distribution of vigor classes listed by species.
Damage	List of most frequent damage classes with number of occurrences and percent of total stems impacted by each.
Damage by Spp	Damage values tallied by type for each species.
Damage by Plot	Damage values tallied by type for each plot.
Planted Stems by Plot and Spp	A matrix of the count of PLANTED living stems of each species for each plot; dead and missing stems are excluded.
PROJECT SUMMARY	
Project Code	261
project Name	Naked Creek
Description	10.6 miles west of Wilkesboro and 18.4 miles east of Boone in Wilkesboro, NC. One Reach (UtNkd) approximately 2,800 linear feet
River Basin	Yadkin-Pee Dee
length(ft)	2,652
stream-to-edge width (ft)	25
area (sq m)	0.01 sq miles (2.92 acres)
Required Plots (calculated)	5
Sampled Plots	5

**Table 6A. Vegetation Condition Assessment
Naked Creek Stream Restoration Project/EEP Project Number:261**

Planted Acreage 2.54

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Planted Acreage
1. Bare Areas	Very limited cover of both woody and herbaceous material.	0.1 acres	dash, pink	2	0.23	9.05%
2. Low Stem Density Areas	Woody stem densities clearly below target levels based on MY3, 4, or 5 stem count criteria.	0.1 acres	----	0	0	0.0%
Total						
3. Areas of Poor Growth Rates or Vigor	Areas with woody stems of a size class that are obviously small given the monitoring year.	0.25 acres	----	0	0	0.0%
Cumaltive Total						9.05%

Easement Acreage 3.9*

Vegetation Category	Definitions	Mapping Threshold	CCPV Depiction	Number of Polygons	Combined Acreage	% of Easement Acreage
4. Invasive Areas of Concern	Areas or points (if too small to render as polygons at map scale).	1000 SF	diagonal, red	7	0.04	1.03%
5. Easement Encroachment Areas**	Areas or points (if too small to render as polygons at map scale).	none	zig zag, blue	2	0.34	8.71%

Notes:

* Easement Acreage is based on information received from EEP on January 24, 2011 and is based on DB 1019 Page 361, Plat 10 Page 486 Wilkes County, and DB 1019 Page 417, Plat 10 Page 486 Wilkes County, Dated November 20, 2007.

** Easement Encroachment Areas are Allowable Use Areas and are areas in which mowing activities have occurred.

Table 7. Stem Count Total and Planted by Plot Species
Naked Creek Stream Restoration Project/EEP Project Number: 261
 Page 1

Scientific Name	Common Name	Species Type	Current Plot Data (MY4 2011)														
			E261-01-VPI			E261-01-VP2			E261-01-VP3			E261-01-VP4			E261-01-VP5		
			PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T	PnoLS	P-all	T
<i>Alnus serrulata</i>	hazel alder	Shrub Tree	2	2	2				1	1	1						
<i>Betula nigra</i>	river birch	Tree	1	1	1	3	3	3									
<i>Cephalanthus occidentalis</i>	common buttonbush	Shrub Tree										2	2	2			
<i>Fraxinus pennsylvanica</i>	green ash	Tree	2	2	2	7	7	7	6	6	6				2	5	
<i>Nyssa sylvatica</i>	blackgum	Tree	1	1	1												
<i>Persea borbonia</i>	redbay	Shrub Tree															
<i>Prunus serotina</i>	black cherry	Shrub Tree							2	2	4						
<i>Quercus falcata</i>	southern red oak	Tree															
<i>Quercus phellos</i>	willow oak	Tree				1	1	1	1	1	1	5	5	5	9	2	
<i>Quercus rubra</i>	northern red oak	Tree	1	1	1												
<i>Robinia pseudoacacia</i>	black locust	Tree															
Stem count			7	7	7	11	11	13	10	10	12	7	7	7	13	7	
size (ares)			1	1	1											1	
size (ACRES)			0.02	0.02	0.02				0.02	0.02	0.02				0.02	0.02	
Species count			5	5	5	3	3	3	4	4	4	2	2	2	3	2	
Stems per ACRE			283.28	283.28	283.28	445.15	445.15	526.09	404.69	404.69	485.62	283.28	283.28	283.28	526.09	283.28	

Notes:

- a) Data presented in table was provided to EcoEngineering from the Carolina Vegetation Survey. Data was not manipulated by EcoEngineering. Formatting of table was performed by EcoEngineering.
- b) Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all planted stems within a vegetation monitoring plot have been surveyed and accounted for. Therefore, any additional species observed in proceeding monitoring years are considered volunteer species.
- c) PnoLS = Planted Excluding Live Stakes; P-all = All Planted Stems; T = Total Planted and Volunteer Stems
- d) Cells highlighted in VIOLET indicate the presence of volunteers.

Color for Density of Total Planted and Volunteer Stems	
Exceeds requirements by 10%	
Fails to meet requirements, by less than 10%	
Exceeds requirements, but by less than 10%	
Fails to meet requirements, by less than 10%	
Fails to meet requirements by more than 10%	

**Table 7. Stem Count Total and Planted by Plot Species
Naked Creek Stream Restoration Project/EEP Project Number: 261
Page 2**

Scientific Name	Common Name	Species Type	Annual Means											
			MY4 (2011)			MY3 (2010)			MY2 (2009)			MY1 (2008)		
			P-noLS	P-all	T	P-noLS	P-all	T	P-noLS	P-all	T	P-noLS	P-all	T
<i>Alnus serrulata</i>	hazel alder	Shrub Tree	3	3	3	3	3	3	3	3	3	3	3	3
<i>Betula nigra</i>	river birch	Tree	4	4	4	4	4	4	4	4	4	4	4	4
<i>Cephalanthus occidentalis</i>	common buttonbush	Shrub Tree	2	2	2	1	1	1	1	1	1	1	1	1
<i>Fraxinus pennsylvanica</i>	green ash	Tree	20	20	23	22	22	26	22	22	22	22	15	15
<i>Nyssa sylvatica</i>	blackgum	Tree	1	1	1	3	3	3	3	3	3	3	3	3
<i>Persea borbonia</i>	redbay	Shrub Tree	2	2	2	2	2	2	3	3	3	2	2	2
<i>Prunus serotina</i>	black cherry	Shrub Tree	2	2	4	2	2	5	2	2	2	2	3	3
<i>Quercus falcata</i>	southern red oak	Tree	1	1	1	1	1	1	1	1	1	2	2	2
<i>Quercus phellos</i>	willow oak	Tree	9	9	15	9	9	12	11	11	11	9	9	9
<i>Quercus rubra</i>	northern red oak	Tree	1	1	1	1	1	1	2	2	2	1	1	1
<i>Robinia pseudoacacia</i>	black locust	Tree												
Stem count			42	42	53	47	47	59	51	51	51	39	39	39
size (ares)			5	5	5	5	5	5	5	5	5	5	5	5
size (ACRES)			0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12
Species count			8	8	8	9	9	11	9	9	9	8	8	8
Stems per ACRE			339.94	339.94	428.97	380.4	380.4	477.53	412.78	412.78	412.78	315.65	315.65	315.65

Notes:

a) Data presented in table was provided to EcoEngineering from the Carolina Vegetation Survey. Data was not manipulated by EcoEngineering. Formatting of table was performed by EcoEngineering.
 b) Original baseline vegetation monitoring data was not provided prior to the 2008 Monitoring Year 1 and 2008 is considered a drought year. The 2009 Monitoring Year 2 is considered the baseline datum because after two years of monitoring it is assumed all

c) P-noLS = Planted Excluding Live Stakes; P-all = All Planted Stems; T = Total Planted and Volunteer Stems

d) Cells highlighted in VIOLET indicate the presence of volunteers

Color for Density of Planted Excluding Live Stakes

Exceeds requirements by 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%

Color for Density of Total Planted and Volunteer Stems

Exceeds requirements by 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements, by less than 10%

Fails to meet requirements by more than 10%



PHOTO VP1: LOOKING NORTH AT VEGETATION PLOT VP1.



PHOTO VP2: LOOKING NORTH AT VEGETATION PLOT VP2.

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PROJECT NO. EEP-08000
 FILENAME: EEP-08000
 SCALE: NTS
 DATE: 04-08-11



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PHOTO VP 3: LOOKING NORTHEAST OF VEGETATION PLOT VP3.



PHOTO VP 4: LOOKING NORTHWEST AT VEGETATION PLOT VP4.

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PHOTO VP 5: LOOKING SOUTHEAST AT VEGETATION PLOT VP5.

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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: 2,655 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	% Perform in Stable Condition	Feature Perform. Mean or Total
A. Riffles	1. Present ?	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 Bkt > 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 spong)	15	17	NA	88	82
C. Thalweg	1. Upstream of meander bend (run/inflection) centering?	25	28	NA	89	
	2. Downstream of meander (glide/inflection) centering?	26	28	NA	93	91
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?	21	27	NA	78	
	4. Sufficient floodplain access and relief?	27	27	NA	100	95
E. Bed General	1. General channel bed aggradation areas (bar formation)	NA	NA	3/700	72	
	2. Channel bed degradation – areas of increasing down-cutting or head cutting?	NA	NA	NA	100	86
F. Bank	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	
G. Vanes	4. Free of piping or other structural failures?	29	34	NA	85	96
	1. Free of scour?	36	36	NA	100	
H. Wads/ Boulders	2. Footing stable?	36	36	NA	100	100

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)
07/15/10	Between 09/16/09 and 07/15/10	On-Site Crest Gage located at Station 10+97. Observed elevation on gage at elevation 1297.81	Not Available
04/06/11	Between 07/15/10 and 04/06/11	On-Site Crest Gage located at Station 10+97. Observed elevation on gage at elevation 1297.93	Not Available

Note: A crest gage was installed during the 2009 Monitoring Year 2 field investigations so that bankfull events can be documented during subsequent monitoring years. 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.

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PHOTO 3: LOOKING DOWNSTREAM AT CHANNEL.



PHOTO 4: LOOKING DOWNSTREAM FROM UPPER CROSSING AT CHANNEL.

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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.

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 FILENAME: EEP-08000
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PHOTO 7: LOOKING DOWNSTREAM FROM HILLSIDE ON RIGHT BANK.



PHOTO 8: LOOKING UPSTREAM FROM HILLSIDE ON RIGHT BANK.

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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:	04-08-11



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PHOTO 11: LOOKING UPSTREAM FROM RIGHT BANK.



PHOTO 12: LOOKING DOWNSTREAM FROM HILLSIDE.

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PROJECT NO. EEP-08000
 FILENAME: EEP-08000
 SCALE: NTS
 DATE: 04-08-11



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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.

