Kimley-Horn and Associates, Inc.

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1.0 Introduction

1.1 Review

This report is intended for use by North Carolina Department of Environment and Natural Resources (NCDENR) Wetland Restoration Program (NCWRP) for post construction monitoring assessment on Jumping Run Stream, Payne Dairy Farms, Alexander County, North Carolina. This report was prepared pursuant to NCWRP's request to Kimley-Horn and Associates, Inc. per Contract # EW 901, Project # PD/CAT/99, Task Authorization # PD/CAT/99/11.

1.2 Purpose

Morphologic field investigation and data analysis was conducted on June 13 and June 14, 2001 in order to establish a procedure for post construction monitoring on Jumping Run Stream restoration site. A three-man team from Kimley-Horn and Associates, Inc. (KHA) performed the field reconnaissance. A geomorphic survey and photo documentation was completed. This monitoring plan includes assessment of stream bank stability as well as stream morphology. Field reconnaissance involved the establishment of monumented cross-sections at riffles and pools, longitudinal profiles, and Modified Wolman pebble counts.

2.0 Methodologies

The following is a discussion of the methodologies used in field reconnaissance (Rosgen Level II) and summary report documentation. This document will facilitate follow-up monitoring efforts and enable replication of the field reconnaissance that was performed.

The geomorphology of the stream should be assessed using the Rosgen classification system. The morphology of the stream is to be monitored a minimum of once a year for 5 years after construction. It is also recommended to survey the stream after major (>2 year) storm events during this period.

2.1 Reference Photographs

Monitoring – Locations of the photograph points were established at all cross section locations and at distinguishing points along stream.

The order of photos taken are referenced by sheet number (Appendix E) and in general taken from upstream to downstream points along the stream corridor. Each photo point was established and either marked in field with a wooden stake or referenced by cross-section or stream feature (i.e. rock vane). All photo points are called out on the Record Drawing plan sheets. Refer to Photo Index and Record Drawings for location of photo points.

Procedure – Photographs should be taken standing at the approximate location of established photo point, cross section location, and/or referenced stream feature/structure. Photographs will be taken throughout the monitoring period. Photos should be compared to previous year(s) photos to evaluate vegetative growth along the stream corridor of the restoration site and channel evolution. All follow up monitoring photos should be taken at approximately the same location as

in the initial photo point locations as established in this report. This aspect of monitoring will last for five (5) years.

Success Criteria – Photographs will be used to subjectively evaluate channel aggradation or degradation, bank erosion, success of riparian vegetation and effectiveness of in-stream structures and erosion control measures. Longitudinal photos should indicate the absences of developing bars within the channel or an excessive increase in channel depth. Photos should not indicate excessive erosion or continuing degradation of the bank over time. A series of photos over time should indicate successional maturation of riparian vegetation.

2.2 Morphology

Cross-section geometry, longitudinal profile, and Modified Wolman Pebble Count data were gathered during field reconnaissance. Four distinctive areas (upstream to downstream) along the stream channel denoted as Area 1, Area 2, Area 3, and Area 4 were surveyed and established for monitoring. The location of each of these areas begins and ends along each of the four longitudinal profiles. These areas are shown on the Record Drawings plan sheets. Stream geometry and substrate data for each area is located in Appendices A – D.

Cross-Sections

Monitoring – Permanent cross sections were established along the stream corridor of the restoration site. Cross-sections were taken in the four areas established along the stream corridor denoted as Area 1, Area 2, Area 3, and Area 4. One riffle and one pool cross-section was surveyed for each of the four areas established. The locations of each cross-section were marked to establish the exact transect location. The cross-section data was compiled and plotted for each area (Appendices A-D).

Rebar was used to mark the established location of each cross-section. Each rebar is referenced alphabetically in consecutive order of cross sections taken (i.e. rebar A & B for cross section 1). One rebar was driven vertically flush to ground on each side of bank to establish the outer limits of each cross-section surveyed. Two wooden stakes (wrapped with pink tape) were also placed adjacent to each rebar marker to aid in locating the rebar in the field. All cross-section locations are shown on Record Drawing plan sheets.

Procedure – The following steps should be executed to ensure successful replication of cross-section location and surveying parameters. Data will be collected once a year for five (5) years. Cross-sections should be plotted over that of previous year(s) for comparison.

Minimum Equipment Needed:
Tape (at least 100') for cross-sections
Tape (at least 300') for profile
Surveyor's Level (Optical or Laser)
Surveyor's Rod
Camera
Bank Pins
Record Drawings
Monitoring Report

General Procedure:

- Locate CROSS-SECTION on Record Drawing plan sheets and in field
- Locate end points on banks marked with rebar
- Pull tape (100' tape) from left bank to right bank looking downstream at cross-section location between the two rebar points. The end of the tape (0'0") should be directly over the left rebar (temporary benchmark, TBM)
- Locate permanent/temporary bench mark
- Set up Level/surveying equipment in location to limit visual constraints
- Survey any permanent/temporary benchmarks (refer to Appendices A-D and Record Drawing plan sheets)
- Survey from left to right bank
- Survey distinctive points (i.e. top of bank, edge of water, bankful features, etc.)

Table 1: Summary of Cross-Section Locations

Cross section	Rebar Pins	Area	Permanent/ temporary Benchmark	Cross Section Type
1	A,B	1	Nail in Hickory	Riffle
2	C,D	1	Nail in Hickory	Pool (incl. Oxbow pond)
3	E,F	2	pin	Riffle
4	G,H	2	pin	Pool
5	I,J	3	pin	Riffle (incl. Old channel)
6	K,L	3	pin	Pool
7	M,N	4	pin	Riffle
8	O,P	4	pin	Pool

All cross-section locations are shown on Record Drawing plan sheets.

All elevations along Area 1 (cross-sections 1 & 2) are based on a permanent benchmark and tied to a real elevation of 1105.48 (refer to Appendices A-D & Record Drawing plan sheets). All other elevations for Areas 2, 3, and 4 are based on relative elevations (TBM). Survey elevations in an area can be based on any rebar pins (TBM) set in field. The relative elevation at each pin is located in Appendix A-D.

At least 20 measurements are recommended to accurately portray channel cross-sections. Measure all significant breaks of slope that occurs across the channel. Outside the channel, measure important features including the active floodplain, bankfull elevations, and stream terraces.

Longitudinal Profile

The longitudinal profile will measure points up and down the stream channel. The profile will indicate any changes in slope of water surface, channel bed, floodplain, and terraces. The elevations and positions of channel defining indicators can also be monitored with this profile.

Monitoring – Longitudinal profiles were taken along the stream corridor of the restoration site for each Area 1-4 established. The profiles were taken in four distinctive areas (upstream to

downstream) along stream corridor denoted as Area 1, Area 2, Area 3, and Area 4 (refer to Record Drawing plan sheets). This data was compiled and plotted for each area (Appendices A-D).

Procedure – Conduct the longitudinal profile survey when conducting the cross-section surveys. Run tape beginning at the established STA 0 point and continue downstream to the established length of stream. Survey points at each station should include a ground shot (thalwag), water surface shot, and any channel forming features (bankful, top of bank, etc.). The start and end points of each longitudinal profile is shown on the Record Drawing plan sheets. Each profile runs from up to downstream a length of approximately 20 bank-full widths. Data will be collected once a year for five (5) years. Longitudinal profiles should be plotted over that of previous year(s) for comparison.

Modified Wolman Pebble Count

The composition of the streambed and banks is a good indicator of changes in stream character, channel form, hydraulics, erosion rates, and sediment supply. Composition can indicate how a stream is behaving. A pebble count gives a quantitative description of the bed material.

Monitoring – Pebble counts were performed at each of the four areas along the stream reach (representative of two meander wavelengths and within the longitudinal profile of each area). Each pebble count consisted of 50 counts at a riffle section and 50 counts at a pool section along the stream (based on pool/riffle distribution at the time of fieldwork). Pool/riffle counts were chosen near the cross-sections taken for that area. This data was compiled and plotted for each area (Appendices A-D).

Procedure – Follow the basic steps for the Modified Wolman Pebble Count (Rosgen, Applied River Morphology). Perform count at each of the four areas along the stream channel. Measure a minimum of 100 particles (50 pools/50 riffles) to obtain a valid count. Use a tally sheet to record the count. Data will be collected once a year for five (5) years. Pebble counts should be plotted over previous year(s) for comparison.

Success Criteria

Judgements on success or failure of restoration activities using this data will be subjective. It is expected that there will be some minimal changes in the cross sections, profile and/or substrate composition. Changes that may occur during the monitoring period will be evaluated to determine if they represent a movement toward a more unstable condition (down-cutting, deposition, erosion) or are minor changes that represent an increase in stability (settling, vegetative changes, decrease in width/depth ratio). Unstable conditions that require remediation will indicate failure of restoration activities.

2.3 Vegetation

Monitoring – Survival of vegetation will be evaluated using survival plots and/or direct counts. Survival of live stakes will be evaluated along the stream corridor of the restoration site. Live stake planting will be monitored for five (5) years before success or failure is accessed. Plants should be replaced per the contract documents (November 2000).

Procedure - Vegetation survival inside the riparian buffer will be documented for a 5-year period through photograph documentation of the entire length of the corridor in which buffers were planted. Documentation will occur at pre-established stations/plot areas. Vegetation survival of target dominant species will be confirmed.

Plot Locations

Plots should be located adjacent and tied to the geomorphic monitoring points or other known locations for future replication. Plots should be located along geomorphic features such as riffles, runs, glides, and pools. In some cases, plots will be located in areas such as outside meander bends or atop bankfull benches into the riparian buffer. Plot locations will be determined during 1st year monitoring.

Plot Size

Two different types of plots need to be established to determine survivorship of stakes and bare root seedlings. Sizes and numbers of plots will depend on site conditions, particularly buffer width and project size. Ideally, rectangular plots up to 100 meters square will be used in determining survivability for bare root trees. These should be linear and parallel the stream channel. Stakes should be counted from beginning to end of outside meander bends if this is the sole location of stakes. If stakes are planted along runs, riffles, or glides, rectangular plots should again be used as with the bare root trees. Plot size will depend on site conditions and project size. Herbaceous cover can be incorporated into one of the two plots. Plot size for herbaceous cover should be no more than one meter square in size. Plot size will depend on site conditions and project size.

Timing

Vegetation sampling should be completed before the end of the initial growing season from August 1 to October 31.

Data Recorded

Numbers of live woody stems per plot by species for both stakes and bare roots will be recorded. Estimate of coverage of herbaceous vegetation along with dominant species will be recorded.

3.0 Mitigation (See Plan Section

Within a 40-acre easement, 5,755 feet of Jumping Run and unnamed tributaries were restored and 2,640 feet of stream were preserved.

The 5,755 feet of Jumping Run and three unnamed tributaries were restored to a more natural stable dimension, pattern, and profile through Priority 1 restoration: thereby raising the groundwater and restoring the abandoned floodplain. In-stream structures - including rock crossvanes, logvanes, and root wads - were added to direct flow, create stability, protect the stream banks, and provide habitat. Adjacent plant communities were restored with live stakes, bare root seedlings, and a riparian and upland permanent seed mix, creating a riparian buffer.

Additionally, 2,640 feet of stream were preserved. The riparian buffer adjacent to the preserved stream was restored and/or enhanced and expanded with bare root seedling. Controlled cattle

crossings and exclusionary fencing were included to preserve both the stream and buffer restoration.

4.0 Summary

Geomorphic and vegetative monitoring will be performed on the proposed constructed stream segment for five (5) years to determine success.

All follow up monitoring photos should be compared to the previous year(s) documented photo points to access any changes that may have occurred during the year. Cross-section geometry, longitudinal profile, and Modified Wolman Pebble Count data gathered during field reconnaissance in all follow-up monitoring efforts should be compiled and plotted over the previous year(s) data. A comparison of data sets should be done and accessed for any indications of change toward a more unstable/stable condition.

5.0 References

Rosgen, David L. 1997. "A Geomorphological Approach To Restoration Of Incised Rivers", Proceedings of the Conference on Management of Landscapes Disturbed by Channel Incision.

Rosgen, David L. 1996. Applied River Morphology. Wildland Hydrology Books, Pagosa Springs, CO.

The Division of Land Resources (DLR) and The Division of Water Quality (DWQ), 2000. "Draft Internal Technical Guide for Stream Work in North Carolina".

Kimley-Horn and Associates, Inc. 2000. "Jumping Run Creek, Payne Dairy Farm, Stream Restoration , Executive Summary of Preliminary Design, Alexander County, NC".

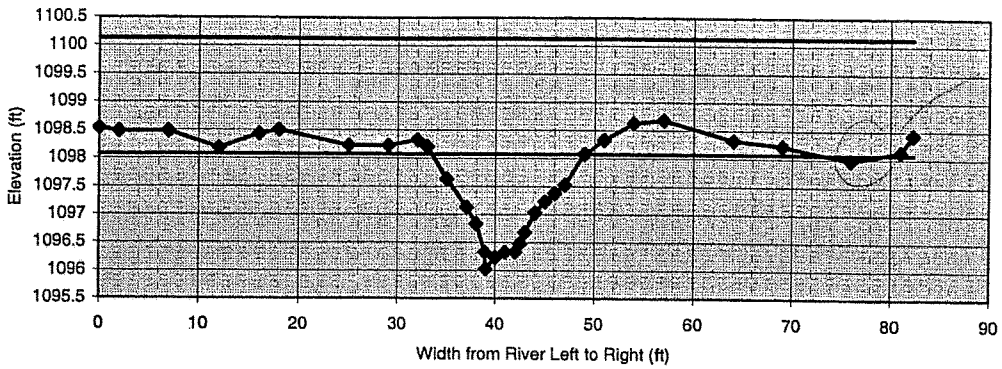
Kimley-Horn and Associates, Inc. 2000. "Contract Documents for Jumping Stream Restoration , Alexander County, NC".

Appendix A
AREA 1: Stream Geometry and Substrate Data

Cross-Section

Cross Section

Classifaction Riffle AREA 1 - Jumping Run Creek



section:	**Classifaction**
	Riffle
	AREA 1 - Jumping Run Creek
	---
description:	Riffle Cross Section - Area 1 at STA 79 (PINS A,B)
height of instrument (ft):	**1104.23**

notes	omit pt	distance (ft)	FS (ft)	elevation
grd shot	☐	0	5.7	1098.53
	☐	2	5.75	1098.48
	☐	7	5.75	1098.48
	☐	12	6.05	1098.18
	☐	16	5.8	1098.43
	☐	18	5.73	1098.5
	☐	25	6	1098.23
	☐	29	6	1098.23
	☐	32	5.9	1098.33
TOB	☐	33	6.02	1098.21
	☐	35	6.6	1097.63
	☐	37	7.1	1097.13
	☐	38	7.4	1096.83
EOW	☐	38.9	7.9	1096.33
	☐	39	8.2	1096.03
	☐	40	8	1096.23
	☐	41	7.9	1096.33
EOW	☐	42	7.9	1096.33
	☐	42.5	7.75	1096.48
	☐	43	7.55	1096.68
	☐	44	7.2	1097.03
	☐	45	7	1097.23
	☐	46	6.85	1097.38
	☐	47	6.7	1097.53
TOB/BKFL	☐	49	6.15	1098.08
	☐	51	5.9	1098.33
	☐	54	5.6	1098.63
	☐	57	5.55	1098.68
	☐	64	5.9	1098.33
	☐	69	6	1098.23
	☐	76	6.25	1097.98
	☐	81	6.1	1098.13
grd shot	☐	82.3	5.8	1098.43
pin B	☐		5.72	1098.51
	☐			
pin A	☑		5.65	1098.58
	☐			
	☐			
	☐			
	☐			

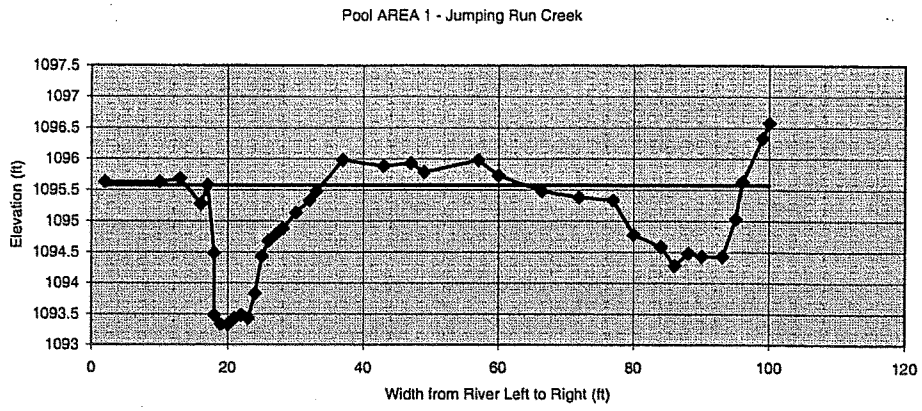
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
6.15	**6.15**		**0.56**	**0.037**
1098.08	1098.08			

dimensions			
15.9	x-section area	0.7 1.9	d mean
~~21.7~~ 16	width	22.5	wet P
2.0	d max	0.7	hyd radi
2.1	bank ht	29.6	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
2.4	velocity (ft/sec)
38.0	discharge rate, Q (cfs)
0.25	shear stress ((lbs/ft sq)
0.36	shear velocity (ft/sec)
0.612	unit stream power (lbs/ft/sec)
0.24	Froude number
6.7	friction factor u/u*
13.8	threshold grain size (mm)

check from channel material			
3	measured D84 (mm)		
88.7	relative roughness	13.9	fric. factor
0.018	Manning's n from channel materia		

Cross Section



section: Pool
AREA 1 - Jumping Run Creek

description: Pool Cross Section - Area 1 (Includes oxbow lake) at STA 260.5 (PINS C,D)

height of instrument (ft): 1104.23

notes	omit pt	distance (ft)	FS (ft)	elevation
pin C			8.34	1095.89
grd shot		2	8.6	1095.63
		10	8.6	1095.63
		13	8.55	1095.68
		16	8.95	1095.28
TOB -lft		17	8.65	1095.58
EOW		18	9.75	1094.48
channel bo		18	10.75	1093.48
		19	10.9	1093.33
		20	10.9	1093.33
		21	10.8	1093.43
		22	10.75	1093.48
		23	10.8	1093.43
		24	10.4	1093.83
EOW		25	9.8	1094.43
		26	9.55	1094.68
		27	9.45	1094.78
		28	9.35	1094.88
		30	9.1	1095.13
TOB		32	8.9	1095.33
		33	8.75	1095.48
		37	8.25	1095.98
		43	8.35	1095.88
		47	8.3	1095.93
		49	8.45	1095.78
		57	8.25	1095.98
		60	8.5	1095.73
EOW - oxb		66.5	8.75	1095.48
		72	8.85	1095.38
		77	8.9	1095.33
		80	9.45	1094.78
		84	9.65	1094.58
		86	9.95	1094.28
		88	9.75	1094.48
		90	9.8	1094.43
		93	9.8	1094.43
		95	9.2	1095.03
EOW - oxb		96	8.6	1095.63
		99	7.9	1096.33
grd shot		100	7.65	1096.58
pin D			7.4	1096.83

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
8.65	8.65		0.56	
1095.58	1095.58			

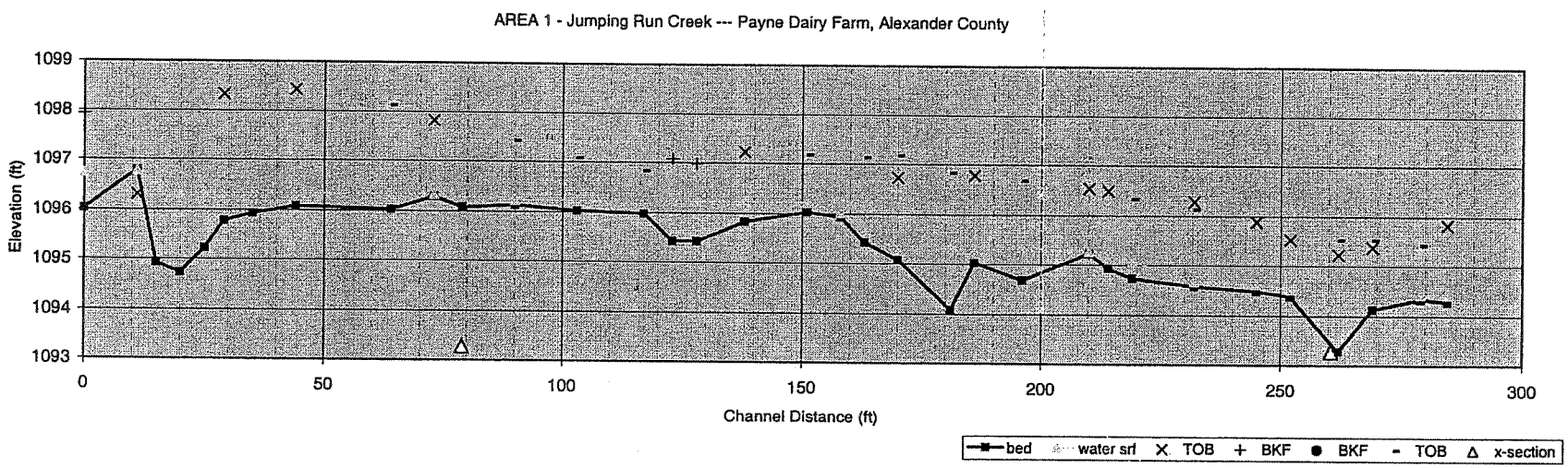
dimensions			
39.6	x-section area	0.8	d mean
52.1	width	54.3	wet P
2.3	d max	0.7	hyd radi
2.3	bank ht	~~68.4~~	w/d ratio
~~0.0~~	W flood prone area	~~0.0~~	ent ratio

hydraulics	
~~0.0~~	velocity (ft/sec)
~~0.0~~	discharge rate, Q (cfs)
0.25	shear stress ((lbs/ft sq)
0.36	shear velocity (ft/sec)
~~0.000~~	unit stream power (lbs/ft/sec)
~~0.00~~	Froude number
~~0.0~~	friction factor u/u*
14.2	threshold grain size (mm)

check from channel material			
~~3~~	measured D84 (mm)		
~~92.0~~	relative roughness	~~14.0~~	fric. factor
~~0.018~~	Manning's n from channel material		

Longitudinal Profile

Slope Profile



1105.48 Elevation BM

1105.48 Elevation BM

notes	cross section	station		BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	AZ azimuth	ELEV bed	ELEV water srf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
TP				1.5	1106.98	6.4													
pin A				5.65	1104.23														
fenceline		0			1104.23		8.2	0.7			6.3			1096.03	1096.73			1097.93	
crossvn		11			1104.23		7.45	0		7.93				1096.78	1096.78		1096.3		
pool		15			1104.23		9.3	1.5						1094.93	1096.43				
		20			1104.23		9.5	1.6						1094.73	1096.33				
		25			1104.23		9	1.1						1095.23	1096.33				
glide		29			1104.23		8.45	0.55		5.9				1095.78	1096.33		1098.33		
		35			1104.23		8.3	0.4						1095.93	1096.33				
		44			1104.23		8.15	0.25		5.8				1096.08	1096.33		1098.43		
		64			1104.23		8.2	0.3				8.1		1096.03	1096.33				1098.13
riffle		73			1104.23		7.95	0.05		6.4				1096.28	1096.33		1097.83		
	xsect	79			1104.23		8.15	0.2						1096.08	1096.28				
end riffle		80			1104.23		8.1	0.1				6.8		1096.13	1096.23				1097.43
		103			1104.23		8.2	0.2				7.15		1096.03	1096.23				1097.08
logvane		117			1104.23		8.25	0.2				7.4		1095.98	1096.18				1096.83
		120			1104.23		8.8	0.8			7.15			1095.43	1096.23			1097.08	
c of pool		128			1104.23		8.8	0.8			7.25			1095.43	1096.23			1096.98	
end pool		138			1104.23		8.4	0.4		7				1095.83	1096.23		1097.23		
riffle		151			1104.23		8.2	0.2				7.05		1096.03	1096.23				1097.18
notch in log		158			1104.23		8.3	0.1						1095.93	1096.03				
		163			1104.23		8.8	0.25				7.1		1095.43	1095.68				1097.13
		170			1104.23		9.15	0.2		7.5		7.05		1095.08	1095.28		1096.73		1097.18
		181			1104.23		10.15	1.25				7.4		1094.08	1095.33				1096.83
		186			1104.23		9.2	0.25		7.45				1095.03	1095.28		1096.78		
c of pool		196			1104.23		9.55	0.65				7.55		1094.68	1095.33				1096.68
		210			1104.23		9	0.05		7.7				1095.23	1095.28		1096.53		
riffle		214			1104.23		8.9	0.35		7.75				1094.93	1095.28		1096.48		
c of riffle		218			1104.23		9.5	0.35				7.9		1094.73	1095.08				1096.33
		232			1104.23		9.66	0.1		7.95		8.1		1094.58	1094.68		1096.28		1096.13
		245			1104.23		9.76	0.15		8.35				1094.48	1094.63		1095.88		
pool		252			1104.23		9.85	0.15		8.7				1094.38	1094.53		1095.53		
	xsect	260.5			1104.23														
c of pool		262			1104.23		10.95	1.2		9		8.7		1093.28	1094.48		1095.23		1095.53
end pool		269			1104.23		10.1	0.35		8.85		8.7		1094.13	1094.48		1095.38		1095.53
		279			1104.23		9.9	0.1				8.8		1094.33	1094.43				1095.43
rock		284.5			1104.23		9.95	0.15		8.4				1094.28	1094.43		1095.83		
					1104.23														
					1104.23														
					1104.23														
					1104.23														
					1104.23														
					1104.23														

Modified Wolman Pebble Count

Reference Reach						Hints
Stream:	AREA 1 - Jumping Run Creek					
Watershed:	---					
Location:	Payne Dairy Farm, Alexander County					
Latitude:	---					
Longitude:	---					
County:	Alexander					
Date:	June 13, 2001					
Observers:	WRW,NLT,MM					
Channel Type:	---					
Drainage Area (sq mi):	---					

Channel Materials

	total	riffle	pool	run	glide	bar sample
D16	0.070	#N/A	0.078	0.000	0.000	---
D35	0.12	0.15	0.11	0.00	0.00	---
D50	0.2	0.3	0.2	0.0	0.0	---
D84	3	9	0	0	0	---
D95	10	19	1	0	0	---
Largest of Bar Sample						
% Silt/Clay	12%	20%	4%	---	---	---
% Sand	71%	46%	96%	---	---	---
% Gravel	17%	34%	0%	---	---	---
% Cobble	0%	0%	0%	---	---	---
% Boulder	0%	0%	0%	---	---	---
% Bedrock	0%	0%	0%	---	---	

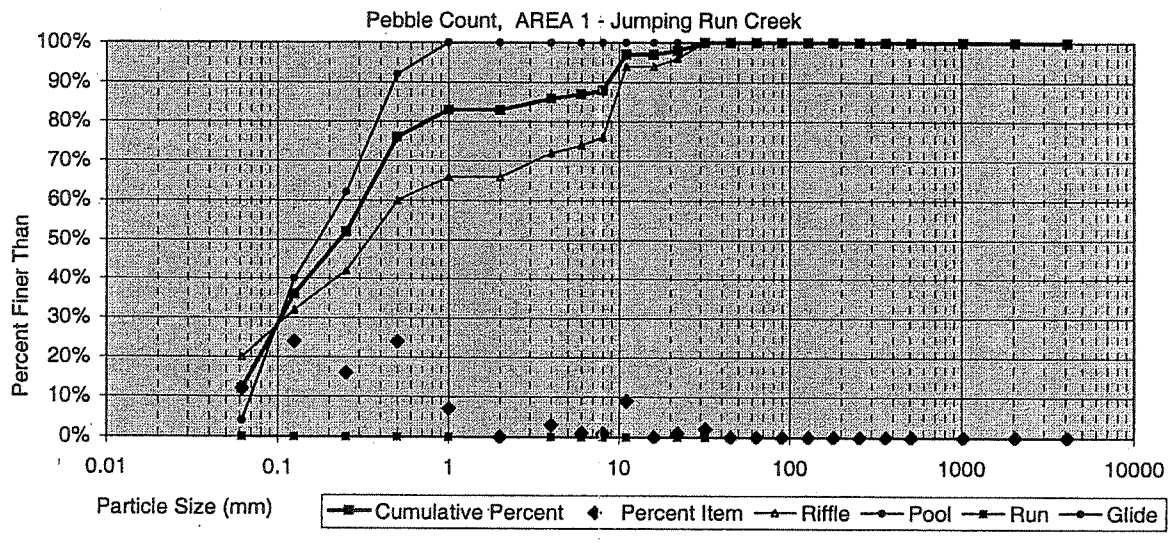
Weighted Pebble Count

Percent Riffle:	50	Percent Run:	
Percent Pool:	50	Percent Glide:	

Pebble Count,
AREA 1 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Classification Pebble Count**

Material	Size Range (mm)		Total #	
silt/clay	0	0.062	12.0	#
very fine sand	0.062	0.13	24.0	#
fine sand	0.13	0.25	16.0	#
medium sand	0.25	0.5	24.0	#
coarse sand	0.5	1	7.0	#
very coarse sand	1	2	0.0	#
very fine gravel	2	4	3.0	#
fine gravel	4	6	1.0	#
fine gravel	6	8	1.0	#
medium gravel	8	11	9.0	#
medium gravel	11	16	0.0	#
coarse gravel	16	22	1.0	#
coarse gravel	22	32	2.0	#
very coarse gravel	32	45	0.0	#
very coarse gravel	45	64	0.0	#
small cobble	64	90	0.0	#
medium cobble	90	128	0.0	#
large cobble	128	180	0.0	#
very large cobble	180	256	0.0	#
small boulder	256	362	0.0	#
small boulder	362	512	0.0	#
medium boulder	512	1024	0.0	#
large boulder	1024	2048	0.0	#
very large boulder	2048	4096	0.0	#
bedrock			0.0	#
		Weighted Count:	100	
		True Total Particle Count:	100	



Size percent less than (mm)				
D16	D35	D50	D84	D95
0.070	0.12	0.2	3	10

Percent by substrate type					
silt/clay	sand	gravel	cobble	boulder	bedrock
12%	71%	17%	0%	0%	0%

Riffle Pebble Count

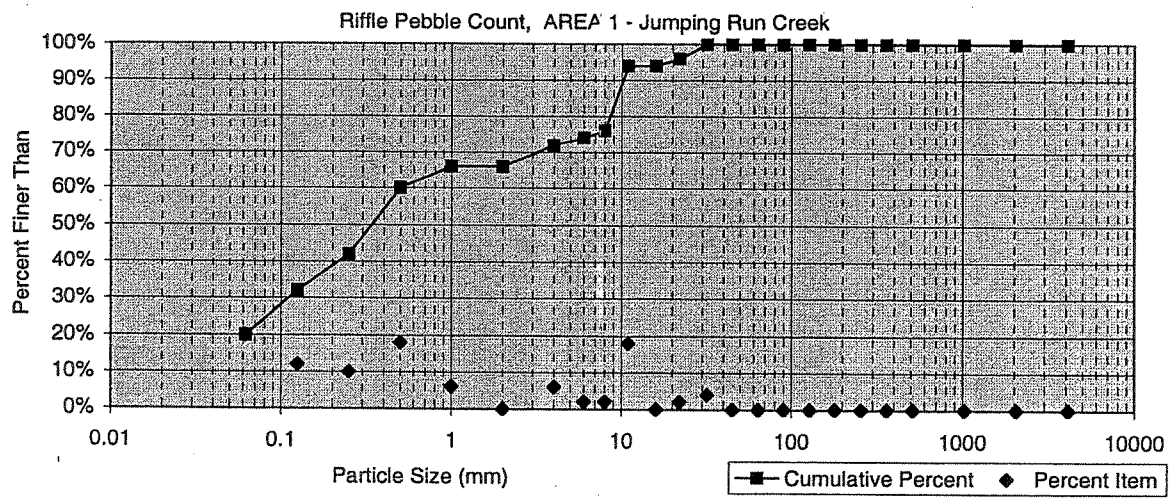
Material	Size Range (mm)		Count	
silt/clay	0	0.062	10	# #
very fine sand	0.062	0.13	6	# #
fine sand	0.13	0.25	5	# #
medium sand	0.25	0.5	9	# #
coarse sand	0.5	1	3	# #
very coarse sand	1	2	0	# #
very fine gravel	2	4	3	# #
fine gravel	4	6	1	# #
fine gravel	6	8	1	# #
medium gravel	8	11	9	# #
medium gravel	11	16	0	# #
coarse gravel	16	22	1	# #
coarse gravel	22	32	2	# #
very coarse gravel	32	45	0	# #
very coarse gravel	45	64	0	# #
small cobble	64	90	0	# #
medium cobble	90	128	0	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
	Total Particle Count:		50	

Riffle Pebble Count,

AREA 1 - Jumping Run Creek

Payne Dairy Farm, Alexander County

Note: **Area 1**



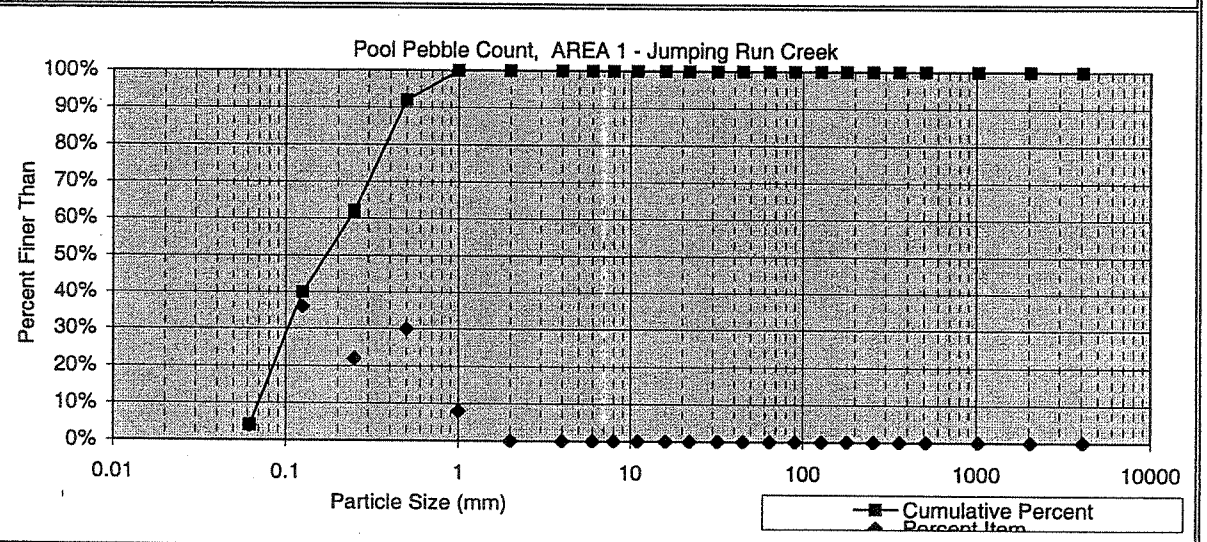
Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/c ay	sand	gravel	cobble	boulder	bedrock
#N/A	0.15	0.3	9	19	20%	46%	34%	0%	0%	0%

Pool Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062	2	# #
very fine sand	0.062	0.13	18	# #
fine sand	0.13	0.25	11	# #
medium sand	0.25	0.5	15	# #
coarse sand	0.5	1	4	# #
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	# #
very coarse gravel	32	45	0	# #
very coarse gravel	45	64	0	# #
small cobble	64	90	0	# #
medium cobble	90	128	0	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
Total Particle Count:			50	

Pool Pebble Count,
AREA 1 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Area 1**



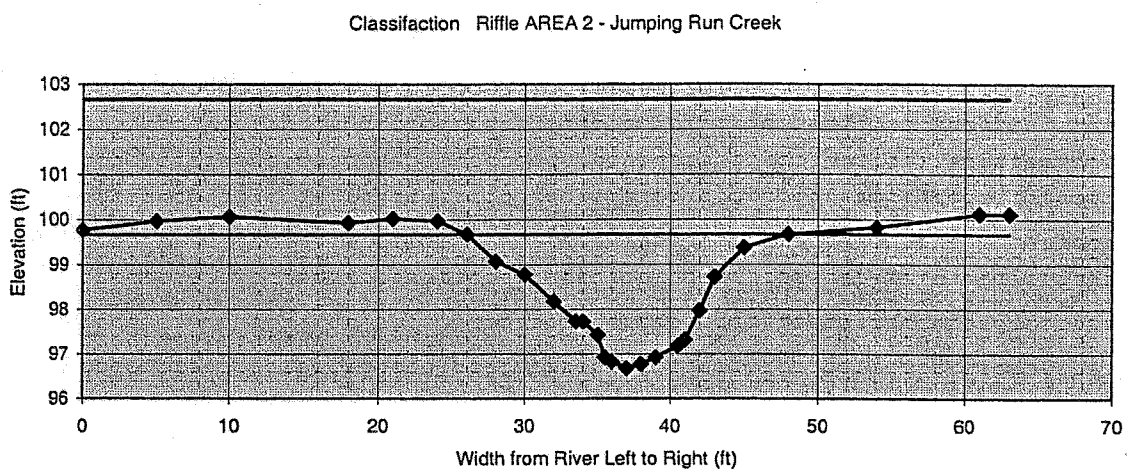
Size percent less than (mm)				
D16	D35	D50	D84	D95
0.078	0.11	0.2	0	1

Percent by substrate type					
silt/clay	sand	gravel	cobble	boulder	bedrock
4%	96%	0%	0%	0%	0%

Appendix B
AREA 2: Stream Geometry and Substrate Data

Cross-Section

Cross Section



section:	Classifaction
	Riffle
	AREA 2 - Jumping Run Creek
	---
description:	Riffle Cross Section - Area 2 at STA 225 (PINS E, F)
height of instrument (ft):	106.07

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	6.3	99.77
	☐	5	6.1	99.97
	☐	10	6	100.07
	☐	18	6.15	99.92
	☐	21	6.05	100.02
	☐	24	6.1	99.97
	☐	26	6.4	99.67
	☐	28	7	99.07
	☐	30	7.3	98.77
	☐	32	7.9	98.17
	☐	33.5	8.35	97.72
	☐	34	8.35	97.72
	☐	35	8.65	97.42
EOW	☐	35.5	9.15	96.92
	☐	36	9.25	96.82
	☐	37	9.4	96.67
	☐	38	9.3	96.77
EOW	☐	39	9.15	96.92
	☐	40.5	8.9	97.17
	☐	41	8.75	97.32
	☐	42	8.1	97.97
	☐	43	7.35	98.72
	☐	45	6.7	99.37
	☐	48	6.4	99.67
	☐	54	6.25	99.82
	☐	61	5.95	100.12
grd shot	☐	63	5.95	100.12
pin F	☐		5.75	100.32
	☐			
pin E	☑		6.07	100
	☐			
	☐			
	☐			

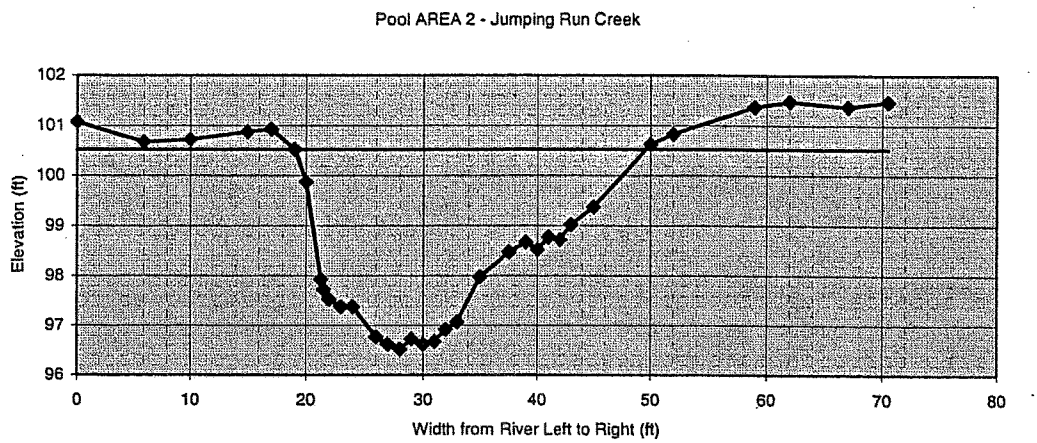
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
6.4	6.4		0.75	0.037
99.67	99.67			

dimensions			
31.7	x-section area	1.4	d mean
22.0	width	23.2	wet P
3.0	d max	1.4	hyd radi
3.0	bank ht	15.3	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
4.3	velocity (ft/sec)
136.0	discharge rate, Q (cfs)
0.64	shear stress ((lbs/ft sq)
0.57	shear velocity (ft/sec)
2.894	unit stream power (lbs/ft/sec)
0.40	Froude number
7.5	friction factor u/u*
40.4	threshold grain size (mm)

check from channel material			
10	measured D84 (mm)		
44.8	relative roughness	12.2	fric. factor
0.023	Manning's n from channel material		

Cross Section



section: Pool
AREA 2 - Jumping Run Creek
---

description: Pool Cross Section - Area 2 at STA 82 (PINS G,H)

height of instrument (ft): 106.07

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	5	101.07
	☐	6	5.4	100.67
	☐	10	5.35	100.72
	☐	15	5.2	100.87
	☐	17	5.15	100.92
TOB -lft	☐	19	5.55	100.52
	☐	20	6.2	99.87
EOW	☐	21.3	8.15	97.92
	☐	21.5	8.35	97.72
	☐	22	8.55	97.52
	☐	23	8.7	97.37
	☐	24	8.7	97.37
	☐	26	9.3	96.77
	☐	27	9.45	96.62
	☐	28	9.55	96.52
	☐	29	9.35	96.72
	☐	30	9.45	96.62
	☐	31	9.4	96.67
	☐	32	9.15	96.92
	☐	33	9	97.07
EOW	☐	35	8.1	97.97
	☐	37.5	7.6	98.47
	☐	39	7.4	98.67
	☐	40	7.55	98.52
	☐	41	7.3	98.77
	☐	42	7.35	98.72
	☐	43	7.05	99.02
	☐	45	6.7	99.37
	☐	50	5.45	100.62
	☐	52	5.25	100.82
	☐	59	4.7	101.37
	☐	62	4.6	101.47
	☐	67	4.7	101.37
grd shot	☐	70.5	4.6	101.47
pin H	☐		4.34	101.73
	☐			
pin G	☑		4.85	101.22
	☐			
	☐			

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
5.55	5.55		0.75	
100.52	100.52			

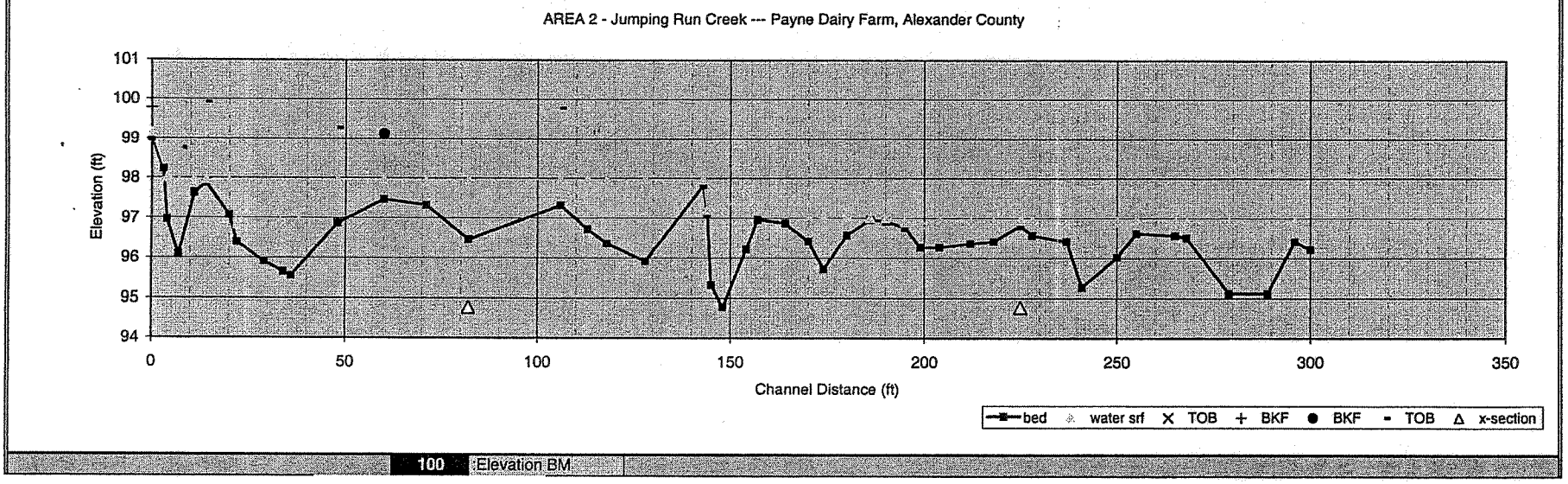
dimensions			
71.4	x-section area	2.3	d mean
30.6	width	32.7	wet P
4.0	d max	2.2	hyd radi
4.0	bank ht	~~13.1~~	w/d ratio
~~0.0~~	W flood prone area	~~0.0~~	ent ratio

hydraulics	
~~0.0~~	velocity (ft/sec)
~~0.0~~	discharge rate, Q (cfs)
1.02	shear stress ((lbs/ft sq)
0.73	shear velocity (ft/sec)
~~0.000~~	unit stream power (lbs/ft/sec)
~~0.00~~	Froude number
~~0.0~~	friction factor u/u*
75.8	threshold grain size (mm)

check from channel material			
~~10~~	measured D84 (mm)		
~~72.5~~	relative roughness	~~13.4~~	fric. factor
~~0.022~~	Manning's n from channel material		

Longitudinal Profile

Slope Profile



100 Elevation BM

					100	Elevation BM													
notes	cross section	station		BS	HI	FS	FS	depth	FS	FS	FS	FS	AZ	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV
				6.07	106.07	TP	bed	water	BKF	TOB	BKF	TOB	azimuth	bed	water srf	BKF	TOB	BKF	TOB
		0			106.07		7.05	0.15			6.3			99.02	99.17			99.77	
top rock		3			106.07		7.85							98.22					
		4			106.07		9.1	1.05						96.97	98.02				
		7			106.07		10	1.85						96.07	97.92				
		11			106.07		8.45	0.35						97.62	97.97				
		14			106.07		8.2	0.1				6.15		97.87	97.97				99.92
		20			106.07		9	0.85						97.07	97.92				
TP					106.07	6.07													
				6.3	106.3														
pool		22			106.3		8.9	0.45						96.4	96.85				
		29			106.3		10.4	1.9						95.9	97.8				
		34			106.3		10.65	1.2						95.65	96.85				
		36			106.3		10.75	1.25						95.55	96.8				
					106.3	6.3													
				6.07	106.07														
		48			106.07		9.2	1.1				6.8		96.87	97.97				99.27
		60			106.07		8.6	0.5	6.85					97.47	97.97	99.12			
		71			106.07		8.75	0.6						97.32	97.92				
	xsect	82			106.07		9.6	1.5						96.47	97.97				
		106			106.07		8.75	0.65				6.3		97.32	97.97				99.77
		113			106.07		9.35	1.25						96.72	97.97				
c of pool		118			106.07		9.7	1.6						96.37	97.97				
		128			106.07		10.15	2.06						95.92	97.97				
top of rock		143			106.07		8.25	0.15						97.82	97.97				
top footer		144			106.07		8.95	0.1						97.12	97.22				
		145			106.07		10.75	1.95						95.32	97.27				
		148			106.07		11.3	2.4						94.77	97.17				
		154			106.07		9.85	1.5						96.22	97.72				
		157			106.07		9.1	0.25						96.97	97.22				
		164			106.07		9.2							96.87					
		170			106.07		9.65	0.65						96.42	97.07				
c of pool		174			106.07		10.35	1.4						95.72	97.12				
end pool		180			106.07		9.5	0.5						96.57	97.07				
riffle		186			106.07		9.1	0.05						96.97	97.02				
c of riffle		190			106.07		9.15	0.1						96.92	97.02				
run		195			106.07		9.3	0.15						96.77	96.92				
pool		199			106.07		9.8	0.6						96.27	96.87				
c of pool		204			106.07		9.8	0.7						96.27	96.97				
end pool		212			106.07		9.7	0.55						96.37	96.92				
		218			106.07		9.65	0.5						96.42	96.92				
c riffle	xsect	225			106.07		9.25	0.15						96.82	96.97				
run		228			106.07		9.6	0.36						96.57	96.95				
pool		237			106.07		9.65	0.45						96.42	96.87				
c of pool		241			106.07		10.8							95.27					
		250			106.07		10.05	0.9						96.02	96.92				
riffle		255			106.07		9.46	0.36						96.62	96.97				
		265			106.07		9.5	0.35						96.57	96.92				
pool		268			106.07		9.55	0.4						96.52	96.92				
c of pool		279			106.07		10.95	1.8						95.12	96.92				
end pool		289			106.07		10.95	1.75						95.12	96.87				
		296			106.07		9.65	0.5						96.42	96.92				
		300			106.07		9.85							96.22					
rock		313			106.07														
					106.07														
					106.07														
					106.07														
					106.07														
					106.07														

Modified Wolman Pebble Count

NOTE:

Area 2 Modified Wolman Pebble count

A 30/50 (riffle/pool) count was performed in this area from STA 0+00 TO first structure, stream is ponded.

