# Purlear Creek - Phase II
# Stream Restoration
# Annual Monitoring Report

**Monitoring Year: 2007**
**Measurement Year: 2**
**As-built Date: 2005**
**NCEEP Project Number: 010559701**

Submitted to: NCDENR-Ecosystem Enhancement Program
1619 Mail Service Center
Raleigh, NC 27699-1619

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# PURLEAR CREEK - PHASE II STREAM RESTORATION
# 2007 MONITORING REPORT

## CONDUCTED FOR THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

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## I. Executive Summary/Project Abstract

This report represents monitoring year 2 for the Purlear Creek Phase II stream restoration project in Wilkes County, North Carolina. The project background is summarized in Section II of this report. The project is comprised of two reaches. The upper reach is Reach 4 and the lower reach is Reach 1. The channel has remained stable since construction. Study reaches show no significant bed profile, channel pattern or cross sectional changes. The majority of channel banks are well-covered with vegetation. Planted trees and shrubs are doing well throughout the buffer.

Two problem areas were identified in the 2006 monitoring report in Reach 1. The first area was erosion along the outside meander at station 5+75. This area appeared to stabilize in 2007. The second problem area was concentrated flow from the adjacent cow pasture piping through the buffer at station 9+80. Problem area 2 was less of an issue in 2007 due to the drought conditions. However, it is recommended that the area outside of the buffer be fenced and the swale cutting through the buffer be turned into a level spreader to repair this location. Both areas shall continue to be monitored. An additional problem area was identified on Reach 1 in 2007. Problem area 3 consists of a beaver dam on Reach 1, which is backing up water and obstructing flow. It is recommended that the beaver dam be removed so the stream can flow as intended.

No problem areas were identified in Reach 4.

Vegetation suffered from the drought in 2007. Within the wetland tracts, much of the wetland herbaceous vegetation was replaced by species common to dryer areas. There was 28% mortality of planted stems in plots between the 2006 and 2007 sampling. This follows the 39% mortality of planted stems in plots recorded in 2006. Estimated surviving planted stem density extrapolated from the eight sampling plots is now 624 stems per acre. A few stems within plots had been cut, but this was not a systematic problem throughout the buffer. There were no other encroachment problems observed. The primary cause of low vigor and survival appears to be the unusual drought.

Based on visual observations, the wetlands appear to be exceeding minimal conditions for hydrology. Both groundwater wells were replaced in August 2007. However, it was discovered that one well was not functioning properly when field staff attempted to download water level data in November 2007. This well shall be calibrated or repaired before the 2008 growing season. The wetland exceeded minimal conditions for hydrology in the functioning well.

## II. Project Background

1. Location and Setting
   Phase II of the Purlear Creek Stream and Wetland Restoration project falls within the Hayes Property in Wilkes County, North Carolina approximately 8 miles northwest of the Town of Wilkesboro. Figure 1 shows a map with detailed directions to the project site. An aerial photograph of the project is contained in Figure 2.

2. Project Structure, Mitigation Type, Approach and Objectives
   Phase II of the Purlear Creek stream and wetland restoration project strived to restore two (2) stream reaches and restore and enhance adjacent riparian wetlands. Both streams lie within an area that is actively used for cattle grazing. The alignments of the channels indicated that the channels had been straightened and channelized in the past. The designer used a Priority I approach to restore the upper reach (Reach 4). A new channel was dug into the abandoned floodplain. For the lower reach (Reach 1), the designer used a Priority II approach to restore the reach. The existing channel banks were laid

back to create an expanded floodplain and new channel alignment was placed within the expanded floodplain. For both reaches, in-stream structures such as A-Vane, Cross-Vanes, and J-Hooks were installed to provide additional stability to the channel. Root wads were installed to provide additional habitat.

Much of the riparian wetlands had been cleared and cattle grazing severely limited regrowth of woody vegetation. Groundwater and surface water hydrologic components were impaired due to channelization of the adjacent stream. One of the objectives of the priority I restoration of the adjacent stream was to restore the wetland hydrology by increasing the frequency and duration of overbank flows into the wetland and raising the groundwater elevations that are influenced by the base flow elevation of the stream.

Most of the riparian corridor (including the riparian wetland) had been cleared and maintained as pasture. The ecological function of the corridor relative to the streams and wetland had been impaired. The restoration effort planted the area with a mix of woody vegetation to help reestablish a viable riparian forest community. The planting plan assumes that there is adequate seed source for herbaceous species to reestablish in the area. The planted area shall be maintained to promote the growth of planted and preferred volunteer species and to limit populations of nuisance and invasive species.

Table I lists project structure and objectives while Table II lists project activity and reporting history. The project contact table is listed in Table III and Table IV lists the background information for the project.

**Table I. Project Mitigation Structure and Objectives Table**
**Purlear Creek Phase II / Project ID 010559701**

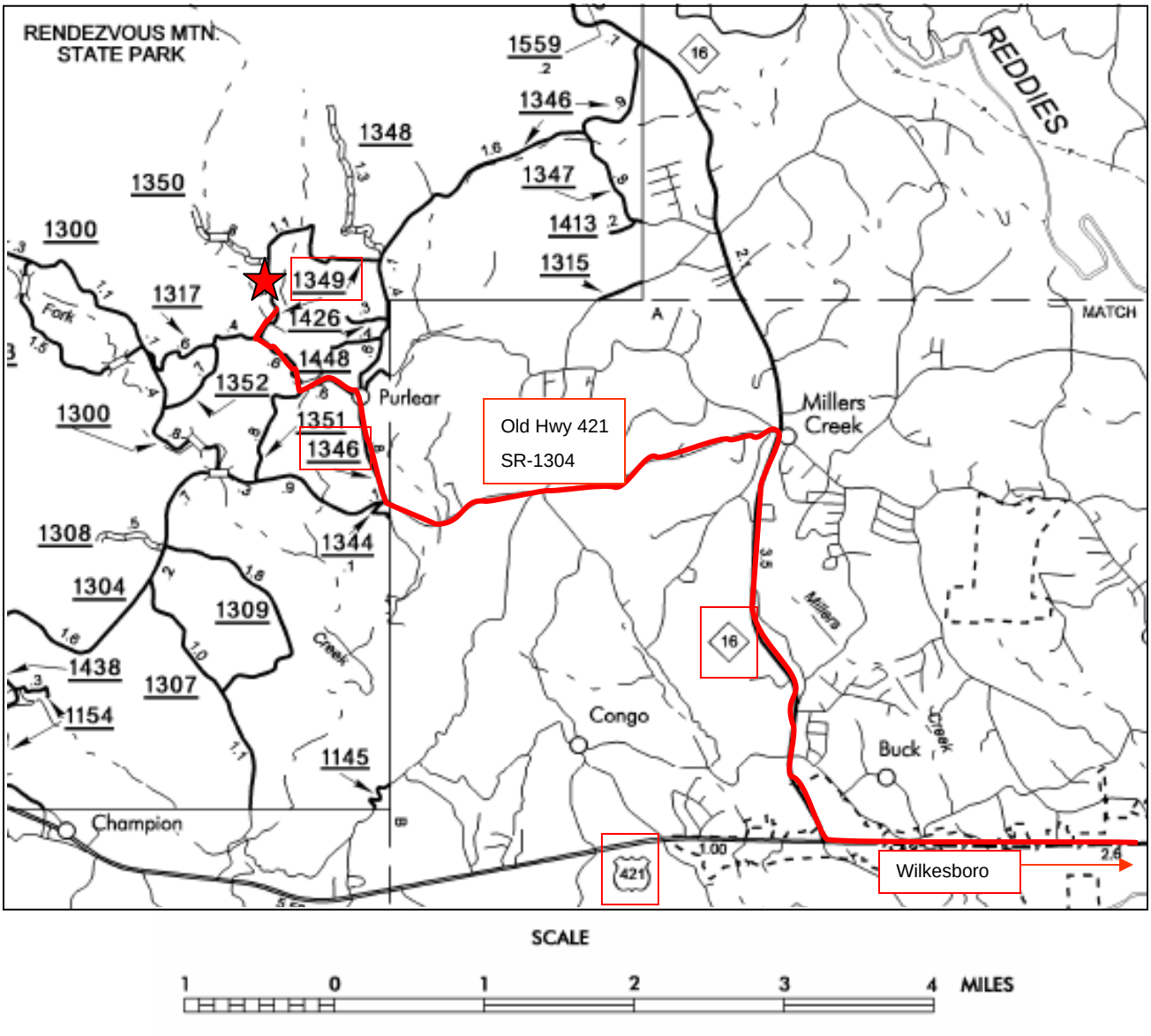
| Project Segment or Reach ID | Existing (ft or ac) | Mitigation Type | Approach | Linear Footage (lf) or Acreage (ac) | Stationing | Comment |
|---|---|---|---|---|---|---|
| **Reach 1** | 1100 | Restoration | Priority II | 1,140 lf | 00 + 00 - 11 + 40 | -- |
| **Reach 4** | 1412 | Restoration | Priority I | 1,480 lf | 00 + 00 - 14 + 80 | -- |
| **Tract W1** | 0.21 | Restoration | Rehabilitation | 0.21 ac. | 307 + 50 - 310 + 50 | Improvement of vegetation and hydrology of seep wetland |
| **Tract W2** | 0.84 | Restoration | Re-establishment | 0.84 ac. | 301 + 60 - 313 + 90 | Restoration of riverine wetland located along left side of Reach 4 |

| Table II. Project Activity and Reporting History<br>Purlear Creek Phase II / Project ID 010559701 | | | | |
|---|---|---|---|---|
| **Activity or Report** | **Scheduled Completion** | **Data Collection Complete** | **Actual Completion or Delivery** | **Comments** |
| **Restoration Plan** | | | April 2004 | |
| **Final Design – 90%** | March 2004 | -- | May 2004 | |
| **Construction** | Spring 2005 | -- | Spring 2006 | Construction delay due to delay in obtaining easment and mulitple bids |
| **Temporary S&E mix applied to entire project area** | -- | -- | -- | |
| **Permanent seed mix applied** | -- | -- | -- | |
| **Containerized and B&B plantings for reach/segments 1&2** | -- | -- | January 2006 | |
| **Mitigation Plan / As-built (Year 0 Monitoring – baseline)** | December 2005 | -- | May 2006 | Delay in planting |
| **Year 1 monitoring** | December 2006 | October 2006 | December 2006 | |
| **Year 2 Monitoring** | December 2007 | October 2007 | December 2007 | Survey completed in August, photo points completed in October |
| **Year 3 Monitoring** | -- | -- | -- | |
| **Year 4 Monitoring** | -- | -- | -- | |
| **Year 5 Monitoring** | -- | -- | -- | |
| **Year 5+ Monitoring** | -- | -- | -- | |

| Table III. Project Contact Table<br>Purlear Creek Phase II / Project ID 010559701 | | |
|---|---|---|
| **Designer** | P.O. Box 33068 | |
| Kimley-Horn and Associates | Raleigh, NC 27636-3068 | |
| Primary Designer POC | Will Wilhelm, P.E. | (704) 319-7684 |
| **Construction Contractor** | 220 Stoneridge Drive, Suite 405 | |
| L-J, INC | Columbia, SC 29210 | |
| Primary Contractor POC | Richard Goodwin | (803) 929-1181 |
| **Planting Contractor** | P.O. Box 655 | |
| HARP | Newell, NC 28126 | |
| Planting contractor POC | Jim Matthews, Ph.D. | (704) 841-2841 |
| **Seeding Contractor** | | |
| UNKNOWN | | |
| Planting contractor POC | UNKNOWN | |
| Seed Mix Sources | UNKNOWN | |
| Nursery Stock Suppliers | UNKNOWN | |
| **Monitoring Performers** | | |
| North Carolina State University | Campus Box 7625<br>Raleigh, NC 27695 | |
| Stream Monitoring POC | Zan Price | 828-545-8347 |
| Vegetation Monitoring POC | Karen Hall | 919-515-8242 |
| Wetland Monitoring POC | Zan Price | 828-545-8347 |

| Table IV. Project Background Table<br>Purlear Creek Phase II / Project ID 010559701 | | |
|---|---|---|
| **Project County** | Wilkes | |
| **Drainage Area** | Reach 1 | 3.0 $mi^2$ |
| | Reach 4 | 0.4 $mi^2$ |
| **Drainage impervious cover estimate (%)** | Reach 1 | < 5% |
| | Reach 4 | < 5% |
| **Stream Order** | Reach 1 | 3 |
| | Reach 4 | 1 |
| **Physiographic Region** | Piedmont | |
| **Ecoregion** | Northern Inner Piedmont | |
| **Rosgen Classification of As-built** | Reach 1 | C4/1 |
| | Reach 4 | C4 |
| **Cowardin Classification** | PEM01E | |
| **Dominant soil types** | Chewacla loam (CkA); Pacolet Sandy clay loam (PcC2); Pacolet sandy loam (PaD); Wehadkee loam (WhA) | |
| **Reference site ID** | Upstream 1; Upper Big Warrior Creek; Basin Creek | |
| **USGS HUC for Project and Reference** | 03040101 (All project and reference reaches) | |
| **NCDWQ Sub-basin for Project and Reference** | 03-07-01 (All project and reference reaches) | |
| **NCDWQ classification for Project and Reference** | Project Reaches & Upstream 1 Reference | 12-31-1-8-(2) |
| | Upper Warrior Creek | 12-29-1 (2) |
| | Basin Creek | 12-46-2-2 |
| **Any portion of any project segment 303d listed?** | No | |
| **Any portion of any project segment upstream of a 303d listed segment?** | N/A | |
| **Reasons for 303d listing or stressor** | N/A | |
| **% of project easement fenced** | 100% | |

Figure 1. Project Location

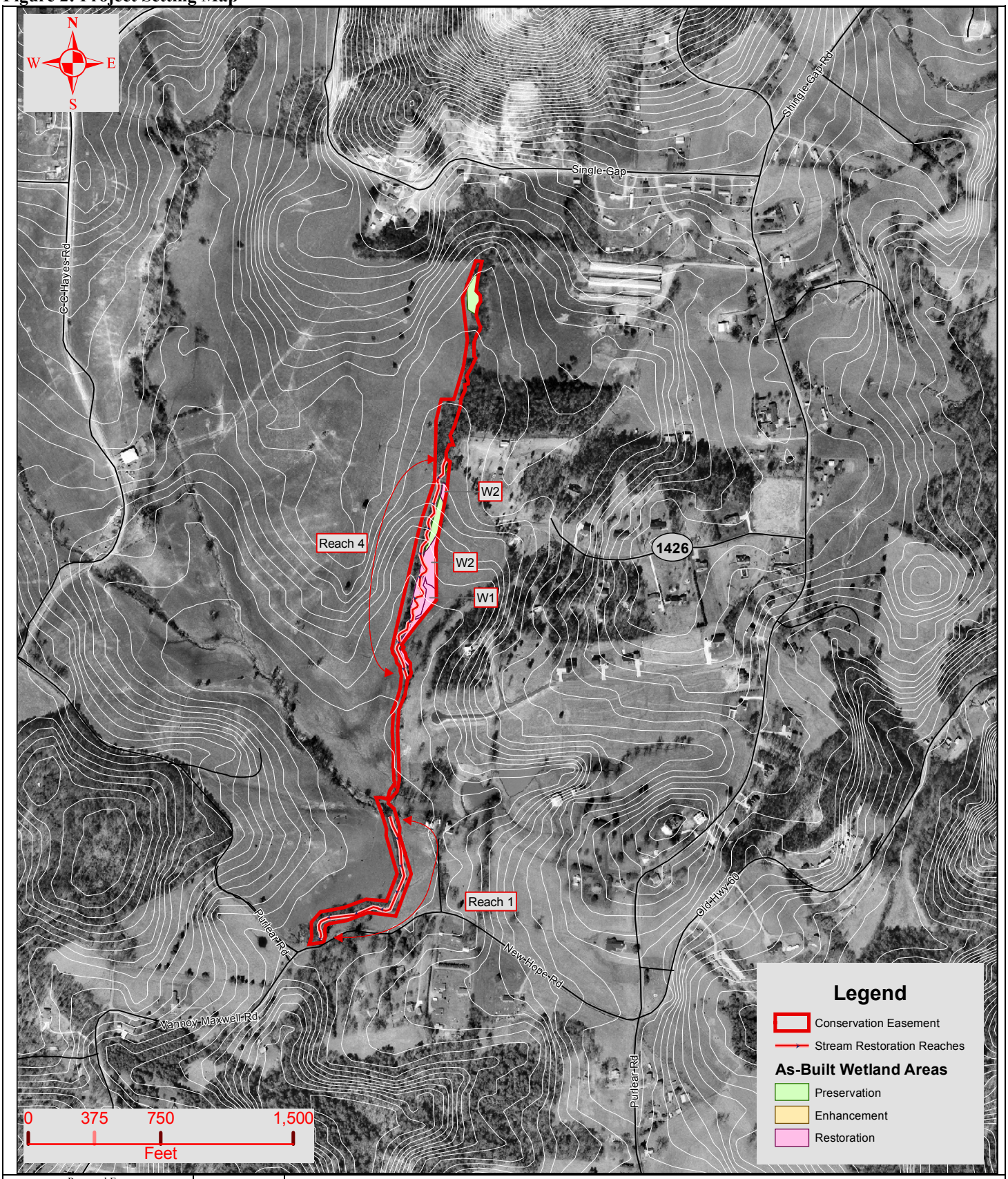



**Directions from Hwy. 421 in Wilkesboro:**

From Wilkesboro on Hwy. 421, turn right onto NC-16. Follow NC-16 for 3.5 miles to the Miller's Creek intersection. Turn left onto Old Hwy. 421 (SR-1304) and follow for 2.6 miles. Turn right onto Purlear Road (SR-1346) and follow for 0.8 miles. You will come to a stop sign at a church, turn left to stay on Purlear Road (also called New Hope Road). Follow Purlear Road for 0.6 miles until the intersection with Vannoy Maxwell Road. Project begins at this intersection and continues through the intersection with CC Hayes Road (SR- 1349).

**Contact the EEP Project Manager for access and landowner notification instructions. Access is not permitted to this site without prior approval.**

**Figure 2: Project Setting Map**




| | | |
|---|---|---|
| Prepared For: Ecosystem Enhancement Program | **Project** | Purlear Creek Phase II Stream and Wetland Restoration – Year 0 Monitoring 2006<br>Wilkes County, North Carolina |
| | **Date**<br>6/5/06 | **Project Number**<br>010559701 |

# REACH 4
# WETLAND REACH

NORTH

NOTE: PEBBLE COUNT ZONE

CROSS SECTION #2
REACH 4
POOL

CROSS SECTION #3
REACH 4
RIFFLE

CROSS SECTION #1
REACH 4
RIFFLE

CROSS SECTION #4
REACH 4
POOL

CROSS SECTION #5
REACH 4
RIFFLE

CROSS SECTION #6
REACH 4
POOL

RDS–W1

RDS–W2

BOX CULVERT

FLOW DIRECTION

FLOW DIRECTION

Veg Plot #1

Veg Plot #2

Veg Plot #3

Veg Plot #4

Veg Plot #5

Veg Plot #6

P11 P12 P13 P14 P15 P16 P17 P18 P19 P20 P21 P22 P23 P24 P25 P26 P27 P28

00+0 1+00 2+00 3+00 4+00 5+00 6+00 7+00 00+8 9+00 10+00 00+1 12+00 13+00 14+00 14+79.60

LEGEND

- 2007 THALWEG
- 2007 WATER EDGE
- 2007 BANKFULL/ TOP OF BANK
- AS–BUILT THALWEG/ ALIGNMENT
- 2006 THALWEG
- FENCE LINE
- CROSS SECTION
- PHOTO POINT P#
- VEG PLOT

SCALE 1" = 50'

25 0 25 50

Ecosystem Enhancement PROGRAM

| NO | DESCRIPTION | DRN | CHK | DATE |
|---|---|---|---|---|
| 1 | AS–BUILT PLAN | ZP | JMP | 12/01/06 |
| 2 | 2007 MONITORING | ZP | JMP | 12/01/07 |

REVISIONS


NC STATE UNIVERSITY

BIOLOGICAL & AGRICULTURAL ENGINEERING
Weaver Labs Campus Box 7625
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Raleigh, NC 27695


PURLEAR CREEK – PHASE 2
REACH 4 – WETLAND AREA
WILKES COUNTY, N.C.

MONITORING PLAN SHEET
FIGURE 3a

DATE 03/01/2006

PROJECT NO. 294

FILENAME PULEARII07.DWG

SHEET NO.

# REACH 1
# MAIN STEM REACH

NORTH

CROSS SECTION #7
REACH 1
RIFFLE

CROSS SECTION #8
REACH 1
RIFFLE

CROSS SECTION #9
REACH 1
POOL

CROSS SECTION #10
REACH 1
POOL

P1
P2
P3
P4
P5
P6
P7
P8
P9
P10

0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00
10+00
11+00
11+40.52

Veg Plot #7
Veg Plot #8

BRIDGE

FLOW DIRECTION
FLOW DIRECTION

NOTE: PEBBLE COUNT ZONE

LEGEND
- 2007 THALWEG
- 2007 WATER EDGE
- 2007 BANKFULL/ TOP OF BANK
- AS-BUILT THALWEG/ ALIGNMENT
- 2006 THALWEG
- FENCE LINE
- CROSS SECTION
- PHOTO POINT (P#)
- VEG PLOT

SCALE 1" = 50'

25 0 25 50

Ecosystem Enhancement PROGRAM

| NO | REVISIONS | DRN | CHK | DATE |
|---|---|---|---|---|
| 1 | AS-BUILT PLAN | DRC | JMP | 12/01/06 |
| 2 | 2007 MONITORING | ZP | JMP | 12/01/07 |

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PURLEAR CREEK – PHASE 2
REACH 1 – MAIN STEM REACH
WILKES COUNTY, N.C.

MONITORING PLAN SHEET
FIGURE 3b

DATE 03/01/2006
PROJECT NO. 294
FILENAME PULEARII07.DWG
SHEET NO.

## III. Project Condition and Monitoring Results

### A. Vegetation Assessment

Eight vegetation monitoring plots in the riparian buffer of the Purlear Phase II project were surveyed. All the plots had been previously established and sampled after construction in early 2006. Plot numbering is consistent with numbering from the Vegetation Baseline Data post-construction monitoring report.

Vegetation suffered from the drought in 2007. Within the wetland tracts, much of the wetland herbaceous vegetation was replaced by species common to dryer areas. There was 28% mortality of planted stems in plots between the 2006 and 2007 sampling. This follows the 39% mortality of planted stems in plots recorded in 2006. Estimated surviving planted stem density extrapolated from the eight sampling plots is now 624 stems per acre. A few stems within plots had been cut, but this was not a systematic problem throughout the buffer. There were no other encroachment problems observed. The primary cause of low vigor and survival appears to be the unusual drought.

No vegetative problem areas were observed. Vegetation data is presented in Appendix A of this report.

### B. Stream Assessment

The stream channel is in a stable condition, with only localized problem areas identified in this survey.

Hydrologic Assessment

Continuous stage recorders were installed at various locations along the channel in the winter of 2005 for a graduate student research project. Table V lists the number of events equal to or greater then bankfull. The graduate research project ended in fall 2006 and no bankfull events were recorded or inferred in 2007.

**Table V. Verification of Bankfull Events**
**Purlear Creek Phase II / Project ID 010559701**

| Date of Data Collection | Date of Occurrence | Method | Photo # |
|---|---|---|---|
| Monthly | 6/28/2006 | On-site transducer/data logger | NA |
| Monthly | 7/31/2006 | On-site transducer/data logger | NA |
| | | | |

Bank Stability Assessment - Monitoring Year 05

Table VI. BEHI and Sediment Export Estimates shall be included in the monitoring year 5 report.

Project Problem Area

The problem area Table B1, plan sheet and photographs can be found in Appendix B. Two problem areas were identified in the 2006 monitoring report in Reach 1. Problem area 1 appeared to stabilize in 2007. Problem area 2 was less of an issue in 2007 due to the drought conditions. Both areas shall continue to be monitored. An additional problem area was identified on Reach 1 in 2007. Problem area 3 consists of a beaver dam on Reach 1, which is backing up water and obstructing flow. It is recommended that the beaver dam be removed so the stream can flow as intended.

No problems areas have been identified in Reach 4.

Stream Visual Assessment

Table VII lists the results of a visual assessment conducted over each study reach. The data used to calculate the percentages listed in this table are found in Table B2 in Appendix B.

**Table VII. Categorical Stream Feature Visual Stability Assessment**
**Purlear Creek Phase II / Project ID 010559701**

| Reach 1 (1140 Feet) | | | | | | |
|---|---|---|---|---|---|---|
| **Feature** | **Initial** | **MY-01** | **MY-02** | **MY-03** | **MY-04** | **MY-05** |
| A. Riffles | 100% | 69% | 69% | -- | -- | -- |
| B. Pools | 100% | 92% | 92% | -- | -- | -- |
| C. Thalweg | 80% | 80% | 100% | -- | -- | -- |
| D. Meanders | 100% | 92% | 100% | -- | -- | -- |
| E. Bed General | 100% | 90% | 100% | -- | -- | -- |
| F. Bank Condition | -- | -- | 100% | | | |
| G. Vanes / J Hooks etc. | 100% | 100% | 100% | -- | -- | -- |
| H. Wads and Boulders | 100% | 100% | 100% | -- | -- | -- |
| **Reach 4 (1480 Feet)** | | | | | | |
| **Feature** | **Initial** | **MY-01** | **MY-02** | **MY-03** | **MY-04** | **MY-05** |
| A. Riffles | 100% | 75% | 85% | -- | -- | -- |
| B. Pools | 100% | 97% | 97% | -- | -- | -- |
| C. Thalweg | 100% | 100% | 100% | -- | -- | -- |
| D. Meanders | 100% | 100% | 100% | -- | -- | -- |
| E. Bed General | 100% | 83% | 100% | -- | -- | -- |
| F. Bank Condition | -- | -- | 100% | | | |
| G. Vanes / J Hooks etc. | 98% | 100% | 100% | -- | -- | -- |
| H. Wads and Boulders | -- | -- | -- | -- | -- | -- |

***Reach 1 - Main Stem Purlear Creek***

The channel profile is similar to the as-built survey condition, with bedform features maintaining their locations and depths. Channel cross sections showed no significant changes in cross sectional area. One localized area of bank erosion that existed around station 5+75 in 2006 has stabilized with vegetation. The typical bed material particle size became slightly coarser in 2007 compared to 2006.