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 FILENAME: EEP-08000
 SCALE: NTS
 DATE: 04-08-11



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

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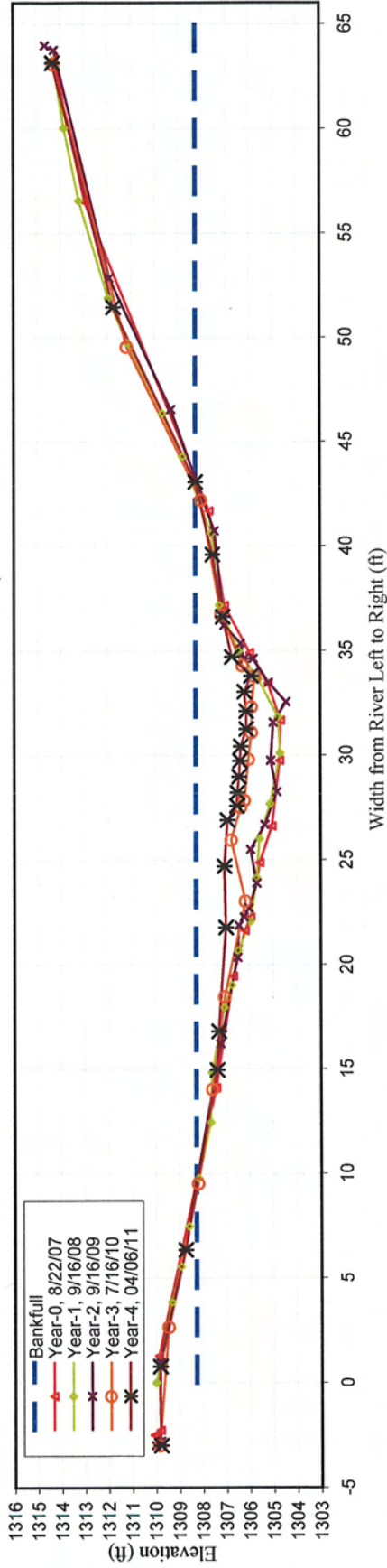
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NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 1											
Year-0		Year-1		Year-2		Year-3		Year-4		Year-5		Year-6			
Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)	Station (ft)	Elev. (ft)		
-2.50	1310.07	0.00	1309.99	-3.00	1310.02	-3.00	1309.84	-3	1309.8						
-2.27	1309.80	3.84	1309.31	-2.79	1309.79	2.65	1309.45	0.76	1309.83						
1.27	1309.87	5.55	1308.91	0.96	1309.82	9.53	1308.18	6.34	1308.73						
14.11	1307.42	7.47	1308.57	6.40	1308.75	14.04	1307.56	14.95	1307.38						
19.44	1306.68	9.77	1308.17	16.22	1307.24	18.47	1307.04	16.8	1307.3						
21.63	1306.18	12.46	1307.64	20.34	1306.50	23.03	1306.16	21.76	1307						
22.26	1305.94	14.84	1307.58	21.87	1306.44	25.95	1306.76	24.68	1307.06						
24.87	1305.55	17.94	1307.07	22.28	1306.22	27.52	1306.35	26.89	1306.92						
26.61	1305.03	19.02	1306.73	22.70	1306.01	27.85	1306.19	27.57	1306.53						
29.75	1304.70	20.68	1306.47	23.89	1305.68	29.81	1306.02	28.21	1306.5						
31.66	1304.67	22.07	1305.93	25.50	1305.93	31.09	1305.89	28.96	1306.43						
33.44	1305.20	24.14	1305.68	26.69	1305.34	32.32	1305.88	29.72	1306.39						
34.89	1305.96	26.01	1305.55	28.26	1304.83	33.76	1305.75	30.41	1306.35						
37.15	1307.04	27.68	1305.11	29.75	1305.08	34.29	1306.27	31.24	1306.12						
41.68	1307.67	30.11	1304.68	31.57	1304.97	36.71	1307.17	32.09	1306.12						
56.53	1312.96	31.83	1304.77	32.55	1304.43	42.20	1308.02	33.02	1306.2						
63.35	1314.26	33.64	1305.59	33.47	1305.17	49.56	1311.16	33.78	1305.91						
		34.98	1306.43	34.61	1305.82	63.11	1314.30	34.69	1306.73						
		37.17	1307.25	34.61	1306.21			36.6	1307.11						
		40.61	1307.57	35.35	1306.35			39.58	1307.54						
		44.29	1308.81	36.20	1307.05			43.06	1308.27						
		46.35	1309.66	40.72	1307.45			51.45	1311.74						
		49.73	1311.14	46.54	1309.30			63.14	1314.34						
		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-4, 2011 SURVEY DATA
 PROJECT NAKED CREEK
 TASK CROSS SECTION
 REACH NAKED CREEK
 DATE 4/04/2011 to 4/06/2011
 CREW BUCHHOLZ/PARRISH

CROSS-SECTION: 1
 FEATURE: Pool

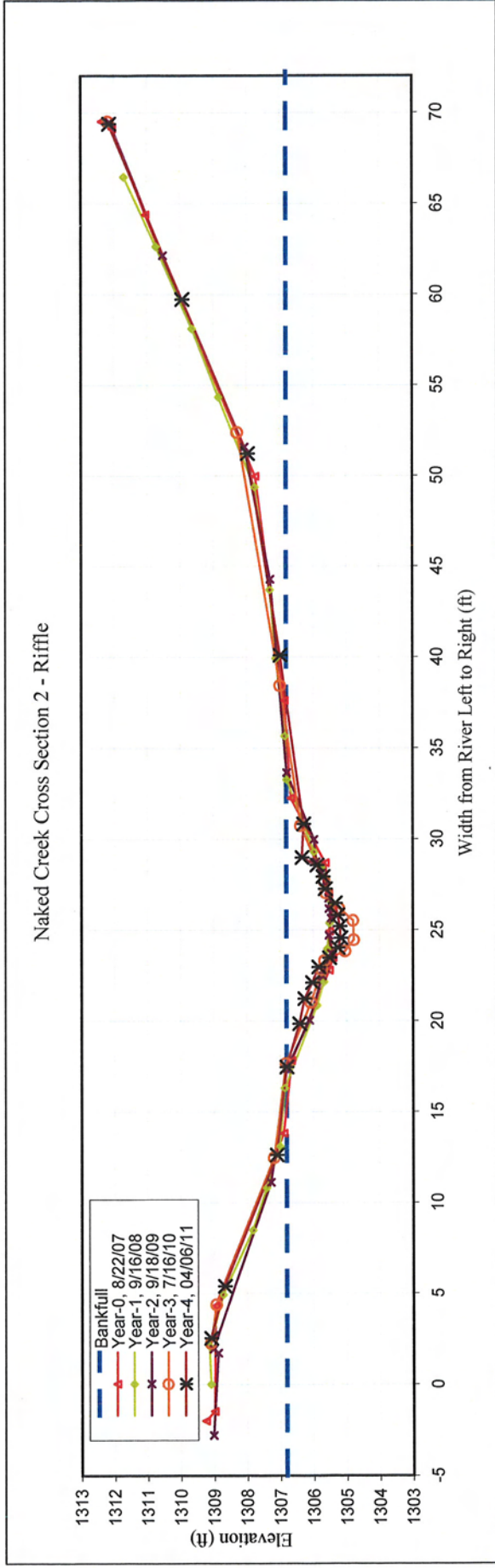
Summary Data
 All dimensions in feet.

Bankfull X-sec area	38.1	sq. ft.
Bankfull Width	33.8	ft.
Bankfull Mean Depth	1.1	ft.
Bankfull Max Depth	2.4	ft.
Width/Depth Ratio	30.0	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	
Bankfull Elevation:	1308.27	ft.



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 2		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)
-2.00	1309.25	0.00	1309.10	-2.80	1309.01	2.00	1308.94	2.53	1309.1	2.00	1309.01	2.00	1308.94	2.53	1309.1	2.00	1308.94	2.53	1309.1
-1.48	1308.98	2.10	1309.14	1.72	1308.88	2.28	1309.09	5.39	1308.68	2.28	1308.88	2.28	1309.09	5.39	1308.68	2.28	1308.88	2.28	1309.09
4.32	1308.96	4.94	1308.72	1.94	1309.02	4.39	1308.93	12.62	1307.11	1.94	1309.02	4.39	1308.93	12.62	1307.11	4.39	1308.93	12.62	1307.11
13.81	1306.89	8.49	1307.82	11.12	1307.28	12.48	1307.18	17.46	1306.81	11.12	1307.28	12.48	1307.18	17.46	1306.81	12.48	1307.18	17.46	1306.81
17.81	1306.65	10.81	1307.41	17.38	1306.80	17.67	1306.82	19.84	1306.42	17.38	1306.80	17.67	1306.82	19.84	1306.42	17.67	1306.82	19.84	1306.42
22.79	1305.52	13.10	1307.01	20.04	1306.12	21.02	1306.06	21.22	1306.26	20.04	1306.12	21.02	1306.06	21.22	1306.26	21.02	1306.06	21.22	1306.26
23.48	1305.41	16.30	1306.86	22.47	1305.73	22.82	1305.74	22.1	1306.03	22.47	1305.73	22.82	1305.74	22.1	1306.03	22.82	1305.74	22.1	1306.03
24.93	1305.51	20.85	1305.88	22.89	1305.63	23.33	1305.65	22.96	1305.84	22.89	1305.63	23.33	1305.65	22.96	1305.84	23.33	1305.65	22.96	1305.84
26.27	1305.42	22.15	1305.67	23.72	1305.46	23.85	1305.04	23.47	1305.52	23.72	1305.46	23.85	1305.04	23.47	1305.52	23.85	1305.04	23.47	1305.52
27.00	1305.53	23.96	1305.57	24.70	1305.53	24.46	1304.77	24.01	1305.26	24.70	1305.53	24.46	1304.77	24.01	1305.26	24.46	1304.77	24.01	1305.26
28.69	1305.63	25.38	1305.51	25.65	1305.46	25.53	1304.80	24.56	1305.18	25.65	1305.46	25.53	1304.80	24.56	1305.18	25.53	1304.80	24.56	1305.18
32.26	1306.67	26.58	1305.47	26.17	1305.52	26.20	1305.23	25.2	1305.2	26.17	1305.52	26.20	1305.23	25.2	1305.2	26.20	1305.23	25.2	1305.2
37.62	1306.86	28.38	1305.74	26.75	1305.53	27.05	1305.61	25.82	1305.27	26.75	1305.53	27.05	1305.61	25.82	1305.27	27.05	1305.61	25.82	1305.27
49.96	1307.73	29.29	1305.97	27.38	1305.59	27.68	1305.66	26.48	1305.34	27.38	1305.59	27.68	1305.66	26.48	1305.34	27.68	1305.66	26.48	1305.34
64.39	1311.04	33.26	1306.79	27.98	1305.68	30.74	1306.37	27.26	1305.64	27.98	1305.68	30.74	1306.37	27.26	1305.64	30.74	1306.37	27.26	1305.64
69.12	1312.05	35.66	1306.85	28.13	1305.75	38.44	1306.99	27.92	1305.71	28.13	1305.75	38.44	1306.99	27.92	1305.71	38.44	1306.99	27.92	1305.71
69.52	1312.36	39.93	1307.12	28.74	1305.91	52.41	1308.27	28.56	1305.89	28.74	1305.91	52.41	1308.27	28.56	1305.89	52.41	1308.27	28.56	1305.89
		43.70	1307.30	29.98	1305.98	69.52	1312.17	28.98	1306.34	29.98	1305.98	69.52	1312.17	28.98	1306.34	69.52	1312.17	28.98	1306.34
		49.37	1307.75	33.65	1306.79	69.64	1312.38	30.82	1306.29	33.65	1306.79	69.64	1312.38	30.82	1306.29	30.82	1306.29	30.82	1306.29
		54.34	1308.84	44.29	1307.29	40.09	1306.99	40.09	1306.99	44.29	1307.29	40.09	1306.99	40.09	1306.99	40.09	1306.99	40.09	1306.99
		58.12	1309.64	51.58	1308.06	51.2	1307.97	51.2	1307.97	51.58	1308.06	51.2	1307.97	51.2	1307.97	51.2	1307.97	51.2	1307.97
		62.63	1310.72	62.15	1310.51	59.71	1309.94	59.71	1309.94	62.15	1310.51	59.71	1309.94	59.71	1309.94	59.71	1309.94	59.71	1309.94
		66.47	1311.70	69.48	1312.12	69.37	1312.15	69.37	1312.15	69.48	1312.12	69.37	1312.15	69.37	1312.15	69.37	1312.15	69.37	1312.15





CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-4, 2011 SURVEY DATA
PROJECT NAKED CREEK
TASK CROSS SECTION
REACH NAKED CREEK
DATE 4/04/2011 to 4/06/2011
CREW BUCHHOLZ/PARRISH

CROSS-SECTION: 2
FEATURE: Riffle

Summary Data
 All dimensions in feet.