All riffle counts are past second structure downstream

Reference Reach						Hints
Stream:	AREA 2 - Jumping Run Creek					
Watershed:	---					
Location:	Payne Dairy Farm, Alexander County					
Latitude:	---					
Longitude:	---					
County:	Alexander					
Date:	June 13, 2001					
Observers:	WRW,NLT,MM					
Channel Type:	---					
Drainage Area (sq mi):	---					
Channel Materials						
	total	riffle	pool	run	glide	bar sample
D16	0.069	0.233	#N/A	0.000	0.000	---
D35	0.12	1.19	0.09	0.00	0.00	---
D50	0.2	8.5	0.1	0.0	0.0	---
D84	10	16	0	0	0	---
D95	18	27	1	0	0	---
Largest of Bar Sample						
% Silt/Clay	13%	3%	18%	---	---	---
% Sand	65%	37%	82%	---	---	---
% Gravel	23%	60%	0%	---	---	---
% Cobble	0%	0%	0%	---	---	---
% Boulder	0%	0%	0%	---	---	---
% Bedrock	0%	0%	0%	---	---	

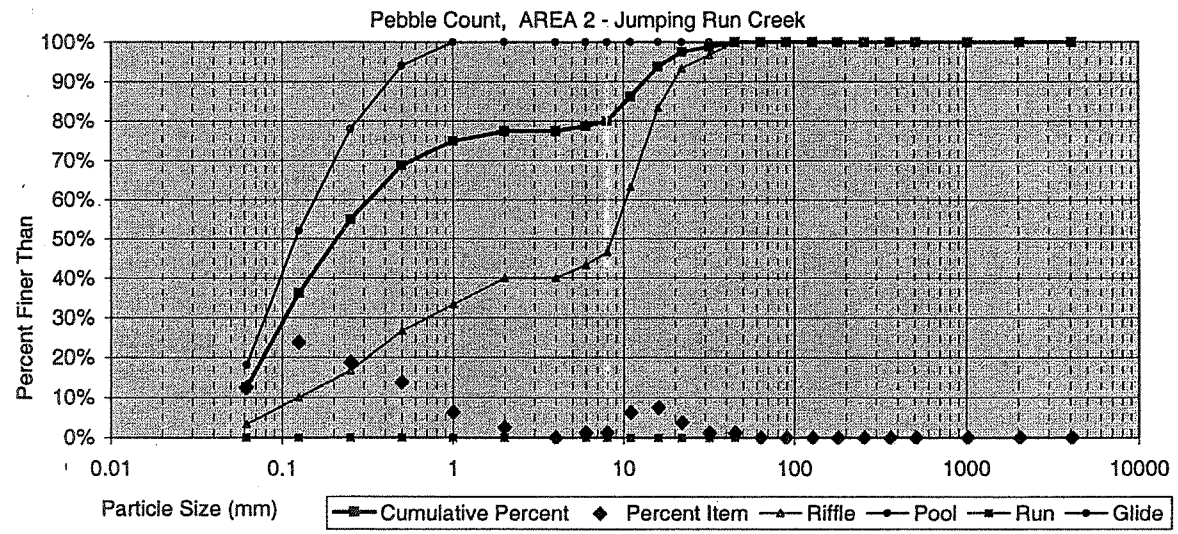
Weighted Pebble Count

Percent Riffle:	30	Percent Run:	
Percent Pool:	50	Percent Glide:	

Pebble Count,
AREA 2 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Classification Pebble Count**

Material	Size Range (mm)		Total #	
silt/clay	0	0.062	10.0	# #
very fine sand	0.062	0.13	19.0	# #
fine sand	0.13	0.25	15.0	# #
medium sand	0.25	0.5	11.0	# #
coarse sand	0.5	1	5.0	# #
very coarse sand	1	2	2.0	# #
very fine gravel	2	4	0.0	# #
fine gravel	4	6	1.0	# #
fine gravel	6	8	1.0	# #
medium gravel	8	11	5.0	# #
medium gravel	11	16	6.0	# #
coarse gravel	16	22	3.0	# #
coarse gravel	22	32	1.0	# #
very coarse gravel	32	45	1.0	# #
very coarse gravel	45	64	0.0	# #
small cobble	64	90	0.0	# #
medium cobble	90	128	0.0	# #
large cobble	128	180	0.0	# #
very large cobble	180	256	0.0	# #
small boulder	256	362	0.0	# #
small boulder	362	512	0.0	# #
medium boulder	512	1024	0.0	# #
large boulder	1024	2048	0.0	# #
very large boulder	2048	4096	0.0	# #
bedrock			0.0	#
		Weighted Count:	80	
		True Total Particle Count:	80	



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.069	0.12	0.2	10	18	13%	65%	23%	0%	0%	0%

Riffle Pebble Count

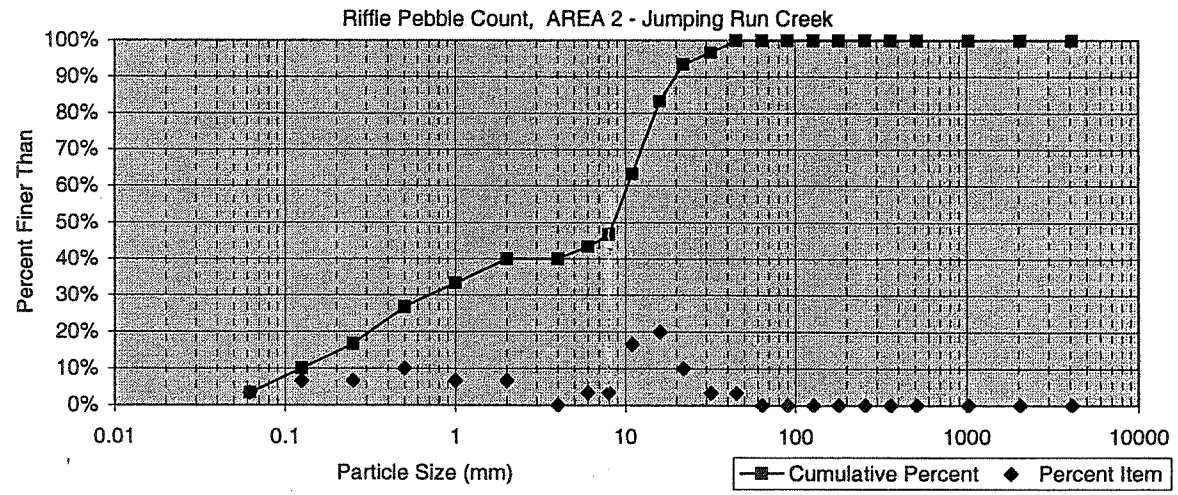
Material	Size Range (mm)		Count
silt/clay	0	0.062	1
very fine sand	0.062	0.13	2
fine sand	0.13	0.25	2
medium sand	0.25	0.5	3
coarse sand	0.5	1	2
very coarse sand	1	2	2
very fine gravel	2	4	0
fine gravel	4	6	1
fine gravel	6	8	1
medium gravel	8	11	5
medium gravel	11	16	6
coarse gravel	16	22	3
coarse gravel	22	32	1
very coarse gravel	32	45	1
very coarse gravel	45	64	0
small cobble	64	90	0
medium cobble	90	128	0
large cobble	128	180	0
very large cobble	180	256	0
small boulder	256	362	0
small boulder	362	512	0
medium boulder	512	1024	0
large boulder	1024	2048	0
very large boulder	2048	4096	0
bedrock			0
Total Particle Count:			30

Riffle Pebble Count,

AREA 2 - Jumping Run Creek

Payne Dairy Farm, Alexander County

Note: **AREA 2**



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.233	1.19	8.5	16	27	3%	37%	60%	0%	0%	0%

Pool Pebble Count

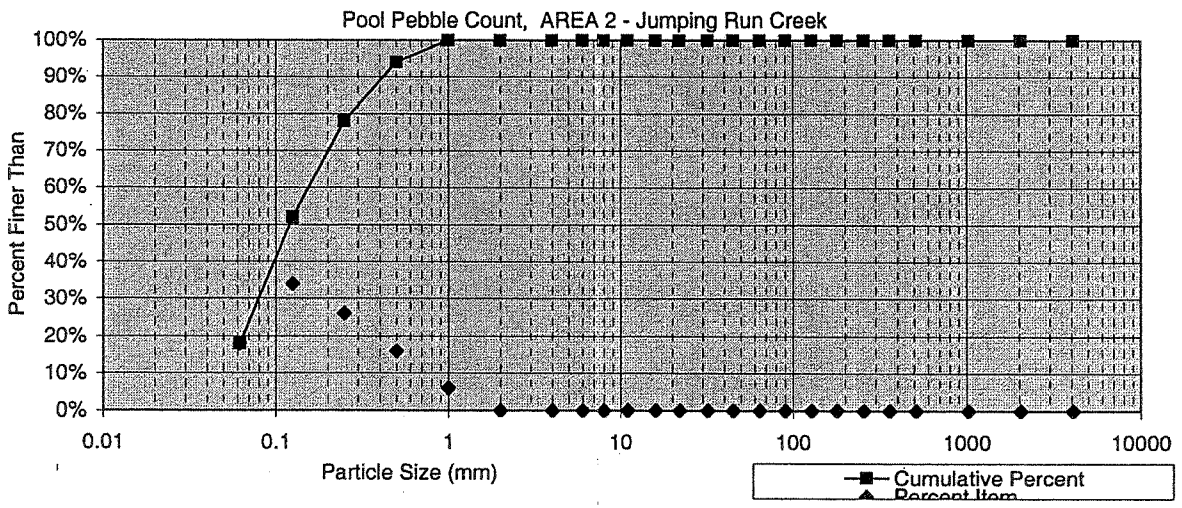
Material	Size Range (mm)		Count	
silt/clay	0	0.062	9	# #
very fine sand	0.062	0.13	17	# #
fine sand	0.13	0.25	13	# #
medium sand	0.25	0.5	8	# #
coarse sand	0.5	1	3	# #
very coarse sand	1	2	0	# #
very fine gravel	2	4	0	# #
fine gravel	4	6	0	# #
fine gravel	6	8	0	# #
medium gravel	8	11	0	# #
medium gravel	11	16	0	# #
coarse gravel	16	22	0	# #
coarse gravel	22	32	0	# #
very coarse gravel	32	45	0	# #
very coarse gravel	45	64	0	# #
small cobble	64	90	0	# #
medium cobble	90	128	0	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
	Total Particle Count:		50	

Pool Pebble Count,

AREA 2 - Jumping Run Creek

Payne Dairy Farm, Alexander County

Note: **AREA 2**

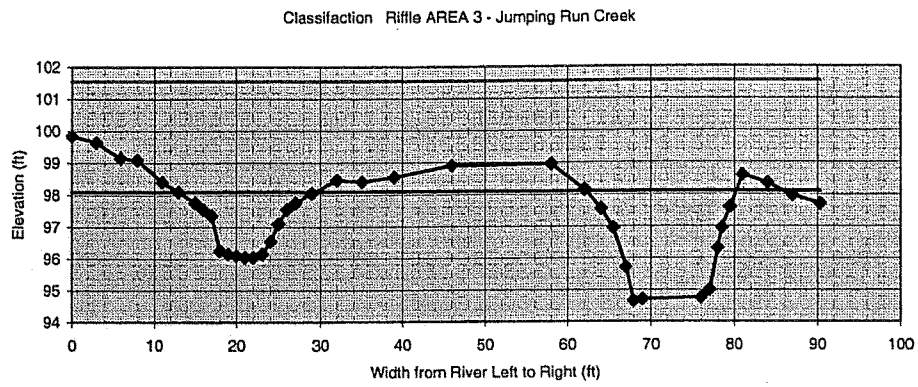


Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
#N/A	0.09	0.1	0	1	18%	82%	0%	0%	0%	0%

Appendix C
AREA 3: Stream Geometry and Substrate Data

Cross-Section

Cross Section



section: **Classifaction**

Riffle
AREA 3 - Jumping Run Creek
---

description: Riffle Cross Section - Area 3 (includes old stream) at STA 143 (PINS I,J)

height of instrument (ft): **105.85**

notes	omit pt	distance (ft)	FS (ft)	elevation
grd shot	☐	0	6	99.85
	☐	3	6.2	99.65
	☐	6	6.7	99.15
	☐	8	6.75	99.1
	☐	11	7.45	98.4
TOB	☐	13	7.75	98.1
	☐	15	8.1	97.75
	☐	16	8.3	97.55
	☐	17	8.5	97.35
EOW	☐	18	9.6	96.25
	☐	19	9.7	96.15
	☐	20	9.75	96.1
	☐	21	9.8	96.05
	☐	22	9.8	96.05
EOW	☐	23	9.7	96.15
	☐	24	9.3	96.55
	☐	25	8.75	97.1
	☐	26	8.3	97.55
TOB	☐	27	8.1	97.75
	☐	29	7.8	98.05
	☐	32	7.4	98.45
	☐	35	7.45	98.4
	☐	39	7.3	98.55
	☐	46	6.95	98.9
	☐	58	6.9	98.95
	☐	62	7.7	98.15
	☐	64	8.3	97.55
EOW-old	☐	65.5	8.9	96.95
	☐	67	10.15	95.7
	☐	68	11.2	94.65
	☐	69	11.15	94.7
	☐	76	11.1	94.75
	☐	77	10.85	95
	☐	78	9.55	96.3
EOW-old	☐	78.5	8.9	96.95
	☐	79.5	8.25	97.6
	☐	81	7.25	98.6
	☐	84	7.5	98.35
	☐	87	7.9	97.95
grd shot	☐	90.33	8.15	97.7
pin J	☐		8	97.85
	☐			
pin I	☑		5.85	100
	☐			
	☐			
	☐			
	☐			

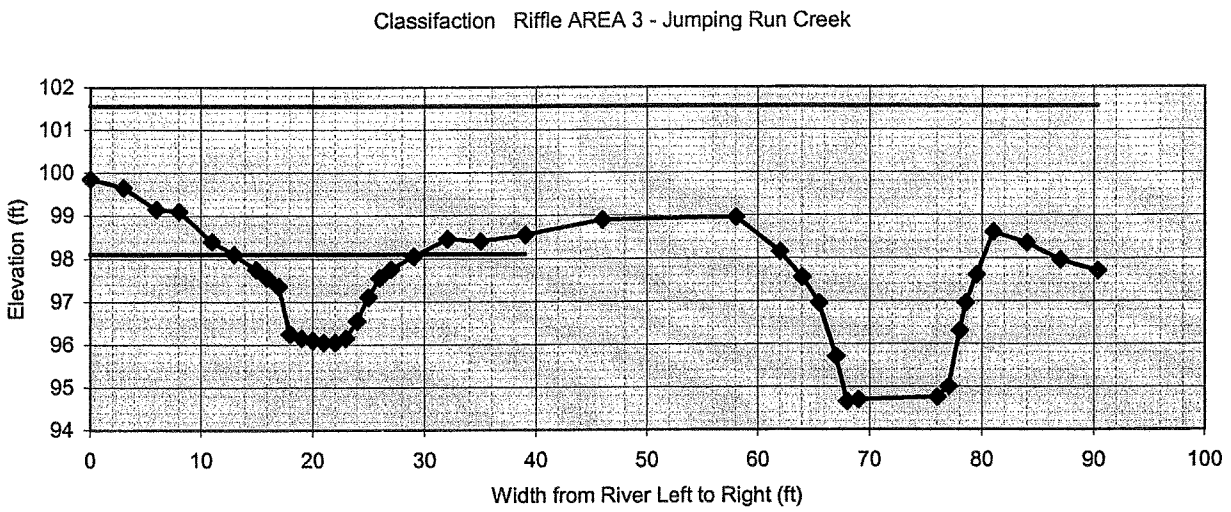
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
7.75	**7.75**		**0.79**	**0.037**
98.1	98.1			

dimensions			
89.6	x-section area	0.7	d mean
129.2	width	132.6	wet P
3.5	d max	0.7	hyd radl
3.5	bank ht	186.5	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
2.7	velocity (ft/sec)
246.2	discharge rate, Q (cfs)
0.33	shear stress ((lbs/ft sq)
0.41	shear velocity (ft/sec)
0.939	unit stream power (lbs/ft/sec)
0.34	Froude number
6.6	friction factor u/u*
19.5	threshold grain size (mm)

check from channel material			
36	measured D84 (mm)		
5.9	relative roughness	7.2	fric. factor
0.034	Manning's n from channel material		

Cross Section



section:	Classifaction
	Riffle
	AREA 3 - Jumping Run Creek
	---
description:	Riffle Cross Section - Area 3 (includes old stream) at STA 143 (PINS I,J)
height of instrument (ft):	105.85

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	6	99.85
	☐	3	6.2	99.65
	☐	6	6.7	99.15
	☐	8	6.75	99.1
	☐	11	7.45	98.4
TOB	☐	13	7.75	98.1
	☐	15	8.1	97.75
	☐	16	8.3	97.55
	☐	17	8.5	97.35
EOW	☐	18	9.6	96.25
	☐	19	9.7	96.15
	☐	20	9.75	96.1
	☐	21	9.8	96.05
	☐	22	9.8	96.05
EOW	☐	23	9.7	96.15
	☐	24	9.3	96.55
	☐	25	8.75	97.1
	☐	26	8.3	97.55
TOB	☐	27	8.1	97.75
	☐	29	7.8	98.05
	☐	32	7.4	98.45
	☐	35	7.45	98.4
	☐	39	7.3	98.55
	☑	46	6.95	98.9
	☑	58	6.9	98.95
	☑	62	7.7	98.15
	☑	64	8.3	97.55
EOW-old	☑	65.5	8.9	96.95
	☐			

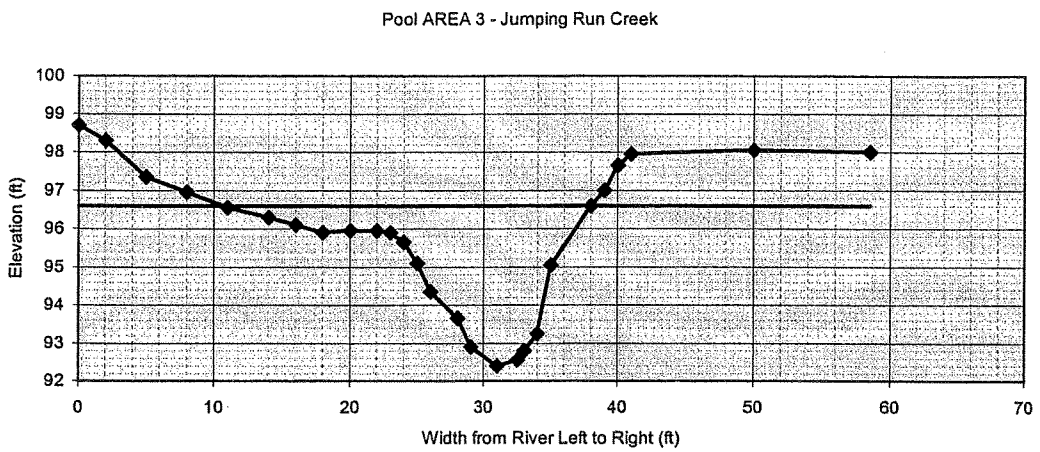
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
7.75	7.75		0.79	0.037
98.1	98.1			

dimensions			
17.4	x-section area	1.1	d mean
16.4	width	17.3	wet P
3.5	d max	1.0	hyd radi
3.5	bank ht	15.4	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
3.6	velocity (ft/sec)
62.1	discharge rate, Q (cfs)
0.49	shear stress ((lbs/ft sq)
0.50	shear velocity (ft/sec)
1.870	unit stream power (lbs/ft/sec)
0.38	Froude number
7.1	friction factor u/u*
30.3	threshold grain size (mm)

check from channel material			
36	measured D84 (mm)		
9.0	relative roughness	8.3	fric. factor
0.032	Manning's n from channel material		

Cross Section



section:	
	Pool AREA 3 - Jumping Run Creek ---
description:	Pool Cross Section - Area 3 at STA 282 (PINS K,L)
height of instrument (ft):	105.85

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	7.15	98.7
	☐	2	7.55	98.3
	☐	5	8.5	97.35
	☐	8	8.9	96.95
	☐	11	9.3	96.55
	☐	14	9.55	96.3
	☐	16	9.75	96.1
	☐	18	9.95	95.9
	☐	20	9.9	95.95
	☐	22	9.9	95.95
	☐	23	9.95	95.9
	☐	24	10.2	95.65
EOW	☐	25	10.75	95.1
	☐	26	11.5	94.35
	☐	28	12.2	93.65
	☐	29	12.95	92.9
	☐	31	13.45	92.4
	☐	32.5	13.3	92.55
	☐	33	13.05	92.8
	☐	34	12.6	93.25
EOW	☐	35	10.8	95.05
top of rt wa	☐	38	9.25	96.6
	☐	39	8.85	97
	☐	40	8.2	97.65
	☐	41	7.9	97.95
	☐	50	7.8	98.05
grd shot	☐	58.5	7.85	98
pin L	☐		7.65	98.2
	☐			
pin K	☑		6.9	98.95
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

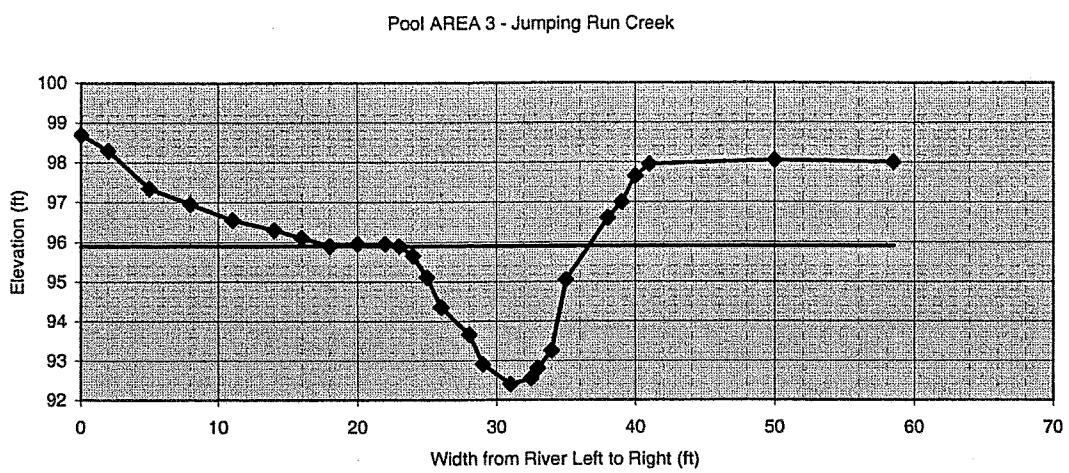
FS bankfull	FS top of bank		channel slope (%)	
9.25	9.95		0.79	
96.6	95.9			

dimensions			
42.7	x-section area	1.6	d mean
27.4	width	29.9	wet P
4.2	d max	1.4	hyd radi
3.5	bank ht	17.5	w/d ratio
0.0	w flood prone area	0.0	ent ratio

hydraulics	
0.0	velocity (ft/sec)
0.0	discharge rate - Q (cfs)
0.71	shear stress ((lbs/ft sq)
0.60	shear velocity (ft/sec)
0.000	unit stream power (lbs/ft/sec)
0.00	Froude number
0.0	friction factor f/4
44.9	threshold grain size (mm)

36	measured D84 (mm)		
13.3	relative roughness	9.2	hfc factor
0.030	Manning's n from channel material		

Cross Section



section:	
	Pool AREA 3 - Jumping Run Creek ---
description:	Pool Cross Section - Area 3 at STA 282 (PINS K,L)
height of instrument (ft):	105.85

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	7.15	98.7
	☐	2	7.55	98.3
	☐	5	8.5	97.35
	☐	8	8.9	96.95
	☐	11	9.3	96.55
	☐	14	9.55	96.3
	☐	16	9.75	96.1
	☐	18	9.95	95.9
	☐	20	9.9	95.95
	☐	22	9.9	95.95
	☐	23	9.95	95.9
	☐	24	10.2	95.65
EOW	☐	25	10.75	95.1
	☐	26	11.5	94.35
	☐	28	12.2	93.65
	☐	29	12.95	92.9
	☐	31	13.45	92.4
	☐	32.5	13.3	92.55
	☐	33	13.05	92.8
	☐	34	12.6	93.25
EOW	☐	35	10.8	95.05
top of rt wa	☐	38	9.25	96.6
	☐	39	8.85	97
	☐	40	8.2	97.65
	☐	41	7.9	97.95
	☐	50	7.8	98.05
grd shot	☐	58.5	7.85	98
pin L	☐		7.65	98.2
	☐			
pin K	☑		6.9	98.95
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
9.95	9.95		0.79	
95.9	95.9			

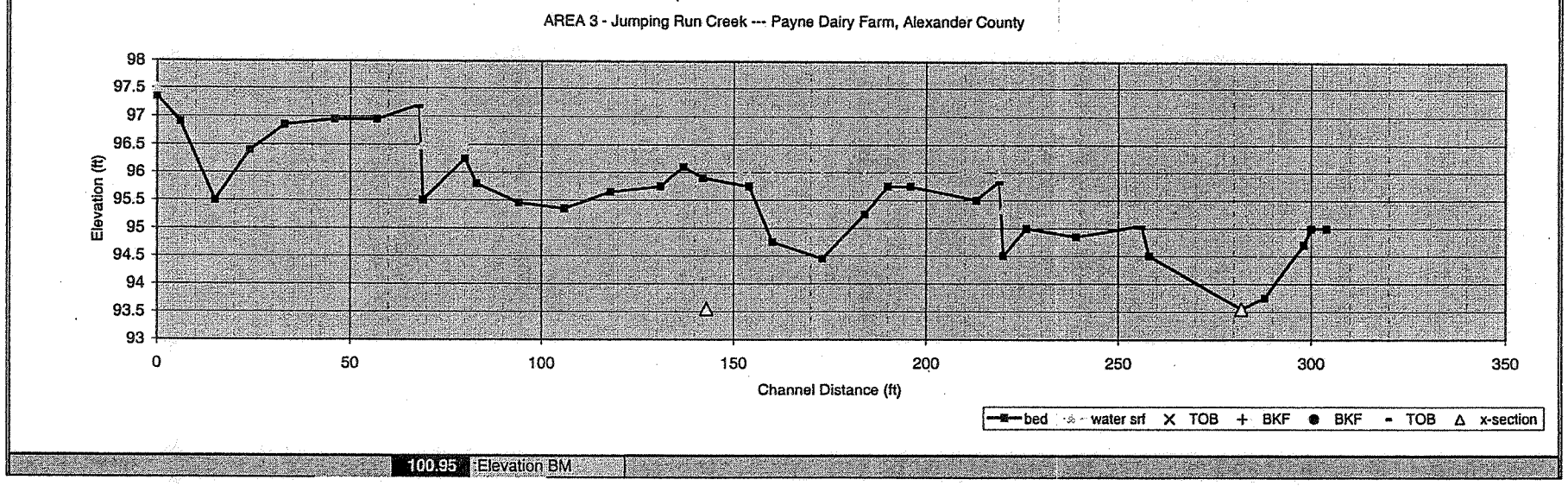
dimensions			
26.8	x-section area	2.0	d mean
13.6	width	15.9	wet P
3.5	d max	1.7	hyd radi
3.5	bank ht	~~6.9~~	w/d ratio
~~0.0~~	W flood prone area	~~0.0~~	ent ratio

hydraulics	
~~0.0~~	velocity (ft/sec)
~~0.0~~	discharge rate, Q (cfs)
0.83	shear stress ((lbs/ft sq)
0.65	shear velocity (ft/sec)
~~0.000~~	unit stream power (lbs/ft/sec)
~~0.00~~	Froude number
~~0.0~~	friction factor u/u*
50.4	threshold grain size (mm)

check from channel material			
~~36~~	measured D84 (mm)		
~~16.7~~	relative roughness	~~9.8~~	fric. factor
~~0.029~~	Manning's n from channel material		

Longitudinal Profile

Slope Profile



100.95 Elevation BM

					100.95	Elevation BM													
notes	cross section	station		BS	HI	FS	FS	depth	FS	FS	FS	FS	AZ	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV
				4.9	105.85	TP	bed	water	BKF	TOB	BKF	TOB	azimuth	bed	water srf	BKF	TOB	BKF	TOB
riffle		0			105.85		8.5	0.15						97.35	97.5				
		6			105.85		8.95	0.45						96.9	97.35				
c of pool		15			105.85		10.35	1.9						95.5	97.4				
		24			105.85		9.45	0.95						96.4	97.35				
		33			105.85		9	0.5						96.85	97.35				
		46			105.85		8.9	0.4						96.95	97.35				
		57			105.85		8.9	0.4						96.95	97.35				
of notch in log		68			105.85		8.65	0.1						97.2	97.3				
		69			105.85		10.35	1						95.5	96.5				
logvane		80			105.85		9.6	0.25						96.25	96.5				
		83			105.85		10.05	0.55						95.8	96.35				
pool		94			105.85		10.4	0.8						95.45	96.25				
		106			105.85		10.5	0.9						95.35	96.25				
nd pool/glide		118			105.85		10.2	0.7						95.65	96.35				
		131			105.85		10.1	0.6						95.75	96.35				
top of riffle		137			105.85		9.75	0.2						96.1	96.3				
c of riffle		142			105.85		9.95	0.3						95.9	96.2				
	xsect	143			105.85														
end riff/run		154			105.85		10.1	0.2						95.75	95.95				
nd run/pool		160			105.85		11.1	1.2						94.75	95.95				
c of pool		173			105.85		11.4	1.5						94.45	95.95				
		184			105.85		10.6	0.7						95.25	95.95				
		190			105.85		10.1	0.2						95.75	95.95				
		196			105.85		10.1	0.2						95.75	95.95				
		213			105.85		10.35	0.6						95.5	96				
of notch in log		219			105.85		10	0.1						95.85	95.95				
		220			105.85		11.35	0.85						94.5	95.35				
		226			105.85		10.85	0.2						95	95.2				
		239			105.85		11	0.35						94.85	95.2				
top logvane		256			105.85		10.8	0.1						95.05	95.15				
		258			105.85		11.35	0.7						94.5	95.2				
pool	xsect	282			105.85		12.3	1.6						93.55	95.35				
		288			105.85		12.1	0.4						93.75	94.15				
		298			105.85		11.15	0.45						94.7	95.15				
top riffle		300			105.85		10.85							95					
c of riffle		304			105.85		10.85							95					
					105.85														
					105.85														
					105.85														
					105.85														
					105.85														

Modified Wolman Pebble Count

Reference Reach						Hints
Stream:	AREA 3 - Jumping Run Creek					
Watershed:	---					
Location:	Payne Dairy Farm, Alexander County					
Latitude:	---					
Longitude:	---					
County:	Alexander					
Date:	June 13, 2001					
Observers:	WRW,NLT,MM					
Channel Type:	---					
Drainage Area (sq mi):	---					

Channel Materials

	total	riffle	pool	run	glide	bar sample
D16	0.062	#N/A	0.066	0.000	0.000	---
D35	0.30	4.90	0.12	0.00	0.00	---
D50	0.8	14.6	0.4	0.0	0.0	---
D84	36	52	11	0	0	---
D95	72	95	54	0	0	---
Largest of Bar Sample						
% Silt/Clay	16%	18%	14%	---	---	---
% Sand	40%	14%	66%	---	---	---
% Gravel	38%	58%	18%	---	---	---
% Cobble	6%	10%	2%	---	---	---
% Boulder	0%	0%	0%	---	---	---
% Bedrock	0%	0%	0%	---	---	

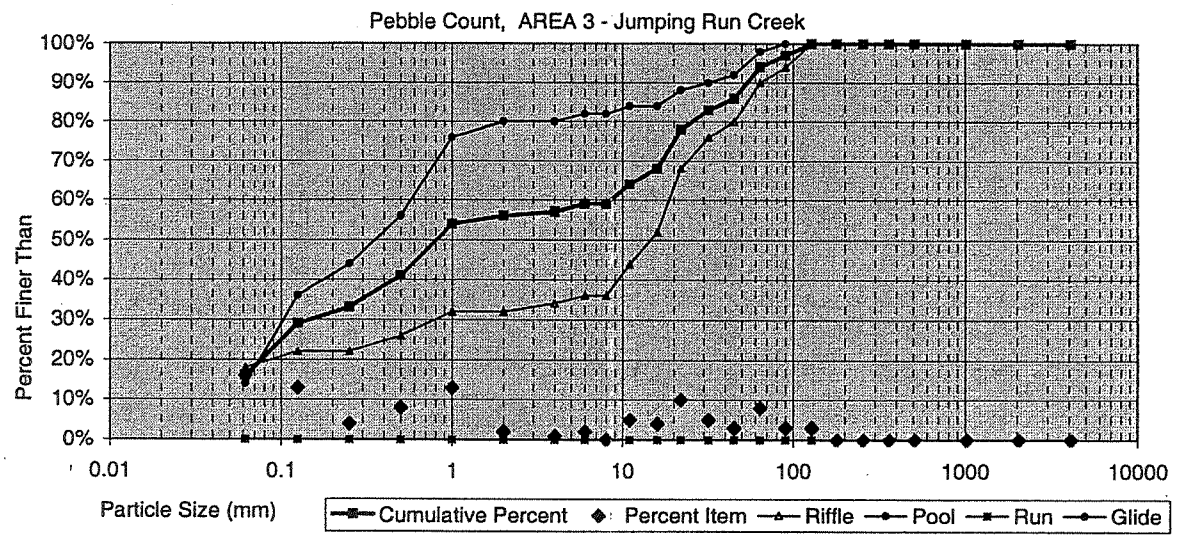
Weighted Pebble Count

Percent Riffle:	50	Percent Run:	
Percent Pool:	50	Percent Glide:	

Pebble Count,
AREA 3 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Classification Pebble Count**

Material	Size Range (mm)		Total #	
silt/clay	0	0.062	16.0	# #
very fine sand	0.062	0.13	13.0	# #
fine sand	0.13	0.25	4.0	# #
medium sand	0.25	0.5	8.0	# #
coarse sand	0.5	1	13.0	# #
very coarse sand	1	2	2.0	# #
very fine gravel	2	4	1.0	# #
fine gravel	4	6	2.0	# #
fine gravel	6	8	0.0	# #
medium gravel	8	11	5.0	# #
medium gravel	11	16	4.0	# #
coarse gravel	16	22	10.0	# #
coarse gravel	22	32	5.0	# #
very coarse gravel	32	45	3.0	# #
very coarse gravel	45	64	8.0	# #
small cobble	64	90	3.0	# #
medium cobble	90	128	3.0	# #
large cobble	128	180	0.0	# #
very large cobble	180	256	0.0	# #
small boulder	256	362	0.0	# #
small boulder	362	512	0.0	# #
medium boulder	512	1024	0.0	# #
large boulder	1024	2048	0.0	# #
very large boulder	2048	4096	0.0	# #
bedrock			0.0	#
		Weighted Count:	100	
		True Total Particle Count:	100	



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.062	0.30	0.8	36	72	16%	40%	38%	6%	0%	0%

Riffle Pebble Count

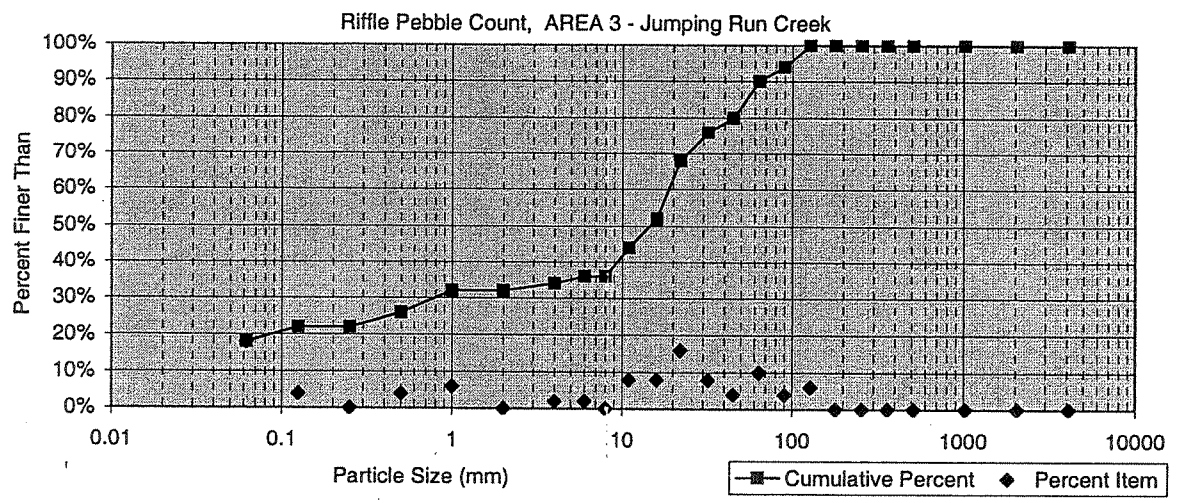
Material	Size Range (mm)		Count	
silt/clay	0	0.062	9	# #
very fine sand	0.062	0.13	2	# #
fine sand	0.13	0.25	0	# #
medium sand	0.25	0.5	2	# #
coarse sand	0.5	1	3	# #
very coarse sand	1	2	0	# #
very fine gravel	2	4	1	# #
fine gravel	4	6	1	# #
fine gravel	6	8	0	# #
medium gravel	8	11	4	# #
medium gravel	11	16	4	# #
coarse gravel	16	22	8	# #
coarse gravel	22	32	4	# #
very coarse gravel	32	45	2	# #
very coarse gravel	45	64	5	# #
small cobble	64	90	2	# #
medium cobble	90	128	3	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
	Total Particle Count:		50	

Riffle Pebble Count,

AREA 3 - Jumping Run Creek

Payne Dairy Farm, Alexander County

Note: **Area 3**



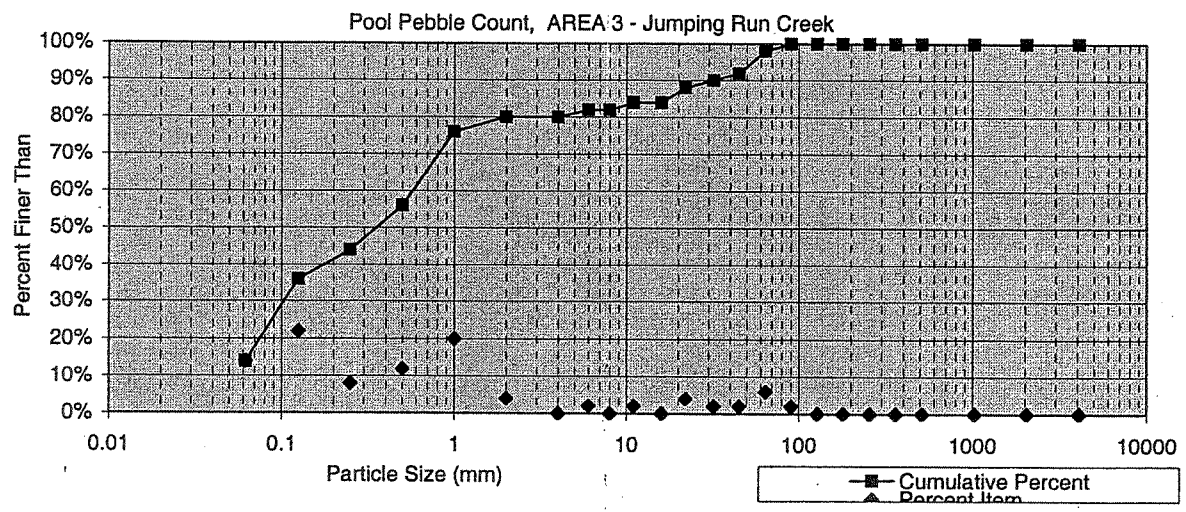
Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
#N/A	4.90	14.6	52	95	18%	14%	58%	10%	0%	0%

Pool Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062	7	# #
very fine sand	0.062	0.13	11	# #
fine sand	0.13	0.25	4	# #
medium sand	0.25	0.5	6	# #
coarse sand	0.5	1	10	# #
very coarse sand	1	2	2	# #
very fine gravel	2	4	0	# #
fine gravel	4	6	1	# #
fine gravel	6	8	0	# #
medium gravel	8	11	1	# #
medium gravel	11	16	0	# #
coarse gravel	16	22	2	# #
coarse gravel	22	32	1	# #
very coarse gravel	32	45	1	# #
very coarse gravel	45	64	3	# #
small cobble	64	90	1	# #
medium cobble	90	128	0	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
	Total Particle Count:		50	

Pool Pebble Count,
AREA 3 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Area 3**

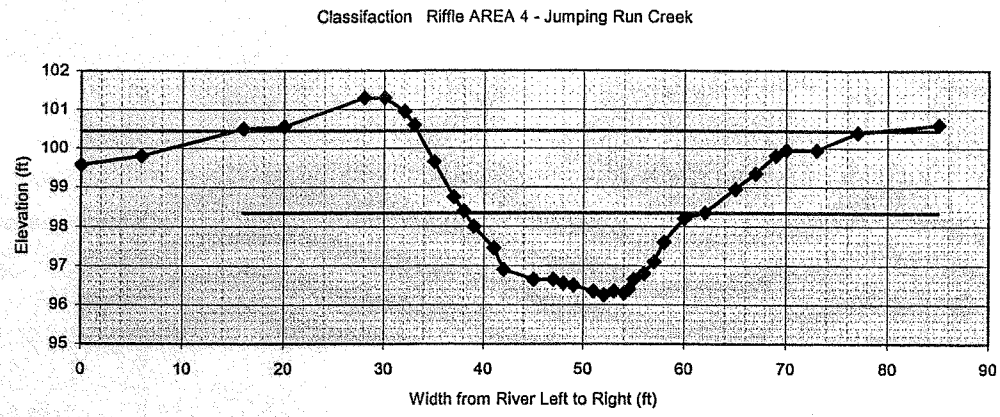


Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.066	0.12	0.4	11	54	14%	66%	18%	2%	0%	0%

Appendix D
AREA 4: Stream Geometry and Substrate Data

Cross-Section

Cross Section



section: **Classifaction**
Riffle
AREA 4 - Jumping Run Creek
---
description: Riffle Cross Section - Area 4 at STA 223 (PINS M,N)
height of instrument (ft): 105.00

notes	omit pt	distance (ft)	FS (ft)	elevation
grd shot	☑	0	5.42	99.58
	☑	6	5.2	99.8
	☑	12		
	☐	16	4.5	100.5
	☐	20	4.45	100.55
	☐	28	3.7	101.3
	☐	30	3.7	101.3
	☐	32	4.05	100.95
	☐	33	4.4	100.6
	☐	35	5.35	99.65
	☐	37	6.25	98.75
	☐	38	6.6	98.4
	☐	39	7	98
	☐	41	7.55	97.45
	☐	42	8.1	96.9
	☐	45	8.35	96.65
	☐	47	8.35	96.65
	☐	48	8.45	96.55
EOW	☐	49	8.5	96.5
	☐	51	8.65	96.35
	☐	52	8.75	96.25
	☐	53	8.65	96.35
	☐	54	8.7	96.3
EOW	☐	54.5	8.6	96.4
	☐	55	8.35	96.65
	☐	56	8.2	96.8
	☐	57	7.9	97.1
	☐	58	7.4	97.6
	☐	60	6.8	98.2
	☐	62	6.65	98.35
	☐	65	6.05	98.95
	☐	67	5.65	99.35
	☐	69	5.19	99.81
	☐	70	5.05	99.95
	☐	73	5.05	99.95
	☐	77	4.6	100.4
grd shot	☐	85	4.4	100.6
pin N	☐		4.21	100.79
	☐			
pin M	☑		5	100
	☐			
	☐			