A visual assessment of this reach showed a total decrease in number of riffles and pools but those that remain are mostly stable. Meanders are maintaining location and stability throughout the reach. No structures have failed their purpose in this reach.

***Reach 4 - Upper Middle Tributary***

The channel profile is similar to the as-built survey condition, with the majority of bedform features maintaining their locations and depths. Channel cross sections showed no significant changes in cross sectional area. The channel thalweg is being maintained in the proper location and banks show no signs of degrading.

The typical bed material particle size became slightly coarser in 2007 compared to 2006. Channel pattern is similar to as-built conditions. Dense vegetation is establishing along the channel banks. This vegetation is providing an excellent root mass to stabilize the banks. There are no areas of visible meander migrations throughout this reach. No erosion areas were observed along this reach.

Quantitative Measures Summary Tables

The tables below present all of the quantitative summary data from the survey cross-sectional surveys, longitudinal surveys, and pebble counts. The associated raw data and plots are located in Appendix B of this report.

**Table VIIIa. Baseline Morphology and Hydraulic Summary**
**Purlear Creek Phase II / Project ID 010559701**
**Reach 1 - 1140 Feet**

| Parameter | | USGS Gage Data | | | Regional Curve (3.0 $mi^2$) | | | Pre-Existing Condition | | | Project Reference Stream | | | Design | | | As-built | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dimension** | **Units** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** |
| BF Width | ft | -- | -- | -- | -- | -- | 28.6 | -- | -- | 23.9 | -- | -- | -- | -- | -- | 24.2 | 25.7 | 26.8 | 26.3 |
| Floodprone Width | ft | -- | -- | -- | -- | -- | -- | -- | -- | 50 | -- | -- | -- | -- | -- | 62 | -- | -- | 74.0 |
| BF Cross Sectional Area | $ft^2$ | -- | -- | -- | -- | -- | 45.6 | -- | -- | 40.3 | -- | -- | -- | -- | -- | 43.5 | 25.8 | 48.9 | 37.3 |
| BF Mean Depth | ft | -- | -- | -- | -- | -- | 1.6 | -- | -- | 1.7 | -- | -- | -- | -- | -- | 1.8 | 1.0 | 1.9 | 1.4 |
| BF Max Depth | ft | -- | -- | -- | -- | -- | -- | -- | -- | 2.8 | -- | -- | -- | -- | -- | 2.7 | 2.0 | 3.4 | 2.7 |
| Width/Depth Ratio | | -- | -- | -- | -- | -- | -- | -- | -- | 14.2 | 11.2 | 20.8 | 16 | -- | -- | 13.5 | -- | -- | 15.9 |
| Entrenchment Ratio | | -- | -- | -- | -- | -- | -- | -- | -- | 2.1 | 1.4 | 9.9 | 4 | -- | -- | 2.6 | -- | -- | 3.1 |
| Wetted Perimeter | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydraulic radius | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.9 | 1.8 | 1.4 |
| **Pattern** | | | | | | | | | | | | | | | | | | | |
| Channel Beltwidth | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 28 | 61 | 43 |
| Radius of Curvature | ft | -- | -- | -- | -- | -- | -- | -- | -- | 75 | -- | -- | -- | 48 | 83 | 66 | 33 | 57 | 43 |
| Meander Wavelength | ft | -- | -- | -- | -- | -- | -- | -- | -- | 200 | -- | -- | -- | -- | -- | 200 | 126 | 220 | 179 |
| Meander Width ratio | | -- | -- | -- | -- | -- | -- | -- | -- | -- | 1.7 | 3.4 | 2.3 | -- | -- | -- | 1.1 | 2.3 | 1.6 |
| **Profile** | | | | | | | | | | | | | | | | | | | |
| Riffle length | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Riffle slope | ft/ft | -- | -- | -- | -- | -- | -- | -- | -- | 0.015 | -- | -- | -- | -- | -- | 0.009 | 0.001 | 0.01 | 0.005 |
| Pool length | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 28 | 76 | 53 |
| Pool spacing | ft | -- | -- | -- | -- | -- | -- | 61 | 181 | 121 | -- | -- | -- | 121 | 194 | 194 | 127 | 200 | 145 |
| **Substrate** | | | | | | | | | | | | | | | | | | | |
| d50 | mm | -- | -- | -- | -- | -- | -- | -- | -- | 1 | -- | -- | -- | -- | -- | 6 | 5.3 | 6.7 | 6.0 |
| d84 | mm | -- | -- | -- | -- | -- | -- | -- | -- | 35 | -- | -- | -- | -- | -- | 22 | 21.8 | 24.9 | 23.4 |
| | | | | | | | | | | | | | | | | | | | |
| **Additional Reach Parameters** | | | | | | | | | | | | | | | | | | | |
| Valley Length | ft | -- | | | -- | | | 1000 | | | -- | | | 1000 | | | 1035 | | |
| Channel Length | ft | -- | | | -- | | | 1100 | | | -- | | | 1100 | | | 1139 | | |
| Sinuosity | | -- | | | -- | | | 1.1 | | | 1.1 | 1.4 | 1.2 | 1.1 | | | 1.1 | | |
| Water Surface Slope | ft/ft | -- | | | -- | | | 0.005 | | | 0.01 | 0.016 | 0.013 | 0.005 | | | 0.006 | | |
| BF slope | ft/ft | -- | | | -- | | | 0.005 | | | 0.01 | 0.016 | 0.013 | 0.005 | | | 0.006 | | |
| Rosgen Classification | | -- | | | -- | | | B4c/1 | | | B4c - C4 | | | C4/1 | | | C4/1 | | |
| *Habitat Index | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |
| *Macrobenthos | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | | |

**Table VIIIb. Baseline Morphology and Hydraulic Summary**
**Purlear Creek Phase II / Project ID 010559701**
**Reach 4 - 1480 Feet**

| Parameter | | USGS Gage Data | | | Regional Curve (0.4 $mi^2$) | | | Pre-Existing Condition | | | Project Reference Stream | | | Design | | | As-built | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Dimension** | **Units** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** |
| BF Width | ft | -- | -- | -- | -- | -- | 8 | -- | -- | 7.4 | -- | -- | -- | -- | -- | 8 | 7.2 | 9.7 | 8.5 |
| Floodprone Width | ft | -- | -- | -- | -- | -- | -- | -- | -- | 9.5 | -- | -- | -- | -- | -- | 55 | -- | -- | 60.1 |
| BF Cross Sectional Area | $ft^2$ | -- | -- | -- | -- | -- | 11.5 | -- | -- | 3.5 | -- | -- | -- | -- | -- | 4.1 | 4.1 | 5.1 | 4.6 |
| BF Mean Depth | ft | -- | -- | -- | -- | -- | 1.1 | -- | -- | 0.5 | -- | -- | -- | -- | -- | 0.5 | 0.5 | 0.6 | 0.5 |
| BF Max Depth | ft | -- | -- | -- | -- | -- | -- | -- | -- | 1.4 | -- | -- | -- | -- | -- | 1.4 | 0.9 | 1.4 | 1.1 |
| Width/Depth Ratio | | -- | -- | -- | -- | -- | -- | -- | -- | 15.5 | 11.2 | 20.8 | 16 | -- | -- | 16 | -- | -- | 15.4 |
| Entrenchment Ratio | | -- | -- | -- | -- | -- | -- | -- | -- | 1.3 | 1.4 | 9.9 | 4 | -- | -- | 6.8 | -- | -- | 7.1 |
| Wetted Perimeter | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Hydraulic radius | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 0.5 | 0.5 | 0.5 |
| **Pattern** | | | | | | | | | | | | | | | | | | | |
| Channel Beltwidth | ft | -- | -- | -- | -- | -- | -- | -- | -- | 40 | -- | -- | 80 | -- | -- | -- | 18.5 | 55.3 | 34.7 |
| Radius of Curvature | ft | -- | -- | -- | -- | -- | -- | 10 | 40 | 25 | -- | -- | 24 | 48 | 83 | 66 | 12.8 | 38.1 | 20.6 |
| Meander Wavelength | ft | -- | -- | -- | -- | -- | -- | 50 | 60 | 55 | 60 | 80 | 70 | -- | -- | 200 | 75.4 | 124.6 | 93 |
| Meander Width ratio | | -- | -- | -- | -- | -- | -- | -- | -- | 5.4 | -- | -- | 10 | -- | -- | -- | 2.2 | 6.5 | 4.1 |
| **Profile** | | | | | | | | | | | | | | | | | | | |
| Riffle length | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Riffle slope | ft/ft | -- | -- | -- | -- | -- | -- | 0.007 | 0.02 | 0.01 | -- | -- | -- | -- | -- | 0.009 | 0.002 | 0.03 | 0.01 |
| Pool length | ft | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | 2.7 | 24.6 | 15.8 |
| Pool spacing | ft | -- | -- | -- | -- | -- | -- | -- | -- | 70 | -- | -- | -- | 40 | 64 | 64 | 26.6 | 63.8 | 43.5 |
| **Substrate** | | | | | | | | | | | | | | | | | | | |
| d50 | mm | -- | -- | -- | -- | -- | -- | -- | -- | 0.5 | -- | -- | -- | -- | -- | 6 | 0.5 | 2.0 | 1.3 |
| d84 | mm | -- | -- | -- | -- | -- | -- | -- | -- | 5 | -- | -- | -- | -- | -- | 22 | 9.3 | 26.2 | 17.8 |
| | | | | | | | | | | | | | | | | | | | |
| **Additional Reach Parameters** | | | | | | | | | | | | | | | | | | | |
| Valley Length | ft | | -- | | | -- | | | 1284 | | | -- | | | 1284 | | | 1327 | |
| Channel Length | ft | | -- | | | -- | | | 1412 | | | -- | | | 1541 | | | 1460 | |
| Sinuosity | | | -- | | | -- | | | 1.1 | | 1.1 | 1.4 | 1.2 | | 1.2 | | | 1.1 | |
| Water Surface Slope | ft/ft | | -- | | | -- | | | 0.0165 | | 0.01 | 0.016 | 0.013 | | 0.0183 | | | 0.013 | |
| BF slope | ft/ft | | -- | | | -- | | | 0.0165 | | 0.01 | 0.016 | 0.013 | | 0.0183 | | | 0.013 | |
| Rosgen Classification | | | -- | | | -- | | | F4 | | | B4c - C4 | | | C4 | | | C5 | |
| *Habitat Index | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | |
| *Macrobenthos | | | -- | | | -- | | | -- | | | -- | | | -- | | | -- | |

**Table IXa. Morphology and Hydraulic Monitoring Summary**
**Purlear Creek Phase II / Project ID 010559701**
**Reach 4 (1,480 feet)**

| Parameter | | Cross Section 1 | | | | | Cross Section 2 | | | | | Cross Section 3 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Riffle | | | | | Pool | | | | | Riffle | | | | |
| **Dimension** | **Units** | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 |
| BF Width | ft | 11.1 | - | | | | 9.4 | 10.8 | | | | 7.8 | 7.3 | | | |
| Floodprone Width | ft | 72 | - | | | | - | - | | | | 72.0 | 72 | | | |
| BF Cross Sectional Area | sq ft | 6.7 | - | | | | 4.2 | 5.9 | | | | 4.8 | 4.3 | | | |
| BF Mean Depth | ft | 0.6 | - | | | | 0.4 | 0.6 | | | | 0.6 | 0.6 | | | |
| BF Max Depth | ft | 1.3 | - | | | | 1.0 | 0.9 | | | | 1.4 | 1.4 | | | |
| Width/Depth Ratio | | 18.4 | - | | | | - | - | | | | 12.7 | 12.3 | | | |
| Entrenchment Ratio | | 6.5 | - | | | | - | - | | | | 9.2 | 9.9 | | | |
| Bank Height Ratio | | 1.0 | - | | | | 1.0 | 1.0 | | | | 1.0 | 1.0 | | | |
| Wetted Perimeter | ft | 12.3 | | | | | - | - | | | | 9.0 | 8.5 | | | |
| Hydraulic radius | ft | 0.5 | | | | | - | - | | | | 0.5 | 0.5 | | | |
| | | 2006 | | 2007 | | | | | | | | | | | | |
| **Substrate** | | Upper | Lower | Upper | Lower | | | | | | | | | | | |
| d50 | mm | silt | silt | 0.5 | 0.12 | | | | | | | | | | | |
| d84 | mm | silt | 1.03 | 36.3 | 5.5 | | | | | | | | | | | |

| Parameter | | Cross Section 4 | | | | | Cross Section 5 | | | | | Cross Section 6 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Pool | | | | | Riffle | | | | | Pool | | | | |
| **Dimension** | **Units** | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 |
| BF Width | ft | 13.7 | 10.3 | | | | 9.9 | 8.8 | | | | 8 | 10.9 | | | |
| Floodprone Width | ft | - | - | | | | 46 | 46 | | | | - | - | | | |
| BF Cross Sectional Area | sq ft | 14.2 | 13.3 | | | | 7.0 | 6.2 | | | | 7.9 | 8.2 | | | |
| BF Mean Depth | ft | 1.0 | 1.3 | | | | 0.7 | 0.7 | | | | 1.0 | 0.8 | | | |
| BF Max Depth | ft | 2.5 | 2.6 | | | | 1.4 | 1.4 | | | | 1.7 | 1.9 | | | |
| Width/Depth Ratio | | | | | | | 14.0 | 12.5 | | | | | | | | |
| Entrenchment Ratio | | | | | | | 4.6 | 5.2 | | | | | | | | |
| Bank Height Ratio | | 1.0 | 1.0 | | | | 1.4 | 1.4 | | | | | | | | |
| Wetted Perimeter | ft | | | | | | 11.3 | 10.2 | | | | | | | | |
| Hydraulic radius | ft | | | | | | 0.6 | 0.6 | | | | | | | | |

| Parameter | | MY-01 (2006) | | | MY-02 (2007) | | | MY-03 (2008) | | | MY-04 (2009) | | | MY-05 (2010) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pattern** | | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** |
| Channel Beltwidth | ft | 17 | 42 | 29 | 17 | 42 | 29 | | | | | | | | | |
| Radius of Curvature | ft | 13 | 112 | 26 | 13 | 112 | 26 | | | | | | | | | |
| Meander Wavelength | ft | 62 | 171 | 88 | 62 | 171 | 88 | | | | | | | | | |
| Meander Width ratio | | | | | 2.1 | 5.2 | 3.6 | | | | | | | | | |
| **Profile** | | | | | | | | | | | | | | | | |
| Riffle length | ft | 5 | 93 | 17 | 6 | 38 | 18 | | | | | | | | | |
| Riffle slope | ft/ft | 0.20% | 6.14% | 2.12% | 0.35% | 5.6% | 2.0% | | | | | | | | | |
| Pool length | ft | 10 | 38 | 21 | 10 | 57 | 24 | | | | | | | | | |
| Pool spacing | ft | 25 | 73 | 40 | 28 | 66 | 40 | | | | | | | | | |
| **Additional Parameters** | | | | | | | | | | | | | | | | |
| Valley Length | ft | 1277 | | | 1277 | | | | | | | | | | | |
| Channel Length | ft | 1480 | | | 1480 | | | | | | | | | | | |
| Sinuosity | | 1.2 | | | 1.2 | | | | | | | | | | | |
| Water Surface Slope | ft/ft | 1.60% | | | 1.61% | | | | | | | | | | | |
| BF slope | ft/ft | | | | 1.60% | | | | | | | | | | | |
| Rosgen Classification | | C | | | C | | | | | | | | | | | |

**Table IXb. Morphology and Hydraulic Monitoring Summary**
**Purlear Creek Phase II / Project ID 010559701**
**Reach 1 (1,140 feet)**

| Parameter | | Cross Section 7 | | | | | Cross Section 8 | | | | | Cross Section 9 | | | | | Cross Section 10 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Riffle | | | | | Riffle | | | | | Pool | | | | | Pool | | | | |
| **Dimension** | **Units** | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 | MY1 | MY2 | MY3 | MY4 | MY5 |
| BF Width | ft | 42.3 | 40 | | | | 31.3 | 30.2 | | | | 28.8 | 29.3 | | | | 34.5 | 30 | | | |
| Floodprone Width | ft | 100 | 100 | | | | 98 | 98 | | | | - | - | | | | - | - | | | |
| BF Cross Sectional Area | sq ft | 50.7 | 46.9 | | | | 54.8 | 57.9 | | | | 31.5 | 28.6 | | | | 42.4 | 45.2 | | | |
| BF Mean Depth | ft | 1.2 | 1.2 | | | | 1.8 | 1.9 | | | | 1.1 | 1 | | | | 1.2 | 1.5 | | | |
| BF Max Depth | ft | 2.7 | 2.7 | | | | 3.5 | 3.5 | | | | 3.2 | 3.4 | | | | 3.0 | 3.1 | | | |
| Width/Depth Ratio | | 35.2 | 34.2 | | | | 14.0 | 15.8 | | | | - | - | | | | - | - | | | |
| Entrenchment Ratio | | 2.4 | 2.5 | | | | 3.1 | 3.2 | | | | - | - | | | | - | - | | | |
| Bank Height Ratio | | 1.0 | 1.0 | | | | 1.0 | 1.0 | | | | 1.0 | 1.0 | | | | 1.6 | 1.6 | | | |
| Wetted Perimeter | ft | 44.7 | 42.3 | | | | 34.8 | 34.0 | | | | - | - | | | | - | - | | | |
| Hydraulic radius | ft | 1.1 | 1.1 | | | | 1.6 | 1.7 | | | | - | - | | | | - | - | | | |
| | | | | | | | | | | | | | | | | | | | | | |
| **Substrate** | | **2006** | **2007** | | | | | | | | | | | | | | | | | | |
| d50 | mm | 9.65 | | | | | | | | | | | | | | | | | | | |
| d84 | mm | 37.01 | | | | | | | | | | | | | | | | | | | |

| Parameter | | MY-01 (2006) | | | MY-02 (2007) | | | MY-03 (2008) | | | MY-04 (2009) | | | MY-05 (2010) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Pattern** | | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** | **Min** | **Max** | **Med** |
| Channel Beltwidth | ft | 36 | 44 | 40 | 36 | 44 | 40 | | | | | | | | | |
| Radius of Curvature | ft | 38 | 88 | 50 | 38 | 88 | 50 | | | | | | | | | |
| Meander Wavelength | ft | 201 | 255 | 228 | 201 | 255 | 228 | | | | | | | | | |
| Meander Width ratio | | | | | 1.0 | 1.3 | 1.1 | | | | | | | | | |
| **Profile** | | | | | | | | | | | | | | | | |
| Riffle length | ft | 9 | 50 | 18 | 21 | 47 | 23 | | | | | | | | | |
| Riffle slope | ft/ft | 0.41% | 4.56% | 1.15% | 0.08% | 4.80% | 1.17% | | | | | | | | | |
| Pool length | ft | 17 | 113 | 74 | 21 | 113 | 74 | | | | | | | | | |
| Pool spacing | ft | 59 | 134.5 | 100 | 59 | 134.5 | 100 | | | | | | | | | |
| **Additional Parameters** | | | | | | | | | | | | | | | | |
| Valley Length | ft | 1021 | | | 1021 | | | | | | | | | | | |
| Channel Length | ft | 1140 | | | 1140 | | | | | | | | | | | |
| Sinuosity | | 1.1165524 | | | 1.1 | | | | | | | | | | | |
| Water Surface Slope | ft/ft | 0.008459245 | | | 0.86% | | | | | | | | | | | |
| BF slope | ft/ft | | | | 0.71% | | | | | | | | | | | |
| Rosgen Classification | | | | | C | | | | | | | | | | | |

## C. Wetland Assessment

See Table X below for a performance summary of the wetlands adjacent to Reach 4. For well RDS-W1a, the groundwater level was within 12-inches of the ground surface for all but three days during the measurement period. See Appendix C for the water level measurement data. The water level indicator for RDS-W2a is malfunctioning and must be either calibrated or replaced.

**Table X. Wetland Criteria Attainment**
**Purlear Creek Phase II / Project ID 010559701**

| Tract | Well ID | Well Hydrology Threshold Met? | Tract Mean | Vegetation Plot ID | Vegetation Survival Threshold Met? | Tract Mean |
|---|---|---|---|---|---|---|
| W2 | RDS-W1a | Y | * | V1 | Y | 100% |
| | RDS-W2a | * | | V6 | Y | |

*Note: New monitoring wells were installed on August 2, 2007. Water level data was downloaded on November 14, 2007. The water level indicator for RDS-W2 was malfunctioning and needs to be calibrated or replaced.

## VI. Methodology Section

Monitoring methods used are based on US Army Corps of Engineering and NC Division of Water Quality Guides as referenced below.

The taxonomic standard for vegetation used in this report was based on "Flora of the Carolinas, Virginia, Georgia, and Surrounding Areas", by Alan S. Weakley. The vegetation monitoring protocol used for collecting vegetation data was the CVS-EEP Protocol for Recording Vegetation Version 4.0 (Lee et al. 2006).

**References:**

Lee, Michael T., R. K. Peet, S. D. Roberts, and T. R. Wentworth. 2006. *CVS-EEP Protocol for Recording Vegetation*, Version 4.0 (http://cvs.bio.unc.edu/methods.htm)

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

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

Weakley, Alan S., *Flora of the Carolinas, Virginia, Georgia, and Surrounding Areas*

# APPENDIX A

1. Vegetation Data Tables
   - Table 1. Vegetation Metadata
   - Table 2. Vegetation Vigor by Species
   - Table 3. Vegetation Damage by Species
   - Table 4. Vegetation Damage by Plot
   - Table 5. Stem Count by Plot and Species
   - Table 6. Vegetation Problem Area Tables
   - Table 10. Vigor
   - Table 11. Damage

2. Vegetation Problem Area Photos – No problem areas observed
3. Vegetation Monitoring Plot Photos

Notes:

- No separate plan view was established for vegetation conditions. See monitoring plan view for this information.
- No vegetation problems areas have been identified on this project. Therefore, those sections have been omitted from the appendix.