Bankfull X-sec area	13.1	sq. ft.
Bankfull Width	20.2	ft.
Bankfull Mean Depth	0.6	ft.
Bankfull Max Depth	1.6	ft.
Width/Depth Ratio	31.3	ft.
Entrenchment Ratio	4.9	ft.
Classification	C	
Bankfull Elevation:	1306.81	ft.



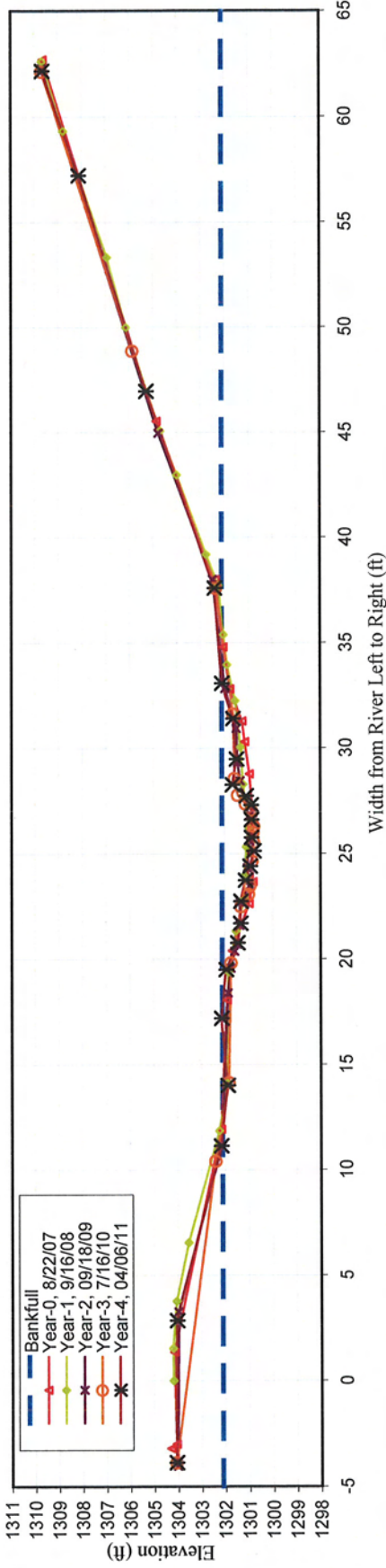
CROSS SECTION PHOTO - LOOKING DOWNSTREAM



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 3											
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)		
-3.20	1304.09	0.00	1304.18	-4.03	1304.01	-4.00	1304.19	-3.87	1304.07	-3.87	1304.05				
-3.00	1303.86	1.53	1304.20	3.27	1303.98	-3.87	1304.06	2.85	1304.05						
1.35	1303.96	3.77	1304.04	11.12	1302.14	-3.87	1304.06	11.14	1302.17						
11.93	1301.96	6.55	1303.54	18.40	1301.87	10.41	1302.39	14	1301.89						
18.06	1301.71	11.86	1302.24	19.57	1301.75	14.15	1301.84	17.19	1302.15						
20.40	1301.49	14.12	1301.91	20.37	1301.59	19.83	1301.74	19.51	1301.96						
22.63	1300.78	19.40	1301.86	20.70	1301.46	22.50	1301.31	20.77	1301.47						
23.67	1300.61	21.34	1301.53	21.59	1301.37	23.08	1301.00	21.69	1301.35						
26.92	1300.63	22.85	1301.18	22.70	1301.36	23.49	1300.93	22.74	1301.33						
28.78	1300.76	23.95	1301.18	23.46	1300.95	24.64	1300.85	23.73	1301.14						
30.30	1300.96	25.32	1301.10	24.34	1301.05	25.54	1300.77	24.4	1300.95						
31.29	1301.07	26.24	1300.99	25.60	1300.96	26.02	1300.80	25.12	1300.79						
32.81	1301.58	28.29	1301.23	26.77	1300.98	26.31	1300.77	25.76	1300.88						
34.80	1301.86	30.05	1301.34	28.46	1301.35	27.07	1300.87	26.6	1300.88						
38.00	1302.16	32.25	1301.55	29.33	1301.45	27.37	1301.12	27.3	1300.9						
45.53	1304.65	33.95	1301.89	30.93	1301.51	27.77	1301.45	27.73	1301.1						
62.71	1309.43	35.38	1302.04	32.82	1301.98	28.57	1301.58	28.26	1301.68						
63.02	1309.72	37.72	1302.24	38.00	1302.49	31.63	1301.64	29.48	1301.51						
		39.19	1302.76	44.96	1304.76	37.59	1302.36	31.4	1301.65						
		42.97	1304.00	62.29	1309.69	48.88	1305.85	33.07	1302.11						
		45.07	1304.70			62.14	1309.69	37.58	1302.42						
		50.00	1306.11			62.31	1309.91	46.94	1305.28						
		53.33	1306.93					57.21	1308.13						
		59.33	1308.78					62.15	1309.67						
		62.61	1309.67												



Naked Creek Cross Section 3 - Riffle



CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-4, 2011 SURVEY DATA
 PROJECT NAKED CREEK
 TASK CROSS SECTION
 REACH NAKED CREEK
 DATE 4/04/2011 to 4/06/2011
 CREW BUCHHOLZ/PARRISH

CROSS-SECTION: 3
 FEATURE: Riffle

Summary Data

All dimensions in feet.

Bankfull X-sec area	8.1	sq. ft.
Bankfull Width	14.6	ft.
Bankfull Mean Depth	0.6	ft.
Bankfull Max Depth	1.2	ft.
Width/Depth Ratio	26.4	ft.
Entrenchment Ratio	2.1	ft.
Classification	C	

Bankfull Elevation: 1302.11 ft.

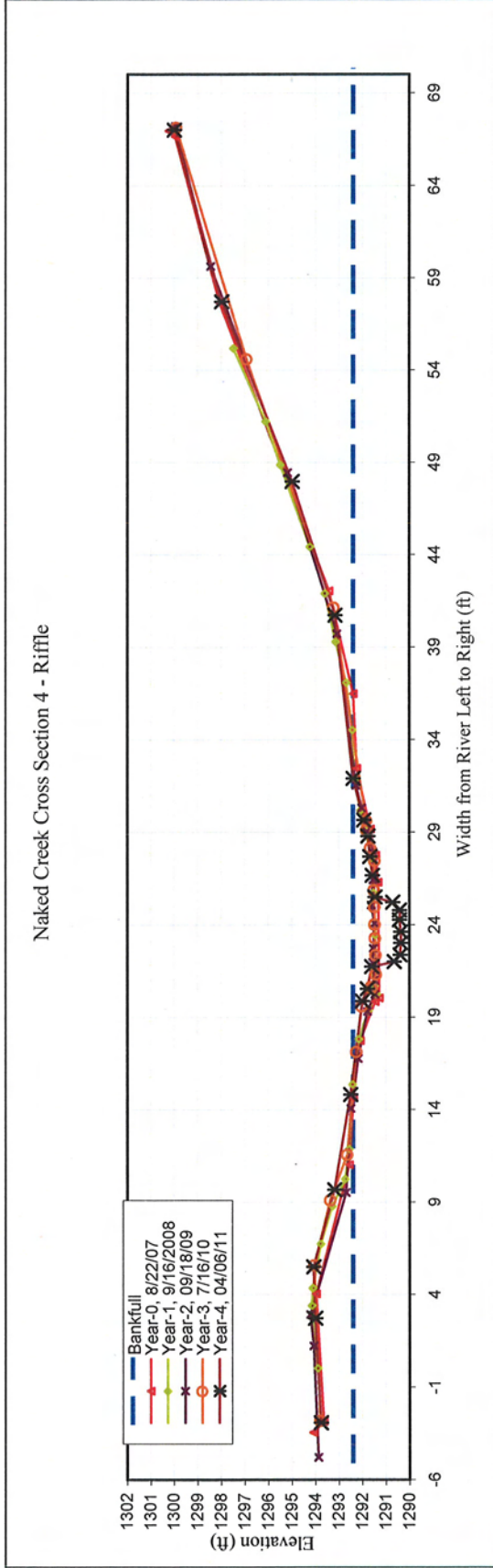


CROSS SECTION PHOTO - LOOKING DOWNSTREAM



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)	
-3.45	1294.08	0.00	1293.89	-4.80	1293.87	-3.00	1293.94	-2.93	1293.76									
-2.86	1293.64	3.40	1294.15	1.22	1294.06	-2.82	1293.79	2.7	1294.01									
4.04	1293.97	4.36	1294.11	2.91	1294.21	5.58	1294.04	5.49	1294.08									
11.02	1292.54	6.74	1293.76	9.52	1292.69	9.11	1293.37	9.66	1293.19									
14.67	1292.38	8.77	1293.28	14.07	1292.49	11.57	1292.64	14.82	1292.5									
17.74	1292.08	10.25	1292.73	16.77	1292.17	17.13	1292.25	19.87	1292									
19.86	1291.46	11.87	1292.54	19.32	1291.78	19.60	1292.02	20.54	1291.78									
20.04	1291.29	15.36	1292.41	20.24	1291.47	20.55	1291.62	21.73	1291.59									
26.31	1291.33	17.81	1292.14	21.01	1291.48	20.65	1291.63	22	1290.64									
27.76	1291.43	19.39	1291.73	21.97	1291.56	21.32	1291.42	22.36	1290.39									
29.18	1291.66	20.24	1291.40	22.72	1291.53	22.36	1291.43	23.01	1290.37									
32.45	1292.24	20.69	1291.48	24.08	1291.48	23.28	1291.46	23.62	1290.37									
36.48	1292.38	21.74	1291.57	25.07	1291.62	24.02	1291.47	24.27	1290.41									
42.05	1293.42	23.44	1291.46	26.42	1291.55	24.97	1291.48	24.78	1290.41									
57.67	1298.07	25.73	1291.54	27.94	1291.55	25.88	1291.51	25.22	1290.7									
66.66	1299.97	27.62	1291.63	29.03	1291.81	27.47	1291.48	25.5	1291.45									
66.97	1300.23	29.10	1291.86	29.51	1291.87	28.15	1291.66	26.67	1291.57									
		30.18	1292.07	30.31	1292.02	29.13	1291.82	27.67	1291.67									
		31.82	1292.34	31.54	1292.28	29.64	1291.83	28.79	1291.76									
		34.52	1292.42	39.72	1293.09	41.14	1293.23	29.65	1291.93									
		37.08	1292.69	48.44	1295.18	54.60	1296.93	31.89	1292.38									
		39.29	1293.14	59.63	1298.45	67.14	1299.92	40.72	1293.16									
		41.90	1293.60	67.20	1299.97	67.32	1299.92	47.96	1294.98									
		44.43	1294.23					57.7	1297.98									
		48.88	1295.48					66.99	1300.01									
		51.23	1296.11															
		55.20	1297.48															
		58.52	1298.34															
		61.31	1298.85															
		64.99	1299.68															





CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-4, 2011 SURVEY DATA
PROJECT NAKED CREEK
TASK CROSS SECTION
REACH NAKED CREEK
DATE 4/04/2011 to 4/06/2011
CREW BUCHHOLZ/PARRISH



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

CROSS-SECTION: 4
FEATURE: Riffle

Summary Data
 All dimensions in feet.