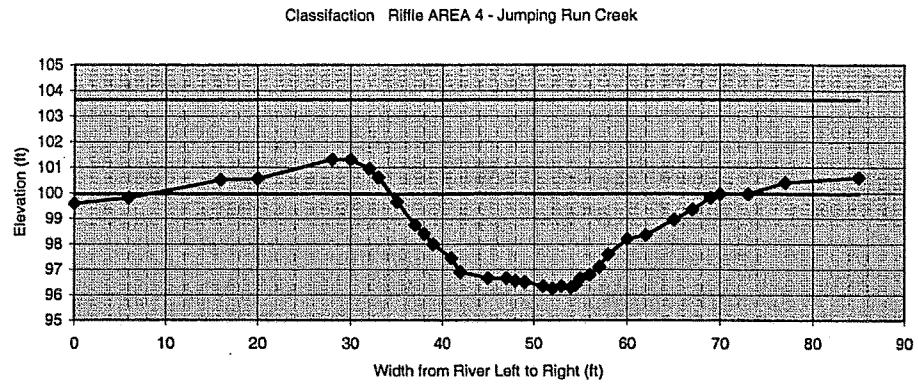
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
6.65	4.6		0.39	0.037
98.35	100.4			

dimensions			
31.2	x-section area	1.3	d mean
23.9	width	24.5	wet P
2.1	d max	1.3	hyd radi
4.2	bank ht	18.2	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
2.9	velocity (ft/sec)
92.1	discharge rate, Q (cfs)
0.31	shear stress ((lbs/ft sq)
0.40	shear velocity (ft/sec)
0.939	unit stream power (lbs/ft/sec)
0.21	Froude number
7.4	friction factor u/u*
18.0	threshold grain size (mm)

check from channel material			
25	measured D84 (mm)		
16.0	relative roughness	9.7	fric. factor
0.028	Manning's n from channel material		

Cross Section



section: **Classifaction**

Riffle
AREA 4 - Jumping Run Creek
---

description: Riffle Cross Section - Area 4 at STA 223 (PINS M,N)

height of instrument (ft): **105.00**

notes	omit pt.	distance (ft)	FS (ft)	elevation
grd shot	☐	0	5.42	99.58
	☐	6	5.2	99.8
	☑	12		
	☐	16	4.5	100.5
	☐	20	4.45	100.55
	☐	28	3.7	101.3
	☐	30	3.7	101.3
	☐	32	4.05	100.95
	☐	33	4.4	100.6
	☐	35	5.35	99.65
	☐	37	6.25	98.75
	☐	38	6.6	98.4
	☐	39	7	98
	☐	41	7.55	97.45
	☐	42	8.1	96.9
	☐	45	8.35	96.65
	☐	47	8.35	96.65
	☐	48	8.45	96.55
EOW	☐	49	8.5	96.5
	☐	51	8.65	96.35
	☐	52	8.75	96.25
	☐	53	8.65	96.35
	☐	54	8.7	96.3
EOW	☐	54.5	8.6	96.4
	☐	55	8.35	96.65
	☐	56	8.2	96.8
	☐	57	7.9	97.1
	☐	58	7.4	97.6
	☐	60	6.8	98.2
	☐	62	6.65	98.35
	☐	65	6.05	98.95
	☐	67	5.65	99.35
	☐	69	5.19	99.81
	☐	70	5.05	99.95
	☐	73	5.05	99.95
	☐	77	4.6	100.4
grd shot	☐	85	4.4	100.6
pin N	☐		4.21	100.79
	☐			
pin M	☑		5	100
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

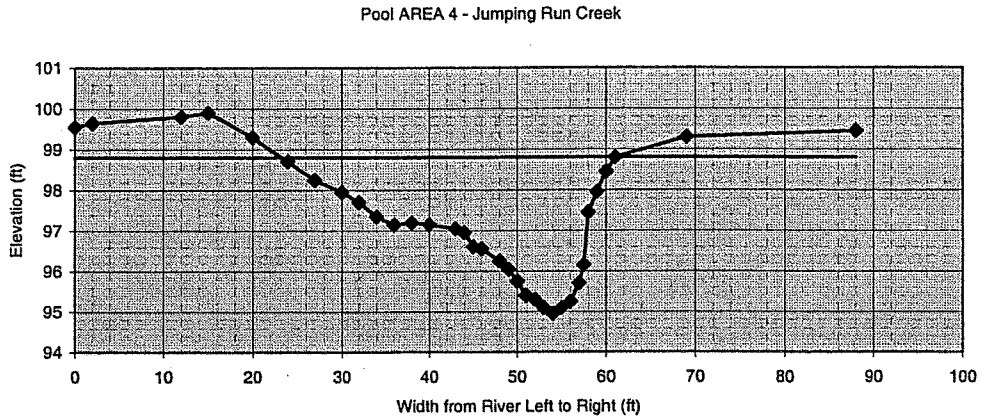
FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
5.05	4.6		0.39	0.037
99.95	100.4			

dimensions			
80.5	x-section area	1.9	d mean
41.6	width	42.8	wet P
3.7	d max	1.9	hyd radi
4.2	bank ht	21.5	w/d ratio
0.0	W flood prone area	0.0	ent ratio

hydraulics	
3.8	velocity (ft/sec)
307.6	discharge rate, Q (cfs)
0.46	shear stress ((lbs/ft sq)
0.49	shear velocity (ft/sec)
1.798	unit stream power (lbs/ft/sec)
0.23	Froude number
7.9	friction factor u/u*
27.8	threshold grain size (mm)

check from channel material			
25	measured D84 (mm)		
23.6	relative roughness	10.7	fric. factor
0.027	Manning's n from channel material		

Cross Section



section:	
	Pool AREA 4 - Jumping Run Creek ---
description:	Pool Cross Section - Area 4 at STA 353 (PINS O,P)
height of instrument (ft):	105.00

notes	omit pt	distance (ft)	FS (ft)	elevation
grd shot	☐	0	5.45	99.55
	☐	2	5.35	99.65
	☐	12	5.2	99.8
	☐	15	5.1	99.9
	☐	20	5.7	99.3
	☐	24	6.3	98.7
	☐	27	6.75	98.25
	☐	30	7.05	97.95
	☐	32	7.3	97.7
	☐	34	7.65	97.35
	☐	36	7.85	97.15
	☐	38	7.8	97.2
	☐	40	7.85	97.15
	☐	43	7.95	97.05
	☐	44	8.05	96.95
	☐	45	8.4	96.6
	☐	46	8.45	96.55
EOW	☐	48	8.75	96.25
	☐	49	8.95	96.05
	☐	50	9.25	95.75
	☐	51	9.6	95.4
	☐	52	9.7	95.3
	☐	53	9.9	95.1
	☐	54	10.05	94.95
	☐	55	9.9	95.1
	☐	56	9.75	95.25
	☐	57	9.3	95.7
EOW	☐	57.5	8.85	96.15
	☐	58	7.55	97.45
	☐	59	7.05	97.95
	☐	60	6.55	98.45
	☐	61	6.2	98.8
	☐	69	5.7	99.3
grd shot	☐	88	5.55	99.45
pin P	☐		5.22	99.78
	☐			
pin O	☑		5.15	99.85
	☐			
	☐			
	☐			
	☐			
	☐			
	☐			

FS bankfull	FS top of bank	W fpa (ft)	channel slope (%)	Manning's "n"
6.2	6.2		0.39	
98.8	98.8			

dimensions			
67.8	x-section area	1.8	d mean
37.7	width	39.5	wet P
3.8	d max	1.7	hyd radi
3.9	bank ht	~~20.9~~	w/d ratio
~~0.0~~	W flood prone area	~~0.0~~	ent ratio

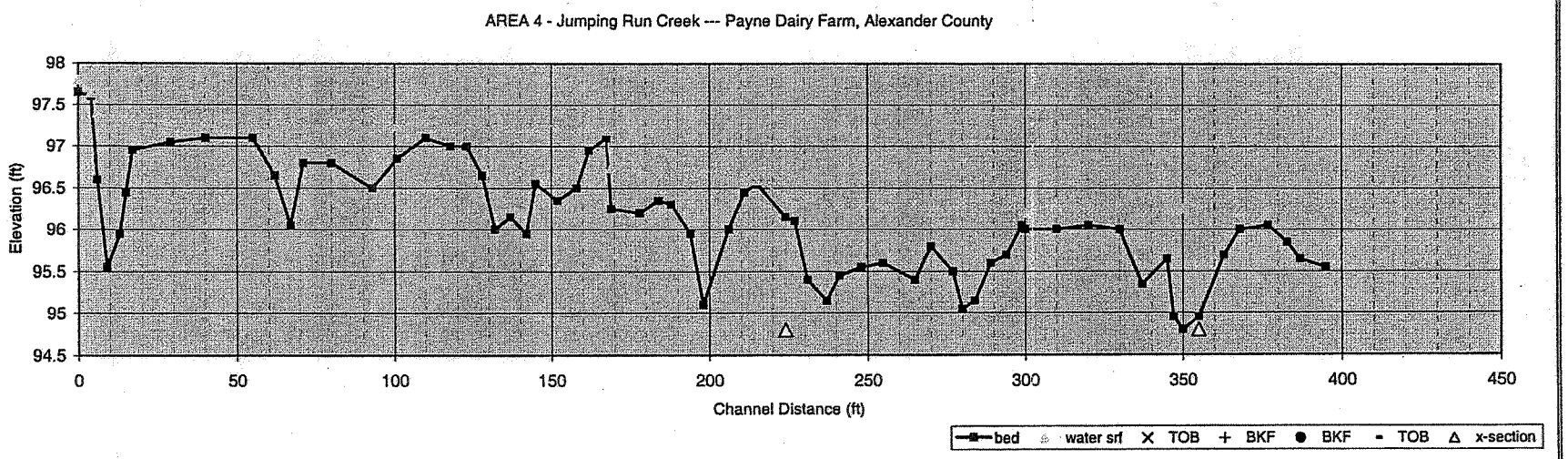
hydraulics	
~~0.0~~	velocity (ft/sec)
~~0.0~~	discharge rate, Q (cfs)
0.42	shear stress ((lbs/ft sq)
0.46	shear velocity (ft/sec)
~~0.000~~	unit stream power (lbs/ft/sec)
~~0.00~~	Froude number
~~0.0~~	friction factor u/u*
25.1	threshold grain size (mm)

check from channel material			
~~25~~	measured D84 (mm)		
~~22.0~~	relative roughness	~~10.5~~	fric. factor
~~0.027~~	Manning's n from channel material		

Longitudinal Profile

Longitudinal Profile

Slope Profile



100 Elevation BM

					100	Elevation BM														
notes	cross section	station		BS	HI	FS	FS	depth	FS	FS	FS	FS	AZ	ELEV	ELEV	ELEV	ELEV	ELEV	ELEV
				5	105	TP	bed	water	BKF	TOB	BKF	TOB	azimuth	bed	water srf	BKF	TOB	BKF	TOB
FORD		0			105		7.35	0.15						97.65	97.8				
rock vane		4			105		7.4	0.05						97.6	97.65				
		6			105		8.4	0.8						96.6	97.4				
		9			105		9.45	1.8						95.55	97.35				
		13			105		9.05	1.4						95.95	97.35				
		15			105		8.55	0.9						96.45	97.35				
		17			105		8.05	0.35						96.95	97.3				
		29			105		7.95	0.25						97.05	97.3				
		40			105		7.9	0.2						97.1	97.3				
		55			105		7.9	0.2						97.1	97.3				
		62			105		8.35	0.65						96.65	97.3				
		67			105		8.05	1.25						96.05	97.3				
		71			105		8.2	0.5						96.8	97.3				
		80			105		8.2	0.5						96.8	97.3				
		93			105		8.5	0.85						96.5	97.35				
		101			105		8.15	0.4						96.85	97.25				
		110			105		7.9	0.2						97.1	97.3				
		118			105		8	0.25						97	97.25				
		123			105		8	0.2						97	97.2				
		128			105		8.35	0.6						96.65	97.25				
		132			105		9	1.2						96	97.2				
		137			105		8.85	1.1						96.15	97.25				
		142			105		9.06	1.3						95.95	97.25				
		145			105		8.45	0.7						96.55	97.25				
		152			105		8.65	0.9						96.35	97.25				
		158			105		8.5	0.7						96.5	97.2				
		162			105		8.05	0.3						96.95	97.25				
if notch in log		167.5			105		7.9	0.1						97.1	97.2				
		169			105		8.75	0.5						96.25	96.75				
		178			105		8.8	0.5						96.2	96.7				
		184			105		8.65	0.3						96.35	96.65				
		188			105		8.7	0.4						96.3	96.7				
		194			105		8.05	0.7						95.95	96.65				
		198			105		9.9	1.6						95.1	96.7				
		206			105		9	0.7						96	96.7				
		211			105		8.55	0.2						96.45	96.65				
riffle		215			105		9.45	0.05						96.55	96.6				
STA 223	xsect	224			105		8.85	0.25						96.15	96.4				
		227			105		8.9	0.2						96.1	96.3				
		231			105		9.6	1						95.4	96.4				
		237			105		9.85	1.15						95.15	96.3				
		241			105		9.55	0.85						95.45	96.3				
		248			105		9.45	0.75						95.55	96.3				
		255			105		9.4	0.7						95.6	96.3				
		265			105		9.6	0.9						95.4	96.3				
		270			105		9.2	0.45						95.8	96.25				
		277			105		9.5	0.75						95.5	96.25				
		280			105		9.95	1.25						95.05	96.3				
		284			105		9.65	1.1						95.15	96.25				
		289			105		9.4	0.7						95.6	96.3				
		294			105		8.3	0.6						95.7	96.3				
		299			105		8.95	0.2						96.05	96.25				
		300			105		9	0.2						96	96.2				
		310			105		9	0.3						96	96.3				
		320			105		8.95	0.2						96.05	96.25				
		330			105		9	0.25						96	96.25				
		337			105		8.65	0.9						95.35	96.25				
		345			105		9.35	0.6						95.65	96.25				
		347			105		10.05	1.3						94.95	96.25				
pool		350			105		10.2	1.45						94.8	96.25				
STA 353	xsect	355			105		10.05	1.25						94.95	96.3				
		363			105		9.3	1.6						95.7	97.2				
		368			105		9	0.2						96	96.2				
		377			105		8.95	0.2						96.05	96.25				
		383			105		9.15	0.4						95.85	96.25				
		387			105		9.35	0.6						95.65	96.25				
		395			105		9.45	0.7						95.55	96.25				
					105														
					105														
					105														
					105														
					105														

Modified Wolman Pebble Count

Reference Reach						Hints
Stream:	AREA 4 - Jumping Run Creek					
Watershed:	---					
Location:	Payne Dairy Farm, Alexander County					
Latitude:	---					
Longitude:	---					
County:	Alexander					
Date:	June 13, 2001					
Observers:	WRW,NLT,MM					
Channel Type:	---					
Drainage Area (sq mi):	---					

Channel Materials	total	riffle	pool	run	glide	bar sample
D16	0.077	0.250	0.062	0.000	0.000	---
D35	0.19	7.34	0.13	0.00	0.00	---
D50	0.5	11.0	0.2	0.0	0.0	---
D84	25	32	1	0	0	---
D95	45	54	41	0	0	---
Largest of Bar Sample						
% Silt/Clay	12%	8%	16%	---	---	---
% Sand	43%	16%	70%	---	---	---
% Gravel	42%	72%	12%	---	---	---
% Cobble	3%	4%	2%	---	---	---
% Boulder	0%	0%	0%	---	---	---
% Bedrock	0%	0%	0%	---	---	

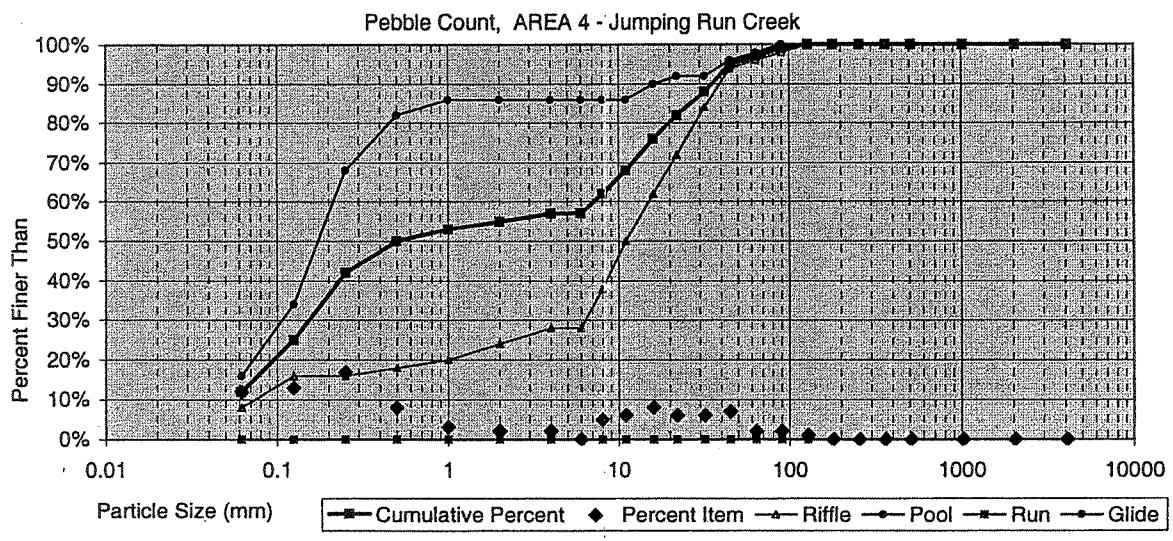
Weighted Pebble Count

Percent Riffle:	50	Percent Run:	
Percent Pool:	50	Percent Glide:	

Pebble Count,
AREA 4 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Classification Pebble Count**

Material	Size Range (mm)		Total #	
silt/clay	0	0.062	12.0	# #
very fine sand	0.062	0.13	13.0	# #
fine sand	0.13	0.25	17.0	# #
medium sand	0.25	0.5	8.0	# #
coarse sand	0.5	1	3.0	# #
very coarse sand	1	2	2.0	# #
very fine gravel	2	4	2.0	# #
fine gravel	4	6	0.0	# #
fine gravel	6	8	5.0	# #
medium gravel	8	11	6.0	# #
medium gravel	11	16	8.0	# #
coarse gravel	16	22	6.0	# #
coarse gravel	22	32	6.0	# #
very coarse gravel	32	45	7.0	# #
very coarse gravel	45	64	2.0	# #
small cobble	64	90	2.0	# #
medium cobble	90	128	1.0	# #
large cobble	128	180	0.0	# #
very large cobble	180	256	0.0	# #
small boulder	256	362	0.0	# #
small boulder	362	512	0.0	# #
medium boulder	512	1024	0.0	# #
large boulder	1024	2048	0.0	# #
very large boulder	2048	4096	0.0	# #
bedrock			0.0	#
		Weighted Count:	100	
		True Total Particle Count:	100	



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.077	0.19	0.5	25	45	12%	43%	42%	3%	0%	0%

Riffle Pebble Count

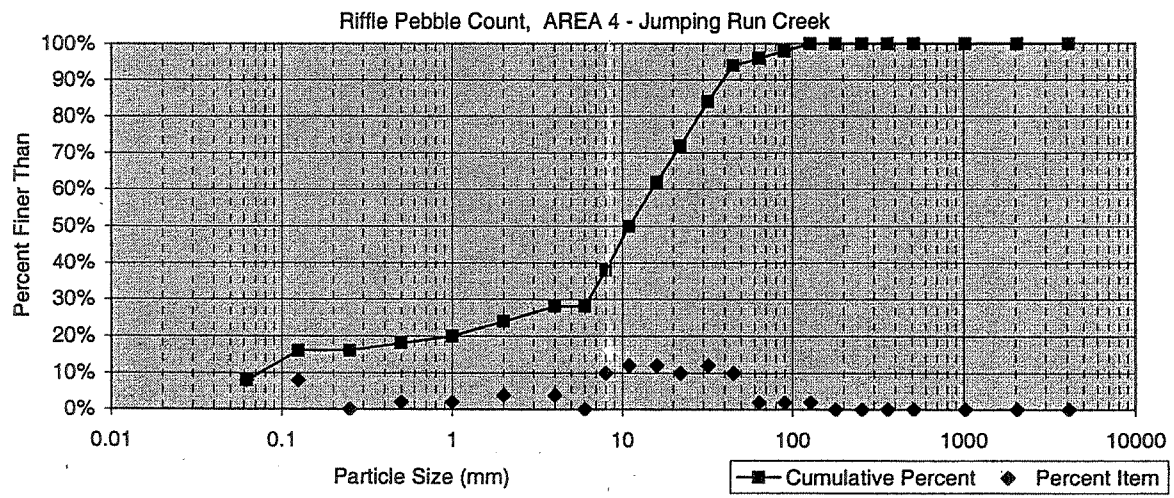
Material	Size Range (mm)		Count
silt/clay	0	0.062	4
very fine sand	0.062	0.13	4
fine sand	0.13	0.25	0
medium sand	0.25	0.5	1
coarse sand	0.5	1	1
very coarse sand	1	2	2
very fine gravel	2	4	2
fine gravel	4	6	0
fine gravel	6	8	5
medium gravel	8	11	6
medium gravel	11	16	6
coarse gravel	16	22	5
coarse gravel	22	32	6
very coarse gravel	32	45	5
very coarse gravel	45	64	1
small cobble	64	90	1
medium cobble	90	128	1
large cobble	128	180	0
very large cobble	180	256	0
small boulder	256	362	0
small boulder	362	512	0
medium boulder	512	1024	0
large boulder	1024	2048	0
very large boulder	2048	4096	0
bedrock			0
Total Particle Count:			50

Riffle Pebble Count,

AREA 4 - Jumping Run Creek

Payne Dairy Farm, Alexander County

Note: **Area 4**



Size percent less than (mm)				
D16	D35	D50	D84	D95
0.250	7.34	11.0	32	54

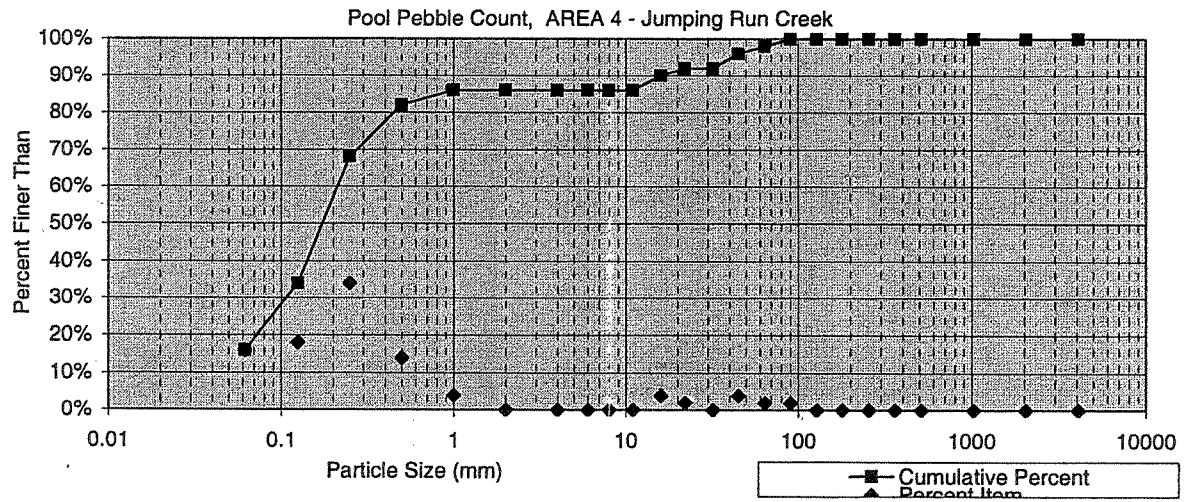
Percent by substrate type					
silt/clay	sand	gravel	cobble	boulder	bedrock
8%	16%	72%	4%	0%	0%

Pool Pebble Count

Material	Size Range (mm)		Count	
silt/clay	0	0.062	8	# #
very fine sand	0.062	0.13	9	# #
fine sand	0.13	0.25	17	# #
medium sand	0.25	0.5	7	# #
coarse sand	0.5	1	2	# #
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	2	# #
coarse gravel	16	22	1	# #
coarse gravel	22	32	0	# #
very coarse gravel	32	45	2	# #
very coarse gravel	45	64	1	# #
small cobble	64	90	1	# #
medium cobble	90	128	0	# #
large cobble	128	180	0	# #
very large cobble	180	256	0	# #
small boulder	256	362	0	# #
small boulder	362	512	0	# #
medium boulder	512	1024	0	# #
large boulder	1024	2048	0	# #
very large boulder	2048	4096	0	# #
bedrock			0	#
Total Particle Count:			50	

Pool Pebble Count,
AREA 4 - Jumping Run Creek

Payne Dairy Farm, Alexander County
Note: **Area 4**



Size percent less than (mm)					Percent by substrate type					
D16	D35	D50	D84	D95	silt/clay	sand	gravel	cobble	boulder	bedrock
0.062	0.13	0.2	1	41	16%	70%	12%	2%	0%	0%

Appendix E
Photo Reference Points

Photos not included in this DRAFT copy.

Photo Index

x - cross section
s - stake
f - structure/feature (i.e. rock crossvane, log vane, etc.)

Photo Point	Sheet Number	Marked by
1	4	x
2	4	x
3	4	x
4	4	x
5	4	s
6	4	s
7	4	s
8	4	s
9	4	f
10	4	f
11	4	f
12	4	f
127	4	s
126	4	s
125	4	s
124	4	s
123	5	s
122	5	s
121	5	s
120	5	s
119	5	s
118	5	s
13	5	f
14	5	f
117	5	s
116	5	s
115	5	s
114	5	s
113	5	s
112	5	s
111	5	s
110	5	s
15	6	x
16	6	x
17	5	s
18	5	s
19	5	x
20	5	x
21*	-	-
22*	-	-
23	6	s
24	6	s
25	6	s
26	6	s

Photo Index

x - cross section
s - stake
f - structure/feature (i.e. rock crossvane, log vane, etc.)

Photo Point	Sheet Number	Marked by
27	6	f
28	6	f
29	6	s
30	6	s
31	7	s
32	7	s
33	7	s
34	7	s
35	7	s
36	7	s
37	7	s
38	7	s
39	7	x
40	7	x
41*	-	-
42*	-	-
43	8	s
44	8	s
45	8	s
46	9	x
47	9	x
48	9	x
49	9	x
50	9	s
51	9	s
52	9	f
53	9	f
54	9	f
55	9	f
56	9	f
57	11	s
58	11	s

* Photos 21,22,41,42 have been omitted due to poor resolution of photo. Photos should be taken during monitoring at these points (years 1-5).

Appendix F
Morphological Measurement Table

Kimley-Horn and Associates, Inc.

Jun-01
Jumping Run, Alexander County, NC
Morphological Measurement Table
Upstream of SR 1614 (North Section)

Variables	Existing Pre - Construction	Proposed / Acceptable Range	Post-Construction Monitoring Area 1**	Post-Construction Monitoring Area 2**	Post-Construction Monitoring Area 3**
Stream Type (Rosgen)	Incised E6, G6, C5	C5/4 - E5/4	C5	C5	C4/5
Drainage Area (sq mi)	0.74-1.2	0.74-1.2	0.74	0.8	1.2
Bankfull Width (ft.)	12-21*	12-30	16	22	16.4
Bankfull Mean Depth (ft.)	1.0-1.8*	0.9-2.5	1	1.4	1.1
Width / Depth Ratio (ft.)	7-21*	8-18	16	15.7	15.4
Bankfull cross-sectional Area (ft^2)	12-24*	12-30	16	31	17.4
Bankfull Max Depth (ft.)	1.8	1.2-3	2	3	3.5
Width of Flood prone Area (ft.)	13-75	70+	160	170	150+
Entrenchment Ratio	1-6	2.5+	10	7.7	9+
Channel Material (D50)	-	-	0.2	0.2	0.8
Meander Length (ft.)	50	85-420	130	100	120-165
Ratio of Meander Length to Bankfull Width	2.1-4.1	7-14	8.1	4.5	7.5-10
Radius of Curvature (ft.)	16-45	36+	60	33	35-84
Ratio of Radius of Curv. To Bankfull Width	1.3-2.1	2.5+	3.75	1.5	2.1-5..1
Sinuosity (Stream Length / Valley Length)	1.14	1.2+	1.3	1.3	1.21
Maximum Pool Depth @ pool x-section (ft.)	2-3	varies	2.25	2.9	4.2
Ratio of Pool Depth to Avg. Bankfull Depth	1.6-2.0	2.2+	2.25	4	3.8
Pool Width (ft.)	*	16+	15	31	27.4
Ratio of Pool Width to Bankfull Width	*	1.3-1.7	1.0	1.4	1.7
Pool to Pool Spacing (ft.)	50	45-210	60	30-96	55-90
Ratio of Pool Pool Spacing to Bankfull Width	2.4-4.2	3.5-7	3.75	1.4-4.4	3.4-5.6
Bank HT Ratio (Low Bank / Max Bankfull) (ft.)	1.7-2.2	1.0 - 1.3	1.1	1.0	1.0

* Field indicators in the existing channel were difficult to identify due to heavy disturbance from cattle, severe bank erosion, and overall channel instability.

** Location of Monitoring Areas Shown on Record Drawings - Data Recorded June 2001

*** Plan feature (Length of Meander, Radius of Curvature, and Belt Width) were measure from Record Drawings). These items should be measured in the field during future monitoring.

**** At time of survey (June, 2001) new channel had only experienced one bankfull event. Bankfull indicators had not formed. Bankfull width and depth approximated

Kimley-Horn
and Associates, Inc.

Jun-01
Jumping Run, Alexander County, NC
Morphological Measurement Table
Downstream of SR 1605

Variables	Existing Pre - Construction	Proposed / Acceptable Range	Post-Construction Monitoring Area 4**
Stream Type (Rosgen)	incised C5/1 -> D	C5/4	C5
Drainage Area (sq mi)	2.2	2.2	2.2
Bankfull Width (ft.)	25-35	20-24	24
Bankfull Mean Depth (ft.)	1.7	1-3	1.3
Width / Depth Ratio (ft.)	12.5-17.5	8-18	18.2
Bankfull cross-sectional Area (ft^2)	42-60*	30-40	31.2
Bankfull Max Depth (ft.)	2	1.2-4.5	2.1
Width of Flood prone Area (ft.)	125-205	60+	60+
Entrenchment Ratio	4.3-6.1	2.5+	2.5+
Channel Material (D50)	-	-	0.5
Meander Length (ft.)	150	140-336	140
Ratio of Meander Length to Bankfull Width	5.8-7.1	7-14	5.8
Radius of Curvature (ft.)	30-70	50+	60+
Ratio of Radius of Curv. To Bankfull Width	1.3-3.0	2.5+	2.5+
Sinuosity (Stream Length / Valley Length)	1.05	1.2+	1.2
Maximum Pool Depth @ pool x-section (ft.)	2.0-2.25	2.2+	3.7
Ratio of Pool Depth to Avg. Bankfull Depth	1.2-1.5	2.2+	2.8
Pool Width (ft.)	*	26-41	37.7
Ratio of Pool Width to Bankfull Width	*	1.3-1.7	1.6
Pool to Pool Spacing (ft.)	100	70-168	50-70
Ratio of Pool Pool Spacing to Bankfull Width	4.3	3.5-7	2.1-3.0
Bank HT Ratio (Low Bank / Max Bankfull) (ft.)	1.4+	1.0 - 1.3	1.1

* Field indicators in the existing channel were difficult to identify due to heavy disturbance from cattle, severe bank erosi

** Location of Monitoring Areas Shown on Record Drawings - Field Data Recorded June 2001

*** Plan feature (Length of Meander, Radius of Curvature, and Belt Width) were measure from Record Drawings). These during future monitoring.

**** At time of survey (June, 2001) new channel had only experienced one bankfull event. Bankfull indicators had not form

Year 1
Monitoring Report

Kimley-Horn
and Associates, Inc.

Introduction

The field investigation and data analysis for the first year of post-construction monitoring of Jumping Run, Payne Dairy Farm, Alexander County, NC was conducted on December 5-6, 2001.

A three-man team from Kimley-Horn and Associates, Inc. (KHA) performed the field reconnaissance. Geomorphic survey (including cross-sections, longitudinal profiles, and modified pebble counts), photo documentation, and vegetation plots were completed. The geomorphic monitoring was performed according to the methodologies outlined in this report.

The plantings within the restored areas were assessed using belted transects. The width and length of the transects varied, based on the location and type of the assessed plantings. The survival rate of live stakes and bare-roots along the stream corridor were evaluated separately. Also, the seeding success was visually observed.

All geomorphic and vegetation data collected is provided in this report. Cross-sections, longitudinal profiles, and modified Wolman pebble counts for Year 1 (December 2001) have been compiled and plotted over Year 0 (June 2001). This summary is intended to be a qualitative and quantitative interpretation of the data collected and field observations from Year 1 monitoring.

On December 5-6, the weather was sunny with morning fog (as indicated in some of the pictures). There had been little rainfall (<1 inch) in October and November.

Morphology

Overall Channel Stability

Overall, the channel was found to be extremely stable. Only minor bank failure (<10 feet) was observed in one location along the 5,755 linear feet of restoration. All the rock cross vanes were functioning as designed to serve as grade control. Two rock cross vanes had some minor flow trough at low flow but were still serving as grade control. One structure was repaired by hand by KHA with on-site materials. Over time, the small holes between the header rocks of the second structure should be filled in by bedload.

Area 1

The riffle cross-section experienced no discernable change, while the pool cross-section had some slight aggradation of the channel thalweg. There was no change in the channel banks. The slight filling of the pool is normal in a period of drought/sustained low flows. The longitudinal profile indicates a headcut at Station 2+18, which should be monitored. No repair is recommended at this time. The modified Wolman pebble count shifted to the right, indicating that the channel pavement is coarsening up. This trend is usually associated with successful Priority 1 restoration.

Area 2

There was little discernable change in the cross-sectional data for Area 2. The longitudinal profile indicates that a pool has filled in at Station 0+20 to 0+48 and a riffle has aggraded at Station 1+65. Since the rock cross vanes in this area were designed to raise the thalweg, this aggradation indicates that the design objective is being met. All pools and riffle depths are still

within the accepted range (see Morphological Measurement Table in Appendix F) and there was no significant change in the pebble count.

Area 3
There was little discernable change in the riffle cross-section data for Area 3. The pool cross-section indicates that the right bank has become slightly more vertical and the bottom has aggraded slightly. However, there was no visible evidence of any bank failure at this point. The only noticeable change along the longitudinal profile is a deeper, more defined pool at Station 1+04. The modified Wolman pebble count shifted to the right, indicating that the channel pavement is coarsening up. This trend is usually associated with successful Priority 1 restoration.

Area 4
There was little discernable change in the cross-sectional data for Area 4. The profile indicated some shifts in the length of the pool at Station 0+42 to 0+64. Some of the discrepancies in Year 0 and Year 1 can be attributed to the difficulty in duplicating how the tape is laid down along the thalweg. The modified Wolman pebble count showed little change.

Vegetation

The survival of the plantings within the restored areas were assessed using belted transects. The width and length of the transects varied, based on the location and type of the assessed plantings. The survival rate of live stakes and bare-roots along the stream corridor were evaluated separately. Also, the seeding success was visually observed.

During the restoration construction, 6,925 stakes were planted within the stream channel (from top-of-bank to top-of-bank) along with 8,750 bare-root seedlings in Zones 1 and 2. In addition, 12 pound of riparian seed mix and 60 pounds of upland seed mix were applied. The exact number and composition of planted species is provided on sheet V0 of the Record Drawing Vegetation Details and Notes (attached).

The vegetation within the channel from bankfull to top-of-bank is doing well. In general, the stakes have done well, except for in Area 1. The bare-root plantings outside the top-of-bank have not done well: the rate of survival was low (<10%) with only a few trees surviving. The riparian seed mix did well both along the channel banks and in Zone 1.

Plot Locations
Plots were located adjacent to the geomorphic monitoring points or other known locations. Plots were located along geomorphic features such as riffles, runs, glides, and pools. In some cases, plots were located in areas such as outside meander bends or atop bankfull benches into the riparian buffer. Plot locations for first year monitoring are provided in the vegetation plan sheets in the back of this report.

Plot Number and Size
A total of 12 belted transects were completed. Four bare-root transects and eight stake belted transect were assessed in the channel, Zone 1, and Zone 2. Bare-root transects were 100 feet long and 10 feet wide. Stake transects varied from 50 to 100 feet in length and were 5 feet wide. To determine the amount of cover, the planted seed mix along the transect was visually assessed.

Recorded Data

The numbers of live woody stems for both stakes and bare roots were recorded per plot by species. Seeded areas were difficult to determine. Not all areas had riparian seed mix applied. The herbaceous cover was qualitatively assessed. Several species in the seed mix had died at the time of monitoring, making it difficult to determine an accurate species composition and cover amount.

Four belted transects for bare-roots found that there was an average of 2.5 live stems per transect. The number of live stems per transect varied between 1 and 4. Of the seven species planted, only four species were counted. According to the plans and specifications, there should have been an average of 14 stems per plot.

Eight belted transects for stakes found an average of 23 live stems per transect. The number of live stems per transect varied between 12 and 29 stems. According to the plans and specifications, there should have been an average of 27 stems per acre per transect.

All areas along the channel banks and within Zone 1 contained excellent herbaceous cover.

Recommendations

Morphology

No repairs to structures and/or banks are required. The headcut in Area 1 should be monitored. The erosive right bank (<10 feet) upstream of the pool cross-section at Area 4 should continue to be monitored.

Vegetation

Bare-root plantings were well below the survival levels for successful mitigation. Some areas of Zone 1 and Zone 2 will require replanting of bare-root seedlings. These areas will require preparation to insure survival of the planted trees. The zones are overgrown with tall herbaceous cover and large areas of *Fescue*. In mid-July, the areas to be replanted should be bush-hogged to allow for easier assess. Three to five weeks after the bush hogging, the new growth should be sprayed with Roundup (or similar broad-spectrum systemic herbicide). The herbicide should be applied according to the manufacture's label. Care should be taken during application to minimize drift into planted areas adjacent to the stream channel and portions of Zone 1. The following winter (December-February) the herbicide areas should be replanted with bare-root plantings.

Area 1 within the channel requires supplemental staking. This area can be replanted this winter or the following winter during replanting of bare-root plantings. Approximately 500 stakes should be replanted within Area 1 within the channel.

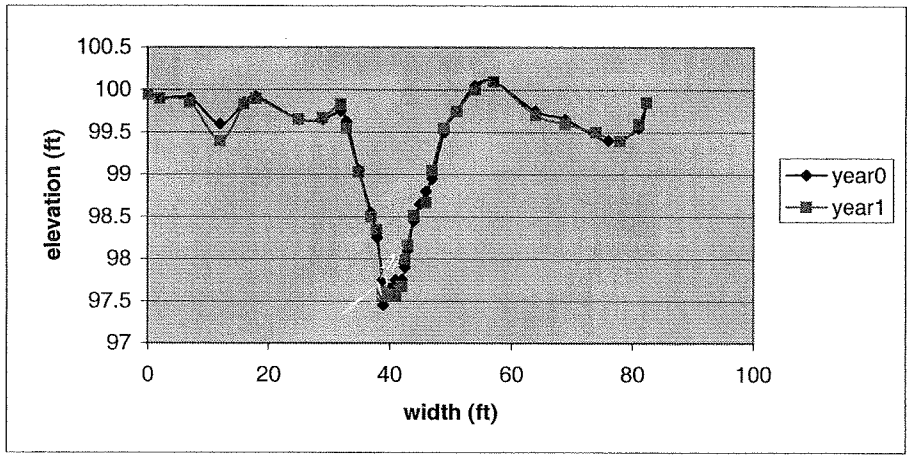
AREA 1: Stream Geometry and Substrate Data

Cross-Section

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 1
Section Riffle **CLASSIFICATION**
Location STA 79 (PINS A,B)

H OF I (ft) 105.65 year 0
H OF I (ft) 104.8 year 1

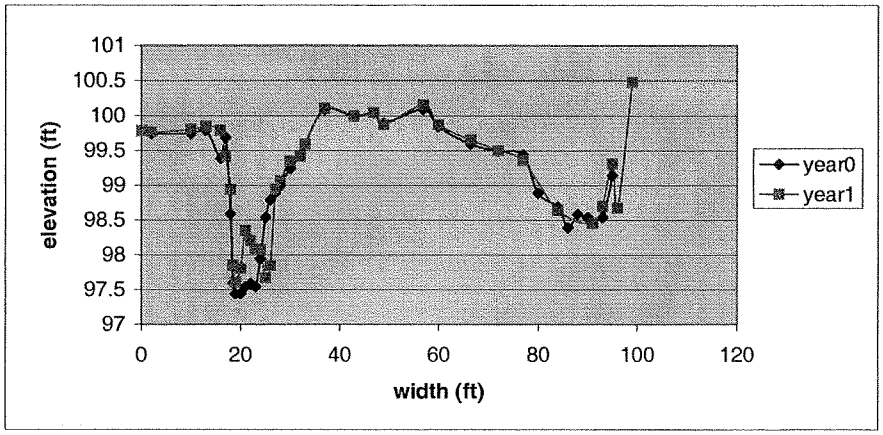


year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.95	5.7		0	99.95	4.85
	2	99.9	5.75		2	99.9	4.9
	7	99.9	5.75		7	99.85	4.95
	12	99.6	6.05		12	99.4	5.4
	16	99.85	5.8		16	99.83	4.97
	18	99.92	5.73		18	99.9	4.9
	25	99.65	6		25	99.65	5.15
	29	99.65	6		29	99.67	5.13
	32	99.75	5.9		32	99.83	4.97
	33	99.63	6.02		33	99.55	5.25
	35	99.05	6.6		35	99.03	5.77
	37	98.55	7.1		37	98.5	6.3
	38	98.25	7.4		38	98.35	6.45
	38.9	97.75	7.9		38.9	97.6	7.2
	39	97.45	8.2		39	97.56	7.24
	40	97.65	8		40	97.58	7.22
	41	97.75	7.9		41	97.57	7.23
	42	97.75	7.9		42	97.67	7.13
	42.5	97.9	7.75		42.5	98	6.8
	43	98.1	7.55		43	98.16	6.64
	44	98.45	7.2		44	98.51	6.29
	45	98.65	7		45		
	46	98.8	6.85		46	98.67	6.13
	47	98.95	6.7		47	99.05	5.75
	49	99.5	6.15		49	99.55	5.25
	51	99.75	5.9		51	99.75	5.05
	54	100.05	5.6		54	100	4.8
	57	100.1	5.55		57	100.1	4.7
	64	99.75	5.9		64	99.7	5.1
	69	99.65	6		69	99.6	5.2
	76	99.4	6.25		74	99.5	5.3
	81	99.55	6.1		78	99.4	5.4
	82.3	99.85	5.8		81	99.6	5.2
		99.93	5.72		82.3	99.85	4.95
		100	5.65			99.91	4.89

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 1
Section Pool CLASSIFICATION
Location STA (PINS C,D)

H OF I (ft) 108.34 year 0
H OF I (ft) 107.5 year 1



year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	2	99.74	8.6		0	99.78	7.72
	10	99.74	8.6		2	99.76	7.74
	13	99.79	8.55		10	99.8	7.7
	16	99.39	8.95		13	99.84	7.66
	17	99.69	8.65		16	99.79	7.71
	18	98.59	9.75		17	99.41	8.09
	18.5	97.59	10.75		18	98.94	8.56
	19	97.44	10.9		18.5	97.85	9.65
	20	97.44	10.9		19	97.6	9.9
	21	97.54	10.8		20	97.8	9.7
	22	97.59	10.75		21	98.35	9.15
	23	97.54	10.8		22	98.2	9.3
	24	97.94	10.4		23	98.08	9.42
	25	98.54	9.8		24	98.07	9.43
	26	98.79	9.55		25	97.67	9.83
	27	98.89	9.45		26	97.84	9.66
	28	98.99	9.35		27	98.94	8.56
	30	99.24	9.1		28	99.06	8.44
	32	99.44	8.9		30	99.34	8.16
	33	99.59	8.75		32	99.41	8.09
	37	100.09	8.25		33	99.59	7.91
	43	99.99	8.35		37	100.1	7.4
	47	100.04	8.3		43	100	7.5
	49	99.89	8.45		47	100.04	7.46
	57	100.09	8.25		49	99.87	7.63
	60	99.84	8.5		57	100.15	7.35
	66.5	99.59	8.75		60	99.87	7.63
	72	99.49	8.85		66.5	99.65	7.85
	77	99.44	8.9		72	99.5	8
	80	98.89	9.45		77	99.35	8.15
	84	98.69	9.65		84	98.64	8.86
	86	98.39	9.95		91	98.45	9.05
	88	98.59	9.75		93	98.7	8.8
	90	98.54	9.8		95	99.31	8.19
	93	98.54	9.8		96	98.67	8.83
	95	99.14	9.2		99	100.48	7.02
	96	99.74	8.6		100	100.78	6.72
	99	100.44	7.9			100.99	6.51
	100	100.69	7.65				
		100.94	7.4				