**Table 1. Vegetation Metadata**

| | |
|---|---|
| **Report Prepared By** | Nathan Buchanan |
| **Date Prepared** | 10/29/2007 17:09 |
| | |
| | |
| **database name** | CVS_EEP_EntryTool_v220.mdb |
| **database location** | \\atlantic\group\Nathan B\Purlear\EEP CVS DATA Entry |
| **computer name** | WOLFPREP1 |
| | |
| | |
| **DESCRIPTION OF WORKSHEETS IN THIS DOCUMENT----------** | |
| **Metadata** | This worksheet, which is a summary of the project and the project data. |
| **Proj, planted** | Each project is listed with its PLANTED stems, for each year. This excludes live stakes and lists stems per acre. |
| **Proj, total stems** | Each project is listed with its TOTAL stems, for each year. This includes live stakes, all planted stems, and all natural/volunteer stems. Listed in stems per acre. |
| **Plots** | List of plots surveyed. |
| **Vigor** | Frequency distribution of vigor classes. |
| **Vigor by Spp** | Frequency distribution of vigor classes listed by species. |
| **Damage** | List of most frequent damage classes with number of occurrences and percent of total stems impacted by each. |
| **Damage by Spp** | Damage values tallied by type for each species. |
| **Damage by Plot** | Damage values tallied by type for each plot. |
| **ALL Stems by Plot and spp** | Count of total living stems of each species (planted and natural volunteers combined) for each plot; dead and missing stems are excluded. |
| | |
| **PROJECT SUMMARY----------** | |
| **Project Code** | Purl2 |
| **project Name** | Purlear 2 |
| **Description** | downstream 3000 feet |
| **River Basin** | |
| **Length(ft)** | |
| **Stream-to-edge width (ft)** | |
| **area (sq m)** | |
| **Required Plots (calculated)** | |
| **Sampled Plots** | 8 |

**Table 2. Vegetation Vigor by Species**

| | Species | 4 | 3 | 2 | 1 | 0 | Missing | Unknown |
|---|---|---|---|---|---|---|---|---|
| | *Asimina triloba* | | | 2 | | 2 | 1 | |
| | *Cephalanthus occidentalis* | | | 1 | 1 | | 1 | |
| | *Cornus amomum* | | 4 | 16 | 4 | 4 | 1 | |
| | *Diospyros virginiana* | | 2 | 4 | 1 | 1 | 4 | |
| | *Juglans nigra* | | | | 1 | | | |
| | *Morus alba* | | 1 | 3 | | 1 | 1 | 1 |
| | *Quercus michauxii* | | 7 | 6 | 1 | | 2 | |
| | *Quercus phellos* | | 6 | 1 | 2 | | 1 | 1 |
| | *Salix nigra* | | | | | | 1 | |
| | *Morus rubra* | | | 1 | | | | |
| | *Cornus* spp. | | 5 | | | 2 | | |
| | *Cercis canadensis* | | | 2 | 2 | | | |
| | *Quercus* spp. | | 8 | 4 | 1 | 2 | 5 | |
| | *Liriodendron tulipifera* | 1 | | | | | | |
| | *Platanus occidentalis* | | 1 | 5 | 1 | | 7 | |
| | *Populus deltoides* | | 1 | | | | | |
| | Unknown | | 1 | 4 | 4 | 15 | 5 | 2 |
| **TOT:** | **17** | **1** | **36** | **49** | **18** | **27** | **29** | **4** |

**Table 3. Vegetation Damage by Species**

| | Species | All Damage Categories | (no damage) | Cut | Deer | Diseased | Human Trampled | Insects | Rodents | Site Too Dry | Unknown |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Asimina triloba* | 5 | 2 | | | | | 1 | | 2 | |
| | *Cephalanthus occidentalis* | 3 | 1 | | 1 | | | | | 1 | |
| | *Cercis canadensis* | 4 | | 2 | 1 | | | | | 1 | |
| | *Cornus* spp. | 7 | | | | 1 | | 3 | | 3 | |
| | *Cornus amomum* | 29 | 1 | 2 | 8 | 3 | | 6 | | 9 | |
| | *Diospyros virginiana* | 12 | 4 | | 2 | 2 | | 2 | | 2 | |
| | *Juglans nigra* | 1 | | 1 | | | | | | | |
| | *Liriodendron tulipifera* | 1 | 1 | | | | | | | | |
| | *Morus alba* | 7 | 2 | | 1 | | | | | 4 | |
| | *Morus rubra* | 1 | | | | | | | | 1 | |
| | *Platanus occidentalis* | 14 | 7 | | | | | 1 | | 6 | |
| | *Populus deltoides* | 1 | | | | 1 | | | | | |
| | *Quercus* spp. | 20 | 5 | 1 | 5 | 1 | 1 | 2 | | 2 | 3 |
| | *Quercus michauxii* | 16 | 3 | | 9 | | | | 1 | 3 | |
| | *Quercus phellos* | 11 | 2 | | 4 | | | 1 | 1 | 1 | 2 |
| | *Salix nigra* | 1 | 1 | | | | | | | | |
| | Unknown | 31 | 7 | | 3 | 1 | | | 1 | 18 | 1 |
| **TOT:** | **17** | **164** | **36** | **6** | **34** | **9** | **1** | **16** | **3** | **53** | **6** |

**Table 4. Vegetation Damage by Plot**

| | plot | All Damage Categories | (no damage) | Cut | Deer | Diseased | Human Trampled | Insects | Rodents | Site Too Dry | Unknown |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 18 | 5 | | 4 | 1 | | 3 | | 5 | |
| | 2 | 29 | 6 | | 7 | | | 1 | | 15 | |
| | 3 | 10 | 1 | | 1 | | | | | 8 | |
| | 4 | 18 | 9 | | | | | 2 | | 7 | |
| | 5 | 39 | 4 | | 9 | 1 | 1 | 4 | 2 | 18 | |
| | 6 | 18 | 10 | | 5 | 2 | | | 1 | | |
| | 7 | 27 | 1 | 6 | 6 | 4 | | 6 | | | 4 |
| | 8 | 5 | | | 2 | 1 | | | | | 2 |
| **TOT:** | **8** | **164** | **36** | **6** | **34** | **9** | **1** | **16** | **3** | **53** | **6** |

**Table 5. Stem Count by Plot and Species**

| | Species | Total Planted Stems | # plots | avg# stems | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Asimina triloba* | 2 | 1 | 2 | | | | 2 | | | | |
| | *Cephalanthus occidentalis* | 2 | 2 | 1 | 1 | | | | | 1 | | |
| | *Cercis canadensis* | 4 | 3 | 1.33 | | 1 | 1 | | | | 2 | |
| | *Cornus* spp. | 5 | 1 | 5 | | | | | 5 | | | |
| | *Cornus amomum* | 24 | 3 | 8 | 1 | 6 | | | | | 17 | |
| | *Diospyros virginiana* | 7 | 3 | 2.33 | 3 | 2 | | | | 2 | | |
| | *Juglans nigra* | 1 | 1 | 1 | | | | | | | 1 | |
| | *Liriodendron tulipifera* | 1 | 1 | 1 | | | | | | 1 | | |
| | *Morus alba* | 5 | 2 | 2.5 | | 2 | 3 | | | | | |
| | *Morus rubra* | 1 | 1 | 1 | | 1 | | | | | | |
| | *Platanus occidentalis* | 7 | 2 | 3.5 | | 5 | 2 | | | | | |
| | *Populus deltoides* | 1 | 1 | 1 | | | | | | 1 | | |
| | *Quercus* spp. | 13 | 4 | 3.25 | 5 | | | | 3 | | 3 | 2 |
| | *Quercus michauxii* | 14 | 4 | 3.5 | 4 | 3 | 1 | | 6 | | | |
| | *Quercus phellos* | 10 | 4 | 2.5 | | | | 1 | 2 | 5 | 2 | |
| | Unknown | 11 | 4 | 2.75 | | | 1 | | 6 | 2 | | 2 |
| **TOT:** | **16** | **108** | **16** | | **14** | **20** | **8** | **3** | **22** | **12** | **25** | **4** |

**Table 6. Vegetation Problem Areas**

No Problem Areas Observed.

**Table 10. Vigor**

| vigor | Count | Percent |
|---|---|---|
| 0 | 27 | 16.5 |
| 1 | 18 | 11 |
| 2 | 49 | 29.9 |
| 3 | 36 | 22 |
| 4 | 1 | 0.6 |
| Missing | 29 | 17.7 |
| Unknown | 4 | 2.4 |

**Table 11. Damage**

| Damage | Count | Percent Of Stems |
|---|---|---|
| Site Too Dry | 53 | 32.3 |
| (no damage) | 36 | 22 |
| Deer | 34 | 20.7 |
| Insects | 16 | 9.8 |
| Diseased | 9 | 5.5 |
| Unknown | 6 | 3.7 |
| Cut | 6 | 3.7 |
| Rodents | 3 | 1.8 |
| Human Trampled | 1 | 0.6 |

# Vegetation Monitoring Plot Photos

**Purlear 2**

**Plot 1, 13-Sep-07**

**Plot 2, 13-Sep-07**

**Purlear 2**

**Plot 3, 13-Sep-07**

**Plot 4, 13-Sep-07**

**Purlear 2**

**Plot 5, 13-Sep-07**

**Plot 6, 13-Sep-07**

**Purlear 2**

**Plot 7, 14-Sep-07**

**Plot 8, 14-Sep-07**

# APPENDIX B

Morphology Raw Data

1. Current Condition Plan View
2. Stream Problem Area Table
3. Stream Problem Area Photos/Project Photo Log
4. Visual Morphological Stability Assessment Tables
5. Cross section and Pebble Count Plots and Raw Data Tables
6. Longitudinal Plots and Raw Data Tables
7. Feature Slope and Length Calculations
8. Channel Pattern Measurements

# REACH 1
# MAIN STEM REACH

NORTH

CROSS SECTION #7
REACH 1
RIFFLE

0+00
1+00
2+00
3+00
4+00
5+00
6+00
7+00
8+00
9+00

Veg Plot #7

Veg Plot #8

FLOW DIRECTION

CROSS SECTION #8
REACH 1
RIFFLE

CROSS SECTION #9
REACH 1
POOL

CROSS SECTION #10
REACH 1
POOL

PA2

PA3

10+00
11+00
11+40.52

LEGEND
- 2007 THALWEG
- 2007 WATER EDGE
- 2007 BANKFULL/ TOP OF BANK
- AS-BUILT THALWEG/ ALIGNMENT
- 2006 THALWEG
- FENCE LINE
- CROSS SECTION
- PROBLEM PHOTO (PA#)
- PROBLEM AREA

SCALE 1" = 50'

25 0 25 50

Ecosystem Enhancement PROGRAM

| NO | DESCRIPTION | CHK | DRN | DATE |
|---|---|---|---|---|
| 1 | AS-BUILT PLAN | JMP | DRC | 12/01/06 |
| 2 | 2007 MONITORING | JMP | ZP | 12/01/07 |

REVISIONS

NC STATE UNIVERSITY
BIOLOGICAL & AGRICULTURAL ENGINEERING
Weaver Labs Campus Box 7625
North Carolina State University
Raleigh, NC 27695

PURLEAR CREEK – PHASE 2
REACH 1 – MAIN STEM REACH
WILKES COUNTY, N.C.

CURRENT CONDITION PLAN VIEW
FIGURE B2

DATE 03/01/2006
PROJECT NO. 294
FILENAME PULEARII07.DWG
SHEET NO. MONITORING 1 of 3

# REACH 4
# WETLAND REACH

NORTH

CROSS SECTION #2
REACH 4
POOL

CROSS SECTION #3
REACH 4
RIFFLE

CROSS SECTION #1
REACH 4
RIFFLE

CROSS SECTION #4
REACH 4
POOL

CROSS SECTION #5
REACH 4
RIFFLE

CROSS SECTION #6
REACH 4
POOL

Veg Plot #1
Veg Plot #2
Veg Plot #3
Veg Plot #4
Veg Plot #5
Veg Plot #6

FLOW DIRECTION
FLOW DIRECTION

00+0
1+00
2+00
3+00
4+00
5+00
6+00
7+00
00+8
9+00
10+00
11+00
12+00
13+00
14+00
14+79.60

LEGEND
- 2007 THALWEG
- 2007 WATER EDGE
- 2007 BANKFULL/ TOP OF BANK
- AS-BUILT THALWEG/ ALIGNMENT
- 2006 THALWEG
- FENCE LINE
- CROSS SECTION
- PROBLEM PHOTO (PA#)
- PROBLEM AREA

SCALE 1" = 50'

25 0 25 50

Ecosystem Enhancement PROGRAM

| NO | REVISIONS | DRN | CHK | DATE |
|---|---|---|---|---|
| 1 | AS-BUILT PLAN | DRC | JMP | 12/01/06 |
| 2 | 2007 MONITORING | ZP | JMP | 12/01/07 |


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PURLEAR CREEK – PHASE 2
REACH 4 – WETLAND AREA
WILKES COUNTY, N.C.

CURRENT CONDITION PLAN VIEW
FIGURE B1

DATE 03/01/2006
PROJECT NO. 294
FILENAME PULEARII07.DWG
SHEET NO.

| Table B1. Stream Problem Areas<br>Purlear Creek Phase II / Project ID 010559701 | | | | | |
|---|---|---|---|---|---|
| **Feature Issue** | **Reach** | **Station numbers** | **Description** | **Suspected Cause** | **Photo number** |
| **Piping through Buffer** | 1 | 9+75 | Nutrient laden water piping through buffer | Wet Seep and heavy cattle usage | PA02 |
| | - | | | -- | -- |
| **Beaver dam** | 1 | 7+69 | Beaver dam backing up water and impeding flow | Beaver actitvity | PA03 |
| | - | | | -- | -- |

# 2007 Purlear Phase II
# Problem Area Photo Log – Reach 1

**Oct. 5 2006** **Oct. 18 2007**

**PA2. Reach 1 – Station 9+80 – Concentrated flow into and through the buffer (2006). (top photo – gully through buffer. Bottom photo – seep from field) No flow observed in 2007 due to drought conditions.**

**Oct. 18 2007**

**PA3. Reach 1 – Station 7+69 – Beaver dam**

# 2007 Purlear Phase II
# Photo Log – Reach 1

**Oct. 5 2006** **Oct. 18 2007**

**P1. Reach 1 – Start and X7 looking upstream**

**P2. Reach 1 – Start and X7 looking downstream**

**Oct. 5 2006** **Oct. 18 2007**


**P3. Reach 1 – X8 looking upstream**


**P4. Reach 1 – X8 looking downstream**


**P5. Reach 1 – X9 looking upstream**

**Oct. 5 2006** **Oct. 18 2007**

**P6. Reach 1 – X9 looking downstream**

**P7. Reach 1 – X10 looking upstream**

**P8. Reach 1 – X10 looking downstream**

**Oct. 5 2006** **Oct. 18 2007**

**P9. Reach 1 – End Project looking upstream**

**P10. Reach 1 – End Project looking downstream**

# 2007 Purlear Phase II
# Photo Log – Reach 4

**Oct. 5 2006** **Oct. 18 2007**


**P11. Reach 4 – Start looking upstream**


**P12. Reach 1 – Start and X7 looking downstream**

Oct. 5 2006 Oct. 18 2007


**P13. Reach 4 – X1 looking upstream**


**P14. Reach 4 – X1 looking downstream**


**P15. Reach 4 – X2 looking upstream**

**Oct. 5 2006** **Oct. 18 2007**


**P16. Reach 4 – X2 looking downstream**


**P17. Reach 4 – X3 looking upstream**


**P18. Reach 4 – X3 looking downstream**

Oct. 5 2006 Oct. 18 2007

**P19. Reach 4 – X4 looking upstream**

**P20. Reach 4 – X4 looking downstream**

**P21. Reach 4 – X5 looking upstream**

Oct. 5 2006 Oct. 18 2007


**P22. Reach 4 – X5 looking downstream**


**P23. Reach 4 – X6 looking upstream**


**P24. Reach 4 – X6 looking downstream**

Oct. 5 2006 Oct. 18 2007


**P25. Reach 4 – Bridge looking upstream**


**P26. Reach 4 – Bridge looking downstream**


**P27. Reach 4 – End of reach looking upstream**

**Oct. 5 2006** **Oct. 18 2007**

**P28. Reach 4 – End of reach looking downstream**

## Table B2. Visual Morphological Stability Assessment
### Purlear Creek Phase II / Project ID 010559701
### Reach 1 (1140 Feet)

| Feature Category | | Metric (per As-built and reference baselines) | (# Stable) Number Performing as Intended | Total number per As-built | Total Number/feet in unstable state | % Perform in Stable Condition | Feature Perform. Mean or Total |
|---|---|---|---|---|---|---|---|
| A. Riffles | 1 | Present? | 9 | 13 | NA | 69% | 69% |
| | 2 | Armor stable (e.g. no displacement)? | 9 | 13 | NA | 69% | |
| | 3 | Facet grade appears stable? | 9 | 13 | NA | 69% | |
| | 4 | Minimal evidence of embedding/fining? | 9 | 13 | NA | 69% | |
| | 5 | Length appropriate? | 9 | 13 | NA | 69% | |
| B. Pools | 1 | Present? (e.g not subject to severe aggrad. or migrat.?) | 11 | 12 | NA | 92% | 92% |
| | 2 | Sufficiently deep (Max Pool D:Mean Bkf >1.6?) | 11 | 12 | NA | 92% | |
| | 3 | Length appropriate? | 11 | 12 | NA | 92% | |
| C. Thalweg | 1 | Upstream of meander bend (run/inflection) centering? | 5 | 5 | NA | 100% | 100% |
| | 2 | Downstream of meander (glide/inflection) centering? | 5 | 5 | NA | 100% | |
| D. Meanders | 1 | Outer bend in state of limited/controlled erosion? | 4 | 4 | NA | 100% | 100% |
| | 2 | Of those eroding, # w/concomitant point bar formation? | -- | -- | NA | | |
| | 3 | Apparent Rc within spec? | 4 | 4 | NA | 100% | |
| | 4 | Sufficient floodplain access and relief? | 4 | 4 | NA | 100% | |
| E. Bed General | 1 | General channel bed aggradation areas (bar formation) | NA | NA | 0/0 | 100% | 100% |
| | 2 | Channel bed degradation – areas of increasing down-cutting or head cutting? | NA | NA | 0/0 | 100% | |
| F. Bank | 1 | Actively eroding, wasting, or slumping bank | NA | NA | 0/0 | 100% | 100% |
| G. Vanes | 1 | Free of back or arm scour? | 3 | 3 | NA | 100% | 100% |
| | 2 | Height appropriate? | 3 | 3 | NA | 100% | |
| | 3 | Angle and geometry appear appropriate? | 3 | 3 | NA | 100% | |
| | 4 | Free of piping or other structural failures? | 3 | 3 | NA | 100% | |
| H. Wads/ Boulders | 1 | Free of scour? | 1 | 1 | NA | 100% | 100% |
| | 2 | Footing stable? | 1 | 1 | NA | 100% | |

### Reach 4 (1480 Feet)

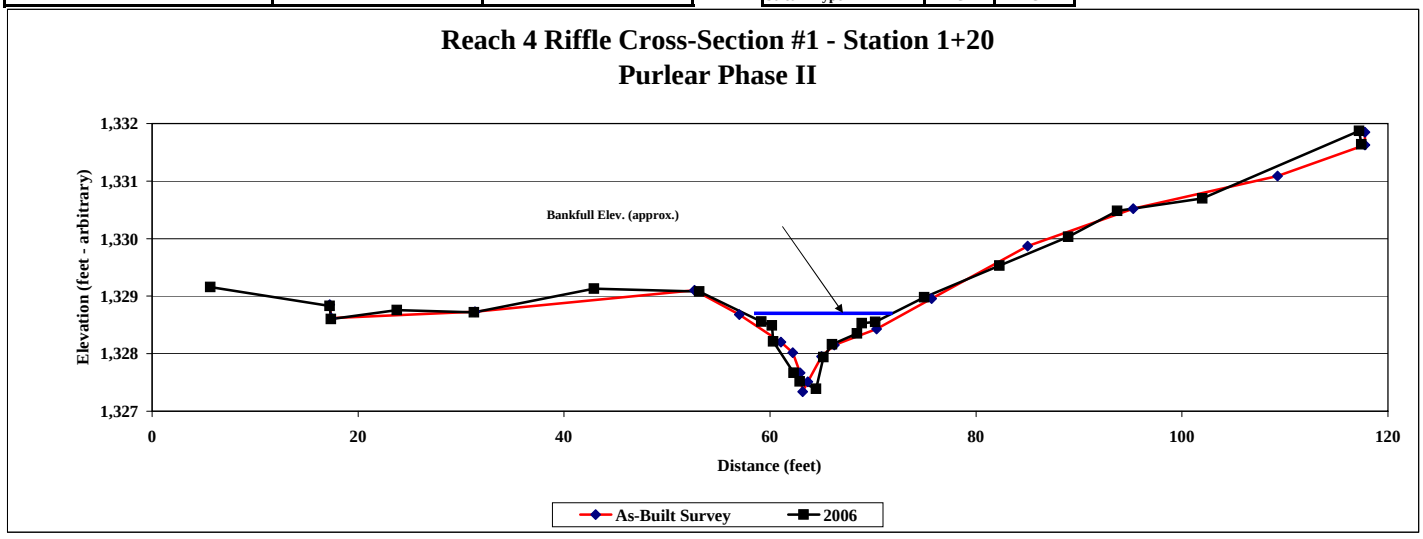
| Feature Category | | Metric (per As-built and reference baselines) | (# Stable) Number Performing as Intended | Total number per As-built | Total Number/feet in unstable state | Total Number / feet in unstable state | Feature Perform. Mean or Total |
|---|---|---|---|---|---|---|---|
| A. Riffles | 1 | Present? | 31 | 35 | NA | 89% | 85% |
| | 2 | Armor stable (e.g. no displacement)? | 31 | 35 | NA | 89% | |
| | 3 | Facet grade appears stable? | 31 | 35 | NA | 89% | |
| | 4 | Minimal evidence of embedding/fining? | 28 | 35 | NA | 80% | |
| | 5 | Length appropriate? | 28 | 35 | NA | 80% | |
| B. Pools | 1 | Present? (e.g not subject to severe aggrad. or migrat.?) | 33 | 34 | NA | 97% | 97% |
| | 2 | Sufficiently deep (Max Pool D:Mean Bkf >1.6?) | 33 | 34 | NA | 97% | |
| | 3 | Length appropriate? | 33 | 34 | NA | 97% | |
| C. Thalweg | 1 | Upstream of meander bend (run/inflection) centering? | 27 | 27 | NA | 100% | 100% |
| | 2 | Downstream of meander (glide/inflection) centering? | 27 | 27 | NA | 100% | |
| D. Meanders | 1 | Outer bend in state of limited/controlled erosion? | 27 | 27 | NA | 100% | 100% |
| | 2 | Of those eroding, # w/concomitant point bar formation? | -- | -- | NA | | |
| | 3 | Apparent Rc within spec? | 27 | 27 | NA | 100% | |
| | 4 | Sufficient floodplain access and relief? | 27 | 27 | NA | 100% | |
| E. Bed General | 1 | General channel bed aggradation areas (bar formation) | NA | NA | 0/0 | 100% | 100% |
| | 2 | Channel bed degradation – areas of increasing down-cutting or head cutting? | NA | NA | 0/0 | 100% | |
| F. Bank | 1 | Actively eroding, wasting, or slumping bank | NA | NA | 0/0 | 100% | 100% |
| G. Vanes | 1 | Free of back or arm scour? | 29 | 29 | NA | 100% | 100% |
| | 2 | Height appropriate? | 29 | 29 | NA | 100% | |
| | 3 | Angle and geometry appear appropriate? | 29 | 29 | NA | 100% | |
| | 4 | Free of piping or other structural failures? | 29 | 29 | NA | 100% | |
| F. Wads/ Boulders | 1 | Free of scour? | -- | -- | | | -- |
| | 2 | Footing stable? | -- | -- | | | |

| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X1 Reach 4 |
| **Feature** | Riffle |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 117.77 | 1,331.85 | PIN | 5.64 | 1329.16 | (FENCE) | | | |
| 117.77 | 1,331.63 | FP | 17.23 | 1328.83 | (X1LP) | | | |
| 109.28 | 1,331.09 | FP | 17.36 | 1328.6 | (X1) | | | |
| 95.26 | 1,330.52 | FP | 23.76 | 1328.76 | (X1) | Wrong cross section surveyed | | |
| 85.02 | 1,329.87 | FP | 31.25 | 1328.72 | (X1) | in the field. | | |
| 75.69 | 1,328.96 | RB | 42.9 | 1329.13 | (X1) | No data for 2007 | | |
| 70.35 | 1,328.43 | RB | 53.14 | 1329.08 | (X1) | | | |
| 66.26 | 1,328.15 | RB | 59.16 | 1328.56 | (X1) | | | |
| 65 | 1,327.95 | REW | 60.2 | 1328.49 | (X1W) | | | |
| 63.68 | 1,327.51 | SB | 60.32 | 1328.21 | (X1) | | | |
| 63.18 | 1,327.34 | SB | 62.31 | 1327.67 | (X1) | | | |
| 62.93 | 1,327.67 | SB | 62.88 | 1327.52 | (X1) | | | |
| 62.21 | 1,328.02 | LEW | 64.47 | 1327.39 | (X1) | | | |
| 61.05 | 1,328.20 | LB | 65.19 | 1327.94 | (X1) | | | |
| 57.02 | 1,328.68 | BKF | 66.04 | 1328.16 | (X1) | | | |
| 52.68 | 1,329.10 | FP | 68.46 | 1328.35 | (X1) | | | |
| 31.35 | 1,328.73 | FP | 68.93 | 1328.53 | (X1W) | | | |
| 17.4 | 1,328.62 | FP | 70.21 | 1328.55 | (X1) | | | |
| 17.23 | 1,328.85 | PIN1 | 74.98 | 1328.98 | (X1) | | | |
| | | | 82.27 | 1329.53 | (X1) | | | |
| | | | 88.95 | 1330.03 | (X1) | | | |
| | | | 93.72 | 1330.48 | (X1) | | | |
| Adjusted | | | 101.98 | 1330.7 | (X1) | | | |
| Right | 17.23' | | 117.2 | 1331.87 | (X1RP) | | | |
| | | | 117.43 | 1331.64 | (X1) | | | |
| | | | Adusted up | 1235.77' | | | | |

**Photo of Cross-Section #1 - Looking Downstream**

| | **As-Built** | **2006** |
|---|---|---|
| **Area** | 7.31 | 6.7 |
| **Width** | 17.5 | 11.1 |
| **Mean Depth** | 0.4 | 0.6 |
| **Max Depth** | 1.3 | 1.3 |
| **w/d ratio** | 41.8 | 18.3 |
| **FPW** | 72 | 72 |
| **ER (greater than)** | 4.1 | 6.5 |
| **Stream Type** | C | C |