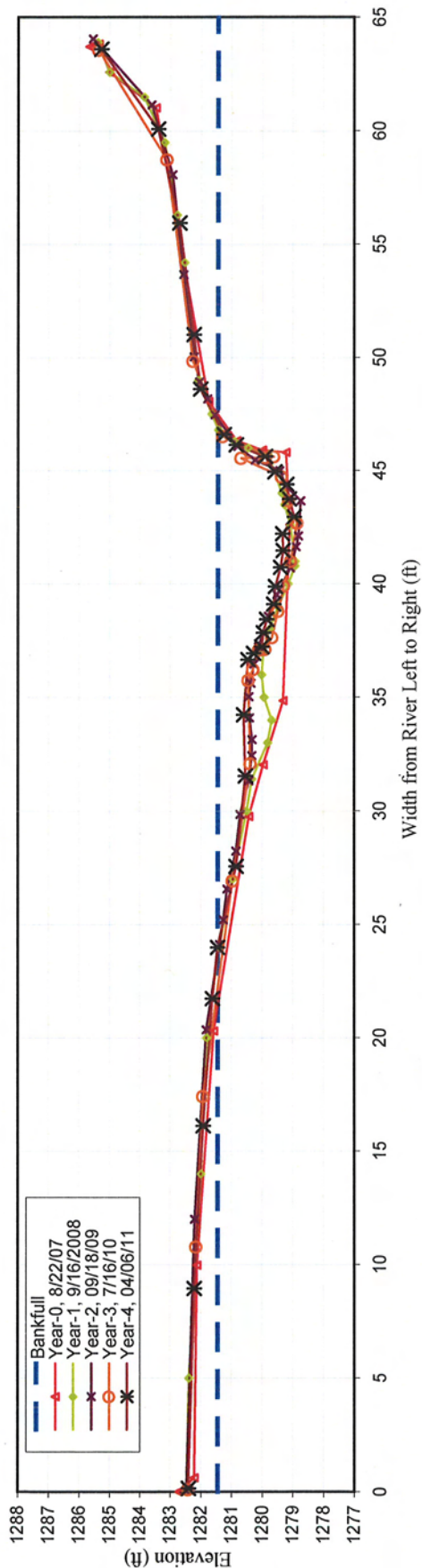
Bankfull X-sec area	12.4	sq. ft.
Bankfull Width	15.9	ft.
Bankfull Mean Depth	0.8	ft.
Bankfull Max Depth	2.0	ft.
Width/Depth Ratio	20.3	ft.
Entrenchment Ratio	6.3	ft.
Classification	B	
Bankfull Elevation:	1292.38	ft.



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 5		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)	
-2.50	1282.92	0.00	1282.46	0.04	1282.46	0.00	1282.74	0.15	1282.4	0.00	1282.46	0.00	1282.74	0.15	1282.4	0.00	1282.4	0.15	1282.4	
-1.88	1282.41	5.00	1282.37	12.00	1282.19	0.10	1282.41	8.94	1282.21	12.00	1282.19	0.10	1282.41	8.94	1282.21	0.10	1282.21	8.94	1282.21	
7.47	1282.32	14.00	1281.99	20.35	1281.82	10.77	1282.15	16.11	1281.92	20.35	1281.82	10.77	1282.15	16.11	1281.92	10.77	1281.92	16.11	1281.92	
17.80	1281.78	20.00	1281.80	24.12	1281.38	17.42	1281.92	21.72	1281.62	24.12	1281.38	17.42	1281.92	21.72	1281.62	17.42	1281.62	21.72	1281.62	
27.26	1280.63	24.00	1281.39	25.20	1281.26	26.92	1280.96	23.98	1281.45	25.20	1281.26	26.92	1280.96	23.98	1281.45	26.92	1280.96	23.98	1281.45	
29.53	1280.17	27.00	1280.95	26.56	1281.13	32.08	1280.38	27.55	1280.85	26.56	1281.13	32.08	1280.38	27.55	1280.85	32.08	1280.38	27.55	1280.85	
32.35	1279.52	30.00	1280.50	28.23	1280.85	35.75	1280.45	31.53	1280.54	28.23	1280.85	35.75	1280.45	31.53	1280.54	35.75	1280.45	31.53	1280.54	
40.12	1279.30	31.40	1280.33	29.85	1280.72	36.22	1280.30	34.22	1280.6	29.85	1280.72	36.22	1280.30	34.22	1280.6	36.22	1280.30	34.22	1280.6	
43.31	1279.43	33.00	1279.82	31.33	1280.43	37.08	1280.11	36.66	1280.46	31.33	1280.43	37.08	1280.11	36.66	1280.46	37.08	1280.11	36.66	1280.46	
43.41	1280.20	34.00	1279.69	32.44	1280.33	37.12	1279.91	36.93	1280.28	32.44	1280.33	37.12	1279.91	36.93	1280.28	37.12	1279.91	36.93	1280.28	
43.82	1281.02	35.00	1279.93	33.14	1280.33	37.64	1279.69	37.22	1280.02	33.14	1280.33	37.64	1279.69	37.22	1280.02	37.64	1279.69	37.22	1280.02	
45.56	1281.95	36.00	1280.01	34.10	1280.41	38.79	1279.49	37.84	1279.96	34.10	1280.41	38.79	1279.49	37.84	1279.96	38.79	1279.49	37.84	1279.96	
58.52	1283.68	37.00	1279.96	35.03	1280.43	39.90	1279.30	38.43	1279.86	35.03	1280.43	39.90	1279.30	38.43	1279.86	39.90	1279.30	38.43	1279.86	
60.09	1285.21	38.00	1279.76	35.63	1280.37	41.00	1279.07	39.09	1279.63	35.63	1280.37	41.00	1279.07	39.09	1279.63	41.00	1279.07	39.09	1279.63	
61.33	1285.56	39.00	1279.48	36.46	1280.27	42.68	1278.86	39.88	1279.57	36.46	1280.27	42.68	1278.86	39.88	1279.57	42.68	1278.86	39.88	1279.57	
61.22	1285.86	40.00	1279.14	37.23	1280.12	43.68	1279.14	40.72	1279.4	37.23	1280.12	43.68	1279.14	40.72	1279.4	43.68	1279.14	40.72	1279.4	
		40.80	1278.91	38.58	1279.81	44.73	1279.38	41.46	1279.32	38.58	1279.81	44.73	1279.38	41.46	1279.32	44.73	1279.38	41.46	1279.32	
		41.00	1278.91	39.53	1279.53	45.55	1280.69	42.2	1279.34	39.53	1279.53	45.55	1280.69	42.2	1279.34	45.55	1280.69	42.2	1279.34	
		42.60	1279.07	40.71	1279.08	45.58	1279.90	42.95	1278.95	40.71	1279.08	45.58	1279.90	42.95	1278.95	45.58	1279.90	42.95	1278.95	
		43.50	1279.27	41.63	1278.89	45.62	1279.63	43.74	1279.11	41.63	1278.89	45.62	1279.63	43.74	1279.11	45.62	1279.63	43.74	1279.11	
		44.00	1279.36	42.12	1278.81	46.51	1281.29	44.38	1279.2	42.12	1278.81	46.51	1281.29	44.38	1279.2	46.51	1281.29	44.38	1279.2	
		45.70	1279.81	43.66	1278.73	49.85	1282.26	44.94	1279.59	43.66	1278.73	49.85	1282.26	44.94	1279.59	49.85	1282.26	44.94	1279.59	
		46.00	1280.46	44.33	1279.23	58.74	1283.12	45.62	1279.9	44.33	1279.23	58.74	1283.12	45.62	1279.9	58.74	1283.12	45.62	1279.9	
		46.30	1280.90	45.00	1279.44	63.56	1285.36	46.13	1280.85	45.00	1279.44	63.56	1285.36	46.13	1280.85	63.56	1285.36	46.13	1280.85	
		46.80	1281.42	45.46	1280.24	63.74	1285.74	46.58	1281.24	45.46	1280.24	63.74	1285.74	46.58	1281.24	63.74	1285.74	46.58	1281.24	
		47.50	1281.65	46.07	1280.80			48.6	1282.01	46.07	1280.80			48.6	1282.01	48.6	1282.01	48.6	1282.01	
		49.00	1282.08	47.47	1281.54			51	1282.23	47.47	1281.54			51	1282.23	51	1282.23	51	1282.23	
		54.20	1282.53	48.17	1281.79			55.94	1282.7	48.17	1281.79			55.94	1282.7	55.94	1282.7	55.94	1282.7	
		56.30	1282.78	48.93	1282.05			60.08	1283.4	48.93	1282.05			60.08	1283.4	60.08	1283.4	60.08	1283.4	
		59.50	1283.18	50.03	1282.24			63.59	1285.28	50.03	1282.24			63.59	1285.28	63.59	1285.28	63.59	1285.28	
		61.50	1283.86	53.67	1282.57					53.67	1282.57									
		62.60	1285	58.07	1282.93					58.07	1282.93									
		63.90	1285.39	61.15	1283.61					61.15	1283.61									
				64.06	1285.55					64.06	1285.55									



Naked Creek Cross Section 5 - Pool



CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-4, 2011 SURVEY DATA
 PROJECT NAKED CREEK
 TASK CROSS SECTION
 REACH NAKED CREEK
 DATE 4/04/2011 to 4/06/2011
 CREW BUCHHOLZ/PARRISH

CROSS-SECTION: 5
 FEATURE: Pool

Summary Data

All dimensions in feet.

Bankfull X-sec area	22.1	sq. ft.
Bankfull Width	21.4	ft.
Bankfull Mean Depth	1.0	ft.
Bankfull Max Depth	2.3	ft.
Width/Depth Ratio	20.7	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	

Bankfull Elevation: 1281.44 ft.