Longitudinal Profile

Longitudinal Profile
Jumping Run Creek
Monitoring Document
AREA 1

BM 100 year0
BM 100 year1

YEAR 0

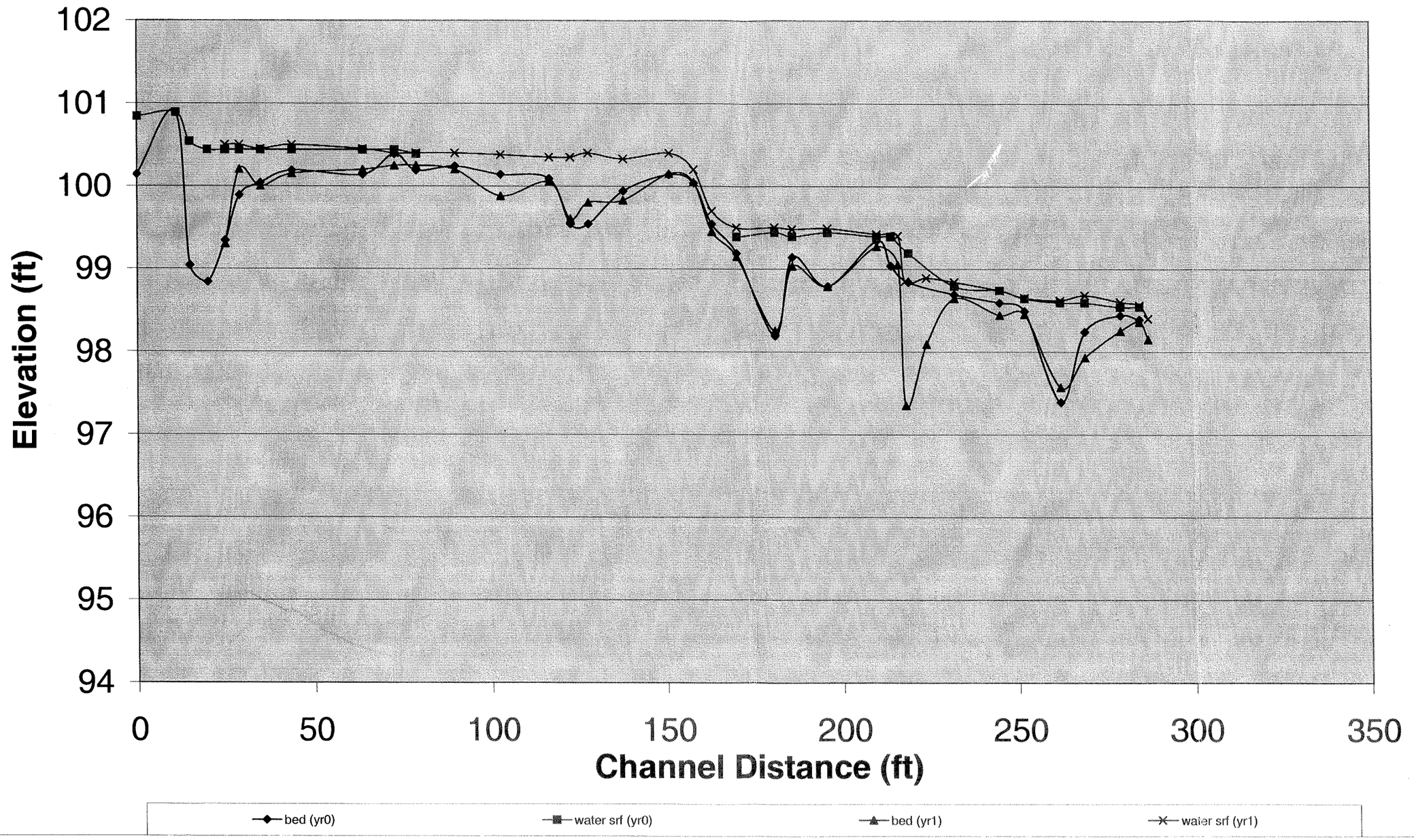
Notes	Station	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pool pin at left bank		8.34	108.34													
	0	8.34	108.34		8.2	0.7				6.3	100.14	100.84				
top of rock cross vane	11.1	8.34	108.34		7.45	0		7.93			100.89	100.89				
pool	15	8.34	108.34		9.3	1.5					99.04	100.54				
	20	8.34	108.34		9.5	1.6					98.84	100.44				
	25	8.34	108.34		9	1.1					99.34	100.44				
end pool/begin glide	29	8.34	108.34		8.45	0.55					99.89	100.44				
	35	8.34	108.34		8.3	0.4					100.04	100.44				
	44	8.34	108.34		8.15	0.25					100.19	100.44				
	64	8.34	108.34		8.2	0.3					100.14	100.44				
top riffle/end glide	73	8.34	108.34		7.95	0.05					100.39	100.44				
xsection riffle	79	8.34	108.34		8.15	0.2					100.19	100.39				
end riffle	90	8.34	108.34		8.1						100.24					
	103	8.34	108.34		8.2						100.14					
log vane	117	8.34	108.34		8.25						100.09					
d/s log vane	123	8.34	108.34		8.8						99.54					
center of pool	128	8.34	108.34		8.8						99.54					
end pool	138	8.34	108.34		8.4						99.94					
start riffle	151	8.34	108.34		8.2						100.14					
center of notch in log	158	8.34	108.34		8.3						100.04					
	163	8.34	108.34		8.8						99.54					
	170	8.34	108.34		9.15	0.2					99.19	99.39				
	181	8.34	108.34		10.15	1.25					98.19	99.44				
	186	8.34	108.34		9.2	0.25					99.14	99.39				
center of pool	196	8.34	108.34		9.55	0.65					98.79	99.44				
end pool	210	8.34	108.34		9	0.05					99.34	99.39				
begin riffle	214	8.34	108.34		9.3	0.35					99.04	99.39				
center of riffle	219	8.34	108.34		9.5	0.35					98.84	99.19				
	232	8.34	108.34		9.65	0.1					98.69	98.79				
	245	8.34	108.34		9.75	0.15					98.59	98.74				
end run/begin pool	252	8.34	108.34		9.85	0.15					98.49	98.64				
center of pool	262	8.34	108.34		10.95	1.2					97.39	98.59				
	269	8.34	108.34		10.1	0.35					98.24	98.59				
	279	8.34	108.34		9.9	0.1					98.44	98.54				
center of rock struc	284.5	8.34	108.34		9.95	0.15					98.39	98.54				

YEAR 1

Notes	Station	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pool pin at left bank		8.2	108.2													
	0	8.2	108.2													
	20	8.2	108.2													
	25	8.2	108.2		8.9	1.2					99.3	100.5				
	29	8.2	108.2		8	0.3					100.2	100.5				
	35	8.2	108.2		8.2	0.45					100	100.45				
	44	8.2	108.2		8.05	0.35					100.15	100.5				
	64	8.2	108.2		8	0.25					100.2	100.45				
	73	8.2	108.2		7.95	0.15					100.25	100.4				
	79	8.2	108.2		7.95	0.15					100.25	100.4				
	90	8.2	108.2		8	0.2					100.2	100.4				
	103	8.2	108.2		8.32	0.5					99.88	100.38				
	117	8.2	108.2		8.15	0.3					100.05	100.35				
	123	8.2	108.2		8.6	0.75					99.6	100.35				
	128	8.2	108.2		8.4	0.6					99.8	100.4				
	138	8.2	108.2		8.37	0.5					99.83	100.33				
	151	8.2	108.2		8.05	0.25					100.15	100.4				
check dam	158	8.2	108.2		8.15	0.15					100.05	100.2				
	163	8.2	108.2		8.75	0.25					99.45	99.7				
	170	8.2	108.2		9.05	0.35					99.15	99.5				
1' u/s of log structure	181	8.2	108.2		9.95	1.25					98.25	99.5				
	186	8.2	108.2		9.17	0.45					99.03	99.48				
	196	8.2	108.2		9.41	0.7					98.79	99.49				
	210	8.2	108.2		8.93	0.15					99.27	99.42				
top of headcut	216	8.2	108.2		9.15	0.35					99.05	99.4				
bottom of headcut	218	8.2	108.2		10.85	1.5					97.35	98.85				
	224	8.2	108.2		10.11	0.8					98.09	98.89				
	232	8.2	108.2		9.56	0.2					98.64	98.84				
	245	8.2	108.2		9.76	0.3					98.44	98.74				
	252	8.2	108.2		9.75	0.2					98.45	98.65				
	262	8.2	108.2		10.63	1.05					97.57	98.62				
	269	8.2	108.2		10.27	0.75					97.93	98.68				
	279	8.2	108.2		9.95	0.35					98.25	98.6				
	284.5	8.2	108.2		9.84	0.2					98.36	98.56				
Rock Structure	287	8.2	108.2		10.05	0.25					98.15	98.4				

Year 1 - Head cut observed at Station 218

Longitudinal Profile (AREA 1)



Modified Wolman Pebble Count

YEAR 0

PEBBLE COUNT			Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	12	12	0.12	0.12	7	7	0.12	0.12	16	16	0.16	0.16	12	12	0.12	0.12
0.125	.062-.125	.002-.01	Very Fine	45	57	0.45	0.57	12	19	0.20	0.32	13	29	0.13	0.29	13	25	0.13	0.25
0.25	.125-.25		Fine	7	64	0.07	0.64	10	29	0.17	0.48	4	33	0.04	0.33	17	42	0.17	0.42
0.5	.25-.5	.01-.02	Medium	12	76	0.12	0.76	8	37	0.13	0.62	8	41	0.08	0.41	8	50	0.08	0.50
1	.5-1.0	.02-.04	Coarse	7	83	0.07	0.83	3	40	0.05	0.67	13	54	0.13	0.54	3	53	0.03	0.53
2	1.0-2.0	.04-.08	Very Coarse		83	0.00	0.83	2	42	0.03	0.70	2	56	0.02	0.56	2	55	0.02	0.55
4	2-4	.08-.16	Very Fine	3	86	0.03	0.86		42	0.00	0.70	1	57	0.01	0.57	2	57	0.02	0.57
5.7	4-5.7	.16-.22	Fine	1	87	0.01	0.87	1	43	0.02	0.72	2	59	0.02	0.59		57	0.00	0.57
8	5.7-8	.22-.31	Fine	1	88	0.01	0.88	1	44	0.02	0.73	5	64	0.05	0.64	5	62	0.05	0.62
11.3	8-11.3	.31-.44	Medium	9	97	0.09	0.97	5	49	0.08	0.82	4	68	0.04	0.68	6	68	0.06	0.68
16	11.3-16	.44-.63	Medium		97	0.00	0.97	6	55	0.10	0.92	10	78	0.10	0.78	8	76	0.08	0.76
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	3	58	0.05	0.97	5	83	0.05	0.83	6	82	0.06	0.82
32	22.6-32	.89-1.26	Coarse	2	100	0.02	1.00	1	59	0.02	0.98	3	86	0.03	0.86	6	88	0.06	0.88
45	32-45	1.26-1.77	Very Coarse		100	0.00	1.00	1	60	0.02	1.00	8	94	0.08	0.94	7	95	0.07	0.95
64	45-64	1.77-2.5	Very Coarse		100	0.00	1.00		60	0.00	1.00	3	97	0.03	0.97	2	97	0.02	0.97
90	64-90	2.5-3.5	Small		100	0.00	1.00		60	0.00	1.00	3	100	0.03	1.00	2	99	0.02	0.99
128	90-128	3.5-5	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00	1	100	0.01	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00

YEAR 0

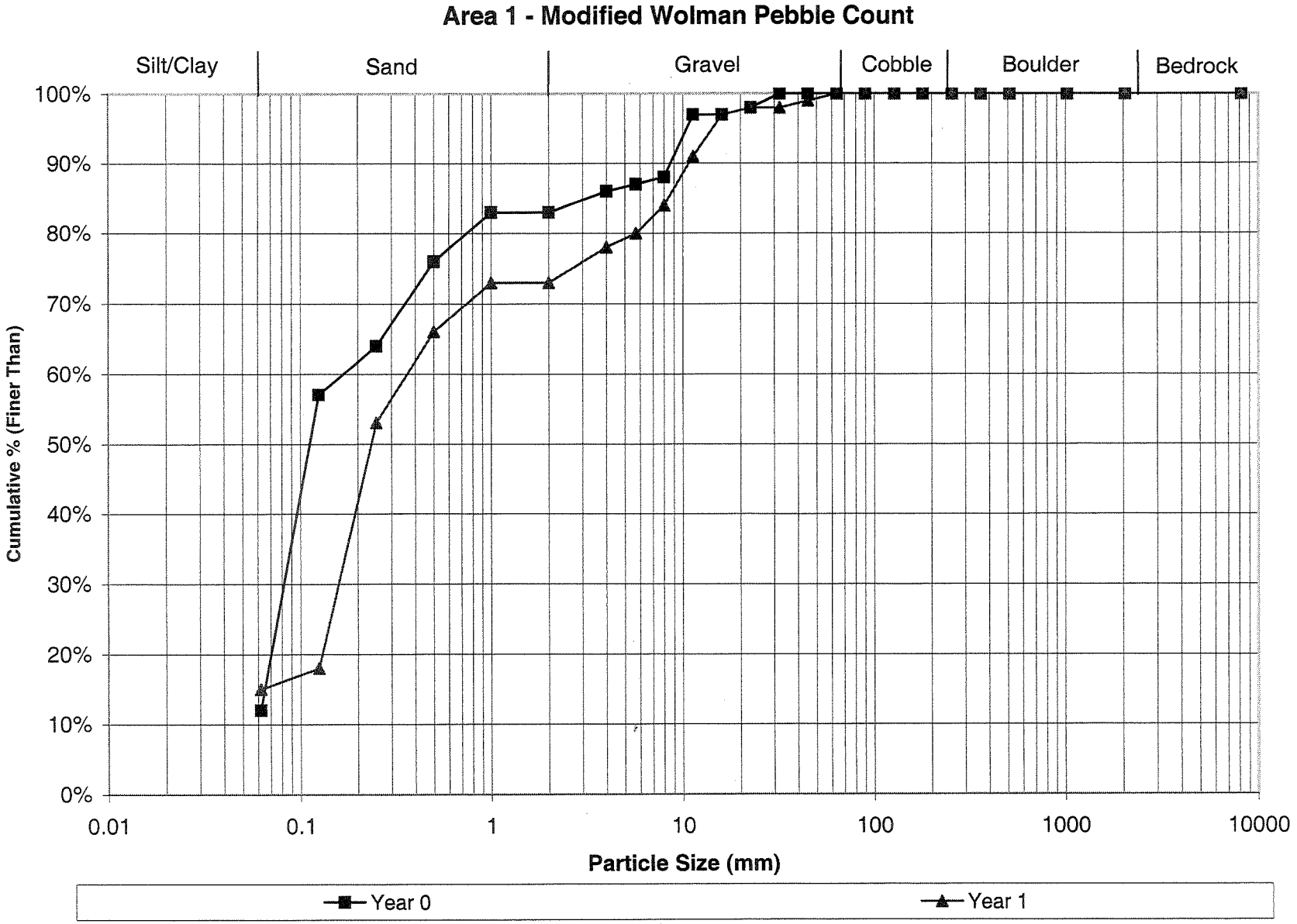
PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle		Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
<.062	<.002	Silt/Clay		10	10	0.20	0.20	1	1	0.03	0.03	9	9	0.18	0.18	4	4	0.08	0.08
.062-.125	.002-.01	Very Fine		6	16	0.12	0.32	2	3	0.07	0.10	2	11	0.04	0.22	4	8	0.08	0.16
.125-.25		Fine		5	21	0.10	0.42	2	5	0.07	0.17		11	0.00	0.22		8	0.00	0.16
.25-.5	.01-.02	Medium		9	30	0.18	0.60	3	8	0.10	0.27	2	13	0.04	0.26	1	9	0.02	0.18
.5-1.0	.02-.04	Coarse		3	33	0.06	0.66	2	10	0.07	0.33	3	16	0.06	0.32	1	10	0.02	0.20
1.0-2.0	.04-.08	Very Coarse			33	0.00	0.66	2	12	0.07	0.40		16	0.00	0.32	2	12	0.04	0.24
2-4	.08-.16	Very Fine		3	36	0.06	0.72		12	0.00	0.40	1	17	0.02	0.34	2	14	0.04	0.28
4-5.7	.16-.22	Fine		1	37	0.02	0.74	1	13	0.03	0.43	1	18	0.02	0.36		14	0.00	0.28
5.7-8	.22-.31	Fine		1	38	0.02	0.76	1	14	0.03	0.47		18	0.00	0.36	5	19	0.10	0.38
8-11.3	.31-.44	Medium		9	47	0.18	0.94	5	19	0.17	0.63	4	22	0.08	0.44	6	25	0.12	0.50
11.3-16	.44-.63	Medium			47	0.00	0.94	6	25	0.20	0.83	4	26	0.08	0.52	6	31	0.12	0.62
16-22.6	.63-.89	Coarse		1	48	0.02	0.96	3	28	0.10	0.93	8	34	0.16	0.68	5	36	0.10	0.72
22.6-32	.89-1.26	Coarse		2	50	0.04	1.00	1	29	0.03	0.97	4	38	0.08	0.76	6	42	0.12	0.84
32-45	1.26-1.77	Very Coarse			50	0.00	1.00	1	30	0.03	1.00	2	40	0.04	0.80	5	47	0.10	0.94
45-64	1.77-2.5	Very Coarse			50	0.00	1.00		30	0.00	1.00	5	45	0.10	0.90	1	48	0.02	0.96
64-90	2.5-3.5	Small			50	0.00	1.00		30	0.00	1.00	2	47	0.04	0.94	1	49	0.02	0.98
90-128	3.5-5	Small			50	0.00	1.00		30	0.00	1.00	3	50	0.06	1.00	1	50	0.02	1.00
128-180	5-7.1	Large			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
180-256	7.1-10.1	Large			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
256-362	10.1-14.3	Small			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
362-512	14.3-20	Small			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
512-1024	20-40	Medium			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
1024-2048	40-80	Vy Lg Boulders			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
		Bedrock			50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00

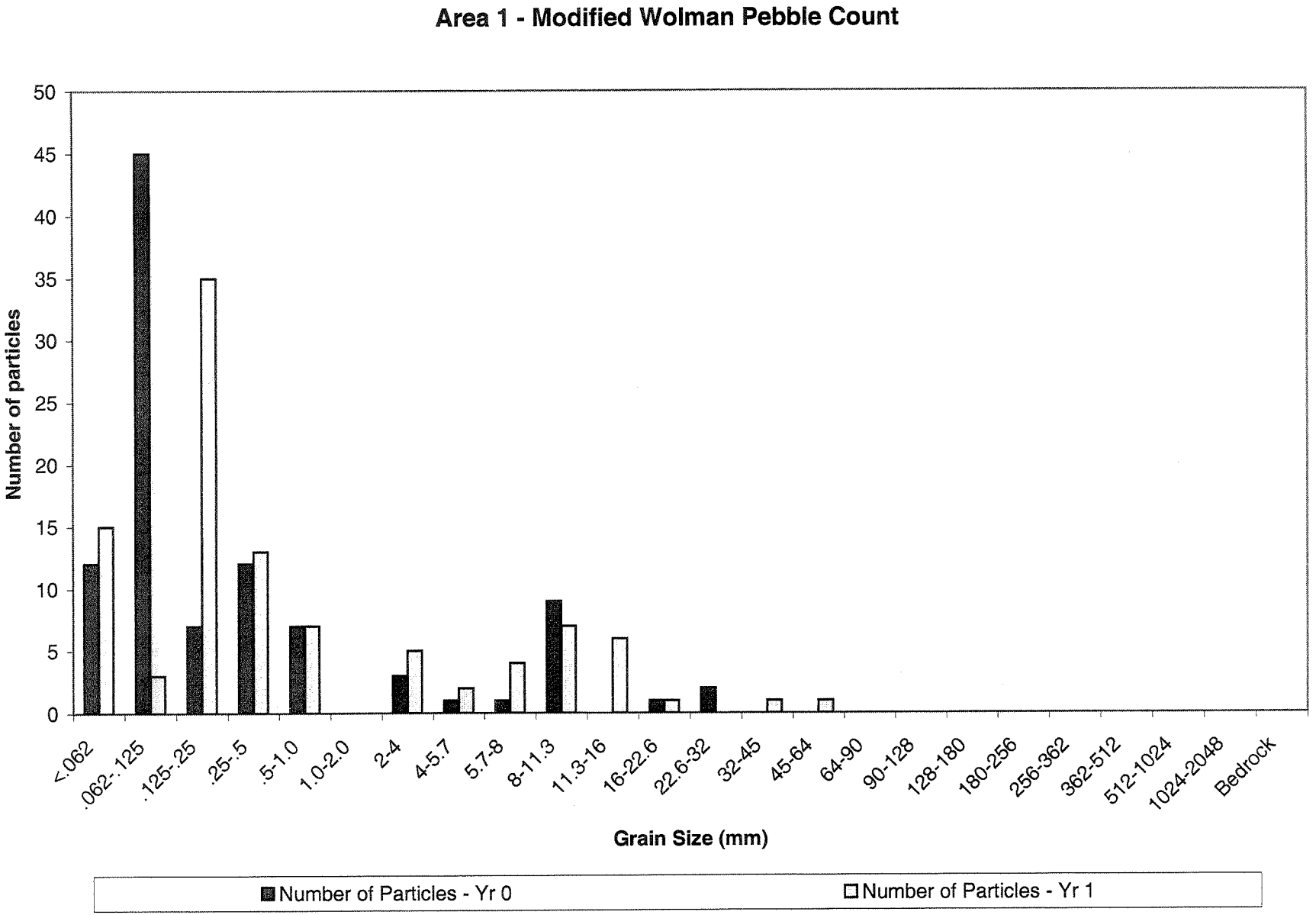
YEAR 1

PEBBLE COUNT			Combined	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	15	15	0.15	0.15	9	9	0.09	0.09	9	9	0.11	0.11	4	4	0.04	0.04
0.125	.062-.125	.002-.01	Very Fine	3	18	0.03	0.18		9	0.00	0.09	6	15	0.08	0.19	9	13	0.09	0.13
0.25	.125-.25		Fine	35	53	0.35	0.53	28	37	0.28	0.37	11	26	0.14	0.33	17	30	0.17	0.30
0.5	.25-.5	.01-.02	Medium	13	66	0.13	0.66	27	64	0.27	0.64	3	29	0.04	0.36	14	44	0.14	0.44
1	.5-1.0	.02-.04	Coarse	7	73	0.07	0.73	13	77	0.13	0.77	7	36	0.09	0.45	8	52	0.08	0.52
2	1.0-2.0	.04-.08	Very Coarse		73	0.00	0.73		77	0.00	0.77		36	0.00	0.45	1	53	0.01	0.53
4	2-4	.08-.16	Very Fine	5	78	0.05	0.78	1	78	0.01	0.78	4	40	0.05	0.50	3	56	0.03	0.56
5.7	4-5.7	.16-.22	Fine	2	80	0.02	0.80		78	0.00	0.78	2	42	0.03	0.53	4	60	0.04	0.60
8	5.7-8	.22-.31	Fine	4	84	0.04	0.84	1	79	0.01	0.79	1	43	0.01	0.54	2	62	0.02	0.62
11.3	8-11.3	.31-.44	Medium	7	91	0.07	0.91	1	80	0.01	0.80	7	50	0.09	0.63	4	66	0.04	0.66
16	11.3-16	.44-.63	Medium	6	97	0.06	0.97	4	84	0.04	0.84	2	52	0.03	0.65	4	70	0.04	0.70
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	5	89	0.05	0.89	3	55	0.04	0.69	6	76	0.06	0.76
32	22.6-32	.89-1.26	Coarse		98	0.00	0.98	6	95	0.06	0.95	6	61	0.08	0.76	9	85	0.09	0.85
45	32-45	1.26-1.77	Very Coarse	1	99	0.01	0.99	3	98	0.03	0.98	7	68	0.09	0.85	6	91	0.06	0.91
64	45-64	1.77-2.5	Very Coarse	1	100	0.01	1.00	2	100	0.02	1.00	7	75	0.09	0.94	9	100	0.09	1.00
90	64-90	2.5-3.5	Small		100	0.00	1.00		100	0.00	1.00	4	79	0.05	0.99		100	0.00	1.00
128	90-128	3.5-5	Small		100	0.00	1.00		100	0.00	1.00	1	80	0.01	1.00		100	0.00	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00

YEAR 1

PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
<.062	<.002	Silt/Clay	1	1	0.02	0.02	5	5	0.10	0.10	6	6	0.15	0.15	2	2	0.04	0.04
.062-.125	.002-.01	Very Fine	3	4	0.06	0.08		5	0.00	0.10	1	7	0.03	0.18	2	4	0.04	0.08
.125-.25		Fine	10	14	0.20	0.28	4	9	0.08	0.18	1	8	0.03	0.20	6	10	0.12	0.20
.25-.5	.01-.02	Medium	3	17	0.06	0.34	5	14	0.10	0.28	1	9	0.03	0.23	1	11	0.02	0.22
.5-1.0	.02-.04	Coarse	6	23	0.12	0.46	13	27	0.26	0.54	1	10	0.03	0.25	4	15	0.08	0.30
1.0-2.0	.04-.08	Very Coarse		23	0.00	0.46		27	0.00	0.54		10	0.00	0.25		15	0.00	0.30
2-4	.08-.16	Very Fine	5	28	0.10	0.56	1	28	0.02	0.56	3	13	0.08	0.33	2	17	0.04	0.34
4-5.7	.16-.22	Fine	2	30	0.04	0.60		28	0.00	0.56		13	0.00	0.33	3	20	0.06	0.40
5.7-8	.22-.31	Fine	4	34	0.08	0.68	1	29	0.02	0.58		13	0.00	0.33	1	21	0.02	0.42
8-11.3	.31-.44	Medium	7	41	0.14	0.82	1	30	0.02	0.60	2	15	0.05	0.38	3	24	0.06	0.48
11.3-16	.44-.63	Medium	6	47	0.12	0.94	4	34	0.08	0.68	2	17	0.05	0.43	5	29	0.10	0.58
16-22.6	.63-.89	Coarse	1	48	0.02	0.96	5	39	0.10	0.78	1	18	0.03	0.45	5	34	0.10	0.68
22.6-32	.89-1.26	Coarse		48	0.00	0.96	6	45	0.12	0.90	5	23	0.13	0.58	7	41	0.14	0.82
32-45	1.26-1.77	Very Coarse	1	49	0.02	0.98	3	48	0.06	0.96	7	30	0.18	0.75	2	43	0.04	0.86
45-64	1.77-2.5	Very Coarse	1	50	0.02	1.00	2	50	0.04	1.00	5	35	0.13	0.88	7	50	0.14	1.00
64-90	2.5-3.5	Small		50	0.00	1.00		50	0.00	1.00	4	39	0.10	0.98		50	0.00	1.00
90-128	3.5-5	Small		50	0.00	1.00		50	0.00	1.00	1	40	0.03	1.00		50	0.00	1.00
128-180	5-7.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
180-256	7.1-10.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
256-362	10.1-14.3	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
362-512	14.3-20	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
512-1024	20-40	Medium		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
		Bedrock		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00


Area 1 - Modified Wolman Pebble Count
Silt/Clay
Sand
Gravel
Cobble
Boulder
Bedrock
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative % (Finer Than)
0.01
0.1
1
10
100
1000
10000
Particle Size (mm)
Year 0
Year 1


Area 1 - Modified Wolman Pebble Count
Number of particles
50
45
40
35
30
25
20
15
10
5
0
<.062
.062-.125
.125-.25
.25-.5
.5-1.0
1.0-2.0
2-4
4-5.7
5.7-8
8-11.3
11.3-16
16-22.6
22.6-32
32-45
45-64
64-90
90-128
128-180
180-256
256-362
362-512
512-1024
1024-2048
Bedrock
Grain Size (mm)
Number of Particles - Yr 0
Number of Particles - Yr 1

Vegetation

Plot #1 (Bareroot)	(10x100)	
Pinus taeda		2
Cornus drummondii		1
Plot #2 (Stakes)	(5x50)	
Salix nigra		15
Cornus amomum		8
Sambucus canadensis		1
Viburnum dentatum		0
Plot #3 (Stakes)	(5x50)	
Salix nigra		13
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #4 (Bareroot)	(10x100)	
Cornus drummondii		3
Juglans nigra		1
Plot #5 (Stakes)	(5x100)	
Salix nigra		27
Cornus amomum		18
Sambucus canadensis		1
Viburnum dentatum		0
Plot #6 (Stakes)	(5x100)	
Salix nigra		39
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #7 (Bareroot)	(10x100)	
Pinus virginiana		1

Plot #8 (Stakes)	(5x50)
Salix nigra	10
Cornus amomum	5
Sambucus canadensis	0
Viburnum dentatum	1

Plot #9 (Stakes)	(5x50)
Salix nigra	9
Cornus amomum	3
Sambucus canadensis	0
Viburnum dentatum	0

Plot #10 (Stakes)	(5x50)
Salix nigra	11
Cornus amomum	9
Sambucus canadensis	0
Viburnum dentatum	2

Plot #11 (Stakes)	(5x50)
Salix nigra	18
Cornus amomum	9
Sambucus canadensis	0
Viburnum dentatum	2

Plot #12 (Bareroot)	(10x100)
Juglans nigra	1
Cornus drummondii	1

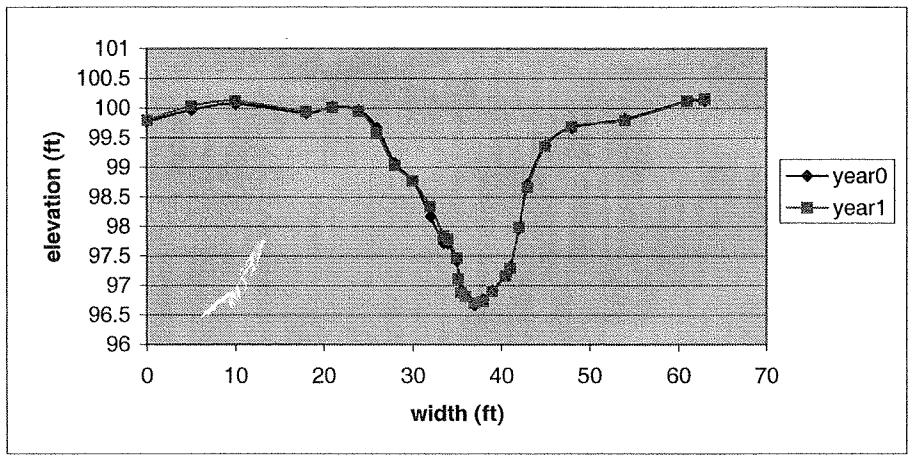
AREA 2: Stream Geometry and Substrate Data

Cross-Section

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 2
Section Riffle **CLASSIFICATION**
Location STA (PINS E,F)

H OF I (ft) 106.07 year 0
H OF I (ft) 106.64 year 1

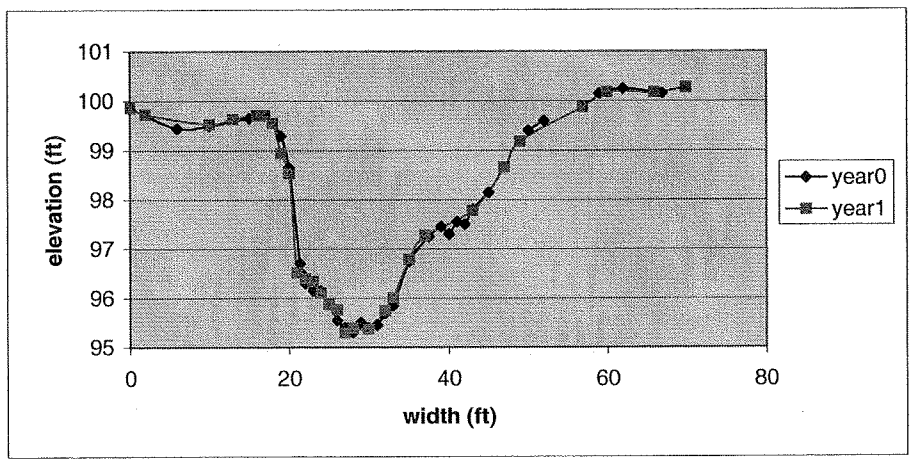


year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.77	6.3		0	99.8	6.84
	5	99.97	6.1		5	100.03	6.61
	10	100.07	6		10	100.12	6.52
	18	99.92	6.15		18	99.94	6.7
	21	100.02	6.05		21	100.01	6.63
	24	99.97	6.1		24	99.95	6.69
	26	99.67	6.4		26	99.58	7.06
	28	99.07	7		28	99.03	7.61
	30	98.77	7.3		30	98.77	7.87
	32	98.17	7.9		32	98.33	8.31
	33.5	97.72	8.35		33.5	97.84	8.8
	34	97.72	8.35		34	97.78	8.86
	35	97.42	8.65		35	97.46	9.18
	35.5	96.92	9.15		35.2	97.11	9.53
	36	96.82	9.25		35.5	96.88	9.76
	37	96.67	9.4		36	96.82	9.82
	38	96.77	9.3		37	96.71	9.93
	39	96.92	9.15		38	96.73	9.91
	40.5	97.17	8.9		39	96.9	9.74
	41	97.32	8.75		40.5	97.16	9.48
	42	97.97	8.1		41	97.29	9.35
	43	98.72	7.35		42	97.99	8.65
	45	99.37	6.7		43	98.66	7.98
	48	99.67	6.4		45	99.35	7.29
	54	99.82	6.25		48	99.69	6.95
	61	100.12	5.95		54	99.8	6.84
	63	100.12	5.95		61	100.12	6.52
		100.32	5.75		63	100.15	6.49
						100.32	6.32

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 2
Section **Pool** **CLASSIFICATION**
Location **STA (PINS G,H)**

H OF I (ft) 104.85 year 0
H OF I (ft) 105.4 year 1



year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.85	5		0	99.87	5.53
	6	99.45	5.4		2	99.73	5.67
	10	99.5	5.35		10	99.53	5.87
	15	99.65	5.2		13	99.64	5.76
	17	99.7	5.15		16	99.7	5.7
	19	99.3	5.55		17	99.71	5.69
	20	98.65	6.2		18	99.55	5.85
	21.3	96.7	8.15		19	98.94	6.46
	21.5	96.5	8.35		20	98.53	6.87
	22	96.3	8.55		21	96.51	8.89
	23	96.15	8.7		22	96.4	9
	24	96.15	8.7		23	96.34	9.06
	26	95.55	9.3		24	96.1	9.3
	27	95.4	9.45		25	95.87	9.53
	28	95.3	9.55		26	95.77	9.63
	29	95.5	9.35		27	95.3	10.1
	30	95.4	9.45		28	95.39	10.01
	31	95.45	9.4		30	95.37	10.03
	32	95.7	9.15		32	95.75	9.65
	33	95.85	9		33	96.01	9.39
	35	96.75	8.1		35	96.78	8.62
	37.5	97.25	7.6		37	97.27	8.13
	39	97.45	7.4		43	97.78	7.62
	40	97.3	7.55		47	98.65	6.75
	41	97.55	7.3		49	99.18	6.22
	42	97.5	7.35		57	99.88	5.52
	43	97.8	7.05		60	100.18	5.22
	45	98.15	6.7		66	100.17	5.23
	47				70	100.27	5.13
	50	99.4	5.45			100.5	4.9
	52	99.6	5.25				
	54						
	56						
	59	100.15	4.7				
	62	100.25	4.6				
	67	100.15	4.7				
	70.5	100.25	4.6				
		100.51	4.34				

Longitudinal Profile

Longitudinal Profile
Jumping Run Creek
Monitoring Document
AREA 2

BM	100	year0
BM	100	year1

YEAR 0

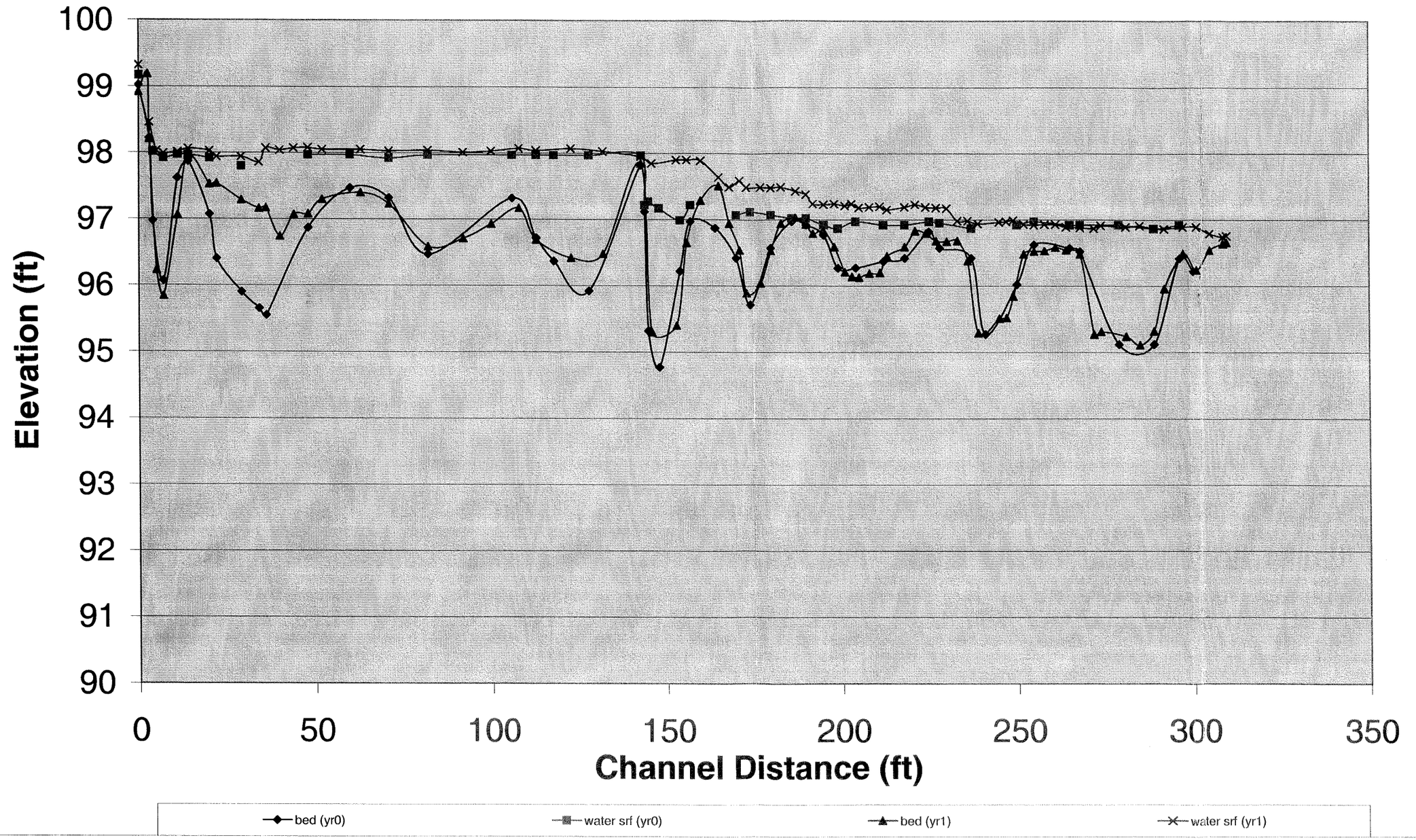
Notes	Station	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
riffle pin at left bank		6.07	106.07													
	0	6.07	106.07		7.05	0.15					99.02	99.17				
top of rock/footer	3	6.07	106.07		7.85						98.22					
d/s footer	4	6.07	106.07		9.1	1.05					96.97	98.02				
	7	6.07	106.07		10	1.85					96.07	97.92				
	11	6.07	106.07		8.45	0.35					97.62	97.97				
	14	6.07	106.07		8.2	0.1					97.87	97.97				
center of pool	20	6.07	106.07		9	0.85					97.07	97.92				
begin pool	22	6.3	106.3		9.9						96.4					
center of pool	29	6.3	106.3		10.4	1.9					95.9	97.8				
	34	6.3	106.3		10.65						95.65					
	36	6.3	106.3		10.75						95.55					
	48	6.07	106.07		9.2	1.1					96.87	97.97				
	60	6.07	106.07		8.6	0.5					97.47	97.97				
	71	6.07	106.07		8.75	0.6					97.32	97.92				
cross section	82	6.07	106.07		9.6	1.5					96.47	97.97				
	106	6.07	106.07		8.75	0.65					97.32	97.97				
	113	6.07	106.07		9.35	1.25					96.72	97.97				
center of pool	118	6.07	106.07		9.7	1.6					96.37	97.97				
	128	6.07	106.07		10.15	2.05					95.92	97.97				
top of rock structure	143	6.07	106.07		8.25	0.15					97.82	97.97				
top of footer rock	144	6.07	106.07		8.95	0.1					97.12	97.22				
	145	6.07	106.07		10.75	1.95					95.32	97.27				
	148	6.07	106.07		11.3	2.4					94.77	97.17				
	154	6.07	106.07		9.85	0.77					96.22	96.99				
	157	6.07	106.07		9.1	0.25					96.97	97.22				
	164	6.07	106.07		9.2						96.87					
	170	6.07	106.07		9.65	0.65					96.42	97.07				
center of pool	174	6.07	106.07		10.35	1.4					95.72	97.12				
end pool	180	6.07	106.07		9.5	0.5					96.57	97.07				
begin riffle	186	6.07	106.07		9.1	0.05					96.97	97.02				
center of riffle	190	6.07	106.07		9.15	0.1					96.92	97.02				
end riffle/begin run	195	6.07	106.07		9.3	0.15					96.77	96.92				
end run/begin pool	199	6.07	106.07		9.8	0.6					96.27	96.87				
center of pool	204	6.07	106.07		9.8	0.7					96.27	96.97				
end pool	212	6.07	106.07		9.7	0.55					96.37	96.92				
	218	6.07	106.07		9.65	0.5					96.42	96.92				
center of riffle	225	6.07	106.07		9.25	0.15					96.82	96.97				
end riffle/begin run	228	6.07	106.07		9.5	0.38					96.57	96.95				
end run/begin pool	237	6.07	106.07		9.65	0.45					96.42	96.87				
center of pool	241	6.07	106.07		10.8						95.27					
	250	6.07	106.07		10.05	0.9					96.02	96.92				
riffle	255	6.07	106.07		9.45	0.35					96.62	96.97				
	265	6.07	106.07		9.5	0.35					96.57	96.92				
begin pool	268	6.07	106.07		9.55	0.4					96.52	96.92				
center of pool	279	6.07	106.07		10.95	1.8					95.12	96.92				
end pool	289	6.07	106.07		10.95	1.75					95.12	96.87				
	296	6.07	106.07		9.65	0.5					96.42	96.92				
	300	6.07	106.07		9.85						96.22					
rock structure	313	6.07	106.07													

YEAR 1

Notes	Station	Station Adjusted*	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
riffle pin at left bank			6.64	106.64													
Top of rock structure	0	0	6.64	106.64		7.72	0.4					98.92	99.32				
	2.5	2.5	6.64	106.64		7.45						99.19					
	3	3	6.64	106.64		8.43	0.25					98.21	98.46				
Top of footer	5	5	6.64	106.64		10.41	1.8					96.23	98.03				
Scour pool	7	7	6.64	106.64		10.8	2.15					95.84	97.99				
	11	11	6.64	106.64		9.58	0.95					97.06	98.01				
	14	14	6.64	106.64		8.68	0.1					97.96	98.06				
	20	20	6.64	106.64		9.11	0.5					97.53	98.03				
	22	22	6.64	106.64		9.1	0.4					97.54	97.94				
	29	29	6.64	106.64		9.35	0.65					97.29	97.94				
	34	34	6.64	106.64		9.48	0.7					97.16	97.86				
	36	36	6.64	106.64		9.47	0.9					97.17	98.07				
	40	40	6.64	106.64		9.9	1.3					96.74	98.04				
	44	44	6.64	106.64		9.57	1					97.07	98.07				
	48	48	6.64	106.64		9.56	1					97.08	98.08				
	52	52	6.64	106.64		9.34	0.75					97.3	98.05				
	63	63	6.64	106.64		9.24	0.65					97.4	98.05				
	71	71	6.64	106.64		9.41	0.8					97.23	98.03				
Center of pool	82	82	6.64	106.64		10.05	1.45					96.59	98.04				
	97	92	6.64	106.64		9.93	1.3					96.71	98.01				
	105	100	6.64	106.64		9.71	1.1					96.93	98.03				
	113	108	6.64	106.64		9.47	0.9					97.17	98.07				
	118	113	6.64	106.64		9.95	1.35					96.69	98.04				
Center of pool	128	123	6.64	106.64		10.22	1.65					96.42	98.07				
	137	132	6.64	106.64		10.16	1.55					96.48	98.03				
	148	143	6.64	106.64		8.79	0.1					97.85	97.95				
Scour pool	151	146	6.64	106.64		11.34	2.55					95.3	97.85				
	158	153	6.64	106.64		11.24	2.5					95.4	97.9				
end pool	161	156	6.64	106.64		9.99	1.25					96.65	97.9				
	165	160	6.64	106.64		9.35	0.6					97.29	97.89				
	170	165	6.64	106.64		9.13	0.13					97.51	97.64				
top of pool	173	168	6.64	106.64		9.7	0.55					96.94	97.49				
	176	171	6.64	106.64		10.1	1.05					96.54	97.59				
Center of pool	178	173	6.64	106.64		10.75	1.6					95.89	97.49				
	182	177	6.64	106.64		10.6	1.45					96.04	97.49				
	185	180	6.64	106.64		10.11	0.95					96.53	97.48				
	188	183	6.64	106.64		9.7	0.55					96.94	97.49				
	192	187	6.64	106.64		9.61	0.4					97.03	97.43				
	195	190	6.64	106.64		9.71	0.45					96.93	97.38				
	197	192	6.64	106.64		9.85	0.45					96.79	97.24				
	200	195	6.64	106.64		9.81	0.4					96.83	97.23				
	203	198	6.64	106.64		10.05	0.65					96.59	97.24				
	206	201	6.64	106.64		10.43	1					96.21	97.21				
	208	203	6.64	106.64		10.5	1.1					96.14	97.24				
	210	205	6.64	106.64		10.51	1.05					96.13	97.18				
	213	208	6.64	106.64		10.45	1					96.19	97.19				
	216	211	6.64	106.64		10.44	1					96.2	97.2				
	218	213	6.64	106.64		10.19	0.7					96.45	97.15				
	220	215	6.64	106.64		10.05	0.6					96.59	97.19				
	226	221	6.64	106.64		9.81	0.4					96.83	97.23				
	229	224	6.64	106.64		9.85	0.4					96.79	97.19				
	232	227	6.64	106.64		9.96	0.5					96.68	97.18				
	235	230	6.64	106.64		9.97	0.5					96.67	97.17				
	238	233	6.64	106.64		9.96	0.3					96.68	96.98				
	241	236	6.64	106.64		10.26	0.6					96.38	96.98				
	244	239	6.64	106.64		11.35	1.65					95.29	96.94				
	248	245	6.64	106.64		11.13	1.45					95.51	96.96				
	250	247	6.64	106.64		11.12	1.45					95.52	96.97				
	252	249	6.64	106.64		10.8	1.15					95.84	96.99				
	255	252	6.64	106.64		10.16	0.45					96.48	96.93				
	258	255	6.64	106.64		10.12	0.4					96.52	96.92				
	261	258	6.64	106.64		10.11	0.4					96.53	96.93				
	264	261	6.64	106.64		10.06	0.35					96.58	96.93				
	267	264	6.64	106.64		10.1	0.35					96.54	96.89				
top of pool	271	268	6.64	106.64		10.16	0.4					96.48	96.88				
	275	272	6.64	106.64		11.37	1.6					95.27	96.87				
	277	274	6.64	106.64		11.33	1.6					95.31	96.91				
	284	281	6.64	106.64		11.4	1.65					95.24	96.89				
	288	285	6.64	106.64		11.53	1.8					95.11	96.91				
	292	289	6.64	106.64		11.32	1.55					95.32	96.87				
	295	292	6.64	106.64		10.68	0.9					95.96	96.86				
	300	297	6.64	106.64		10.15	0.4					96.49	96.89				
	304	301	6.64	106.64		10.4	0.65					96.24	96.89				
	308	305	6.64	106.64		10.1	0.25					96.54	96.79				
	312	309	6.64	106.64		10	0.1					96.64	96.74				
Top of rock structure	313	310	6.64	106.64		9.98	0.1					96.66	96.76				