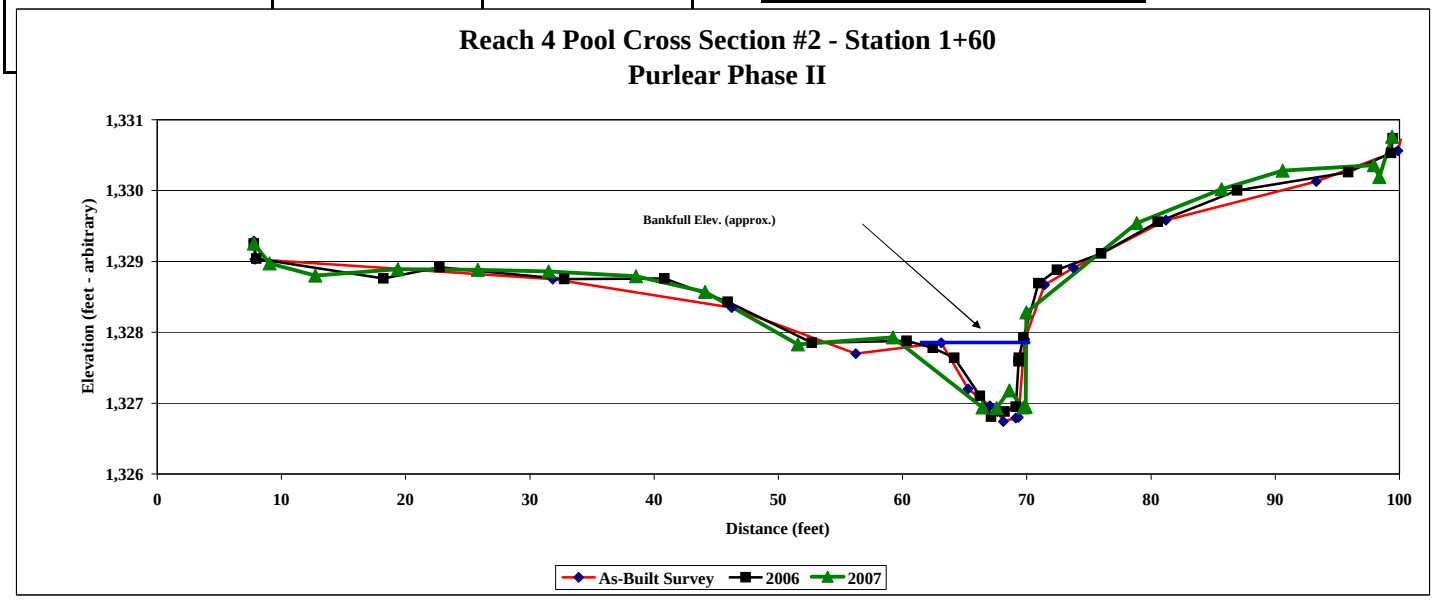


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X2 Reach 4 |
| **Feature** | Pool |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 100.11 | 1,330.72 | PIN | 7.78 | 1329.25 | (X2LP) | 7.78 | 1329.25 | XS2LP07 |
| 99.88 | 1,330.56 | FP | 7.98 | 1329.04 | (X2) | 9.05 | 1328.97 | XS2 |
| 93.3 | 1,330.13 | FP | 18.22 | 1328.76 | (X1) | 12.73 | 1328.8 | XS2 |
| 81.2 | 1,329.58 | FP | 22.73 | 1328.92 | (X2) | 19.36 | 1328.89 | XS2 |
| 73.76 | 1,328.91 | RB | 32.76 | 1328.75 | (X2) | 25.81 | 1328.88 | XS2 |
| 71.44 | 1,328.67 | RB | 40.84 | 1328.76 | (X2) | 31.5 | 1328.86 | XS2 |
| 69.83 | 1,327.90 | RB | 45.94 | 1328.43 | (X2) | 38.54 | 1328.79 | XS2 |
| 69.31 | 1,326.80 | SB | 52.71 | 1327.85 | (X2) | 44.09 | 1328.57 | XS2 |
| 69.12 | 1,326.79 | SB | 60.34 | 1327.88 | (X2) | 51.57 | 1327.83 | XS2 |
| 68.12 | 1,326.74 | SB | 62.44 | 1327.78 | (X2) | 59.22 | 1327.93 | XS2 |
| 67.64 | 1,326.88 | SB | 64.16 | 1327.64 | (X2W) | 66.44 | 1326.94 | XS2 |
| 67.02 | 1,326.96 | LEW | 66.24 | 1327.1 | (X2) | 67.57 | 1326.93 | XS2 |
| 65.28 | 1,327.20 | LB | 67.14 | 1326.81 | (X2) | 68.61 | 1327.18 | XS2W |
| 63.12 | 1,327.85 | BKF | 68.2 | 1326.88 | (X2) | 69.73 | 1326.94 | XS2 |
| 56.23 | 1,327.70 | LB | 69.11 | 1326.95 | (X2) | 69.92 | 1326.95 | XS2 |
| 46.24 | 1,328.35 | FP | 69.35 | 1327.59 | (W) | 69.97 | 1328.28 | XS2 |
| 31.83 | 1,328.75 | FP | 69.38 | 1327.64 | (X2W) | 78.86 | 1329.54 | XS2 |
| 7.86 | 1,329.03 | FP | 69.74 | 1327.93 | (X2) | 85.67 | 1330.02 | XS2 |
| 7.78 | 1,329.29 | PIN | 70.93 | 1328.69 | (X2) | 90.6 | 1330.28 | XS2 |
| | | | 72.44 | 1328.88 | (X2) | 97.94 | 1330.36 | XS2 |
| | | | 75.98 | 1329.11 | (X2) | 98.38 | 1330.19 | XS2 |
| | | | 80.54 | 1329.56 | (X2) | 99.42 | 1330.76 | XS2RP07 |
| | | | 86.94 | 1330 | (X2) | | | |
| | | | 95.87 | 1330.26 | (X2) | | | |
| | | | 99.34 | 1330.53 | (X2) | | | |
| | | | 99.47 | 1330.74 | (X2RP) | | | |

**Photo of Cross-Section #2 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 4.9 | 4.2 | 5.9 |
| **Width** | 6.2 | 9.4 | 10.8 |
| **Mean Depth** | 0.8 | 0.4 | 0.6 |
| **Max Depth** | 1.1 | 1.0 | 0.9 |

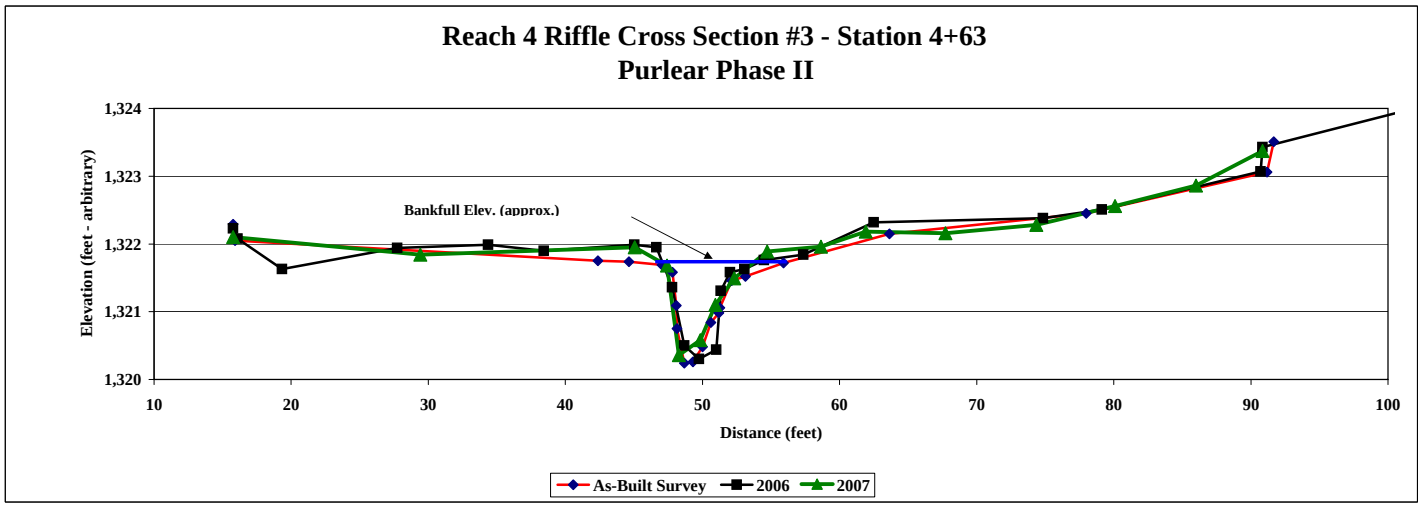


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X3 Reach 4 |
| **Feature** | Riffle |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 91.67 | 1,323.51 | PIN | 15.76 | 1322.23 | (X3LP) | 15.76 | 1322.1 | XS3LP07 |
| 91.18 | 1,323.06 | FP | 16.1 | 1322.08 | (X3) | 29.41 | 1321.84 | XS3 |
| 77.99 | 1,322.45 | FP | 19.34 | 1321.63 | (X3) | 45.06 | 1321.95 | XS3 |
| 63.63 | 1,322.15 | FP | 27.75 | 1321.94 | (X3) | 47.42 | 1321.68 | XS3 |
| 55.9 | 1,321.72 | RB | 34.36 | 1321.99 | (X3) | 48.28 | 1320.36 | XS3 |
| 53.13 | 1,321.52 | BKF | 38.43 | 1321.9 | (X3) | 49.84 | 1320.58 | XS3 |
| 52.12 | 1,321.46 | RB | 45.03 | 1321.99 | (X3) | 50.95 | 1321.1 | XS3W |
| 51.27 | 1,321.06 | REW | 46.65 | 1321.95 | (X3) | 52.31 | 1321.49 | XS3 |
| 51.19 | 1,320.98 | SB | 47.79 | 1321.36 | (X3) | 54.73 | 1321.89 | XS3 |
| 50.61 | 1,320.84 | SB | 48.68 | 1320.5 | (X3) | 58.65 | 1321.96 | XS3 |
| 50 | 1,320.48 | SB | 49.75 | 1320.3 | (X3) | 61.92 | 1322.18 | XS3 |
| 49.3 | 1,320.26 | SB | 51.01 | 1320.44 | (X3) | 67.72 | 1322.16 | XS3 |
| 48.67 | 1,320.24 | SB | 51.33 | 1321.31 | (X3W) | 74.34 | 1322.28 | XS3 |
| 48.13 | 1,320.75 | SB | 52.02 | 1321.58 | (X3) | 80.09 | 1322.56 | XS3 |
| 48.1 | 1,321.09 | LEW | 53.06 | 1321.63 | (X3) | 85.99 | 1322.86 | XS3 |
| 47.8 | 1,321.58 | LB | 54.49 | 1321.76 | (X3) | 90.85 | 1323.37 | XS3RP07 |
| 47.03 | 1,321.69 | LB | 57.36 | 1321.84 | (X3) | | | |
| 44.63 | 1,321.74 | BKF | 62.5 | 1322.32 | (X3) | | | |
| 42.38 | 1,321.75 | FP | 74.83 | 1322.38 | (X3) | | | |
| 15.91 | 1,322.05 | FP | 79.14 | 1322.51 | (X3) | | | |
| 15.76 | 1,322.29 | PIN | 90.72 | 1323.07 | (X3) | | | |
| | | | 90.85 | 1323.43 | (X3RP) | | | |
| | | | 101.55 | 1323.98 | (FENCE) | | | |

**Photo of Cross-Section #3 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 4.93 | 4.8 | 4.3 |
| **Width** | 10.3 | 7.8 | 7.3 |
| **Mean Depth** | 0.5 | 0.6 | 0.6 |
| **Max Depth** | 1.5 | 1.4 | 1.4 |
| **w/d ratio** | 21.5 | 12.9 | 12.3 |
| **FPW** | 72 | 72 | 72 |
| **ER (greater than)** | 7.0 | 9.2 | 9.9 |
| **Stream Type** | C | C | C |



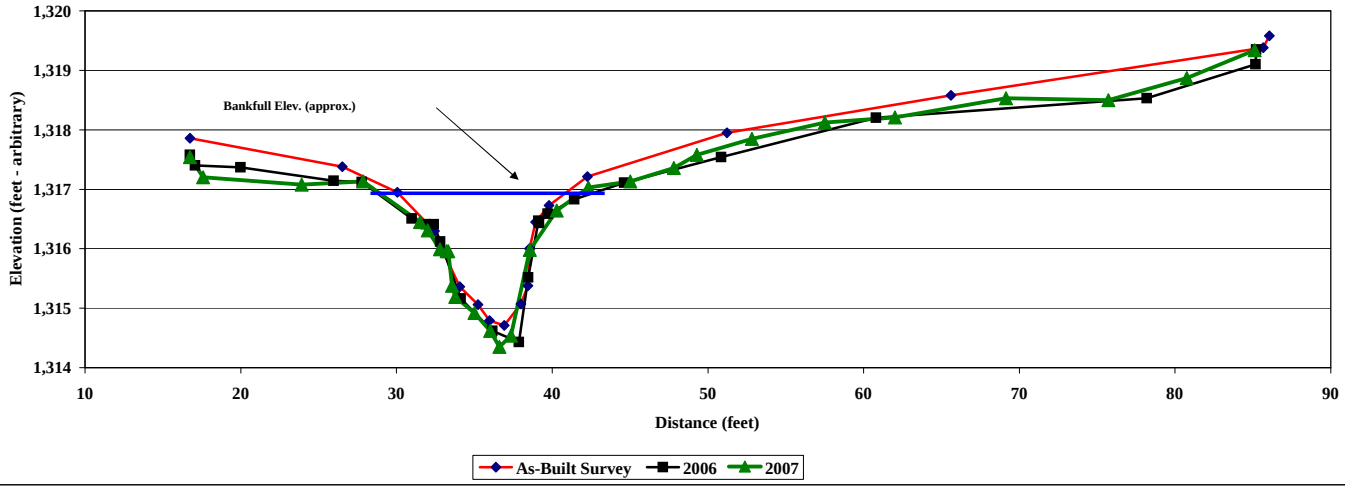
| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X4 Reach 4 |
| **Feature** | Pool |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 86.06 | 1,319.58 | PIN | 16.74 | 1317.58 | (XS4LP) | 16.74 | 1317.54 | XS4LP07 |
| 85.66 | 1,319.38 | FP | 17.07 | 1317.4 | (XS4) | 17.59 | 1317.2 | XS4 |
| 65.6 | 1,318.58 | RB | 19.98 | 1317.37 | (XS4) | 23.92 | 1317.08 | XS4 |
| 51.23 | 1,317.95 | RB | 25.97 | 1317.14 | (XS4) | 27.86 | 1317.13 | XS4 |
| 42.27 | 1,317.21 | RB | 27.77 | 1317.12 | (XS4) | 31.51 | 1316.45 | XS4 |
| 39.8 | 1,316.73 | RB | 30.99 | 1316.51 | (XS4) | 32 | 1316.31 | XS4 |
| 38.93 | 1,316.45 | RB | 31.88 | 1316.41 | (XS4W) | 32.79 | 1315.99 | XS4 |
| 38.54 | 1,316.00 | REW | 32.4 | 1316.41 | (W) | 33.23 | 1315.96 | XS4 |
| 38.45 | 1,315.38 | SB | 32.82 | 1316.12 | (XS4) | 33.32 | 1315.96 | XS4W |
| 37.98 | 1,315.07 | SB | 34.12 | 1315.16 | (XS4) | 33.58 | 1315.38 | XS4 |
| 36.93 | 1,314.71 | SB | 36.17 | 1314.62 | (XS4) | 33.78 | 1315.19 | XS4 |
| 35.98 | 1,314.79 | SB | 37.87 | 1314.43 | (XS4) | 35.01 | 1314.92 | XS4 |
| 35.23 | 1,315.06 | SB | 38.47 | 1315.52 | (XS4) | 36.01 | 1314.62 | XS4 |
| 34.06 | 1,315.36 | SB | 39.11 | 1316.47 | (XS4W) | 36.61 | 1314.35 | XS4 |
| 32.92 | 1,316.00 | LEW | 39.16 | 1316.43 | (W) | 37.35 | 1314.54 | XS4 |
| 32.45 | 1,316.30 | LB | 39.72 | 1316.59 | (XS4) | 38.56 | 1315.98 | XS4W |
| 30.05 | 1,316.95 | BKF | 41.42 | 1316.83 | (XS4) | 40.29 | 1316.64 | XS4 |
| 26.53 | 1,317.38 | FP | 44.62 | 1317.11 | (XS4) | 42.32 | 1317.03 | XS4 |
| 16.74 | 1,317.86 | PIN | 50.85 | 1317.54 | (XS4) | 45.01 | 1317.13 | XS4 |
| | | | 60.8 | 1318.2 | (XS4) | 47.82 | 1317.36 | XS4 |
| | | | 78.19 | 1318.53 | (XS4) | 49.29 | 1317.58 | XS4 |
| | | | 85.18 | 1319.1 | (XS4) | 52.83 | 1317.85 | XS4 |
| | | | 85.21 | 1319.35 | (X4RP) | 57.51 | 1318.12 | XS4 |
| | | | | | | 62.01 | 1318.21 | XS4 |
| | | | | | | 69.14 | 1318.53 | XS4 |
| | | | | | | 75.72 | 1318.5 | XS4 |
| | | | | | | 80.75 | 1318.87 | XS4 |
| | | | | | | 85.1 | 1319.34 | XS4RP07 |

**Photo of Cross-Section #4 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 12.1 | 14.2 | 13.3 |
| **Width** | 11.3 | 13.7 | 10.3 |
| **Mean Depth** | 1.1 | 1.0 | 1.3 |
| **Max Depth** | 2.2 | 2.5 | 2.6 |

## Reach 4 Pool Cross Section #4 - Station 7+60
## Purlear Phase II

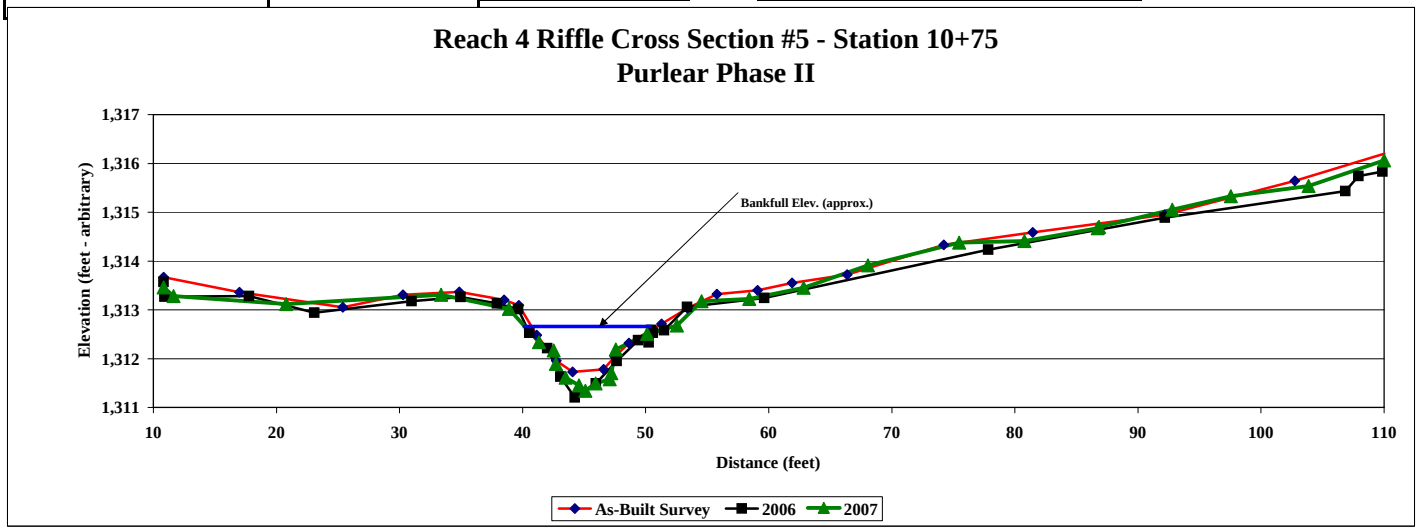


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X5 Reach 4 |
| **Feature** | Riffle |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 110.02 | 1,316.20 | pin | 10.83 | 1313.57 | (X5LP) | 10.83 | 1313.46 | XS5LP07 |
| 102.75 | 1,315.64 | fp | 10.91 | 1313.27 | (X5) | 11.63 | 1313.28 | XS5 |
| 92.16 | 1,314.95 | fp | 17.77 | 1313.28 | (X5) | 20.79 | 1313.12 | XS5 |
| 81.44 | 1,314.59 | fp | 23.07 | 1312.94 | (X5) | 33.37 | 1313.31 | XS5 |
| 74.22 | 1,314.33 | fp | 30.97 | 1313.18 | (X5) | 38.89 | 1313.02 | XS5 |
| 66.38 | 1,313.72 | fp | 34.95 | 1313.26 | (X5) | 41.33 | 1312.34 | XS5 |
| 61.91 | 1,313.55 | fp | 37.93 | 1313.13 | (X5) | 42.53 | 1312.17 | XS5W |
| 59.1 | 1,313.40 | fp | 39.65 | 1313.01 | (X5) | 42.7 | 1311.89 | XS5 |
| 55.78 | 1,313.32 | fp | 40.54 | 1312.53 | (X5W) | 43.49 | 1311.61 | XS5 |
| 53.39 | 1,313.03 | bank | 42.01 | 1312.21 | (X5) | 44.58 | 1311.45 | XS5 |
| 51.29 | 1,312.71 | bkf | 43.08 | 1311.63 | (X5) | 45.09 | 1311.34 | XS5 |
| 48.64 | 1,312.32 | bank | 44.24 | 1311.2 | (X5) | 45.93 | 1311.49 | XS5 |
| 47.5 | 1,312.04 | rew | 45.97 | 1311.49 | (X5) | 47.07 | 1311.58 | XS5 |
| 46.58 | 1,311.78 | sb | 47.65 | 1311.95 | (X5) | 47.2 | 1311.7 | XS5 |
| 44.05 | 1,311.73 | sb | 49.4 | 1312.38 | (X5) | 47.56 | 1312.19 | XS5W |
| 42.73 | 1,311.96 | lew | 50.24 | 1312.33 | (X5) | 50.13 | 1312.51 | XS5 |
| 41.16 | 1,312.48 | bkf | 50.45 | 1312.59 | (W) | 52.53 | 1312.68 | XS5 |
| 39.69 | 1,313.09 | fp | 50.6 | 1312.53 | (X5W) | 54.53 | 1313.18 | XS5 |
| 38.51 | 1,313.20 | fp | 51.5 | 1312.58 | (X5) | 58.42 | 1313.22 | XS5 |
| 34.85 | 1,313.37 | fp | 53.37 | 1313.06 | (X5) | 62.83 | 1313.45 | XS5 |
| 30.28 | 1,313.31 | fp | 59.63 | 1313.24 | (X5) | 68.06 | 1313.91 | XS5 |
| 25.38 | 1,313.05 | fp | 77.84 | 1314.23 | (X5) | 75.46 | 1314.38 | XS5 |
| 17 | 1,313.36 | fp | 92.2 | 1314.89 | (X5) | 80.78 | 1314.41 | XS5 |
| 10.83 | 1,313.67 | pin | 106.85 | 1315.43 | (X5) | 86.72 | 1314.67 | XS5 |
| | | | 107.92 | 1315.74 | (X5) | 86.84 | 1314.7 | XS5 |
| | | | 109.86 | 1315.83 | (X5) | 92.79 | 1315.05 | XS5 |
| | | | 110.1 | 1316.05 | (X5RP) | 97.55 | 1315.33 | XS5 |
| | | | | | | 103.86 | 1315.54 | XS5 |
| | | | | | | 110.01 | 1316.06 | XS5RP07 |

**Photo of Cross-Section #5 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 5.1 | 7.0 | 6.2 |
| **Width** | 10.1 | 9.9 | 8.8 |
| **Mean Depth** | 0.5 | 0.7 | 0.7 |
| **Max Depth** | 0.9 | 1.4 | 1.3 |
| **w/d ratio** | 20.0 | 14.0 | 12.5 |
| **FPW** | 46 | 46 | 46 |
| **ER (greater than)** | 4.5 | 4.6 | 5.2 |
| **Stream Type** | C | C | C |

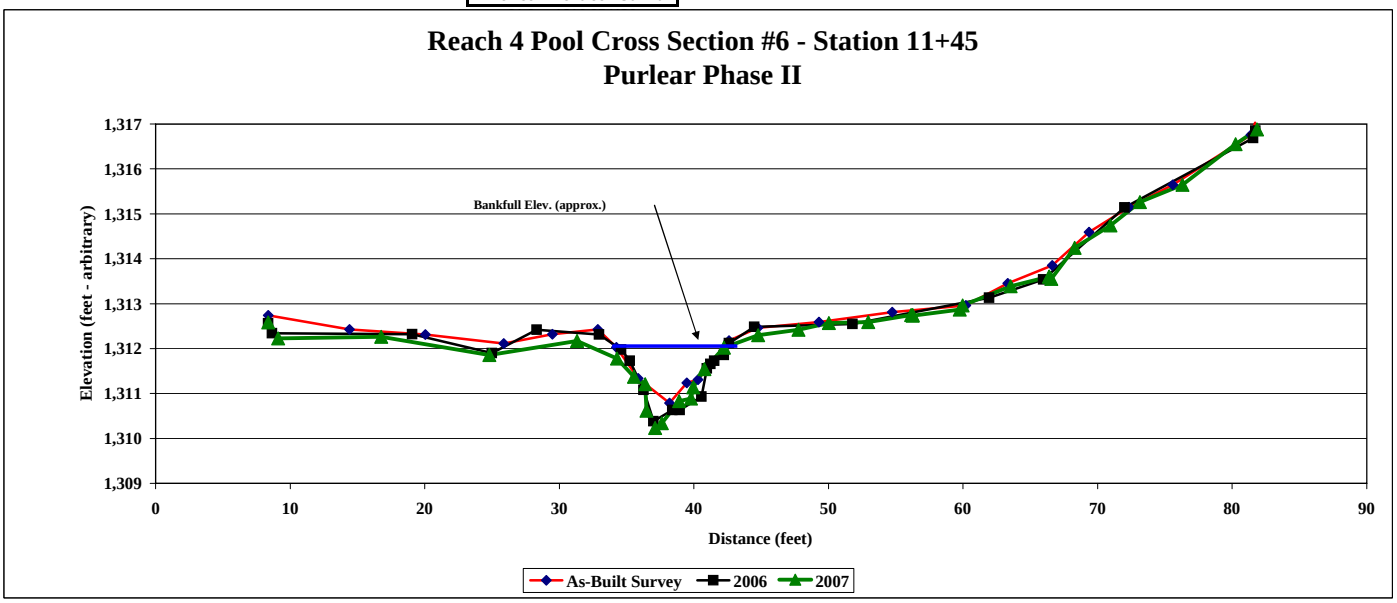


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X6 Reach 4 |
| **Feature** | Pool |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 81.7 | 1,317.03 | pin | 8.38 | 1312.56 | (X6LP) | 8.38 | 1312.58 | XS6LP07 |
| 81.4 | 1,316.76 | ltr | 8.66 | 1312.34 | (X6) | 9.1 | 1312.23 | XS6 |
| 75.58 | 1,315.65 | ltr | 19.08 | 1312.32 | (X6) | 16.76 | 1312.26 | XS6 |
| 72.33 | 1,315.15 | ltr | 24.98 | 1311.9 | (X6) | 24.8 | 1311.86 | XS6 |
| 69.35 | 1,314.59 | ltr | 28.31 | 1312.42 | (VP) | 31.31 | 1312.17 | XS6 |
| 66.62 | 1,313.85 | ltr | 32.95 | 1312.31 | (X6) | 34.29 | 1311.78 | XS6 |
| 63.33 | 1,313.45 | fp | 34.6 | 1311.98 | (X6) | 35.56 | 1311.37 | XS6 |
| 60.21 | 1,312.96 | fp | 35.25 | 1311.73 | (X6W) | 36.38 | 1311.21 | XS6W |
| 54.73 | 1,312.81 | fp | 36.27 | 1311.08 | (X6) | 36.47 | 1310.62 | XS6 |
| 49.3 | 1,312.59 | fp | 37 | 1310.38 | (X6) | 37.11 | 1310.23 | XS6 |
| 44.76 | 1,312.46 | fp | 38.41 | 1310.63 | (X6) | 37.62 | 1310.34 | XS6 |
| 42.6 | 1,312.18 | bkf | 38.95 | 1310.63 | (X6) | 38.89 | 1310.83 | XS6 |
| 40.3 | 1,311.31 | rew | 40.57 | 1310.93 | (X6) | 39.78 | 1310.89 | XS6 |
| 39.48 | 1,311.24 | sb | 40.98 | 1311.56 | (X6) | 39.94 | 1311.14 | XS6W |
| 38.18 | 1,310.79 | sb | 41.22 | 1311.66 | (X6W) | 40.79 | 1311.54 | XS6 |
| 35.85 | 1,311.34 | lew | 41.51 | 1311.73 | (W) | 42.22 | 1312.02 | XS6 |
| 34.24 | 1,312.03 | bkf | 42.22 | 1311.86 | (X6) | 44.77 | 1312.3 | XS6 |
| 32.85 | 1,312.43 | fp | 42.62 | 1312.12 | (X6) | 47.77 | 1312.42 | XS6 |
| 29.48 | 1,312.32 | fp | 44.48 | 1312.48 | (X6) | 50.04 | 1312.57 | XS6 |
| 25.86 | 1,312.11 | fp | 51.78 | 1312.55 | (X6) | 52.96 | 1312.59 | XS6 |
| 20.04 | 1,312.31 | fp | 61.93 | 1313.13 | (X6) | 56.14 | 1312.75 | XS6 |
| 14.4 | 1,312.43 | fp | 65.97 | 1313.54 | (X6) | 56.25 | 1312.75 | XS6 |
| 8.38 | 1,312.74 | pin | 72 | 1315.14 | (X6) | 56.25 | 1312.73 | XS6 |
| | | | 81.56 | 1316.69 | (X6) | 59.75 | 1312.87 | XS6 |
| | | | 81.72 | 1316.85 | (X6RP) | 59.96 | 1312.96 | XS6 |
| | | | | | | 63.53 | 1313.39 | XS6 |
| | | | | | | 66.39 | 1313.6 | XS6 |
| | | | | | | 66.41 | 1313.6 | XS6 |
| | | | | | | 66.55 | 1313.55 | XS6 |
| | | | | | | 68.28 | 1314.24 | XS6 |
| | | | | | | 70.95 | 1314.74 | XS6 |
| | | | | | | 73.14 | 1315.26 | XS6 |
| | | | | | | 76.31 | 1315.65 | XS6 |
| | | | | | | 80.24 | 1316.55 | XS6 |
| | | | | | | 81.85 | 1316.88 | XS6RP07 |