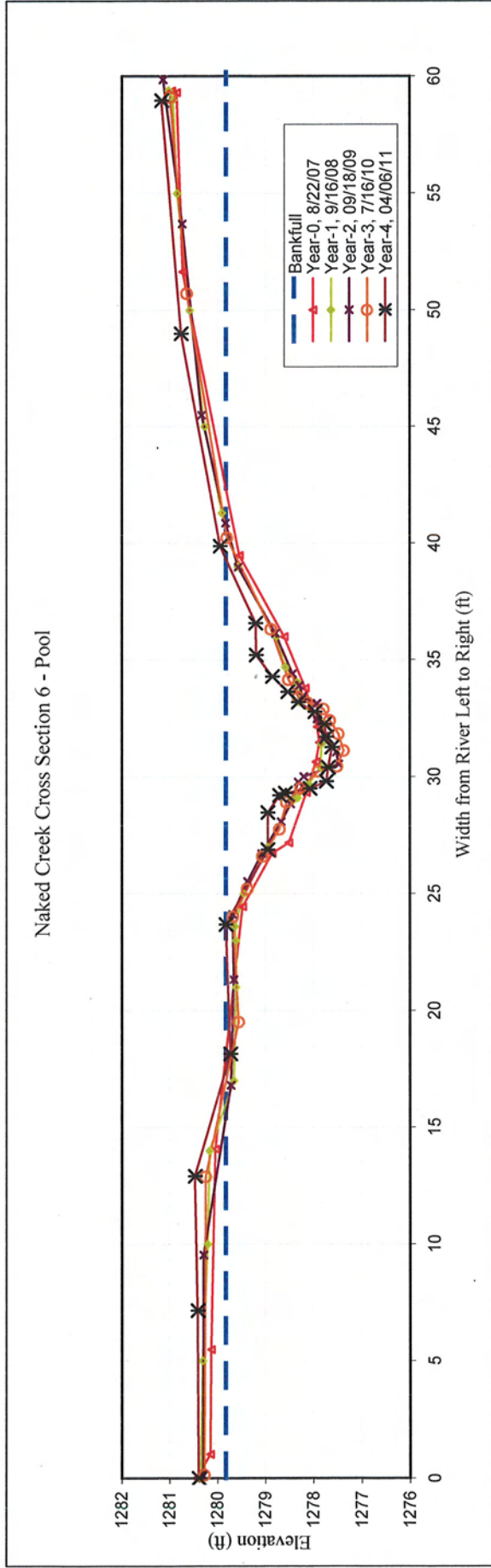


CROSS SECTION PHOTO - LOOKING DOWNSTREAM



NAKED CREEK		EEP PROJECT # 261		CROSS SECTION 6		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)		
0.00	1280.44	0.00	1280.34	0.00	1280.34	0.14	1280.27	0	1280.39	0.14	1280.34	0.14	1280.27	0	1280.39	0	1280.39	0	1280.39	0	1280.39
1.02	1280.14	5.00	1280.30	5.00	1280.30	12.89	1280.24	7.15	1280.41	12.89	1280.30	12.89	1280.24	7.15	1280.41	7.15	1280.41	7.15	1280.41	7.15	1280.41
5.49	1280.12	10.00	1280.20	10.00	1280.20	19.52	1279.55	19.52	1279.55	19.52	1280.20	19.52	1279.55	12.9	1280.47	12.9	1280.47	12.9	1280.47	12.9	1280.47
14.07	1280.04	14.00	1280.16	14.00	1280.16	24.03	1279.67	14.00	1280.16	24.03	1279.67	24.03	1279.67	18.14	1279.72	18.14	1279.72	18.14	1279.72	18.14	1279.72
24.46	1279.47	17.00	1279.65	17.00	1279.65	25.22	1279.37	17.00	1279.65	25.22	1279.37	25.22	1279.37	23.69	1279.82	23.69	1279.82	23.69	1279.82	23.69	1279.82
26.73	1278.85	21.00	1279.60	21.00	1279.60	26.60	1279.06	21.00	1279.60	26.60	1279.06	26.60	1279.06	26.88	1278.95	26.88	1278.95	26.88	1278.95	26.88	1278.95
27.19	1278.51	23.00	1279.61	23.00	1279.61	27.77	1278.70	23.00	1279.61	27.77	1278.70	27.77	1278.70	28.47	1278.95	28.47	1278.95	28.47	1278.95	28.47	1278.95
29.33	1278.15	23.60	1279.63	23.60	1279.63	28.93	1278.55	23.60	1279.63	28.93	1278.55	28.93	1278.55	29.21	1278.7	29.21	1278.7	29.21	1278.7	29.21	1278.7
30.64	1277.95	25.00	1279.44	25.00	1279.44	29.52	1278.26	25.00	1279.44	29.52	1278.26	29.52	1278.26	29.3	1278.58	29.3	1278.58	29.3	1278.58	29.3	1278.58
31.47	1277.87	27.00	1278.94	27.00	1278.94	30.24	1277.90	27.00	1278.94	30.24	1277.90	30.24	1277.90	29.5	1278.07	29.5	1278.07	29.5	1278.07	29.5	1278.07
32.13	1277.92	29.00	1278.42	29.00	1278.42	30.45	1277.51	29.00	1278.42	30.45	1277.51	30.45	1277.51	29.8	1277.73	29.8	1277.73	29.8	1277.73	29.8	1277.73
33.79	1278.17	29.10	1278.33	29.10	1278.33	31.13	1277.37	29.10	1278.33	31.13	1277.37	31.13	1277.37	30.4	1277.69	30.4	1277.69	30.4	1277.69	30.4	1277.69
36.00	1278.61	29.70	1278.10	29.70	1278.10	31.84	1277.48	29.70	1278.10	31.84	1277.48	31.84	1277.48	31.26	1277.62	31.26	1277.62	31.26	1277.62	31.26	1277.62
39.47	1279.54	30.40	1277.84	30.40	1277.84	32.42	1277.66	30.40	1277.84	32.42	1277.66	32.42	1277.66	31.7	1277.73	31.7	1277.73	31.7	1277.73	31.7	1277.73
51.65	1280.73	31.40	1277.83	31.40	1277.83	32.90	1277.79	31.40	1277.83	32.90	1277.79	32.90	1277.79	32.25	1277.77	32.25	1277.77	32.25	1277.77	32.25	1277.77
59.31	1280.85	32.30	1277.80	32.30	1277.80	33.19	1278.13	32.30	1277.80	33.19	1278.13	33.19	1278.13	32.78	1277.97	32.78	1277.97	32.78	1277.97	32.78	1277.97
59.38	1280.96	33.20	1278.30	33.20	1278.30	33.42	1278.31	33.20	1278.30	33.42	1278.31	33.42	1278.31	33.19	1278.31	33.19	1278.31	33.19	1278.31	33.19	1278.31
		34.05	1278.33	34.05	1278.33	34.16	1278.51	34.05	1278.33	34.16	1278.51	34.16	1278.51	33.63	1278.53	33.63	1278.53	33.63	1278.53	33.63	1278.53
		34.70	1278.58	34.70	1278.58	36.33	1278.88	34.70	1278.58	36.33	1278.88	36.33	1278.88	34.28	1278.85	34.28	1278.85	34.28	1278.85	34.28	1278.85
		36.00	1278.77	36.00	1278.77	40.25	1279.80	36.00	1278.77	40.25	1279.80	40.25	1279.80	35.21	1279.19	35.21	1279.19	35.21	1279.19	35.21	1279.19
		39.00	1279.57	39.00	1279.57	50.72	1280.64	39.00	1279.57	50.72	1280.64	50.72	1280.64	36.57	1279.2	36.57	1279.2	36.57	1279.2	36.57	1279.2
		41.30	1279.90	41.30	1279.90	59.13	1280.99	41.30	1279.90	59.13	1280.99	59.13	1280.99	39.87	1279.94	39.87	1279.94	39.87	1279.94	39.87	1279.94
		45.00	1280.27	45.00	1280.27			45.00	1280.27					48.99	1280.76	48.99	1280.76	48.99	1280.76	48.99	1280.76
		50.00	1280.58	50.00	1280.58			50.00	1280.58					58.96	1281.17	58.96	1281.17	58.96	1281.17	58.96	1281.17
		55.00	1280.84	55.00	1280.84			55.00	1280.84												
		59.00	1280.93	59.00	1280.93																
		59.40	1281.02	59.40	1281.02																





CROSS SECTION PLOT - LOOKING DOWNSTREAM

YEAR-4, 2011 SURVEY DATA
PROJECT NAKED CREEK
TASK CROSS SECTION
REACH NAKED CREEK
DATE 4/04/2011 to 4/06/2011
CREW BUCHHOLZ/PARRISH

CROSS-SECTION: 6
FEATURE: Pool

Summary Data
 All dimensions in feet.

Bankfull X-sec area	15.5	sq. ft.
Bankfull Width	21.2	ft.
Bankfull Mean Depth	0.7	ft.
Bankfull Max Depth	2.2	ft.
Width/Depth Ratio	29.0	ft.
Entrenchment Ratio	n/a	ft.
Classification	n/a	

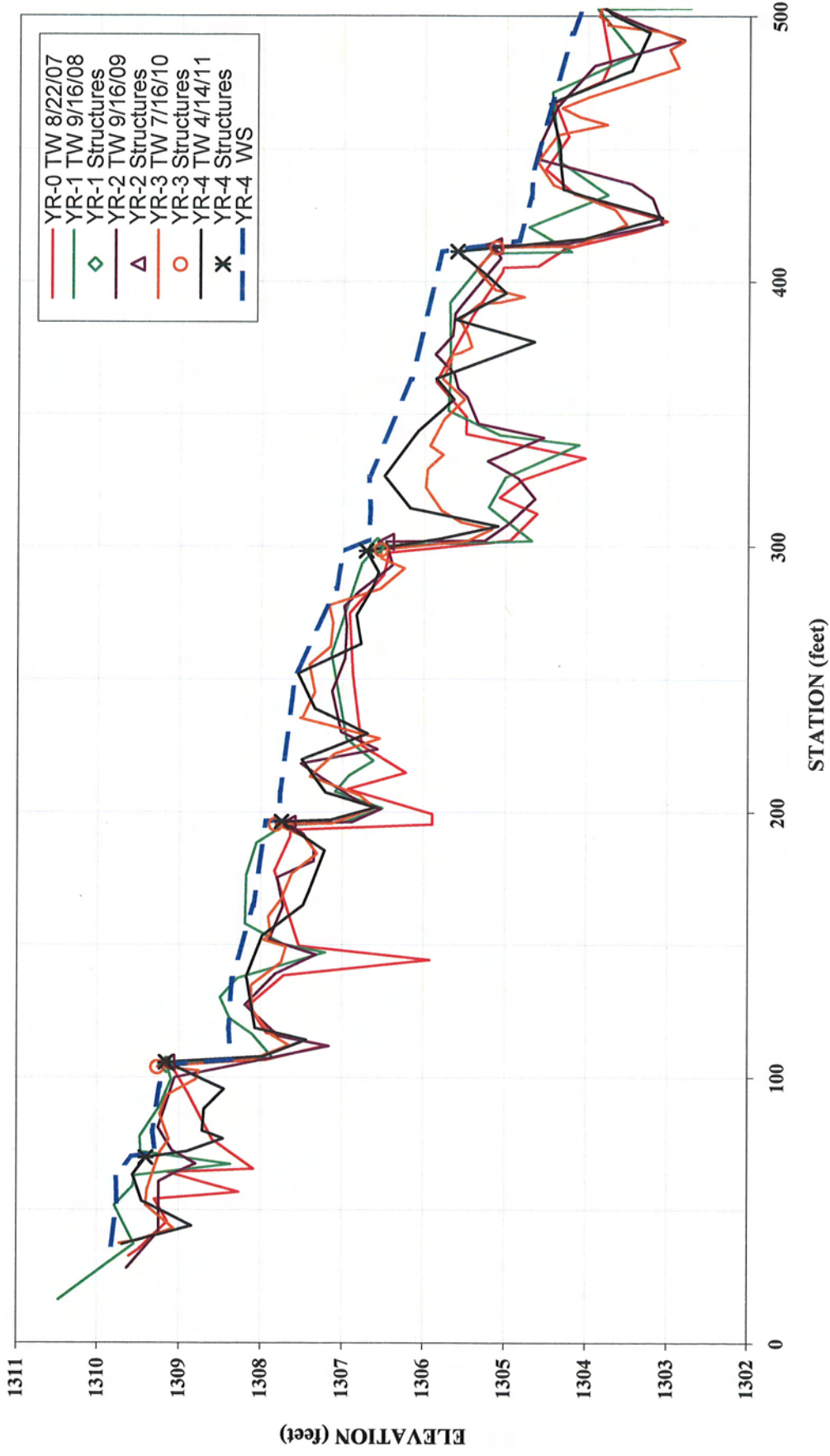
Bankfull Elevation: 1279.82 ft.