*Station Adjusted to match exisitng Stationing from year 0 at physical features (i.e. structures). In accuracies in stationing due to the way the tape is laid down the centerline of the stream

Longitudinal Profile (AREA 2)



Modified Wolman Pebble Count

YEAR 0

	PEBBLE COUNT		Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	12	12	0.12	0.12	7	7	0.12	0.12	16	16	0.16	0.16	12	12	0.12	0.12
0.125	.062-.125	.002-.01	Very Fine	45	57	0.45	0.57	12	19	0.20	0.32	13	29	0.13	0.29	13	25	0.13	0.25
0.25	.125-.25		Fine	7	64	0.07	0.64	10	29	0.17	0.48	4	33	0.04	0.33	17	42	0.17	0.42
0.5	.25-.5	.01-.02	Medium	12	76	0.12	0.76	8	37	0.13	0.62	8	41	0.08	0.41	8	50	0.08	0.50
1	.5-1.0	.02-.04	Coarse	7	83	0.07	0.83	3	40	0.05	0.67	13	54	0.13	0.54	3	53	0.03	0.53
2	1.0-2.0	.04-.08	Very Coarse		83	0.00	0.83	2	42	0.03	0.70	2	56	0.02	0.56	2	55	0.02	0.55
4	2-4	.08-.16	Very Fine	3	86	0.03	0.86		42	0.00	0.70	1	57	0.01	0.57	2	57	0.02	0.57
5.7	4-5.7	.16-.22	Fine	1	87	0.01	0.87	1	43	0.02	0.72	2	59	0.02	0.59		57	0.00	0.57
8	5.7-8	.22-.31	Fine	1	88	0.01	0.88	1	44	0.02	0.73	5	64	0.05	0.64	5	62	0.05	0.62
11.3	8-11.3	.31-.44	Medium	9	97	0.09	0.97	5	49	0.08	0.82	4	68	0.04	0.68	6	68	0.06	0.68
16	11.3-16	.44-.63	Medium		97	0.00	0.97	6	55	0.10	0.92	10	78	0.10	0.78	8	76	0.08	0.76
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	3	58	0.05	0.97	5	83	0.05	0.83	6	82	0.06	0.82
32	22.6-32	.89-1.26	Coarse	2	100	0.02	1.00	1	59	0.02	0.98	3	86	0.03	0.86	6	88	0.06	0.88
45	32-45	1.26-1.77	Very Coarse		100	0.00	1.00	1	60	0.02	1.00	8	94	0.08	0.94	7	95	0.07	0.95
64	45-64	1.77-2.5	Very Coarse		100	0.00	1.00		60	0.00	1.00	3	97	0.03	0.97	2	97	0.02	0.97
90	64-90	2.5-3.5	Small		100	0.00	1.00		60	0.00	1.00	3	100	0.03	1.00	2	99	0.02	0.99
128	90-128	3.5-5	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00	1	100	0.01	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00

YEAR 0

PEBBLE COUNT		Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
<.062	<.002	Silt/Clay	10	10	0.20	0.20	1	1	0.03	0.03	9	9	0.18	0.18	4	4	0.08	0.08
.062-.125	.002-.01	Very Fine	6	16	0.12	0.32	2	3	0.07	0.10	2	11	0.04	0.22	4	8	0.08	0.16
.125-.25		Fine	5	21	0.10	0.42	2	5	0.07	0.17		11	0.00	0.22		8	0.00	0.16
.25-.5	.01-.02	Medium	9	30	0.18	0.60	3	8	0.10	0.27	2	13	0.04	0.26	1	9	0.02	0.18
.5-1.0	.02-.04	Coarse	3	33	0.06	0.66	2	10	0.07	0.33	3	16	0.06	0.32	1	10	0.02	0.20
1.0-2.0	.04-.08	Very Coarse		33	0.00	0.66	2	12	0.07	0.40		16	0.00	0.32	2	12	0.04	0.24
2-4	.08-.16	Very Fine	3	36	0.06	0.72		12	0.00	0.40	1	17	0.02	0.34	2	14	0.04	0.28
4-5.7	.16-.22	Fine	1	37	0.02	0.74	1	13	0.03	0.43	1	18	0.02	0.36		14	0.00	0.28
5.7-8	.22-.31	Fine	1	38	0.02	0.76	1	14	0.03	0.47		18	0.00	0.36	5	19	0.10	0.38
8-11.3	.31-.44	Medium	9	47	0.18	0.94	5	19	0.17	0.63	4	22	0.08	0.44	6	25	0.12	0.50
11.3-16	.44-.63	Medium		47	0.00	0.94	6	25	0.20	0.83	4	26	0.08	0.52	6	31	0.12	0.62
16-22.6	.63-.89	Coarse	1	48	0.02	0.96	3	28	0.10	0.93	8	34	0.16	0.68	5	36	0.10	0.72
22.6-32	.89-1.26	Coarse	2	50	0.04	1.00	1	29	0.03	0.97	4	38	0.08	0.76	6	42	0.12	0.84
32-45	1.26-1.77	Very Coarse		50	0.00	1.00	1	30	0.03	1.00	2	40	0.04	0.80	5	47	0.10	0.94
45-64	1.77-2.5	Very Coarse		50	0.00	1.00		30	0.00	1.00	5	45	0.10	0.90	1	48	0.02	0.96
64-90	2.5-3.5	Small		50	0.00	1.00		30	0.00	1.00	2	47	0.04	0.94	1	49	0.02	0.98
90-128	3.5-5	Small		50	0.00	1.00		30	0.00	1.00	3	50	0.06	1.00	1	50	0.02	1.00
128-180	5-7.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
180-256	7.1-10.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
256-362	10.1-14.3	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
362-512	14.3-20	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
512-1024	20-40	Medium		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
		Bedrock		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00

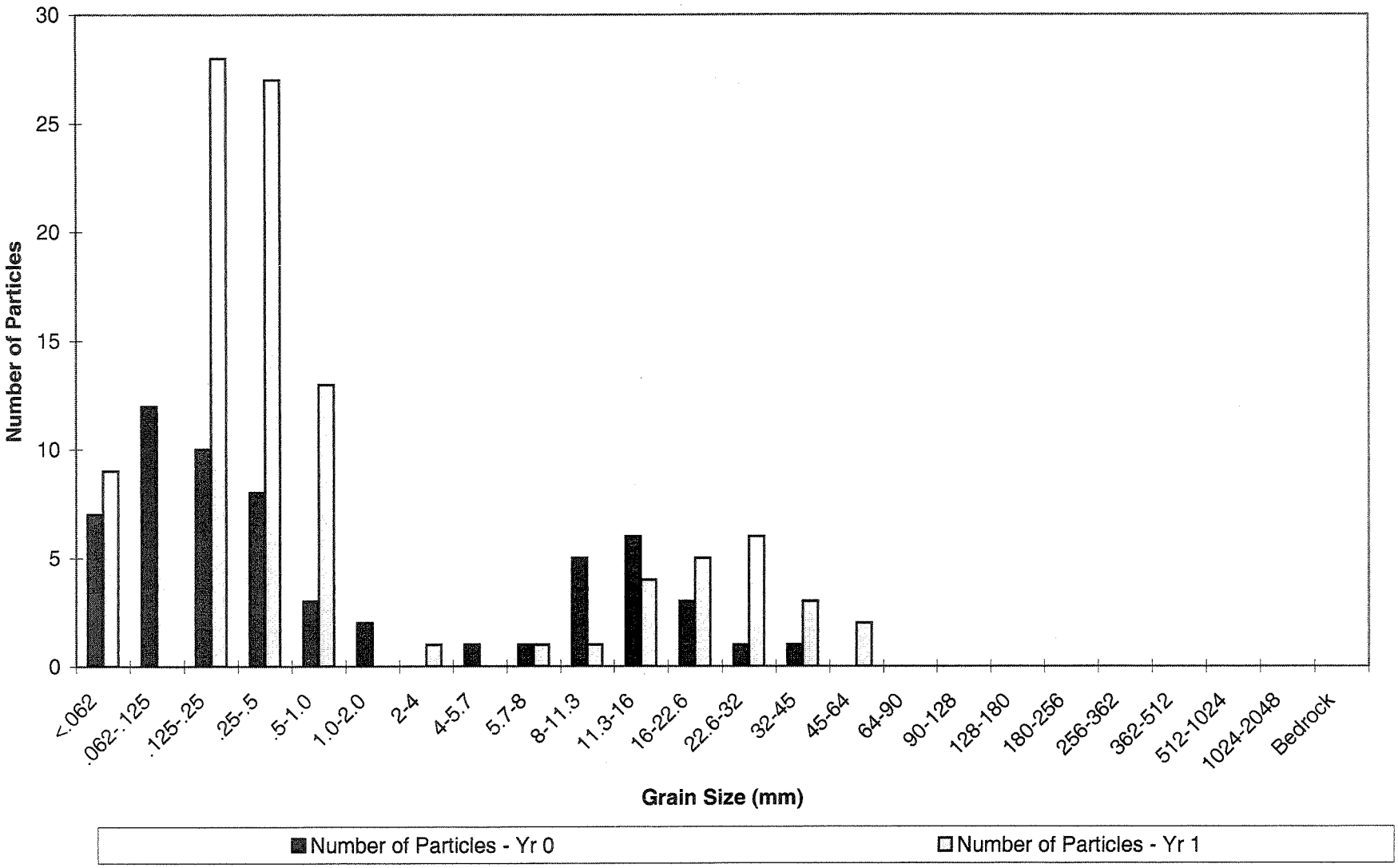
YEAR 1

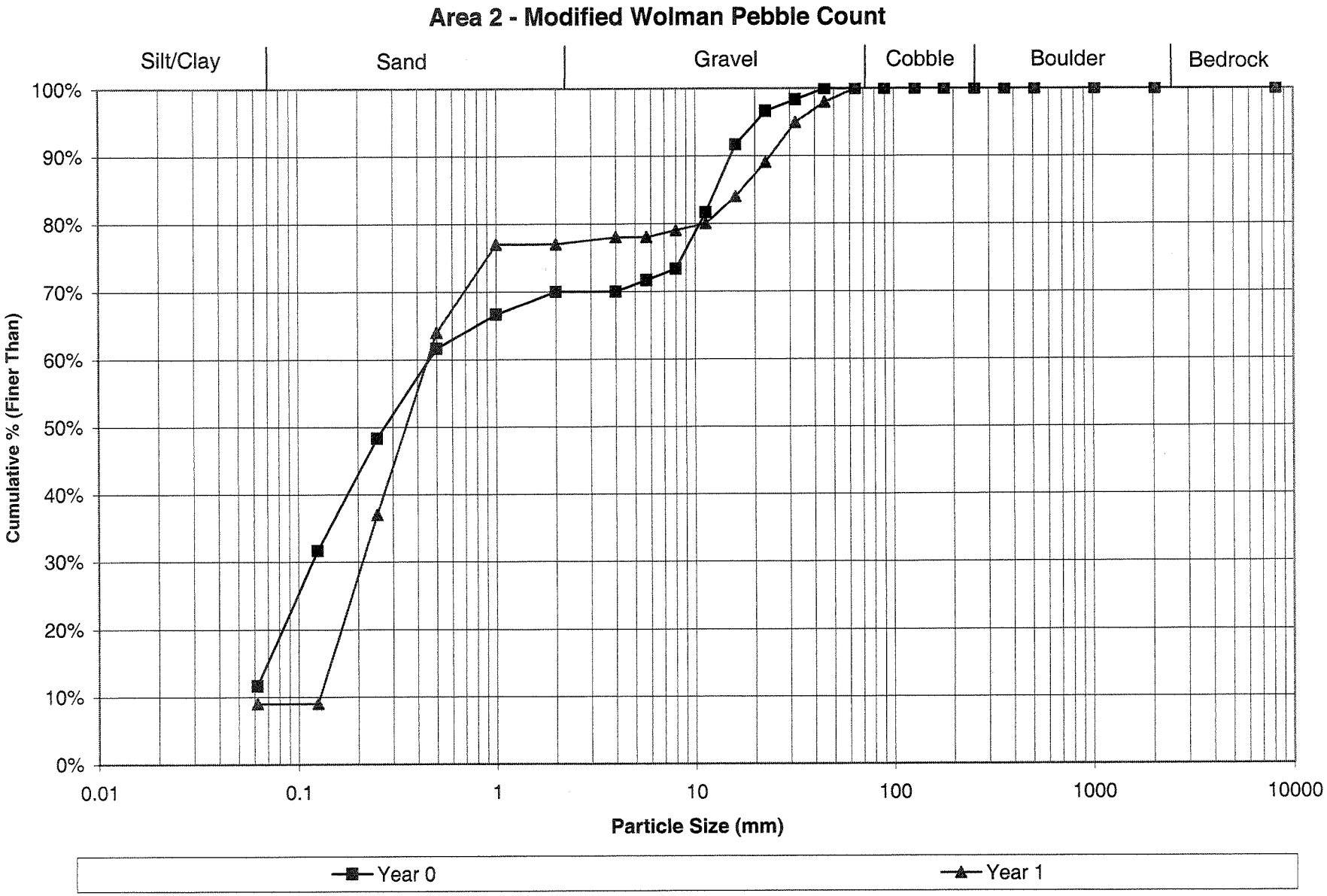
PEBBLE COUNT			Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	15	15	0.15	0.15	9	9	0.09	0.09	9	9	0.11	0.11	4	4	0.04	0.04
0.125	.062-.125	.002-.01	Very Fine	3	18	0.03	0.18		9	0.00	0.09	6	15	0.08	0.19	9	13	0.09	0.13
0.25	.125-.25		Fine	35	53	0.35	0.53	28	37	0.28	0.37	11	26	0.14	0.33	17	30	0.17	0.30
0.5	.25-.5	.01-.02	Medium	13	66	0.13	0.66	27	64	0.27	0.64	3	29	0.04	0.36	14	44	0.14	0.44
1	.5-1.0	.02-.04	Coarse	7	73	0.07	0.73	13	77	0.13	0.77	7	36	0.09	0.45	8	52	0.08	0.52
2	1.0-2.0	.04-.08	Very Coarse		73	0.00	0.73		77	0.00	0.77		36	0.00	0.45	1	53	0.01	0.53
4	2-4	.08-.16	Very Fine	5	78	0.05	0.78	1	78	0.01	0.78	4	40	0.05	0.50	3	56	0.03	0.56
5.7	4-5.7	.16-.22	Fine	2	80	0.02	0.80		78	0.00	0.78	2	42	0.03	0.53	4	60	0.04	0.60
8	5.7-8	.22-.31	Fine	4	84	0.04	0.84	1	79	0.01	0.79	1	43	0.01	0.54	2	62	0.02	0.62
11.3	8-11.3	.31-.44	Medium	7	91	0.07	0.91	1	80	0.01	0.80	7	50	0.09	0.63	4	66	0.04	0.66
16	11.3-16	.44-.63	Medium	6	97	0.06	0.97	4	84	0.04	0.84	2	52	0.03	0.65	4	70	0.04	0.70
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	5	89	0.05	0.89	3	55	0.04	0.69	6	76	0.06	0.76
32	22.6-32	.89-1.26	Coarse		98	0.00	0.98	6	95	0.06	0.95	6	61	0.08	0.76	9	85	0.09	0.85
45	32-45	1.26-1.77	Very Coarse	1	99	0.01	0.99	3	98	0.03	0.98	7	68	0.09	0.85	6	91	0.06	0.91
64	45-64	1.77-2.5	Very Coarse	1	100	0.01	1.00	2	100	0.02	1.00	7	75	0.09	0.94	9	100	0.09	1.00
90	64-90	2.5-3.5	Small		100	0.00	1.00		100	0.00	1.00	4	79	0.05	0.99		100	0.00	1.00
128	90-128	3.5-5	Small		100	0.00	1.00		100	0.00	1.00	1	80	0.01	1.00		100	0.00	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00

YEAR 1

PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
	<.062	<.002	Silt/Clay	1	1	0.02	0.02	5	5	0.10	0.10	6	6	0.15	0.15	2	2	0.04	0.04
	.062-.125	.002-.01	Very Fine	3	4	0.06	0.08		5	0.00	0.10	1	7	0.03	0.18	2	4	0.04	0.08
	.125-.25		Fine	10	14	0.20	0.28	4	9	0.08	0.18	1	8	0.03	0.20	6	10	0.12	0.20
	.25-.5	.01-.02	Medium	3	17	0.06	0.34	5	14	0.10	0.28	1	9	0.03	0.23	1	11	0.02	0.22
	.5-1.0	.02-.04	Coarse	6	23	0.12	0.46	13	27	0.26	0.54	1	10	0.03	0.25	4	15	0.08	0.30
	1.0-2.0	.04-.08	Very Coarse		23	0.00	0.46		27	0.00	0.54		10	0.00	0.25		15	0.00	0.30
	2-4	.08-.16	Very Fine	5	28	0.10	0.56	1	28	0.02	0.56	3	13	0.08	0.33	2	17	0.04	0.34
	4-5.7	.16-.22	Fine	2	30	0.04	0.60		28	0.00	0.56		13	0.00	0.33	3	20	0.06	0.40
	5.7-8	.22-.31	Fine	4	34	0.08	0.68	1	29	0.02	0.58		13	0.00	0.33	1	21	0.02	0.42
	8-11.3	.31-.44	Medium	7	41	0.14	0.82	1	30	0.02	0.60	2	15	0.05	0.38	3	24	0.06	0.48
	11.3-16	.44-.63	Medium	6	47	0.12	0.94	4	34	0.08	0.68	2	17	0.05	0.43	5	29	0.10	0.58
	16-22.6	.63-.89	Coarse	1	48	0.02	0.96	5	39	0.10	0.78	1	18	0.03	0.45	5	34	0.10	0.68
	22.6-32	.89-1.26	Coarse		48	0.00	0.96	6	45	0.12	0.90	5	23	0.13	0.58	7	41	0.14	0.82
	32-45	1.26-1.77	Very Coarse	1	49	0.02	0.98	3	48	0.06	0.96	7	30	0.18	0.75	2	43	0.04	0.86
	45-64	1.77-2.5	Very Coarse	1	50	0.02	1.00	2	50	0.04	1.00	5	35	0.13	0.88	7	50	0.14	1.00
	64-90	2.5-3.5	Small		50	0.00	1.00		50	0.00	1.00	4	39	0.10	0.98		50	0.00	1.00
	90-128	3.5-5	Small		50	0.00	1.00		50	0.00	1.00	1	40	0.03	1.00		50	0.00	1.00
	128-180	5-7.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	180-256	7.1-10.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	256-362	10.1-14.3	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	362-512	14.3-20	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	512-1024	20-40	Medium		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
			Bedrock		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00

Area 2 - Modified Wolman Pebble Count




Area 2 - Modified Wolman Pebble Count
Silt/Clay
Sand
Gravel
Cobble
Boulder
Bedrock
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative % (Finer Than)
0.01
0.1
1
10
100
1000
10000
Particle Size (mm)
Year 0
Year 1

Vegetation

Plot #1 (Bareroot)	(10x100)	
Pinus taeda		2
Cornus drummondii		1
Plot #2 (Stakes)	(5x50)	
Salix nigra		15
Cornus amomum		8
Sambucus canadensis		1
Viburnum dentatum		0
Plot #3 (Stakes)	(5x50)	
Salix nigra		13
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #4 (Bareroot)	(10x100)	
Cornus drummondii		3
Juglans nigra		1
Plot #5 (Stakes)	(5x100)	
Salix nigra		27
Cornus amomum		18
Sambucus canadensis		1
Viburnum dentatum		0
Plot #6 (Stakes)	(5x100)	
Salix nigra		39
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #7 (Bareroot)	(10x100)	
Pinus virginiana		1

Plot #8 (Stakes)	(5x50)	
Salix nigra		10
Cornus amomum		5
Sambucus canadensis		0
Viburnum dentatum		1
Plot #9 (Stakes)	(5x50)	
Salix nigra		9
Cornus amomum		3
Sambucus canadensis		0
Viburnum dentatum		0
Plot #10 (Stakes)	(5x50)	
Salix nigra		11
Cornus amomum		9
Sambucus canadensis		0
Viburnum dentatum		2
Plot #11 (Stakes)	(5x50)	
Salix nigra		18
Cornus amomum		9
Sambucus canadensis		0
Viburnum dentatum		2
Plot #12 (Bareroot)	(10x100)	
Juglans nigra		1
Cornus drummondii		1

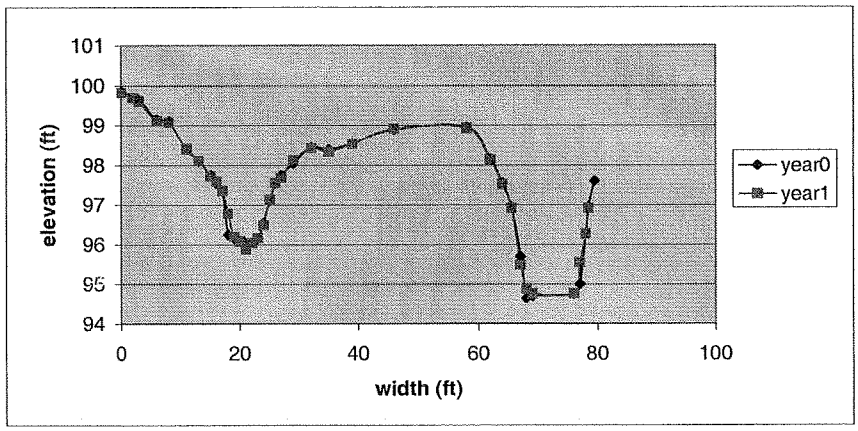
AREA 3: Stream Geometry and Substrate Data

Cross-Section

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 3
Section Riffle CLASSIFICATION
Location STA (PINS I,J)

H OF I (ft) 105.85 year 0
H OF I (ft) 105.63 year 1

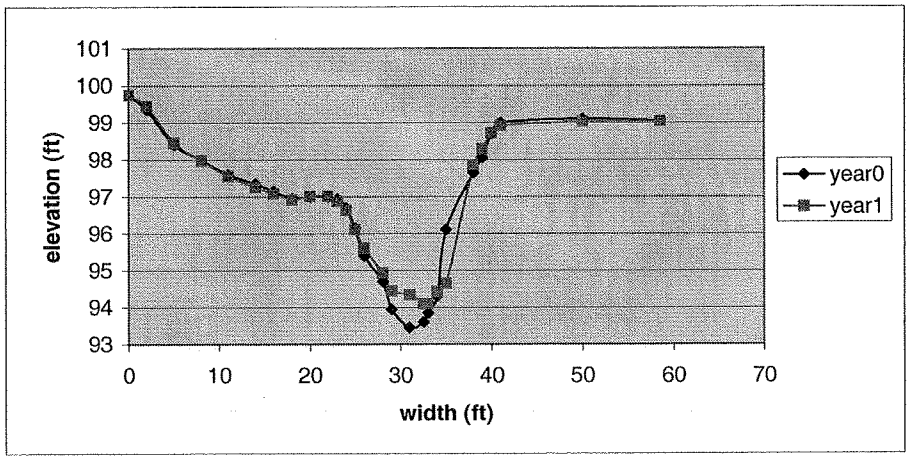


year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
ground	0	99.85	6		0	99.82	5.81
	3	99.65	6.2		2	99.7	5.93
	6	99.15	6.7		3	99.61	6.02
	8	99.1	6.75		6	99.11	6.52
	11	98.4	7.45		8	99.07	6.56
	13	98.1	7.75		11	98.41	7.22
	15	97.75	8.1		13	98.11	7.52
	16	97.55	8.3		15	97.72	7.91
	17	97.35	8.5		16	97.59	8.04
	18	96.25	9.6		17	97.35	8.28
	19	96.15	9.7		18	96.78	8.85
	20	96.1	9.75		19	96.2	9.43
	21	96.05	9.8		20	96.08	9.55
	22	96.05	9.8		21	95.88	9.75
	23	96.15	9.7		22	96.04	9.59
	24	96.55	9.3		23	96.16	9.47
	25	97.1	8.75		24	96.49	9.14
	26	97.55	8.3		25	97.12	8.51
	27	97.75	8.1		26	97.55	8.08
	29	98.05	7.8		27	97.68	7.95
	32	98.45	7.4		29	98.12	7.51
	35	98.4	7.45		32	98.43	7.2
	39	98.55	7.3		35	98.34	7.29
	46	98.9	6.95		39	98.53	7.1
	58	98.95	6.9		46	98.91	6.72
	62	98.15	7.7		58	98.93	6.7
	64	97.55	8.3		62	98.13	7.5
	65.5	96.95	8.9		64	97.51	8.12
	67	95.7	10.15		65.5	96.92	8.71
	68	94.65	11.2		67	95.48	10.15
	69	94.7	11.15		68	94.88	10.75
	76	94.75	11.1		69	94.76	10.87
	77	95	10.85		76	94.76	10.87
	78	96.3	9.55		77	95.55	10.08
	78.5	96.95	8.9		78	96.27	9.36
	79.5	97.6	8.25		78.5	96.92	8.71
	81	98.6	7.25		79.5	97.75	7.88
	84	98.35	7.5		81	98.62	7.01
	87	97.95	7.9		84	98.38	7.25
	90.33	97.7	8.15		87	97.93	7.7
pins		97.85	8		90.33	97.71	7.92
						97.83	7.8

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 3
Section Pool **CLASSIFICATION**
Location STA (PINS K,L)

H OF I (ft) 106.9 year 0
H OF I (ft) 106.65 year 1



year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.75	7.15		0	99.75	6.9
	2	99.35	7.55		2	99.44	7.21
	5	98.4	8.5		5	98.46	8.19
	8	98	8.9		8	97.97	8.68
	11	97.6	9.3		11	97.56	9.09
	14	97.35	9.55		14	97.25	9.4
	16	97.15	9.75		16	97.09	9.56
	18	96.95	9.95		18	96.92	9.73
	20	97	9.9		20	97.01	9.64
	22	97	9.9		22	97.01	9.64
	23	96.95	9.95		23	96.87	9.78
	24	96.7	10.2		24	96.63	10.02
	25	96.15	10.75		25	96.11	10.54
	26	95.4	11.5		26	95.61	11.04
	28	94.7	12.2		28	94.94	11.71
	29	93.95	12.95		29	94.45	12.2
	31	93.45	13.45		31	94.35	12.3
	32.5	93.6	13.3		32.5	94.1	12.55
	33	93.85	13.05		33	94.1	12.55
	34	94.3	12.6		34	94.43	12.22
	35	96.1	10.8		35	94.65	12
	38	97.65	9.25		38	97.85	8.8
	39	98.05	8.85		39	98.29	8.36
	40	98.7	8.2		40	98.71	7.94
	41	99	7.9		41	98.91	7.74
	50	99.1	7.8		50	99.03	7.62
	58.5	99.05	7.85		58.5	99.04	7.61
		99.25	7.65			99.21	7.44

Longitudinal Profile

Longitudinal Profile
Jumping Run Creek
Monitoring Document
AREA 3

BM	100	year0
BM	100	year1

YEAR 0

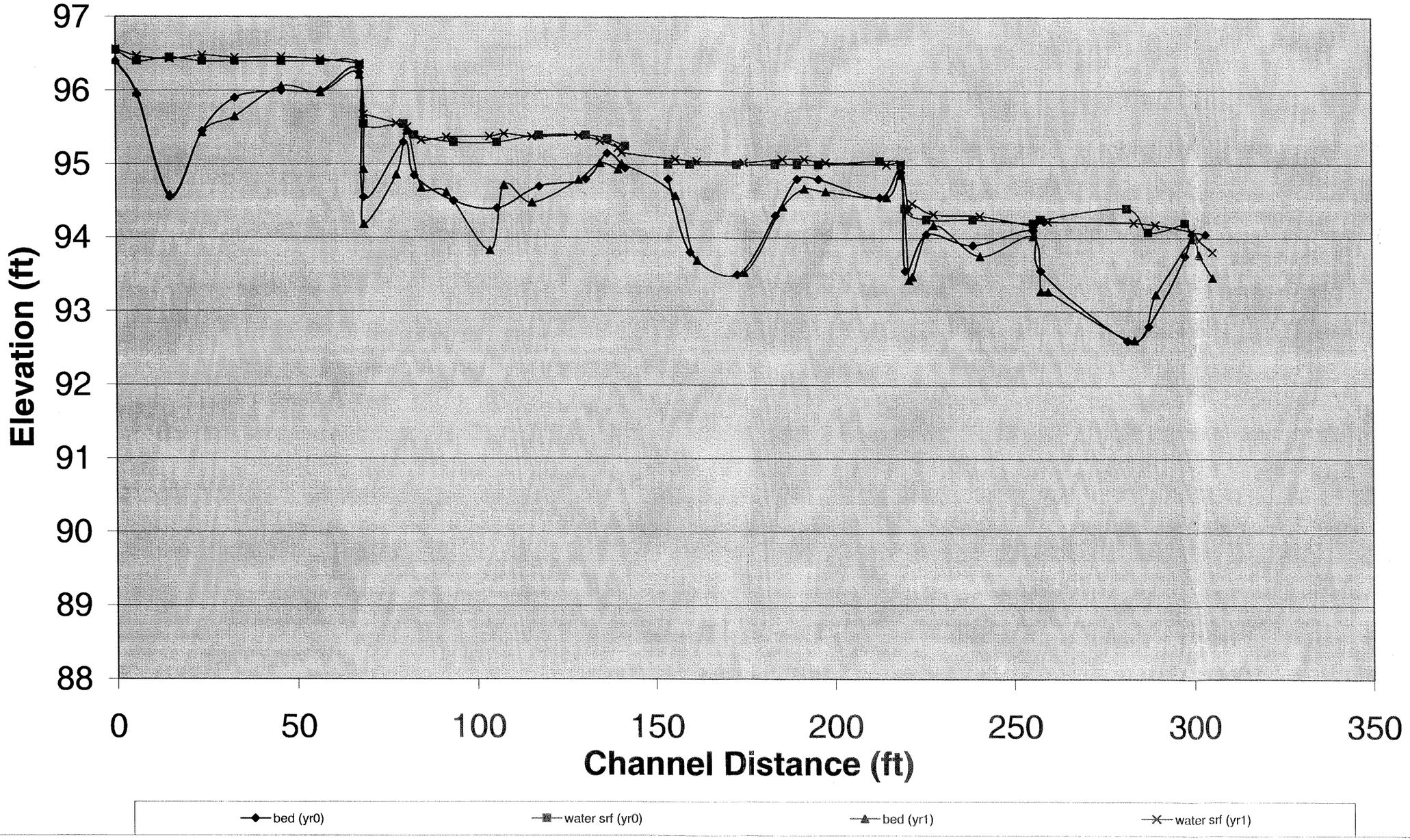
Notes	Station	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pin u/s of tributary (BM		4.9	104.9													
riffle	0	4.9	104.9		8.5	0.15					96.4	96.55				
	6	4.9	104.9		8.95	0.45					95.95	96.4				
center of pool (tributary)	15	4.9	104.9		10.35	1.9					94.55	96.45				
	24	4.9	104.9		9.45	0.95					95.45	96.4				
	33	4.9	104.9		9	0.5					95.9	96.4				
	46	4.9	104.9		8.9	0.4					96	96.4				
	57	4.9	104.9		8.9	0.4					96	96.4				
top of notch in log	68	4.9	104.9		8.65	0.1					96.25	96.35				
	69	4.9	104.9		10.35	1					94.55	95.55				
logvane	80	4.9	104.9		9.6	0.25					95.3	95.55				
below logvane	83	4.9	104.9		10.05	0.55					94.85	95.4				
begin pool	94	4.9	104.9		10.4	0.8					94.5	95.3				
	106	4.9	104.9		10.5	0.9					94.4	95.3				
end of pool/begin glide	118	4.9	104.9		10.2	0.7					94.7	95.4				
	131	4.9	104.9		10.1	0.6					94.8	95.4				
top of riffle	137	4.9	104.9		9.75	0.2					95.15	95.35				
center of riffle	142	4.9	104.9		9.95	0.3					94.95	95.25				
xsection riffle	143	4.9	104.9													
end riffle/begin run	154	4.9	104.9		10.1	0.2					94.8	95				
end run/begin pool	160	4.9	104.9		11.1	1.2					93.8	95				
center of pool	173	4.9	104.9		11.4	1.5					93.5	95				
end pool	184	4.9	104.9		10.6	0.7					94.3	95				
	190	4.9	104.9		10.1	0.2					94.8	95				
	196	4.9	104.9		10.1	0.2					94.8	95				
	213	4.9	104.9		10.35	0.5					94.55	95.05				
top of notch in log	219	4.9	104.9		10	0.1					94.9	95				
	220	4.9	104.9		11.35	0.85					93.55	94.4				
	226	4.9	104.9		10.85	0.2					94.05	94.25				
	239	4.9	104.9		11	0.35					93.9	94.25				
top of log vane	256	4.9	104.9		10.8	0.1					94.1	94.2				
	258	4.9	104.9		11.35	0.7					93.55	94.25				
center of pool/xsection	282	4.9	104.9		12.3	1.8					92.6	94.4				
	288	4.9	104.9		12.1	1.28					92.8	94.08				
	298	4.9	104.9		11.15	0.45					93.75	94.2				
top of riffle	300	4.9	104.9		10.85						94.05					
center of riffle	304	4.9	104.9		10.85						94.05					

YEAR 1

Notes	Station	Station Adjusted*	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pin u/s of tributary (BM			4.68	104.68													
	0	0	4.68	104.68		8.27	0.15					96.41	96.56				
	6	6	4.68	104.68		8.71	0.5					95.97	96.47				
center of pool, trib	15	15	4.68	104.68		10.1	1.85					94.58	96.43				
	24	24	4.68	104.68		9.25	1.05					95.43	96.48				
	33	33	4.68	104.68		9.03	0.8					95.65	96.45				
	46	46	4.68	104.68		8.62	0.4					96.06	96.46				
	57	57	4.68	104.68		8.7	0.45					95.98	96.43				
top of log	68	68	4.68	104.68		8.46	0.15					96.22	96.37				
d/s log	69	69	4.68	104.68		9.75						94.93					
scour pool	71	69	4.68	104.68		10.5	1.5					94.18	95.68				
	80	78	4.68	104.68		9.82	0.7					94.86	95.56				
top of log vane	83	81	4.68	104.68		9.22	0.05					95.46	95.51				
	87	85	4.68	104.68		10	0.65					94.68	95.33				
	94	92	4.68	104.68		10.06	0.75					94.62	95.37				
pool	106	104	4.68	104.68		10.85	1.55					93.83	95.38				
top of glide	110	108	4.68	104.68		9.96	0.7					94.72	95.42				
	118	116	4.68	104.68		10.2	0.9					94.48	95.38				
top of riffle	131	129	4.68	104.68		9.89	0.6					94.79	95.39				
	137	135	4.68	104.68		9.66	0.3					95.02	95.32				
center of pool	142	140	4.68	104.68		9.75	0.3					94.93	95.23				
riffle	143	141	4.68	104.68		9.67	0.15					95.01	95.16				
end riffle/begin run	154	156	4.68	104.68		10.11	0.5					94.57	95.07				
end run/begin pool	160	162	4.68	104.68		10.99	1.35					93.69	95.04				
pool	173	175	4.68	104.68		11.15	1.5					93.53	95.03				
end pool/begin glide	184	186	4.68	104.68		10.26	0.65					94.42	95.07				
	190	192	4.68	104.68		10.01	0.4					94.67	95.07				
	196	198	4.68	104.68		10.05	0.4					94.63	95.03				
u/s log	213	215	4.68	104.68		10.13	0.45					94.55	95				
	217	219	4.68	104.68		9.82	0.15					94.86	95.01				
top of log	219	221	4.68	104.68		11.26	0.95					93.42	94.37				
scour pool	220	222	4.68	104.68		11.21	1					93.47	94.47				
riffle	226	228	4.68	104.68		10.51	0.15					94.17	94.32				
run	239	241	4.68	104.68		10.93	0.55					93.75	94.3				
top of log vane	254	256	4.68	104.68		10.66	0.15					94.02	94.17				
d/s log	256	258	4.68	104.68		11.41	0.95					93.27	94.22				
	258	260	4.68	104.68		11.41	0.95					93.27	94.22				
pool	282	284	4.68	104.68		12.07	1.6					92.61	94.21				
glide	288	290	4.68	104.68		11.45	0.95					93.23	94.18				
riffle	298	300	4.68	104.68		10.7	0.1					93.98	94.08				
riffle	300	302	4.68	104.68		10.91	0.2					93.77	93.97				
top of log	304	306	4.68	104.68		11.22	0.35					93.46	93.81				

*Station Adjusted to match existing Stationing from year 0 at physical features (i.e. structures). Inaccuracies in stationing due to the way the tape is laid down the centerline of the stream

Longitudinal Profile (AREA 3)



Modified Wolman Pebble Count

YEAR 0

PEBBLE COUNT			Combined	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	12	12	0.12	0.12	7	7	0.12	0.12	16	16	0.16	0.16	12	12	0.12	0.12
0.125	.062-.125	.002-.01	Very Fine	45	57	0.45	0.57	12	19	0.20	0.32	13	29	0.13	0.29	13	25	0.13	0.25
0.25	.125-.25		Fine	7	64	0.07	0.64	10	29	0.17	0.48	4	33	0.04	0.33	17	42	0.17	0.42
0.5	.25-.5	.01-.02	Medium	12	76	0.12	0.76	8	37	0.13	0.62	8	41	0.08	0.41	8	50	0.08	0.50
1	.5-1.0	.02-.04	Coarse	7	83	0.07	0.83	3	40	0.05	0.67	13	54	0.13	0.54	3	53	0.03	0.53
2	1.0-2.0	.04-.08	Very Coarse		83	0.00	0.83	2	42	0.03	0.70	2	56	0.02	0.56	2	55	0.02	0.55
4	2-4	.08-.16	Very Fine	3	86	0.03	0.86		42	0.00	0.70	1	57	0.01	0.57	2	57	0.02	0.57
5.7	4-5.7	.16-.22	Fine	1	87	0.01	0.87	1	43	0.02	0.72	2	59	0.02	0.59		57	0.00	0.57
8	5.7-8	.22-.31	Fine	1	88	0.01	0.88	1	44	0.02	0.73	5	64	0.05	0.64	5	62	0.05	0.62
11.3	8-11.3	.31-.44	Medium	9	97	0.09	0.97	5	49	0.08	0.82	4	68	0.04	0.68	6	68	0.06	0.68
16	11.3-16	.44-.63	Medium		97	0.00	0.97	6	55	0.10	0.92	10	78	0.10	0.78	8	76	0.08	0.76
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	3	58	0.05	0.97	5	83	0.05	0.83	6	82	0.06	0.82
32	22.6-32	.89-1.26	Coarse	2	100	0.02	1.00	1	59	0.02	0.98	3	86	0.03	0.86	6	88	0.06	0.88
45	32-45	1.26-1.77	Very Coarse		100	0.00	1.00	1	60	0.02	1.00	8	94	0.08	0.94	7	95	0.07	0.95
64	45-64	1.77-2.5	Very Coarse		100	0.00	1.00		60	0.00	1.00	3	97	0.03	0.97	2	97	0.02	0.97
90	64-90	2.5-3.5	Small		100	0.00	1.00		60	0.00	1.00	3	100	0.03	1.00	2	99	0.02	0.99
128	90-128	3.5-5	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00	1	100	0.01	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00

YEAR 0

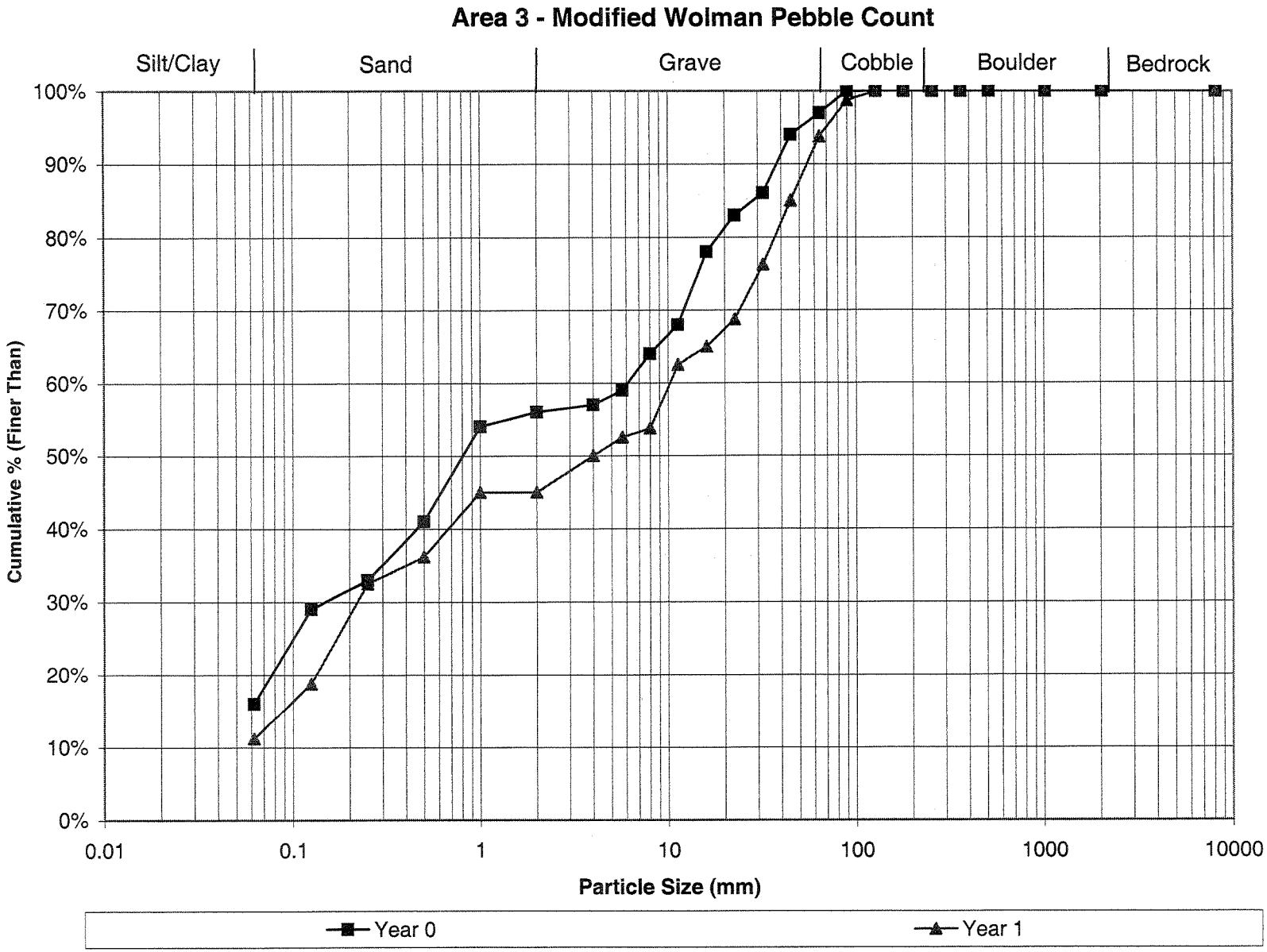
PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
<.062	<.002	Silt/Clay	10	10	0.20	0.20	1	1	0.03	0.03	9	9	0.18	0.18	4	4	0.08	0.08
.062-.125	.002-.01	Very Fine	6	16	0.12	0.32	2	3	0.07	0.10	2	11	0.04	0.22	4	8	0.08	0.16
.125-.25		Fine	5	21	0.10	0.42	2	5	0.07	0.17		11	0.00	0.22		8	0.00	0.16
.25-.5	.01-.02	Medium	9	30	0.18	0.60	3	8	0.10	0.27	2	13	0.04	0.26	1	9	0.02	0.18
.5-1.0	.02-.04	Coarse	3	33	0.06	0.66	2	10	0.07	0.33	3	16	0.06	0.32	1	10	0.02	0.20
1.0-2.0	.04-.08	Very Coarse		33	0.00	0.66	2	12	0.07	0.40		16	0.00	0.32	2	12	0.04	0.24
2-4	.08-.16	Very Fine	3	36	0.06	0.72		12	0.00	0.40	1	17	0.02	0.34	2	14	0.04	0.28
4-5.7	.16-.22	Fine	1	37	0.02	0.74	1	13	0.03	0.43	1	18	0.02	0.36		14	0.00	0.28
5.7-8	.22-.31	Fine	1	38	0.02	0.76	1	14	0.03	0.47		18	0.00	0.36	5	19	0.10	0.38
8-11.3	.31-.44	Medium	9	47	0.18	0.94	5	19	0.17	0.63	4	22	0.08	0.44	6	25	0.12	0.50
11.3-16	.44-.63	Medium		47	0.00	0.94	6	25	0.20	0.83	4	26	0.08	0.52	6	31	0.12	0.62
16-22.6	.63-.89	Coarse	1	48	0.02	0.96	3	28	0.10	0.93	8	34	0.16	0.68	5	36	0.10	0.72
22.6-32	.89-1.26	Coarse	2	50	0.04	1.00	1	29	0.03	0.97	4	38	0.08	0.76	6	42	0.12	0.84
32-45	1.26-1.77	Very Coarse		50	0.00	1.00	1	30	0.03	1.00	2	40	0.04	0.80	5	47	0.10	0.94
45-64	1.77-2.5	Very Coarse		50	0.00	1.00		30	0.00	1.00	5	45	0.10	0.90	1	48	0.02	0.96
64-90	2.5-3.5	Small		50	0.00	1.00		30	0.00	1.00	2	47	0.04	0.94	1	49	0.02	0.98
90-128	3.5-5	Small		50	0.00	1.00		30	0.00	1.00	3	50	0.06	1.00	1	50	0.02	1.00
128-180	5-7.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
180-256	7.1-10.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
256-362	10.1-14.3	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
362-512	14.3-20	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
512-1024	20-40	Medium		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00
		Bedrock		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00