**Photo of Cross-Section #6 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 6.1 | 7.9 | 8.2 |
| **Width** | 8.4 | 8.0 | 10.9 |
| **Mean Depth** | 0.7 | 1.0 | 0.8 |
| **Max Depth** | 1.3 | 1.7 | 1.9 |



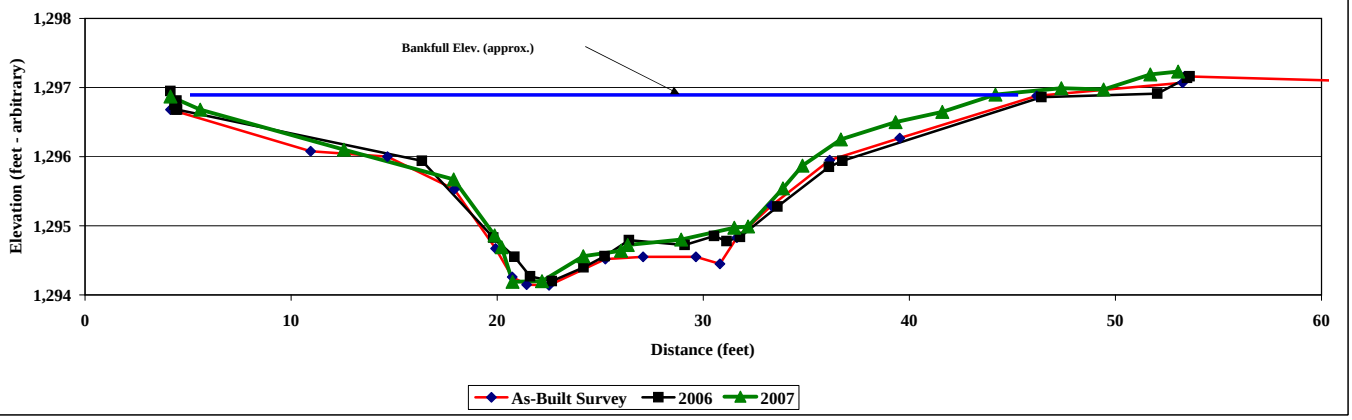
| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X7 Reach 1 |
| **Feature** | Riffle |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 4.14 | 1,296.68 | PIN | 4.14 | 1296.95 | (xs7lp) | 4.14 | 1296.87 | XS7LP07 |
| 10.94 | 1,296.08 | FP | 4.35 | 1296.75 | (XS7) | 5.59 | 1296.68 | XS7 |
| 14.68 | 1,296.00 | BKF | 4.41 | 1296.68 | (XS7) | 12.56 | 1296.1 | XS7 |
| 17.92 | 1,295.53 | LB | 4.44 | 1296.81 | (xs7lp) | 17.89 | 1295.67 | XS7 |
| 19.92 | 1,294.67 | LEW | 4.47 | 1296.68 | (xs7) | 19.88 | 1294.86 | XS7 |
| 20.73 | 1,294.26 | SB | 16.35 | 1295.94 | (xs7) | 20.22 | 1294.69 | XS7W |
| 21.43 | 1,294.15 | SB | 19.81 | 1294.83 | (xs7w) | 20.75 | 1294.19 | XS7 |
| 22.51 | 1,294.14 | SB | 20.84 | 1294.55 | (xs7) | 22.18 | 1294.2 | XS7 |
| 25.25 | 1,294.52 | SB | 21.6 | 1294.27 | (xs7) | 24.17 | 1294.56 | XS7 |
| 27.08 | 1,294.55 | REW | 22.66 | 1294.2 | (xs7) | 26.01 | 1294.64 | XS7 |
| 29.64 | 1,294.55 | BAR | 24.19 | 1294.4 | (xs7) | 26.33 | 1294.72 | XS7W |
| 30.81 | 1,294.45 | REW | 25.22 | 1294.56 | (xs7) | 28.93 | 1294.8 | XS7 |
| 31.63 | 1,294.83 | RB | 26.4 | 1294.79 | (xs7) | 31.51 | 1294.97 | XS7 |
| 33.31 | 1,295.29 | RB | 29.1 | 1294.72 | (xs7) | 32.17 | 1294.99 | XS7 |
| 36.13 | 1,295.95 | BKF | 30.53 | 1294.85 | (xs7) | 33.86 | 1295.54 | XS7 |
| 39.53 | 1,296.27 | TOB | 31.14 | 1294.78 | (xs7) | 34.82 | 1295.87 | XS7 |
| 46.18 | 1,296.88 | FP | 31.78 | 1294.84 | (xs7w) | 36.67 | 1296.25 | XS7 |
| 53.26 | 1,297.07 | FP | 33.61 | 1295.28 | (xs7) | 39.33 | 1296.5 | XS7 |
| 53.35 | 1,297.16 | FP | 36.1 | 1295.85 | (xs7) | 41.6 | 1296.65 | XS7 |
| 102.6 | 1,296.75 | PIN | 36.76 | 1295.94 | (xs7) | 44.18 | 1296.9 | XS7 |
| | | | 46.41 | 1296.86 | (xs7) | 47.37 | 1296.99 | XS7 |
| | | | 52.03 | 1296.91 | (xs7) | 49.42 | 1296.97 | XS7 |
| | | | 53.48 | 1297.14 | (xs7rp) | 51.69 | 1297.19 | XS7 |
| | | | 53.61 | 1297.16 | (XS7) | 53.05 | 1297.23 | XS7RP07 |

**Photo of Cross-Section #7 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 49.9 | 50.7 | 46.9 |
| **Width** | 35.2 | 42.3 | 40.0 |
| **Mean Depth** | 1.4 | 1.2 | 1.2 |
| **Max Depth** | 2.7 | 2.7 | 2.7 |
| **w/d ratio** | 24.9 | 35.2 | 34.2 |
| **FPW** | 100 | 100 | 100 |
| **ER (greater than)** | 2.8 | 2.4 | 2.5 |
| **Stream Type** | C | C | C |

## Reach 1 Riffle Cross Section #7 - Station 1+65
## Purlear Phase II



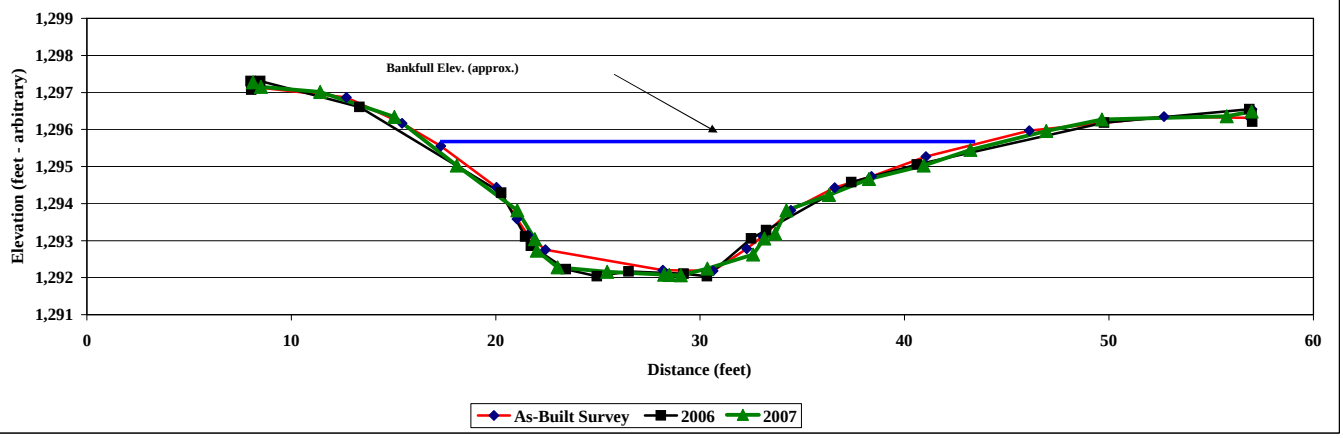
| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X8 Reach 1 |
| **Feature** | Riffle |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 8.13 | 1,297.15 | FP | 8.02 | 1297.31 | (XS8) | 8.13 | 1297.27 | XS8LP07 |
| 12.7 | 1,296.87 | TOB | 8.04 | 1297.07 | (xs8) | 8.52 | 1297.15 | XS8 |
| 15.42 | 1,296.17 | LB | 8.13 | 1297.19 | (xs8lp) | 11.41 | 1297.01 | XS8 |
| 17.31 | 1,295.55 | BKF | 8.48 | 1297.31 | (xs8lp) | 15.04 | 1296.34 | XS8 |
| 20.04 | 1,294.44 | LB | 13.33 | 1296.61 | (xs8) | 18.1 | 1295.03 | XS8 |
| 21.04 | 1,293.58 | LB | 20.27 | 1294.29 | (xs8) | 21.05 | 1293.82 | XS8 |
| 21.57 | 1,293.15 | LEW | 21.45 | 1293.11 | (xs8w) | 21.91 | 1293.04 | XS8W |
| 22.43 | 1,292.75 | SB | 21.73 | 1292.86 | (xs8) | 22.01 | 1292.73 | XS8 |
| 28.17 | 1,292.20 | SB | 23.43 | 1292.23 | (xs8) | 23.02 | 1292.28 | XS8 |
| 30.63 | 1,292.18 | SB | 24.95 | 1292.04 | (xs8) | 25.45 | 1292.16 | XS8 |
| 32.27 | 1,292.78 | SB | 26.5 | 1292.17 | (xs8) | 28.24 | 1292.08 | XS8 |
| 33.06 | 1,293.12 | REW | 29.2 | 1292.11 | (xs8) | 28.49 | 1292.07 | XS8 |
| 34.43 | 1,293.82 | RB | 30.34 | 1292.04 | (xs8) | 29.05 | 1292.06 | XS8 |
| 36.58 | 1,294.43 | RB | 32.5 | 1293.06 | (xs8w) | 30.35 | 1292.24 | XS8 |
| 38.39 | 1,294.73 | RB | 33.24 | 1293.28 | (xs8) | 32.59 | 1292.62 | XS8 |
| 41.05 | 1,295.27 | RB | 37.4 | 1294.58 | (xs8) | 33.14 | 1293.06 | XS8W |
| 46.1 | 1,295.97 | RB | 40.6 | 1295.05 | (xs8) | 33.67 | 1293.19 | XS8 |
| 52.69 | 1,296.35 | FP | 49.77 | 1296.18 | (xs8) | 34.22 | 1293.82 | XS8 |
| 56.9 | 1,296.31 | FP | 56.87 | 1296.55 | (XS8) | 36.3 | 1294.23 | XS8 |
| 56.99 | 1,296.55 | PIN | 56.98 | 1296.42 | (xs8rp) | 38.25 | 1294.66 | XS8 |
| | | | 57.01 | 1296.21 | (xs8) | 40.93 | 1295.03 | XS8 |
| | | | | | | 43.22 | 1295.45 | XS8 |
| | | | | | | 46.93 | 1295.96 | XS8 |
| | | | | | | 49.65 | 1296.27 | XS8 |
| | | | | | | 55.76 | 1296.36 | XS8 |
| | | | | | | 56.98 | 1296.49 | XS8RP07 |

**Photo of Cross-Section #8 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 48.59 | 54.8 | 57.9 |
| **Width** | 23.7 | 31.3 | 30.2 |
| **Mean Depth** | 2.0 | 1.8 | 1.9 |
| **Max Depth** | 3.4 | 3.5 | 3.5 |
| **w/d ratio** | 11.6 | 17.9 | 15.7 |
| **FPW** | 98 | 98 | 98 |
| **ER (greater than)** | 4.1 | 3.1 | 3.2 |
| **Stream Type** | C | C | C |

## Reach 1 Riffle Cross Section # 8 - Station 4+60
## Purlear Phase II

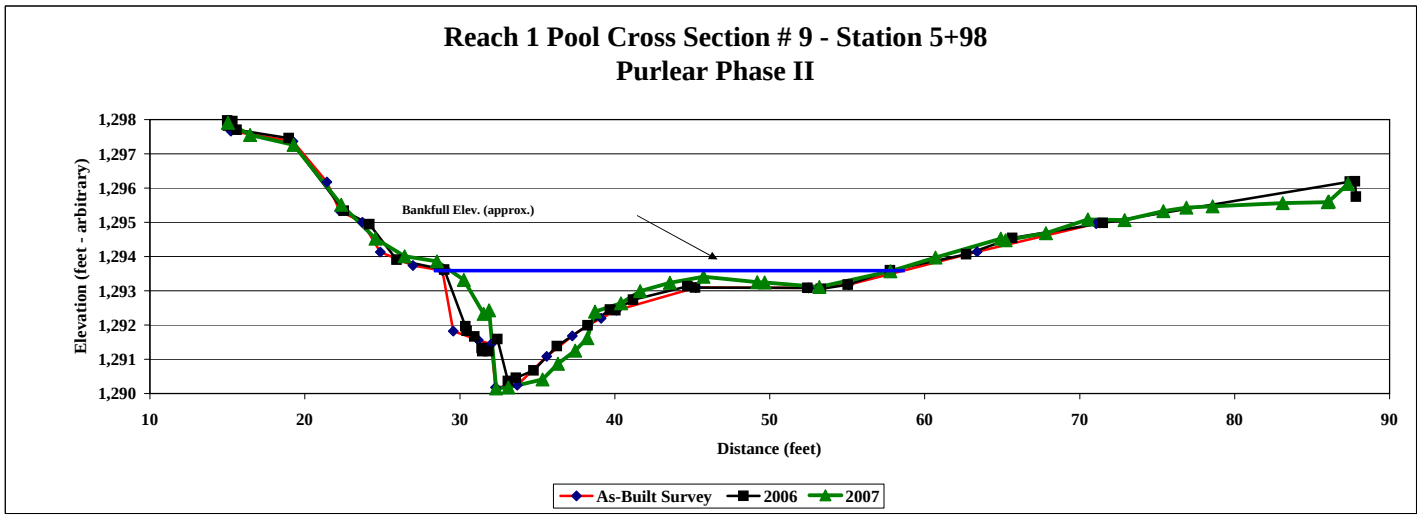


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X9 Reach 1 |
| **Feature** | Pool |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 15.04 | 1,297.97 | PIN | 14.99 | 1297.97 | (XS9) | 15.04 | 1297.91 | XS9LP07 |
| 15.23 | 1,297.66 | FP | 15.04 | 1297.82 | (xs9lp) | 16.46 | 1297.55 | XS9 |
| 19.23 | 1,297.36 | TOB | 15.32 | 1297.95 | (xs9lp) | 19.27 | 1297.26 | XS9 |
| 21.42 | 1,296.18 | LB | 15.59 | 1297.7 | (xs9) | 22.34 | 1295.51 | XS9 |
| 22.24 | 1,295.34 | LB | 18.96 | 1297.46 | (xs9) | 24.56 | 1294.52 | XS9 |
| 23.72 | 1,295.00 | LB | 22.51 | 1295.34 | (xs9) | 26.43 | 1294.01 | XS9 |
| 24.86 | 1,294.13 | LB | 24.16 | 1294.94 | (xs9) | 28.53 | 1293.86 | XS9 |
| 26.98 | 1,293.74 | LB | 25.93 | 1293.91 | (xs9) | 30.25 | 1293.32 | XS9 |
| 28.87 | 1,293.59 | BKF | 29 | 1293.62 | (xs9) | 31.53 | 1292.33 | XS9W |
| 29.57 | 1,291.82 | SB | 30.36 | 1291.96 | (xs9) | 31.88 | 1292.43 | XS9W |
| 31.18 | 1,291.56 | SB | 30.45 | 1291.83 | (xs9) | 32.35 | 1290.15 | XS9 |
| 32.01 | 1,291.44 | SB | 30.93 | 1291.66 | (xs9) | 33.12 | 1290.18 | XS9 |
| 32.31 | 1,290.18 | SB | 31.41 | 1291.33 | (xs9) | 35.34 | 1290.41 | XS9 |
| 33.71 | 1,290.24 | SB | 31.45 | 1291.23 | (xs9) | 36.32 | 1290.87 | XS9 |
| 35.6 | 1,291.08 | SB | 31.84 | 1291.23 | (xs9) | 37.44 | 1291.25 | XS9 |
| 37.26 | 1,291.68 | SB | 32.42 | 1291.59 | (xs9) | 38.22 | 1291.62 | XS9 |
| 38.26 | 1,291.99 | SB | 33.11 | 1290.36 | (xs9) | 38.72 | 1292.39 | XS9W |
| 39.11 | 1,292.20 | REW | 33.62 | 1290.46 | (xs9) | 40.39 | 1292.64 | XS9 |
| 40.1 | 1,292.43 | PB | 34.77 | 1290.67 | (xs9) | 41.64 | 1292.99 | XS9 |
| 45.22 | 1,293.09 | PB | 36.27 | 1291.38 | (xs9) | 43.56 | 1293.23 | XS9 |
| 52.49 | 1,293.08 | PB | 38.26 | 1291.99 | (xs9w) | 45.73 | 1293.41 | XS9 |
| 55.08 | 1,293.18 | PB | 39.7 | 1292.45 | (xs9) | 49.19 | 1293.25 | XS9 |
| 63.39 | 1,294.14 | RB | 40.05 | 1292.43 | (XS9) | 49.66 | 1293.24 | XS9 |
| 71.06 | 1,294.96 | TOB | 41.19 | 1292.74 | (xs9) | 53.21 | 1293.11 | XS9 |
| | | | 44.7 | 1293.13 | (xs9) | 57.79 | 1293.57 | XS9 |
| | | | 45.18 | 1293.09 | (XS9) | 60.7 | 1293.97 | XS9 |
| | | | 52.44 | 1293.08 | (XS9) | 64.9 | 1294.52 | XS9 |
| | | | 53.3 | 1293.06 | (xs9) | 65.21 | 1294.48 | XS9 |
| | | | 55.04 | 1293.18 | (XS9) | 67.82 | 1294.68 | XS9 |
| | | | 57.77 | 1293.6 | (xs9) | 70.53 | 1295.08 | XS9 |
| | | | 62.67 | 1294.07 | (xs9) | 72.91 | 1295.07 | XS9 |
| | | | 65.65 | 1294.54 | (xs9) | 75.39 | 1295.33 | XS9 |
| | | | 71.5 | 1294.98 | (xs9) | 76.89 | 1295.43 | XS9 |
| | | | 87.44 | 1296.19 | (XS9) | 78.57 | 1295.47 | XS9 |
| | | | 87.76 | 1296.2 | (xs9rp) | 83.1 | 1295.56 | XS9 |
| | | | | | | 86.01 | 1295.59 | XS9 |
| | | | | | | 86.07 | 1295.61 | XS9 |
| | | | | | | 87.31 | 1296.12 | XS9RP |

**Photo of Cross-Section #9 - Looking Downstream**

| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 33.8 | 31.5 | 28.6 |
| **Width** | 29.2 | 28.8 | 29.3 |
| **Mean Depth** | 1.2 | 1.1 | 1.0 |
| **Max Depth** | 3.4 | 3.2 | 3.4 |

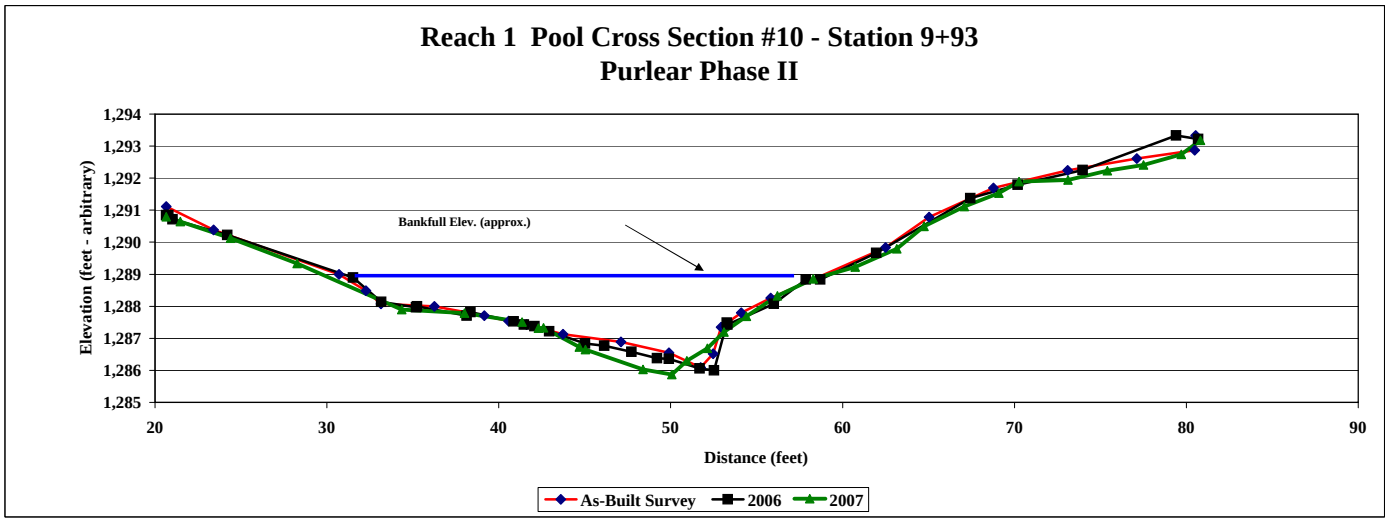


| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | X10 Reach 1 |
| **Feature** | Pool |
| **Date** | 8/6/2007 |
| **Crew** | Roberts, Price, Zink |

| 2005 As-Built Survey | | | 2006 MY - 01 | | | 2007 MY - 02 | | |
|---|---|---|---|---|---|---|---|---|
| **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** | **Station** | **Elevation** | **Notes** |
| 20.66 | 1,291.11 | FP | 20.66 | 1290.84 | (xs10lp) | 20.66 | 1290.79 | XS10LP07 |
| 23.41 | 1,290.38 | | 20.79 | 1290.84 | (xs10lp) | 21.47 | 1290.64 | XS10 |
| 30.71 | 1,289.00 | BKF | 21.02 | 1290.71 | (xs10) | 24.39 | 1290.12 | XS10 |
| 32.26 | 1,288.49 | LB | 24.2 | 1290.22 | (xs10) | 28.27 | 1289.34 | XS10 |
| 33.14 | 1,288.08 | LB | 31.52 | 1288.9 | (xs10) | 34.36 | 1287.9 | XS10 |
| 36.25 | 1,288.00 | PB | 33.17 | 1288.14 | (xs10) | 38.01 | 1287.79 | XS10 |
| 39.16 | 1,287.71 | PB | 35.2 | 1287.97 | (xs10) | 41.36 | 1287.51 | XS10 |
| 40.58 | 1,287.54 | LEW | 35.24 | 1288 | (XS10) | 42.3 | 1287.32 | XS10W |
| 41.62 | 1,287.43 | | 38.14 | 1287.71 | (XS10) | 42.61 | 1287.33 | XS10 |
| 43.73 | 1,287.13 | SB | 38.35 | 1287.82 | (xs10) | 44.68 | 1286.73 | XS10 |
| 47.1 | 1,286.89 | SB | 40.87 | 1287.53 | (xs10) | 45.04 | 1286.65 | XS10 |
| 49.89 | 1,286.55 | SB | 41.46 | 1287.43 | (xs10) | 48.4 | 1286.03 | XS10 |
| 51.74 | 1,286.09 | SB | 42.08 | 1287.38 | (xs10) | 50.07 | 1285.87 | XS10 |
| 52.47 | 1,286.52 | SB | 42.93 | 1287.22 | (xs10) | 50.94 | 1286.3 | XS10 |
| 52.93 | 1,287.35 | REW | 45.03 | 1286.84 | (xs10) | 52.14 | 1286.69 | XS10 |
| 54.1 | 1,287.80 | RB | 46.14 | 1286.77 | (xs10) | 53.11 | 1287.2 | XS10W |
| 55.81 | 1,288.26 | RB | 47.73 | 1286.58 | (xs10) | 54.4 | 1287.69 | XS10 |
| 62.51 | 1,289.83 | RB | 49.21 | 1286.38 | (xs10) | 56.21 | 1288.33 | XS10 |
| 65.03 | 1,290.78 | RB | 49.9 | 1286.36 | (xs10) | 58.3 | 1288.86 | XS10 |
| 68.78 | 1,291.69 | TOB | 51.68 | 1286.06 | (xs10) | 60.73 | 1289.23 | XS10 |
| 73.09 | 1,292.24 | FP | 52.52 | 1286 | (xs10) | 63.16 | 1289.79 | XS10 |
| 77.12 | 1,292.61 | FP | 53.26 | 1287.49 | (xs10) | 64.73 | 1290.49 | XS10 |
| 80.49 | 1,292.87 | FP | 53.3 | 1287.43 | (xs10w) | 67.08 | 1291.11 | XS10 |
| 80.55 | 1,293.33 | PIN | 56 | 1288.08 | (xs10) | 69.1 | 1291.53 | XS10 |
| | | | 57.86 | 1288.84 | (xs10) | 70.26 | 1291.89 | XS10 |
| | | | 58.71 | 1288.84 | (xs10) | 73.12 | 1291.94 | XS10 |
| | | | 61.96 | 1289.66 | (xs10) | 75.4 | 1292.23 | XS10 |
| | | | 67.43 | 1291.37 | (xs10) | 77.51 | 1292.41 | XS10 |
| | | | 70.2 | 1291.79 | (xs10) | 79.71 | 1292.74 | XS10 |
| | | | 73.97 | 1292.25 | (xs10) | 80.82 | 1293.18 | XS10RP07 |
| | | | 79.41 | 1293.33 | (XS10) | | | |
| | | | 80.7 | 1293.22 | (xs10rp) | | | |