CROSS SECTION PHOTO - LOOKING DOWNSTREAM

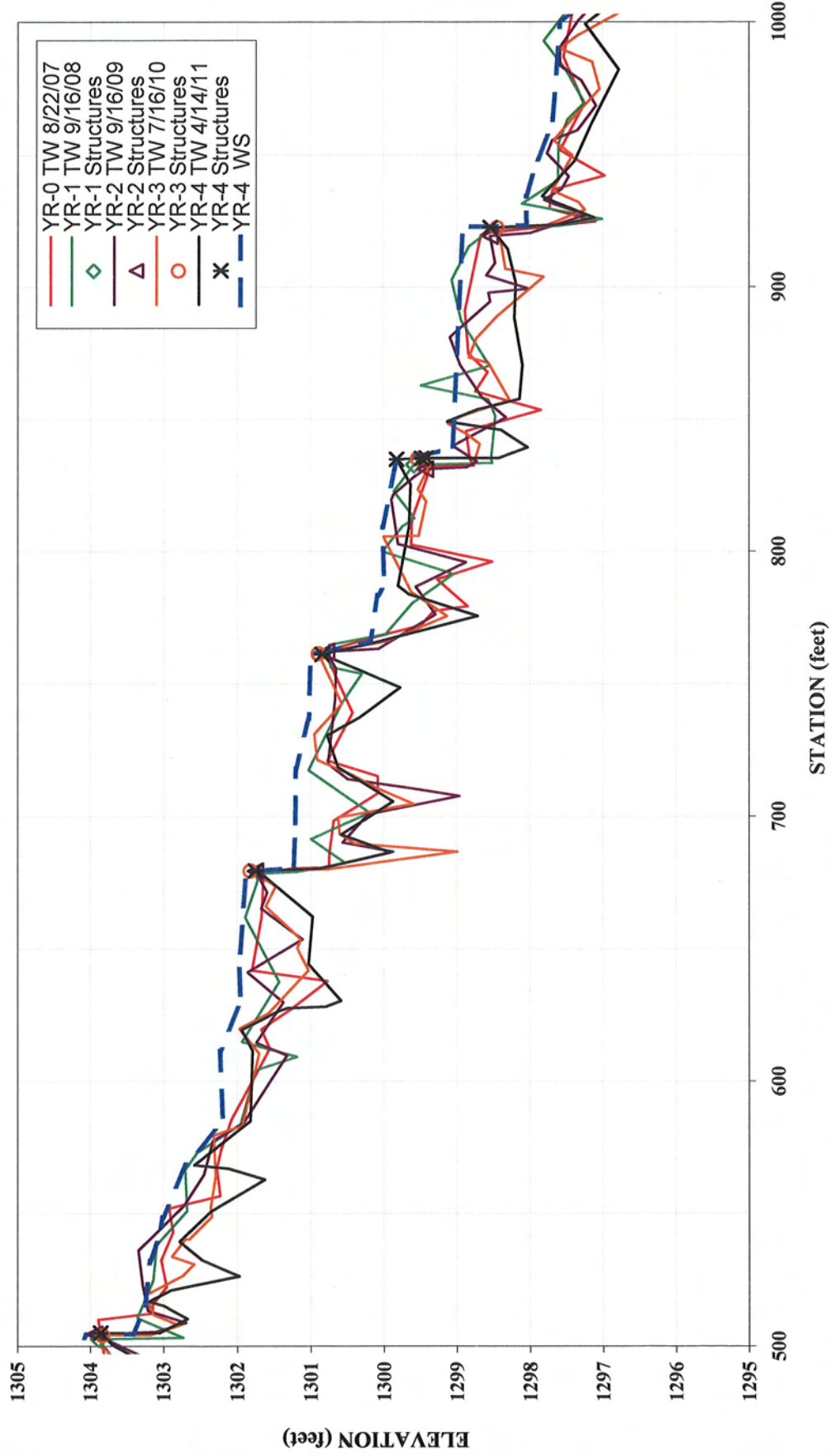


**Naked Creek
Longitudinal Profile
2011 (Year-4) Monitoring**



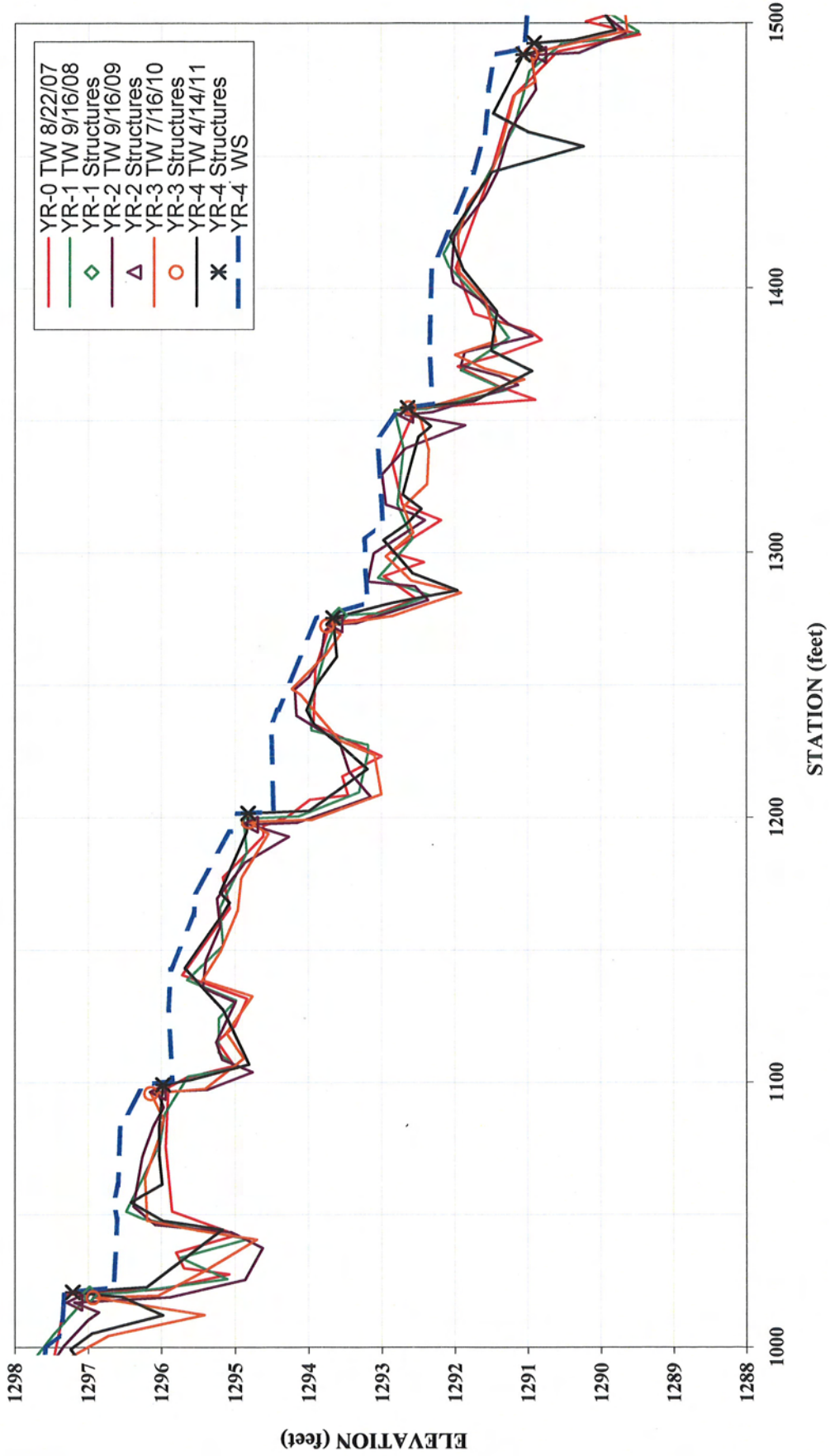
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek
Longitudinal Profile
2011 (Year-4) Monitoring**



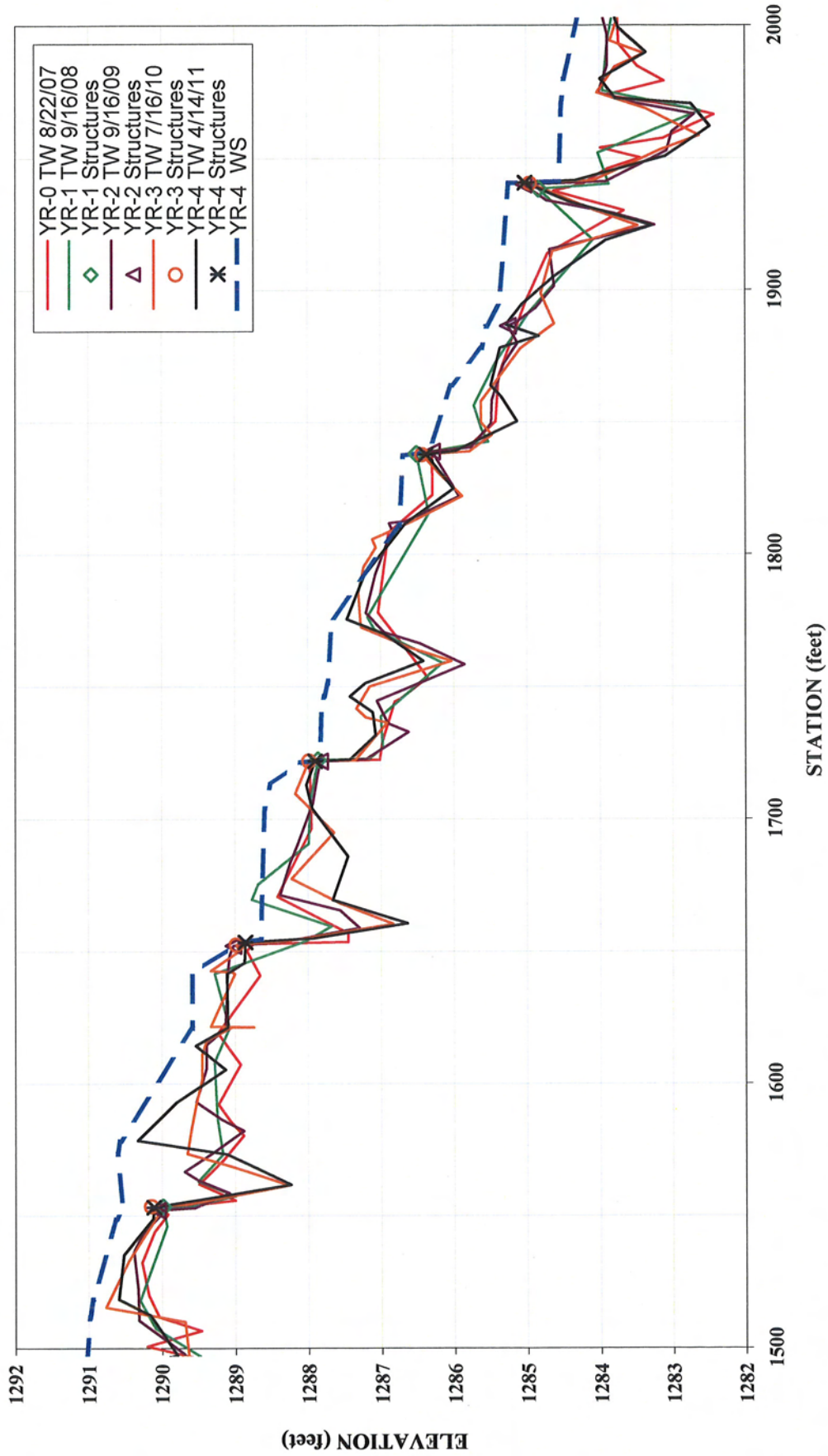
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek
Longitudinal Profile
2011 (Year-4) Monitoring**