YEAR 1

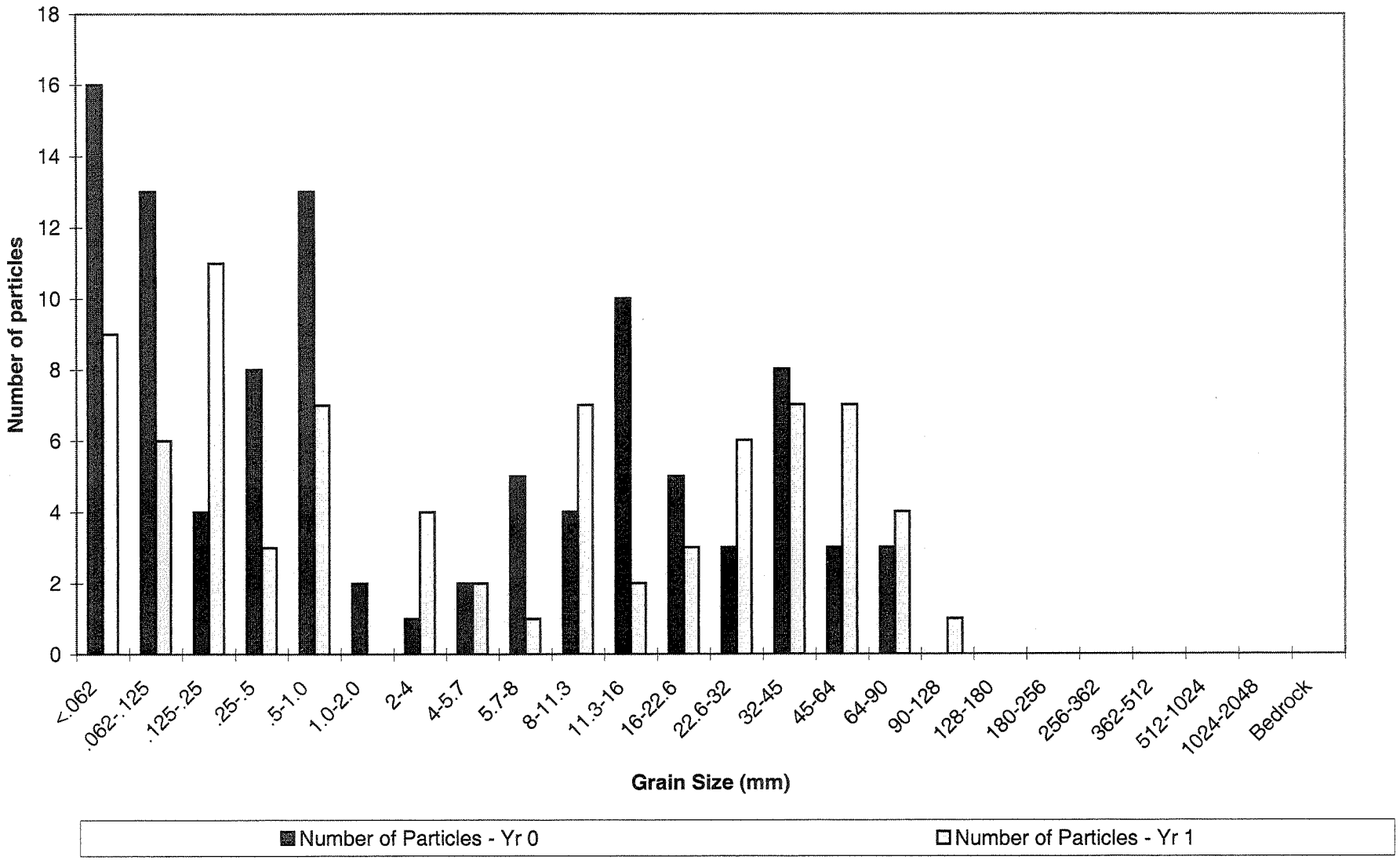
	PEBBLE COUNT		Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	15	15	0.15	0.15	9	9	0.09	0.09	9	9	0.11	0.11	4	4	0.04	0.04
0.125	.062-.125	.002-.01	Very Fine	3	18	0.03	0.18		9	0.00	0.09	6	15	0.08	0.19	9	13	0.09	0.13
0.25	.125-.25		Fine	35	53	0.35	0.53	28	37	0.28	0.37	11	26	0.14	0.33	17	30	0.17	0.30
0.5	.25-.5	.01-.02	Medium	13	66	0.13	0.66	27	64	0.27	0.64	3	29	0.04	0.36	14	44	0.14	0.44
1	.5-1.0	.02-.04	Coarse	7	73	0.07	0.73	13	77	0.13	0.77	7	36	0.09	0.45	8	52	0.08	0.52
2	1.0-2.0	.04-.08	Very Coarse		73	0.00	0.73		77	0.00	0.77		36	0.00	0.45	1	53	0.01	0.53
4	2-4	.08-.16	Very Fine	5	78	0.05	0.78	1	78	0.01	0.78	4	40	0.05	0.50	3	56	0.03	0.56
5.7	4-5.7	.16-.22	Fine	2	80	0.02	0.80		78	0.00	0.78	2	42	0.03	0.53	4	60	0.04	0.60
8	5.7-8	.22-.31	Fine	4	84	0.04	0.84	1	79	0.01	0.79	1	43	0.01	0.54	2	62	0.02	0.62
11.3	8-11.3	.31-.44	Medium	7	91	0.07	0.91	1	80	0.01	0.80	7	50	0.09	0.63	4	66	0.04	0.66
16	11.3-16	.44-.63	Medium	6	97	0.06	0.97	4	84	0.04	0.84	2	52	0.03	0.65	4	70	0.04	0.70
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	5	89	0.05	0.89	3	55	0.04	0.69	6	76	0.06	0.76
32	22.6-32	.89-1.26	Coarse		98	0.00	0.98	6	95	0.06	0.95	6	61	0.08	0.76	9	85	0.09	0.85
45	32-45	1.26-1.77	Very Coarse	1	99	0.01	0.99	3	98	0.03	0.98	7	68	0.09	0.85	6	91	0.06	0.91
64	45-64	1.77-2.5	Very Coarse	1	100	0.01	1.00	2	100	0.02	1.00	7	75	0.09	0.94	9	100	0.09	1.00
90	64-90	2.5-3.5	Small		100	0.00	1.00		100	0.00	1.00	4	79	0.05	0.99		100	0.00	1.00
128	90-128	3.5-5	Small		100	0.00	1.00		100	0.00	1.00	1	80	0.01	1.00		100	0.00	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00

YEAR 1

PEBBLE COUNT		Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
<.062	<.002	Silt/Clay	1	1	0.02	0.02	5	5	0.10	0.10	6	6	0.15	0.15	2	2	0.04	0.04
.062-.125	.002-.01	Very Fine	3	4	0.06	0.08		5	0.00	0.10	1	7	0.03	0.18	2	4	0.04	0.08
.125-.25		Fine	10	14	0.20	0.28	4	9	0.08	0.18	1	8	0.03	0.20	6	10	0.12	0.20
.25-.5	.01-.02	Medium	3	17	0.06	0.34	5	14	0.10	0.28	1	9	0.03	0.23	1	11	0.02	0.22
.5-1.0	.02-.04	Coarse	6	23	0.12	0.46	13	27	0.26	0.54	1	10	0.03	0.25	4	15	0.08	0.30
1.0-2.0	.04-.08	Very Coarse		23	0.00	0.46		27	0.00	0.54		10	0.00	0.25		15	0.00	0.30
2-4	.08-.16	Very Fine	5	28	0.10	0.56	1	28	0.02	0.56	3	13	0.08	0.33	2	17	0.04	0.34
4-5.7	.16-.22	Fine	2	30	0.04	0.60		28	0.00	0.56		13	0.00	0.33	3	20	0.06	0.40
5.7-8	.22-.31	Fine	4	34	0.08	0.68	1	29	0.02	0.58		13	0.00	0.33	1	21	0.02	0.42
8-11.3	.31-.44	Medium	7	41	0.14	0.82	1	30	0.02	0.60	2	15	0.05	0.38	3	24	0.06	0.48
11.3-16	.44-.63	Medium	6	47	0.12	0.94	4	34	0.08	0.68	2	17	0.05	0.43	5	29	0.10	0.58
16-22.6	.63-.89	Coarse	1	48	0.02	0.96	5	39	0.10	0.78	1	18	0.03	0.45	5	34	0.10	0.68
22.6-32	.89-1.26	Coarse		48	0.00	0.96	6	45	0.12	0.90	5	23	0.13	0.58	7	41	0.14	0.82
32-45	1.26-1.77	Very Coarse	1	49	0.02	0.98	3	48	0.06	0.96	7	30	0.18	0.75	2	43	0.04	0.86
45-64	1.77-2.5	Very Coarse	1	50	0.02	1.00	2	50	0.04	1.00	5	35	0.13	0.88	7	50	0.14	1.00
64-90	2.5-3.5	Small		50	0.00	1.00		50	0.00	1.00	4	39	0.10	0.98		50	0.00	1.00
90-128	3.5-5	Small		50	0.00	1.00		50	0.00	1.00	1	40	0.03	1.00		50	0.00	1.00
128-180	5-7.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
180-256	7.1-10.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
256-362	10.1-14.3	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
362-512	14.3-20	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
512-1024	20-40	Medium		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
		Bedrock		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00


Area 3 - Modified Wolman Pebble Count
Silt/Clay
Sand
Grave
Cobble
Boulder
Bedrock
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative % (Finer Than)
0.01
0.1
1
10
100
1000
10000
Particle Size (mm)
Year 0
Year 1

Area 3 - Modified Wolman Pebble Count



Vegetation

Plot #1 (Bareroot)	(10x100)	
Pinus taeda		2
Cornus drummondii		1
Plot #2 (Stakes)	(5x50)	
Salix nigra		15
Cornus amomum		8
Sambucus canadensis		1
Viburnum dentatum		0
Plot #3 (Stakes)	(5x50)	
Salix nigra		13
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #4 (Bareroot)	(10x100)	
Cornus drummondii		3
Juglans nigra		1
Plot #5 (Stakes)	(5x100)	
Salix nigra		27
Cornus amomum		18
Sambucus canadensis		1
Viburnum dentatum		0
Plot #6 (Stakes)	(5x100)	
Salix nigra		39
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #7 (Bareroot)	(10x100)	
Pinus virginiana		1

Plot #8 (Stakes)	(5x50)
Salix nigra	10
Cornus amomum	5
Sambucus canadensis	0
Viburnum dentatum	1

Plot #9 (Stakes)	(5x50)
Salix nigra	9
Cornus amomum	3
Sambucus canadensis	0
Viburnum dentatum	0

Plot #10 (Stakes)	(5x50)
Salix nigra	11
Cornus amomum	9
Sambucus canadensis	0
Viburnum dentatum	2

Plot #11 (Stakes)	(5x50)
Salix nigra	18
Cornus amomum	9
Sambucus canadensis	0
Viburnum dentatum	2

Plot #12 (Bareroot)	(10x100)
Juglans nigra	1
Cornus drummondii	1

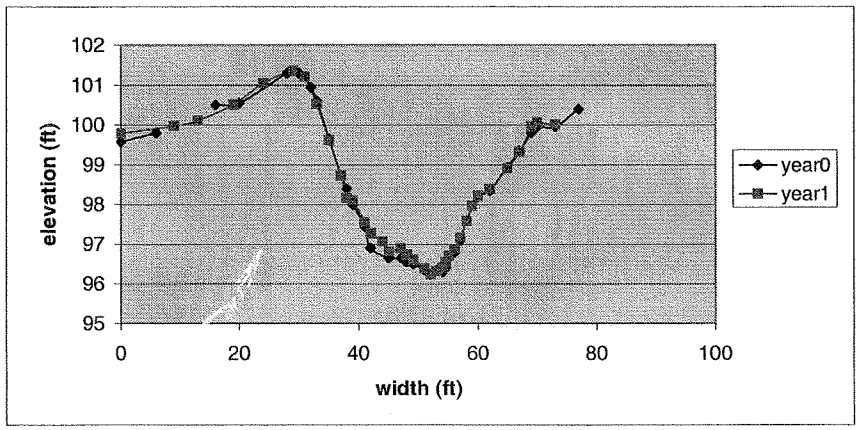
AREA 4: Stream Geometry and Substrate Data

Cross-Section

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 4
Section Riffle **CLASSIFICATION**
Location STA (PINS M,N)

H OF I (ft) 105 year 0
H OF I (ft) 105.21 year 1

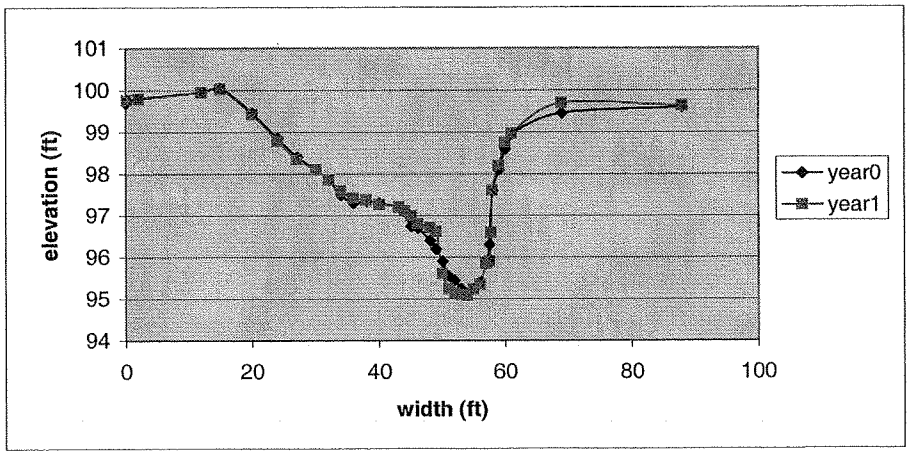


year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.58	5.42		0	99.79	5.42
	6	99.8	5.2		9	99.98	5.23
	12				13	100.11	5.1
	16	100.5	4.5		19	100.51	4.7
	20	100.55	4.45		24	101.05	4.16
	28	101.3	3.7		29	101.35	3.86
	30	101.3	3.7		31	101.21	4
	32	100.95	4.05		33	100.53	4.68
	33	100.6	4.4		35	99.61	5.6
	35	99.65	5.35		37	98.73	6.48
	37	98.75	6.25		38	98.17	7.04
	38	98.4	6.6		39	98.11	7.1
	39	98	7		41	97.56	7.65
	41	97.45	7.55		42	97.27	7.94
	42	96.9	8.1		44	97.07	8.14
	45	96.65	8.35		45	96.81	8.4
	47	96.65	8.35		47	96.89	8.32
	48	96.55	8.45		48	96.73	8.48
	49	96.5	8.5		49	96.6	8.61
	51	96.35	8.65		51	96.39	8.82
	52	96.25	8.75		52	96.25	8.96
	53	96.35	8.65		53	96.32	8.89
	54	96.3	8.7		54	96.4	8.81
	54.5	96.4	8.6		54.5	96.55	8.66
	55	96.65	8.35		55	96.71	8.5
	56	96.8	8.2		56	96.88	8.33
	57	97.1	7.9		57	97.16	8.05
	58	97.6	7.4		58	97.58	7.63
	60	98.2	6.8		59	97.96	7.25
	62	98.35	6.65		60	98.21	7
	65	98.95	6.05		62	98.39	6.82
	67	99.35	5.65		65	98.91	6.3
	69	99.81	5.19		67	99.32	5.89
	70	99.95	5.05		69	99.96	5.25
	73	99.95	5.05		70	100.06	5.15
	77	100.4	4.6		73	100.01	5.2
	85	100.6	4.4		77	100.37	4.84
		100.79	4.21		85	100.61	4.6
						100.8	4.41

Cross Section Geometry
Jumping Run Creek
Monitoring Report

AREA 4
Section **Pool** **CLASSIFICATION**
Location **STA (PINS O,P)**

H OF I (ft) 105.15 year 0
H OF I (ft) 105.35 year 1



year 0				year 1			
Notes	Distance (ft)	elevation (ft)	FS (ft)	Notes	Distance (ft)	elevation (ft)	FS (ft)
	0	99.7	5.45		0	99.76	5.59
	2	99.8	5.35		2	99.79	5.56
	12	99.95	5.2		12	99.95	5.4
	15	100.05	5.1		15	100.03	5.32
	20	99.45	5.7		20	99.43	5.92
	24	98.85	6.3		24	98.79	6.56
	27	98.4	6.75		27	98.35	7
	30	98.1	7.05		30	98.1	7.25
	32	97.85	7.3		32	97.86	7.49
	34	97.5	7.65		34	97.6	7.75
	36	97.3	7.85		36	97.42	7.93
	38	97.35	7.8		38	97.38	7.97
	40	97.3	7.85		40	97.27	8.08
	43	97.2	7.95		43	97.22	8.13
	44	97.1	8.05		44	97.13	8.22
	45	96.75	8.4		45	97	8.35
	46	96.7	8.45		46	96.81	8.54
	48	96.4	8.75		48	96.71	8.64
	49	96.2	8.95		49	96.62	8.73
	50	95.9	9.25		50	95.62	9.73
	51	95.55	9.6		51	95.25	10.1
	52	95.45	9.7		52	95.15	10.2
	53	95.25	9.9		53	95.1	10.25
	54	95.1	10.05		54	95.09	10.26
	55	95.25	9.9		55	95.24	10.11
	56	95.4	9.75		56	95.35	10
	57	95.85	9.3		57	95.85	9.5
	57.5	96.3	8.85		57.5	95.9	9.45
	58	97.6	7.55		57.8	96.6	8.75
	59	98.1	7.05		58	97.61	7.74
	60	98.6	6.55		59	98.2	7.15
	61	98.95	6.2		60	98.75	6.6
	69	99.45	5.7		61	98.97	6.38
	88	99.6	5.55		69	99.69	5.66
		99.93	5.22		88	99.63	5.72
						99.94	5.41

Longitudinal Profile

Longitudinal Profile
Jumping Run Creek
Monitoring Document
AREA 4

BM 100 year0
BM 100 year1

YEAR 0

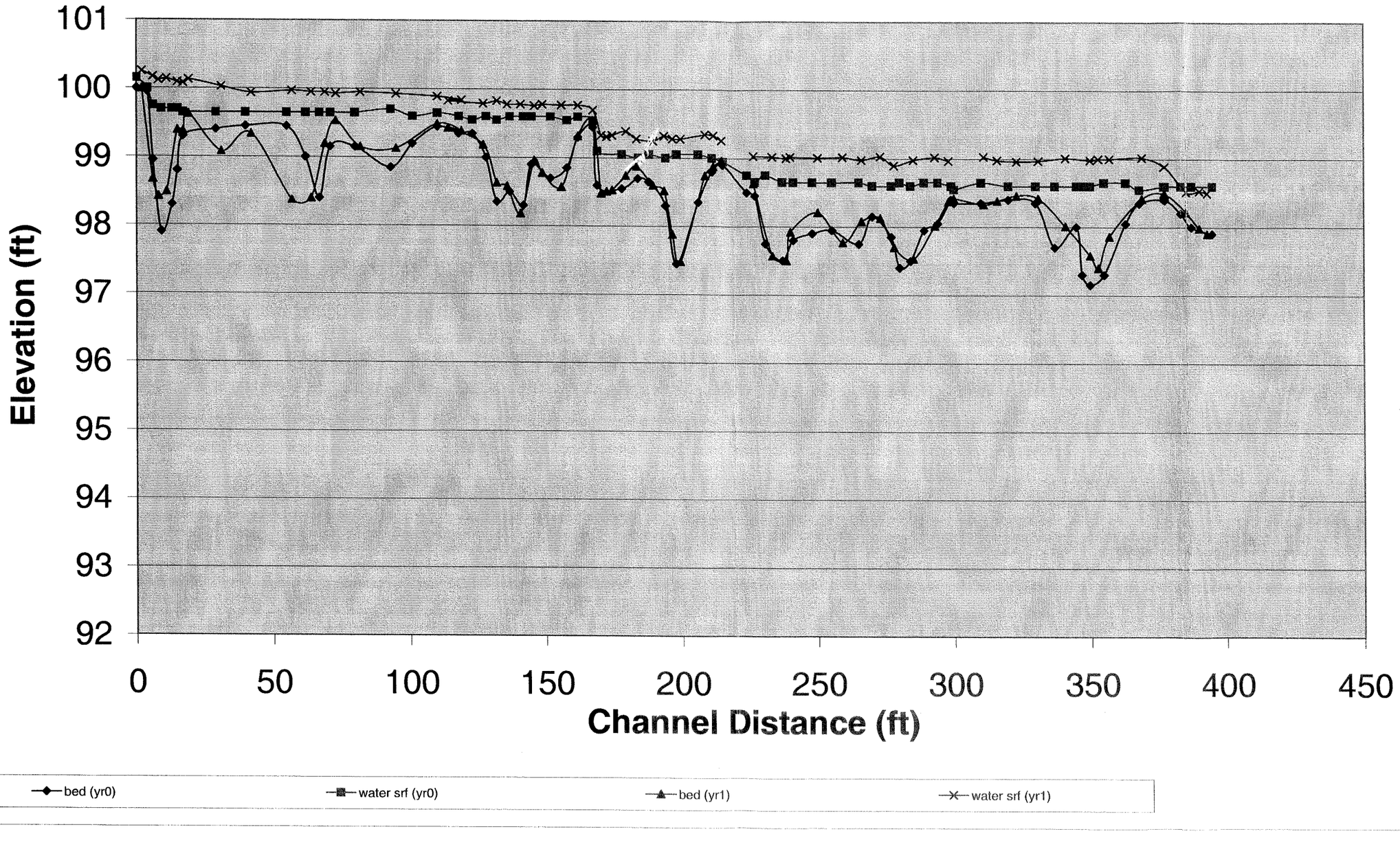
Notes	Station Original Field	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pin at fence between fence pst		7.35	107.35													
	0	7.35	107.35		7.35	0.15					100	100.15				
top of rock vane	4	7.35	107.35		7.4	0.05					99.95	100				
	6	7.35	107.35		8.4	0.8					98.95	99.75				
	9	7.35	107.35		9.45	1.8					97.9	99.7				
	13	7.35	107.35		9.05	1.4					98.3	99.7				
	15	7.35	107.35		8.55	0.9					98.8	99.7				
	17	7.35	107.35		8.05	0.35					99.3	99.65				
	29	7.35	107.35		7.95	0.25					99.4	99.65				
	40	7.35	107.35		7.9	0.2					99.45	99.65				
	55	7.35	107.35		7.9	0.2					99.45	99.65				
	62	7.35	107.35		8.35	0.65					99	99.65				
	67	7.35	107.35		8.95	1.25					98.4	99.65				
	71	7.35	107.35		8.2	0.5					99.15	99.65				
	80	7.35	107.35		8.2	0.5					99.15	99.65				
	93	7.35	107.35		8.5	0.85					98.85	99.7				
	101	7.35	107.35		8.15	0.4					99.2	99.6				
	110	7.35	107.35		7.9	0.2					99.45	99.65				
	118	7.35	107.35		8	0.25					99.35	99.6				
	123	7.35	107.35		8	0.2					99.35	99.55				
	128	7.35	107.35		8.35	0.6					99	99.6				
	132	7.35	107.35		9	1.2					98.35	99.55				
	137	7.35	107.35		8.85	1.1					98.5	99.6				
	142	7.35	107.35		9.05	1.3					98.3	99.6				
	145	7.35	107.35		8.45	0.7					98.9	99.6				
	152	7.35	107.35		8.65	0.9					98.7	99.6				
	158	7.35	107.35		8.5	0.7					98.85	99.55				
	162	7.35	107.35		8.05	0.3					99.3	99.6				
center of notch in log	167.5	7.35	107.35		7.9	0.1					99.45	99.55				
d/s log	169	7.35	107.35		8.75	0.5					98.6	99.1				
	176	7.35	107.35		8.8	0.5					98.55	99.05				
	184	7.35	107.35		8.65	0.3					98.7	99				
	188	7.35	107.35		8.7	0.4					98.65	99.05				
	194	7.35	107.35		9.05	0.7					98.3	99				
	198	7.35	107.35		9.9	1.6					97.45	99.05				
	206	7.35	107.35		9	0.7					98.35	99.05				
	211	7.35	107.35		8.55	0.2					98.8	99				
	215	7.35	107.35		8.45	0.05					98.9	98.95				
riffle xsection at 223	224	7.35	107.35		8.85	0.25					98.5	98.75				
	227	7.35	107.35		8.9	0.2					98.45	98.65				
	231	7.35	107.35		9.6	1					97.75	98.75				
	237	7.35	107.35		9.85	1.15					97.5	98.65				
	241	7.35	107.35		9.55	0.85					97.8	98.65				
	248	7.35	107.35		9.45	0.75					97.9	98.65				
	255	7.35	107.35		9.4	0.7					97.95	98.65				
	265	7.35	107.35		9.6	0.9					97.75	98.65				
	270	7.35	107.35		9.2	0.45					98.15	98.6				
	277	7.35	107.35		9.5	0.75					97.85	98.6				
	280	7.35	107.35		9.95	1.25					97.4	98.65				
	284	7.35	107.35		9.85	1.1					97.5	98.6				
	289	7.35	107.35		9.4	0.7					97.95	98.65				
	294	7.35	107.35		9.3	0.6					98.05	98.65				
	299	7.35	107.35		8.95	0.2					98.4	98.6				
	300	7.35	107.35		9	0.2					98.35	98.55				
	310	7.35	107.35		9	0.3					98.35	98.65				
	320	7.35	107.35		8.95	0.2					98.4	98.6				
	330	7.35	107.35		9	0.25					98.35	98.6				
	337	7.35	107.35		9.65	0.9					97.7	98.6				
	345	7.35	107.35		9.35	0.6					98	98.6				
	347	7.35	107.35		10.05	1.3					97.3	98.6				
	350	7.35	107.35		10.2	1.45					97.15	98.6				
pool xsection at 353	355	7.35	107.35		10.05	1.35					97.3	98.65				
	363	7.35	107.35		9.3	0.6					98.05	98.65				
	388	7.35	107.35		9	0.2					98.35	98.55				
	377	7.35	107.35		8.95	0.2					98.4	98.6				
	383	7.35	107.35		9.15	0.4					98.2	98.6				
	387	7.35	107.35		9.35	0.6					98	98.6				
	395	7.35	107.35		9.45	0.7					97.9	98.6				

YEAR 1

Notes	Station	Station Adjusted*	BS	HI	FS TP	FS bed	depth water	FS BKF	FS TOB	FS BKF	FS TOB	ELEV bed	ELEV water surf	ELEV BKF	ELEV TOB	ELEV BKF	ELEV TOB
pin at fence between fence pst			7.63	107.63													
	0	2	7.63	107.63		7.63	0.25					100	100.25				
	4	6	7.63	107.63		8.96	1.5					98.67	100.17				
	6	8	7.63	107.63		9.21	1.7					98.42	100.12				
	9	11	7.63	107.63		9.14	1.65					98.49	100.14				
pool	13	15	7.63	107.63		8.24	0.7					99.39	100.09				
	15	17	7.63	107.63		8.25	0.7					99.38	100.08				
	17	19	7.63	107.63		8	0.5					99.63	100.13				
begin run	29	31	7.63	107.63		8.55	0.95					99.08	100.03				
	40	42	7.63	107.63		8.29	0.6					99.34	99.94				
center of pool, rootwd at 58	55	57	7.63	107.63		9.26	1.6					98.37	99.97				
center of pool	62	64	7.63	107.63		9.23	1.55					98.4	99.95				
start glide	67	69	7.63	107.63		8.43	0.75					99.2	99.95				
	71	73	7.63	107.63		8.1	0.4					99.53	99.93				
	80	82	7.63	107.63		8.48	0.8					99.15	99.95				
middle glide	93	95	7.63	107.63		8.5	0.8					99.13	99.93				
end glide	101	110	7.63	107.63		8.14	0.4					99.49	99.89				
	110	119	7.63	107.63		8.24	0.45					99.39	99.84				
riffle	118	114	7.63	107.63		8.2	0.4					99.43	99.83				
outside bend/end run	123	127	7.63	107.63		8.44	0.6					99.19	99.79				
begin pool	128	132	7.63	107.63		9	1.2					98.63	99.83				
center of pool	132	136	7.63	107.63		9.05	1.2					98.58	99.78				
edge of pool	137	141	7.63	107.63		9.45	1.6					98.18	99.78				
	142	146	7.63	107.63		8.67	0.8					98.96	99.76				
begin glide	145	149	7.63	107.63		8.85	1					98.78	99.78				
center of glide	152	156	7.63	107.63		9.06	1.2					98.57	99.77				
riffle	158	162	7.63	107.63		8.31	0.45					99.32	99.77				
top of log notch	162	167.5	7.63	107.63		8.08	0.15					99.55	99.7				
	165	170.5	7.63	107.63		9.15	0.85					98.48	99.33				
	167	172.5	7.63	107.63		9.12	0.8					98.51	99.31				
	169	174.5	7.63	107.63		9.1	0.8					98.53	99.33				
	174	179.5	7.63	107.63		8.89	0.65					98.74	99.39				
	178	183.5	7.63	107.63		8.75	0.4					98.88	99.28				
	184	189.5	7.63	107.63		9.03	0.65					98.6	99.25				
pool	188	193.5	7.63	107.63		9.11	0.8					98.52	99.32				
center of pool	191	196.5	7.63	107.63		9.75	1.4					97.88	99.28				
persimmon tree	194	199.5	7.63	107.63		10.15	1.8					97.48	99.28				
	203	208.5	7.63	107.63		8.89	0.6					98.74	99.34				
begin glide	206	211.5	7.63	107.63		8.75	0.45					98.88	99.33				
top of riffle	209	214.5	7.63	107.63		8.67	0.3					98.96	99.26				
xsection riffle	219	224.5	7.63	107.63													
end riffle	221	226.5	7.63	107.63		9	0.4					98.63	99.03				
end run/begin pool	228	233.5	7.63	107.63		10.06	1.45					97.57	99.02				
center of pool	233	238.5	7.63	107.63		10.13	1.5					97.5	99				
end pool/begin glide (roodwd	240	240	7.63	107.63		9.71	1.1					97.92	99.02				
glide	250	250	7.63	107.63		9.42	0.8					98.21	99.01				
persimmon tree	259	259	7.63	107.63		9.86	1.25					97.77	99.02				
	266	266	7.63	107.63		9.55	0.9					98.08	98.98				
	273	273	7.63	107.63		9.5	0.9					98.13	99.03				
	278	278	7.63	107.63		9.93	1.2					97.7	98.9				
center of pool	285	285	7.63	107.63		10.1	1.45					97.53	98.98				
	293	293	7.63	107.63		9.61	1					98.02	99.02				
	298	298	7.63	107.63		9.26	0.6					98.37	98.97				
holly tree	300	300	7.63	107.63		9.21						98.42					
	311	311	7.63	107.63		9.3	0.7					98.33	99.03				
	316	316	7.63	107.63		9.25	0.6					98.38	98.98				
begin run	323	323	7.63	107.63		9.17	0.5					98.46	98.96				
center run	331	331	7.63	107.63		9.21	0.55					98.42	98.97				
end run/begin pool	341	341	7.63	107.63		9.62	1					98.01	99.01				
erosion	350	350	7.63	107.63		10.05	1.4					97.58	98.98				
xsection pool	358	353	7.63	107.63		10.23	1.6					97.4	99				
end pool/begin glide	362	357	7.63	107.63		9.77	1.14					97.86	99				
end glide/begin riffle	374	369	7.63	107.63		9.21	0.6					98.42	99.02				
begin riffle	382	377	7.63	107.63		9.14	0.4					98.49	98.89				
begin run	390	385	7.63	107.63		9.41	0.3					98.22	98.52				
run	395	390	7.63	107.63		9.65	0.55					97.98	98.53				
run	398	393	7.63	107.63		9.73	0.6					97.9	98.5				

*Station Adjusted to match exisitng Stationing from year 0 at physical features (i.e. structures). In accuracies in stationing due to the way the tape is laid down the centerline of the stream

Longitudinal Profile (AREA 4)



Modified Wolman Pebble Count

YEAR 0

	PEBBLE COUNT		Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	12	12	0.12	0.12	7	7	0.12	0.12	16	16	0.16	0.16	12	12	0.12	0.12
0.125	.062-.125	.002-.01	Very Fine	45	57	0.45	0.57	12	19	0.20	0.32	13	29	0.13	0.29	13	25	0.13	0.25
0.25	.125-.25		Fine	7	64	0.07	0.64	10	29	0.17	0.48	4	33	0.04	0.33	17	42	0.17	0.42
0.5	.25-.5	.01-.02	Medium	12	76	0.12	0.76	8	37	0.13	0.62	8	41	0.08	0.41	8	50	0.08	0.50
1	.5-1.0	.02-.04	Coarse	7	83	0.07	0.83	3	40	0.05	0.67	13	54	0.13	0.54	3	53	0.03	0.53
2	1.0-2.0	.04-.08	Very Coarse		83	0.00	0.83	2	42	0.03	0.70	2	56	0.02	0.56	2	55	0.02	0.55
4	2-4	.08-.16	Very Fine	3	86	0.03	0.86		42	0.00	0.70	1	57	0.01	0.57	2	57	0.02	0.57
5.7	4-5.7	.16-.22	Fine	1	87	0.01	0.87	1	43	0.02	0.72	2	59	0.02	0.59		57	0.00	0.57
8	5.7-8	.22-.31	Fine	1	88	0.01	0.88	1	44	0.02	0.73	5	64	0.05	0.64	5	62	0.05	0.62
11.3	8-11.3	.31-.44	Medium	9	97	0.09	0.97	5	49	0.08	0.82	4	68	0.04	0.68	6	68	0.06	0.68
16	11.3-16	.44-.63	Medium		97	0.00	0.97	6	55	0.10	0.92	10	78	0.10	0.78	8	76	0.08	0.76
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	3	58	0.05	0.97	5	83	0.05	0.83	6	82	0.06	0.82
32	22.6-32	.89-1.26	Coarse	2	100	0.02	1.00	1	59	0.02	0.98	3	86	0.03	0.86	6	88	0.06	0.88
45	32-45	1.26-1.77	Very Coarse		100	0.00	1.00	1	60	0.02	1.00	8	94	0.08	0.94	7	95	0.07	0.95
64	45-64	1.77-2.5	Very Coarse		100	0.00	1.00		60	0.00	1.00	3	97	0.03	0.97	2	97	0.02	0.97
90	64-90	2.5-3.5	Small		100	0.00	1.00		60	0.00	1.00	3	100	0.03	1.00	2	99	0.02	0.99
128	90-128	3.5-5	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00	1	100	0.01	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		60	0.00	1.00		100	0.00	1.00		100	0.00	1.00

YEAR 0

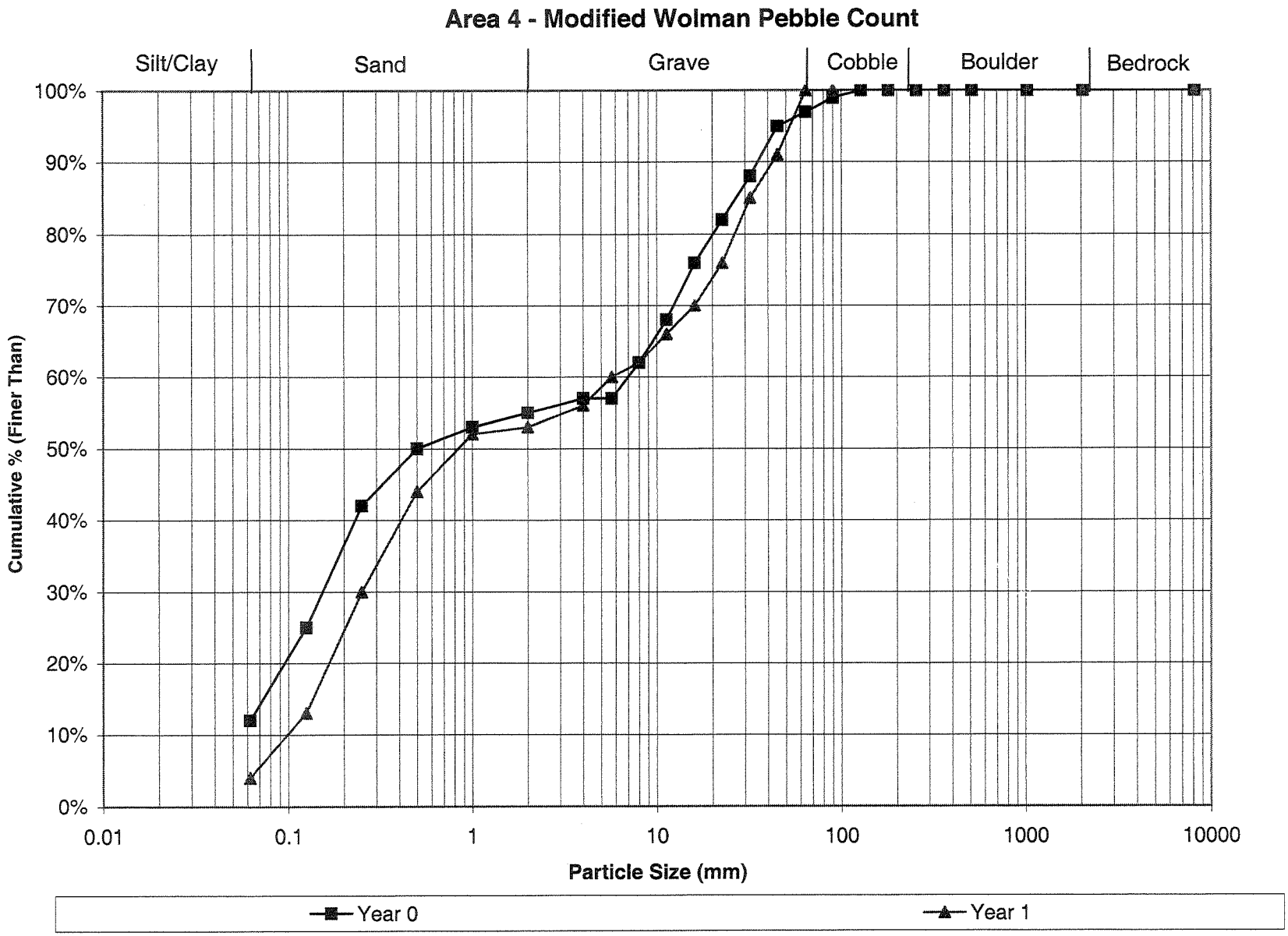
PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	
<.062	<.002	Silt/Clay	10	10	0.20	0.20	1	1	0.03	0.03	9	9	0.18	0.18	4	4	0.08	0.08	
.062-.125	.002-.01	Very Fine	6	16	0.12	0.32	2	3	0.07	0.10	2	11	0.04	0.22	4	8	0.08	0.16	
.125-.25		Fine	5	21	0.10	0.42	2	5	0.07	0.17		11	0.00	0.22		8	0.00	0.16	
.25-.5	.01-.02	Medium	9	30	0.18	0.60	3	8	0.10	0.27	2	13	0.04	0.26	1	9	0.02	0.18	
.5-1.0	.02-.04	Coarse	3	33	0.06	0.66	2	10	0.07	0.33	3	16	0.06	0.32	1	10	0.02	0.20	
1.0-2.0	.04-.08	Very Coarse		33	0.00	0.66	2	12	0.07	0.40		16	0.00	0.32	2	12	0.04	0.24	
2-4	.08-.16	Very Fine	3	36	0.06	0.72		12	0.00	0.40	1	17	0.02	0.34	2	14	0.04	0.28	
4-5.7	.16-.22	Fine	1	37	0.02	0.74	1	13	0.03	0.43	1	18	0.02	0.36		14	0.00	0.28	
5.7-8	.22-.31	Fine	1	38	0.02	0.76	1	14	0.03	0.47		18	0.00	0.36	5	19	0.10	0.38	
8-11.3	.31-.44	Medium	9	47	0.18	0.94	5	19	0.17	0.63	4	22	0.08	0.44	6	25	0.12	0.50	
11.3-16	.44-.63	Medium		47	0.00	0.94	6	25	0.20	0.83	4	26	0.08	0.52	6	31	0.12	0.62	
16-22.6	.63-.89	Coarse	1	48	0.02	0.96	3	28	0.10	0.93	8	34	0.16	0.68	5	36	0.10	0.72	
22.6-32	.89-1.26	Coarse	2	50	0.04	1.00	1	29	0.03	0.97	4	38	0.08	0.76	6	42	0.12	0.84	
32-45	1.26-1.77	Very Coarse		50	0.00	1.00	1	30	0.03	1.00	2	40	0.04	0.80	5	47	0.10	0.94	
45-64	1.77-2.5	Very Coarse		50	0.00	1.00		30	0.00	1.00	5	45	0.10	0.90	1	48	0.02	0.96	
64-90	2.5-3.5	Small		50	0.00	1.00		30	0.00	1.00	2	47	0.04	0.94	1	49	0.02	0.98	
90-128	3.5-5	Small		50	0.00	1.00		30	0.00	1.00	3	50	0.06	1.00	1	50	0.02	1.00	
128-180	5-7.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
180-256	7.1-10.1	Large		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
256-362	10.1-14.3	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
362-512	14.3-20	Small		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
512-1024	20-40	Medium		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	
		Bedrock		50	0.00	1.00		30	0.00	1.00		50	0.00	1.00		50	0.00	1.00	

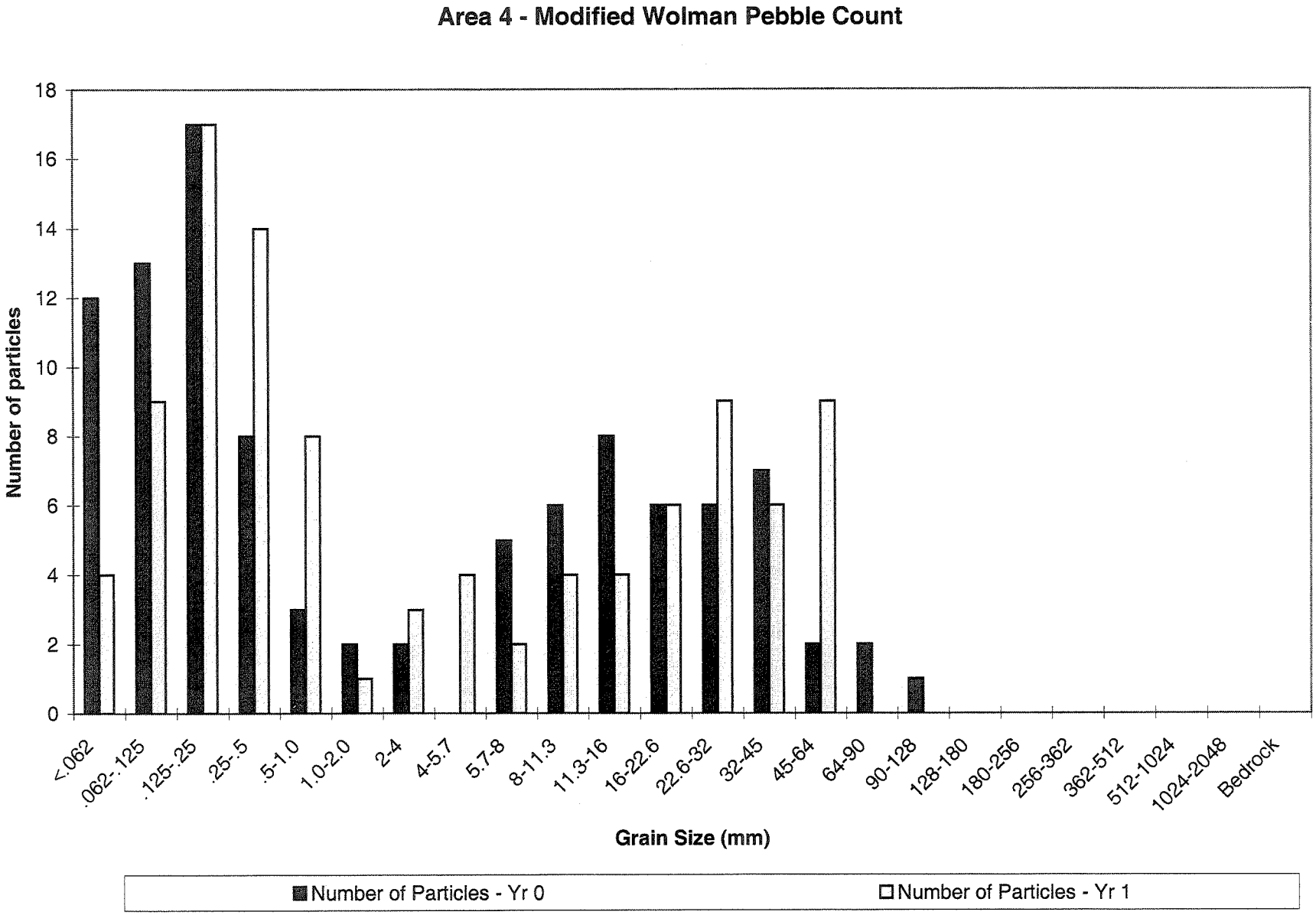
YEAR 1

PEBBLE COUNT			Combined	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
0.062	<.062	<.002	Silt/Clay	15	15	0.15	0.15	9	9	0.09	0.09	9	9	0.11	0.11	4	4	0.04	0.04
0.125	.062-.125	.002-.01	Very Fine	3	18	0.03	0.18		9	0.00	0.09	6	15	0.08	0.19	9	13	0.09	0.13
0.25	.125-.25		Fine	35	53	0.35	0.53	28	37	0.28	0.37	11	26	0.14	0.33	17	30	0.17	0.30
0.5	.25-.5	.01-.02	Medium	13	66	0.13	0.66	27	64	0.27	0.64	3	29	0.04	0.36	14	44	0.14	0.44
1	.5-1.0	.02-.04	Coarse	7	73	0.07	0.73	13	77	0.13	0.77	7	36	0.09	0.45	8	52	0.08	0.52
2	1.0-2.0	.04-.08	Very Coarse		73	0.00	0.73		77	0.00	0.77		36	0.00	0.45	1	53	0.01	0.53
4	2-4	.08-.16	Very Fine	5	78	0.05	0.78	1	78	0.01	0.78	4	40	0.05	0.50	3	56	0.03	0.56
5.7	4-5.7	.16-.22	Fine	2	80	0.02	0.80		78	0.00	0.78	2	42	0.03	0.53	4	60	0.04	0.60
8	5.7-8	.22-.31	Fine	4	84	0.04	0.84	1	79	0.01	0.79	1	43	0.01	0.54	2	62	0.02	0.62
11.3	8-11.3	.31-.44	Medium	7	91	0.07	0.91	1	80	0.01	0.80	7	50	0.09	0.63	4	66	0.04	0.66
16	11.3-16	.44-.63	Medium	6	97	0.06	0.97	4	84	0.04	0.84	2	52	0.03	0.65	4	70	0.04	0.70
22.6	16-22.6	.63-.89	Coarse	1	98	0.01	0.98	5	89	0.05	0.89	3	55	0.04	0.69	6	76	0.06	0.76
32	22.6-32	.89-1.26	Coarse		98	0.00	0.98	6	95	0.06	0.95	6	61	0.08	0.76	9	85	0.09	0.85
45	32-45	1.26-1.77	Very Coarse	1	99	0.01	0.99	3	98	0.03	0.98	7	68	0.09	0.85	6	91	0.06	0.91
64	45-64	1.77-2.5	Very Coarse	1	100	0.01	1.00	2	100	0.02	1.00	7	75	0.09	0.94	9	100	0.09	1.00
90	64-90	2.5-3.5	Small		100	0.00	1.00		100	0.00	1.00	4	79	0.05	0.99		100	0.00	1.00
128	90-128	3.5-5	Small		100	0.00	1.00		100	0.00	1.00	1	80	0.01	1.00		100	0.00	1.00
180	128-180	5-7.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
256	180-256	7.1-10.1	Large		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
362	256-362	10.1-14.3	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
512	362-512	14.3-20	Small		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
1024	512-1024	20-40	Medium		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
2048	1024-2048	40-80	Vy Lg Boulders		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00
8192	Bedrock	Bedrock	Bedrock		100	0.00	1.00		100	0.00	1.00		80	0.00	1.00		100	0.00	1.00