**Photo of Cross-Section #10 - Looking Downstream**

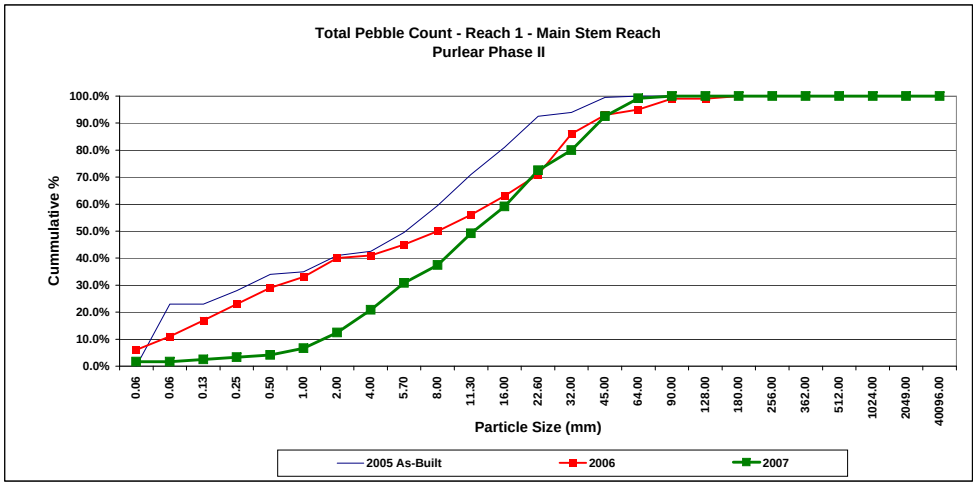
| | **As-Built** | **2006** | **2007** |
|---|---|---|---|
| **Area** | 40.0 | 42.4 | 45.2 |
| **Width** | 28.3 | 34.5 | 30.0 |
| **Mean Depth** | 1.4 | 1.2 | 1.5 |
| **Max Depth** | 2.9 | 3.0 | 3.1 |



| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | Reach 1 - Main Stem Reach |
| **Feature** | |
| **Date** | 8/2/2007 |
| **Crew** | Roberts, Brim, Young |

| | | 2005 As-Built | | | | | 2006 | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Material** | **Size (mm)** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** |
| **Silt/Clay** | silt/clay | 0.061 | 0 | 0 | 0.0% | 0.0% | 3 | 3 | 6.0% | 6.0% | 1 | 1 | 1.7% | 1.7% |
| **Sand** | very fine sand | 0.062 | 37 | 9 | 23.0% | 23.0% | 5 | 0 | 5.0% | 11.0% | 0 | 0 | 0.0% | 1.7% |
| | fine sand | 0.125 | 0 | 0 | 0.0% | 23.0% | 4 | 2 | 6.0% | 17.0% | 0 | 1 | 0.8% | 2.5% |
| | medium sand | 0.25 | 7 | 3 | 5.0% | 28.0% | 5 | 1 | 6.0% | 23.0% | 1 | 0 | 0.8% | 3.3% |
| | course sand | 0.50 | 9 | 3 | 6.0% | 34.0% | 5 | 1 | 6.0% | 29.0% | 1 | 0 | 0.8% | 4.2% |
| | very course sand | 1.0 | 0 | 2 | 1.0% | 35.0% | 3 | 1 | 4.0% | 33.0% | 3 | 0 | 2.5% | 6.7% |
| **G r a v e l** | very fine gravel | 2.0 | 5 | 7 | 6.0% | 41.0% | 5 | 2 | 7.0% | 40.0% | 3 | 4 | 5.8% | 12.5% |
| | fine gravel | 4.0 | 3 | 0 | 1.5% | 42.5% | 0 | 1 | 1.0% | 41.0% | 4 | 6 | 8.3% | 20.8% |
| | fine gravel | 5.7 | 4 | 10 | 7.0% | 49.5% | 4 | 0 | 4.0% | 45.0% | 4 | 8 | 10.0% | 30.8% |
| | medium gravel | 8.0 | 1 | 19 | 10.0% | 59.5% | 2 | 3 | 5.0% | 50.0% | 4 | 4 | 6.7% | 37.5% |
| | medium gravel | 11.3 | 4 | 19 | 11.5% | 71.0% | 3 | 3 | 6.0% | 56.0% | 5 | 9 | 11.7% | 49.2% |
| | course gravel | 16.0 | 12 | 8 | 10.0% | 81.0% | 1 | 6 | 7.0% | 63.0% | 2 | 10 | 10.0% | 59.2% |
| | course gravel | 22.6 | 8 | 15 | 11.5% | 92.5% | 2 | 6 | 8.0% | 71.0% | 8 | 8 | 13.3% | 72.5% |
| | very course gravel | 32 | 3 | 0 | 1.5% | 94.0% | 2 | 13 | 15.0% | 86.0% | 6 | 3 | 7.5% | 80.0% |
| | very course gravel | 45 | 6 | 5 | 5.5% | 99.5% | 3 | 4 | 7.0% | 93.0% | 5 | 10 | 12.5% | 92.5% |
| **Cobble** | small cobble | 64 | 1 | 0 | 0.5% | 100.0% | 1 | 1 | 2.0% | 95.0% | 2 | 6 | 6.7% | 99.2% |
| | medium cobble | 90 | 0 | 0 | 0.0% | 100.0% | 2 | 2 | 4.0% | 99.0% | 1 | 0 | 0.8% | 100.0% |
| | large cobble | 128 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 99.0% | 0 | 0 | 0.0% | 100.0% |
| | very large cobble | 180 | 0 | 0 | 0.0% | 100.0% | 0 | 1 | 1.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Boulder** | small boulder | 256 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | small boulder | 362 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | medium boulder | 512 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | large boulder | 1024 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very large boulder | 2049 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Bedrock** | bedrock | 40096 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **TOTAL / %of whole count** | | | 100 | 100 | 100.0% | | 50 | 50 | 100% | | 50 | 70 | 100% | |

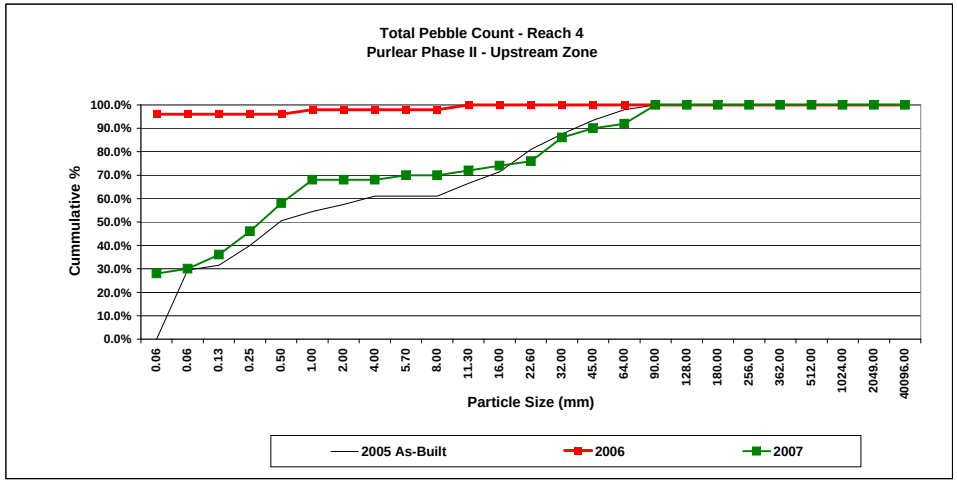
| | **d16** | **d35** | **d50** | **d84** | **d95** |
|---|---|---|---|---|---|
| **2005 As-Built** | 0.08 | 1.50 | 6.99 | 21.39 | 41.41 |
| **2006** | 0.17 | 1.93 | 9.65 | 37.01 | 77.00 |
| **2007** | 3.78 | 8.60 | 14.12 | 43.62 | 62.94 |
| **2008** | | | | | |
| **2009** | | | | | |
| **2010** | | | | | |



| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | Reach 4 - Upstream Zone |
| **Feature** | |
| **Date** | 8/2/2007 |
| **Crew** | Roberts, Brim, Young |

| | | 2005 As-Built | | | | | 2006 | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Material** | **Size (mm)** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** |
| **Silt/Clay** | silt/clay | 0.061 | 0 | 0 | 0.0% | 0.0% | 25 | 23 | 96.0% | 96.0% | 9 | 5 | 28.0% | 28.0% |
| **Sand** | very fine sand | 0.062 | 32 | 27 | 29.5% | 29.5% | 0 | 0 | 0.0% | 96.0% | 0 | 1 | 2.0% | 30.0% |
| | fine sand | 0.125 | 0 | 4 | 2.0% | 31.5% | 0 | 0 | 0.0% | 96.0% | 2 | 1 | 6.0% | 36.0% |
| | medium sand | 0.25 | 8 | 9 | 8.5% | 40.0% | 0 | 0 | 0.0% | 96.0% | 4 | 1 | 10.0% | 46.0% |
| | course sand | 0.50 | 11 | 10 | 10.5% | 50.5% | 0 | 0 | 0.0% | 96.0% | 6 | 0 | 12.0% | 58.0% |
| | very course sand | 1.0 | 6 | 2 | 4.0% | 54.5% | 0 | 1 | 2.0% | 98.0% | 4 | 1 | 10.0% | 68.0% |
| **Gravel** | very fine gravel | 2.0 | 0 | 6 | 3.0% | 57.5% | 0 | 0 | 0.0% | 98.0% | 0 | 0 | 0.0% | 68.0% |
| | fine gravel | 4.0 | 2 | 5 | 3.5% | 61.0% | 0 | 0 | 0.0% | 98.0% | 0 | 0 | 0.0% | 68.0% |
| | fine gravel | 5.7 | 0 | 0 | 0.0% | 61.0% | 0 | 0 | 0.0% | 98.0% | 0 | 1 | 2.0% | 70.0% |
| | medium gravel | 8.0 | 0 | 0 | 0.0% | 61.0% | 0 | 0 | 0.0% | 98.0% | 0 | 0 | 0.0% | 70.0% |
| | medium gravel | 11.3 | 4 | 7 | 5.5% | 66.5% | 0 | 1 | 2.0% | 100.0% | 0 | 1 | 2.0% | 72.0% |
| | course gravel | 16.0 | 3 | 7 | 5.0% | 71.5% | 0 | 0 | 0.0% | 100.0% | 0 | 1 | 2.0% | 74.0% |
| | course gravel | 22.6 | 16 | 3 | 9.5% | 81.0% | 0 | 0 | 0.0% | 100.0% | 0 | 1 | 2.0% | 76.0% |
| | very course gravel | 32 | 3 | 10 | 6.5% | 87.5% | 0 | 0 | 0.0% | 100.0% | 0 | 5 | 10.0% | 86.0% |
| | very course gravel | 45 | 5 | 7 | 6.0% | 93.5% | 0 | 0 | 0.0% | 100.0% | 0 | 2 | 4.0% | 90.0% |
| **Cobble** | small cobble | 64 | 8 | 1 | 4.5% | 98.0% | 0 | 0 | 0.0% | 100.0% | 0 | 1 | 2.0% | 92.0% |
| | medium cobble | 90 | 2 | 2 | 2.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 4 | 8.0% | 100.0% |
| | large cobble | 128 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very large cobble | 180 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Boulder** | small boulder | 256 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | small boulder | 362 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | medium boulder | 512 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | large boulder | 1024 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very large boulder | 2049 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Bedrock** | bedrock | 40096 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **TOTAL / %of whole count** | | | 100 | 100 | 100.0% | | 25 | 25 | 100.0% | | 25 | 25 | 100% | |

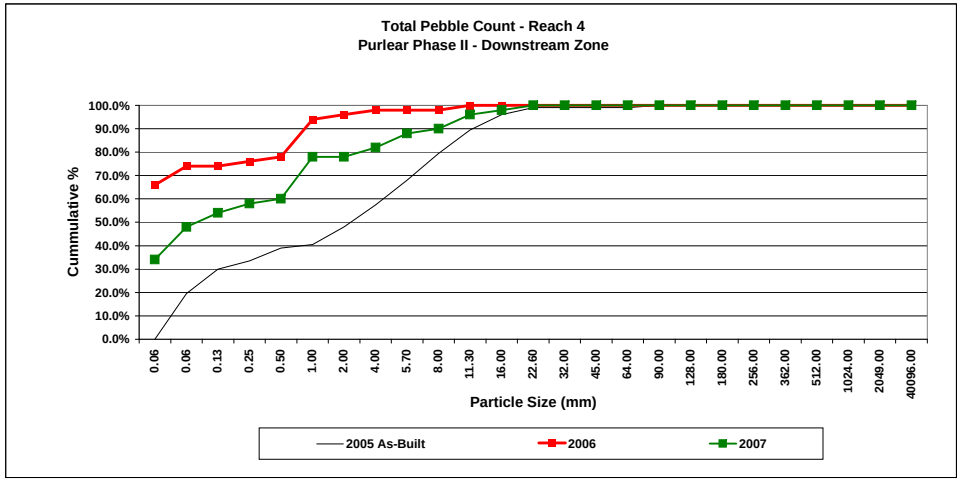
| | **d16** | **d35** | **d50** | **d84** | **d95** |
|---|---|---|---|---|---|
| **2005 As-Built** | 0.08 | 0.26 | 0.73 | 32.47 | 62.00 |
| **2006** | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **2007** | 0.00 | 0.17 | 0.50 | 36.26 | 89.00 |
| **2008** | | | | | |
| **2009** | | | | | |
| **2010** | | | | | |



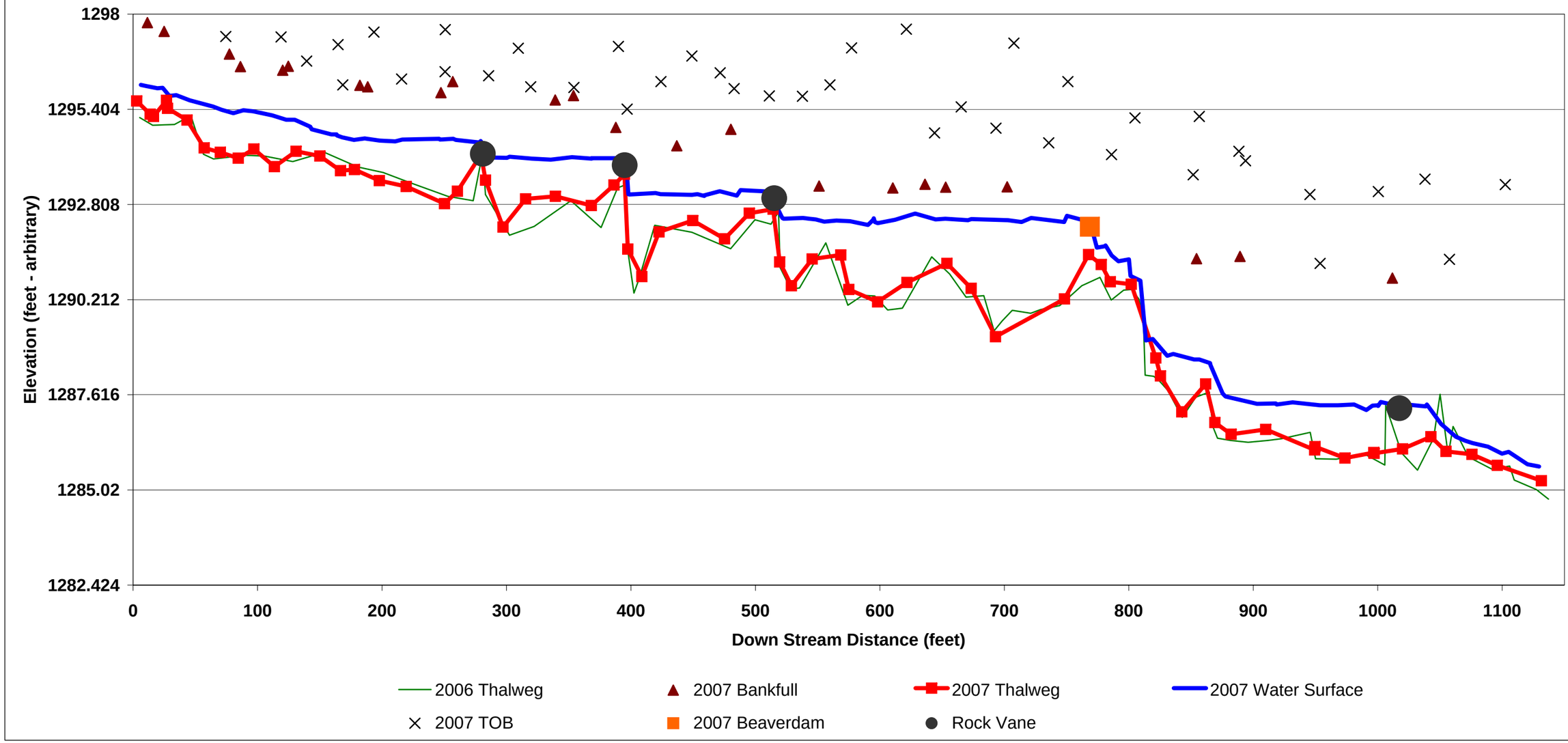
| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Cross Section** | Reach 4 - Downstream Zone |
| **Feature** | |
| **Date** | 8/2/2007 |
| **Crew** | Roberts, Brim, Young |

| | | 2005 As-Built | | | | | 2006 | | | | 2007 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Description** | **Material** | **Size (mm)** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** | **Pool** | **Riffle** | **%** | **Cum %** |
| **Silt/Clay** | silt/clay | 0.061 | 0 | 0 | 0.0% | 0.0% | 11 | 22 | 66.0% | 66.0% | 11 | 6 | 34.0% | 34.0% |
| **Sand** | very fine sand | 0.062 | 23 | 16 | 19.5% | 19.5% | 3 | 1 | 8.0% | 74.0% | 5 | 2 | 14.0% | 48.0% |
| | fine sand | 0.125 | 17 | 4 | 10.5% | 30.0% | 0 | 0 | 0.0% | 74.0% | 3 | 0 | 6.0% | 54.0% |
| | medium sand | 0.25 | 7 | 0 | 3.5% | 33.5% | 1 | 0 | 2.0% | 76.0% | 1 | 1 | 4.0% | 58.0% |
| | course sand | 0.50 | 8 | 3 | 5.5% | 39.0% | 1 | 0 | 2.0% | 78.0% | 1 | 0 | 2.0% | 60.0% |
| | very course sand | 1.0 | 3 | 0 | 1.5% | 40.5% | 7 | 1 | 16.0% | 94.0% | 2 | 7 | 18.0% | 78.0% |
| **G r a v e l** | very fine gravel | 2.0 | 5 | 10 | 7.5% | 48.0% | 1 | 0 | 2.0% | 96.0% | 0 | 0 | 0.0% | 78.0% |
| | fine gravel | 4.0 | 10 | 9 | 9.5% | 57.5% | 1 | 0 | 2.0% | 98.0% | 0 | 2 | 4.0% | 82.0% |
| | fine gravel | 5.7 | 6 | 15 | 10.5% | 68.0% | 0 | 0 | 0.0% | 98.0% | 0 | 3 | 6.0% | 88.0% |
| | medium gravel | 8.0 | 11 | 12 | 11.5% | 79.5% | 0 | 0 | 0.0% | 98.0% | 0 | 1 | 2.0% | 90.0% |
| | medium gravel | 11.3 | 3 | 17 | 10.0% | 89.5% | 0 | 1 | 2.0% | 100.0% | 1 | 2 | 6.0% | 96.0% |
| | course gravel | 16.0 | 3 | 10 | 6.5% | 96.0% | 0 | 0 | 0.0% | 100.0% | 0 | 1 | 2.0% | 98.0% |
| | course gravel | 22.6 | 4 | 2 | 3.0% | 99.0% | 0 | 0 | 0.0% | 100.0% | 1 | 0 | 2.0% | 100.0% |
| | very course gravel | 32 | 0 | 0 | 0.0% | 99.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very course gravel | 45 | 0 | 0 | 0.0% | 99.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Cobble** | small cobble | 64 | 0 | 0 | 0.0% | 99.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | medium cobble | 90 | 0 | 2 | 1.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | large cobble | 128 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very large cobble | 180 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Boulder** | small boulder | 256 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | small boulder | 362 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | medium boulder | 512 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | large boulder | 1024 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| | very large boulder | 2049 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **Bedrock** | bedrock | 40096 | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% | 0 | 0 | 0.0% | 100.0% |
| **TOTAL / %of whole count** | | | 100 | 100 | 100.0% | | 25 | 25 | 100% | | 25 | 25 | 100% | |

| | d16 | d35 | d50 | d84 | d95 |
|---|---|---|---|---|---|
| **2005 As-Built** | 0.09 | 0.48 | 3.39 | 11.45 | 18.43 |
| **2006** | 0.00 | 0.00 | 0.00 | 1.03 | 2.25 |
| **2007** | 0.00 | 0.06 | 0.12 | 5.52 | 12.98 |
| **2008** | | | | | |
| **2009** | | | | | |
| **2010** | | | | | |



# Purlear Phase II
# Longitudinal Profile
# 2007 - Reach 1
# Main Channel
# Survey: 8/2/07



**Project Name** Purlear Phase II
**Task** Longitudinal Profile
**Section** Reach 1 - Main Channel
**Date** 8/6/07
**Crew** Roberts, Price, Zink