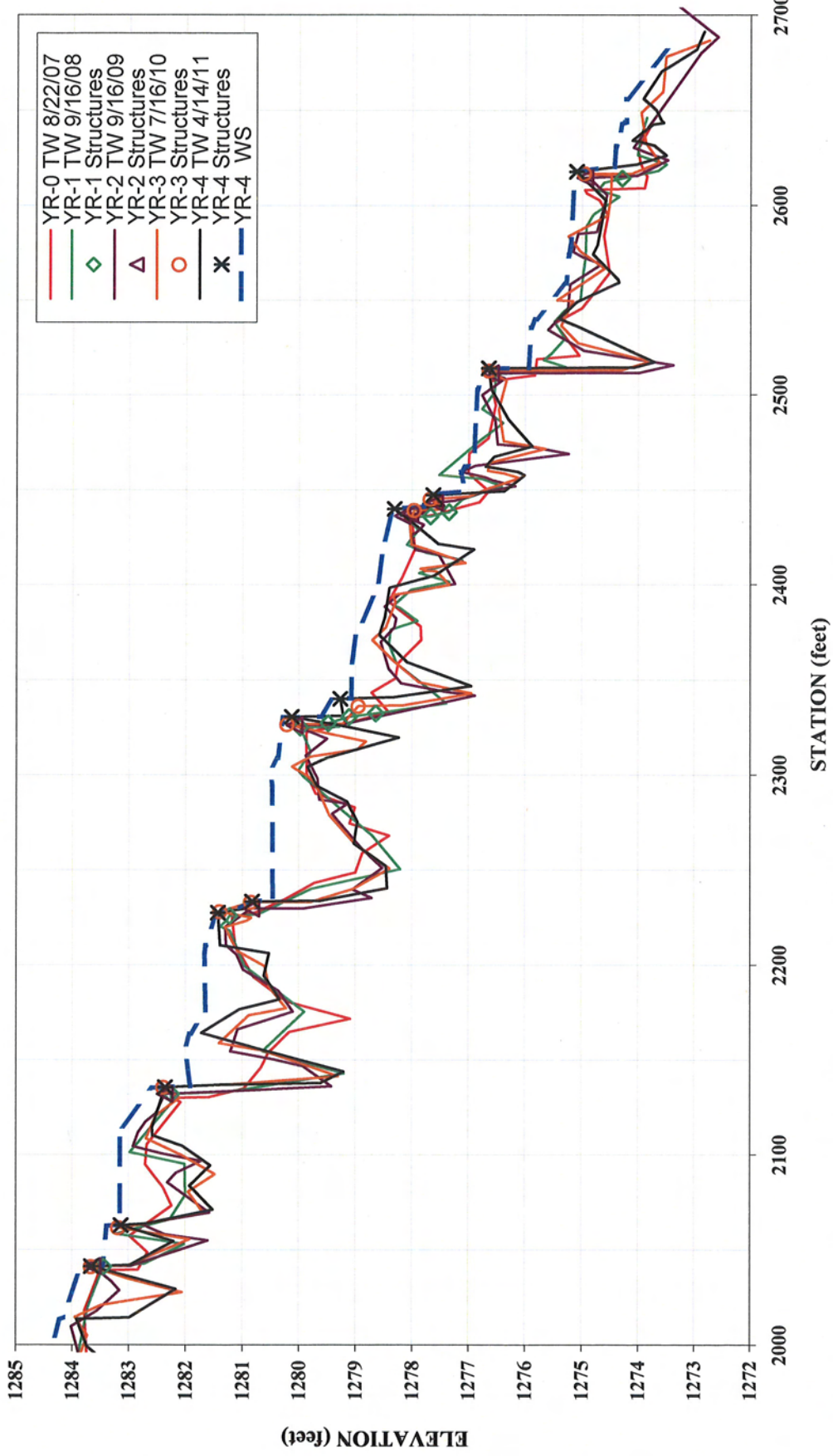
Note: Due to slight differences in thalweg length, longitudinal profile was adjusted horizontally. Elevation data was not changed.

**Naked Creek
Longitudinal Profile
2011 (Year-4) Monitoring**



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

**Naked Creek
Longitudinal Profile
2011 (Year-4) Monitoring**



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

4-YEAR, 2011 SURVEY DATA

PROJECT NAME NAKED CREEK

**FEATURE/FACET SLOPE
LENGTH, AND SPACING AND
LONGITUDINAL PROFILE DATA**

TASK LONGITUDINAL PROFILE
REACH NAKED CREEK
DATE 4/4/2011 to 4/6/2011
CREW BUCHHOLZ/PARRISH

Overall water surface slope =	1.4%	DESIGN	MIN.	MAX.
		Riffle	0.0195	0.025
WS sta. start =	36.76 ft	Run	---	---
WS sta. end =	2712.17 ft	p-p spacing	80	144
ELEV. Start =	1309.82 ft msl			
ELEV. End =	1272.83 ft msl			

Results

	n =	MIN.	MEDIAN.	AVG.	MAX.
Riffle slopes measured =	43	0.2%	2.6%	3.1%	9.2%
Run slopes measured =	31	0.2%	3.6%	9.4%	116.4%
Pools measured =	44	15	64	61	119

All data reported in units of **feet** unless otherwise specified.

Feature	Station	Length	Slope		
RIFFLE	63.21	6.44	2.48%	n =	43
RIFFLE	97.01	17.64	2.66%	MIN =	0.23%
RIFFLE	146.71	27.14	2.58%	MEDIAN =	2.58%
RIFFLE	261.04	32.44	2.84%	AVG. =	3.07%
RIFFLE	335.44	36.86	1.71%	MAX =	9.17%
RIFFLE	443.74	7.83	5.75%		
RIFFLE	509.26	4.72	3.60%		
RIFFLE	525.75	4.24	7.08%		
RIFFLE	548.38	11.47	3.75%		
RIFFLE	577.3	16.58	4.58%		
RIFFLE	628.43	8.18	7.70%		
RIFFLE	733.41	18.9	1.53%		
RIFFLE	801.92	22.08	0.68%		
RIFFLE	864.06	4.47	9.17%		
RIFFLE	949.31	13.38	3.36%		
RIFFLE	1014.27	5.89	4.92%		
RIFFLE	1069.6	6.79	6.33%		
RIFFLE	1098.26	15.83	0.32%		
RIFFLE	1158.12	20.23	2.52%		
RIFFLE	1186.68	22.94	1.57%		
RIFFLE	1250.1	5.39	1.86%		
RIFFLE	1319.62	6.03	5.14%		
RIFFLE	1336.8	21.79	1.01%		
RIFFLE	1425.04	36.88	1.06%		
RIFFLE	1484	9.99	1.90%		
RIFFLE	1536.45	30.34	1.55%		
RIFFLE	1596.41	42.79	2.64%		
RIFFLE	1730.85	8.98	1.34%		
RIFFLE	1764.22	5.01	4.19%		
RIFFLE	1793.33	36.04	2.19%		

4-YEAR, 2011 SURVEY DATA

PROJECT NAME NAKED CREEK

RIFFLE	1881.87	14.28	0.91%		
RIFFLE	1904.84	7.83	2.81%		
RIFFLE	1997.89	61.31	0.54%		
RIFFLE	2132.28	21.19	1.09%		
RIFFLE	2182.13	12.43	5.39%		
RIFFLE	2228.22	17.21	0.23%		
RIFFLE	2322.1	4.61	7.38%		
RIFFLE	2391.37	24.89	0.72%		
RIFFLE	2483.11	5.16	2.91%		
RIFFLE	2523.74	11.22	0.45%		
RIFFLE	2561.12	19.1	5.55%		
RIFFLE	2595.14	4.75	1.68%		
RIFFLE	2655.08	8.47	4.25%		
Feature	Station	Length	Slope		
RUN	174	31	0.86%	n =	31
RUN	293	14	0.58%	MIN =	0.2%
RUN	372	14	8.71%	MEDIAN =	3.6%
RUN	452	9	5.65%	AVG. =	9.4%
RUN	530	5	17.32%	MAX =	116.4%
RUN	560	12	6.14%		
RUN	637	1	116.36%		
RUN	752	24	2.14%		
RUN	824	26	0.65%		
RUN	869	4	14.15%		
RUN	963	14	1.60%		
RUN	1020	7	14.08%		
RUN	1076	11	0.37%		
RUN	1178	4	2.24%		
RUN	1210	7	0.29%		
RUN	1255	35	1.04%		
RUN	1326	6	3.56%		
RUN	1359	14	1.07%		
RUN	1462	10	13.08%		
RUN	1494	12	1.80%		
RUN	1567	4	0.23%		
RUN	1769	8	9.42%		
RUN	1829	26	1.10%		
RUN	1896	4	11.83%		
RUN	1913	11	4.19%		
RUN	2195	5	13.58%		
RUN	2327	11	11.83%		
RUN	2416	6	12.40%		
RUN	2488	5	12.34%		
RUN	2580	2	0.66%		
RUN	2600	39	0.95%		

4-YEAR, 2011 SURVEY DATA

PROJECT NAME NAKED CREEK

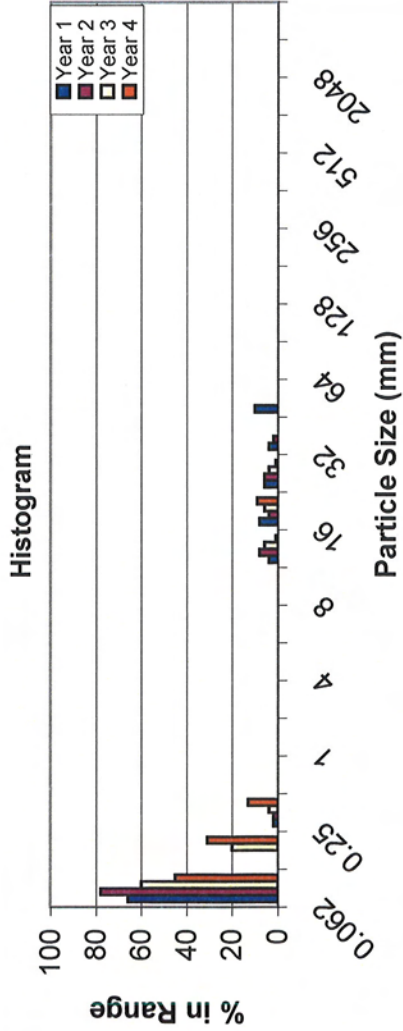
Feature	Station	Length	p-p spacing	n =	44
POOL	44	7		MIN =	15
POOL	77	8	33	MEDIAN =	64
POOL	123	11	46	AVG. =	61
POOL	211	10	88	MAX =	119
POOL	317	11	106		
POOL	405	48	88		
POOL	433	16	29		
POOL	489	51	55		
POOL	519	10	31		
POOL	535	11	16		
POOL	572	16	36		
POOL	639	57	68		
POOL	701	13	62		
POOL	791	18	89		
POOL	854	10	64		
POOL	873	69	18		
POOL	941	9	69		
POOL	1027	14	86		
POOL	1059	25	32		
POOL	1122	27	62		
POOL	1233	24	111		
POOL	1301	11	67		
POOL	1387	19	86		
POOL	1472	15	85		
POOL	1515	19	44		
POOL	1580	24	64		
POOL	1679	15	99		
POOL	1750	18	71		
POOL	1868	20	119		
POOL	1942	39	74		
POOL	1980	31	37		
POOL	2072	21	93		
POOL	2089	68	17		
POOL	2162	20	73		
POOL	2200	29	38		
POOL	2258	60	58		
POOL	2338	17	79		
POOL	2365	18	27		
POOL	2437	23	72		
POOL	2478	10	42		
POOL	2494	20	15		
POOL	2538	21	45		
POOL	2582	15	44		
POOL	2647	10	65		

(p-p spacing)