YEAR 1

PEBBLE COUNT			Riffle	AREA 1				AREA 2				AREA 3				AREA 4			
	Metric (mm)	English inches	Particle	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum	Count	Tot #	% Tot	% Cum
	<.062	<.002	Silt/Clay	1	1	0.02	0.02	5	5	0.10	0.10	6	6	0.15	0.15	2	2	0.04	0.04
	.062-.125	.002-.01	Very Fine	3	4	0.06	0.08		5	0.00	0.10	1	7	0.03	0.18	2	4	0.04	0.08
	.125-.25		Fine	10	14	0.20	0.28	4	9	0.08	0.18	1	8	0.03	0.20	6	10	0.12	0.20
	.25-.5	.01-.02	Medium	3	17	0.06	0.34	5	14	0.10	0.28	1	9	0.03	0.23	1	11	0.02	0.22
	.5-1.0	.02-.04	Coarse	6	23	0.12	0.46	13	27	0.26	0.54	1	10	0.03	0.25	4	15	0.08	0.30
	1.0-2.0	.04-.08	Very Coarse		23	0.00	0.46		27	0.00	0.54		10	0.00	0.25		15	0.00	0.30
	2-4	.08-.16	Very Fine	5	28	0.10	0.56	1	28	0.02	0.56	3	13	0.08	0.33	2	17	0.04	0.34
	4-5.7	.16-.22	Fine	2	30	0.04	0.60		28	0.00	0.56		13	0.00	0.33	3	20	0.06	0.40
	5.7-8	.22-.31	Fine	4	34	0.08	0.68	1	29	0.02	0.58		13	0.00	0.33	1	21	0.02	0.42
	8-11.3	.31-.44	Medium	7	41	0.14	0.82	1	30	0.02	0.60	2	15	0.05	0.38	3	24	0.06	0.48
	11.3-16	.44-.63	Medium	6	47	0.12	0.94	4	34	0.08	0.68	2	17	0.05	0.43	5	29	0.10	0.58
	16-22.6	.63-.89	Coarse	1	48	0.02	0.96	5	39	0.10	0.78	1	18	0.03	0.45	5	34	0.10	0.68
	22.6-32	.89-1.26	Coarse		48	0.00	0.96	6	45	0.12	0.90	5	23	0.13	0.58	7	41	0.14	0.82
	32-45	1.26-1.77	Very Coarse	1	49	0.02	0.98	3	48	0.06	0.96	7	30	0.18	0.75	2	43	0.04	0.86
	45-64	1.77-2.5	Very Coarse	1	50	0.02	1.00	2	50	0.04	1.00	5	35	0.13	0.88	7	50	0.14	1.00
	64-90	2.5-3.5	Small		50	0.00	1.00		50	0.00	1.00	4	39	0.10	0.98		50	0.00	1.00
	90-128	3.5-5	Small		50	0.00	1.00		50	0.00	1.00	1	40	0.03	1.00		50	0.00	1.00
	128-180	5-7.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	180-256	7.1-10.1	Large		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	256-362	10.1-14.3	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	362-512	14.3-20	Small		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	512-1024	20-40	Medium		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
	1024-2048	40-80	Vy Lg Boulders		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00
			Bedrock		50	0.00	1.00		50	0.00	1.00		40	0.00	1.00		50	0.00	1.00


Area 4 - Modified Wolman Pebble Count
Silt/Clay
Sand
Grave
Cobble
Boulder
Bedrock
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative % (Finer Than)
0.01
0.1
1
10
100
1000
10000
Particle Size (mm)
Year 0
Year 1


Area 4 - Modified Wolman Pebble Count
Number of particles
18
16
14
12
10
8
6
4
2
0
<.062
.062-.125
.125-.25
.25-.5
.5-1.0
1.0-2.0
2-4
4-5.7
5.7-8
8-11.3
11.3-16
16-22.6
22.6-32
32-45
45-64
64-90
90-128
128-180
180-256
256-362
362-512
512-1024
1024-2048
Bedrock
Grain Size (mm)
Number of Particles - Yr 0
Number of Particles - Yr 1

Vegetation

Plot #1 (Bareroot)	(10x100)	
Pinus taeda		2
Cornus drummondii		1
Plot #2 (Stakes)	(5x50)	
Salix nigra		15
Cornus amomum		8
Sambucus canadensis		1
Viburnum dentatum		0
Plot #3 (Stakes)	(5x50)	
Salix nigra		13
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #4 (Bareroot)	(10x100)	
Cornus drummondii		3
Juglans nigra		1
Plot #5 (Stakes)	(5x100)	
Salix nigra		27
Cornus amomum		18
Sambucus canadensis		1
Viburnum dentatum		0
Plot #6 (Stakes)	(5x100)	
Salix nigra		39
Cornus amomum		15
Sambucus canadensis		0
Viburnum dentatum		0
Plot #7 (Bareroot)	(10x100)	
Pinus virginiana		1

Plot #8 (Stakes)	(5x50)	
Salix nigra		10
Cornus amomum		5
Sambucus canadensis		0
Viburnum dentatum		1
Plot #9 (Stakes)	(5x50)	
Salix nigra		9
Cornus amomum		3
Sambucus canadensis		0
Viburnum dentatum		0
Plot #10 (Stakes)	(5x50)	
Salix nigra		11
Cornus amomum		9
Sambucus canadensis		0
Viburnum dentatum		2
Plot #11 (Stakes)	(5x50)	
Salix nigra		18
Cornus amomum		9
Sambucus canadensis		0
Viburnum dentatum		2
Plot #12 (Bareroot)	(10x100)	
Juglans nigra		1
Cornus drummondii		1

YEAR 1

Photo Reference Points

COMPARISON

Year 0

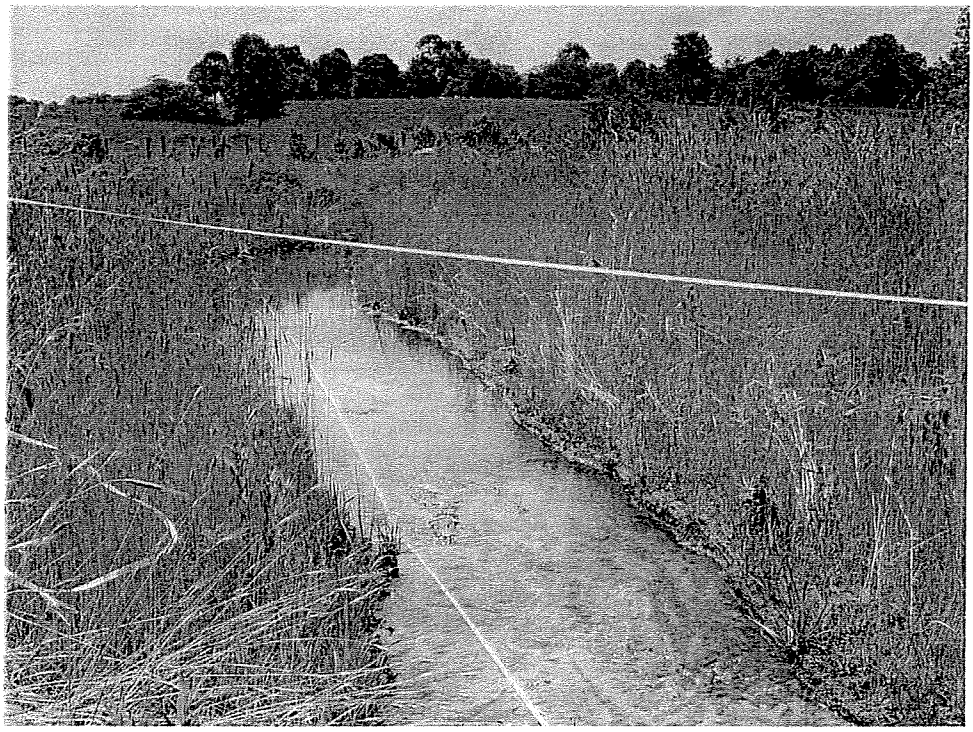


Photo Point 1: Standing at riffle cross-section looking downstream (begin project)

Year 1

Year 0

Photo Point 2: Standing at riffle cross-section looking upstream (begin project)

Year 1

Year 0

Photo Point 3: Standing at pool cross-section looking upstream

Year 1

Year 0

Photo Point 4: Standing at pool cross-section looking downstream

Year 1

Year 0

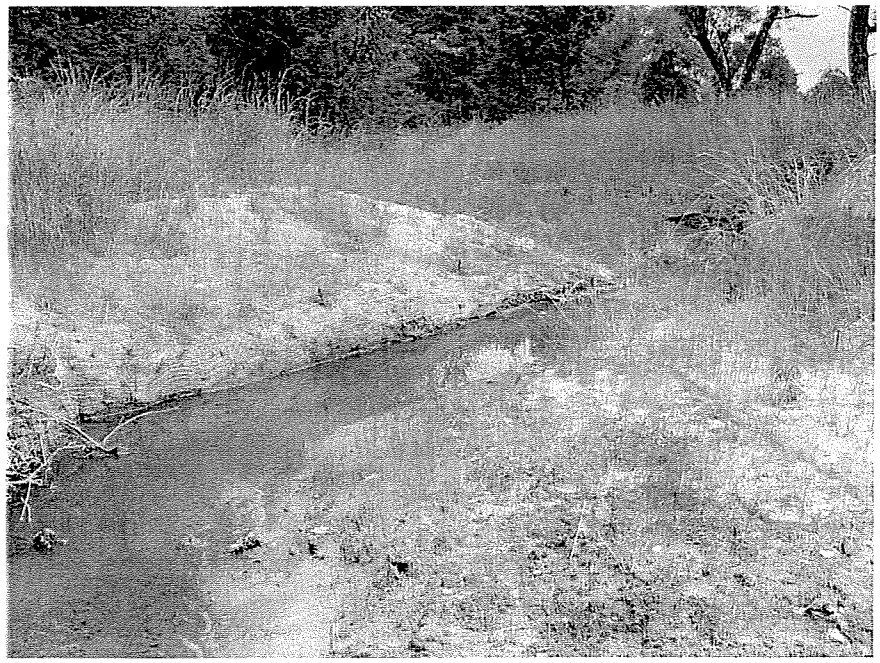


Photo Point 15: Standing at riffle cross-section looking downstream

Year 1

Year 0

Photo Point 16: Standing at riffle cross-section looking upstream

Year 1

Year 0

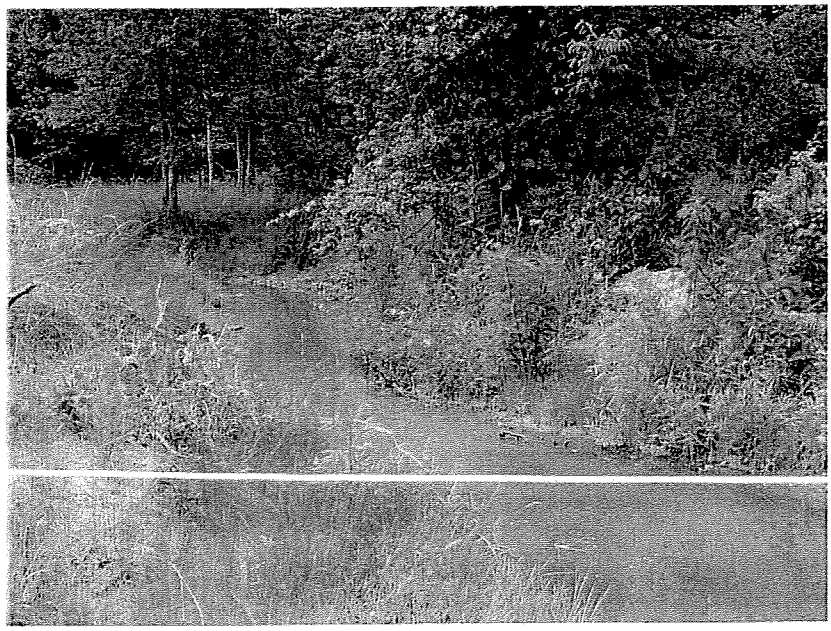
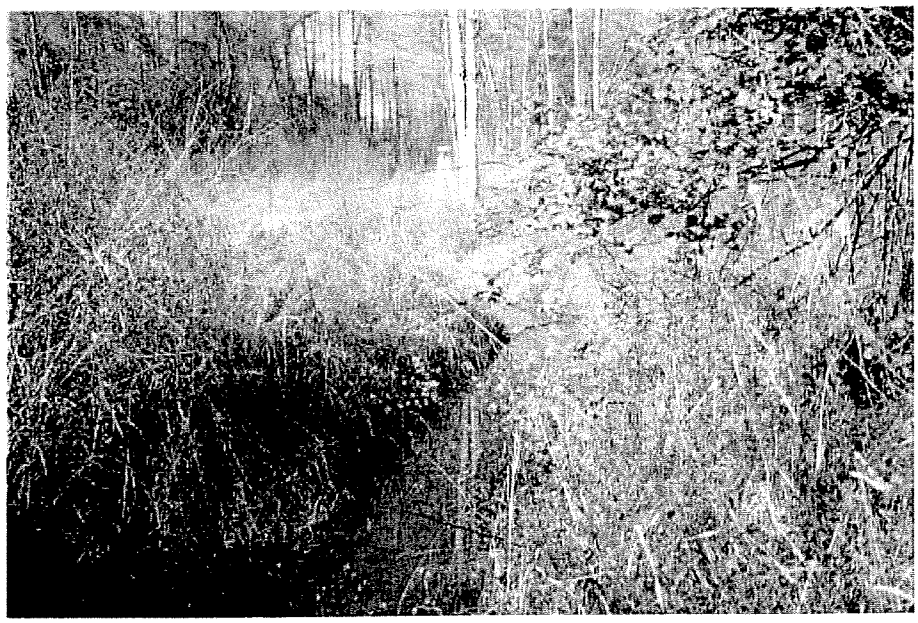


Photo Point 19: Standing at pool cross-section looking upstream



Year 1

Year 0

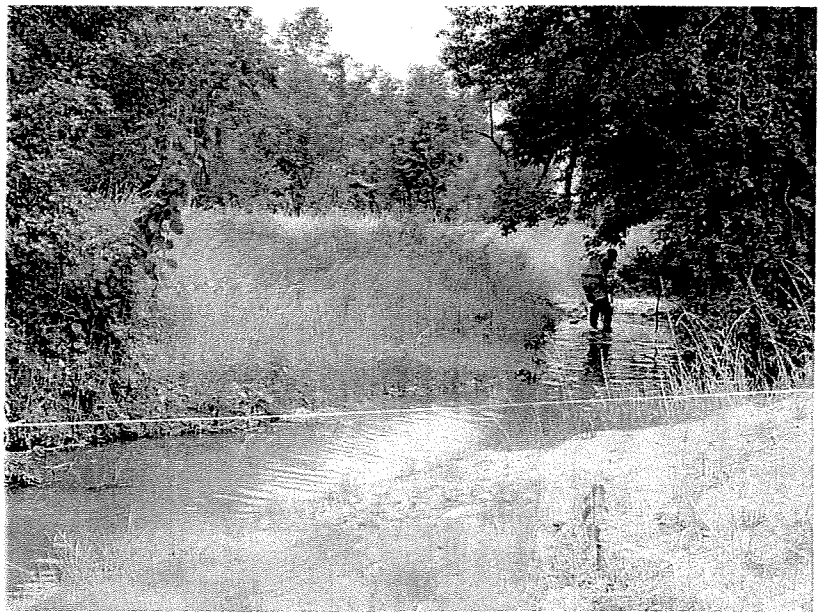


Photo Point 20: Standing at pool cross-section looking downstream

Year 1

Year 0

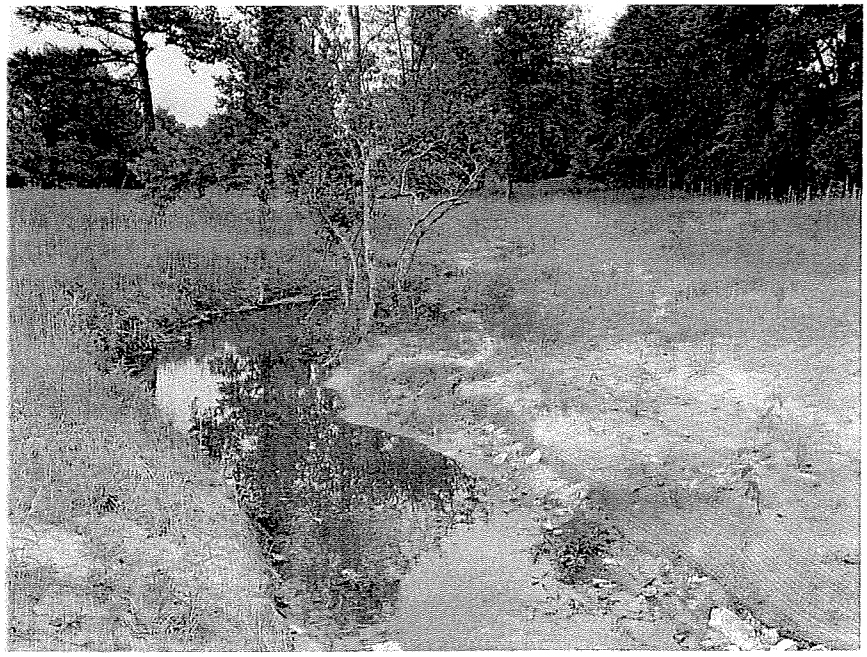


Photo Point 39: Standing at riffle cross-section looking upstream

Year 1

Year 0

Photo Point 40: Standing at riffle cross-section looking downstream near Henry Road

Year 1

Year 0

Photo to be taken during follow up monitoring

Photo Point 41: Standing at pool cross-section looking upstream

Year 1

Year 0

Photo to be taken during follow up monitoring

Photo Point 42: Standing at pool cross-section looking downstream

Year 1

Year 0

Photo Point 46: Standing at pool cross-section looking upstream

Year 1

Year 0

Photo Point 47: Standing at pool cross-section looking downstream

Year 1

Year 0

Photo Point 48: Standing at riffle cross-section looking upstream

Year 1

Year 0

Photo Point 49: Standing at riffle cross-section looking downstream

Year 1

Year 0

Photo Point 50: Looking upstream towards Paul Payne Store Road

Year 1

Year 0

No Photo Taken

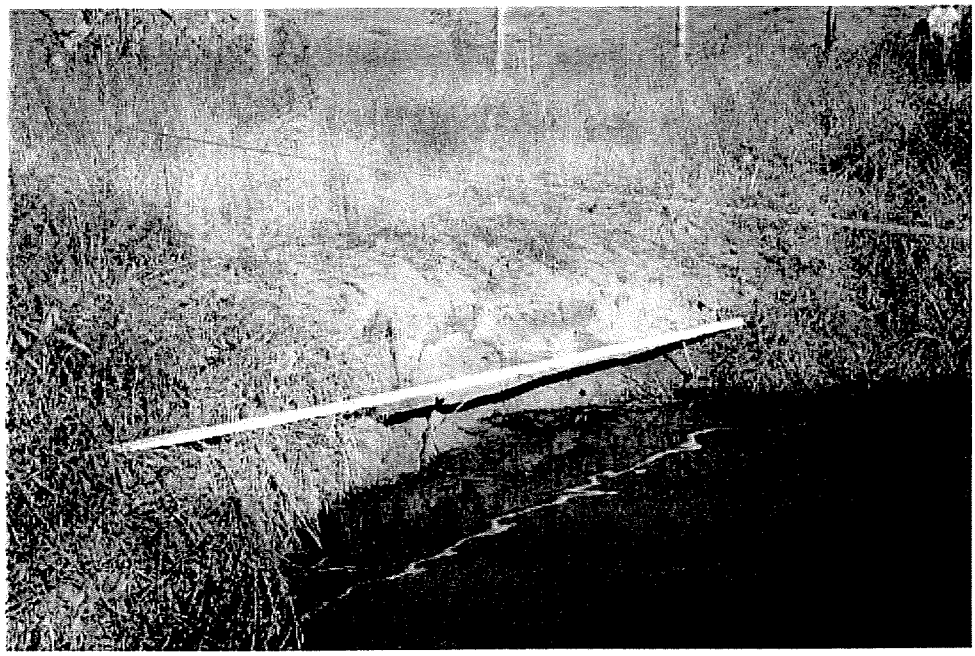
Area 1 – Headcut observed

Year 1

Year 0

No Photo Taken

Area 4 – Severe Bank Erosion Observed



Year 1

PLANS

NCWRP Project Mitigation Report **Payne Dairy**

Wetlands

Type:		Credits
Acreage:	Restoration-	
	Creation-	
	Enhancement-	
	Preservation-	

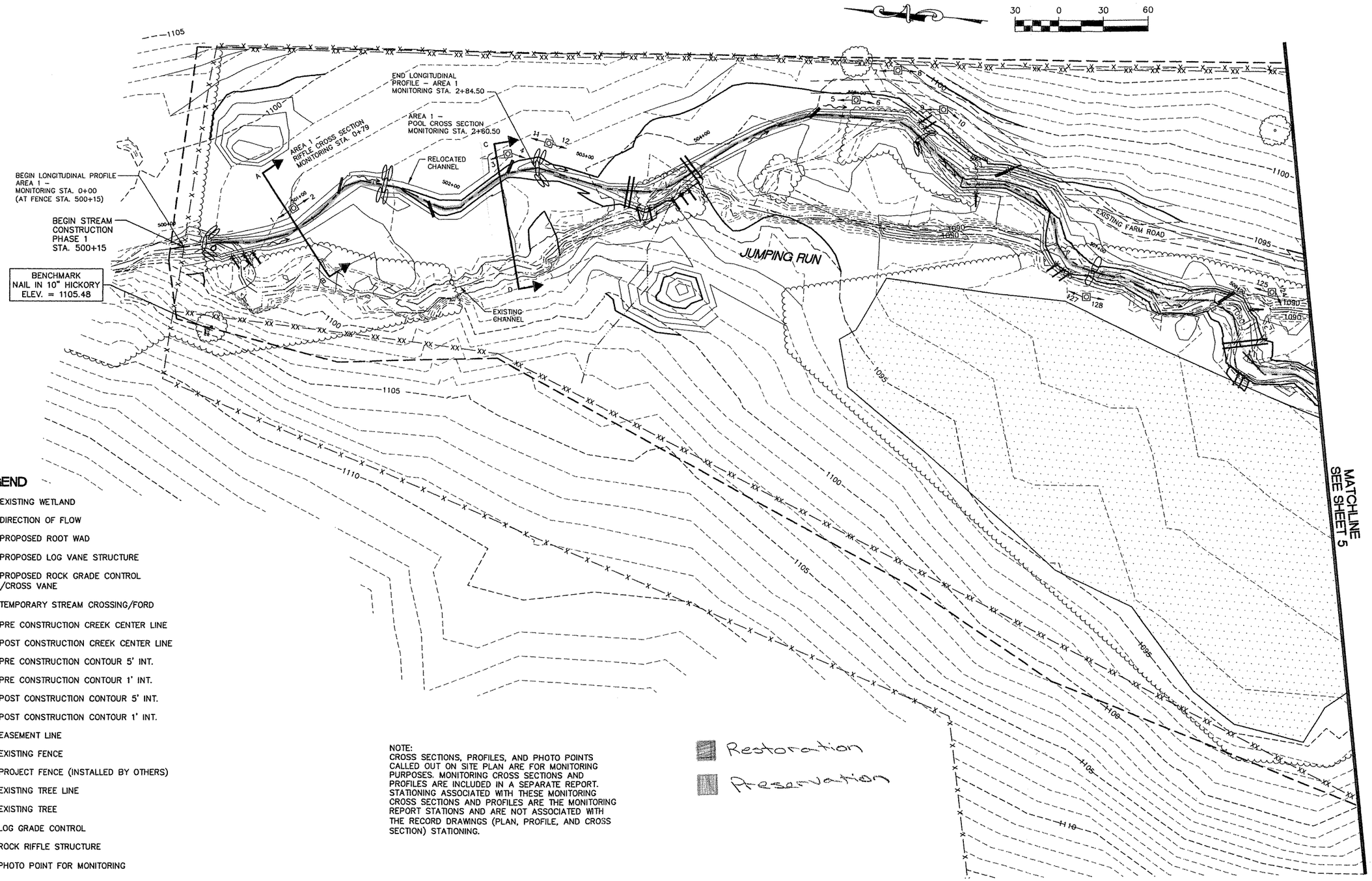
Total Credit=

Streams

Temperature: Warm		Credits
Linear Footage:	Restoration- 5177 ft	5177
	Enhancement I- 470 ft	235
	Enhancement II- 1350 ft	450
	Preservation- 0 ft	

Total Credit= 5862

Summary: Complete upper section (4377 ft) is priority I restoration. Reach starting at culvert on lower section is priority I restoration for 800 ft (tributary confluence). Enhancement I (dimension, profile) begins at confluence and extends down to fenceline, also 90 ft up the tributary (470 ft.). Enhancement II was done on entire length of tributary (1350 ft), including fencing out cattle and riparian zone planting. Final 1450 ft was preserved by fencing, but only 1 side is protected by easement (no credit).



LEGEND

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- DIRECTION OF FLOW
- PROPOSED ROOT WAD
- PROPOSED LOG VANE STRUCTURE
- PROPOSED ROCK GRADE CONTROL /CROSS VANE
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- PRE CONSTRUCTION CREEK CENTER LINE
- POST CONSTRUCTION CREEK CENTER LINE
- PRE CONSTRUCTION CONTOUR 5' INT.
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- EXISTING TREE LINE
- EXISTING TREE
- LOG GRADE CONTROL
- ROCK RIFFLE STRUCTURE
- PHOTO POINT FOR MONITORING

NOTE:
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PHONE: (919) 677–2000 FAX: (919) 677–2050

CLIENT: NCDENR WRP

TITLE: RECORD DRAWINGS SITE PLAN

SEAL:

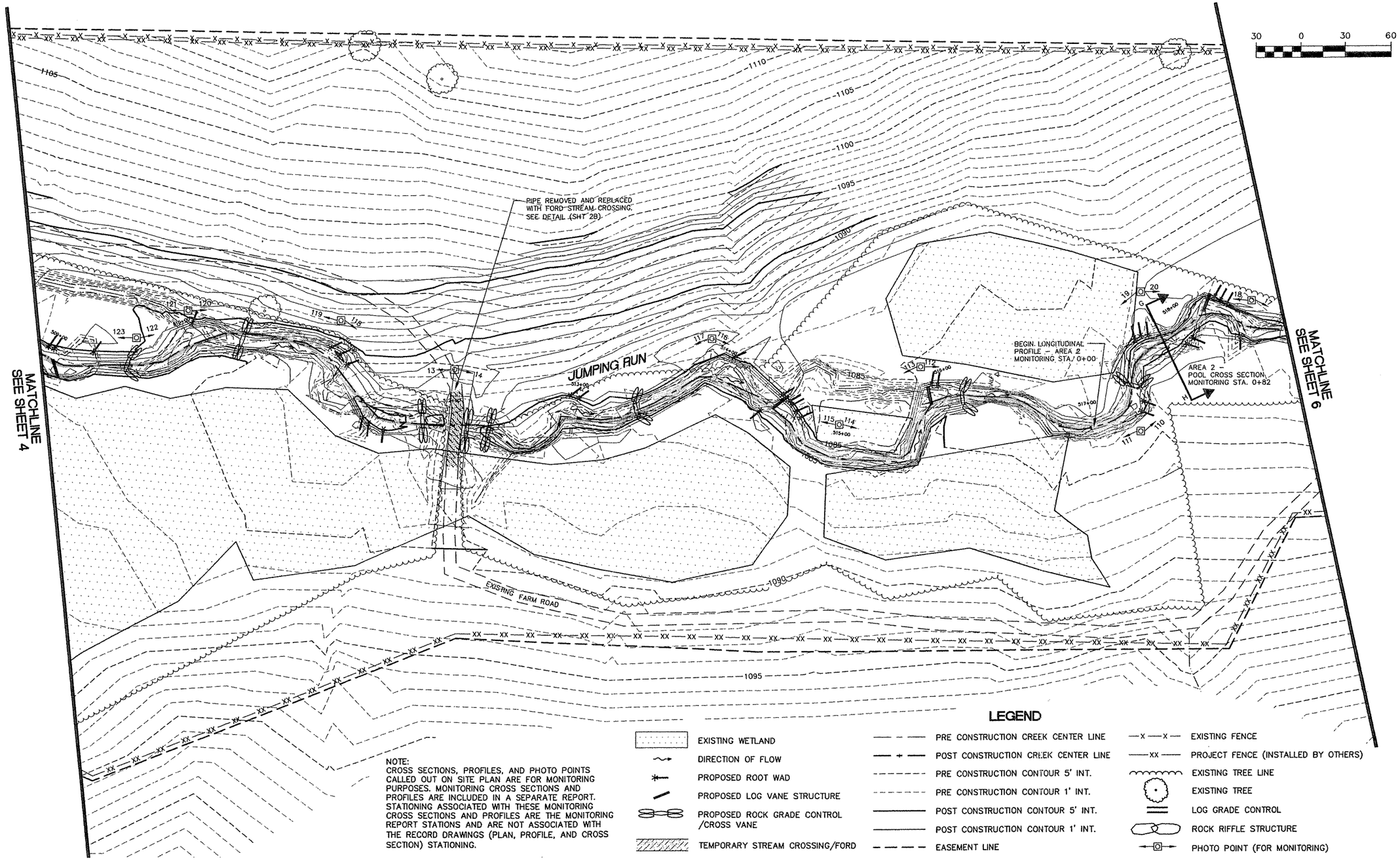
DATE: 6-04-01
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 4 OF 16

Restoration

Preservation



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VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

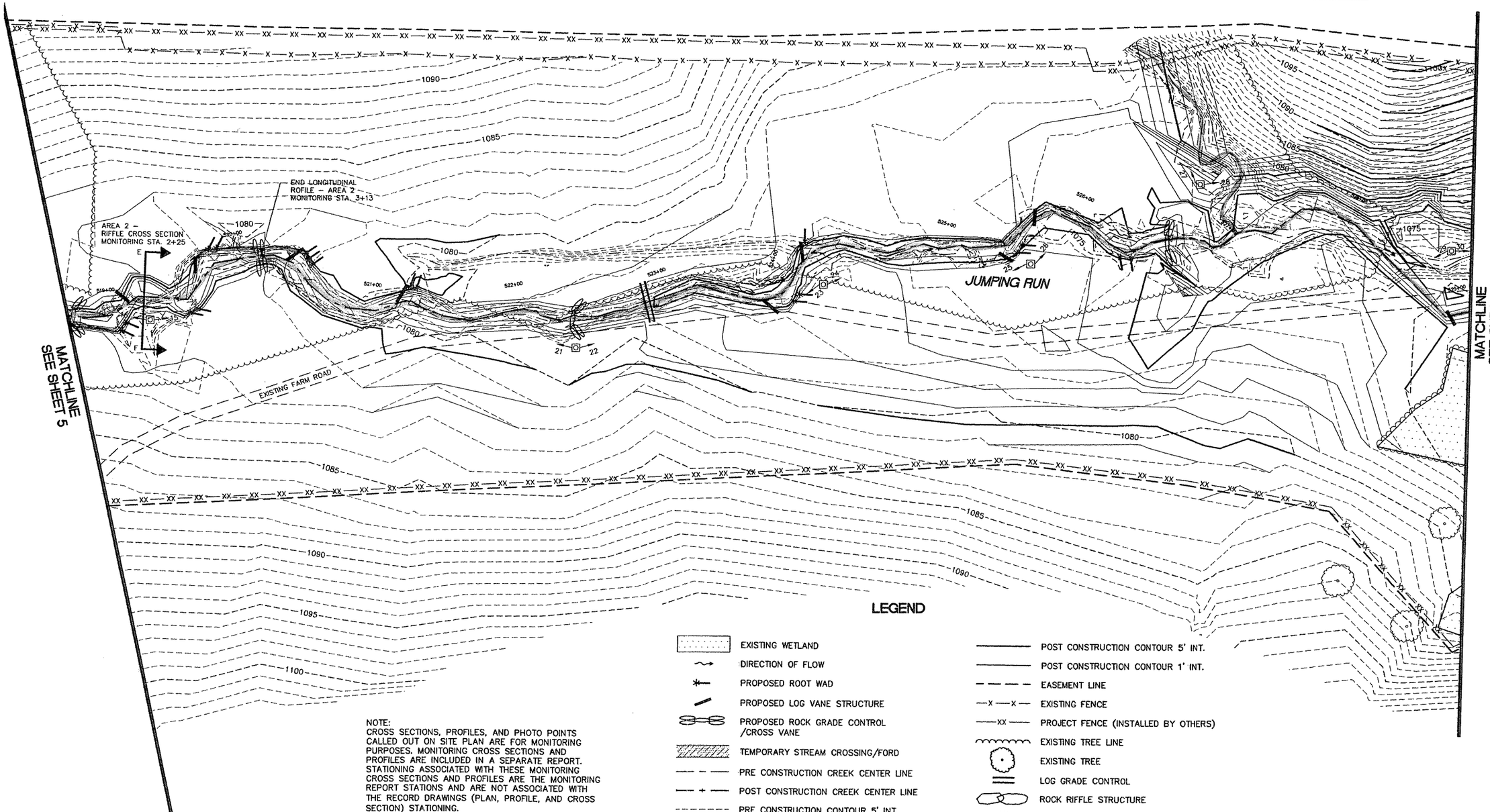
PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 5 OF 16

Restoration

Reservation

30 0 30 60



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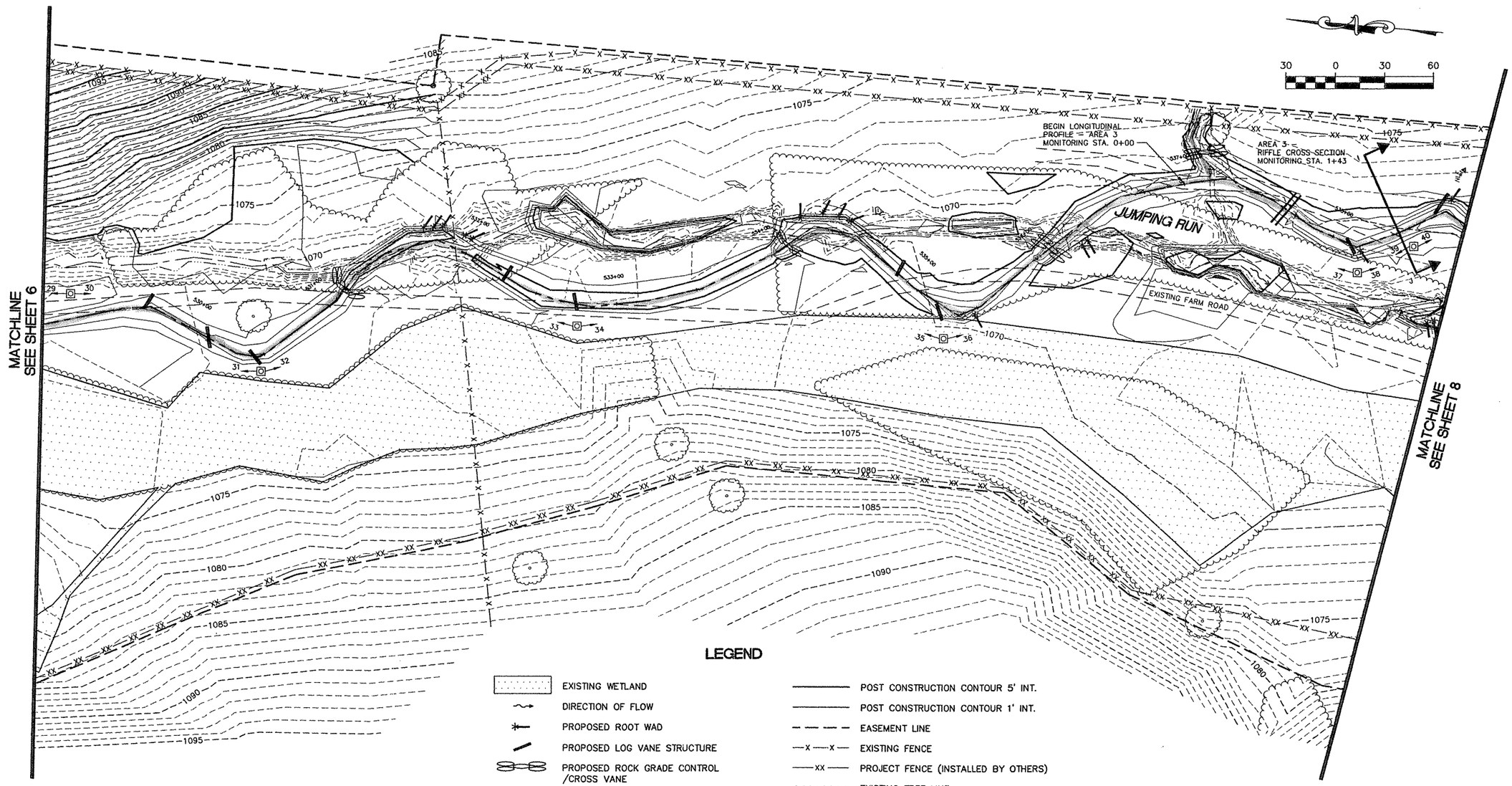
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 6 OF 16



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Restoration

Preservation

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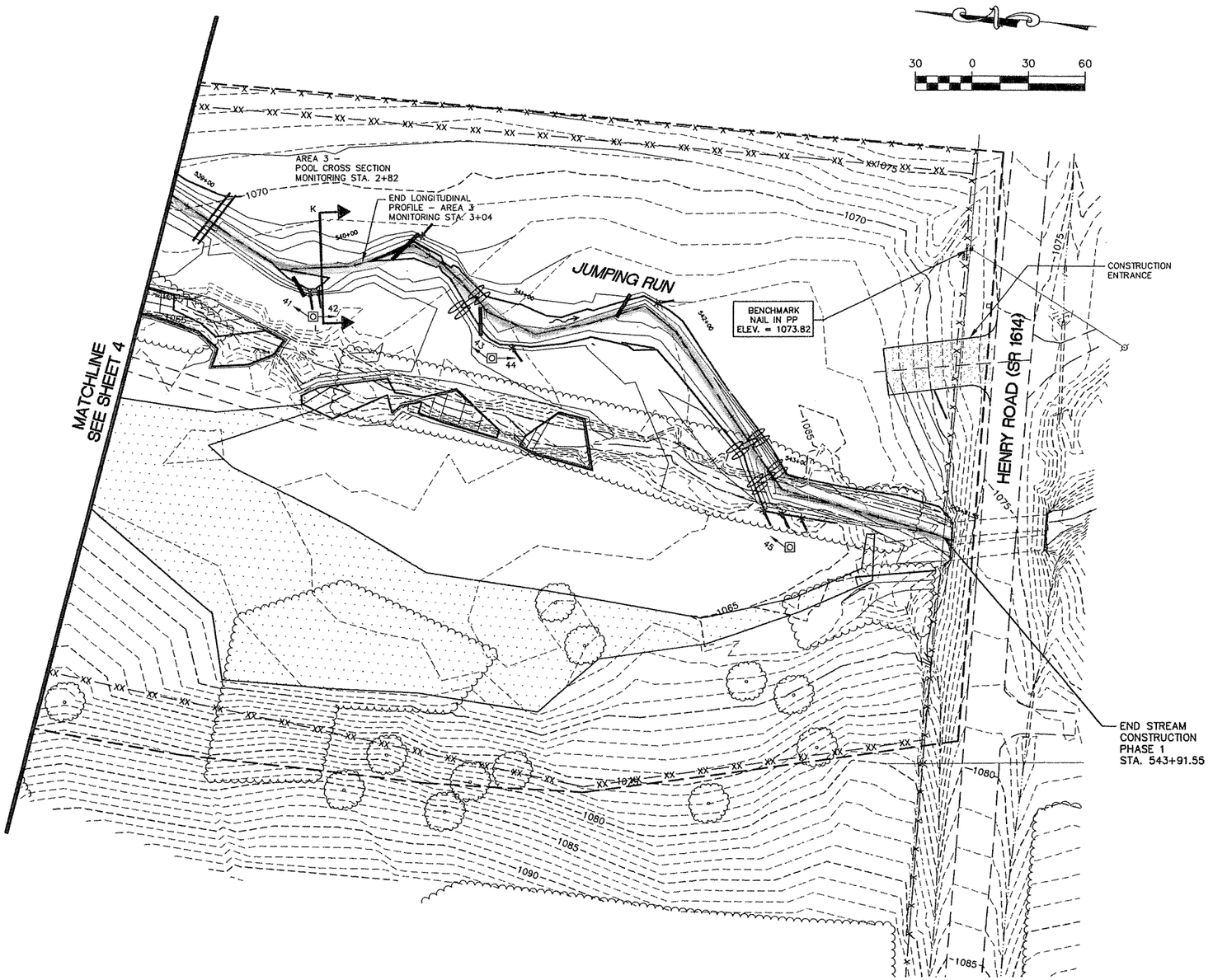
TITLE: RECORD DRAWINGS SITE PLAN

SEAL:

DATE: 6-04-01
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY: WW
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 7 OF 16



Restoration

Preservation

LEGEND

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VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 8 OF 16

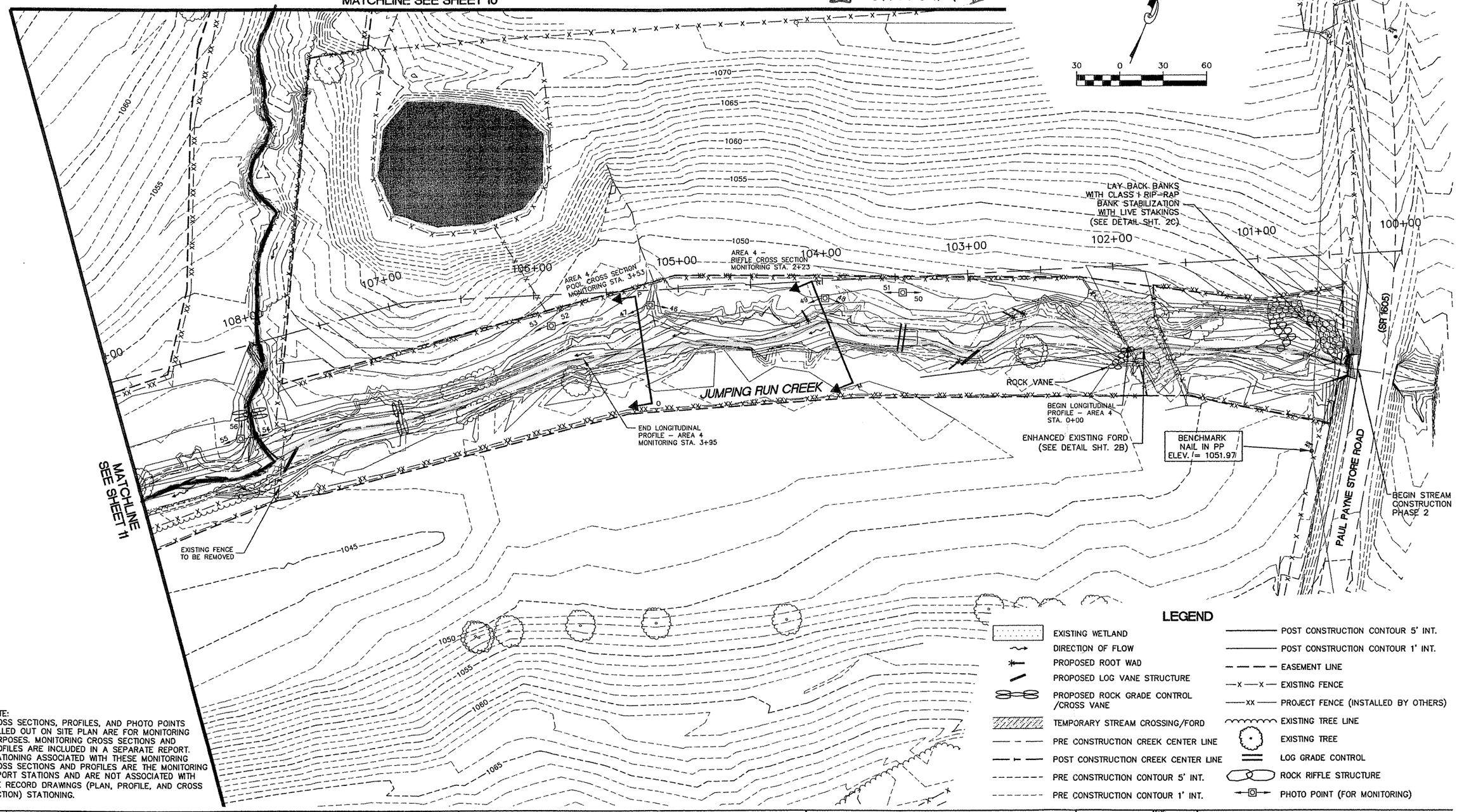
Restoration

Preservation

Enhancement I

Enhancement II

MATCHLINE SEE SHEET 10



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REV. No.:	REVISION:	ABJR-SP5	DATE:	DRAWN BY:	CHECKED BY:

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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NCDENR WRP

TITLE: RECORD DRAWINGS SITE PLAN

SEAL:

DATE: 6-04-01
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 9 OF 16

NOTE: NO INSTREAM WORK OR BANK STABILIZATION PROPOSED. ONLY VEGETATIVE PLANTINGS PER SHEET V6.