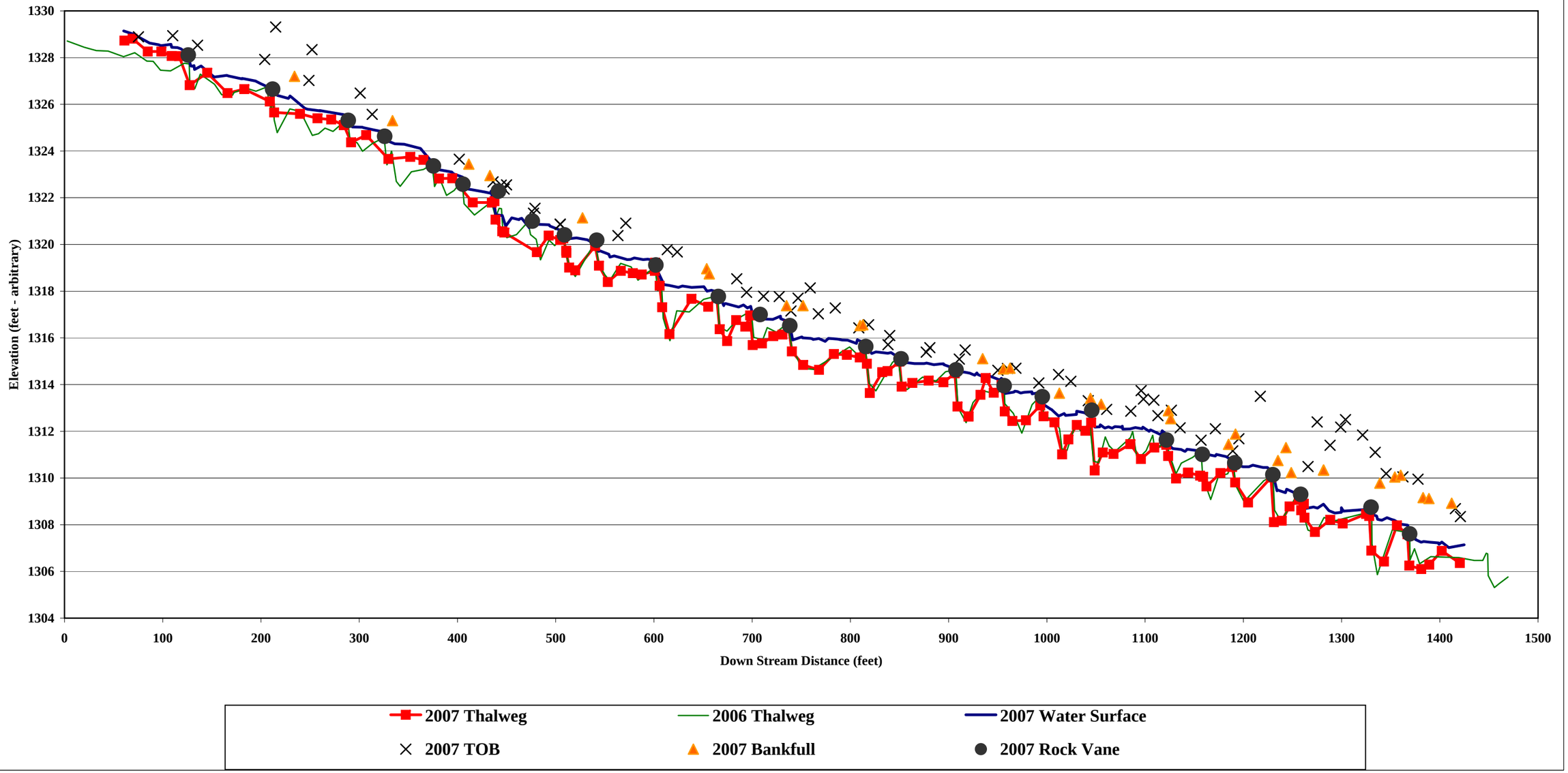
**2007 Survey**

| Station | Elev | Description |
|---|---|---|
| 2.89 | 1295.63 | T |
| 13.74 | 1295.27 | T |
| 16.45 | 1295.21 | T |
| 26.89 | 1295.65 | T |
| 27.69 | 1295.43 | T |
| 43.36 | 1295.11 | T |
| 57.16 | 1294.35 | T |
| 70.13 | 1294.23 | T |
| 84.54 | 1294.07 | T |
| 97.07 | 1294.32 | T |
| 113.54 | 1293.84 | T |
| 130.98 | 1294.26 | T |
| 150.09 | 1294.13 | T |
| 166.71 | 1293.73 | T |
| 177.88 | 1293.76 | T |
| 197.88 | 1293.46 | T |
| 219.4 | 1293.3 | T |
| 250.16 | 1292.83 | T |
| 260.59 | 1293.17 | T |
| 279.56 | 1294.17 | T |
| 283.15 | 1293.47 | T |
| 297.24 | 1292.19 | T |
| 315.4 | 1292.96 | T |
| 339.28 | 1293.03 | T |
| 368.2 | 1292.78 | T |
| 386.42 | 1293.34 | T |
| 394.81 | 1293.63 | T |
| 397.48 | 1291.59 | T |
| 408.79 | 1290.84 | T |
| 422.54 | 1292.06 | T |
| 449.65 | 1292.37 | T |
| 475.23 | 1291.87 | T |
| 495.13 | 1292.57 | T |
| 514.23 | 1292.68 | T |
| 519.48 | 1291.24 | T |
| 528.95 | 1290.59 | T |
| 545.64 | 1291.32 | T |
| 568.63 | 1291.43 | T |
| 575.07 | 1290.49 | T |
| 598.24 | 1290.15 | T |
| 621.75 | 1290.68 | T |
| 653.91 | 1291.2 | T |
| 673.4 | 1290.52 | T |
| 692.93 | 1289.2 | T |
| 748.35 | 1290.23 | T |
| 767.7 | 1291.44 | T |
| 777.86 | 1291.17 | T |
| 785.11 | 1290.7 | T |
| 801.98 | 1290.63 | T |
| 821.73 | 1288.62 | T |
| 825.45 | 1288.13 | T |
| 842.58 | 1287.15 | T |
| 861.78 | 1287.91 | T |
| 869.19 | 1286.86 | T |
| 882.21 | 1286.54 | T |
| 910.02 | 1286.67 | T |
| 949.36 | 1286.11 | T |
| 949.6 | 1286.2 | T |
| 973.65 | 1285.89 | T |
| 996.87 | 1286.04 | T |
| 997.07 | 1286.02 | T |
| 1019.93 | 1286.14 | T |
| 1042.74 | 1286.47 | T |
| 1054.85 | 1286.07 | T |
| 1075.7 | 1285.99 | T |
| 1096.1 | 1285.69 | T |
| 1131.52 | 1285.27 | T |
| | | |
| | | |
| | | |
| 6.26 | 1296.07 | W |
| 10.36 | 1296.04 | W |
| 19.56 | 1295.98 | W |
| 23.75 | 1295.99 | W |
| 29.14 | 1295.77 | W |
| 34.72 | 1295.79 | W |
| 45.54 | 1295.65 | W |
| 64.24 | 1295.48 | W |
| 71.15 | 1295.39 | W |
| 80.55 | 1295.3 | W |
| 88.65 | 1295.38 | W |
| 96.41 | 1295.35 | W |
| 111.66 | 1295.24 | W |
| 122.99 | 1295.12 | W |
| 129.85 | 1295.12 | W |
| 142.38 | 1294.93 | W |
| 143.49 | 1294.86 | W |
| 159.31 | 1294.72 | W |
| 163.5 | 1294.72 | XS7W |
| 163.85 | 1294.69 | XS7W |
| 167.96 | 1294.64 | W |
| 177.46 | 1294.57 | W |
| 186.08 | 1294.61 | W |
| 198.14 | 1294.55 | W |
| 210.62 | 1294.53 | W |
| 216.32 | 1294.58 | W |
| 245.91 | 1294.6 | W |
| 246.62 | 1294.58 | W |
| 257.26 | 1294.6 | W |
| 259.25 | 1294.57 | W |
| 278.29 | 1294.5 | W |
| 279.28 | 1294.54 | W |
| 287.37 | 1294.09 | W |
| 300.43 | 1294.08 | W |
| 302.41 | 1294.11 | W |
| 320.4 | 1294.06 | W |
| 330.54 | 1294.04 | W |
| 335.64 | 1294.03 | W |
| 352.64 | 1294.1 | W |
| 368.39 | 1294.06 | W |
| 368.46 | 1294.07 | W |
| 388.26 | 1294.07 | W |
| 393.06 | 1293.78 | W |
| 395.94 | 1294.08 | W |
| 397.91 | 1293.09 | W |
| 398.64 | 1293.08 | W |
| 419.71 | 1293.12 | W |
| 423.78 | 1293.09 | W |
| 448.97 | 1293.07 | W |
| 453.39 | 1293.09 | W |
| 458.93 | 1293.04 | XS8W |
| 459.08 | 1293.06 | XS8W |
| 471.36 | 1293.17 | W |
| 485.06 | 1293.05 | W |
| 488.03 | 1293.2 | W |
| 511.2 | 1293.16 | W |
| 521.6 | 1292.44 | W |
| 522.6 | 1292.42 | W |

| Station | Elev | Description |
|---|---|---|
| 538.21 | 1292.44 | W |
| 543.27 | 1292.42 | W |
| 548.47 | 1292.4 | W |
| 555.34 | 1292.34 | W |
| 565.12 | 1292.37 | W |
| 576.12 | 1292.35 | W |
| 590.48 | 1292.25 | W |
| 594.69 | 1292.39 | XS9W |
| 595.09 | 1292.43 | XS9W |
| 595.91 | 1292.33 | XS9W |
| 598.25 | 1292.3 | W |
| 612.18 | 1292.39 | W |
| 616.9 | 1292.44 | W |
| 628.35 | 1292.56 | W |
| 644.79 | 1292.4 | W |
| 652.62 | 1292.42 | W |
| 670.84 | 1292.38 | W |
| 673.44 | 1292.41 | W |
| 702.89 | 1292.38 | W |
| 713.85 | 1292.33 | W |
| 721.53 | 1292.44 | W |
| 748.1 | 1292.33 | W |
| 750.31 | 1292.5 | W |
| 768.87 | 1292.33 | W |
| 774.35 | 1291.63 | W |
| 781.2 | 1291.67 | W |
| 781.31 | 1291.69 | W |
| 786.17 | 1291.42 | W |
| 791.67 | 1291.26 | W |
| 800.13 | 1291.31 | W |
| 801.39 | 1290.86 | W |
| 809.34 | 1290.73 | W |
| 813.73 | 1289.1 | W |
| 819.26 | 1289.14 | W |
| 830.84 | 1288.68 | W |
| 835.72 | 1288.73 | W |
| 852.51 | 1288.58 | W |
| 856.62 | 1288.58 | W |
| 865.34 | 1288.48 | W |
| 865.55 | 1288.43 | W |
| 875.39 | 1287.65 | W |
| 877.74 | 1287.57 | W |
| 901.72 | 1287.38 | W |
| 902.93 | 1287.37 | W |
| 918.13 | 1287.38 | W |
| 918.77 | 1287.35 | W |
| 931.59 | 1287.41 | W |
| 953.64 | 1287.33 | W |
| 967.94 | 1287.33 | W |
| 981 | 1287.35 | W |
| 990.82 | 1287.2 | XS10W |
| 995.79 | 1287.32 | XS10W |
| 1000.14 | 1287.33 | W |
| 1000.36 | 1287.31 | W |
| 1002.41 | 1287.42 | W |
| 1018.8 | 1287.3 | W |
| 1023.05 | 1287.35 | W |
| 1038.55 | 1287.3 | W |
| 1039.5 | 1287.35 | W |
| 1050.95 | 1286.82 | W |
| 1062.8 | 1286.47 | W |
| 1070.49 | 1286.36 | W |
| 1076.06 | 1286.3 | W |
| 1088.64 | 1286.2 | W |
| 1099.86 | 1286.01 | W |
| 1105.18 | 1286.06 | W |
| 1120.29 | 1285.72 | W |
| 1129.66 | 1285.66 | W |
| | | |
| | | |
| 11.51 | 1298.84 | TOB |
| 19.22 | 1298.98 | TOB |
| 74.5 | 1297.39 | TOB |
| 87.55 | 1299.07 | TOB |
| 118.86 | 1297.38 | TOB |
| 139.5 | 1296.72 | TOB |
| 164.66 | 1297.17 | TOB |
| 168.49 | 1296.07 | TOB |
| 193.51 | 1297.51 | TOB |
| 215.76 | 1296.23 | TOB |
| 250.66 | 1296.43 | TOB |
| 250.83 | 1297.58 | TOB |
| 285.67 | 1296.32 | TOB |
| 309.5 | 1297.07 | TOB |
| 319.47 | 1296.02 | TOB |
| 354.16 | 1296 | TOB |
| 382.52 | 1299.49 | TOB |
| 382.9 | 1300.72 | TOB |
| 382.93 | 1300.22 | TOB |
| 389.91 | 1297.12 | TOB |
| 396.92 | 1295.41 | TOB |
| 424.09 | 1296.16 | TOB |
| 449 | 1296.86 | TOB |
| 471.73 | 1296.4 | TOB |
| 482.93 | 1295.97 | TOB |
| 511.2 | 1295.77 | TOB |
| 537.78 | 1295.76 | TOB |
| 559.92 | 1296.07 | TOB |
| 577.26 | 1297.08 | TOB |
| 621.31 | 1297.59 | TOB |
| 643.94 | 1294.76 | TOB |
| 665.33 | 1295.47 | TOB |
| 693.27 | 1294.89 | TOB |
| 707.71 | 1297.21 | TOB |
| 735.7 | 1294.49 | TOB |
| 751.05 | 1296.16 | TOB |
| 786.13 | 1294.17 | TOB |
| 804.98 | 1295.17 | TOB |
| 851.7 | 1293.62 | TOB |
| 856.63 | 1295.21 | TOB |
| 888.48 | 1294.26 | TOB |
| 893.75 | 1294 | TOB |
| 945.56 | 1293.08 | TOB |
| 953.69 | 1291.2 | TOB |
| 1000.45 | 1293.16 | TOB |
| | | |
| 1037.99 | 1293.5 | TOB |
| 1057.67 | 1291.31 | TOB |
| 1102.49 | 1293.35 | TOB |

| Station | Elev | Description |
|---|---|---|
| 11.49 | 1297.77 | BNKF |
| 24.94 | 1297.53 | BNKF |
| 77.4 | 1296.91 | BNKF |
| 86.27 | 1296.57 | BNKF |
| 120.18 | 1296.47 | BNKF |
| 124.7 | 1296.58 | BNKF |
| 182.19 | 1296.06 | BNKF |
| 188.56 | 1296.02 | BNKF |
| 247.33 | 1295.86 | BNKF |
| 256.82 | 1296.16 | BNKF |
| 339.18 | 1295.66 | BNKF |
| 353.86 | 1295.78 | BNKF |
| 387.86 | 1294.91 | BNKF |
| 436.85 | 1294.41 | BNKF |
| 480.32 | 1294.86 | BNKF |
| 551.14 | 1293.31 | BNKF |
| 610.43 | 1293.26 | BNKF |
| 636.25 | 1293.36 | BNKF |
| 652.9 | 1293.28 | BNKF |
| 702.27 | 1293.29 | BNKF |
| 854.46 | 1291.33 | BNKF |
| 889.36 | 1291.39 | BNKF |
| 1011.77 | 1290.8 | BNKF |
| | | |
| | | |
| | | |
| 768.69 | 1292.2 | BVRDAM |
| 771.53 | 1292.28 | BVRDAM |
| | | |
| | | |
| 280.99 | 1294.19 | Rock Vane |
| 394.99 | 1293.88 | Rock Vane |
| 515.14 | 1292.98 | Rock Vane |
| 1017.42 | 1287.25 | Rock Vane |

**Purlear Phase II**
**Longitudinal Profile**
**2007 -Reach 4**
**Wetland Area**
**Survey: 8/2/07**



**Project Name** Purlear Phase II
**Task** Longitudinal Profile
**Section** Reach 4 Wetland
**Date** 8/6/07
**Crew** Roberts, Price, Zink

**2007 Survey**

| Station | Elev | Description |
|---|---|---|
| 61.03 | 1328.73 | T |
| 69.38 | 1328.81 | T |
| 84.74 | 1328.26 | T |
| 98.64 | 1328.26 | T |
| 109.12 | 1328.07 | T |
| 116.72 | 1328.06 | T |
| 127.45 | 1326.82 | T |
| 145.29 | 1327.35 | T |
| 165.95 | 1326.48 | T |
| 183.04 | 1326.65 | T |
| 208.98 | 1326.12 | T |
| 211.91 | 1326.58 | T |
| 213.43 | 1325.65 | T |
| 239.77 | 1325.59 | T |
| 257.58 | 1325.4 | T |
| 271.51 | 1325.35 | T |
| 284.33 | 1325.11 | T |
| 284.4 | 1325.11 | T |
| 291.73 | 1324.37 | T |
| 307.13 | 1324.68 | T |
| 329.73 | 1323.66 | T |
| 352.02 | 1323.75 | T |
| 365.41 | 1323.62 | T |
| 381.24 | 1322.82 | T |
| 394.77 | 1322.83 | T |
| 415.64 | 1321.8 | T |
| 434.97 | 1321.79 | T |
| 437.76 | 1321.85 | T |
| 438.82 | 1321.06 | T |
| 445.66 | 1320.56 | T |
| 447.75 | 1320.51 | T |
| 480.82 | 1319.67 | T |
| 492.88 | 1320.38 | T |
| 504.6 | 1320.19 | T |
| 507.74 | 1320.26 | T |
| 510.71 | 1319.73 | T |
| 510.89 | 1319.64 | T |
| 513.72 | 1319.01 | T |
| 519.94 | 1318.89 | T |
| 540.21 | 1319.93 | T |
| 544.05 | 1319.09 | T |
| 553.1 | 1318.39 | T |
| 566.36 | 1318.87 | T |
| 578.54 | 1318.77 | T |
| 587.52 | 1318.71 | T |
| 600.96 | 1318.87 | T |
| 601.32 | 1319.22 | T |
| 605.89 | 1318.23 | T |
| 608.42 | 1317.31 | T |
| 615.89 | 1316.16 | T |
| 638.22 | 1317.67 | T |
| 655.29 | 1317.33 | T |
| 663.88 | 1317.73 | T |
| 666.99 | 1316.37 | T |
| 674.54 | 1315.86 | T |
| 683.68 | 1316.76 | T |
| 693.03 | 1316.48 | T |
| 697.94 | 1316.96 | T |
| 700.55 | 1315.69 | T |
| 710.04 | 1315.76 | T |
| 721.47 | 1316.07 | T |
| 730.89 | 1316.14 | T |
| 736.83 | 1316.55 | T |
| 740.41 | 1315.42 | T |
| 751.92 | 1314.84 | T |
| 768.04 | 1314.63 | T |
| 783.23 | 1315.31 | T |
| 796.39 | 1315.27 | T |
| 809.52 | 1315.16 | T |
| 814.43 | 1315.52 | T |
| 816.82 | 1314.89 | T |
| 819.77 | 1313.64 | T |
| 832.43 | 1314.53 | T |
| 837.82 | 1314.58 | T |
| 849.96 | 1314.98 | T |
| 852.26 | 1313.91 | T |
| 863.1 | 1314.07 | T |
| 879.69 | 1314.17 | T |
| 894.75 | 1314.1 | T |
| 906.27 | 1314.48 | T |
| 909.04 | 1313.06 | T |
| 920.24 | 1312.63 | T |
| 920.41 | 1312.64 | T |
| 932.43 | 1313.56 | T |
| 937.72 | 1314.28 | T |
| 945.9 | 1313.65 | T |
| 953.87 | 1313.98 | T |
| 957.2 | 1312.85 | T |
| 964.85 | 1312.44 | T |
| 978.74 | 1312.47 | T |
| 993.24 | 1313.1 | T |
| 996.6 | 1312.64 | T |
| 1007.74 | 1312.38 | T |
| 1015.51 | 1311.01 | T |
| 1021.95 | 1311.65 | T |
| 1030.47 | 1312.27 | T |
| 1039.26 | 1312.02 | T |
| 1045.09 | 1312.37 | T |
| 1048.71 | 1310.32 | T |
| 1056.94 | 1311.09 | T |
| 1067.87 | 1311.03 | T |
| 1084.98 | 1311.45 | T |
| 1095.73 | 1310.81 | T |
| 1109.41 | 1311.3 | T |
| 1121.57 | 1311.42 | T |
| 1123.47 | 1310.94 | T |

| Station | Elev | Description |
|---|---|---|
| 1131.54 | 1309.98 | T |
| 1143.65 | 1310.22 | T |
| 1144.01 | 1310.23 | T |
| 1155.98 | 1310.1 | T |
| 1159.07 | 1310.05 | T |
| 1162.52 | 1309.64 | T |
| 1176.67 | 1310.21 | T |
| 1188.59 | 1310.47 | T |
| 1191.71 | 1309.81 | T |
| 1204.86 | 1308.95 | T |
| 1228.12 | 1310.02 | T |
| 1231.08 | 1308.11 | T |
| 1239.07 | 1308.17 | T |
| 1247.12 | 1308.78 | T |
| 1256.48 | 1309.06 | T |
| 1258.93 | 1308.62 | T |
| 1261.61 | 1308.89 | T |
| 1262.24 | 1308.3 | T |
| 1272.89 | 1307.69 | T |
| 1288.48 | 1308.21 | T |
| 1301.17 | 1308.05 | T |
| 1324.96 | 1308.46 | T |
| 1328.21 | 1308.37 | T |
| 1330.28 | 1306.89 | T |
| 1343.2 | 1306.42 | T |
| 1356.35 | 1307.97 | T |
| 1367.1 | 1307.59 | T |
| 1368.96 | 1306.25 | T |
| 1381.09 | 1306.1 | T |
| 1389.25 | 1306.29 | T |
| 1401.96 | 1306.88 | T |
| 1420.39 | 1306.36 | T |
| | | |
| | | |
| | | |
| 60.19 | 1329.14 | W |
| 69.98 | 1329.01 | W |
| 75.99 | 1328.87 | W |
| 86.61 | 1328.62 | W |
| 95.84 | 1328.55 | W |
| 98.21 | 1328.51 | W |
| 108.43 | 1328.57 | W |
| 109.05 | 1328.44 | W |
| 114.89 | 1328.43 | W |
| 118.34 | 1328.38 | W |
| 124.63 | 1328.2 | W |
| 128.59 | 1327.64 | W |
| 130.31 | 1327.63 | XS1W |
| 131.87 | 1327.66 | W |
| 132.34 | 1327.49 | XS1W |
| 139.07 | 1327.64 | W |
| 151.99 | 1327.18 | XS2W |
| 152.92 | 1327.17 | XS2W |
| 165.18 | 1327.24 | W |
| 167.25 | 1327.21 | W |
| 180.69 | 1327.09 | W |
| 180.73 | 1327.11 | W |
| 194.36 | 1327 | W |
| 199.42 | 1326.89 | W |
| 206.64 | 1326.75 | W |
| 209.61 | 1326.7 | W |
| 216.72 | 1326.38 | W |
| 217.75 | 1326.37 | W |
| 227.94 | 1326.25 | W |
| 229.57 | 1326.36 | W |
| 244.55 | 1325.83 | W |
| 247.31 | 1325.79 | W |
| 260.15 | 1325.72 | W |
| 260.21 | 1325.73 | W |
| 288.42 | 1325.53 | W |
| 288.45 | 1325.52 | W |
| 293.03 | 1325.03 | W |
| 303.09 | 1325.02 | W |
| 304.51 | 1325 | W |
| 315.47 | 1324.9 | W |
| 324.73 | 1324.82 | W |
| 328.08 | 1324.52 | W |
| 330.74 | 1324.4 | W |
| 336.2 | 1324.31 | W |
| 345.74 | 1324.29 | W |
| 362.39 | 1324.11 | W |
| 365.73 | 1323.94 | W |
| 374.75 | 1323.5 | W |
| 375.01 | 1323.54 | W |
| 377.41 | 1323.19 | W |
| 378.16 | 1323.22 | W |
| 394.35 | 1323.1 | W |
| 395.62 | 1323.03 | W |
| 405.46 | 1322.88 | W |
| 410.86 | 1322.37 | W |
| 415.12 | 1322.34 | W |
| 427.41 | 1322.25 | W |
| 432.84 | 1322.2 | W |
| 434.16 | 1322.2 | W |
| 434.26 | 1322.28 | W |
| 439.01 | 1321.29 | W |
| 439.28 | 1321.27 | W |
| 445.7 | 1321.24 | W |
| 449.11 | 1320.78 | W |
| 455.23 | 1321.14 | W |
| 462.66 | 1321.06 | XS3W |
| 463.7 | 1321.1 | XS3W |
| 465.44 | 1321.12 | W |
| 473.12 | 1320.71 | W |
| 473.37 | 1320.93 | W |
| 476.53 | 1320.83 | W |

| Station | Elev | Description |
|---|---|---|
| 477.78 | 1320.87 | W |
| 478.08 | 1320.87 | W |
| 493.39 | 1320.84 | W |
| 494.04 | 1320.79 | W |
| 504.16 | 1320.62 | W |
| 507.86 | 1320.49 | W |
| 507.92 | 1320.39 | W |
| 513.61 | 1320.28 | W |
| 514.7 | 1320.25 | W |
| 521.15 | 1320.28 | W |
| 532.15 | 1320.2 | W |
| 541.13 | 1320 | W |
| 543.81 | 1319.7 | W |
| 544.8 | 1319.73 | W |
| 554.12 | 1319.58 | W |
| 555.21 | 1319.46 | W |
| 559.62 | 1319.51 | W |
| 566.38 | 1319.43 | W |
| 572.8 | 1319.35 | W |
| 576.23 | 1319.36 | W |
| 579.98 | 1319.42 | W |
| 589.15 | 1319.35 | W |
| 593.72 | 1319.37 | W |
| 598.45 | 1319.34 | W |
| 610.24 | 1318.28 | W |
| 615.29 | 1318.25 | W |
| 624.99 | 1318.16 | W |
| 628.91 | 1318.22 | W |
| 638.37 | 1318.16 | W |
| 650.93 | 1318.19 | W |
| 653.99 | 1318 | W |
| 658.58 | 1318.04 | W |
| 665.14 | 1317.95 | W |
| 671.12 | 1317.38 | W |
| 671.37 | 1317.45 | W |
| 672.84 | 1317.47 | W |
| 686.28 | 1317.32 | W |
| 691.21 | 1317.41 | W |
| 695.22 | 1317.28 | W |
| 698.55 | 1317.35 | W |
| 701.3 | 1316.83 | W |
| 708.48 | 1316.79 | W |
| 712.18 | 1316.81 | W |
| 720.94 | 1316.79 | W |
| 728.83 | 1316.93 | W |
| 729.07 | 1316.82 | W |
| 737.85 | 1316.68 | W |
| 740.91 | 1315.99 | W |
| 741.26 | 1315.91 | W |
| 750.62 | 1316.04 | W |
| 751.35 | 1316 | W |
| 759.42 | 1315.98 | XS4W |
| 761.14 | 1315.96 | XS4W |
| 761.68 | 1315.95 | W |
| 762.02 | 1315.93 | W |
| 767.85 | 1315.97 | W |
| 774.38 | 1315.85 | W |
| 777.63 | 1315.98 | W |
| 786.72 | 1315.95 | W |
| 791.51 | 1315.91 | W |
| 797.17 | 1315.9 | W |
| 806.17 | 1315.76 | W |
| 807.04 | 1315.92 | W |
| 814.92 | 1315.77 | W |
| 821.62 | 1315.33 | W |
| 825.98 | 1315.4 | W |
| 838.08 | 1315.34 | W |
| 841.37 | 1315.37 | W |
| 850.98 | 1315.11 | W |
| 855.41 | 1314.98 | W |
| 857.19 | 1314.94 | W |
| 865.37 | 1314.9 | W |
| 875.06 | 1314.9 | W |
| 877.57 | 1314.92 | W |
| 885.04 | 1314.85 | W |
| 890.93 | 1314.88 | W |
| 894.72 | 1314.89 | W |
| 895.14 | 1314.85 | W |
| 906.49 | 1314.68 | W |
| 907.77 | 1314.68 | W |
| 909.52 | 1314.55 | W |
| 911.65 | 1314.54 | W |
| 916.38 | 1314.53 | W |
| 921.47 | 1314.49 | W |
| 926.59 | 1314.4 | W |
| 928.76 | 1314.5 | W |
| 929.71 | 1314.43 | W |
| 937.62 | 1314.29 | W |
| 939.19 | 1314.41 | W |
| 952.03 | 1314.2 | W |
| 953.7 | 1314.27 | W |
| 955.57 | 1314.17 | W |
| 957.73 | 1313.62 | W |
| 966.55 | 1313.68 | W |
| 967.34 | 1313.72 | W |
| 970.08 | 1313.7 | W |
| 973.28 | 1313.64 | W |
| 977.17 | 1313.67 | W |
| 984.79 | 1313.69 | W |
| 984.95 | 1313.6 | W |
| 991.23 | 1313.65 | W |
| 996.89 | 1313.14 | W |
| 1003.8 | 1312.95 | W |
| 1004.72 | 1312.93 | W |
| 1011.96 | 1312.65 | W |
| 1017.64 | 1312.76 | W |