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



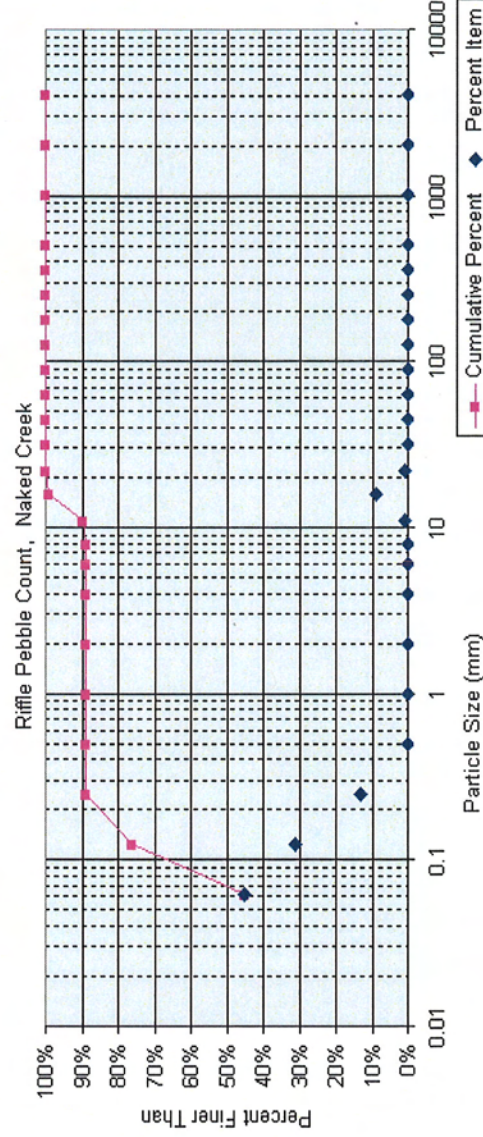
PROJECT NAKED CREEK
 TASK PEBBLE COUNT
 REACH NAKED CREEK
 DATE 4/4/2011 to 4/6/2011
 CREW BUCHHOLZ/PARRISH



Material	Size Range (mm)	Count
silt/clay	0 - 0.062	45
very fine sand	0.062 - 0.13	31
fine sand	0.13 - 0.25	13
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	1
medium gravel	11 - 16	9
coarse gravel	16 - 22	1
coarse gravel	22 - 32	1
very coarse gravel	32 - 45	45
very coarse gravel	45 - 64	64
small cobble	64 - 90	90
medium cobble	90 - 128	128
large cobble	128 - 180	180
very large cobble	180 - 256	256
small boulder	256 - 362	362
small boulder	362 - 512	512
medium boulder	512 - 1024	1024
large boulder	1024 - 2048	2048
very large boulder	2048 - 4096	4096
bedrock		
Total Particle Count:		100

Naked Creek

Note:



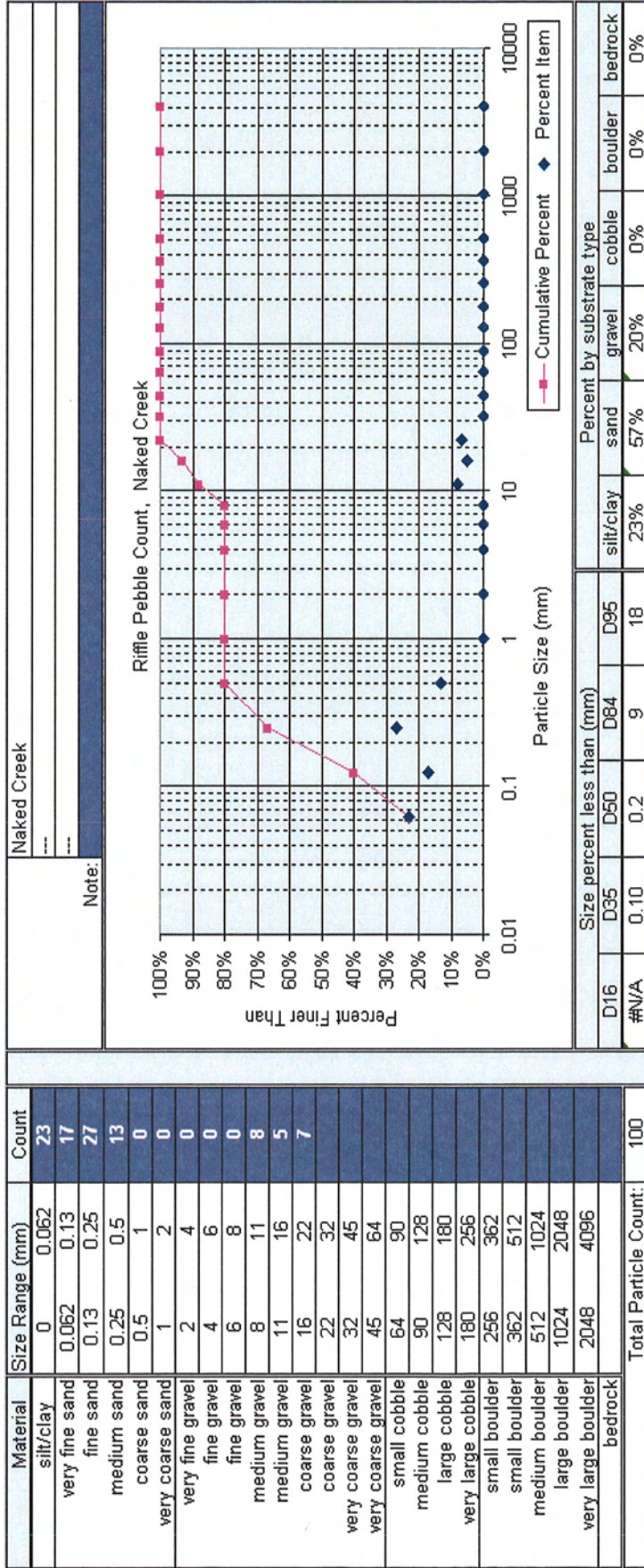
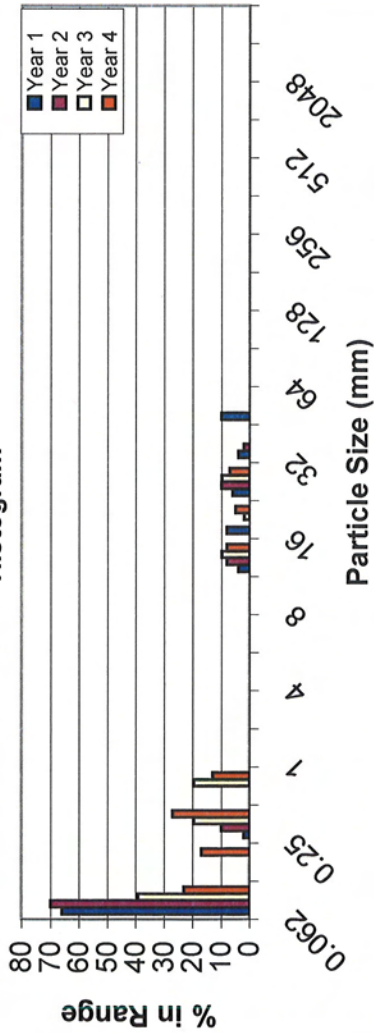
Size percent less than (mm)		Percent by substrate type							
D16	D35	D64	D95	sand	silt/clay	gravel	cobble	boulder	bedrock
#/N/A	#/N/A	0	14	44%	45%	11%	0%	0%	0%

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



PROJECT NAKED CREEK
 TASK PEBBLE COUNT
 REACH NAKED CREEK
 DATE 4/4/2011 to 4/6/2011
 CREW BUCHHOLZ/PARRISH

Histogram

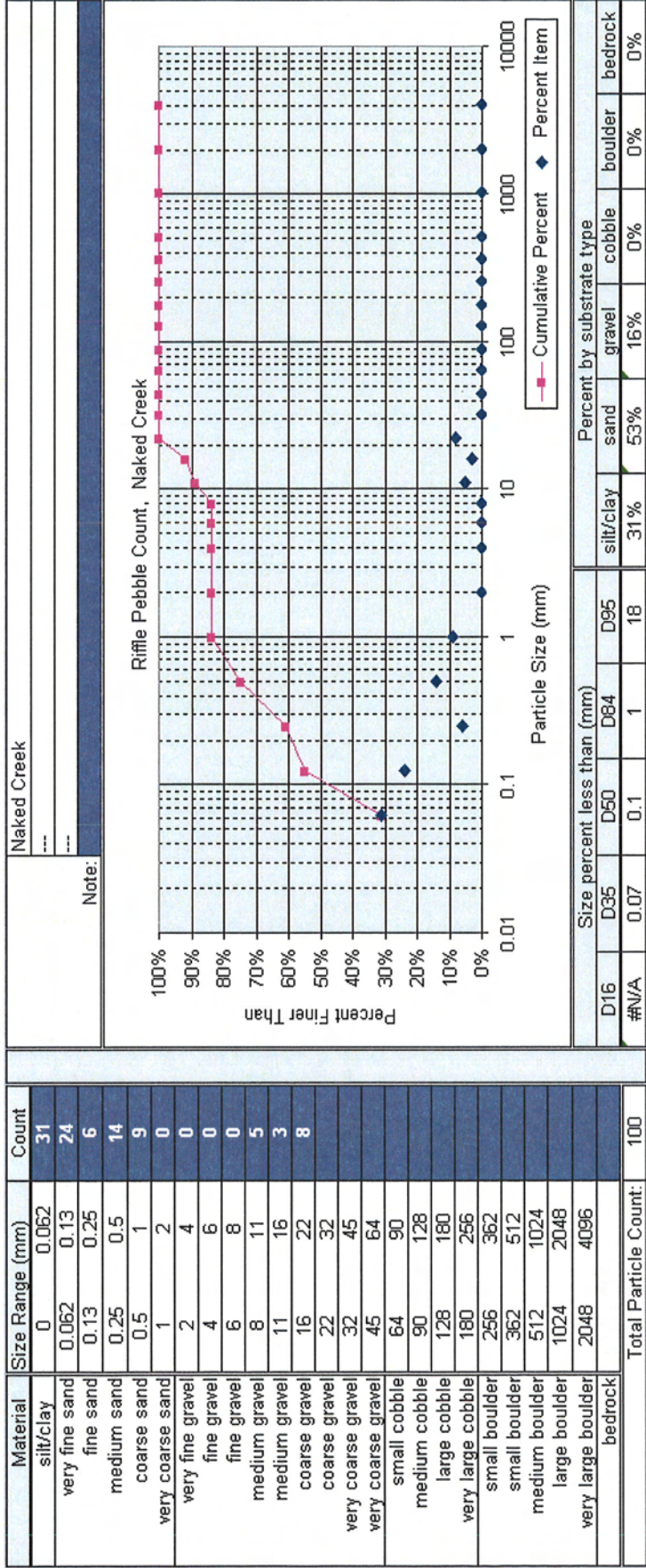
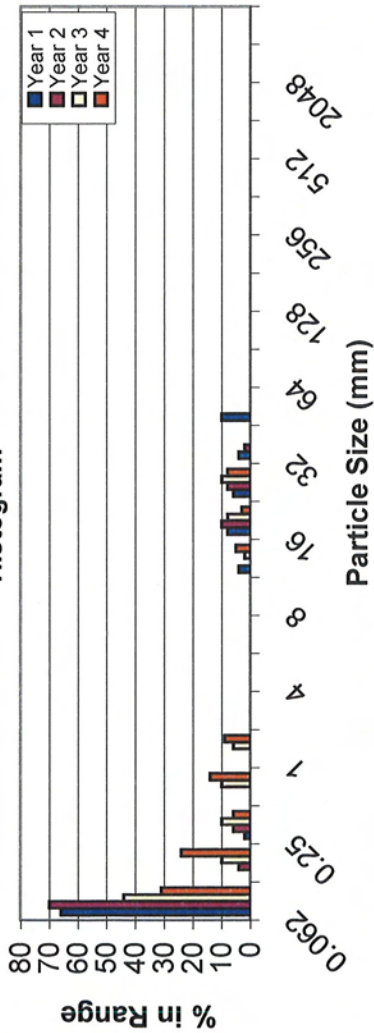


EEP PROJECT ID: 261
 CROSS-SECTION: 4
 FEATURE: RIFFLE



PROJECT NAKED CREEK
 TASK PEBBLE COUNT
 REACH NAKED CREEK
 DATE 4/4/2011 to 4/6/2011
 CREW BUCHHOLZ/PARRISH

Histogram



APPENDIX E

Wetland Assessment
(omitted, not applicable)