30 0 30 60

LEGEND

- EXISTING WETLAND
- DIRECTION OF FLOW
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CATTLE BARN

MATCHLINE SEE SHEET 9

Restoration
Preservation
Enhancement II

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DATE: 6-04-01
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VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 10 of 16

LEGEND

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- PROJECT FENCE (INSTALLED BY OTHERS)
- EXISTING TREE LINE
- EXISTING TREE
- LOG GRADE CONTROL
- ROCK RIFFLE STRUCTURE
- PHOTO POINT (FOR MONITORING)

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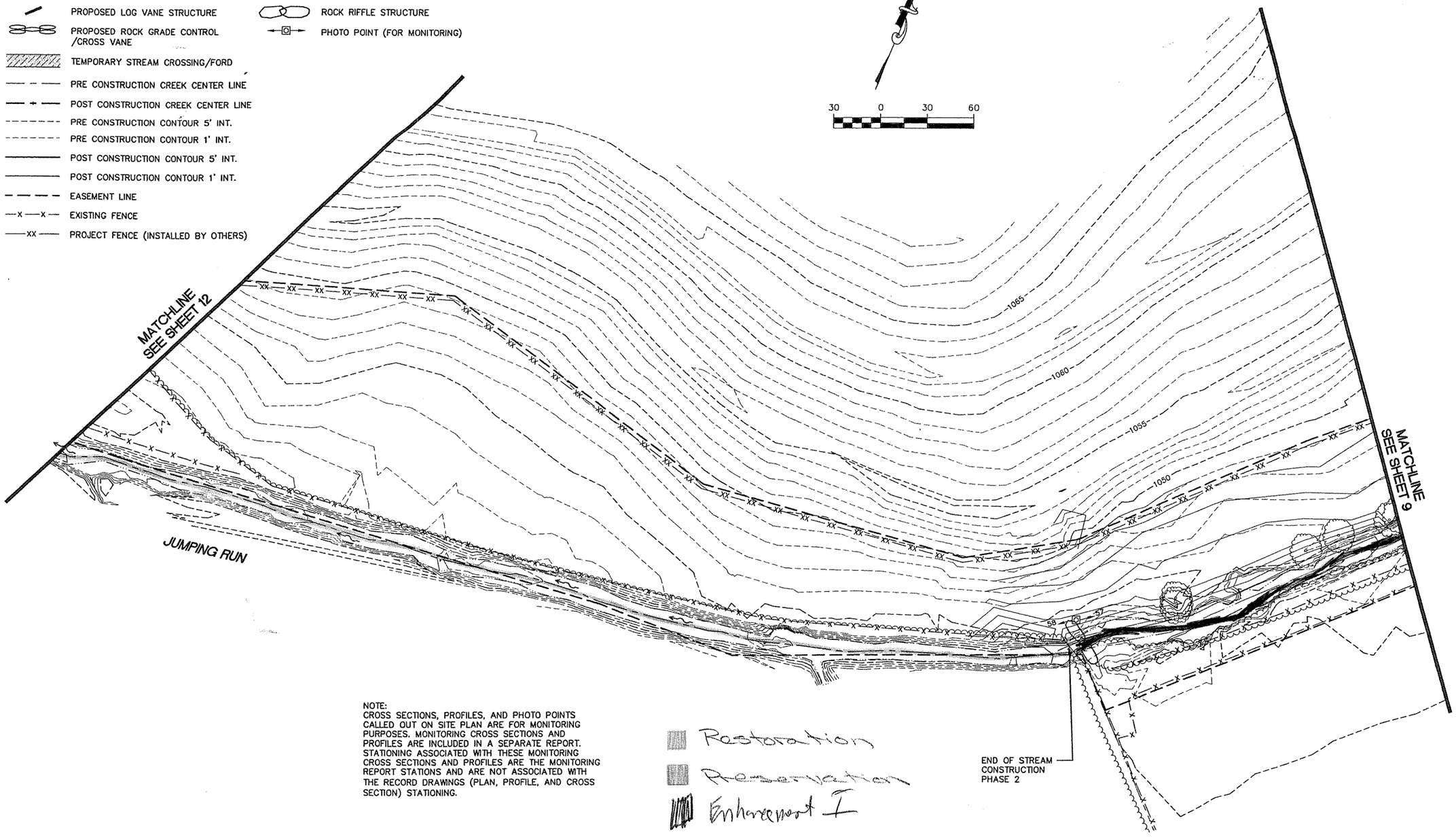

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Restoration
Re-vegetation
Enhancement I

REV. No.	REVISION:	ABJR-SP7	DATE:	DRAWN BY:	CHECKED BY:

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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NCDENR WRP

TITLE: RECORD DRAWINGS SITE PLAN

SEAL:

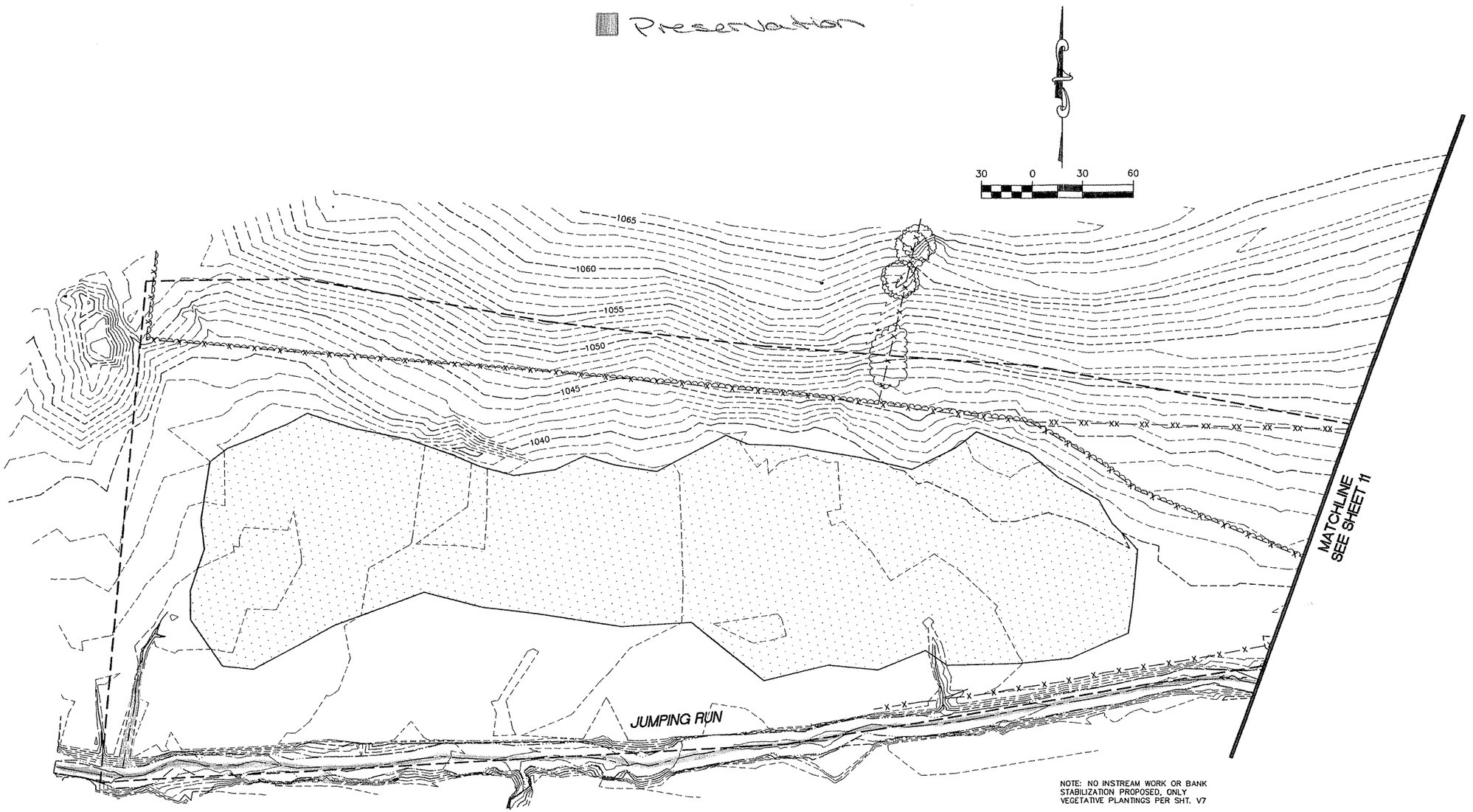
DATE: 6-04-01
HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 11 OF 16

Restoration

Preservation



NOTE: NO INSTREAM WORK OR BANK STABILIZATION PROPOSED, ONLY VEGETATIVE PLANTINGS PER SHT. V7

LEGEND

- EXISTING WETLAND
- DIRECTION OF FLOW
- PROPOSED ROOT WAD
- PROPOSED LOG VANE STRUCTURE
- PROPOSED ROCK GRADE CONTROL /CROSS VANE
- TEMPORARY STREAM CROSSING/FORD
- PRE CONSTRUCTION CREEK CENTER LINE
- POST CONSTRUCTION CREEK CENTER LINE
- PRE CONSTRUCTION CONTOUR 5' INT.
- PRE CONSTRUCTION CONTOUR 1' INT.
- POST CONSTRUCTION CONTOUR 5' INT.
- POST CONSTRUCTION CONTOUR 1' INT.
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DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

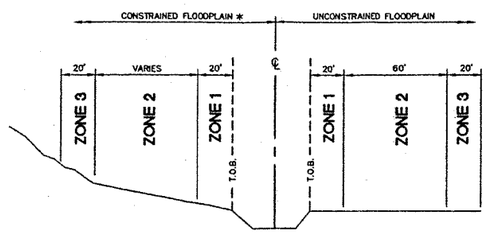
ATTACHED REFERENCE FILES: AS-BUILTZ.DWG
JOB NUMBER: 011795005
SHEET NUMBER: 12 OF 16

Revegetation List

NCWRP Stream Restoration: Payne Dairy Farm, Alexander County

ZONE	Type of Planting	Common Name	Botanical Name	Moisture Regime [1]	Planting Type	Quantity	Benefits	Notes
Live Staking	Trees	Black Willow	Salix nigra	FACW+	Live Stake	2875 stems	Fast growing	
	Shrubs	Silky Dogwood	Cornus amomum	FACW	Live Stake	2250	Fast growing, fruit	
		Elderberry	Sambucus canadensis	FACW-	Live Stake	1000	Fast growing, fruit	
		Southern Arrowwood	Viburnum dentatum	FAC	Live Stake	800	Deep rooted, fruit	
Zone 1: Riparian Forested Stream Bank, 0 to 20 feet from the Top of Bank	Trees	Black Walnut	Juglans nigra	FACU	Bare-root seedling	400 stems	Fast growing	Planted as transitional seedling between Zones 1 and 2
	Shrubs	Roughleaf Dogwood	Cornus drummondii	FAC	Bare-root seedling	1300		
Zone 2: Forested Riparian Area, 20 to 80 feet from the Top of Bank	Trees	Persimmon	Diospyros virginiana	FACU+	Bare-root seedling	300 stems		
		Sugarberry	Celtis occidentalis	FACU	Bare-root seedling	500	Moderate growth, fruit	
		White Oak	Quercus alba	FACU	Bare-root seedling	700	Slow growing, transplants easily	
		Willow Oak	Quercus stellata	FACU	Bare-root seedling	600	Fast growing, transplants easily	
		Loblolly Pine	Pinus taeda	FAC	Bare-root seedling	2250	Will grow in poorly drained floodplains	
		Virginia Pine	Pinus virginiana	UPL	Bare-root seedling	2500	Prefers clay and loamy soils	
	Shrubs	Roughleaf Dogwood	Cornus drummondii	FAC	Bare-root seedling	200	Fast growing	
Zone 3: Grass Filter Strip, 80 to 100 feet from the Top of Bank	Seed mix (10 lbs. per acre)	Indiangrass	Sorghastrum nutans	UPL	Seed	3 lbs.		
		Switchgrass	Panicum virgatum	FAC+	Seed	18		
		Big Bluestem	Andropogon gerardii	FACU	Seed	3		
		Redtop	Agrostis alba	FAC	Seed	18		
		Kentucky Bluegrass	Poa pratensis	UPL	Seed	18	*Total of 8 acres seeded in Zone 3 = 60 lbs of applied seed	
Disturbed or Bare-Earth Areas within the Floodplain	Seed mix (12 lbs. per acre)	Switchgrass	Panicum virgatum	FAC+	Seed	3 lbs.	Disturbed or exposed bare earth areas upslope from the active floodplain that are within the easement boundary are to be seeded using the Zone 3 seed mix species composition. If the area is located within Zone 1 or 2, bare rooting seedlings as described	
		Deertongue	Panicum clandestinum	FACW	Seed	3		
		Rush	Juncus effusus	FACW+	Seed	3		
		Rice Cutgrass	Leersia oryzoides	OBL	Seed	1		
		Hop Sedge	Carex lupulina	OBL	Seed	1		
		Sensitive Fern	Onoclea sensibilis	FACW	Seed	1	*Total of 1 acre of floodplain area seeded = 12 lbs of applied seed	

[1] Hydrologic regime as defined in the " NATIONAL LIST OF VASCULAR PLANT SPECIES THAT OCCUR IN WETLANDS: 1996 NATIONAL SUMMARY,
UPL – Obligate upland, >99% probability to occur in nonwetlands
FACU – Facultative upland, 67–99% probability to occur in nonwetlands
FAC – Facultative, equally likely to occur in wetlands or nonwetlands
FACW – Facultative wetland, 67–99% probability to occur in wetlands
OBL – Obligate wetland, >99% probability to occur in wetlands
+ More likely to be located in drier areas
– More likely to be located in wetter areas



* NOTE:
CONSTRAINED FLOODPLAIN: FLOODPLAIN IS LESS THAN 100' FROM TOP OF BANK (T.O.B.) DUE TO TOPOGRAPHY/UPSLOPE AREAS.

UNCONSTRAINED FLOODPLAIN: FLOODPLAIN IS GREATER THAN OR EQUAL TO 100' FROM THE STREAM TOP OF BANK (T.O.B.).

PLANTING ZONES
NTS

Vegetation General Notes

Permanent vegetation plantings/seeding is to be done in the fall season

If not planted immediately upon delivery to the site, bare root seedlings are to be heeled–in in constantly moist soil or sawdust in an acceptable manner corresponding to generally accepted horticultural practices.

Prior to planting, or in transportation, the contractor shall protect the plants from drying out by using wet canvass, burlap, straw, of other acceptable means appropriate to the weather conditions and length of time roots are to remain out of the ground.

Bare root seedlings that are planted in existing fescue/pasture areas are to be protected by weed control fabric such as RoLanka International, Inc. BioD–Weedmat (approximately 20 in. x 20 in.), or equal product.

Vegetation Zones

The vegetation zones are defined as:
Zone 1 Stream bank vegetation
Zone 2 Riparian/Floodplain vegetation
Zone 3 Grass filter/Upland buffer

The zones are to be measured from the Top of Bank (TOB) feature and spaced as shown in the attached detail.

Zone 1

Plantings are to be bare root seedlings comprised of the species listed in the attached Species List for Zone 1. Species composition is to consist of a mixture of species, with no one species comprising more than 30% of the total number of seedlings. The seedlings are to be planted at a density of one bare root seedling per two square yards. Planting on approximately 8–foot centers is preferred; however, it will be to the supervising engineer's discretion as to a natural "clumping" pattern and location of plantings. Generally, much of Zone 1 is currently pasture. Bare root seedlings will be planted in these areas while the existing grasses will remain to minimize soil disturbance. There are areas of Zone 1 that are forested wetlands and/ or riparian areas. Plantings will not be placed in these areas unless the area experiences disturbance from construction activities. The Supervising Engineer reserves the right to reject any Zone 1 plantings that do not meet the above mentioned criteria. The Contractor shall replace rejected work at no additional cost to the owner.

Zone 2

Plantings are to be bare root seedlings comprised of the species listed in the attached Species List for Zone 2. Seedling spacing and density for Zone 2 is the same as stated above for Zone 1. Similar to Zone 1, much of Zone 2 is currently pasture. Bare root seedlings will be planted in these areas while the existing grasses will remain to minimize soil disturbance. Also, as there is in Zone 1, there are areas of Zone 2 that are forested wetlands and/ or riparian areas. Plantings will not be placed in these areas unless the area experiences disturbance from construction activities. The Supervising Engineer reserves the right to reject any Zone 2 plantings that do not meet the above mentioned criteria. The Contractor shall replace rejected work at no additional cost to the owner.

Zone 3

Zone 3 is intended to provide a grassed buffer strip to the riparian buffer, extending the total buffer width to 100 feet from the top of bank on both sides of the stream. Much of the existing buffer strip is currently in posture with established grasses in place. These areas will be maintained. However, in areas of disturbance, or where the grasses have been removed as sod for other applications in the project area, the grass buffer strip will be seeded comprised of species listed in the attached Species List. The seed mix is not to contain more than 30% of one particular species. The seed mix is to be applied to Zone 3 areas at an application rate of 10 pounds per acre.

Additional Disturbed or Bare–Earth Areas

The existing conditions of vegetation of the easement are mostly pasture, or forested wetland/riparian areas. It is anticipated that certain areas will be disturbed exposing bare soil from construction activities. The areas upslope from the designed floodplain are to be reseeded with the seed mixture as described for Zone 3 areas. For areas of disturbance within the design floodplain, the areas are to be reseeded with the seed mixture listed in the Species List. The seed mix is not to contain more than 30% of one particular species, and is to be applied to the disturbed areas at an application rate of 10 pounds per acre. If the disturbed areas are within Zones 1 or 2, bare root seedling plantings as described in the previous sections are to be applied as well.

Live Stakes

Live stakes are to be installed on exposed stream banks to bankfull elevation of the designed stream. The stakes are to be installed at a density of 2 to 4 live stakes per square yard. The species to be used for live staking are listed in the attached Species List. The species composition of live–stakes is to include approximately 25–40% each of Salix nigra and Cornus amomum species (at least 50 % of the total number live stakes is to be comprised of these two species). The remaining species should include a mixture of the most readably available species listed in the Species List. The Supervising Engineer reserves the right to reject any "stakes" that do not meet the above mentioned criteria. The Contractor shall replace rejected work at no additional cost to the owner.

Live stakes are to be dormant (cut fall or winter), and either gathered locally or purchased from a commercial supplier.

Collection/Preparation
- Stakes must be freshly cut with side branches removed, but with bark in tact (ensure that the bark is not stripped during the cutting, preparation, or installation of the stake).
- Cuttings are to be collected using a saw (not an ax).
- One end must be cut at an angle for insertion into the soil, and the other must be cut square for tamping.
- Cuttings must be kept fresh and moist prior to installation.
- Cuttings must be prepared from 0.5 to 2–inch diameter stock and approximately 2 to 3 feet in length.

Installation
- Install stakes the same day they are prepared.
- Start the installation nearest to the stream and work up the bank/floodplain.
- Cuttings must be installed right side up with the buds pointing upward.
- Cuttings should be tamped into the ground at right angles to the slope and angled downstream.
- They are to be tamped into the ground for approximately 4/5 of their length.
- Cuttings that split or become "mushroomed" must be replaced.
- Stakes are to be spaced at such that there are 2 to 4 stakes per square yard.
- Stakes should be installed in a random configuration to prevent gullies and promote a more natural effect in the re–vegetated area.

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PHONE: (919) 677–2000 FAX: (919) 677–2050

CLIENT: NCDENR WRP

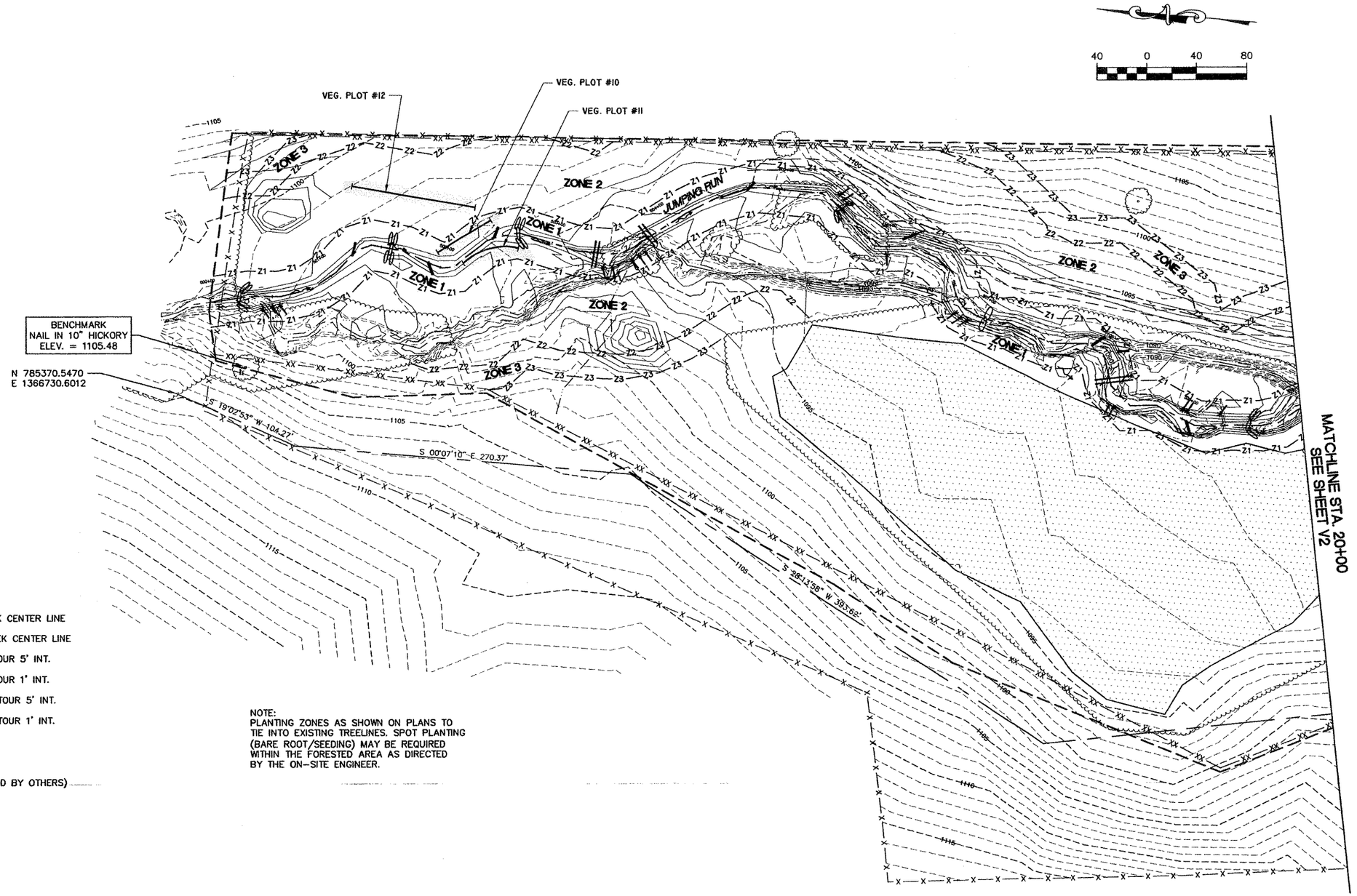
TITLE: RECORD DRAWINGS VEGETATION DETAILS AND NOTES

SEAL:

DATE: 6–04–01
HORIZONTAL SCALE: NTS
VERTICAL SCALE: NTS
DRAWN BY: SES
DESIGNED BY: WW
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES:
JOB NUMBER: 011795005
SHEET NUMBER: V0 or V7



LEGEND

- EXISTING WETLAND
- CONSTRUCTION BASELINE
- PRE CONSTRUCTION CREEK CENTER LINE
- POST CONSTRUCTION CREEK CENTER LINE
- PRE CONSTRUCTION CONTOUR 5' INT.
- PRE CONSTRUCTION CONTOUR 1' INT.
- POST CONSTRUCTION CONTOUR 5' INT.
- POST CONSTRUCTION CONTOUR 1' INT.
- EASEMENT LINE
- EXISTING FENCE
- PROJECT FENCE (INSTALLED BY OTHERS)
- EXISTING TREE LINE
- BUFFER ZONE 1
- BUFFER ZONE 2
- BUFFER ZONE 3
- EXISTING TREE

NOTE:
PLANTING ZONES AS SHOWN ON PLANS TO TIE INTO EXISTING TREELINES. SPOT PLANTING (BARE ROOT/SEEDING) MAY BE REQUIRED WITHIN THE FORESTED AREA AS DIRECTED BY THE ON-SITE ENGINEER.

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PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NCDENR WRP

TITLE: RECORD DRAWINGS VEGETATION PLAN

SEAL:

DATE: 6-04-01
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: V1 of V7

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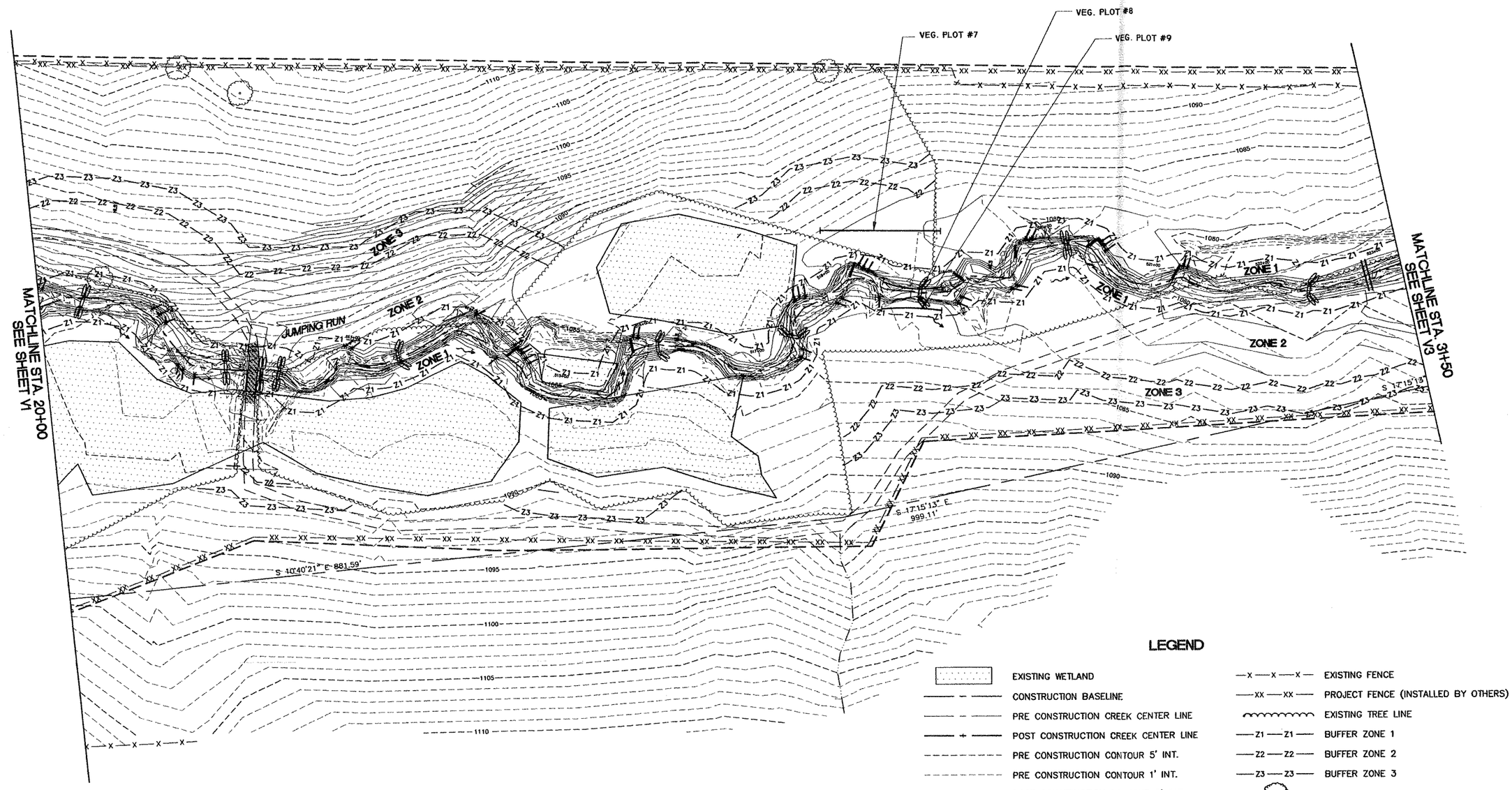

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CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

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SHEET NUMBER: V2 of V7

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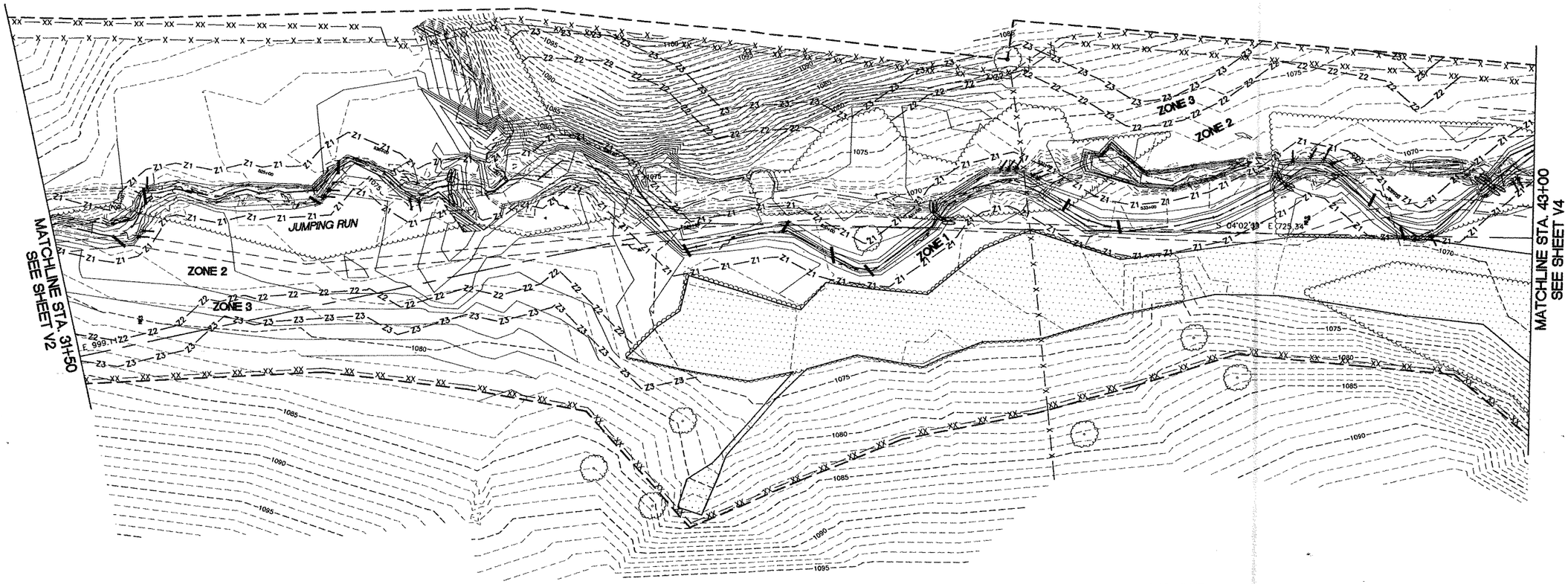

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VERTICAL SCALE: NA
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DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

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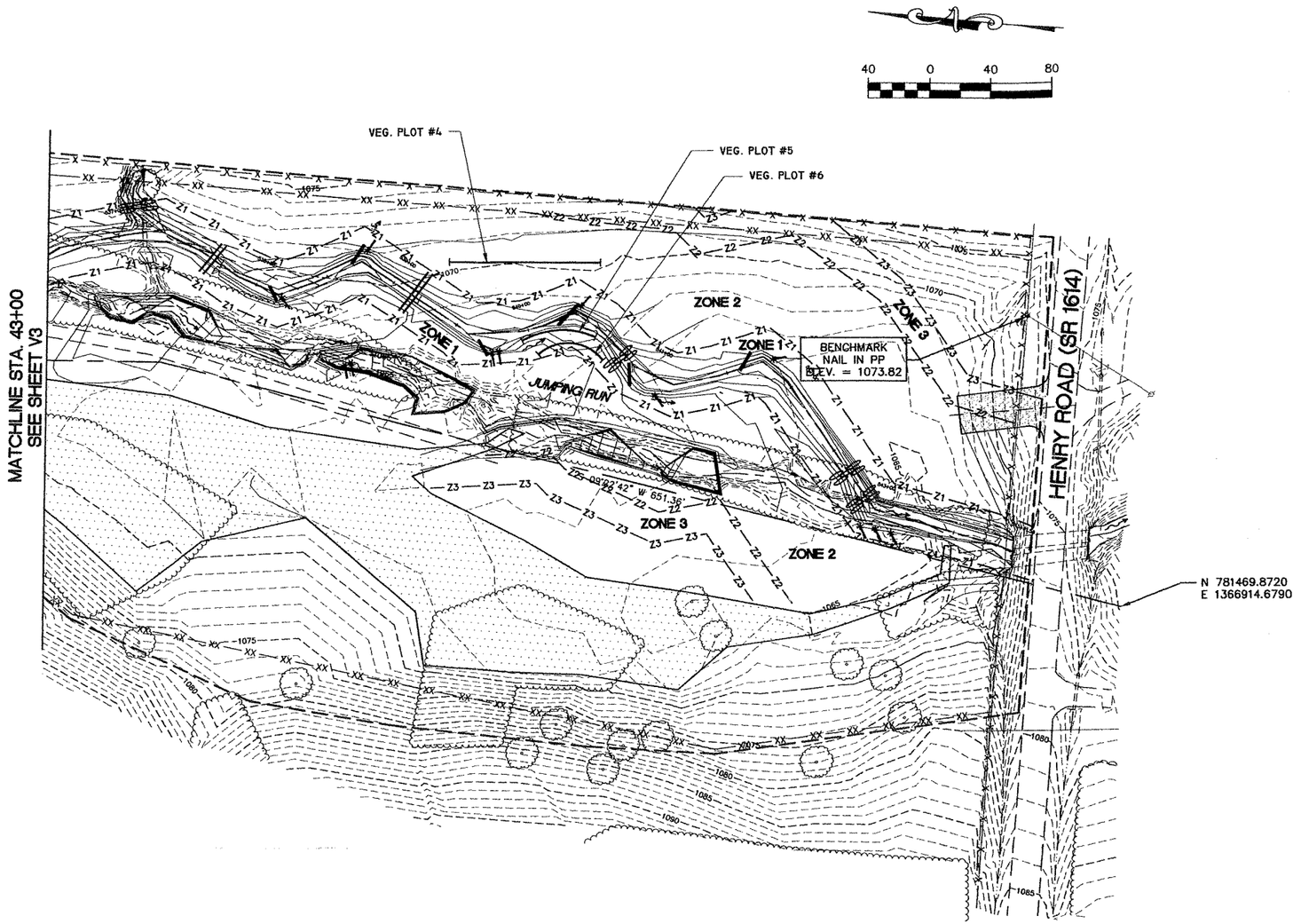
SHEET NUMBER: V3 OF V7



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- PRE CONSTRUCTION CREEK CENTER LINE
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- PRE CONSTRUCTION CONTOUR 5' INT.
- PRE CONSTRUCTION CONTOUR 1' INT.
- POST CONSTRUCTION CONTOUR 5' INT.
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- EASEMENT LINE
- —X—X—X— EXISTING FENCE
- —XX—XX— PROJECT FENCE (INSTALLED BY OTHERS)
- EXISTING TREE LINE
- —Z1—Z1— BUFFER ZONE 1
- —Z2—Z2— BUFFER ZONE 2
- —Z3—Z3— BUFFER ZONE 3
- EXISTING TREE

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CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: V4 OF V7

MATCHLINE SEE SHEET V6

MATCHLINE-STA. 112+00
SEE SHEET V7

ZONE 1
ZONE 2
JUMPING RUN
STAKES #2
VEG. PLOT #3
BENCHMARK
NAIL IN PP
ELEV. = 1051.97
PAUL PAYNE STORE ROAD (SR 1605)

40 0 40 80

LEGEND

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- CONSTRUCTION BASELINE
- PRE CONSTRUCTION CREEK CENTER LINE
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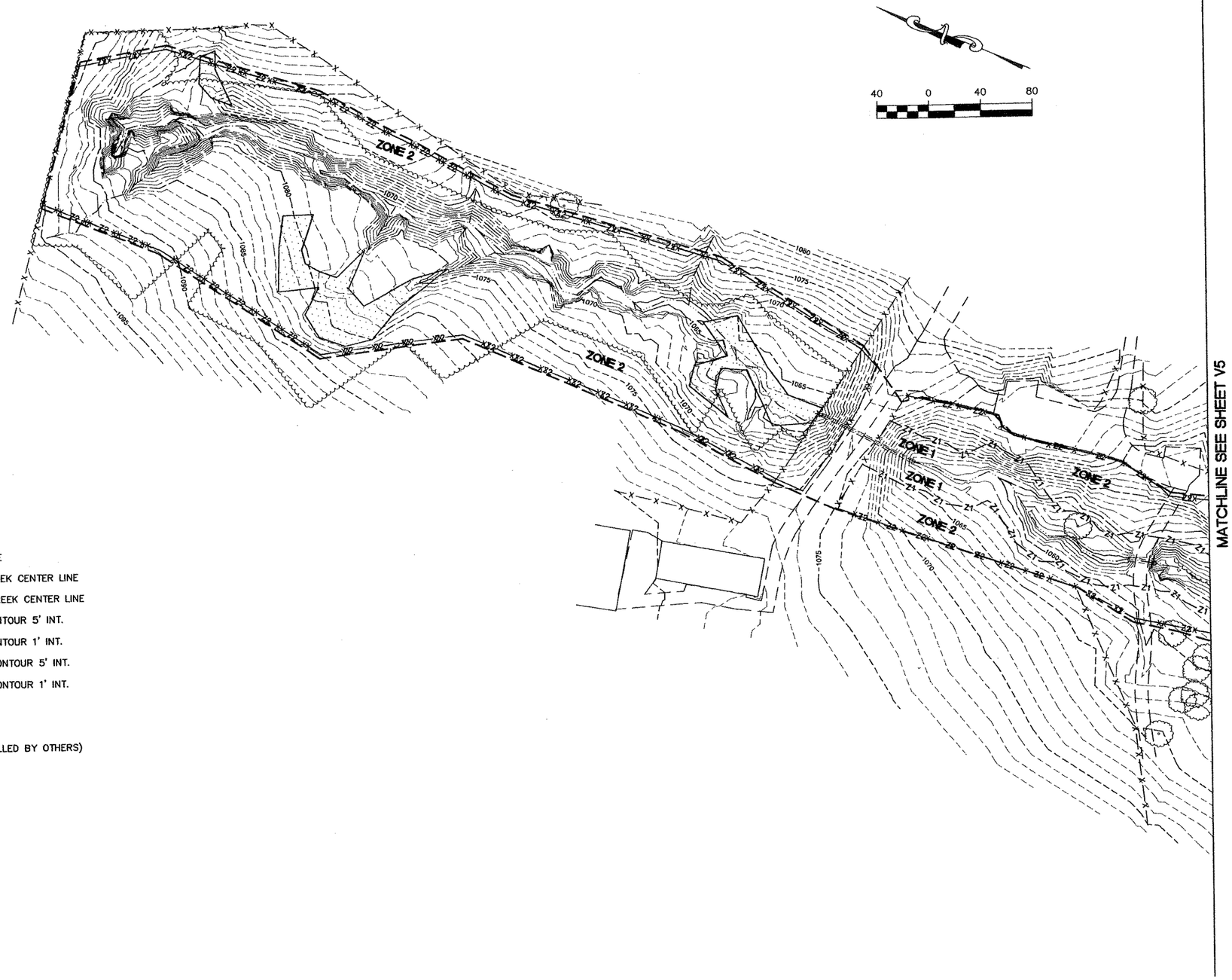
ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: V5 OF V7



LEGEND

- EXISTING WETLAND
- CONSTRUCTION BASELINE
- PRE CONSTRUCTION CREEK CENTER LINE
- POST CONSTRUCTION CREEK CENTER LINE
- PRE CONSTRUCTION CONTOUR 5' INT.
- PRE CONSTRUCTION CONTOUR 1' INT.
- POST CONSTRUCTION CONTOUR 5' INT.
- POST CONSTRUCTION CONTOUR 1' INT.
- EASEMENT LINE
- —x—x—x— EXISTING FENCE
- —xx—xx— PROJECT FENCE (INSTALLED BY OTHERS)
- EXISTING TREE LINE
- —Z1—Z1— BUFFER ZONE 1
- —Z2—Z2— BUFFER ZONE 2
- —Z3—Z3— BUFFER ZONE 3
- EXISTING TREE

REV. No.:	REVISION:	DATE:	DRAWN BY:	CHECKED BY:
	AB.JR-VP6.DWG			

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PREPARED IN THE OFFICE OF:
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P.O. BOX 33068 – RALEIGH, NORTH CAROLINA 27636-3068
PHONE: (919) 677-2000 FAX: (919) 677-2050

CLIENT: NCDENR WRP

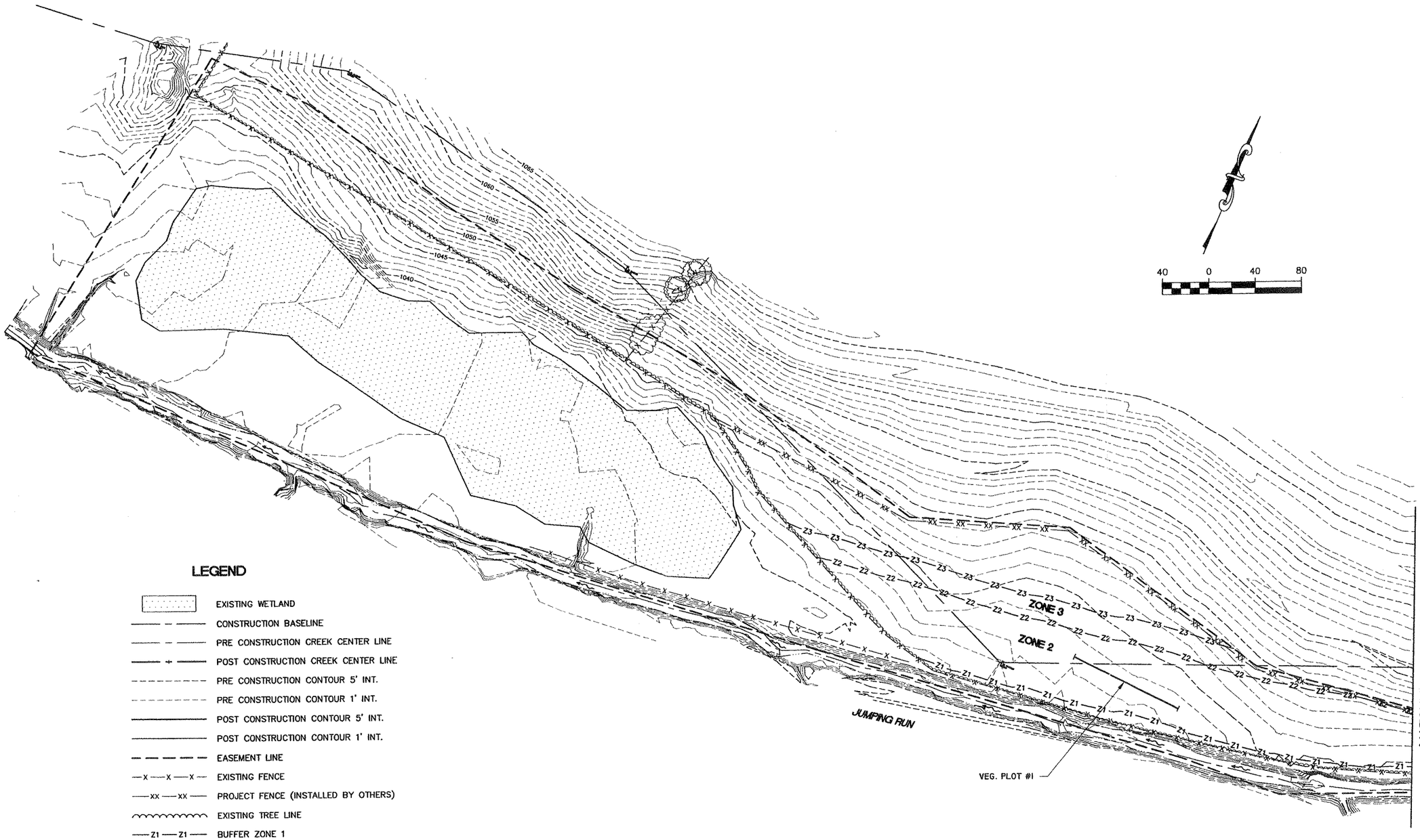
TITLE: RECORD DRAWINGS VEGETATION PLAN

SEAL:

DATE: 6-04-01
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: NA
DRAWN BY: SES
DESIGNED BY:
CHECKED BY: JME/SWB

PROJECT: PAYNE DAIRY FARM ALEXANDER COUNTY

ATTACHED REFERENCE FILES: AS-BLT2.DWG
JOB NUMBER: 011795005
SHEET NUMBER: V6 OF V7



LEGEND

- EXISTING WETLAND
- CONSTRUCTION BASELINE
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- BUFFER ZONE 2
- BUFFER ZONE 3
- EXISTING TREE

REV. No.:	REVISION:	ABJR-VP7.DWG	DATE:	DRAWN BY:	CHECKED BY:

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JOB NUMBER: 011795005
SHEET NUMBER: V7 OF V7