| Station | Elev | Description |
|---|---|---|
| 1018.95 | 1312.68 | W |
| 1030.12 | 1312.72 | W |
| 1030.4 | 1312.86 | W |
| 1038.68 | 1312.79 | W |
| 1045.13 | 1312.58 | W |
| 1048.84 | 1312.18 | W |
| 1053.78 | 1312.19 | W |
| 1054.34 | 1312.28 | W |
| 1058.98 | 1312.14 | W |
| 1062.75 | 1312.19 | W |
| 1066.36 | 1312.13 | W |
| 1069.17 | 1312.2 | W |
| 1073.45 | 1312.19 | XS5W |
| 1075.58 | 1312.17 | XS5W |
| 1076.8 | 1312.22 | W |
| 1077.29 | 1312.09 | W |
| 1084.67 | 1312.1 | W |
| 1090.04 | 1312.16 | W |
| 1096.99 | 1312.11 | W |
| 1097.73 | 1312.18 | W |
| 1104.12 | 1312 | W |
| 1105.49 | 1312.06 | W |
| 1116.16 | 1311.85 | W |
| 1117.46 | 1312.02 | W |
| 1121.71 | 1311.87 | W |
| 1126.09 | 1311.34 | W |
| 1128.15 | 1311.26 | W |
| 1136.62 | 1311.22 | W |
| 1139.91 | 1311.15 | W |
| 1140.78 | 1311.14 | XS6W |
| 1142.37 | 1311.21 | XS6W |
| 1142.6 | 1311.23 | W |
| 1151.97 | 1311.18 | W |
| 1157.06 | 1311.12 | W |
| 1160.66 | 1310.9 | W |
| 1160.68 | 1311.03 | W |
| 1171.53 | 1310.94 | W |
| 1172.5 | 1311.01 | W |
| 1178.68 | 1310.95 | W |
| 1182.37 | 1310.92 | W |
| 1188.54 | 1310.76 | W |
| 1191.59 | 1310.51 | W |
| 1198.51 | 1310.5 | W |
| 1199.61 | 1310.48 | W |
| 1205.59 | 1310.48 | W |
| 1209.61 | 1310.55 | W |
| 1220 | 1310.45 | W |
| 1224.51 | 1310.45 | W |
| 1229.61 | 1310.24 | W |
| 1229.96 | 1310.21 | W |
| 1234.25 | 1309.45 | W |
| 1234.7 | 1309.49 | W |
| 1242.84 | 1309.37 | W |
| 1244.14 | 1309.52 | W |
| 1252.57 | 1309.36 | W |
| 1254.46 | 1309.41 | W |
| 1257.62 | 1309.29 | W |
| 1260.46 | 1308.9 | W |
| 1264.06 | 1308.7 | W |
| 1271.41 | 1308.76 | W |
| 1275.49 | 1308.71 | W |
| 1281.55 | 1308.88 | W |
| 1287.12 | 1308.6 | W |
| 1293.08 | 1308.5 | W |
| 1299.77 | 1308.53 | W |
| 1299.8 | 1308.73 | W |
| 1301.88 | 1308.58 | W |
| 1324.16 | 1308.65 | W |
| 1326.3 | 1308.69 | W |
| 1329.05 | 1308.48 | W |
| 1335.73 | 1308.37 | W |
| 1336.61 | 1308.23 | W |
| 1340.93 | 1308.19 | W |
| 1346.22 | 1308.3 | W |
| 1350.41 | 1308.23 | W |
| 1353.66 | 1308.19 | W |
| 1360.41 | 1308.02 | W |
| 1367.33 | 1307.98 | W |
| 1367.91 | 1307.87 | W |
| 1374.73 | 1307.43 | W |
| 1375.19 | 1307.37 | W |
| 1380.94 | 1307.25 | W |
| 1383.62 | 1307.28 | W |
| 1390.02 | 1307.25 | W |
| 1398.68 | 1307.22 | W |
| 1399.18 | 1307.16 | W |
| 1401.98 | 1307.26 | W |
| 1409.2 | 1307.02 | W |
| 1424.76 | 1307.14 | W |
| | | |
| | | |
| 65.57 | 1330.73 | TOB |
| 75.35 | 1328.89 | TOB |
| 110.17 | 1328.94 | TOB |
| 132.07 | 1330.42 | TOB |
| 135.48 | 1328.53 | TOB |
| 140.22 | 1330.73 | TOB |
| 203.86 | 1327.92 | TOB |
| 214.99 | 1329.31 | TOB |
| 248.76 | 1327.02 | TOB |
| 251.97 | 1328.34 | TOB |
| 301.08 | 1326.48 | TOB |
| 313.21 | 1325.57 | TOB |
| 401.87 | 1323.65 | TOB |
| 436.24 | 1322.68 | TOB |
| 444.54 | 1322.54 | TOB |

| Station | Elev | Description |
|---|---|---|
| 447.52 | 1322.37 | TOB |
| 450.01 | 1322.55 | TOB |
| 477.41 | 1321.34 | TOB |
| 478.94 | 1321.55 | TOB |
| 504.63 | 1320.86 | TOB |
| 504.63 | 1320.87 | TOB |
| 563.33 | 1320.38 | TOB |
| 571.36 | 1320.91 | TOB |
| 613.63 | 1319.78 | TOB |
| 623.77 | 1319.68 | TOB |
| 684.38 | 1318.53 | TOB |
| 694.33 | 1317.95 | TOB |
| 711.56 | 1317.78 | TOB |
| 727.53 | 1317.77 | TOB |
| 739.47 | 1317.15 | TOB |
| 746.8 | 1317.7 | TOB |
| 759.09 | 1318.14 | TOB |
| 767.35 | 1317.03 | TOB |
| 784.61 | 1317.28 | TOB |
| 808.54 | 1316.43 | TOB |
| 818.52 | 1316.56 | TOB |
| 838.29 | 1315.71 | TOB |
| 840.06 | 1316.1 | TOB |
| 877.19 | 1315.39 | TOB |
| 880.85 | 1315.58 | TOB |
| 910.83 | 1315.09 | TOB |
| 916.82 | 1315.48 | TOB |
| 950.16 | 1314.61 | TOB |
| 959.85 | 1314.69 | TOB |
| 968.46 | 1314.7 | TOB |
| 991.77 | 1314.07 | TOB |
| 1011.88 | 1314.43 | TOB |
| 1024.42 | 1314.14 | TOB |
| 1042.12 | 1313.31 | TOB |
| 1060.89 | 1312.94 | TOB |
| 1085.46 | 1312.86 | TOB |
| 1095.98 | 1313.74 | TOB |
| 1098.31 | 1313.38 | TOB |
| 1108.91 | 1313.33 | TOB |
| 1113.03 | 1312.67 | TOB |
| 1126.7 | 1312.9 | TOB |
| 1135.62 | 1312.15 | TOB |
| 1156.93 | 1311.62 | TOB |
| 1171.51 | 1312.11 | TOB |
| 1189.19 | 1311.16 | TOB |
| 1195.46 | 1311.68 | TOB |
| 1217.31 | 1313.5 | TOB |
| 1265.83 | 1310.49 | TOB |
| 1275.12 | 1312.4 | TOB |
| 1288.31 | 1311.4 | TOB |
| 1299.05 | 1312.18 | TOB |
| 1303.94 | 1312.5 | TOB |
| 1321.43 | 1311.84 | TOB |
| 1334.19 | 1311.1 | TOB |
| 1345.39 | 1310.19 | TOB |
| 1362.49 | 1310.05 | TOB |
| 1377.82 | 1309.95 | TOB |
| 1415.86 | 1308.69 | TOB |
| 1420.93 | 1308.35 | TOB |
| | | |
| | | |
| 234.15 | 1327.2 | BNKF |
| 333.92 | 1325.3 | BNKF |
| 411.58 | 1323.44 | BNKF |
| 433.07 | 1322.95 | BNKF |
| 527.36 | 1321.14 | BNKF |
| 653.7 | 1318.96 | BNKF |
| 656.34 | 1318.74 | BNKF |
| 735.01 | 1317.38 | BNKF |
| 751.77 | 1317.38 | BNKF |
| 809.9 | 1316.53 | BNKF |
| 812.7 | 1316.56 | BNKF |
| 934.59 | 1315.11 | BNKF |
| 955.72 | 1314.67 | BNKF |
| 962.38 | 1314.7 | BNKF |
| 1012.7 | 1313.63 | BNKF |
| 1044.38 | 1313.41 | BNKF |
| 1055.23 | 1313.16 | BNKF |
| 1123.72 | 1312.88 | BNKF |
| 1126.13 | 1312.54 | BNKF |
| 1184.95 | 1311.44 | BNKF |
| 1192 | 1311.88 | BNKF |
| 1235.25 | 1310.75 | BNKF |
| 1243.42 | 1311.3 | BNKF |
| 1248.75 | 1310.23 | BNKF |
| 1281.57 | 1310.34 | BNKF |
| 1281.83 | 1310.34 | BNKF |
| 1338.97 | 1309.78 | BNKF |
| 1354.22 | 1310.04 | BNKF |
| 1360.15 | 1310.12 | BNKF |
| 1382.99 | 1309.16 | BNKF |
| 1388.94 | 1309.12 | BNKF |
| 1412.08 | 1308.92 | BNKF |

| Station | Elev | Description |
|---|---|---|
| 125.98 | 1328.11 | Rock Vane |
| 211.89 | 1326.65 | Rock Vane |
| 288.85 | 1325.31 | Rock Vane |
| 325.94 | 1324.63 | Rock Vane |
| 375.56 | 1323.36 | Rock Vane |
| 405.6 | 1322.58 | Rock Vane |
| 441.73 | 1322.28 | Rock Vane |
| 476.24 | 1321 | Rock Vane |
| 508.99 | 1320.41 | Rock Vane |
| 541.76 | 1320.18 | Rock Vane |
| 601.98 | 1319.12 | Rock Vane |
| 665.6 | 1317.77 | Rock Vane |
| 708.12 | 1317 | Rock Vane |
| 738.33 | 1316.52 | Rock Vane |
| 815.66 | 1315.63 | Rock Vane |
| 851.62 | 1315.1 | Rock Vane |
| 907.52 | 1314.63 | Rock Vane |
| 956.51 | 1313.95 | Rock Vane |
| 995.36 | 1313.48 | Rock Vane |
| 1045.72 | 1312.9 | Rock Vane |
| 1121.71 | 1311.63 | Rock Vane |
| 1158.28 | 1311.01 | Rock Vane |
| 1191.35 | 1310.65 | Rock Vane |
| 1230.07 | 1310.14 | Rock Vane |
| 1258.41 | 1309.3 | Rock Vane |
| 1330.03 | 1308.75 | Rock Vane |
| 1369.26 | 1307.61 | Rock Vane |

| | |
|---|---|
| **Project Name** | Purlear Creek - Phase II |
| **Task** | Feature Slope and Length Calculations |
| | |
| **Date** | |
| **Crew** | Roberts, Price, Zink |

**Reach 4 - 2007**

| Riffle Station | Change | Water Elev | change | slope |
|---|---|---|---|---|
| 60 | | 1329.14 | | |
| 95 | 35 | 1328.55 | 0.59 | 1.69% |
| 139 | | 1327.64 | | |
| 153 | 14 | 1327.17 | 0.47 | 3.36% |
| 194 | | 1327 | | |
| 216 | 22 | 1326.38 | 0.62 | 2.82% |
| 229.5 | | 1326.36 | | |
| 260 | 30.5 | 1325.72 | 0.64 | 2.10% |
| 288 | | 1325.52 | | |
| 303 | 15 | 1325.02 | 0.5 | 3.33% |
| 315 | | 1324.9 | | |
| 325 | 10 | 1324.82 | 0.08 | 0.80% |
| 362 | | 1324.11 | | |
| 378 | 16 | 1323.22 | 0.89 | 5.56% |
| 395 | | 1323.03 | | |
| 415 | 20 | 1322.34 | 0.69 | 3.45% |
| 465 | | 1321.12 | | |
| 478 | 13 | 1320.87 | 0.25 | 1.92% |
| 494 | | 1320.84 | | |
| 515 | 21 | 1320.25 | 0.59 | 2.81% |
| 566 | | 1319.43 | | |
| 589 | 23 | 1319.35 | 0.08 | 0.35% |
| 651 | | 1318.19 | | |
| 671 | 20 | 1317.45 | 0.74 | 3.70% |
| 695 | | 1317.28 | | |
| 709 | 14 | 1316.79 | 0.49 | 3.50% |
| 737 | | 1316.68 | | |
| 751 | 14 | 1316 | 0.68 | 4.86% |
| 777 | | 1315.98 | | |
| 815 | 38 | 1315.77 | 0.21 | 0.55% |
| 841 | | 1315.37 | | |
| 865 | 24 | 1314.9 | 0.47 | 1.96% |
| 885 | | 1314.85 | | |
| 907 | 22 | 1314.68 | 0.17 | 0.77% |
| 938 | | 1314.29 | | |
| 956 | 18 | 1314.17 | 0.12 | 0.67% |
| 997 | | 1313.14 | | |
| 1018 | 21 | 1312.76 | 0.38 | 1.81% |
| 1039 | | 1312.79 | | |
| 1045 | 6 | 1312.58 | 0.21 | 3.50% |
| 1097 | | 1312.11 | | |
| 1106 | 9 | 1312.06 | 0.05 | 0.56% |
| 1115 | | 1311.85 | | |
| 1126 | 11 | 1311.34 | 0.51 | 4.64% |
| 1143 | | 1311.23 | | |
| 1161 | 18 | 1310.9 | 0.33 | 1.83% |
| 1178 | | 1310.95 | | |
| 1189 | 11 | 1310.76 | 0.19 | 1.73% |
| 1220 | | 1310.45 | | |
| 1229 | 9 | 1310.24 | 0.21 | 2.33% |
| 1244 | | 1309.52 | | |
| 1257 | 13 | 1309.29 | 0.23 | 1.77% |
| 1354 | | 1308.19 | | |
| 1375 | 21 | 1307.43 | 0.76 | 3.62% |
| 1401 | | 1307.26 | | |
| 1424 | 23 | 1307.14 | 0.12 | 0.52% |

**Reach 1 - 2007**

| Riffle Station | Change | Water Elev | change | slope |
|---|---|---|---|---|
| 24 | | 1295.99 | | |
| 45 | 21 | 1295.65 | 0.34 | 1.62% |
| 130 | | 1295.12 | | |
| 177 | 47 | 1294.57 | 0.55 | 1.17% |
| 488 | | 1293.2 | | |
| 511 | 23 | 1293.1 | 0.1 | 0.43% |
| 555 | | 1292.34 | | |
| 576 | 21 | 1292.3 | 0.04 | 0.19% |
| 644 | | 1292.4 | | |
| 670 | 26 | 1292.38 | 0.02 | 0.08% |
| 774 | | 1291.63 | | |
| 800 | 26 | 1291.3 | 0.33 | 1.27% |
| 856 | | 1288.58 | | |
| 877 | 21 | 1287.57 | 1.01 | 4.81% |
| 931 | | 1287.41 | | |
| 954 | 23 | 1287.33 | 0.08 | 0.35% |
| 1076 | | 1286.3 | | |
| 1120 | 44 | 1285.7 | 0.6 | 1.36% |

| Pool Station | length | p-p spacing |
|---|---|---|
| **Reach 1 - 2006** | | |
| 3 | | |
| 24 | 21 | |
| 57 | | |
| 131 | 74 | 80.5 |
| 181 | | |
| 276 | 95 | 134.5 |
| 282 | | |
| 395 | 113 | 110 |
| 399 | | |
| 497 | 98 | 109.5 |
| 520 | | |
| 557 | 37 | 90.5 |
| 575 | | |
| 640 | 65 | 69 |

**Reach 4 - 2006**

| | | | | | |
|---|---|---|---|---|---|
| 93 | | | 740 | | |
| 122 | 29 | | 797 | 57 | 53.5 |
| 129 | | | 816 | | |
| 141 | 12 | 27.5 | 842 | 26 | 60.5 |
| 164 | | | 854 | | |
| 194 | 30 | 44 | 895 | 41 | 45.5 |
| 211 | | | 910 | | |
| 229 | 18 | 41 | 934 | 24 | 47.5 |
| 247 | | | 958 | | |
| 285 | 38 | 46 | 992 | 34 | 53 |
| 295 | | | 1018 | | |
| 315 | 20 | 39 | 1039 | 21 | 53.5 |
| 329 | | | 1047 | | |
| 364 | 35 | 41.5 | 1082 | 35 | 36 |
| 378 | | | 1094 | | |
| 397 | 19 | 41 | 1109 | 15 | 37 |
| 414 | | | 1126 | | |
| 434 | 20 | 36.5 | 1147 | 21 | 35 |
| 446 | | | 1161 | | |
| 465 | 19 | 31.5 | 1178 | 17 | 33 |
| 478 | | | 1191 | | |
| 498 | 20 | 32.5 | 1224 | 33 | 38 |
| 515 | | | 1232 | | |
| 539 | 24 | 39 | 1247 | 15 | 32 |
| 542 | | | 1264 | | |
| 568 | 26 | 28 | 1298 | 34 | 41.5 |
| 588 | | | 1333 | | |
| 598 | 10 | 38 | 1354 | 21 | 62.5 |
| 610 | | | 1376 | | |
| 651 | 41 | 37.5 | 1401 | 25 | 45 |
| 672 | | | 1449 | | |
| 698 | 26 | 54.5 | 1460 | 11 | 66 |
| 701 | | | | | |
| 729 | 28 | 30 | | | |

| Reach 4 | min | max | median |
|---|---|---|---|
| **Riffle Length** | 6.0 | 38.0 | 18.0 |
| **Riffle Slope** | 0.35% | 5.56% | 2.03% |
| **Pool Length** | 10.0 | 57.0 | 24.0 |
| **Pool Spacing** | 28 | 66 | 40 |

| Reach 1 | min | max | median |
|---|---|---|---|
| **Riffle Length** | 21.0 | 47.0 | 23.0 |
| **Riffle Slope** | 0.08% | 4.81% | 1.17% |
| **Pool Length** | 21.0 | 113.0 | 74.0 |
| **Pool Spacing** | 59 | 135 | 100 |

Note: minimum riffle slope caused by beaver dam

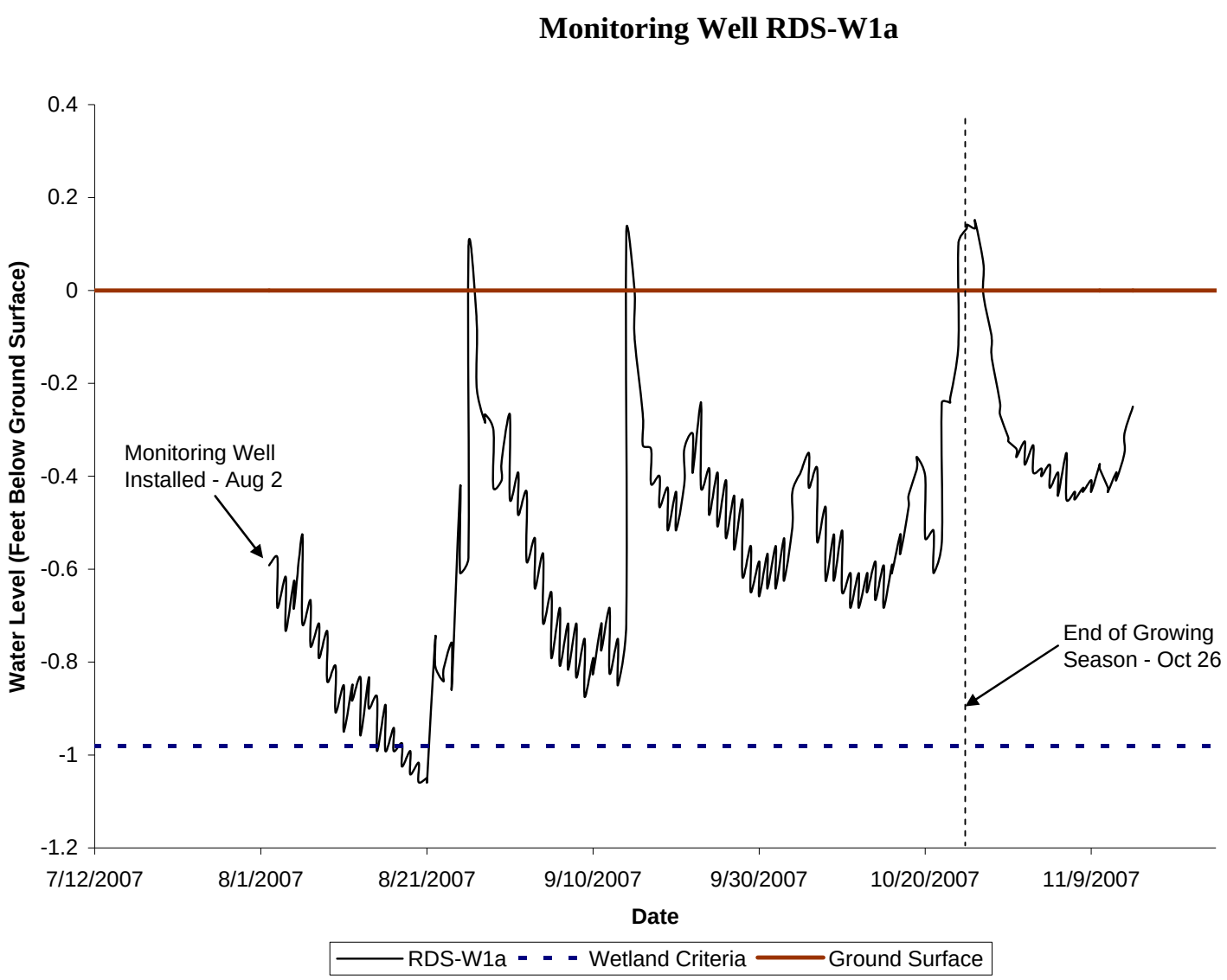
| | |
|---|---|
| **Project Name** | Purlear Phase II |
| **Task** | Channel Pattern Measurements |
| | |
| **Date** | |
| **Crew** | Roberts, Price, Zink |

| **Reach 4** 2007 | | | |
|---|---|---|---|
| **Radius of Curvature** | **Meander Wavelength** | **Channel Beltwidth** | |
| 41 | 111 | 24 | |
| 38 | 97 | 20 | |
| 68 | 76 | 26 | |
| 26 | 62 | 17 | |
| 45 | 117 | 18 | |
| 16 | 171 | 21 | |
| 29 | 133 | 41 | |
| 13 | 132 | 41 | |
| 112 | 88 | 36 | |
| 17 | 74 | 42 | |
| 25 | 64 | 38 | |
| 33 | 69 | 31 | |
| 18 | 71 | 28 | |
| 21 | 97 | 30 | |
| 15 | 66 | 22 | |
| 13 | 77 | 29 | |
| 25 | 98 | 34 | |
| 22 | | 20 | |
| 30 | | | |
| 21 | | | |
| 37 | | | |
| 21 | | | |
| 49 | | | |
| 49 | | | |
| 37 | | | |
| | | | |
| 13 | 62 | 17 | ***min*** |
| 112 | 171 | 42 | ***max*** |
| 26 | 88 | 29 | ***median*** |

| **Reach 1** 2007 | | | |
|---|---|---|---|
| **Radius of Curvature** | **Meander Wavelength** | **Channel Beltwidth** | |
| 38 | 201 | 36 | |
| 50 | 255 | 44 | |
| 88 | | | |
| | | | |
| | | | |
| | | | |
| 38 | 201 | 36 | ***min*** |
| 88 | 255 | 44 | ***max*** |
| 50 | 228 | 40 | ***median*** |

# APPENDIX C

1. Wetland Groundwater Level Graphs


Monitoring Well RDS-W1a
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1.2
Water Level (Feet Below Ground Surface)
Monitoring Well Installed - Aug 2
End of Growing Season - Oct 26
7/12/2007
8/1/2007
8/21/2007
9/10/2007
9/30/2007
10/20/2007
11/9/2007
Date
RDS-W1a
Wetland Criteria
Ground Surface